



Schaeffler SmartWeb

User manual

Imprint

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1 General

The Schaeffler SmartWeb software offers you a user interface with which you can manage the Schaeffler SmartCheck or ProLink device. For example, you can configure inputs and outputs, use a wizard to create measurement jobs for monitoring your machine, or verify the functions of the SmartCheck or ProLink device. To be able to use the SmartWeb software, the device must be connected to a computer.

About the vibration monitoring systems

SmartCheck and ProLink are vibration monitoring systems for permanent frequency-selective monitoring. They offer you the following functionality:

The Schaeffler SmartCheck system can capture, record and analyse measurement values using two integrated signals and up to three connected signals. After the analysis, the system can switch outputs and display the status using LEDs depending on user-defined alarm limits. Inputs are available, which record additional signals, to allow the device to be integrated into a superordinate system. These signals can be used as command variables for a dependent signal analysis, e.g. to initiate time or event-controlled measurement jobs.

The Schaeffler ProLink system consists of a processor module and at least one vibration module. The system can be extended to a maximum of 4 vibration modules. Up to 4 analogue and 2 digital signals can be connected per vibration module and measured values can be logged, recorded and analysed. After the analysis, the system can switch up to 4 digital outputs per vibration module depending on user-defined alarm limits, and report the state to an external control system, for example. In addition, up to eight analogue or digital inputs or outputs can be created completely flexibly per connected I/O module.

The Schaeffler vibration monitoring system can be used to cover a wide range of applications; the system can be configured to meet your own requirements using the integrated SmartWeb web application. You can combine multiple SmartCheck or ProLink devices in a network. All devices are administered centrally on a PC via the SmartUtility Light software. With the full version of SmartUtility, you can also open the devices directly in the SmartWeb software, analyse measurement data in the SmartUtility Viewer and download configurations and install them on other devices.

With the SmartCheck and ProLink system, Schaeffler offers status monitoring that is optimised to suit your requirements.



1.1 About this guide

This guide describes how to use the Schaeffler SmartWeb software. Read this guide carefully before using the software, and store it in a safe place.

Make sure that

- This guide is available to all users
- If the product is passed on to other users, that this guide is also passed on with it.
- Additions and amendments provided by the manufacturer are always attached to this guide.



System-specific instructions and illustrations

You can use the software described here with both the Schaeffler SmartCheck system and the Schaeffler ProLink system. The usage is largely the same for both systems. The text in this manual always highlights any differences.

Illustrations provide examples to clarify the information and instructions contained in the text. For instances where there is hardly any difference between the systems, we have omitted the illustration of the other system to improve readability and clarity.

Further information

This software is an integral part of the Schaeffler SmartCheck or ProLink vibration monitoring system. These systems also include the Schaeffler SmartUtility Light software. The individual systems and the SmartUtility Light software are described in a separate manual.

Optionally, instead of the Schaeffler SmartUtility Light software, you can purchase the Schaeffler SmartUtility software with enhanced functionality. This is also described in a separate manual.

Definitions

- Product: the Schaeffler SmartWeb software described in this manual.
- User: person or organisation capable of putting the product into operation and using it.

Symbols used



This symbol indicates


- Helpful additional information and
 - device settings or practical tips that will help you to perform activities more efficiently.
-

CAUTION



The damage that can occur is described here

Actions to prevent the damage are explained here.

Cross-reference symbol : This symbol refers to a page in the manual that provides further information. If you are reading the manual in PDF format on a screen, clicking the word to the left of the cross-reference symbol will take you straight to the section in question.

2 Starting the software



Perform a firmware update before commissioning. You can download the latest version via the SmartUtility software or from the microsite for the following systems:

- **SmartCheck:** www.schaeffler.de/condition-monitoring/smartcheck
- **ProLink:** www.schaeffler.de/condition-monitoring/prolink

Only start the SmartWeb software after ensuring the following:

- The system is connected to the Ethernet network or to your computer via the Ethernet cable.
- The system is supplied with power.
- The system has finished loading and starting and is in measuring mode.

Details on how to connect and start your Schaeffler SmartCheck or ProLink device can be found in the user documentation for the relevant vibration monitoring system.

The Schaeffler SmartWeb software can be started in two different ways:

- **Start with IP address in the browser**

The Schaeffler SmartCheck or ProLink device is delivered with the default IP address 192.168.1.100. Enter this IP address in the address field of your browser:

Press the Enter key to start the SmartWeb software.

- **Start-up via the Schaeffler SmartUtility Light or Schaeffler SmartUtility software**

With this software, you can search for and open Schaeffler SmartCheck or ProLink devices with the help of a wizard. In doing so, the SmartWeb software opens in a separate tab of your browser for each device. For more details, refer to the manual for the software SmartUtility Light or SmartUtility.

This option also requires the system to be connected to the Ethernet network or to your computer via the Ethernet cable and supplied with power.



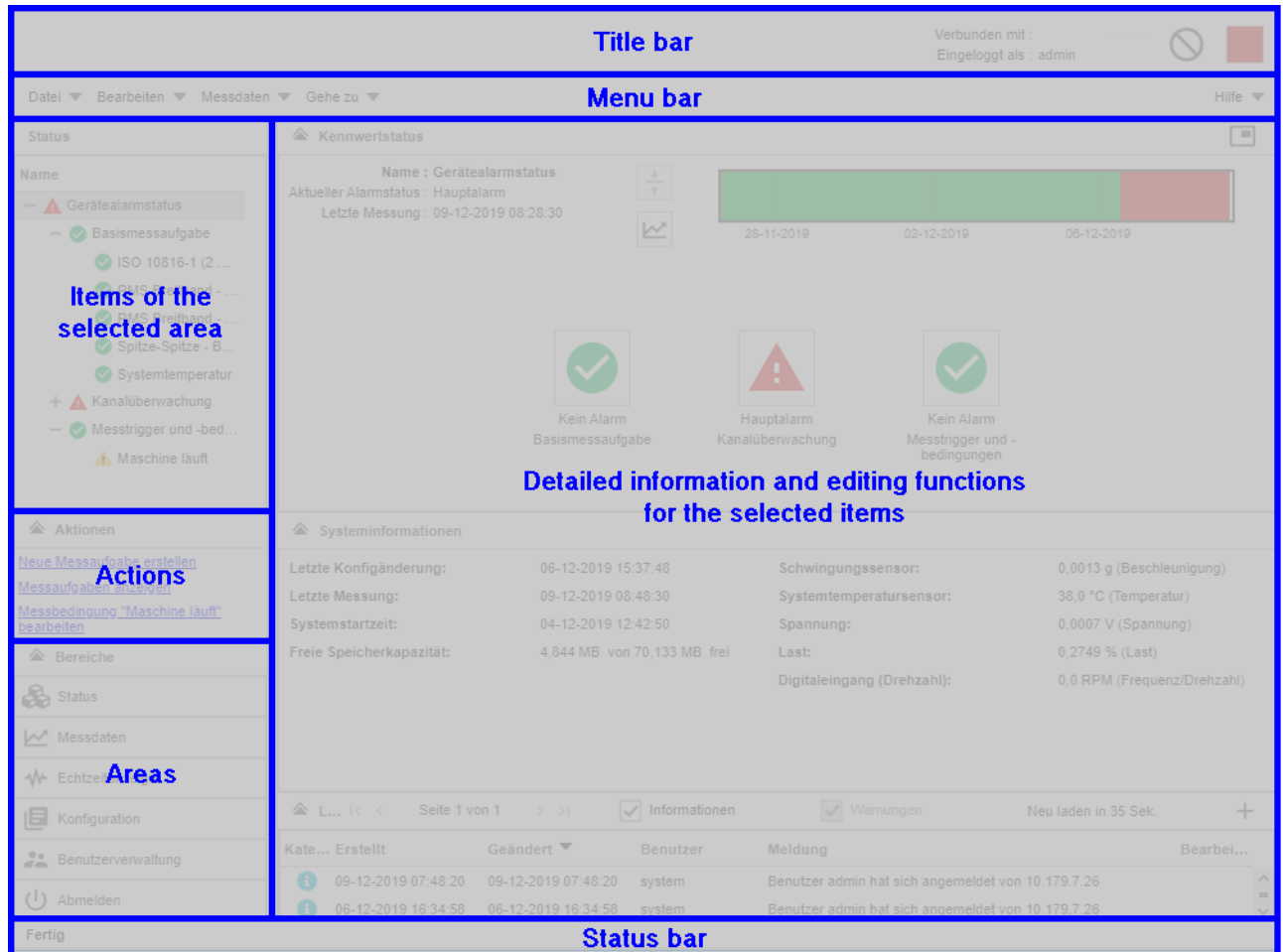
- If you cannot adapt the IP address field on your computer to the default IP address of the Schaeffler SmartCheck or ProLink device, you will need to change the IP address of the Schaeffler SmartCheck or ProLink device. This is possible both with the Schaeffler SmartUtility Light software included in the scope of delivery and with the optional Schaeffler SmartUtility software. Details on this can be found in the respective user documentation.
- If you are using a proxy server between the browser and the internet in your company network, you will need to adjust your browser's internet settings accordingly. To do so, go to Internet Explorer and enter the address and port number of the proxy server under **Tools > Internet options**. Please contact your system administrator for more detailed information about proxy settings.
- Once the SmartWeb software is started, the system time of the Schaeffler SmartCheck or ProLink device is compared with the computer time. The system time can be adjusted ¹⁵⁸ if required.
- The SmartWeb software checks on a regular basis whether SmartUtility or SmartUtility Light has new configurations. If so, the page is reloaded.
- If a Schaeffler SmartCheck or ProLink device cannot be opened in the browser, clear the browser cache and try again.
- If you receive the message stating that cookies are not accepted, please allow the use of cookies or enter the IP address of the Schaeffler SmartCheck or ProLink device as an exception.
- If you are working on a computer with several Schaeffler SmartCheck or ProLink devices, these devices should have identical firmware versions installed. If different firmware versions are installed, this can have undesired effects within the browser.

3 The user interface at a glance



- If the browser window is closed by mistake or the connection to the Schaeffler SmartCheck or ProLink device is interrupted, any settings that you have not yet confirmed with **OK** will be lost. Consequently, always check whether the last change you made via the user interface of the software has actually been adopted.
- If you do not make any changes for more than an hour in the SmartWeb software, you are automatically logged out. You can edit the automatic log-off time ⁹.

The user interface of the Schaeffler SmartWeb software can be divided as follows:




The user interface offers you these options:




Title bar

The following information can be found in the right-hand corner or the title bar:

Connected to: Here you will find the name of the SmartCheck or ProLink device.

Logged in as: Here you will find the user name under which you are currently logged in.

 (SmartCheck only): This symbol indicates which status the "Machine is running" measurement condition has identified for the machine. Under **Measurement conditions** ¹⁰⁶, you can set the criteria for the "Machine is running" measurement condition for your machine. Depending on the status determined, the following symbol is displayed:

- : the "Machine is running" measurement condition is fulfilled: the machine is in operation.
- : the "Machine is running" measurement condition is not fulfilled: the machine is not in operation.
- : If this symbol is visible, at least one characteristic value is in learning mode.

■: The square symbol shows you the alarm status of the SmartCheck or ProLink device; the symbol is displayed in different colours according to the status:

- **Grey:** No characteristic value has yet been measured.
- **Green:** No alarm exists.
- **Yellow:** One or several characteristic values have triggered a pre-alarm.
- **Red:** One or several characteristic values have triggered a main alarm.
- **Alternating between grey and green:** Learning mode is active for one of your measurement jobs. If a pre-alarm or main alarm is triggered during learning, the alarm symbol indicates the respective alarm status without flashing, i.e. it lights up continuously yellow or red.

Menu bar

The following options can be found in the menus:

File

- **Print page:** This command prints the current view of the SmartWeb software. Ensure that you have selected the option for page setup in your browser such that the page is reduced to fit the page size when printing. Find the corresponding option e.g. in Mozilla Firefox (**Shrink to fit Page Width**) and also in Windows Internet Explorer (Enable **Shrink-to-Fit**) under **File > Page Setup**.
- **Save device configuration/Upload device configuration:** These options allow you to save the entire device configuration (except for the network settings), including all device settings and measurement configurations, or to upload a saved device configuration back to a device. This is useful, for example, when replacing a defective device^[17]. The number of modules in the old and new device must match.



Uploading the device configuration to a new SmartCheck or ProLink device will cause the network settings and all existing measurement data to be lost. Back up the measurement data^[52] before uploading the device configuration. After uploading, you must adjust the network settings^[155].

- **Log out:** Use this command to log out of the SmartCheck or ProLink device. The connection to the device is closed.

Edit

The functions available in the **Edit** menu depend on your user rights. Under certain circumstances, some functions are deactivated because you do not have the authorisations for them.

- **Change password:** This command opens the corresponding area^[164] in the SmartWeb software. You can then change your password or the password of the logged-in user.
- **User management:** With each of the commands in this submenu, the corresponding area^[164] in the SmartWeb software opens. You can then make your changes.
- **Device settings:** With each of the commands in this sub-menu, the corresponding area^[155] in the SmartWeb software opens. You can then make your changes. You can also specify the following:
 - **Edit security settings:** You can enter a password for data encryption here. This password is required when an encrypted device configuration is uploaded^[17] to an SmartCheck or ProLink device or when the measurement data downloaded^[52] with the SmartWeb software is to be opened in SmartUtility.
 - **Edit automatic log-off time:** Here you can define that the current user is automatically logged off in the SmartWeb software after a certain period of inactivity. The automatic log-off function is activated by default and is set to one hour. You can only configure the log-off function if the "Edit system settings" user right is activated.



- No other user can access the software as long as you are logged into the SmartWeb software.
- There is a potential security risk if you deactivate the log-off function or set the time frame for logging out as too long, because unauthorised third parties could access the SmartWeb software.

- **Create new measurement job:** This command starts a wizard that guides you through creating a new measurement job [78](#).
- **Edit program settings:** Here you can specify the following:
 - **Units:** Determine the system of units that the SmartWeb software should use. Among other things, this setting affects the dialogues in which you must select a unit.
 - With **ISO**, international units are displayed, e.g. mm/s.
 - With **US**, American units are displayed, e.g. mil/s.
 - With **All**, both international and American units are displayed, e.g. mm/s and mil/s.
 - **Language:** When possible, the SmartWeb software is automatically launched in the language that you have set for your browser. Here you can manually set the language in which the interface of the SmartWeb software is to be displayed.

Measurement data

- **Open measurement data display:** Use this command to go to the **Measurement data** [45](#) area.
- **Download measurement data:** Use this command to open a dialogue in which you can select measurement data for download [52](#).
- **Delete measurement data:** Use this command to open a dialogue in which you can select measurement data for deletion [53](#).

Go to

With the commands in this menu, you can switch to those areas that you can also control via the buttons under **Areas**, i.e. to Status [39](#), Measurement data [45](#), Live view [55](#), Configuration [58](#) and User Management [164](#).

Help

- **Open Help:** Use this command to open a link to the website of the SmartCheck or ProLink device. You can open the SmartWebHelp from there under Downloads.
- **Update firmware** [13](#): Use this command to open a dialogue in which you can update the firmware.
- **Select device restart** [14](#): Use this command to open a dialogue in which you can reset or restart the device. Using this dialogue you can also open the **Maintenance System** of the device or reset the data partition.
- **Install Schaeffler Cloud Onboarding** [16](#): this command opens a dialogue box that allows you to connect the device to Schaeffler Cloud services.
- **View Open Source Licences-** this command opens a window with detailed information about the third-party libraries used by the SmartCheck or ProLink software.
- **Open licence manager** [15](#): Use this command to open the **licence manager** window. In this window, you can view your existing licences or licence group names and add licences or licence groups. You will not be able to use or see functions in the SmartWeb software for which you do not have a licence.
- **Version information:** Use this command to open a window with detailed information about the version of the SmartCheck or ProLink device, including factory firmware, device ID and serial number. You can copy the information to the clipboard using the **Copy as text** button and paste it into a word processor or email..




The settings for **units**, **language**, and **messages** are stored as cookies. When you delete cookies, these settings are also deleted in the SmartWeb software. Next time the SmartWeb software starts, it will be using the pre-set units and the language set for your browser again. Automatic messages are displayed again by default.

The language setting is also influenced by the Schaeffler SmartUtility Light or Schaeffler SmartUtility software: If you open the SmartWeb software via the SmartUtility Light or SmartUtility software, the language setting of the software is used.


Areas

These buttons take you to the different areas of the SmartWeb software. You can also log out of the SmartCheck or ProLink device here:



Status:  Detailed information on the system and on the status of the measurement jobs and their characteristic values can be found here. You can see at a glance which measurement jobs are active or scheduled and which characteristic values have triggered an alarm. You can also track the activity of the SmartCheck or ProLink device using the entries in the logbook.




Measurement data:  The measurement data for specific characteristic values can be displayed in this area. The display includes trends, time signals and spectral data.




Live view:  The signals of the configured inputs can be displayed here in real time.



Configuration:  This area is particularly significant when setting up a new SmartCheck or ProLink device: This is where you create measurement jobs, configure inputs and outputs, make basic device settings, and edit the databases for bearings and bearing manufacturers. You will also find details about the modules of the ProLink system.



User management:  Here you can create, delete and manage users and user groups, as well as change your password or the password of the user currently logged in. In addition, you will find in this area the functions for activating and deactivating user management.



Log out: Click on this button to log out of the SmartCheck or ProLink device and close the SmartWeb software.

Actions

Here you will find the selected important actions, which are either possible in the current area or lead to another area as a link. For example, if you have opened the **Measurement data** area, you will find the following commands here: **Show measurement jobs**, **Download measurement data** and **Delete measurement data**.

Items of the selected area

What you see here depends on the current area. For example, if you have opened the **Configuration** area, you can select individual configuration items - such as **Measurement Jobs** or **Measurement Conditions** - here and then view information about them in the main panel of the SmartWeb software and make further edits.

Detailed information and editing functions for the selected items

If you have selected an item on the left, you will see detailed information on it in the main panel of the SmartWeb software and can make further edits. What exactly is possible depends on your particular selection.

Status bar

The status bar informs you e.g. whether your browser has already finished loading the selected new area.



You can use the separator between the overview columns on the left and the main panel on the right to adapt the interface of the SmartWeb software to suit your requirements:

- Holding down the left mouse button, drag the separator to the left or the right to alter the size of the respective surface.
- Click on the separator to hide the overview columns on the left. This enlarges the main panel to fill the full screen width. Click again on the separator to restore the view.

At many points in the interface, items are displayed in a tree structure. To see subordinate items, click on **+**; to hide them again, click on **−**.

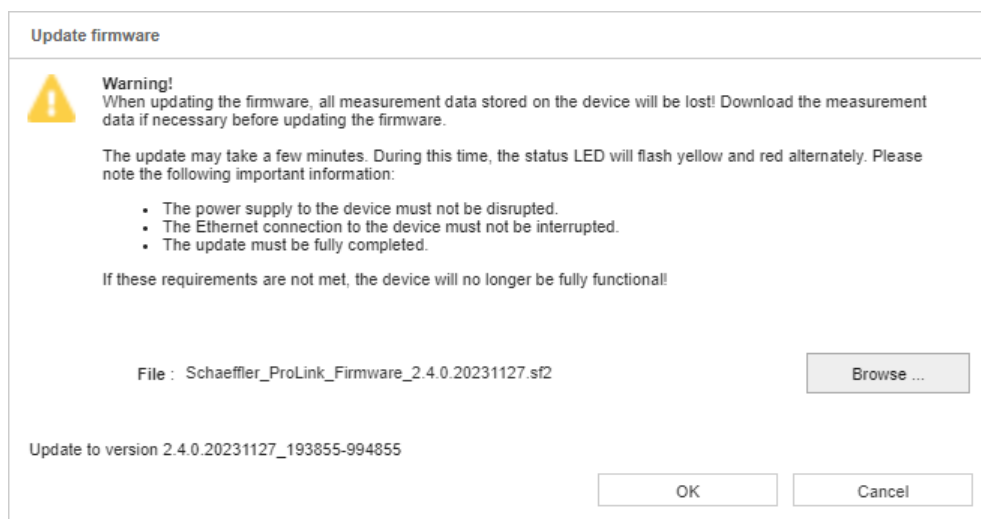
In some areas of the SmartWeb software, the information is presented in tables. You can structure tables using the following functions:

- **Columns as sort criteria:** Set any column of a table as a sort criterion by clicking in the column title. Click a second time to change the sort order, i.e. from ascending to descending or vice-versa. The current sort order is displayed by the symbols ▲ for ascending and ▼ for descending.
 - **Move columns:** Move any column to another position in the table. To do this, click with the left mouse button in the column title and hold down the mouse button. Then drag the cursor to the position in the table you want the column to appear in future.
-

3.1 Update firmware

How to update the firmware

1. From the **Help** menu, select the **Update firmware option** in order to open the corresponding window:



2. Click **Browse** to locate and select the firmware file.
3. Click **OK** to update the SmartCheck or ProLink device with the selected firmware. Click **Cancel** to close the window without applying any changes.



- When the firmware is updated, all measurement data and configurations on the device may be lost. Before updating, save everything by downloading measurement data and, if applicable, configurations with the SmartUtility software. The taught-in alarm limits are part of the configuration and are downloaded at the same time.
- The update can take several minutes. The status LED on your SmartCheck or ProLink device will flash yellow and red alternately during this time. The following is very important in this process:
 - The power supply to the SmartCheck or ProLink device must not be interrupted.
 - The Ethernet connection to the SmartCheck or ProLink device must not be interrupted.
 - The update must be fully completed.

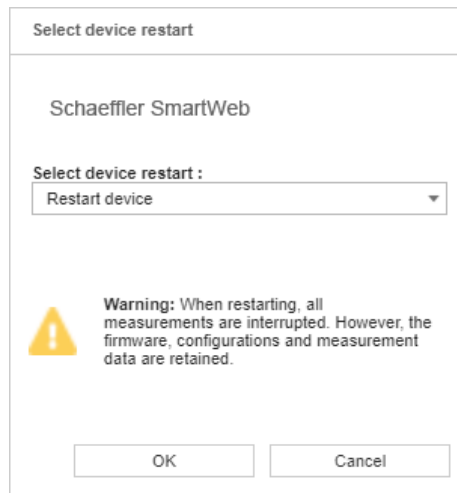
The device is no longer functional if these conditions are not met!

- If a serious error occurs during a firmware update, the device is reset to the factory firmware. You can find the version of your factory firmware under **Help > Version information**.
- After you have performed the firmware update, empty the browser cache. This is necessary to ensure that the latest version of the Schaeffler SmartWeb software is loaded in your browser.

3.2 Select device restart

To select the device restart, proceed as follows

1. From the **Help** menu, select the **Select device restart** option to open the corresponding window:



2. Select the required option from the list box:

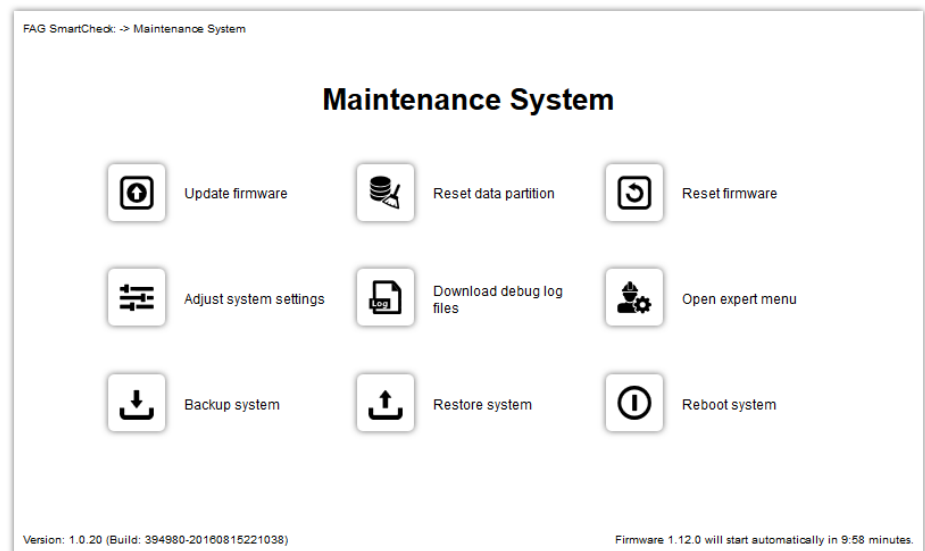
Restart device

This option restarts the SmartCheck or ProLink device:

- Current measurements are interrupted.
- Existing measurement data, configurations and the firmware are retained.

Start the device's Maintenance System

You use this option to start the **Maintenance System** of the device. Here you will find extensive maintenance functions, including for firmware update, device configuration and system back-up. The Maintenance System also contains further options for restarting the device.



When User management is activated ¹⁶⁵, a logon dialogue appears first. You can only log on to the Maintenance System as an administrator and using the administrator password.

Reset data partition

This option resets the data range:

- All existing measurement data is lost.
- Firmware and configurations, including taught-in alarm limits, are retained.

Restore factory default setting

This option restores the SmartCheck or ProLink device to the factory default setting:

- All existing measurement data is lost.
- All taught-in alarm limits are deleted.
- All configurations are lost.
- The firmware is reset to the factory default firmware.

To save measurement data, taught-in alarm limits and configurations, download the measurement data and configurations with the SmartUtility software before you restore the factory default setting. The taught-in alarm limits are part of the configuration and are downloaded at the same time. After restoring the factory settings, the Schaeffler SmartCheck or ProLink device can be reached at the IP address defined by you. Click **Cancel** to close the window without applying any changes.

3. Click **OK** to reset the SmartCheck or ProLink device with the selected option.



Ensure that the device is accessible and then install the latest firmware.

3.3 Add licences or licence groups

Some features of the SmartWeb software require additional licences or licence groups. You will receive an additional licence or licence group by email and can be added via the **licence manager**. Open the licence manager in the **Help** menu using the **Open licence manager** option:

Licence name	Valid from	Valid until
Channel Monitoring	Email	OPC/UA PROFINET

Text area for pasting licence information.

Buttons: Add, Close

You can find a list of licences that are installed on your SmartCheck or ProLink device here, including the following information:

Licence name Here you can find the name of the licence. The name refers to the function that is enabled by the licence.

Valid from/valid until This data indicates the period of time for which the licences are valid.

How to add licences or licence groups

1. From the **Help** menu, select the **Open licence manager** option to open the corresponding window:
2. Click on the **Add** button. The **Add licences or licence groups** window opens.
3. Open the TXT licence document that you received by email in a text editor.
4. Copy the content of the document to the clipboard.
5. Click in the text area of the **Add licences or licence groups** window and paste the document content from the clipboard.
A message informing you about the valid licences and licence groups contained in the pasted document appears below the text area:

Add licences or licence groups

Schaeffler SmartWeb

You have received an licence document via email. Please open the document in a text editor and copy and paste the content of the file here :

```
<syn:Licenses>
<syn:License>
  <syn:Properties>
    <syn:Id>A515FF31-B993-481D-A000-000000000005</syn:Id>
    <syn:Name>Channel Monitoring</syn:Name>
    <syn:Scope>
      <syn:SerialNumber>F4:3D:80:00:1C:99</syn:SerialNumber>
    </syn:Scope>
    <syn:ValidUntil>2020-12-31T00:00:00Z</syn:ValidUntil>
  </syn:Properties>

  <syn:Key>LBfVpJOKNXUC6hmQxn0e8CsiQqtWcp/uwRI0jTR36wDcQndzoJdMM6uXxmSYGiglGdr6RYlvf7d5FwV+i2Pf21drCpH2kh1HZemqLuzn
  tDgmV54n8g+gP+jAfKvQgraNg0Qj2oMZij6gUmzpw0qUkLJ2zAMIDlivPPriKmqLdAy9bddXGoY4K2Cj9lj3qKFhZWjgqsmUUknUljXOxG+MZssA7Hpj
  y5vGMSX9NidiGrZi4kZ+PwW94pilPYIKDbHfvxoBoQL8LThKssORLWzJbr/9J2t2NdF78CzcOmSOGDbmlics0sabbkgr2aYkV5N9h8GvkDxQx3nXVITX
  GZQ==</syn:Key>
</syn:License>
<syn:License>
  <syn:Properties>
    <syn:Id>A515FF31-B993-481D-A000-000000000007</syn:Id>
    <syn:Name>Email</syn:Name>
    <syn:Scope>
      <syn:SerialNumber>F4:3D:80:00:1C:99</syn:SerialNumber>
    </syn:Scope>
    <syn:ValidUntil>2020-12-31T00:00:00Z</syn:ValidUntil>
  </syn:Properties>

  <syn:Key>OMbt5CtX5zJ5RadmVRo3BaXOaYm1s/D5Fo/9t45Kc4F0gl0IFCnAMbulKW4ONGK37q42ldkG5wRTb/8KpggbZRPoe9GpYJgFzHsw2+e
  dNFVFLhjsqik3BKREmWCaTPkrT9jQ0tgFQQfyHWPwl5sG8fEHKYQY+cN8RapdMxOSqWDju/vjTqZdDRyHnbDqv3qSgUeny297t+r1FGellkC0lwwJ
  Ow5xVo8RWVoRk2q3rjNDeSXGIQFcA122iP3NiGpFv03BbC1K/CIFsNdGaysApelMUrot7F7Xe3Ljw65SE/GVOJZswLVmbxu1H/0TjJGcuZGfMVCd+
  5Du2EMoGSDA==</syn:Key>
</syn:License>
<syn:License>
  <syn:Properties>
    <syn:Id>A515FF31-B993-481D-A000-000000000008</syn:Id>
    <syn:Name>Channel Monitoring</syn:Name>
    <syn:Scope>
      <syn:SerialNumber>F4:3D:80:00:1C:99</syn:SerialNumber>
    </syn:Scope>
    <syn:ValidUntil>2020-12-31T00:00:00Z</syn:ValidUntil>
  </syn:Properties>
  <syn:Key>LBfVpJOKNXUC6hmQxn0e8CsiQqtWcp/uwRI0jTR36wDcQndzoJdMM6uXxmSYGiglGdr6RYlvf7d5FwV+i2Pf21drCpH2kh1HZemqLuzn
  tDgmV54n8g+gP+jAfKvQgraNg0Qj2oMZij6gUmzpw0qUkLJ2zAMIDlivPPriKmqLdAy9bddXGoY4K2Cj9lj3qKFhZWjgqsmUUknUljXOxG+MZssA7Hpj
  y5vGMSX9NidiGrZi4kZ+PwW94pilPYIKDbHfvxoBoQL8LThKssORLWzJbr/9J2t2NdF78CzcOmSOGDbmlics0sabbkgr2aYkV5N9h8GvkDxQx3nXVITX
  GZQ==</syn:Key>
</syn:License>
</syn:Licenses>
```

0 valid licence group(s) and 8 valid licence(s) have been found.

Add Close

6. Click on **Add**. The licence or licence group you added appears in the overview of the **licence manager** window.

How to delete licences

Select the corresponding licence in the licence manager, click on **Delete** and confirm with **OK**. The **Channel monitor**, **OPCUA** and **Email** licences cannot be deleted.

3.4 Connect Schaeffler Cloud services


If you want to connect the SmartCheck device or ProLink device to the Schaeffler Cloud services, you need a configuration file. Further information on this can be found here.

This is how you create a connection to the Schaeffler Cloud services

1. From the **Help** menu, select the **Install Schaeffler cloud onboarding** option to open the appropriate window:

Install Schaeffler cloud onboarding

You need a configuration file to use the Schaeffler Cloud. You can find further information on the Internet at: www.schaeffler.com

 -

Browse...

OK Cancel

2. Click on **Browse** to locate and select the configuration file.

3. Click on **OK** to save the new input. Click on **Cancel** to close the window without applying any changes.



This step automatically creates the Communication channel for the Schaeffler Cloud¹⁵⁵ and makes all necessary settings for data transmission. If necessary, you must adjust the proxy settings¹⁵⁵.

3.5 Replace a defective device

If you need to replace a defective SmartCheck or ProLink device, you can use the **Save device configuration** and **Upload device configuration** features to quickly restore the device settings:

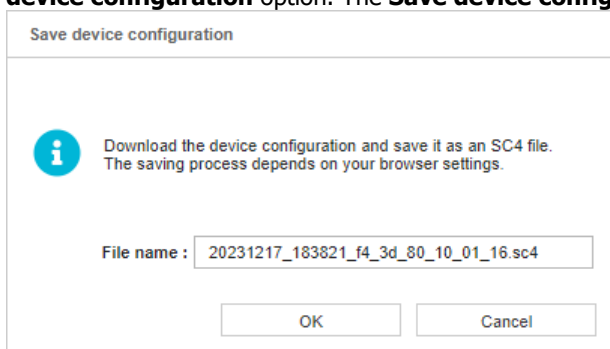
- **Save device configuration** saves all measurement configurations and all device settings for the device, except the network settings.
- Use **Upload device configuration** to load these settings onto a new device.




- Uploading the device configuration to a new SmartCheck or ProLink device will cause the network settings and all existing measurement data to be lost. Back up the measurement data  before uploading the device configuration. After uploading, you may need to adjust the network settings .
- You can replace individual vibration modules or I/O modules, as well as the entire unit with the processor module. If you replace only an individual module, existing measurement jobs will be adjusted to use the new module. If you replace multiple modules of a single type, i.e. multiple vibration modules or multiple I/O modules, they are assigned to a configuration based on the alphabetical order of the module serial numbers.

Proceed as follows:

1. In the SmartWeb software for the defective SmartCheck or ProLink device, open the **File** menu and select the **Save device configuration** option. The **Save device configuration** dialogue opens:




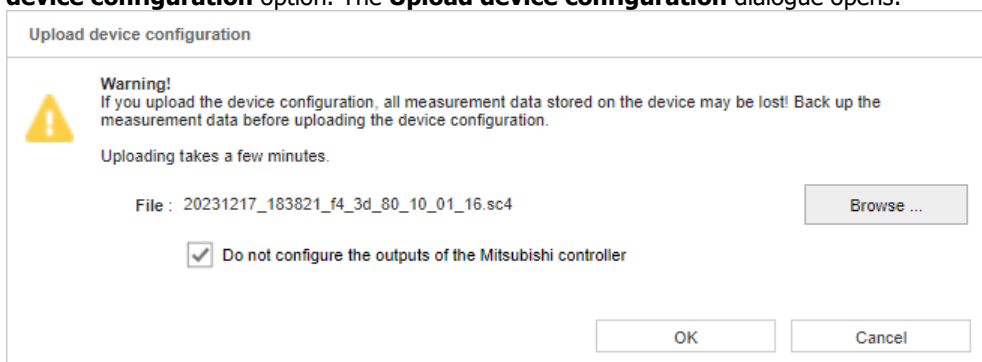
Save device configuration

 Download the device configuration and save it as an SC4 file. The saving process depends on your browser settings.


File name : 20231217_183821_f4_3d_80_10_01_16.sc4

OK Cancel

2. Click **OK** to start the preset save process in your browser and save the device configuration.
3. If necessary, back up the measurement data .
4. Remove the defective SmartCheck or ProLink device from your system.
5. Insert the new SmartCheck or ProLink device into your system.
6. In the SmartWeb software for the new SmartCheck or ProLink device, open the **File** menu and select the **Upload device configuration** option. The **Upload device configuration** dialogue opens:



Upload device configuration

 **Warning!**
If you upload the device configuration, all measurement data stored on the device may be lost! Back up the measurement data before uploading the device configuration.

Uploading takes a few minutes.

File : 20231217_183821_f4_3d_80_10_01_16.sc4 Browse ...

☒ Do not configure the outputs of the Mitsubishi controller

OK Cancel

7. Click **Browse** and select the file with the extension .SC4 that you downloaded from the defective SmartCheck or ProLink device.


You have the following options:

Password

You can specify the data encryption password here if the configuration file was encrypted on the original device. Select **Show password** to make the password visible while you enter it.

Do not configure the outputs of the Mitsubishi controller

If the configuration file contains outputs for controllers, you can determine here whether they are also configured. All devices to which you send these outputs will write to the same registers of the controller. For this reason, the option is enabled by default. The communication channel, i.e. the settings for the controller, is always transmitted.

8. Click **OK** to transfer the saved device settings to the new SmartCheck or ProLink device.
9. If necessary, adjust the network settings  ¹⁵⁵.
10. The new device is integrated into your network and all measurement jobs are adopted.

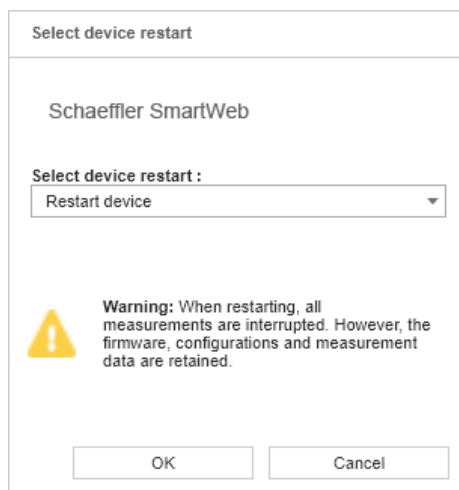
4 Maintenance system of the device

The maintenance system of the Schaeffler SmartCheck or ProLink device provides you with comprehensive maintenance functions. You can use this system, for example, to update the firmware, configure the SmartCheck or ProLink device, to back up a system, or to restore a system from back-up. You can also use the latter function to duplicate devices. The Maintenance System also offers securely protected expert functions for updating the Maintenance System or for deleting the entire system on a SmartCheck or ProLink device among other things.

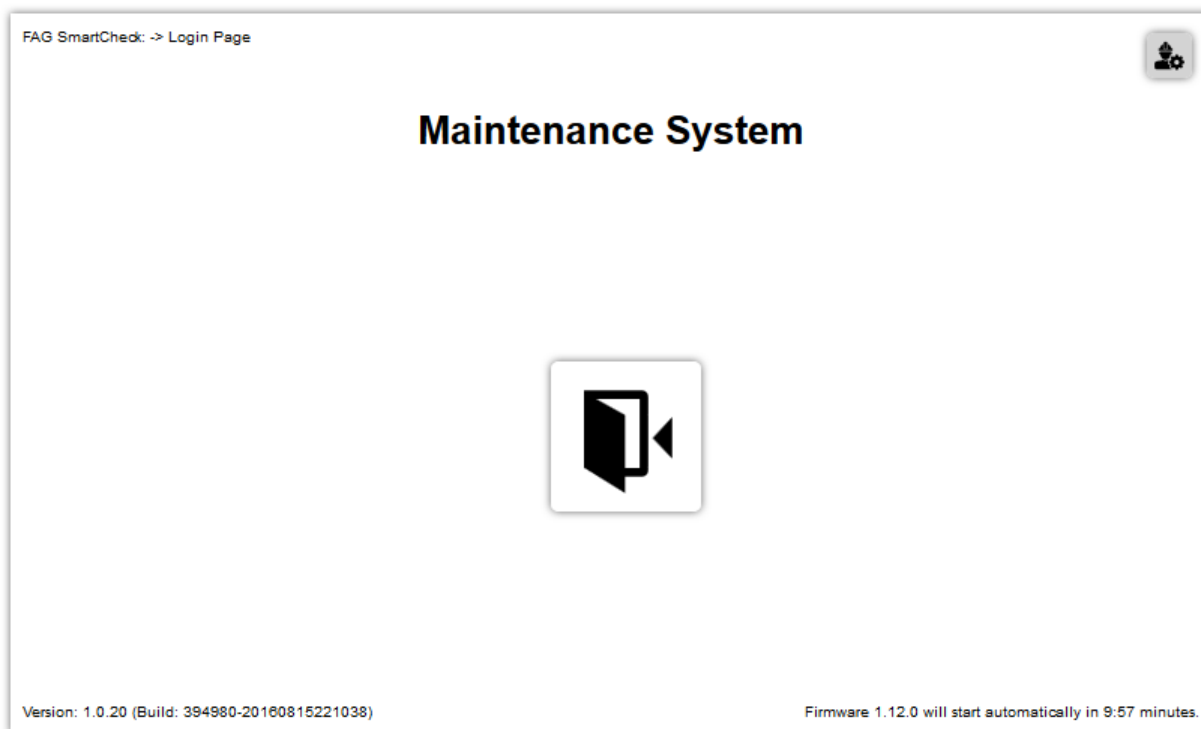
The Maintenance System is only available in English. It is independent of the actual firmware on the device and can also be accessed via the browser, for example, if a firmware update has not run correctly.

To open the Maintenance System of the SmartCheck or ProLink device, proceed as follows:

1. From the **Help** menu, select the **Select device restart** option to open the corresponding window:

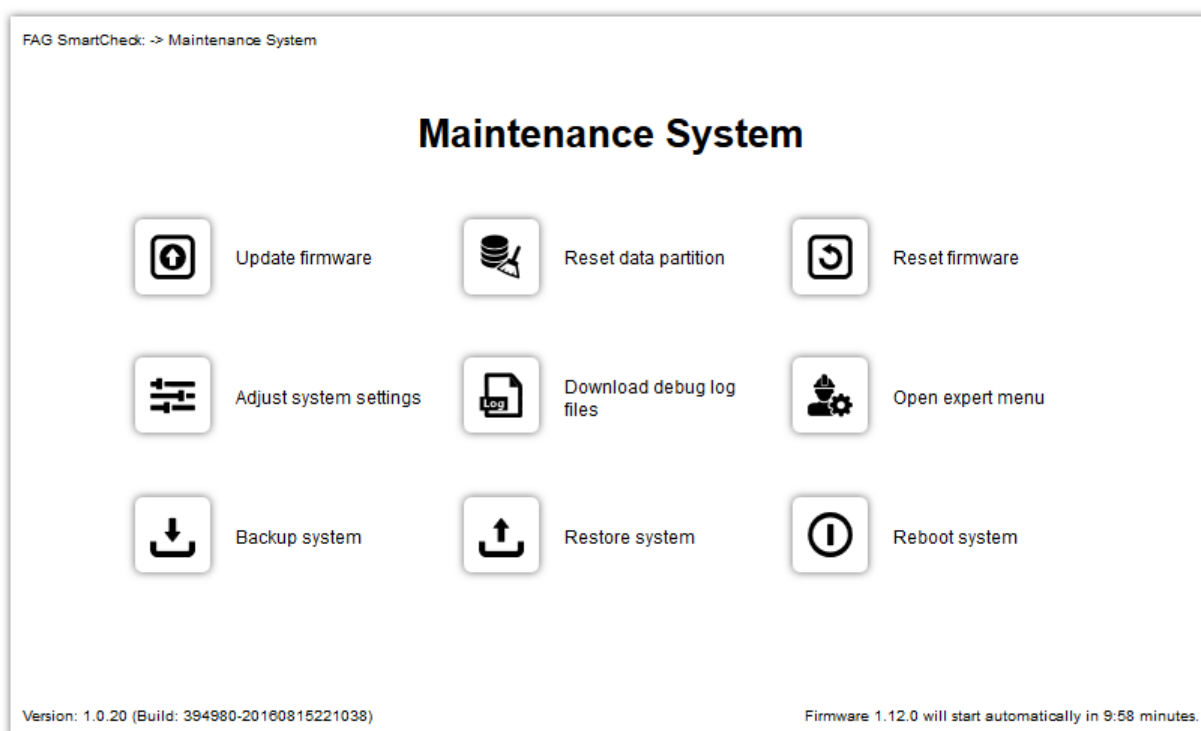


2. From the drop-down list, choose the option **Start the device's Maintenance System**.
3. Click on **OK**. The log-in page for the Maintenance System is displayed:




4. Click on the **Login** button to open the start page of the Maintenance System. Use the **Expert Menu** button to directly access the Expert menu. If user management is activated in the SmartCheck or ProLink firmware, a log-in dialogue appears in which you are

required to log in as an administrator using the administrator password. If user management is deactivated, the start page opens directly:




5. On the start page, click on an icon to select the relevant function. Depending on the function you choose, you will then need to perform further steps or select sub-functions in a submenu. For information on the individual functions of the Maintenance System, see the following sections.



- If the Maintenance System is started, the SmartCheck or ProLink device interrupts all measurements.
- If you have opened a function of the Maintenance System, the **Homepage**  button is displayed at the top right. Click on this button to return to the start page of the Maintenance System.
- The Maintenance System has a timer function: if you do not make any changes for a certain period of time, the device is automatically restarted. The length of time depends on where you are in the Maintenance System:
 - Login page of the Maintenance System: restart after 2 minutes
 - Start page of the Maintenance System and all function pages: restart after 10 minutes
 - Login page of the expert menu **Expert Menu**: 60 minutesThe remaining time until the device restarts is always displayed at the bottom right.

4.1 Update firmware

Click on the button **Update firmware**  to start this function. You can update your system with a new firmware version here. This does not delete the measurement data.




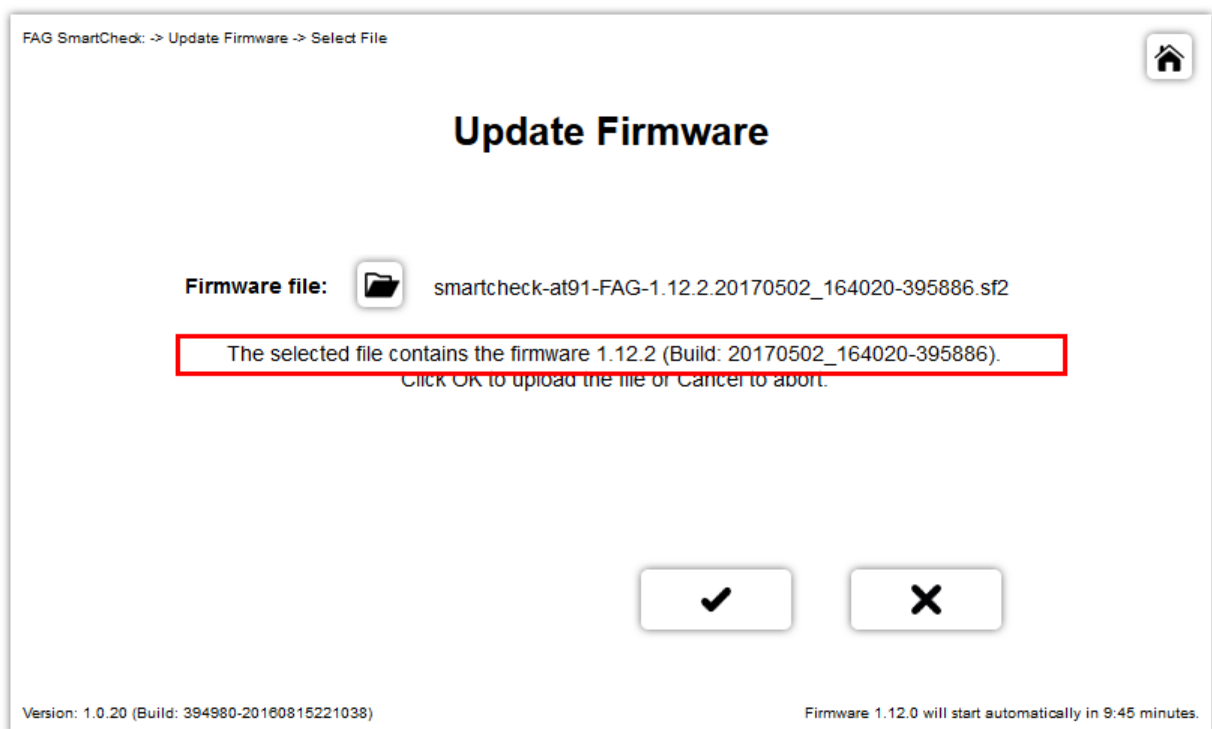
Depending on the version of your firmware, you can also use this function to downgrade to a previous firmware version. In this case, the measurement data is also deleted.

The option to downgrade is available as follows:

- Up to the release of SmartCheck version 1.10.0 or ProLink version 1.18.0: Downgrading to previous versions is possible
- From the release of SmartCheck version 1.10.0 or ProLink version 1.18.0: Downgrading is possible only up to version 1.10.0 or 1.18.0

How to update the firmware

1. Click on the **Select file**  button and search for the SF2 file containing the required firmware.
2. Open the SF2 file. The system analyses the file and informs you whether the update is possible, and if yes, which firmware will be installed:



If the selected file is not a valid firmware file, you will be informed of this too.

3. Click on the **OK**  button to start the update.




- When the firmware is updated, all measurement data and, in some cases, also the configurations on the device are lost. Before updating, save everything by downloading measurement data and, if applicable, configurations with the SmartUtility software. The taught-in alarm limits are part of the configuration and are downloaded at the same time.
- The update can take several minutes. The status LED on your SmartCheck or ProLink device will flash yellow and red alternately during this time. The following is very important in this process:
 - The power supply to the SmartCheck or ProLink device must not be interrupted.
 - The Ethernet connection to the SmartCheck or ProLink device must not be interrupted.
 - The update must be fully completed.

The device is no longer functional if these conditions are not met!


- If a serious error occurs during a firmware update, the device is reset to the factory firmware. You can find the version of your factory firmware under Help > Version information.
 - After you have performed the firmware update, empty the browser cache. This is necessary to ensure that the latest version of the Schaeffler SmartWeb software is loaded in your browser.
-


4.2 Reset data partition

Click on the button **Reset data partition**  to start this function. Here you can reset the data partition. This deletes all measurement data from the system. The measurement configurations are retained.


Click on **OK**  to reset the data partition.

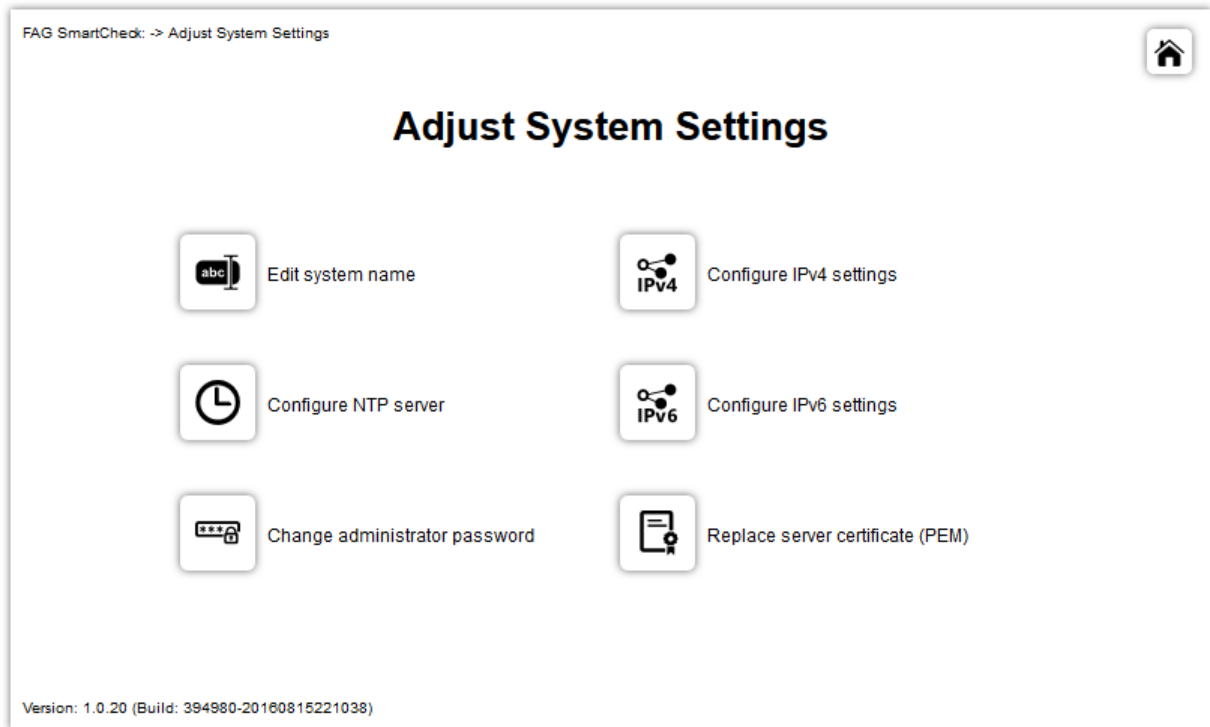
4.3 Reset firmware

Click on the **Reset firmware**  button to start this function. Here you can format the data partition. In this process, all measurement configurations and measurement data of the system are deleted and the default measurement configuration is restored.

