CSMcalibrate

Quickstart Guide

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Product disposal/recycling

If this symbol (crossed-out wheeled bin) appears on the device, this means that the European Directive 2012/19/EU applies to this device.

The correct disposal of old equipment will protect the environment and people from possible negative consequences.

Become familiar with local regulations for separate collection of electrical and electronic equipment.

Follow local regulations and do not dispose of old equipment with household waste.

Contact information

CSM offers support for its products over the entire product life cycle. Updates for the individual components (e.g. documentation, configuration software and firmware) are made available on the CSM website. To keep up to date, it is therefore recommended that you check the download area of the CSM website for updates at least once a month.

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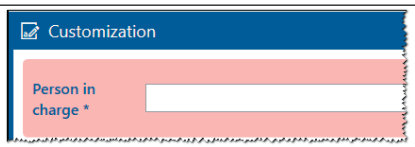
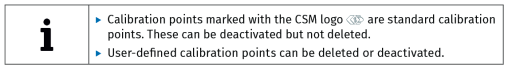
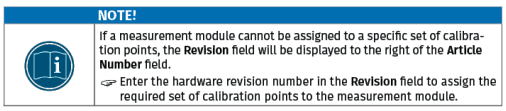
1 Introduction

1.1 About this quickstart guide

This quickstart guide contains important information for using the product. Please read the entire document carefully before installation and initial operation.

1.2 Symbols and writing conventions

Symbol/note	Meaning	Example of application
☞	User instruction	☞ Enter the **Test equipment number** for the new test equipment.
⇨	Result of an action	⇨ The **New department** dialog opens.
→	Cross reference to external information source(s)	→ Chapter 2.4 "Account"
	Terms in bold blue that appear in the text indicate an integrated cross-reference.	▸ In the **Environment** menu, the **Monitoring** option must be enabled.
*	A field marked with an asterisk * is a mandatory field that needs to be completed.	
i	This pictogram refers to important notes or additional information on a specific topic.	
	A directive contains important information about the product described in the guide. Failure to observe a directive may result in malfunction and/or damage to property and material.	

Tab. 1-1: Symbols and writing conventions

1.3 Legal disclaimer

This guide and other documents are part of the product and contain important information for its safe and efficient use. To maintain the high quality level the product is continuously being developed, which may result in the product's technical details changing at short notice. As a result, the contents of this documentation may differ from the technical specifications of the product. No claims against the manufacturer can therefore be derived from the contents of the product documentation.

The Computer-Systeme-Messtechnik GmbH (hereafter referred to as "CSM") is not liable for technical or editorial errors or missing information.

CSM assumes no liability for damage resulting from improper use of the product and/or non-observance of the product documentation, in particular the safety instructions.

2 Calibrating CSM Measurement Modules

CSMcalibrate is a calibration software for the automated handling of calibration processes for CSM measurement modules. The software also provides the option of documenting calibration processes and organizing calibration and device data.

This quick start guide refers to CSMcalibrate, version 2.1.0.

2.1 Which measurement modules can be calibrated?

Low-voltage measurement modules	High-voltage measurement modules
▸ AD CAN MM Series[1]	▸ HV AD CAN MM Series ▸ HV AD CAN TBM Series
▸ AD ECAT MM Series[1]	▸ HV AD ECAT MM Series ▸ HV AD XCP MM Series
▸ CNT CAN MM Series[1]	
▸ PT CAN MM Series[1]	▸ HV PT2 MM ▸ HV PT8 TBM
▸ STG6 CAN MM Series	
▸ STG6 ECAT MM Series	▸ HV STG4 ECAT MM Series
▸ TH CAN MM Series (Type K, Type T and Type J)[1]	▸ HV TH CAN MM Series ▸ HV TH CAN TBM Series

Tab. 2-1: CSM measurement modules which can be calibrated

2.2 Which calibrators are supported?

- Burster Digistant 4462
- Burster Digistant 4463
- Burster RTD Simulator 4530
- Fluke 5500A
- Fluke 5502E
- Fluke 5522A
- Fluke 5540A
- HBM K148
- Tektronix AFG 3021 C

1 With the appropriate firmware, these measurement modules are also available as CANopen versions. A special license is required to calibrate these measurement modules. See chapter 3.6.1 "License".

2.3 Components for setting up a calibration station

A calibration station for the calibration of the measurement modules listed in Tab. 2-1 consists of the following components:

- a PC on which CSMcalibrate (plus license dongle) and the drivers for the interface in use are installed
- a power supply unit for providing the CSM measurement module to be calibrated (DUT) with power
- a calibrator (→ chapter 2.2)
- a Calib Adapter[2] (AD CAN/ECAT, HV AD CAN/ECAT, CNT CAN, PT CAN and HV PT CAN) or a cable whip (TH CAN, HV AD XW CAN, STG CAN/ECAT and HV STG ECAT)
- a USB-C cable for connecting the Calib adapter to the PC (AD, CNT and PT modules)
- a serial data cable for connecting the calibrator to the PC
- a CAN interface or an XCP-Gateway plus ECAT connecting cable to connect the DUT to the PC and the power supply
- a CAN or ECAT interface cable (e.g. K176 (CAN) or K420 (ECAT))
- a CAN termination resistor (if required)

2 A Calib Adapter is a module for distributing the test signals from the calibrator to the measurement inputs of the DUT. The Calib Adapter is available in two versions: "Calib Adapter AD/CNT" and "Calib Adapter PT".

2.4 Calibration setups for CSM CAN and ECAT measurement modules

i	The calibration setups described in the following chapters are example setups. Components such as the CAN interface cable K176 with integrated termination resistor or the CAN interface VN 1610 are used as examples. There are alternative CSM interface cables and CAN interfaces that can be used instead for the calibration setups.

2.4.1 Calibration setup for AD CAN measurement modules

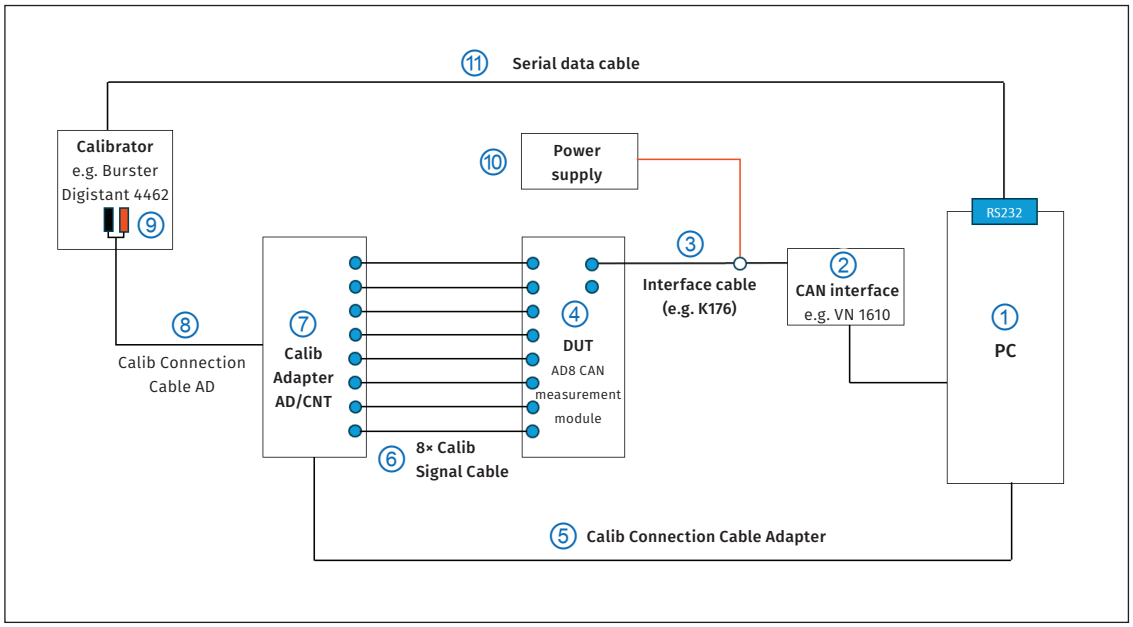


Fig. 2-1: Example setup for the calibration of CSM AD CAN measurement modules

- Connect the interface cable K176 ③ with the DUT ④.
- Connect the opposite end of the interface cable K176 ③ to the CAN interface ②.
- Connect the CAN Interface ② to the PC ①.
- Connect the signal cables (Calib Signal Cable) ⑥ for the transmission of the calibration signals.
  - Insert the signal cables ⑥ into the measurement inputs of the DUT ④.
  - Then connect the opposite ends of the signal cables ⑥ to the corresponding signal outputs of the Calib Adapter AD/CNT ⑦.
- Connect the Calib Adapter AD/CNT ⑦ to the PC ① using the Calib Connection Cable Adapter ⑤.
- Connect the signal input of the Calib Adapter AD/CNT ⑦ to the calibrator ⑨ using the Calib Connection Cable AD ⑧.
- Connect the calibrator ⑨ to the PC ① using a serial data cable ⑪.
- Connect the banana plugs of the interface cable K176 ③ to the power supply ⑩.

2.4.2 Calibration setup for AD ECAT measurement modules

The calibration setup for AD ECAT measurement modules is very similar to the setup for the calibration of AD CAN measurement modules. The layout for AD ECAT measurement modules differs in the following details:

- The CAN interface is replaced by an XCP-Gateway ③.
- The interface cable K176 is replaced by the following cables:
  - a K400 connection cable ④ for connecting the DUT ⑤ to the XCP-Gateway ③
  - a K420 interface cable ② for connecting the XCP-Gateway ③ to the PC ① and the power supply ⑫

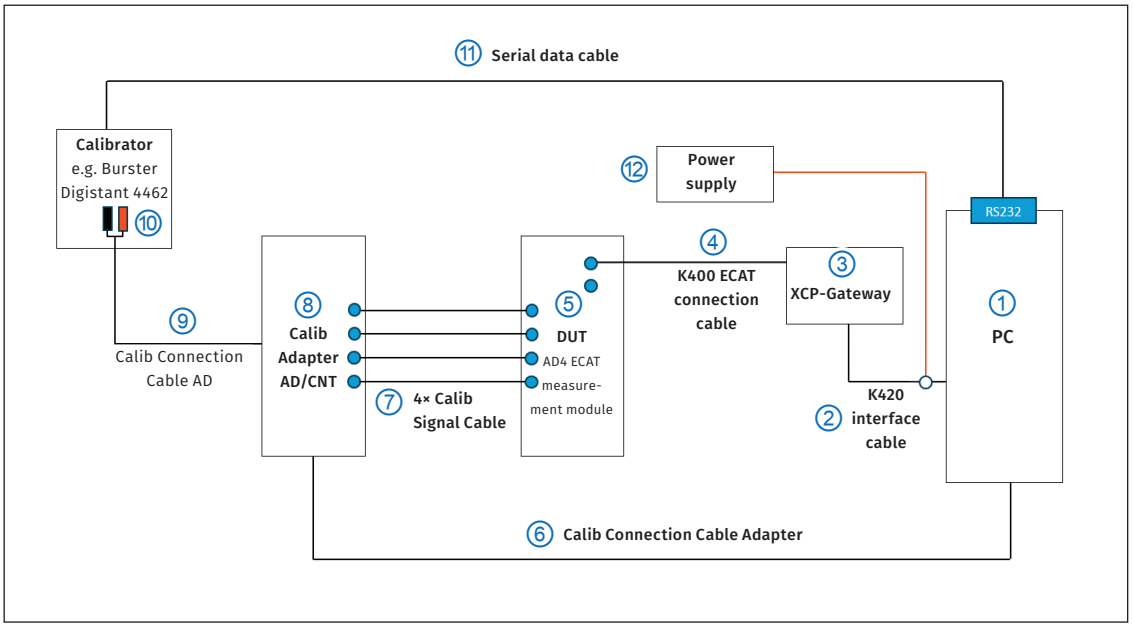


Fig. 2-2: Example setup for the calibration of CSM AD ECAT measurement modules

- Connect the interface cable K400 ④ with the DUT ⑤.
- Connect the opposite end of the K400 connection cable ④ to the XCP-Gateway ③.
- Connect the XCP-Gateway ③ to the PC ① using the K420 interface cable ②.
- Connect the signal cables (Calib Signal Cable) ⑦ for the transmission of the calibration signals.
  - Insert the signal cables ⑦ into the measurement inputs of the DUT ⑤.
  - Then connect the opposite ends of the signal cables ⑦ to the corresponding signal outputs of the Calib Adapter AD/CNT ⑧.
- Connect the Calib Adapter AD/CNT ⑧ to the PC ① using the Calib Connection Cable Adapter ⑥.
- Connect the signal input of the Calib Adapter AD/CNT ⑧ to the calibrator ⑩ using the Calib Connection Cable AD ⑨.
- Connect the calibrator ⑩ to the PC ① using a serial data cable ⑪.
- Connect the banana plugs of the interface cable K420 ③ to the power supply ⑫.

