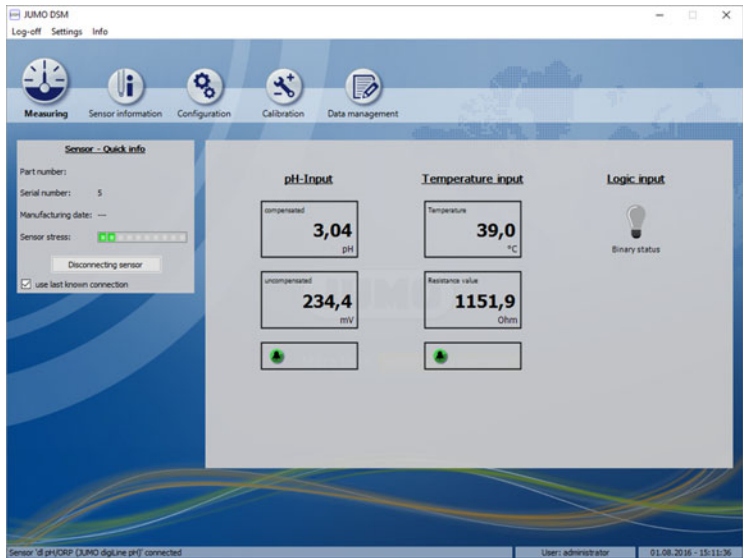# JUMO DSM software

PC software for management, configuration, and maintenance of digital sensors

digiLine

Operating Manual

20359900T90Z001K000

V1.00/EN/00661398

JUMO

1 Introduction

The JUMO DSM software (**D**igital **S**ensor **M**anagement) is PC software for managing, calibrating, testing, and configuring digital sensors from JUMO. A summary of the software functions is presented in the following breakdown.

- **Management:** Saving and archiving of sensor histories, creation of buffer set tables for pH sensors and keeping this information available for calibration with the software under laboratory conditions
- **Calibration:** Sensors can be calibrated with a PC/laptop and the JUMO DSM software. The calibration step can be carried out prior to using the sensor on the system. In this way, downtimes associated with sensor replacement are shortened.
- **Testing:** Measurement data can be displayed in real time with the software. This permits sensor operation to be checked in the laboratory.
- **Configuration:** The configuration of a digital sensor can be checked and changed if necessary. However, changing the configuration with the JUMO DSM software is practical only if the JUMO digiLine electronics is in the 2-wire transmitter mode and the digital sensors are operating in conjunction with a JUMO mTRON T. When digital sensors are used in the digiLine mode, the configuration step is carried out only on the JUMO digiLine master device (JUMO AQUIS touch S/P). Changes in the configuration made with the JUMO DSM software are overwritten by the JUMO digiLine master device.

1 Introduction

2 Installation

A PC satisfying the following requirements is necessary for installation and operation of the JUMO DSM software:

- Operating system: Microsoft®[1]Windows 7®[1] or higher (32-bit or 64- bit version)
- RAM: at least 512 MB
- Free hard disk space: at least 500 MB
- DVD drive (when installing the software from a DVD)
- USB host interface (for connection of digital sensors via the USB RS485 interface included in the accessories for digital sensors; part no.: 00638346)

NOTE!

Close all applications on your PC before starting installation of the JUMO DSM software.

Procedure

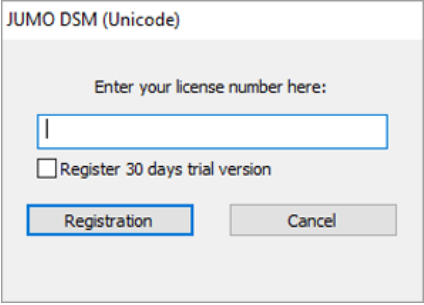| Step	Action
1	With the PC running, insert the CD into the drive and close it.
2	After inserting the CD, the installation program automatically starts. If the program does not start, proceed as follows: Start the "Launch.exe" file in the main directory of the CD.
3	The installation program guides you through the rest of installation accompanied by on-screen messages.
4	Read and confirm the license agreement. Acceptance of the agreement is a basic requirement for installation of the software.
5	Select the program folder to which the links for starting the software art be copied. The directory for the program data is automatically specified.
6	Click the "Install" button and wait until the installation has completed.

All program functions except for "Data management" are available following installation. The "Data management" program function can be activated if necessary.

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[1] Microsoft and Windows are registered trademarks of Microsoft Corporation.