Click on **OK**  to reset the firmware.


4.4 Adjust system settings

Click on the **Adjust system settings**  button to open the menu containing the system setting functions:



Click on one of the buttons to open the corresponding function. The following sections contain more information about the individual functions.


4.4.1 Edit system name

Click on the **Edit system name**  button to start this function. Here you can define a new name for your SmartCheck or ProLink device.

To edit the system name, proceed as follows:

1. In the input field, enter the new name for your SmartCheck or ProLink device:



FAG SmartCheck: -> Adjust System Settings -> Edit System Name



Edit System Name

System name:


Enter system name and click OK to save or Cancel to abort.

Version: 1.0.20 (Build: 394980-20160815221038)

2. Click on **OK**  to confirm the name.


4.4.2 Configure NTP server

Click on the **Configure NTP server**  button to start this function. Here you can define an NTP server from which the SmartCheck or ProLink device can obtain the system time.

To configure the NTP server, proceed as follows:

1. Enter the IP address of the NTP server or the NTP server name in the input field:

FAG SmartCheck: -> Adjust System Settings -> Configure NTP Server



Configure NTP Server


NTP server:

Here you can configure an NTP server from which the system can load the system time.

Enter the NTP server address and click OK to proceed or Cancel to abort.

✓
✗


Version: 1.0.20 (Build: 394980-20160815221038)

2. Click on **OK**  to confirm the IP address or the NTP server name.



- If you use the NTP server name, you must enter a DNS server or set it using DHCP.
- If the system time is based on an NTP server, synchronization runs constantly. For this method, therefore, the SmartCheck or ProLink device must have a permanent connection to the network, and the NTP server must always be accessible.


4.4.3 Change administrator password

Click on the **Change administrator password**  button to start this function. Here you can change the administrator password for user management.


To change the administrator password, proceed as follows:


1. Enter the new password in the field **Administrator password**.
2. Repeat this password in the field **Reenter password**:

FAG SmartCheck: -> Adjust System Settings -> Change Administrator Password





Change Administrator Password

1.  Administrator password:


2.  Reenter password:

Here you can change the administrator password.
Note: Leaving the password empty will disable the user management.


Click OK to proceed or Cancel to abort.

Version: 1.0.20 (Build: 394980-20160815221038)


3. Click on **OK**  to confirm the new password.



If you enter an administrator password here, user management  is activated automatically on the SmartCheck or ProLink device.

If you do not enter an administrator password here, user management is deactivated on the SmartCheck or ProLink device.


4.4.4 Configure IPv4 settings

Click on the **Configure IPv4 settings**  button to start this function. Here you can edit the IPv4 network settings.

To edit the IPv4 network settings, proceed as follows:

1. Select the required DHCP mode from the list **DHCP mode**:

FAG SmartCheck: -> Adjust System Settings -> Configure IPv4 Settings



Configure IPv4 Settings

DHCP mode:

Host name:

IP address:

Netmask:

Gateway:

Name server:

Select the DHCP mode and configure the network settings for IPv4.

Click OK to proceed or Cancel to abort.

Version: 1.0.20 (Build: 394980-20160815221038)

You have the following options:

No DHCP

With this option, you can specify the IPv4 address or continue to use the default IP address of the SmartCheck or ProLink device.


If **No DHCP** is activated, you must also specify the other settings in this step, e.g. **IP address**, **Netmask** or **Gateway**.

DHCP: Send host name to server

With this option, the SmartCheck or ProLink device automatically receives an IP address within your network. The host name is registered by the SmartCheck or ProLink device in the network's DNS server.

DHCP: Load host name from server


With this option, the SmartCheck or ProLink device automatically receives an IP address within your network. The host name is specified via the network's DNS server.

2. Depending on the selection for **DHCP mode**, you will need to make further entries under **Host name**, **IP address**, **Netmask**, **Gateway** or **Name server**.
3. Click on **OK**  to confirm the changes and return to the system settings menu.



- If you change the IP address of the SmartCheck or ProLink device, you no longer have access to the SmartWeb software at the previous address. You must then enter the new address of the device in the browser in order to load the software and the Maintenance System again.
- If the IP address is allocated automatically via DHCP, the SmartCheck or ProLink device can only be accessed via the automatically allocated IP address or using the host name (DNS). You can no longer use the default IP address.

4.4.5 Configure IPv6 settings

Click on the **Configure IPv6 settings**  button to start this function. Here you can edit the IPv6 network settings.

To edit the IPv6 network settings, proceed as follows:

1. Select the required DHCP mode from the list **DHCP mode**:

FAG SmartCheck: -> Adjust System Settings -> Configure IPv6 Settings

Configure IPv6 Settings

DHCP mode:

IP address:

Netmask:

Gateway:

Name server:

Select the DHCP mode and configure the network settings for IPv6.

Click OK to proceed or Cancel to abort.

Version: 1.0.20 (Build: 394980-20180815221038) Firmware 1.12.0 will start automatically in 9:57 minutes.

You have the following options:

No DHCP

With this option, you can specify the IPv4 address or continue to use the default IP address of the SmartCheck or ProLink device.

If **No DHCP** is activated, you must also specify the other settings in this step, e.g. **IP address**, **Netmask** or **Gateway**.

DHCP: Load host name from server


With this option, the SmartCheck or ProLink device automatically receives an IP address within your network. The host name is specified via the network's DNS server.

- Depending on the selection for **DHCP mode** you will need to make further entries under **IP address**, **Netmask**, **Gateway** or **Name server**.
- Click on **OK** ✓ to confirm the changes and return to the system settings menu.




- If you change the IP address of the SmartCheck or ProLink device, you no longer have access to the SmartWeb software at the previous address. You must then enter the new address of the device in the browser in order to load the software and the Maintenance System again.
- If the IP address is allocated automatically via DHCP, the SmartCheck or ProLink device can only be accessed via the automatically allocated IP address or using the host name (DNS). You can no longer use the default IP address.

4.4.6 Replace server certificate (PEM)


Click on the **Replace server certificate (PEM)**  button to start this function. Server certificates are used for authentication of the server by the client. Here you can replace the server certificate that is defined on the SmartCheck or ProLink device with your own server certificate.

To replace the server certificate of the SmartCheck or ProLink device, proceed as follows:

- Click on the button **Server certificate file**  and search for the PEM file containing the required server certificate.
- Open the PEM file and, if necessary, enter the password for the PEM file in the field **Passphrase**:

FAG SmartCheck -> Adjust System Settings -> Replace Server Certificate -> Select File

Replace Server Certificate

Server certificate file:  server2.pem

Passphrase:

Click OK to upload the server certificate or Cancel to abort.

✓
✗

Version: 1.0.20 (Build: 394980-20160815221038) Firmware 1.12.0 will start automatically in 9:52 minutes.

3. Click on **OK** ✓ to upload the certificate. The system analyses the file and informs you if can install the file:

FAG SmartCheck -> Adjust System Settings -> Replace Server Certificate -> Install

Replace Server Certificate

```

cert. version : 1
serial number : 88:C9:63:FA:28:A3:92:86
issuer name : C=DE, ST=BY, L=Schweinfurt, O=Schaeffler Technologies GmbH & Co. KG, OU=,
CN=www.fag-smartcheck.com, emailAddress=industrial-services@schaeffler.com
subject name : C=DE, ST=BY, L=Schweinfurt, O=Schaeffler Technologies GmbH & Co. KG, OU=,
CN=www.fag-smartcheck.com, emailAddress=industrial-services@schaeffler.com
issued on : 2016-07-14 08:27:02
expires on : 2026-07-15 08:27:02
  
```

The server certificate is ready to be installed.

Click OK to install or Cancel to abort.


✓
✗

Version: 1.0.20 (Build: 394980-20160815221038) Firmware 1.12.0 will start automatically in 9:46 minutes.


If the file does not contain a valid server certificate, you will be informed of this too.

4. Click on **OK** ✓ to install the server certificate.

4.5 Download debug log files

Click on the button **Download debug log files**  to start this function. Here you can create and download an error log file. You cannot view this file yourself. You need to send it to our Support team where it can be analysed.

To download the log files, proceed as follows:

1. Click on **OK**  to start the action.
2. The error log file is downloaded. A progress bar informs you of the progress.
3. Your browser prompts you to save the file. Confirm this prompt. You can then find the error log file *.SCLG in the standard download folder.

4.6 Open expert menu


Click on the **Open expert menu**  button to start the secure log-in process for the expert menu.

The expert menu contains functions that you can use to change the basic settings of the Schaeffler SmartCheck or ProLink device. Because these are system-critical settings, the expert menu can only be opened via the secure log-in process with a single-use password. The following section contains information about the secure log-in process.

To perform the secure log-in process, proceed as follows:


1. On the start page of the log-in process, you will find an ID. Share this ID with our Support team, e.g. by email or telephone.

FAG SmartCheck: -> Open Expert Menu -> Login




Open Expert Menu - Access Verification


This section is password protected. Please call the customer support to generate a one-time password from this ID:

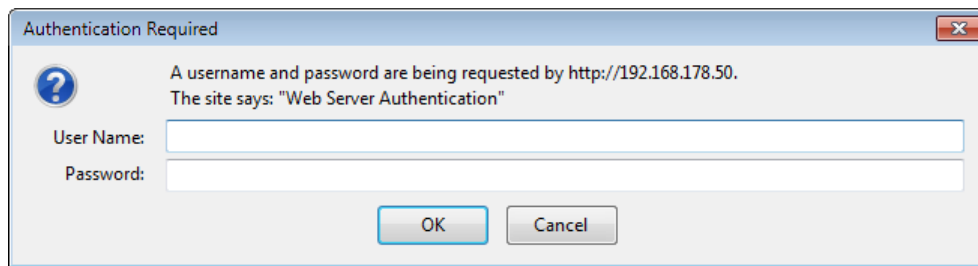
 **fa4bbc87**


Click the button below to log into the restricted area. Enter the user and the generated password for authentication. The password is valid until next system reboot.

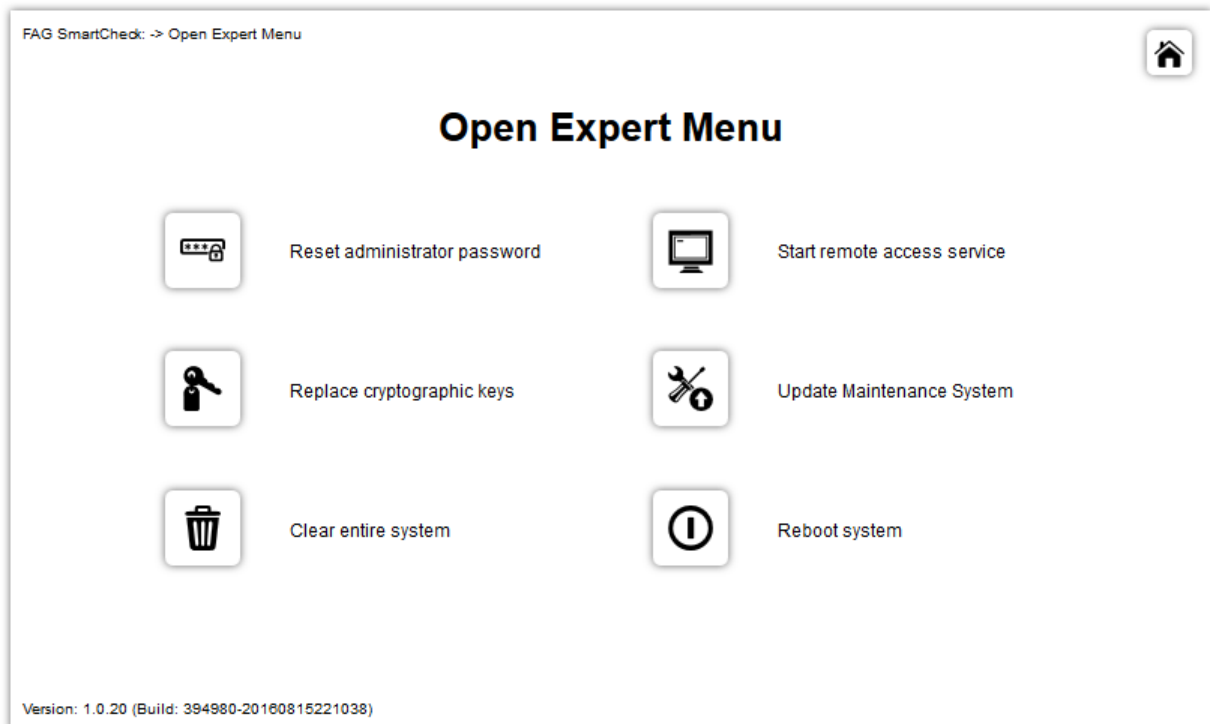


Version: 1.0.20 (Build: 394980-20160815221038)

2. Our support team will use this ID to generate a single-use password and will forward this to you.
3. Click on the **Login**  button to open the authentication page; enter the user name in the **User Name** field and the single-use password in the **Password** field:




4. Click the **OK**  button. The expert menu home page is displayed:





Click on one of the buttons to open the corresponding function. The following sections contain more information about the individual functions in the expert menu.



- The ID and the single-use password are only valid while you remain in the maintenance system. As soon as you restart the SmartCheck or ProLink device, the ID and password are no longer valid. When you restart the maintenance system, a new ID then becomes valid, and you can use this to request a new password from support.
- On the homepage for the log-in process, you have 60 minutes to obtain the single-use password from support. During this time, if you use the  button to switch to the maintenance system and from there back to the home page of the log-in process, the timer is reset to 60 minutes.

4.6.1 Reset administrator password


Click on the button **Reset administrator password**  to start this function. Here you can reset the administrator password to the factory default setting. All users can then log on without a password and have administrator rights. This deactivates user management.

Click on **OK**  to reset the administrator password.




Use the **Change administrator password**  function to change the administrator password. To find this function, choose **Adjust system settings** in the main menu of the Maintenance System.


4.6.2 Replace cryptographic keys

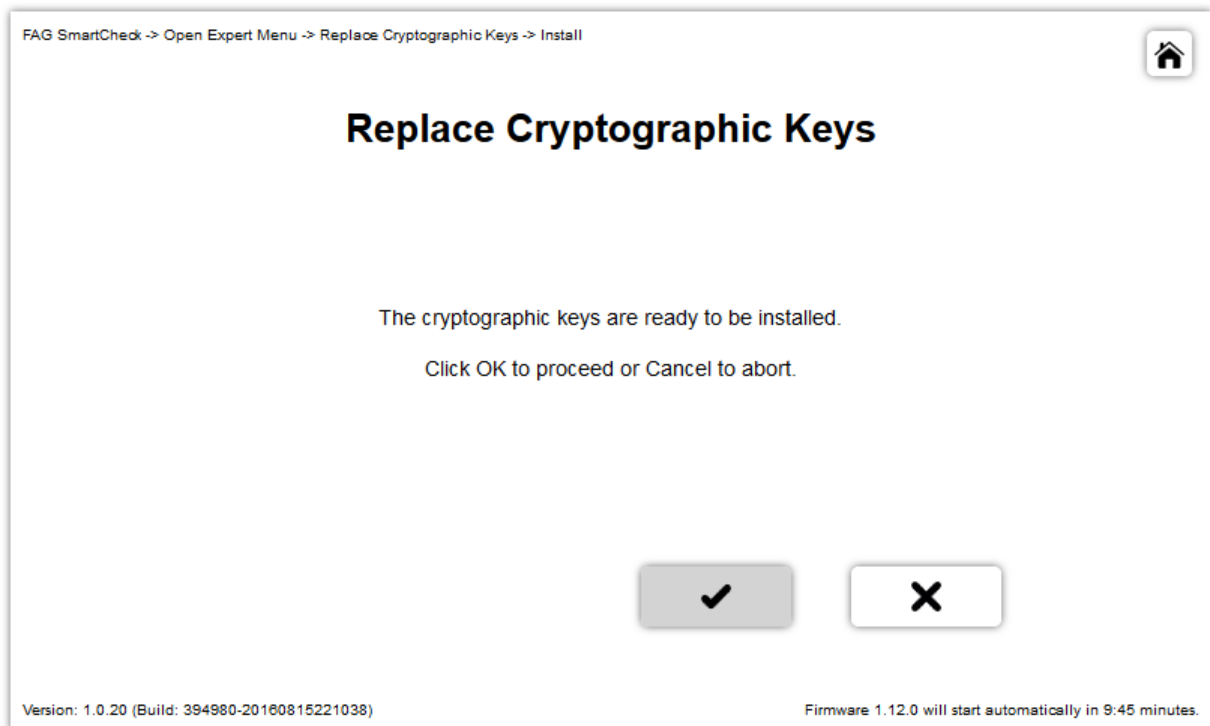
Click on the button **Replace cryptographic keys**  to start this function. The cryptographic keys are used to decode firmware files (*.SF2) and back-up files (*.SCBK) and for encoding back-up and protocol files. If they have become known due to a cyber attack, they must be replaced. This ensures that no harmful software can be installed on the system.

To replace the cryptographic keys, proceed as follows:

1. Click on the button **Keystore**  and search for the file containing the cryptographic keys.
2. Open the file:



3. Click on **OK**  to upload the cryptographic keys. The system analyses the file and informs you if can install the file:



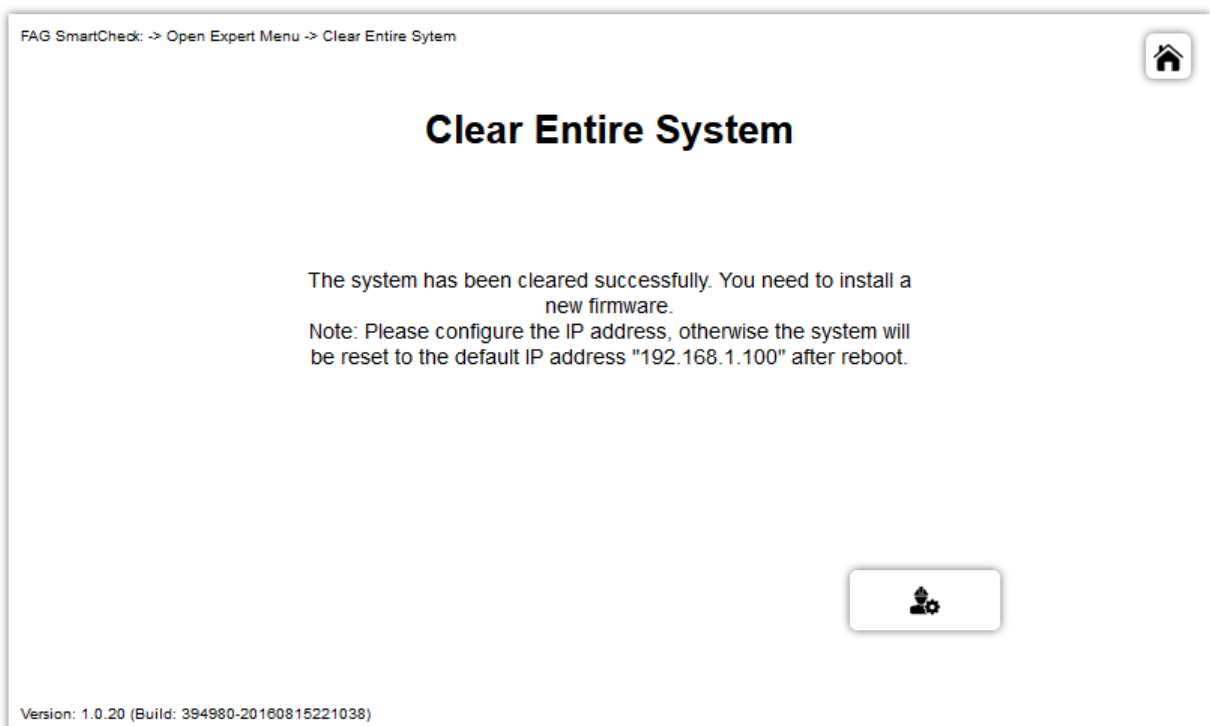
If the file does not contain any valid cryptographic keys, you will be informed of this too.

4. Click on **OK** ✓ to install the new cryptographic keys.

4.6.3 Clear entire system

Click on the button **Clear entire system** 🗑️ to start this function. Here you can delete the entire system including firmware, configurations and measurement data. The Maintenance System remains unaffected by this function.



1. Click on **OK** ✓ to delete the entire system. The system is deleted and you then receive the following message:




2. You must now install new firmware. You also need to reconfigure the IP address of the SmartCheck or ProLink device, because it has been reset to the standard IP address by this action.




After you have used the action **Clear entire system**, no firmware is available on the SmartCheck or ProLink device. You have the following options to continue working with the device:


- Load a new firmware file onto the device using **Update firmware** .
- Choose **Restore system**  to load a previously created back-up file containing the entire system onto the device.

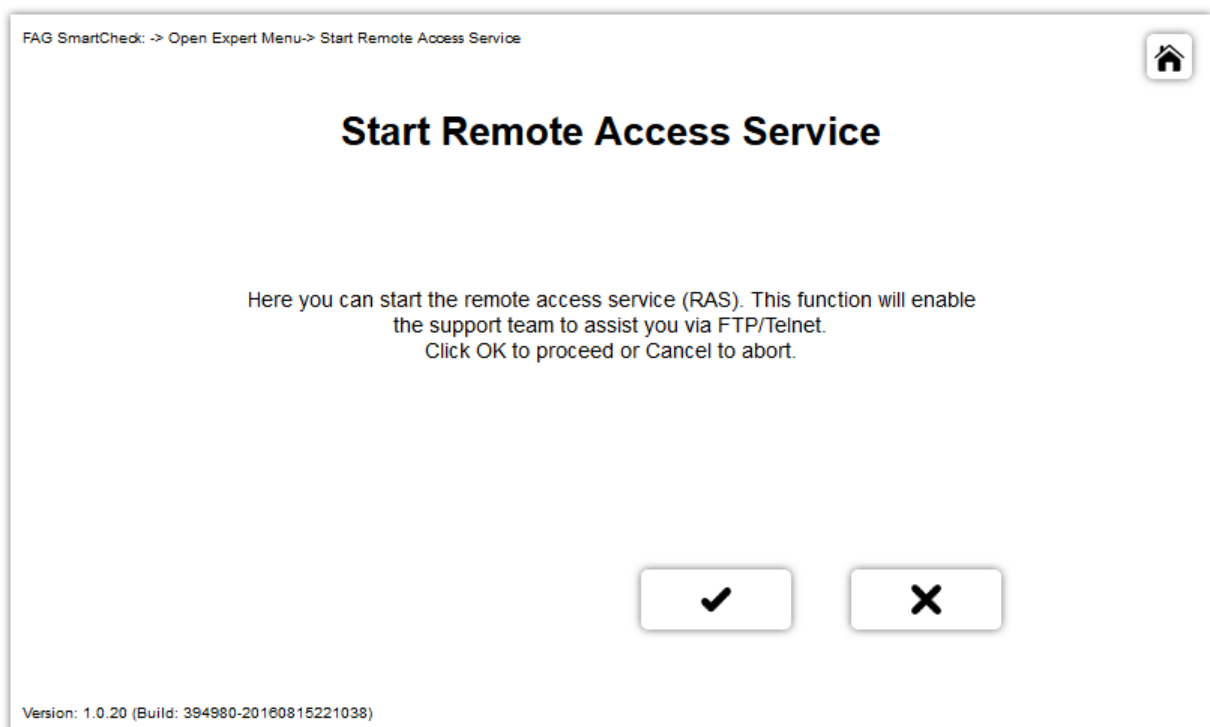
If you have enabled additional functions through licences, you will need to **add the licences again** .

4.6.4 Start remote access service


Click on the button **Start remote access service**  to start this function. Using this function, our Support team can assist you via an FTP/Telnet server in the Maintenance System. As soon as you restart the SmartCheck or ProLink device, the Remote Access Service (RAS) is terminated.

To start remote access via RAS, proceed as follows:


1. Click on **OK**  to start remote access via RAS.
2. The system reports that RAS has started successfully:

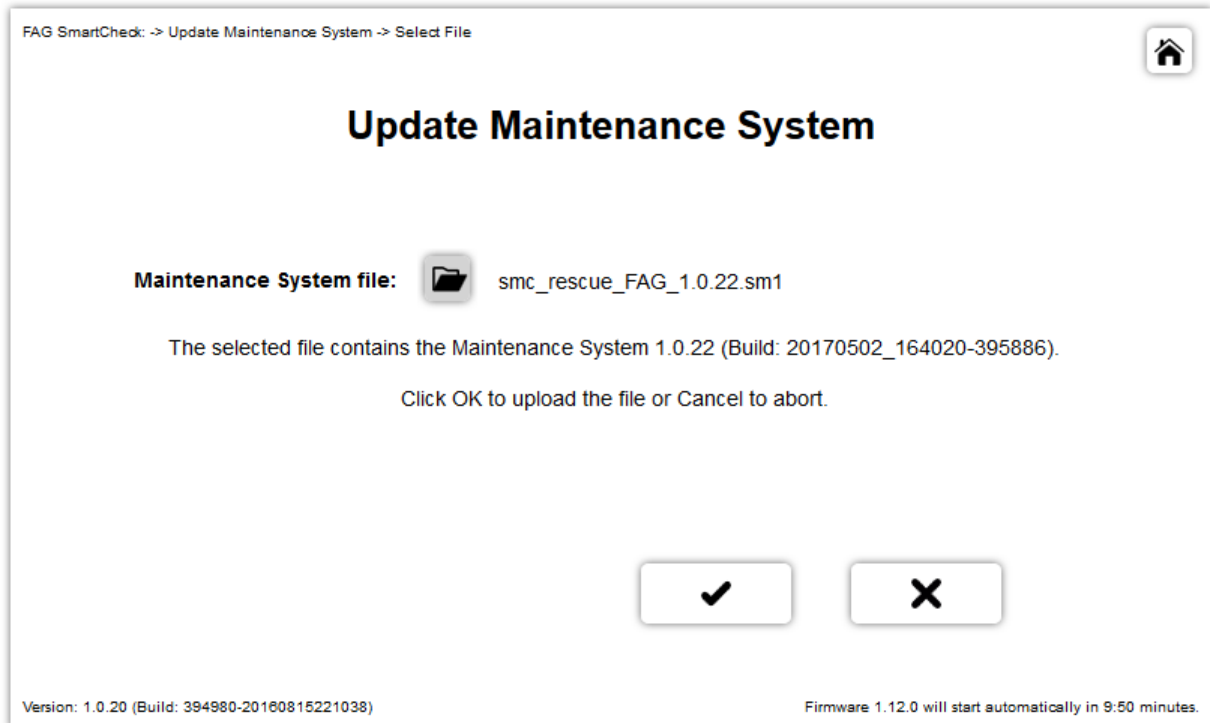


4.6.5 Update Maintenance System

Click on the button **Update Maintenance System**  to start this function. Here you can upload an SM1 file to update the Maintenance System.

To update the Maintenance System, proceed as follows:

1. Click on the **Maintenance system file**  button and search for the SM1 file containing the required Maintenance System.
2. Open the SM1file. The system analyses the file and informs you which version of the Maintenance System it contains:





If the selected file does not contain a Maintenance System, you will be informed of this too.

3. Click on **OK**  to update the Maintenance System.



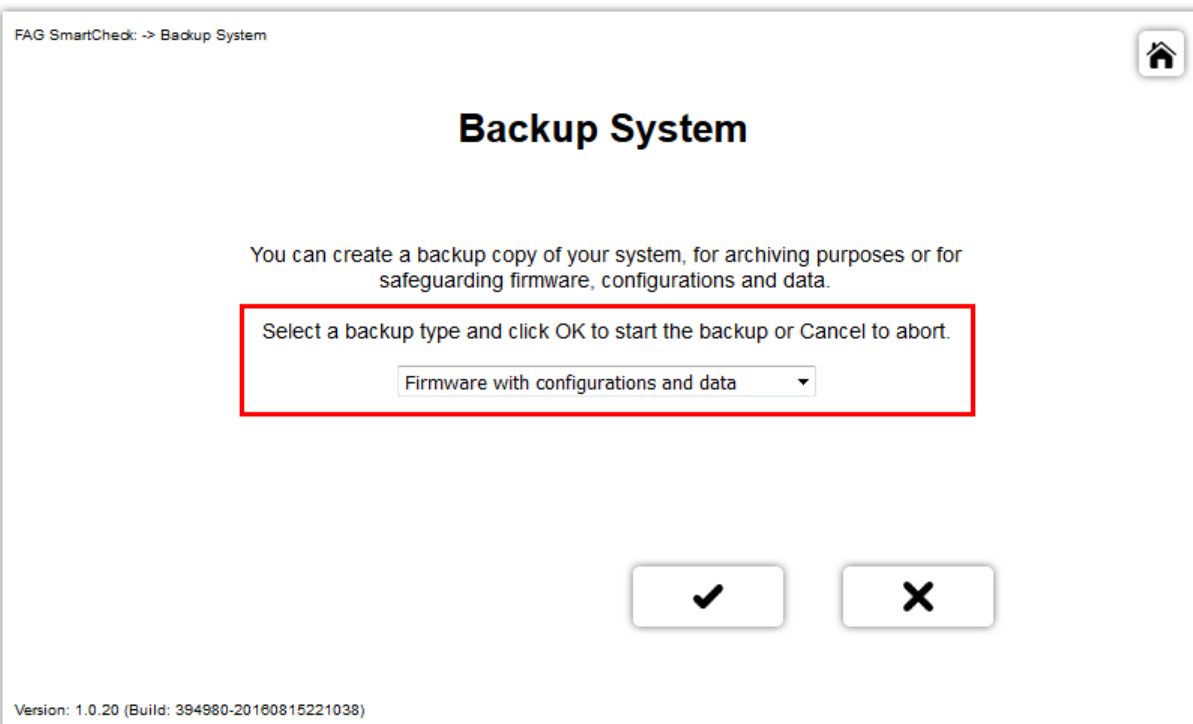
For this function, ensure a functioning power supply and an uninterrupted connection to the SmartCheck or ProLink device. If problems occur during the update, send the device to our Support team.

4.7 Backup system

Click on the button **Backup system**  to start this function. Here you can create a back-up file of your system in order to save firmware, configurations and data. You can then use the **Restore system**  function to select and load a back-up file to restore a system, or to duplicate devices, e.g. to load configurations on multiple SmartCheck or ProLink devices.

To back up your system, proceed as follows:

1. Select the required back-up type from the selection list:



You have the following options:

Firmware with configurations (without data)

You can use this option to save the firmware and the configurations of the system. The measurement data is not saved.

Firmware with configurations and data



You can use this option to save the firmware, configurations and measurement data of the system.

2. Click on **OK** ✓ to confirm the selected type of back-up and start the action.
3. The back-up file is downloaded. A progress bar informs you of the progress.
4. Your browser prompts you to save the file. Confirm this prompt. You can then find the back-up file *.SCBK in the standard download folder.




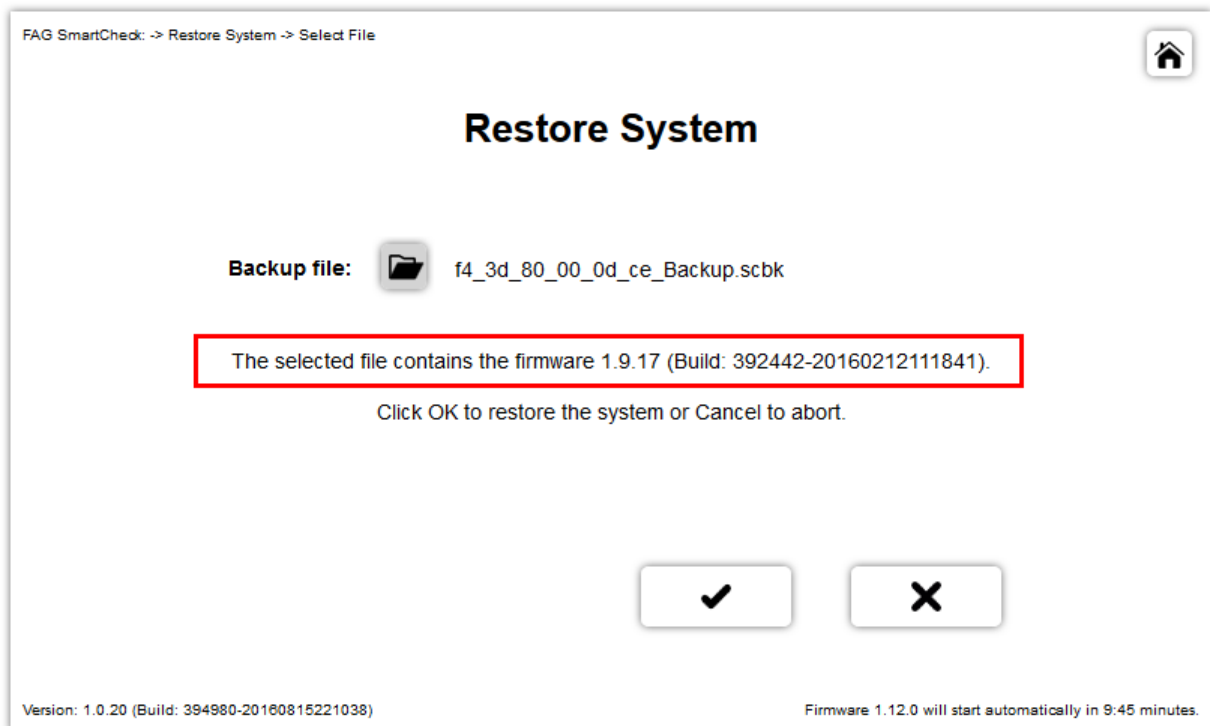
Depending on the data volume, if you use the option **Firmware with configurations and data** the file can become very large and the download therefore may take a long time. During the download, the timer function is repeatedly reset to 10 minutes and does not expire.

4.8 Restore system

Click on the button **Restore system**  to start this function. Here you can select a previously created back-up file  to restore a system. The back-up file either contains only the firmware and configurations, or it contains the entire system (firmware, configurations, and data). A back-up file can, for example, be loaded to a new SmartCheck or ProLink device that will replace a previous device. In addition, you can also use a back-up file to copy a particular system to multiple devices.

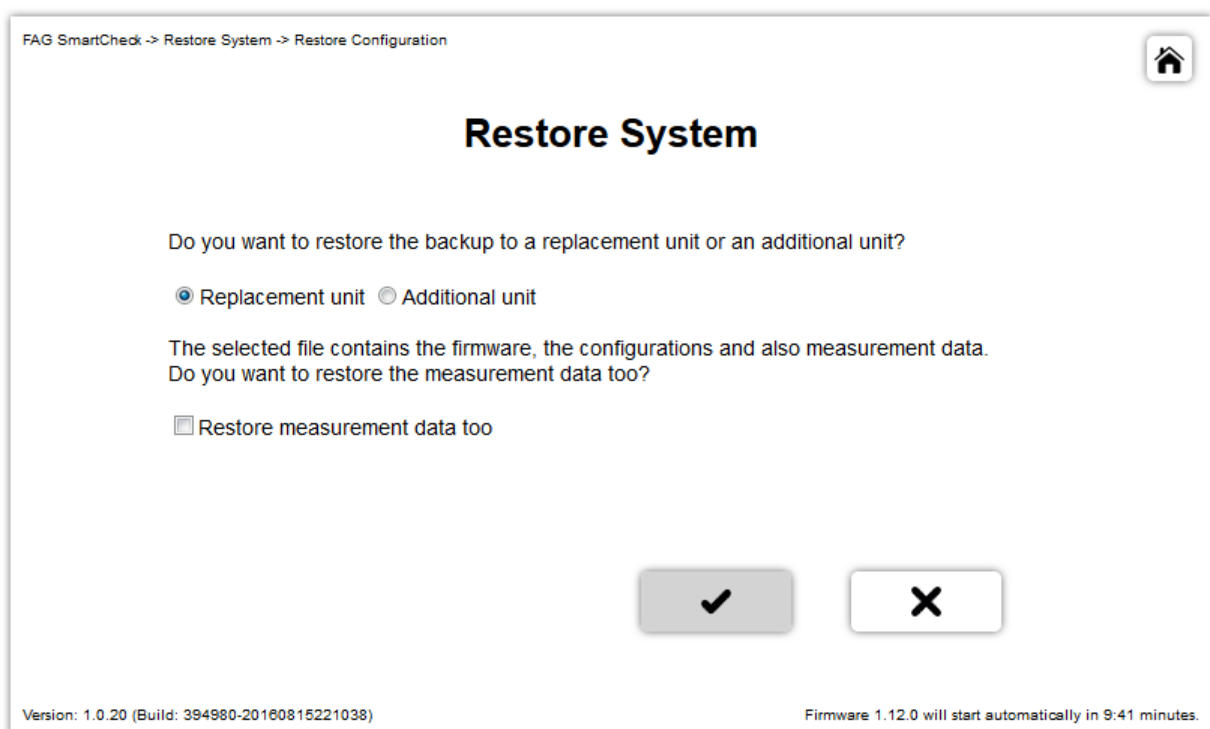
To restore the system, proceed as follows:

1. Click on the **Select file**  button and search for the SCBK file containing the required system.
2. Open the SCBK file. The system analyses the file and informs you which firmware the selected file contains:



If the selected file is not a valid back-up file, you will be informed of this too.

3. Click the **OK**  button. You will then be prompted to enter more precise details for restoring the system:



You have the following options:

Replacement unit

Select this option if you want to use the back-up file to load the system to a replacement unit. If the selected back-up file also contains measurement data, the option **Restore measurement data too** also appears (see below).

Additional unit

Select this option if you want to use the back-up file to copy the firmware and the configurations to other SmartCheck or ProLink devices.

Restore measurement data too

This option is only displayed

- if the selected back-up file also contains measurement data (in addition to the firmware and configurations) and
- if you have selected the option **Replacement unit**.


Select this option to also restore the measurement data of the back-up file. By default, this option is deactivated and the system is restored without measurement data.

4. Click on **OK** ✓ to confirm your selection and to start restoration of the system.



- If the **Restore System** function is cancelled after it has been started, there will no longer be any firmware on the SmartCheck or ProLink device. When you start the SmartCheck or ProLink device, the Maintenance System opens. You must then load new firmware onto the device, for example, using the functions **Update firmware** or **Restore system**.
 - When you create a back-up file, not all content is copied. A back-up file for instance does not contain a network address. If you use **Restore system** to load a back-up file onto a new device, the network address of the new device is retained.
-

4.9 Reboot system


Click on the button **Reboot system** ⓘ to start this function. This function enables you to shut down and restart the system. This shortens the time until the automatic restart specified by the timer function of the Maintenance System .

Click on **OK** ✓ to confirm the restart.



This function is available both on the start page of the Maintenance System and in the expert menu.

5 Status











Click on the **Status**  button to open the corresponding area. Here you will find a general overview of the status of the SmartCheck or ProLink device:



You can find the following information here:

Status and context menu


Your measurement jobs and the corresponding characteristic values are listed here. The alarm symbols show you at a glance:

- Non-critical measurement job 
- Measurement job with pre-alarm 
- Measurement job with main alarm 
- Non-critical characteristic value 
- Characteristic value with pre-alarm 
- Characteristic value with main alarm 
- Characteristic value without measured values 
- Sensor fault 
- Active measurement job  

To see the status of a characteristic value in the main panel of the area, click on the desired characteristic value.

For each item in this list, you can right-click to open a context menu, where you will find the following commands:


• Deactivate measurement job

For individual measurement jobs: Choose this option to prevent the measurement job from being scheduled for measurements or started by a measurement trigger. **Deactivated measurement jobs**  can be found at the end of the list.

- **Activate measurement job**

For individual measurement jobs: Choose this option to re-enable a deactivated measurement job. The measurement job will then be scheduled for measurements or started by a measurement trigger again.

- **Start instant measurement**

For individual measurement jobs: Start the instant measurement of this measurement job here. The measurement starts immediately and appears on the right under **Measurement jobs**^[41] as an active measurement job . For the ProLink device, the already running measurement is continued in parallel. For the SmartCheck device, the ongoing measurement is canceled for the instant measurement.



With the **Start instant measurement** option, you can also measure deactivated measurement jobs, for example, to check them. After the instant measurement, the measurement job remains deactivated.

- **Reset alarm**

For individual characteristic values: Switch off the alarm for this characteristic value manually here. This option is required if alarms for this measurement job are not automatically reset as soon as the measured value drops below the alarm limit.

- **Reset all alarms**

For individual measurement jobs: Manually switch off the alarms of all subordinate items here.



You can only reset alarms manually, e.g. via this context menu, if you made the corresponding setting when creating or editing a measurement job in the **Set Alarms**^[81] step: under **Reset Alarms**, you must activate the **Manual** option.

- **Alarm settings**^[50]

For individual characteristic values: Here you open a dialogue in which you can view and edit the alarm settings for this characteristic value.

- **Edit hour meter**

for measurement conditions: Edit the value for the hour meter here. Details on the hour meter and how it works can be found here^[51].

- **Start learning mode**

For individual characteristic values: Start the learning mode for the selected characteristic value again here. Details on the learning mode and how it works can be found here^[89].

- **Start learning mode for all**

For individual measurement jobs: Start the learning mode again for all subordinate items for which the learning mode is authorised. Details on the learning mode and how it works can be found here^[89].

- **Activate learning mode for all**

For the whole device, for individual measurement jobs or characteristic values: Activate this option to switch on the learning mode for all subordinate elements. Details on the learning mode and how it works can be found here^[89].

- **Live view**

For individual characteristic values: Switch here to the **Live view**^[55] area. There you will see in real time the signal used for the calculation of this characteristic value.

- **Measurement data**

Switch here to the **Measurement data**^[45] area. There you can display the trends and time signals of these measurement jobs/this characteristic value and carry out an initial analysis.

- **Measurement jobs**

Switch here to the **measurement jobs**^[76]. There you will find an overview of all measurement jobs and can view and edit them.

- **Measurement conditions**

Switch here to the measurement condition Machine is running^[106] of the corresponding device. There you can customise the measurement condition to meet the requirements of your machine.

The commands available depend on which level in the tree structure the selected item is located and whether you have the user rights for the desired action.

Actions

In this area, you will find the menu items **Create new measurement job**^[78] and **Show measurement jobs**^[76]. They allow you to create a new measurement job and to go straight to the detailed overview of your measurement jobs via the corresponding wizards.

If you use one of these menu items, you will then be taken automatically to the **Configuration** area.

Here you will also find the menu item **Edit the "Machine is running" measurement condition** ¹⁰⁶ for the SmartCheck device. This measurement condition is preconfigured when the device is shipped and should be adapted to the requirements of your machine.

Characteristic value status

For the selected measurement job/characteristic value, the name, alarm status, time of last measurement and an illustration showing the development of the measurement job/characteristic value are displayed here in one view. The button in the **Characteristic value status** title bar and the two buttons before the illustration provide direct access to important functions:



Click on this button to display the status indicator for the entire system.




Click on this button to open a dialogue for editing the alarm settings.

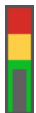


Click on this button to view the measurement data and carry out an initial analysis of trends and time signals.



- If the **Device alarm status** is selected:
Click this button to switch to the **Characteristic value status** display for this measurement job.
A blue dot on the button  indicates that the measurement job is currently active, i.e. that measurement is being carried out.
- If a measurement job is selected:
Click this button to switch to the **Characteristic value status** display for this characteristic value.

An additional illustration shows you how the characteristic values of the measurement job or an individual characteristic value behave in terms of the pre-alarm and main alarm:



The **grey column** symbolises the current value of the characteristic value. Depending on where it is positioned, it indicates the following:

- **Green area:** The measured value is unproblematic.
- **Yellow area:** The measured value has exceeded the threshold of the pre-alarm.
- **Red area:** The measured value has exceeded the threshold of the main alarm.

If the measured value significantly exceeds the main alarm limit, a small black triangle is displayed above the bar:



If the measured value is below the lower pre-alarm limit **Signal always greater than**, the small black triangle is displayed below the bar. The characteristic value then has a pre-alarm:



In symmetrical signals, for example in the case of torques in different directions, negative values are also possible. In this case, a yellow area for the lower pre-alarm and a red area for the lower main alarm are also displayed below the green area:



If no measured values have yet been measured, a white area is displayed.



Click the alarm symbol next to the column to view details of that characteristic value.

Measurement jobs

You can find information here about which measurement jobs are currently being carried out by the device and which measurement jobs are in the queue. You will find the **Name** of each measurement job. The time in minutes and seconds appears under **Duration [m:s]** as soon as the measurement job has been carried out. The measurement jobs are divided into the following areas:

- **Active** This area contains the currently active measurement jobs, i.e. the measurement jobs that are currently being carried out by the device.
- 📅 **Scheduled** This area contains the scheduled measurement jobs.
- ⬇️ **Waiting for trigger** This area contains the measurement jobs waiting for a trigger. As soon as the trigger occurs, these measurement jobs become active.
- ✓ **Waiting for measurement condition** This area contains the measurement jobs waiting for a measurement condition. As soon as the measurement condition occurs, these measurement jobs move to the **Scheduled** area.

Click + or – to expand or collapse an area.

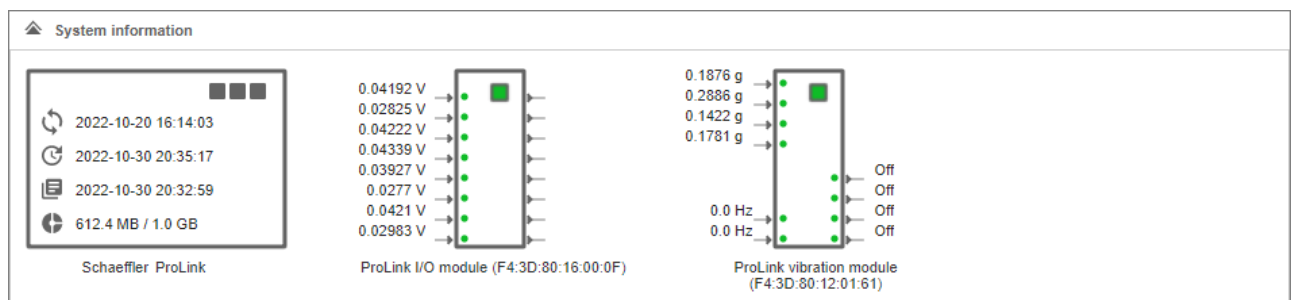


Active measurement jobs are indicated with a blue dot both on the left-hand side of the tree under **Status** and under **Characteristic value status** ●.

System information

General information about the system is displayed here, e.g. when the system was started, when the configuration was last changed, when a measurement was last performed. You will also find the current values for the individual inputs here.

For the Schaeffler ProLink device, the information about the processor module and all connected modules are shown in illustrations:

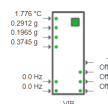


The illustrations provide access to the following information and features:





The illustration furthest left provides information and functions for the processor module of the ProLink device:

- Here you will find the **start time of the device**, **time of the last measurement** and the **last configuration change** as well as the available and remaining **disk space**.
- Move the mouse over the illustration to read additional information about the **device temperature** and the **operating hours**.
- Click on the illustration to open the **device configuration** ⁵⁸ overview. Here you can define basic settings for your ProLink device and specify measurement jobs.



The illustrations to the right of the processor module provide information about the modules connected to your processor module:

- The modules are displayed in ascending alphanumeric order from left to right. The combination of module name - for example ProLink I/O module or ProLink vibration module - and serial number determines the sequence. You should take this into account at installation of the modules. To change the sort order and map your physical system configuration, you can edit the names of the modules ⁶⁰.
- For each module, you will find the current values for the four analogue and two digital inputs here, as well as the current values for the four digital switching outputs.
- You will find here the current values of the eight inputs or outputs for each I/O module.

- Move the mouse over the illustration to read additional information about the **firmware version**, **hardware version**, **device temperature** and **operating hours**.
- Click on the illustration to open the **module configuration** . Here you can view details for the respective module and edit its name.
-  **Status and module identification**: The colour of the symbol indicates the status of the device:
Green: The device is connected.
Grey: The device is not connected.
Flashing green and grey: The device is being identified.
 You can identify the associated physical module by clicking on the symbol. The LEDs of the physical module in question flash alternately. Click again to exit identification mode.








To calculate the characteristic values, the measurement triggers and the measurement conditions, the root mean square (RMS) value is calculated from a specified number of measurement values. The squaring process means that this value is always positive, even if the measurement values are smaller than zero:

Example for measurement trigger: At a measurement range of -3000 rpm to +3000 rpm, if you set a threshold of 1500 rpm with a rising edge, this threshold is triggered both when the value exceeds +1500 rpm and when it falls below -1500 rpm.




Example for measurement condition: At a measurement range of -3000 rpm to +3000 rpm, if you set a lower threshold of 1500 rpm and an upper threshold of 2000 rpm, this condition is met both when the value is between +1500 rpm and +2000 rpm and when it is between -1500 rpm and -2000 rpm.

Logbook

This table contains all messages created by the system or by users of the system, including dates on which the system was created or changed and the level of the message. You have the following options:

- **Browse messages**
 If your messages are spread over several pages, you can use the navigation elements   and   of the **logbook** to skip forward and back a page or jump to the start or end of the logbook.
- **Show warnings only**
 The SmartWeb software displays all logbook entries, i.e. errors, warnings and information, by default. You can filter the results to display only **errors** and **warnings** by removing the checkmark from **Information**. If you also deactivate **Warnings**, only errors are displayed.
- **Add message**
 Click on  to create a new message. You can find details on this in the **Create Message in the Logbook**  section.
- **Edit messages**
 You can edit messages you created yourself. To do so, click on  in the **Edit** column. A window opens, in which you can change the text in the **Message** field. Confirm your change by clicking on **OK**.

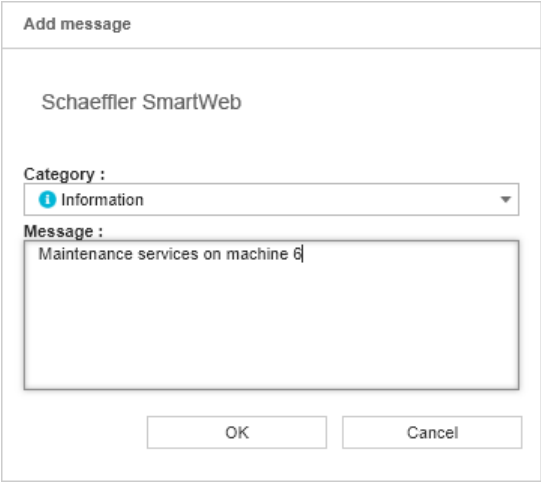
The categories of the messages created automatically by the system have the following meaning:

-  **Information** refers to events in the system; this includes e.g. a user having logged on or a configuration having been changed.
-  **Warnings** are mostly references to misconfigurations, e.g. when a machine exceeds the maximum rotational speed specified in the measurement job.
-  **Errors** report system-critical problems. In this case, contact our Support team.