2.4.3 Calibration station setup for CNT CAN measurement modules

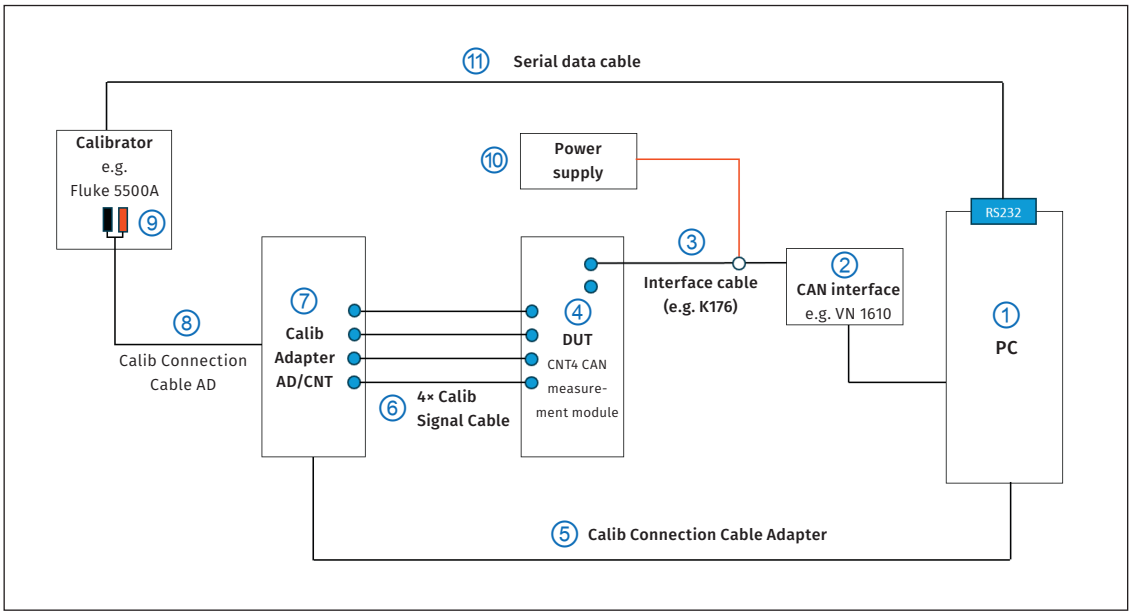


Fig. 2-3: Example setup for the calibration of CSM CNT CAN measurement modules

- Connect the interface cable K176 ③ with the DUT ④.
- Connect the opposite end of the interface cable K176 ③ to the CAN interface ②.
- Connect the CAN Interface ② to the PC ①.
- Connect the signal cables (Calib Signal Cable) ⑥ for the transmission of the calibration signals.
  - Insert the signal cables ⑥ into the measurement inputs of the DUT ④.
  - Then connect the opposite ends of the signal cables ⑥ to the corresponding signal outputs of the Calib Adapter AD/CNT ⑦.
- Connect the Calib Adapter AD/CNT ⑦ to the PC ① using the Calib Connection Cable Adapter ⑤.
- Connect the signal input of the Calib Adapter AD/CNT ⑦ to the calibrator ⑨ using the Calib Connection Cable AD ⑧.
- Connect the calibrator ⑨ to the PC ① using a serial data cable ⑪.
- Connect the banana plugs of the interface cable K176 ③ to the power supply ⑩.

2.4.4 Calibration setup for PT CAN measurement modules

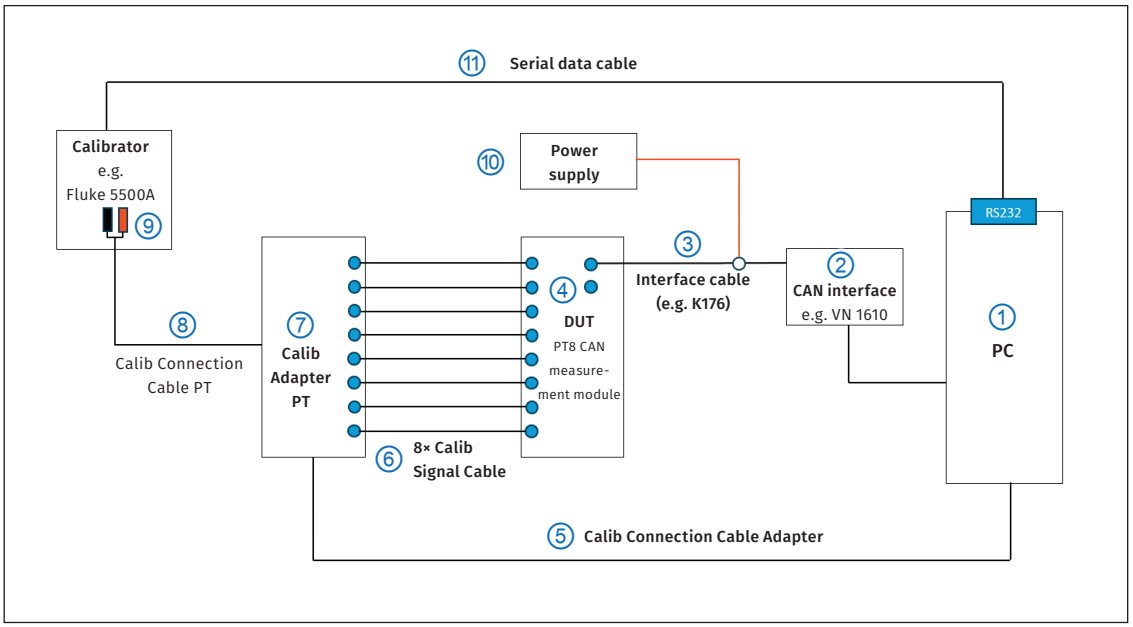


Fig. 2-4: Example setup for the calibration of CSM PT CAN measurement modules

- Connect the interface cable K176 ③ with the DUT ④.
- Connect the opposite end of the interface cable K176 ③ to the CAN interface ②.
- Connect the CAN Interface ② to the PC ①.
- Connect the signal cables (Calib Signal Cable) ⑥ for the transmission of the calibration signals.
  - Insert the signal cables ⑥ into the measurement inputs of the DUT ④.
  - Then connect the opposite ends of the signal cables ⑥ to the corresponding signal outputs of the Calib Adapter PT ⑦.
- Connect the Calib Adapter PT ⑦ to the PC ① using the Calib Connection Cable Adapter ⑤.
- Connect the signal input of the Calib Adapter PT ⑦ to the calibrator ⑨ using the Calib Connection Cable PT ⑧.
- Connect the calibrator ⑨ to the PC ① using a serial data cable ⑪.
- Connect the banana plugs of the interface cable K176 ③ to the power supply ⑩.

2.4.5 Calibration setup for STG CAN measurement modules

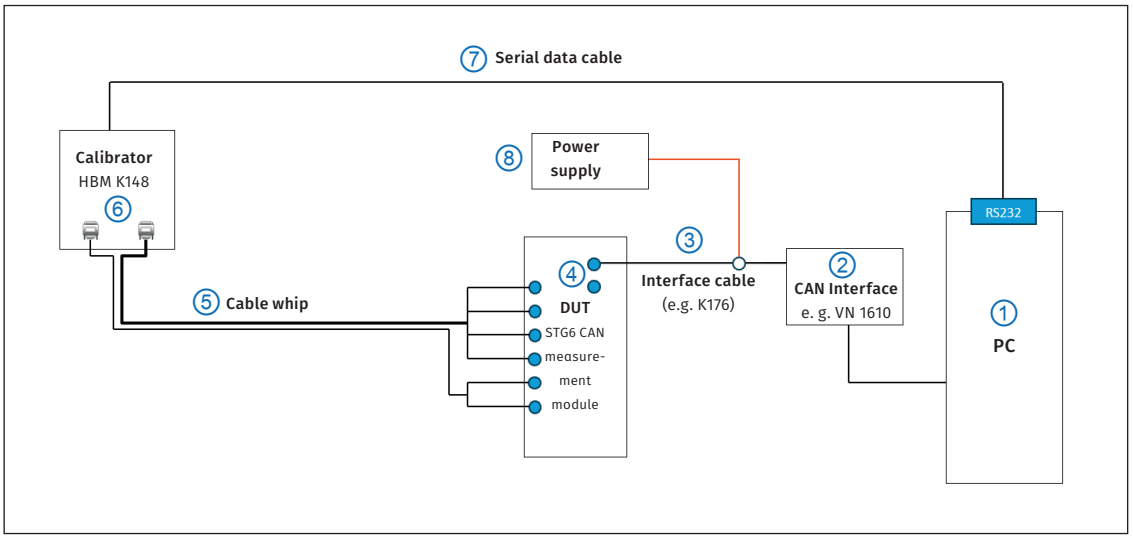


Fig. 2-5: Example setup for the calibration of CSM STG CAN measurement modules

- Connect the interface cable K176 ③ to the DUT ④.
- Connect the opposite end of the interface cable ③ to the CAN interface ②.
- Connect the CAN interface ② to the PC ①.
- Connect the signal lines of the cable whip ⑤.[3]
  - Connect the signal lines of the cable whip ⑤ to the measurement inputs of the DUT ④.
  - Connect the opposite ends of the cable whip ⑤ to the inputs of the calibrator ⑥.
- Connect the calibrator ⑥ to the PC ① using a serial data cable ⑦.
- Connect the banana plugs of the interface cable K176 ③ to the power supply ⑧.

3 A cable whip for STG modules (CAN and ECAT) consists of two cable harnesses with and four signal lines.

2.4.6 Calibration setup for STG ECAT measurement modules

The calibration setup for STG ECAT measurement modules is very similar to the Calibration setup for STG CAN measurement modules. The layout for STG ECAT measurement modules differs in the following details:

- The CAN interface is replaced by an XCP-Gateway ③.
- The interface cables K176 is replaced by the following cables:
  - a K400 connection cable ④ for connecting the DUT ⑤ to the XCP-Gateway ③
  - a K420 interface cable ② for connecting the XCP-Gateway ③ to the PC ① and the power supply ⑩

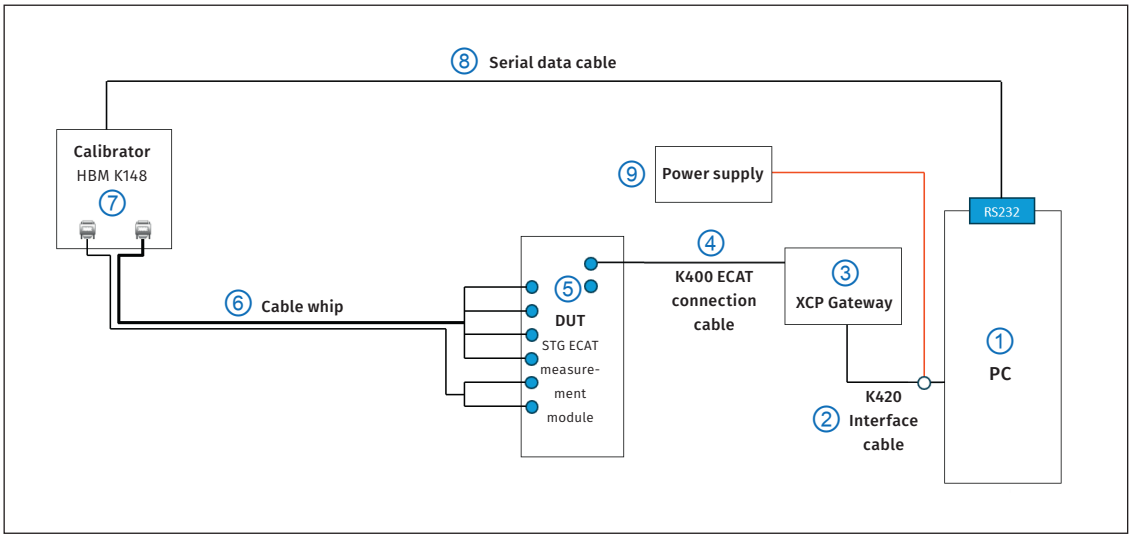


Fig. 2-6: Example setup for the calibration of CSM STG ECAT measurement modules

- Connect the interface cable K400 ④ to the DUT ⑤.
- Connect the opposite end of the connection cable K400 ④ to the XCP-Gateway ③.
- Connect the XCP-Gateway ③ to the PC ① using the interface cable K420 ②.
- Connect the signal lines of the cable whip ⑥.[4]
  - Connect the signal lines of the cable whip ⑥ to the measurement inputs of the DUT ⑤.
  - Connect the opposite ends of the cable whip ⑥ to the inputs of the calibrator ⑦.
- Connect the calibrator ⑧ to the PC ① using a serial data cable ⑧.
- Connect the banana plugs of the interface cable K420 ② to the power supply ⑨.