2 Installation

Activating the "Data management" program function

To activate the "Data management" program function, you must enter a license key. This key can be purchased from JUMO. As an alternative, a 30-day test version can be activated without the license key. To activate program functions, proceed as follows:

Step	Action
1	Open the dialog for entry of license numbers. On the menu bar, open: Adjustments > Activation of program functions
2	The dialog for entry of the license number opens. Enter your license number here and click the "Register" button. Alternatively, you can activate all program functions as a 30-day test version (checkbox in the dialog window) without a license key. **JUMO DSM (Unicode)** Enter your license number here: [	] ☐ Register 30 days trial version [Registration] [Cancel]
3	Once the correct license number has been entered, a message confirms activation and requests that you restart the JUMO DSM software. Close the program and open it again.
4	The program function is now available.

An overview of the JUMO DSM software user interface is presented in the following.

(1) (2) (3) (4)
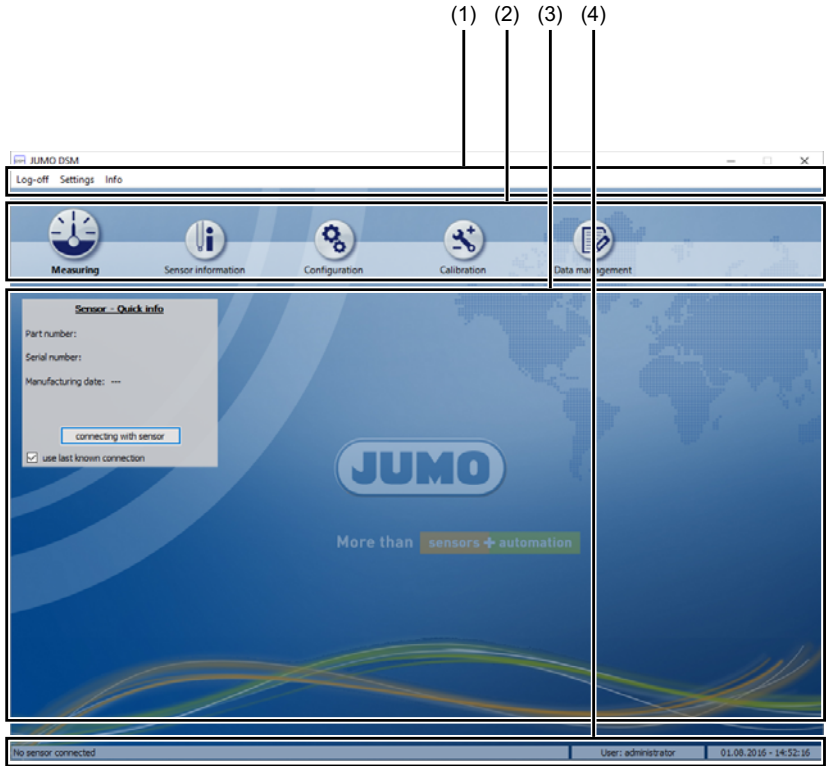
(1) **Menu bar:** Contains general menu commands
(2) **Sensor menus:** The data for the currently connected sensor can be accessed here. The functions available in the individual sensor menus are described in detail in a separate section.
⇨ chapter 6 "Sensor menus", page 21
(3) **Working range:** The data for the open sensor menu are displayed here. If necessary, configuration data can be edited here. However, changing the configuration data is practical only if you are configuring JUMO digiLine electronics for the 2-wire transmitter mode or digital sensors for operation in conjunction with a JUMO mTRON T. When operated in conjunction with JUMO digiLine master devices (JUMO AQUIS touch S/P), the configuration in digital sensors is overwritten by the master device.
(4) **Status bar:** Displays the current date and time, the user name of the logged-in user as well as Sensor connection status

Working range buttons

Various buttons for context-based functions are displayed in the lower area of the working range of sensor menus (see chapter 6 "Sensor menus", page 21). The functions of the buttons in the lower area of the working range are explained in the following table.

3 User interface

Button	Function	
Connect sensor	"Connect sensor" establishes a connection to a digital sensor connected to a PC (see chapter 5 "Connecting a sensor", page 17)	
Disconnecting the sensor	"Disconnect sensor" terminates the existing connection to the currently connected digital sensor. In order to prevent loss of the configuration changes, the "Write data" button must be pressed first.	
Print	"Print" prints out a complete report containing the configuration and sensor information.	
Export	"Export" saves the configuration data and sensor information as either an XML or CSV file.	
Import	"Import" imports the configuration data from an XML export file in the JUMO DSM software. A dialog that shows data in the XML file that differs from the existing data appears prior to incorporation of the imported data in the JUMO DSM software. The imported data can be accepted or rejected in this dialog.	
Autoclaving performed	"Autoclaving performed" increments the "Autoclaving counter" for a connected JUMO digiLine pH by 1. Autoclaving cycles are not detected automatically by the JUMO digiLine electronics and must be recorded by the user with the aid of this function.	
Change electrode	"Replace electrode" sets recorded monitoring and calibration data of the sensors back to the as-delivered state in the electronics and increments the "Sensor replacement counter" by 1. This function must be actuated by the user when a worn or defective electrode is changed on the JUMO digiLine electronics.	
Read data	"Read data" reads the data from the digital sensor connected to the PC.	