5.1 Creating/editing a message in the logbook

How to create a message in the logbook

1. Click on  to open the **Add message** window:



Add message

Schaeffler SmartWeb


Category :
Information

Message :
Maintenance services on machine 6


OK Cancel

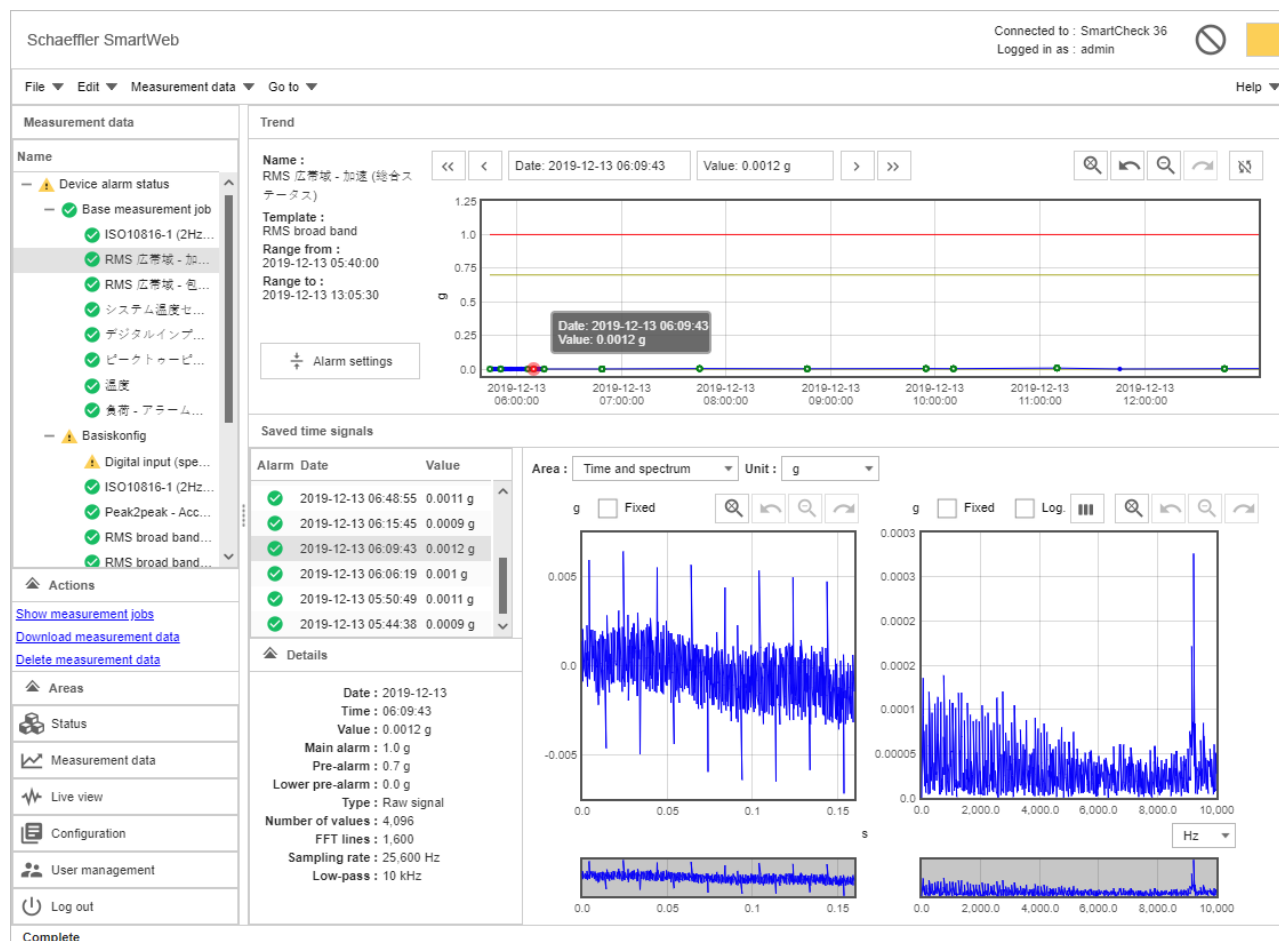
2. Select the **Category** for your message.
3. Enter the text of your message in the **Message** field.
4. Click on **OK** to save your message. The **Logbook** will now include the message.

How to edit a message in the logbook

1. In the line of the message you want to edit, click on **Edit** .
2. Make the desired specifications for **Category** and under **Message**.
3. Click on **OK** to accept your changes.

6 Measurement data

Click on the **Measurement data**  button to open the corresponding area. Here you can view the trends and time signals of characteristic values and the trends for measurement triggers and conditions, and you can carry out an initial analysis. On the left, you will find your measurement triggers and conditions, and also the measurement jobs and their characteristic values. If you select an item, you will see the associated trends and saved time signals in the main panel. As soon as you select a saved signal, the corresponding curve appears:

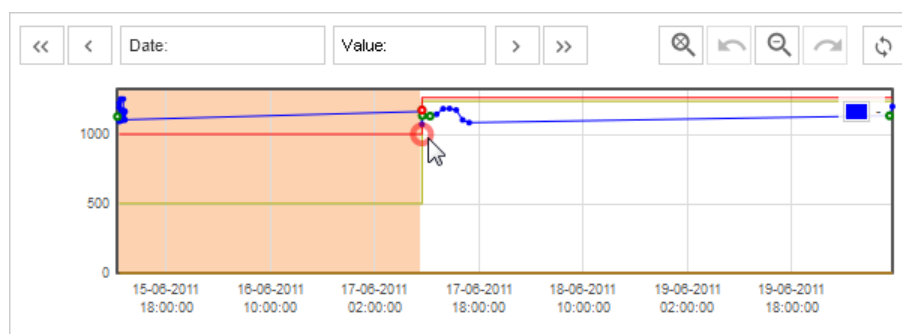


As soon as you have selected a characteristic value and a saved time signal, you will find the following information and functions here:

Trend

Under **Trend**, you will find a graph of the trend values for the selected characteristic value. On the left, you will find precise information on the characteristic value and the save period under **Name**, **Template** and **Range**.

As well as the trend (blue) and the saved time signals, the pre-alarm limits (yellow) and the main alarm limits (red) are also depicted in the graph:



How to work with the graph:

Highlighted in colour

The section highlighted in colour tells you about the alarm status at a glance:

- **White:** no alarm
- **Yellow:** pre-alarm
- **Red:** alarm

If the background is **grey**, a characteristic value error has occurred.

Blue line

The blue line represents the trend.

Red line

The red line represents the main alarm limit. Changes in the line occur

- If you have changed the value for the limit
- If the system has learned a new alarm limit via Learning mode^[89]
- If a new status area was reached in relation to Alarm maps^[91].

Yellow line

The yellow line represents the pre-alarm limit. Changes in the line occur

- If you have changed the value for the limit
- If the system has learned a new alarm limit via Learning mode^[89]
- If a new status area was reached in relation to Alarm maps^[91].



If you place the cursor at certain places in the graph, a mark appears and you can then read the corresponding values in the **Date** and **Value** fields. You have this option:

- At the starting points of the trend and of the alarm limits
- At the end points of the trend and of the alarm limits
- At the changing points of the alarm limits
- At all measurement points of the trend (blue and green symbols).



On the blue trend line, you will find the following symbols:

- **Blue:** trend value
- **Green with white centre:** trend value with saved time signal; click on the symbol to display the time signal.
- **Red with white centre:** time signal currently displayed

Additional options

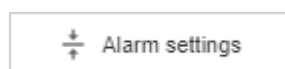


and

Use this button to activate/deactivate the update mode.

If the update mode is activated, the trend is reloaded every 60 seconds and new measurement values appear automatically in the trend window.

If you select in the trend window a trend range in which the last measured value no longer appears, the update mode automatically deactivates.



Click this button to open a dialogue in which you can view and edit the alarm settings for the relevant characteristic value^[50].



- The trend display for measurement triggers and measurement conditions enables you to check if and when the value that you have defined as the trigger or condition has been encountered.
- If you select a time segment with very many time signals, it is possible that not all of them will be displayed. In this case, you will only see a selection; if you zoom in on the area, the "hidden" time signals will also appear.
- You can find detailed explanations on the learning mode and on alarm maps in the **Learning mode and alarm maps**^[89] section.

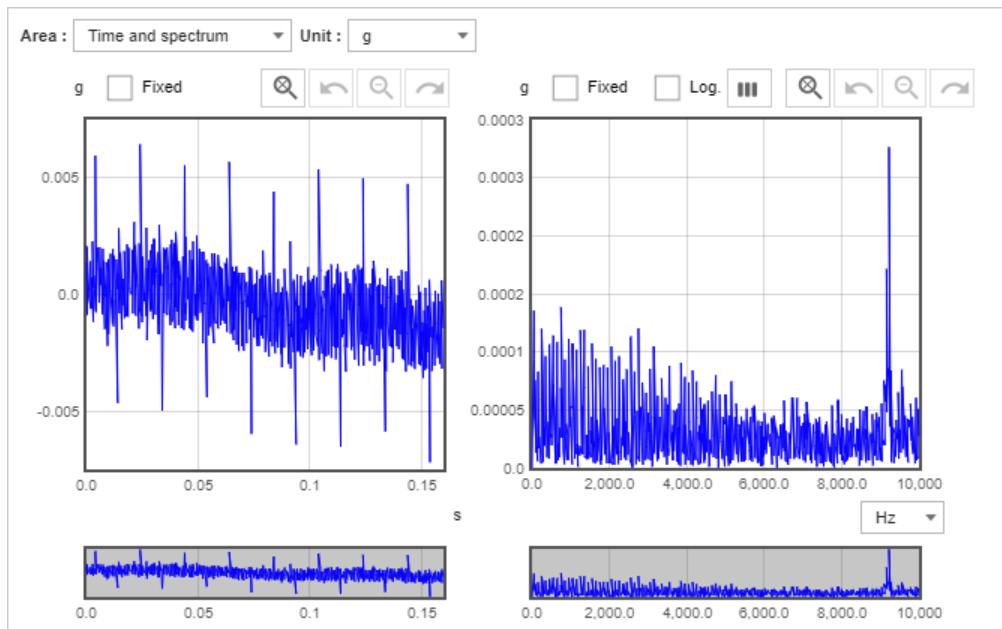
Saved time signals

Here you will find on the left a **list of all saved time signals** of the trend segment currently displayed, each with details on the alarm status, date and value.

- Click on a time signal in the list to see details about it below the list and in the graph on the right.

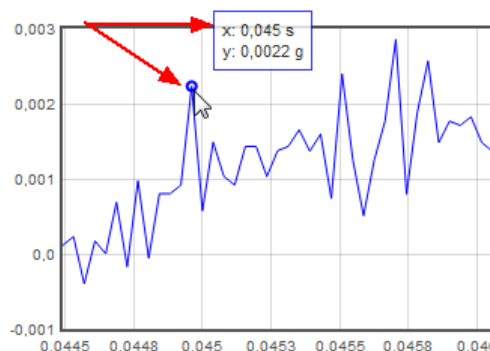
- When you have selected a time signal, you can use the arrow keys to navigate up and down through the list.
- To sort the list, click on a column header.
- If you have zoomed in on a saved time signal as described below, the zoom range also remains in place if you select a different time signal from the list.

By default, the **graphical display** on the right shows an overview of the saved time signal as a time signal and as a spectrum. Here you can also perform an initial analysis:

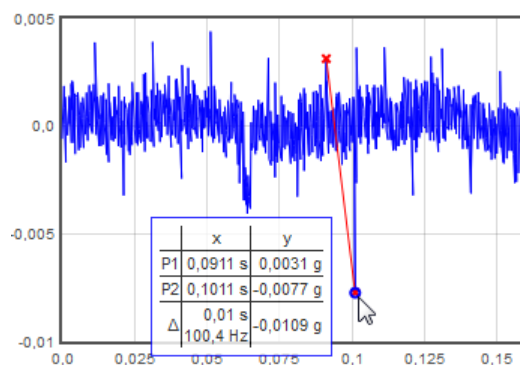


You have the following options:

- Select the **range**:
 - **Time**: The signal is displayed as a time signal.
 - **Orbit**: The signal is displayed as an orbit diagram. The time signal is averaged over the revolutions selected in the zoom range. Signals whose frequency deviates from the revolution frequency are filtered out. This diagram makes effects synchronized with the rotational speed clearly visible.
 - **Spectrum**: The signal is displayed as a spectrum.
 - **Time and spectrum**: The signal is displayed in two graphs, as a time signal and as a spectrum.
 - **Orbit and spectrum**: The signal is displayed in two graphs, as an orbit and as a spectrum.
 - **Time and orbit**: The signal is displayed in two graphs, as a time signal and as an orbit.
- Activate the **Fixed** option to display the signal with fixed scaling. You can then zoom both horizontally and vertically.
- You can view the exact values for each peak; move the cursor over the peak until a blue circle appears. The values of this peak are then displayed in a small box:




- **Time and spectrum** only: Activate a **measurement tool** by clicking on any point: when you click, a red cross appears on the point. You can then drag a red line over the graphic. The values of the points and their distance to each other can now be seen in a box next to the line:



- If you zoom into a sub-area, as described below, the narrow strip beneath the main graph acts as an overview: The full area is always shown here and the zoomed area is highlighted in colour.

Additional functions in the spectrum

For the spectrum view, the following additional functions are available:

- Activate the **Log.** option above the graphic to display the signal with a logarithmic scaling.
- Select the required unit from the selection list below the graphic.
- The button  above the graphic opens the **Edit speed/frequency band display** dialogue. Here you can edit the display of speed, harmonics and frequency bands:

Edit speed/frequency band display — ✕

Speed source : User-defined

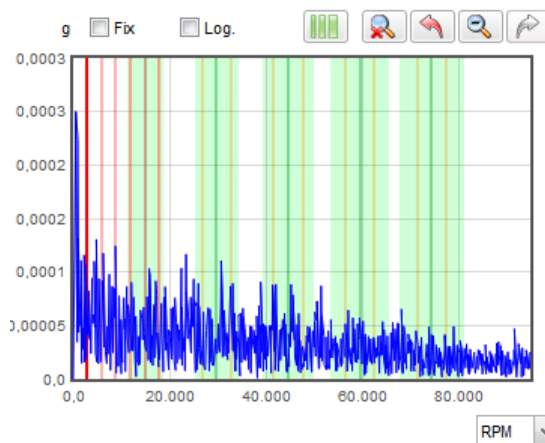
Rotational frequency [Hz] : 2.0 Harmonics : 10

Frequency bands : Do not display frequency bands

You have the following options:

- **Speed source:** Choose between **Do not display speed**, **Fixed speed**, and **User-defined**. The speed is displayed in dark red.
- **Rotational frequency (RPM):** If you have selected the **User-defined** option for **speed source**, enter the required rotational frequency here. You can also enter the speed automatically: To do this, move the cursor over a peak and double click when the blue circle appears. The corresponding speed is then copied to the dialogue.
- **Harmonics:** Here you determine how many harmonics are displayed in the graphic. Harmonics are displayed in light red.
- **Frequency bands:** Choose between **Do not display frequency bands** and the frequency bands relevant for the selected characteristic value. Frequency bands are displayed in green

When you have set the speed, harmonics, and frequency bands, the spectrum might look as follows, for example:





In confidential measurement jobs [\[79\]](#) only users with special rights can edit the frequency band display.

Additional features in orbit

The Orbit view offers the following additional functions:

Speed: Select the appropriate speed and determine its value and unit.

Revolutions (selected/total): Below the graph on the right, you will find the number of currently selected revolutions used for averaging and the total number of revolutions contained in the signal.

Settings in the "Orbit and spectrum" view: Hover over the line in the spectrum with the mouse until a blue circle appears. Double-click to automatically set this speed in the orbit diagram. At the same time, the **Edit speed/frequency band view** [\[48\]](#) dialog opens.

Zoom functions in all graphs

It is possible to zoom in on all graphs: To zoom, click in the graph and draw the cursor over the area on which you want to zoom in while holding down the left mouse button; this highlights the zoomed area in colour. You can also find details on this function here [\[56\]](#).

The following buttons are then available for you to work with zoomed areas:



Switches back to the original display



Jumps back a step in your zoom editing



Enlarges the selected time range



Jumps forward a step in your zoom editing



The zoom function of the orbit can be found in the narrow strip below the graph, which displays all revolutions:

Click in the desired area and drag with the left mouse button held down; the zoomed area will be highlighted in colour. The graph adjusts for the selected revolutions.

Actions

On the left under **Actions**, you will find the following menu items:

- **Show measurement jobs** [\[76\]](#): Use this link to jump directly to the **Measurement jobs** area. There you will find an overview of all measurement jobs, their characteristic values and the corresponding details.
- **Download measurement data:** [\[52\]](#) Use this command to open a dialogue in which you can select measurement data for download.
- **Delete measurement data:** [\[53\]](#) Use this command to open a dialogue in which you can select measurement data for deletion.



- The **Measurement data** area is only designed for an initial analysis. For a detailed analysis, you must download the data of the SmartCheck or ProLink device [\[52\]](#). You can then use the built-in SmartUtility Viewer software to perform a more detailed analysis.
- The **details** in the **Saved time signals** section also contain information on the number of measurement values. However, the actual number of measured values displayed depends on the limitations of your browser.

If you are using Internet Explorer, the whole time signal cannot be displayed for performance reasons. You can identify the actual number of measured values displayed under **Number of values**. Two values are displayed:

Type : Raw signal

Number of values : 4,096


FFT lines : 1,600

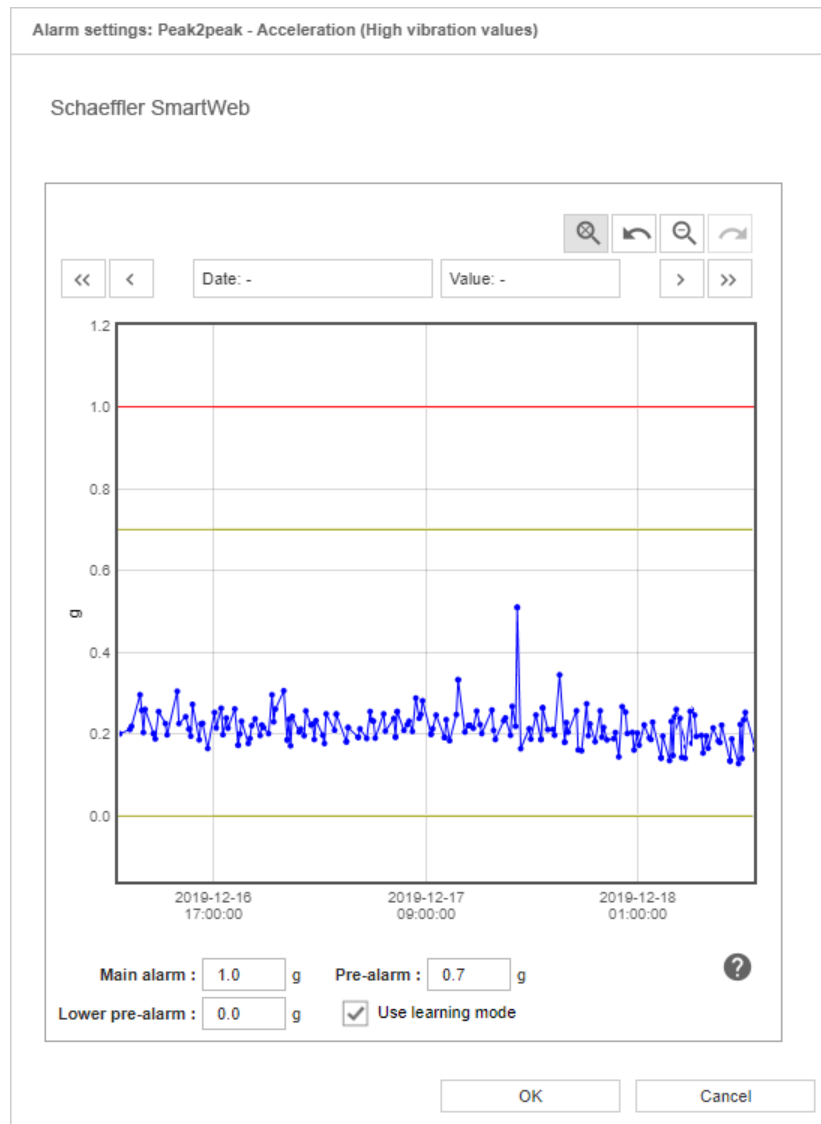
In this example, only 1600 of 4096 measured values are displayed.

6.1 Edit alarm settings

The alarm settings for a characteristic value are initially set as part of a measurement job [81](#). You have access to a dialogue in which you can edit the alarm settings at a later point.

How to edit the alarm settings

1. In the **Measurement data** area, click  **Alarm settings**.
2. In the **Alarm settings** window, enter the desired specifications:



You have the following options:

Buttons and graphic

- You can use the buttons above the graphic to navigate the trend and use zoom functions. More details can be found in the **Measurement data** [45](#) section.
- The graphic shows you the trend of the selected characteristic value. The graphic provides the same information and functions as the graphic in the **Measurement data** area. You can find details on this in the **Measurement data** [45](#) section.
- You can also adjust the alarm limits manually from here:
 - **Main alarm:** Click the red main alarm limit, hold down the mouse button and drag the limit to the required position. The pre-alarm limit is automatically dragged with it as soon as you go below the pre-alarm limit.

- **Pre-alarm:** Click the yellow pre-alarm limit, hold down the mouse button and drag the limit to the required position. This does not change the main alarm limit and the pre-alarm limit cannot be dragged over the main alarm limit.

Main alarm

This is where you determine the limit at which the main alarm is triggered.

Lower main alarm

Symmetrical signals, for example for rotational movements in different directions, also have negative values. Enter the main alarm limit for the negative value range.

Pre-alarm

This is where you determine the limit at which the pre-alarm is triggered. Next to the absolute value is the percentage value calculated from the pre-alarm limit and main alarm limit.


Lower pre-alarm


Enter the pre-alarm threshold for the negative value range of a symmetrical signal.

Signal always larger than

Enter a value for an additional pre-alarm limit. This pre-alarm is triggered when the signal value is below the value determined here.

Use learning mode

Activate this option to use the learning mode for this characteristic value. The system can then automatically learn the alarm limits depending on the current status of the machine. Learning mode can only commence if there is a tick here, e.g. entered via the context menu of the characteristic value in the **Status**  area.

You can find details on the learning mode in the **Learning mode and alarm maps**  section.



Move the mouse over the question mark  to read additional information.

3. Click **OK** to save the new alarm settings.

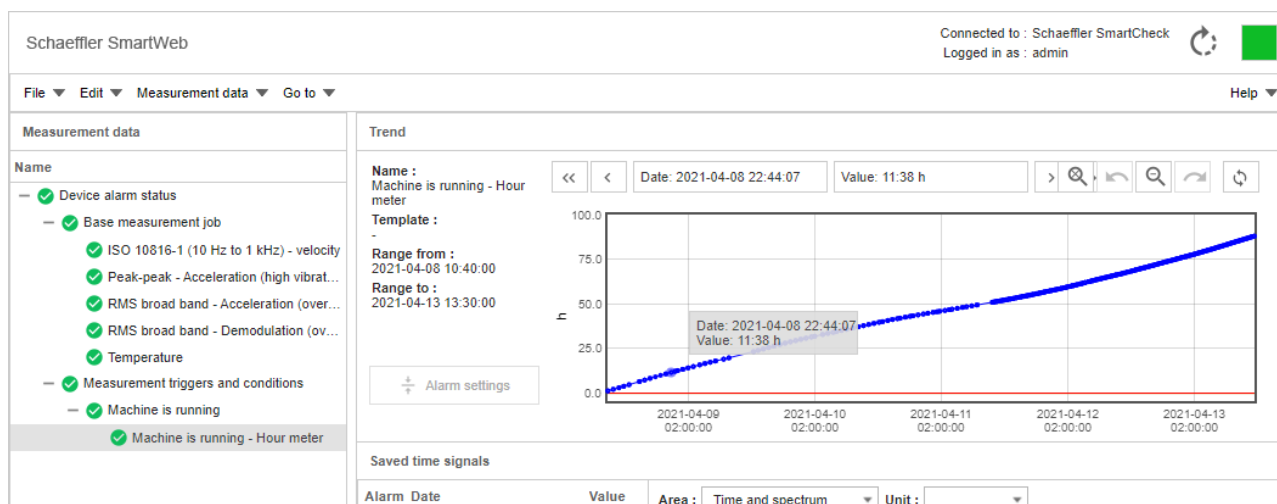


You can also edit the alarm settings for an alarm map here. In this case, you must edit the alarm settings of the individual alarm maps.

6.2 Edit hour meter

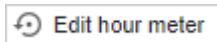
When you create a measurement condition, an hour meter is automatically created which indicates the active operating time of a measurement condition. This allows you to determine how long a measurement condition has been satisfied and for example to track the running time of a pump.

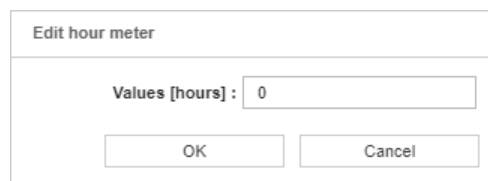
The hour meter starts as soon as the corresponding measurement condition  is fulfilled.



Here you can view the trend of the hour meter and carry out an initial analysis.

How to edit an hour meter

1. Click on the **Measurement condition** under **Measurement triggers and conditions** in the **Measurement data** area.
2. Click on **Hour meter** and make a selection from the shortcut menu .
3. Set the desired specifications in the **Hour meter** window:



The dialog box titled "Edit hour meter" contains a text input field labeled "Values [hours] :" with the value "0". Below the input field are two buttons: "OK" and "Cancel".

The following options are available:

Values [hours]

Here you can specify the hour value from which the hour meter should run. The default setting is **0**.

Adjust the hour meter if the component has been in operation for a long time and you installed the monitoring at a later time. If you exchanged the component, reset the hour meter back to 0.

3. Click **OK** to save the hour meter settings.

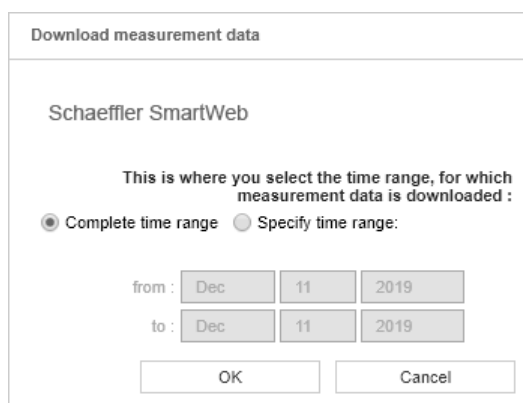
You can view the trend of the hour meter in the **Measurement data** area below the associated measurement condition.

6.3 Download measurement data

The **Measurement data** area is only designed for an initial analysis. For a detailed analysis, you must download the data of the SmartCheck or ProLink device. You can execute this using the Schaeffler SmartUtility software and analyse the data directly using the integrated SmartUtility Viewer software. Alternatively, you can download the measurement data using the corresponding function of the SmartWeb software and open it later in the SmartUtility Viewer software for analysis.

How to download the measurement data

1. In the **Measurement data** area, select the **Download measurement data** action.
2. In the **Download measurement data** window, enter the desired specifications:



The dialog box titled "Download measurement data" contains the following elements:

- A header "Schaeffler SmartWeb".
- A text label: "This is where you select the time range, for which measurement data is downloaded :".
- Two radio buttons: "Complete time range" (selected) and "Specify time range:".
- Two rows of date pickers labeled "from :" and "to :". Each row has three buttons for month (Dec), day (11), and year (2019).
- Two buttons at the bottom: "OK" and "Cancel".

You have the following options:

Entire measuring period Activate this option to download all saved measurement data.

Selected measuring period If you activate this option, the calendar functions become active:

You can then use the list boxes or the calendar selection to determine the time range for which the measurement data is to be downloaded.

3. Click on **OK**. You must then confirm the download of the *.scd1 or *.scd2 file to your downloads directory.
4. Once the *.scd1 or *.scd2 file has been downloaded, you must convert the data directory in the SmartUtility software. You can then analyse the data in the Viewer software.



You can save downloaded files with a password for data encryption. The **Edit > Device settings > Edit security settings** menu option opens a dialogue box in which you can enter the password. This password is required if the measurement data downloaded with the SmartWeb software should be opened in SmartUtility.

6.4 Delete measurement data

You can delete measurement data from your SmartCheck or ProLink device. In doing so, you can define both the time range of the data to be deleted and the affected measurement jobs, measurement triggers and measurement conditions.

How to delete measurement data from the SmartCheck or ProLink device

1. In the **Measurement data** area, select the **Delete measurement data** action.
2. In the **Delete measurement data** window, enter the desired specifications:

Delete measurement data

Schaeffler SmartWeb

This is where you select the time range for which measurement data is deleted :

☐ Complete time range
☒ Specify time range:

from :
Dec
11
2019

to :
Dec
11
2019

This is where you select which measuring data from the specified time range is deleted :

☒ All measurement data
☐ Define measurement data:

Base measurement job
Basiskonfig
Measurement triggers and conditions




OK
Cancel

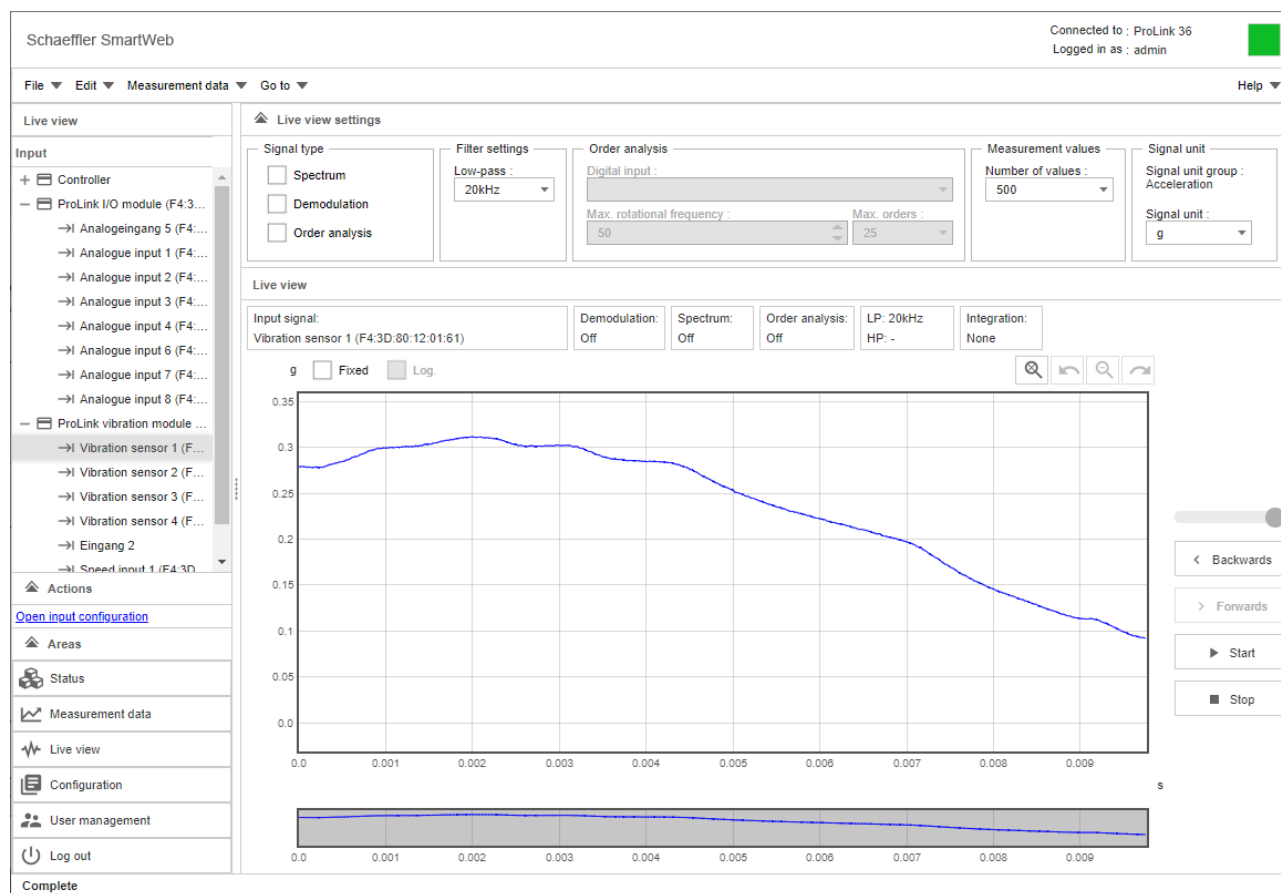
You have the following options:

- | | |
|--------------------------------|--|
| Complete time range | Activate this option to use the entire measuring period as the basis for deleting measurement data. |
| Selected time range | If you activate this option, the calendar functions become active: You can then use the list boxes or the calendar selection to determine the time range for which the measurement data is to be deleted. |
| All measurement data | Activate this option to delete all measurement data within the time range selected above. |
| Define measurement data | <p>Activate this option to select specific measurement jobs, measurement triggers or measurement conditions from the list. Only the measurement data in this selection is then deleted for the time range selected above.</p> <p>How to select items from the list:</p> <ul style="list-style-type: none"> • Left-click: selects the item. • CTRL + left-click: Adds the item to an existing selection. • SHIFT + left-click: Selects all items between the first and last selected items. |

3. Click on **OK**. The measurement data corresponding to your selection is deleted.

7 Live view


Click on the **Live view**  button to open the corresponding area. Here you can view the relevant signal for each input and the scaling factors  created for them. This allows you to check whether a valid signal is coming in, whether you have connected and configured the inputs correctly and whether the SmartCheck or ProLink device is working properly. You can also try out different filter settings for vibration sensors here. You create the basis for this when creating the base configuration: If you activate the **expert settings**  in the configuration wizard, you can set filters in the corresponding step in some measurement jobs.



As soon as you have selected an input or scaling factor on the left, you will find the following information and functions here:

Live view settings

Various options here enable you to influence the display in the live view:




- **Signal type:** Here you can select which signal type should be displayed. If no selection is made, the raw signal is displayed.
- **Filter settings:** Here you can modify the filters that are used.
- **Order analysis:** If you have selected the **Order Analysis** signal type, you can specify details here , i.e. the digital input for the order analysis, the underlying pulses per revolution, the maximum rotational frequency of the component and the maximum number of orders contained in the signal.
- **Measurement values:** You can determine how many measurement values are displayed here. With the **Number of values**, you can specify the area in which you can work with the navigation elements and the zoom function.
- **Signal unit:** You have the ability to change the signal unit here. In our example above, you can change from acceleration and m/s² to speed and mm/s or to displacement and mm.








If you select the **Order analysis** option under **Signal type**, the x-axis displays the number of revolutions in the **live view**.

Live view and navigation elements


To use the functions above and in the graphical display of the live view, proceed as follows:

- Fixed** Activate this option to display the signal with fixed scaling. You can then zoom both horizontally and vertically.
- Log.** Spectrum only:
Activate this option to display the signal with logarithmic scaling.
-  Use this button to open the **Edit speed/frequency band display**  dialogue. Here, you can edit the display of speed, harmonics, and frequency bands.
- Click on the graphic** Clicking on the graphic activates a **measuring tool**  that you can use to determine the distance between two points on the display.

Use the navigation elements to further analyse the live view as follows:

-  As soon as you move the slider, the live view is stopped; you can then navigate with the slider through the last 50 measurements.
-  As soon as you click on **Back**, the live view is stopped and the display jumps backwards in individual steps.
-  If you have stopped the live view and rewound, you can jump forwards in individual steps by pressing the **Forward** button.
-  Use the **Stop** and **Start** buttons to stop or resume the live view.
- 

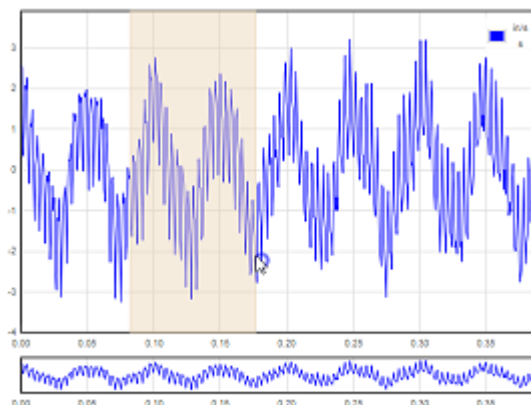


In confidential measurement jobs  only users with special rights can edit the frequency band display.

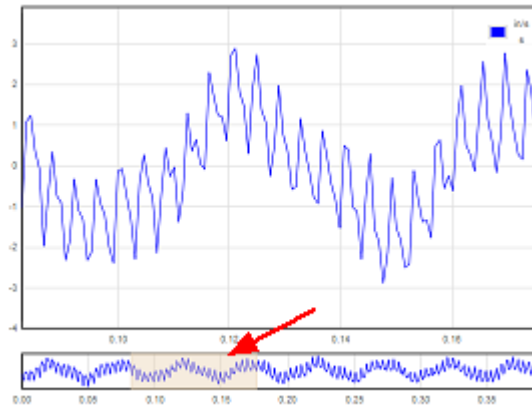
Zooming in on the live view

You can have a closer look at areas of the live view by zooming in on them:

- Click in the area you want to look at and move over the area whilst holding down the left mouse button. This highlights the zoomed area in colour:




- As soon as you release the mouse button, only the zoomed area appears in the live view. The thin strip below shows an overview of the original display area, indicating the area that has been zoomed in on:




- Further **zoom functions**  are available using the buttons above the graphic.

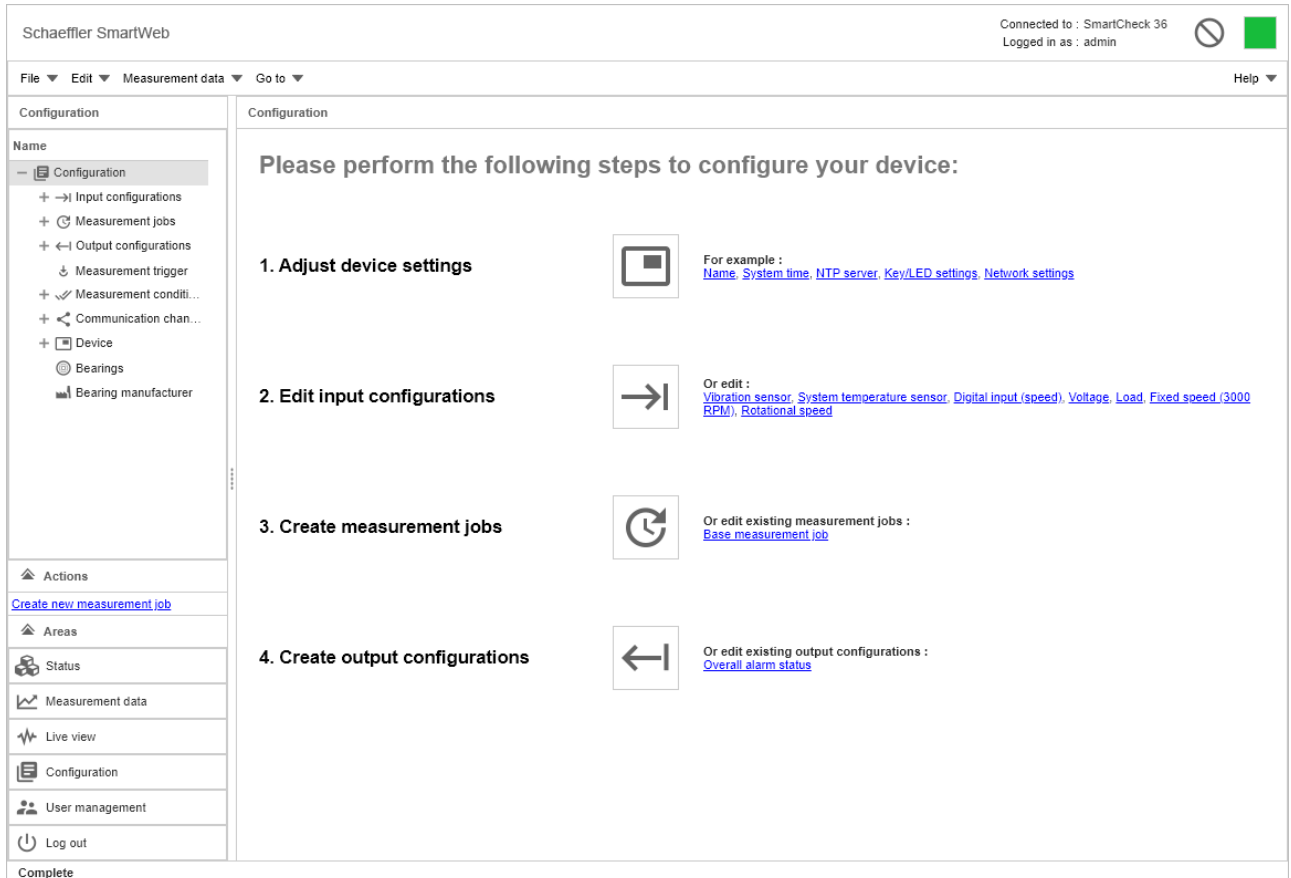
Actions

On the left under **Actions**, you will find the **Open input configuration** menu item, with which you can jump directly to the **Input configurations**  area to edit the selected input.

8 Configuration

Click on the **Configuration**  button to open the corresponding area. In this area of the SmartWeb software, you can make basic settings for your SmartCheck or ProLink device and specify measurement jobs. The **Configuration** is thus the core of your SmartCheck or ProLink device: How reliably the machine monitoring is executed depends on the settings in this area.

When you use the Schaeffler SmartCheck or ProLink device for the first time, the configuration overview opens automatically when you click on the **Configuration**  button:



Schaeffler SmartWeb

Connected to : SmartCheck 36
Logged in as : admin

File Edit Measurement data Go to Help

Configuration

Name

- Configuration
- Input configurations
- Measurement jobs
- Output configurations
- Measurement trigger
- Measurement condi...
- Communication chan...
- Device
- Bearings
- Bearing manufacturer

Actions

[Create new measurement job](#)

Areas

Status

Measurement data

Live view





Configuration

User management






Log out

Complete


Please perform the following steps to configure your device:

- 1. Adjust device settings** 
For example : [Name](#), [System time](#), [NTP server](#), [Key/LED settings](#), [Network settings](#)
- 2. Edit input configurations** 
Or edit : [Vibration sensor](#), [System temperature sensor](#), [Digital input \(speed\)](#), [Voltage](#), [Load](#), [Fixed speed \(3000 RPM\)](#), [Rotational speed](#)
- 3. Create measurement jobs** 
Or edit existing measurement jobs : [Base measurement job](#)
- 4. Create output configurations** 
Or edit existing output configurations : [Overall alarm status](#)














This overview depicts what a logical work flow looks like once you have installed the SmartCheck or ProLink device and established a connection to the SmartWeb software:

1. First you should set System parameters  such as device name and system time. These settings are not relevant as regards measurement.
2. This step relates to the Signal inputs . The system inputs are already available with a base configuration. However, if you would like to connect additional inputs, for example, a speed sensor, you should configure it now. The system must know the additional inputs in order to correctly interpret the incoming signal. Moreover, you can only use existing input configurations for measurement jobs (see below).
3. In the third step, create measurement jobs . Characteristic values are calculated via measurement jobs, which give you information about the condition of the machine. A measurement job is already present for each analogue input in the factory default setting of the SmartCheck or ProLink device, the **Base configuration**. You can also edit and adapt this measurement job to your own needs. A configuration wizard is available both for the creation and editing of measurement jobs.
For the SmartCheck device, in this step, you should also change the preconfigured **"Machine is running" measurement condition**  to the requirements of your machine.
4. If you want to connect the outputs  of the SmartCheck or ProLink device to your controller, you must define here for the SmartCheck device whether a characteristic value or an alarm status is to be output at the output. For the ProLink device, you must define which alarm status is to be output at the output.





You can open the configuration overview from every configuration area. To do so, click on the **Configuration overview**  symbol in the top right.

In the expanded overview on the left, you will find all areas in which you can make settings:

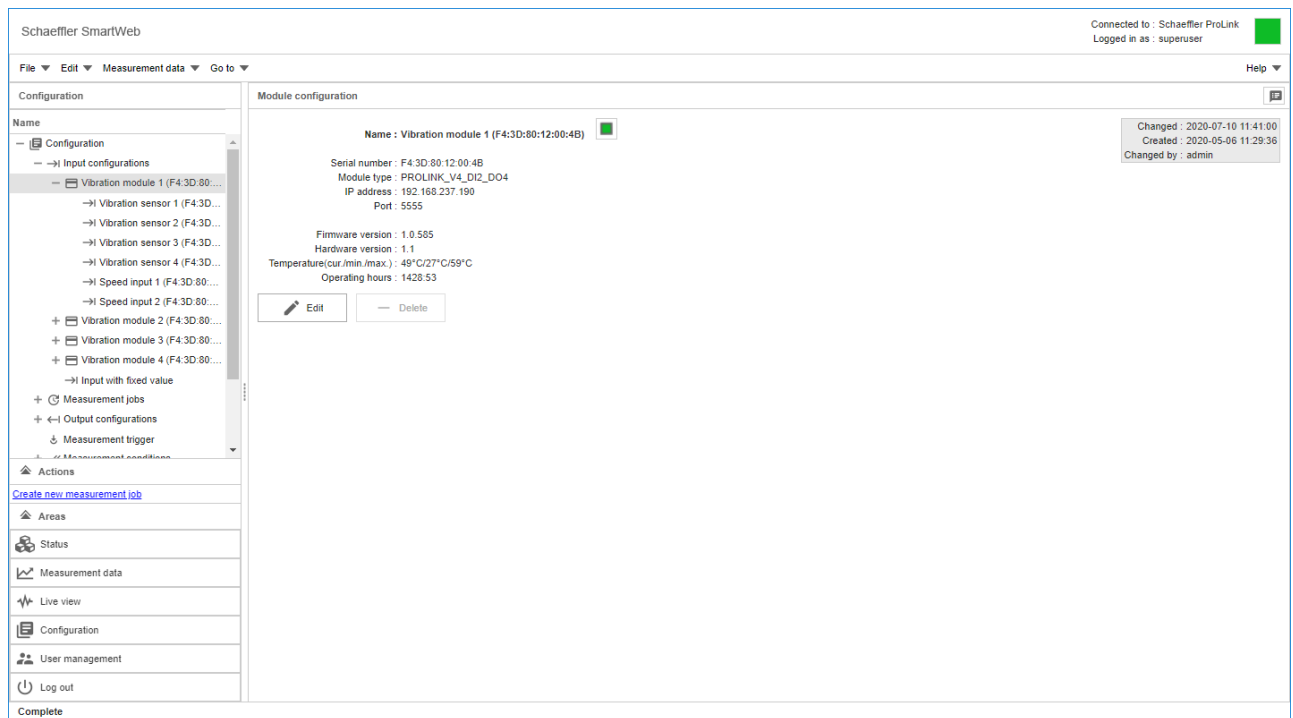
- ➔ **Input configurations** : Here you can configure the analogue and digital inputs of the SmartCheck or ProLink device and additionally create scaling factors.
- 🕒 **Measurement jobs** : Here you can find an overview of your measurement jobs and the associated characteristic value configurations. You can also create, edit or delete new measurement jobs here. Different measurements are bundled in each measurement job, which are performed respectively at a certain time or in a certain order.
- ↔ **Output configurations** : Here you configure the analogue and the digital outputs of the system.
- ⬇ **Measurement trigger** : Here you specify when measurements should be started. If a measurement trigger is fulfilled, the current measurement is immediately interrupted and the measurement initiated by this particular measurement trigger is started.
- ⚙ **Measurement conditions** : Here you specify the conditions under which measurements are started.
- 🔗 **Communication channels** : Here you can create an email communication channel , integrate external controllers , configure the SmartCheck or ProLink device as an OPC UA server  or configure the PROFINET module  for connecting the ProLink device to a controller. The email communication channel enables emails to be sent from the SmartCheck or ProLink device. Data from the integrated controllers can be used in the SmartCheck or ProLink device or alarm statuses for characteristic values can be transferred from the SmartCheck or ProLink device to these controllers. Other controllers can read out process parameters of the SmartCheck or ProLink device via the OPC UA server communication channel or provide the SmartCheck or ProLink device with additional process parameters via the OPC UA server inputs. A controller can read data from the ProLink device connected to it and send process data to the ProLink device via the PROFINET module.
- 📄 **Device** : In this area, you can view and partly change the main settings of the SmartCheck or ProLink device. This includes e.g. the device name and the system time.
- ⚙ **Bearings** : Here you will find the bearing database, which you can expand yourself.
- 🏭 **Bearing manufacturer** : Here you will find a list of bearing manufacturers. You can add further manufacturers to this list.



In each of these areas, under the **Actions** menu, you will find the item **Create new measurement job** . This menu item starts a wizard, with which you create a measurement job step by step. This task is also facilitated by virtue of measurement templates , which are already available in the SmartCheck or ProLink device. They are automatically incorporated by the wizard and support the creation of specific measurements.

8.1 Module configuration (ProLink only)

Schaeffler ProLink You can connect a maximum of four vibration modules and a maximum of four I/O modules to the processor module. Once you have properly put the system into operation, the modules are automatically created in the SmartWeb software and displayed in the individual areas as separate levels. In the tree, select a module to view details, change its name and identify its physical module. For I/O modules, you can also define the inputs and outputs here:



If you select a vibration module in the expanded overview, you will find the following in the main panel:

- **Name:** Here you will find the full name of the module.
In the SmartWeb software, the modules are sorted alphanumerically in ascending order. The module name determines the sort order. This affects details such as the **system information** ⁴² in the **Status** area. To change the sort order and map your physical system configuration, you must edit the module name using .
- **Module identification:** Click the symbol to identify the associated physical module. The LEDs of the physical module in question flash alternately. Click again to exit identification mode.
- Below the name you will find more details about the module, such as the **serial number**, **IP address** or **temperature** of the module.
- On the right, in the area highlighted in grey, you will find details on creating and changing the module.
- Click on to edit the name of the module ⁶⁰.
You can also define the inputs and outputs of the I/O module ⁶¹ via the same button.
- Click on to open the configuration overview ⁵⁸.

Here is how to edit the name of a module

1. Click on to open the **Edit module** window:

Edit module ...

Schaeffler SmartWeb

Name :

Vibration module 1 (F4:3D:80:12:00:4B)

OK


Cancel

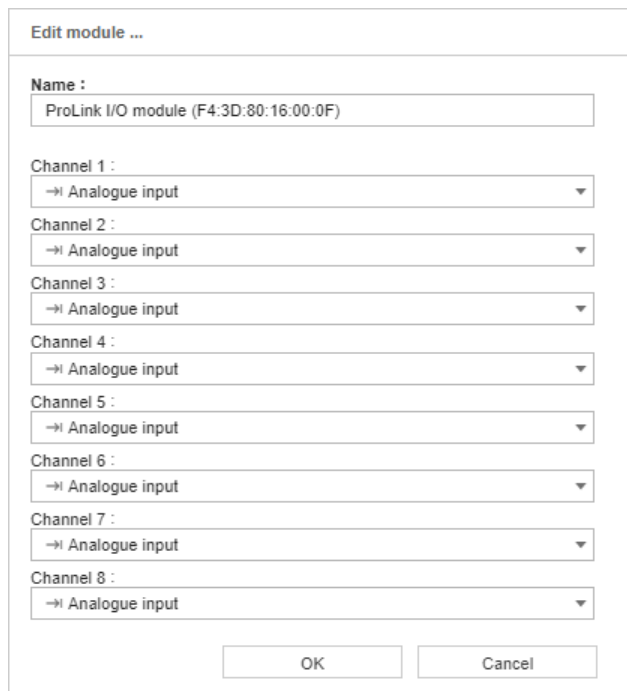
You can make the following changes here:

Name The module is listed under this name in the SmartWeb software. Due to the alphanumeric sorting sequence, the name determines where a module is placed in the respective list. You can change the display of details such as the **system information** ⁴² in the **Status** area to map your physical system configuration.


