SIPOS
A K T O R I K

se7en

User manual

COM-SIPOS

PC parameterization program
for SEVEN actuators

Bluetooth®

Software for:

- Commissioning

- Parameterization

- Operation

- Diagnosis

- Maintenance

- Visualization

Contents

1   General remarks

COM-SIPOS is a software for commissioning, parameterization, operation, diagnosis, maintenance, trouble-shooting and visualization.

For **PROFITRON/HiMod,** all parameters represented via COM-SIPOS can also be set and indicated in the graphic actuator display using the Drive Controller at the local control unit.
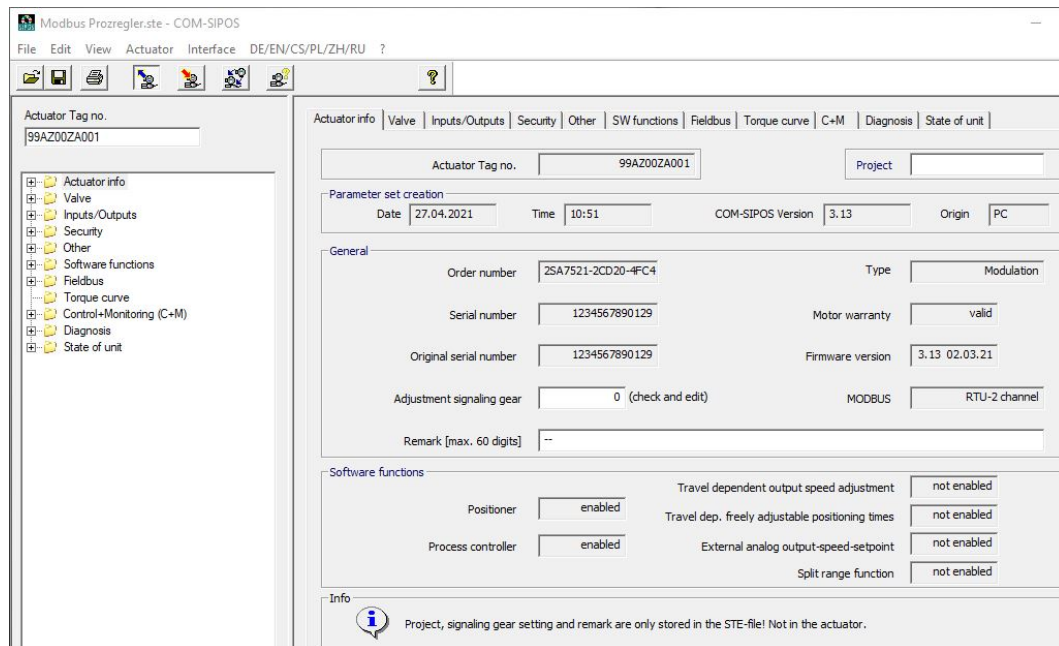For **ECOTRON**, not all parameters can be set with the Drive Controller at the local control unit.

Fig.: COM-SIPOS start screen

There are dangerous high voltage levels inside the actuator. During communication, the cover of the electronics unit has to be removed, if required, depending on type and version. Avoid touching tracks or components on the boards with the fingers and prevent tracks or components coming into contact with metal objects.

By consulting the person responsible for the plant, obtain an assurance or establish that unintentional startup of the equipment cannot cause a disturbance in the plant or injury to persons. If a cut-off mode has been selected that is not appropriate for the valve, damage to the valve may result!

Highly sensitive CMOS semiconductor components are mounted on the printed circuit boards which are extremely sensitive to static electricity. Avoid touching tracks or components on the boards with the fingers and prevent tracks or components coming into contact with metal objects.

This manual is only complete in combination with the instruction manual of the respective actuator:

ECOTRON	Y070.301/EN,
PROFITRON/HiMod	Y070.302/EN.

2 Installation and program start

2 Installation and program start

2.1 Scope of delivery

The scope of delivery for order no.: 2SX7100-3PC02 (Fig. 1), includes:

- USB stick:
  USB stick with "COM-SIPOS PC parameterization program" and user manual,
- USB cable A/A (for PROFITRON/HiMod):
  USB 2.0 cable with two identical connectors, type standard A, for connection between laptop and external USB port at electronics housing,
- USB cable A/B (for ECOTRON):
  USB 2.0 cable with two different connectors, type standard A and standard B for connection between laptop and internal USB port on control PCB.