Button	Function	
Write data	"Write data" writes the current configuration data from the JUMO DSM software to the digital sensor connected to the PC.	

3 User interface

4.1   User log-on

The operating options for the JUMO DSM software depend on the user rights of the currently logged-in user. The user name of the currently logged-in user appears in the status bar of the program window (see chapter 3 "User interface", page 9).

To log in using one of the 6 available user accounts (see chapter 4.2 "User administration", page 14), click the "Log in" command in the command line of the program window. This opens a login dialog that asks you to enter the relevant login data. As long as no password has been configured for the user account in user management, only the user name is requested in the login dialog. Enter the login data for the desired user account here and then click on the "Log in" button. If you have entered the correct login data, the user name for the corresponding user account appears in the status bar of the program window. If you wish to log out, click on "Log out" in the menu bar of the program window.

When the program is started, a standard user login occurs automatically as the "operator" user account as long as the user account "user 1" has not yet been configured. If the user account "user 1" has been set up, the standard user login occurs with the account "user 1" on program start. You should thus ensure a suitably restrictive configuration of user rights in the accounts "operator" and "user 1".

4 User rights

4.2 User administration

User management offers 6 user accounts. The user rights are preconfigured in accordance with the following table at the factory.

User name in the JUMO DSM software	User accounts					
	administrator	operator[a]	laboratory	accounts	user 1[b]	user 2
Operation — Log in user[c]	✓	✓	✓	✓	✗	✗
Change program settings	✓	✓	✓	✓	✗	✗
Manage users	✓	✗	✗	✓	✗	✗
Print	✓	✓	✓	✗	✗	✗
Export data	✓	✓	✓	✗	✗	✗
Import data	✓	✗	✓	✗	✗	✗
Manage buffer solutions	✓	✗	✓	✗	✗	✗
Advertisement — Measured values	✓	✓	✓	✗	✗	✗
Sensor information	✓	✓	✓	✗	✗	✗
Calibration data	✓	✓	✓	✗	✗	✗
Sensor access — Sensor calibration	✓	✗	✓	✗	✗	✗
Sensor configuration	✓	✗	✓	✗	✗	✗
Sensor management	✓	✗	✗	✗	✗	✗
CIP/SIP configuration	✓	✗	✗	✗	✗	✗

a   The "operator" account logs in automatically on program start if the "user 1" account has not yet been configured.

b   If the "user 1" account has been configured, this account logs in automatically on program start.

c   The user rights for "User login" cannot be configured in user management. It is assigned automatically. Only configured user accounts are authorized to log in. The accounts "user 1/2" are not authorized to log in unless they have been configured by the user.

The user accounts can be edited in user management. The user rights for the user account "user 1/2" can be changed there. The user rights for "User login" cannot be changed here. These are assigned automatically as soon as an account is configured with a password by the user. The rights of the other accounts are fixed and cannot be changed. The passwords and user names associated with all accounts can be changed. To change the password for a user account, you must enter the current password for this account in the "Old password" field and enter the new password in the "New password" field. You must also enter the new password in the "Confirm password" field. The password change is accepted only if the entries in the "New password" and "Confirm password" fields match. Clicking the "Save" button confirms the changes, which then apply the next time the program starts.

In order to edit user rights, you must be logged in with a user name that is activated for the "Manage users" user right. The users "administrator" and "accounts" have this setting from the factory.

Open user management: Settings > User management

4 User rights

To access the data for a digital sensor with the JUMO DSM software, the sensor must be connected to the PC, the JUMO DSM software started and data communication between the software and digital sensor established.