2. Click on **OK** to save your changes.

This is how you define the inputs and outputs of an I/O module

1. Click on  to open the **Edit module** window:










You can make the following changes here:


- Name** The module is listed under this name in the SmartWeb software. Due to the alphanumeric sorting sequence, the name determines where a module is placed in the respective list. You can change the display of details such as the **system information**  in the **Status** area to map your physical system configuration.
- Channel 1-8** Select the required analogue or digital input or output for each channel of the I/O module. You can then configure the inputs in the **input configurations** area and the outputs in the **output configurations** area.

2. Click on **OK** to save your changes.

8.2 Input configurations

Depending on the system, you have the following options:

- **Schaeffler SmartCheck device:** The device has a vibration and temperature sensor , which supplies input signals directly after commissioning. In addition, you can connect a total of three further external sensors via the two analogue inputs  and the digital input  to the SmartCheck device and configure them here.
- **Schaeffler ProLink device:** Once you have started the Schaeffler ProLink device, the inputs for the connected vibration modules  are automatically created and assigned to the modules. Four analogue inputs  and two digital inputs  are possible per vibration module. You can configure these inputs here. In addition, eight analogue inputs are automatically created for each of the connected I/O modules. You can configure these inputs here. Use the module configuration  to switch these analogue inputs to digital inputs, analogue outputs or digital outputs.

You can find details on how to connect the SmartCheck or ProLink device properly in the respective user documentation. Moreover, the SmartCheck or ProLink device is capable of creating fixed values . Here, for example, you can specify a constant speed in order to ensure the correct calculation of the characteristic values.

In the expanded overview on the left, you will find all inputs of the SmartCheck device. For the ProLink device you will find all connected modules and associated inputs here. You can see details on the input currently selected along with possible editing functions in the main panel under Input configurations:

Schaeffler SmartWeb

Connected to : SmartCheck 36
Logged in as : admin

File Edit Measurement data Go to Help

Configuration

Name

Configuration
Input configurations
Vibration sensor ...
System temperaturat...
Voltage - Analog...
Load - Analogue ...
Digital input (spe...
Input with fixed v...
Measurement jobs
Output configurations
Measurement trigger
Measurement conditi...
Communication chan...
Device
Bearings
Bearing manufacturer

Actions
Create new measurement job
Areas
Status
Measurement data
Live view
Configuration
User management
Log out

Input configurations

Input channel : Vibration sensor

Name : Vibration sensor

Input channel type : Vibration Source
Signal/sensor unit : g (Acceleration)
Sampling rate : 25,600 Hz

Edit

Changed : 2019-11-25 08:35:48
Created : 2019-11-25 08:35:48
Changed by : admin

The information and functions you can access here depend on the selected input. Relevant details can be found in the following sections.

8.2.1 Internal sensors (SmartCheck only)

In the factory default setting, the Schaeffler SmartCheck device has two internal sensors: a temperature sensor and a vibration sensor. As soon as the system is properly commissioned, these two sensors supply signals and can be incorporated into a Measurement job⁷⁶. In the **Input configurations** area, you can view and partly edit the details on the corresponding inputs:

Schaeffler SmartWeb

Connected to : SmartCheck 36
Logged in as : admin

File Edit Measurement data Go to Help

Configuration

Name

Configuration
Input configurations
Vibration sensor ...
System temperaturat...
Voltage - Analog...
Load - Analogue ...
Digital input (spe...
Input with fixed v...
Measurement jobs
Output configurations
Measurement trigger
Measurement conditi...
Communication chan...

Input configurations

Input channel : Temperature sensor


Name : System temperature sensor

Input channel type : Temperature Source
Signal/sensor unit : °C (Temperature)
Sampling rate : 1.0 Hz



Edit

Changed : 2019-11-25 08:35:48
Created : 2019-11-25 08:35:48
Changed by : admin

If you select the input of an internal sensor in the expanded overview, you will find the following in the main panel:

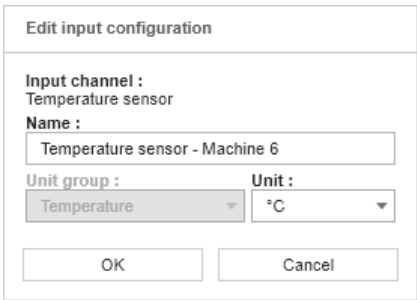
- The details on the selected input are shown on the left: Next to **Input channel**, you will find the name of the physical connection: next to **Name**, you will find the name you yourself gave this specific configuration.
- On the right, in the area highlighted in grey, you will find details on creating and changing the input.
- Click on  to edit the input configuration of the internal sensor.

62

- Click on  to open the configuration overview .

How to edit the input configuration of an internal sensor

- Click on  to open the **Edit input configuration** window:



You can make the following changes here:

- | | |
|-------------|---|
| Name | The input is listed under this name in the Input configurations area. Therefore, you should choose a practical name which will enable you to distinguish between several inputs. |
| Unit | Here you can change the unit of measurement for the sensor signal. By default, the unit of the corresponding input configuration is selected here. |

- Click on **OK** to save your changes.

8.2.2 Analogue inputs

The SmartCheck device has two analogue inputs. Each vibration module of the ProLink device has four analogue inputs, which you can use either as a vibration input or as an analogue input with other signal sources, such as torque or temperature sensors. Each I/O module of the ProLink device has up to eight analogue inputs that you can configure flexibly

In the factory default settings, these are configured as follows:

SmartCheck device:

- **Analogue 1**
 - Unit group: voltage
 - Signal unit: V
 - Input range: 0-10 V
- **Analogue 2**
 - Unit group: load
 - Signal unit: %
 - Input range: 0-20 mA
 - Scaling factor: 5

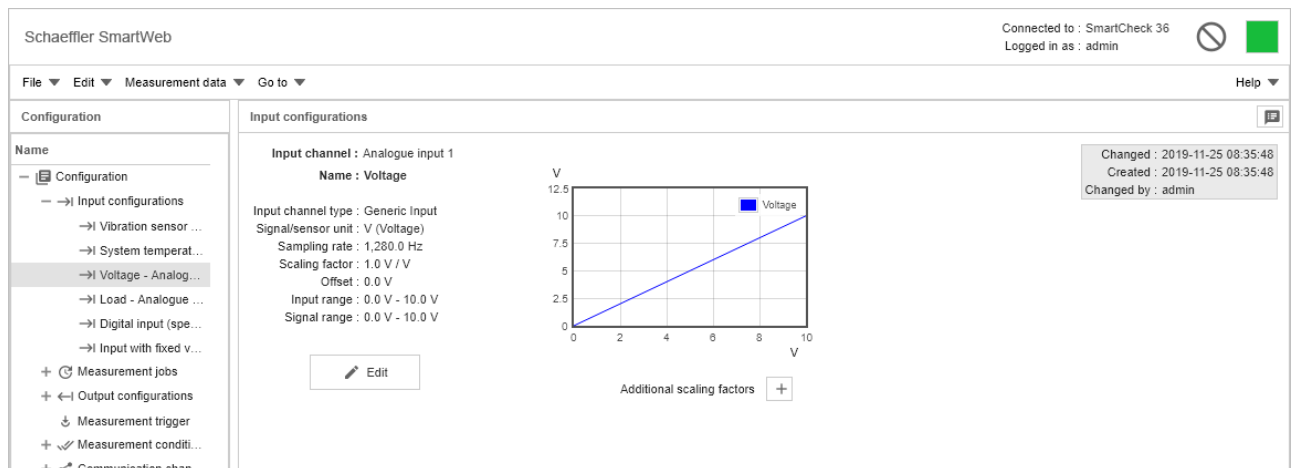
Vibration module of the ProLink device:

- **Analogue 1–4**
 - Input type: Vibration input
 - Unit group: acceleration
 - Signal unit: g
 - Sensor type: AC
 - Sensor sensitivity [mV/g]: 100








I/O module of the ProLink device:

- **Analogue 1-8**
 - Unit group: voltage
 - Signal unit: V
 - Sample rate: 500 Hz
 - Input type: 0–10 V


In the **Input configurations** area, you can view and partly edit the details on the corresponding inputs:



If you select an analogue input in the expanded overview, you will find the following in the main panel:

- The details on the selected input are shown on the left: next to **Input channel** you will find the name of the physical connection; next to **Name** you will find the name that the system has automatically assigned (the ProLink device only) or that you yourself gave this specific configuration.
- Beside the details, you will find a diagram illustrating the details. The diagram is automatically adjusted when you edit the input configuration.
The diagram does not appear for vibration inputs.
- On the right, in the area highlighted in grey, you will find details on creating and changing the input.
- Click on  to edit the input configuration of the analogue input .
- Click on  to add additional scaling factors  to the input; you can also access scaling factors e.g. when creating measurement jobs .
- Click on  to open the configuration overview .

How to edit an analogue input configuration

1. In the expanded overview on the left, select the analogue input you would like to edit.
2. Click on **Edit**  in the main panel to open the **Edit input configuration** window.

For the SmartCheck device, you will see the following dialogue box:

Edit input configuration

Schaeffler SmartWeb

Name :
Rotational speed - Rev6

Unit group : Frequency/speed **Signal/sensor unit :** RPM

Sampling rate :
1,280.0 Hz

Input type :
0 to 10 V

Max : 10.0 **RPM**

Scaling : 1.0

Min : 0.0

OK Cancel

You have the following options:

- Name** Here, specify the name that the input is to appear under in the SmartWeb software.
- Unit group** Here, specify which physical value is measured by the sensor you are connecting to this input, e.g. **Frequency/speed**.
- Signal unit** Here, select the appropriate unit of measurement for your sensor.
- Input type** Here, select the range of the voltage/current that applies for this input configuration. The SmartCheck device supports the following ranges for the analogue inputs:
- 0-10 V
 - 0-24 V
 - 4-20 mA
 - 0-20 mA
- Max, Scaling, Min** Use these settings to determine the range within which the measurement values should lie. First enter a minimum value **Min**. Then enter a maximum value **Max** or define the factor with which the incoming signal should be scaled in the **Scaling** field. Both the diagram and the values of the respective other field are then adjusted automatically.

For the vibration module you will see the following dialogue depending on the input type:

Input type: Vibration input

Input type: Analogue input

You have the following options:

- | | |
|---|---|
| Name | Here, specify the name that the input is to appear under in the SmartWeb software. |
| Input type | Select the appropriate input type for the connected vibration sensor: <ul style="list-style-type: none"> • Vibration input • Analogue input |
| Unit group | Here, specify which physical value is measured by the sensor you are connecting to this input, e.g. Frequency/speed . |
| Signal unit | Here, select the appropriate unit of measurement for your sensor. |
| Sensor type
(vibration input only) | Select the appropriate sensor type for the connected vibration sensor: <ul style="list-style-type: none"> • AC • DC • IEPE: Select this option for IEPE acceleration sensors. |
| Sensor sensitivity
(vibration input only) | Select the value specified on the calibration data sheet for the sensor. |
| Min./max. Bias voltage
(vibration input only) | Adjust this value for the IEPE acceleration sensor if necessary. |
| Voltage input
(analogue input only) | Here, select the range of the voltage/current that applies for this input configuration. The ProLink device supports the following ranges for the analogue inputs: <ul style="list-style-type: none"> • 0 V to 10 V • -10 V to 10 V |
| Low-pass
(analogue input only) | Select the value of the low-pass here. |



A 50 Hz low-pass is automatically applied, with which only relatively slow signals can be measured. If you use the analogue input for a measurement trigger or a measurement condition, this low-pass is also connected in between. When selecting the measurement length, you must therefore expect 128 samples per second.

Max, Scaling, Min
(analogue input only)

Use these settings to determine the range within which the measurement values should lie. First enter a minimum value **Min**. Then enter a maximum value **Max** or define the factor with which the incoming signal should be scaled in the **Scaling** field. Both the diagram and the values of the respective other field are then adjusted automatically.

Invert
(analogue input only)

Activate this option to invert the scaling factor.

Example: A combined vibration and temperature sensor delivers a value of 10 mV/°C. With a voltage range from 0 V to 10 V, this yields a measuring range from 0 °C to 1000 °C. By default, the scaling factor is set to °C/V. With **Invert** you can automatically change the scaling factor to V/°C.

The following dialogue is displayed for the I/O module:

The screenshot shows a dialog box titled "Edit module ...". Inside, there is a "Name :" field containing "ProLink I/O module (F4:3D:80:16:00:0F)". Below this are eight "Channel" fields, each with a dropdown menu. All dropdowns are currently set to "Analogue input". At the bottom of the dialog are "OK" and "Cancel" buttons.

You have the following options:


- | | |
|--------------------------|---|
| Name | Here, specify the name that the input is to appear under in the SmartWeb software. |
| Unit group | Here, specify which physical value is measured by the sensor you are connecting to this input, e.g. Frequency/speed . |
| Signal unit | Here, select the appropriate unit of measurement for your sensor. |
| Input type | Here, select the range of the voltage/current that applies for this input configuration. The I/O module supports the following ranges for the analogue inputs: <ul style="list-style-type: none"> • 0-10 V • 0-20 mA • 4-20 mA |
| Max, Scaling, Min | Use these settings to determine the range within which the measurement values should lie. First enter a minimum value Min . Then enter a maximum value Max or define the factor with which the incoming signal should be scaled in the Scaling field. Both the diagram and the values of the respective other field are then adjusted automatically. |

3. Click on **OK** to save your changes.



- If you want to edit an input that is already used by a measurement job, measurement condition or measurement trigger, you must first delete this associated configuration.
- You can also enter negative values for the **Min** and **Max** for an analogue speed input. This enables you to distinguish between different directions of rotation.
- Analogue inputs that you create on the ProLink device can be added as an additional characteristic value to a measurement job or used as an input for a measurement trigger, a measurement condition or for channel monitoring. You cannot use these analogue inputs directly for a vibration measurement job.

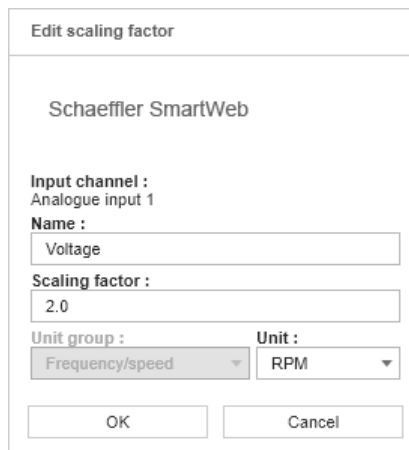
How to add a scaling factor to the input

You can add scaling factors to the analogue input, which you can access e.g. when creating a measurement job . Using scaling factors, you can calculate logical values for other areas from the physical value measured at one area of the component.

Example: With the analogue input, you measure the speed in front of the gear. The speed behind the gear is 5 times smaller. You can create a scaling factor for this:

1. **Speed in front of the gear**
2. **Speed behind the gear** with a factor of 0.2 (1/5)

1. Click on **+** to open the **Add scaling factor** window:



You have the following options:

- | | |
|-----------------------|--|
| Name | The scaling factor is listed under this name, along with the other inputs. Therefore, you should choose a practical name that will enable you to distinguish between the inputs. |
| Scaling factor | The physical input signal is multiplied by the value you enter here. |
| Unit | Here you can change the unit of measurement for the sensor signal. By default, the unit of the corresponding input configuration is selected here. |

2. Click on **OK** to save your changes. The new scaling factor appears in the diagram and in the list of scaling factors:

Schaeffler SmartWeb

Connected to : SmartCheck 36
Logged in as : admin

File Edit Measurement data Go to Help

Configuration

Name

- Configuration
 - Input configurations
 - Vibration sensor ...
 - System temperatur ...
 - Rotational speed ...
 - Load - Analogue ...
 - Digital input (spe...
 - Input with fixed v...
 - Measurement jobs
 - Output configurations
 - Measurement trigger
 - Measurement conditi...
 - Communication chan...

Input configurations

Input channel : Analogue input 1
Name : Rotational speed - Rev6

Input channel type : Speed Source
Signal/sensor unit : RPM (Frequency/speed)
Sampling rate : 1,280.0 Hz
Scaling factor : 1.0 RPM / V
Offset : 0.0 RPM
Input range : 0.0 V - 10.0 V
Signal range : 0.0 RPM - 10.0 RPM

RPM

Additional scaling factors

0	Voltage (RPM)	2.0 x

Changed : 2019-12-11 21:30:56
Created : 2019-12-11 21:30:56
Changed by : admin

3. To delete or edit the scaling factor, right-click to open the context menu and select the corresponding command here:

Schaeffler SmartWeb

Connected to : SmartCheck 36
Logged in as : admin

File Edit Measurement data Go to Help

Configuration

Name

- Configuration
 - Input configurations
 - Vibration sensor ...
 - System temperatur ...
 - Rotational speed ...
 - Load - Analogue ...
 - Digital input (spe...
 - Input with fixed v...
 - Measurement jobs
 - Output configurations
 - Measurement trigger
 - Measurement conditi...
 - Communication chan...
 - Device
 - Bearings
 - Bearing manufacturer
 - Actions

Input configurations

Input channel : Analogue input 1
Name : Rotational speed - Rev6

Input channel type : Speed Source
Signal/sensor unit : RPM (Frequency/speed)
Sampling rate : 1,280.0 Hz
Scaling factor : 1.0 RPM / V
Offset : 0.0 RPM
Input range : 0.0 V - 10.0 V
Signal range : 0.0 RPM - 10.0 RPM

RPM

Additional scaling factors

0	Voltage (RPM)	2.0 x

Edit

Delete

Changed : 2019-12-11 21:30:56
Created : 2019-12-11 21:30:56
Changed by : admin



If you delete a scaling factor which is being used by a measurement job, the system gives you a warning message. If you delete the scaling factor, you also automatically delete the relevant measurement job.

8.2.3 Digital input

The digital input of the SmartCheck device or the two digital inputs of each Schaeffler ProLink vibration module are configured as follows in the factory default setting:

- Unit group: frequency/speed
- Signal unit: rpm (SmartCheck) or Hz (ProLink)
- Pulses per revolution: 1
- Signal threshold: 7 V
- Hysteresis: 2 V



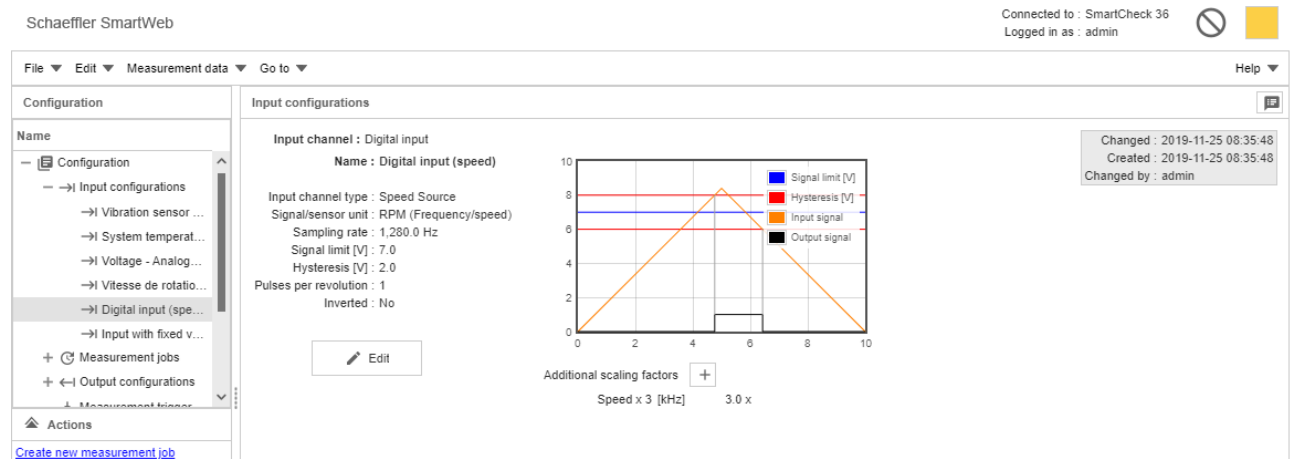
SmartCheck device:

When selecting the dropping resistor, please note the impedance of the input signal of your digital input. Note the maximum switching current of the digital switching output of the Schaeffler SmartCheck device (1 A/30 V) and the power of the dropping resistor.

With the Schaeffler ProLink I/O module you can create up to eight digital inputs⁵⁹. They are created with the following values, which cannot be changed:

- Unit group: no unit
- Signal unit: -
- Sample rate: 500 Hz
- Pulses per revolution: 1
- Signal threshold: 3 V
- Hysteresis: 0.5 V

In the **Input configurations** area, you can view and partly edit the details for the digital input:



If you select the digital input in the expanded overview, you will find the following in the main panel:

- The details on the selected input are shown on the left: next to **Input channel**, you will find the name of the physical connection; next to **Name**, you will find the name that the ProLink device has automatically assigned or that you yourself gave this specific configuration.
- Beside the details, you will find a diagram illustrating the details.
- On the right, in the area highlighted in grey, you will find details on creating and changing the input.
- Click on to edit the input configuration of the digital input⁷⁰.
- Click on to add additional scaling factors⁷² to the input; you can also access scaling factors e.g. when creating measurement jobs⁷⁸.
- Click on to open the configuration overview⁵⁸.

How to edit a digital input configuration



:For the digital inputs of the ProLink device, you can only change the **name** and the setting for **Inverted**. If you need adjustable switching thresholds, you must use the speed input of the Schaeffler ProLink vibration module.

1. Select the digital input in the expanded overview on the left.
2. In the main panel, click on **Edit** to open the **Edit input configuration** window:

Edit input configuration

Name :
Digital input (speed)

Unit group : Frequency/speed Signal/sensor unit : RPM

Sampling rate :
1,280.0 Hz

☐ Inverted

Pulses per revolution :
1

Signal limit [V] :
7.0

Hysteresis [V] :
2.0

OK Cancel

You have the following options:

Name	Here, specify the name that the input is to appear under in the SmartWeb software.
Unit group	Here you have the choice between No unit and Frequency/speed . Select the option No unit if you want the input to display a status such as "Machine on" or "Machine off".
Signal unit	Here you will only find a list box if you have selected Frequency/speed as the Unit group .
Inverted	Activate this option to invert the digital input signal.
Signal type (ProLink only)	Here you have the following options: <ul style="list-style-type: none"> • Speed signal (excl. direction of rotation) • A/B encoder (incl. direction of rotation)
Pulses per revolution	This option is only available when Frequency/speed is selected as the Unit group .
Signal threshold	Specify in volts the average input level, above or below which the digital input switches; in the diagram, the Signal threshold is drawn in blue. The specified value is rounded up/down to the nearest .0 or .5.
Hysteresis	With Hysteresis , you specify in volts the range within which the input level is permitted to drop below or rise above the Signal threshold without the digital input switching; in the diagram, the Hysteresis is drawn in red. The hysteresis should be set in every case, as otherwise the signal could generate spurious pulses at the signal threshold. The poorer the signal, the higher you should set the hysteresis. The specified value is rounded up/down to the nearest .0 or .5.
Diagram	The diagram illustrates how the input reacts to your settings, in other words how the system converts real input pulses e.g. between 0 V and 12 V into digital 0 and 1; with each change, the diagram is immediately updated. The diagram in the example is interpreted as follows: <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Example: With a Signal threshold of 5 V and a Hysteresis of 2 V, the status of the digital input remains unchanged between 4 V and 6 V.</p> </div>

The input signal (orange) passes the hysteresis line (red) above the signal threshold (blue). The signal output (black) reacts to this and jumps from 0 to 1. As soon as the input signal undercuts the hysteresis line below the signal limit, the signal output reacts again and jumps from 1 to 0.

Example: Your sensor delivers pulses between 0 V and 12 V. In this case, set the signal threshold to 6 V and the hysteresis e.g. to 2 V.

3. Click on **OK** to save your changes.

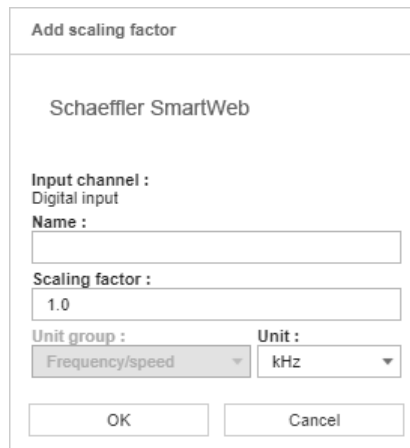
How to add a scaling factor

You can add scaling factors to the digital input, which you can access e.g. when creating a measurement job⁷⁸. Using scaling factors, you can calculate logical values for other areas from the physical value measured at one area of the component.

Example: With the digital input, you measure the speed in front of the gear. The speed behind the gear is 5 times smaller. You can create a scaling factor for this:

1. **Speed in front of the gear**
2. **Speed behind the gear** with a factor of 0.2 (1/5)

1. Click on **+** to open the **Add scaling factor** window:



You have the following options:

- | | |
|-----------------------|--|
| Name | The scaling factor is listed under this name, along with the other inputs. Therefore, you should choose a practical name that will enable you to distinguish between the inputs. |
| Scaling factor | The physical input signal is multiplied by the value you enter here. |
| Unit | Here you can change the unit of measurement for the sensor signal. By default, the unit of the corresponding input configuration is selected here. |

2. Click on **OK** to save your changes. The new scaling factor appears in the list of scaling factors:

Schaeffler SmartWeb

Connected to : SmartCheck 36
Logged in as : admin

File Edit Measurement data Go to Help

Configuration

Name

- Configuration
 - Input configurations
 - Vibration sensor ...
 - System temperat...
 - Voltage - Analog...
 - Vitesse de rotatio...
 - Digital input (spe...
 - Input with fixed v...
 - Measurement jobs
 - Output configurations
- Actions
- Create new measurement job
- Areas
- Status

Input configurations

Input channel : Analogue input 2

Name : Vitesse de rotation

Input channel type : Speed Source

Signal/sensor unit : RPM (Frequency/speed)

Sampling rate : 1,280.0 Hz

Scaling factor : 5.0 RPM / mA

Offset : 0.0 RPM

Input range : 0.0 mA - 20.0 mA

Signal range : 0.0 RPM - 100.0 RPM

Edit

RPM

Additional scaling factors

- Vitesse de rotatio [kHz] 0.2 x

Changed : 2019-12-19 00:35:17
Created : 2019-12-19 00:35:17
Changed by : admin

3. To delete or edit the scaling factor, right-click to open the context menu and select the corresponding command here:

Schaeffler SmartWeb

Connected to : SmartCheck 36
Logged in as : admin

File Edit Measurement data Go to Help

Configuration

Name

- Configuration
 - Input configurations
 - Vibration sensor ...
 - System temperat...
 - Voltage - Analog...
 - Vitesse de rotatio...
 - Digital input (spe...
 - Input with fixed v...
 - Measurement jobs
 - Output configurations
- Actions
- Create new measurement job
- Areas
- Status

Input configurations

Input channel : Analogue input 2

Name : Vitesse de rotation

Input channel type : Speed Source

Signal/sensor unit : RPM (Frequency/speed)

Sampling rate : 1,280.0 Hz

Scaling factor : 5.0 RPM / mA

Offset : 0.0 RPM

Input range : 0.0 mA - 20.0 mA

Signal range : 0.0 RPM - 100.0 RPM

Edit

RPM

Additional scaling factors

- Vitesse de
 - Edit
 - Delete

Changed : 2019-12-19 00:35:17
Created : 2019-12-19 00:35:17
Changed by : admin



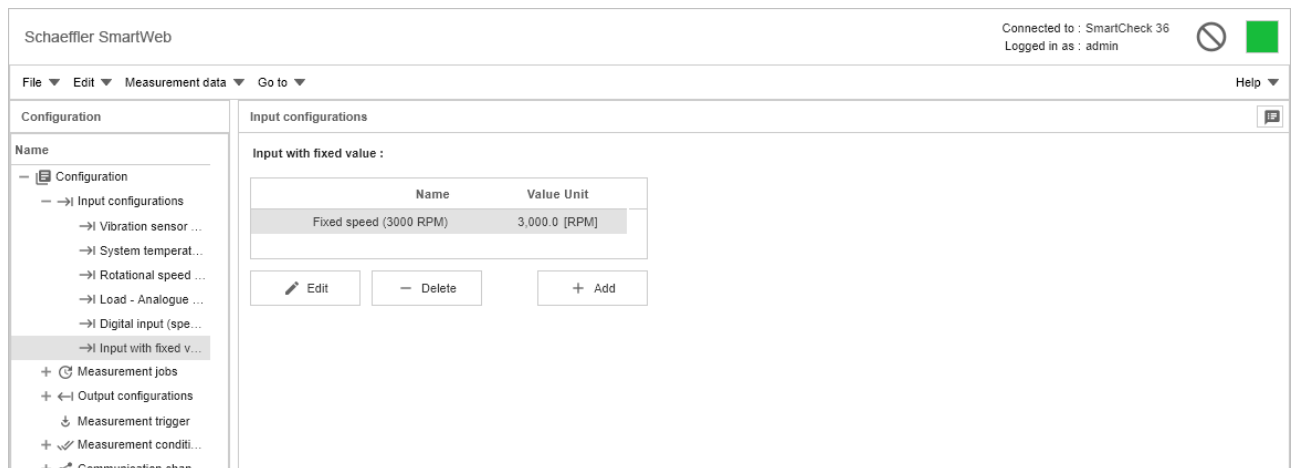
If you delete a scaling factor which is being used by a measurement job, the system gives you a warning message. If you delete the scaling factor, you also automatically delete the relevant measurement job.

8.2.4 Input with fixed value






In the SmartWeb software, you can create inputs with a fixed value, which you can access when creating measurement jobs. An input with a fixed value can be useful, for example, if the machine to be monitored runs at a constant speed. In this case, you do not have to connect a sensor; rather you can specify the speed via the fixed value. In the factory default setting, the SmartCheck or ProLink device has one input with a fixed value, which is configured as follows:

- Name: Fixed speed
- Value: 3000
- Unit: RPM


In the **Input configurations** area, you can view and edit the details for the fixed values:



You have the following options:

- Click on **Edit**  to edit the selected input with a fixed value.
- Click on **Delete**  to delete the selected input with a fixed value.
- Click on **Add**  to add another input with a fixed value.
- Click on  to open the configuration overview .

How to add a new input with a fixed value

1. Click on  to open the window **Add fixed value**:

Add fixed value

Input channel :
Input with fixed value

Name :

Value :

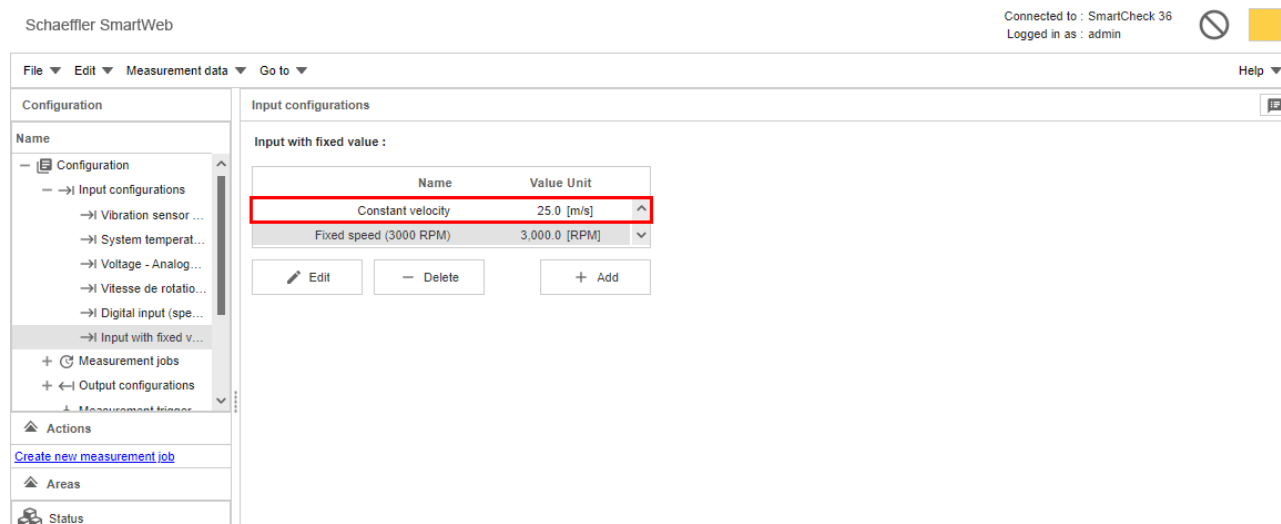
Unit group :



Unit :

You have the following options:

- Name** The input with a fixed value is listed under this name, along with the other inputs. Therefore, you should choose a practical name that will enable you to distinguish between the inputs.
- Value** Here you specify the fixed value.
- Unit group** Here you specify which unit group the fixed value belongs to, e.g. **Torque**, **Pressure**, **Speed** or **Force**.
- Unit** Here you can specify the unit of measurement for the fixed value. The selection options correspond to the selected unit group.

2. Click on **OK** to save your changes. The new input with a fixed value appears in the table:



3. To **Delete**  or **Edit**  the input with a fixed value, select the entry in the table and then choose the corresponding command.

8.2.5 Setting order analysis

In many measurement configuration templates, step 2 of the wizard determines the input signals on which monitoring is based. If the monitoring is based on a measured speed signal and the speed is measured from the digital input of a vibration module, you can activate and set an order analysis. This reduces the influence of speed fluctuations on the monitoring result. The order analysis converts the vibration signal into a signal where the influence of speed fluctuations during the measurement is reduced. You can activate this option on machines that have a very dynamic rotational speed, such as wind energy plants or lifts.

Proceed as follows to use and set the function:

1. In step 2 of the wizard, under **Speed signal**, select the desired speed input.
Order analysis requires a high-resolution speed signal. For this reason, you must select a digital speed input of a vibration module so that you can activate and edit the **Order analysis** option.
2. Activate the **Order analysis** option. The **Pulses per revolution** list box appears:

Create configuration

Steps

1: Select component
2: Specify details for roller bearing
3: Save settings/measurement triggers and conditions
4: Additional signals
5: Set alarms

Description

Enter information on the roller bearing and measurement signals.

Step: Specify details for roller bearing

Name of roller bearing :

Bearing 6202

?

Bearing type :

No bearing selected.

?

+

Standing bearing race :

☒ Outer race
☐ Inner race

?

Vibration signal :

☒ Vibration sensor 1 (F4:3D:80:12:01:61)

?

Speed signal :

☒ Speed input 1 (F4:3D:80:12:01:61)

+

?

Maximum speed [0.1 - 100 Hz] :

50

☒ Maximum speed deviation (+/-)

5

%

?

☒ Order analysis

?

☐ Expert settings

Back

Next

Cancel

- From the list, select how many **Pulses per revolution** you want to evaluate.
For this setting, you need to know how the pulses are distributed across the rotation, i.e. evenly or unevenly. The order analysis depends on the pulses per revolution being as regular as possible. If the pulses are irregular–i.e. the angle between two pulses is not always the same–it may be useful to ignore some of the pulses per revolution. The **Pulses per revolution** setting allows you to reduce the pulse count used for the calculation. This does not change the rotational speed value.



The **Pulses per revolution** list box only appears if the **Pulses per revolution** value is set to between 2 and 32 in the digital input configuration.

If the value is higher than 32, the vibration module reduces the pulses per revolution. This is done for performance limitation reasons. In this case, the **Pulses per revolution** list box is not present in step 2 of the wizard.

- Click **Next**, make additional settings in the other steps, if necessary, and exit the wizard with **OK**.

8.3 Measurement jobs

To enable the Schaeffler SmartCheck or ProLink vibration monitoring system to monitor your machine and trigger alarms if appropriate, the incoming signals must be measured and characteristic values calculated. The corresponding instructions are located in what are known as measurement jobs, which you can create using the SmartWeb software.

The SmartCheck or ProLink device is distinguished by the support the system gives you in the creation of these measurement jobs and especially in the calculation rules for characteristic values: You create measurement jobs exclusively with the aid of the Configuration wizard⁷⁸. In the very first step of the wizard, you select a template⁸² that is suitable for your machine. According to the template you selected, e.g. the **Gear stage** template for the monitoring of two gears, the SmartCheck or ProLink device then automatically generates the appropriate characteristic values. In addition, a superordinate alarm characteristic value is generated for each measurement job, which summarises the alarm status of all characteristic values.

You cannot edit the characteristic values the SmartCheck or ProLink device generates; you can only view them in the corresponding overview in the SmartWeb software. However, you specify a series of framework conditions for the

measurement job in the configuration wizard, e.g. triggers or conditions^[82], the dependency of an alarm on additional signals, or the activation of the learning mode.

Selection of the right template and correct entries in the configuration wizard is a key factor in enabling your system to perform the monitoring as required. Consequently, the following sections are to support you in these work steps. You will find here:

- The detailed description of the **Measurement jobs**^[77] area.
- An overview of the Steps in the configuration wizard^[78] that you follow to create a measurement job. This section contains a summary of each step and any additional information further to the info texts in the configuration wizard.
- An Overview of the templates^[82] available to you when creating a measurement job.
- Detailed explanations of the Learning mode^[89] and Alarm maps^[91], two special functionalities that the SmartCheck or ProLink device provides you for monitoring. Both are activated from the configuration wizard.

8.3.1 Measurement jobs area

In the **Measurement jobs** area, you will find an overview of all measurement jobs you have created for the SmartCheck or ProLink device. Each measurement job includes the following components:

- **Measurement configurations:** These determine the inputs at which measurements are made and how these measurements are performed.
- **Characteristic value configurations:** These values are calculated automatically from measurement signals according to internal templates.
- **Optional component:** Triggers or conditions^[82] can be added to the measurement job in order to control the execution of measurements.

You can view and partly edit all of these components and their details in the **Measurement jobs** area. In the factory default setting of the SmartCheck device or for each ProLink vibration sensor, the **base configuration** is created:

Schaeffler SmartWeb

Connected to : SmartCheck 36
Logged in as : admin

File Edit Measurement data Go to Help

Configuration

Name

- Configuration
- Input configurations
- Measurement jobs
- Base measurement...
- Output configurations
- Measurement trigger
- Measurement condition...
- Communication chan...
- Device
- Bearings
- Bearing manufacturer

Actions

Create new measurement job

Areas

Status

Measurement data

Live view

Configuration

User management

Log out

Complete

Measurement job

Name : Base measurement job

Measurement condition : Machine is running

Changed : 2019-11-25 08:36:24
Created : 2019-11-25 08:36:24
Changed by : admin

Edit Duplicate Deactivate Delete Create

Characteristic value configuration

Base measurement job

ISO 10816-1 (2 Hz to...)

Peak2peak - Acceler...

RMS broad band - Ac...

RMS broad band - D...

System temperature

Name: System temperature

Unit: °C (Temperature)

Measurement template used: Base configuration

Save settings: every 1 hour(s)

Characteristic value type: DC

Reset alarms: Automatically

Alarm limit overruns: 10

Use learning mode: No

Main alarm: 70.0 °C

Pre-alarm: 52.5 °C

Lower pre-alarm: 0.0 °C

Measurement configuration

System temperature sensor

Vibration sensor - Acceleration 1...

Vibration sensor - Demodulation ...

Vibration sensor - Velocity 1 kHz I...

Name: System temperature sensor

Input signal: System temperature sensor

Unit: °C (Temperature)

Signal type: Raw signal

Input filter: -

Output filter: 1Hz (Low-pass)



Spectral lines: 1,600

Window type: Hann (Hanning)

Save settings for time signals: every 1 day(s)

In the expanded overview on the left, you will find all measurement jobs for the SmartCheck or ProLink device. Click on a measurement job to access the following information and functions in the main panel:

- Under **Measurement jobs**, you will see the name of the measurement job as well as any details such as triggers or conditions used. You will also find a grey box with change details and the **Edit**, **Duplicate**, **Delete** and **Create** buttons here.

- Under **Characteristic value configuration** you will see the individual characteristic values that belong to the selected measurement job. If you click on one of the values, the details about it are displayed on the right. These details partly correspond to your own settings, which you made when creating the measurement job^[78]; the rest are added automatically by the wizard from system templates.
- Under **Measurement configuration** you will see the measurements that belong to this measurement job. If you click on one of the values, the details about it are displayed on the right. These details partly correspond to your own settings, which you made when creating the measurement job^[78]; the rest are added automatically by the wizard from system templates.
Under **Characteristic value configuration**, the characteristic values that belong to the selected measurement are also automatically highlighted in bold.
- You can edit the selected measurement job^[78].
- You can duplicate the selected measurement job. To do this, click **Duplicate**. The configuration wizard opens with a copy of the selected measurement job. You must give this copy a new name. All other parameters that have been transferred from the existing measurement job can be edited as usual^[78].
- You can deactivate or activate the selected measurement job. A deactivated measurement job will no longer be scheduled for measurements or started by a measurement trigger.
- You can add new measurement jobs^[78].
- You can delete the selected measurement job. To do so, click **Delete**  and confirm with **OK**.
- In the top right corner, click on  to open the Configuration overview^[58].



- You can find the menu item **Create new measurement job** in most work areas of the SmartWeb software on the left under **Actions**, which means that you are always able to access this main system task.
- When a characteristic of a measurement task is used for the alarm status configuration of a controller^[120] you cannot delete this measurement task. Additionally, certain changes, such as changes to additional channels and alarm field settings, are not possible.
- With the **Start instant measurement**^[40] option, you can measure deactivated measurement tasks, for example, to check them. After the instant measurement, the measurement task remains deactivated.
You can find the **Start instant measurement** option in the context menu of the measurement task in the **Status** section.

8.3.2 Creating/editing new measurement jobs

The configuration wizard opens when you want to create, duplicate or edit a measurement job. This guides you step by step through the creation process. Here you only need to specify a few details, as the complex calculations of the characteristic values of a component are executed inside the system using the relevant templates^[82].



To be able to use input signals for the monitoring, you must create the corresponding input configuration^[61] before you start the wizard.

The configuration wizard consists of several steps, which are displayed in the left margin right from the start. How many steps you need to go through depends on which component template you choose and whether you activate the **Expert settings**:

Create configuration

Steps

1: Select component
2: Specify details for base configuration
3: Save settings/measurement triggers and conditions
4: Additional signals
5: Set alarms

Description

Select a component template. The next steps in the wizard will be generated automatically depending on the template selected.

Step: Select component

Component template :

Base configuration

?

Description :

Component template for broad band measurements


☐ Expert settings

Back

Next


Cancel




The wizard queries additional information in the individual steps. Generally, the entries you need to or can make are already explained in the wizard. Simply move the mouse over the question mark  to read the explanation.


In the following sections, you will find a summary of each individual step along with additional information that goes beyond the basic Help.

Select component

Here you choose the component you want to monitor from the predefined list. The system template  that is used to create the measurement configuration depends on your selection here.

If you turn on the **Expert settings**, you can select the **Confidential** option. This means that the measurement job remains visible in the user interface and the measurements run as usual. However, the alarm limits and frequency bands of confidential measurement jobs are only visible for users with special rights . No other users can view or edit the details of the measurement job. This restriction applies not only to the **measurement job** area but also to the display of frequency bands in the **live view** and **measurement data** areas.



In some measurement jobs, it is necessary to be able to edit the speed channel. Users without special rights cannot do this for a confidential measurement job. In such a case, assign the **Edit speed channel**  right. Users with this right cannot see the details of the measurement job, but can edit the speed channel.

Specify details about the component

Here you make detailed specifications about the selected component. Make these specifications depending on the component, e.g. the maximum speed, the type of installation, or the number of blades or vanes. This is also where you

determine the input signals on which the monitoring is to be based. If you are monitoring a machine on which the rotational speed can fluctuate during a measurement, you can activate and set the order analysis^[75]. This reduces the influence of speed fluctuations during a measurement on the monitoring result. Order analysis is possible in all measurement tasks with multiple frequency windows.

If the component is a bearing, you can select the bearing type straight from the system bearing database in this step. If it is not in the database, you can create it using the wizard.



In this step, many templates require a **Speed signal** as well as the **Maximum speed**. For the speed signal, a characteristic value is automatically created. The alarm limits for this value depend on the specified **Maximum speed**. While the other characteristic values created by the wizard are listed in the last step in an overview, this characteristic value remains in the background. Consequently, you can neither change its alarm limit nor activate the Learning mode^[89] for it.

The system default alarm limit, which uses this characteristic value, is calculated as follows:

- **Pre-alarm:** 1% above the specified maximum speed
- **Main alarm:** 5% above the specified maximum speed

Apply expert settings/Apply expert settings for the Wellhausen counter

These steps only become visible if you activate the **Expert settings** option on the bottom left of the wizard.

Furthermore, the step **Apply expert settings for the Wellhausen counter** is only available for the **default configuration**. In both steps, you have the option of adjusting some preset values of the template for your specific measurement job, e.g. specifying the number of spectral lines or the high-pass for the demodulation.

You should only edit this step if you possess expert knowledge.



The value that you specify for **Number of spectral lines** affects the length of the recorded signals. All vibration measurements are based on this value. As such, the duration of the various measurements may vary. The duration of the longest vibration measurement determines the measurement duration for all other additional measurements:

$$\text{Measuring time for vibration time signals [s]} = \text{number of lines} / \text{low-pass}$$

Additional channels record the number of values required for the longest vibration measurement up to a maximum of 100,000 values. For an analogue input, for example, this corresponds to a measuring period of approx. 78 s.

Apply learning mode settings

This step is only visible if you activate the **Expert settings** option on the bottom left of the wizard. Here you can specify the algorithm used by the learning mode to calculate the alarm limits and the factors used to determine the main alarm and pre-alarm.



If you select the **Learning mode type**, you should note the following:

- **Standard deviation:** This process takes into account when signals vary or are not very stable, i.e. when the value for sigma, the signal variance, is high.
- **Maximum values:** This selection is preset and is the better method in most cases. You can select this method when the vibration values are very stable, i.e. when the value for sigma, the signal variance, is low.

You should only edit this step if you possess expert knowledge.

Save settings/triggers and conditions

Here you specify how often trends and time signals should be saved. In addition, you can determine whether the measurements should depend on Measurement triggers^[102], Time triggers, Measurement conditions^[105] or Time conditions.


If you have not yet created any measurement triggers or measurement conditions or the existing ones do not meet your requirements, you can create them using the wizard. You can only create time triggers and time conditions within the wizard. You can find information on this in the **Triggers and conditions**^[82] section.

Additional signals

Here you can add additional input signals to the measurement configuration. This adds further trends to the characteristic value trends, which are generated automatically by the template.





The automatically created characteristic values of the additional signals can be retrieved in the characteristic value overview in the last step of the configuration wizard. There you can also change the alarm limits of these characteristic values.

Typically, it is not necessary to activate the Learning mode  for the additional signals; if you do want to authorise it, you can do so in the last step of the wizard.

Resetting/setting alarms

In this step, you specify:

- Whether alarms are to be reset automatically or manually, i.e. via the Context menu , for example.
- Whether and for which characteristic values the learning mode should always be authorised.
- Whether the learning mode calculates alarm limits contingent on measured machine parameters (alarm map ).
- Where the limits for the main alarm and pre-alarm lie: You can specify this for all characteristic values together or for each individual characteristic value.
- For symmetrical signals with a negative value range: where the thresholds for the lower main alarm and pre-alarm lie; these options are only used for additional signals.
- How the alarms are reset: You can specify this for all characteristic values together or for each individual characteristic value.

If **Expert settings** are activated, you can also set the number of times an alarm limit must be exceeded or undershot before it changes the alarm status.



If you activate the option **Change alarm limits in line with other signals**, you also must authorise the learning mode; otherwise, the option has no effect.

You should not use the learning mode when the measurement range and the limits that must not be exceeded or fallen below are known. This is the case, for example, with temperature, pressure, or load. In this case, enter the alarm limits according to the machine specifications.

For characteristic values based on ISO, the limits of machine class II are preset for the alarm limits. Learning mode is activated by default and can therefore overwrite the alarm limits based on ISO, if applicable:

Alarm settings :

☐ The same alarm settings for all characteristic values with the same unit

☒ Alarm settings for each individual characteristic value

1. Alarm settings for "ISO10816-1 (2Hz - 1kHz) - Velocity"

Machine class (ISO 10816)

Main alarm : 7.1 mm/s Pre-alarm : 2.8 mm/s

Lower pre-alarm : 0.0 mm/s

☒ Use learning mode

2. Alarm settings for "RMS broad band - Acceleration (Overall status)"

Main alarm : 1.0 g Pre-alarm : 0.7 g

Lower pre-alarm : 0.0 g

☒ Use learning mode

Here you have the following options:

- Click **Machine class (ISO 10816)**. A context menu is displayed, from which you can select the required alarm limits.
- You can manually set alarm limits that deviate from the ISO recommendations.

8.3.3 Available templates for measurement configurations

In the first step of the configuration wizard, you need to choose a template that will be used to create the measurement job for monitoring your machine. The following list gives a rough overview of which template is most suitable for which machine/monitoring scenario:

- **Basic configuration:** Use the template for broad-band measurement. It can be used for all machines, but only offers a very general monitoring.
- **User-defined frequency bands:** Use this template to define user-defined frequency bands, where a separate characteristic value is created for each one. You should only use this template if you possess expert knowledge.
- **Gear stage:** Use this template for continuous monitoring of two gears.
- **Journal bearing:** Use this template for the monitoring of a bearing with oil film.
- **Channel monitoring:** This template lets you continuously monitor up to three channels (similar to the condition guard), resulting in a faster response to changes.
- **Coupling:** Use this template for the monitoring of a jaw coupling.
- **Fan:** Use this template for the monitoring of fan blades.
- **Managed frequency bands:** Use this template to define managed frequency bands, where a separate characteristic value is created for each one. Speed-coupled frequency bands are shifted depending on a speed signal. The frequencies are not entered in Hz, but instead are standardised according to the speed. You should only use this template if you have the relevant expert knowledge.


Example:

You use the rotational frequency to identify an imbalance. To do this, create a window of 0.95 and 1.05. At a speed of 50 Hz, the device dynamically adapts the frequency band:

$(50 \text{ Hz} * 0.95 =) \text{ 47.5 Hz to } (50 \text{ Hz} * 1.05 =) \text{ 52.5 Hz}$

- **Process signal monitoring:** This template allows you to monitor process signals from up to eight input channels simultaneously.
Except for vibration inputs, you can select all channels for monitoring: Physically existing channels in the system and external channels transmitted via OPC/UA, SLMP, PROFINET, as well as EtherNet/IP.
You cannot monitor vibration signals with this template.
- **Pump:** Use this template for the monitoring of pump vanes.
- **Belt drive:** Use this template for the monitoring of a belt level.
- **Default configuration:** Use this template for broad-band measurement with several filters. It can be used for all machines, but only offers a very general monitoring.
- **Shaft:** Use this template for the monitoring of a shaft.
- **Roller bearing:** Use this template for the monitoring of a roller bearing.
- **Time-synchronous averaging (experimental):** Use the template for precise analysis of machines with multiple components at different speeds. Time-synchronous averaging helps to separate signals more effectively to obtain a clear signal for individual components.
- **Condition guard:** Use this special template for the constant monitoring of a machine pursuant to the standard ISO 10816-1.



Some of the measurement templates listed here can only be used with an additional licence. For an overview of your current licences, select **Open licence manager**  from the **Help** menu.