Fig. 1: Scope of delivery

2.2 System requirements

Hardware:

- Pentium 100 MHz, USB port
- At least 25 MB of available hard-disk capacity
- Bluetooth (for PROFITRON/HiMod if communication is to be made via Bluetooth)

Operating System: Windows® 7/8/10

2.3   Installation

☞   Installation of COM-SIPOS is only possible with administrator rights!

Connect USB stick to USB port of laptop. The installation either starts automatically or by double-clicking the "Setup_COM-SIPOS.exe" file.

Click on "Select Language" first to select the user interface language of the installation program.

If previous COM-SIPOS versions are installed, this information will be displayed in the next window.

Click on the "Yes" button to start the recommended de-installation of the former version(s) found on the computer. To delete these versions, simply acknowledge the following confirmation in English.

When the "Uninstall successfully completed" or "Uninstall completed. Some elements…" message appears, click "OK" to close "Remove Program From Your Computer" window.

The uninstall routine is displayed for each former COM-SIPOS version found.

Recommendation: Have all former versions removed.

☞   The actuator parameter files (extension: *.ste) contained in the former program directories "Setup COM-SIPOS Flash German" or "Setup COM-SIPOS Flash English" are retained in the stored directory!
COM-SIPOS Flash directories without actuator parameter files are completely deleted.

The actual installation of the current program version starts now ➔ Click "Next" button ➔ Read and confirm "License Agreement" with "I Agree" ➔ "ReadMe File", among others with the features of the new version.
Click "Next" to get to the next step, "Destination Location": Default setting for the target directory is "C:\Program Files (x86)\COM-SIPOS".

In the following window, click "Next" to start the actual copying procedure which is shortly displayed in another window.

"Finish" in the last window completes the installation.

<div style="text-align: right">**Installation and program start**</div>

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Installation and program start

2.4   Start COM-SIPOS

Due to the installation, 3 links for starting the program were created:

- Icon (Fig., item 1) on the desktop,
- Short-cut under "Start ➔ All Programs" (Fig., item 2) and
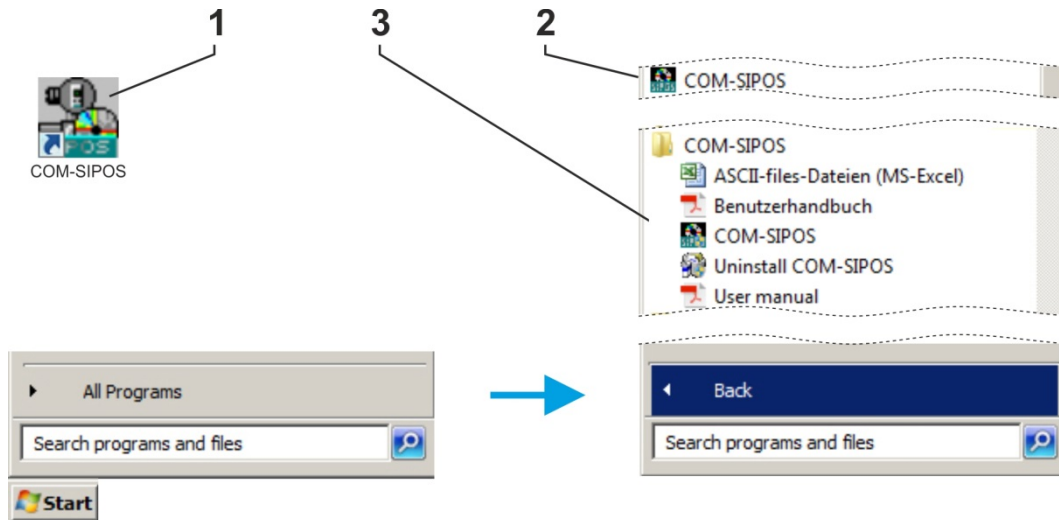- as main entry under "Start ➔ All Programs ➔ COM-SIPOS" (Fig., item 3).