Connecting a digital sensor from JUMO to a PC/laptop

To connect digital sensors to the PC, you need the USB-RS485 converter (part no.: 00638346). Insert the converter into a free USB port on your PC and connect the digital sensor to the converter via the M12 cable socket. When you use the USB-RS485 converter on your computer for the first time, the drivers for the converter are installed automatically by your computer's operating system. Data communication with a digital sensor cannot take place until the driver has been installed successfully. For the 8-pole version of the JUMO digiLine electronics, you also need the JUMO M12 adapter cable (part no.: 00638325).
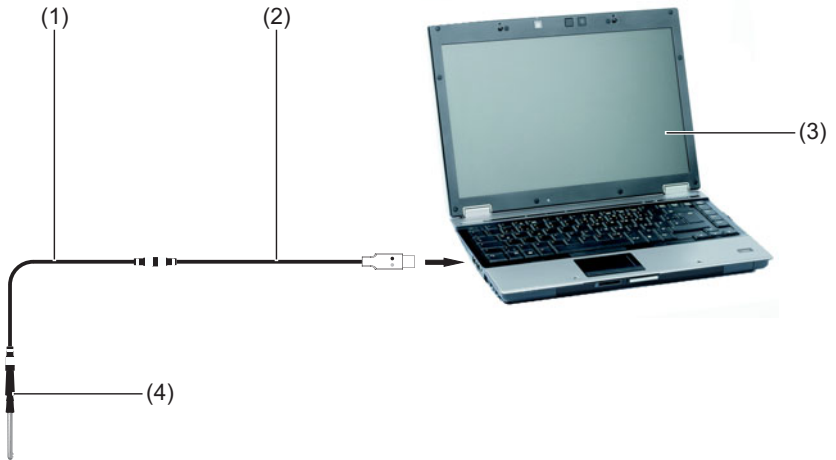
Digital sensor, 5-pole
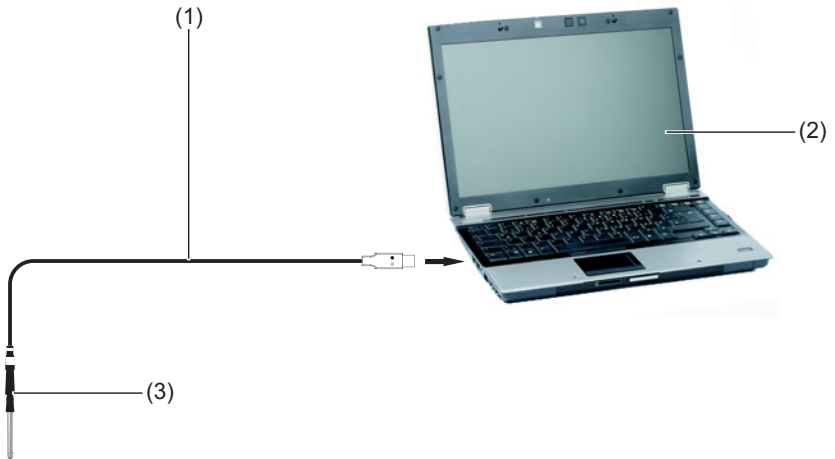
(1)   Digital sensor with 5-pole M12 plug connector
(2)   PC/laptop with JUMO DSM software
(3)   USB-RS485 converter

5 Connecting a sensor

**Digital sensor, 8-pole**

(1) JUMO M12 adapter cable, 8-pole to 5-pole (see Accessories)
(2) USB-RS485 converter
(3) PC/laptop with JUMO DSM software
(4) Sensor with 8-pole JUMO digiLine electronics

Activating data communication with a digital sensor

After a digital sensor has been connected to the PC/laptop, you can activate data communication between the JUMO DSM software and the digital sensor, and access to its information and configuration data. To do this, start the software and click the "Connect to sensor" button in the software. The software searches for the interface settings of the connected digital sensor and establishes data communication.
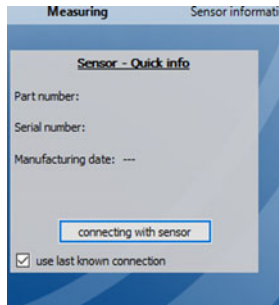
If the option "Use known connection" is activated, the JUMO DSM software uses the interface settings for the last connection when establishing the connection. The software then skips the search step, shortening the time needed to establish the connection. If the software does not find the last session for the digital sensor because it was terminated or a different digital sensor was connected, the software proceeds with the search.

If several digital sensors, each with its own USB-RS485 converter, are connected to the computer, the software displays a "sensor list" at the end of the search. In this case, select your sensor from the list and click "OK".

Sensor list
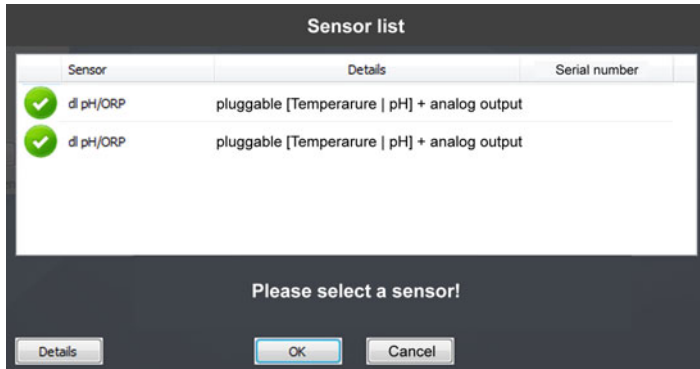
Once you have selected one of the digital sensors connected, the software loads the associated data and displays it in the sensor menu.
⇨ chapter 6 "Sensor menus", page 21

5 Connecting a sensor

6.1 Navigating through the sensor menus

After you have opened the JUMO DSM software and connected a sensor, you can open the individual sensor menus in the software by clicking on them to display the sensor data and make settings.