8.3.4 Triggers and conditions

The SmartCheck or ProLink device generally works through the measurement jobs in a fixed order. You can use triggers and conditions to interrupt this order. In the **Memory settings/measurement triggers and conditions** step, you can create or edit triggers and conditions:

Edit configuration

Schaeffler SmartWeb

<div>Steps</div> <div> 1: Select component 2: Specify details for base configuration 3: Apply expert settings 4: Apply learning mode settings 5: Save settings/measurement triggers and conditions 6: Additional signals 7: Set alarms </div>	<div>Step: Save settings/measurement triggers and conditions</div> <div> <div>Save settings for trends :</div> <div> 1 hour(s) ? </div> <div>Save settings for time signals :</div> <div> 1 day(s) ? </div> <div>Measurement triggers and conditions :</div> <div> + Time trigger + Meas. trigger ? </div> <div> + Time condition + Meas. conditions </div> </div>
<div>Description</div> <div> This is where you specify the frequency at which trend values and time signals are saved. You can also determine conditions that must be met for this measurement and triggers that launch this measurement. </div>	

☒ Expert settings
Back
Next
Cancel

You can create the following triggers and conditions here:

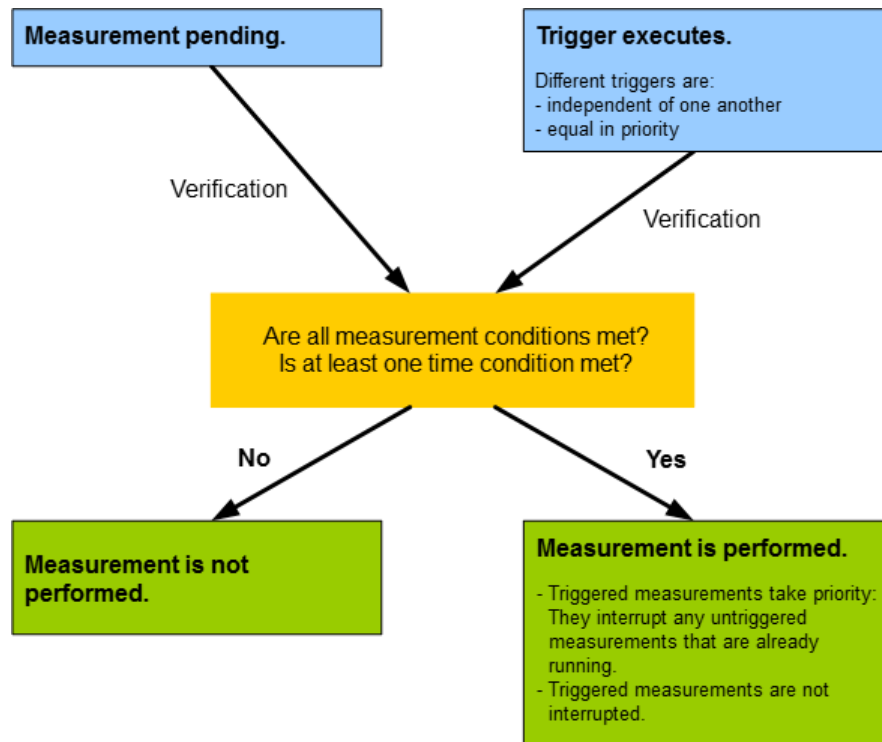
- **Time trigger** ⁸⁴
- **Meas. trigger** ⁸⁵
- **Time condition** ⁸⁶
- **Measurement condition** ⁸⁸

Relevant details can be found in the following sections.



- You can also create and edit measurement triggers and measurement conditions without the wizard in the **Measurement trigger** ¹⁰² and **Measurement conditions** ¹⁰⁵ areas. You can then select the triggers and conditions created there from a list in the wizard.
- You cannot use measurement triggers and measurement conditions for output configurations.
- For each measurement trigger and each measurement condition, a characteristic value is created. This characteristic value can be found in the overview under the measurement job **Measurement triggers and conditions**.
The corresponding characteristic values are also saved only if a trigger or condition is used by at least one measurement task. When creating the trigger or the condition, determine the saving interval. In addition, characteristic values are always stored if the status changes, for example, if the condition changes from valid to invalid or a trigger is initiated.
You can use the trends for these characteristic values to check whether measurement triggers and measurement conditions on the real machine behave as you expect. You can therefore check whether a measurement trigger is also actually triggered, or whether a measurement condition is correctly enabled or disabled.

The diagram below provides an overview of the interaction and prioritisation of conditions and triggers:



Under the following circumstances, a measurement initiated by triggers is not started:

- If the conditions are not fulfilled at the time of the trigger.
- A measurement initiated by a trigger is already running.

8.3.4.1 Time trigger

A time trigger allows you to specify that the measurement will take place regularly at an interval defined by you, e.g. every 5 minutes. You can only create one time trigger for each measurement job.

How to create a time trigger

1. Click the **+ Time trigger** button.
2. Enter the desired specifications under **Time trigger**:

Step: Save settings/measurement triggers and conditions

Save settings for trends :

1 hour(s) ?

Save settings for time signals :

1 day(s) ?

Measurement triggers and conditions :

Time trigger + Meas. trigger ?

+ Time condition + Meas. conditions

Time trigger :


Measurement interval: every 1 minute(s) Actions: - ?

Start of measuring: Dec 11 2019 22:30 HH:MM

You have the following options:

Measurement interval: Use this specification to determine the measurement interval, i.e. the time after which the measurement is to be repeated. You can specify an interval in **Minutes, Hours** or **Days**.

Start of measuring Here you specify the day and time when the measurements are to start. Here you have the following options:

- You can either select the start date from the list boxes or set it directly via the **calendar** .
- Enter the start time in the field next to **HH:MM**.

—

Click **Delete**  to remove this time trigger.



Move the mouse over the question mark  to read additional information.



Time triggers ignore the shift that results from the change from summer to winter time.

Example:

- In winter, you create a time trigger with **Start of measuring** 14:00. In summer, the start of measuring will not be until 15:00.
- In summer, you create a time trigger with **Start of measuring** 14:00. In winter, the start of measuring will be at 13:00.

8.3.4.2 Measurement trigger

You can use a measurement trigger to interrupt the order of measurements. If the trigger condition you have defined is fulfilled, the current measurement is cancelled and the measurement controlled by the measurement trigger is started.

How to create a measurement trigger

1. Click the **+ Measurement trigger** button.
2. Enter the desired specifications under **Measurement trigger**:

Step: Save settings/measurement triggers and conditions

Save settings for trends :

1 hour(s) ?

Save settings for time signals :

1 day(s) ?

Measurement triggers and conditions :

+ Time trigger + Meas. trigger ?

+ Time condition + Meas. conditions

Measurement trigger :

Measurement trigger 1 : Measurement trigger 1 Actions: + - ?

You have the following options:

Measurement trigger (list box)

This list contains the measurement triggers that you have previously created in the **Measurement trigger**¹⁰²⁾ area. Select the required measurement trigger from here.



If you cannot find a suitable measurement trigger in the list box, click **+** to create a new measurement trigger. The **Add measurement trigger** dialogue opens and you can enter the desired specifications here. You can find details on this in the **Adding/editing measurement trigger**¹⁰³⁾ section.



Click **Delete** **-** to remove this measurement trigger.



Move the mouse over the question mark **?** to read additional information.

8.3.4.3 Time condition

You can use a time condition to ensure that measurements are only performed at a certain time.

How to create a time condition

1. Click the **+** **Time condition** button.
2. Enter the desired specifications under **Time condition**:

Edit configuration

Schaeffler SmartWeb

Steps

1: Select component
2: Specify details for base configuration
3: Apply expert settings
4: Apply learning mode settings
5: Save settings/measurement triggers and conditions
6: Additional signals
7: Set alarms

Description

This is where you specify the frequency at which trend values and time signals are saved. You can also determine conditions that must be met for this measurement and triggers that launch this measurement.

Step: Save settings/measurement triggers and conditions

Save settings for trends :

1
hour(s)
?

Save settings for time signals :

1
day(s)
?

Measurement triggers and conditions :

+ Time trigger

+ Meas. trigger

+ Time condition

+ Meas. conditions

Time condition :

Mon.
Tue.
Wed.
Thur.
Fri.
Sat.
Sun.

☒
☒
☒
☒
☒
☐
☐

From :
8:00
HH:MM
To :
17:00
HH:MM

Actions:

-

?

☒ Expert settings
Back
Next
Cancel

You have the following options:

Mon.-Sun.

Activate here the days on which measurements are to start.

From ... To ...

Enter here the times between which the measurements are to take place.

The time range that you specify here can also run from one day into the next.

Example: You have activated **Mon** and **Tues** and enter the following as the time range:
From: 17:00 To: 8:00

The time range for measurements then begins on Monday at 17:00 and ends Tuesday morning at 8:00. After a break, measurements will resume at Tuesday 17:00 and continue until Wednesday at 8:00.



Click **Delete** to remove this time condition.



Move the mouse over the question mark to read additional information.



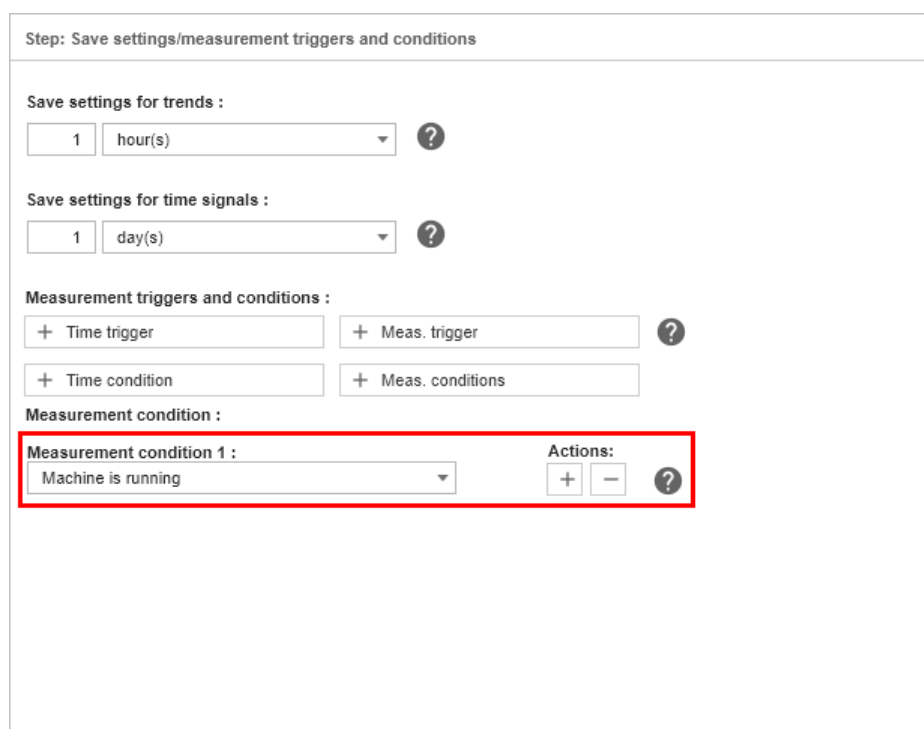
- If multiple time conditions are defined for a single measurement job, only one condition needs to be met for the measurement to be performed.
- Time conditions ignore the shift that results from the change from summer to winter time.
Example:
 - In winter, you create a time condition for the period **from 14:00 to 16:00**. In summer, the time period shifts to 15:00 to 17:00.
 - In summer, you create a time condition for the period **from 14:00 to 16:00**. In winter, the time period shifts to 13:00 to 15:00.

8.3.4.4 Measurement condition

In a similar way to the time condition, the condition you define here must be met in order for a pending measurement to take place. If a measurement is pending but the measurement condition you defined is not met, the device skips this measurement and goes straight to the next one.

How to create a measurement condition

1. Click the **+** **Measurement condition** button.
2. Enter the desired specifications under **Measurement condition**:



You have the following options:

Measurement condition (list box)

This list contains the measurement conditions that you have previously created in the **Measurement conditions** ¹⁰⁵ area. The default selection is the **Machine is running** measurement condition as preconfigured on the device. This can be deleted on a ProLink device, but not on a SmartCheck or ProLink device. Select the required measurement condition from here.



If you cannot find a suitable measurement condition in the list box, click **+** to create a new measurement condition. The **Add measurement condition** dialogue opens and you can enter the desired specifications here. You can find details on this in the **Adding/editing measurement conditions** ¹⁰⁶ section.



Click **Delete** ¹⁰⁷ to remove this measurement condition.



Move the mouse over the question mark ¹⁰⁸ to read additional information.



If multiple measurement conditions are defined for a single measurement job, all conditions must be met for the measurement to be performed.

8.3.5 Setting order analysis

In many measurement configuration templates, step 2 of the wizard determines the input signals on which monitoring is based. If the monitoring is based on a measured speed signal and the speed is measured from the digital input of a

vibration module, you can activate and set an order analysis. This reduces the influence of speed fluctuations on the monitoring result. The order analysis converts the vibration signal into a signal where the influence of speed fluctuations during the measurement is reduced. You can activate this option on machines that have a very dynamic rotational speed, such as wind energy plants or lifts.

Proceed as follows to use and set the function:

1. In step 2 of the wizard, under **Speed signal**, select the desired speed input.
Order analysis requires a high-resolution speed signal. For this reason, you must select a digital speed input of a vibration module so that you can activate and edit the **Order analysis** option.
2. Activate the **Order analysis** option. The **Pulses per revolution** list box appears:

Create configuration

Steps

- 1: Select component
- 2: Specify details for roller bearing
- 3: Save settings/measurement triggers and conditions
- 4: Additional signals
- 5: Set alarms

Description

Enter information on the roller bearing and measurement signals.

Step: Specify details for roller bearing

Name of roller bearing :
Bearing 6202 ?

Bearing type :
No bearing selected. ?

Standing bearing race :
☒ Outer race ?
☐ Inner race

Vibration signal :
☒ Vibration sensor 1 (F4:3D:80:12:01:61) ?

Speed signal :
☒ Speed input 1 (F4:3D:80:12:01:61) + ?

Maximum speed [0.1 - 100 Hz] :
50

☒ **Maximum speed deviation (+/-)** 5 %

☒ **Order analysis** ?

☐ Expert settings

Back Next Cancel

3. From the list, select how many **Pulses per revolution** you want to evaluate.
For this setting, you need to know how the pulses are distributed across the rotation, i.e. evenly or unevenly. The order analysis depends on the pulses per revolution being as regular as possible. If the pulses are irregular—i.e. the angle between two pulses is not always the same—it may be useful to ignore some of the pulses per revolution. The **Pulses per revolution** setting allows you to reduce the pulse count used for the calculation. This does not change the rotational speed value.



The **Pulses per revolution** list box only appears if the **Pulses per revolution** value is set to between 2 and 32 in the digital input configuration.

If the value is higher than 32, the vibration module reduces the pulses per revolution. This is done for performance limitation reasons. In this case, the **Pulses per revolution** list box is not present in step 2 of the wizard.

4. Click **Next**, make additional settings in the other steps, if necessary, and exit the wizard with **OK**.

8.3.6 Learning mode and alarm maps

When you create a measurement job, the relevant characteristic values are automatically generated. The default alarm limits of the SmartCheck or ProLink device initially apply to these characteristic values. If you activate the learning mode

in the **Set alarms** step of the configuration wizard and then start learning mode, the SmartCheck or ProLink device starts to evaluate the measurement values of the relevant characteristic values for alarm limits, which are adapted to your machine. When the learning mode is completed, the default alarm limits are replaced by the newly calculated alarm limits.

Essentially, the learning mode can be run in two different scenarios, in the simple Default setting⁹⁰ or with an Alarm map⁹¹, i.e. dependent on one or two other signals (machine parameters). These scenarios are described in detail in the following sections. In further sections, you will be given important information on using the learning mode⁹⁴ and how to proceed during the initial setup⁹⁵ of the SmartCheck or ProLink device.

Scenario 1: Learning mode in default setting

When you create a measurement job - in this example, the pre-configured **Base configuration** - the learning mode is already activated in the **Set alarms** step for all vibration characteristic values:

Edit configuration

Schaeffler SmartWeb

Steps	Step: Set alarms
1: Select component	<p>Variable alarm limits :</p> <p><input type="checkbox"/> Change alarm limits in line with other signals ?</p> <p>Reset alarms :</p> <p><input checked="" type="radio"/> Automatically ? <input type="radio"/> Manually ?</p> <p>Alarm settings :</p> <p><input type="radio"/> The same alarm settings for all characteristic values with the same unit ?</p> <p><input checked="" type="radio"/> Alarm settings for each individual characteristic value</p> <p>1. Alarm settings for "ISO10816-1 (2Hz - 1kHz) - Velocity"</p> <p>Machine class (ISO 10816) ?</p> <p>Main alarm : 7.1 mm/s Pre-alarm : 2.8 mm/s</p> <p>Lower pre-alarm : 0.0 mm/s</p> <p><input checked="" type="checkbox"/> Use learning mode</p> <p>2. Alarm settings for "RMS broad band - Acceleration (Overall status)"</p> <p>Main alarm : 1.0 g Pre-alarm : 0.7 g</p> <p>Lower pre-alarm : 0.0 g</p> <p><input checked="" type="checkbox"/> Use learning mode</p>
2: Specify details for base configuration	
3: Save settings/measurement triggers and conditions	
4: Additional signals	
5: Set alarms	
Description	
<p>This is where you specify alarm limits and determine whether they depend on other signals. You can also determine how alarms are reset.</p>	

☐ Expert settings

Back OK Cancel

When you complete the wizard with **OK**, you can then start learning mode for all characteristic values for which the learning mode was activated. You have the following options:

- Press the **TEACH** key on the SmartCheck or ProLink device to start learning mode for all characteristic values for which the learning mode was activated.
- In the SmartWeb software, open the context menu for a characteristic value. Use the **Start learning mode** command to start learning mode for the selected characteristic value.
- In the SmartWeb software, open the context menu for a measurement job. Use the **Start learning mode for all** command to start learning mode for all characteristic values for the selected measurement job.

The learning process then looks like this:

- The Schaeffler SmartCheck or ProLink device records 1000 measurement values; here each measurement performed is saved in the trend - independently of the memory cycle of the trend that you specified in the **Save settings/triggers and conditions** step. The speed of this process can depend on your triggers and conditions⁸².



- The default of 1000 measured values can be changed in the configuration wizard. To do so, activate the **Expert settings** option. The **Apply learning mode settings** step appears, in which you can change the **number of values**.
- Learning mode is deactivated by default for characteristic values **ISO10816-1 (2 Hz to 1 kHz) - velocity** and **ISO10816-1 (10 Hz to 1 kHz) - velocity**.

- As soon as the SmartCheck or ProLink device has saved 1000 measurement values in the trend, a new alarm limit for the relevant characteristic value is calculated on this basis; here the SmartCheck or ProLink device uses the **Maximum values** as an algorithm. In the **Apply learning mode settings** step of the wizard, you can change/adapt this procedure.
- When the learning mode for a characteristic value is completed, a corresponding message appears in the logbook, which also contains the newly calculated alarm limits. You can view the alarm limits in the trend in the **Measurement data** area as well.
- Once learning is complete, learning mode for this characteristic value is automatically deactivated in the measurement job. If you wish to restart learning mode at a later point, you must tick the appropriate box again in order to activate. You can do this in either the configuration wizard or the **Edit alarm settings** dialogue.
- During this process, the learning mode only determines main and pre-alarm limits. The value you specified for **Signal always larger than** in the **Set alarms** step is automatically adjusted if the new alarm limits overlap.

Scenario 2: Learning mode and alarm map

Alarm maps are used in connection with the learning mode if your machine is operated in different operating states each having its own alarm limits. In this case, you can run the learning mode dependent on one or two further signals (machine parameters). To do this, the SmartCheck or ProLink device must be able to measure the corresponding signals via the analogue or digital input. The following example shows which specifications you must make additionally in the configuration wizard:

Your machine, which is operated at different speeds, has a speed range of between 2000 rpm and 3000 rpm. In order to calculate alarm limits contingent on this speed range with the learning mode, make the following entries in the **Set alarms** step of the configuration wizard:

Step: Set alarms

Variable alarm limits :

☒ Change alarm limits in line with other signals

First input signal : Digital input (speed) Min [RPM] : 2,000.0 Max [RPM] : 3,000.0

Second input signal : Min : Max :

Reset alarms :

☒ Automatically ☐ Manually

Alarm settings :

☐ The same alarm settings for all characteristic values with the same unit

☒ Alarm settings for each individual characteristic value

1. Alarm settings for "ISO10816-1 (2Hz - 1kHz) - Velocity"

Machine class (ISO 10816)

Main alarm : 7.1 mm/s Pre-alarm : 2.8 mm/s

Lower pre-alarm : 0.0 mm/s

☒ Use learning mode

2. Alarm settings for "RMS broad band - Acceleration (Overall status)"

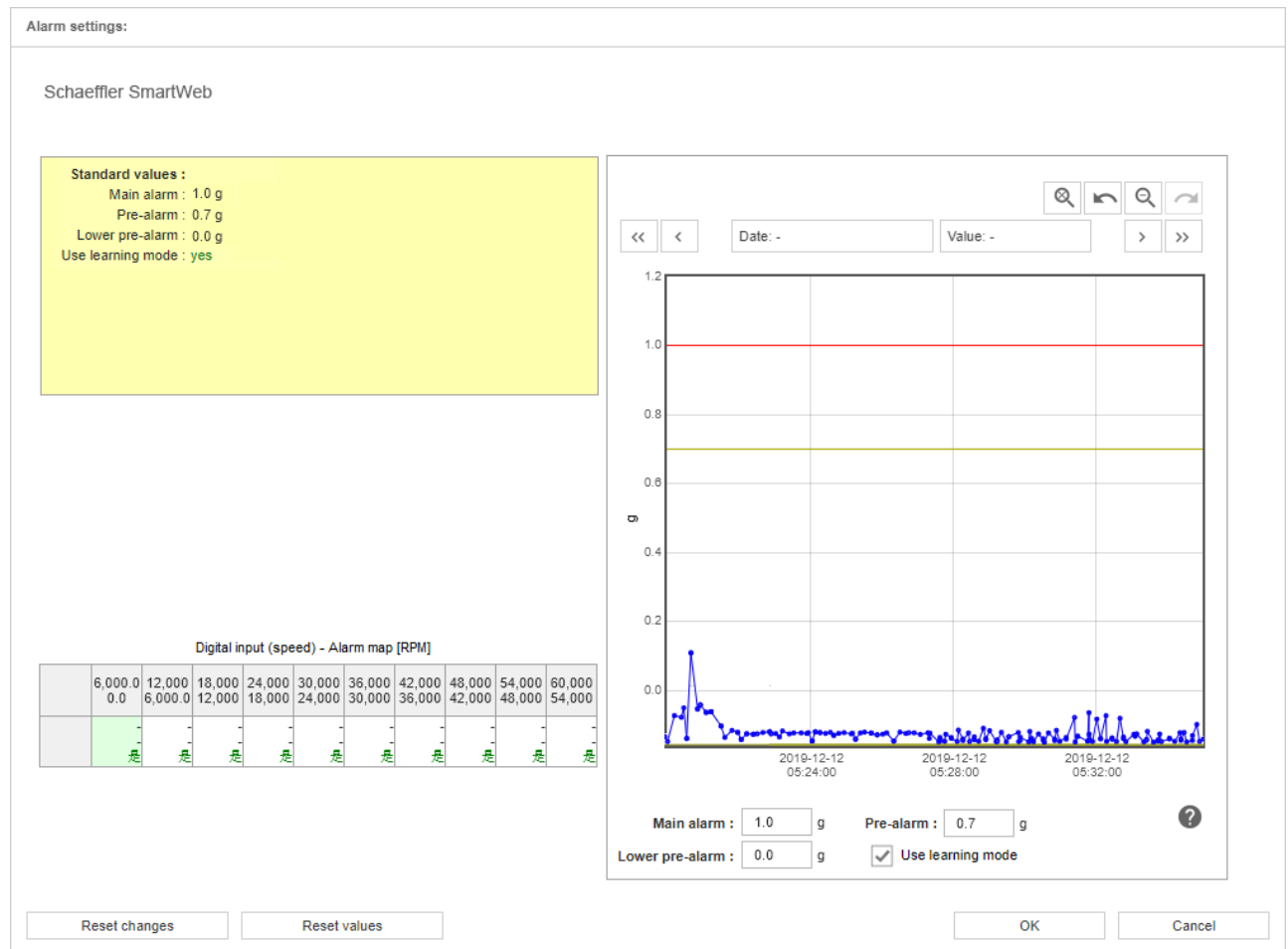
Main alarm : 1.0 g Pre-alarm : 0.7 g

- Activate the **Change alarm limits in line with other signals** option.
- For the input, select the speed input – in this example the digital input.
- For **Min [RPM]**, specify the value 2000.
- For **Max [RPM]**, specify the value 3000.

- Activate the learning mode for the corresponding characteristic values.

As soon as you complete the wizard with **OK**, you can start learning mode in the same way as with the Default setting⁹⁰; learning process deviations from the default setting are as follows:

- The reference speed range of 2000 to 3000 is broken down into an alarm map with 10 fixed alarm fields:



- For each of these alarm fields, the SmartCheck or ProLink device takes in 1000 measurement values in order to calculate from them an alarm limit of its own for the corresponding alarm field.
- For as long as an alarm field does not yet have a new alarm limit, the default alarm limit applies for the field.
- Each alarm field is processed⁵⁰ individually, which means it is possible for the learning mode to be completed in one alarm field already, while the default alarm limits still apply in the other alarm fields.
- When the learning mode for an alarm field is completed, a corresponding message appears in the logbook⁴³, which also contains the newly calculated alarm limits.
- While the learning mode is running, the status LED of the SmartCheck or ProLink device flashes. When running through the alarm fields in an alarm map, the LED may stop flashing briefly because the device has reached a field that is already completed. However, it will start flashing again as soon as it reaches a field for which the learning mode is not completed.

You can also use the learning mode contingent on two machine parameters. In this case, you must specify a second signal in the **Set alarms** step of the configuration wizard:

Step: Set alarms

Variable alarm limits :

☒ Change alarm limits in line with other signals

First input signal : ● Digital input (speed) — Min [RPM] : 2,000.0 Max [RPM] : 3,000.0

Second input signal : ● Load — Min [%] : 20.0 Max [%] : 80.0

Reset alarms :

☒ Automatically ☐ Manually

Alarm settings :

☐ The same alarm settings for all characteristic values with the same unit

☒ Alarm settings for each individual characteristic value

1. Alarm settings for "ISO10816-1 (2Hz - 1kHz) - Velocity"

Machine class (ISO 10816)

Main alarm : 7.1 mm/s Pre-alarm : 2.8 mm/s

Lower pre-alarm : 0.0 mm/s

☒ Use learning mode

2. Alarm settings for "RMS broad band - Acceleration (Overall status)"

Main alarm : 1.0 g Pre-alarm : 0.7 g

As soon as you complete the wizard with **OK**, you can start the learning mode process as described above. However, the alarm map is significantly expanded, as a matrix with 100 alarm fields is now generated, with an alarm limit calculated for each field.

Alarm settings: ISO10816-1 (2Hz - 1kHz)

Schaeffler SmartWeb

Standard values :

Main alarm : 7.1 mm/s
Pre-alarm : 2.8 mm/s
Lower pre-alarm : 0.0 mm/s
Use learning mode : yes

Digital input (speed) - Alarm map [RPM]

	6,000.0 0.0	12,000 6,000.0	18,000 12,000	24,000 18,000	30,000 24,000	36,000 30,000	42,000 36,000	48,000 42,000	54,000 48,000	60,000 54,000
100.0	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
90.0	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
80.0	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
70.0	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
60.0	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
50.0	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
40.0	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
30.0	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
20.0	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
10.0	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
0.0	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes

mm/s

8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0

2019-12-14 01:00:00 2019-12-15 09:00:00 2019-12-16 17:00:00

Main alarm : 7.1 mm/s Pre-alarm : 2.8 mm/s

Lower pre-alarm : 0.0 mm/s ☒ Use learning mode

Reset changes Reset values OK Cancel



- The SmartCheck or ProLink device creates the characteristic value for the machine parameter(s) in the background; you cannot change their alarm limits manually: they depend on your entry for the value range.
- If a measured value lies outside the value range you have specified, the SmartCheck or ProLink device uses the alarm limit of the nearest alarm field.
- After a firmware update, the checkbox for **Use learning mode** is activated for all alarm maps – regardless of whether or not the learning mode has already been completed for this map. Learning mode is not activated after the update, the control maps therefore initially remain unchanged. As soon as you activate learning mode, all control maps are learned again. In this process, they lose all previously learned values. To prevent this, proceed as follows: In the SmartWeb software, set learning mode for each individual field by selecting one or more fields and deactivating/activating the checkbox for **Use learning mode**.

General information on the learning mode

In this section, you will find useful pointers on working with the learning mode.

When is it useful/possible to use the learning mode, and when not?

- For the learning mode, the machine must be in good condition, i.e. not damaged in any way. For monitoring vibrations in accordance with ISO 10816-1, an additional requirement is that the machine vibrations should lie within the range of the ISO characteristic value. This is true of machines "that are normally considered acceptable for long-term operation" (ISO definition for the good condition of a machine).
- The learning mode can only determine optimal values if the machine is in its normal state/operation. You should not start the learning mode if your machine is currently idle or being started or stopped.



If you are not sure how to find out the normal operating state of your machine, ask your customer support representative.

- In general, it makes sense to use the learning mode in connection with vibration signals.
- You should not use the learning mode when the measurement range and the limits that must not be exceeded or fallen below are known. This is the case, for example, with temperature, pressure, or load. In this case, enter the alarm limits according to the machine specifications.
- For additional signals, which you specify in the **Additional signals** step (configuration wizard), the learning mode is generally not necessary.



No alarm is output during the learning phase. An alarm is output only if learning mode is complete and the machine exhibits high vibrations. The status LED of your SmartCheck or ProLink device then lights up permanently in yellow or red. This could be an indication of excessive vibrations. In this case, inspect the machine and the settings in the SmartWeb software. If necessary, contact a vibration expert or your customer support representative (see Support).

How do changes to the system affect the learning mode?

- In changing the value range of the signal that is used for the alarm map in the **Set alarms** step (configuration wizard), you also change the dimension of the alarm map. Therefore, upon completion of the wizard, all alarm limits that the learning mode has determined up to that point are discarded. As for a newly created measurement job, the default alarm limits are now in all alarm fields again.
- When you work with the learning mode, the SmartCheck or ProLink device takes over the default alarm limits of the characteristic values at the start of the process. As soon as the learning mode has been completed once, the system will then only use the new alarm limits. If you change the default alarm limits of the characteristic value, the changes take effect immediately on the system. As such, you can also adjust the alarm limits during the learning phase.
- If you switch off the SmartCheck or ProLink device, the learning mode will only be interrupted; the measurement results to date are not lost.



If you turn off the machine while the learning mode is active, the learning mode will be executed on an idle machine, which will result in incorrect measurement values and thus incorrectly calculated alarm limits too. You should therefore restart the learning mode when the machine is running again.

When should the learning mode be restarted and what happens then?

- You should always restart the learning mode when the machine parameters or the vibration behaviour have changed. This is likely in the following cases, for example:
 - After repairs
 - After structural changes to the machine
 - After changes of mechanical parameters.
- If the learning mode was already completed, the previous alarm limits will be retained after a restart until the calculation of the new alarm limits is finished.
- If the learning mode was not yet completed and is restarted, the values already measured will be discarded and all set values will need to be measured again.

How is the learning mode activated/started?

Activation


- Schaeffler SmartWeb: Via the **Create new measurement job** or **Edit measurement job** wizard in the **Set alarms** step, or via the **Alarm settings** button under **Characteristic value configuration**

Start/Restart

- Schaeffler SmartWeb: Via the context menu for measurement configurations and characteristic values, e.g. in the **Status** area.
- Schaeffler SmartCheck or ProLink: via the **TEACH** key. This starts the learning mode for all characteristic values of your system for which the learning mode is authorised.




Procedure for initial set-up

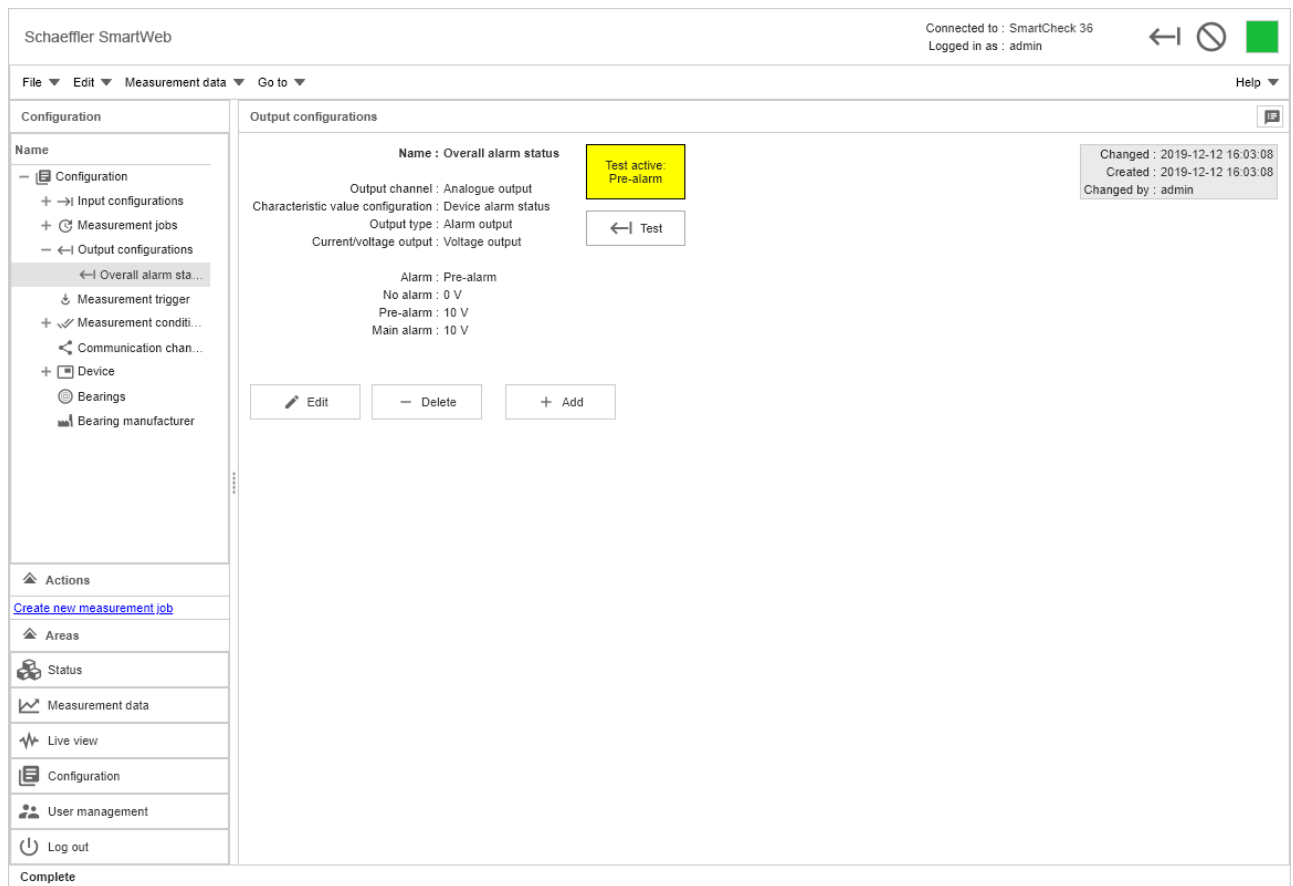
For the initial set-up of the Schaeffler SmartCheck or ProLink device, proceed as follows:

1. Install the SmartCheck or ProLink device and set up the connections. Details on this can be found in the Schaeffler SmartCheck or ProLink user documentation.
2. Create the desired configuration with the SmartWeb software. You can find an initial overview of the necessary steps on the start page of the **Configuration**  area.
3. Only start the learning mode once your machine is in a defined normal state, i.e. temperature, pressure etc. have reached normal values. Measurements outside the normal state can negatively affect the measurement result.




8.4 Output configurations

Depending on the system, you have the following options:


- **Schaeffler SmartCheck device:** For the Schaeffler SmartCheck device, you can configure  a total of two outputs, one analogue output and one digital output. In the **Output configurations** area, you will find an overview of all outputs of the SmartCheck device currently configured. In the factory default setting of the SmartCheck device, the analogue output is configured as **Overall alarm status**
- **Schaeffler ProLink device:** Once you have started the Schaeffler ProLink device, the outputs for the connected vibration modules  are automatically created and assigned to the modules. Four digital outputs are possible per vibration module. You can also create up to eight analogue or digital outputs for the connected I/O modules via the module configuration . In the **Output configurations** area, you will find an overview of all outputs and you can also configure them here.


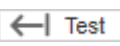




In the expanded overview on the left, you will find all output configurations for the SmartCheck or ProLink device. Click on an output configuration to access the following information and functions in the main panel:

- The **Name** and the details on the selected output configuration are displayed on the left.
- On the right, in the area highlighted in grey, you will find details on creating and changing the output configuration.
- You can edit the output configuration .
- You can add a new output configuration . The maximum number possible is one digital and one analogue output configuration for the SmartCheck device or four digital output configurations for each ProLink vibration sensor.
- You can delete the selected output configuration. To do so, click **Delete**  and confirm with **OK**.



For the I/O module of the ProLink device you must use the module configuration  to add or delete outputs.

- You can test the selected output configuration . To do this, click on  and define the type of test. The display above the button indicates whether a test is currently active.
- In the top right corner, click on  to open the Configuration overview .

If you reconfigure the outputs on the SmartCheck or ProLink device, you have the following basic options:

Digital alarm limit

You can use the digital output, a pure switching output, as a two-stage alarm limit for any characteristic value configuration or for the overall alarm status. It can output whether an alarm exists or not, whereby you can determine whether it should switch as soon as the pre-alarm is triggered or only when the main alarm is reached. For this output to occur, the output must be connected to your controller.

Analogue alarm output (SmartCheck and Schaeffler ProLink I/O module)

You can use the analogue output as a three-stage alarm output for any characteristic value configuration or for the overall alarm status. It can output whether a pre-alarm, a main alarm or no alarm exists. For this output to occur, the output must be connected to your controller.

Analogue characteristic value output (SmartCheck and Schaeffler ProLink I/O module)

You can also use the analogue output to output the characteristic value for any characteristic value configuration or for the overall alarm status. The selected characteristic value, e.g. temperature, is given to the output as a voltage signal proportional to the size of the characteristic value and passed on to your controller, where the value can be interpreted.



- You cannot use triggers or measurement conditions for an output configuration
- Exact information on how to connect the outputs of the SmartCheck or ProLink device with your controller can be found in the Schaeffler SmartCheck or ProLink user documentation.

8.4.1 Adding/editing output configurations

You can configure the following outputs on the SmartCheck or ProLink device:

- Analogue characteristic value output^[97] (SmartCheck and Schaeffler ProLink I/O module)
- Analogue alarm output^[98] (SmartCheck and Schaeffler ProLink I/O module)
- Digital alarm output^[99]

You can edit^[100] existing output configurations at any time.



For the I/O module of the ProLink device, you must use the module configuration^[61] to add outputs. To configure the added outputs for your system, select the output in the expanded overview and click **Edit** under **Output configurations** . For information on the configuration options, refer to the following sections on the analogue characteristic value output^[97], the analogue alarm output^[98] and the digital alarm output^[99].

How to create an analogue characteristic value output (SmartCheck and Schaeffler ProLink I/O module)

1. Under **Output configurations** click on **Add** (SmartCheck only).
2. Set the required specifications in the **Add output configuration** window:

Add output configuration

Name : Cumulative alarm

Output channel : Analogue output

Characteristic value configuration : Base measurement job - Peak2peak - Acceleration (...)

Output type :
☐ Alarm output
☒ Characteristic value output

Current/voltage output : Voltage [0-10 V]

Output range:

V

12.5
10
7.5
5
2.5
0

0 2 4 6 8 10

g

Min : 0.0 Scaling factor : 1.0 Max : 10.0

OK Cancel

You have the following options:

Name	Here, enter the name under which the output configuration is to appear in the overview.
Output channel	From here, select the Analogue output option.

Characteristic value configuration

In this list, you can find the overall alarm status, all measurement jobs and the corresponding individual characteristic values of your system. For the analogue characteristic value output, you must select an individual characteristic value. You can only select measurement jobs and overall alarm status for one alarm output.

Output type

Here, select the **Characteristic value output** option.

Current/voltage output

Here, determine the range of the voltage or current that is to apply for the analogue characteristic value output. SmartCheck or ProLink supports the following ranges:

- 0-10 V
- 0-20 mA
- 4-20 mA

Scaling factor, Min, Max

Use these settings to determine the range within which the characteristic value should lie. First enter a minimum value **Min**. Then enter a maximum value **Max** or define the factor with which the outgoing signal should be scaled in the **Scaling** field. Both the diagram and the values of the respective other field are then adjusted automatically.

If the output value exceeds the maximum value **Max**, then the maximum voltage is output.

3. Click on **OK** to save the new output configuration.

To create an analogue alarm output (SmartCheck and Schaeffler ProLink I/O module)

1. In the **Actions** area, click on **Add** + (SmartCheck only).
2. Set the required specifications in the **Add output configuration** window:

Edit output configuration

Name :
Overall alarm status

Output channel :
Analogue output

Characteristic value configuration :
Device alarm status

Output type :
☒ Alarm output
☐ Characteristic value output

Current/voltage output :
Current [4–20 mA]

Alarm limit :
Pre and main alarm

Alarm	Output
No alarm	4 mA
Pre-alarm	12 mA
Main alarm	20 mA

OK

Cancel

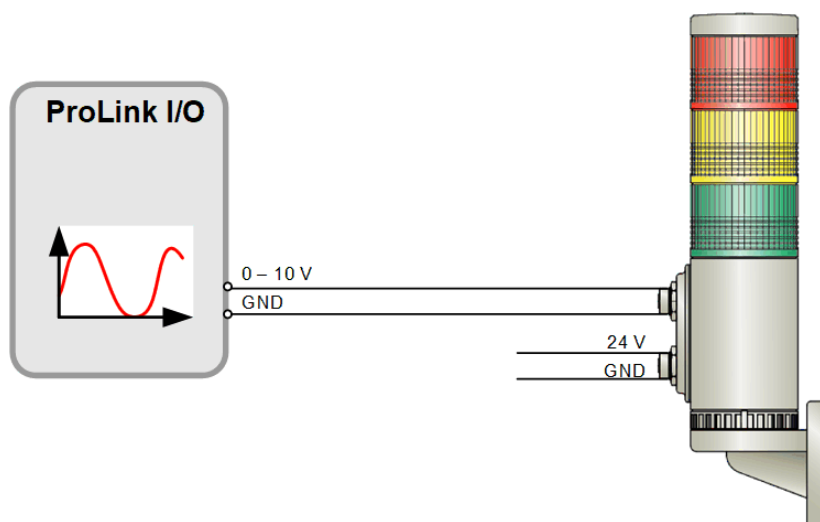
You have the following options:

Name	Here, enter the name under which the output configuration is to appear in the overview.
Output channel	From here, select the Analogue output option.
Characteristic value configuration	In this list you will find the overall alarm status and the individual characteristic values of all measurement jobs of your system. You can choose whether the alarm should be output for the entire system or for an individual characteristic value.
Output type	From here, select the Alarm output option.
Current/voltage output	<p>Here, determine the range of the voltage or current that should apply for the analogue alarm output. SmartCheck or ProLink supports the following ranges:</p> <ul style="list-style-type: none"> • 0-10 V • 0-20 mA • 4-20 mA
Alarm limit	From here, you determine whether the alarm output is to output the pre-alarm , the main alarm or the pre and main alarms . Below the drop-down list, you can find information on how current/voltage are distributed to the alarm statuses.

3. Click on **OK** to save the new output configuration.



The analogue outputs of the I/O module are configured as standard in such a way that you can connect and operate a Schaeffler SmartLamp without any further settings:



The SmartLamp visualises the ProLink alarm status. Refer to the user documentation for further details SmartLamp.

How to create a digital alarm output

1. Under **Actions**, click on **Add +**.
2. Set the required specifications in the **Add output configuration** window:

Add output configuration

Name :
Device alarm status

Output channel :
Digital output

Characteristic value configuration :
Device alarm status

Output type :
☒ Alarm output
☐ Characteristic value output

☐ Inverted

Alarm limit :
Main alarm

Alarm	Output
No alarm	Off (open/pull-up)
Pre-alarm	Off (open/pull-up)
Main alarm	On (closed/earth)

OK


Cancel

You have the following options:

Name	Here, enter the name under which the output configuration is to appear in the overview.
Output channel	<ul style="list-style-type: none"> SmartCheck: Here, select the Digital output option. ProLink: The Digital output is preset and cannot be changed.
Characteristic value configuration	In this list, you can find the overall alarm status, all measurement jobs and the corresponding individual characteristic values of your system. You can choose whether the alarm should be output for the entire system, a measurement job or an individual characteristic value.
Output type	This is where the Alarm output option is specified.
Alarm limit	From here, you determine whether the alarm output is to output the pre-alarm , the main alarm or the pre and main alarms . In the list box, you can find information on how the output reacts to the alarm statuses.

- Click on **OK** to save the new output configuration.

How to edit an output configuration

- Select the **Output configuration** in the expanded overview on the left.
- Under **Output configurations**, click on **Edit**  and set the required specifications in the **Edit output configuration** window.
For your SmartCheck device, you can also change an analogue alarm output to a characteristic value output and vice versa here, among other possibilities.
- Click on **OK** to accept your changes.

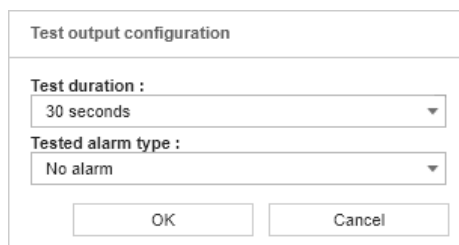
8.4.2 Test output configuration

You have the option of activating a test for your output configuration and thus verifying whether your output configuration is working correctly. You can then determine whether the cabling and the connection to a controller or display are correct. If a test is already active, it is cancelled as soon as another alarm output is tested.

In the following sections, you will find details on how to test your configured alarm output^[101]. You can also test your configured characteristic value output^[101] for your SmartCheck device.

How to test a configured alarm output

1. Under **Output configurations**, click .
2. In the **Test output configuration** window, enter the desired specifications:



The dialog box is titled "Test output configuration". It contains two dropdown menus: "Test duration :" with "30 seconds" selected, and "Tested alarm type :" with "No alarm" selected. At the bottom are "OK" and "Cancel" buttons.

You have the following options:

Test duration

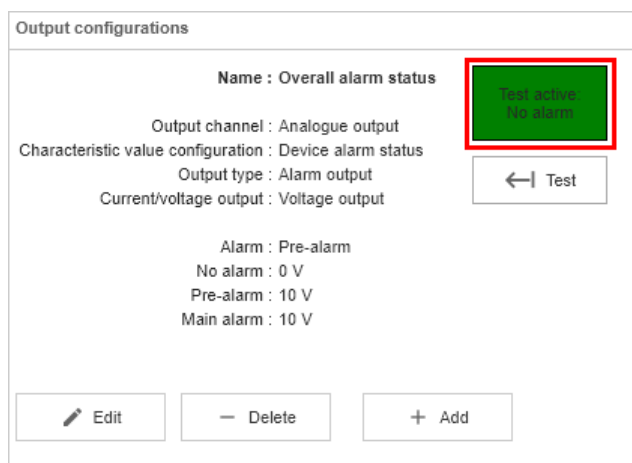
This is where you define the test duration.

Tested alarm type

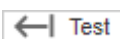
Here you can select what the test is to simulate:

- **No alarm:** the test simulates a status without an alarm.
- **Pre-alarm:** the test simulates a pre-alarm.
- **Main alarm:** the test simulates a main alarm.

3. Click **OK** to confirm your settings and start the test. You will then be informed that the test is active and told what is being tested. This appears as follows for the SmartCheck device, for example:

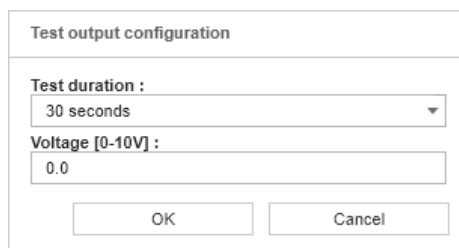


The "Output configurations" window shows details for "Overall alarm status". It lists "Output channel : Analogue output", "Characteristic value configuration : Device alarm status", "Output type : Alarm output", and "Current/voltage output : Voltage output". Below this, it specifies "Alarm : Pre-alarm", "No alarm : 0 V", "Pre-alarm : 10 V", and "Main alarm : 10 V". A green box with a red border highlights the "Test active No alarm" status. A "Test" button with a left arrow icon is also visible. At the bottom are "Edit", "Delete", and "Add" buttons.

4. To cancel the test, click  again.

How to test a configured characteristic value output (SmartCheck only)

1. Under **Output configurations**, click .
2. In the **Test output configuration** window, enter the desired specifications:



Test output configuration

Test duration :
30 seconds

Voltage [0-10V] :
0.0

OK Cancel

You have the following options:

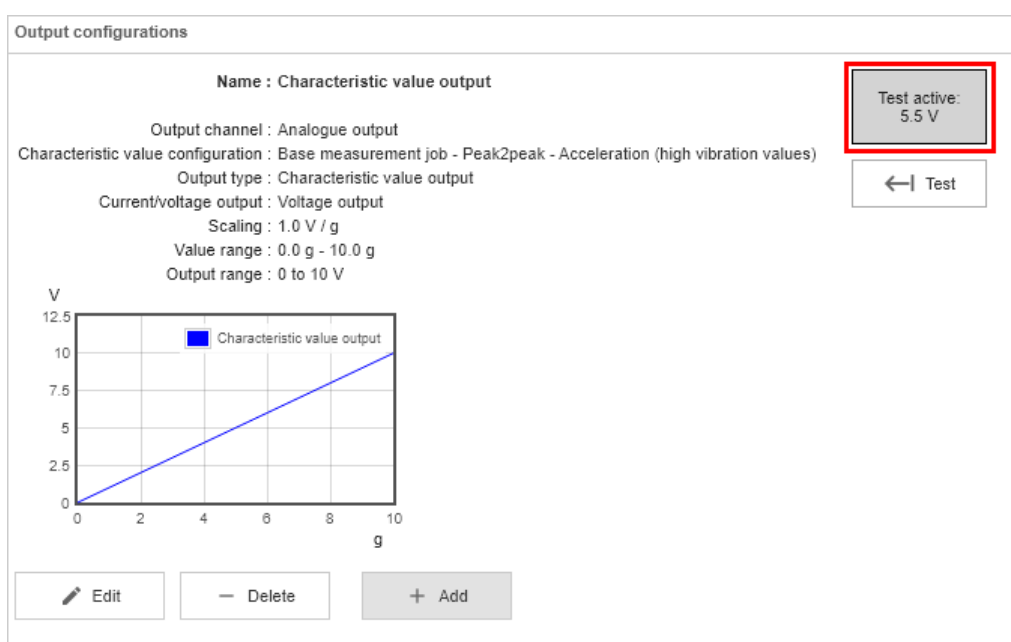
Test duration

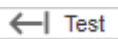
This is where you define the test duration.

Voltage

Here, enter the value for voltage or current that is to be tested.