Fig.: Start COM-SIPOS

The user manuals in the available languages as well as "Uninstall COM-SIPOS" to remove the software from your laptop can be found under "Start\All Programs\COM-SIPOS".

After clicking one of the start options, the COM-SIPOS user interface will appear. The default language is that of the operating system (if COM-SIPOS does not support the language of the operating system, English is set as default). The setting of a different program language is described in chapter 5.6.

2.5   Establish connection

Depending on the version, there are the following options for connecting the actuator to the laptop:

- **ECOTRON: Connection via USB cable A/B**
  Connection of USB cable A/B to internal USB port, type B, on control PCB, while electronics housing is open, see chapter 2.5.1.

Avoid any electrostatic discharge (ESD) to any electronic part inside the SIPOS 5 while the electronics housing is open. Any ESD may damage some highly sensitive CMOS devices. Do not touch any electronic part with your hands or metallic tools!

- **PROFITRON/HiMod: Connection via USB cable A/A**
  Connection of USB cable A/A to external USB port at electronics housing, see chapter 2.5.2.
- **PROFITRON/HiMod: Connection with Bluetooth**
  The communication is wireless via the Bluetooth interface integrated in the actuator, see chapter 2.5.3.

Bluetooth communication is only possible with Windows® 7, 8 and 10!

2.5.1 ECOTRON: Connection via USB cable A/B

For connecting the USB cable A/B between laptop and actuator, open the cover of the electronics unit of the actuator which is fastened with screws.

Connect USB cable A/B to internal USB port, type B, within the actuator.
The USB port is located on the control PCB, refer to fig. item 1.

☞
- Only use the USB cable supplied with the software!!
- Communication with COM-SIPOS is also possible in the event of power failure or missing mains connection - the USB interface on the laptop is used as power source!
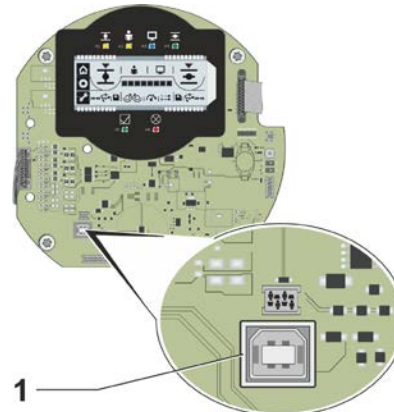
Fig.: Internal USB connection to control PCB for ECOTRON

2.5.2 PROFITRON/HiMod: Connection via USB cable A/A

The USB port at the actuator is protected against dust and water and is located at the bottom left of the electronics housing.

Unscrew protective cap (fig. 1 item 1) of USB port (item 2) for connecting of USB cable A/A between laptop and actuator. The cap is provided with a plastic band for retention.

Then connect USB cable A/A to external USB port, type A.

☞
- Only use the USB cable supplied with the software!
- Communication with COM-SIPOS is also possible in the event of power failure or missing mains connection - the USB interface on the laptop is used as power source. This is indicated in the actuator display with a red frame, a transverse USB symbol and the "14 Mains voltage" fault signal.
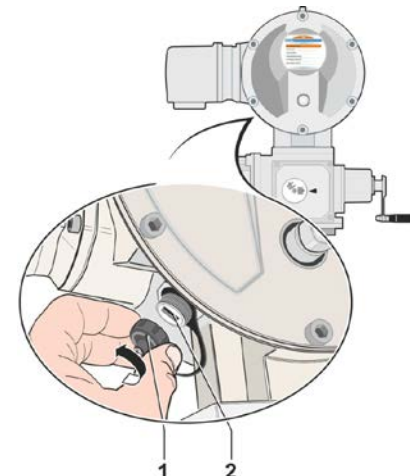
The connection via USB port is indicated in the display via a USB symbol (fig. 2 item 1).

Fig. 1: External USB connection for PROFITRON/HiMod

Fig. 2: Indication in the display for communication via USB

2

Installation and program start

2

Installation and program start

2.5.3   PROFITRON/HiMod: Connection via Bluetooth

PROFITRON and HiMod have a Bluetooth interface. The communication via Bluetooth is ready on delivery.