The following sensor menus are available:

- **Measurement:** You can view the sensor's measurement data and, possibly, the signal at the binary input in real time here.
- **Sensor information:** Information on the type, properties, and operation of the connected sensor is displayed here.
- **Configuration:** The configuration of the connected digital sensor is displayed here. Changes to the sensor configuration take effect only if the sensor is operated as a 2-wire transmitter or it is connect to a JUMO mTRON T.
- **Calibration:** Calibration using the JUMO DSM software is carried out in this sensor menu.
- **Data management:** All operating data and the history (e. g. number of sensor replacements on the JUMO digiLine electronics or buffer sets for pH calibration) of JUMO sensors with digiLine electronics are managed and archived here.
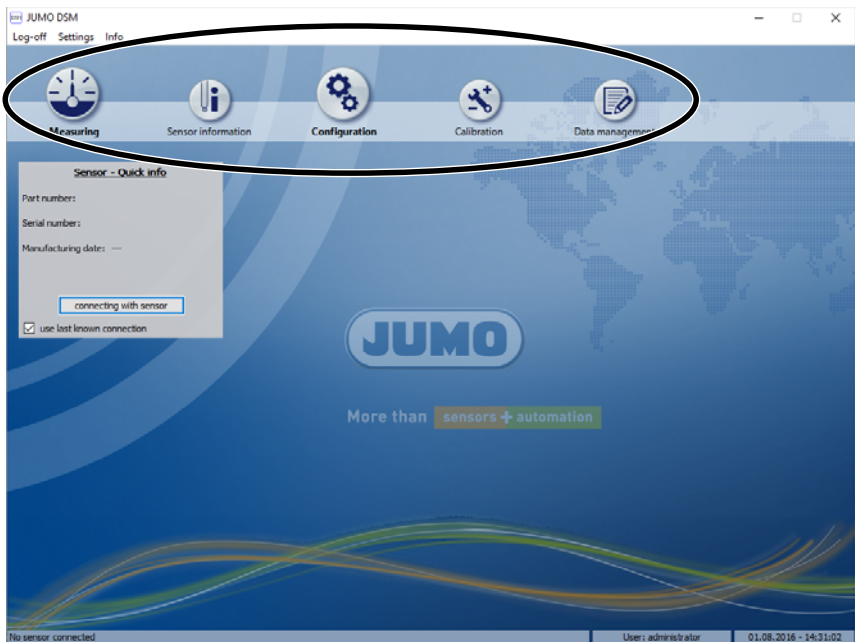

6.2 Trade Fairs

The corresponding measurement data and, possibly, the signal at the binary input are displayed in real time, depending on the type of digital sensor connected. In addition, the current sensor stress level is displayed for a pH sensor with JUMO digiLine electronics.

6 Sensor menus

Example: Display of the real-time measurement of a pH sensor with 8-pole digiLine electronics
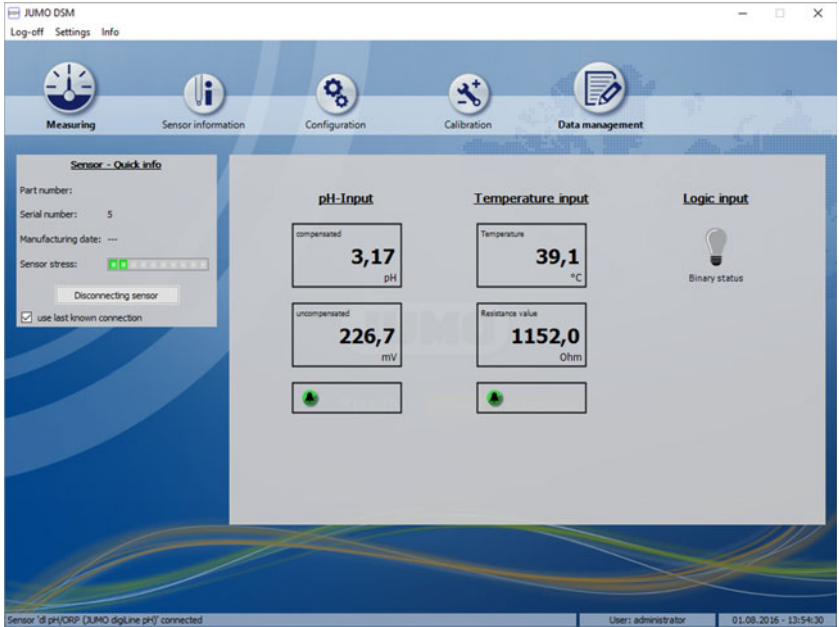
6.3   Sensor information

Information on the type, properties, and operation of the connected sensor is displayed under "Sensor information".

