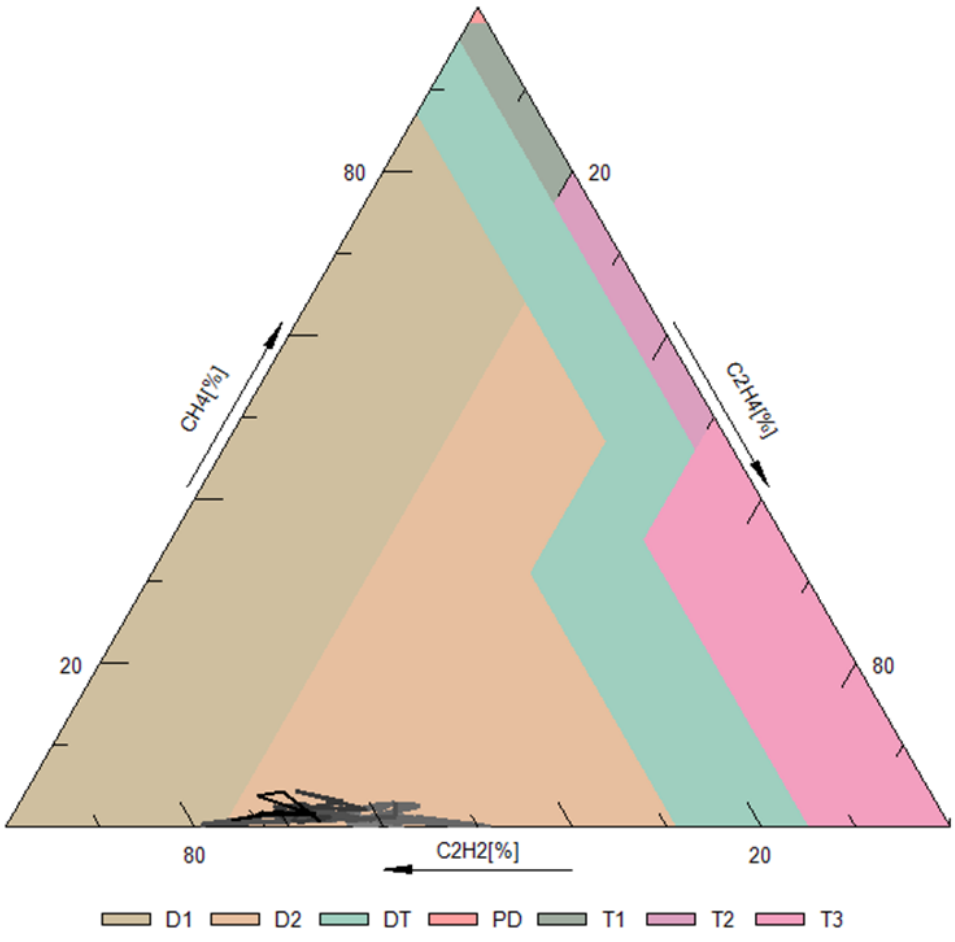
SIEMENS energy

SITRAM®

Multisense Software

Installation and Operation Manual

siemens-energy.com



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Document Revision History

	Revision-ID	Changes
☑	**2.0**	**SE Branding**

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Purpose

This manual is part of a documentation package for the Siemens Energy SITRAM® Multisense 9

The package is subdivided in 3 different manuals with individual main focuses:

	Main Focuses	Topics
☐	Installation	Provides a comprehensive overview and guidelines to work steps of onsite system installation, connection layouts, checkups, preparation and mounting of the hardware components depending on individual situations. Photo material from real installation environment makes it easier to understand settings and points out the essentials.
☐	Commissioning	Describes the approach of configuration and start of the system step-by-step. Possible upcoming problems during the process are addressed in the different sections.
☑	**Communication & Software**	**Provides a detailed overview and guidelines in the context of the system communication capabilities (protocols, interfaces, separate and optional communication units etc.) as well as the system related set of user software and superior monitoring landscape.**
Bold = Does apply for this document / Not Bold = Does not apply for this document		

Audience

See also “Qualified personnel“ section

	Main Focuses	Audience
☐	Installation	Is intended for service technicians and installation staff with electrical background responsible for mounting the equipment and components.
☐	Commissioning	Is intended for normal operator users especially in context of standalone monitoring as well as commissioning engineers who are familiar with dealing with communication protocols and remote connection establishment for SCADA etc.
☑	**Communication & Software**	**Is intended for normal operator users especially in context of standalone monitoring as well as commissioning engineers who are familiar with dealing with communication protocols and remote connection establishment for SCADA etc..**
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Contents

Document Revision History **3**
Purpose **4**
Audience **4**
Contents **5**
Legal Provisions **7**
Warning notice Concept 7
Qualified personell 7
Use of the Product 7
Limitation of use 7
Trademarks 7
Disclaimer of Liability 7
Waste and Recycling 8
Related Manuals **9**
Customer Support Center **9**
1. SITRAM® Multisense Software **10**
1.1 Purpose of the Program 10
1.2 Advice for use of this Operation Manual 10
1.3 PC-Requirements 10
1.4 Installation 10
1.4.1 SITRAM® Multisense Software – InstallShield Wizard 11
1.4.2 Start Program 11
1.4.3 Adjust the Installation 12
2. User Interface Areas **12**
2.1 Menu bar 13
2.1.1 File - Menu 13
2.1.2 Edit - Menu 19
2.1.3 View - Menu 22
2.1.4 Transformer - Menu 24
2.1.5 Extra - Menu 25
2.1.6 Help - Menu 27
2.2 Tree Structure 28
2.3 Working Area 28
2.4 Message Area 29
2.5 Context Menu 29
3. Working with SITRAM® Multisense Software **30**
3.1 Customer Customer 30
3.1.1 Rename the Customer Directory .. 30
3.1.2 Working Area Customer 30
3.1.3 Context Menu Customer 30
3.2 Station Station 31
3.2.1 Set up a New Station 31
3.2.2 Working Area Station 31
3.2.3 Context Menu Station 32
3.3 Transformer Transformer 32
3.3.1 Set up a New Transformer 33
3.3.2 Working Area Transformer 33
3.3.3 Context Menu Transformer 34
3.4 Connection Connection Settings 36
3.4.1 Modem Settings 36
3.4.2 Serial Interface Settings 37
3.4.3 Network Settings 37
3.4.4 Bridge Settings 37
3.4.5 Common Settings 37
3.5 SITRAM® Multisense Device Settings .. 38
3.5.1 Alert Setup Alert Setup 39
3.5.2 Sensor Setup Sensor Setup 42
3.5.3 Alert SMS Setup Alert SMS Setup 46
3.5.4 DGA Level Adjust DGA Level Adjust 47
3.5.5 Analog Output Setup Analog Outputs 49
3.5.6 Digital Output Setup Digital Outputs 50
3.5.7 Settings Settings 51
3.5.8 Transformer Setup Transformer Setup 54
3.6 Diagnostics Diagnostics 59
3.6.1 Duval Triangle Duval Triangle ... 59
3.6.2 Rogers (3D) Rogers (3D) 68
3.7 Transformer Communication with SITRAM® Multisense Devices 77
3.7.1 SITRAM® Multisense Communication 77
3.7.2 SITRAM® Multisense Connection Scheduler 77

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3.7.3 Windows Task Scheduler with SITRAM® Multisense Software Connection scheduler 82
3.7.4 Lock Data Folder....83
3.8 History View Measurement values (History) 84
3.8.1 Sensor Selection Window....84
3.8.2 Time Span Selection Window Measurement Values....86
3.8.3 Result Window 88
3.8.4 Further Processing of the displayed measurement values....91
3.9 Alerts View Alarms 94
3.9.1 Alarm Selection Window....94
3.9.2 Alarm Time Span Window 95
3.9.3 Alarm Window 97
3.9.4 Further Processing of the displayed Alerts 101
3.10 Online Sensors Online Sensors ... 103
3.10.1 Sensor Selection Window Online Sensors 103
3.10.2 Time Span Selection Window Online Sensors 104
3.10.3 Result Window Online Sensors .. 106
3.10.4 Further Processing of the Online Values 108
3.11 Extraction Status Extraction Status 111
3.11.1 Result Selection Window Extraction Status 112
3.11.2 Result Window Extraction Status 113
Customer Feedback formular 127

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Legal Provisions

Warning notice Concept

This manual contains notices that you must observe in the interests of your own personal safety and in order to avoid damage to property. The notices relating to your personal safety are highlighted with a warning triangle. Those relating to the prevention of damage to property only do not have a warning triangle. The warning notices are presented in decreasing order of severity based on the hazard level involved.



DANGER

Death or serious personal injury will occur if the corresponding precautionary measure is not taken.

Damage to property may occur if the corresponding precautionary measure is not taken.

An undesirable result or state may occur if the

In cases where two or more hazard levels apply, it is always only the warning notice for the most severe level which is used alone. A warning notice with a warning triangle primarily involves possible personal injury. But it also can mean damage to property at the same time.

Qualified personell

The product/system associated with this documentation may only be operated by qualified personnel trained for the task concerned, in accordance with the documentation associated with the task concerned and in particular the safety and warning notices contained in this documentation. Qualified personnel are capable, on the basis of their training and experience, of recognizing risks and avoiding potential hazards in their work with these products/systems.

Use of the Product

Please give due consideration to the following:



DANGER

The Siemens Energy SITRAM® Multisense Software product may only be used for the application it is provided for in the cata-log and in the associated documentation. Using this product in a divergent way may have an impact on the protection provided by the system. Any third-party products and com-ponents used must be approved or recommended by Sie-mens. Proper transportation, storage, assembly, installation, setup, commissioning, operation and maintenance are essen-tial for the safe and effective operation of the products. The specified environmental requirements must be met. Notices in the associated documentation must

Limitation of use

The equipment may only be used as secondary equipment at large stationary equipment as power transformers.

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Waste and Recycling

Due to the limitation of use, the device is not subject to WEEE regulation.

Siemens Energy aims to fulfilling all applicable legislation and regulations. This includes also among many others WEEE and in case any applicable exemptions apply for our products, we will continuously review and update our assessment.

The specific requirements are covered by our Zero Harm Framework as part of our certified Integrated Management System and referenced and implemented with the Building Blocks defined therein, e.g. Waste and Recyclability.

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Related Manuals



„SITRAM® Multisense 5/9 Installation and Operation Manual“

Further Siemens Energy and other OEM Manuals mentioned in body text

Customer Support Center



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(Charges depending on provider)

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support@siemens-energy.com

Website:
Please also visit our website for additional information:
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1. SITRAM® Multisense Software

1.1 Purpose of the Program

SITRAM® Multisense Software is a Microsoft® Windows compatible program, which forms a comprehensive transformer monitoring system together with devices of the SITRAM® Multisense family. In addition to the processing and presenting the read out data, SITRAM® Multisense Software is also used for the configuration of SITRAM® Multisense devices. This document is based on the SITRAM® Multisense Software version 1.6.3.

SITRAM® Multisense Software contains the following functions:

- Configuration and organization of one or several SITRAM® Multisense devices.
- Readout of the saved SITRAM® Multisense data. The data can be readout by the different interfaces or if the SITRAM® Multisense device consists of a modem (option), via modem.
- Preparation and presentation of the readout data. The data is presented in form of tables (3.8.3.1) or time elapsed graphics (3.8.3.2).
- Data can be exported into Excel or CSV-format. A printout of the graphics or a copy into the clipboard of MS Windows is possible without any further processing.
- Saving and archiving of the data and configuration.

1.2 Advice for use of this Operation Manual

This operation manual describes in detail the installation and the handling of the SITRAM® Multisense Software program. The following topics are included:

- Installation and start of the program
- Layout of the user interface
- Work with SITRAM® Multisense Software

1.3 PC-Requirements

The PC should meet the following minimal specifications:

- Operating system: Microsoft® Windows 7 and higher
- .NET Framework 4.0 Redistributable or higher must be supported (since Windows Vista this is supported by default)
- Microsoft Data Access Components 2.6 (MDAC) or higher (if not existing this component will be installed during SITRAM® Multisense Software installation)
- Pentium Processor $f_{clock} \geq 300MHz$
- RAM Memory ≥ 256 MB
- Free hard disk space for program installation ≤ 20 MB, plus additional space for data handling
- CD drive
- Ethernet interface RJ45
- RS232C interface (RxD, TxD, GND) or USB-to-RS232 converter

1.4 Installation

All needed components for the installation of the SITRAM® Multisense Software Package are included on the installation USB stick and should be recognized and installed by the installation program automatically.

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Installation can be started with **„run setup.exe".**

1.4.1 SITRAM® Multisense Software – InstallShield Wizard

The SITRAM® Multisense Software – Install Shield Wizard will guide you through the several installation steps (all print screens are based on Windows 7 operating system):

Step 1: Preparing to Install...

The installation is prepared.

Note: You can stop the installation in every step by pressing the Cancel button.

Step 2: Welcome to the InstallShield...

To continue press the Next Button.

Step 3: License Agreement

Select "I accept the terms..." and press the Next button if you are agree.

Note: Print the License Agreement by pressing the Print button.

Step 4: Customer Information

Enter User Name and Organization into the corresponding fields, then press the Next button.

Step 5: Destination Folder

Press the Next button if you want to keep the suggested folder → Step 6.

If not, press the Change button → Step 5a.

Step 5a: Change Current Destination Folder

Select the desired folder for the installation and confirm with the OK button.

Step 6: Ready to Install the Program

Press the Install button to start the installation.

Step 7: Installing SITRAM® Multisense Software

This step may take several minutes.

Step 8: InstallShield Wizard Completed

Select the readme file and press the Finish button to conclude the installation.

Note: In case of a problem please select the Windows Installer log and send this file to Siemens Energy service center.

Step 9: Readme File

This file contains all needed information regarding the actual SITRAM® Multisense Software version.

After installation the program SITRAM® Multisense Software can be started (1.4.2).

1.4.2 Start Program

The program can be started in three different ways:

1.4.2.1 Desktop Shortcut

While installing SITRAM® Multisense Software a shortcut will be created on the desktop automatically:

A double click on this shortcut will start the program SITRAM® Multisense Software.

1.4.2.2 Start Menu Shortcut

If you have initiated the creation of a start menu shortcut, click on the **„Start Button"** in the Task Bar and start the program by selecting this  symbol.

1.4.2.3 Program Folder

The program can also be started by selecting the executable file **„SITRAM® Multisense Software.exe"** in the program folder.

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Note: The program is located in the folder **„C:\Program Files (x86)\Siemens Energy\SITRAM® Multisense Software\"** if the standard destination folder was used during installation.

The SITRAM® Multisense Software program window opens:

Now you can select the appropriate language (2.1.5.1) by using the menu bar.

1.4.3 Adjust the Installation

If needed you can move the SITRAM® Multisense Software Data Folder **(„C:\Program Files (x86)\Siemens Energy\SITRAM® Multisense Software \data")** into any other folder that suits you.

Important: The file **„root.xml"** (part of the installation data) has to be available in the newly created folder. The used data folder will be saved in the file **„SITRAM® Multisense Software.xml"**. If this file does not exist it will be tried to find the folder **„Data"** in the installation folder. If present it will be used as the data folder. If not the corresponding folder has to be set in the Menu **„File"** under **„set Data folder..."**.

2. User Interface Areas

The User Interface of SITRAM® Multisense Software is divided into so called areas, which will be explained in the following chapters. It can be operated by using a computer-mouse or/and a computer-keyboard. The computer-mouse allows an easy and fast operation and is to be preferred.

The 4 main areas of SITRAM® Multisense Software are:

- Menu bar (2.1)
- Tree structure (2.2)
- Working area (2.3)
- Message area (2.4)

SITRAM® Multisense Software can also be operated by the context menu (right mouse click):

- Context menu (2.5)

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2.1 Menu bar

SITRAM® Multisense Software can be operated over the menu bar or with the context menu (2.5). The individual menus from the menu bar and their items will be explained in this chapter:

File	(2.1.1)
Edit	(2.1.2)
View	(2.1.3)
Transformer	(2.1.4)
Extra	(2.1.5)
Help	(2.1.6)

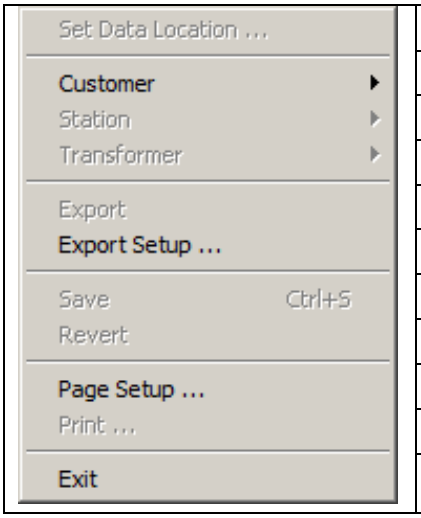
The simplest way to work with SITRAM® Multisense Software is to use the computer-mouse. With it the corresponding menu or the corresponding entry in the tree structure can easily be selected. However it is possible to operate the program with the computer-keyboard only.

In general following symbolism applies to the menu navigation:

- ▶ Additional menu item appear right to the arrow when this point is chosen.
- ... An additional window opens when this menu item is chosen.
- ✔ Indicate the actual selection/choice.

2.1.1 File - Menu

By selection „File“ in the menu bar the following selection window appear:



Set Data Location ...		(2.1.1.1)
Customer	▶	(2.1.1.2)
Station	▶	(2.1.1.3)
Transformer	▶	(2.1.1.4)
Export		(2.1.1.5)
Export Setup		(2.1.1.6)
Save		(2.1.1.7)
Revert		(2.1.1.8)
Page Setup		(2.1.1.9)
Print		(2.1.1.10)
Exit		(2.1.1.11)

Note: Depending on the position of the cursor or which view (2.1.3.4) is selected, the particular menu items are active (black) or inactive (grayed out).

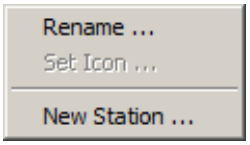
2.1.1.1 Set Data Location ...

After the installation of SITRAM® Multisense Software, this menu item (1.4.3) will be used to adapt the data folder path.

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2.1.1.2 Customer ►

By selecting the menu item „Customer ►“ the following selection window appears:



- **Rename ...** :
  By selecting this menu item the input window „Rename Customer” will open:



  Any name can be entered (3.1.1). With the OK button the entered name will be saved and with the Cancel button it will be aborted.

- **Set Icon ...** :
  This menu item has to be included.

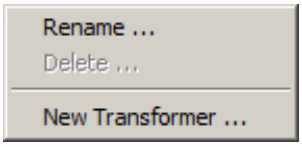
- **New Station ...** :
  By selecting this menu item the input window „New Station” will open:



  Any name can be entered (3.2.1). With the OK button a station is created and saved under the entered name and with the Cancel button it will be aborted. Arbitrary stations can be created and managed.

2.1.1.3 Station ►

By selecting the menu item „Station ►“ the following selection window appears:



- **Rename ...** :
  By selecting this menu item the input window „Rename Station” will open:

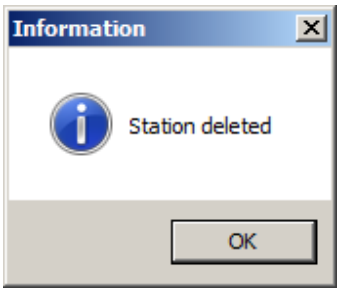


  The input window „Rename Station” opens and any name can be entered (3.2.1).
  With the OK button the entered name will be saved and with the Cancel button it will be aborted.

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Delete ... :

By selecting the menu item „Delete ...” the marked station will be deleted. The information window „Station deleted” opens.



Note: The station can only be deleted, when there are no more transformers available in that station.

- **New Transformer ...** :

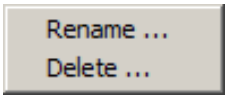
  By selecting this menu item the input window „New Transformer” will open:

  Any name can be entered (3.3.1).

  Additional the type of the SITRAM® Multisense device that is installed on this transformer has to be chosen. The entered name of the transformer will be applied by pressing the OK button and aborted by pressing the Cancel button. Arbitrary transformers can be added to a station and managed.

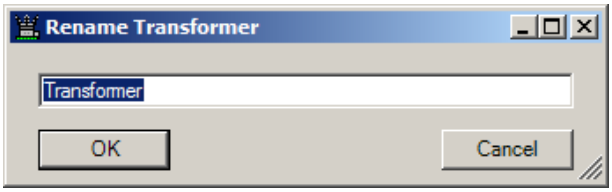
2.1.1.4 Transformer ►

By selecting the menu item „Transformer ►” the following selection window appears:



- **Rename ...** :

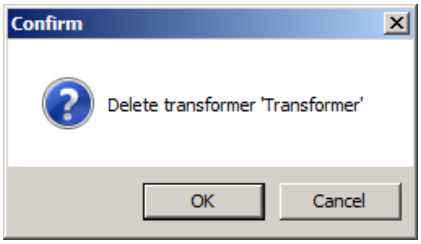
  By selecting this menu item the input window „Rename Transformer” opens:

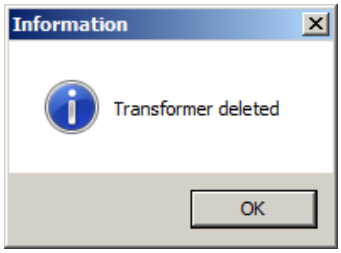


  Any name can be entered (3.3.1). With the OK button the entered name will be saved and with the Cancel button it will be aborted.

- **Delete ...** :

  By selecting this menu item the confirmation window opens:



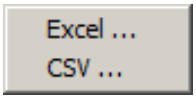


  The action will be cancelled by pressing the Cancel button. The transformer will be deleted by pressing the OK button and confirmed by the information window.

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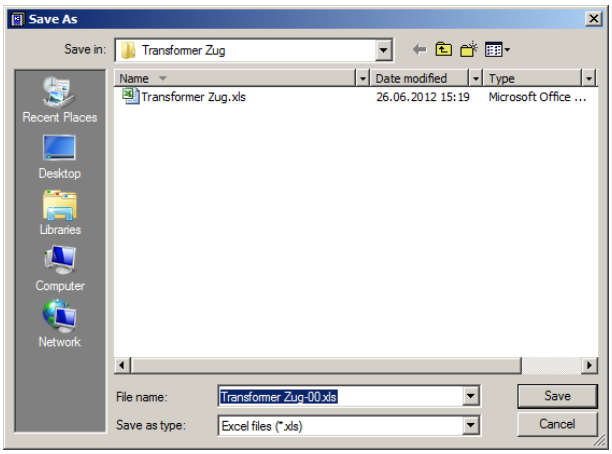
2.1.1.5 Export ►

By selecting the menu item „Transformer ►" following selection window appears:



- **Excel ...** :

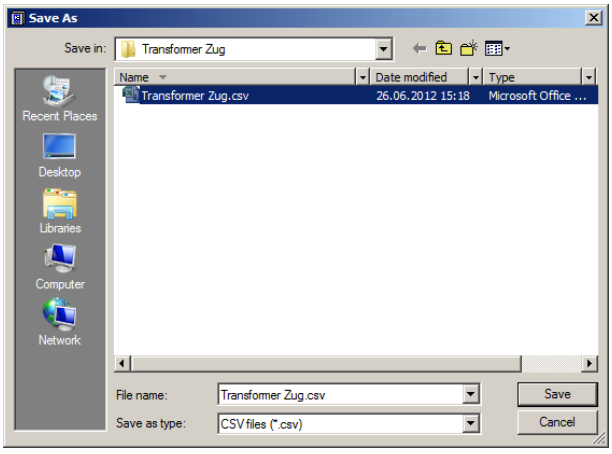
  By selecting this menu item the input window „Save As" opens:



  The system automatically assigns the path under which the Excel file should be saved. It can be changed by hand. Any name can be entered. By pressing the Save button the file will be saved under the entered name and with the Cancel button the export will be aborted.

- **CSV ...** :

  By selecting this menu item the input window „Save As" opens:

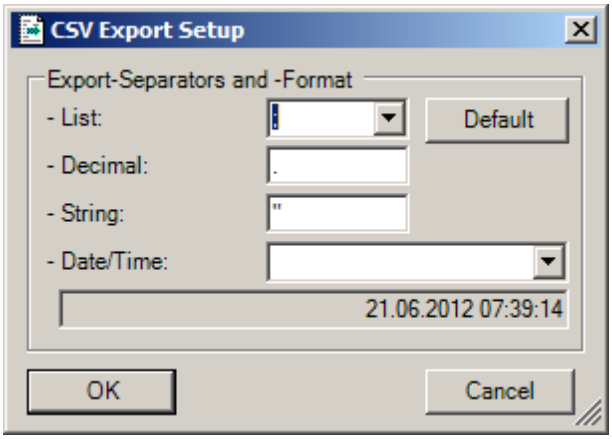


  Any name can be inserted (3.2). With the Save button the entered in name is saved and aborted with the Cancel button.

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2.1.1.6 Export Setup ...

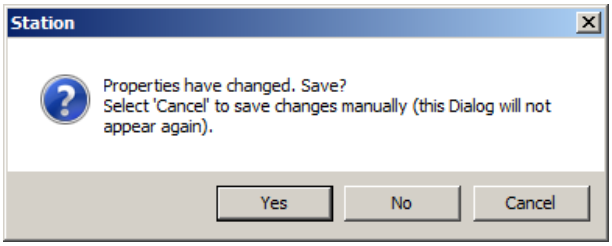
By selecting the menu item „Export Setup ...” the following input window appears:

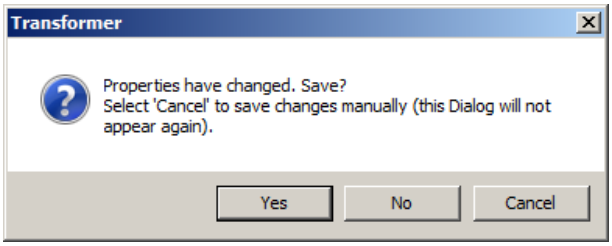


The export separators (List/Decimal/String) and the export format (Date/Time) are defined in the input window „CSV Export Setup”. By pressing the Default button the separators and the export format will be taken from the system settings of the used computer. In this way the import into an appropriate analysis program can be simplified. With the OK button the inputs are saved and aborted with the Cancel button.

2.1.1.7 Save

After the input of detail information (values) into the station- or transformer settings, the menu items „Save” and „Revert” become active (black). By selecting the menu item „Save” the entries will be saved. It is also possible to save the entries by pressing the key combination [Ctrl+S] on the computer-keyboard. Exit the entries without saving, a confirmation window opens automatically:





With the Yes button the entries will be saved and with the No button aborted.

By pressing the Cancel button the entries have to be saved by hand. In this case the confirmation window will close and will not reappear (it appears again only after a restart of SITRAM® Multisense Software).

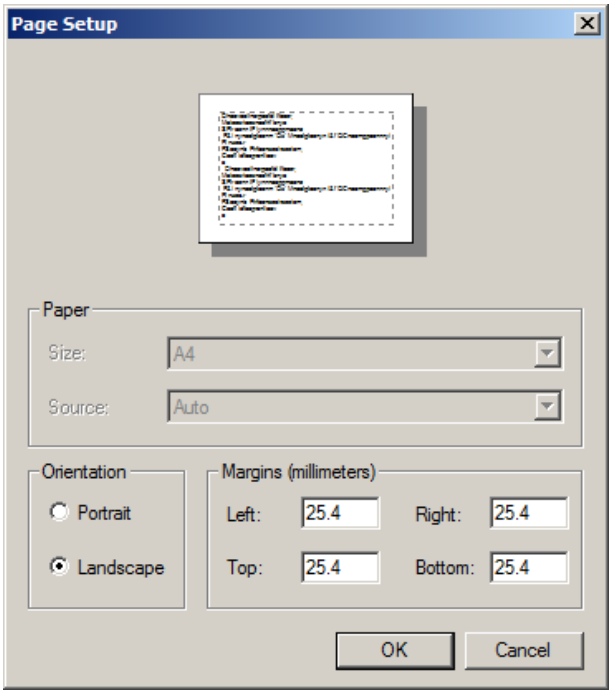
2.1.1.8 Revert

After the input of detail information (values) into the station- or transformer settings, the menu items „Save” and „Revert” become active (black). By selecting the menu item „Revert” the entered settings will be aborted.

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2.1.1.9 Page Setup ...

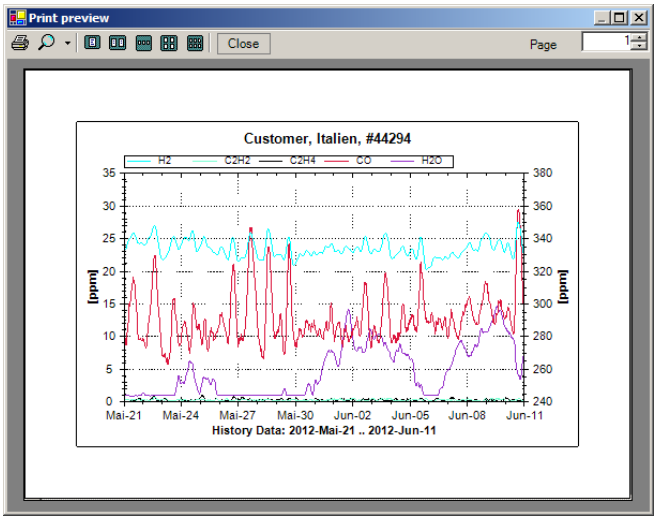
By selecting the menu item „Page Setup ... „ the following input window appears:



The default setting for the print out can be done here. The „Orientation" and the „Margins" (millimeter) can be chosen respectively adjusted in the corresponding field. The settings „Paper" are predetermined. The default printer with paper size A4 is used.

2.1.1.10 Print ...

By selecting the menu item „Print ..." appears the following preview window:



Further features (e.g. print command, zoom, page view and close) are available in this window.

Note: The feature „Print ..." can also be selected by using the context menu

2.1.1.11 Exit

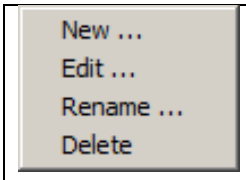
This menu item will close the SITRAM® Multisense Software program.

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2.1.2 Edit - Menu

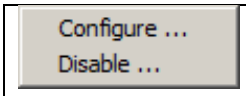
Depending on the selection in the tree structure or what is selected in the working area the following selection window appears by selecting „Edit" in the menu bar:

By selecting Station/Transformer in the tree structure:



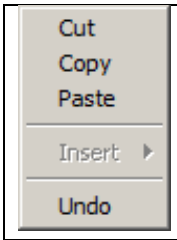
New ...	(2.1.2.1)
Edit ...	(2.1.2.2)
Rename ...	(2.1.2.3)
Delete	(2.1.2.4)

By selecting Alert Properties/Sensor Properties in the tree structure:



Configure ...	(2.1.2.5)
Disable ...	(2.1.2.6)

By selecting Alert-SMS in the tree structure:



Cut	(2.1.2.7)
Copy	(2.1.2.8)
Paste	(2.1.2.9)
Insert ▶	(2.1.2.10)
Undo	(2.1.2.11)

2.1.2.1 New ...

By selecting the menu item „New ..." the following input window appears:



The input window „New Property" opens and any name can be entered. With the OK button the new user defined attribute will be saved under the typed name and aborted with the Cancel button.

2.1.2.2 Edit ...

By selecting the menu item „Edit ..." the following input window appears:



The input window „Edit Property" opens and any name (for the value) can be entered. With the OK button the new name will be saved and aborted with the Cancel button.

2.1.2.3 Rename ...

By selecting the menu item „Rename ..." the following input window appears:

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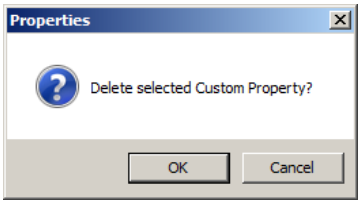


The input window „Rename Customer" opens and any description (for the property) can be entered. With the OK button the inserted name will be saved and aborted with the Cancel button.

Note: Only user defined properties can be renamed!

2.1.2.4 Delete

By selecting the Menu item „Delete" the following confirmation window appears:

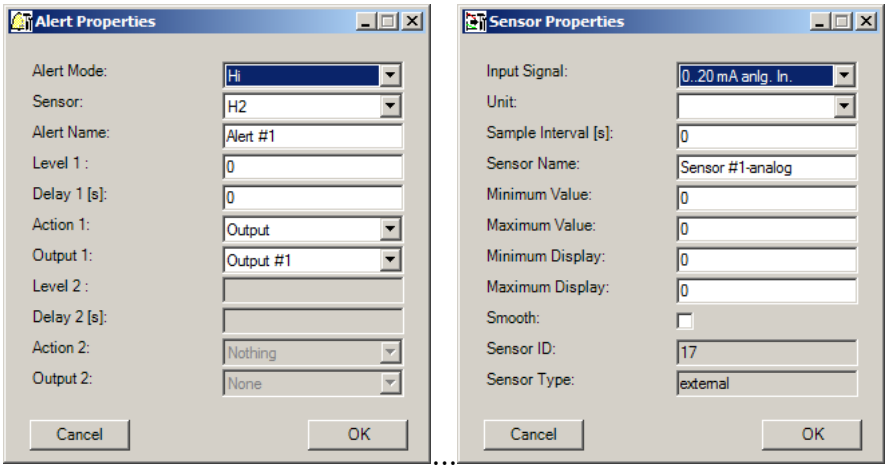


The selected property will be deleted with the OK button. The action will be canceled by pressing the Cancel button.

Note: Only user defined properties can be deleted!

2.1.2.5 Configure ...

Depending on the selection in the tree structure the following input window appears by choosing the menu item „Configure ...":



...

- Alert Properties (3.5.1)
- Sensor Properties (3.5.2)

2.1.2.6 Disable ...

Depending on the selection in the tree structure the following confirmation window appears by choosing the menu item „Disable ...":

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The corresponding alert or sensor will be disabled and the settings will be deleted.

2.1.2.7 Cut

By selecting the menu item „Cut" the selected part will be cut out and put into the Windows clipboard.

2.1.2.8 Copy

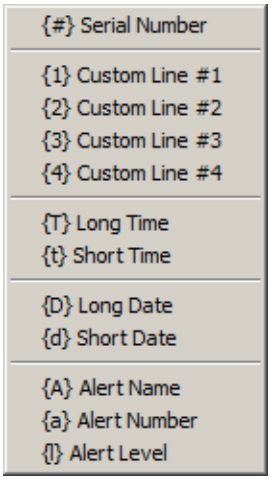
By selecting the menu item „Copy" the selected part will be copied and put into the Windows clipboard.

2.1.2.9 Paste

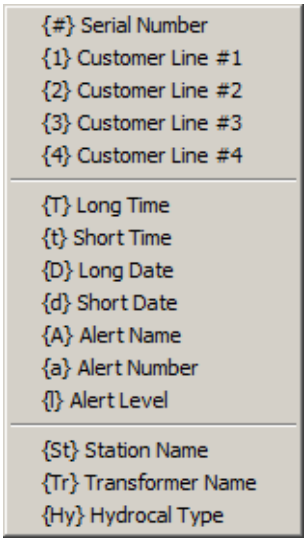
By selecting the menu item „Paste" the Windows clipboard will be inserted to the cursor position.

2.1.2.10 Insert ►

Depending on the selection in the tree structure and what is selected in the working area the following selection window appears by selecting the menu item „Insert ►":



Alert SMS Setup



Alert e-mail Setup

The message text (SMS/e-mail) can be made up with any {place holder} or real alphanumeric text. You'll find more information under (3.5.3) or (2.1.5.2).

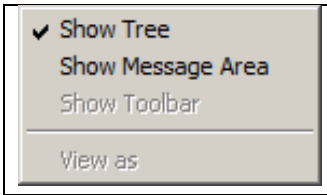
2.1.2.11 Undo

After an input in one of the fields of the Alert SMS Setup the menu item „Undo" will be activated (black). By selecting the menu item „Undo" the input will be aborted.

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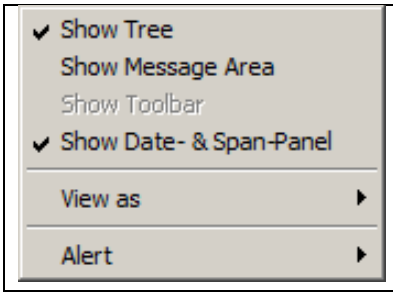
2.1.3 View - Menu

Depending on the selection in the tree structure and what is selected in the working area the following selection window appears by selecting the menu item „View":



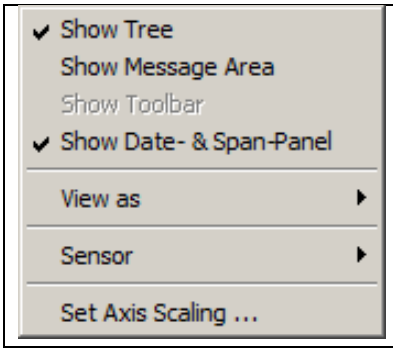
Show Tree	(2.1.3.1)
Show Message Area	(2.1.3.2)
Show Toolbar	(2.1.3.3)
View as ►	(2.1.3.4)

By selecting Alerts in the tree structure



Show Tree	(2.1.3.1)
Show Message Area	(2.1.3.2)
Show Toolbar	(2.1.3.3)
Show Date- & Span-Panel	(2.1.3.5)
View as ►	(2.1.3.4)
Alert ►	(2.1.3.6)

By selecting History in the tree structure



Show Tree	(2.1.3.1)
Show Message Area	(2.1.3.2)
Show Toolbar	(2.1.3.3)
Show Date- & Span-Panel	(2.1.3.5)
View as ►	(2.1.3.4)
Sensor ►	(2.1.3.7)
Set Axis Scaling ...	(2.1.3.8)

2.1.3.1 Show Tree

By selecting the menu item „Show Tree" the tree structure (2.2) will be displayed or hidden. When the ✔ symbol is in front of the text, the tree structure is visible.

2.1.3.2 Show Message Area

By selecting the menu item „Show Message Area" the message area (2.4) will be displayed or hidden. When the ✔ symbol is in front of the menu item text, the message area is visible.

2.1.3.3 Show Toolbar

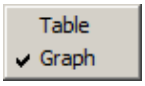
This menu item has to be included.

2.1.3.4 View as ►

Depending on which entry is selected in the tree structure, the following selection window appears by selecting the menu item „View As ►":

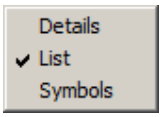
By selecting History / Alerts in the tree structure

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- Table (3.8.3) / (3.9.3)
- Graph (3.8.3) / (3.9.3)

By selecting Alert Setup / Sensor Setup in the tree structure



- Details (3.5.1) / (3.5.2)
- List (3.5.1) / (3.5.2)
- Symbol (3.5.1) / (3.5.2)

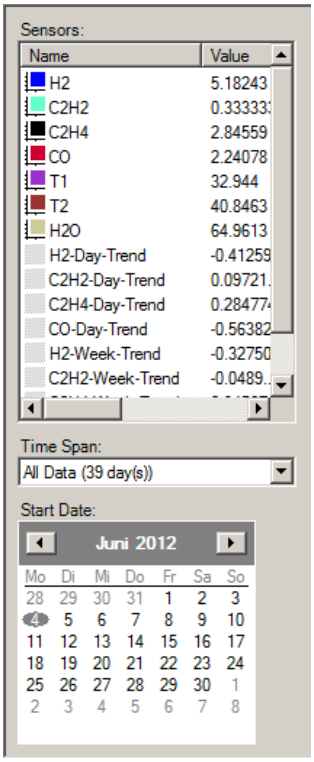
2.1.3.5 Show Date- & Span-Panel

If the tree structure entry History or Alerts is selected and the menu item „Show Date- & Span-Panel" is being selected, the sensor- / alerts selection & time span selection window will be displayed or hidden. When the ✔ symbol is in front of the menu item text, the sensor- / alerts selection & time span selection window is visible.

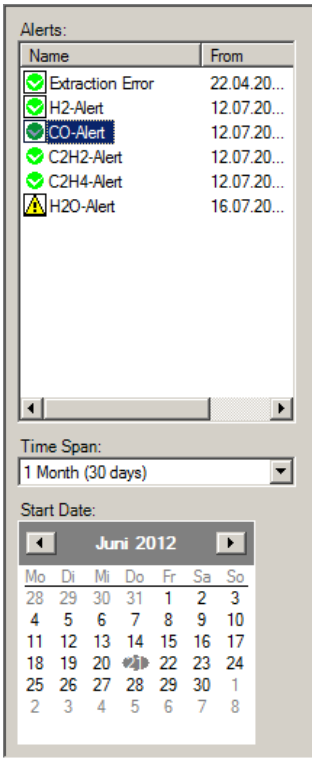
Sensor selection & (3.8.1)

Alert selection &

Time Span selection window (3.8.2)



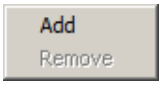
Time Span selection window (3.9.2)



2.1.3.6 Alerts ►

If the tree structure entry Alerts is selected and an alert is chosen in the alert selection window of the working area the following selection window (3.9.3.2) appears by selecting the menu item „Alert ►" :

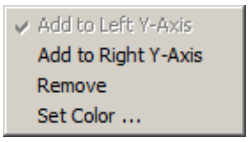
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- Add: The selected Alert is shown in the result window.
- Remove: The selected Alert will be removed from the result window.

2.1.3.7 Sensors ►

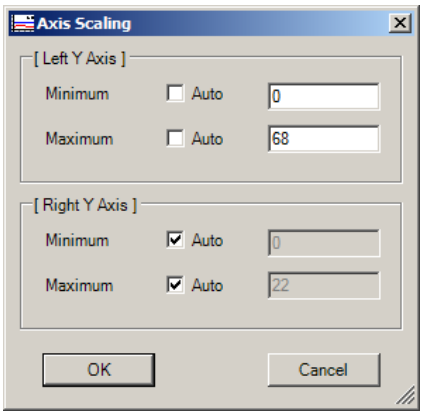
If the tree structure entry History is selected and an active sensor is chosen in the sensor selection window of the working area the following selection window appears by selecting the menu item „Sensors ►“:



- Add to Left Y-Axis: The scaling will be shown on the left Y-Axis of the result window.
- Add to right Y-Axis: The scaling will be shown on the right Y-Axis of the result window.
- Remove: The display of the sensor will be deactivated in the result window.
- Set Color: The window „Set Sensor Color“ will be opened.

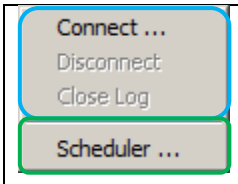
2.1.3.8 Set Axis Scaling ...

If the tree structure entry History is selected and the result window is shown as a graph the following input window appears by selecting the menu item „Set Axis Scaling ►“:



2.1.4 Transformer - Menu

If the tree structure entry Transformer is selected the following selection window appears by selecting „Transformer“ in the menu bar:



Connect ...	(2.1.4.1)
Disconnect	(2.1.4.2)
Close Log	(2.1.4.3)
Scheduler ...	(2.1.4.4)

The first three menu items (blue frame) refer to manually controlled data read & write.

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2.1.4.1 Connect ...

By selecting the menu item „Connect" the dialog window SITRAM® Multisense communication (3.7.1) opens, where the communication options can be selected.

2.1.4.2 Disconnect

By selecting the menu item „Disconnect" the established connection will be terminated immediately (3.7.1). This should be avoided during the login procedure.

2.1.4.3 Close Log

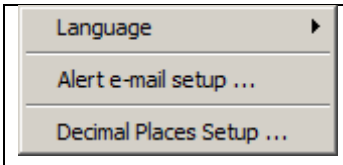
By selecting the menu item „Close Log" the dialog window will be closed. The transformer properties will be shown in the working area again (3.7.1).

2.1.4.4 Scheduler ...

The purpose of the connection scheduler is the automatic data request of the corresponding SITRAM® Multisense device. By selecting the menu item „Scheduler ... " the dialog window SITRAM® Multisense connection scheduler opens (3.7.2.4).

2.1.5 Extra - Menu

By selecting „Extra" in the menu bar the following selection window appears:



Language ►	(2.1.5.1)
Alert e-mail setup ...	(2.1.5.2)
Decimal Places Setup ...	(2.1.5.3)

2.1.5.1 Language ►

By selecting the menu item „Language ►" the following selection window appears:

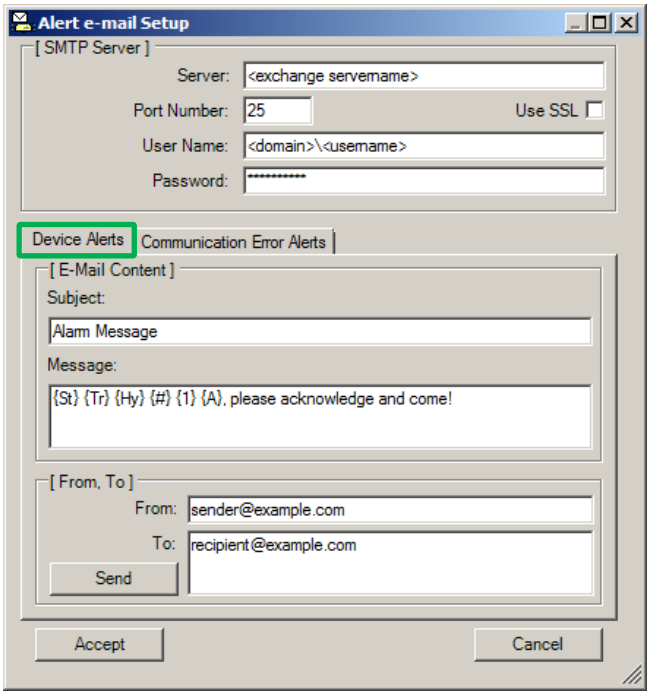


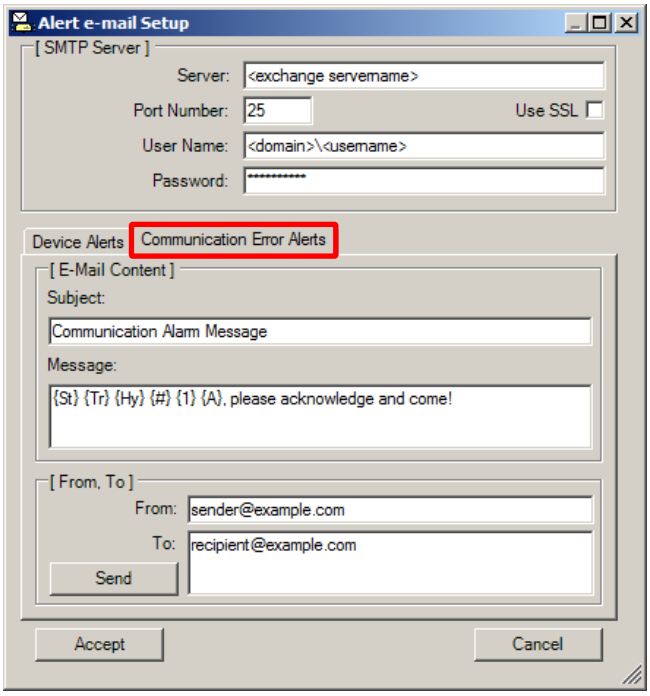
SITRAM® Multisense Software supports the following languages: English, German, Russian, Turkish, French, Chinese, Spanish, Polish and Korean.

2.1.5.2 Alert e-mail Setup ...

There is the option that SITRAM® Multisense Software sends alarm emails. This can be when a device has an error (folder "Device Alarms") or if communication with the device (folder "communication error alarms") is not possible. By selecting the menu item „Alert e-mail setup ... " the following input window appears:

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Remark: Sending an e-mail at communication error alarms is enabled and parameterized in the SITRAM® Multisense input window communication timing (3.7.1).