4 A cable whip for STG modules (CAN and ECAT) consists of two cable harnesses with and four signal lines.

2.4.7 Calibration setup for TH CAN measurement modules

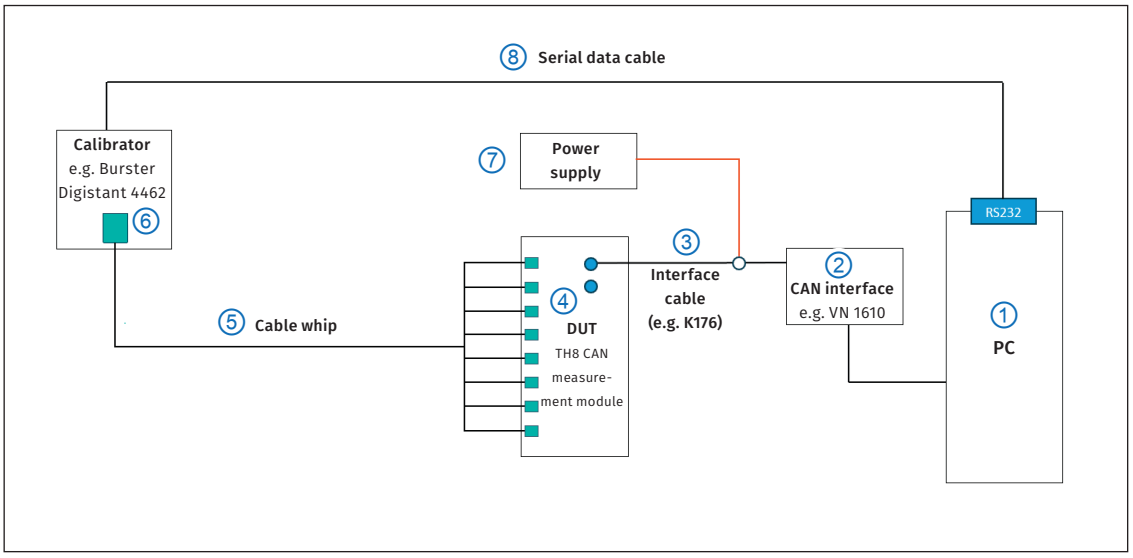


Fig. 2-7: Example setup for the calibration of CSM TH CAN measurement modules

- Connect the interface cable K176 ③ with the DUT ④.
- Connect the opposite end of the interface cable K176 ③ to the CAN interface ②.
- Connect the CAN Interface ② to the PC ①.
- Connect the cable whip ⑤ for the transmission of the calibration signals.
  - Insert the signal cables of the cable whip ⑤ into the measurement inputs of the DUT ④.
  - Connect the opposite end of the cable whip ⑤ to the calibrator ⑥.
- Connect the calibrator ⑥ to the PC ① using a serial data cable ⑧.
- Connect the banana plugs of the interface cable K176 ③ to the power supply ⑦.

NOTE!	
	For TH CAN measurement modules, there are only cable whips for eight measurement channels. Therefore, the calibration of a TH CAN measurement module with 16 channels is divided into two steps. After the calibration of channels 1 to 8 has been successfully completed, the signal cables of the cable whip have to be plugged into the measurement inputs of channels 9 to 16. CSMcalibrate guides the user through the necessary steps.

NOTE!	
	For some calibrators, such as the **Burster Digistant 4462**, a reference junction (adapter) for thermocouples is required in order to connect a cable whip.

2.5 Calibrating an AD CAN measurement module

This chapter describes the calibration of an AD CAN measurement module, including a check of the sensor supply.

i	Some **AD** and **HV AD (LV)** measurement modules provide a sensor supply. For these modules, the sensor supply can also be checked during the calibration process.

☞ Start CSMcalibrate.

⇨ The start screen opens.

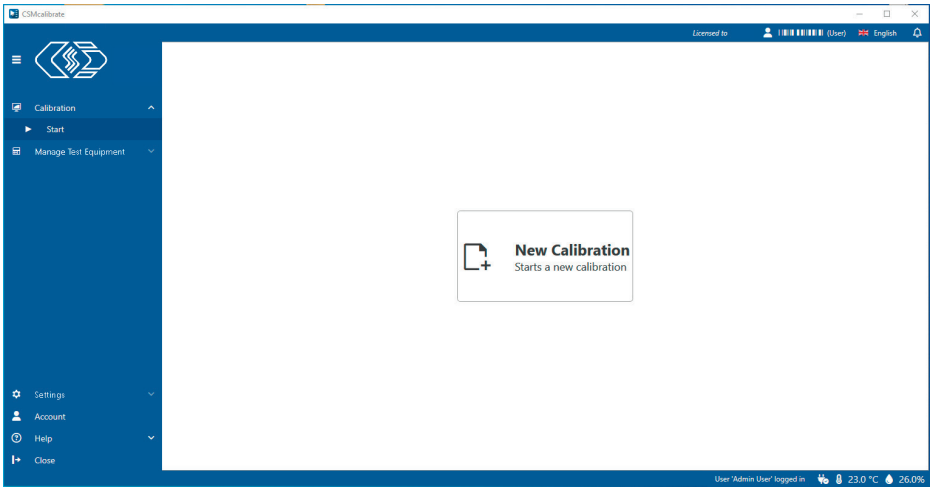


Fig. 2-8: CSMcalibrate start screen

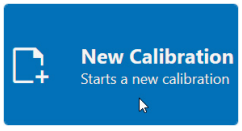


Fig. 2-9: **New Calibration** button

☞ Click on **New calibration**.

⇨ The window **Article number** opens.

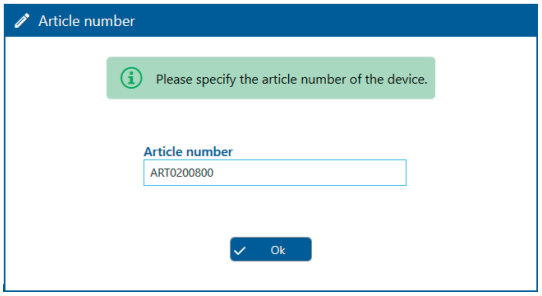


Fig. 2-10: Enter the article number of the DUT

☞ Enter the article number of the DUT in the **Article number** field and confirm with **OK**.[5]

⇨ The **Workflow overview** window opens.

5 If the DUT has been calibrated before, the article number will be displayed automatically and only needs to be confirmed by clicking **OK**.

i	If there is more than one measurement module available, the **Select module** is displayed, listing all the measurement modules integrated in the calibration setup. The device to be tested has to be selected from this list.

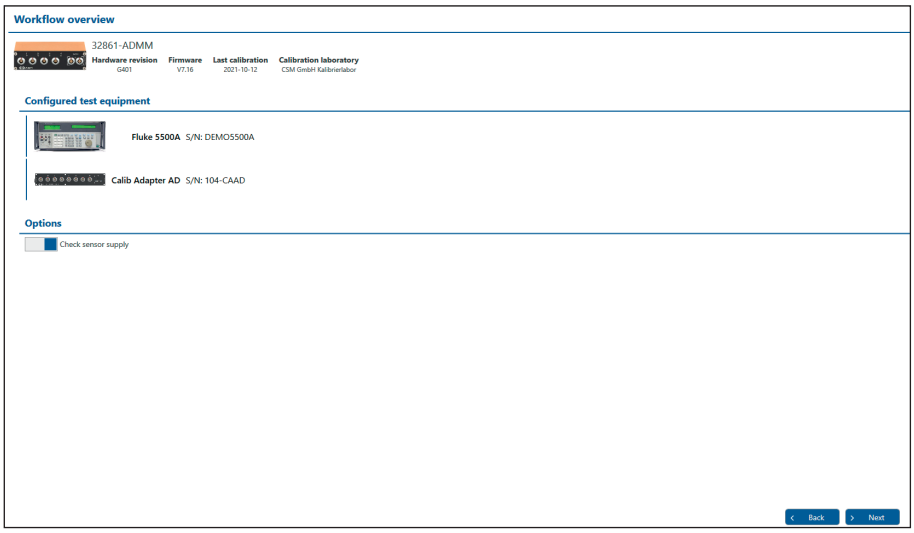


Fig. 2-11: **Workflow overview** window

☞ Check the details displayed in the sections **Workflow overview**, then click **Next** (Fig. 2-11).

⇨ The start screen for the calibration process opens.

⇨ The calibration process will be started.

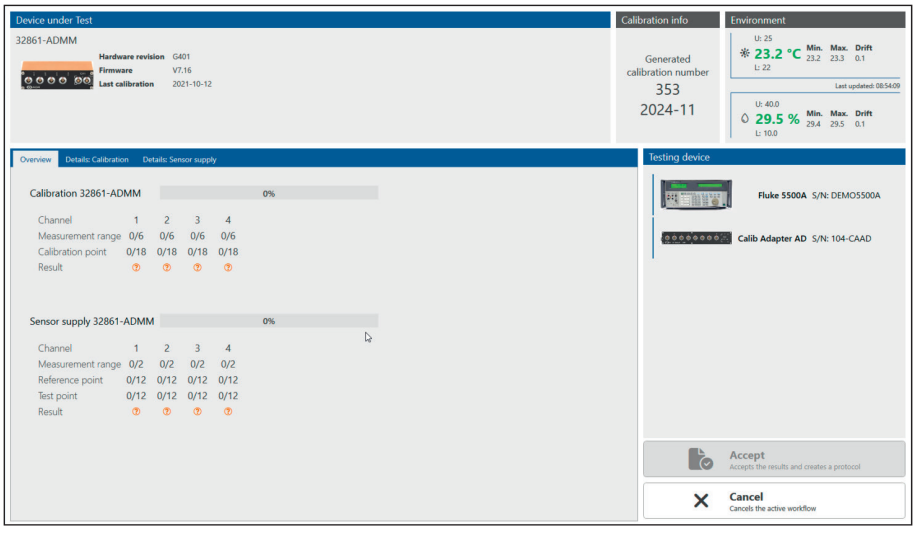


Fig. 2-12: Start screen for the calibration with subsequent test of the sensor supply

i	To check the sensor supply of the relevant AD/HV AD modules, the option for checking the sensor supply has to be enabled both in the **Workflow overview** (Fig. 2-11) and in the **Calibration setup** menu.

Overview Startscreen Calibration Process (Fig. 2-12)

- **Device under Test** – This section displays information on the device under test (HW revision, FW revision and the date of the previous calibration).
- **Calibration info** – This field displays a number that was automatically assigned to the calibration process. It is the number that is also used for the calibration certifcate.
- **Environment** – This info box displays the ambient temperature and relative humidity at the calibration location. To have these values displayed, the following settings have to be configured:
  - In the **Equipment** section of the **Test equipment** menu, the transmitter measuring the temperature and the relatice humidity has to be enabled and an Internet connection to this transmitter has to be established.
  - In the **Environment** menu, the **Monitoring** option has to be enabled.

  If these options are not enabled, the Environment info box will be hidden as no values for temperature and relative humidity can be displayed.
- **Testing device** – This section of the start screen displays the calibrator that is used for the calibration process and further testing equipment.[6]
- **Overview** – This tab shows the green process bar indicating the progress of the calibration process and, if applicable, the sensor supply check.

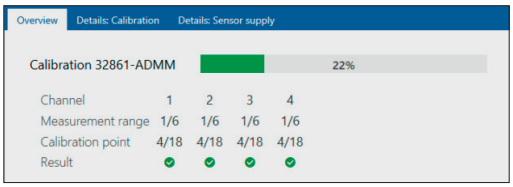


Fig. 2-13: Calibration process

⇨ If the green process bar indicates "100%", the calibration process has been completed. If all calibration points are within the tolerance range, the calibration process has been successfully completed. In the **Result** line, this is indicated by a green symbol for each calibrated channel (Fig. 2-13).

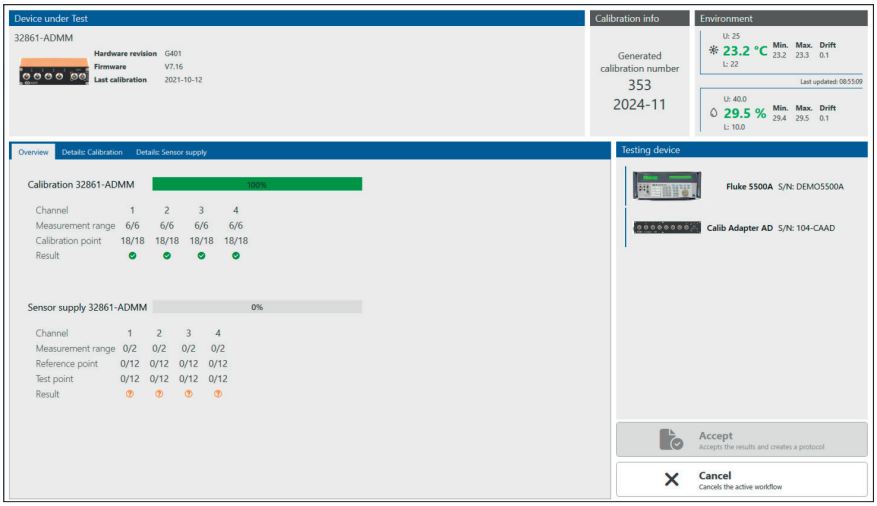


Fig. 2-14: Calibration process successfully completed

⇨ After a successful completion of the calibration process, the sensor supply check will start automatically.

6 Changes to the setup of the calibration or the selection of the test equipment can be made in section **Settings | Workspace | Calibration setup** or **Test equipment**. Administrator rights are required to access these settings. See chapter 2.3 "Account".