Data for various categories is contained on different tabs:
- **Sensor details:** Manufacturer data, type information and information on the measuring point to which the sensor was assigned by the user
- **Operating data:** Real-time measurement data, "sensor monitoring" counter, sensor stress level
- **Operating conditions:** Operating hours and sensor replacement counter as well as drag indicator for operating temperature and extreme conditions (logging of exceeding/dropping below allowable limits for process values)
- **Versions:** Hardware and software version information for the digital sensor
- **Calibration data:** Calibration values and calibration alarm information

# 6 Sensor menus

6.4   Configuration

The settings for the connected digital sensor are displayed in the configuration. When sensors with JUMO digiLine electronics are operated as 2-wire transmitters or when digital sensors are operated in conjunction with a JUMO mTRON T, configuration must be performed with the JUMO DSM software. In the digiLine mode, configuration is performed on the JUMO digiLine master device or with its PC setup program. Configuration changes in the JUMO DSM software are overwritten by JUMO digiLine master devices.

All settings are sorted on the various tabs by categories on the basis of the sensor type. The following figure shows an example of the configuration of a pH sensor with JUMO digiLine electronics in the JUMO DSM software.
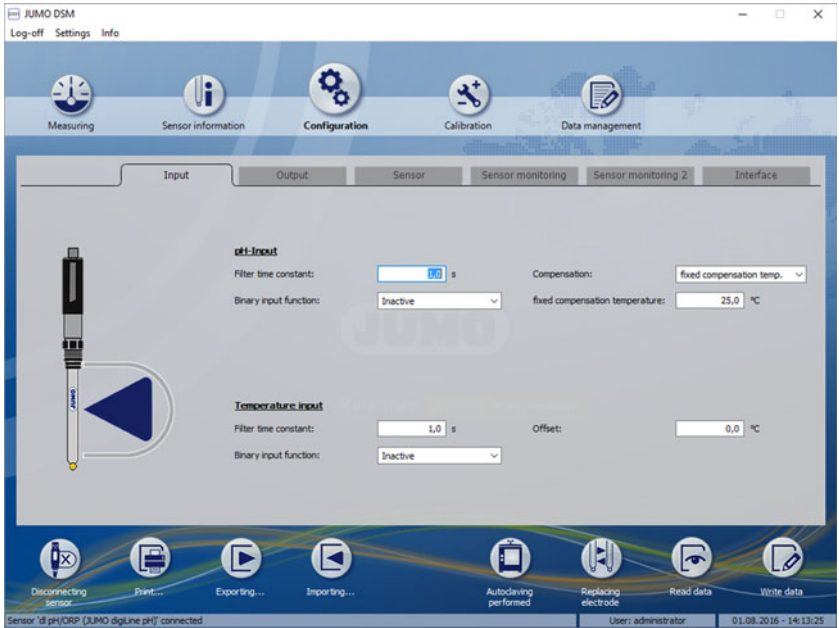
6.5   Calibration

The connected digital sensors can be calibrated in the "Calibration" sensor menu. This gives you the ability to calibrate sensors in the laboratory and prepare them for use in the field. It is then not necessary to calibrate the sensor during installation, thus reducing maintenance and downtime. The calibration procedures for different types of digital sensors differ. The calibration methods needed for the various digital sensors are described in more detail in their documentation. To calibrate a sensor with the JUMO DSM software, you enter the calibration settings in the "Calibration" sensor menu. The parameters of the calibration settings shown differ for the various sensor types. The figure below shows an example of the calibration menu for a pH sensor with JUMO digiLine electronics.
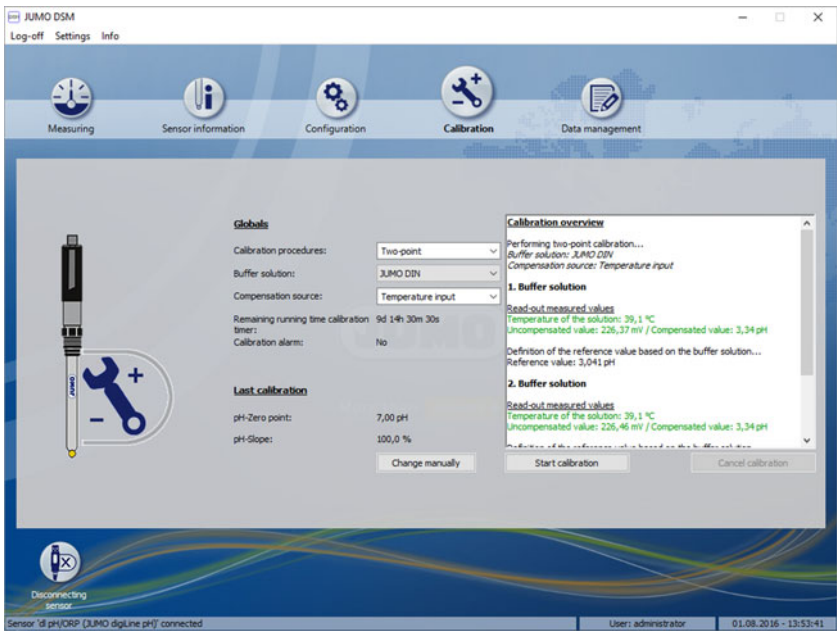
Procedure for calibrating a sensor with the JUMO DSM software