SMTP Server

- Server: Name of the exchange server
- Port-Number: Port number for the e-mail communication
- Use SSL: Data encryption
- User Name: Domain name of the user
- Password: User password

Device Alerts

E-Mail Content

- Subject: Subject line
- Message text: Entry of the message by using text or place holders (3.5.3)

From, To

- From: Sender
- To: Recipient (a semicolon (;) separates more than one recipient)
- Send Button: By pressing this button, a test e-mail will be sent.

Communication Error Alerts

E-Mail Content

- Subject: Subject line
- Message text: Entry of the message by using text or place holders (3.5.3)

From, To

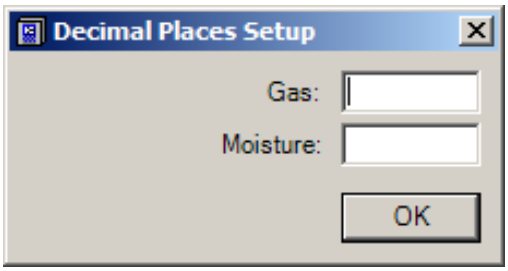
- From: Sender
- To: Recipient (a semicolon (;) separates more than one recipient)
- Send Button: By pressing this button, a test e-mail will be sent.

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Note: This function only makes sense if the „SITRAM® Multisense Connection scheduler" is activated on each transformer (3.7.2.2).

2.1.5.3 Decimal Places Setup ...

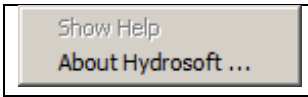
By selecting the menu item „Decimal Places Setup ..." the following input window appears:



There is the possibility to display the data for gas and moisture in oil with a fixed position after decimal point. 0 ... 6 positions after decimal point could be entered. In case the input field is empty the original values will be shown.

2.1.6 Help - Menu

By selecting „Help" in the Menu bar the following selection window appears:

	Show Help	(2.1.6.1)
	About SITRAM® Multisense Software ...	(2.1.6.2)

2.1.6.1 Show Help

This menu item has to be included.

2.1.6.2 About SITRAM® Multisense Software ...

By selecting the menu item "About SITRAM® Multisense Software ... " the following information window opens:

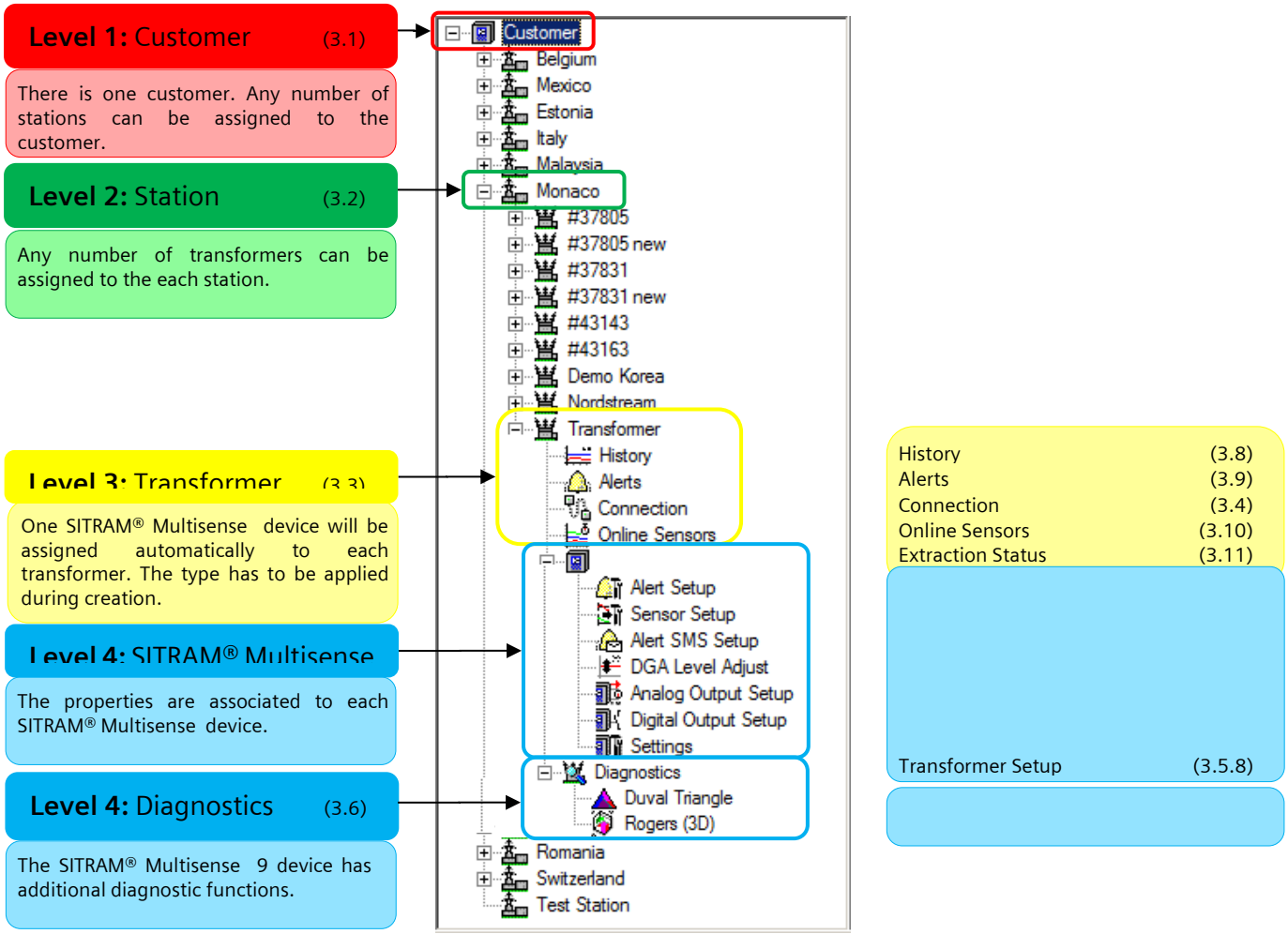
The software version is stated, e.g. 1.5.24

By selection of the  button the information window will be extended by the contact data:

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2.2 Tree Structure

The tree structure is located on the left side of the SITRAM® Multisense Software program window and is used for the navigation. The individual entries in the tree structure are separated into 4 layers:



Remark: For a better presentation of the overview, the tree structure in the upper image has been modified. Detailed explanations refer to chapter (3.5).

The type of the SITRAM® Multisense device has to be set during the creation of the transformer (3.3.1).

Note: The tree structure of the different SITRAM® Multisense types varies in the amount of entries. By selecting the individual entries in the tree structure the content in the working area will change accordingly.

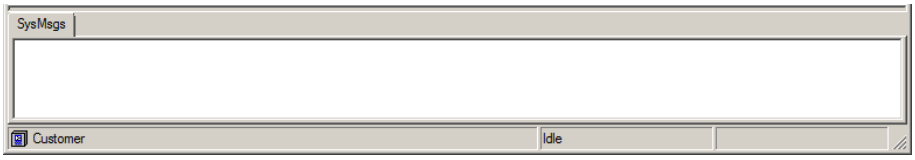
2.3 Working Area

The working area is on the right side of the SITRAM® Multisense Software program window. The content of the working area changes according to the selected entry in the tree structure. The working areas and their
settings will be explained in chapter (3.1).

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2.4 Message Area

The message area is in the lower part of the SITRAM® Multisense Software program window:



It is used to display system messages. These are mainly messages when an error occurs in the database. For example, if the database of a transformer cannot be open or close. These messages are written into a log-file. In case of a problem the log-file can be sent together with the database to the SIEMENS Service Department.

Note: In case of a serious system error the message area will be opened automatically!

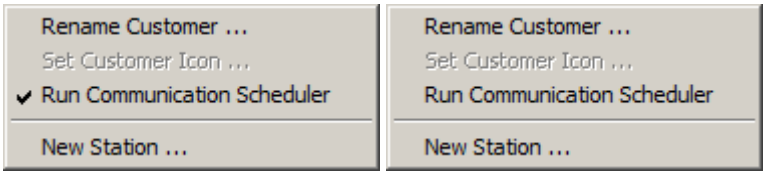
2.5 Context Menu

SITRAM® Multisense Software can be operated via context menu as well. In the following situations it can be opened by performing a right mouse click:

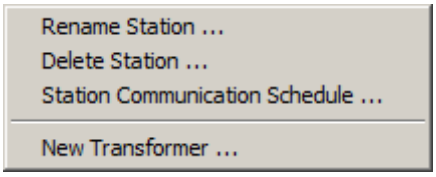
- When the cursor is on the tree structure entry customer, station or transformer.
- When the cursor is on an input field or an entry inside the working area.
- When the cursor is in the working area.
- When the cursor is in the message area.

Here is an example of the context menus for the tree structure levels:

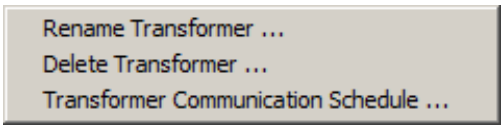
- Customer - Level 1(Connection scheduler on/off)



- Station - Level 2



- Transformer - Level 3



The particular context menus will not be listed here in detail. They will be explained in the corresponding chapters.

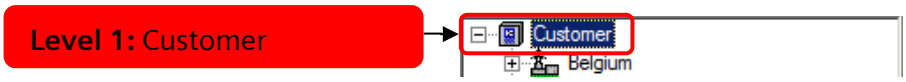
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3. Working with SITRAM® Multisense Software

In the following chapters the most relevant steps are described, which have to be performed to create a SITRAM® Multisense device and its properties in SITRAM® Multisense Software.

3.1 Customer Customer

The customer is located on level 1 in the tree structure (right on top):

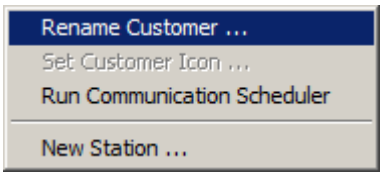


Note: It is often used the term customer directory!

3.1.1 Rename the Customer Directory

The customer directory is automatically created by the program. It can be renamed to your needs. There are two possibilities (context menu 3.1.3) after the tree structure entry customer is selected:

- By menu item **„File ► Customer ► Rename ... „**
- By context menu with the right mouse button





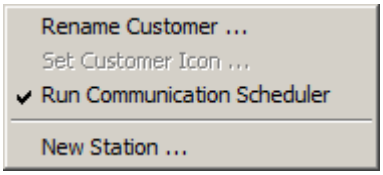
In both cases the input window „Rename Customer" appears. The chosen name is user defined and can be changed at any time.

3.1.2 Working Area Customer

Nothing additional can be set up in the working area. Only the path of the data directory is shown in the header.

3.1.3 Context Menu Customer

The context menu customer contains the following possibilities:



- **Rename Customer ...** :

  By selecting this menu item, the input window „Rename Customer" opens:

  It can be renamed to your needs (3.1.1). By pressing the OK button the entered name will be saved and aborted by pressing the Cancel button.

- **Set Customer Icon ...** :

  This menu item has to be included.

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- **Connection scheduler**:

  Master off-/on switching of the connection scheduler for all activated automatic data readouts. The actual status appears right to the text (✔ switched on / ☐ switched off) and changes when this context menu item is selected.

  Note: When SITRAM® Multisense Software is started, the connection scheduler (Run communication
  scheduler) is always switched on.

- **New Station ...** :

  By selecting this menu item the input window „New Station" opens:

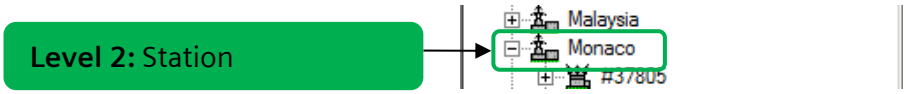


  Any name can be entered (3.2.1). By pressing the OK button the entered station name will be saved and by pressing the Cancel button the entry will be aborted.

  Note: Any number of stations can be created and managed.

3.2 Station Station

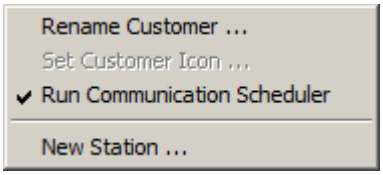
The station is located on level 2 in the tree structure:



3.2.1 Set up a New Station

After the customer directory has been renamed, a new station can be created. This can be done by the known methods menu item or context menu (3.3.3) after the entry customer was selected in the tree structure:

- By menu item **„File ► Customer ► New Station ..."**
- By context menu with the right mouse button





The input window „New Station" appears. Any name can be entered.

Note: Any numbers of stations can be created and managed in SITRAM® Multisense Software.

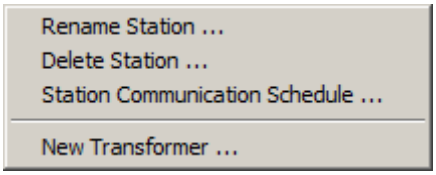
3.2.2 Working Area Station

After the station was created, the station address information can be entered. By double click on one of the four fixed property fields, the corresponding address data (values) can be entered. Additionally to the fixed properties (name, street, zip and town), any number of additional user defined properties (such as country, contact person, telephone number etc.) can be entered. The Address information can only be managed and viewed in SITRAM® Multisense Software.

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3.2.3 Context Menu Station

The context menu station contains the following possibilities:



- **Rename Station ...** :

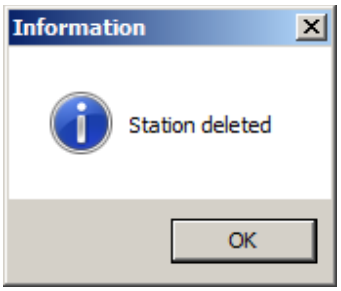
  By selecting this menu item the input window „Rename Station“ appears:

  Any name can be entered. By pressing the OK button the entered name will be saved and aborted by pressing the Cancel button.

- **Delete Station ...** :

  By selecting the menu item „Delete Station“ the marked station will be deleted. The information window „Station deleted“ opens.

  Note: The station can only be deleted, if there is no transformer present in this station.

- **Station Connection scheduler ...** :

  By selecting this menu item the input window „SITRAM® Multisense Connection Scheduler“ ( ) appears:

  Detailed information about the properties can be found under (3.7.2.4)

  Note: The properties from the input window „SITRAM® Multisense Connection Scheduler“ of the stations are automatically copied into the properties of the „SITRAM® Multisense Connection scheduler“ of each transformer within the station.

- **New Transformer ...** :

  By selection of this menu item the input window „New Transformer“ appears:

  Detailed information about the properties can be found under (3.3.1).

3.3 Transformer Transformer

The transformer is located on level 3 in the tree structure and contains 4 sub entries:

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3.3.1 Set up a New Transformer

To set up a new transformer an existing station has to be selected. Then a new transformer can be created in a known manner as transformer station:

- By menu item **„File ► Station ► New Transformer ...“**
- By context menu with the right mouse button

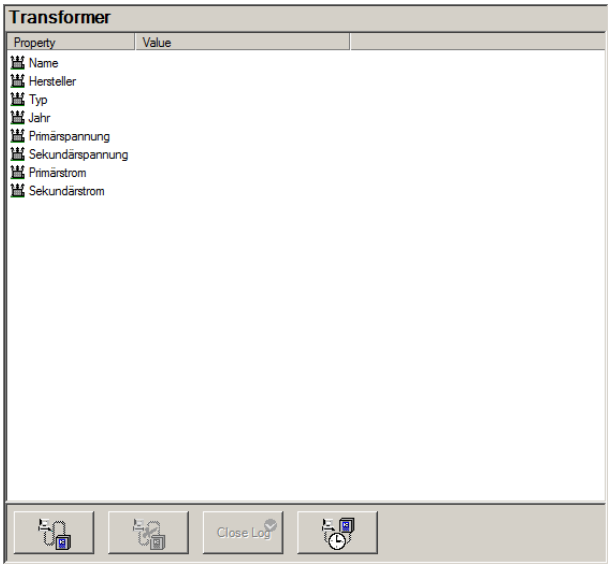
The input window „New Transformer“ appears. Any name can be entered. Additionally the type of the SITRAM® Multisense device (SITRAM® Multisense 5 & 9) has to be chosen.

Note: Any numbers of transformers can be added to a station!

3.3.2 Working Area Transformer

In the working area of the transformer, transformer specific information can be entered. In addition to the fixed properties (name, manufacturer, type, year, primary voltage, secondary voltage, primary current and secondary current) any number of user defined properties (such as power, last revision, serial number, etc.) can be added. This information can only be managed and viewed in SITRAM® Multisense Software. The communication buttons can be found in the lower part of the working area.

Related detail information (values) can be added by double clicking on one of the **„property“** fields after the transformer has been created.



Note: These detail information can only be entered and managed in SITRAM® Multisense Software.

Additionally to the existing standard property fields

- Name
- Manufacturer
- Type
- Year
- Prim. Voltage

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- Sec. Voltage
- Prim. Current
- Sec. Current

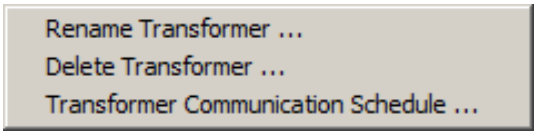
Additionally user defined fields can be added by a right mouse click out of the context menu or by the menu item **„Edit► New"**. The property description can be changed by **„Rename"** and the value description by choosing **„Edit"**. The settings can be completely undone by choosing **„Undo"** and single fields can be deleted by selecting **„Delete"**. Changes have to be saved with the entry **„Save"** or by choosing another entry in the tree structure.

Connection establishment to the SITRAM® Multisense device (3.7)

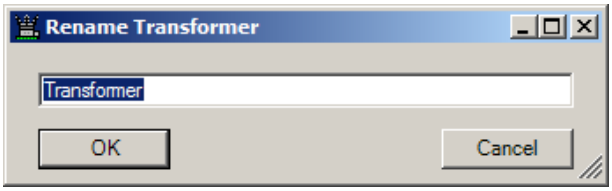
	Open dialog window „SITRAM® Multisense Communication"	(3.7.1)
	Disconnect active communication	
Close Log	Close log window (show working area transformer)	
	Open dialog window „SITRAM® Multisense Connection Scheduler"	(3.7.2)

3.3.3 Context Menu Transformer

The context menu transformer contains the following possibilities:

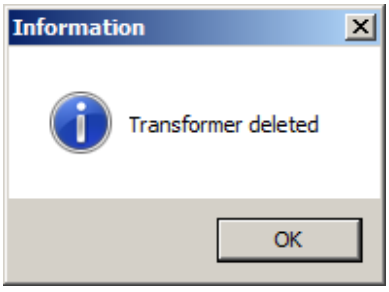


- **Rename Transformer ...** :
  By selecting this menu item the input window „Rename Transformer ..." opens:



  Any name can be entered. By pressing the OK button the entered name will be saved and aborted by pressing the Cancel button.

- **Delete Transformer ... :**
  By selecting the menu item „Delete Transformer ..." the selected transformer will be deleted.
  The information window „Transformer deleted" opens.



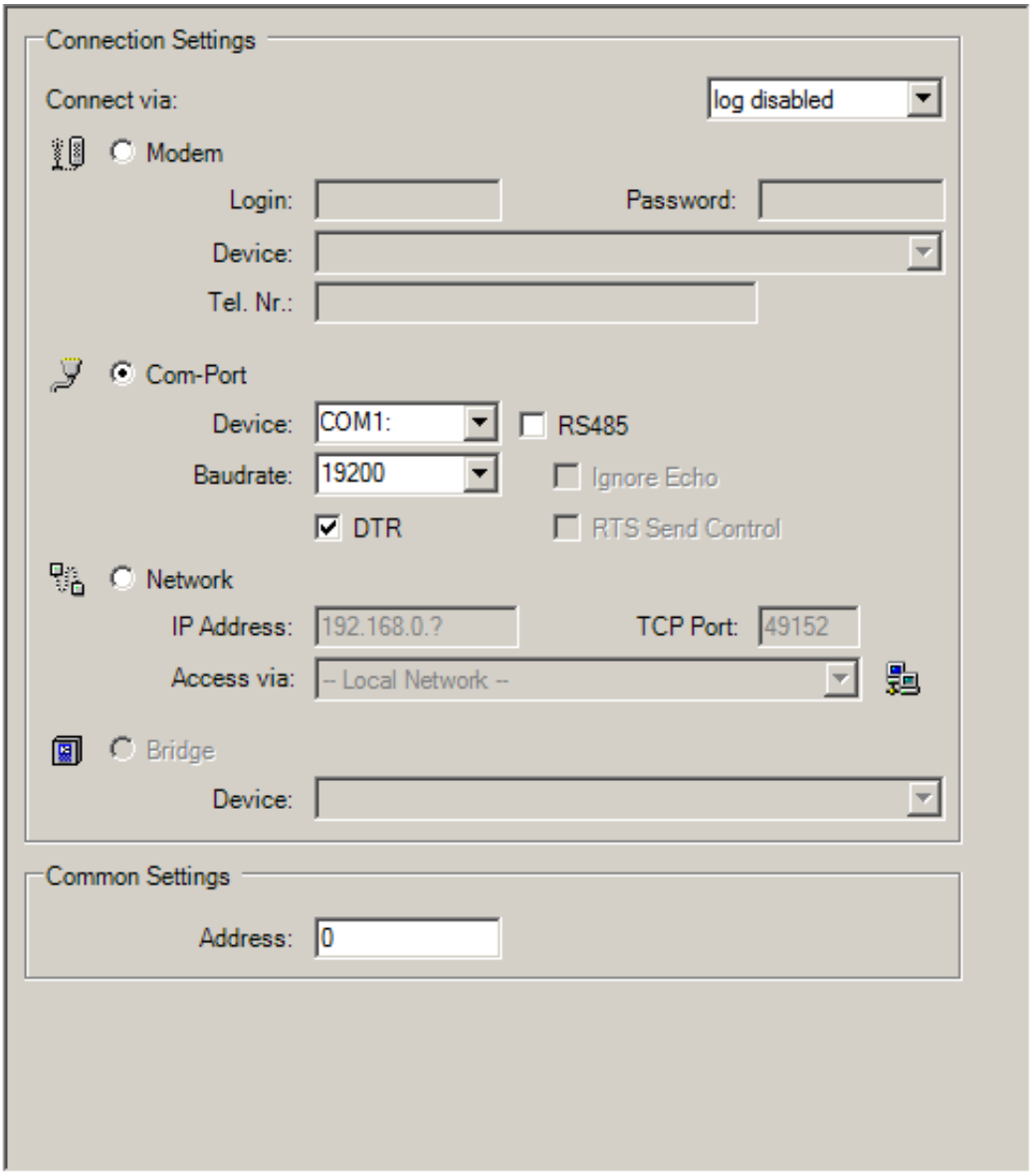
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- **Transformer Connection Scheduler ...** :
  By selecting this menu item the input window „SITRAM® Multisense Connection Scheduler" () appears:
  Detailed information about the properties can be found under (3.7.2.4).

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3.4 Connection Connection Settings

By selecting the tree structure entry Connection the following content appears in the working area:



First determine how the connection to the SITRAM® Multisense device has to be done. Via Modem (option),
Com-Port, Network or Bridge. Mark the corresponding selection field.

3.4.1 Modem Settings

When a modem is used to establish a connection, a login and a password are required. The default settings are „Siemens" for the login and „KWA" for the password. In the selection field „Device" a modem, which is installed on the computer, can be selected for the communication. Afterwards the number of the phone connection, which the SITRAM® Multisense device is connected to, has to be entered into the input field „Tel. Nr.".

Attention: When using a GSM modem with a device of the SITRAM® Multisense family it has to be ensured, that is possible to establish the connection with an analog modem. The provider should be able to confirm this. Alternatively a GSM modem is also required on the PC side (i.e. mobile phone or integrated GSM modem).

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When connections are done with a GSM modem, it is possible that the connection is being interrupted during a read-out procedure due to transmission errors in the GSM network. In this case wait approximately 5 minutes before the data can be sent again. This time is necessary to restart the modem in the SITRAM® Multisense device and to login again into the GSM network.

There is the possibility to generate a so called send/receive-protocol. In this protocol, connection specific data is stored, which contains useful information for the Siemens Energy-service department in case of an error.

The following selections are possible:

- log disabled (protocol off)
- log send/receive (protocol on)

3.4.2 Serial Interface Settings

In case of an onsite connection with the serial interface (RS232), mark the selection field „COM-Port". In the selection field „Device" the corresponding local port of the PC has to be selected. The interface speed has to match the given one from the device (default 19200 Baud) and has to be set in the selection field „Baudrate". The selection field "DTR" (Data terminal ready) is marked by default.

If the serial connection is established via an RS485 interface, the selection field „RS485" must be selected. The selection fields „Ignore Echo" and „RTS Send Control" are selectable. Depending on the interface adapter they can be selected accordingly.

3.4.3 Network Settings

If connected via Ethernet interface, the „IP Address" and the „TCP Port" of the SITRAM® Multisense device are to be entered in the corresponding network input fields. With a dialup connection it is possible to communicate with a SITRAM® Multisense device that is located in an external network. Therefore choose the corresponding connection in the input field „Access via".

Note: Only already created connections will be shown in the field „Access via". In case a new connection is needed, you first have to close SITRAM® Multisense Software. For further information on how to create a new connection consult the Windows documentation.

3.4.4 Bridge Settings

In case the communication to the SITRAM® Multisense device should be done via bus-bridge, the selection field „Bridge" has to be selected. The appropriate gateway device can be selected in the selection field „Device". Further information on how to configure the gateway device can be found in the corresponding SITRAM® Multisense device documentation (Chapter Firmware/Device setup/SITRAM® Multisense setup/ Communication / Connection/RS232 / 485 setup).

3.4.5 Common Settings

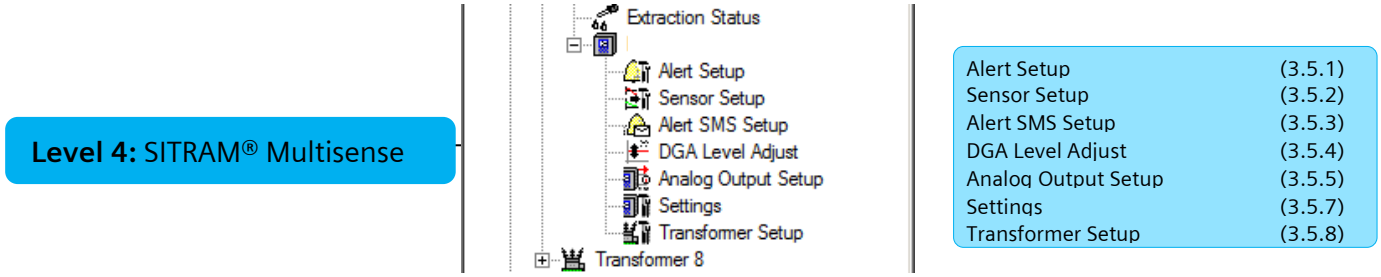
The SITRAM® Multisense device address is to be entered in the input field „Address" of the „Common settings".

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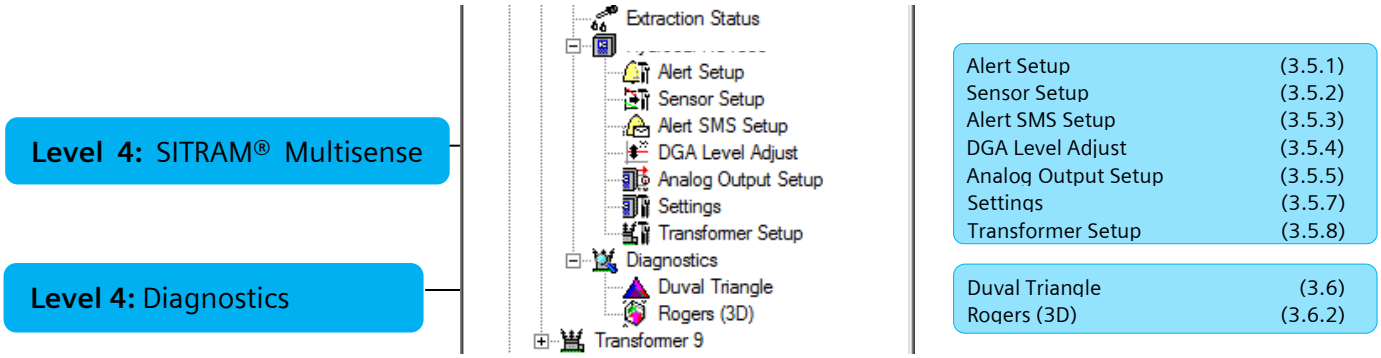
3.5 SITRAM® Multisense Device Settings

The SITRAM® Multisense device is on level 4 in the tree structure and contains, depending on the SITRAM® Multisense type, between 5 and 9 sub entries.

SITRAM® Multisense 5



SITRAM® Multisense 9



The SITRAM® Multisense settings can be configured and saved with SITRAM® Multisense Software.

The SITRAM® Multisense tree structure entry contains the following information that is read-out from the device during a connection:

Serial Number	Serial number of the SITRAM® Multisense device
Version	Firmware version of the SITRAM® Multisense device
Data Directory	Path of the data directory in which the data will be saved on the PC
Last Data Update	Date of last data readout
Customer Line #1	Customer entry line 1
Customer Line #2	Customer entry line 2
Customer Line #3	Customer entry line 3
Customer Line #4	Customer entry line 4
Numeric Password	Numeric password to change the settings (Default 9999)
String Password	String password for modem login (Default KWA).
User Name	User name for modem login (Default Siemens).

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3.5.1 Alert Setup Alert Setup

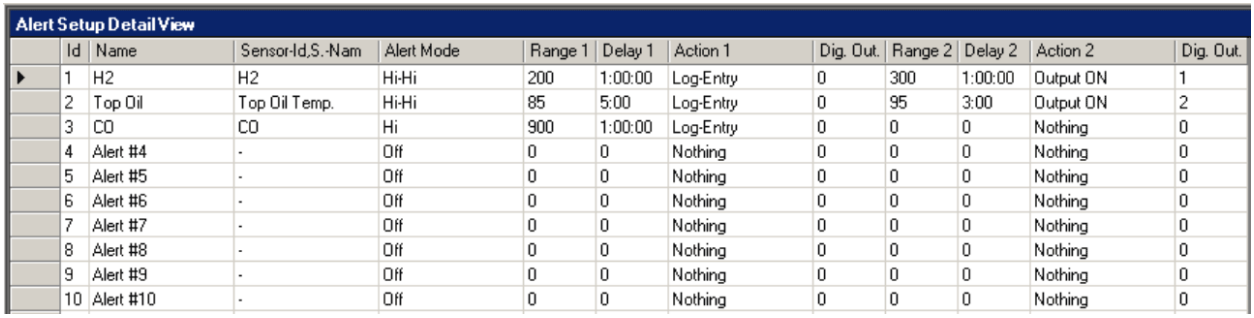
In the Alert Setup menu the alarm settings can be configured. The alarms can be assigned (alarm source) to the internal sensors (content of gas in oil, moisture in oil and temperature) or additional sensors (3.5.2). Alert Mode and Action are freely selectable.

In total 16 alarms can be free defined and assigned.

For different alarms the same output (collective alarm) can be used. The individual alarm states are connected as „OR“ operation, so in case of an alarm the appropriate output is being activated.

The view in the working area - „Alert Setup” - can be chosen as followed:

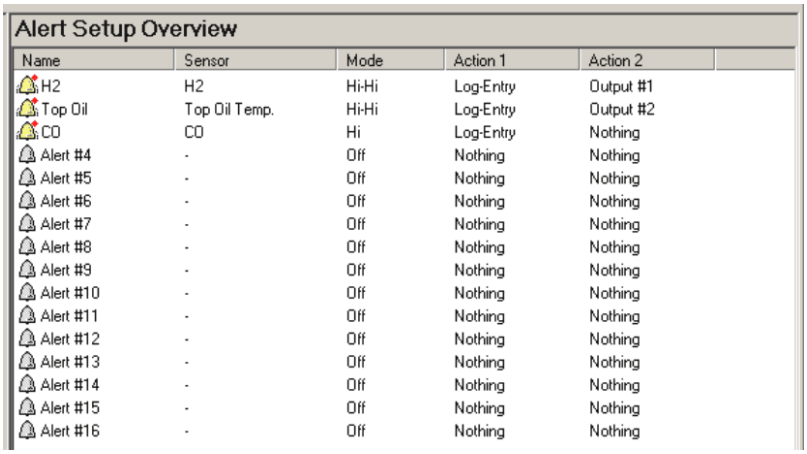
- Details (Detailed view of the alert settings)



Alert Setup Detail View

	Id	Name	Sensor-Id,S.-Nam	Alert Mode	Range 1	Delay 1	Action 1	Dig. Out.	Range 2	Delay 2	Action 2	Dig. Out.
▶	1	H2	H2	Hi-Hi	200	1:00:00	Log-Entry	0	300	1:00:00	Output ON	1
	2	Top Oil	Top Oil Temp.	Hi-Hi	85	5:00	Log-Entry	0	95	3:00	Output ON	2
	3	CO	CO	Hi	900	1:00:00	Log-Entry	0	0	0	Nothing	0
	4	Alert #4	-	Off	0	0	Nothing	0	0	0	Nothing	0
	5	Alert #5	-	Off	0	0	Nothing	0	0	0	Nothing	0
	6	Alert #6	-	Off	0	0	Nothing	0	0	0	Nothing	0
	7	Alert #7	-	Off	0	0	Nothing	0	0	0	Nothing	0
	8	Alert #8	-	Off	0	0	Nothing	0	0	0	Nothing	0
	9	Alert #9	-	Off	0	0	Nothing	0	0	0	Nothing	0
	10	Alert #10	-	Off	0	0	Nothing	0	0	0	Nothing	0

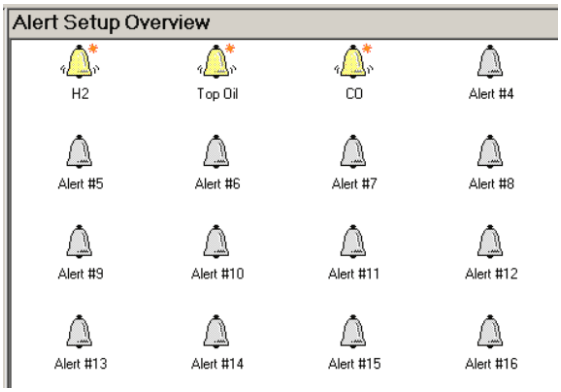
- List (List view of the alert settings)



Alert Setup Overview

Name	Sensor	Mode	Action 1	Action 2
H2	H2	Hi-Hi	Log-Entry	Output #1
Top Oil	Top Oil Temp.	Hi-Hi	Log-Entry	Output #2
CO	CO	Hi	Log-Entry	Nothing
Alert #4	-	Off	Nothing	Nothing
Alert #5	-	Off	Nothing	Nothing
Alert #6	-	Off	Nothing	Nothing
Alert #7	-	Off	Nothing	Nothing
Alert #8	-	Off	Nothing	Nothing
Alert #9	-	Off	Nothing	Nothing
Alert #10	-	Off	Nothing	Nothing
Alert #11	-	Off	Nothing	Nothing
Alert #12	-	Off	Nothing	Nothing
Alert #13	-	Off	Nothing	Nothing
Alert #14	-	Off	Nothing	Nothing
Alert #15	-	Off	Nothing	Nothing
Alert #16	-	Off	Nothing	Nothing

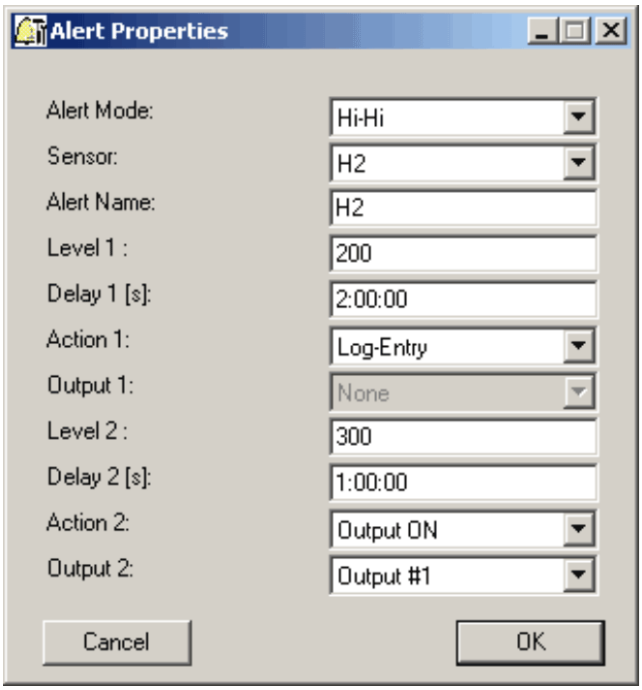
- Symbols (Symbol view of the alert settings)



The selection is carried out as usual either through the context menu by activation with the right mouse button or through the menu item „View ► View as ►...“.

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The following dialog window opens in the views „List" and „Symbols" by a double click on an alarm icon and in the view „Details" by a double click on the row header:



At first the appropriate alarm mode has to be selected under „Alert Mode". The following modes are available:

- **Hi:** A single-stage alarm is triggered when the threshold value „Level 1" is exceeded.
- **Hi - Hi**: A double-stage alarm is triggered. The first stage of the alarm is triggered when the threshold value „Level 1" is exceeded. The second stage of the alarm is triggered when the threshold value „Level 2" is exceeded.
- **Low:** A single-stage alarm is triggered when the threshold value "Level 1" is not achieved.
- **Low - Low:** A double-stage alarm is triggered. The first stage of the alarm is triggered when the threshold value "Level 1" is not achieved. The second stage of the alarm is triggered when the threshold value "Level 2" is not achieved.
- **Out Range (Low – Hi):** A double-stage alarm is triggered when the measurement value is outside of the range. The first stage of the alarm is triggered when the threshold value "Level 1" is not achieved. The second stage of the alarm is triggered when the threshold value "Level 2" is exceeded.
- **In Range:** A single-stage alarm is triggered when the measurement value is inside the range, which is defined by the threshold values "Level 1" and "Level 2".

The next step is to select a sensor that serves as alarm source. All above mentioned internal sensors are available. If additional sensors are connected and setup correctly (3.5.2) these will be selectable as well. Depending on the SITRAM® Multisense type the following measurements are available:

SITRAM® Multisense 5

- H_2 - C_2H_2 - C_2H_4 - CO - H_2O concentration
- H_2 - C_2H_2 - C_2H_4 - CO daily trend
- H_2 - C_2H_2 - C_2H_4 - CO weekly trend
- T1 temperature (gas temperature measurement cell)
- T2 temperature (oil temperature extraction chamber)
- All under additional sensors defined measurements

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SITRAM® Multisense 9

- H_2 - C_2H_2 - C_2H_4 - CO - CO2 - C_2H_6 - CH_4 - H_2O concentration
- H_2 - C_2H_2 - C_2H_4 - CO - CO2 - C_2H_6 - CH_4 daily trend
- H_2 - C_2H_2 - C_2H_4 - CO - CO2 - C_2H_6 - CH_4 weekly trend
- T1 temperature (gas temperature measurement cell)
- T2 temperature (oil temperature extraction chamber)
- All under additional sensors defined measurements

For clear alarm identification an appropriate description can be entered in the input field „Name".

The alarm threshold values are entered in the input fields „Level 1" and if applicable „Level 2". The device „ppm" is used for gas concentrations, the device „°C" for temperatures and for additional sensors the individual defined devices (e.g. volt, ampere ...). The alarm threshold values must be within the corresponding measurement range. These are e.g. 0 ... 2000/5000 ppm for gas concentrations, 0 ... 100 ppm for moisture in oil and -20 ... 100°C for temperatures. For additional sensors defined minimal and maximal threshold values.

The delays (Delay 1 and 2) can be entered to suppress alarms that exceed or not achieve their thresholds only for a short period. As the measurement cycle for gas sensors takes max. 20 minutes the delay time should not be less than 1 hour. The entry of the delay time is in seconds or directly in [days]-[hours]:[minutes]:[seconds]. After confirmation by pressing the OK button the value is shown in the format [days]-[hours]:[minutes]:[seconds

The following actions can be chosen in the selection fields „Action 1" and „Action 2":

- **Log-entry:** A change of the status is stored into the alarm history. The alarm has to be acknowledged.
- **Output:** Depending on the selected mode an output is set in case of exceeding or not achieving the level. This output will be reset as soon as the alarm isn´t present any longer.
- **Output Hold:** Depending on the selected mode an output is set in case of exceeding or not achieving. When leaving the alarm state the output remains switched on until the alarm is acknowledged by hand.
- **Log-entry & SMS:** A change of the status is stored into the alarm history. The alarm has to be acknowledged. Additionally a SMS is send to the defined addresses.
- **Output & SMS:** Depending on the chosen mode an output is set in case of exceeding or not achieving the level and additionally a SMS is send to the defined addressees.
- **Output Hold & SMS:** Depending on the chosen mode an output is set in case of exceeding or not achieving the level. When leaving the alarm state the output is lasting until the alarm is acknowledged by hand. Additionally a SMS is send to the defined recipients.

Note: As soon as an alarm is defined the entry in the alarm history is always active!!!

It is possible to assign the same output to different alarms, to create a so called collective alarm.

After a change of the alarm settings an asterisk appears right to the icon Alert Setup , which indicates that the settings still has to be transferred to the device. The settings are not synchronized at the moment and will be updated to the SITRAM® Multisense device on the next connection (3.7), if the selection field "Update Configuration" is selected.

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3.5.2 Sensor Setup Sensor Setup

The settings for additional sensors (external & virtual) can be changed in the Sensor Setup menu. The view in the working area - „Sensor Setup" - can be chosen as followed:

- Details

Sensor Setup Detail View

Id	Int/Ext	Name	Kind	Sample Interval	Unit	Min	Max	Min View	Max View
1	internal	H2	int. Gas	20:00	ppm	0	2000	0	2000
2	internal	C2H2	int. Gas	20:00	ppm	0	2000	0	2000
3	internal	C2H4	int. Gas	20:00	ppm	0	2000	0	2000
4	internal	CO	int. Gas	20:00	ppm	0	5000	0	5000
5	internal	T1	int. Temp.	20:00	°C	-20	100	-20	100
6	internal	T2	int. Temp.	20:00	°C	-20	100	-20	100
7	internal	H2O	int. Oil Hmdty.	20:00	ppm	0	100	0	100
9	internal	H2-Day-Trend	int. Gas Trend Day	20:00	ppm/d	-2000	2000	-2000	2000
10	internal	C2H2-Day-Trend	int. Gas Trend Day	20:00	ppm/d	-2000	2000	-2000	2000
11	internal	C2H4-Day-Trend	int. Gas Trend Day	20:00	ppm/d	-2000	2000	-2000	2000
12	internal	CO-Day-Trend	int. Gas Trend Day	20:00	ppm/d	-5000	5000	-5000	5000
13	internal	H2-Week-Trend	int. Gas Trend Week	20:00	ppm/w	-2000	2000	-2000	2000
14	internal	C2H2-Week-Trend	int. Gas Trend Week	20:00	ppm/w	-2000	2000	-2000	2000
15	internal	C2H4-Week-Trend	int. Gas Trend Week	20:00	ppm/w	-2000	2000	-2000	2000
16	internal	CO-Week-Trend	int. Gas Trend Week	20:00	ppm/w	-5000	5000	-5000	5000
17	external	Top oil temperature	4..20 mA anlg. In.	20:00	°C	0	100	0	100
18	external	Bottom oil temperature	4..20 mA anlg. In.	20:00	°C	0	100	0	100
19	external	Load current	4..20 mA anlg. In.	20:00	A	0	5	0	5
20	external	Load voltage	4..20 mA anlg. In.	20:00	V	0	250	0	250
21	external	Ambient temperature	4..20 mA anlg. In.	20:00	°C	0	100	0	100
22	external	Free analog #6	Disabled	0		0	0	0	0
23	external	Free analog #7	Disabled	0		0	0	0	0
24	external	Free analog #8	Disabled	0		0	0	0	0
25	external	Free analog #9	Disabled	0		0	0	0	0
26	external	Free analog #10	Disabled	0		0	0	0	0
27	virtual	Hot Spot Temperature	virt. Hot-Spot	20:00	°C	0	130	60	130
28	virtual	Aging Rate	virt. Ag.Rate	1:00:00		0	1	0	1
29	virtual	Loss of Life	virt. L.o.Life	1:00:00	%	0	500	0	500
30	virtual	Free virtual #14	Disabled	0		0	0	0	0

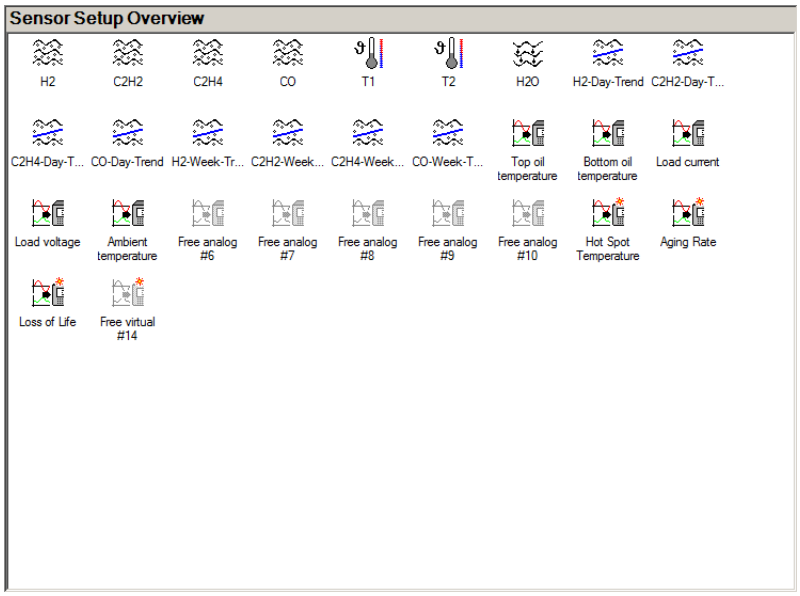
- List

Sensor Setup Overview

Name	Interval [s]	Unit	Minimum	Maximum
H2	1200	ppm	0	2000
C2H2	1200	ppm	0	2000
C2H4	1200	ppm	0	2000
CO	1200	ppm	0	5000
T1	1200	°C	-20	100
T2	1200	°C	-20	100
H2O	1200	ppm	0	100
H2-Day-Trend	1200	ppm/d	-2000	2000
C2H2-Day-Trend	1200	ppm/d	-2000	2000
C2H4-Day-Trend	1200	ppm/d	-2000	2000
CO-Day-Trend	1200	ppm/d	-5000	5000
H2-Week-Trend	1200	ppm/w	-2000	2000
C2H2-Week-Trend	1200	ppm/w	-2000	2000
C2H4-Week-Trend	1200	ppm/w	-2000	2000
CO-Week-Trend	1200	ppm/w	-5000	5000
Top oil temperature	1200	°C	0	100
Bottom oil temperature	1200	°C	0	100
Load current	1200	A	0	5
Load voltage	1200	V	0	250
Ambient temperature	1200	°C	0	100
Free analog #6	0		0	0
Free analog #7	0		0	0
Free analog #8	0		0	0
Free analog #9	0		0	0
Free analog #10	0		0	0
Hot Spot Temperature	1200	°C	0	130
Aging Rate	3600		0	1
Loss of Life	3600	%	0	500
Free virtual #14	0		0	0

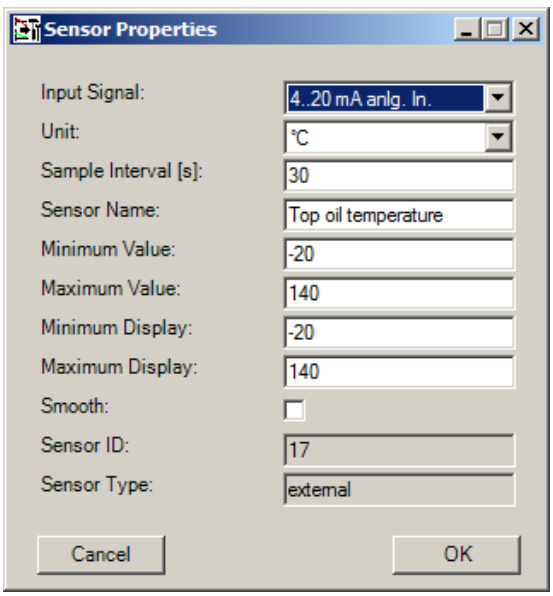
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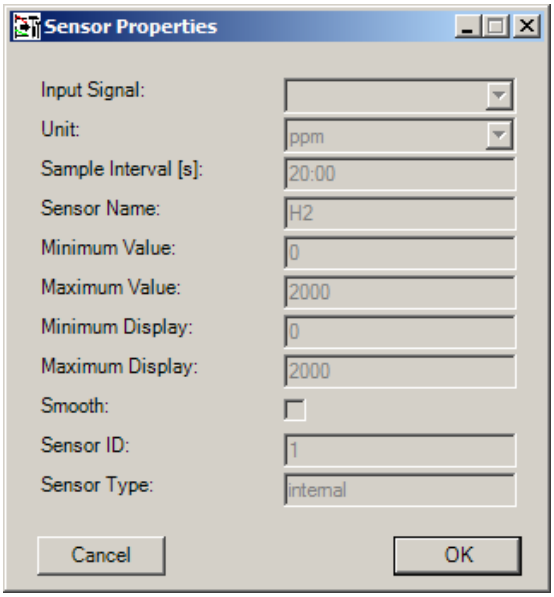
- Symbol



The selection is carried out as usual either through the context menu by activation with the right mouse button or through the menu item „View ► View as ►...".