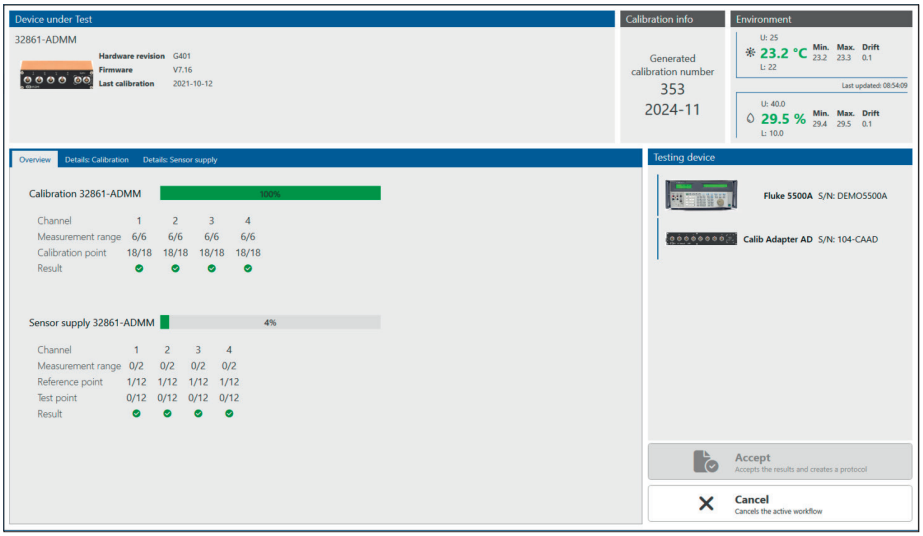


Fig. 2-15: Checking the sensor supply

⇨ If the green process bar in section **Overview | Sensor supply** shows "100%", the verification process has been completed. If the test was successfully completed, this is indicated in the **Result** line with a green symbol for each channel tested (Fig. 2-15).

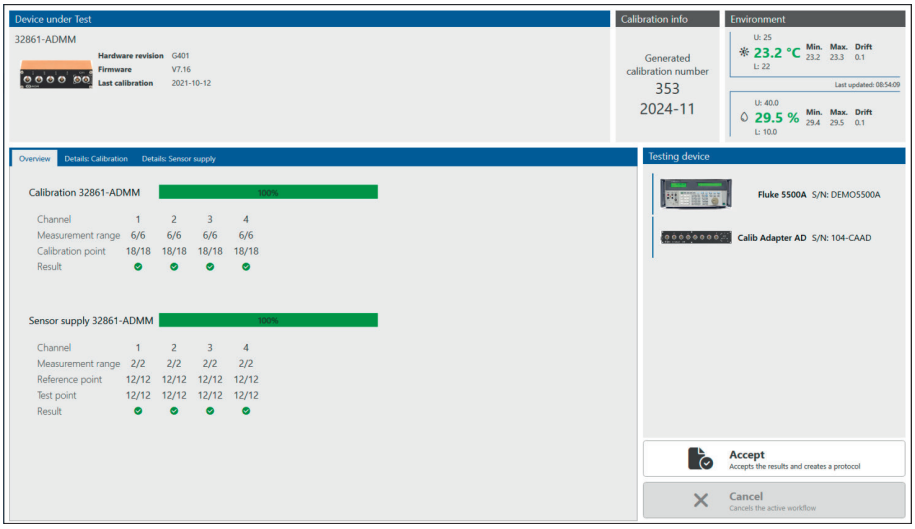


Fig. 2-16: Sensor supply check completed

2.5.1 Information on calibration process and sensor supply test

The **Details: Calibration** tab contains detailed information on the calibration process.

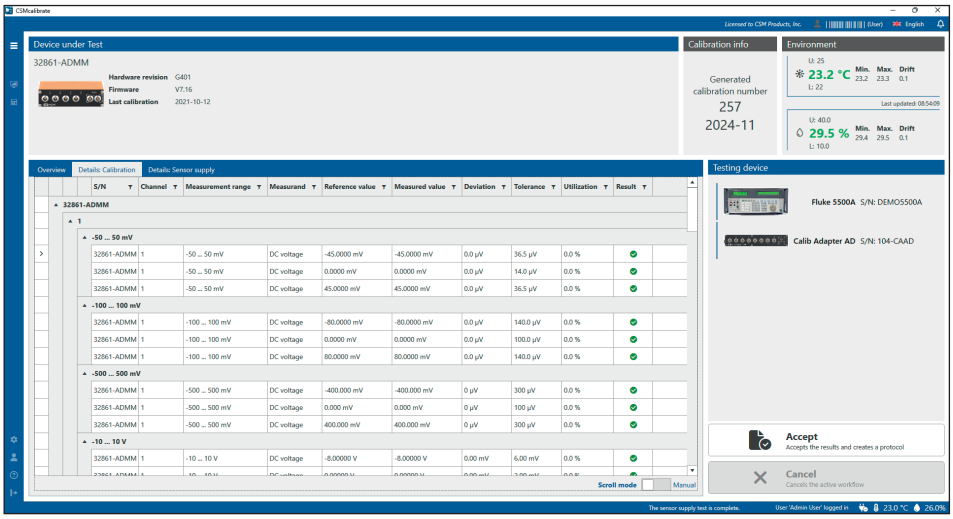


Fig. 2-17: Details on the calibration process

The **Details: Sensor supply** tab contains detailed information on the sensor supply test.

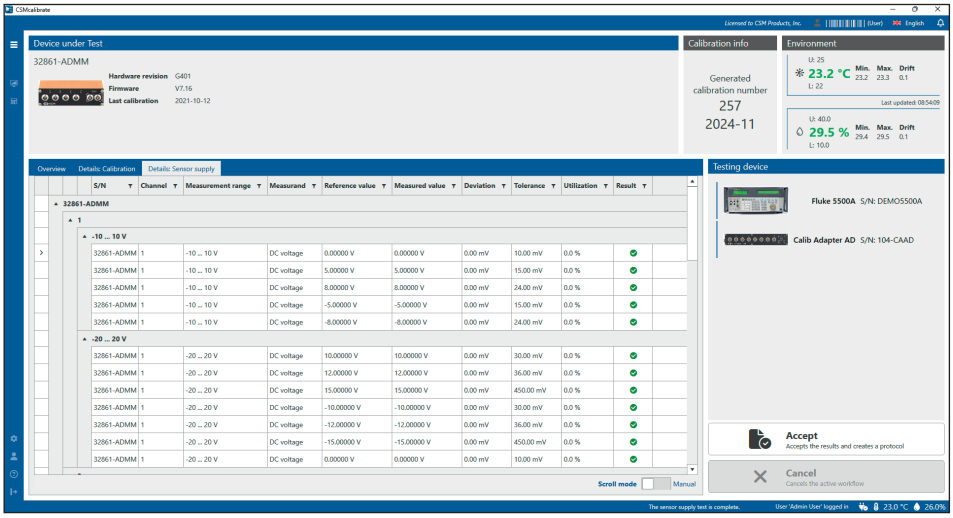


Fig. 2-18: Detailed information on the sensor supply test

2.5.2 Finalize the calibration and testing process and create the calibration certificate

☞ To complete the process, click on **Accept** (Fig. 2-18, ①) in the **Testing device** section to create the calibration protocol.

⇨ The **Customization** form opens.

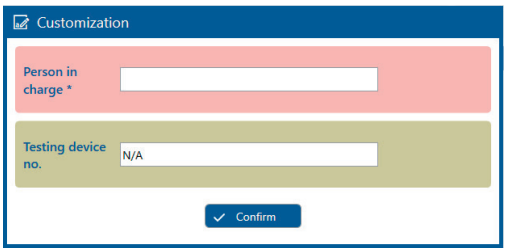


Fig. 2-19: **Customization** form

☞ Enter the name of the person responsible for the calibration in the **Person in charge** field. An entry in the **Test device no.** field is optional.

☞ Click on **Confirm**.

⇨ The calibration certificate will be processed.

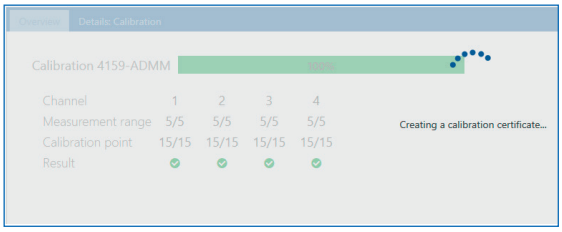


Fig. 2-20: Progress bar calibration certificate

⇨ By default, the completed calibration protocol automatically opens in a separate window.[7]

7 Calibration protocols are created by default as PDF files. To be able to open calibration protocols, a program such as the Adobe Acrobat Reader is required on the PC.

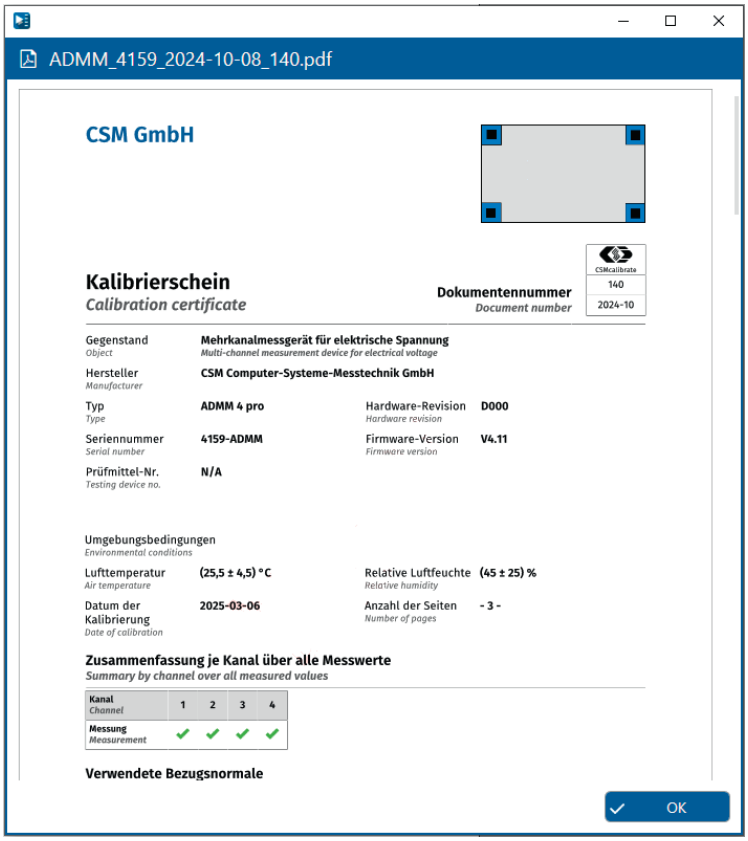


Fig. 2-21: Calibration protocol (sample)

☞ Click on **OK** to close the calibration protocol.

⇨ The CSMcalibrate start screen (Fig. 2-8) opens again.

3 Program Menu

3.1 Design and structure of the user interface

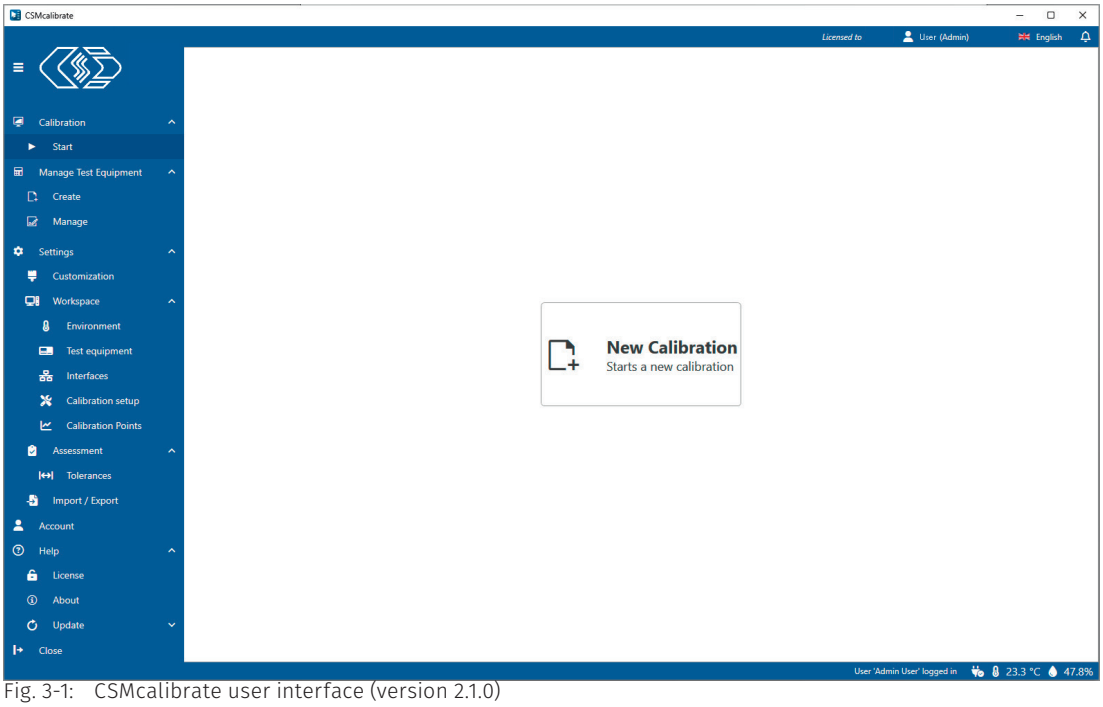


Fig. 3-1: CSMcalibrate user interface (version 2.1.0)

3.1.1 Main menu

The main menu of CSMcalibrate is arranged as a vertical navigation bar on the left-hand side of the user interface. This navigation bar can be hidden and displayed again as required using the ☰ button to the left of the company logo. For better orientation, the individual menu items are marked with unique symbols.