1. Familiarize yourself with the calibration methods for the sensor to be calibrated. Refer to the documentation for the particular digital sensor involved.

2. Prepare the required test/buffer solutions needed for the calibration.

3. Enter the calibration settings in accordance with the calibration method you selected.

4. To start the calibration, press the "Start calibration" button and then follow the instructions displayed by the JUMO DSM software in the message windows.

At the end of the calibration procedure, a summary of the calibration can be viewed in the text field next to the calibration settings. Here, you can see whether the calibration was successful or whether an error occurred and the calibration was terminated or calibration values could not be accepted.

Pressing the "Cancel calibration" button stops an ongoing calibration procedure without accepting the calibration values.

Manual entry of known calibration values

If calibration values are known, you can use the keyboard to enter them. To enter known calibration values, open the "Manual entry" dialog by pressing the "Change manually" button.

6 Sensor menus

6.6 Data management

The data management function is used to manage buffer set tables and the sensor data for your entire inventory of digital sensors.

The configuration tabs:

- **Buffer solutions:** The pH value tables of buffer sets needed for calibration of pH sensors are listed here. Several common standard buffer sets are placed in the table at the factory. Pressing the "New" button allows you to create user-defined buffer sets. These can also be deleted again by pressing the "Remove" button. Standard buffer sets cannot be deleted.

- **Sensors:** Sensor information, the calibration logbook and an archive with configuration changes can be viewed here.

6.6.1 Creating buffer sets

⚠ **CAUTION!**

The pH values of buffer solutions in a buffer set must be at least 2 pH apart.

▶ When creating user-defined buffer sets, be sure to maintain a pH value difference of at least 2 pH between the buffer solutions.

Press the "New" button in the "Buffer solutions" tab. The dialog shown below opens. Enter a name for the buffer set. If desired, you can enter additional information in the "Comment" field. You define the buffer set table with the framed fields. The number of temperature values resulting from the "Start value", "End value", and "Interval" determines the number of lines. The "Number of buffer solutions" determines the number of columns. Für jeden Temperaturwert wird eine Zeile und für jede Pufferlösung eine Spalte angelegt.

New buffer set

Please specify the new buffer set!

Name:

Notice:

Start value: 0,0 °C

End value: 100,0 °C

Interval: 10,0 °C

Number of buffer solutions: 1

OK   Cancel

6 Sensor menus

If you confirm the entries by pressing "OK", the dialog closes again and the newly created user-defined buffer set appears in the buffer set selection on the left side of the "Buffer solutions" tab. Select the new buffer set and fill out the buffer set table on the right side. You do this by simply clicking on a table line and then entering the correct value. You can also use the Tab key to select the next line or "Shift + Tab" to select the previous line. The data in the temperature column or the buffer set selection list can be edited in the same way. Standard buffer sets cannot be edited.
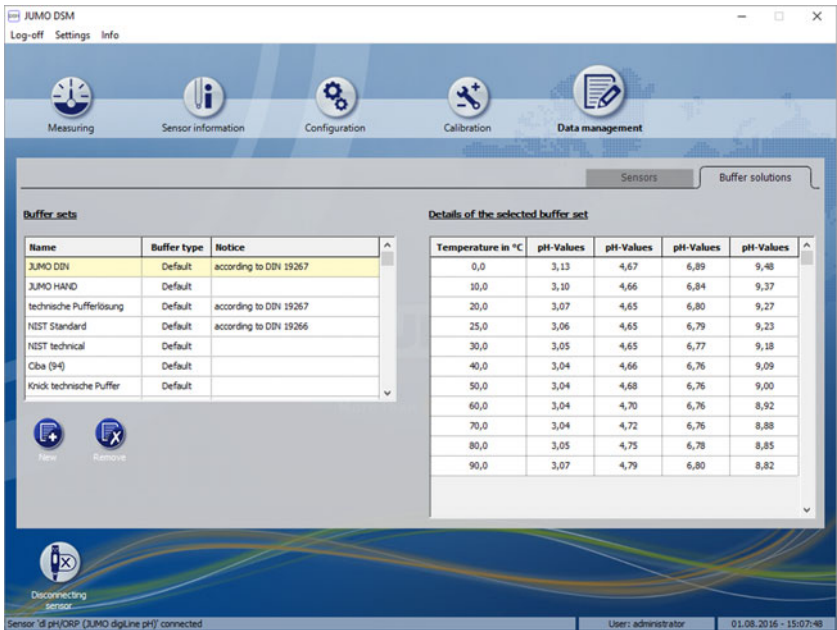
6.6.2   Managing sensors