Each Bluetooth device (slave) has a definite Bluetooth address for clear identification. In addition, each Bluetooth device is assigned a device name for easier selection. As a standard, this name consists of the plant identification number - if available - and the 9 digit serial number.

The actuator signals Bluetooth communication via the flashing Bluetooth symbol (Fig. item 1) in the display.
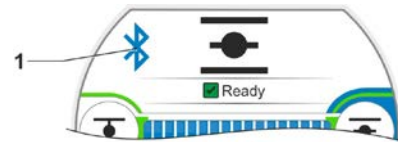
Fig.:   Indication in the display for communication via Bluetooth

☞   ■ The Bluetooth function can be switched off via parameter!
     ■ Bluetooth communication is only possible with Windows® 7, 8 and 10!
     ■ Simultaneous communication setup via USB cable and Bluetooth is not permissible.
       For communication via Bluetooth, an existing connection via USB cable must be interrupted!

2.6   Uninstall COM-SIPOS

Uninstalling COM-SIPOS:

"Start ➔ All Programs ➔ COM-SIPOS ➔ Uninstall COM-SIPOS"

Use the "Uninstall COM-SIPOS" command under "Start\All Programs\COM-SIPOS" to remove the software again: Select Uninstall Method "Automatic", then "Next" to get to the next window and select "Finish" to perform the uninstall procedure.

Always select this method to remove the COM-SIPOS PC parameterization program, otherwise it cannot be ensured that all actuator parameter files, which were saved via COM-SIPOS in the respective directory, are retained.

3   Reading and writing parameters

Read (download) and write (upload) of parameters

Actuator parameters		
How to …	**Description**	**perform steps**
Display	The actuator parameters are displayed in the tab sheets.	① ➜ ②
Change	After download of the parameters, it is possible to change them depending on the actuator type.	① ➜ ② ➜ ③
Save	All actuator parameters (customer and factory parameters), which include end position adjustment and operational data, can be saved in a file (2 kB). *We strongly recommend saving the actuator parameter files after successful commissioning for documentation and reference purposes (especially in case of an electronics replacement).*	① ➜ ④
Duplicate	This function is extremely helpful when installing a replacement electronics or a new control PCB, since all originally programmed customer and factory parameters including end position adjustments are uploaded into the replacement unit. *This results in an identical copy of the replaced unit and makes recommissioning obsolete after the replacement.*	① ➜ ④ ➜ ③
Print	The printed actuator parameters can be used for documentation purposes.	① ➜ ⑤
Send	The saved actuator parameters can be sent for evaluation as attachment to service@sipos.de	① ➜ ④

Trouble shooting		
How to …	**Description**	**perform steps**
Display diagnosis and fault messages	This data is displayed in the tab sheets "Diagnosis", "Fieldbus" and "State of Unit". **In case possible faults cannot be resolved, please save the actuator parameters and send them to service@sipos.de.**	① ➜ ⑥

Firmware-Update		
How to …	**Description**	**perform steps**
Update	The installed firmware version is displayed in the tab sheet "Actuator info".	① ➜ ⑦

Reading and writing parameters **3**

3

Reading and writing parameters

Check wiring		
How to …	**Description**	**perform steps**
Actuator outputs ➔ DCS inputs	The wiring to the process control system can be checked independent of the actuator status.	⑧
DCS outputs ➔ Actuator inputs	The correct transmission of binary and analog control system output signals to the actuator as well as the fieldbus status of the actuator can be checked on the "**C+M**"tab.	① ➔ ⑨

Steps: **see chapter:**

①   Read (download) actuator parameters.   3.1

②   Display/change parameters on tab sheets.   7

③   Write (upload) new/changed actuator parameters.   3.2

④   Save downloaded actuator parameter file.   5.1

⑤   Print a summary of actuator settings and diagnosis data. Example see chapter 10.   5.1

⑥   Display diagnosis and state of unit data.   7.7, 7.10 and 7.11

⑦   Update firmware.   4

⑧   Check interface to the control system (DCS inputs).   8

⑨   Check the DCS outputs (actuator inputs).   7.9

3.1   Read actuator parameters

The data of the actuators can be downloaded for various purposes:

■ Trouble shooting

■ Documentation

■ Availability of data in case of replacement of the electronics or the control PCB available.