The following menu items are arranged in the main menu:

- **Calibration** – This menu item contains the Start button for launching the calibration process.
- **Manage Test Equipment** – This menu contains options for managing and recording test equipment-related master data.
- **Settings** – This menu contains options for customizing the calibration certificate, managing interfaces, configuring calibration setups, setting evaluation/tolerance limits for DUTs, and an export and import function for transferring database data.
- **Account** – This menu contains user-specific information and account settings.
- **Help** – Here you will find information on licensing (license updates), the software and database versions used, and how to perform database updates.

NOTE!	
	Administrator rights are required to access the menus **Manage Test Equipment**, **Settings** and **Update**. → Chapter 3.5 "Account"

3.1.2 Displaying the ambient temperature and relative humidity

The values for the ambient temperature and relative humidity at the calibration setup be displayed at the bottom right of the status bar.

Fig. 3-2: Display of temperature and relative humidity at the calibration station

i	The display is disabled by default. It can be enabled via the menus **Environment** and **Test equipment**.

3.2 Calibration

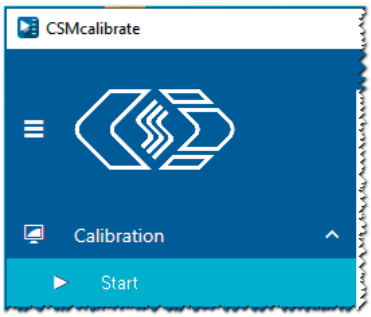


Fig. 3-3: **Calibration** menu

Start calls up the **New Calibration** button. The **New Calibration** button is automatically displayed after launching the program (Fig. 1-3).

i	Example of application for the **Start** option ☞ Use the **Start** option to go directly to the **New Calibration** button from any menu (e.g. **Workspace | Test Equipment** or **Workspace | Calibration setup**).

3.3 Manage Test Equipment

The **Manage Test Equipment** menu contains the following menu items:

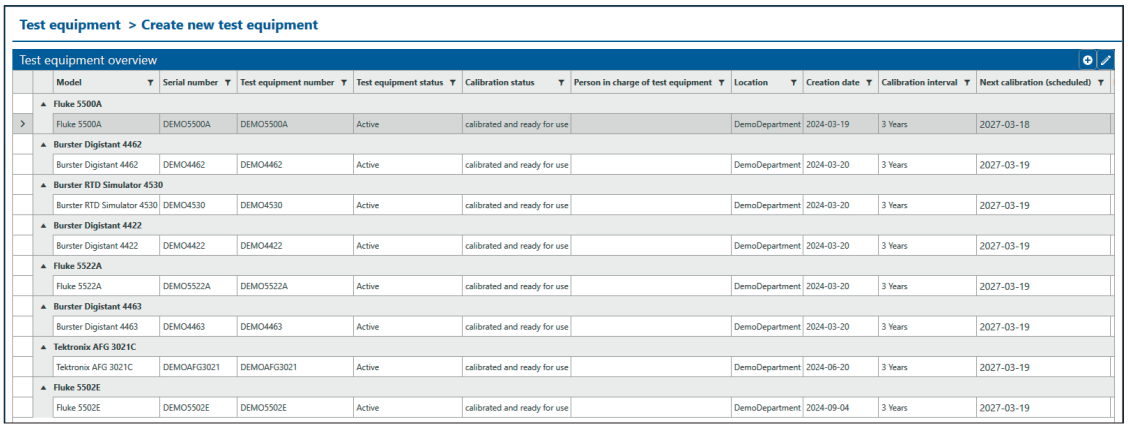
- **Create**
- **Manage**

The test equipment management is used to ensure and maintain the quality and operational readiness of test equipment. The information stored in test equipment management is also included in the calibration certificate. This provides the means to trace which standard was used to perform a calibration.

NOTE!	
	Administrator rights are required to access the contents of the **Manage Test Equipment** menu. → Chapter 3.5 "Account"

3.3.1 Create

The table in the **Create** menu provides a list of the currently available test equipment (calibrators). The table also contains various information on the status of the test equipment (calibration date, next calibration date, etc.).



Model	Serial number	Test equipment number	Test equipment status	Calibration status	Person in charge of test equipment	Location	Creation date	Calibration interval	Next calibration (scheduled)
Fluke 5500A									
Fluke 5500A	DEMO5500A	DEMO5500A	Active	calibrated and ready for use		DemoDepartment	2024-03-19	3 Years	2027-03-18
Burster Digistant 4462									
Burster Digistant 4462	DEMO4462	DEMO4462	Active	calibrated and ready for use		DemoDepartment	2024-03-20	3 Years	2027-03-19
Burster RTD Simulator 4530									
Burster RTD Simulator 4530	DEMO4530	DEMO4530	Active	calibrated and ready for use		DemoDepartment	2024-03-20	3 Years	2027-03-19
Burster Digistant 4422									
Burster Digistant 4422	DEMO4422	DEMO4422	Active	calibrated and ready for use		DemoDepartment	2024-03-20	3 Years	2027-03-19
Fluke 5522A									
Fluke 5522A	DEMO5522A	DEMO5522A	Active	calibrated and ready for use		DemoDepartment	2024-03-20	3 Years	2027-03-19
Burster Digistant 4463									
Burster Digistant 4463	DEMO4463	DEMO4463	Active	calibrated and ready for use		DemoDepartment	2024-03-20	3 Years	2027-03-19
Tektronix AFG 3021C									
Tektronix AFG 3021C	DEMOAFG3021	DEMOAFG3021	Active	calibrated and ready for use		DemoDepartment	2024-06-20	3 Years	2027-03-19
Fluke 5502E									
Fluke 5502E	DEMO5502E	DEMO5502E	Active	calibrated and ready for use		DemoDepartment	2024-09-04	3 Years	2027-03-19

Fig. 3-4: Table **Test equipment overview**

It is also possible to add additional test equipment to the table and to edit existing test equipment entries.

3.3.1.1 Adding new test equipment

☞ Go to the header of the **Test equipment overview** table (Fig. 3-4) and click on .

⇨ The **New test equipment** form opens.

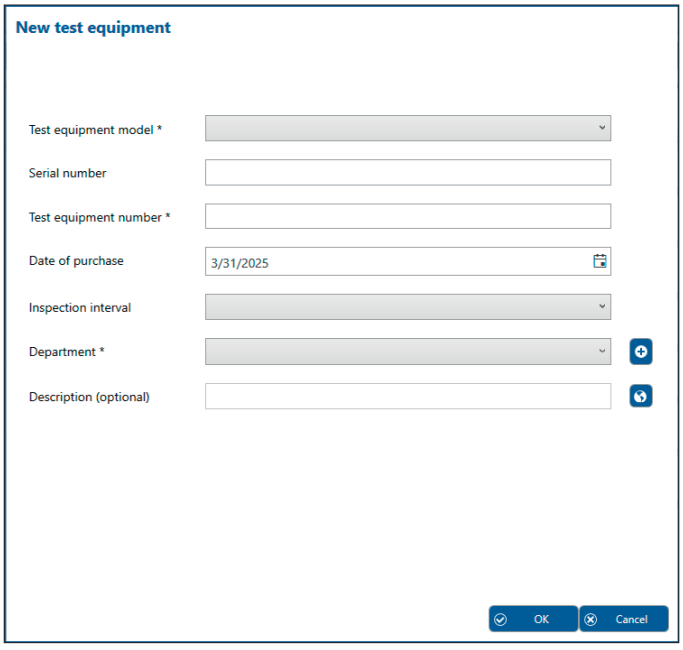


Fig. 3-5: **New test equipment** form

☞ Select the required test equipment from the **Test Equipment modell** selection menu.

☞ Enter the **Test equipment number** for the new test equipment.

☞ Click on the button to the right of the **Department** selection menu in order to enter the department name.

⇨ The **New department** dialog opens.

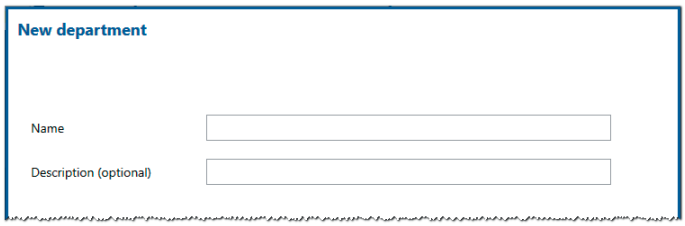


Fig. 3-6: **New department** dialog

☞ Enter the name of the department into the **Name** field.
☞ Click **OK** to close the **New Department** dialog.
☞ Check the entries in the **New test equipment** form and confirm your entries with **OK**.

3.3.1.2 Editing entries of existing test equipment

☞ Mark the row of the test equipment in the table to be edited (e.g. Fluke 5500A → Fig. 3-4).
☞ Click on the ✎ symbol in the header.
⇨ The **Edit test equipment** form opens.
☞ Edit the form and confirm changes by clicking **OK**.

3.3.2 Manage

The table provides an overview on the status of the test equipment which is currently available (validity of the calibration of the test equipment, due dates for calibration, etc.).

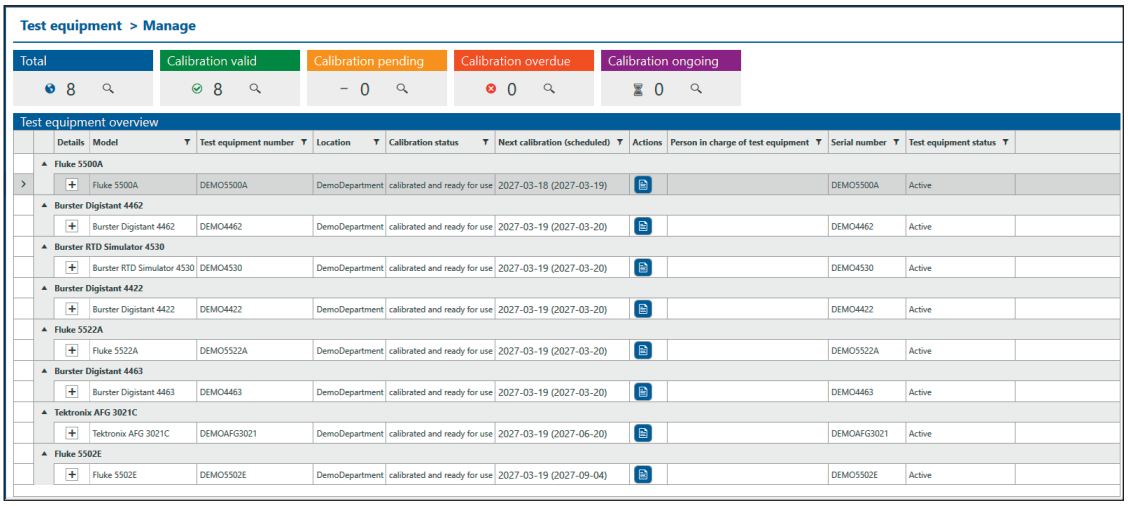


Fig. 3-7: **Test equipment overview** table

This table also provides the option to assign new calibration certificates to the calibrators and to call up current calibration certificates.

3.3.2.1 Entering calibration certificate data for a calibrator

☞ Go to the table row of the calibrator (e.g. Burster Digistant 4463) to which you need to assign a calibration certificate and click on .

⇨ The **Calibration certificate** page opens.

- The **Test equipment** section provides details on the test equipment (calibrator).
- Details on the test equipment's calibration status can be found in the **Information** section.
- The data for the new calibration certificate is entered in the **Calibration certificate** section.

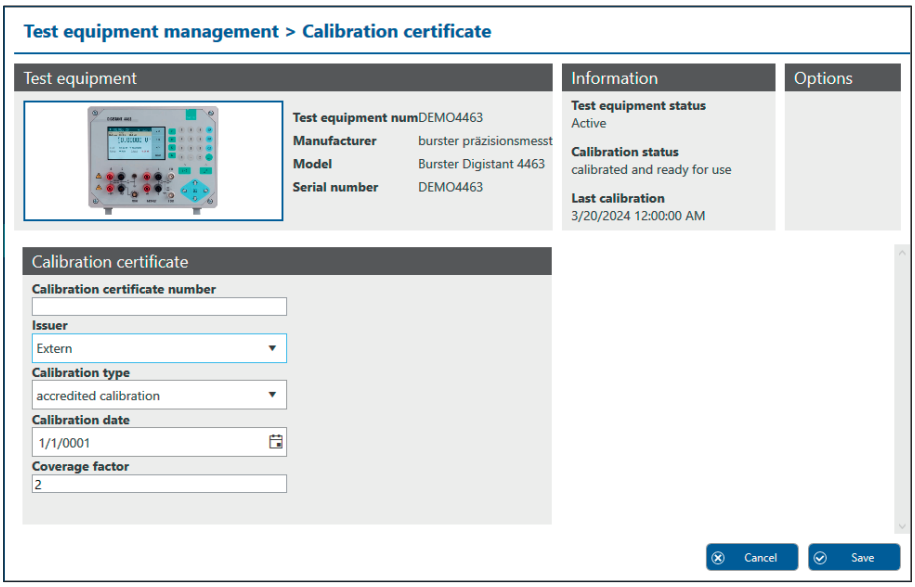


Fig. 3-8: **Calibration certificate** menu

☞ Enter the required data:

- Enter the number of the new calibration certificate into the field **Calibration certificate number**.
- Indicate in the **Issuer** section whether the calibrator was calibrated internally or externally.
- Select the type of calibration (e.g. "Accredited calibration") from the **Calibration type** selection menu.
- Enter the date of issue shown on the calibration certificate in the **Calibration date** field.