The following dialog window opens in the views „List" and „Symbols" by a double click on an sensor icon and in the view „Details" by a double click on the row header. The settings for the internal sensors cannot be changed and therefore they are grayed out:





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Input Signal

In the selection field „Input Signal" the output signal type (current/voltage) and the signal range of the corresponding sensor can be selected. These differ for external and virtual sensors by SITRAM® Multisense type and optional equipment as follows:

Input signal		SITRAM® Multisense 5 / SITRAM® Multisense 9	
#1	ext.	0...20 mA AC / 0...80 V AC / 0...20 mA DC / 4...20 mA DC	ext.
#2	ext.	0...20 mA AC / 0...80 V AC / 0...20 mA DC / 4...20 mA DC	ext.
#3	ext.	0...20 mA AC / 0...80 V AC / 0...20 mA DC / 4...20 mA DC	ext.
#4	ext.	0...20 mA AC / 0...80 V AC / 0...20 mA DC / 4...20 mA DC	ext.
#5	ext.	0...20 mA AC / 0...80 V AC / 0...20 mA DC / 4...20 mA DC	ext.
#6	ext.	0...20 mA AC / 0...80 V AC / 0...20 mA DC / 4...20 mA DC	ext.
#7	ext.	0...20 mA DC / 4...20mA DC	ext.
#8	ext.	0...20 mA DC / 4...20mA DC	ext.
#9	virt.	0...20 mA DC / 4...20mA DC	ext.
#10	virt.	0...20 mA DC / 4...20mA DC	ext.
#11	virt.	virt. Hot-Spot [1] / virt. Ag.Rate [2] / virt. L.o.Life [3] / virt. Avg.r.Ar. [4]	virt.
#12	virt.	virt. Hot-Spot [1] / virt. Ag.Rate [2] / virt. L.o.Life [3] / virt. Avg.r.Ar. [4]	virt.
#13	virt.	virt. Hot-Spot [1] / virt. Ag.Rate [2] / virt. L.o.Life [3] / virt. Avg.r.Ar. [4]	virt.
#14	virt.	virt. Hot-Spot [1] / virt. Ag.Rate [2] / virt. L.o.Life [3] / virt. Avg.r.Ar. [4]	virt.

[1] Hot Spot Temperature
[2] Aging Rate relative
[3] Loss of Life
[4] Average Aging Rate relative
[5] Back plate temperature
[6] Moisture in oil relative

Device

The following device for the measurement of the sensor can be selected:

- - no device
- °C: temperature sensors
- ppm: moisture in oil sensor or other sensors for chemicals
- %: moisture in oil sensor or other sensors for chemicals
- V: voltage measurement
- KV: voltage measurement
- mA: current measurement
- A: current measurement
- kA: current measurement
- ppm/d: Trend ppm / day
- ppm/w: Trend ppm / week

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- #: Number, quantity, position etc.

Sample Interval [s]

The sample interval specifies how often the sensor value (measurement value) is stored in the SITRAM® Multisense device. The default setting for internal sensors is 1200 seconds (20:00).

Sensor Name

For ease of use, each sensor should be assigned with a unique name.

Minimum Value / Maximum Value

The measurement range is scaled with these entries. This means, the measurement range is assigned to the signal range of the sensor. e.g. 4...20 mA DC corresponds to 0 ... 120 °C

	0 %	100 %
Signal range	4 mA DC	20 mA DC
Measurement range	0 °C	120 °C
Minimum Value	0	
Maximum Value		120

Minimum Display / Maximum Display

These minimum and maximum values refer to the bar graph in the main menu (additional sensor status) of the display. If you know in advance that the observed range of the measurement value is only in a segment of the measurement range, this can be narrowed down (zoom), so a change of the measurement value on the bar graph is more apparent.

e.g. The measurement range is 0 ... 120°C, but the measured temperature is between 60 ... 70 °C.

Measurement range	0 °C	120 °C
Minimum Display	60	
Maximum Display		70

Smooth

The function „Smooth“ can be activated by setting a check in the related field.

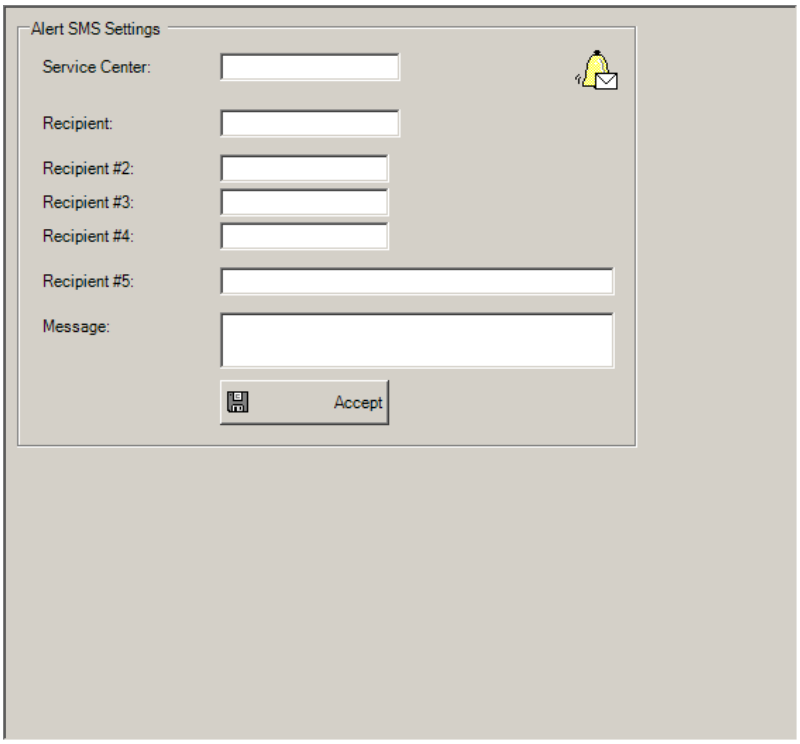
Note: The grayed out entries Sensor ID and Sensor Type are purely informative and cannot be changed.

After a change of the sensor settings an asterisk appears right to the icon Sensor Setup , which indicates that the settings still has to be transferred to the device. The settings are not synchronized at the moment and will be updated to the SITRAM® Multisense device on the next connection (3.7), if the selection field “Update Configuration” is selected.

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3.5.3 Alert SMS Setup Alert SMS Setup

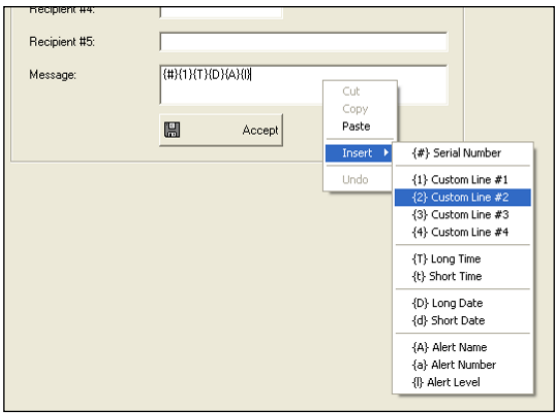
If the SITRAM® Multisense device is equipped with an optional on-board GSM modem, in the Alert SMS Setup menu the settings for sending SMS in case of relevant status changes can be made.



The telephone number of the short message service center has to be entered in the input field „Service Center". Normally this number is preprogrammed on the SIM card. Therefore it has only to be entered in case it is not on the SIM card.

The alarm message, which is defined in the input field „Message" (max. 63 characters), can be send to up to 5 recipients simultaneously. The numbers of these recipients have to be entered in the input fields „Recipient" to „Recipient #5".

By performing a right mouse click on the input field „Message", the content of the alarm message can be combined with pre defined wild-cards as follows:



To add pre-defined text the corresponding wild-cards have to be selected. The following text is available in this form:

- {#} - Serial number
- {1} - Customer data row 1

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- {2} - Customer data row 2
- {3} - Customer data row 3
- {4} - Customer data row 4
- {T} - System time long: „hh:mm:ss"
- {t} - System time short: „hh:mm"
- {D} - System date long: „YYYY:MM:DD"
- {d} - System date short: „YY:MM:DD"
- {A} - Alert name
- {a} - Alert number
- {l} - Alert level

Value of the "Alert level" {l}

Mode	Condition	Value
„All"	No alert	0
Hi	> Hi	1
Hi - Hi	> Hi	1
	> Hi - Hi	2
Low	< Low	1
Low - Low	< Low	1
	< Low - Low	2
Out Range	< Low	1
	> Hi	2
In Range	> Low	1
	< Hi	1

Example: {#}{1}{T}{D}{A}{l}

The following message text is the result: Serial number, Customer data row 1, System time long,

System date long, Alarm name, Alarm level

The content of the message text can be defined freely as well without using the wild-cards.

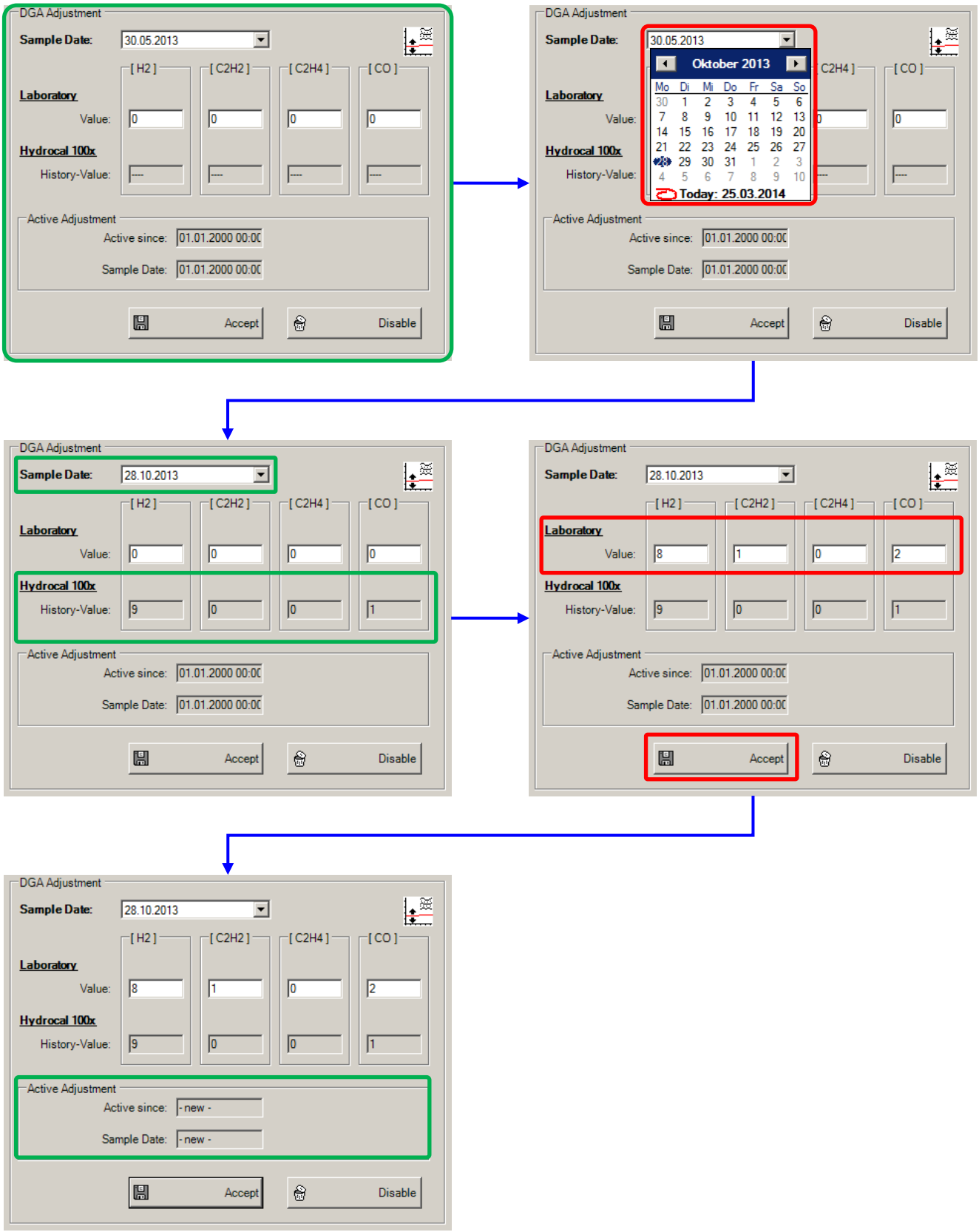
Note: Either „Log-entry & SMS", „Output & SMS" or „Output Hold & SMS" must be selected in the selection field „Alert Setup" (3.5.1) to alarm via SMS. Also the optional GSM modem must be installed and configured.

Settings which has been newly created or modified must be saved with the Accept button afterwards. The asterisk right to the icon Alert SMS Setup indicates that the settings still has to be transferred to the device. The settings are not synchronized at the moment and will be updated to the SITRAM® Multisense device on the next connection (3.7), if the selection field "Update Configuration" is selected.

3.5.4 DGA Level Adjust DGA Level Adjust

The values, which were determined by analyzing the oil sample in a laboratory, can be entered in the DGA Level Adjust menu. These are used to calculate the correction factor to determine the gas quantity. These laboratory values are entered in the appropriate input fields. The following pictures show the dialogs for a SITRAM® Multisense 5 device:

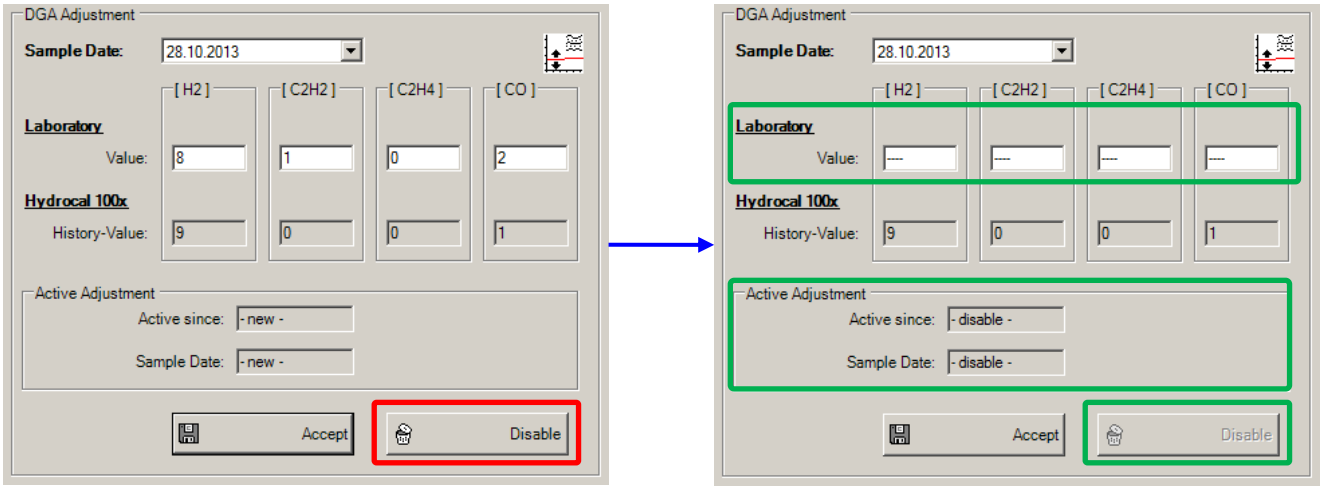
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Before entering the laboratory results, the appropriate date on which the oil sample was taken, has to be selected in the selection field „Sample Date". The average values of the gas concentration on the indicated date will be calculated and shown in the information fields „SITRAM® Multisense - History-Value". After the laboratory values were entered into the corresponding input fields „Laboratory - Value" (H_2, C_2H_2, C_2H_4 and CO), they must be confirmed with the Accept button. In the mask „Active Adjustment" the information fields „Active since" and „Sample Date" change from „- not set -" to „- new -" .

The device will now use these correction factor values as base for the gas concentration calculation. The device is able to save up to 8 DGA level adjustments at which only the last one is active. If 8 DGA level adjustments are already present on the device and a new one is added and the oldest will be replaced by the new one. The DGA level adjustments can only be disabled, but not deleted anymore:



Settings which has been newly created or modified must be saved with the Accept button afterwards. The asterisk right to the icon DGA Level Adjust indicates that the settings still has to be transferred to the device. The settings are not synchronized at the moment and will be updated to the SITRAM® Multisense device on the next connection (3.7), if the selection field "Update Configuration" is selected.

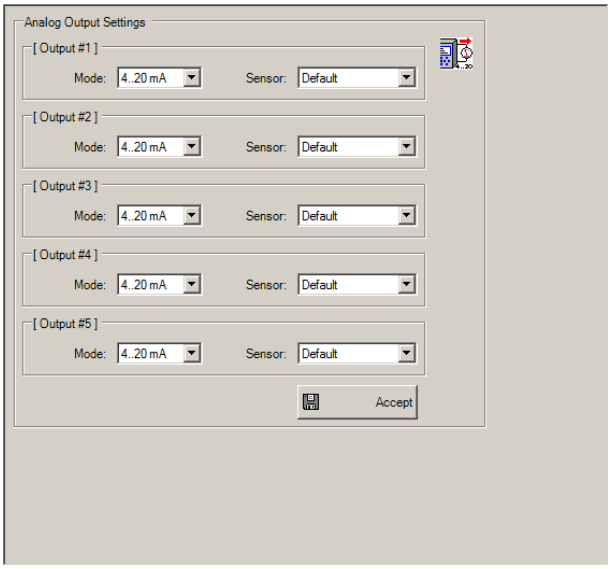
3.5.5 Analog Output Setup Analog Outputs

In the Analog Output Setup menu the available standard analog outputs of the SITRAM® Multisense device are organized. The appropriate size is mapped via 0 ... 20 mA or 4 ... 20 mA current outputs. The default settings, as well as the default factory sensor mappings are as follows:

SITRAM® Multisense	5		9	
	Mode	Sensor	Mode	Sensor
Output #1	4 ... 20 mA	H_2	4 ... 20 mA	H_2
Output #2	4 ... 20 mA	C_2H_2	4 ... 20 mA	C_2H_2
Output #3	4 ... 20 mA	C_2H_4	4 ... 20 mA	C_2H_4
Output #4	4 ... 20 mA	CO	4 ... 20 mA	CO
Output #5	4 ... 20 mA	H_2O	4 ... 20 mA	H_2O
Output #6	-	-	4 ... 20 mA	CO_2
Output #7	-	-	4 ... 20 mA	C_2H_6
Output #8	-	-	4 ... 20 mA	CH_4

Note: These are respectively the concentrations of the corresponding gas.

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In the column „Mode" the following selection can be done:

- Off
- 0 ... 20 mA
- 4 ... 20 mA

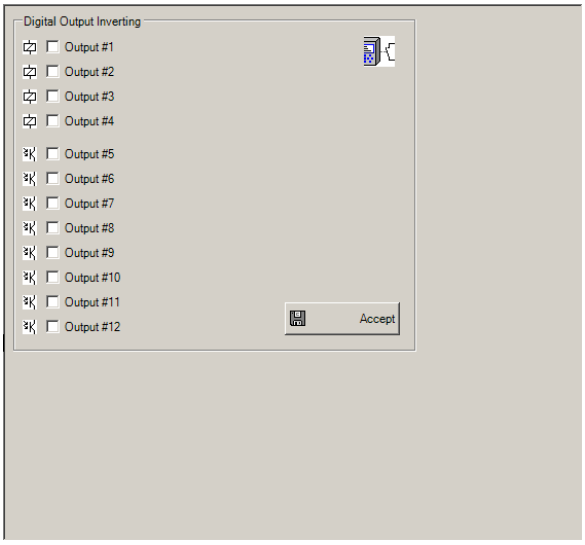
In the column „Sensor" the following selection can be done:

- Default (assignment see table above)
- Gas concentration (gas related to the device type)
- Gas daily trend (gas related to the device type)
- Gas weekly trend (gas related to the device type)
- Temperature (temperature related to the device type)
- All under additional sensors defined Values

Settings which have been newly created or modified must be saved with the Accept button. The asterisk right to the icon Analog Output Setup indicates that the settings still has to be transferred to the device. The settings are not synchronized at the moment and will be updated to the SITRAM® Multisense device on the next connection (3.7), if the selection field "Update Configuration" is selected.

3.5.6 Digital Output Setup Digital Outputs

Depending on the connected device the digital outputs can be inverted.



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3.5.7 Settings Settings

The settings in the Settings menu are distributed in three tabs:

- Real time clock RTC (3.5.7.1)
- Ethernet (3.5.7.2)
- Modbus RS485 (3.5.7.3)
- LED Bar Levels

3.5.7.1 Real Time Clock RTC

Real time clock related settings can be done for each SITRAM® Multisense device in the tab „Real Time Clock RTC" of the menu.

Daylight Saving Time Mode

The following selection can be done in this field:

- Siemens (Middle European Time): Summer- and wintertime are adapted automatically.
- None: The function is disabled.

Note: The Daylight Saving Time Mode relies on the Siemens time zone. That means that the time of the device is being set one hour ahead from the last Sunday in March to the last Sunday in October!

Time Offset

With time offset the time shift in relation to the real time clock (local time) can be adjusted.

The following selection is possible:

- -06:00 to -01:00
- None
- +01:00 to +06:00

The value of the time shift can also be entered directly into the selection field „Time Offset" (user): Take care to not to be less than or exceed the input of -06:00 to +06:00 and that the quarter steps (xx:00 / xx:15 / xx:30 / xx:45) are kept.



Note: „None" means that no time shift in relation to the real time clock (local time) is available. This setting is recommended.

Settings which have been newly created or modified must be saved with the Accept button afterwards. The asterisk right to the icon Settings indicates that the settings still has to be transferred to the device. The settings are not synchronized at the moment and will be updated to the SITRAM® Multisense device on the next connection (3.7), if the selection field "Update Configuration" is selected.

Date and time of the SITRAM® Multisense device can be synchronized by use of the connected PC. Therefore select the selection field „Synchronize with PC Clock" (3.7.1) that is shown after connection to the PC and pressing the button  in the transformer menu:

3.5.7.2 Ethernet

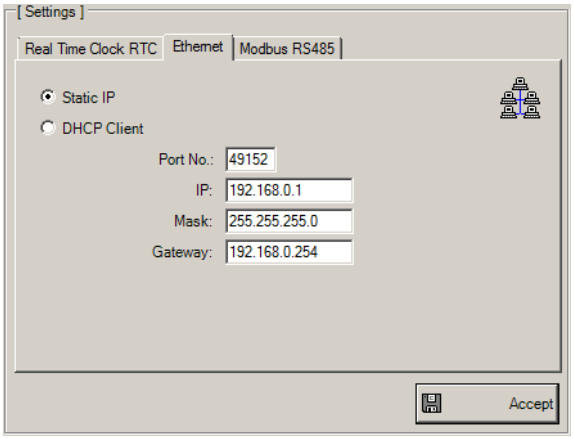
Ethernet related settings can be done for each SITRAM® Multisense device in the tab „Ethernet" of the Settings menu.

It can be chosen out of the following two variants:

- Static IP (3.5.7.2.1)
- DHCP Client (3.5.7.2.2)

3.5.7.2.1 Static IP

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The network settings can be obtained from your corresponding system administrator!

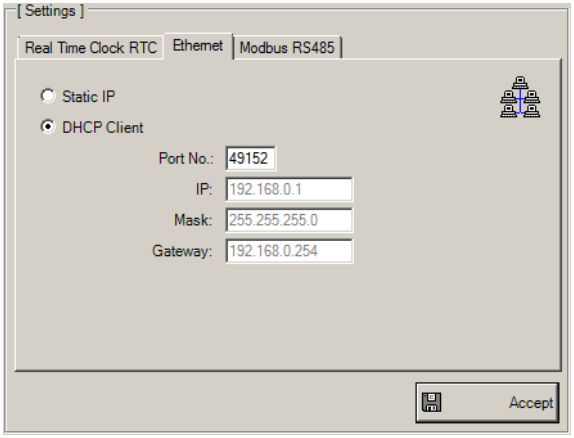
IP Address

Mask The setting 255.255.255.0 can be used in general.

Gateway Normally the automatic assigned setting can be used.

TCP Port Number The TCP port number should be determined by the system administrator as well. The free range for TCP port numbers is: 49152 ... 65535. Theoretically the device allows the following settings: 1 ... 65535. However several TCP port numbers are reserved for other applications for example HTTP, FTP, Mail, etc.

3.5.7.2.2 DHCP Client



By using this setting, the device obtains the network settings from the DHCP server which is responsible for the network administration. In this case only the port number can be entered. The network administrator must allow the automatic TCP/IP address assignment for SITRAM® Multisense in the network.

Settings which have been newly created or modified must be saved with the Accept button afterwards. The asterisk right to the icon Settings indicates that the settings still has to be transferred to the device. The settings are not synchronized at the moment and will be updated to the SITRAM® Multisense device on the next connection (3.7), if the selection field “Update Configuration” is selected.

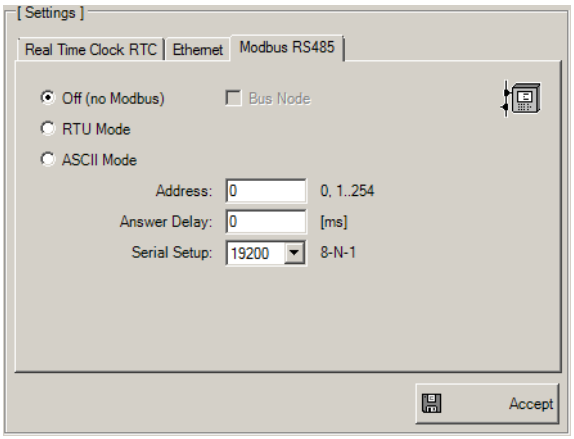
3.5.7.3 Modbus RS485

RS485 or MODBUS® serial related settings can be done for each SITRAM® Multisense device in the tab „Modbus RS485“ of the Settings menu.

- RS485 serial (3.5.7.3.1)
- MODBUS® RTU/ASCII serial (3.5.7.3.2)

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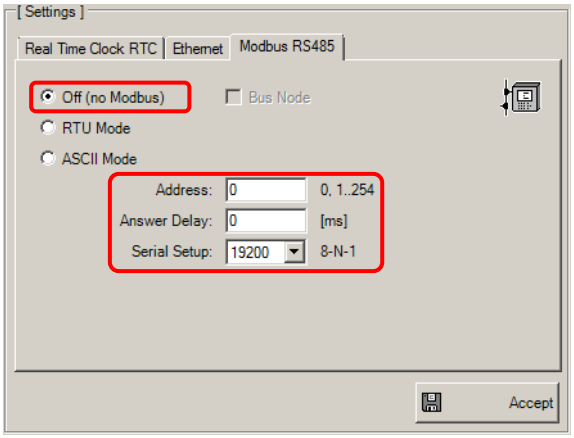
- MODBUS® TCP (3.5.7.3.3)



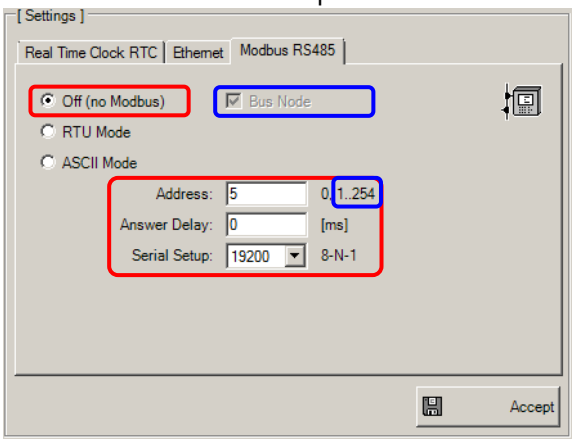
3.5.7.3.1 RS485 serial

The connection of one or multiple SITRAM® Multisense devices to a central SITRAM® Multisense Software computer can be realized via the serial RS485 interface with proprietary protocol and is available on SITRAM® Multisense 5 and 9 devices.

Point-to-Point connection for one device



Bus connection for multiple devices



- Address: 0,1 ... 254 (as Bus Node with Address 1...254)
- Answer Delay: 0 ... 2550 ms
- Baud rate 2400, 4800, 9600, 19200, 38400 or 57600

Data bits, parity and stop bits of the serial interface are set permanent to 8-N-1.

Note: Each device has to have a unique address (0, 1 ... 254). Currently up to 32 devices can be in the same RS485 bus network.

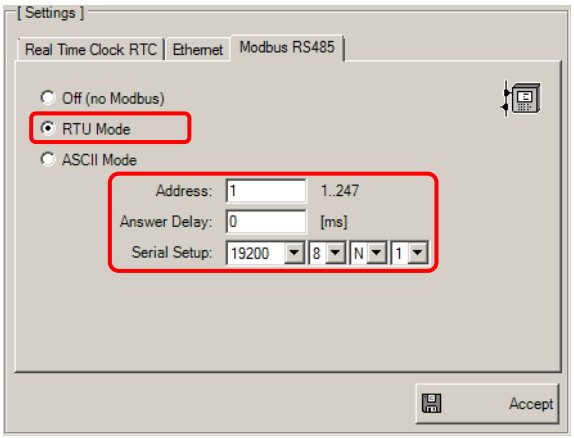
Settings which have been newly created or modified must be saved with the Accept button afterwards. The asterisk right to the icon Settings indicates that the settings still has to be transferred to the device. The settings are not synchronized at the moment and will be updated to the SITRAM® Multisense device on the next connection (3.7), if the selection field “Update Configuration” is selected.

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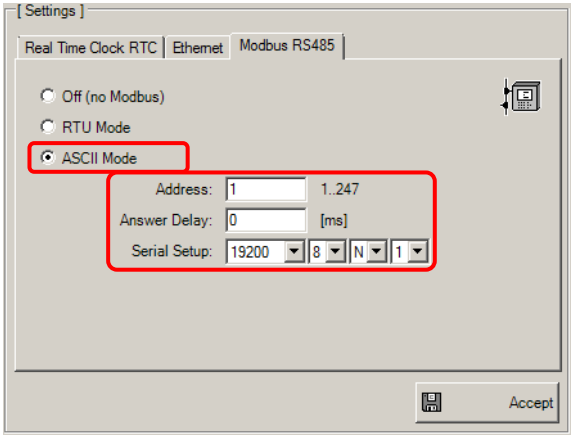
3.5.7.3.2 MODBUS® RTU/ASCII serial

The connection of multiple SITRAM® Multisense devices into a SCADA system can be realized via the serial RS485 interface with MODBUS® serial protocol and is available on SITRAM® Multisense 5 and 9 devices.

RTU Mode



ASCII Mode



- Address: 1 … 254
- Answer Delay: 0 … 2550 ms
- Baud rate 2400, 4800, 9600, 19200, 38400 or 57600
- Data bits 7 or 8
- Parity None (N), Odd (O) or Even (E)
- Stop bits 1 or 2

Note: Each device has to have a unique address (1 … 254). Currently up to 32 devices can be in the same MODBUS® serial network.

Settings which have been newly created or modified must be saved with the Accept button afterwards. The asterisk right to the icon Settings indicates that the settings still has to be transferred to the device. The settings are not synchronized at the moment and will be updated to the SITRAM® Multisense device on the next connection (3.7), if the selection field “Update Configuration” is selected.

3.5.7.3.3 MODBUS® TCP

The MODBUS® communication can be implemented into a network. MODBUS® TCP is available on the SITRAM® Multisense devices 5 and 9 and uses the default port number 502. These are independent from the serial MODBUS® configuration. MODBUS® TCP is not supported by SITRAM® Multisense Software but for the sake of completeness it is mentioned here.

3.5.8 Transformer Setup Transformer Setup

The settings in the Transformer Setup menu are distributed in three tabs:

- Hot Spot Calculation (3.5.8.1)
- Ageing Rate / Loss-of-Life (3.5.8.2)
- Bushing Monitoring (3.5.8.3)

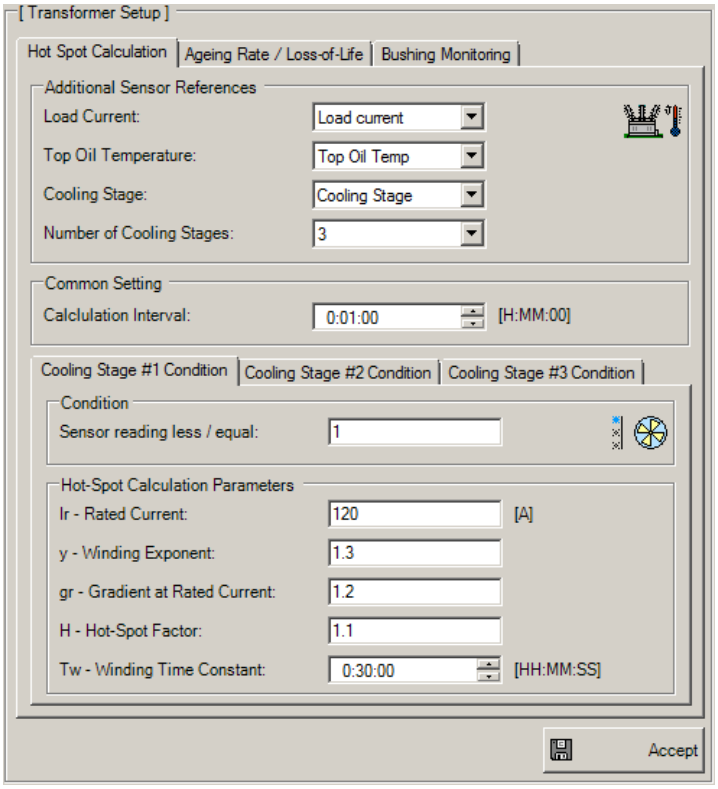
3.5.8.1 Hot Spot Calculation

The SITRAM® Multisense device can calculate the hot spot temperature of a transformer. For this calculation the SITRAM® Multisense device requires additional sensors.

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The tab „Hot Spot Calculation" contains the selection of the required sensors and has additional 1 ... 3 sub tabs, depending on how many cooling stages were selected.

Note: If the required sensors are not available in the selection, they must be defined previously in the Sensor Setup menu (3.5.2).



Additional Sensor References

- Load current : None / - as defined in sensor setup menu -
- Top Oil Temperature: None / - as defined in sensor setup menu -
- Cooling Stage : None / - as defined in sensor setup menu -
- Number of Cooling Stages: 1 ... 3 (only selectable if Cooling Stage present)

Common Setting

- Calculation Interval: 1 ... 86399 Minutes

Note: The calculation interval must be smaller than the storage interval of the top oil temperature sensor! We recommend defining the calculation interval to 0:01:00 (1 minute).

Cooling Stage #1 Condition

The parameters for hotspot calculation have to be entered into this sub tab, independently if a cooling system is present (i.e. ONAF) or not (ONAN). Usually, all data can be known through transformer manufacture technical specifications.

Condition

- Sensor reading less / equal: - as defined in sensor setup menu -

Note: The cooling stage sensor is not necessary required. It improves the calculation model significantly.

Hot Spot Calculation Parameters

- Ir - Rated Current: - from technical specification -
- y - Winding Exponent: - from technical specification -
- gr - Gradient at Rated Current: - from technical specification -
- H - Hot Spot Factor: - from technical specification -

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- Tw - Winding Time Constant: - from technical specification -

Note: All required information of the cooling stage conditions are usually taken from the technical specification of the transformer manufacturer.

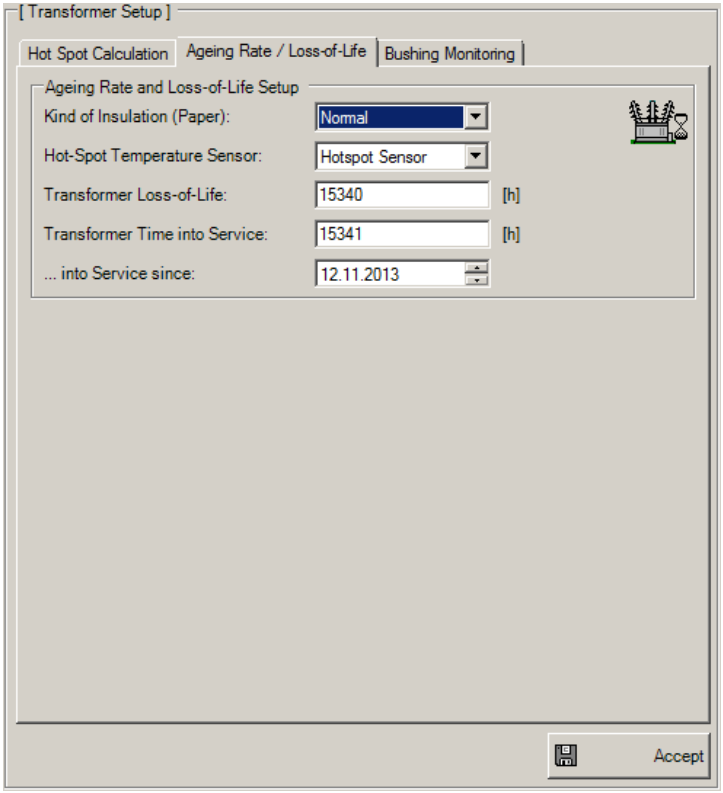
Note: The assignment of the calculated hot spot temperature to a virtual sensor must be defined in the Sensor Setup menu (3.5.2).

Settings which have been newly created or modified must be saved with the Accept button afterwards. The asterisk right to the icon Transformer Setup indicates that the settings still has to be transferred to the device. The settings are not synchronized at the moment and will be updated to the SITRAM® Multisense device on the next connection (3.7), if the selection field "Update Configuration" is selected.

3.5.8.2 Ageing Rate / Loss-of-Life

For the calculation of the ageing rate the SITRAM® Multisense device needs the three parameters: Hot spot temperature, kind of paper insulation and time into service of the transformer. Based on the ageing rate the loss-of-life and mean value of the relative ageing rate of the transformer are calculated. On old transformers the actual Loss-of-Life has to be entered (if necessary this must be evaluated). For new transformer enter 0 (zero). The calculated values (ageing rate, loss-of-life and average relative ageing rate) will be transferred to the virtual sensors and stored in the defined interval.

Note: The assignment of the calculated values to the virtual sensors must be defined previously in the Sensor Setup menu (3.5.2).



First of all, you must define the selection- and input fields with required information. Followings information must be selected respectively entered:

- Kind of Insulation (Paper): Normal / Thermally Updated
- Hot-Spot Temperature Sensor: Select sensor
- Transformer Loss-of-Live: Enter hours
- Transformer Time into Service: Enter hours **or** select date
- ... into Service since: Select date (DD.MM.YYYY)

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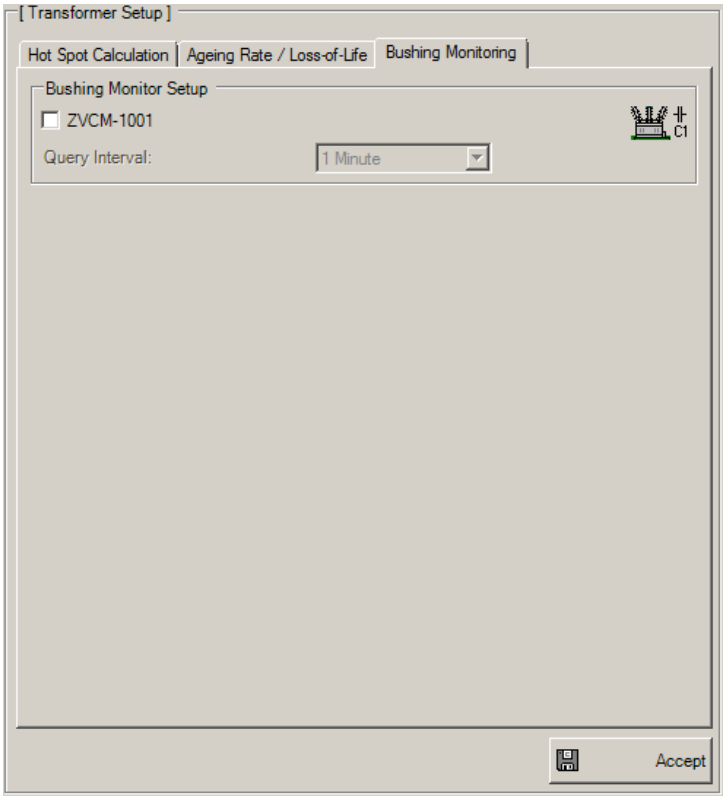
Note: The value for "Transformer Time into Service" is set automatically when the date "... into Service since" is selected. The date is selected in three steps (day – month –year) with the cursors on the right hand side of the field.

Note: If the required sensor is not available in the selection, it must be defined previously in the Sensor Setup menu (3.5.2).

Settings which have been newly created or modified must be saved with the Accept button afterwards. The asterisk right to the icon Transformer Setup indicates that the settings still has to be transferred to the device. The settings are not synchronized at the moment and will be updated to the SITRAM® Multisense device on the next connection (3.7), if the selection field "Update Configuration" is selected.

3.5.8.3 Bushing Monitoring

The SITRAM® Multisense device in its variants 5 and 9 has a connection for the optional implementation monitoring system Siemens Energy Bushing Monitoring system. The measuring Data of the Siemens Energy bushing monitoring system will be read out and copied into its own data memory. The Siemens Energy bushing monitoring -Data on the SITRAM® Multisense device will be shown as virtual sensors. As for all sensors, alarms can be set for the Siemens Energy bushing monitoring measuring data as well.

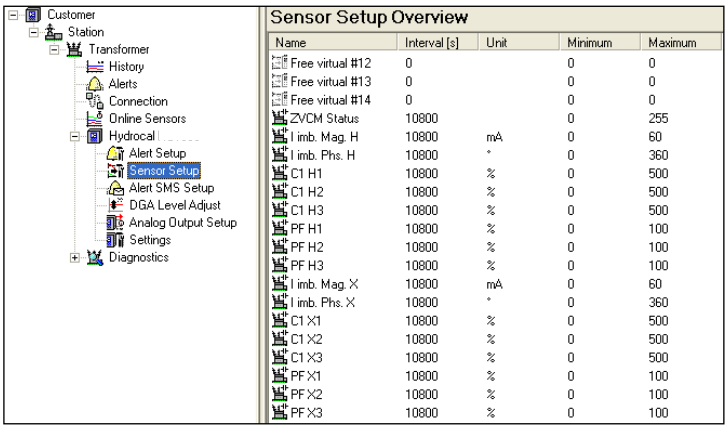


The following options can be selected:

- Siemens Energy bushing monitoring: inactive / active
- Query interval: 1 minute / 3 minuten / 15 minuten / 1 hour

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Remark: The virtual sensors only appear in the menue Sensor Setup (3.5.2) when a Siemens Energy bushing monitoring ist attached and activated in the menue Transformer Setup .
Afterwards the virtual senors appear in the menue Sensor Setup as follows:



Name	Interval [s]	Unit	Minimum	Maximum
Free virtual #12	0		0	0
Free virtual #13	0		0	0
Free virtual #14	0		0	0
ZVCM Status	10800		0	255
I imb. Mag. H	10800	mA	0	60
I imb. Phs. H	10800	°	0	360
C1 H1	10800	%	0	500
C1 H2	10800	%	0	500
C1 H3	10800	%	0	500
PF H1	10800	%	0	100
PF H2	10800	%	0	100
PF H3	10800	%	0	100
I imb. Mag. X	10800	mA	0	60
I imb. Phs. X	10800	°	0	360
C1 X1	10800	%	0	500
C1 X2	10800	%	0	500
C1 X3	10800	%	0	500
PF X1	10800	%	0	100
PF X2	10800	%	0	100
PF X3	10800	%	0	100

For detailed information regarding the sensors, refer to the Siemens Energy bushing monitoring documentation.

Settings which have been newly created or modified must be saved with the Accept button afterwards. The asterisk right to the icon Transformer Setup indicates that the settings still has to be transferred to the device. The settings are not synchronized at the moment and will be updated to the SITRAM® Multisense device on the next connection (3.7), if the selection field “Update Configuration” is selected.

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3.6 Diagnostics Diagnostics

The SITRAM® Multisense 9 device has additional measuring data diagnoses. This can help to interpret the measuring data. The measuring data are represented according to Duval (type 1) and Rogers (3D). Different algorithms can be selected.

The three settings for the two diagnosis methods appear in the menue Diagnostics :

The properties can be selected as follows:

Duval Regions: - standard - / Biotemp / FR3 / IEC 60599 / Midel / Silicone
Remark: The sort of oil for the Duval-triangle can be selected here. Different oil has different boundaries and fault zones. The selection 'standard' corresponds to the type of oil IEC 60599.