- Click **OK** to confirm your settings and start the test. You will then be informed that the test is active and informed on what is being tested:

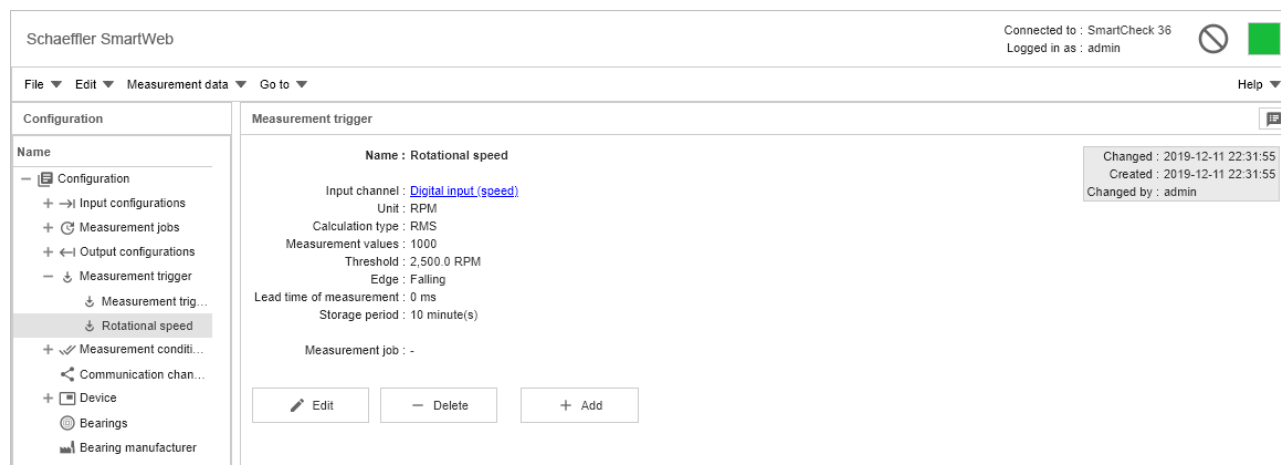


- To cancel the test, click  again.

8.5 Measurement trigger

The SmartCheck or ProLink device generally works through the measurement jobs in a fixed order. However, you can interrupt this order using a measurement trigger. As soon as the trigger condition is fulfilled, the measurement controlled by the measurement trigger is started (after completion of the current measurement).

In the **Measurement trigger** area, you will find an overview of all measurement triggers. In the factory default setting, no measurement trigger is configured for the SmartCheck or ProLink device. As soon as you have defined your own measurement triggers, they are available to you when creating measurement jobs ⁷⁸.



In the expanded overview on the left, you will find all measurement triggers of the SmartCheck or ProLink device. Click on a measurement trigger to access the following information and functions in the main panel:

- The **Name** and the details on the selected measurement trigger are displayed on the left.
- The entry for **Input channel** is a link that takes you straight to the corresponding input configuration.
- The entry for **Measurement job** is a link that takes you straight to the overview of the measurement job in which this measurement trigger is used.
- On the right, in the area highlighted in grey, you will find details on creating and changing the measurement trigger.
- You can edit the measurement trigger ¹⁰³.
- You can add a new measurement trigger ¹⁰³.
- You can delete the selected measurement trigger. To do so, click **Delete** ⁵⁸ and confirm with **OK**.
- In the top right corner, click on ⁵⁸ to open the Configuration overview ⁵⁸.



- When the condition for a measurement trigger is met, the measurement is started immediately, even if this means that an ongoing measurement is interrupted. Measurements that themselves have been started by a measurement trigger are not interrupted.
- If a measurement trigger is used in multiple measurement jobs, these jobs are executed sequentially when the trigger condition is met.

8.5.1 Adding/editing measurement trigger

You can add ¹⁰³ as many measurement triggers and edit ¹⁰⁵ as many existing measurement triggers as you like on the SmartCheck or ProLink device.

How to create a measurement trigger

1. Under **Measurement trigger**, click on **Add** ⁺.
2. In the **Add measurement trigger** window, make the desired specifications:

Add measurement trigger

Schaeffler SmartWeb

Name :
Rotational speed

Input channel :
Digital input (speed)

Unit :
RPM (Frequency/speed)

Calculation type :
RMS

Threshold [0.0-60,000] :
2,500.0

Measurement values[1-38400] :
1000

Edge :
Falling

Lead time of measurement [ms] :
0

Storage period :
10 minute(s)

OK Cancel

You have the following options:

Name	Here, enter the name under which the measurement trigger is to appear in the overview. This name will also appear in the corresponding list box if you want to use the measurement trigger in a measurement job.
Input channel	Here, select the input whose signal you want to use for the measurement trigger. You will find in the list box all inputs and scaling factors of your system.
Unit	This value is automatically filled for the input channel you have selected.
Calculation type	This is where you select the characteristic value most suitable for your signal. The Offset option is available for many application types.
Threshold	Specify here the value from which the measurement trigger should take effect: If the threshold value is exceeded or fallen below—according to the Edge —the SmartCheck or ProLink device interrupts the current measurement and starts the measurement linked to the measurement trigger.
Measurement values	<p>A trigger calculates its current value using the last measured number of values; enter this number here. This value is therefore used to define the number of measurement values that the calculation type configured above should calculate, and the time range over which this value is calculated. You therefore influence the speed at which a trigger reacts to changes in the input signal and the sensitivity of the trigger's reaction to signal disruptions:</p> <ul style="list-style-type: none"> • A smaller number causes a faster reaction. • A larger number makes the trigger less sensitive to disruptions. <p>Example: The sample rate is 1280 values/second (e.g. for an analogue input) and you set Measurement values to 1280. If you have selected Offset as the calculation type, the calculated value corresponds to the average over one second via the input channel.</p>
Edge	<p>Determine here whether the threshold has to be exceeded or fallen below for the measurement trigger to take effect:</p> <p>Falling: The measurement trigger takes effect when the threshold is fallen below.</p> <p>Rising: the measurement trigger takes effect when the threshold is exceeded.</p>

Lead time

Here you define the time prior to initiation of the trigger at which you want the trends to start recording. This enables you to analyse why the trigger has been initiated.

Save interval

Determine here whether you wish to store values regularly in order to monitor the measurement trigger. If values are stored regularly, you can view the trend of the measurement trigger in the **Measurement data** area and verify, for example, that the device is actually taking measurements.


You have the following options:

- **Never:** Select this option if no values are to be stored for a trend.
- **n minutes/hours/days:** Enter here the frequency at which values are to be stored for the trend in minutes, hours or days.

A status change - i.e. the execution of the trigger - is always stored, regardless of the setting selected here.

3. Click on **OK** to save the new measurement trigger.

How to edit a measurement trigger

1. Select the measurement trigger in the expanded overview on the left.
2. Click on **Edit**  and make the desired specifications in the **Edit measurement trigger** window.
3. Click on **OK** to accept your changes.



You can determine the number of **Measurement values** according to the following rough guidelines:

- A small number of measurement values allows the trigger to switch more quickly.
- A small number of measurement values reacts sensitively to short pulses.
- A large number of measurement values is preferable for restless, inconstant signals.

SmartCheck device:


The **save interval** determines how frequently the trend values of the measurement trigger are saved. However, if the trigger relates to an analogue input in 4–20 mA mode, the following restriction applies:


If the value at the analogue input falls below 4 mA, this channel becomes invalid. The values of the trigger are then no longer measured or saved until the channel is valid again (i.e. the value at the input rises above 4 mA). This period is displayed with a grey background in the trend.


8.6 Measurement conditions

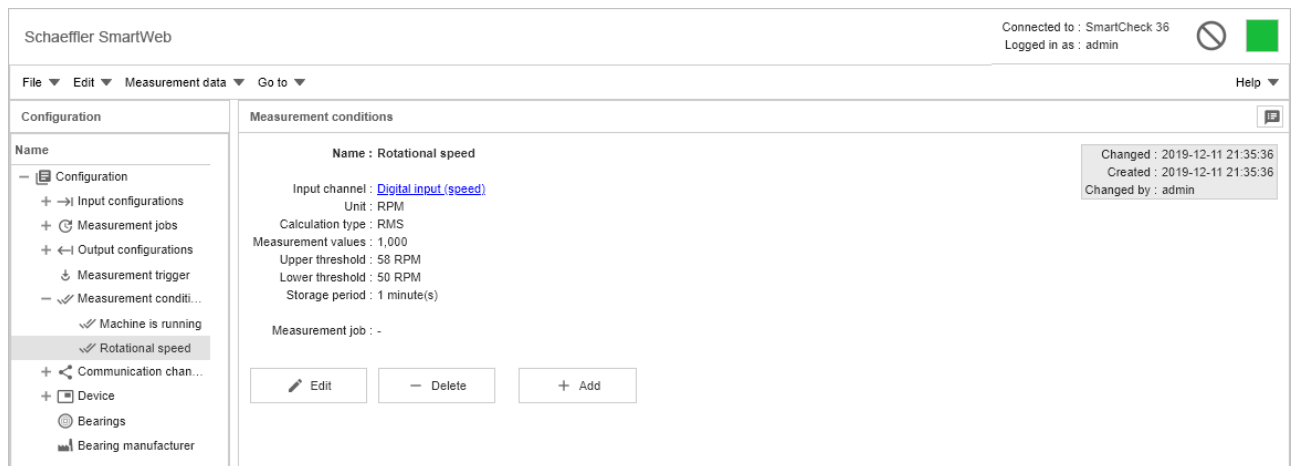
Usually the Schaeffler SmartCheck or ProLink device executes the measurement tasks in a fixed sequence. Using a measurement condition, you can ensure that measurements are skipped: if a measurement is pending but the measurement condition you defined is not met, the device skips this measurement and goes straight to the next one.

If a measurement is pending and the measurement condition is met, the measurement is performed. However, even during a measurement, the system continually monitors whether the measurement condition is still being met. As soon as the measurement condition is no longer being met, the measurement is cancelled.


An **hour meter**  is automatically created for each measurement condition. This indicates the active operating time of a measurement condition and thus the time of the machine or component. You can see the hour meter in the **Measurement data** below the associated measurement condition. There you can edit the hour meter and view the trend of the hour meter.

In the **Measurement conditions** area, you will find an overview of all measurement conditions. In the factory default setting for the SmartCheck or ProLink device, the **Machine is running**  measurement condition is preconfigured.

As soon as you have defined your own measurement conditions, they will be available to you when creating measurement jobs .



In the expanded overview on the left, you will find all measurement conditions for the SmartCheck or ProLink device. Click on a measurement condition to access the following information and functions in the main panel:

- The **Name** and the details on the selected measurement condition are displayed on the left.
- The entry for **Input channel** is a link that takes you straight to the corresponding input configuration.
- The entry for **Measurement job** is a link that takes you straight to the overview of the measurement job in which this measurement condition is used.
- On the right, in the area highlighted in grey, you will find details on creating and changing the measurement condition.
- You can edit the measurement condition ¹⁰⁶.
- You can add a new measurement condition ¹⁰⁶.
- You can delete the selected measurement condition. To do so, click **Delete** ⁵⁸ and confirm with **OK**.
- In the top right corner, click on  to open the Configuration overview ⁵⁸.



The preconfigured **Machine is running** measurement condition is set in the base configuration and ensures that the measuring job is only executed when the relevant machine is actually running. You cannot delete this measurement condition. You can rename this measurement condition (ProLink only).

However, you should adapt this measurement condition to your machine immediately after commissioning the Schaeffler SmartCheck or ProLink device: The fulfilment of the measurement condition **Machine is running** is based, in the factory default setting, on vibration signals. Edit the measurement condition ¹⁰⁶ so that it meets the requirements of your machine. For example, the engine speed is usually a better criterion for determining whether the machine is running.

The **Machine is running** measurement condition is usually added to each newly created configuration by default. However, you can also delete it manually (SmartCheck only).

8.6.1 Adding/editing measurement conditions

On your SmartCheck or ProLink device, you can add ¹⁰⁶ as many measurement conditions and edit ¹⁰⁶ as many existing measurement conditions as you like.

How to create a measurement condition

1. Under **Measurement conditions**, click on **Add** ⁺.
2. In the **Add measurement condition** window, make the desired specifications:

Add measurement condition

Schaeffler SmartWeb

Name :

Input channel :

Unit :
°C (Temperature)

Calculation type :


Measurement values[1-6666] :

Lower threshold [0.0-59.9] :

Upper threshold [40.1-85.0] :

Storage period :

You have the following options:

Name	Here, enter the name under which the measurement condition is to appear in the overview. This name will also appear in the corresponding list box, if you want to use the measurement condition in a measurement job.
Input channel	Here, select the input channel whose signal you want to use for the measurement condition. You will find in the list box all inputs and scaling factors  of your system.
Unit	This value is automatically filled for the input channel you have selected.
Calculation type	This is where you select the characteristic value most suitable for your signal. The Offset option is available for many application types.
Measurement values	<p>A condition calculates its current value using the last measured number of values; enter this number here. This value is therefore used to define the number of measurement values that the calculation type configured above should calculate, and the time range over which this value is calculated. You therefore influence the speed at which a condition reacts to changes in the input signal and the sensitivity of the condition's reaction to signal disruptions:</p> <ul style="list-style-type: none"> • A smaller number causes a faster reaction. • A larger number makes the condition less sensitive to disruptions. <div> Example: The sample rate is 1280 values/second (e.g. for an analogue input) and you set Measurement values to 1280. If you have selected Offset as the calculation type, the calculated value corresponds to the average over one second via the input channel. </div>
Lower threshold / Upper threshold	<p>With these two thresholds, you determine the range within which the measurement condition counts as met; the measurement associated with this condition is then performed.</p> <p>In our example, this range is between 40 and 60°C; with a value of e.g. 65°C, the measurement condition would not be met and the measurement would be skipped or cancelled.</p>
Save interval	Determine here whether you wish to store values regularly in order to monitor the measurement condition. If values are stored regularly, you can view the trend of the measurement condition in the Measurement data area and verify, for example, that the device is actually taking measurements.


You have the following options:

- **Never:** Select this option if no values are to be stored for a trend.
- **n minutes/hours/days:** Enter the frequency at which values are to be stored for the trend in minutes, hours or days here.

A status change - i.e. the fulfilment of the condition - is always stored, regardless of the setting selected here.

3. Click on **OK** to save the new measurement condition.

How to edit a measurement condition

1. Select the measurement condition in the expanded overview on the left
2. Click on **Edit**  and enter the desired specifications in the **Edit measurement condition** window.
3. Click on **OK** to accept your changes.



You can determine the number of **Measurement values** according to the following rough guidelines:

- A small number of measurement values allows the measurement condition to switch more quickly.
- A small number of measurement values reacts sensitively to short pulses.
- A large number of measurement values is preferable for restless, inconstant signals.










SmartCheck device:

The **Save interval** determines how frequently the trend values of the measurement condition are saved. However, if the measurement condition refers to an analogue input in 4–20 mA mode, the following restriction applies:

If the value at the analogue input falls below 4 mA, this channel becomes invalid. The values of the measurement condition are then no longer measured or saved until the channel is valid again (i.e. the value at the input rises above 4 mA). This period is displayed with a grey background in the trend.

8.7 Communication channels

In the **Communication channels** area, the expanded overview on the left shows the communication channels that you have created for the SmartCheck or ProLink device. You can create the following communication channels:

- An  **e-mail communication channel**  ¹⁰⁹, to send e-mails with data attachments from the SmartCheck or ProLink device.
- Multiple channels for  **controllers**  ¹¹⁸, to integrate these into the monitoring with the SmartCheck or ProLink device and to provide you with data from the SmartCheck or ProLink device.
- An  **OPC UA server communication channel**  ¹⁴⁵ to set up the SmartCheck or ProLink device as an OPC UA server.
- A **PROFINET communication channel**  ¹⁵¹ to connect the ProLink device to your controller via the PROFINET module.
- A  **Schaeffler Cloud communications channel**  ¹⁵⁵, to exchange data with the Schaeffler Cloud.

In the right-hand main panel, you will find basic details about the currently selected communication channel as well as information on its inputs and outputs, if these can be created or have been created:

Schaeffler SmartWeb

Connected to : SmartCheck 36
Logged in as : admin

File Edit Measurement data Go to Help

Configuration

Name

- Configuration
 - Input configurations
 - Measurement jobs
 - Output configurations
 - Measurement trigger
 - Measurement conditi...
 - Communication chan...
 - Email
 - OPC UA server
 - PLC_018
 - Device
 - Bearings
 - Bearing manufacturer

Actions

Create new measurement job

Areas

Status

Measurement data

Live view

Configuration

User management

Log out

Complete

Communication channels

Name : PLC_018

Device type : Mitsubishi controller
IP address : 172.28.205.122
Port : 1280
Protocol : TCP
Transfer mode : Binary

Network number : -
Station number : -
Register with version number : D1200
Configuration version : 5

Changed : 2019-12-17 12:23:04
Created : 2019-12-17 10:27:19
Changed by : admin

Edit Delete Add

Inputs for communication channel : PLC_018

Name	Start register	Reg. t...	Polling interval	Min. signal	Max. signal	Unit	Min. reg. value	Max. reg. val...
Velocity from PLC_018	D1000	WORD	1.0 s	0.0	163.837	[RPM]	0.0	10,000

Edit Delete Add

Outputs for communication channel : PLC_018

Register	Register name	Measurement job	Characteristic value	Type	Update interval
D1201	s_communication_status		Communication status	Status	60.0 s
D1202	a_device_status	Device alarm status	Device alarm status	Alarm	60.0 s
D1203	a_crest_factor_acceleration_imp	Default configuration	Crest factor - Acceleration (Impul...	Alarm	60.0 s
D1204	c_crest_factor_acceleration_imp	Default configuration	Crest factor - Acceleration (Impul...	Value	60.0 s
D1206	a_iso10816_1_10hz_1khz_velocity	Default configuration	ISO10816-1 (10Hz - 1kHz) - Velo	Alarm	60.0 s

Edit Delete Create

Click on a communication channel in the main panel to access the information and functions relating to the respective channel. Information and functions are different for each type of communication channel. Relevant details can be found in the following sections.

8.7.1 Communication channel for email

In the **communication channel (e-mail)** area, you can extend the possibilities of condition monitoring using the SmartCheck or ProLink device, by creating an e-mail communication channel and sending e-mails via the SmartCheck or ProLink device. Emails from the SmartCheck or ProLink device are sent to any receiver group via the designated outgoing email server (SMTP server) defined by you. You can include **characteristic values** and **time signals** of the selected measurement tasks as attachments, and the sending of emails is controlled according to timing or alarms.

In order to use the email function, the following steps are necessary:

- First, create the email communication channel. Enter the settings for connection to the email server.
- Next, create one or more outputs for the email communication channel. You can define the structure, content and triggers of the emails.
- After you have created everything, you will find an overview of the email communication channel and its outputs in the **communication channel (email)** area.

8.7.1.1 Communication channel for email area

In the **Communication channels** area, the expanded overview on the left shows the email communication channel that you have created for the SmartCheck or ProLink device. On the right of the main panel, you will find basic details about the selected email communication channel, as well as information about its outputs:

Schaeffler SmartWeb

Connected to : SmartCheck 36
Logged in as : admin

File Edit Measurement data Go to Help

Configuration

Name

Configuration

Input configurations

Measurement jobs

Output configurations

Measurement trigger

Measurement condi...

Communication chan...

Email

OPC OPC UA server

PLC_018

Device

Bearings

Bearing manufacturer

Actions

Create new measurement job

Areas

Status

Measurement data

Live view

Configuration

User management

Log out

Communication channels

Name : Email

SMTP server :

Server name : 10.160.0.201

Server port : 25

Encryption protocol : None

Email sender address : name@email.com

User name : -

Proxy server :

Server name : -

Server port : -

Authentication type : -

User name : -

Maximum message size (MB) : 5

Maximum number of attachments : 100

Edit

Delete

Add

Outputs for communication channel : Email

Name	Recipients	Subject	Data type	Alarm...	Start time point	Repetition																
Condition ...	ConditionMonitoring@e...	CM News: \${device_name} w...	Current values	Yes	2019-12-18 08:00:00	1 day(s)																
<table> <thead> <tr> <th>Measurement jobs</th> <th>Characteristic values</th> <th>Time signals</th> <th>Classification data</th> </tr> </thead> <tbody> <tr> <td>Base measurement job</td> <td>✓</td> <td>✓</td> <td></td> </tr> <tr> <td>Default configuration</td> <td>✓</td> <td>✓</td> <td></td> </tr> <tr> <td>Device alarm status</td> <td>✓</td> <td></td> <td></td> </tr> </tbody> </table>							Measurement jobs	Characteristic values	Time signals	Classification data	Base measurement job	✓	✓		Default configuration	✓	✓		Device alarm status	✓		
Measurement jobs	Characteristic values	Time signals	Classification data																			
Base measurement job	✓	✓																				
Default configuration	✓	✓																				
Device alarm status	✓																					

Edit

Delete

Create

Changed : 2019-12-18 19:58:59








Created : 2019-12-18 19:58:59

Changed by : admin


Click on an email communication channel to access the following information and functions in the main panel:

Communication channels

Here you can find the basic information and functions for the selected email communication channel:

- Alongside the **name** you will find details of the **SMTP server** with which the emails should be sent. You can also see the details of the **proxy server** used, if one is configured.
- : If you select the email communication channel, this symbol is updated to show whether email communication is working or not:
Green symbol: Indicates problem-free communication.
Red symbol: Indicates a problem with the communication. In this case you will see an error message ¹¹⁸ if you hover the mouse over the symbol.
 To update the symbol again, click on .
- Click on  to test the email communication channel.
- Click on **Add**  to add an email communication channel. For more details, please refer to **Adding/editing an email communication channel** ¹¹¹.
- Click on **Edit**  to edit the email communication channel. For more details, please refer to **Adding/editing an email communication channel** ¹¹⁴.
- You can also delete the email communication channel. To do so, click **Delete**  and confirm with **OK**.
- In the top right corner, click on  to open the Configuration overview ⁵⁸.







The SmartCheck or ProLink device supports a maximum of one email communication channel. If you have already configured an email communication channel, the **Add** button  now only enables you to add controllers ¹²¹.

Outputs for communication channel: email

With an email output, you define when and how the email is triggered, the recipient(s) of the email, the text of the email, and which data is included in the attachment.


If you have already created outputs for the email communication channel, the **Outputs for communication channel** area contains the following information:

- The table below shows the most important details of the email output. These include the **name** of the email, its **recipients**, the subject, and information about the attachment (**data type, alarm**) and the triggers (**start time, repetitions**).
- Click  at the beginning of the line to display the attachments that are defined for the selected email output.
- Click on **Edit**  to edit the selected output using the wizard. More details are available in **Creating/editing outputs for an email communication channel** ¹¹⁸.
- Click on **Create**  to create a new output with the assistance of the wizard. More details are available in **Creating/editing outputs for an email communication channel** ¹¹⁴.
- You can also delete the outputs. To do so, click **Delete**  and confirm with **OK**.

8.7.1.2 Adding/editing an email communication channel

To enable the emails to be sent via the SmartCheck or ProLink device, you must create an email communication channel and tell the SmartCheck or ProLink device the details of the SMTP server to use for sending emails and, if applicable, the details of the proxy server used.

How to create an email communication channel

1. Under **Communication channels**, click on **Add**  to open the wizard. This guides you through the creation of the email communication channel in three steps.
2. In the first step, select the **email** communication channel type.



The SmartCheck or ProLink device supports a maximum of one email communication channel. If you have already configured an email communication channel, you can only select controllers ¹²¹ here.

3. In the second step, enter the necessary information about the **SMTP server** used to send the emails:

Add communication channel

Schaeffler SmartWeb

<div>Steps</div> <div> 1: Select communication channel type 2: Configure the email server 3: Configure proxy server </div>	<div>Step: Configure the email server</div> <div> <div>Server name : 10.160.0.201 ?</div> <div>Server port : 25</div> <div>Encryption protocol : None</div> <div>Email sender address : name@email.com</div> <div> <input type="checkbox"/> Activate authentication </div> <div>User name : </div> <div>Password : </div> <div> <input type="checkbox"/> Show password </div> <div>Maximum message size (MB) : 5 ?</div> <div>Maximum number of attachments : 100 ?</div> <div> <div>Connection test</div> <div></div> <div>?</div> </div> </div>
<div>Description</div> <div> Configure the SMTP server settings for email dispatch here. Please enter the server name and port, the security settings and authentication data. </div>	

☐ Expert settings

Back

Next

Finish

Cancel

You have the following options:

Server name

Enter the name of the SMTP server:

- Full network name of the SMTP server, e.g. **smtp.company.com**
- or
- IP address of the SMTP server

You can enter both internal as well as external SMTP servers.

Server port and encryption protocol

Enter the port and encryption protocol of the SMTP server.

The server port automatically adjusts to the default port for the respective encryption protocol:

- **25** for encryption protocol **None**
- **587** for encryption protocol **StartTLS**
- **465** for encryption protocol **SSL**

You can manually change the server port. If you change the encryption protocol following a manual change of the server port, the server port no longer switches automatically to the default port.

Email sender address

Enter the email address that you want to appear as the sender of the SmartCheck or ProLink email. Replies to the email will be sent to this address.

Activate authentication

Activate this option if your SMTP server requires authentication. You will then have to enter the **user name** and **password**.

The **Show password** option is provided to facilitate the input. Once you have confirmed the password, it is no longer visible.

Maximum message size (MB)

Determine the maximum size of the email in MB.

Emails that exceed this size are split into multiple emails.


Maximum number of attachments

Determine the maximum number of email attachments.


If this number is exceeded, the attachments are distributed between multiple emails.

Connection test

Click on this button to check the connection to the SMTP server. Depending on the result, a red or green symbol appears:

- **Green symbol:** Indicates problem-free communication.
- **Red symbol:** Indicates a problem with the communication. In this case will you see an error message  if you hover the mouse over the symbol.




- If you enter a name instead of an IP address under **server name**, and if in the **network settings**  for **DHCP mode** the option **No DHCP** is selected, you must also enter a **DNS server** in the network settings. This is necessary so that the specified server name can be resolved.
- Some SMTP servers automatically create their own sender address. The recipient then sees the sender address set by the SMTP server, and not the **email sender address** entered here. Replies to the email still reach the original **email sender address**.

4. In the third step, you can enter details for the **proxy server**, if applicable:

Add communication channel

Schaeffler SmartWeb

Steps	Step: Configure proxy server
1: Select communication channel type 2: Configure the email server 3: Configure proxy server	<div> <input type="checkbox"/> Use proxy server <div>?</div> </div> <div> Server name : <input type="text"/> </div> <div> Server port : <input type="text"/> </div> <div> Authentication type : <input type="text" value="None"/> </div> <div> User name : <input type="text"/> </div> <div> Password : <input type="password"/> </div> <div> <input type="checkbox"/> Show password </div> <div> <div>Connection test</div> <div></div> </div>
Description	<div>?</div>
If your server can only be reached via a proxy server, you can enter the corresponding details here.	

☐ Expert settings

Back
Next
Finish
Cancel

You have the following options:

Use proxy server

Select this option if you need to specify a proxy server in order to leave the company network.

Server name

Enter the name of the proxy server here:

- Full network name of the proxy server, e.g. **proxy.company.com**
- or
- IP address of the proxy server

Server port	Enter the TCP port of the proxy server here.
Authentication type	<p>Determine the type of authentication of the proxy server. For the options Basic and NTLM, you must also specify the user name and password.</p> <p>The Show password option is provided to facilitate the input. Once you have confirmed the password, it is no longer visible.</p>
Connection test	<p>Click on this button to test the connection to the proxy server. Depending on the result, a red or green symbol appears:</p> <ul style="list-style-type: none"> • Green symbol: Indicates problem-free communication. • Red symbol: Indicates a problem with the communication. In this case will you see an error message¹¹⁸ if you hover the mouse over the symbol.

5. Click **Finish** to save the communication channel for the controller.



- If you enter a name instead of an IP address under **server name**, and if in the **network settings**¹⁵⁵ for **DHCP mode** the option **No DHCP** is selected, you must also enter a **DNS server** in the network settings. This is necessary so that the specified server name can be resolved.
- For detailed information about the configuration data for the proxy server, contact your IT department or system administrator.

How to edit the email communication channel

1. Select the email communication channel in the expanded overview on the left.
2. Under **Communication channels** in the main panel, click on **Edit** . Make the required entries in the respective steps of the wizard.
3. Click on **Finish** to apply your changes.

8.7.1.3 Adding/editing outputs for the email communication channel

For an email output, configure the email that is sent. You define when and how the email is triggered, the recipient(s) of the email, the text of the email and which data is provided in the attachment. You can create multiple email outputs.

How to create the outputs for the email communication channel

1. In the expanded overview on the left, click on the email communication channel.
2. Under **Outputs for communication channel: email**, click on **Create** to open the wizard. The wizard will guide you through the three steps of the creation process.
3. The first step is to **configure the e-mail settings**, including the name, recipients and the text of the e-mail:

Edit outputs

Schaeffler SmartWeb

Steps

1: Configure email settings
2: Select email data
3: Configure email trigger

Description

Configure email settings here. Specify the name, email recipients, subject and content of the email.

Step: Configure email settings

Name :
Condition Monitoring Department

Recipients :
ConditionMonitoring@email.com

Subject :
CM News: \${device_name} with \${alarm_state}
\$ {...}

Content :
This is an automatically generated email from the vibration monitoring system \${device_name}.
\$ {...}

Language :
English (Great Britain)

☐ Expert settings
Back
Next
Finish
Cancel

You have the following options:

- Name** Enter the name under which the email output is to appear in the system. The name can be up to 50 characters long and must be different from all names already in use.
- Recipients** Enter the email addresses to which the email should be sent. You can enter up to 200 characters. Use commas to separate multiple email addresses:
name1@company.com, name2@company.com
- Subject** Enter the text of your choice as the subject of the email. You can enter up to 200 characters.
To the right of the input field, you will see a **selection list with text variables**. You can use these variables, for example, to automatically include the device name or serial number in the subject line.
- Content** Enter the text of your choice with a maximum of 5000 characters as the content of the email.
To the right of the input field, you will see a **selection list with text variables**. You can use these variables, for example, to automatically include the device name or serial number in the subject line.
- Language** Here you can select the language in which the text variables in the email sent are to be displayed.
This setting only affects the text variables. The **subject** and **content** appear in the email exactly as you have entered them.

4. Click on **Next** to move to the second step. Here you **select the email data** to be included as an attachment:

Edit outputs

Schaeffler SmartWeb

Steps

1: Configure email settings
2: Select email data
3: Configure email trigger

Description

Select the data to be sent with the email as an attachment. If you do not select any email data, the email serves only as notification that the device and email connection remain active.

Step: Select email data

Data transfer mode : Transmit most recently computed values

Measurement jobs	Characteristic values	Time signals	Classification data
Base measurement job	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Configuration par défaut	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Default configuration	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Device alarm status	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Measurement triggers and conditions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

☒ Expert settings
Back
Next
Finish
Cancel

You have the following options:

List of measurement jobs

Here you can define for each measurement job whether **characteristic values**, **time signals**, or **classification data** (special version) are to be sent as an attachment.

Expert settings: Data transfer mode

Select this option at the bottom left to display the **data transfer mode** selection list above the measurement jobs. You have the following options:

- **Transmit most recently computed values:** only the current values are transferred.
Select this option if you have a permanent connection to the Internet and always want to be informed about the current situation.
- **Mass transfer of saved values:** the data saved in the device (trends, time signals, classification data) is sent.
Select this option if you want to transfer data in larger blocks, for example, because the SmartCheck or ProLink device only has intermittent access to the Internet.



If you do not select any data, the email will be sent anyway. In this case, the email provides information that the SmartCheck or ProLink device and the email connection are intact.

- Click on **Next** to proceed to the third step. Here you **configure the email initiator**. You can use a time-controlled trigger and/or an alarm-based trigger:

Edit outputs

Schaeffler SmartWeb

Steps

1: Configure email settings
2: Select email data
3: Configure email trigger

Description

Configure when to send your email here. Sending can be triggered either at regular intervals, on alternation of the alarm status or both. You must configure at least one triggering variant.

Step: Configure email trigger

☒ Send email at intervals

Start date :

Dec

18

2019

Start time :

8:00

HH:MM

Repetition interval :

1

day(s)

Minimal alarm status :

Pre-alarm

☒ Send email if alarm status changes

Minimum time between two alarm emails :

1

hour(s)

☒ Expert settings

Back

Next

Finish

Cancel

You have the following options:

Send email at intervals

Select this option to send the email based on regular time intervals. You have the following options:

- **Start date and start time:** Enter the time at which the email should be sent for the first time.
- **Repetition interval:** Define the regularity with which the email is to be sent. You can enter the interval in **minutes, hours, days, weeks** and **months**.

Send email if system event occurs

Select this option to send the email when a system event is triggered. You have the following option:

- **Minimum time interval between two event emails:** Use this option to set the minimum time between two alarm emails. This enables you to prevent too many emails from being sent if there are frequent events. If you select the option **As often as possible**, an email is sent with every system event.

Send email if there is a change in alarm status

Select this option to send the email when the alarm status changes in one of the selected measurement jobs. You have the following option:


- **Minimum time interval between two alarm emails:** This option lets you specify the minimum time that elapses between two alarm emails. This enables you to prevent too many emails from being sent if the alarm status is subject to frequent changes. If you select the option **As often as possible**, an email is sent with every change of alarm.

6. Click on **Finish** to close the wizard and confirm the email output.



If you set the start date to the 31st of a month, in shorter months the email will still be sent on the last day of the month.

How to edit the outputs of the email communication channel

1. In the expanded overview on the left, click on the email communication channel.
2. Under **Outputs for communication channel: email**, click on **Edit**  to open the wizard.
3. Make the desired changes with the assistance of the wizard and confirm them by clicking on **Finish**.


8.7.1.4 Error messages during connection test

The **Communication channels** area and the wizard for adding the email communication channel feature buttons to test the connection to the SMTP server or proxy server. If the test was unsuccessful, move the mouse over the red symbol to learn more about the error and receive recommendations for action.

The following messages may appear: Click on a link to jump to the corresponding location in the manual:

- The server name of the SMTP server cannot be resolved. Please check the server name [\[112\]](#).
- The connection to the SMTP server has failed. Please check the port or the encryption protocol [\[112\]](#).
- The SMTP server is responding with an incorrect protocol. Please check the encryption protocol [\[112\]](#).
- The authentication on the SMTP server has failed. Please check your user name and password [\[112\]](#).
- The SMTP server is unavailable.
- The proxy server name cannot be resolved. Please check the server name [\[113\]](#).
- The connection to the proxy server has failed. Please check the port or the encryption protocol [\[114\]](#).
- The authentication on the proxy server has failed. Please check your user name and password [\[114\]](#).

8.7.2 Communication channel for Mitsubishi controllers

Industrial plants use controllers that contain data such as process parameters; this data is extremely useful for vibration monitoring purposes. In the  **Communication channels (controllers)** [\[119\]](#) area, you can integrate this data into the monitoring using the Schaeffler SmartCheck or ProLink device, and render controller data from the Schaeffler SmartCheck or ProLink device accessible. In order to avail of this potential, the following steps must be taken:

- The Mitsubishi controller that you would like to integrate must first be added as a communication channel [\[121\]](#). In doing so you essentially define the name of the controller and how the Schaeffler SmartCheck or ProLink device can connect with the controller via your network.

It is also possible to configure station forwarding in the Schaeffler SmartWeb software for accessing the remote controller in the internal controller network.

- For problem-free communication between the controller and the Schaeffler SmartCheck or ProLink device, there must be an Ethernet connection between the two. You must also configure the correct settings for the IP address, net mask and the gateway, if applicable.
- If multiple Schaeffler SmartCheck or ProLink devices are to communicate with one controller, an individual port must be reserved in the controller for each device.
- If you would like to read data from the controller, you must create one or more inputs for the controller [\[124\]](#). For this type of input, you can determine how often and from which controller registers the data is read, as well as the value range. You also specify the signal unit and signal value range to which the register data is to be converted.

For each controller, you can set up as many inputs as you wish and use them in the SmartWeb software in exactly the same way as you use the inputs found in the **Input configuration** [\[61\]](#) area; inputs are available for the controller in relation to measurement jobs [\[76\]](#), measurement conditions [\[105\]](#) and measurement triggers [\[102\]](#) in particular.

- If you would like to make controller data from the SmartCheck or ProLink device accessible, you must create a configuration file with outputs for the controller [\[126\]](#). Here, you define the update frequency and the characteristic values for which the alarm status and/or a value is relayed, as well as the controller register to which the information is written.



At the present time, the only communication channels that you can integrate are Mitsubishi controller families that support the SLMP (3E-Frame) protocol and which are connected to the Schaeffler SmartCheck or ProLink device via Ethernet. These are the following controller families:

- System Q
- L series
- System Q and L series via SLMP gateway

There are plans to offer support for additional controllers; for more information, contact your customer support representative.

8.7.2.1 Communication channel for Mitsubishi controllers

In the **Communication channels** area, the expanded overview on the left shows the controllers that you have created for the SmartCheck or ProLink device. In the right-hand main panel, you will find basic details about the currently selected controller as well as information on its inputs and outputs, if these have been created:

Schaeffler SmartWeb

Connected to : SmartCheck 36
Logged in as : admin

File Edit Measurement data Go to Help

Configuration

Name

- Configuration
 - Input configurations
 - Measurement jobs
 - Output configurations
 - Measurement trigger
 - Measurement condi...
 - Communication chan...
 - Email
 - OPC UA server
 - PLC_018
 - Device
 - Bearings
 - Bearing manufacturer
- Actions
 - Create new measurement job
- Areas
- Status
- Measurement data
- Live view
- Configuration
- User management
- Log out

Complete

Communication channels

Name : PLC_018

Device type : Mitsubishi controller
IP address : 172.28.205.122
Port : 1280
Protocol : TCP
Transfer mode : Binary

Network number : -
Station number : -
Register with version number : D1200
Configuration version : 5

Changed : 2019-12-17 12:23:04
Created : 2019-12-17 10:27:19
Changed by : admin

Edit Delete Add

Inputs for communication channel : PLC_018

Name	Start register	Reg. t...	Polling interval	Min. signal	Max. signal	Unit	Min. reg. value	Max. reg. val...
Velocity from PLC_018	D1000	WORD	1.0 s	0.0	163,837	[RPM]	0.0	10,000

Edit Delete Add

Outputs for communication channel : PLC_018

Register	Register name	Measurement job	Characteristic value	Type	Update interval
D1201	s_communication_status		Communication status	Status	60.0 s
D1202	a_device_status	Device alarm status	Device alarm status	Alarm	60.0 s
D1203	a_crest_factor_acceleration_imp	Default configuration	Crest factor - Acceleration (Impul...	Alarm	60.0 s
D1204	c_crest_factor_acceleration_imp	Default configuration	Crest factor - Acceleration (Impul...	Value	60.0 s
D1206	a_iso10816_1_10hz_1khz_velocity	Default configuration	ISO10816-1 (10Hz - 1kHz) - Velo...	Alarm	60.0 s

Edit Delete Create


Click on a controller in order to access the following information and functions in the main panel:

Communication channels

Here you can find the basic information and functions for the selected controller:

- In addition to **Name**, **Device type** and **IP address**, basic settings for addressing the device can be found here. You can find the change details for the controller in the grey box at the top right.
- **Network number** and **Station number** are details required for station forwarding, if this is defined for the controller.
- **Register with version number** relates to the configuration file with outputs that you have created for the controller: here you can find the register into which the version of the configuration file (**Configuration version**) is written. This number functions as a safeguard against unintentional

overwriting of the register.













Click on  to manually set the version counter to a defined value (applies only to SLMP). Normally, the value of this version counter is automatically incremented for writing to the controller when a configuration relevant to the controller is changed on the SmartCheck or ProLink device, e.g., when more registers are used. In the controller, the value in the version register must match the value of this version counter for the SmartCheck or ProLink device to write to the controller. If it is not possible to adjust the value in the controller, you can manually set the version counter here to the value in the controller.

Caution





A manually defined version counter overrides the program's internal security mechanism.

You must ensure that the output configuration for this communication channel matches the controller's configuration. If this is not the case, more or different registers could be overwritten than intended in the controller program.






- : If you select a controller, this icon is updated; it indicates whether communication with the controller is functioning or not: a green icon indicates problem-free communication. If the icon is red, there is a communication problem. In this case you see an error message if you hover the mouse over the icon. To update the icon again you must click on .
- Click on  to test the connection to the controller.
- Click on  to download the configuration file. When you have created outputs for the controller , you need this file in order to prepare the controller for the data transfer.
- Click on **Edit**  to edit the controller. For details, please refer to **Adding/editing a controller** .
- Click on **Add**  to add further controllers. For details, please refer to **Adding/editing a controller** .
- You can also delete the selected controller. To do so, click **Delete**  and confirm with **OK**.
- In the top right corner, click on  to open the Configuration overview .





A controller that you have integrated into a measurement job  cannot be deleted. In this case, the **Delete**  button is deactivated. To delete this controller, you must first delete the measurement job in which it is used.

Inputs for communication channel

This table provides an overview of the inputs that you have created for the selected controller. When you select a controller, the following information and options are displayed here:

- The table contains information on the relevant inputs, in addition to the **Name** e.g. also the register in which the controller starts reading the data (**Start register**), the signal value range into which the data is translated (**Min. signal** to **Max. signal**) and the register value range it covers (**Min. reg. value** to **Max. reg. value**).
- Click on **Edit**  to edit the input. For details, please refer to **Adding/editing a controller input** .
- Click on **Add**  to add further inputs. For details, please refer to **Adding/editing a controller input** .
- You can also delete the selected input. To do so, click **Delete**  and confirm with **OK**.






An input that you have linked to a measurement job  cannot be deleted. In this case, the **Delete**  button is deactivated. To delete this external device, you must first delete the measuring job in which it is used.

Outputs for communication channel

You can use characteristic values that are calculated in the SmartCheck or ProLink device to transfer their alarm status and/or values to a controller. To do this, create a configuration file with outputs and transfer the alarm status and/or value of selected characteristic values via this file to the controller.

If you have already created outputs for the controller, the following information can be found in the **Outputs for communication channel** area:

- The table indicates the characteristic values for which the alarm status and/or value (**Type**) is transferred to the controller, how often this happens (**Update interval**) and the register into which the information is written.
- Click on **Edit**  to edit the outputs with the assistance of the wizard. For more details, please refer to **Creating/editing controller outputs** ¹²⁹.
- Click on **Create**  to create the outputs with the assistance of the wizard. For more details, please refer to **Creating/editing controller outputs** ¹²⁷.
- You can also delete the outputs. To do so, click **Delete**  and confirm with **OK**.




- After you have created or edited the controller outputs in the SmartWeb software, you must transfer the corresponding information to your controller. For details, please refer to the section **Integrating a controller into the system** ¹²⁹.
- If you want to use the Schaeffler SmartUtility software (optional) to download a configuration from the SmartCheck or ProLink device and send this to other devices, the outputs for the controller are not included in the transfer. This prevents multiple Schaeffler SmartCheck or ProLink devices from writing to the same controller register. In this case, please import the configuration file with the outputs manually, as described in the section **Integrating a controller into the system** ¹²⁹.

8.7.2.2 Adding/editing a controller

In order to be able to receive the data from a controller as an input signal, you will need to set up the relevant controller as a communication channel and communicate the network data of the controller to the SmartCheck or ProLink device.

How to create a communication channel for a controller

1. Under **Communication channels**, click on **Add**  to open the wizard. The wizard will guide you through the process of creating the communication channel in two steps.
2. In the first step, under **Communication channel type**, select the controller for which you are creating the communication channel. Currently, you can only integrate Mitsubishi controller families ¹¹⁹ that support the SLMP (3E-Frame) protocol.
3. Click on **Next** to move to the second step. Here you must enter the required details for the controller:

Edit communication channel

Schaeffler SmartWeb

<div>Steps</div> <div> 1: Select communication channel type 2: Configure Mitsubishi Controller (SLMP) </div>	<div>Step: Configure Mitsubishi Controller (SLMP)</div> <div> <div> Name : PLC_018 ? </div> <div> IP address : 172.28.205.122 </div> <div> Port : 1280 </div> <div> <input type="checkbox"/> Station forwarding </div> <div> Protocol : TCP </div> <div> Transfer mode : Binary </div> <div> <div>Connection test</div> <div></div> ? </div> </div>
<div>Description</div> <div> Configure the settings for the Mitsubishi Controller here. Please enter the server name and port, and the protocol details. </div>	

☐ Expert settings

Back

Next

Finish

Cancel

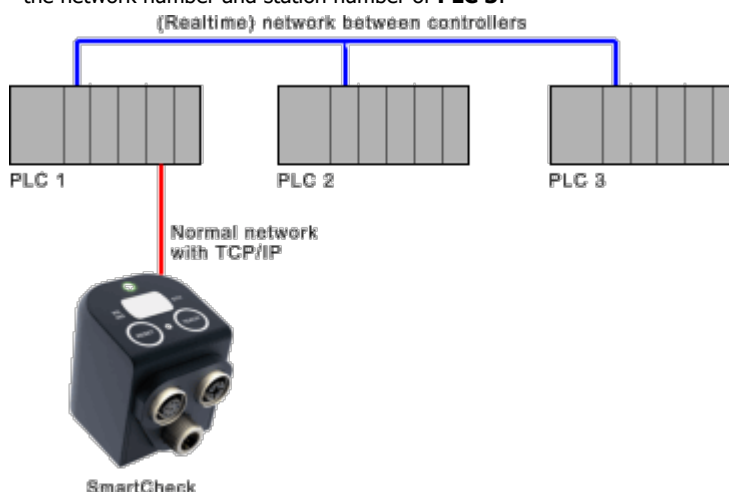
You have the following options:

- | | |
|---------------------------|---|
| Name | Enter the name with which the controller is to appear in the SmartWeb software. |
| IP address | Enter the IP address under which the controller can be accessed in your network. |
| Port | Enter the port via which the connection to the controller is established. |
| Station forwarding | <p>Activate this field if you would like to forward the communication to another controller via the IP address specified above. In this case you must also specify the following:</p> <p>Network number: specify the network number of the remote controller here.</p> <p>Station number: specify the station number of the remote controller here.</p> |

Example:

In order to access the **PLC 3** controller, specify the following:

- the IP address of **PLC 1**
- the network number and station number of **PLC 3**:



The data from the Schaeffler SmartCheck or ProLink device is then forwarded by PLC 1 to PLC 3 via the realtime network.

Protocol
Transfer mode

Enter the **Network protocol** and the **Transfer mode** for transferring data between the Schaeffler SmartCheck or ProLink device and the controller. Make sure that your selection here matches the settings in the controller.

Connection test

Click on this button to check the input connection data. If the test is successful, the box next to the button turns green; otherwise it appears in red.

If you hover the mouse above the red box you will also receive a message explaining why the connection is not working.

4. Click **Finish** to save the communication channel for the controller.



- For the connection between Schaeffler SmartCheck or ProLink and the controller to work, the IP addresses of both devices must be in the same range. That means that - depending on the net mask - the first three numbers of the four-digit IP address must be identical. You can also access the controller with the Schaeffler SmartCheck or ProLink device via a gateway. If you have any questions regarding this, contact your network administrator.
- If the IP address of the controller is outside the IP range of the Schaeffler SmartCheck or ProLink device, but is accessible via a gateway, proceed as follows:
 1. Open the Schaeffler SmartUtility Light or Schaeffler SmartUtility software (optionally available).
 2. Click on **Configure sensor(s)**.
 3. In the first step in the wizard, select the Schaeffler SmartCheck or ProLink device.
 4. In the second step in the wizard, specify the gateway for the Schaeffler SmartCheck or ProLink device.
 5. Close the Wizard with **Send**.

You can obtain more detailed information about creating a gateway from your system administrator. For details on working with the Schaeffler SmartUtility software, refer to the relevant manual.
- The combination of IP address and port must be unique. If you need more combinations – for station forwarding, for example – you must enable more ports in the controller as appropriate.

How to edit the communication channel for a controller

1. Select the controller in the expanded overview on the left.
2. Under **Communication channels** in the main panel, click on **Edit** . Make the required entries in the respective steps of the wizard.
3. Click on **Finish** to apply your changes.

8.7.2.3 Adding/editing inputs for controllers

The Schaeffler SmartCheck or ProLink device receives information about process parameters in the controller via controller inputs.

How to create inputs for the controller

1. In the expanded overview on the left, select the controller for which you would like to add an input.
2. Under **Inputs for communication channel: [Name of the controller]**, click on **Add +**.
3. In the **Add input** window, make the desired entries:

The screenshot shows the 'Edit input' window in Schaeffler SmartWeb. The window contains the following fields and values:

- Name: Velocity from PLC_018
- Start register: D1000
- Register type: WORD
- Unit group: Frequency/speed
- Unit: RPM
- Polling interval: 1 s
- Signal value: 163.837
- Max. [RPM]: 163.837
- Scaling: 16.38
- Min. [RPM]: 0.0
- Min. register value: 0.0
- Max. register value: 10,000

A graph is displayed showing the scaling from register values to RPM. The x-axis represents the register value (0 to 10,000) and the y-axis represents the RPM (0 to 200,000). A blue line shows the linear relationship between the two.

You have the following options:

Name	Here, specify the name that the input is to appear under in the SmartWeb software.													
Start register	Specify the register here that is to be read out. If you choose a data type under Register type for which two registers must be read out, Start register refers to the lower of the two registers. This is where the readout starts.													
Register type	<p>This is where you specify the data format to be used in the Start register or in the register closest to the start register. This specification defines:</p> <ul style="list-style-type: none">• whether one register (16 bits) or two registers (32 bits) are read out and• how large the maximum register value range can be. <p>The selection options available have the following formats or register value ranges:</p> <table><tr><td>INT</td><td>16 bit</td><td>-32,768 to 32,767</td></tr><tr><td>WORD</td><td>16 bit</td><td>0 to 65,535</td></tr><tr><td>DINT</td><td>32 bit</td><td>-2,147,483,648 to 2,147,483,647</td></tr><tr><td>DWORD</td><td>32 bit</td><td>0 to 4,294,967,295</td></tr></table>		INT	16 bit	-32,768 to 32,767	WORD	16 bit	0 to 65,535	DINT	32 bit	-2,147,483,648 to 2,147,483,647	DWORD	32 bit	0 to 4,294,967,295
INT	16 bit	-32,768 to 32,767												
WORD	16 bit	0 to 65,535												
DINT	32 bit	-2,147,483,648 to 2,147,483,647												
DWORD	32 bit	0 to 4,294,967,295												

REAL 32 bit $\pm 1.5 * 10^{-45}$ to $\pm 3.4 * 10^{38}$

Unit group and Unit

This is where you specify the physical value and measurement unit into which the value from the controller is to be converted.

Polling interval

This is where you specify how often the value is to be queried from the controller. A long polling interval is sufficient for values that only change slowly e.g. the temperature. This can reduce the amount of data and the load on the controller.



The logbook message "Connection refused" indicates that the Schaeffler SmartCheck or ProLink device is attempting to connect to the controller again, although the last connection is not yet complete. You can prevent this from occurring by increasing the polling interval.

Register value

Initially, these fields are filled automatically as soon as you have selected a **Register type**. You then have the option of adjusting the **Min. register value** and/or **Max. register value** manually. This may be necessary if the register value range is smaller than the range that was set automatically.

Signal value

Use these settings to determine the range within which the measurement values should lie. First enter a minimum value **Min.** Then enter a maximum value **Max** or define the factor with which the calculated signal should be scaled in the **Scaling** field. Both the diagram and the values of the respective other field are then adjusted automatically.


4. Click on **OK** to save the new input.

Example:

The register R100 is defined as WORD in the controller. The entire numerical range from 0 to 65,535 is limited to the range from 0 to 10,000. This range corresponds to a speed of between 0 and 3000 RPM. Your settings are then the following:



Start register	R100
Register type	WORD
Unit group	Frequency/speed
Unit	RPM
Min. register value	0
	This value is set automatically.
Max. register value	10,000
	The number 65,535 is set automatically and you will need to adjust it manually.
Max. signal value	3000 (RPM)
Min. signal value	0 (RPM)

How to add a scaling factor to the input

You can add scaling factors to the input, which you can access e.g. when creating a measurement job . Using scaling factors, you can calculate logical values for other areas from the physical value measured at one area of the component.