☞ Finally, click on **Save** in the lower right section of the window (Fig. 3-8).

3.3.2.2 View calibration certificate

☞ Open the table section of the required calibrator by clicking on .

⇨ The table is expanded and the **Calibration certificates** submenu is displayed.

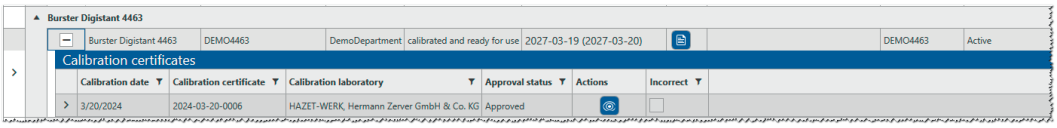


Fig. 3-9: **Test equipment overview** table, **Calibration certificates** submenu

☞ Click on the symbol in the **Actions** column.

⇨ The **Calibration certificates** page with the data of the currently stored calibration certificate opens.

3.4 Settings

3.4.1 Overview

NOTE!
Administrator rights are required to access the contents of the **Settings** menu. → Chapter 3.5 "Account"

The **Settings** menu contains the following submenus:

- **Customization**
- **Workspace**
- **Assessment**
- **Import/Export**

Saving changes

On each page of the **Settings** menu, there are three buttons in the footer area at the lower right, designed to store or discard changes made, or to restore the default settings.

The **Store** and **Discard** buttons will be enabled as soon as any changes are made on the page.

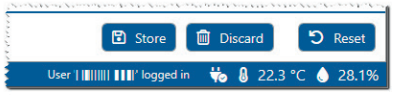


Fig. 3-10: Menu buttons

NOTE!
Any changes made must be saved in the same menu. If changes are not saved, a message will be displayed when leaving the menu, reminding the user that **changes will be lost if they are not saved**.

3.4.2 Customization

The **Customization** menu consists of the sections **Calibration certificate options** and **Sample document**.

The **Calibration certificate options** section, provides the means to edit the calibration certificate. This section contains the following menu items:

- **Output**
- **Header**
- **Title page**
- **Remarks**

The **Sample document** section shows a sample calibration certificate. The preview function provides the means to view the changes made in section **Calibration certificate options** in the calibration certificate.

3.4.2.1 Output

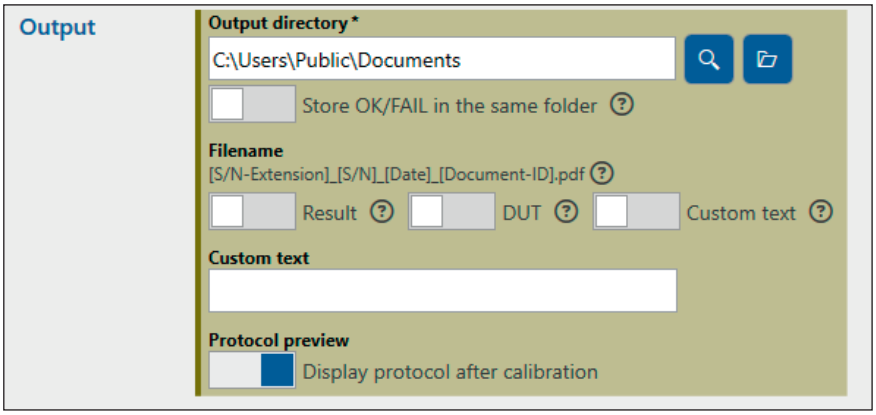


Fig. 3-11: **Calibration certificate options | Output**

- **Output directory**: a customizable storage location for the calibration protocols. Clicking on the button opens the folder specified under **Output directory**. The "active/inactive" switch has the following functions:
  - switch position "inactive": All calibration records ("OK" and "FAIL") will be stored in the folder specified under **Output directory**.
  - switch position "active": Calibration records with the status "FAIL" will be stored in a separate subfolder.
- **File name**: options for naming the calibration protocols. The switches have the following functions:
  - **Result** (switch position "active"): The calibration status ("OK"/"FAIL") is added to the file name.
  - **DUT** (switch position "active"): The test equipment number of the DUT is added to the file name.
  - **Custom text**: see input field **Custom text**
- **Custom text**: This option can be used to add further information to the file name of the calibration certificate. The **Custom text** switch in the **File name** section has to be in the "active position" to use this option.
- **Protocol preview**: After a calibration process has been successfully completed, the corresponding calibration protocol opens automatically. Switch of the **Protocol preview** to disable the automatic display of the calibration certificate.

3.4.2.2 Header

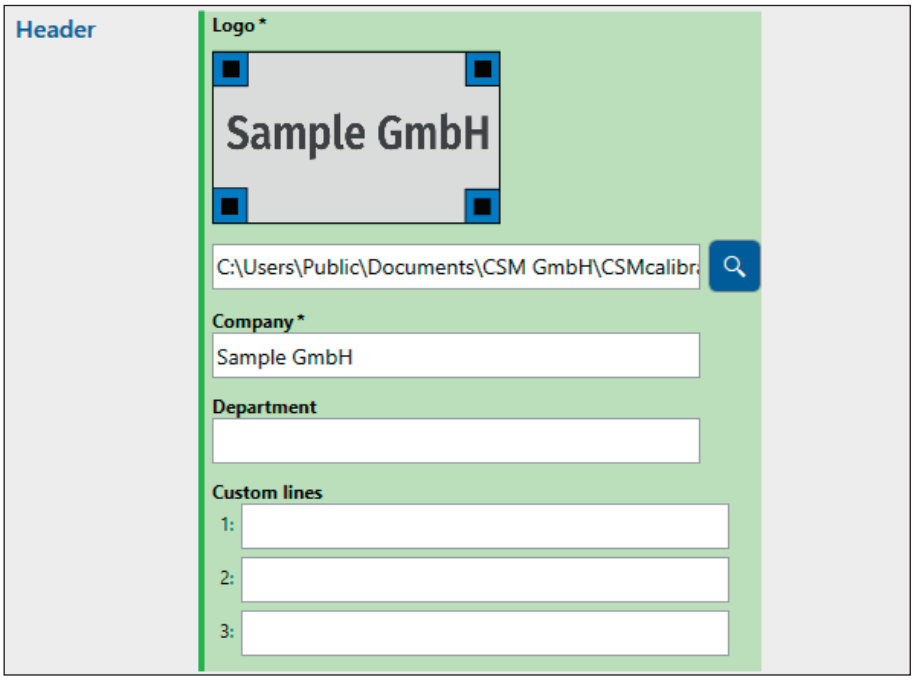


Fig. 3-12: **Calibration certificate options | Header**

- **Logo**: This is where you can specify the path for the logo (company logo) to be displayed in the calibration protocol. Image data in the formats *.jpeg, *.jpg and *.svg can be used.
- **Company**: Name/designation of the company issuing the calibration protocols
- **Department**: Name of the department responsible for the calibrations
- **Custom lines**: Additional comments (e.g. company address)

3.4.2.3 Title page

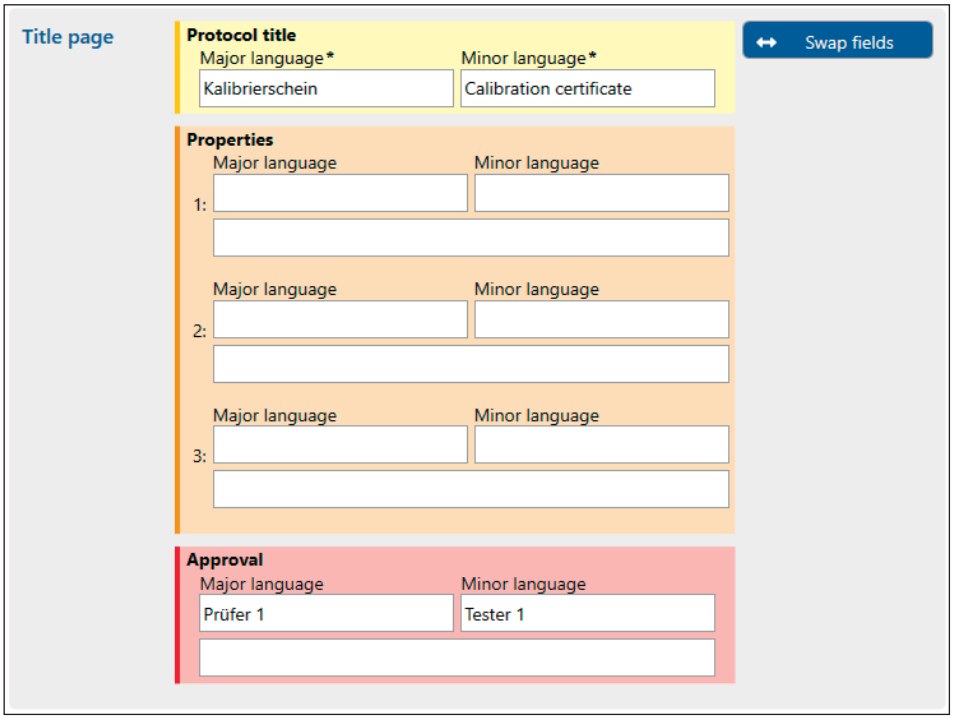


Fig. 3-13: **Calibration certificate options | Title page**

- **Protocol title**: Title of the document (calibration protocol) in the main and secondary languages (e.g. German and English); the standard texts are "Kalibrierschein" and "Calibration certificate" (→ Fig. 3-15).
- **Properties**: This is where customer-specific properties can be entered that have to be included in the calibration certificate (→ Fig. 3-15).
- **Approval:** This is where the name of the person can be entered who will release the calibration certificates.

i	Click the **Swap fields** button to swap the entries for the main and secondary languages in the sections **Title Page** and **Remarks** (→ Chapter 3.4.2.4 "Remarks").

3.4.2.4 Remarks

Fig. 3-14: **Calibration certificate options | Remarks**

- Notes on the calibration protocol in the main and secondary language

3.4.2.5 Sample document

A template of a calibration certificate is shown in the **Sample document** section. Content that may vary depending on user-defined information is highlighted in color (Fig. 3-15, left). The colors correspond to the colors of the input fields for user-defined information in the chapters 3.3.1.2 to 3.4.2.4.

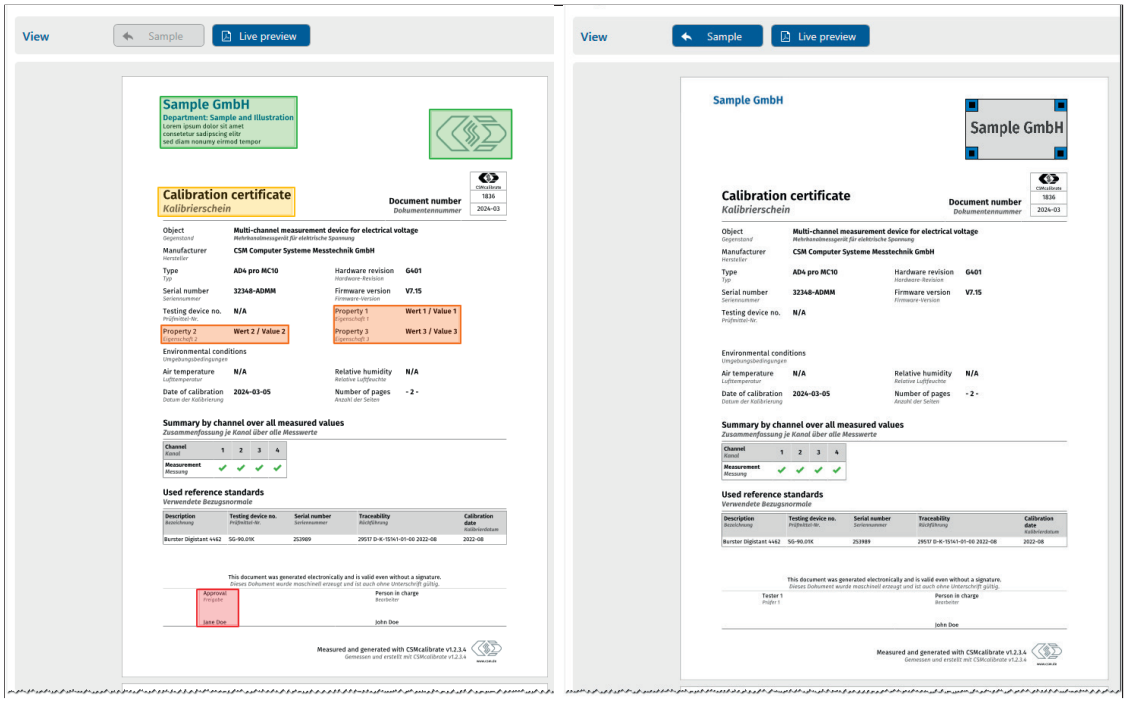


Fig. 3-15: **Sample document** (left), **Live preview** (right)

Clicking the **Live preview** button opens the preview version of the calibration certificate (Fig. 3-15, right), which may contain user-defined changes made according to the options described in the chapters 3.3.1.2 to 3.4.2.4. Clicking the **Sample** button displays the template of the calibration certificate again (Fig. 3-15, left).