- Duval threshold: - standard - / 10-10-10

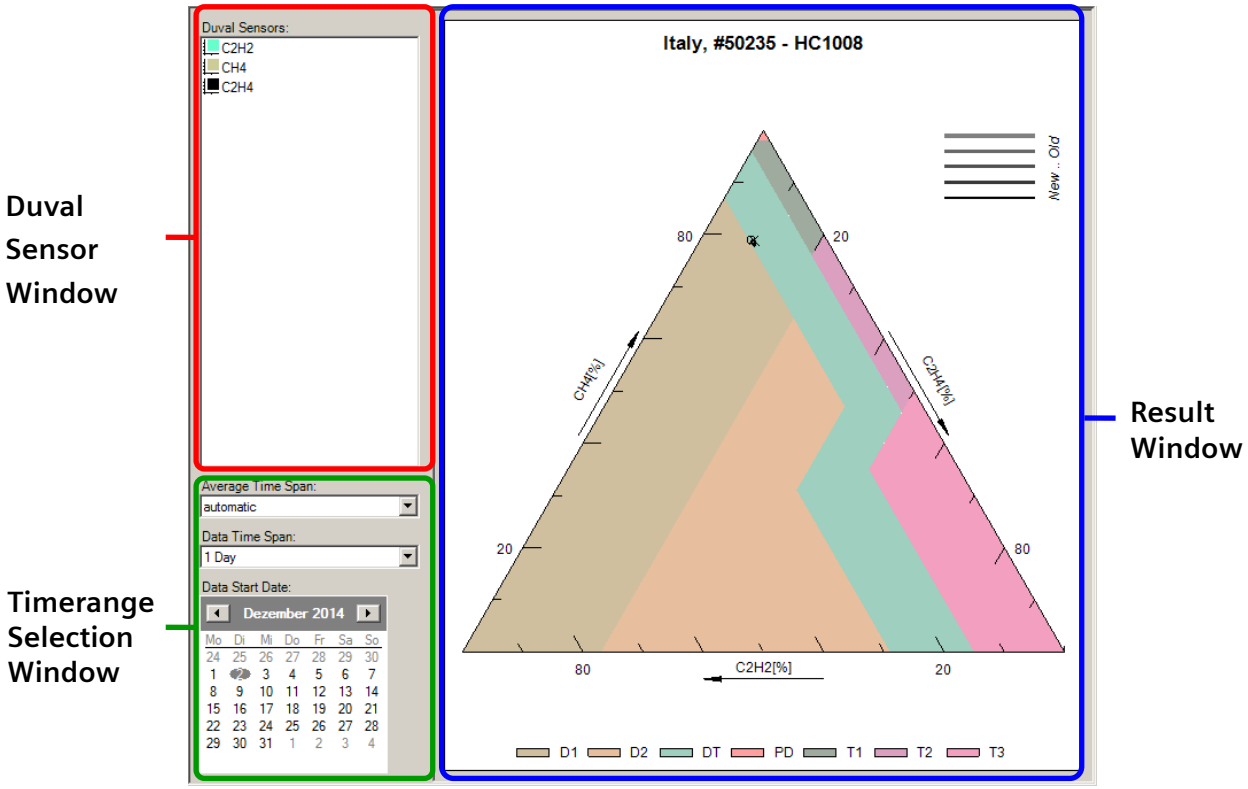
Remark: The selection 10-10-10 means, that the measurement is only visualized in the triangle, when a minimum concentration of at least 10 ppm for the gases C_2H_2, CH_4 and C_2H_4 is present.

- Rogers threshold: - standard - / 10-10-10-10-10

Remark: The selection 10-10-10-10-10 means, that the measurement is only visualized in the 3D grafic, when a minimum concentration of at least 10 ppm for the gases H2, C_2H_2, C_2H_4, C_2H_6 and CH_4 is present.

3.6.1 Duval Triangle Duval Triangle

To view the read out measuring data as a Duval triangle (defined according IEC 60599 type 1 with C_2H_2[%], CH_4[%] and C_2H_4[%]), the entry Duval Triangle has to be selected in the corresponding transformer in the tree structure. Three different operation windows are available (see graphic):



The three gasses are indicated in percent.

The individual operation windows have the following designation:

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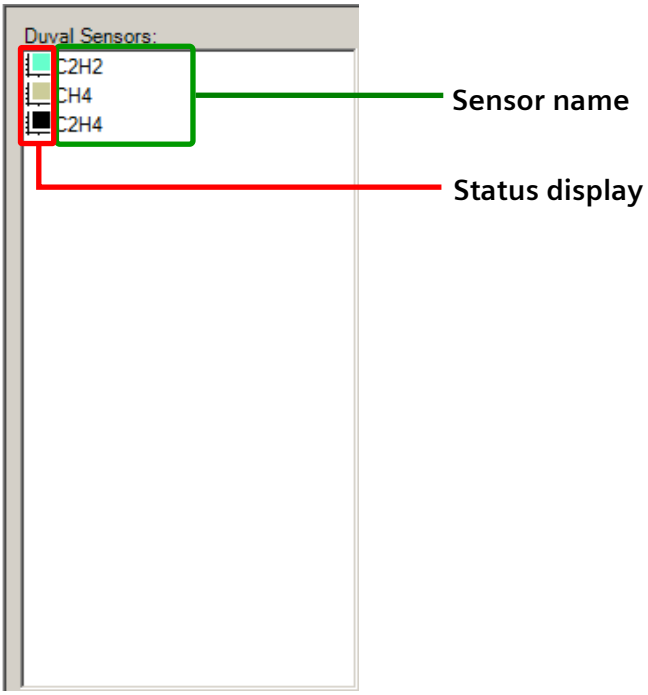
- Duval Sensor Window (3.6.1.1)
- Timerange Selection Window (3.6.1.2)
- Result Window (3.6.1.3)

The Result Window offers the following options in the context menu (right mouse click):

- Continue processing the displayed measuring data (3.6.1.7)

3.6.1.1 Duval Sensor Window

The used sensors for the Duval Triangle are shown in the Duval Sensor Window:

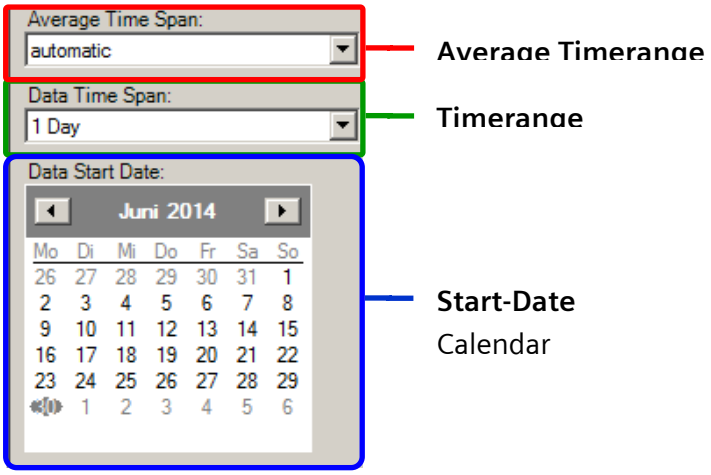


This is for the overview only and presents the sensor colour of the legend from the Result Window in the "Display as Graphic" view.

Remark: The settings are fixed. The status display as well as the corresponding colours can not be changed.

3.6.1.2 Timerange Selection Window (Duval):

The timerange for the display in the Result Window is selected in this window:

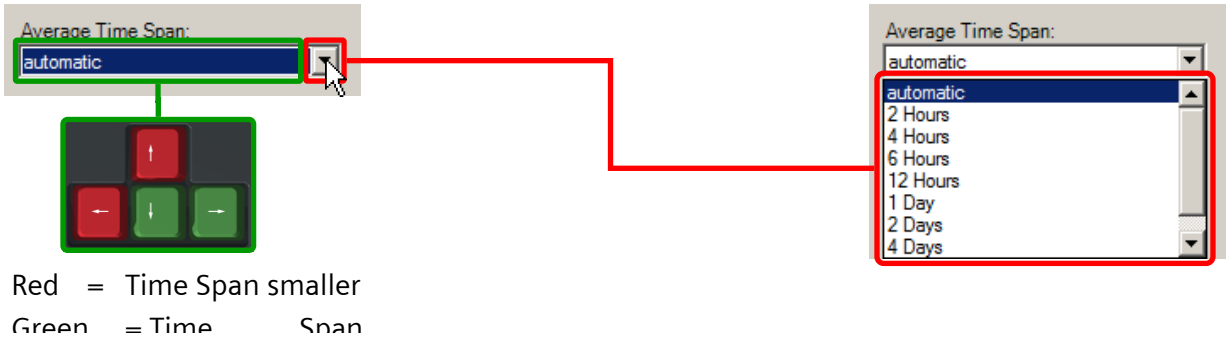


The Timerange is selected in three steps:

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- **Average Timerange**

  The average value in the Result Window can be changed by means of the selection box or with selected timerange (blue background) with the arrow keys of the computer keyboard.



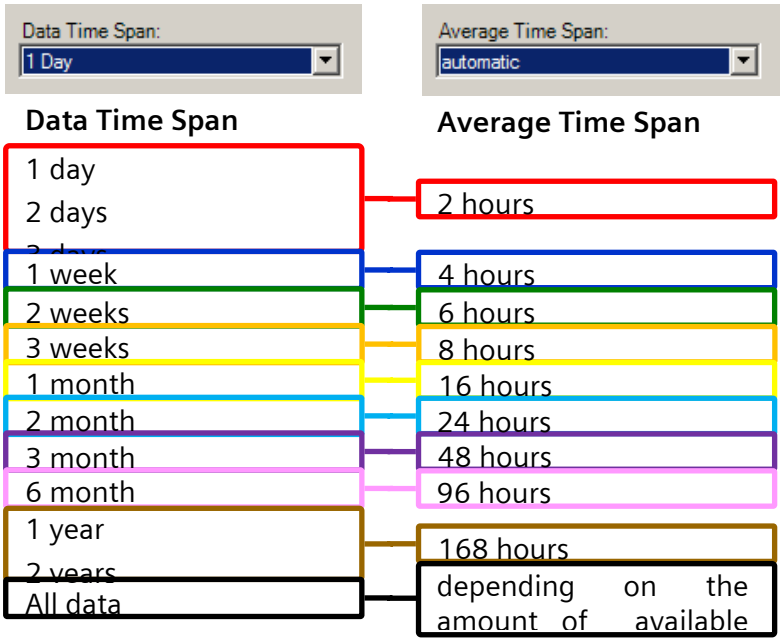
Red = Time Span smaller

Green = Time Span

The following time values are available for the average value generation:

automatic	2 hours	1 day
	4 hours	2 days
	6 hours	4 days
	12 hours	7 days

If "automatic" is selected the following average value generation is deposited at the corresponding time span:

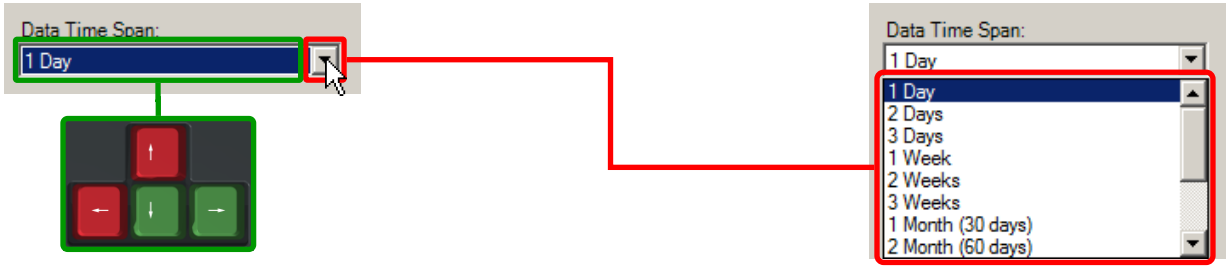


Remark: The average value generation is displayed in square brackets in the header in table view of the Result Window

- **Time Span**

  The time span in the Result Window can be changed by means of the selection box or with selected time span (blue background) with the arrow keys of the computer keyboard.

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Red = Time Span smaller
Green = Time Span

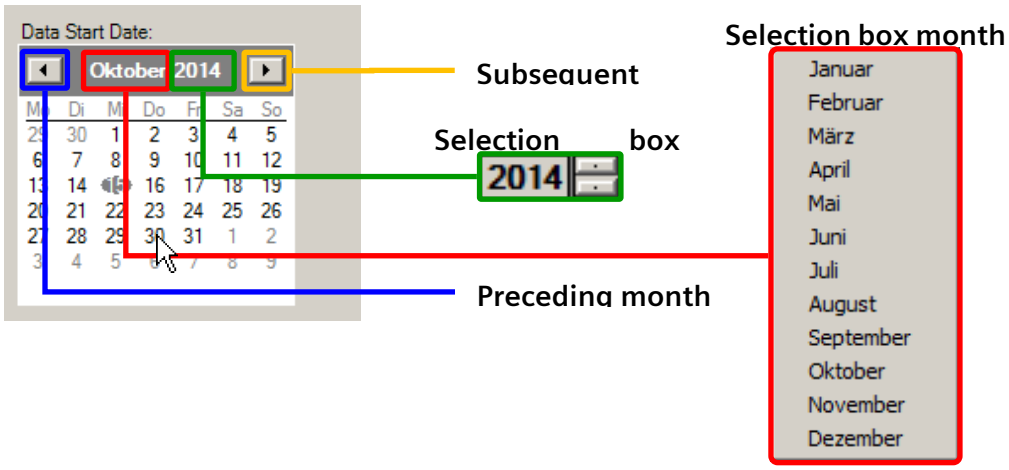
The following time values are available:

1 day	1 week	1 month	1 year	All Data
2 days	2 weeks	2 month	2 years	
3 days	3 weeks	3 month		
		6 month		

If "All Data" is chosen, the Time Span will automatically be adjusted to the timerange in which measurements are available.

- **Start date**

  The start date is set by clicking with the mouse on the desired date in the calendar dialogue. A preceding or subsequent month can be selected within the calendar dialogue by means of the arrow keys.



Remark: The calendar appears in the standard language of the operating system.

3.6.1.3 Result Window (Duval)

In the Result Window, the data points are displayed in the selected time range with the appropriate averaging. Activate the context menu in the Result Window with a right mouse click and choose the desired display type.

Remark: The selection of the view can also be done via the View Menu in the Menubar.

The individual display types have the following designations:

- Result Window Duval Tabel View (3.6.1.4)
- Result Window Duval Graphic View (3.6.1.5)
- Result Window Duval Triangle View (3.6.1.6)

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3.6.1.4 Result Window Duval Tabel View

In the illustration Table View, the data points are displayed in a table within the selected time range with the appropriate averaging

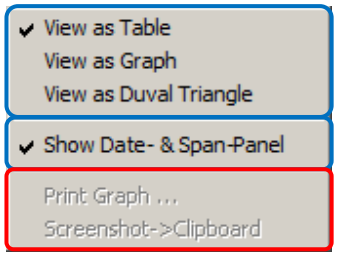
Data:

Date/Time	C2H2 [%]	CH4 [%]	C2H4 [%]
05.02.2014 00:00:00	60.3	0	39.7
07.02.2014 00:00:00	57.8	0.2	42
09.02.2014 00:00:00	58.8	0.6	40.6
11.02.2014 00:00:00	61.5	0.3	38.2
13.02.2014 00:00:00	57	1.4	41.6
15.02.2014 00:00:00	61.7	0.3	38
17.02.2014 00:00:00	59.9	0.7	39.4
19.02.2014 00:00:00	62.7	0.5	36.8
21.02.2014 00:00:00	63.6	0.5	35.9
23.02.2014 00:00:00	61.2	0.2	38.6
25.02.2014 00:00:00	62.5	1.3	36.2
27.02.2014 00:00:00	62.8	1.5	35.7
02.03.2014 00:00:00	60.2	0.7	39.1
03.03.2014 00:00:00	57.9	0.5	41.6
05.03.2014 00:00:00	56.1	1.2	42.7
07.03.2014 00:00:00	59.3	0	40.7
09.03.2014 00:00:00	61.7	1.1	37.2
11.03.2014 00:00:00	56.7	0.6	42.7
13.03.2014 00:00:00	56.6	1.2	42.2
15.03.2014 00:00:00	62.3	0.9	36.8
17.03.2014 00:00:00	54.8	2.6	42.6
19.03.2014 00:00:00	58.8	2.8	38.4
21.03.2014 00:00:00	65.4	1.1	33.5
23.03.2014 00:00:00	65.2	0.7	34.1
25.03.2014 00:00:00	62.1	2	35.9
27.03.2014 00:00:00	59.8	2.4	37.8
29.03.2014 00:00:00	59.8	2	38.2
31.03.2014 00:00:00	57.3	3	39.7
03.04.2014 00:00:00	58.1	1.2	40.7
05.04.2014 00:00:00	79.2	0.3	20.5
07.04.2014 00:00:00	71.6	1.4	27
09.04.2014 00:00:00	68.1	0.9	31
11.04.2014 00:00:00	65	2.4	32.6
13.04.2014 00:00:00	63	3.2	33.8
15.04.2014 00:00:00	63.8	0.7	35.5
17.04.2014 00:00:00	62.3	0.9	36.8
19.04.2014 00:00:00	63.7	1.8	34.5

Beside of the data columns the table consists of a column containing the time of the measurement. It is named Date/Time. By default the sequence of the data is ordered by Date/Time (oldest first).

- **Context Menu**

  The following settings can be done via the context menu in the table view:



  Remark: The settings in the red frame are only possible, if the Graphic- or the Duval Triangle View are active. When changing to Table View they will be grayed out and can not be selected anymore. The blue marked settings can be selected at any time.

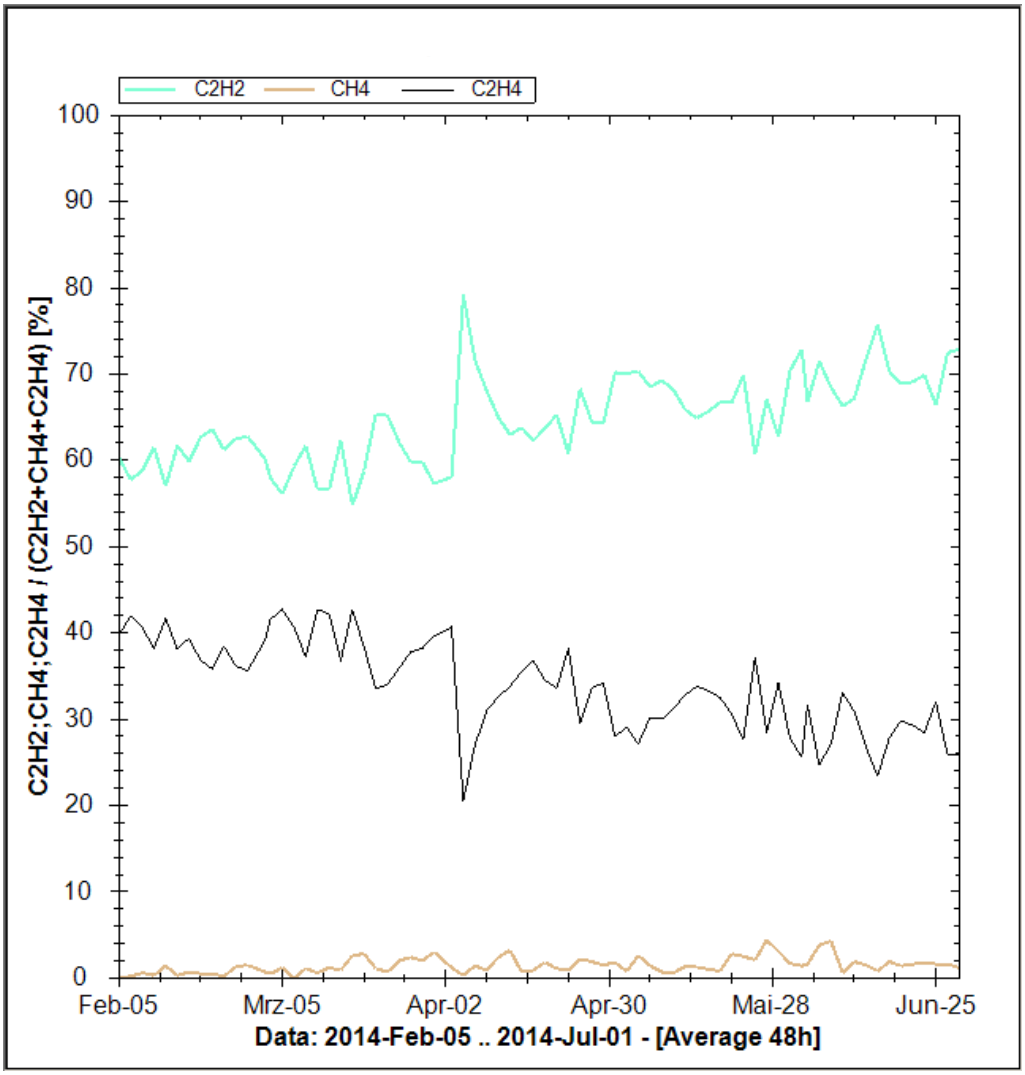
- **Show Alarm-, Date- Timerange:** With this function the sensor- and the time range selection window can be faded in or out. The Result Window will be displayed bigger or smaller accordingly.

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Remark: This function can be switched ON or OFF with a double click in the Result Window as well.

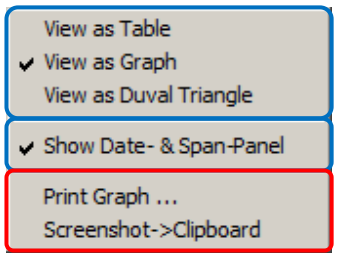
3.6.1.5 Result Window Duval Graphic View

In the illustration Graphic View, the data points are displayed in the selected time range with the appropriate averaging in a graphical curve progression:



- **Context Menu**

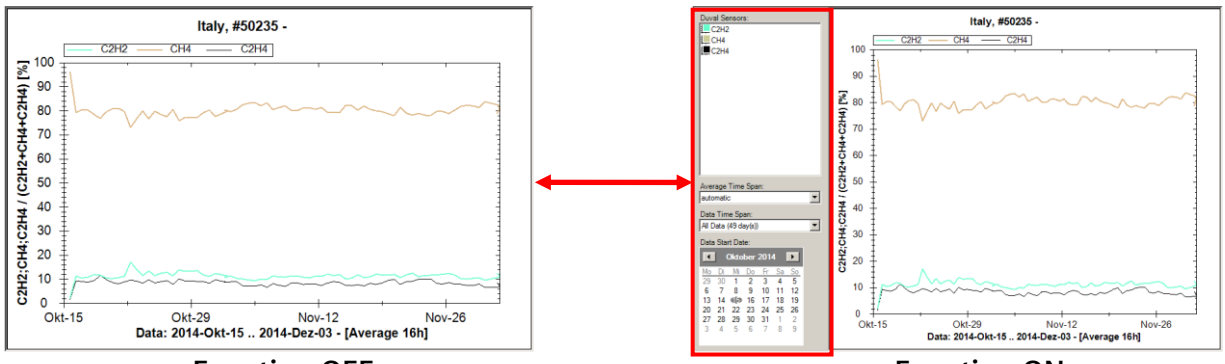
  The following settings can be done via the context menu in the graphic view:



Remark: The settings in the red frame are only possible, if the Graphic- or the Duval Triangle View are active. When changing to Table View they will be grayed out and can not be selected anymore. The blue marked settings can be selected at any time

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- **Show Alarm-, Date- Timerange:** With this function the sensor- and the time range selection window can be faded in or out. The Result Window will be displayed bigger or smaller accordingly.

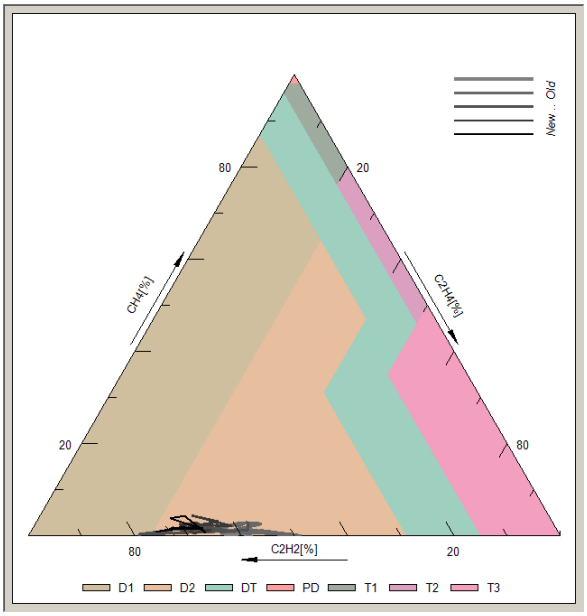


Function OFF **Function ON**

Remark: This function can be switched ON or OFF with a double click in the Result Window as well.

3.6.1.6 Result Window Duval Triangle View

In the illustration Duval Triangle View, the data points are displayed in the selected time range with the appropriate averaging as a Duval Triangle (according typ 1):

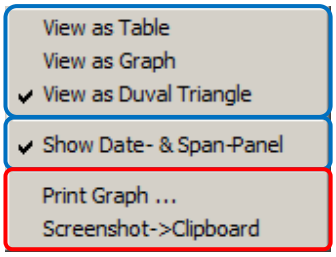


D1 Discharges of low energy
D2 Discharges of high energy
DT Combination thermal faults & discharges
PD Partial discharges
T1 Thermal faults, t < 300°C
T2 Thermal faults,300°C < t < 700°C
T3 Thermal faults, t > 700°C

- **Context Menu**

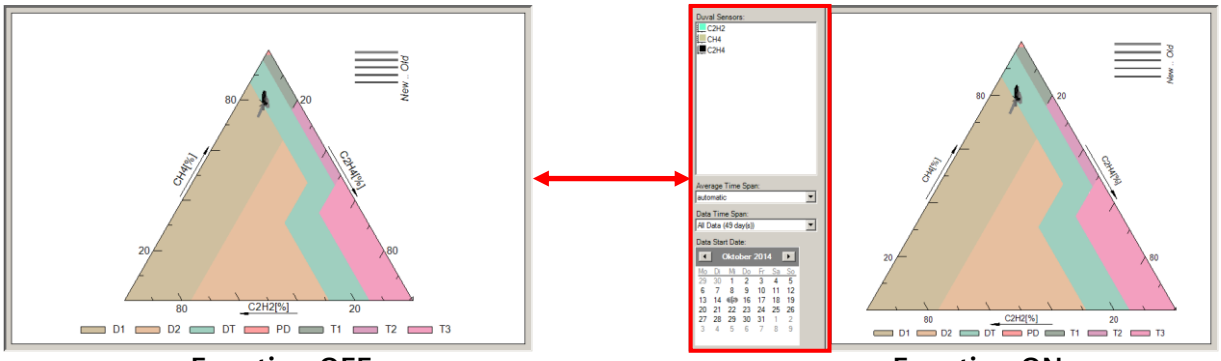
  The following settings can be done via the context menu in the graphic view:

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Remark: The settings in the red frame are only possible, if the Graphic- or the Duval Triangle View are active. When changing to Table View they will be grayed out and can not be selected anymore. The blue marked settings can be selected at any time

- **Show Alarm-, Date- Timerange:** With this function the sensor- and the time range selection window can be faded in or out. The Result Window will be displayed bigger or smaller accordingly.



Function OFF **Function ON**

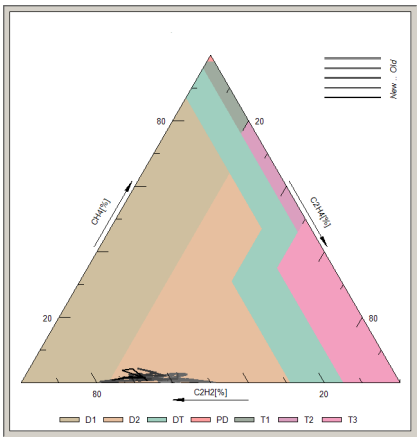
Remark: This function can be switched ON or OFF with a double click in the Result Window as well.

The sort of oil for the Duval-triangle can be selected here.

The sort of oil for the Duval-triangle (Duval Region) can be selected in the workin area of the Diagnostics Menu (3.6). Different oil has different boundaries and fault zones. The selection 'standard' corresponds to the type of oil IEC 60599.

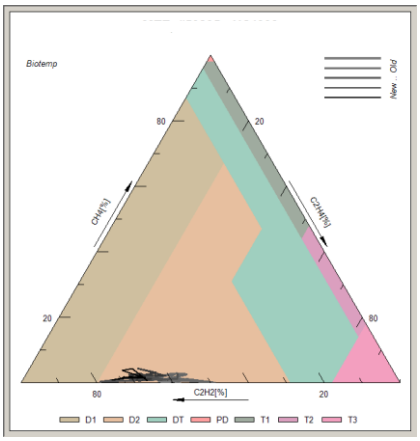
Here the overview of the 6 different settings with the same data points:

Standard



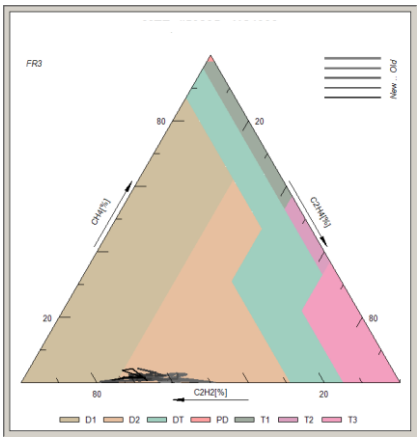
IEC 60599

Biotemp



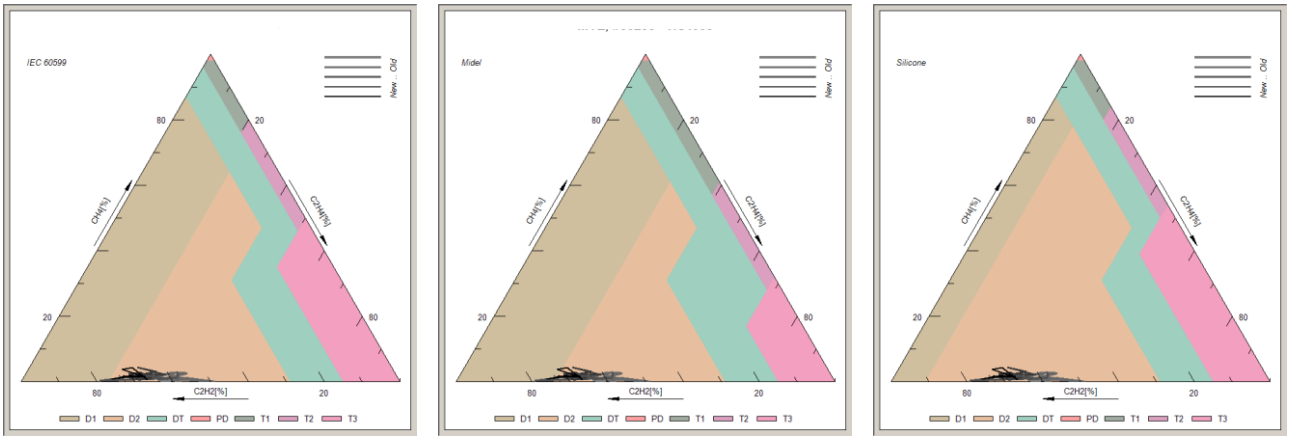
Midel

FR3



Silicone

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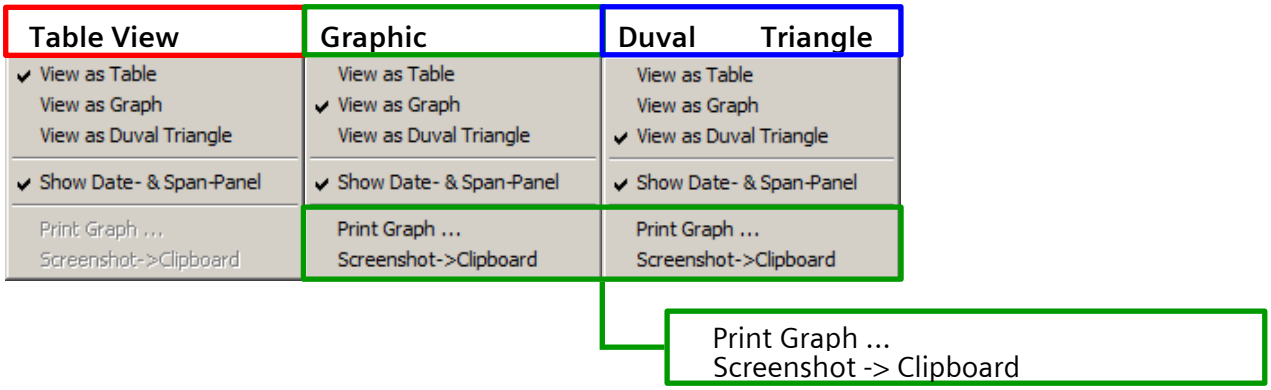


Please be aware: The selection of oil types does not mean, the sensor itself can operate those oil types. Please refer to the documentation of the sensor in that regard.

3.6.1.7 Further processing of the displayed measurement data (Duval)

There are various options available to further process the existing data for Documentation purposes. The different options can be selected via the context menu.

- **Context menu**

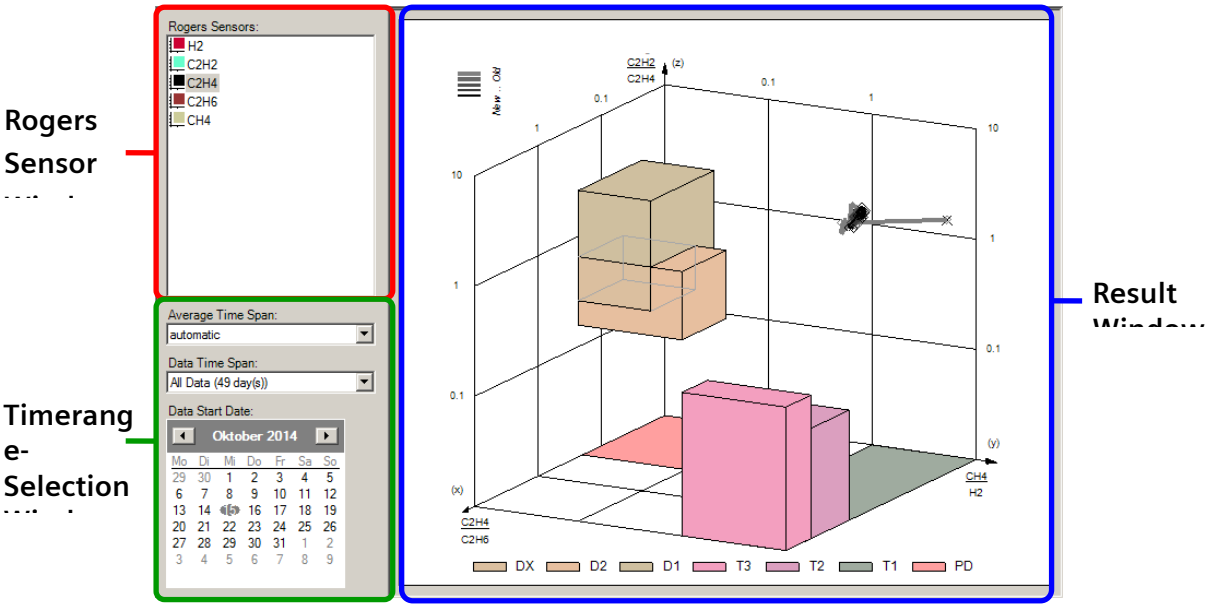


- **Print Graph ...** : (3.8.4.2)
- **Screenshot -> Clipboard** : (3.8.4.3)

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3.6.2 Rogers (3D) Rogers (3D)

To view the read out measuring data as a Rogers 3D Ratio Graphic the entry Rogers (3D) has to be selected in the corresponding transformer in the tree structure. Three different operation windows are available (see graphic):



The five gases are shown as relations in a 3D graphic (according IEC 60599 Relations: X-Axis (Ratio1)=C_2H_4/C_2H_6; Y-Axis (Ratio2)=CH_4/H_2; Z-Axis (Ratio3)=C_2H_2/C_2H_6)

The individual operation windows have the following designation:

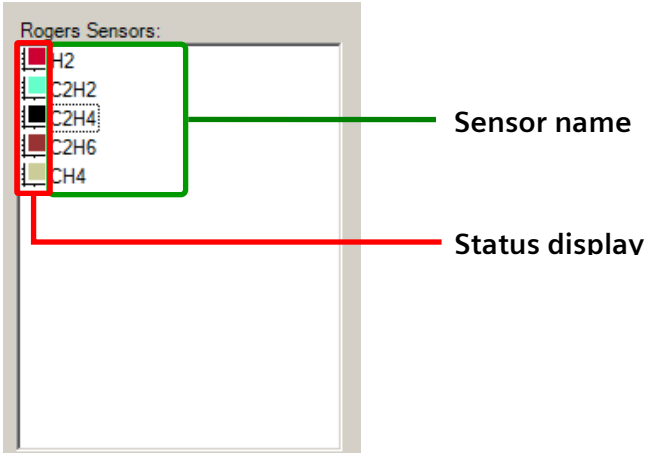
- Rogers Sensor Window (3.6.2.1)
- Timerange Selection Window (3.6.2.2)
- Result Window (3.6.2.3)

The Result Window offers the following options in the context menu (right mouse click):

- Continue processing the displayed measuring data (3.6.2.4)

3.6.2.1 Rogers Sensor Window

The used sensors for the Rogers 3D Graphic are shown in the Rogers Sensor Window:



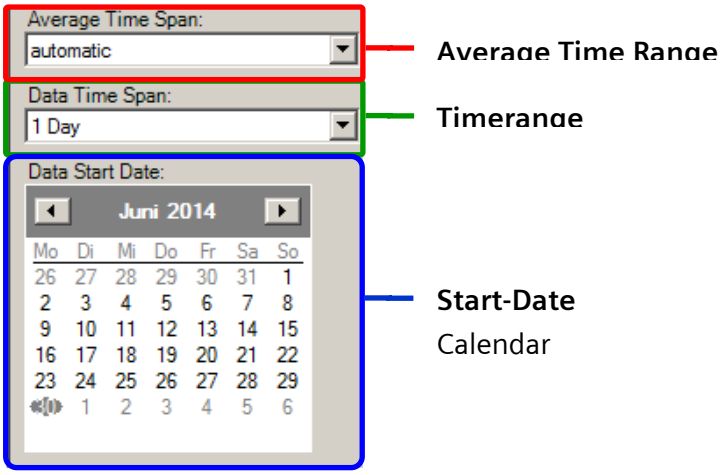
This is for the overview only.

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Remark: The settings are fixed. The status display as well as the corresponding colors can not be changed.

3.6.2.2 Time range Selection Window (Rogers)

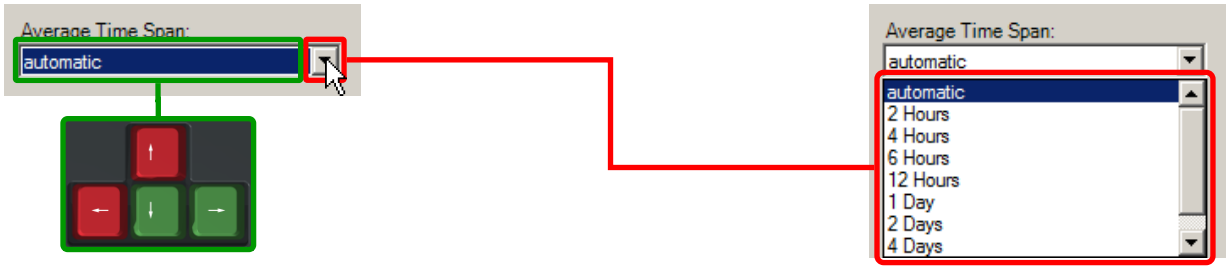
The time range for the display in the Result Window is selected in this window:



The Time range is selected in three steps:

- **Average Timerange**

  The average value in the Result Window can be changed by means of the selection box or with selected time range (blue background) with the arrow keys of the computer keyboard.



Red = Time Span smaller

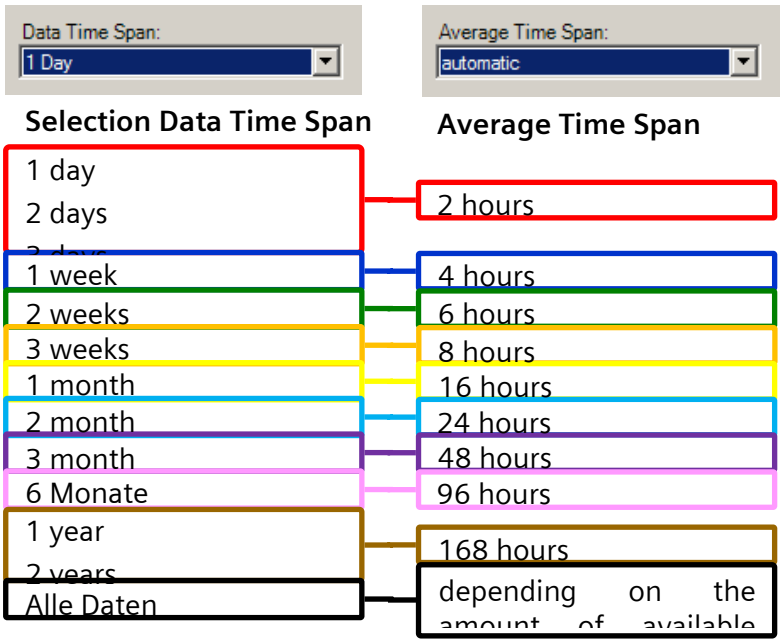
Green = Time Span

The following time values are available for the average value generation:

automatic	2 hours	1 day
	4 hours	2 days
	6 hours	4 days
	12 hours	7 days

If "automatic" is selected the following average value generation is deposited at the corresponding time span:

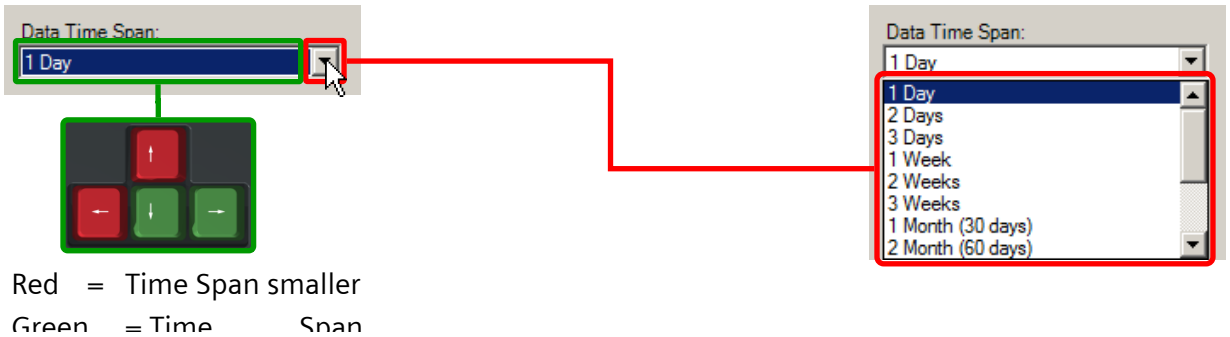
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Remark: The average value generation is displayed in square brackets in the header in table view of the Result Window.

- **Time Span**

  The time span in the Result Window can be changed by means of the selection box or with selected time span (blue background) with the arrow keys of the computer keyboard.



Red = Time Span smaller
Green = Time Span

The following time values are available:

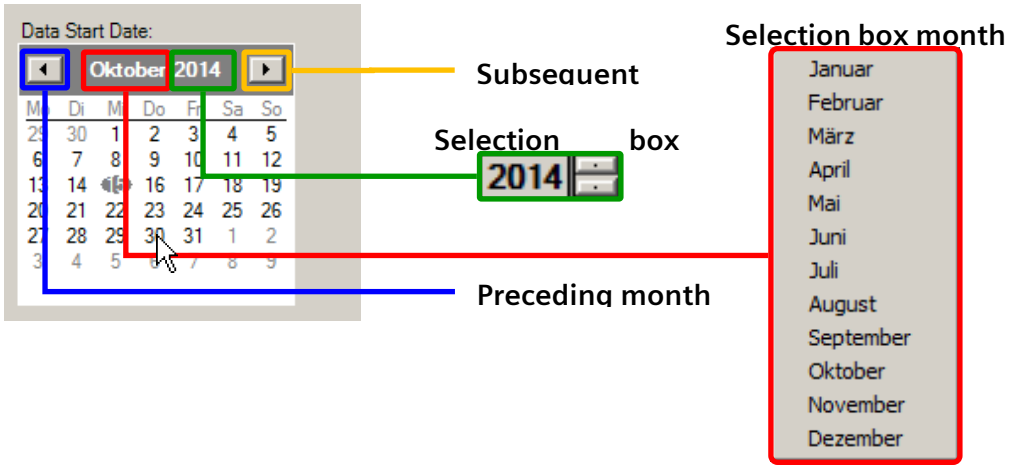
1 day	1 week	1 month	1 year	All Data
2 days	2 weeks	2 month	2 years	
3 days	3 weeks	3 month		
		6 month		

If ”All Data“ is chosen, the Time Span will automatically be adjusted to the timerange in which measurements are available.

- **Start date**

  The start date is set by clicking with the mouse on the desired date in the calendar dialogue. A preceding or subsequent month can be selected within the calendar dialogue by means of the arrow keys.

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Remark: The calendar appears in the standard language of the operating system.

3.6.2.3 Result Window (Rogers)

In the Result Window, the data points are displayed in the selected time range with the appropriate averaging. Activate the context menu in the Result Window with a right mouse click and choose the desired display type.

Remark: The selection of the view can also be done via the View Menu in the Menubar.

The individual display types have the following designations:

- Result Window Rogers Tabel View (3.6.2.3.1)
- Result Window Rogers Graphic View (3.6.2.3.2)
- Result Window Rogers 3D View (3.6.2.3.3)

3.6.2.3.1 Result Window Rogers Table View

In the illustration Table View, the data points are displayed in a table within the selected time range with the appropriate averaging.

Data: Italy, #50235 - HC1

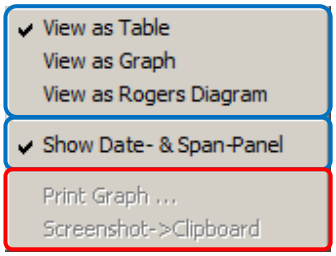
Date/Time	C2H4/C2H6	CH4/H2	C2H2/C2H4
15.10.2014 08:00:00	0.01	5.234	1.373
16.10.2014 00:00:00	0.02	0.768	1.206
16.10.2014 16:00:00	0.019	0.867	1.177
17.10.2014 08:00:00	0.018	0.808	1.242
18.10.2014 00:00:00	0.019	0.781	1.261
18.10.2014 16:00:00	0.024	0.847	1.021
19.10.2014 08:00:00	0.02	0.824	1.061
20.10.2014 00:00:00	0.018	0.863	1.179
20.10.2014 16:00:00	0.017	0.853	1.316
21.10.2014 08:00:00	0.017	0.841	1.268
22.10.2014 00:00:00	0.017	0.867	1.765
22.10.2014 16:00:00	0.017	1.07	1.536
23.10.2014 08:00:00	0.016	1.085	1.364
24.10.2014 00:00:00	0.018	0.907	1.373
24.10.2014 16:00:00	0.017	1.011	1.352
25.10.2014 08:00:00	0.018	1.034	1.384
26.10.2014 00:00:00	0.018	0.97	1.363
26.10.2014 16:00:00	0.017	1.139	1.438
27.10.2014 08:00:00	0.019	0.966	1.356
28.10.2014 00:00:00	0.018	1.016	1.428
28.10.2014 16:00:00	0.019	1.056	1.43
29.10.2014 08:00:00	0.017	0.992	1.492
30.10.2014 00:00:00	0.018	1.056	1.309
30.10.2014 16:00:00	0.018	1.086	1.331
31.10.2014 08:00:00	0.02	0.978	1.266
01.11.2014 16:00:00	0.017	1.039	1.308
01.11.2014 08:00:00	0.019	1.085	1.216
02.11.2014 00:00:00	0.019	1.036	1.283
02.11.2014 16:00:00	0.018	0.991	1.161

Beside of the data columns the table consists of a column containing the time of the measurement. It is named Date/Time. By default the sequence of the data is ordered by Date/Time (oldest first).