Example: Using the input, you measure the speed in front of the gear. The speed behind the gear is 5 times smaller. You can create a scaling factor for this:

1. **Speed in front of the gear**
2. **Speed behind the gear** with a factor of 0.2 (1/5)

1. In the table, select the required input under **Inputs for communication channel: [Name]**.
2. Click on  to expand the list of scaling factors.
3. Click on  to open the **Add scaling factor** window:

Add scaling factor

Input channel :
21G830 - Rotational speed before gear

Name :
Speed before gear

Scaling factor :
0.2

Unit group :
Frequency/speed

Unit :
RPM

OK Cancel

You have the following options:

- Name**
The scaling factor is listed under this name, along with the other inputs. Therefore, you should choose a practical name that will enable you to distinguish between the inputs.
- Scaling factor**
The physical input signal is multiplied by the value you enter here.
- Unit**
Here you can change the unit of measurement for the sensor signal. By default, the unit of the corresponding input configuration is selected here.

- Click on **OK** to save your changes. The new scaling factor is displayed in the list of scaling factors.

To delete or edit the scaling factor, right-click to open the context menu and select the corresponding command here:

Inputs for communication channel : 21G830


Name	Start register	Reg. t...	Polling interval	Min. signal	Max. signal	Unit	Min. reg. value	Max. reg. val...
Rotational speed bef...	R0	INT	1.0 s	-32,768	32,767	[Hz]	-32,768	32,767

Additional scaling factors

Speed before gear
0.2x RPM

Edit
Delete
Live view


Edit
Delete
Add

You can also switch to the **live view**  area here. There you will see in real time the signal used for the calculation of this characteristic value.



If you delete a scaling factor which is being used by a measurement job, the system gives you a warning message. If you delete the scaling factor, you also automatically delete the relevant measurement job.

How to edit the input of a controller

- In the expanded overview on the left, select the controller whose input you would like to edit.
- In the table, under **Inputs for communication channel: [Name of the controller]**, selected the desired input.
- Click on **Edit**  and make the desired entries in the **Edit input** window.
- Click on **OK** to accept your changes.

8.7.2.4 Adding/editing outputs for controllers

CAUTION



Only create a configuration file with outputs for the controller if you are certain that the register area to be written to is free, and that it is not used in the controller program. Otherwise, it is possible that the Schaeffler SmartCheck or ProLink device may overwrite important data in your controller.

You can use the outputs to define the characteristic values whose alarm status, value, and/or alarm limit is transferred to the controller. Here, you can also determine the registers of the controller that will be written to in this process. In addition, you require certain information from the outputs to prepare your controller for the writing process. For more details, refer to the relevant section of the chapter **Integrating a controller into the system** ¹²⁹.

If you have created the configuration file with outputs successfully and have also prepared the controller appropriately, the Schaeffler SmartCheck or ProLink device can write the following values for each characteristic value into the relevant controller register:

Value	Abbreviation	Meaning
0	unknown	The characteristic value has not yet been measured.
1	no_alarm	Alarm status: No alarm – marked in green in the Schaeffler SmartWeb software.
2	pre_alarm	Alarm status: Pre-alarm – marked in yellow in the Schaeffler SmartWeb software.
3	main_alarm	Alarm status: Main alarm – marked in red in the Schaeffler SmartWeb software.
4	charval_error	An error occurred when calculating the characteristic value; it is possible for example that no rotational speed was determined, even though this is necessary for the characteristic value.

How to create the outputs for the controller

1. In the expanded overview on the left, select the controller for which you would like to create the outputs.
2. Under **Outputs for communication channel: [name of the controller]**, click on **Create** ☆ to open the wizard. It will guide you through the creation process in two steps.
3. In the first step, you must **select registers and characteristic values**:

Edit outputs

Schaeffler SmartWeb

Steps

1: Select registers and characteristic values
2: Specify register names

Description

Here you can determine the from which registry in the controller information is written. You can also select the characteristic values whose alarm status, value and/or alarm limits are to be transferred.

Step: Select registers and characteristic values

Start register :
D1200

End register :
D1207

Update interval :
60 s

Characteristic value selection :

Available characteristic values	Alarm status	Value	Alarm limits
– <input checked="" type="checkbox"/> Default configuration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> System temperature sensor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> RMS broad band - Demodulation (Overall status)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> RMS broad band - Acceleration (Overall status)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Crest factor - Acceleration (Impulses)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> ISO10816-1 (10Hz - 1kHz) - Velocity	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Peak2peak - Acceleration (High vibration values)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Periodic value - Demodulation (recurring anomalies)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Periodic value - Acceleration (recurring anomalies)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Temperature	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

☐ Expert settings

Back
Next
Finish
Cancel

You have the following options:

Start register


This is the point where you specify the first register of the register block in which the alarm status is to be stored.

The version number of the configuration file is stored in this first register with the outputs; the alarm statuses and/or values of the selected characteristic values are written into all subsequent registers.

Update interval

This is where you specify how often the alarm statuses and/or values are to be transferred to the controller.

Characteristic value selection

This is where you select the characteristic values whose alarm statuses and/or values are to be transferred to the controller. The characteristic values available here depend on the measurement jobs  that you have created.

Alarm status/alarm limits

Select here if you want to transfer the alarm status, value, and/or the alarm limit of the characteristic value to the controller for every characteristic value. You can only transfer the communication status, the device status and the overriding alarm characteristic value ("basic configuration" here, for example) as alarm statuses. You can then only select the device status if at least one other characteristic value transfers an alarm status.



The alarm limits cannot be selected until the value and/or alarm status has been selected.



Measurement triggers and measurement conditions cannot be selected as a configuration for an output.

- Click on **Next** to move to the second step. This is where you **specify the register name**:

Edit outputs

Schaeffler SmartWeb

Steps

1: Select registers and characteristic values
2: Specify register names

Description

This is where you specify the names that should be used in the controller. Only the characters A-Z, a-z, 0-9 and '_' are permitted. The first character must be a letter.

Step: Specify register names

Register names :

Register with version number : D1200

Measureme...	Characteristic value	Type	Register	Register name
	Communication status	Status	D1201	s_communication_status
	Device status	Alarm	D1202	a_device_status
Default confi...	Crest factor - Acceleration (Impul...	Alarm	D1203	a_crest_factor_acceleration_imp
Default confi...	Crest factor - Acceleration (Impul...	Value	D1204	c_crest_factor_acceleration_imp
Default confi...	ISO10816-1 (10Hz - 1kHz) - Velo...	Alarm	D1206	a_iso10816_1_10hz_1khz_velocity
Default confi...	RMS broad band - Acceleration (...)	Alarm	D1207	a_rms_broad_band_acceleration_o

?

☐ Expert settings


Back

Next

Finish

Cancel

Under **Register names**, you can use the relevant register as a variable in the GX Works2 software.

As far as possible, the register names in the table are generated automatically from the characteristic value names. The sequence of the entries can be edited by selecting one or more entries and moving them up or down with the arrow keys. You can update the register with **update** . The characteristic values are sorted alphabetically by measuring task name and characteristic value name. You can edit any name by double-clicking on the relevant line. The following naming conventions apply:

- The name must be input in ASCII format.
 - A-Z, a-z, 0-9 and _ are allowed characters
 - The first character must be a letter.
 - The number of characters must be between 1 and 32 at most.
5. Click on **Finish** to close the wizard and confirm the configuration with outputs.
 6. To guarantee problem-free communication, you must also transfer the configuration file with outputs to your controller. In the controller's programming environment, the registers into which the Schaeffler SmartCheck or ProLink device will write the alarm status, values, and/or alarm limits is marked as 'reserved'. For details, please refer to the section **Integrating a controller into the system** [129](#).




- The **Register with version number** contains the current version number of the configuration file with outputs. This information functions as a safeguard against unintentional overwriting of registers: when the configuration file has changed in such a way as to affect the configuration of the controller, the version number for the controller in question is immediately incremented. This means that the version number in the controller no longer agrees with the version number on the Schaeffler SmartCheck or ProLink device. Alarm statuses and/or values can no longer be written into the controller, and you will receive an error message.

The alarm statuses and/or values are not written into the controller again until you have transferred the new configuration file to the controller (see section **Integrating a controller into the system** [129](#)).

- The characteristic value **Communication status** writes values into the controller that provide information about communication problems between the Schaeffler SmartCheck or ProLink device and the controller.

Value	Abbreviation and meaning
0	communication_ok : No problems
1	error_configuration_inconsistent : The characteristic value structure on the Schaeffler SmartCheck or ProLink device has changed; the data can no longer be written into the controller at this time. In order to do this again, the configuration file from the Schaeffler SmartCheck or ProLink device must be downloaded again and read into the controller 129 .
2	error_reading_values : The Schaeffler SmartCheck or ProLink device cannot read one or more values from the controller, or the values are incorrect. For more information, refer to the Logbook 43 .
3	error_alarm_state_not_updated : The Schaeffler SmartCheck or ProLink device cannot write one or more values to the controller. For more information, refer to the Logbook 43 .

How to edit the outputs of a controller

1. In the expanded overview on the left, select the controller for which you want to edit the outputs.
2. Under **Outputs for communication channel: [name of the controller]**, click on **Edit**  to open the wizard.
3. Make the desired changes with the assistance of the wizard and confirm them by clicking on **Finish**.
4. To guarantee problem-free communication, you must also transfer the changed configuration file to your controller. For details, please refer to the section **Integrating a controller into the system** [129](#).

8.7.2.5 Integrating a controller into the system

In the following sections you will find a detailed example of how to integrate specific controllers into the Schaeffler SmartCheck or ProLink device as communication channels, and the steps required in order to initiate communication between your controller and the Schaeffler SmartCheck or ProLink device. The following example is currently available:

- Mitsubishi - GX Works2 software [130](#)

In this section, you will find detailed information regarding how to prepare your controller for communication with the Schaeffler SmartCheck or ProLink device and the settings in the Schaeffler SmartWeb software that are required for this. Here is an overview of the necessary steps:

1. **Set up communication settings in the controller**
2. **Create the controller in the SmartWeb software**
3. **Create inputs for the controller in the SmartWeb software**
4. **Create outputs for the controller in the SmartWeb software**
5. **Save the configuration file with outputs in the SmartWeb software**
6. **Import configuration file into GX Works2**
7. **Compile program and transfer it to the controller**

These steps are aligned with the sample specifications you will find in the Initial situation ¹³⁰ section.

Initial situation

The following communications parameters apply to your Mitsubishi controller:

IP address of the controller	172.28.205.122
Port (Host Station Port No.)	Decimal: 1280 or hexadecimal: 0500
Network protocol	TCP (MC protocol)
Transfer mode (Communication Data Code)	Binary
Station forwarding	None

You would like to use the connection between the controller and the Schaeffler SmartCheck or ProLink device as follows:

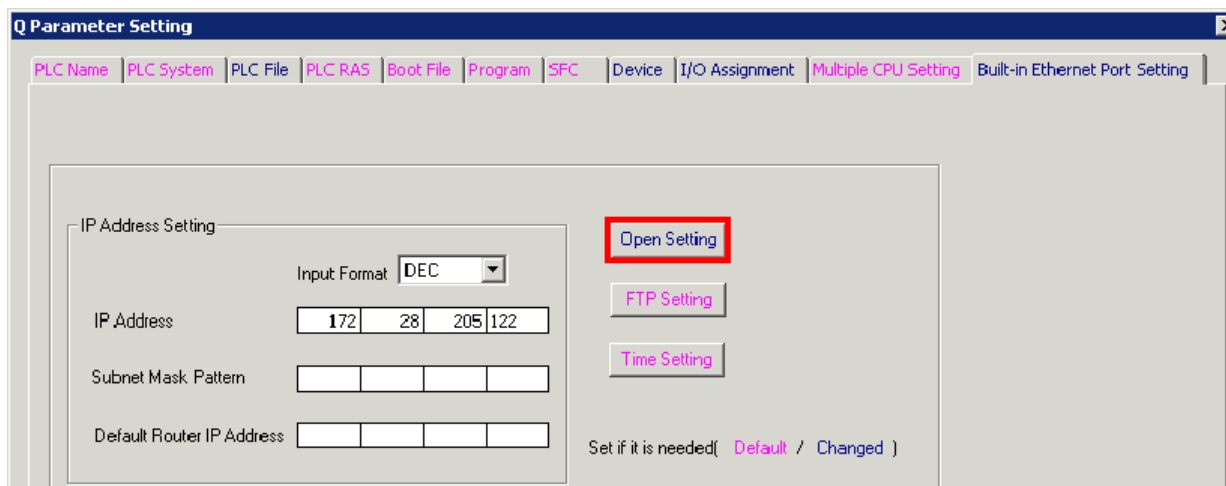
- You would like to read the rotational speed information from register D1000 of the controller. This register has the WORD register type, and a possible value range 0-10,000, which should in turn be transformed to the 0-3000 RPM signal range.
- In addition, the Schaeffler SmartCheck or ProLink device must write the alarm status of the basic configuration and the alarm status and value of the ISO characteristic value into the Mitsubishi controller registers. This writing process must begin in register D1200.

8.7.2.5.1 Mitsubishi GX Works2 software

Step 1: create communication settings in the controller

First set all the parameters required for communication with the Schaeffler SmartCheck or ProLink device:

1. Start the **GX Works2** software.
2. Click on **Project > Open**.
3. Open the project that contains the program for your controller.
4. In the navigation window, double-click on **Parameter > PLC Parameter**.



5. In the **Built-in Ethernet Port Setting** tab, click on **Open Setting**.

Built-in Ethernet Port Open Setting

IP Address/Port No. Input Format: DEC

	Protocol	Open System	TCP Connection	Host Station Port No.	Destination IP Address	Destination Port No.
1	UDP	MELSOFT Connection				
2	TCP	MELSOFT Connection				
3	TCP	MELSOFT Connection				
4	TCP	MELSOFT Connection				
5	TCP	MELSOFT Connection				
6	TCP	MELSOFT Connection				
7	TCP	MELSOFT Connection				
8	TCP	MELSOFT Connection				
9	TCP	MELSOFT Connection				
10	TCP	MELSOFT Connection				
11	TCP	MELSOFT Connection				
12	TCP	MELSOFT Connection				
13	TCP	MELSOFT Connection				
14	TCP	MELSOFT Connection				
15	TCP	MELSOFT Connection				
16	TCP	MC Protocol		1280		

(*) IP Address and Port No. will be displayed by the selected format.
Please enter the value according to the selected number.

End Cancel

6. Enter the following settings:

Protocol TCP

Open System MC Protocol

Host Station Port No. decimal: 1280 (corresponds to hexadecimal: 0500)

7. Click on **End** to accept the settings.

Q Parameter Setting

PLC Name | PLC System | PLC File | PLC RAS | Boot File | Program | SFC | Device | I/O Assignment | **Multiple CPU Setting** | Built-in Ethernet Port Setting

IP Address Setting

Input Format: DEC

IP Address: 172 28 205 122

Subnet Mask Pattern:

Default Router IP Address:

Open Setting

FTP Setting

Time Setting

Set if it is needed(Default / Changed)

Communication Data Code

☒ Binary Code

☐ ASCII Code

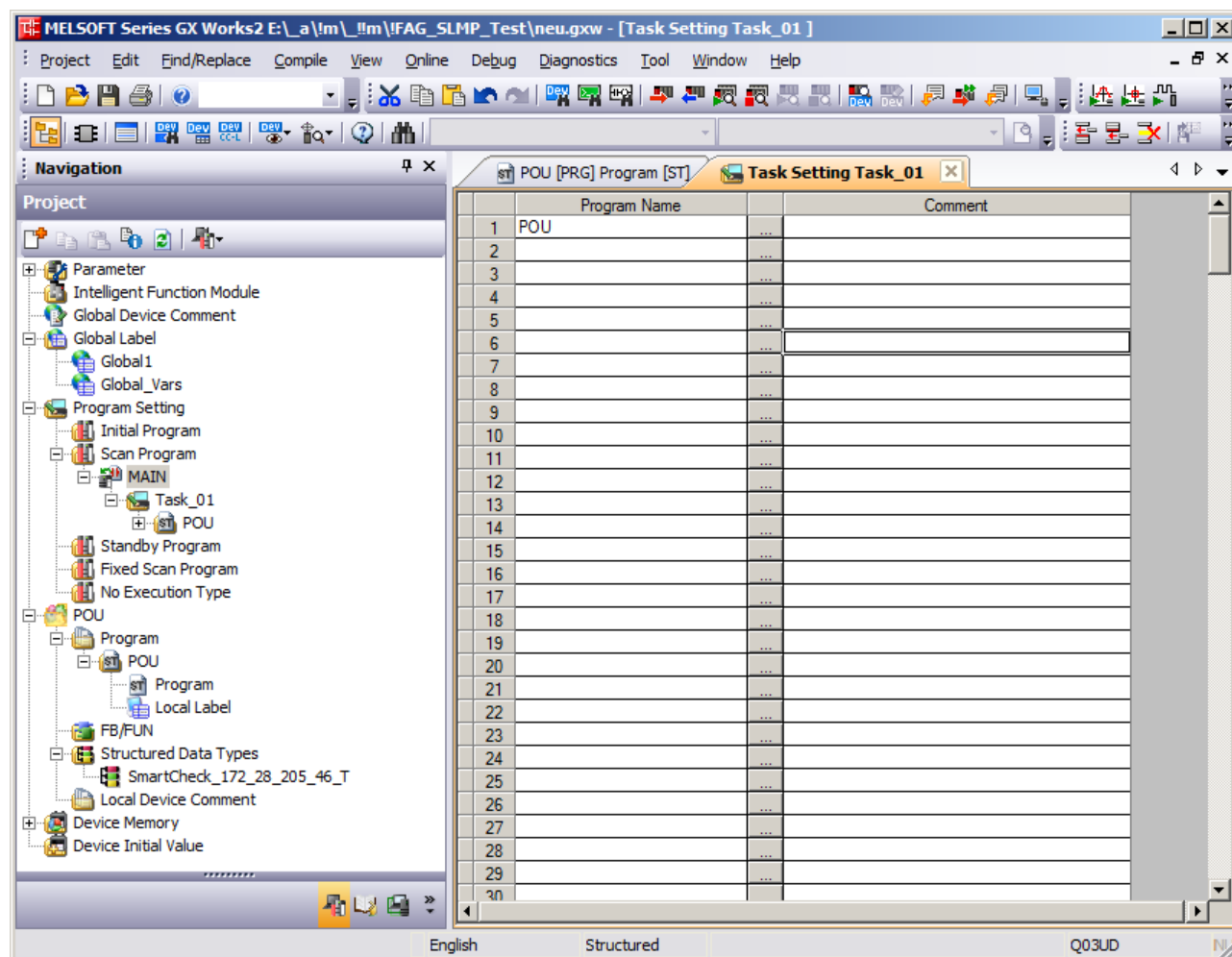
☒ Enable online change (FTP, MC Protocol)

☐ Disable direct connection to MELSOFT

☐ Do not respond to search for CPU (Built-in Ethernet port) on network

Print Window... | Print Window Preview | Acknowledge XY Assignment | Default | Check | End | Cancel

8. Under **Communication Data Code**, set the **Binary Code** transfer mode.
9. Activate **Enable online change (FTP, MC Protocol)** so that the Schaeffler SmartCheck or ProLink data can be written into the controller.
10. Click on **End**.
11. Integrate the program into the Task.



12. Compile the program by selecting **Compile > Rebuild All** in the menu.

13. Transfer the program to the controller.

14. Restart the controller.

Continue configuring the controller in the Schaeffler SmartWeb software.

Step 2: Create the controller in the Schaeffler SmartWeb software

Under **Communication channels**, click on **Add** to open the wizard. The wizard will guide you through the creation of the communication channel in two steps:

- In the first step, select the controller for which you want to create the communication channel.
- In the second step, enter the following details about the controller:

Edit communication channel

Schaeffler SmartWeb

<div>Steps</div> <div> 1: Select communication channel type 2: Configure Mitsubishi Controller (SLMP) </div> <div>Description</div> <div> Configure the settings for the Mitsubishi Controller here. Please enter the server name and port, and the protocol details. </div>	<div>Step: Configure Mitsubishi Controller (SLMP)</div> <div> <div>Name : <input type="text" value="PLC_018"/></div> <div>IP address : <input type="text" value="172.28.205.122"/></div> <div>Port : <input type="text" value="1280"/></div> <div> <input type="checkbox"/> Station forwarding </div> <div>Protocol : <input type="text" value="TCP"/></div> <div>Transfer mode : <input type="text" value="Binary"/></div> <div> <div>Connection test</div> <div></div> </div> </div> <div> <input type="checkbox"/> Expert settings </div> <div> <div>Back</div> <div>Next</div> <div>Finish</div> <div>Cancel</div> </div>
---	---

Name PLC_018

IP address 172.28.205.122

Port decimal: 1280 (corresponds to hexadecimal: 0500)

Protocol TCP

Transfer mode Binary

For further information on how to create a controller, please refer to the section **Adding/editing a controller**.



You can click on the **Connection test** button to verify your entries: if the area next to it turns green your information is correct.

Step 3: Create inputs for the controller in the SmartWeb software

Under **Inputs for communication channel: PLC_018**, click on **Add** and enter the following settings in the **Add input** window:

Edit input

Schaeffler SmartWeb

Name : Velocity from PLC_018

Start register : D1000 ?

Register type : WORD ?

Unit group : Frequency/speed Unit : RPM ?

Polling interval : 1 s ?

Signal value :
 Max. [RPM] : 163,837
 Scaling : 16.38
 Min. [RPM] : 0.0

RPM

Min. register value : 0.0 Max. register value : 10,000

OK Cancel

Name	Speed from PLC_018
Start register	D1000
Register type	WORD
Unit group	Frequency/speed
Unit	RPM
Register value	Change the value for Max to 10,000.
Signal value	For Min , enter the value 0 and for Max , enter the value 3000 .

For more information on how to create an input for the controller, refer to the section **Adding/editing inputs for controllers** ¹²⁴.



- If you have created inputs in the Schaeffler SmartWeb software, you can use the **live view** ⁵⁵ to check whether data is being received by the Schaeffler SmartCheck or ProLink device.
- This input can be used exactly like an internal input for measuring jobs

Step 4: Create outputs for the controller in the SmartWeb software

Under **Outputs for communication channel: PLC_018**, click on **Create** and enter the following settings in the first step of the wizard:

Edit outputs

Schaeffler SmartWeb

Steps

1: Select registers and characteristic values
2: Specify register names

Step: Select registers and characteristic values

Start register :
D1200

End register :
D1207

Update interval :
60 s

Characteristic value selection :

Available characteristic values	Alarm status	Value	Alarm limits
<input checked="" type="checkbox"/> Default configuration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> System temperature sensor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> RMS broad band - Demodulation (Overall status)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> RMS broad band - Acceleration (Overall status)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Crest factor - Acceleration (Impulses)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> ISO10816-1 (10Hz - 1kHz) - Velocity	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Peak2peak - Acceleration (High vibration values)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Periodic value - Demodulation (recurring anomalies)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Periodic value - Acceleration (recurring anomalies)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Temperature	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

☐ Expert settings

Back

Next

Finish

Cancel

Start register

D1200

Update interval

This is where you specify how often the alarm statuses and/or values are to be transferred to the controller.

Available characteristic values

Select the alarm status for the **base configuration** characteristic value and both the alarm status and value for the **ISO 10816-1** characteristic value. To do this, click on the box next to the characteristic value.

In the second step of the wizard, you can, if necessary, adjust the **Register names** that have been assigned automatically. For more information about how to create a configuration with outputs for the controller, refer to the section **Adding/editing outputs for controllers** ¹²⁶.

Step 5: Save the configuration file with outputs for the controller in the SmartWeb software

1. In the **Communication channels** area, click on the desired **Controller** (for example: PLC_018).
2. Click on **Download** to download the configuration file with outputs for the controller.
3. Open the configuration file:

Schaeffler SmartWeb

Connected to : SmartCheck 36
Logged in as : admin

File Edit Measurement data Go to Help

Configuration

Name

- Configuration
 - Input configurations
 - Measurement jobs
 - Output configurations
 - Measurement trigger
 - Measurement condition
 - Communication channels
 - Email
 - OPC UA server
 - PLC_018
 - Device
 - Bearings
 - Bearing manufacturer

Actions

Create new measurement job

Areas

Status

Measurement data

Live view

Configuration

User management

Log out

Complete

Communication channels

Name : PLC_018

Device type : Mitsubishi controller
IP address : 172.28.205.122
Port : 1280
Protocol : TCP
Transfer mode : Binary

Network number : -
Station number : -
Register with version number : D1200
Configuration version : 5

Changed : 2019-12-17 12:23:04
Created : 2019-12-17 10:27:19
Changed by : admin

Inputs for communication channel : PLC_018

Name	Start register	Reg. t...	Polling interval	Min. sign
Velocity from PLC_018	D1000	WORD	1.0 s	0.0

Outputs for communication channel : PLC_018

Register	Register name	Measurement job	Char
D1201	s_communication_status		Comm
D1202	a_device_status	Device alarm status	Devic
D1203	a_crest_factor_acceleration_imp	Default configuration	Crest
D1204	c_crest_factor_acceleration_imp	Default configuration	Crest
D1206	a_iso10816_1_10hz_1khz_velocity	Default configuration	ISO1

```
(*SOFTCONTROL:
VERSION:7.04.01*)
TYPE
SmartCheck_10_179_8_82_T:
STRUCT
config_version: INT:=1;
s_kommunikationsstatus: INT:=0;
a_geratestatus: INT:=0;
a_basiskonfiguration: INT:=0;
END_STRUCT;
END_TYPE
VAR_GLOBAL
SmartCheck_10_179_8_82 AT
@%MW0.1000,%MW0.1001,%MW0.1002,%MW0.1003:
SmartCheck_10_179_8_82_T;
END_VAR

PROGRAM POU
(**)
(**)
VAR_EXTERNAL
SmartCheck_10_179_8_82: SmartCheck_10_179_8_82_T;
END_VAR
ST
BODY
MOV( SM402, 1, SmartCheck_10_179_8_82.config_version);
END_BODY
END_PROGRAM

CONFIGURATION scConfiguration
```

- Select the contents of the new window with **CTRL+A**, copy them to the clipboard with **CTRL+C** and insert them into an editor (e.g. Microsoft Editor) with **CTRL+V**.
- Save the file with any name and the extension **.ASC** (Example: Device_config_01.asc).



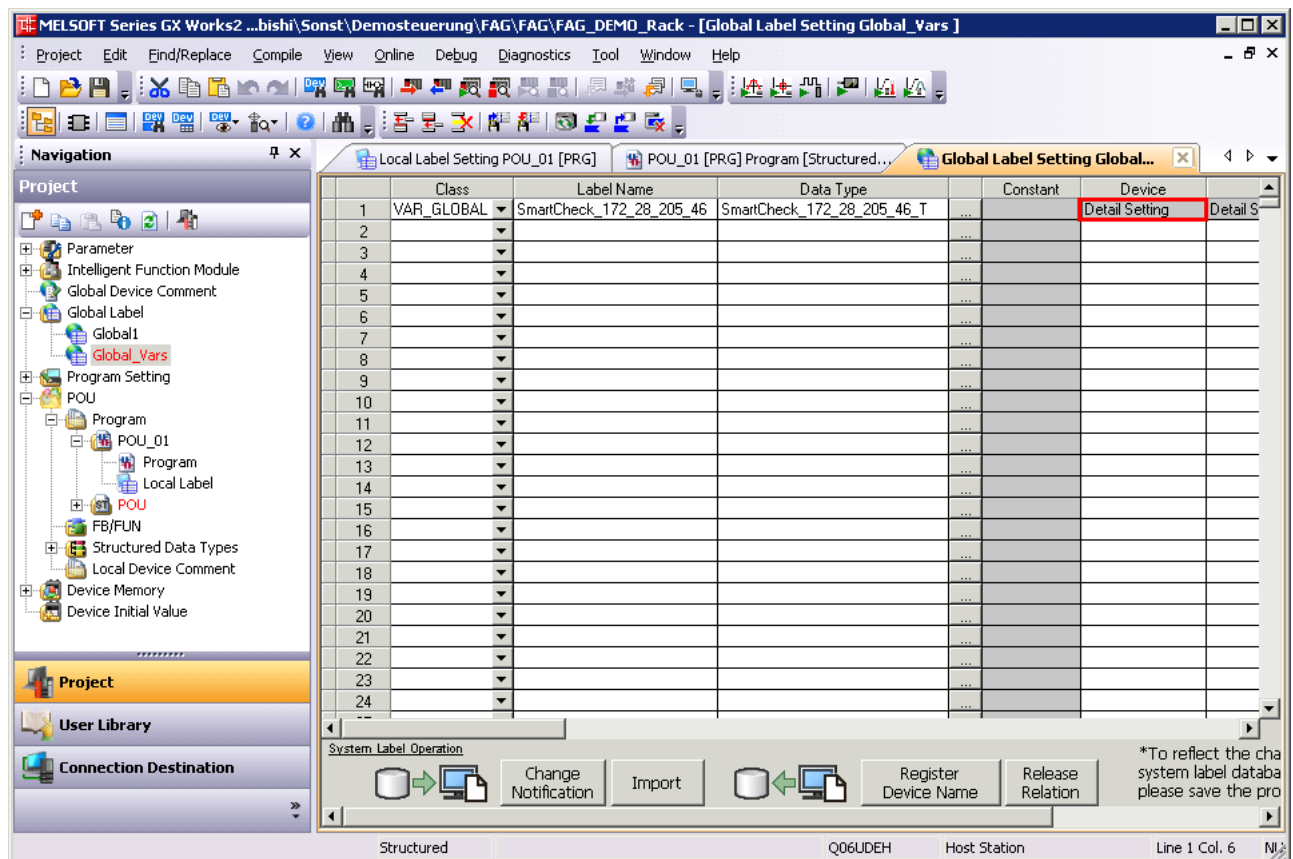
- If you use the Mozilla Firefox browser, you can save the file directly as an ASCII file with the **Save as** function.
- Please make sure that the file has the extension **.ASC** so that it can be read by the GX Works2 software.

Step 6: Read the configuration file into GX Works2

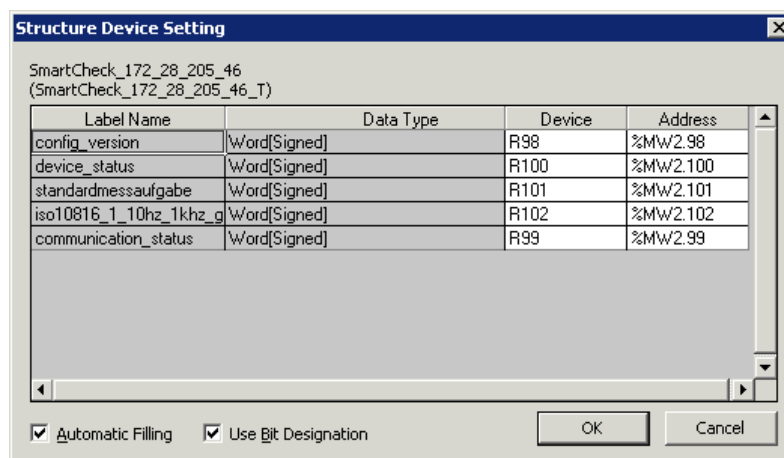


Please create a backup copy of the existing project before importing the Schaeffler SmartCheck or ProLink configuration file.

- Click on **Project > Open Other Data > Read ASC Format File**.
- Select the ASCII file (**.ASC**) you have just created and click on **OK**.
- The Schaeffler SmartCheck or ProLink configuration file is imported and inserted into the tree as a new **Global Label** with the designation **Global_Vars**.



The characteristic values along with the associated registers are displayed if you click in the **Device** column on **Detail Setting**:



Step 7: compile the program and transfer it to the controller

1. Compile the program by selecting **Compile > Rebuild All** in the menu.
2. Save the program and transfer it to the controller.

8.7.2.5.2 Mitsubishi GX IEC Developer software

Step 1: create communication settings in the controller

First set all the parameters required for communication with the Schaeffler SmartCheck or ProLink device:

1. Start the **GX IEC Developer** software.
2. Click on **Project > Open**.
3. Open the project into which the Schaeffler SmartCheck or ProLink configuration file is to be imported.

4. In the navigation window, double-click on **Parameter > PLC Parameter**.

Q parameter setting

PLC name | PLC system | PLC file | **PLC RAS** | Device | Program | Boot file | **SFC** | **I/O assignment** | Built-in Ethernet port

IP address: 172.28.205.122
 Input format: DEC
 Subnet mask pattern:
 Default router IP address:
 Set if it is needed(Default / Changed)

Open settings
 FTP settings
 Time settings

5. In the **Built-in Ethernet port** tab, click on **Open settings**.

Built-in Ethernet Port Open Setting

IP Address/Port No. Input Format: DEC

	Protocol	Open System	TCP Connection	Host Station Port No.	Destination IP Address	Destination Port No.
1	UDP	MELSOFT Connection				
2	TCP	MELSOFT Connection				
3	TCP	MELSOFT Connection				
4	TCP	MELSOFT Connection				
5	TCP	MELSOFT Connection				
6	TCP	MELSOFT Connection				
7	TCP	MELSOFT Connection				
8	TCP	MELSOFT Connection				
9	TCP	MELSOFT Connection				
10	TCP	MELSOFT Connection				
11	TCP	MELSOFT Connection				
12	TCP	MELSOFT Connection				
13	TCP	MELSOFT Connection				
14	TCP	MELSOFT Connection				
15	TCP	MELSOFT Connection				
16	TCP	MC Protocol		1280		

(*) IP Address and Port No. will be displayed by the selected format.
 Please enter the value according to the selected number.

End Cancel

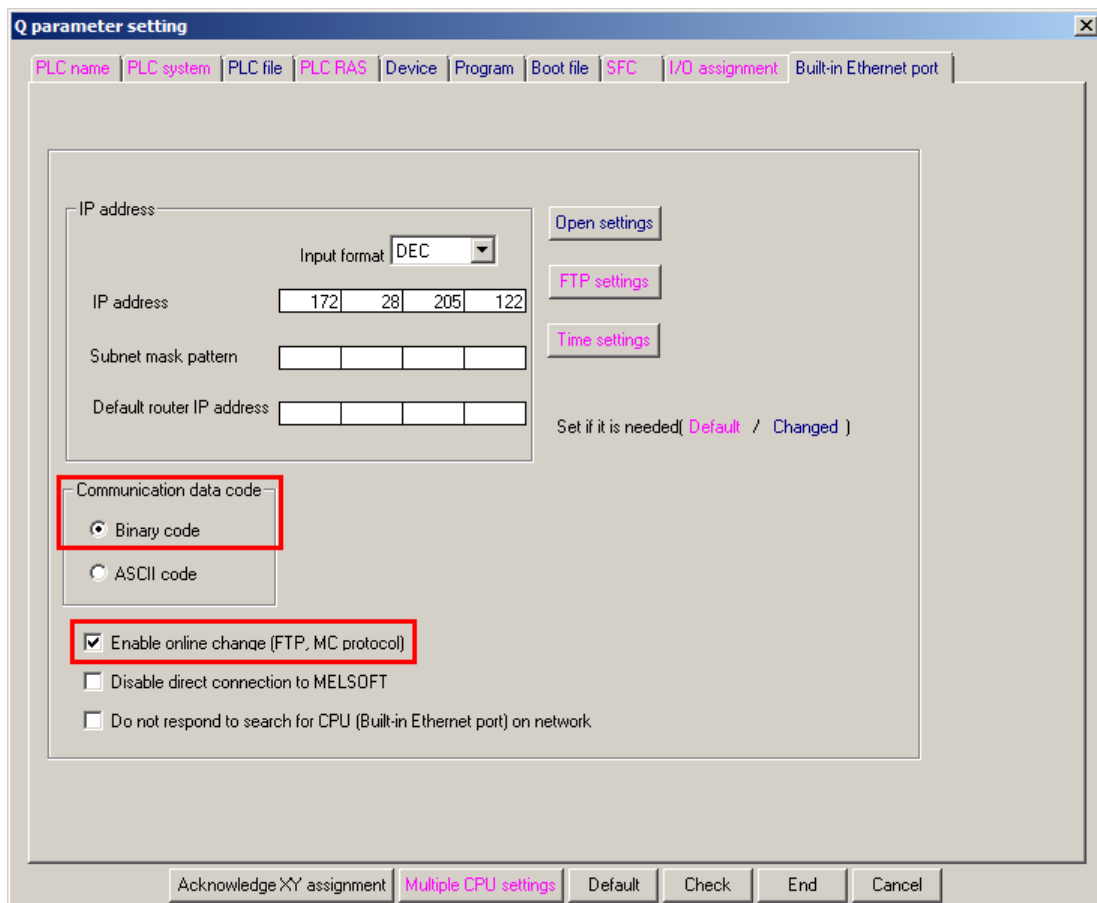
6. Enter the following settings:

Protocol TCP

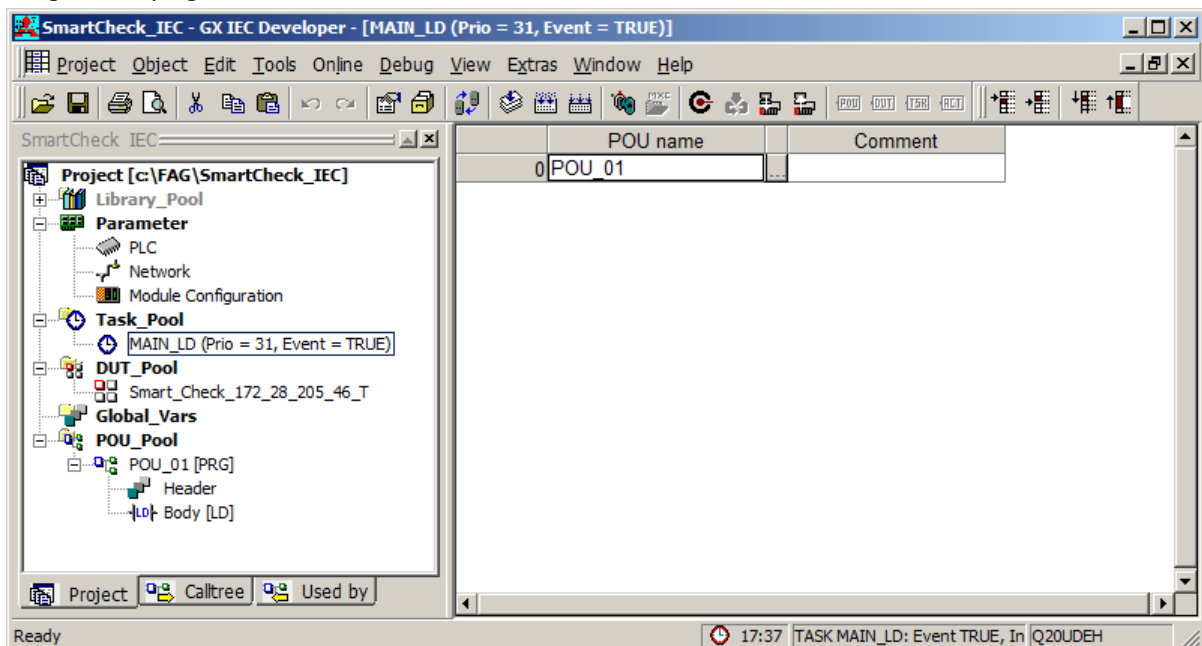
Open System MC Protocol

Host Station Port No. decimal: 1280

7. Click on **End** to accept the settings.



8. Under **Communication Data Code**, set the **Binary Code** transfer mode.
9. Activate **Enable online change (FTP, MC Protocol)** so that the Schaeffler SmartCheck or ProLink data can be written in the controller.
10. Click on **End**.
11. Integrate the program into the Task.



12. Compile the program by selecting **Compile > Rebuild All** in the menu.
 13. Transfer the program to the controller.
 14. Restart the controller.
- Continue configuring the controller in the Schaeffler SmartWeb software.

Step 2: Create the controller in the Schaeffler SmartWeb software

Under **Communication channels**, click on **Add** to open the wizard. The wizard will guide you through the creation of the communication channel in two steps:

- In the first step, select the controller for which you want to create the communication channel.
- In the second step, enter the following details about the controller:

The screenshot shows the 'Edit communication channel' wizard in the Schaeffler SmartWeb software. The title bar says 'Edit communication channel'. Below it, the software name 'Schaeffler SmartWeb' is displayed. The wizard is divided into two main sections: 'Steps' and 'Description'. The 'Steps' section shows two steps: '1: Select communication channel type' and '2: Configure Mitsubishi Controller (SLMP)'. The 'Description' section provides instructions: 'Configure the settings for the Mitsubishi Controller here. Please enter the server name and port, and the protocol details.' The main configuration area is titled 'Step: Configure Mitsubishi Controller (SLMP)'. It contains several input fields: 'Name' (PLC_018), 'IP address' (172.28.205.122), 'Port' (1280), a checkbox for 'Station forwarding', 'Protocol' (TCP), and 'Transfer mode' (Binary). There is a 'Connection test' button and a green status indicator. At the bottom, there is an 'Expert settings' checkbox and four buttons: 'Back', 'Next', 'Finish', and 'Cancel'.

Name	PLC_018
IP address	172.28.205.122
Port	decimal: 1280 (corresponds to hexadecimal: 0500)
Protocol	TCP
Transfer mode	Binary

For further information on how to create a controller, please refer to the section **Adding/editing a controller** .



You can click on the **Connection test** button to verify your entries: if the area next to it turns green your information is correct.

Step 3: Create inputs for the controller in the SmartWeb software

Under **Inputs for communication channel: PLC_018**, click on **Add** and enter the following settings in the **Add input** window:

Edit input

Schaeffler SmartWeb

Name : Velocity from PLC_018

Start register : D1000 ?

Register type : WORD ?

Unit group : Frequency/speed Unit : RPM ?

Polling interval : 1 s ?

Signal value :
 Max. [RPM] : 163,837
 Scaling : 16.38
 Min. [RPM] : 0.0

RPM

Min. register value : 0.0 Max. register value : 10,000

OK Cancel

Name	Speed from PLC_018
Start register	D1000
Register type	WORD
Unit group	Frequency/speed
Unit	RPM
Register value	Change the value for Max to 10,000.
Signal value	For Min , enter the value 0 and for Max , enter the value 3000 .

For more information on how to create an input for the controller, refer to the section **Adding/editing inputs for controllers** ¹²⁴.



- If you have created inputs in the Schaeffler SmartWeb software, you can use the **live view** ⁵⁵ to check whether data is being received by the Schaeffler SmartCheck or ProLink device.
- This input can be used exactly like an internal input for measuring jobs

Step 4: Create outputs for the controller in the SmartWeb software

Under **Outputs for communication channel: PLC_018**, click on **Create** and enter the following settings in the first step of the wizard:

Edit outputs

Schaeffler SmartWeb

Steps

1: Select registers and characteristic values
2: Specify register names

Step: Select registers and characteristic values

Start register :
D1200

End register :
D1207

Update interval :
60 s

Characteristic value selection :

Available characteristic values	Alarm status	Value	Alarm limits
<input checked="" type="checkbox"/> Default configuration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> System temperature sensor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> RMS broad band - Demodulation (Overall status)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> RMS broad band - Acceleration (Overall status)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Crest factor - Acceleration (Impulses)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> ISO10816-1 (10Hz - 1kHz) - Velocity	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Peak2peak - Acceleration (High vibration values)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Periodic value - Demodulation (recurring anomalies)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Periodic value - Acceleration (recurring anomalies)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Temperature	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

☐ Expert settings

Back

Next

Finish

Cancel

Start register

D1200

Update interval




This is where you specify how often the alarm statuses and/or values are to be transferred to the controller.

Available characteristic values

Select the alarm status for the **base configuration** characteristic value and both the alarm status and value for the **ISO 10816-1** characteristic value. To do this, click on the box next to the characteristic value.

In the second step of the wizard, you can, if necessary, adjust the **Register names** that have been assigned automatically. For more information about how to create a configuration with outputs for the controller, refer to the section **Adding/editing outputs for controllers** ¹²⁶.

Step 5: Save the configuration file with outputs for the controller in the SmartWeb software

1. In the  **Communication channels** area, click on the desired  **Controller** (for example: PLC_018).
2. Click on  **Download** to download the configuration file with outputs for the controller.
3. Open the configuration file:

Schaeffler SmartWeb

Connected to : SmartCheck 36
Logged in as : admin

File Edit Measurement data Go to Help

Configuration

Name

- Configuration
 - Input configurations
 - Measurement jobs
 - Output configurations
 - Measurement trigger
 - Measurement condi...
 - Communication chan...
 - Email
 - OPC UA server
 - PLC_018
 - Device
 - Bearings
 - Bearing manufacturer
- Actions
 - Create new measurement job
 - Areas
 - Status
 - Measurement data
 - Live view
 - Configuration
 - User management
 - Log out
- Complete

Communication channels

Name : PLC_018

Device type : Mitsubishi controller
IP address : 172.28.205.122
Port : 1280
Protocol : TCP
Transfer mode : Binary

Network number : -
Station number : -
Register with version number : D1200
Configuration version : 5

Changed : 2019-12-17 12:23:04
Created : 2019-12-17 10:27:19
Changed by : admin

Inputs for communication channel : PLC_018

Name	Start register	Reg. t...	Polling interval	Min. sign
Velocity from PLC_018	D1000	WORD	1.0 s	0.0

Outputs for communication channel : PLC_018

Register	Register name	Measurement job	Char
D1201	s_communication_status		Comr
D1202	a_device_status	Device alarm status	Devic
D1203	a_crest_factor_acceleration_imp	Default configuration	Crest
D1204	c_crest_factor_acceleration_imp	Default configuration	Crest
D1206	a_iso10816_1_10hz_1khz_velocity	Default configuration	ISO1

Download icon (red box) points to the download button in the top right corner of the communication channel configuration window.

```
(*SOFTCONTROL:
VERSION:7.04.01*)
TYPE
SmartCheck_10_179_8_82_T:
STRUCT
config_version: INT:=1;
s_kommunikationsstatus: INT:=0;
a_geratestatus: INT:=0;
a_basiskonfiguration: INT:=0;
END_STRUCT;
END_TYPE
VAR_GLOBAL
SmartCheck_10_179_8_82 AT
@%MW0.1000,%MW0.1001,%MW0.1002,%MW0.1003:
SmartCheck_10_179_8_82_T;
END_VAR

PROGRAM POU
(**)
(**)
VAR_EXTERNAL
SmartCheck_10_179_8_82: SmartCheck_10_179_8_82_T;
END_VAR
ST
BODY
MOV( SM402, 1, SmartCheck_10_179_8_82.config_version);
END_BODY
END_PROGRAM

CONFIGURATION scConfiguration
```

- Select the contents of the new window with **CTRL+A**, copy them to the clipboard with **CTRL+C** and insert them into an editor (e.g. Microsoft Editor) with **CTRL+V**.
- Save the file with any name and the extension **.ASC** (Example: Device_config_01.asc).



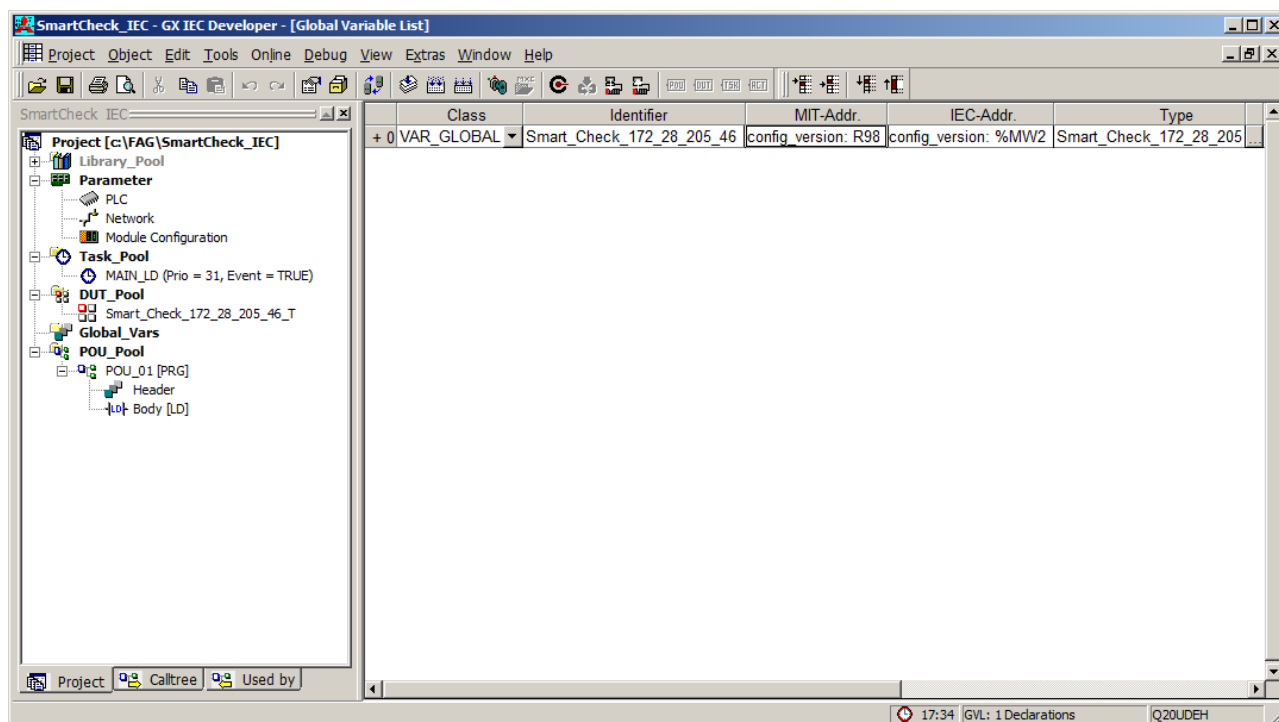
- If you use the Mozilla Firefox browser, you can save the file directly as an ASCII file with the **Save as** function.
- Please make sure that the file has the extension **.ASC** so that it can be read by the GX Works2 software.

Step 6: Read the configuration file into GX Works2

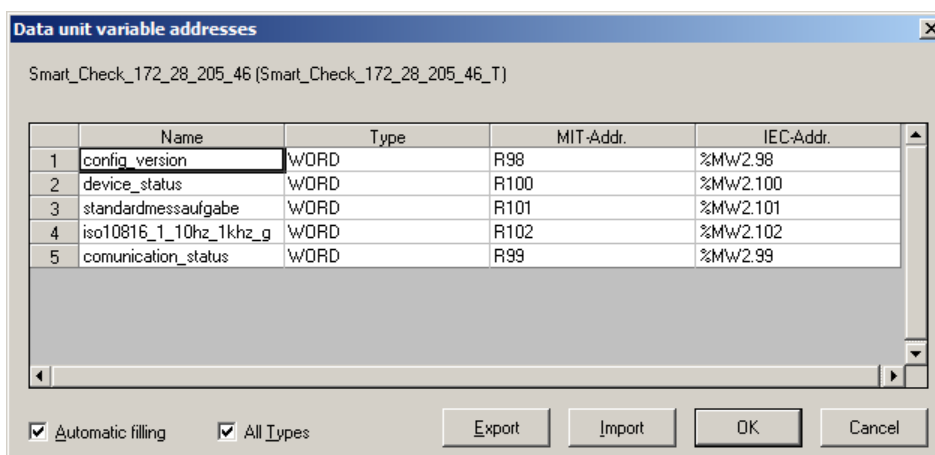


Please create a backup copy of the existing project before importing the Schaeffler SmartCheck or ProLink configuration file.

- Click on **Project > Open Other Data > Read ASC Format File**.
- Select the ASCII file (**.ASC**) you have just created and click on **OK**.
- The Schaeffler SmartCheck or ProLink configuration file is imported and inserted into the tree as a new **Global Label** with the designation **Global_Vars**.