3.4.3 Workspace

The Workspace menu contains the following submenus:

- **Environment**
- **Test equipment**
- **Interfaces**
- **Calibration setup**
- **Calibration points**

3.4.3.1 Environment

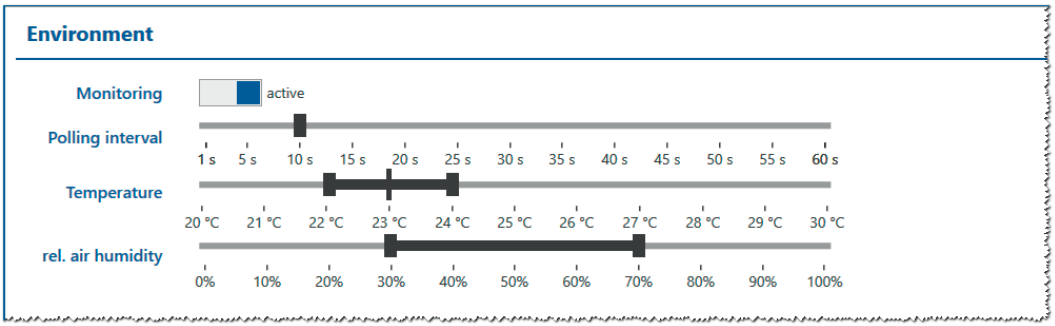


Fig. 3-16: **Environment** menu

The **Environment** menu provides the option to specify the ambient temperature (**Temperature**) and relative humidity (**rel. air humidity**) for the calibration site. The **Polling interval** specifies the interval at which the values for temperature and relative humidity are retrieved.

	NOTE!
	The **Monitoring** option is by default disabled. In order to transfer the values for ambient temperature and relative humidity, not only the **Monitoring** option has to be switched on, but also the transmitter (Fig. 3-17, ①) for transferring these measured values has to be enabled on the **Test equipment** page. → Chapter 3.4.3.2 "Test equipment"

3.4.3.2 Test equipment

The **Test equipment** submenu provides the means to verify the connections of calibrators and other test equipment to the PC on which the calibration software is installed. It is also possible to specify the connection parameters for the calibrators.

If the info box **Environment** (Fig. 2-12) is to be used for displaying the values for ambient temperature and relative humidity, the transmitter for transferring these values in the **Equipment** section (Fig. 3-17, ①) has to be enabled.

→ See also chapter 3.4.3.1 "Environment"

Fig. 3-17: **Test Equipment** menu

3.4.3.3 Interfaces

The interfaces connected to the PC in the calibration setup are listed in the **Interfaces** section.

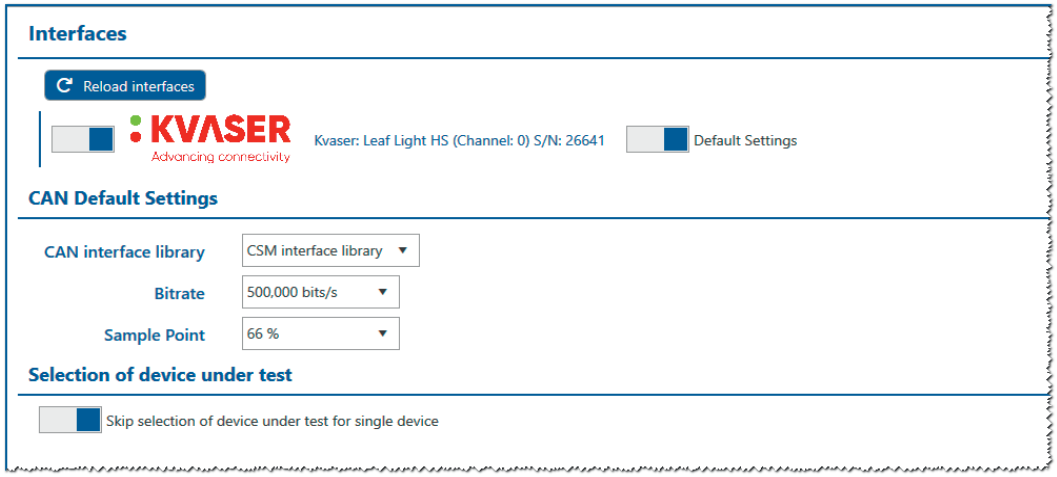


Fig. 3-18: **Interfaces** menu

If further interfaces are added to an existing calibration setup, the list of connected interfaces can be updated by clicking on the **Reload interfaces** button (Fig. 3-18).

Fig. 3-19: Detected interfaces

Fig. 3-19 shows a selection of interfaces integrated into a calibration setup:

- Kvaser Leaf Light HS (CAN, 1 channel)
- Vector VN1610 (CAN, 2 channels)
- XCP-Gateway

If two or more CAN interfaces or CAN interfaces with more than one channel are available in the **Interfaces** section, it is possible to specify individual settings for each interface/interface channel. To do so, the position of the switch of the relevant CAN interface (Fig. 3-19, ①) has to be changed from **Default settings** to **Individual settings**. Fig. 3-20 shows the switch in position **Individual settings** with the interface- and channel-specific setting options.

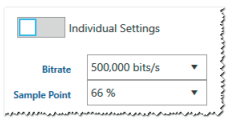


Fig. 3-20: Switch position **Individual settings**

An XCP-Gateway does not provide any customization options.

The interface settings used for the calibration process are specified in section **CAN Default Settings** (Fig. 3-18). This drop-down menu **CAN interface library** provides the options "CSM interface library" and "BOA (INCA 7.x)". The interface libraries are identical to those available in CSMconfig. The change of the CAN interface library only takes effect after the program is restarted.

3.4.3.4 Calibration setup

The test equipment that is used for calibrating the devices is specified in the **Calibration setup** menu.

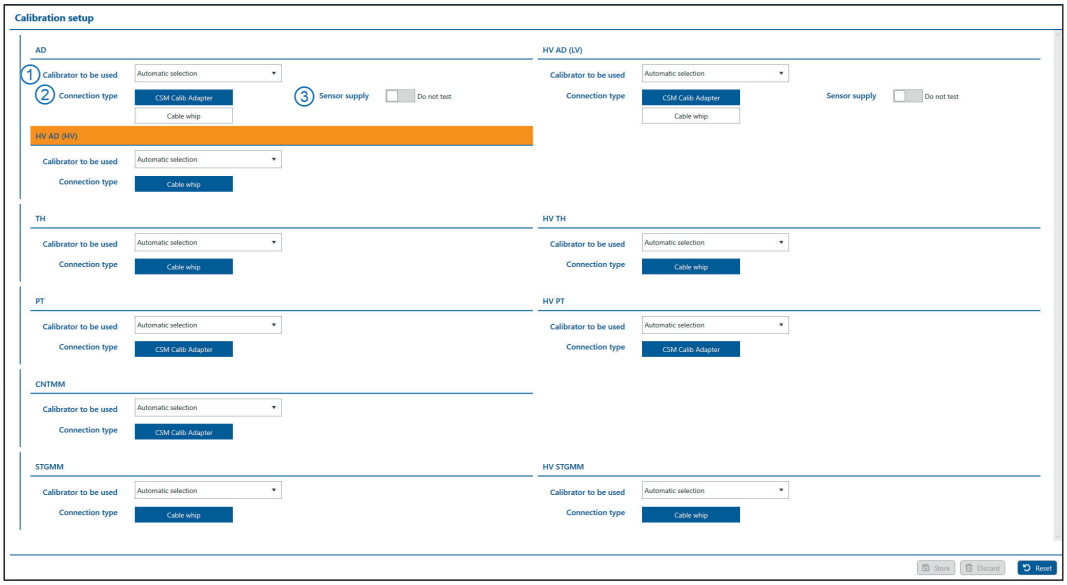


Fig. 3-21: **Calibration setup** menu

If more than one calibrator is available, the required calibrator can be selected directly from the selection menu **Calibrator to be used** (Fig. 3-21, ①). Alternatively, the option "Automatic selection" can be chosen.

Depending on the type of module, which has to be calibrated, the **Connection type** (Fig. 3-21, ②) menu provides the following options:

- AD/HV AD (LV): CSM Calib Adapter AD/CNT or cable whip
- HV AD (HV): cable whip
- CNTMM: CSM Calib Adapter AD/CNT
- PT/HV PT: CSM Calib Adapter PT
- STG/HV STG: cable whip
- TH/HV TH: cable whip

For the measurement module types AD/HV AD (LV), it is also possible to test the sensor supply of the test object after the calibration process has been completed. To do so, the option **Sensor supply** (Fig. 3-21, ③) has to be enabled.

3.4.3.5 Calibration points

The calibration points menu provides the following options:

- In the calibration point table, standard calibration points (marked with the CSM logo ⟨⟩) can be deactivated if required.
- New/user-defined calibration points can be added to the table.

i	▸ Calibration points marked with the CSM logo ⟨⟩ are standard calibration points. These can be deactivated but not deleted. ▸ User-defined calibration points can be deleted or deactivated.

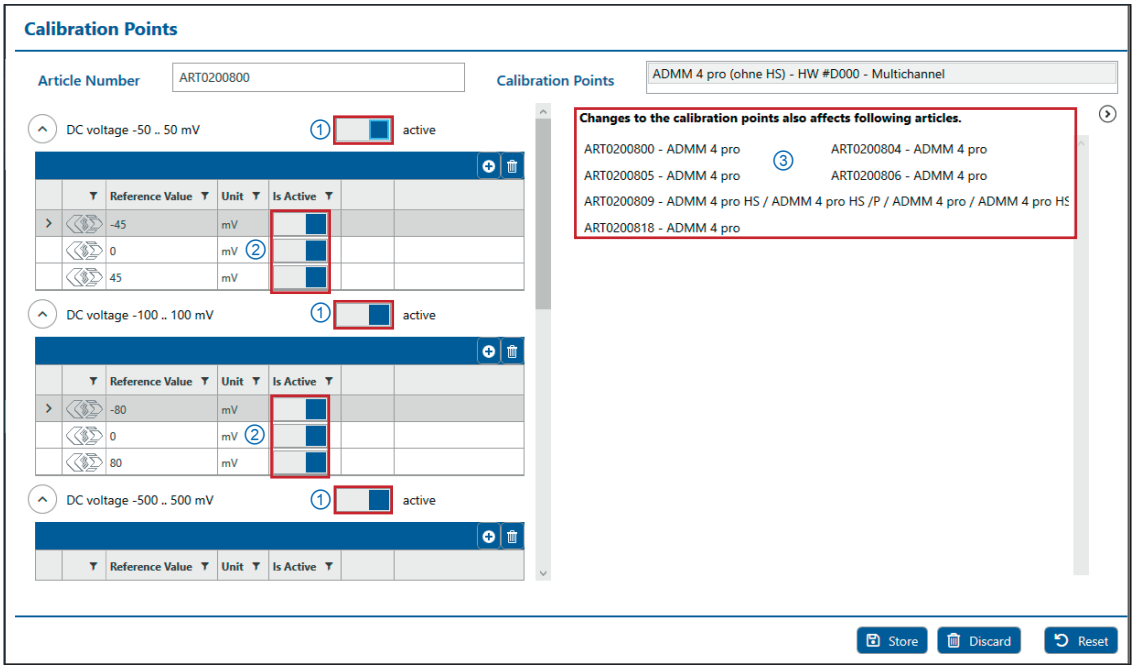


Fig. 3-22: **Calibration Points** menu

Open the calibration point table

The article number of the measurement module to be calibrated has to be entered into the **Article Number** field.

☞ Enter the article number of the measurement module and confirm the entry by pressing the Enter key.

⇨ The module type and hardware revision number are displayed in the **Calibration points** field.

⇨ The calibration table with the standard calibration points is displayed below this. The "active/inactive" buttons can be used to activate or deactivate entire measurement ranges (Fig. 3-22, ①) or individual calibration points (Fig. 3-22, ②).

⇨ If other measurement modules are affected by changes in the calibration point table, a list opens to the right of the calibration point table (Fig. 3-22, ③), in which the relevant measurement modules will be displayed.

NOTE!	
	If a measurement module cannot be assigned to a specific set of calibration points, the **Revision** field will be displayed to the right of the **Article Number** field. ☞ Enter the hardware revision number in the **Revision** field to assign the required set of calibration points to the measurement module.