- **Context Menu**

  The following settings can be done via the context menu in the table view:

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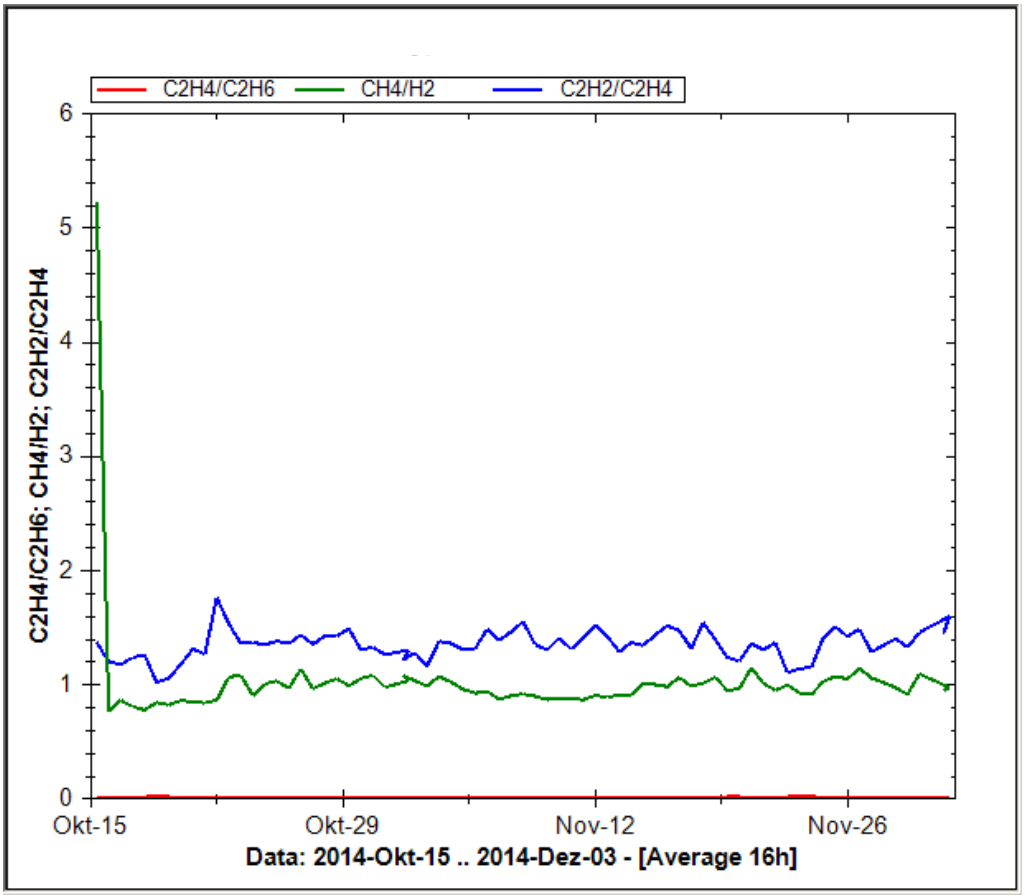
Remark: The settings in the red frame are only possible, if the Graphic- or the Rogers 3 View are active. When changing to Table View they will be grayed out and can not be selected anymore. The blue marked settings can be selected at any time.

- **Show Alarm-, Date- Time range:** With this function the sensor- and the time range selection window can be faded in or out. The Result Window will be displayed bigger or smaller accordingly.

  Remark: This function can be switched ON or OFF with a double click in the Result Window as well.

3.6.2.3.2 Result Window Rogers Graphic VIew

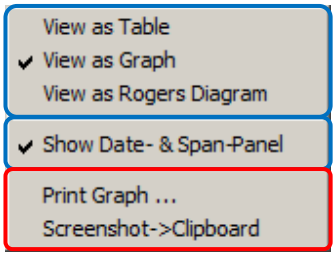
In the illustration Graphic View, the data points are displayed in the selected time range with the appropriate averaging in a graphical curve progression:



- **Context Menu**

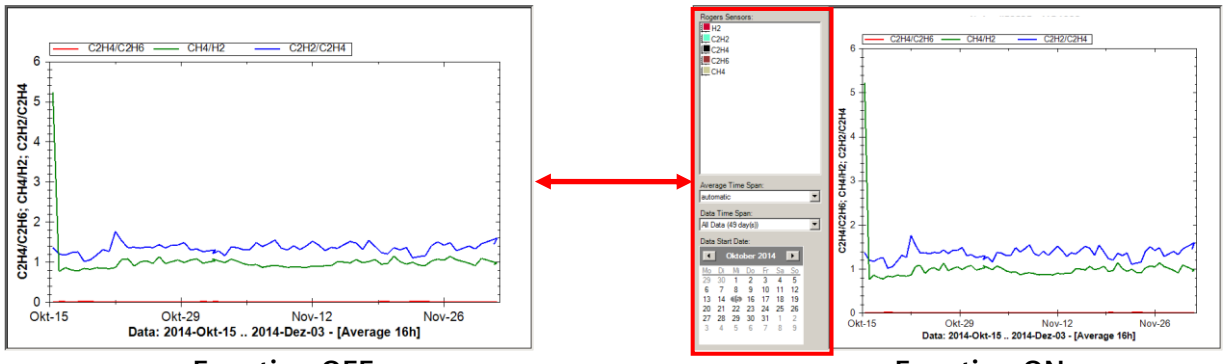
  The following settings can be done via the context menu in the graphic view:

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Remark: The settings in the red frame are only possible, if the Graphic- or the Rogers 3D View are active. When changing to Table View they will be grayed out and can not be selected anymore. The blue marked settings can be selected at any

- **Show Alarm-, Date- Timerange:** With this function the sensor- and the time range selection window can be faded in or out. The Result Window will be displayed bigger or smaller accordingly.



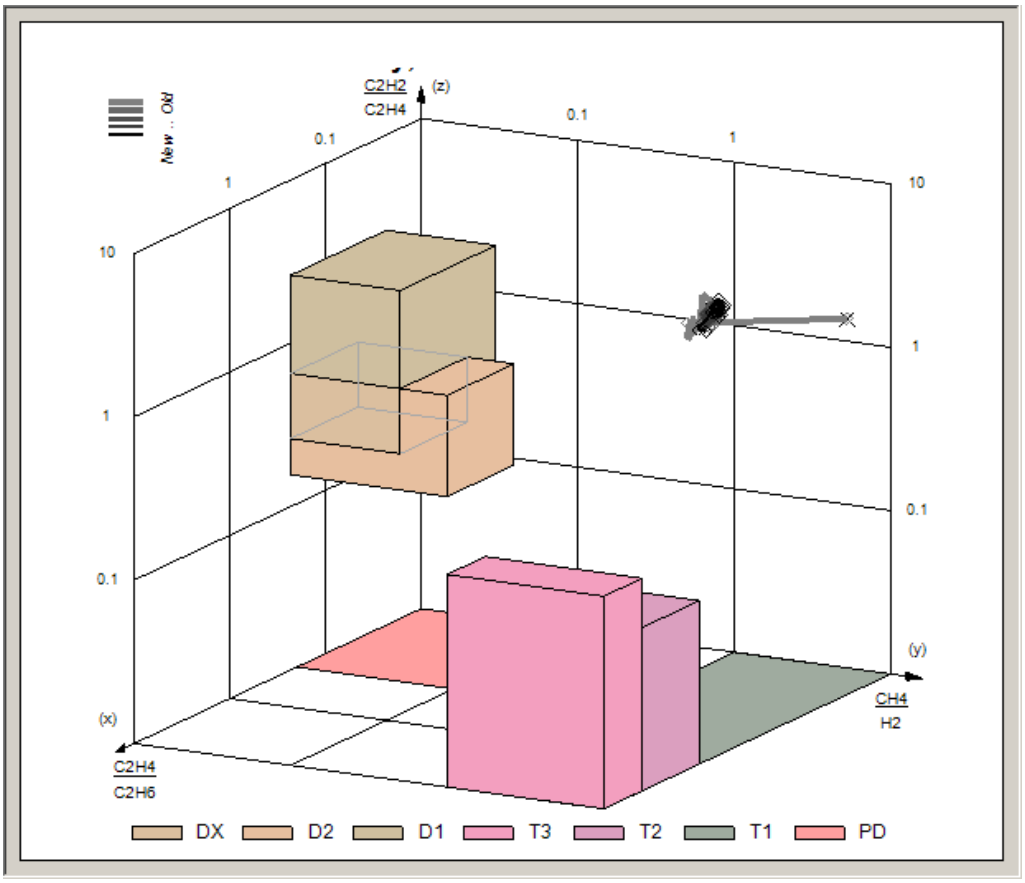
Function OFF **Function ON**

Remark: This function can be switched ON or OFF with a double click in the Result Window as well.

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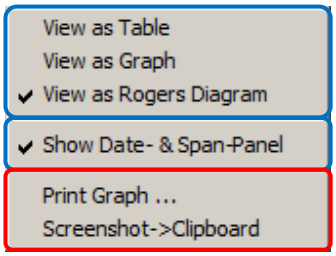
3.6.2.3.3 Result Window Rogers 3D View

In the illustration Rogers 3D View, the relations of the data points are displayed as a Rogers 3D Ratio View with the selected time range and the appropriate averaging:



DX Intersection of D1 and D2
D1 Discharges of low energy
D2 Discharges of high energy
DT Combination thermal faults & discharges
PD Partial discharges
T1 Thermal faults, t < 300°C
T2 Thermal faults,300°C < t < 700°C
T3 Thermal faults, t > 700°C

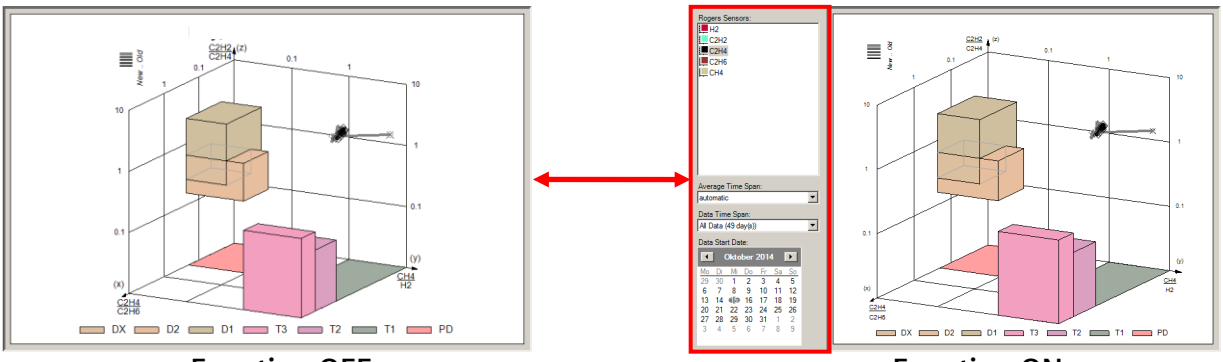
- **Context Menu**
  The following settings can be done via the context menu in the Rogers 3D View:



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Remark: The settings in the red frame are only possible, if the Graphic- or the Rogers 3 View are active. When changing to Table View they will be grayed out and can not be selected anymore. The blue marked settings can be selected at any time.

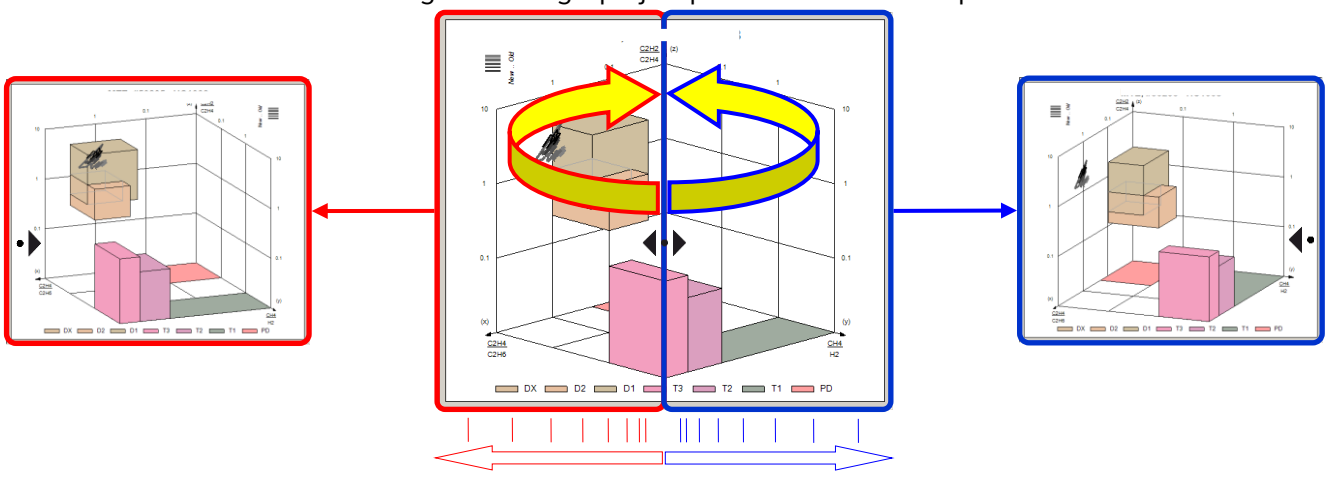
- **Show Alarm-, Date- Timerange:** With this function the sensor- and the time range selection window can be faded in or out. The Result Window will be displayed bigger or smaller accordingly.



Function OFF **Function ON**

Remark: This function can be switched ON or OFF with a double click in the Result Window as well.

In order to clarify whether certain data points are located in a bad sector, the display of the Rogers 3D Ratio View can be rotated in a limited area around the Z axis. Once the mouse cursor is in the workspace, the icon changes to ◀•▶. The rotation can be performed by clicking with the left mouse button in the relevant side of the workspace. In the left side of the work area (red) the rotation is clockwise. In the right side of the work area (blue) the rotation is counterclockwise. The closer the position of the cursor is to middle of the work area, the smaller the rotation steps become. The end positions are indicated by the symbols•▶ (clockwise end position) and ◀• (counterclockwise end position). Through a left mouse click in the middle of the working area the graph jumps back to the home position.

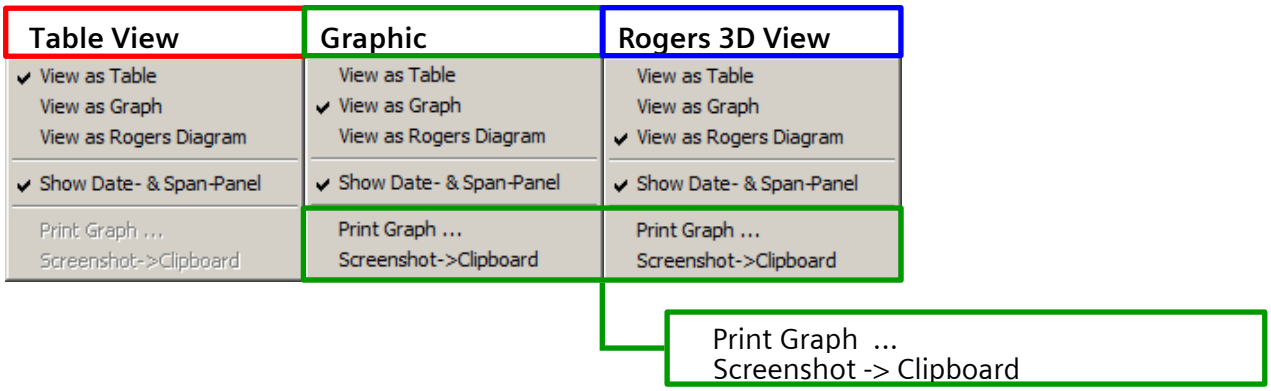


3.6.2.4 Further processing of the displayed measurement data (Rogers)

There are various options available to further process the existing data for Documentation purposes. The different options can be selected via the context menu.

- **Context menu**

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- **Print Graph ...** : (3.8.4.2)
- **Screenshot -> Clipboard**: (3.8.4.3)

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3.7 Transformer Communication with SITRAM® Multisense Devices

With SITRAM® Multisense Software it is possible to read data from SITRAM® Multisense devices (Configuration / Measurement values / Alarms) or to write data onto the SITRAM® Multisense device (Configuration / Alarm acknowledgement / Set Time). For data transmission the entry Transformer (level 3) of the related transformer has to be selected in the tree structure. The selection buttons appear in the lower part of the working area with which the communication to the device can be initiated.

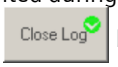
3.7.1 SITRAM® Multisense Communication

By pressing the  button the dialog window „SITRAM® Multisense Communication“ opens:

The following selection- and input fields are available in the dialog window:

- **Read Configuration:** Reads the configuration of the SITRAM® Multisense device. That means that changes done in SITRAM® Multisense Software (marked with a star) will be over written with the configuration from the SITRAM® Multisense device.
- **Read History & Alerts:** All measurement and alarm values which have not already read out at that time, will be read and stored into the SITRAM® Multisense Software database.
- **Update Configuration:** Writes all changes done in SITRAM® Multisense Software to the SITRAM® Multisense device and activates them. The numeric password (default 9999) is needed for this action.
- **Reset Alerts:** With this command all actual alarms which haven't been acknowledged at that time will be acknowledged. The numeric password (default 9999) is needed for this action.
- **Auto-disconnect when done:** Automatically closes the connection when the data transfer is completed. This transfer option is especially recommended when using a modem. As a result, connection costs can be reduced to a minimum.
- **Synchronize with PC Clock:** Automatically synchronizes the date and the time of the SITRAM® Multisense device with the one set up on the PC. The numeric password (default 9999) is needed for this action.
- **Password:** Serves as security and is needed for several actions. Numeric default password: 9999.
- **Timeout [s]:** The default timeout is 5 seconds. When a modem is used an timeout of 20 seconds is recommended.

After the Start button is pressed, the content of the working area changes. Now the log window with the connection- and data transfer status is shown.

By pressing the  button the connection will be terminated immediately. This should be prevented during the login to the device. After termination or abortion of the communication the log window can be closed with this 

button. The transformer properties will be shown again in the working area. In case problems occur with the communication the diagnostic data (log data) (3.4.1) can be used for trouble shooting.

3.7.2 SITRAM® Multisense Connection Scheduler

3.7.2.1 General

Up to SITRAM® Multisense Software version 1.0.16 the read out of SITRAM® Multisense data had to be initialized manually.

With the version 1.0.18 an automatic read out is available. The automatic data read out is realized with the Windows based connection scheduler and is integrated in SITRAM® Multisense Software.

3.7.2.2 Description of the Connection Scheduler

Following you find a detailed description of the connection scheduler (the „*italic written terms*“ relate to descriptions in the dialog window of the connection scheduler).

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The connection scheduler is a separate process and runs, if active, in the back ground of SITRAM® Multisense Software. When „*Scheduled Data Read-Out*" is active the transformers will be checked every 15 seconds if any data read out is available. As soon a transformer is active, it will be checked if the actual time is greater than the point of time „*Next Connect at:*". On this way an internal list with open data read outs will be generated.

In case the list is not empty it will be processed step by step until all transformers are read out before a new list is being generated.

On each transformer data read out, information will be supplied. On every successful read out the „*Connect Fail Count:*" will be set to zero and the „*Next Connect at:*" is updated (actual time and „*Connect Interval:*" will be added – optional synchronized to the „*Connect Time [s]:*" if available).

In case of an error, the „*Connect Fail Count:*" will be increased by one and the point of time „*Next Connect at:*" will be overwritten by the actual time plus a delay. If the „*Connect Fail Count:*" is less than 3 a new connection with a delay of 5 minutes will be initialized. If the „*Connect Fail Count:*" is less than 5 a new connection with a delay of 10 minutes will be initialized. When the „*Connect Fail Count:*" reaches the value 5, the „*Next Connect at:*" is updated (actual time and „*Connect Interval:*" will be added – optional synchronized to the „*Connect Time [s]:*" if available. The same as with successful connections.).

By the time the connection scheduler notices that the length of time since the moment „*Next Connect at:*" is 3 times bigger than the „*Connect Interval:*", the „*Connect Fail Count:*" will be set to 4. On transformers with error status, this leads to a double connection attempt if the application was not active for a longer period of time.

The following points should be noticed:

- Changes which were created by the connection scheduler need some time until they are visualized in the tree structure.
- Even if the read out status of a transformer is bad, a connection attempt based on the „*Connect Interval:*" will always be initiated.
- A manual data read out will not change the moment „*Next Connect at:*". Even if a manual data read out is directly before the moment „*Next Connect at:*" the planed data read out will be executed as well.

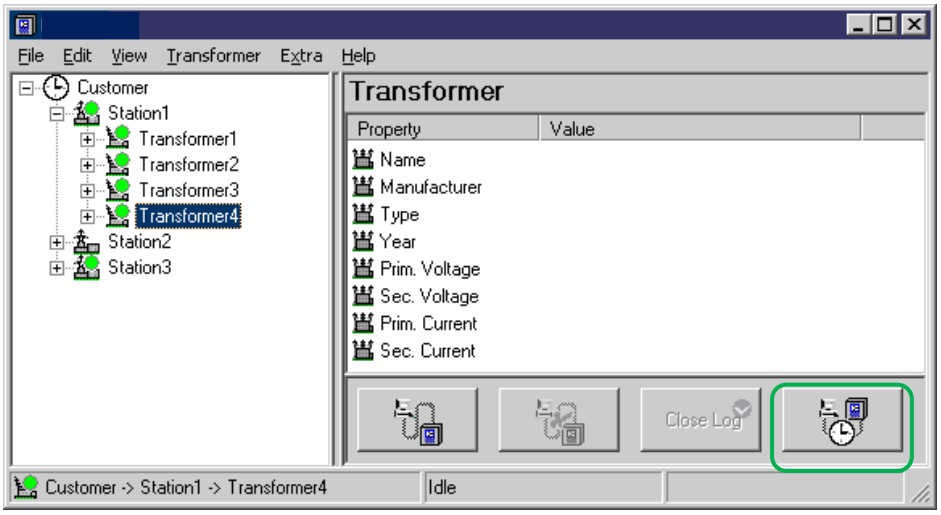
A log file ´Scheduler.log´ will be generated in the SITRAM® Multisense Software data folder. In case of problems with the connection scheduler a view in this file can help finding the error. The entries in the log file are English.

Note: It is not possible to write the configuration or to acknowledge alerts with the connection scheduler. Still these actions are to be performed manually. Only setting the time is possible using the connection scheduler and the corresponding password.

3.7.2.3 Configuration of a Transformer for Automatic Data Read Out

The settings for the configuration of a transformer for automatic data read out are realized in the dialog window SITRAM® Multisense connection scheduler (3.7.2.4).

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To open the dialog window SITRAM® Multisense connection scheduler the corresponding transformer has to be selected in the tree structure. Afterwards the dialog window can be opened with the  button.

Note: There is also the possibility to open the dialog window via the transformer menu (2.1.4.4) or the context menu (3.3.3).

3.7.2.4 Input Window SITRAM® Multisense Connection scheduler

The automatic data read out will be configured via the dialog window. For more details please refer to chapter „Description of the Connection scheduler" (3.7.2.2).

- **Scheduled Data Read-Out:** Selection field to activate the automatic data read out.
- **Check Serial Number:** Selection field for serial number verification - always active.
- **Connect Interval:** Selection field for the time between the data read outs (1...12 hours, 1...3 days, 1...3 weeks or 1 month). After a successful data read out this time will be added to the actual time and so the moment will be calculated when the next read out starts.
- **Connect Time [s]:** When the connect interval is at least 1 day, the time on which the data read out shall start can be defined here. The connect time is entered in the format hh:mm:00 (seconds always have to be zero). In case the function „start time synchronal to clock time" is not desired or needed, a minus (-) has to be entered.
- **Data Read Timeout [s]:** This timeout has the same meaning as the timeout for manual connections. This time will be waited until the connection will be terminated due to communication errors. The default timeout is 5 seconds. If using a modem a timeout of 20 seconds is recommended.
- **Next Connect at:** The calculated moment for the next data read out is shown here.

  Note: In case a test of the connection scheduler is desired, time and date will change with a double click on this field and a connection to the device is performed in the immediate future (afterwards the dialog window must be closed by pressing OK).
- **Connect Fail Count:** The summarized connection errors are shown in this field.

  Note: With a double click on this field, the error counter will be reset to zero (afterwards the dialog window must be closed by pressing OK).

3.7.2.5 Visualisation of the Connection scheduler

The status of the connection scheduler is shown by a change of the symbols of customer, station and transformer in the tree structure. The following sub chapters explain the related symbols.

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3.7.2.5.1 Visualisation Customer Icon

The visualisation of the customer icon is derived from the status of all transformers.

	Automatic read out for a transformer active and read out status ok.
	Automatic read out for a transformer active and start of a read out in the immediate future.
	Automatic read out for a transformer active and actually running.

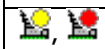
3.7.2.5.2 Visualisation Station Icon

The visualisation of the station icon is derived from the status of the transformers that are assigned to this station.

	No automatic data read out active for this station – default symbol.
	Automatic read out for a transformer active and read out status ok. (connection error less than 3)
	Automatic read out for a transformer active and read out status bad. The connection was interrupted several times and could not be established. (: more than 2 errors, : more than 5 errors)
	Automatic read out for a transformer active and data read out starts in the immediate future. This visualisation overwrites the good- or bad visualisation icon.
	Automatic read out for a transformer active and actually running.

3.7.2.5.3 Visualisation Transformer Icon

The visualisation of the transformer icon is derived from the status of the SITRAM® Multisense device.

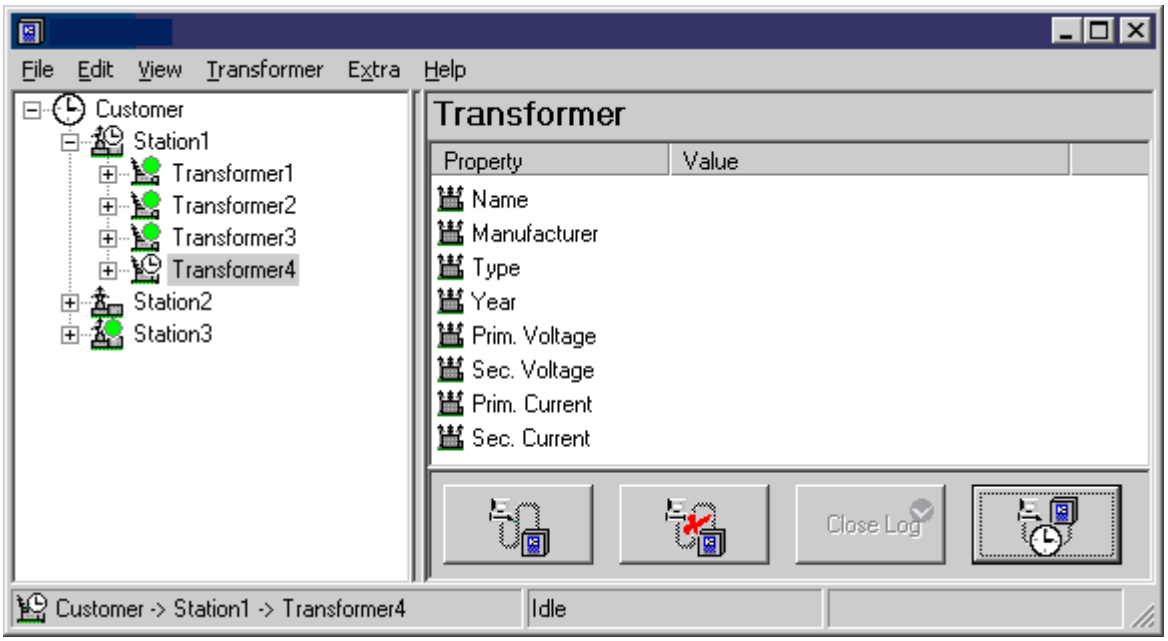
	No automatic data read out active – default symbol.
	Automatic data read out active and read out status ok (connection error less than 3).
	Automatic data read out active and read out status bad. The connection was interrupted several times and could not be established. (: more than 2 errors, : more than 5 errors)
	Automatic data read out active and data read out starts in the immediate future. This visualisation overwrites the good- or bad visualisation icon.
	Automatic data read out active and actually running.
	Automatic data read out active and communication connection to the transformer occupied by another application (manual connection or online sensors). This visualisation overwrites the good- or bad visualisation icon.

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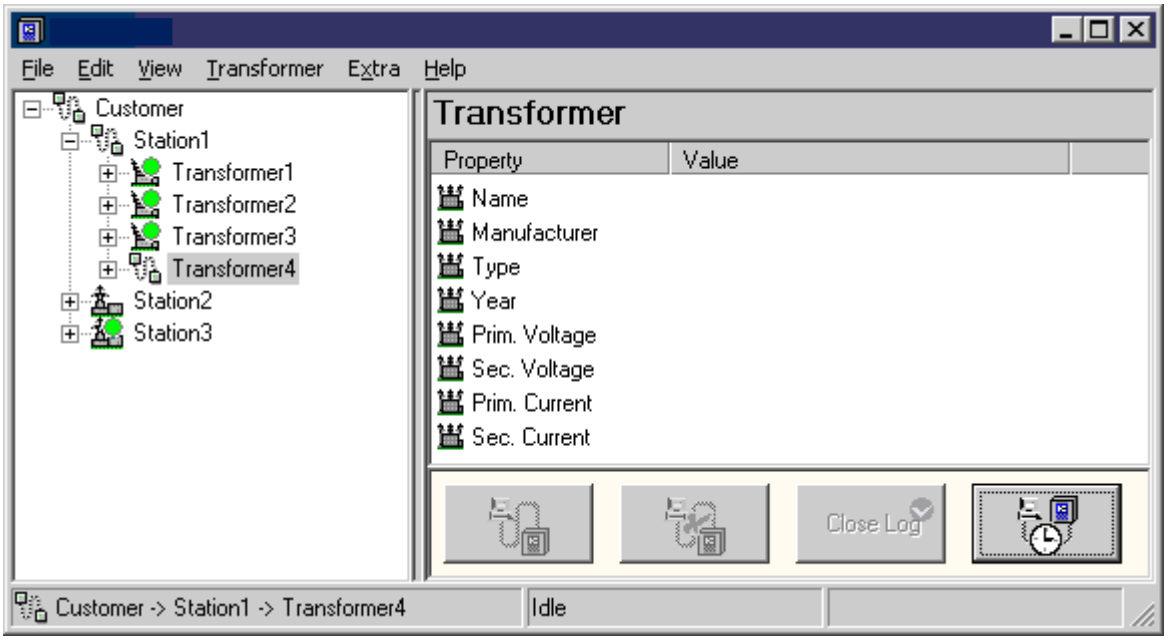
3.7.2.5.4 Visualization Examples

The following screen shots are showing the functionality of the connection scheduler.

The connection scheduler is active and has scanned the transformers. The future read outs (Station1 and Transformer4) are selected. Station 2 does not contain any transformers that have an automatic read out activated.

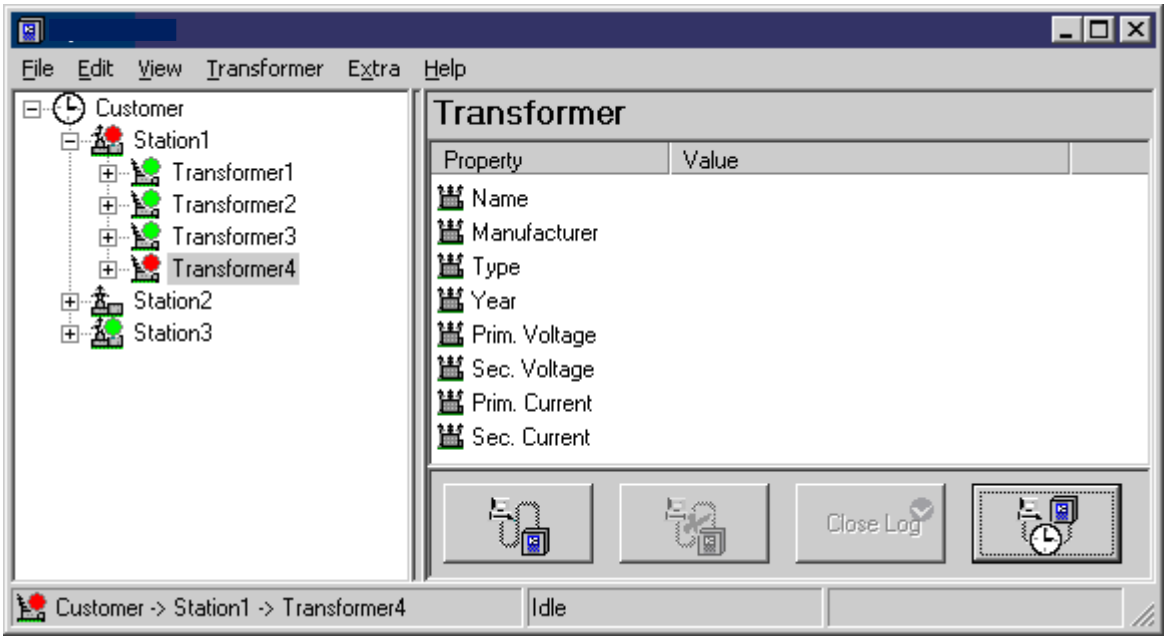


The connection scheduler has established the connection to transformer 4 in station 1. The communication buttons in the working area are deactivated. The changed background color (light pastel yellow) of the buttons indicates that the data read out is actually running.



The connection to transformer1 in station 1 was interrupted more than 5 times or could not be established. The transformer as well as the station is shown with the corresponding error symbol (red station, red transformer).

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3.7.3 Windows Task Scheduler with SITRAM® Multisense Software Connection scheduler

The automatic data read out with the SITRAM® Multisense Software connection scheduler can be retrieved via the Windows task scheduler.

Windows contains an assistant that guides you step by step through the creation of a new task. Follow these instructions to create a task for SITRAM® Multisense Software. The task scheduling depends on the personal necessity and the data read out with SITRAM® Multisense Software. If, for example, you want to perform a daily data read out with SITRAM® Multisense Software, you have to invoke the Windows task scheduler daily as well.

When the task input with the Windows task scheduler is finished, the SITRAM® Multisense Software task can be optimized with the command line parameters (3.7.3.1).

Note: Communication settings and the connection to the device should be checked before a SITRAM® Multisense Software task is initiated via the Windows task scheduler.

3.7.3.1 Command Line Parameters for the Windows Task Scheduler

By invoking the data read out from SITRAM® Multisense Software via the Windows task scheduler two command line parameters can be used.

Example: `<Path>\SITRAM® Multisense Software` **`-IdleClose 0:15:00 –Minimized`**

3.7.3.1.1 Parameter „IdleClose“

The command line parameter „*Idle Close*“ closes the application as soon all data has been read out from SITRAM® Multisense device. This command has to be set with a time which defines the closing delay. This closing delay must have the following format: [hh:mm:ss].

The SITRAM® Multisense Software connection scheduler scans the transformers in regard to the next data read out and determines so the starting point. In case the rest time until the next data read out is greater than the „Idle Close”-time the application will be closed. If a data read out should take place every day the default „Idle Close”-time should be set to 15 minutes. This leaves the possibility to repeat the dial-up in case of a failure and closes the application within a reasonable time if a communication error occurs.

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3.7.3.1.2 Parameter „Minimized"

The command line parameter *„Minimized"* limits the application to the minimal program window size when opened (program only visible in the task bar).

Note: A SITRAM® Multisense Software application, opened by the Windows task scheduler, will be closed immediately and without any error message if there is a manual started SITRAM® Multisense Software application already running.

3.7.4 Lock Data Folder

A soon a SITRAM® Multisense Software application is running, the data folder will be secured by SITRAM® Multisense Software with a (file-) lock. It is not possible to start an additional SITRAM® Multisense Software application at the same time.

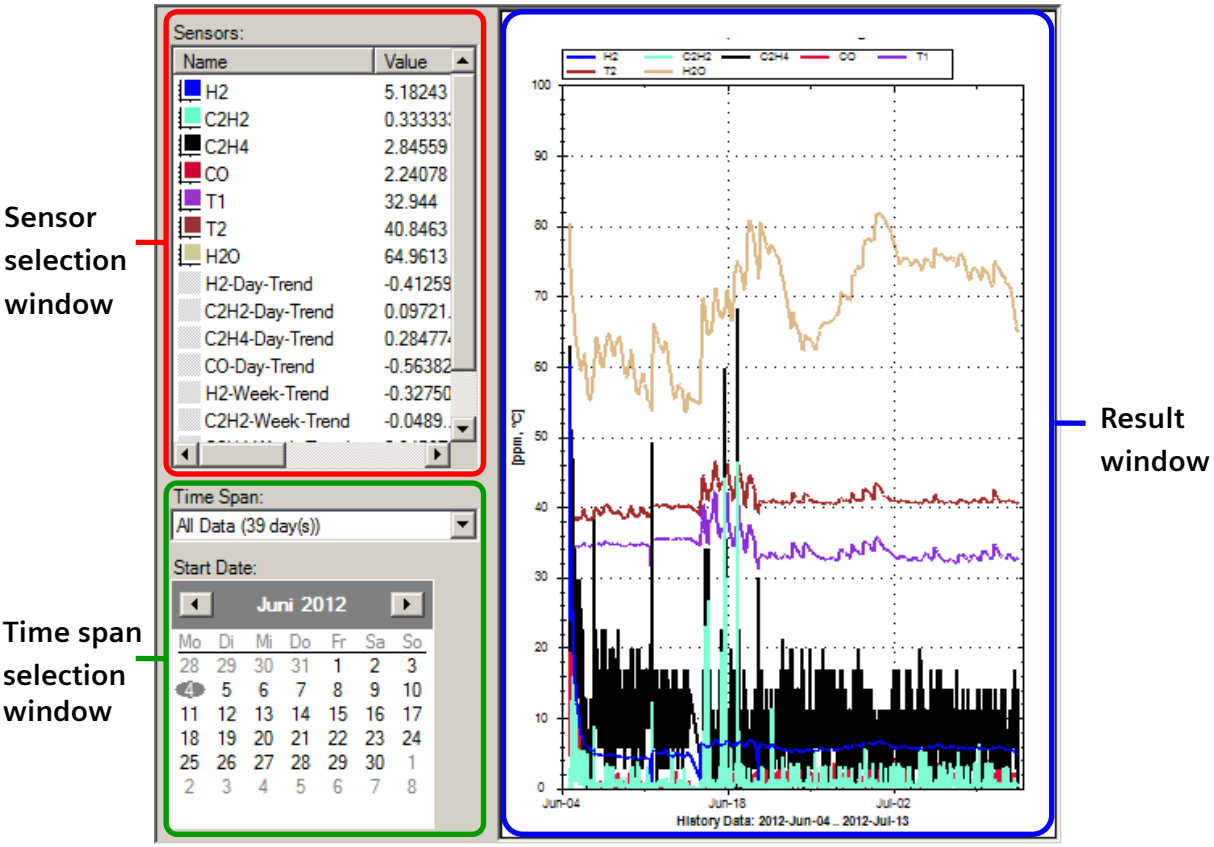
The lock serves the data integrity in case a user is already working with a SITRAM® Multisense Software application and in the background another SITRAM® Multisense Software application (e.g. an application started by the Windows task scheduler) is trying to have access to the data.

The SITRAM® Multisense Software application will close with the following error message (see picture) if the data folder is already used at its start.

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3.8 History View Measurement values (History)

To view the read out measurement values (History), select the History entry of the corresponding transformer in the tree structure. Three operation windows are available in the working area (see picture):



The individual operation windows in the working area have the following labels:

- Sensor selection window (3.8.1)
- Time span selection window (3.8.2)
- Result window (3.8.3)

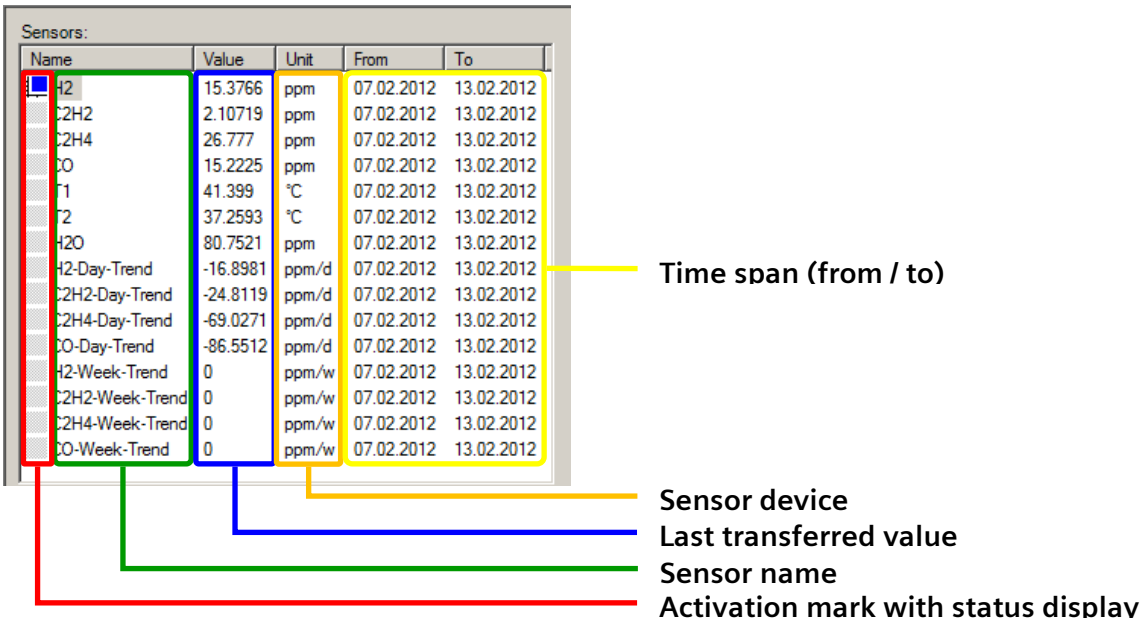
By the context menu (right mouse click) in the result window the following options arise:

- Further processing of the shown data (3.8.4)

3.8.1 Sensor Selection Window

The different sensors available in the SITRAM® Multisense devices are shown in the sensor selection window (depending on the type of the device):

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Beside of the sensor name the last transferred data, the device and the time span (from / to), in which measurement values are available, will be displayed. There is an activation mark in front of the sensor name (i. e.: H2: H_2 Sensor is activated and therefore shown in the result window). With a double click on the sensor name or the associated activation mark, the view in the result window of the corresponding sensor can be changed. In this case the scaling of the active sensor will automatically be projected on the Y-Axis.

- **Activation mark with Status Display**

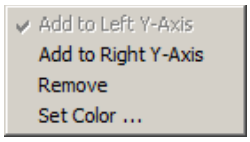
  Sensor view active – Scaling is displayed on the left Y-Axis

  Sensor view active – Scaling is displayed on the right Y-Axis

  Sensor view inactive

  With a right mouse click on the sensor name or the corresponding activation mark the context menu will open.

- **Context menu**



Add to left Y-Axis: The scale is displayed on the left Y-Axis.

Add to right Y-Axis: The scale is displayed on the right Y-Axis.

Remove: The display of the sensor is deactivated.

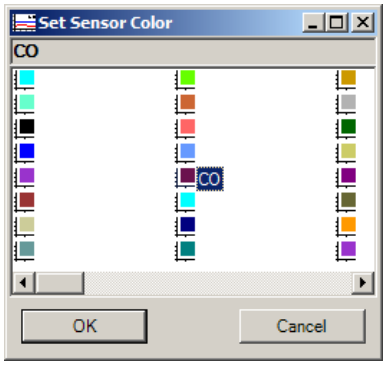
Set Color: The window „Set Sensor Color" will open.

Note: The pre-selection related to Y-Axis scale (left or right) will be illustrated with the ✔ icon and remains according to the last selection.

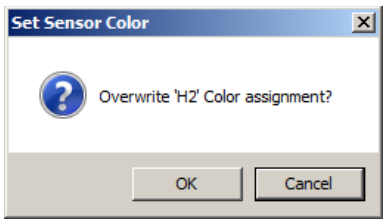
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- **Set Sensor Color**

  In the selection window „Set Sensor Color“ the desired color can be assigned to the selected sensor (in this case CO):

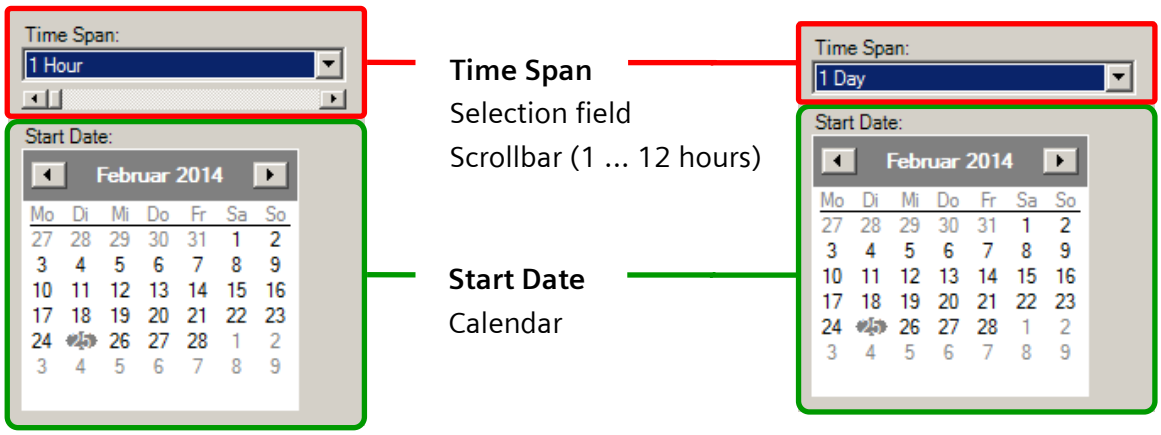


  If the color is already assigned to a sensor, the corresponding name will be displayed on the right side of the color icon. However if you want to assign a color that is already allocated, you have the possibility to overwrite the color assignation. Therefore the message „Overwrite ‘XX’ Color assignment?“ has to be confirmed by pressing OK.



3.8.2 Time Span Selection Window Measurement Values

In this window the time span can be selected. The measurement values for this selected time span are displayed in the result window.

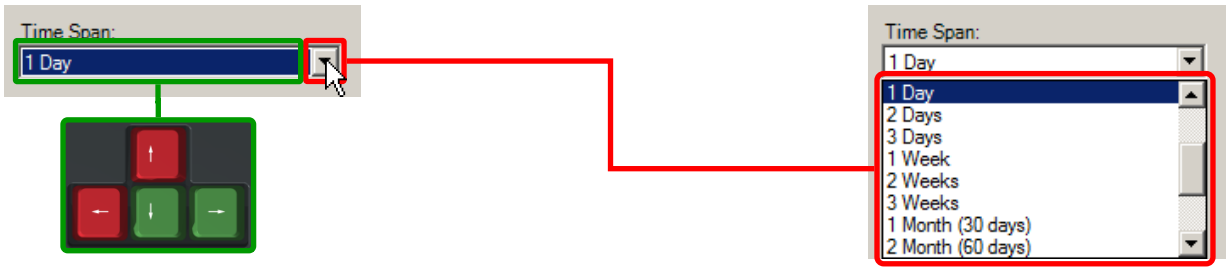


The time span has to be selected in two steps:

- **Time span**

  The time span in the result window can be changed in the time range selection window or by selected time span field (blue background) with the arrow keys on the keyboard.