The calibration logbook as well as a summary of the current sensor information, together with a history of all recorded configuration changes, can be opened on the "Sensors" tab.

Configuration

Pressing the "Configuration" button on this tab opens a report containing the history of all configuration changes that the JUMO DSM software was able to gather for the digital sensor selected in the sensor list. Configuration changes are recorded either if the settings were changed using the JUMO DSM software or if, when establishing the connection, different settings were found on comparison with the last-recorded configuration. The configuration of a digital sensor could, for example, have been changed on a JUMO AQUIS touch S/P. The software detects this and records the configuration change.

Every new entry is saved with the current date and current time at the moment of recording. Different settings in this entry are displayed in red.

6.6.3   Calibration logbook

The calibration logbook is saved in the digiLine electronics of the sensor. The last 10 successful calibrations are saved in the calibration logbook. After a connection to the digital sensor has been established successfully by the JUMO DSM software, the calibration logbook entries in the digital sensor connected to the PC are read by the JUMO DSM software and saved on the PC. There is no limit to the number of calibration logbook entries that can be saved on the PC. Canceled or failed calibrations (calibrations outside the admissible limits) are not saved in the logbook. Manual changes of calibration values are also documented. The following data are retained in the logbook:

•   Date and time

•   Calibration values determined or entered

•   Reference values used and temperatures of the buffer and test solutions

•   Calibration mode (true calibration/manual entry of calibration values)

•   Calibration assessment (assessment of the calibration values determined during the true calibration)

•   Sensor replacement counter reading (to assign the calibration logbook entries to the individual sensors in the sensor replacement history of the JUMO digiLine electronics)

The calibration logbook can be viewed on the JUMO AQUIS touch S/P or on the PC using the JUMO DSM software.

Pressing the "Calibration logbook" button displays the calibration logbook of the digital sensor selected in the sensor list.
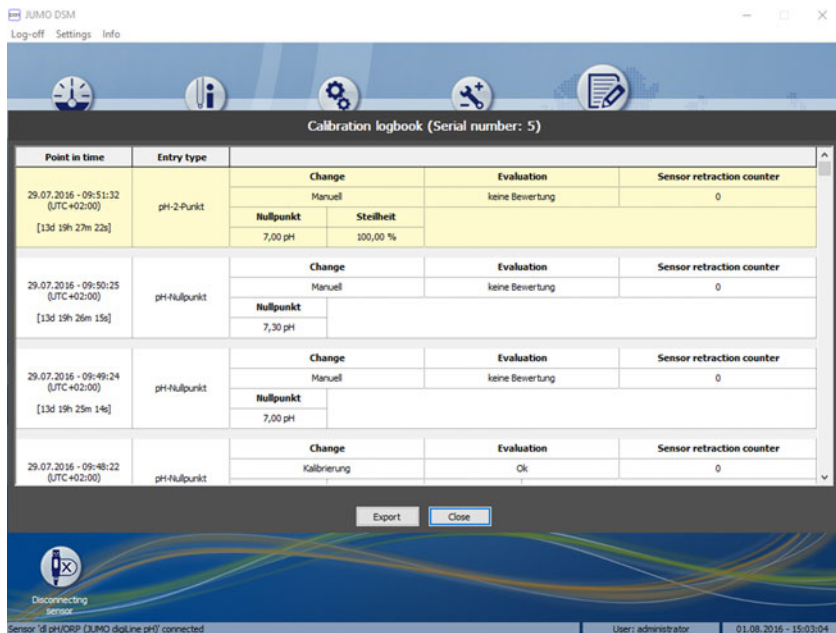
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