The characteristic values along with the associated registers are displayed if you click in the **Device** column on **Detail Setting**:



Step 7: compile the program and transfer it to the controller

1. Compile the program by selecting **Compile > Rebuild All** in the menu.
2. Save the program and transfer it to the controller.

8.7.3 Communication channel for OPC UA server

OPC UA is a standard that enables devices to communicate and exchange data. In the **OPC Communication channels (OPC UA server)** ¹⁴⁶⁾ area you can configure the Schaeffler SmartCheck or ProLink device as an OPC UA server. The characteristic values of the device can then be read out by other controllers. You can also integrate process parameters of other controllers into the SmartCheck or ProLink device via OPC UA server inputs. In order to avail of this potential, the following steps must be taken:

- You must first add the OPC UA server as a communication channel ¹⁴⁷⁾. In doing so you essentially define the server port and any authentication data.
- If you want to read data from other controllers via the OPC UA server, you must create one or more inputs for the OPC UA server ¹⁴⁸⁾ for this purpose. For this type of input, you can determine how often the data is read from the controller registers, as well as the value range. You also specify the signal unit and signal value range to which the register data is to be converted.

- You can create as many inputs for the OPC UA server as you wish and use them in the SmartWeb software in exactly the same way as you use the inputs found in the Input configuration [61](#) area. In particular, inputs are available for the server in relation to measurement jobs [76](#), measurement conditions [105](#) and measurement triggers [102](#).
- Use an OPC UA client to check which data is available via the OPC UA server. You can then download the values in a readable format from the OPC UA server.

8.7.3.1 Communication channel area for the OPC UA server

In the **Communication channels** area, the expanded overview on the left shows the OPC UA server that you have created for the Schaeffler SmartCheck or ProLink device. In the right-hand main panel, you will find basic details about the OPC UA server as well as information on its inputs, if these have been created:

The screenshot shows the Schaeffler SmartWeb interface. The top bar indicates 'Connected to : SmartCheck 36' and 'Logged in as : admin'. The left sidebar contains a 'Configuration' menu with options like 'Input configurations', 'Measurement jobs', 'Output configurations', 'Measurement trigger', 'Measurement condi...', 'Communication chan...', 'Email', 'OPC UA server', 'PLC_018', 'Device', 'Bearings', and 'Bearing manufacturer'. The main panel is titled 'Communication channels' and displays details for the 'OPC UA server'. The details include 'Name : OPC UA server', 'Server port : 4840', 'User name : -', and 'Password : -'. There are buttons for 'Edit', 'Delete', and 'Add'. Below this, there is a section for 'Inputs for communication channel : OPC UA server' which contains a table with the following data:

Name	Min. signal	Max. signal	Unit	Min. reg. value	Max. reg. value	Polling interval
Speed input	-10.0	10.0	[kHz]	-10.0	10.0	1.0

At the bottom of the inputs section, there are buttons for 'Edit', 'Delete', and 'Add'.

Click on an OPC UA server to access the following information and functions in the main panel:






Communication channels

Here you can find the basic information and functions for the OPC UA server:



- Alongside the **Name**, you will see the **Server port** used.
- If authentication is activated for the OPC UA server, you will also see the **User name** and **Password** details.
- Click on **Add** to add an OPC UA server. For details, please refer to **Adding/editing an OPC UA server** [147](#).
- Click on **Edit** to edit the OPC UA server. For details, please refer to **Adding/editing an OPC UA server** [148](#).
- You can delete the OPC UA server communication channel. To do so, click **Delete** and confirm with **OK**.
- In the top right corner, click on to open the Configuration overview [58](#).

Inputs for communication channel

This table provides an overview of the inputs that you have created for the OPC UA server. The following information and functions are to be found here:

- The table contains information on the relevant inputs in addition to the **Name**, e.g. the signal value range into which the data is translated (**Min. Signal** to **Max. Signal**), the register value range it covers (**Min. reg. value** to **Max. reg. value**), and at which interval the value is queried.
- Click on **Edit**  to edit the input. For details, please refer to **Adding/editing an OPC UA server input** .
- Click on **Add**  to add further inputs. For details, please refer to **Adding/editing an OPC UA server input** .
- You can delete the selected input. To do so, click **Delete**  and confirm with **OK**.




An input that you have linked to a measurement job  cannot be deleted. In this case, the **Delete**  button is deactivated. To delete this external device, you must first delete the measuring job in which it is used.

8.7.3.2 Adding/editing an OPC UA server


To use the Schaeffler SmartCheck or ProLink device as an OPC UA server, you must create the corresponding communication channel.

How to create the communication channel for the OPC UA server

1. Under **Communication channels**, click on **Add**  to open the wizard. The wizard will guide you through the process of creating the communication channel in two steps.
2. In the first step, select the **OPC UA server** communication channel type.
3. Click on **Next** to move to the second step. You must enter the required details for the OPC UA server here:

Add communication channel

Schaeffler SmartWeb

<div>Steps</div> <div> 1: Select communication channel type 2: Configure OPC UA server </div>	<div>Step: Configure OPC UA server</div> <div> Server port : <input type="text" value="4840"/>  </div> <div> <input type="checkbox"/> Activate authentication </div> <div> User name : <input type="text"/> </div> <div> Password : <input type="password"/> </div> <div> <input type="checkbox"/> Show password </div>
<div>Description</div> <div> Configure the settings for the OPC UA server here. Please enter the OPC UA server port and authentication data. </div>	

☒ Expert settings

Back
Next
Finish
Cancel

You have the following options:

Server port

Enter the TCP port of the server on the SmartCheck or ProLink device.



The OPC UA standard specifies the value **4840** for the server port. Do not change this value unless you possess expert knowledge.

Activate authentication

Activate this option if you want to regulate the readout of the device data. If this option is activated, you can specify the **User name** and **Password** that must be entered for authentication before using the SmartCheck or ProLink device for OPC UA communication. Select **Show password** to make the password visible while you enter it.

Node IDs for Int32 data type – Siemens S7-compatible

Visible only when **Expert settings** are activated:

Activate this option for controllers that can only process node IDs of the Int32 data type. This is the case for controllers in the Siemens S7 family, among others. If this option is activated, the server generates node IDs up to a maximum value of 2147483647.


If this option is deactivated, the server generates node IDs up to a maximum value of 4294967295 – as permitted by the OPCUA specification.



If you change this option, all node IDs are recreated. You will then also have to update the node IDs in your controller.

4. Click **Finish** to save the communication channel for the OPC UA server.


How to edit the communication channel for the OPC UA server

1. Select the OPC UA server in the expanded overview on the left.
2. Under **Communication channels** in the main panel, click on **Edit** . Make the required entries in the respective steps of the wizard.
3. Click on **Finish** to apply your changes.

8.7.3.3 Adding/editing an OPC UA server input

The Schaeffler SmartCheck or ProLink device receives information about process parameters in other controllers via OPC UA server inputs.

How to create an input for the OPC UA server

1. Select the OPC UA server in the expanded overview on the left.
2. Under **Inputs for communication channel: OPC UA server**, click on **Add** .
3. In the **Add input** window, make the desired entries:

Add input

Schaeffler SmartWeb

Name :

Register type : ?

Unit group : Unit : ?

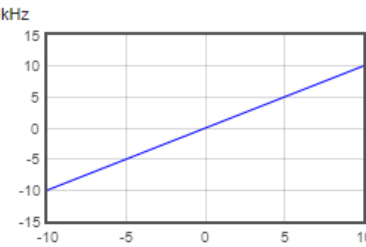
Polling interval : ?

Signal value : kHz

Max. [kHz] :

Scaling :

Min. [kHz] :



Min. register value : Max. register value :

You have the following options:

- Name** Here, specify the name that the input is to appear under in the SmartWeb software.
- Register type** This is where you specify the format in which the data is transferred. This specifies how large the maximum register value range can be.
The following format is currently supported:
FLOAT 32 bit
- Unit group and Unit** This is where you specify the physical value and measurement unit into which the value from the controller is to be converted.
- Polling interval** This is where you specify how often the value is to be queried from the controller. A long polling interval is sufficient for values that only change slowly e.g. the temperature. This can reduce the amount of data and the load on the controller.
- Register value** Initially, these fields are filled automatically as soon as you have selected a **Register type**. You then have the option of adjusting the **Min. register value** and/or **Max. register value** manually. This may be necessary if the register value range is smaller than the range that was set automatically.
- Signal value** Use these settings to determine the range within which the measurement values should lie. First enter a minimum value **Min.** Then enter a maximum value **Max** or define the factor with which the calculated signal should be scaled in the **Scaling** field. Both the diagram and the values of the respective other field are then adjusted automatically.

4. Click on **OK** to save the new input.

Speed input example:

The speed in your application is between 0 and 3000 RPM. In the register, this corresponds to the value range 0 to 10,000. In order to use this speed as an external input, your settings need to be as follows:

Register type	FLOAT
Unit group	Frequency/speed
Unit	RPM

Min. register value	0
Max. register value	10,000
Max. signal value	3000 (RPM)
Min. signal value	0 (RPM)

How to add a scaling factor to the input

You can add scaling factors to the input, which you can access e.g. when creating a measurement job⁷⁸. Using scaling factors, you can calculate logical values for other areas from the physical value measured at one area of the component.

Example: Using the input, you measure the speed in front of the gear. The speed behind the gear is 5 times smaller. You can create a scaling factor for this:

1. **Speed in front of the gear**
2. **Speed behind the gear** with a factor of 0.2 (1/5)

1. In the table, select the required input under **Inputs for communication channel: [Name]**.
2. Click on ► to expand the list of scaling factors.
3. Click on + to open the **Add scaling factor** window:

The 'Add scaling factor' dialog box contains the following fields:

- Input channel :** 21G830 - Rotational speed before gear
- Name :** Speed before gear
- Scaling factor :** 0.2
- Unit group :** Frequency/speed
- Unit :** RPM
- Buttons:** OK, Cancel

You have the following options:

- Name** The scaling factor is listed under this name, along with the other inputs. Therefore, you should choose a practical name that will enable you to distinguish between the inputs.
- Scaling factor** The physical input signal is multiplied by the value you enter here.
- Unit** Here you can change the unit of measurement for the sensor signal. By default, the unit of the corresponding input configuration is selected here.

4. Click on **OK** to save your changes. The new scaling factor is displayed in the list of scaling factors.

To delete or edit the scaling factor, right-click to open the context menu and select the corresponding command here:

The screenshot shows a table titled 'Inputs for communication channel : 21G830' with columns: Name, Start register, Reg. t..., Polling interval, Min. signal, Max. signal, Unit, Min. reg. value, Max. reg. val... The first row is 'Rotational speed bef...' with value 'R0'. Below the table is a section 'Additional scaling factors' containing a table with one row: 'Speed before gear' with a scaling factor of '0.2x' and unit 'RPM'. A right-click context menu is open over this row, showing options: Edit, Delete, and Live view. The 'Edit' and 'Delete' options are highlighted with a red box.

You can also switch to the **live view**⁵⁵ area here. There you will see in real time the signal used for the calculation of this characteristic value.



If you delete a scaling factor which is being used by a measurement job, the system gives you a warning message. If you delete the scaling factor, you also automatically delete the relevant measurement job.

How to edit an input for the OPC UA server

1. Select the OPC UA server in the expanded overview on the left.
2. In the table, under **Inputs for communication channel: OPC UA server**, select the desired input.
3. Click on **Edit** and make the desired entries in the **Edit input** window.
4. Click on **OK** to accept your changes.

8.7.4 Communication channel for PROFINET

If you have inserted a PROFINET module in the ProLink CPU, it appears automatically as a communication channel in the **Configuration** area. With the aid of this communication channel and the correspondingly programmed controller, ¹⁵² all alarm statuses of the characteristic values and the ProLink device can be read via the cyclic data. Process data can also be sent from the controller to the ProLink device via the cyclic data. To do this, you must create the process data of the ProLink device as inputs in the SmartWeb software. ¹⁵² In addition, all characteristic values and their alarm limits can be queried by the controller in the acyclic data.



The PROFINET module is not automatically detected until firmware version 2.0 or higher and is displayed as a communication channel. If it does not appear, update your firmware using the **Help > Update firmware** ¹³ function.

8.7.4.1 Communication channel for PROFINET area








In the **communication channels** area, you will find the communication channel for the PROFINET module that was detected on the ProLink device in the overview shown on the left. On the right of the main panel, you will find basic details about the PROFINET communication channel, as well as information about its inputs:

The screenshot displays the Schaeffler SmartWeb interface. The top bar shows 'Connected to: Schaeffler ProLink' and 'Logged in as: admin'. The left sidebar contains a navigation menu with options like Configuration, Measurement jobs, Output configurations, Measurement trigger, Measurement conditions, Communication channels, and PROFINET. The main panel is titled 'Communication channels' and shows a table with one entry: 'PROFINET' with status 'Idle'. Below this, there are buttons for 'Edit', 'Delete', and 'Add'. The 'Edit' button is highlighted. The 'Inputs for communication channel: PROFINET' section shows a table with columns: Name, Min. signal, Max. signal, Unit, Min. reg. value, Max. reg. value, and Polling interval. The table contains one row: 'Speed PN' with values 0.0, 100.0, Hz, 0.0, 100.0, and 1.0. Below the table, there is a section for 'Additional scaling factors' with a 'Scaling' input set to '0.2x Hz'.

Click on the PROFINET communication channel to access the following information and functions in the main panel:






Communication channels

Here you can find the basic information and functions for the selected communication channel for PROFINET:


- In addition to the **name**, **MAC** address and **firmware** version, you will find the **station names** of the ProLink device and controller, as well as details on the network configuration.
- **Status** informs you about the current status of the communication channel:
 - **Connected:**
The communication channel for PROFINET works without any problems.
 - **Deactivated:**
The communication channel for PROFINET has been deactivated via the **Edit** function .
 - **Inactive:**
The ProLink device has not yet commissioned the PROFINET module.
 - **Idle:**
The PROFINET module is not yet connected to a controller.
 - **Configuration error:**
The controller is configured incorrectly.
- Click  to download a ZIP file containing information on programming the controller. It contains the following:
 - **info.txt:**
The PROFINET module of the ProLink device functions as a DAP (device access point) and has one or two virtual sub-slots depending on the configuration. The **info.txt** file contains detailed information on which modules must be programmed and how and which cyclic and acyclic data ProLink is exchanged between the device and the controller.
 - **gsd folder:**
In this folder you will find a product image and the **gsd.xml** file which describes the ProLink interface in detail.
 - **s7 folder:**
This folder contains programming examples for reading cyclic and acyclic data.
- Click on **Edit**  to edit the PROFINET communication channel. You can then activate, deactivate or reactivate **PROFINET**.
- Click on **Add**  to add further communication channels .
- In the top right corner, click on  to open the Configuration overview .

Inputs for communication channel

Here you will find a tabular view of the inputs that you have created for the PROFINET communication channel. The following information and functions can be found here:

- The table contains information on the relevant inputs in addition to the **name**, e.g. the signal value range into which they are translated (**Min. signal** to **Max. signal**), the register value range it covers (**Min. reg. value** to **Max. reg. value**) and the **query interval**.
- Click on **Edit**  to edit the input. For details, please refer to **Adding/editing inputs for PROFINET communication channel** .
- Click on **Add**  to add further inputs. For details, please refer to **Adding/editing inputs for PROFINET communication channel** .
- You can also delete the selected input. To do so, click **Delete**  and confirm with **OK**.



- If you change the measurement tasks, the **info.txt** file is updated. You must then download the ZIP file again and adapt the controller programming .
- The ProLink device can be restarted from the controller. In addition, the controller automatically detects when the ProLink device is switched off or restarted, and it also indicates this.

8.7.4.2 Adding/editing inputs for PROFINET communication channel

Process data can be transferred from the controller to the ProLink device via inputs for the PROFINET communication channel.

How to create an input for the PROFINET communication channel

1. Select the PROFINET communication channel in the expanded overview on the left.
2. Under **Inputs for communication channel: PROFINET**, click on **Add +**.
3. In the **Add input** window, make the desired entries:

The 'Add input' window is shown with the following settings:

- Name :** Speed
- Register type :** FLOAT
- Unit group :** Frequency/speed
- Unit :** Hz
- Polling interval :** 1 s
- Signal value :** Max. [Hz] : 100
- Scaling :** 1
- Min. [Hz] :** 0
- Min. register value :** 0
- Max. register value :** 100


A graph is displayed showing a linear scaling from 0.0 to 100.0 Hz on the x-axis to 0.0 to 125.0 Hz on the y-axis.

You have the following options:

Name	Here, specify the name that the input is to appear under in the SmartWeb software.
Register type	Only the FLOAT register type is available.
Unit group and Unit	This is where you specify the physical value and measurement unit into which the value from the controller is to be converted.
Polling interval	This is where you specify how often the value is to be queried from the controller. A long polling interval is sufficient for values that only change slowly e.g. the temperature. This enables you to reduce the amount of data.
Register value	Initially, these fields are filled automatically as soon as you have selected a Register type . You then have the option of adjusting the Min. register value and/or Max. register value manually. This may be necessary if the register value range is smaller than the range that was set automatically.
Signal value	Use these settings to determine the range within which the measurement values should lie. First enter a minimum value Min. Then enter a maximum value Max or define the factor with which the calculated signal should be scaled in the Scaling field. Both the diagram and the values of the respective other field are then adjusted automatically.

4. Click on **OK** to save the new input.

How to add a scaling factor to the input

You can add scaling factors to the input, which you can access e.g. when creating a measurement job . Using scaling factors, you can calculate logical values for other areas from the physical value measured at one area of the component.

Example: Using the input, you measure the speed in front of the gear. The speed behind the gear is 5 times smaller. You can create a scaling factor for this:

1. **Speed in front of the gear**
2. **Speed behind the gear** with a factor of 0.2 (1/5)


1. In the table, select the required input under **Inputs for communication channel: [Name]**.
2. Click on ► to expand the list of scaling factors.
3. Click on + to open the **Add scaling factor** window:

You have the following options:

- Name** The scaling factor is listed under this name, along with the other inputs. Therefore, you should choose a practical name that will enable you to distinguish between the inputs.
- Scaling factor** The physical input signal is multiplied by the value you enter here.
- Unit** Here you can change the unit of measurement for the sensor signal. By default, the unit of the corresponding input configuration is selected here.

4. Click on **OK** to save your changes. The new scaling factor is displayed in the list of scaling factors.


To delete or edit the scaling factor, right-click to open the context menu and select the corresponding command here:

You can also switch to the **live view**  area here. There you will see in real time the signal used for the calculation of this characteristic value.



If you delete a scaling factor which is being used by a measurement job, the system gives you a warning message. If you delete the scaling factor, you also automatically delete the relevant measurement job.

How to edit the input of the PROFINET communication channel

1. Select the PROFINET communication channel in the expanded overview on the left.
2. Select the required input under **Inputs for communication channel: PROFINET** in the table.
3. Click on **Edit**  and make the desired entries in the **Edit input** window.
4. Click on **OK** to accept your changes.

8.7.5 Communication channel for Schaeffler Cloud

You can use the  **Communication channel (Schaeffler Cloud)** ¹⁵⁵ area to expand the possibilities of monitoring the condition of the SmartCheck or ProLink device by connecting to the Schaeffler Cloud and transferring **data** to the cloud using the SmartCheck or ProLink device.

In order to use the cloud functionality, the following steps are necessary:

- You must first **connect the Schaeffler Cloud services** ¹⁶ (cloud onboarding). The communication channel for the Schaeffler Cloud is created automatically and all necessary settings are made.
- If necessary, configure the proxy settings of the communication channel (Schaeffler Cloud) by clicking on **Edit**.



Further information on Schaeffler Cloud can be found in the Schaeffler Mediatheque.

8.8 Device

Under **Device**, you will find the **Device settings** ¹⁵⁵ and **System time settings** ¹⁵⁸. Click on the desired area to view the main settings of the SmartCheck or ProLink device. Some settings can also be changed here.

8.8.1 Device settings

Under **Device Settings**, details on the Schaeffler SmartCheck or ProLink device, the network, and the keys and the status LED on the device are listed:

Schaeffler SmartWeb

Connected to : SmartCheck 36
Logged in as : admin

File Edit Measurement data Go to Help

Configuration

Name

- Configuration
 - Input configurations
 - Measurement jobs
 - Output configurations
 - Measurement trigger
 - Measurement condi...
 - Communication chan...
- Device
 - Device settings**
 - System time setti...
 - Bearings
 - Bearing manufacturer

Device settings

Name : SmartCheck 36
Serial number : f4:3d:80:00:01:4b
MAC address : f4-3d-80-00-01-4b
Description :
Position : -

Edit

Key/LED settings

Reset alarm(s) : Allowed
Restart learning mode : Allowed
Reboot device : Allowed
Restore factory default setting : Not allowed

Status LED : Enabled

Edit

Network settings

IP address : 10.179.7.203
Netmask : 255.255.255.0
Gateway : 10.179.7.254
DNS server : 10.179.0.248
DHCP mode : DHCP client mode (load host name from server)

Edit

Actions

- Create new measurement job
- Areas
- Status
- Measurement data
- Live view
- Configuration
- User management
- Log out

Complete

You can find the following information here:

Device settings


The **name**, **serial number** and **MAC address** (network address) of the SmartCheck or ProLink device are listed here. If specified, you will also find the **description** and **position** of the device here.

Changes are possible for the entries under **Name**, **Description** and **Position**; to make changes, click on **Edit**  and enter the desired changes.

Key/LED settings

The Schaeffler SmartCheck device has two keys and one status LED. The Schaeffler ProLink device also has two keys and three LEDs.

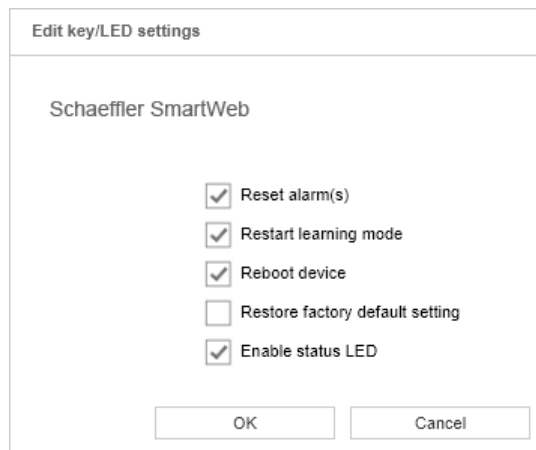
Under **Key/LED settings**, you can specify the actions permissible with the keys. In this way, you protect the SmartCheck or ProLink device against inadvertent operation. You can also specify here whether the status LED on the SmartCheck device or the alarm LED on the ProLink device is to display alarm statuses. As a rule, the following settings are possible:

Reset alarm(s)	This switches off all existing alarms.
Restart learning mode	This restarts the Learning mode  ; current measurement values and alarm limits are retained; only the process for determining new alarm limits is restarted.
Reboot device	This restarts the SmartCheck or ProLink device, i.e. the device is shut down and booted up again.
Restore factory default setting	This resets the SmartCheck or ProLink device to the factory default setting. All the settings and configurations you made are lost.
Enable status LED	<p>This option is activated by default.</p> <p>If you disable the option, it will affect your system in the following way:</p> <ul style="list-style-type: none">• ProLink device: The alarm LED signals are disabled.• SmartCheck device: The alarm signals of the status LED are disabled. It still flashes yellow and red for instance when the firmware is updating. <p>The SmartCheck or ProLink device then no longer indicates the alarm status through a red, yellow or green light.</p>

The key lock is enabled by default to prevent unintentional operation. You can find details on which key or key combination you have to press in each case in the Schaeffler SmartCheck or ProLink user documentation.

To change the key/LED settings, proceed as follows:

1. Click on **Edit** .
2. In the **Edit key/LED settings** window, define the permissible actions:



- If you deactivate a key option, the corresponding key can no longer be used for this purpose. In our example, this applies to **Restore factory default setting**.
 - If you deactivate the **Enable status LED** option, the alarm status is no longer indicated on the SmartCheck or ProLink device.
3. Click on **OK** to save your changes.

Network settings

The current settings for **DHCP**, **Host name**, **IP address**, **Gateway** and **Netmask** are listed here. To change the network settings, proceed as follows:

1. Click on **Edit** .

2. In the **Edit network settings** window, enter the desired specifications:

Edit network settings

Schaeffler SmartWeb

DHCP mode : DHCP client mode (load host name from server) ▼

IP address : 10.179.7.203

Netmask : 255.255.255.0

Gateway : 10.179.7.254

DNS server : 10.179.0.248

Host name : FagSmartCheck


OK Cancel

You have the following options:

No DHCP

With this option, you can specify the IP address or continue to use the SmartCheck or ProLink device's default IP address.

If **No DHCP** is enabled, you must also change the other settings in this step, such as **IP address**, **Netmask**, **Gateway** or **DNS server**.

The **DNS server** is required when you create an email communication channel  using either the SMTP server or the proxy server as a name and not as an IP address. In this case, the specified server name is resolved by the DNS server.

DHCP client mode

(send host name to server)

With this option, the SmartCheck or ProLink device automatically receives an IP address within your network. The host name is registered by the SmartCheck or ProLink device in the network's DNS server.

DHCP client mode

(load host name from server)

With this option, the SmartCheck or ProLink device automatically receives an IP address within your network. The host name is specified via the network's DNS server (reverse DNS).

3. Click on **OK** to save your changes.



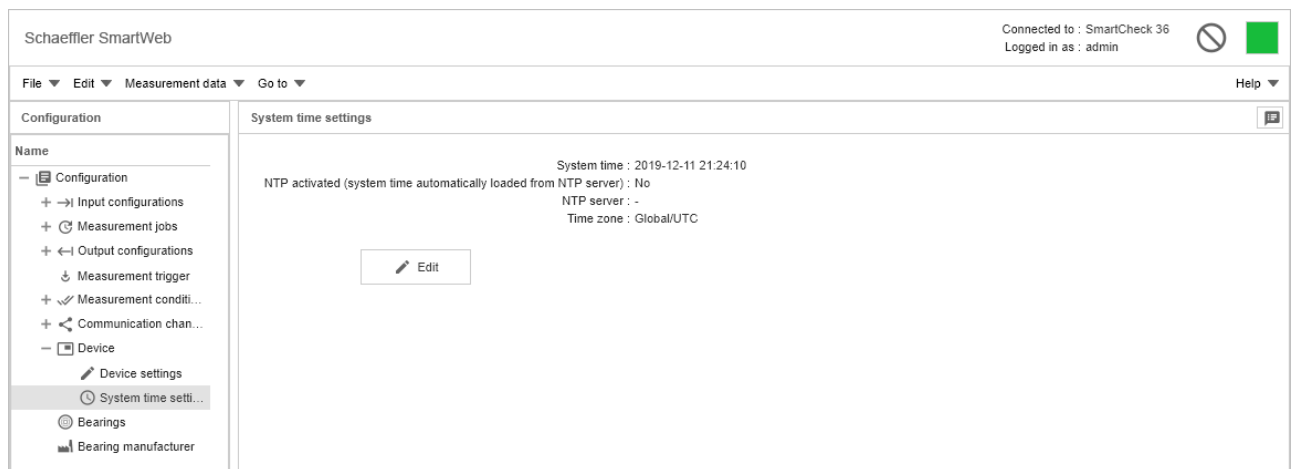
- If you change the IP address of the SmartCheck or ProLink device, you no longer have access to the SmartWeb software at the previous address. You must then enter the new address in the browser in order to load the software again.
- If the IP address is allocated automatically via DHCP, the SmartCheck or ProLink device can only be accessed via the automatically allocated IP address. You can no longer use the default IP address.

8.8.2 System time settings



- Schaeffler SmartCheck or ProLink has an internal clock, which will be operational provided that the device is supplied with power. However, as it has no buffer battery, it becomes inoperative as soon as the power supply is interrupted – unless you have connected an external battery or power supply to the battery input.
If you restore the interrupted power supply and you have selected **Set system time manually**, you should correct the system time, otherwise the internal clock will continue to run from the time of the last successful measurement before the power failure.
For information on how to connect the internal clock to an external battery, refer to the user documentation Schaeffler SmartCheck or ProLink.
- If a new SmartCheck or ProLink device does not have access to information on the current time, the time information is taken from the firmware.

Under **System time settings**, various details on the system time of SmartCheck or ProLink are listed:



The following information and functions can be found here:

System time

Here the current date and current time of the SmartCheck or ProLink device are displayed.

NTP activated

Here you can see whether the SmartCheck or ProLink device loads the system time from an NTP server, i.e. a time server in the network. If so, **Yes** will be displayed here.

NTP server

If the SmartCheck or ProLink device loads the system time from an NTP server, you will see the name of the server here.

Time zone

You can see the time zone in which the SmartCheck or ProLink device is located here.

Edit button

To change the settings for system time and NTP server, proceed as follows:


1. Click on **Edit** 
2. In the **Edit system time** window make the desired specifications:

Method

Here you can specify what the system time of the SmartCheck or ProLink device should be based on. The time setting can have the time of the connected **PC** or that of an **NTP server** as its reference. You can also enter it **manually**.

If the system time is based on an NTP server, synchronization runs constantly. For this method, therefore, the SmartCheck or ProLink device must have a permanent connection to the network, and the NTP server must always be accessible.

Date

Only in the case of **Set system time manually**: enter the current date and the current time here. You can either select the date from the list boxes or set it directly from the **calendar** .

NTP server


Only for **Use NTP server to synchronise system time**: specify the name of the NTP server here. using the IP address of the desired NTP server.

Time zone of device

Here you can select the time zone in which the SmartCheck or ProLink device is located.

- Click on **OK** to save your changes.

8.9 Bearing

Schaeffler SmartCheck or ProLink contains a comprehensive bearing database, to which you can add further bearings. These bearings are available when you create a new measurement configuration . In the **Bearings** area, you will find an overview with search function:

Schaeffler SmartWeb

Connected to : SmartCheck 36
Logged in as : admin

File Edit Measurement data Go to Help

Configuration

Name

- Configuration
 - Input configurations
 - Measurement jobs
 - Output configurations
 - Measurement trigger
 - Measurement conditions
 - Communication channels
 - Device
 - Bearings**
 - Bearing manufacturer
- Actions
- Create new measurement job
- Areas
- Status
- Measurement data
- Live view
- Configuration
- User management
- Log out

Complete

Bearing overview

Manufacturer : FAG Search criteria :

Bearing search result

Name	Manufacturer	BPFI	BPFO	BSF	FTF (standing outer ...)	FTF (standing inner ...)	
108-TVH	FAG	6.0591	3.9409	2.2027	0.3941	0.6059	🔒
11204-TVH	FAG	7.1332	4.8668	2.5090	0.4056	0.5944	🔒
11205-TVH	FAG	7.1080	4.8920	2.5751	0.4077	0.5923	🔒
11206-TVH	FAG	8.2134	5.7866	2.7599	0.4133	0.5867	🔒
11207-TVH	FAG	9.1894	6.8106	3.2524	0.4257	0.5743	🔒
11208-TVH	FAG	9.7206	7.2794	3.3749	0.4282	0.5718	🔒
11209-TVH	FAG	9.1724	6.8276	3.3070	0.4267	0.5733	🔒
11210-TVH	FAG	10.2244	7.7756	3.5760	0.4320	0.5680	🔒
11211-TVH	FAG	10.7513	8.2487	3.7004	0.4341	0.5659	🔒
11212-TVH	FAG	10.7187	8.2813	3.8056	0.4359	0.5641	🔒
1200-TVH	FAG	5.5727	3.4273	1.9342	0.3808	0.6192	🔒
1201-TVH	FAG	6.0834	3.9166	2.1344	0.3917	0.6083	🔒
1202-TVH	FAG	6.1097	3.8903	2.0896	0.3890	0.6110	🔒
1203-TVH	FAG	7.1784	4.8216	2.3818	0.4018	0.5982	🔒

Bearing information







Name : 108-TVH
Manufacturer : FAG

Ball pass frequency inner race (BPFI) : 6.059
Ball pass frequency outer race (BPFO) : 3.941
Ball spin frequency (BSF) : 2.203
Fundamental train frequency (FTF) standing outer race : 0.3941
Fundamental train frequency (FTF) standing inner race : 0.6059

Changed : 2019-11-25 08:36:07
Created : 2019-11-25 08:36:07
Changed by : admin

Edit Copy Delete Add

The following information and functions can be found here:



- Searching for bearings by **manufacturer** is possible. You can expand the corresponding list box as much as you like in the **Bearing manufacturer**  area.
- You can search for bearings by name in the database. To do so, enter the name in the **Search criteria** field. Here you have the following options:
 - The placeholder * stands for any character string.
 - The placeholder ? stands for any single character.
 - Upper/Lower case is irrelevant.
- The details on the bearing currently selected are displayed under **Bearing information**. In the example, you can see the details for the first bearing in the list. In the grey box on the right, you will find the details on creating and changing the selected bearing
- You can add a new bearing .
- You can copy and edit existing bearings .
- You can delete copies of bearings or newly created bearings. To do this, select the relevant bearing, click on **Delete** , and choose **OK** to confirm. Bearings that are used in a measurement job cannot be deleted.
- In the top right corner, click on  to open the Configuration overview .




You can neither delete nor edit the bearings from the preset database. However, you can copy a bearing from the database and then edit the copy.

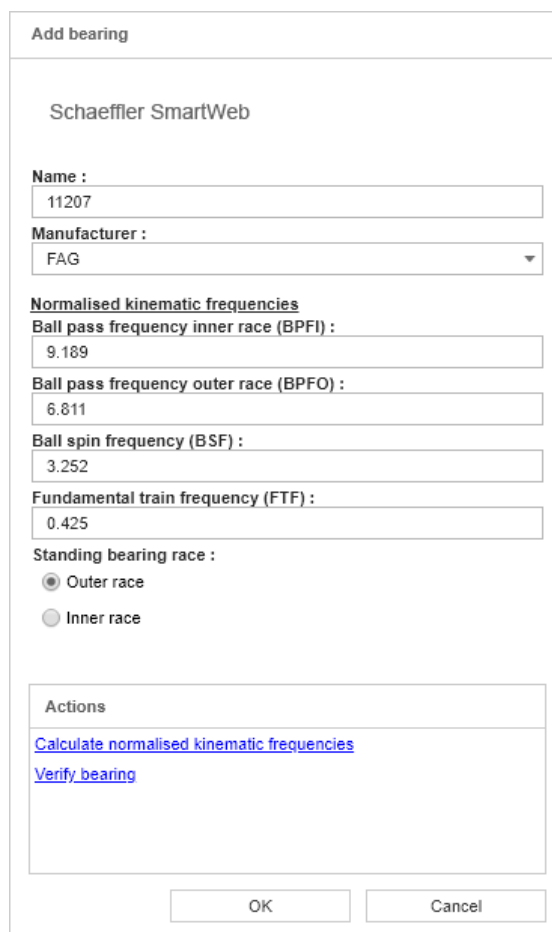
8.9.1 Adding/editing bearings

You can expand the Schaeffler SmartCheck or ProLink bearing database as much as you like. In doing so, you have two options:


- You can add new bearings .
- You can copy existing bearings , edit the copy and then save it under a new name.

How to add a new bearing

1. Under **Bearing information**, click on **Add** .
2. In the **Add bearing** window, make the desired specifications:



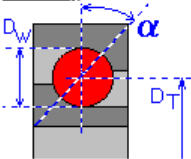
You have the following options:

Name	Enter the name of the bearing here. You can also find the bearing under this name if you want to select it for a measurement job.
Manufacturer	Select the manufacturer for the new bearing here. What is in this list box is determined by your selections in the Bearing manufacturer  area.
Normalised kinematic frequencies	<p>These specifications are important for the correct calculation of bearing damage frequencies and thus for the reliable monitoring of this component. You can find the corresponding information on BPFI, BPFO, BSF and FTF in the technical data of the bearing.</p> <p>Alternatively, you can have the normalised kinematic frequencies calculated with the help of the program, using the geometry of the bearing (see below).</p>
Calculate normalised kinematic frequencies	Click here to calculate normalised kinematic frequencies with the aid of the bearing geometry. In this case, you need the load angle , the diameter of the pitch circle and of the roller element , and the number of roller elements :

Calculate normalised kinematic frequencies

Schaeffler SmartWeb

Geometry



Load angle (alpha) :

Pitch circle diameter [mm] (DT) :

Roller element diameter [mm] (DW) :

Number of roller elements :

If you want to add a double-row bearing, only enter the number of one row in **Number of roller elements**.

Make the corresponding specifications and then click on **Calculate**. The software calculates the values for the normalised kinematic frequencies from the geometry and transfers them to the corresponding fields.


Verify bearing

Click here to check your specifications for plausibility. This check reduces the probability of you having made incorrect specifications for the normalised kinematic frequencies. Otherwise, the bearing is accepted into the database without a plausibility check.

- Click on **OK** to add the new bearing to the database.

How to copy and edit a bearing


The bearing database, which is already available in the factory default setting of the Schaeffler SmartCheck or ProLink device, is write-protected; the individual bearings can be neither edited nor deleted. However, you can copy a bearing from the database and edit the copy, e.g. to create a new bearing with only minor deviations. To do this, proceed as follows:

- Select the bearing you want to copy and edit
- Under **Bearing information**, click on **Copy** 
- In the **Copy bearing** window, make the desired specifications. If you do not change the name here, Schaeffler SmartCheck or ProLink creates by default a bearing with the name **Copy of [name of the original bearing]**.
- Click on **OK** to save your changes and transfer the bearing into the database.



Calculating normalised kinematic frequencies from the bearing geometry requires expert knowledge. Only with the correct specifications for angles and diameters can the values for the bearing be determined correctly and lead to a correct measurement configuration.

8.10 Bearing manufacturer

If you add a new bearing in the **Bearing**  area, you also have to specify the manufacturer of the bearing. You manage the manufacturers available for selection in the **Bearing manufacturer** area:

Schaeffler SmartWeb

Connected to : SmartCheck 36
Logged in as : admin

File Edit Measurement data Go to Help

Configuration

Name

- Configuration
 - Input configurations
 - Measurement jobs
 - Output configurations
 - Measurement trigger
 - Measurement condi...
 - Communication chan...
 - Device
 - Bearings
 - Bearing manufacturer

Actions

[Create new measurement job](#)

Areas

Status

Measurement data

Live view

Configuration

User management

Log out

Complete






Manage manufacturers

FAG

INA

Edit Delete Add


Here you have the following options:

- **Add manufacturer:** Under **Manage manufacturers**, click on **Add** , enter the name of the manufacturer and confirm with **OK**.
- **Edit manufacturer:** Under **Manage manufacturers**, click on **Edit** , change the name of the manufacturer and confirm with **OK**.
- **Delete manufacturer:** Under **Manage manufacturers**, click on **Delete**  and confirm with **OK**.
- In the top right corner, click on  to open the Configuration overview .

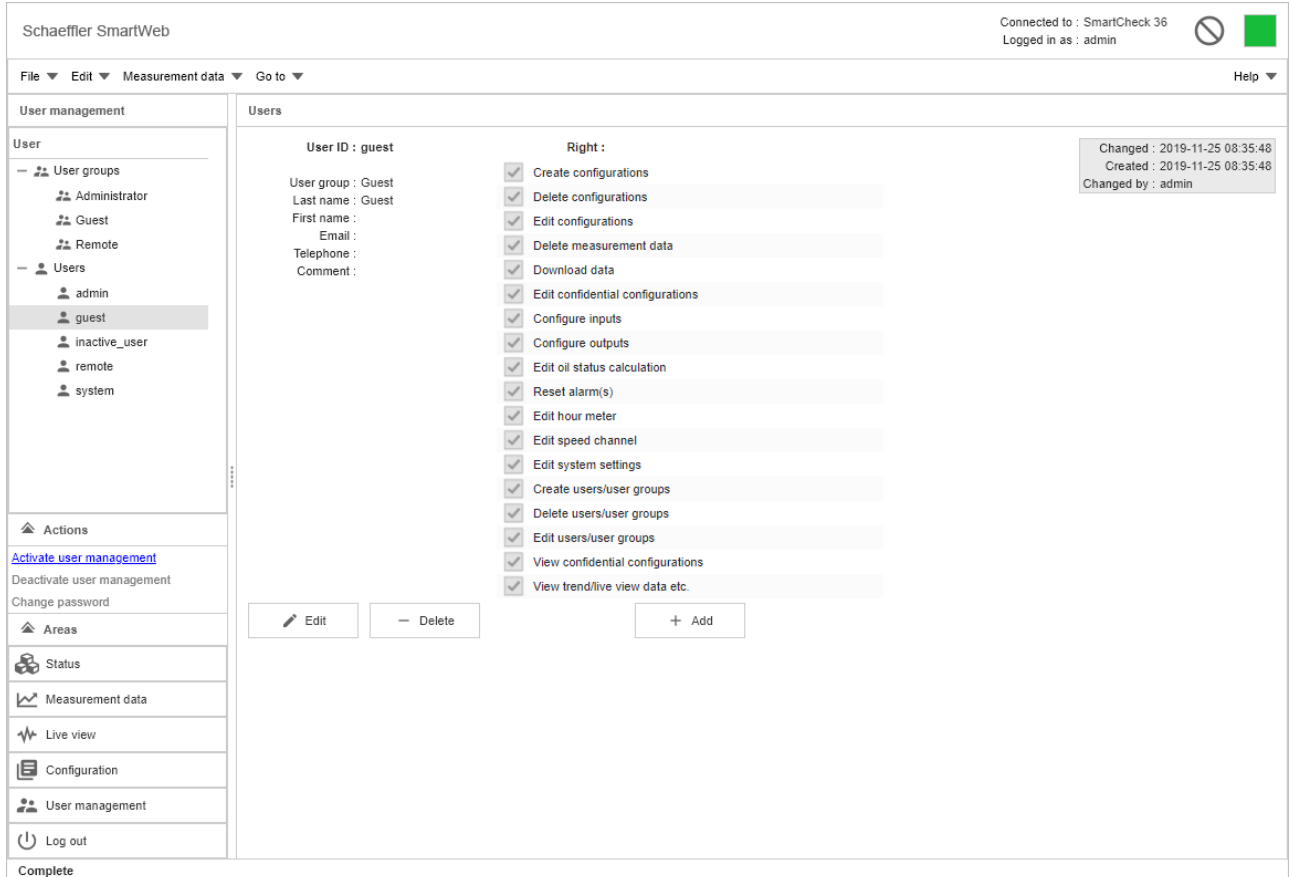


You cannot delete or edit the manufacturers **FAG** or **INA** or any other manufacturers you may have added that you have already used when specifying a bearing.

9 User management

Click on the **User management**  button to open the corresponding area. Here you can change, add and delete user groups and users in the SmartWeb software. You can also activate and deactivate the user management here. On the left, you will find an overview of all user groups and users. The user currently logged in is displayed in the top right in the title bar next to **Logged in as**.






In the factory default setting, the user groups **Administrator**, **Remote** and **Guest** are created with the users **admin**, **remote** and **guest**. If you select a group or an individual user, you will see the corresponding details and rights in the main panel:



Here you have the following options:



User groups

If, as in the example, you select a user group in the expanded overview, you will find the following in the main panel:

- The name of the selected **User group** is displayed on the left.
- Below the name, you will find the list of **Rights**  for the selected user group. The rights activated here – i.e. the ones that are ticked – are granted to every user you create for this user group. To change the rights, click on **Edit** .
- Beside the rights, you will find the list of **Members of the user group**. This gives you a quick overview of the users who, for example, were affected by a change to the user group.
- You can add or edit a user group . This excludes the system user groups **Administrator** and **Remote**, which cannot be changed.
- You can delete a user group provided that it is empty, i.e. it no longer contains any users. To do so, click **Delete**  and confirm with **OK**.
- On the right, in the area highlighted in grey, you will find details on creating and changing the user group. The  symbol indicates user groups that you can neither change nor delete. This includes the system user groups **Administrator** and **Remote**.

Users

If you select a user in the expanded overview, you will find the following in the main panel:

- The **User ID** and the details on the selected user are displayed on the left.
- Beside the details, you will find the list of the **Rights** ¹⁶⁵ for the selected user. The rights activated here - i.e. the ones that are ticked - are granted to the user via membership of a user group. The rights can only be changed for the whole user group.
- You can add or edit a user ¹⁶⁷. This excludes the system users **admin** and **remote**, which cannot be changed.
- You can delete a user. To do so, click **Delete**  and confirm with **OK**.
- On the right, in the area highlighted in grey, you will find details on creating and changing the user. The  symbol indicates users whom you can neither change nor delete. This includes the system users **admin** and **remote**.

Rights

When you create a user group, you can grant rights that will then apply for every user in this user group. The following rights are available:

- **Edit system settings**
This allows the settings found under **Device settings** ¹⁵⁵ and **System time settings** ¹⁵⁸ to be edited by the user.
- **Create configurations, Edit configurations and Delete configurations**
With these rights, the user can create, edit and/or delete configurations accordingly. Excluded from this right are the input and output configurations, which have their own rights (see below).
- **Configure inputs and Configure outputs**
With these rights, the user can configure inputs and/or outputs.
- **Create users/user groups, Edit users/user groups and Delete users/user groups**
If you grant these rights, the user can execute the corresponding functions of the user management.
- **Download data**
This right is necessary if the user wants to download and analyse data from the SmartCheck or ProLink device.
- **Reset alarm(s)**
This right enables the user, using the SmartWeb software, to switch off the alarms of the SmartCheck or ProLink device.
- **View trend/real-time data etc.**
This allows the user to open the **Live view** ⁵⁵ and **Measurement data** ⁴⁵ areas and use the corresponding functions there.
- **Delete measurement data**
This right allows the user to **delete measurement data** ⁵³ that is on the SmartCheck or ProLink device.
- **View confidential configurations**
This right allows the user to view alarm limits and frequency bands for sensitive measurement jobs ⁷⁹.
- **Edit confidential configurations**
This right allows the user to view and edit alarm limits and frequency bands for sensitive measurement jobs ⁷⁹.
- **Edit speed channel**
This right allows users to edit the speed channel, even if they otherwise have only limited authorisations and/or are not allowed to process measurement jobs.
- **Edit hour meter**
This right allows users to edit the value of the hour meter.

Activate/Deactivate user management

By default, you can open the SmartWeb software without logging in with your user name and password. So that the software and the SmartCheck or ProLink device can only be operated by authorised users, you can **Activate user management**. With activated user management, each user has to log in with user name and password. Users only have the rights granted to their user group.

To activate user management, click on the corresponding menu item, enter a new administrator password twice and then click on **OK**. You must then refresh the Schaeffler SmartWeb software in your browser, so that the user management is active.

To deactivate user management again, click on the corresponding menu item, enter the administrator password and then click on **OK**. The administrator password is reset to the factory default setting. Now everyone can log in without user name and password and everyone has administrator rights.

Change password

This function is only available if user management is activated.

Click on **Change password**, enter your new password twice and then click on **OK**. Now you can use the new password.



- If you are using the Schaeffler SmartUtility software, you can store your user name and password in the software settings. To do so, your details here must match the user name and password stored in the user management of the SmartWeb software.
- In the factory default setting, system users have the following passwords:
 - User ID **admin**: Password **admin123**
 - User ID **remote**: Password **remote123**
 - User ID **guest**: Password **guest123**

9.1 Adding/editing user group

To be able to create a user, you first need a user group. A user group consists of a name and a selection of rights¹⁶⁵. These rights pass automatically to every user in this group. Thus, the rights users have when using Schaeffler SmartCheck or ProLink are defined by means of the group they belong to.

How to add a user group

1. In the overview on the left, select **User groups**.
2. In the main panel, click on **Add** +.
3. In the window **Add user group**, make the desired specifications:

The screenshot shows the 'Add user group' dialog box. The title bar is 'Add user group'. The main content area has 'Schaeffler SmartWeb' at the top. Below that is a text input field labeled 'User group :' containing the text 'Service'. Underneath is a list of rights, each preceded by an unchecked checkbox. The rights listed are: Right, Edit system settings, Create configurations, Edit configurations, Delete configurations, Configure inputs, Configure outputs, Create users/user groups, Edit users/user groups, Delete users/user groups, Download data, Reset alarm(s), and View trend/live view data etc. At the bottom of the dialog are two buttons: 'OK' and 'Cancel'.

You have the following options:

User group


Here, enter the name under which the user group is to appear in the overview.

Right


Here, activate the rights that are to apply for users in this user group. You can either select each right individually or activate them all at the same time via **Right**.

4. Click on **OK** to save the new user group.


How to edit a user group

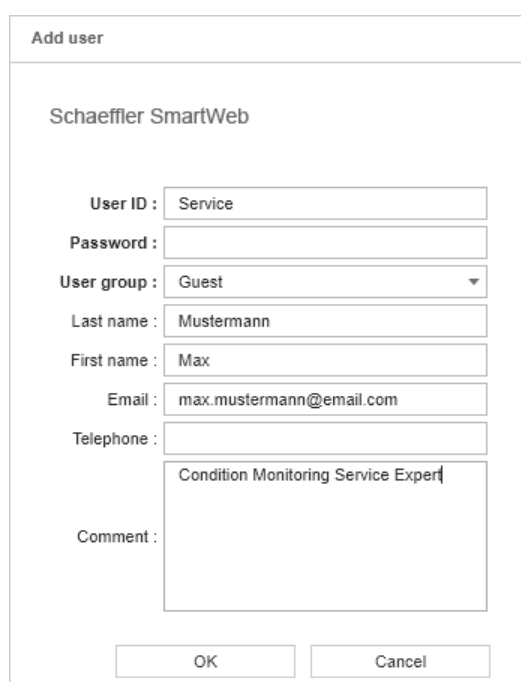
1. In the expanded overview, click on the desired user group.
2. Click on **Edit**  and enter the desired specifications in the **Edit user group** window.
3. Click on **OK** to adopt your changes.

9.2 Adding/editing users

You can only add users in connection with a user group. The user group is used to define the rights  that the user has for Schaeffler SmartCheck or ProLink.

How to add a user

1. In the overview on the left, select **User**.
2. In the main panel, click on **Add** .
3. In the **Add user** window, make the desired specifications:



Add user

Schaeffler SmartWeb

User ID :

Password :

User group :

Last name :

First name :

Email :

Telephone :


Comment :

You have the following options:

User ID	Here enter the user ID with which the user will log into SmartCheck or ProLink in future.
Password	Enter here the password that the user will use to log into SmartCheck or ProLink in future.
User group	Specify here the user group that the user is to belong to. Use the user group to determine the rights that the user will have.
Surname, first name email, phone	Specify here the contact data of the user. This information is optional.
Comment	Enter here any comment you may want to add about this user.

1. Click on **OK** to save the new user.

How to edit a user

1. In the expanded overview, click on the user.
2. Click on **Edit**  and enter the desired specifications in the **Edit user** window.
3. Click on **OK** to adopt your changes.

10 Manufacturer/support

Manufacturer

Schaeffler Monitoring Services GmbH

Kaiserstraße 100
52134 Herzogenrath
Germany

Tel.: +49 2407 9149-66
Fax: +49 2407 9149-59

Internet: www.schaeffler.com/en/services

Further information:

- www.schaeffler.de/en/condition-monitoring/smartcheck
- www.schaeffler.de/en/condition-monitoring/prolink

Contact: industrial-services@schaeffler.com

Please send all correspondence directly to Schaeffler Monitoring Services GmbH!

A subsidiary of

Schaeffler Technologies AG & Co. KG

PO Box 1260
97419 Schweinfurt
Germany

Georg-Schäfer-Straße 30
97421 Schweinfurt
Germany

Support

For information on technical support, go to www.schaeffler.de/en/technical-support.

We provide support services for the device and related software products. For a detailed description of the nature and scope of our support services, go to:

- www.schaeffler.de/en/condition-monitoring/smartcheck
- www.schaeffler.de/en/condition-monitoring/prolink

You can find the support definition in the "Technical documents" > "Software, Licences, Manuals" section.