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Red = Time span smaller
Green = Time span

The following time intervals are available:

1 hour	1 day	1 week	1 month	1 year	All Data
2 hours	2 days	2 weeks	2 month	2 years	
3 hours	3 days	3 weeks	3 month		
6 hours			6 month		
12 hours					

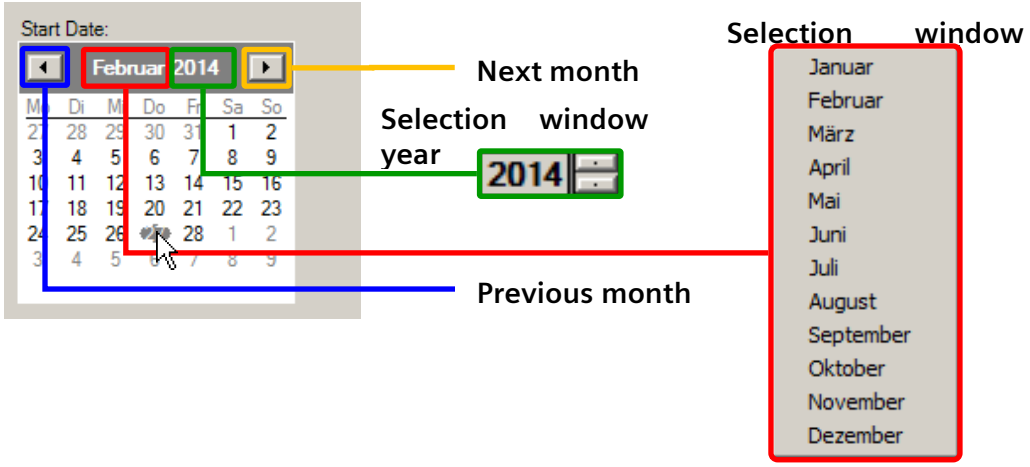
On selecting „All Data" the time span will automatically be adjusted to the range in which measurement values are available.



Note: The scroll bar appears only when selecting 1, 2, 3, 6 or 12 hours, with a resolution of 1 hour. The scroll bar can be moved with the arrow keys or selected and moved with the left mouse button.

- **Start Date**

The start date is set with a mouse click on the desired date in the calendar dialog. The previous or next month can be selected with the arrow keys in the calendar dialog.



Note: The calendar appears in the default language of the operating system.

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3.8.3 Result Window

The results for all activated sensors will be displayed in the result window for the chosen time span. A right mouse click in the result window activates the context menu. Choose the desired display view:

The individual display formats have the following label:

- Result Window Table view (3.8.3.1)
- Result Window Graph view (3.8.3.2)

3.8.3.1 Result Window Table View

In the table view the measurement values of the active sensors will be displayed for the selected time span in a table:

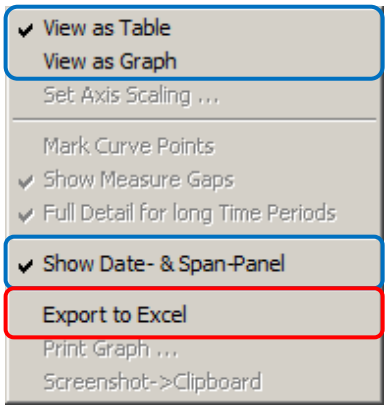
History Data:

Date/Time	H2 [ppm]	C2H2 [ppm]	C2H4 [ppm]	CO [ppm]
16.06.2012 00:13:00	6.35608	1	8.53677	0.765484
16.06.2012 00:33:00	6.32515	1.33333	5.69118	0.382742
16.06.2012 00:53:00	6.30024	1	5.69118	3.71608
16.06.2012 01:13:00	6.27534	13.0599	17.0735	3.33333
16.06.2012 01:33:00	6.24545	17.7505	31.3015	3.33333
16.06.2012 01:53:00	6.20691	23.1078	34.1471	0
16.06.2012 02:13:00	6.17677	10.7146	19.9191	0
16.06.2012 02:33:00	6.1537	6.02397	11.3824	0
16.06.2012 02:53:00	6.13692	1.33333	14.2279	0.382742
16.06.2012 03:13:00	6.11438	1.33333	14.2279	0.382742
16.06.2012 03:33:00	6.09314	0.666667	11.3824	0.765484
16.06.2012 03:53:00	6.07374	0.666667	5.69118	0.382742
16.06.2012 04:13:00	6.0588	0.666667	5.69118	0.765484
16.06.2012 04:33:00	6.03652	3.67865	11.3824	0.765484
16.06.2012 04:53:00	6.01057	3.01198	11.3824	0.765484
16.06.2012 05:13:00	5.98225	3.34532	11.3824	2.24078
16.06.2012 05:33:00	5.95735	0.333333	5.69118	3.71608
16.06.2012 05:53:00	5.93376	0.333333	2.84559	4.09882
16.06.2012 06:13:00	5.91331	0	2.84559	2.24078
16.06.2012 06:33:00	5.90125	0.333333	0	0.765484
16.06.2012 06:53:00	5.91855	0.333333	5.69118	0.765484
16.06.2012 07:13:00	5.96836	26.7985	34.1471	0.765484
16.06.2012 07:33:00	6.03337	26.4651	34.1471	0.382742
16.06.2012 07:53:00	6.08344	26.4651	28.4559	0
16.06.2012 08:13:00	6.10232	0.333334	0	0.382742
16.06.2012 08:33:00	6.10415	0.333333	5.69118	0.382742
16.06.2012 08:53:00	6.09052	1	5.69118	0.765484
16.06.2012 09:13:00	6.07296	0.666667	5.69118	0.382742
16.06.2012 09:33:00	6.05408	1	0	0.382742

Beside of the measurement value columns the table contains a column with the time stamp. This column is named with Date/Time. By default the order of the measurement value is sorted by Date/Time (oldest data first).

- **Context Menu**

  In the table view the following settings can be done via the context menu:



  Note: The red marked settings are only available in active table view. On a change to graph view they will be grayed out and cannot be selected anymore. The blue marked settings are always available.

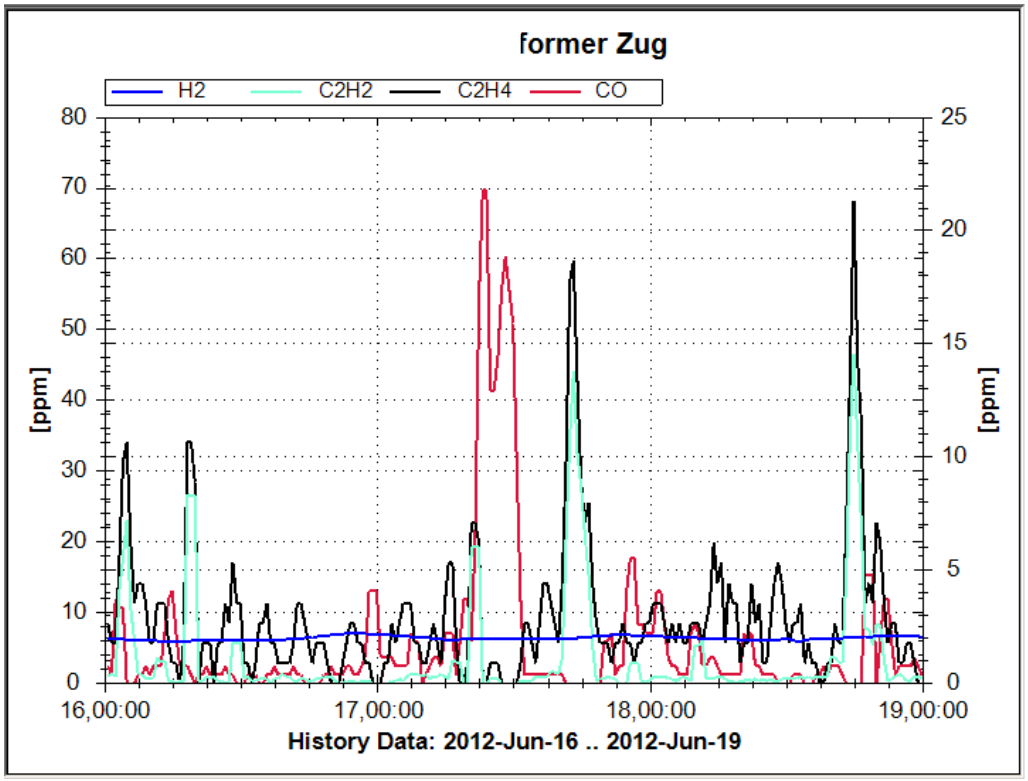
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- **Show Date- & Span-Panel:** The sensors- and the time span selection window can be switched on or off with this function. The result window will be displayed smaller or bigger accordingly.

  Note: With a double click of the left mouse button in the result window this function can also be switched on or off.
- **Export to Excel**: (3.8.4.1)

3.8.3.2 Result Window Graph View

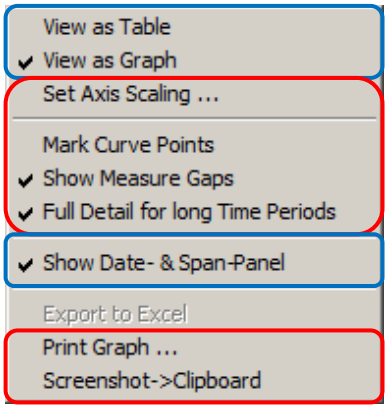
In the graph view the measurement values of the active sensors will be displayed for the selected time span in a graph trend:



By moving the cursor to a desired position on the graph, the corresponding measurement value will be displayed as decimal value with date and time CO=12.9506 (12-Jun-17 10:13) in a light yellow pop up window.

- **Context Menu**

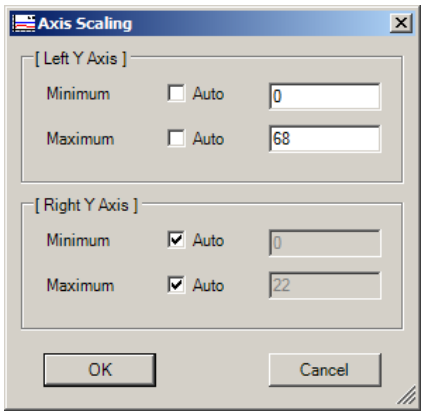
  In the graph view the following settings can be done via the context menu:



Note: The red marked settings are only available in active graph view. On a change to table view they will be grayed out and cannot be selected anymore. The blue marked settings are always available.

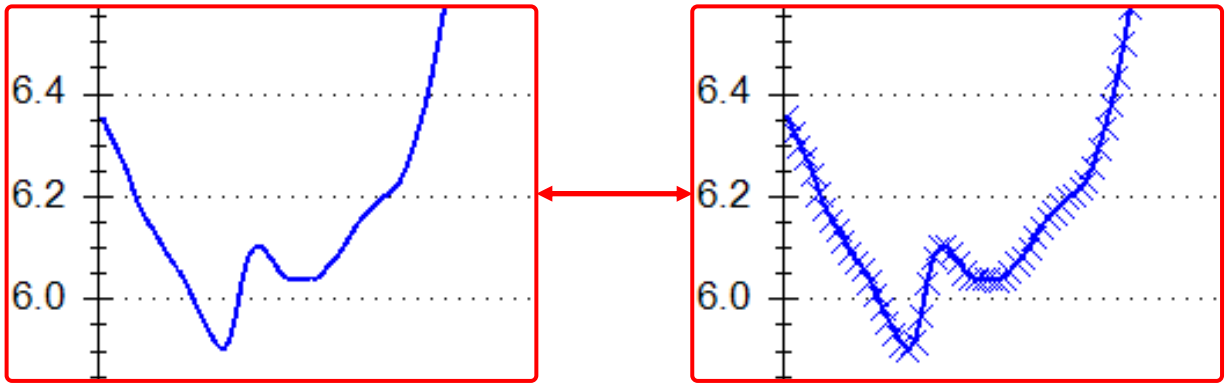
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- **Set Axis Scaling ... :** By selecting „Set Axis Scaling ...” the input window „Axis Scaling” opens:



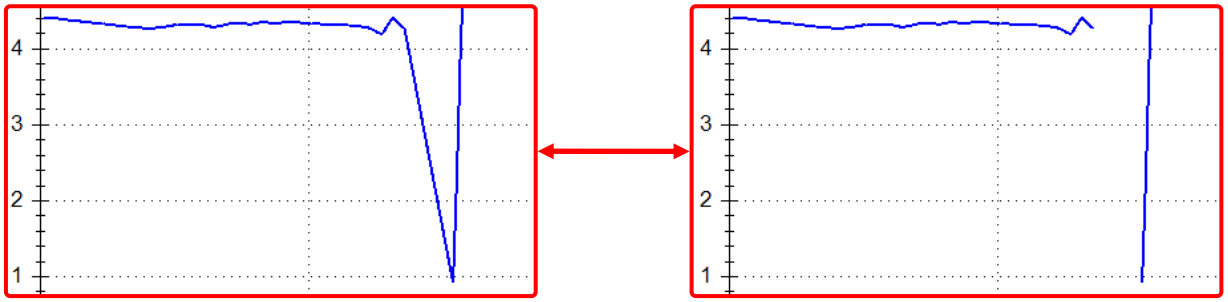
The scale setting of both axis (left Y-axis and right Y-axis) can be done independently from each other. By selecting „Auto” the range will be adjusted automatically related to the active sensors. If the relation between the individual sensors becomes too big, the assignment of the sensors (3.7.1) to both Y-axes can be selected manually.

- **Mark Curve Points:** Every single measurement value is displayed with a cross marker in the curve shape.



Function OFF **Function ON**

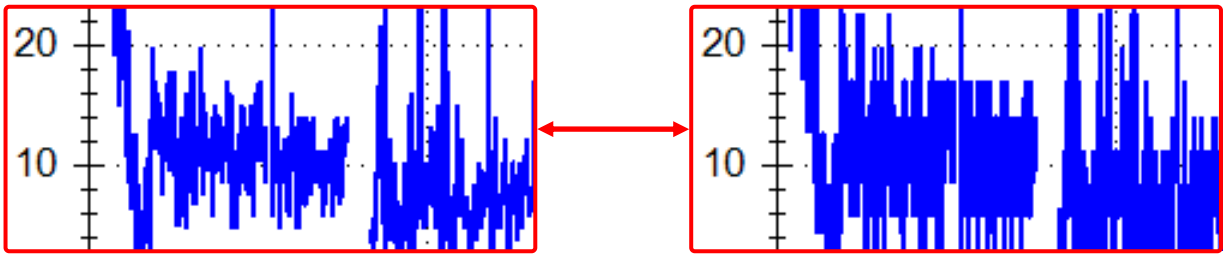
- **Show Measure Gaps:** Here you can choose whether missing data will be displayed with a gap or if the gap between the measurement values will be interpolated.



Function OFF **Function ON**

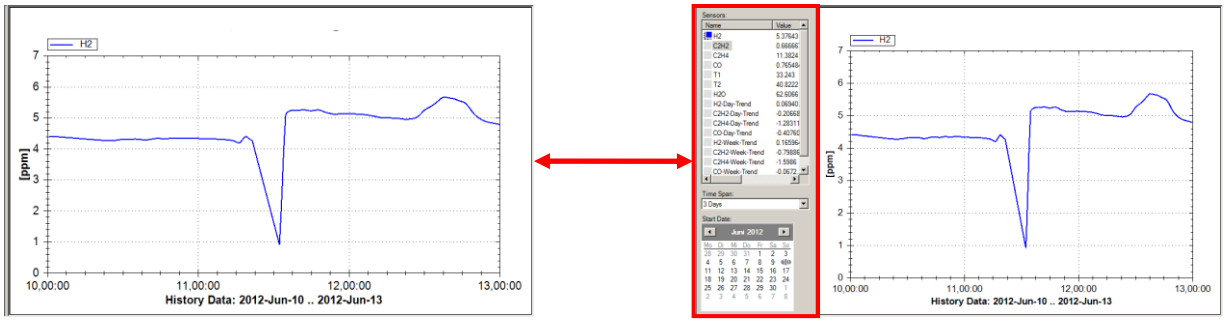
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- **Full Detail for long Time Periods:** To ensure a fast presentation over long time spans, average values will be displayed over the curve shape. By activating this function, all measurement values will be displayed on the curve shape.



Function OFF **Function ON**

- **Show Date- &Span-Panel:** The sensor- and the time span selection window can be switched on or off with this function. The result window will be displayed smaller or bigger accordingly.



Function OFF **Function ON**

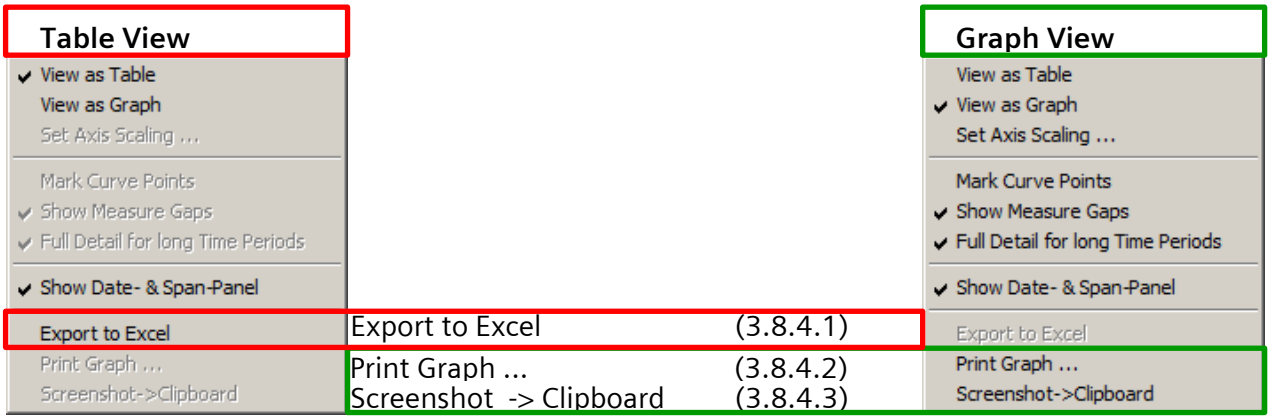
Note: With a double click of the left mouse button in the result window the sensor- and the time span selection window can be switched on or off as well.

- **Print Graph ...** : (3.8.4.2)
- **Screenshot -> Clipboard**: (3.8.4.3)

3.8.4 Further Processing of the displayed measurement values

There are several possibilities available to further process the available measurement values for documentation purposes. The different possibilities can be selected via the context menu.

- **Context menu**



Note: The functions „ Export ► „ (2.1.1.5) and „Print Graph ...“ (2.1.1.10) can be selected via the menu bar as well.

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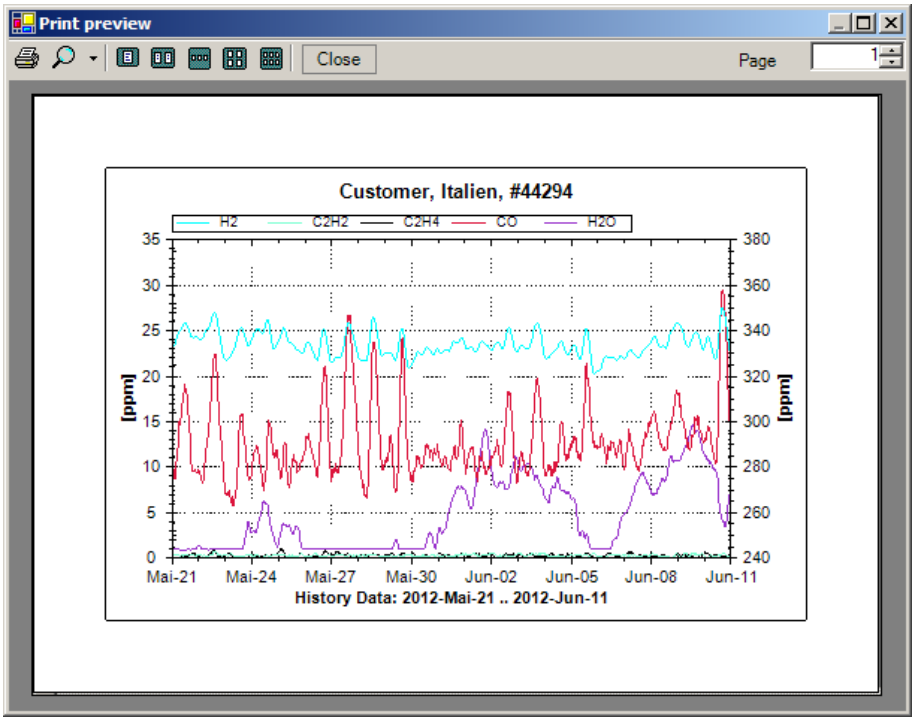
3.8.4.1 Export to Excel

The active sensors in the selected time span can be exported into an Excel-file via the function „Export to Excel ...".

Note: The export into a text-file (CSV) is only possible via the menu bar entry (2.1.1.5). Isolated problems can occur in interaction between some MS Windows- and MS Excel-versions. In this case the table export should be done via CSV export (2.1.1.5). This text-file (.csv) can be opened in Excel afterwards and then be saved as an Excel-file (.xls).

3.8.4.2 Print Graph ...

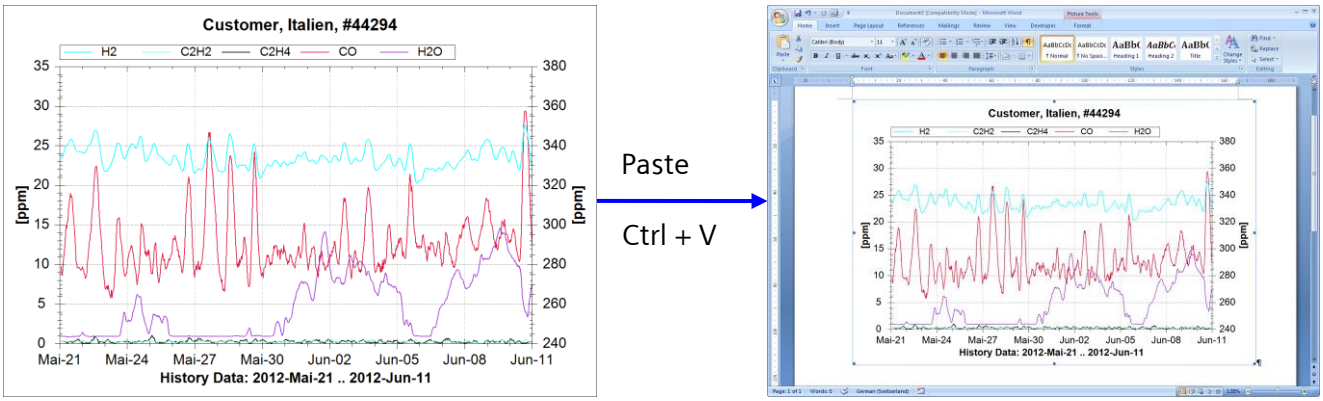
You have the possibility to print out the result window. With the function „Print Graph ..." the print preview window will open (see below). More functions are available in this window (e.g. print command, zoom, page view and close).



Note: The function „Print Graph ..." can be activated via the menu bar entry (2.1.1.10) as well.

3.8.4.3 Copy of the Result Window to the Windows Clipboard

With this function (Screenshot -> Clipboard), the actual content of the result window will be copied into the Windows clipboard. With the shortcut [Ctrl + V] the content of the clipboard can be pasted into any program.



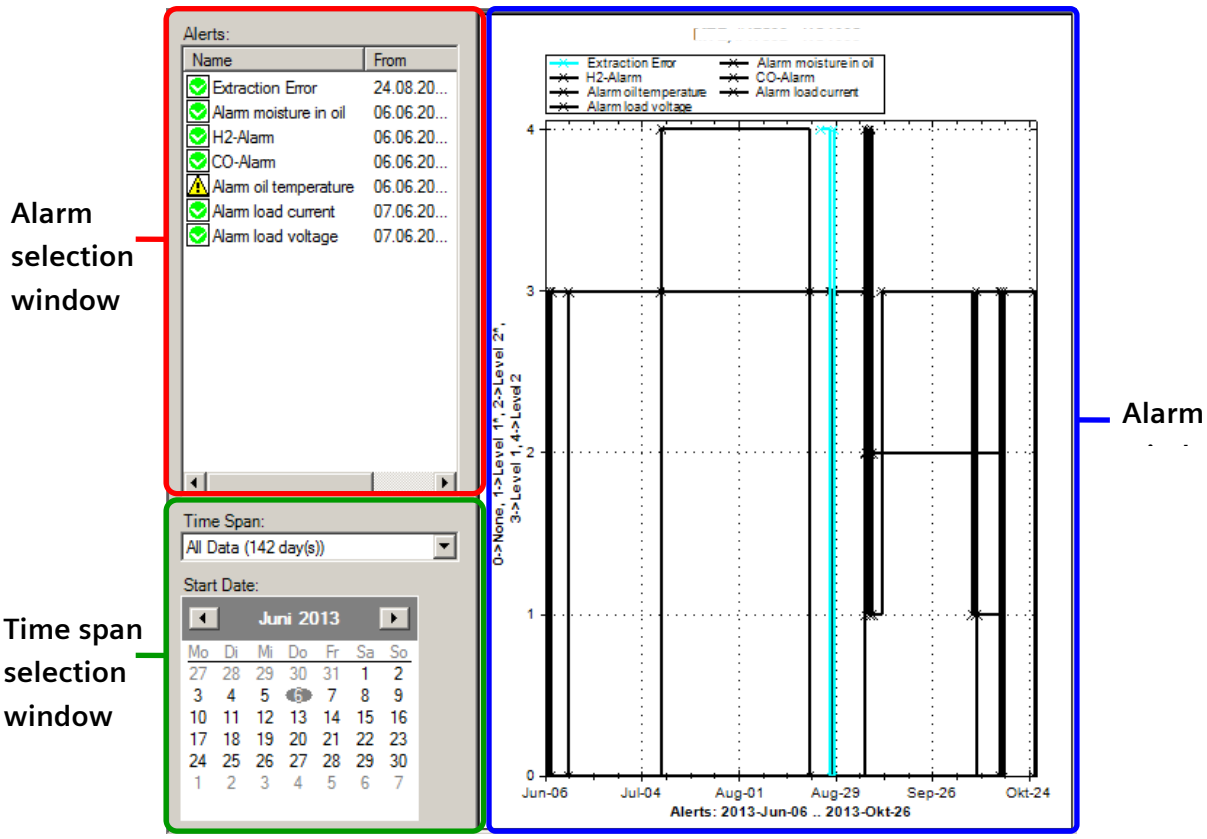
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Note: As soon an additional copy- or cut command is being performed the clipboard will be overwritten and the content of the result window will not be available any longer!

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3.9 Alerts View Alarms

To view read out alarms (Alerts), select the Alerts entry of the corresponding transformer in the tree structure. Three operation windows are available in the working area (see picture):



The individual operation windows in the working area have the following labels:

- Alarm selection window (3.9.1)
- Time span selection window (3.9.2)
- Alarm window (3.9.3)

By the context menu (right mouse click) in the alert window the following options arise:

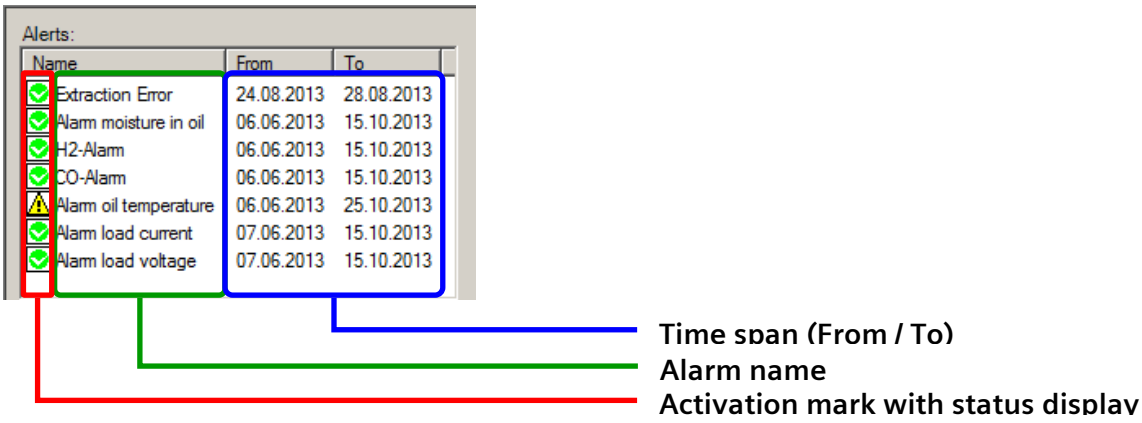
- Further processing of the shown alerts (3.9.4)

3.9.1 Alarm Selection Window

In the alarm selection window the various available alarms can be activated. In the time span selection window the time range to be viewed will be defined and displayed in the alarm window.

The alarms which were configured in the alarm setup (3.5.1) or directly on the device are displayed in the alarm selection window. On the SITRAM® Multisense types 5 and 9 the alarm “extraction error” will be displayed by default. Beside of the alarm name the last alarm state is displayed, that means after the read out of the data it represents the actual condition.

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The activation mark with status display is in front of the alarm name. With a double click on the alarm name or the activation mark the display of the corresponding alarm can be changed.

- **Activation mark with status display**

   Alarm display active – Alarm state 0

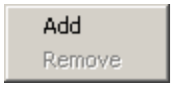
   Alarm display active – Alarm state 3

   Alarm display inactive – Alarm state 0

   Alarm display inactive – Alarm state 3

  The context menu can be opened with a right mouse click on the alarm name or the corresponding activation mark.

- **Context menu**

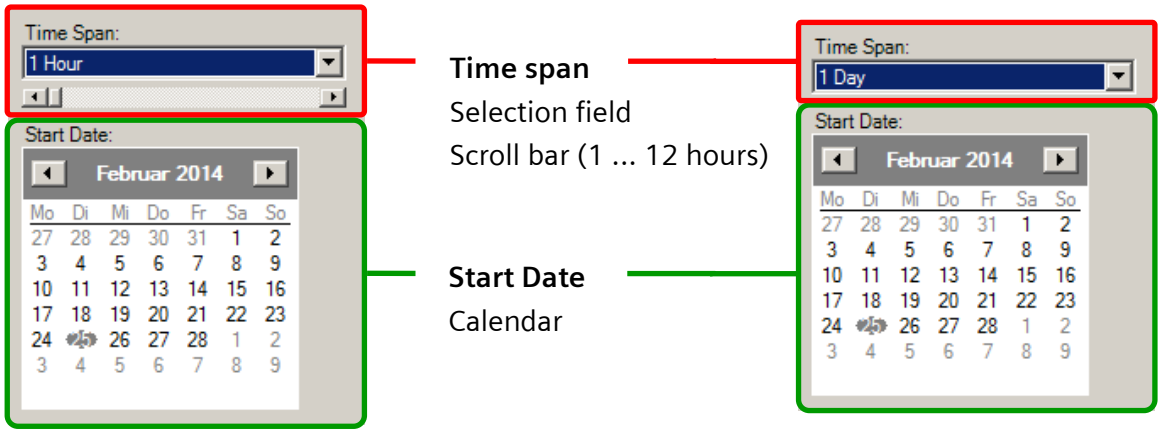
  

  Add: The display of the alarm in the alarm window will be activated.

  Remove: The display of the alarm in the alarm window will be deactivated.

3.9.2 Alarm Time Span Window

In this window the time span to be shown in the alarm window will be selected.

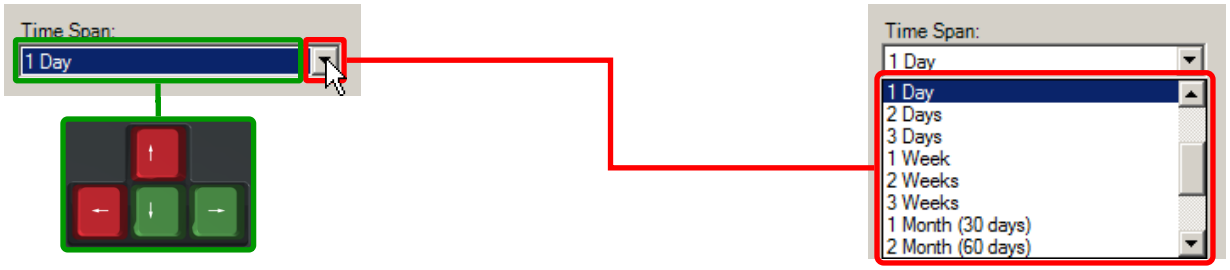


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The time span has to be selected in two steps:

- **Time span**

  The time span in the result window can be changed in the time range selection window or by selected time span field (blue background) with the arrow keys on the keyboard.



Red = Time span smaller

Green = Time span

The following time intervals are available:

1 hour	1 day	1 week	1 month	1 year	All Data
2 hours	2 days	2 weeks	2 month	2 years	
3 hours	3 days	3 weeks	3 month		
6 hours			6 month		
12 hours					

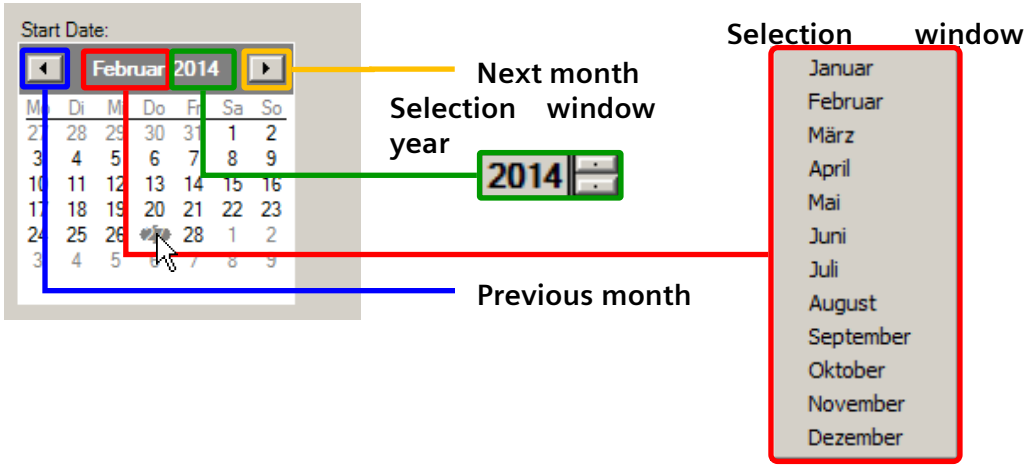
On selecting „All Data" the time span will automatically be adjusted to the range in which measurement values are available.



Note: The scroll bar appears only when selecting 1, 2, 3, 6 or 12 hours, with a resolution of 1 hour. The scroll bar can be moved with the arrow keys or selected and moved with the left mouse button.

- **Start Date**

  The start date is set with a mouse click on the desired date in the calendar dialog. The previous or next month can be selected with the arrow keys in the calendar dialog.



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Note: The calendar appears in the default language of the operating system.

3.9.3 Alarm Window

The results for all activated alarms will be displayed in the alarm window for the chosen time span. A right mouse click in the alarm window activates the context menu. Choose the desired display view:

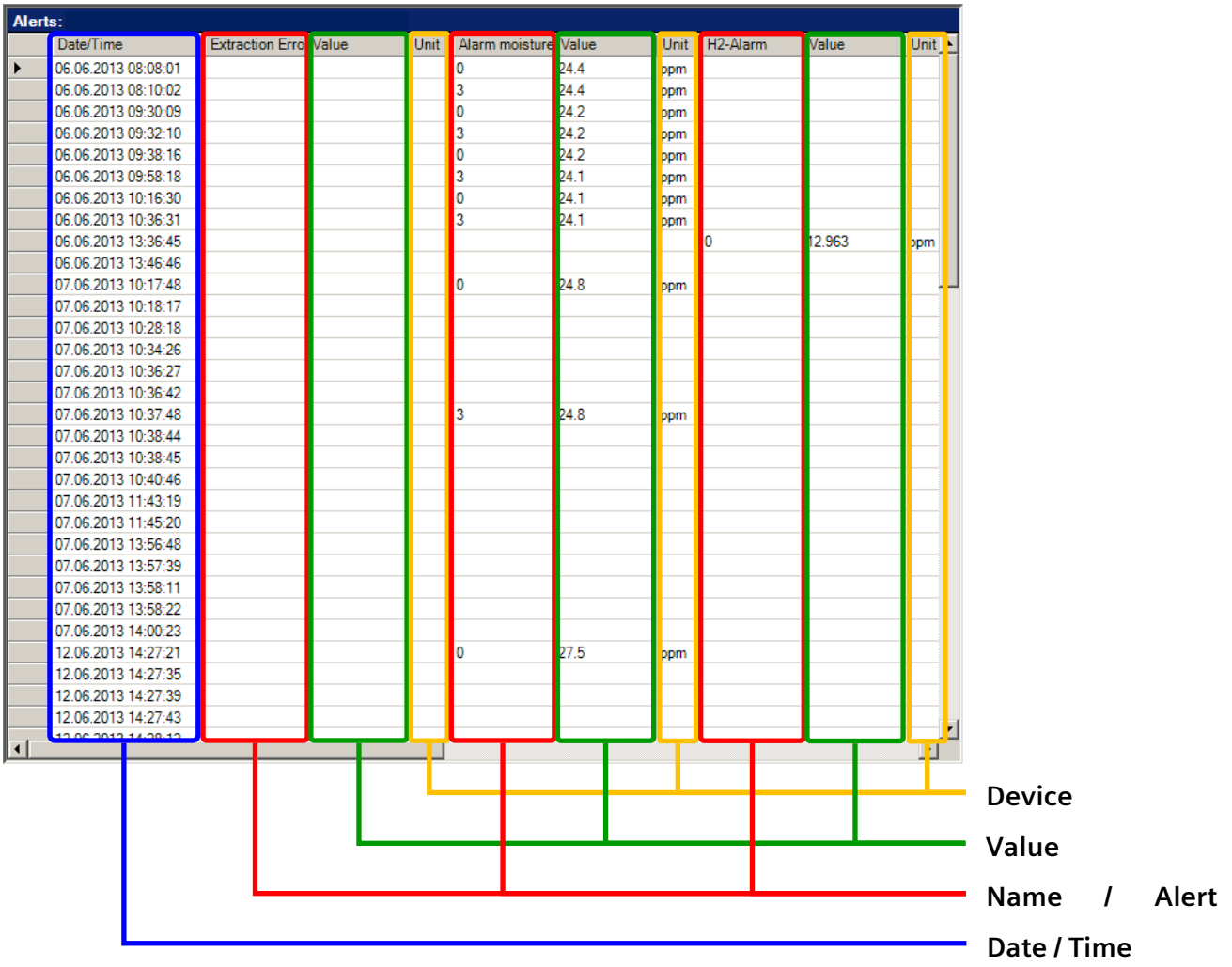
The individual display formats have the following label:

- Alarm window table view (3.9.3.1)
- Alarm window graph view (3.9.3.2)

Note: The table view contains more information than the graph view.

3.9.3.1 Alert Window Table View

In table view the data of the active alarms will be displayed in a table for the selected time range:



The table contains the following columns:

- **Date / Time**

  The moment of the alarm state alteration is displayed with date and time. By default the order of the alarms is displayed by date/time (oldest date first).

- **Name / Alarm state**

  The name of the related alarm which was configured in SITRAM® Multisense Software alarm setup (3.5.1) or directly on the device is in the column title. The alarm status or the alarm state (0 ... 4) is displayed in the rows.

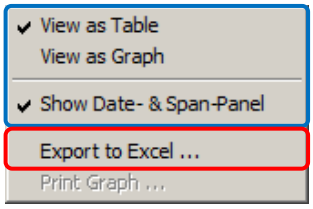
- **Value**

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The value that is assigned to the alarm will be displayed at the moment of the alarm state alteration. I.e. with delay = 0 it is the same value as the level (threshold) and with delay > 0 it is the value after expiring of the delay time.

- **Device**
  This column describes the device of the measurement value on which the alarm is referenced.

- **Context Menu**
  In the table view the following settings can be done via the context menu:



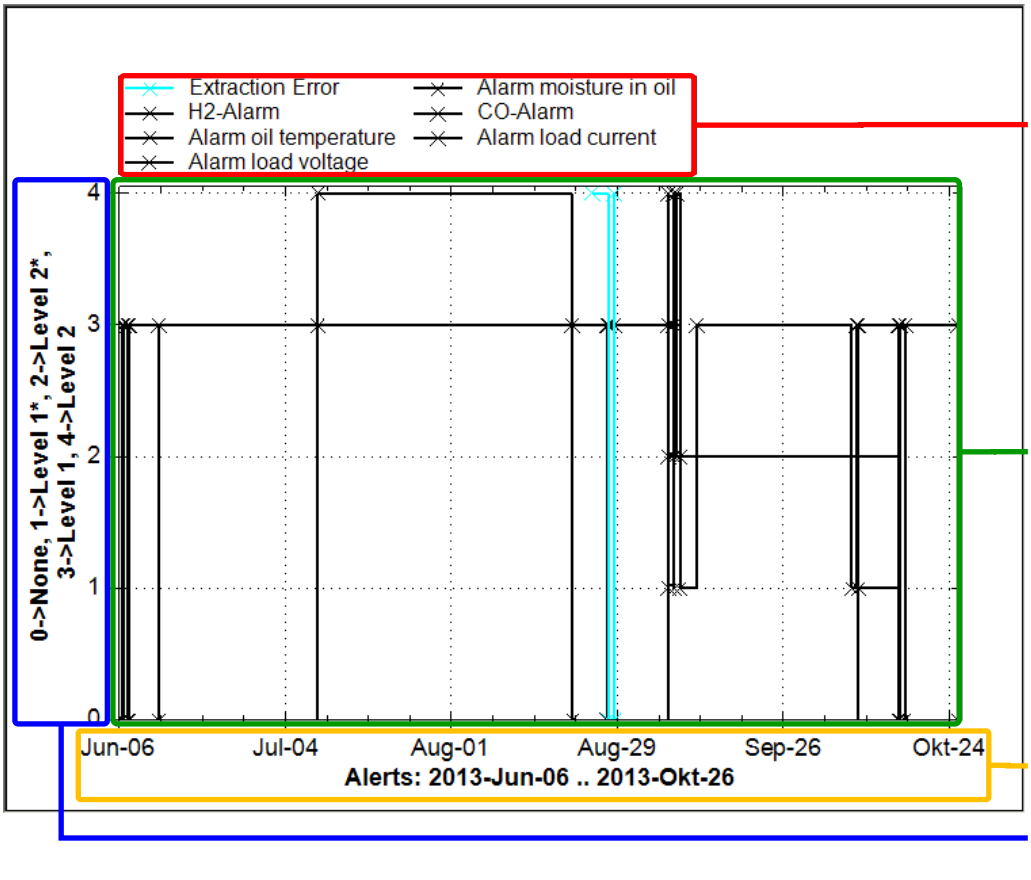
  Note: The red marked settings are only available in active table view. On a change to graph view they will be grayed out and cannot be selected anymore. The blue marked settings are always available.

- **Show Date- &Span-Panel:** The alarm- and the time span selection window can be switched on or off with this function. The alarm window will be displayed smaller or bigger accordingly.
  Note: With a double click of the left mouse button in the alarm window this function can also be switched on or off.
- **Export to Excel**: (3.9.4.1)

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3.9.3.2 Alarm Window Graph View

In the graph view all active alarms will be displayed for the selected time span in a graph trend:



The graph view contains the following information:

- **Visible alarms**
  The alarm legend of the activated alarms in the alarm selection window is shown here again.
- **Graphical trend**
  Related to the settings in the alarm selection window, the graphical trend is displayed for the visible time span.
- **Visible time span**
  In this window the time related information of the alarms (X-Axis) is shown.
- **Y-Axis scaling**
  In the graph view as well as in the table view 5 different alarm states are displayed. The meaning of the different states is as follows:

  0->None ⓪

  No alarm active. I.e. the threshold “level 1” of the alarm was not exceeded in the past or the pending alarm was acknowledged in the past.

  1->Level 1* ①

  The defined threshold “level 1” for a Hi - alarm was exceeded in the past. The threshold “level 1” was underrun again.

  2-> Level 2* ②

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The defined threshold “level 2” for a Hi - Hi - alarm was exceeded in the past. The thresholds “level 2” and “level 1” were underrun again.

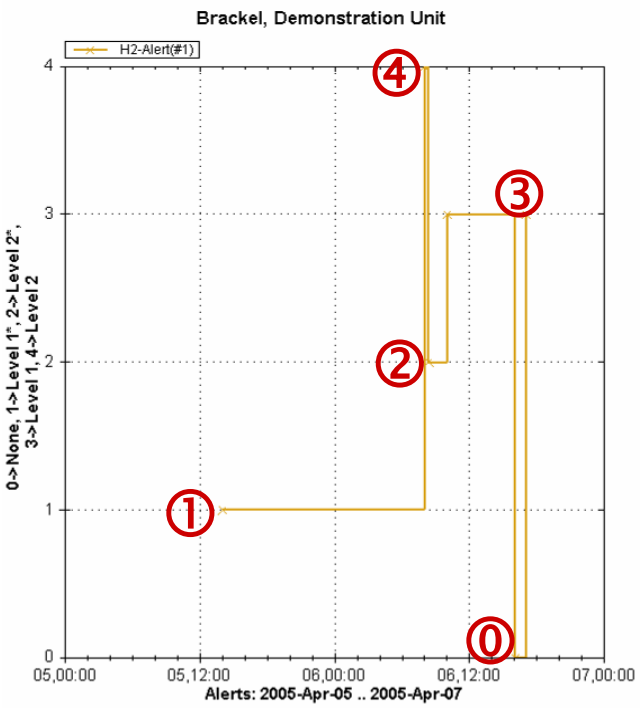
3-> Level 1 ③

The defined threshold “level 1” for a Hi - alarm is currently exceeded.

4-> Level 2 ④

The defined threshold “level 2” for a Hi - Hi - alarm is currently exceeded

Following an example of the same alarm trend in both display formats:

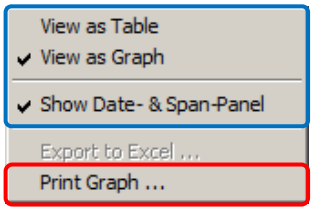


Alerts: Brackel, Demonstration Unit - 05.04.2005 .. 07.04.2005

	Date/Time	H2-Alert(#1)	Value	Unit
▶	05.04.2005 14:00:12	1	0	ppm
	06.04.2005 07:58:01	4	2000	ppm
	06.04.2005 08:00:12	4	0	ppm
	06.04.2005 08:20:12	2	0	ppm
	06.04.2005 10:00:12	3	500	ppm
	06.04.2005 16:02:47	0	675,718	ppm
	06.04.2005 17:00:12	3	707,18	ppm

- **Context menu**

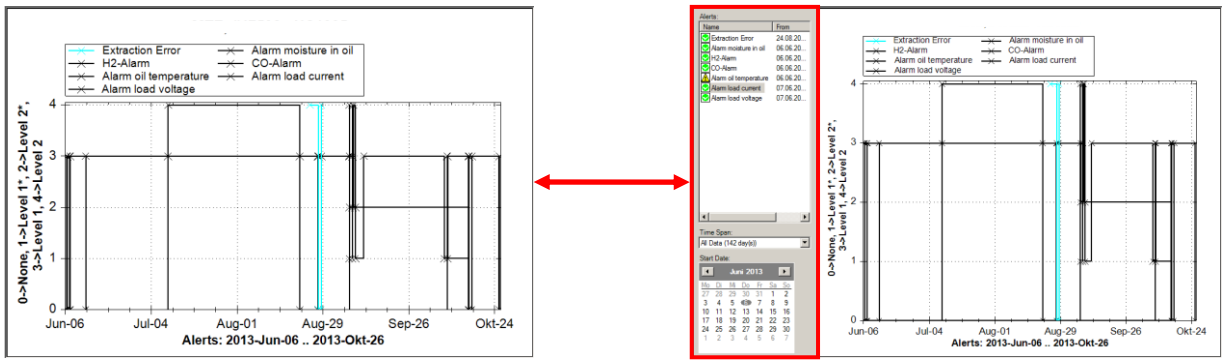
  In the graph view the following settings can be done via the context menu:



  Note: The red marked settings are only available in active table view. On a change to graph view they will be grayed out and cannot be selected anymore. The blue marked settings are always available.