Adding user-defined calibration points

NOTE!	
	Please note that only values that can be output by the calibrator may be used for the user-defined calibration points. **The calibration process will be aborted if unsupported values are used.**

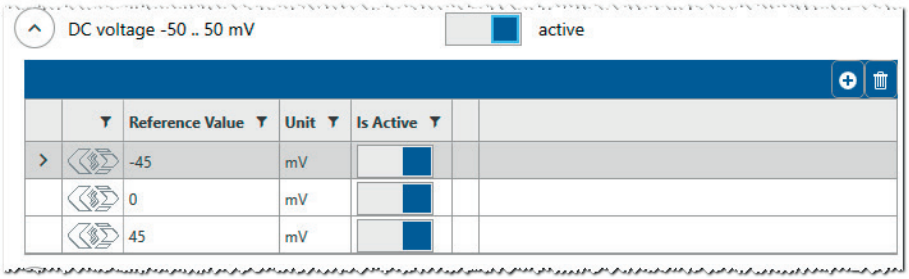


Fig. 3-23: Table containing standard calibration points

☞ Click on the ⊕ button in the table header.

⇨ A new row will be added to the table.

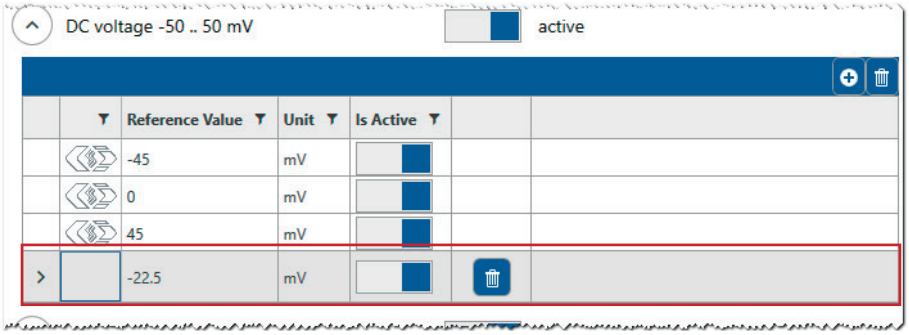


Fig. 3-24: A user-defined calibration point has been added

⇨ A standard value for the user-defined calibration point is displayed in the **Reference Value** column. This value can be changed if necessary.[8]

User-defined calibration points can be deleted again by clicking on the 🗑 symbol.

8 The tolerances for user-defined calibration points are calculated on the basis of a linear interpolation.

3.4.4 Assessment

CSMcalibrate calibrates the devices under test according to the manufacturer's tolerances. The tolerance values (in percent) refer to the maximum error according to the manufacturer's specifications.

Fig. 3-25: Menu **Assessment | Tolerances**

In the **Assessment | Tolerances** section, the limits recommended by CSM are set by default for each type of module. Alternatively, it is possible to specify user-specific tolerance ranges for each type of module.

Displaying and changing tolerance values

☞ Left-click on the corresponding black slider and keep the mouse button pressed.

⇨ The current tolerance value will be displayed.

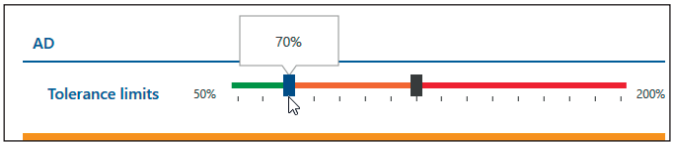


Fig. 3-26: Display of current tolerance value

☞ To change a tolerance value, press and hold the mouse button, move the black slider to the new position and release the mouse button.

i	If the left and right sliders are moved up until they overlap, the "conditionally OK" (orange) area is faded out. Only the areas "OK" (green) and "not OK" (red) are displayed.

3.4.5 Import/Export

The “Export” function creates a copy of the CSMcalibrate database and saves it in any target directory. This database copy can be imported by using the “Import” function. These functions are designed to transfer the contents of the CSMcalibrate database from one computer to another (e.g., when changing/replacing a computer). A database copy in the *.cdx exchange format is used for the data transfer.

Fig. 3-27: **Import/Export** menu

Exporting the database file (exporting computer)

☞ Click on **Select file path for export**.

⇨ The **Export Data to ...** dialog opens.

⇨ The database file **CSMdate.cdx** is displayed in the **File name** field.

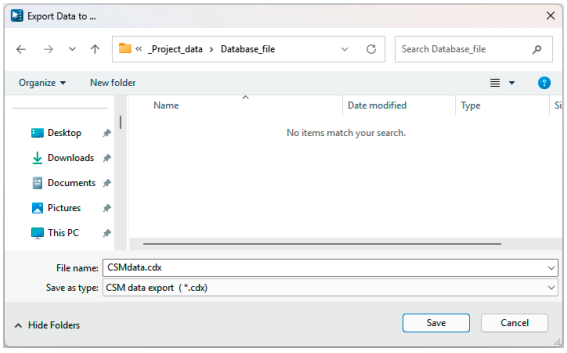


Fig. 3-28: **Export Data to** ... dialog

☞ Navigate to the folder where the database file is to be saved.

☞ Click **Save** to save the file in that folder.

Importing the database file (importing computer)

☞ Click on **Choose import file**.

⇨ The **Import Data from ...** dialog opens.

☞ Navigate to the directory where the CSMdata.cdx database file is located.

☞ Select the file and click **Open**.

⇨ The database file is saved in the destination folder on your computer and is available in CSMcalibrate.

NOTE!	
	This feature is available as of program version 2.1.0 and is not downward-compatible. Export and import must be performed with the same software version (version 2.1.0).

3.5 Account

To make changes in the menus **Manage Test Equipment** and **Settings**, administrator rights are required. The user rights can be changed in the **Account** menu.

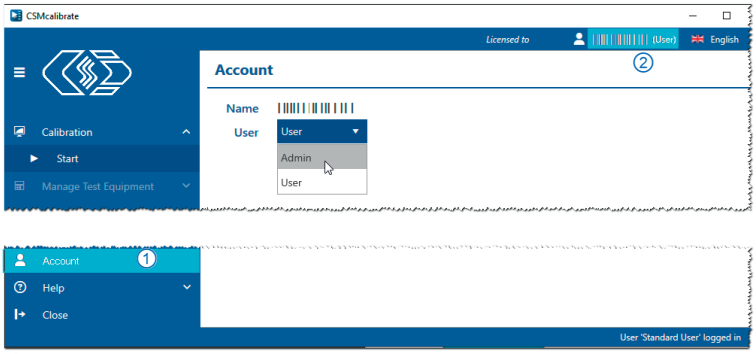


Fig. 3-29: **Account** menu

☞ Click on **Account** in the menu on the left (Fig. 3-29, ①) or in the field in the header on the right (Fig. 3-29, ②), where the name of the currently logged-in user is displayed.

⇨ The **Account** menu is displayed.

☞ Select the "Admin" option in the **User** drop-down menu.

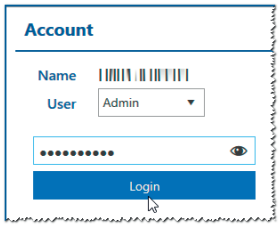


Fig. 3-30: Administrator login

☞ Log-in as administrator.

⇨ The options in the **Manage Test Equipment** and **Settings** menus as well as the **Update** option in the **Help** menu are now freely accessible.

3.6 Help

The **Help** menu contains entries with information on the software license, program version and database update.

3.6.1 License

This menu contains information on the currently installed CSMcalibrate license and options for updating the license.

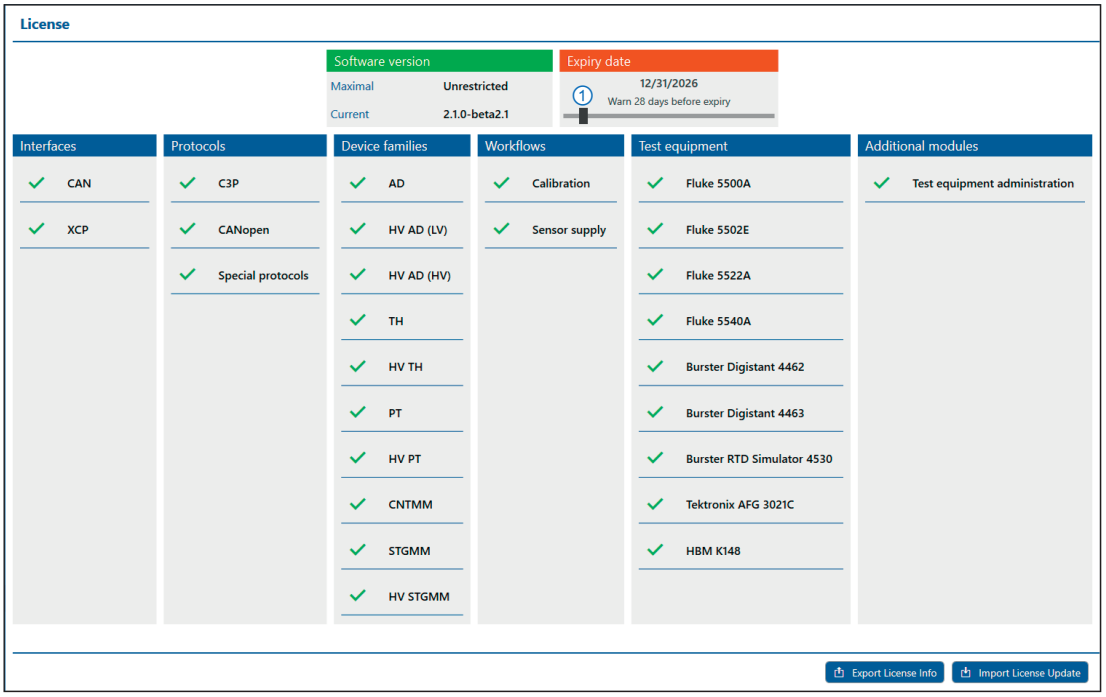


Fig. 3-31: **License** menu

The slider in the info box **Expiry date** (Fig. 3-31, ①) can be used to set the time span in days until the software license expires. At the beginning of the specified time span, a warning message appears after the program start indicating the license expiry date.

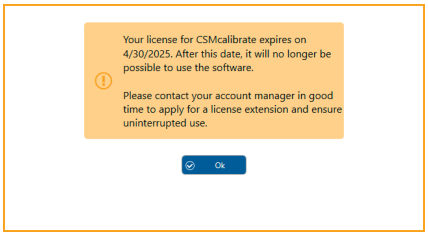


Fig. 3-32: Note on the expiry date of the software license

i	A special license for CSMcalibrate is required in order to calibrate particular CSM measurement modules in CANopen mode and CSM measurement modules using special protocols. For more information, please contact your CSM sales representative.

Buttons for importing and exporting license information/licenses

- **Export License Info** exports details of the currently installed license to a file with the extension *.lif.
- Use **Import License Update** to import a new license file (*.clu) with updated license data.

3.6.2 About

This submenu contains information on the current versions of the program and the database.

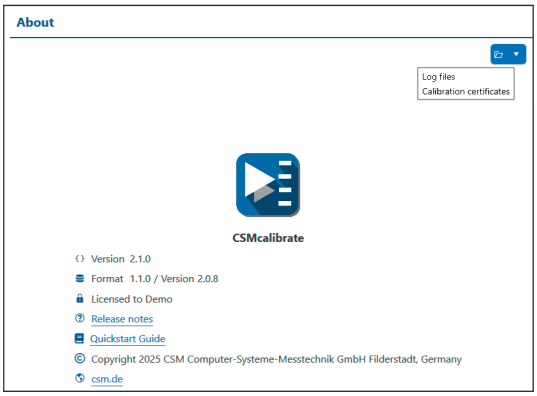


Fig. 3-33: Information on the current software version

- **Version**: Software version number
- **Format/Version**: Version number of database format/version number of database contents
- **Licensed to**: Licensee's name
- **Release notes**: Link to the release notes of the current software version
- **Quickstart Guide**: Link to the CSMcalibrate quickstart guide
- Clicking on the button opens a selection menu with the options **Log files** and **Calibration certificates**.
  - The **Log files** folder is predefined and contains the log files of the program.
  - The **Calibration certificates** folder stores the calibration protocols generated during calibration of the measurement modules. This folder can be configured in the submenu **Output** of the **Customization** menu.

3.6.3 Update

The Database update menu provides options to import database files (*.dbu) containing updated hardware and firmware information.

Current versions displays the version numbers of the current database design (**Format**) and database version (**Version**).

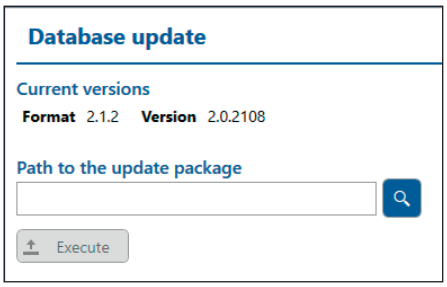


Fig. 3-34: Database update

☞ Select the database file (*.dbu).

☞ Then click the **Execute** button to import the database file.

i	When installing a new program version or importing a new database via **Database update**, a backup of the contents of the previously used database will be created. ▸ The database file is located under **C:\Users\Public\Documents\CSM GmbH\CSMcalibrate\Database**. ▸ The backup file is stored in the **Backup** subfolder of the **Database** folder.

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