- **Show Date- &Span-Panel:** The alerts- and the time span-panel can be switched on or off with this function. The result window will be displayed smaller or bigger accordingly.

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Function OFF **Function ON**

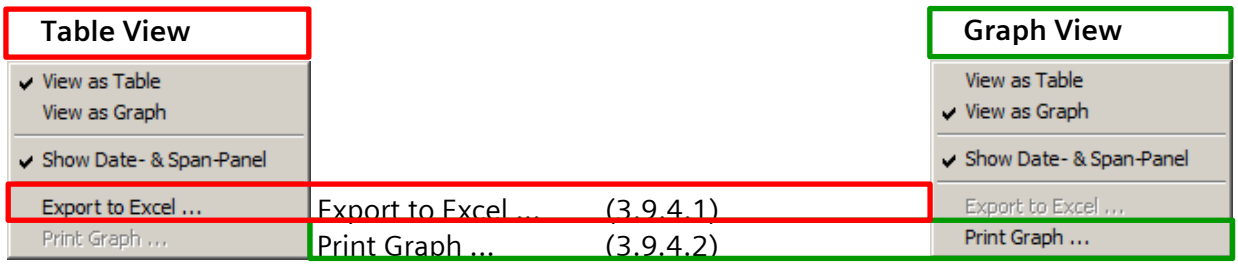
Note: With a double click of the left mouse button in the alarm window the alarm- and time span selection window can be switched on or off as well.

- **Print Graph ...** : (3.9.4.2)

3.9.4 Further Processing of the displayed Alerts

There are several possibilities available to further process the available alarms for documentation purposes. The different possibilities can be selected via the context menu.

- **Context menu**



Note: The functions „ Export ► „ (2.1.1.5) and „Print Graph ...” (2.1.1.10) can be selected via the menu bar as well.

3.9.4.1 Export to Excel ...

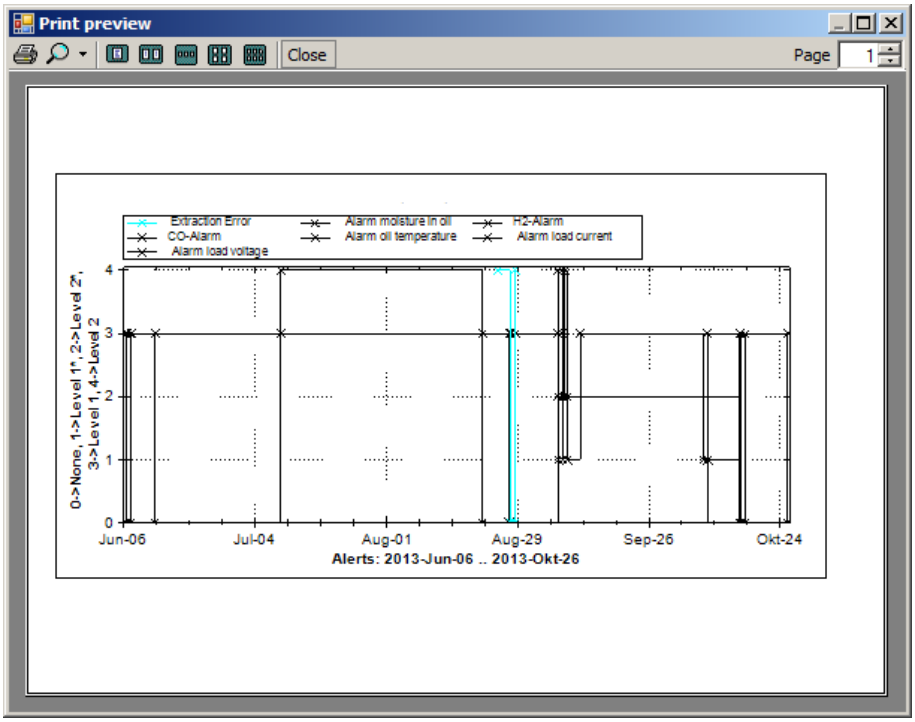
The active alarms in the selected time span can be exported into an Excel-file via the function „Export to Excel ...”

Note: The export into a text-file (CSV) is only possible via the menu bar entry (2.1.1.5). Isolated problems can occur in interaction between some MS Windows- and MS Excel-versions. In this case the table export should be done via CSV export (2.1.1.5). This text-file (.csv) can be opened in Excel afterwards and then be saved as an Excel-file (.xls).

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3.9.4.2 Print Graph ...

You have the possibility to print out the alarm window. With the function „Print Graph ...” the print preview window will open (see below). More functions are available in this window (e.g. print command, zoom, page view and close)



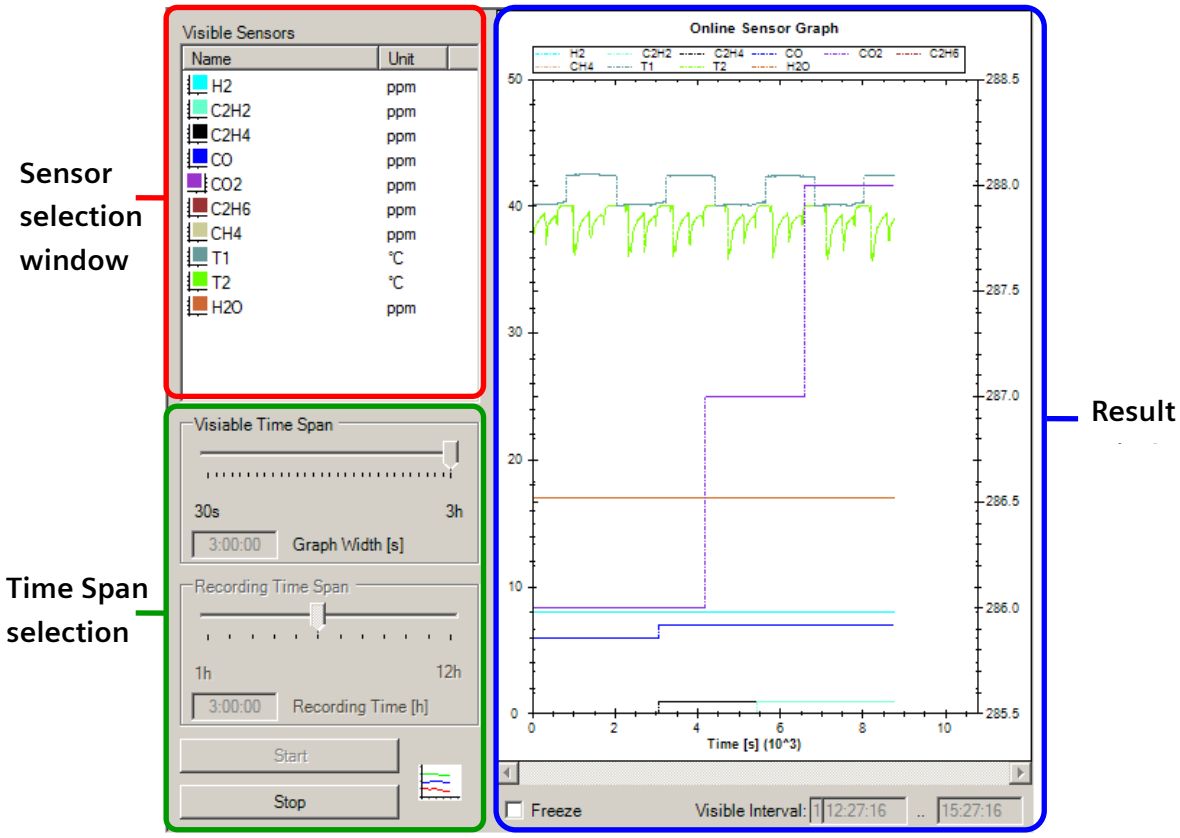
Note: The function „Print Graph ...” can be activated via the menu bar entry (2.1.1.10) as well.

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3.10 Online Sensors Online Sensors

To show and record actual measurement values the Online Sensors menu could be selected under the corresponding transformer. In the online mode ideally all sensors will be recorded every second. The cycle time however depends on the interface used for the device (modem, serial interface or network) and their settings. In worst case the cycle time increases up to 5 ... 10 seconds.

The following display appears in the working area:



The individual operation windows on the working area have the following labels:

- Sensor selection window online sensors (3.10.1)
- Time span selection window online sensors (3.10.2)
- Result window online sensors (3.10.3)

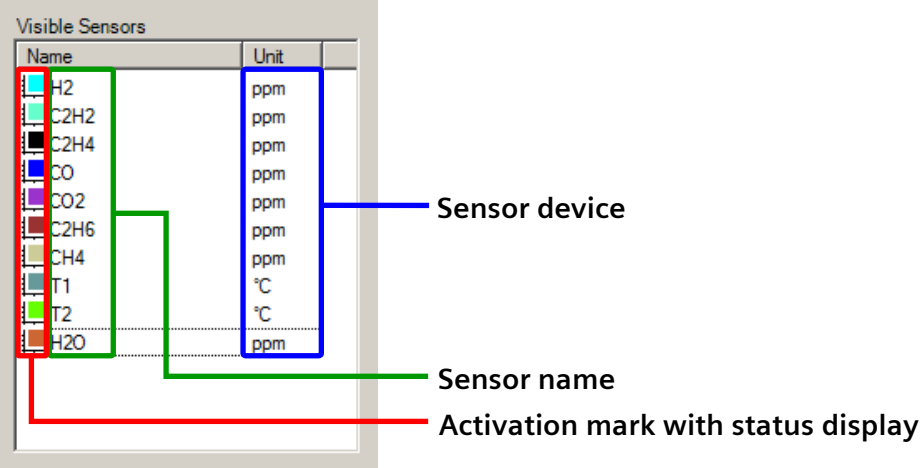
By the context menu (right mouse click) in the result window the following options arise:

- Further processing of the online values (3.10.4)

3.10.1 Sensor Selection Window Online Sensors

All sensors which are available in the SITRAM® Multisense device (related to the device type) are displayed in the sensor selection window (Visible Sensors). Basically all sensors will be recorded, even if they are not displayed active in the result window.

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The sensor device is displayed on the right side of the sensor name. There is an activation mark in front of the sensor name (i.e.: H2: H_2 Sensor is activated and therefore shown in the result window). The color for the displayed sensor is assigned automatically. With a double click (left mouse button) on the sensor name or the associated activation mark the view in the result window of the corresponding sensor can be changed.

- **Activation mark with Status Display**

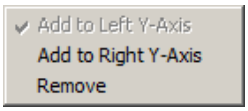
  Sensor view active – Scaling is displayed on the left Y-Axis

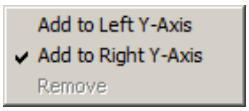
  Sensor view active – Scaling is displayed on the right Y-Axis

  Sensor view inactive

  With a right mouse click on the sensor name or the corresponding activation mark the context menu will open.

- **Context menu**





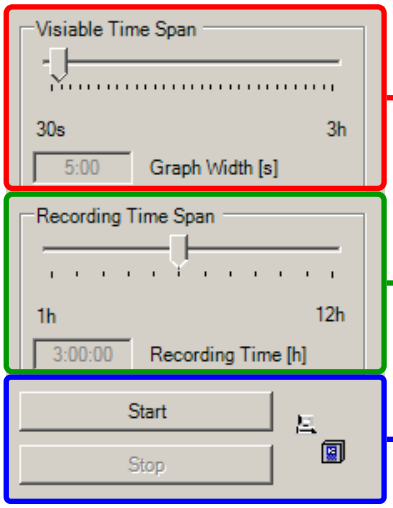
Add to left Y-Axis:	The scaling is displayed on the left Y-Axis.
Add to right Y-Axis:	The scaling is displayed on the right Y-Axis.
Remove:	The display of the sensor is deactivated.

Note: The presetting related to display on Y-Axis (left or right) will be represented with ✔ and stays according to the last selection.

3.10.2 Time Span Selection Window Online Sensors

The time relevant settings as well as the communication connection can be done in the time span selection window.

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Visible Time Span
Scroll Bar / Graph Width [s]

Recording Time Span
Scroll Bar / Recording Time [h]

Communication connection
Start / Stop / Online Status

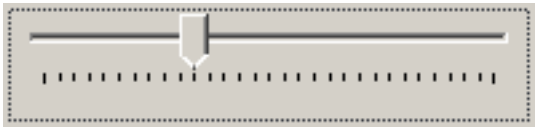
- **Visible time span**

  The visible time span in the result window can be adjusted by the scroll bar. Either it can be selected and shifted with the left mouse button or selected with the left mouse button and shifted with the arrow keys (left and right) on the keyboard. The maximum time span relates to the time span of the data recording. The settings grid is 30 seconds and will be displayed as a time value [hh:mm:ss] in the field graph width [s].

  The visible time span can be adjusted to the desired value at any time.



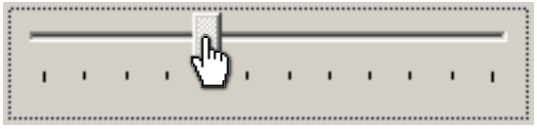
Left Mouse Button
Select and shift



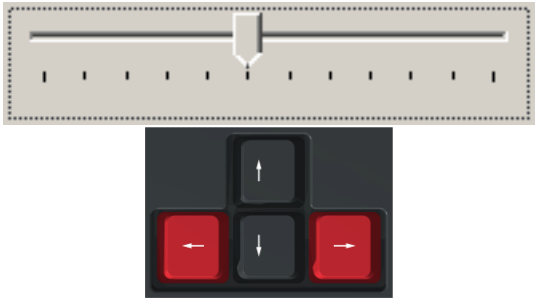
Left Mouse Button & arrow keys
Select with left mouse button

- **Time Span Recording**

  The time span recording is adjusted via the scroll bars as well. Either it can be selected and shifted with the left mouse button or selected with the left mouse button and shifted with the arrow keys (left and right) on the keyboard. The time span can be adjusted from 1 ... 12 hours. The increments are 1 hour and will be displayed as a time value [hh:mm:ss] in the field recording time [h]. The time span recording has to be set before the communication connection is active.



Left Mouse Button
Select and shift



Left Mouse Button & arrow keys
Select with left mouse button

Note: When a data recording is not finished within the defined time span, the already recorded data will be overwritten continuously.

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- **Communication connection with Online Status**

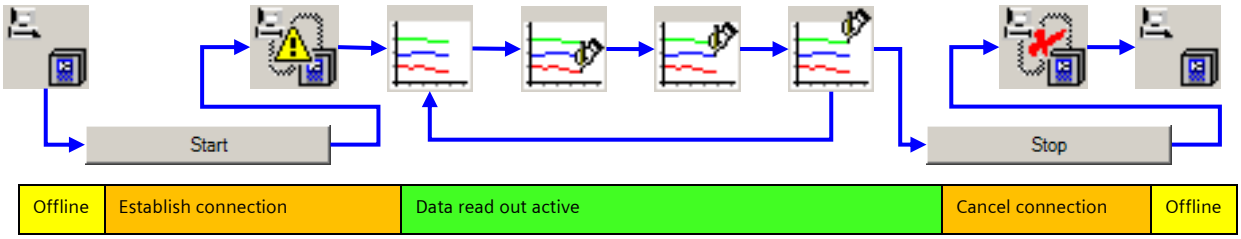
  To ensure the communication connection to the device the correct connection settings (3.4) for the desired device have to be defined first.

  Start The data recording will start.

  Stop The data recording will be terminated.

  The actual online status will be displayed right to the start- and stop buttons.

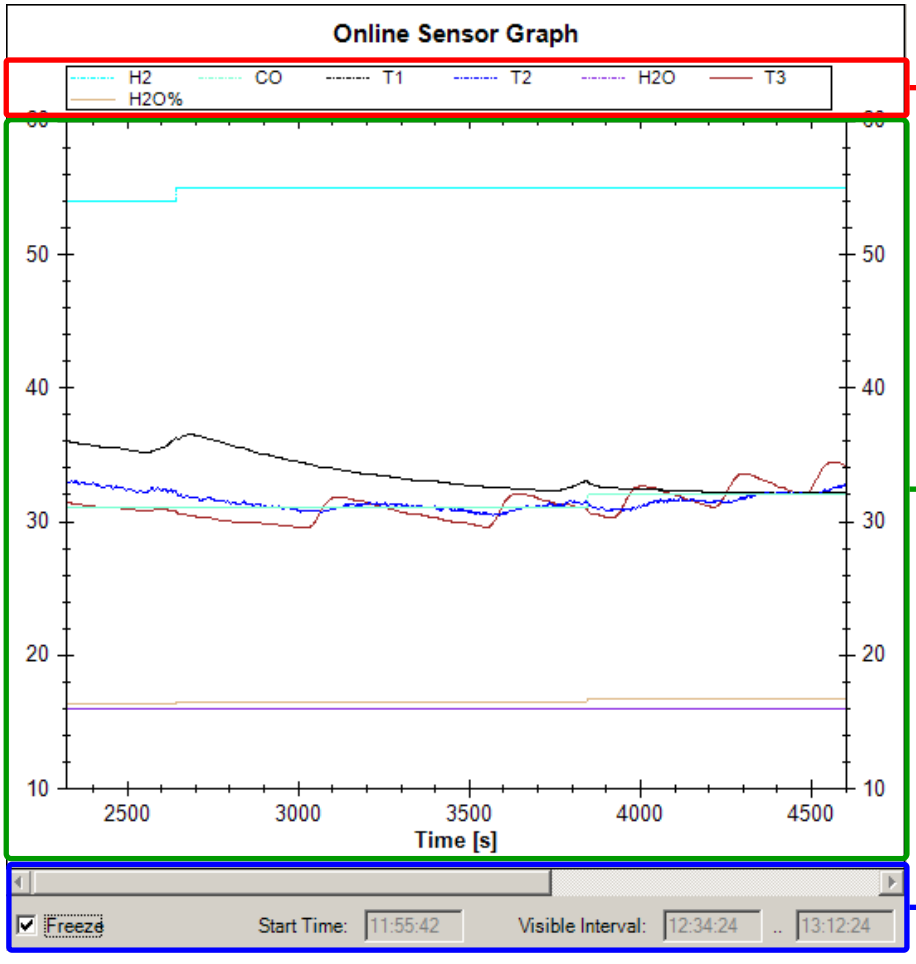
  Online Status:



Note: There is no context menu for the time span connection window.

3.10.3 Result Window Online Sensors

The actual data of the online sensors will be shown as a curve progression in the result window. The desired detail of the curve progression can be chosen via the zoom function and the „visible time span". Further processing of the data is possible from here.



Visible Sensors
Color Legend

Actual Measurement Values
Visible Time Span [s]
Scaling left Y-Axis
Scaling right Y-Axis

Actual Time Span
Scroll Bar
Freeze
Start Time

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- **Visible Sensors**

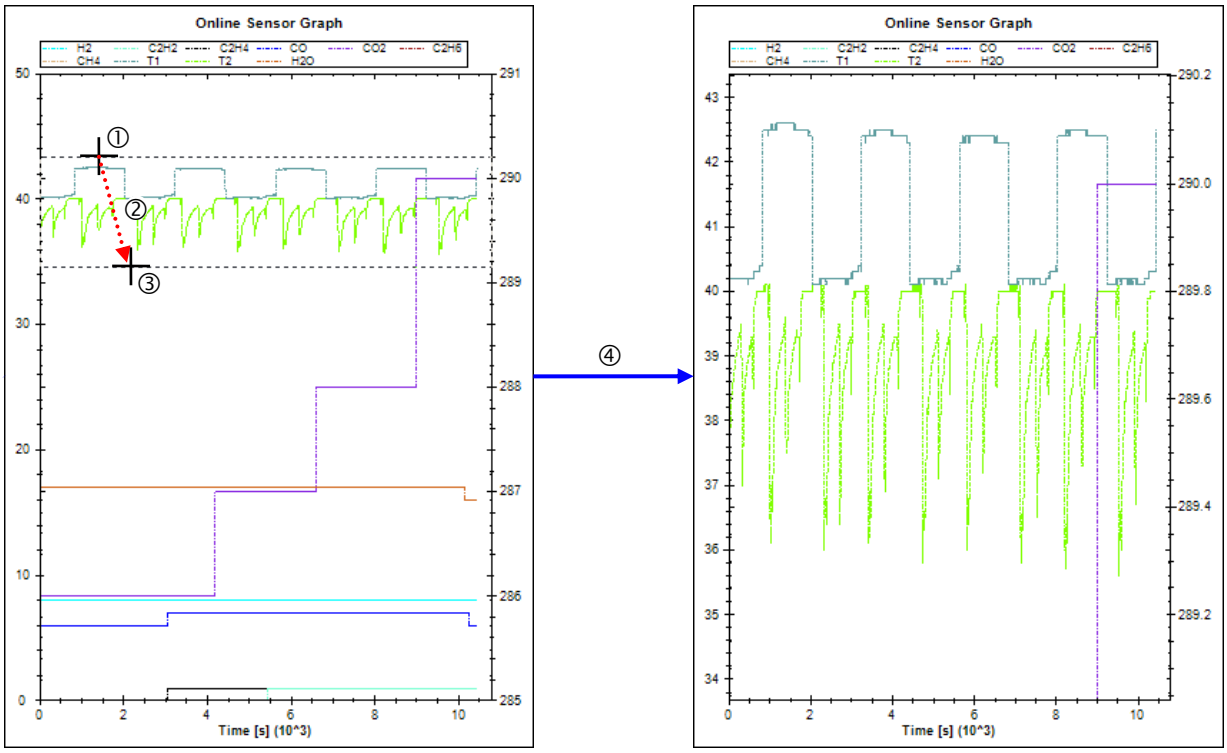
  The color legend for the active sensors in the sensor selection window is being displayed here again.



- **Actual Measurement Values**

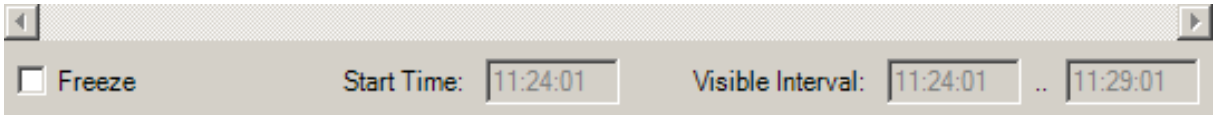
  The graphical curve progression (actual measurement values) is displayed related to the settings in the sensor selection window (color and assignment Y-axis) for the visible time span [s] (e.g. 2300 ... 4600 [s]). The cursor icon (->) changes as soon it is within the window „Actual Data". This means that the function zoom is available. Zooming works as follows:

  1. Bring the cursor into its desired position, press and hold the left mouse button,
  2. Drag the cursor to its next position,
  3. Release the left mouse button,
  4. The actual measurement values window shows now the zoomed area.



- **Actual Time Span**

  The time based information of the measurement values (X-Axis) is displayed in this window. In case the visible time span is less than the time span of the data recording, a scroll bar appears with which you can scroll back and forward and so the desired visible interval can be selected.



  The chosen interval can be hold by mark the selection field (freeze):



Freeze the displayed interval: switched ON



Freeze the displayed interval: switched OFF



Freeze the displayed interval: Inactive (no recording active)

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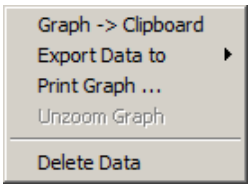
Start time: Time on which the data recording was started [hh:mm:ss]

Visible Interval: Start- and End time of the visible interval [hh:mm:ss]

3.10.4 Further Processing of the Online Values

Out of the result window online sensors the data can be further processed. The different options can be selected via the context menu.

- **Context menu**



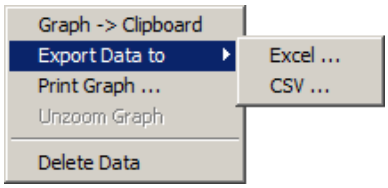
Graph -> Clipboard (3.10.4.1)

Export Data to ► (3.10.4.2)

Print Graph ... (3.10.4.3)

Unzoom Graph

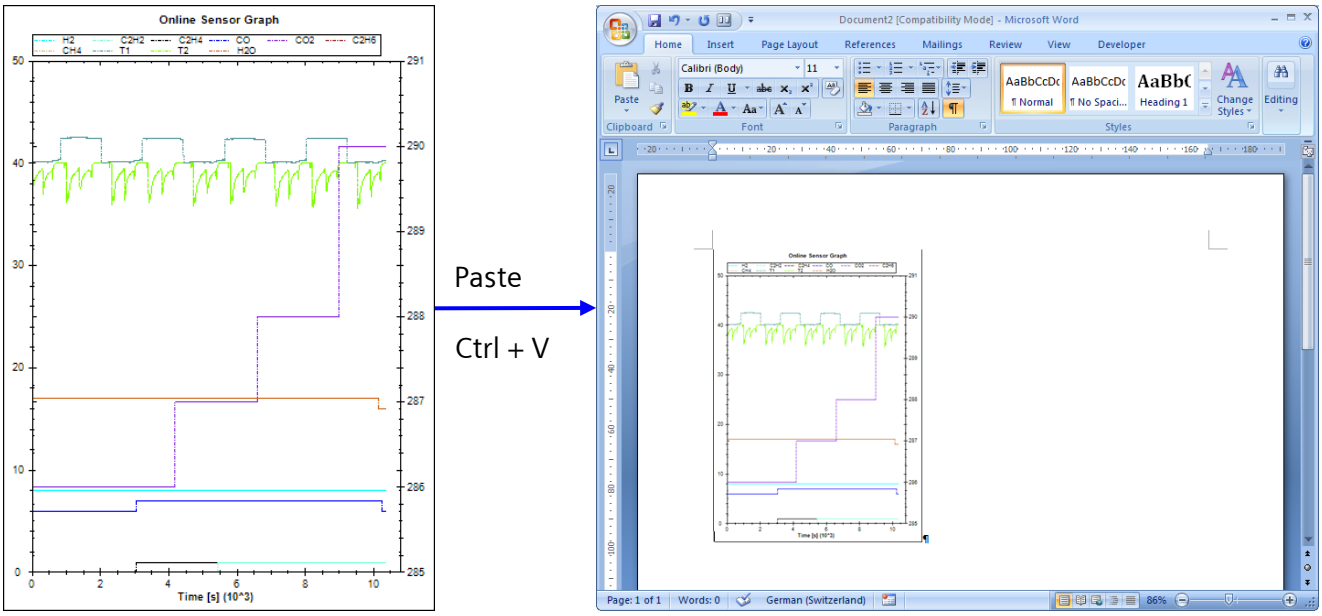
Delete Data (3.10.4.5)



Note: The function „Export Data to ►" can be selected via the menu bar entry (2.1.1.5) as well.

3.10.4.1 Copy of the Result Window to the Windows Clipboard

The window „Actual Measurement Values" will be copied into the Windows clipboard.



With the command "paste" or with the shortcut [Ctrl + V] the content of the clipboard can be pasted into the desired program.

3.10.4.2 Export

The actual data will be exported with the function „Export Data to ►" into an Excel- or CSV-file. The export contains the values of all existing sensors in its corresponding cycle time.

Excel ...

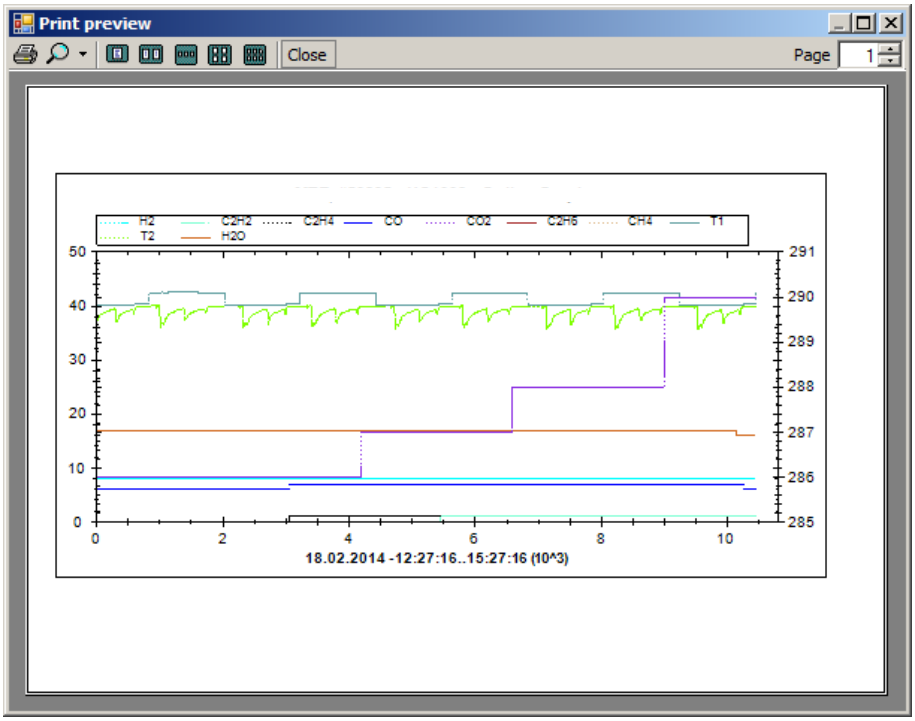
CSV ...

Note: Depending on the used operating system and the Excel version installed on your PC, it can rarely happens, that the communication to the device will be interrupted when an Excel export is being performed during an active data read out.

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3.10.4.3 Print

By selecting the context menu entry „Print Graph ... „ the following preview window opens:

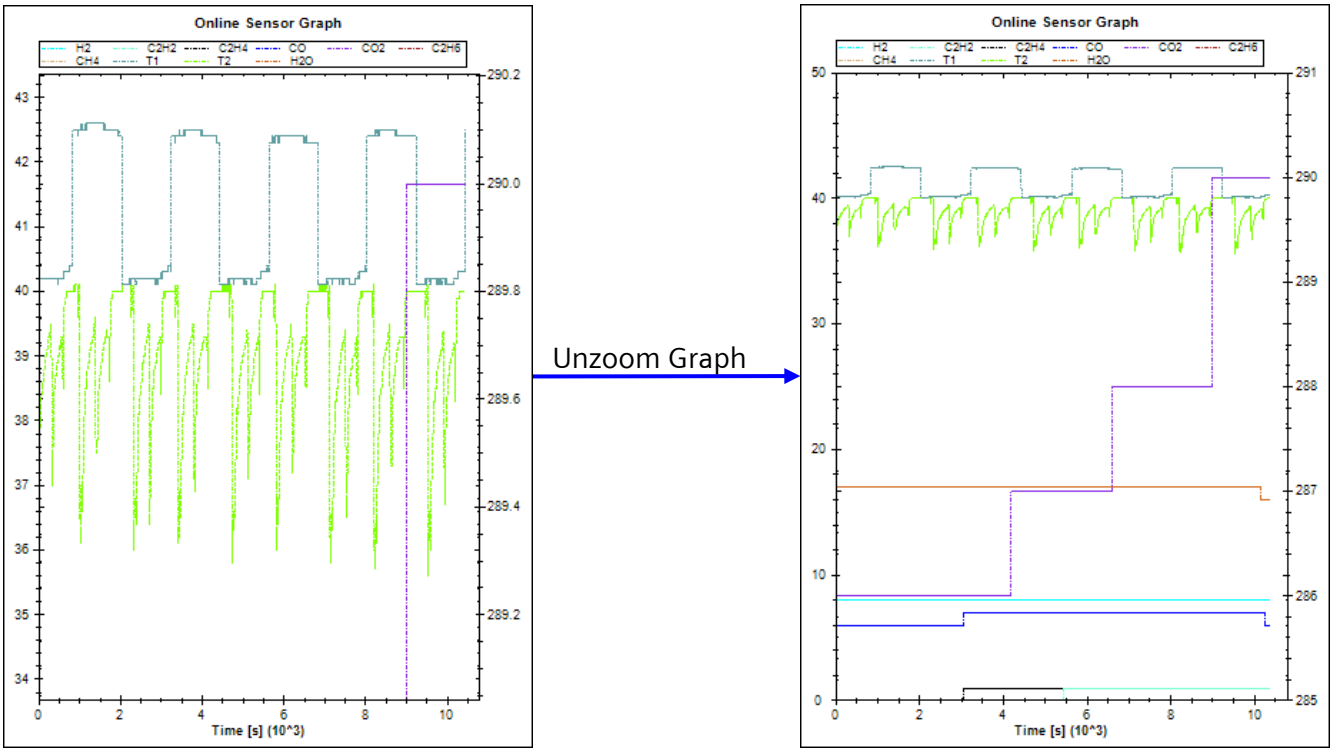


More functions are available in this window (e.g. print command, zoom, page view and close)

Note: The function „Print Graph ...” can be activated via the menu entry (2.1.1.10) as well.

3.10.4.4 Unzoom Graph

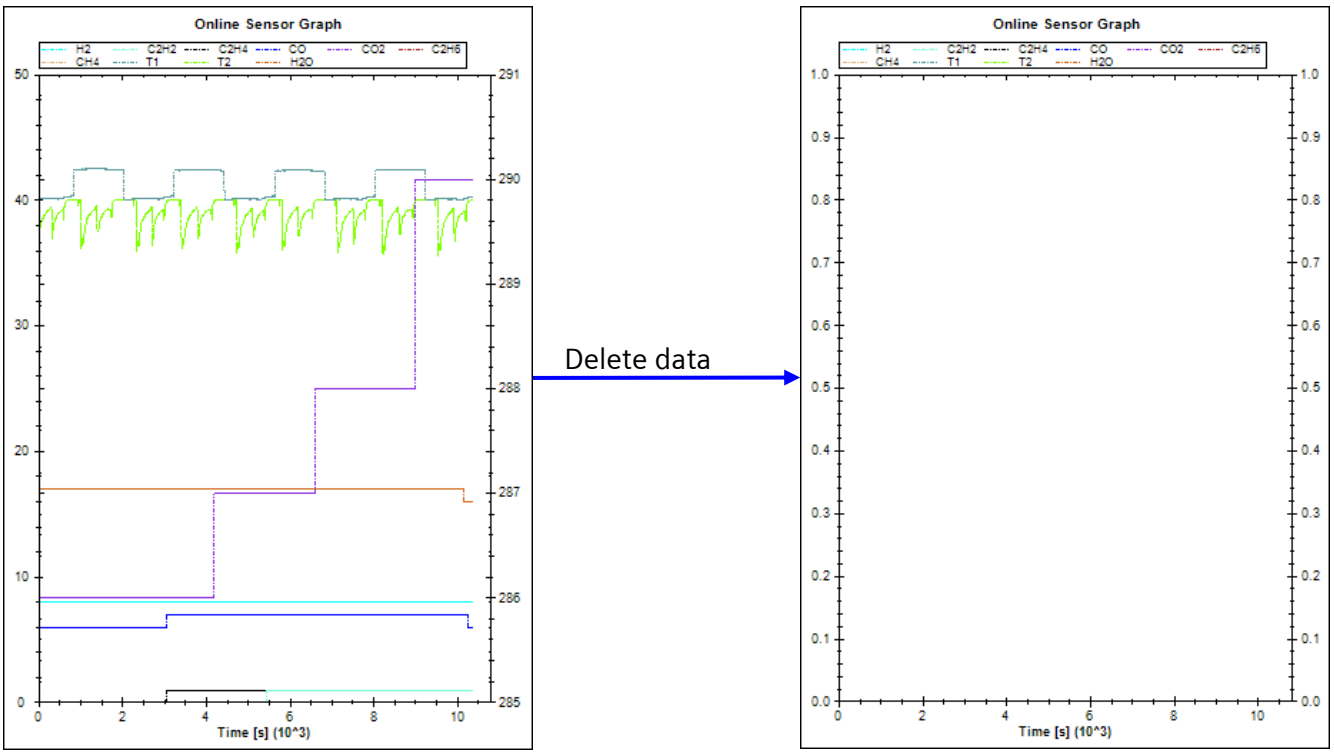
The zoomed Y-Axis scaling will be set back the start value.



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3.10.4.5 Delete Data

The actual measurement values can be deleted with the context menu entry „Delete Data".



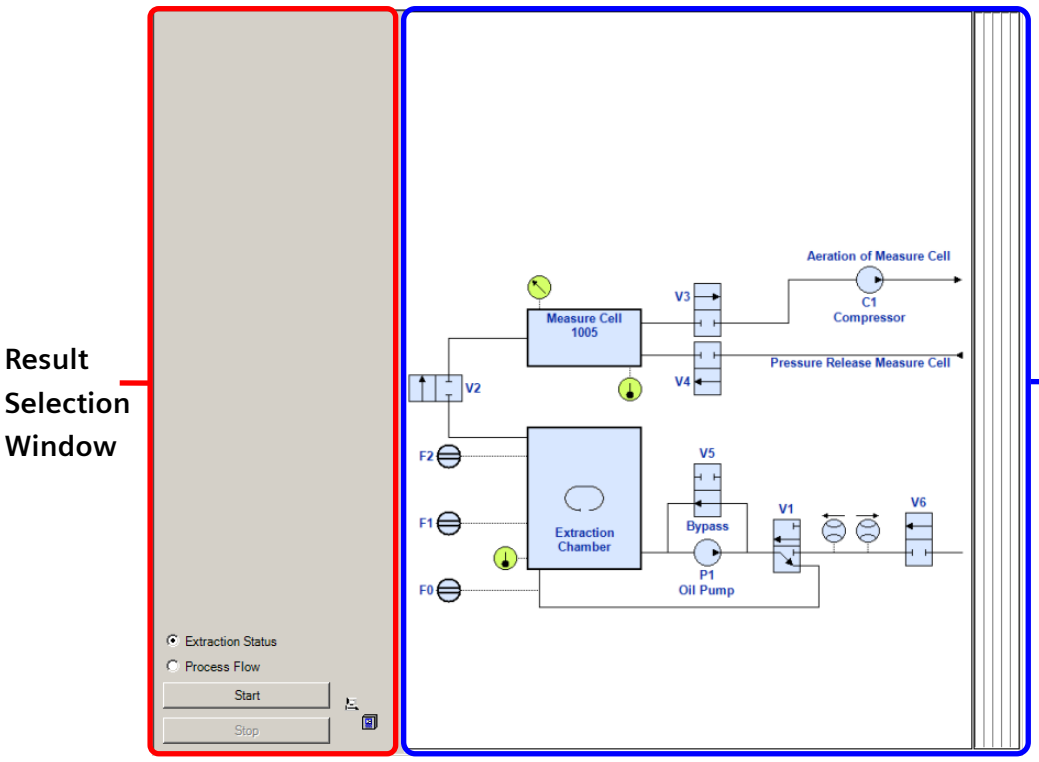
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3.11 Extraction Status Extraction Status

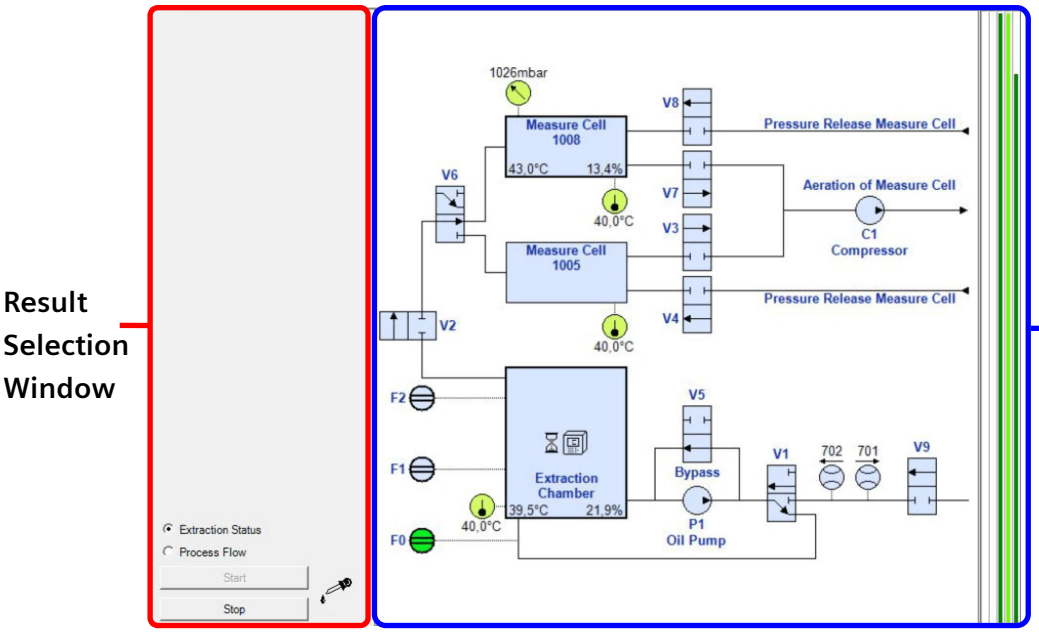
To view the actual process flow and the extraction status of the SITRAM® Multisense device (for SITRAM® Multisense 5 and SITRAM® Multisense 9 only) the entry Extraction Status has to be selected in the corresponding transformer in the tree structure

The following windows are available in the work area:

SITRAM® Multisense 5



SITRAM® Multisense 9



In online mode, all sensors are ideally recorded every second. However, the cycle time depends upon the used communication interface (modem, serial interface or network) and its settings. In worst case, the cycle time increases to 5 ... 10 seconds.

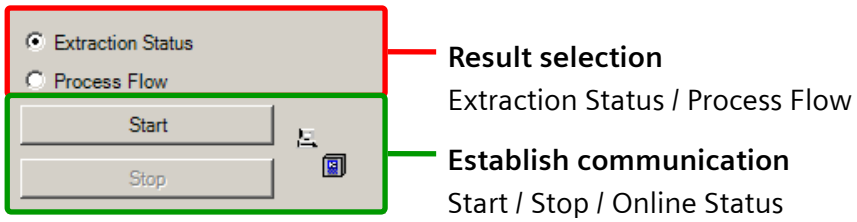
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The individual operating windows have the following designations:

- Result Selection Window Extraction Status (3.11.1)
- Result Window Extraction Status (3.11.2)

3.11.1 Result Selection Window Extraction Status

In the Result Selection Window the result relevant settings are done as well as establishing the connection to the device.



- **Result selection**

  Here the selection between the two result views can be done (view Extraction Status or Prozess Flow in the result window). The selection can be changed at any time.

- **Establish Communication with Online Status**

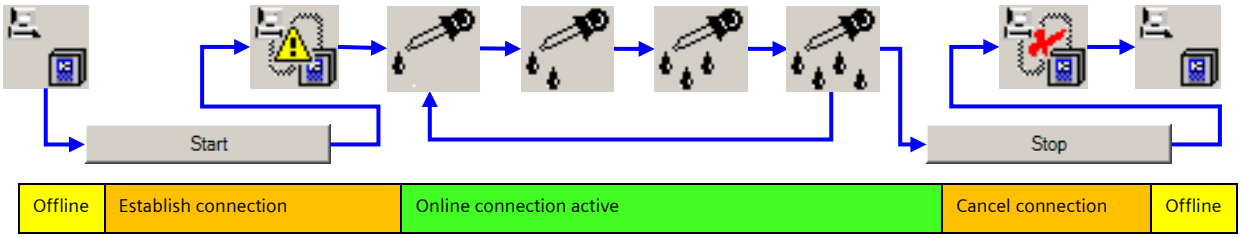
  To ensure the communication connection to the device, the correct connection settings (3.4) for the desired device have to be done first.

  Start The online connection will be started.

  Stop The online connection will be canceled.

  The actual online status is visualized to the right of the Start- and Stop button.

  Online Status:

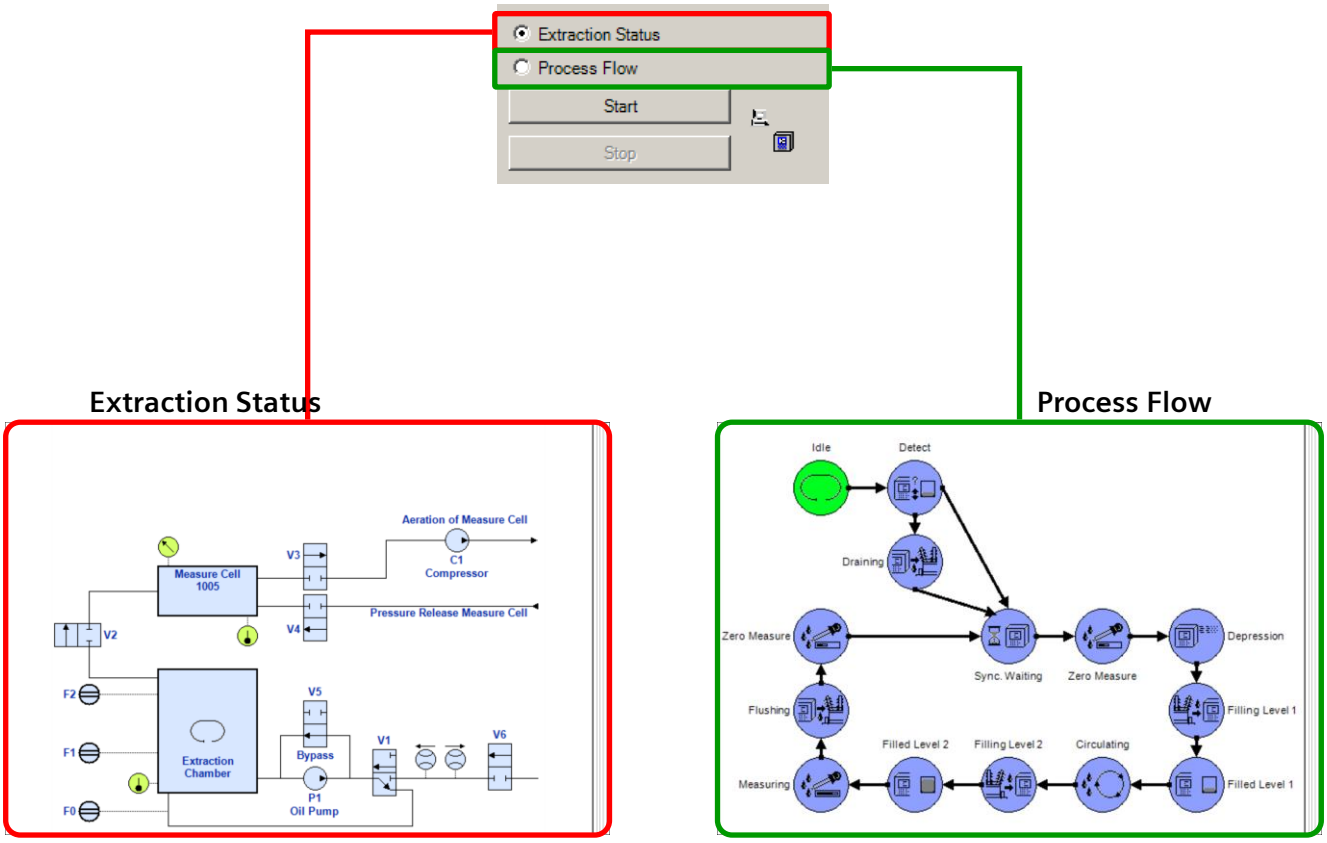


Remark: There is no context menu for the Result Selection Window.

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3.11.2 Result Window Extraction Status

Depending on the selection in the Result Selection Window (3.11.1) either the actual process flow or the actual extraction satus will be displayed in the result window.



The individual result windows have the following designation:

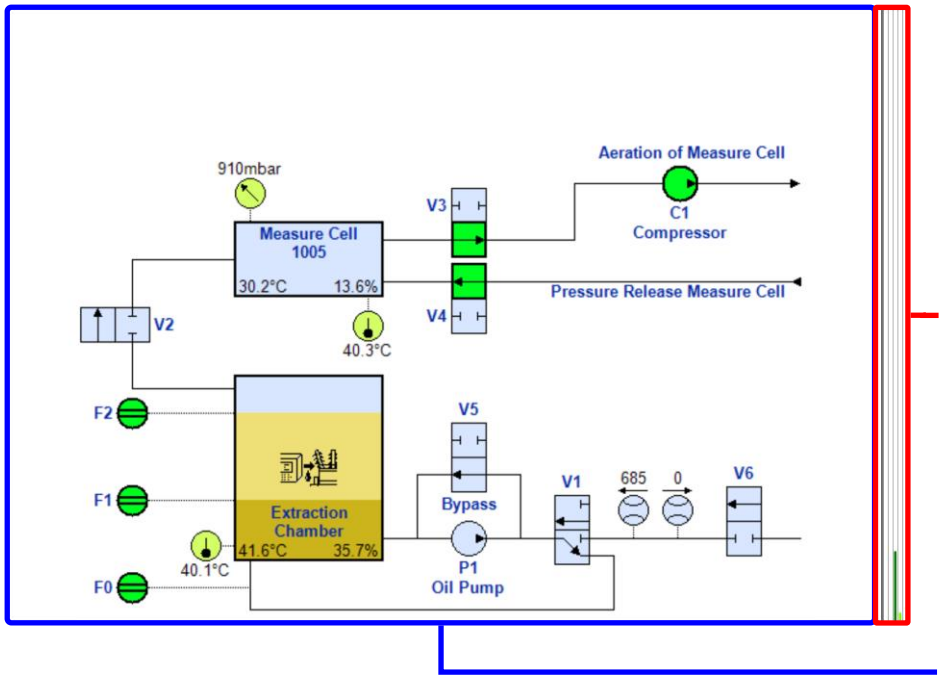
- Extraction Status (3.11.2.1)
- Process Flow (3.11.2.2)
- Overview Process Flow and Extraction Status (3.11.2.3)

Remark: There is no context menu for the Result Selection Window.

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3.11.2.1 Extraction Status

The measurement and extraction components as well as the time bar graph of the SITRAM® Multisense device are being displayed in the Extraction Status view:



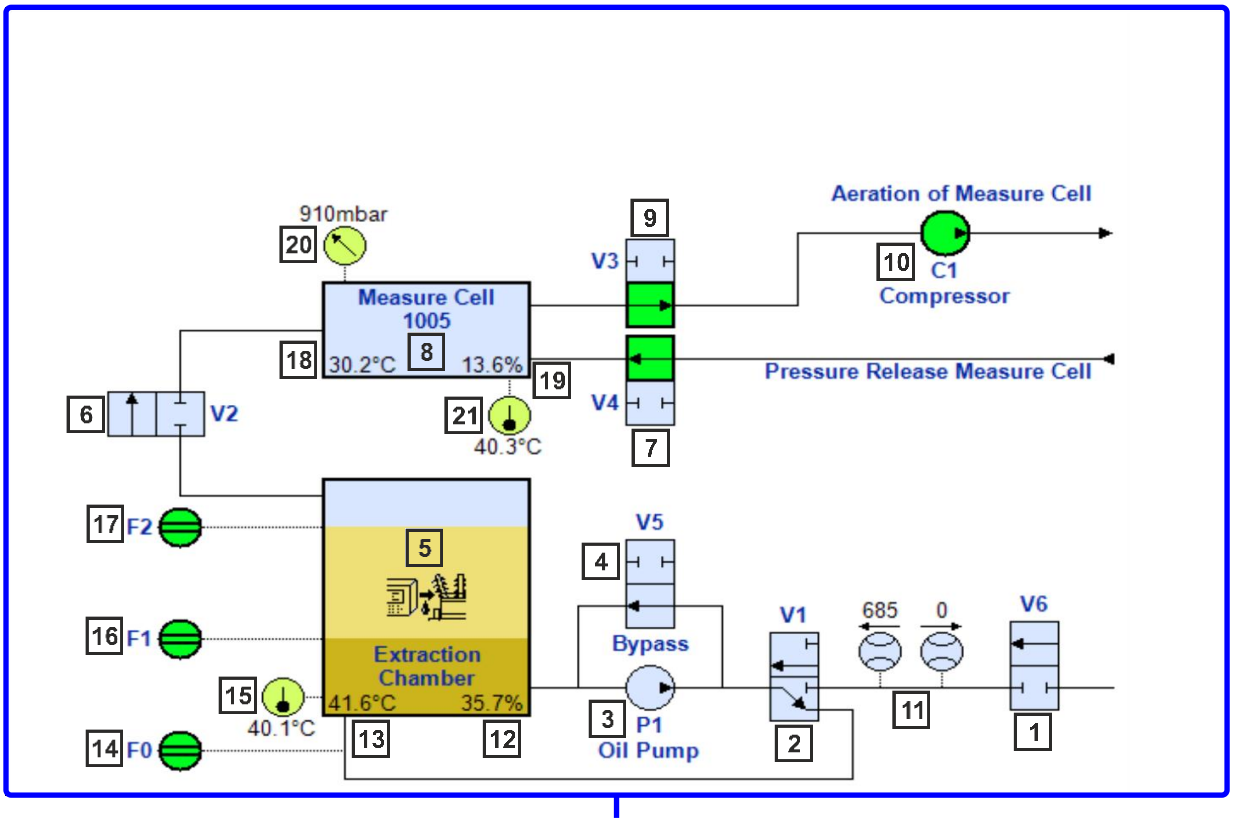
The Result Window Extraction Status contains the following information:

- **Device Status**

  Depending on the process step the extraction components will be displayed active. The corresponding readings appear at the measuring components

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SITRAM® Multisense 5



Measurement- and extraction

Legend	Name	Short name	(Valve function)
[1]	In- / outlet valve	Valve V6	(NC)
[2]	Degassing valve	Valve V1	(NC)
[3]	Oil pump	Pump P1	-
[4]	Bypass valve oil pump	Valve V5	(NO)
[5]	Extraction chamber	-	-
[6]	Measurement cell isolation valve	Valve V2	(NC)
[7]	Ventilation valve	Valve V4	(NC)
[8]	Measurement cell	-	-
[9]	Depression valve	Valve V3	(NC)
[10]	Depression compressor	Compressor K1	-
[11]	Oil flow meter	Flow F1	
[12]	Moisture in oil sensor	Moisture H_2O	
[13]	Oil temperature sensor	Temperature T2	
[14]	Level sensor zero detection	Level L0	

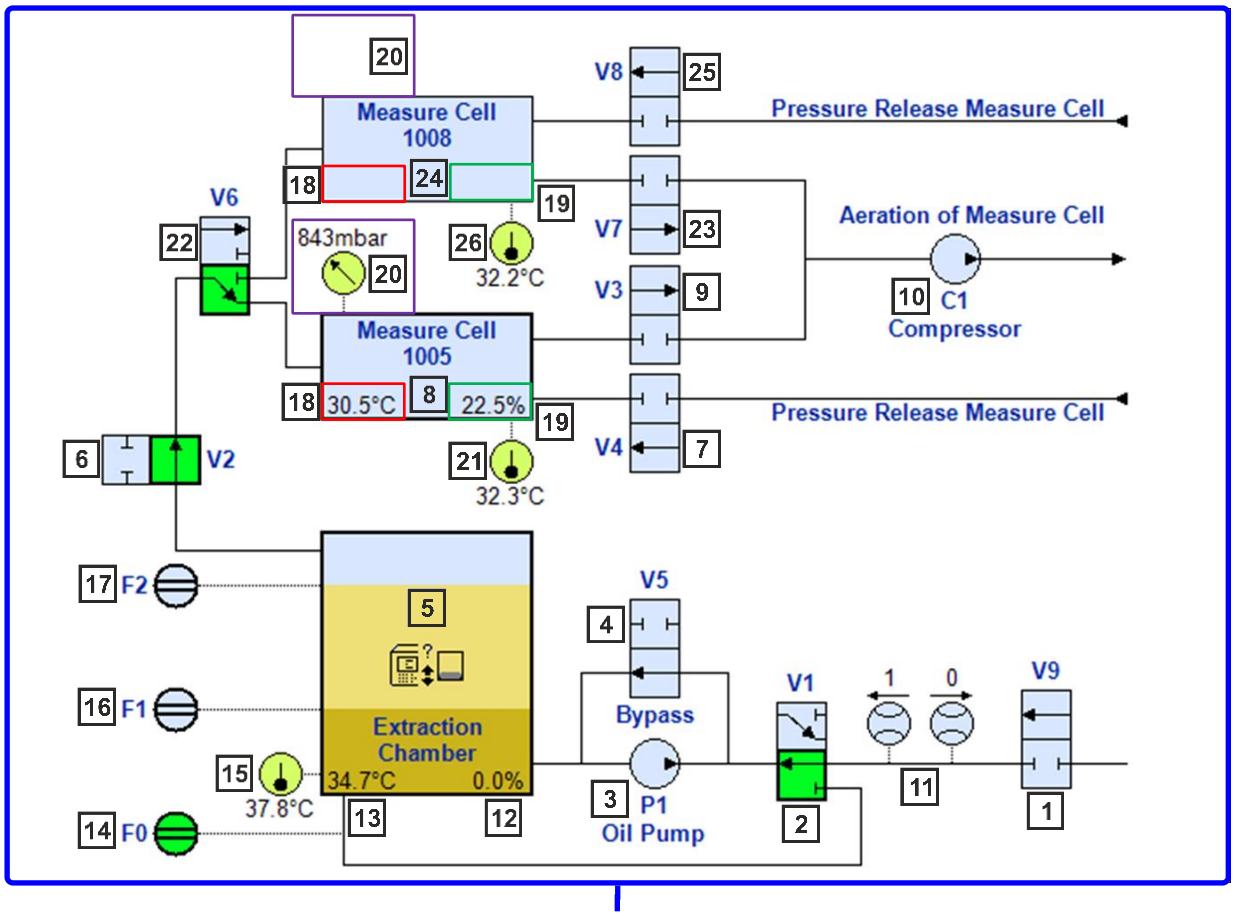
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[15]	**Temperature sensor heating extraction chamber**	-	
[16]	**Level sensor low extraction chamber**	Level L1	
[17]	**Level sensor high extraction chamber**	Level L2	
[18]	**Gas temperature measurement cell**	Temperature T1	
[19]	**Gas moisture measurement cell**	-	
[20]	**Pressure sensor measurement cell**	-	
[21]	**Temperature sensor heating measurement cell**	-	

(NC): Valve Normally Closed (NO): Valve Normally Open

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SITRAM® Multisense 9



Measurement- and extraction

Legend	Name	Short name	(Valve function)
[1]	In- / outlet valve	Valve V9	(NC)
[2]	Degassing valve	Valve V1	(NC)
[3]	Oil pump	Pump P1	-
[4]	Bypass valve oil pump	Valve V5	(NO)
[5]	Extraction chamber	-	-
[6]	Measurement cell isolation valve	Valve V2	(NC)
[7]	Ventilation valve - measurement cell 1	Valve V4	(NC)
[8]	Measurement cell 1 (1005)	-	-
[9]	Depression valve - measurement cell 1	Valve V3	(NC)
[10]	Depression compressor	Compressor K1	-
[11]	Oil flow meter	Flow F1	
[12]	Moisture in oil sensor	Moisture H_2O	
[13]	Oil temperature sensor	Temperature T2	

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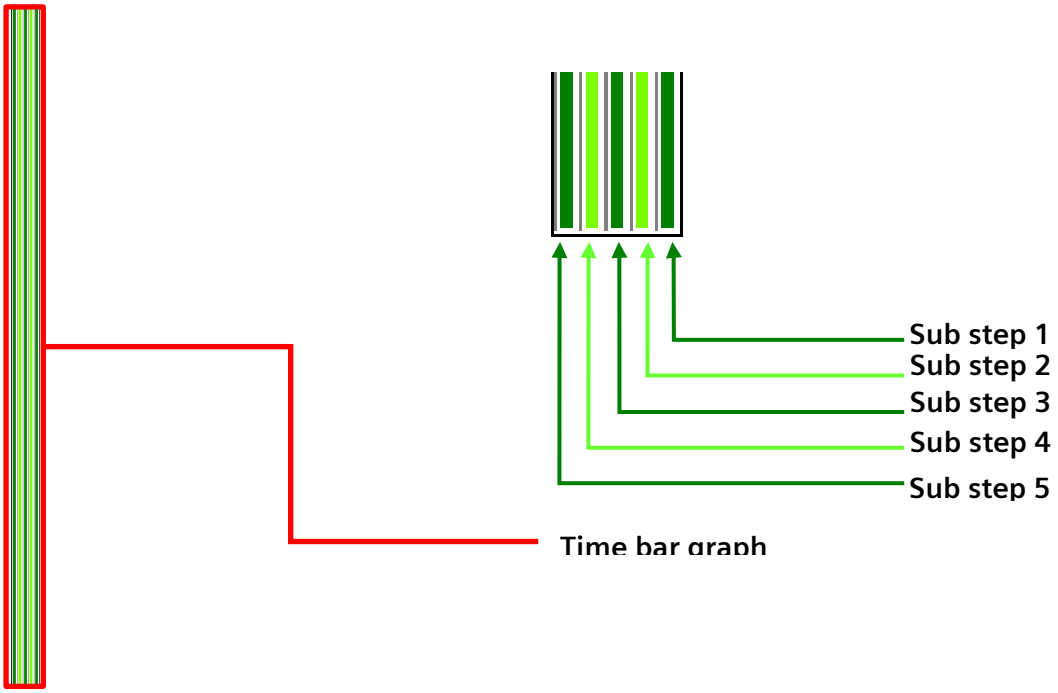
[14]	**Level sensor zero detection**	Level L0	
[15]	**Temperature sensor heating extraction chamber**	-	
[16]	**Level sensor low extraction chamber**	Level L1	
[17]	**Level sensor high extraction chamber**	Level L2	
[18]	**Gas temperature measurement cell**	Temperature T1	
[19]	**Gas moisture measurement cell**	-	
[20]	**Pressure sensor measurement cell**	-	
[21]	**Temperature sensor heating measurement cell 1**	-	
[22]	**Measurement cell switching valve**	Valve V6	(NC)
[23]	**Depression valve - measurement cell 2**	Valve V7	(NC)
[24]	**Measurement cell 2 (1008)**	-	
[25]	**Ventilation valve - measurement cell 2**	Valve V8	(NC)
[26]	**Temperature sensor heating measurement cell 2**	-	

(NC): Valve Normally Closed

(NO): Valve Normally Open

- **Status Information**

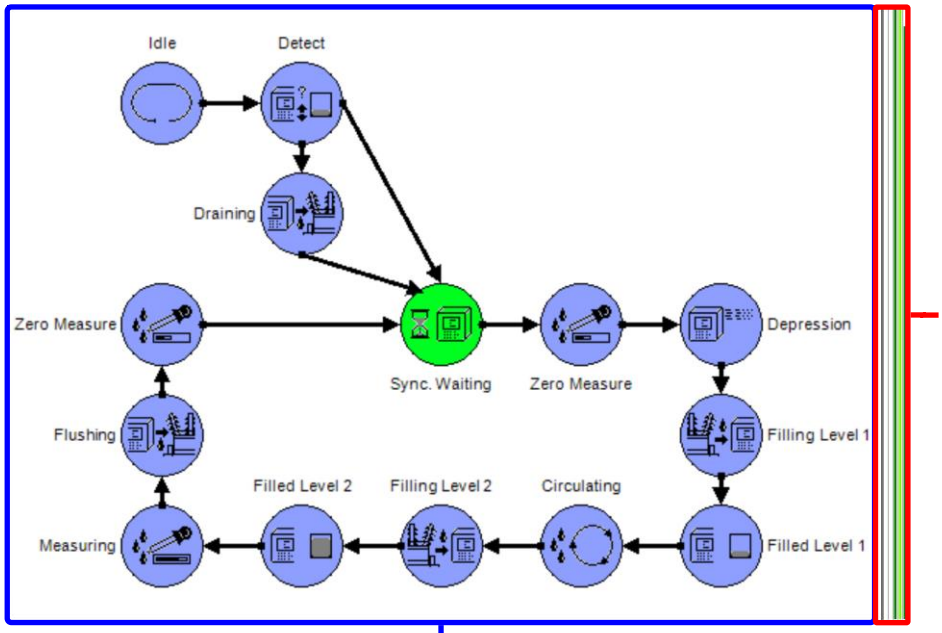
  The status information displays the progress within the process flow and is presented with up to 5 time bar graphs (3 dark and 2 light green). Each time bar graph depicts the degree of fulfillment of a partial step within the process step



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3.11.2.2 Process Flow

In the Process Flow view, the process steps and the time bar graph of the SITRAM® Multisense device are being displayed:



Status information

Process information

Process steps

The Result Window Prozess Flow contains the following information:

- **Process Information**

  The current process step is active shown in green.

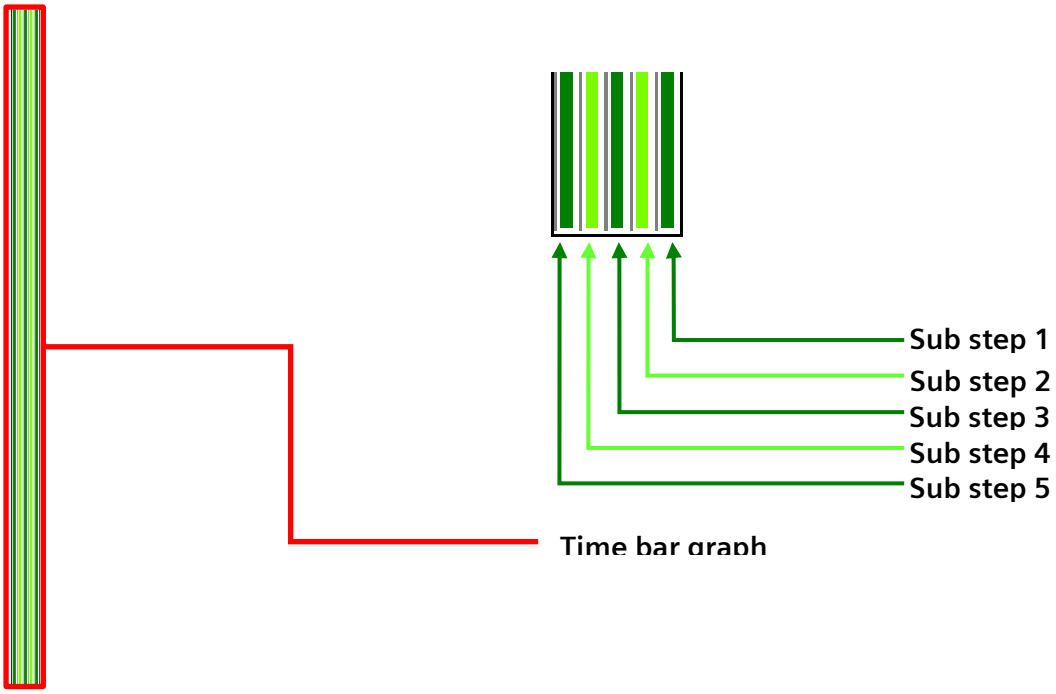
  

  In case of an error or a not installed device an additional step (red) will be displayed in the upper right area of the result window.

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- **Status Information**
- The status information displays the progress within the process flow and is presented with up to 5 time bar graphs (3 dark and 2 light green). Each time bar graph depicts the degree of fulfillment of a partial step within the process step.



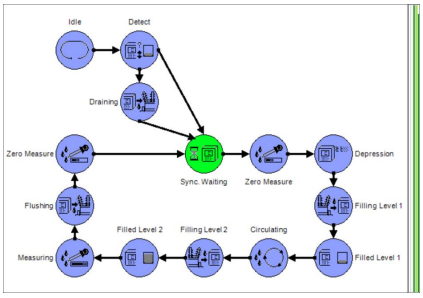
3.11.2.3 Overview Process Flow and Extraction Status

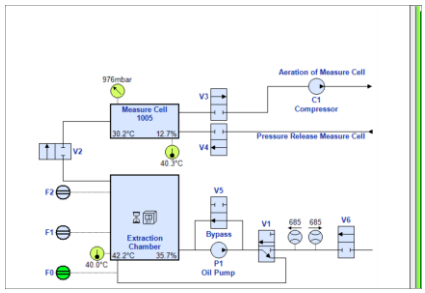
Following you will find all process steps with its corresponding extraction status illustrations.

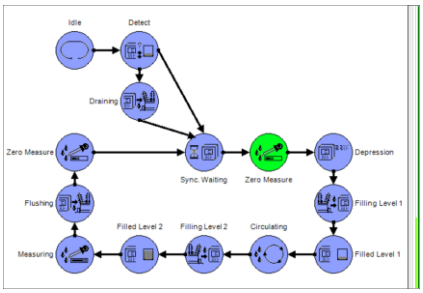
- Wait (clock-Sync.) (3.11.2.4)
- Depression (3.11.2.5)
- Depression (3.11.2.5)
- Fill Level 1 (3.11.2.6)
- Filled Level 1 (3.11.2.7)
- Circulate (3.11.2.9)
- Fill Level 2 (3.11.2.9)
- Filled Level 2 (3.11.2.10)
- Measurement (3.11.2.11)
- Purging (3.11.2.12)
- Not installed (3.11.2.13)
- Ready (3.11.2.14)
- Detect – Disassemble (3.11.2.15)
- Draining (3.11.2.16)

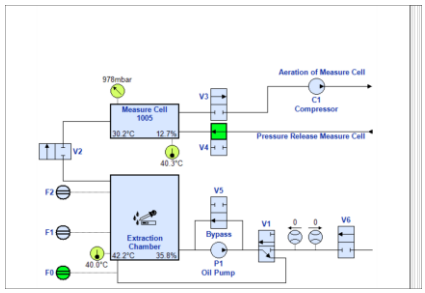
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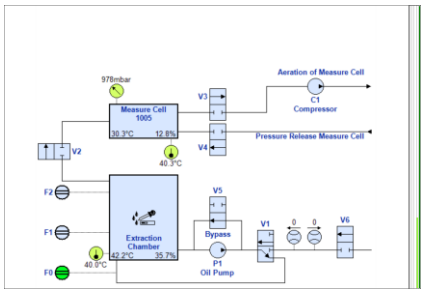
3.11.2.4 Wait (clock-Sync.)



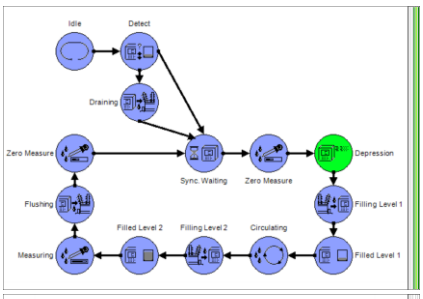


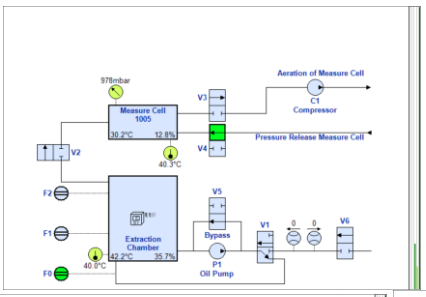


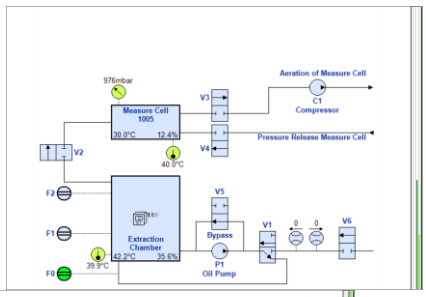


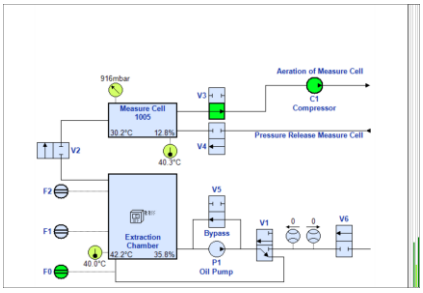


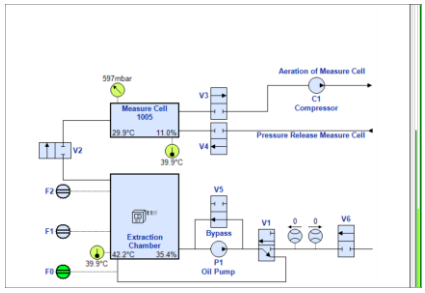
3.11.2.5 Depression

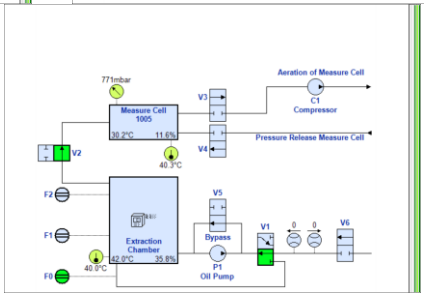




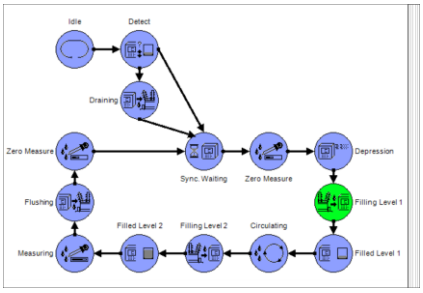


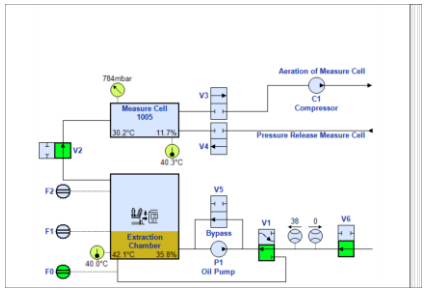


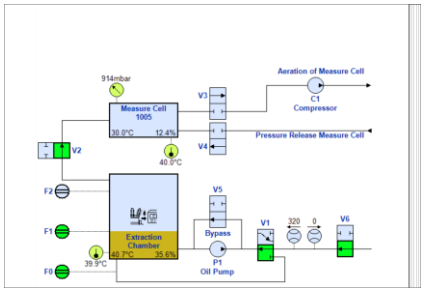




3.11.2.6 Fill Level 1

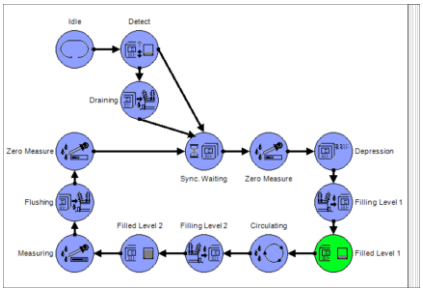




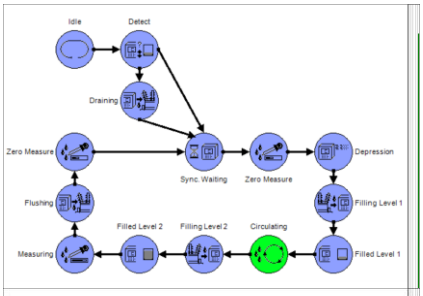


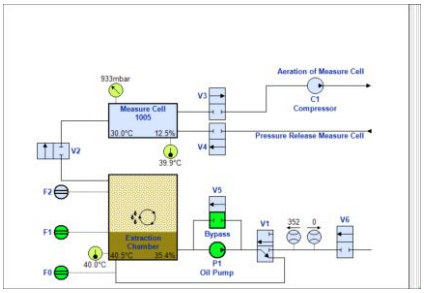
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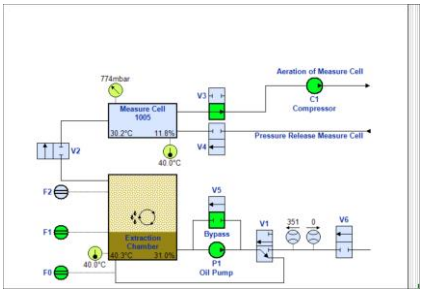
3.11.2.7 Filled Level 1

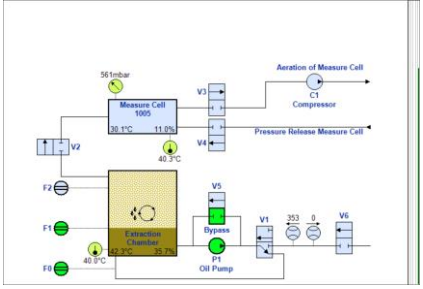


3.11.2.8 Circulate

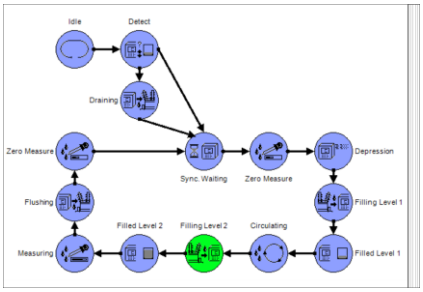


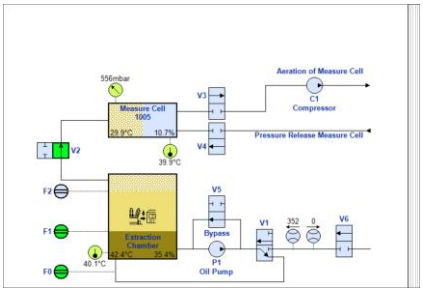


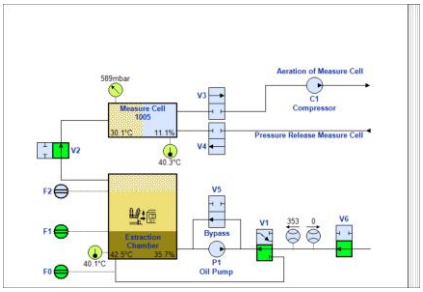




3.11.2.9 Fill Level 2

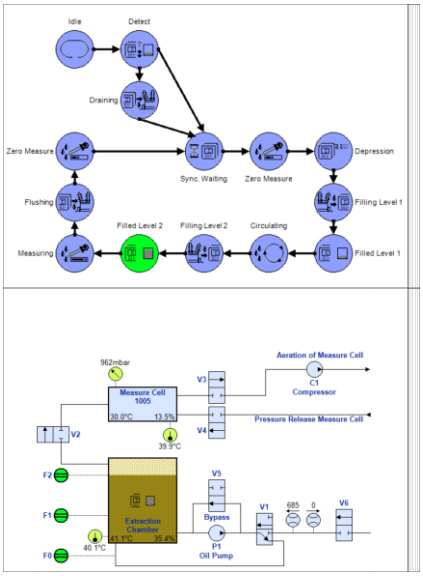


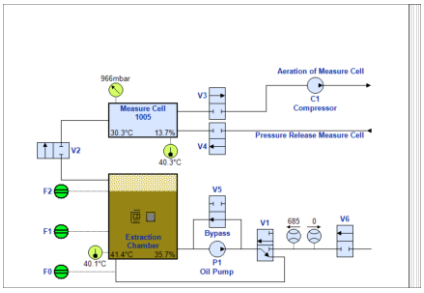


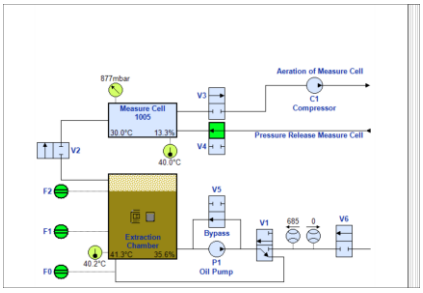


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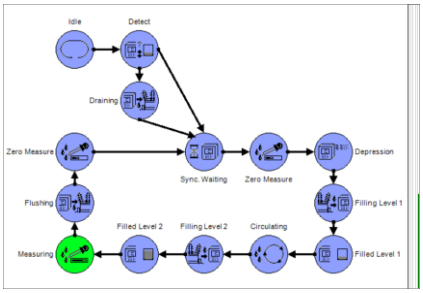
3.11.2.10 Filled Level 2

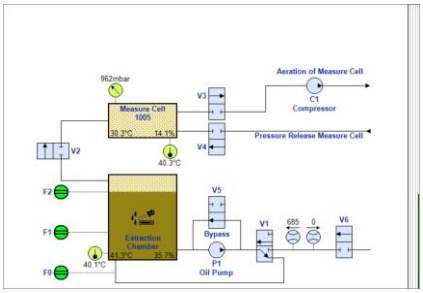






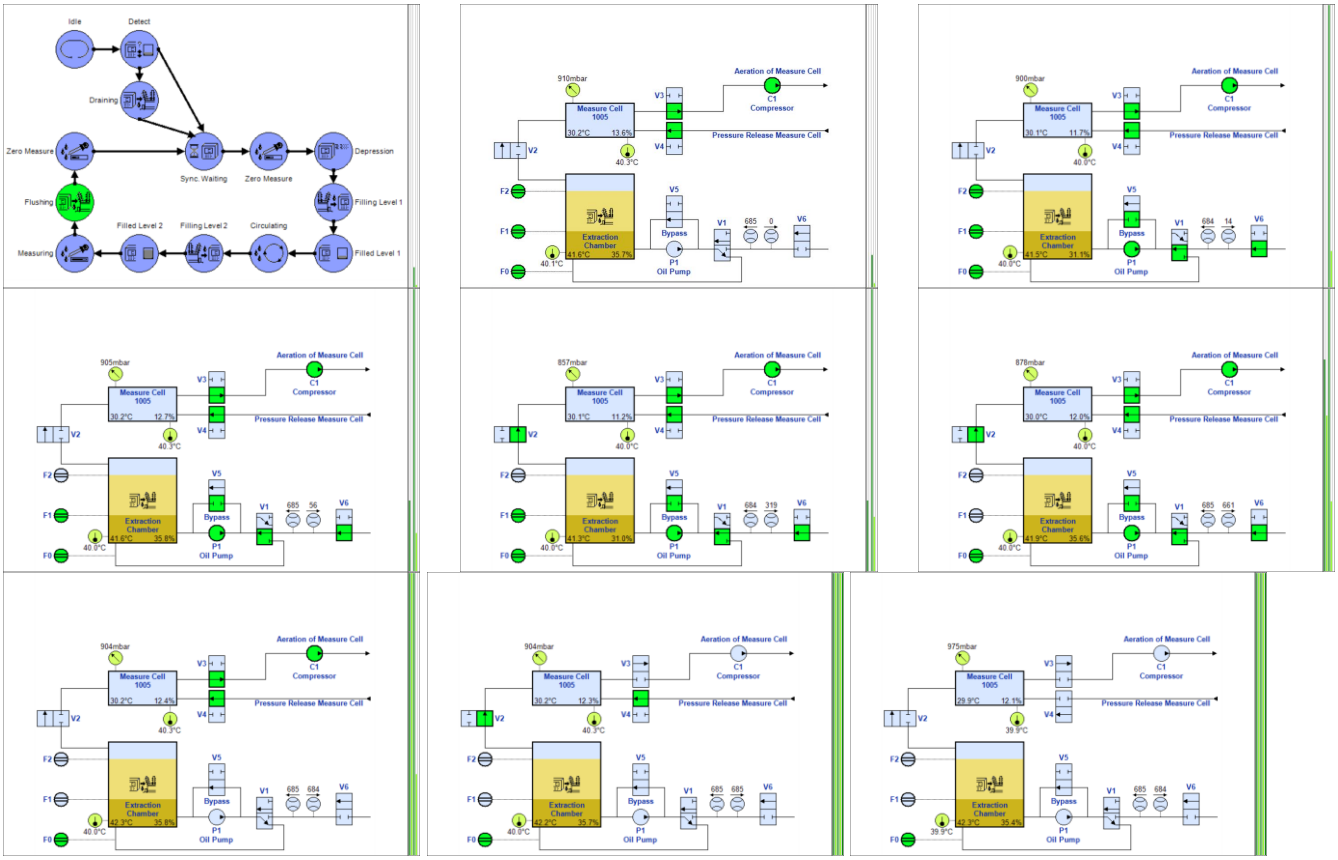
3.11.2.11 Measurement



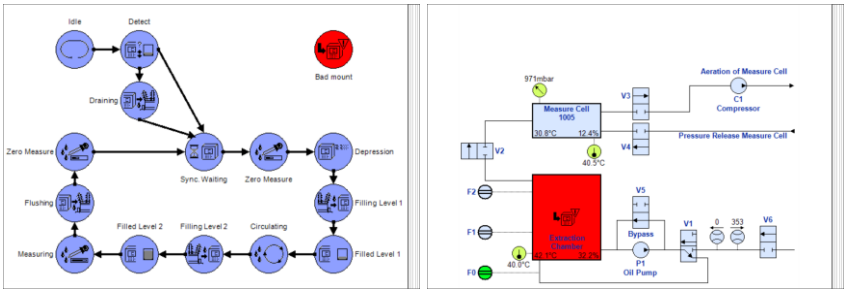


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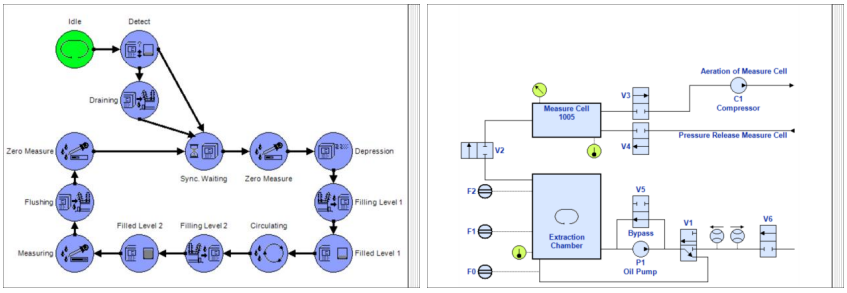
3.11.2.12 Purging



3.11.2.13 Not installed

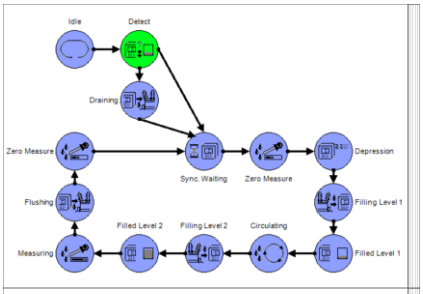


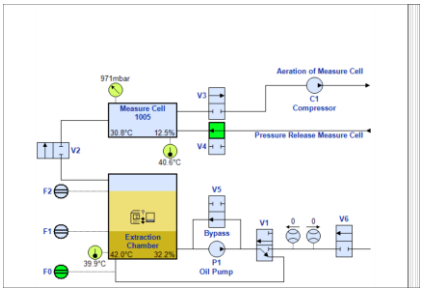
3.11.2.14 Ready

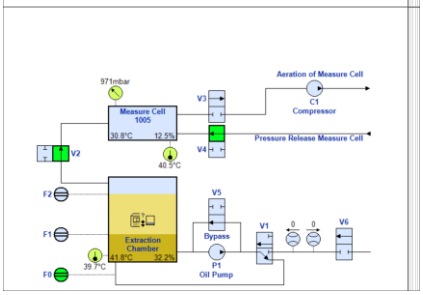


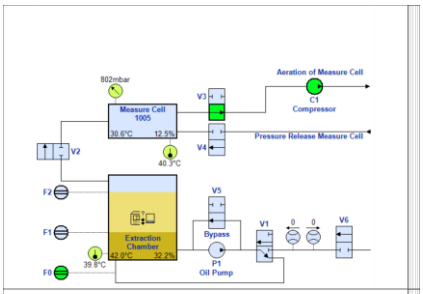
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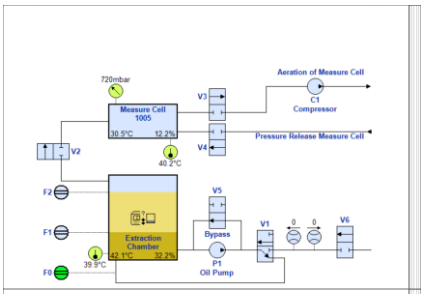
3.11.2.15 Detect – Disassemble

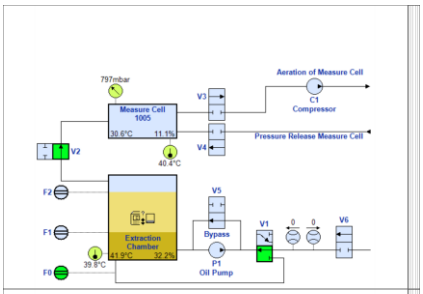


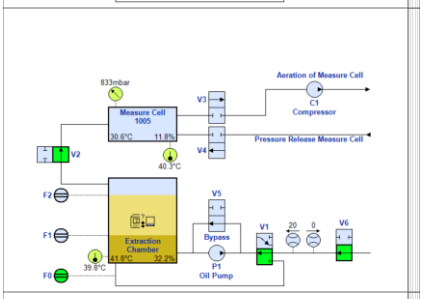


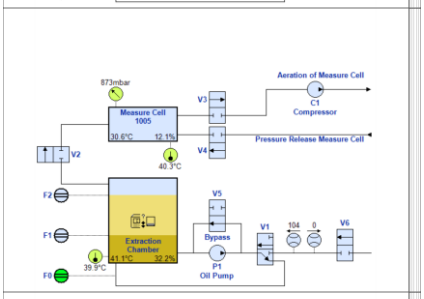


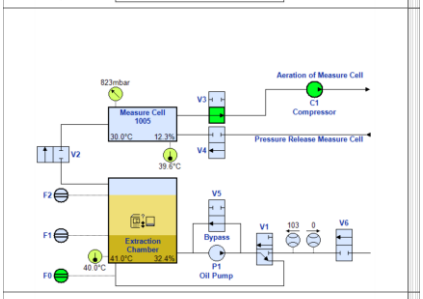


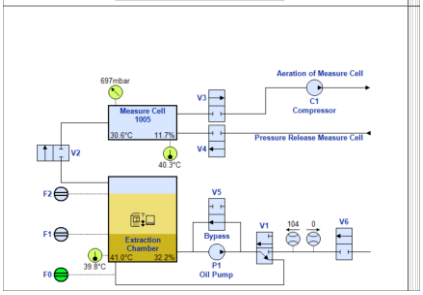


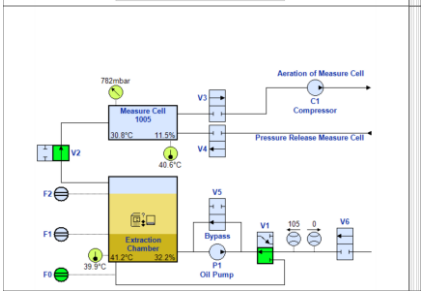


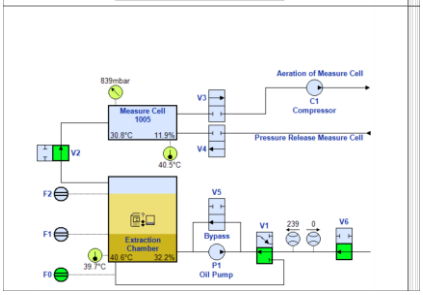




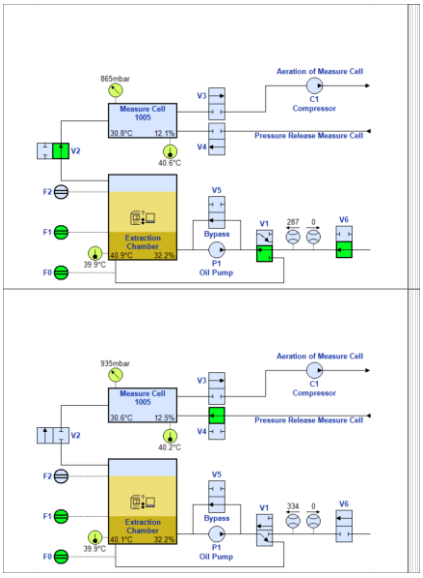


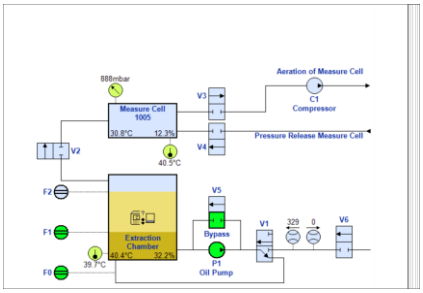




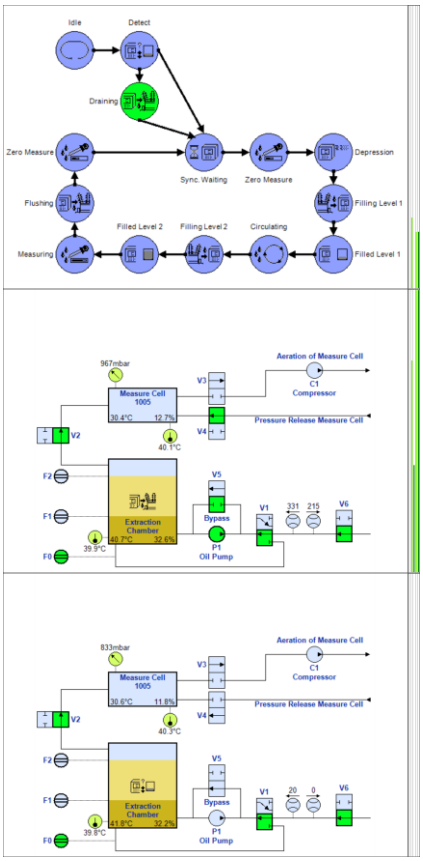


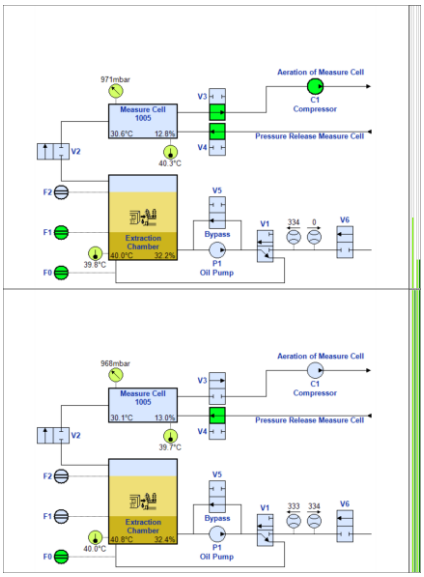
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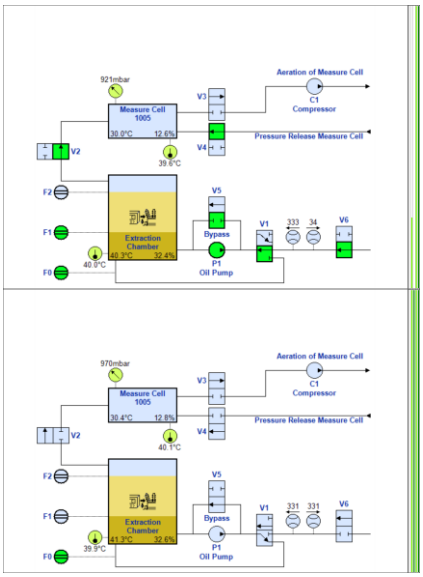




3.11.2.16 Draining







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Product Type	Part Number	Serial Number
Multisense Software		
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