☞   Therefore we strongly recommend downloading and saving the actuator parameters after successful commissioning! All actuator parameters, **including the end position adjustment,** can then be uploaded to replacement electronics. Provided that the gear unit was not disconnected from the valve, recommissioning after performing the replacement is not required!

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Reading and writing parameters

Procedure:

(Steps 1 and 2 are not required for Bluetooth applications.)

1. Remove the cover of the electronics unit (only ECOTRON).

2. Connect USB cable (see chapter 2.5).

3. Start COM-SIPOS (see chapter 2.4).

4. If necessary, select the correct interface
   (see chapter 5.5).
   The set interface is stored until the next
   change.

5. Read (download) actuator parameters (see
   Fig. 1).
   "Read parameter"contains all actuator
   parameters, i.e. both factory parameters and
   customer parameters which can be changed
   using COM-SIPOS, including end position
   adjustments and operational data.
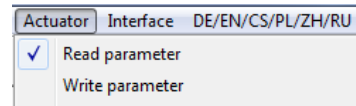
Fig. 1: Reading of actuator parameters

6. Define storage procedure (see Fig. 2).
   Name, revision history as well as storage
   location of an actuator parameter file (*.ste)
   can be preset via "Settings STE-file", see also
   chapter 5.1

☞   The settings remain stored until next
    revision!
    New STE-files are stored with "**Save**" in the
    preset folder with the set file name.

    If the STE-file setting is changed once
    again during an application, restart COM-
    SIPOS for activation!
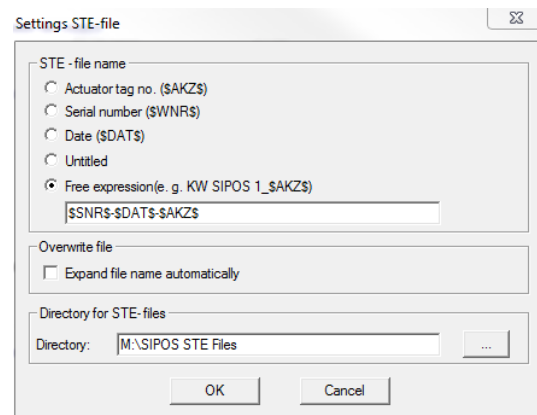
Fig. 2: Preset *.ste files

7. Save actuator parameters
   (see fig. 3).

☞   ■ The created file has an ".ste" extension.
       The size is only a few bytes, ideal for
       sending via e-mail!
    ■ Select "**Save As**", if no presetting was
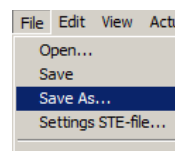   made, via "Setting STE-file"!

Fig. 3: Save actuator parameters

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3.2   Write new/changed actuator parameters

3.2.1   to the actuator

If the customer parameters (e.g. tripping torque, output speed, etc.) were changed after reading out the actuator parameters using COM-SIPOS and if these changes are to become effective, perform an upload via "Actuator" menu, "**Write parameter**" menu item, see Fig.
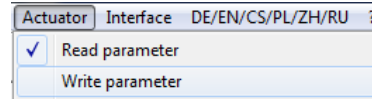

Fig.: Save changed parameters

3.2.2   to the replacement electronics

The following procedure has proved extremely useful when installing a replacement electronics unit since all actuator parameters read and stored from the original actuator (customer and factory parameters including end position adjustment and operational data) are uploaded to the new replacement part. This results in an identical copy of the replaced unit. Recommissioning after replacing a part would only be required if the gear unit of the actuator was also disconnected from the valve.

Procedure:

(Steps 1 and 2 are not required for Bluetooth applications.)

1. Remove the cover of the electronics unit (only ECOTRON).

2. Connect USB cable (see chapter 2.5).

3. Start COM-SIPOS (see chapter 2.4).

4. If necessary, select the correct interface (see chapter 5.5).

5. **Open actuator parameter file (*.ste) of the original actuator in COM-SIPOS,** see Fig. 1 and 2.
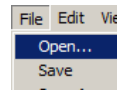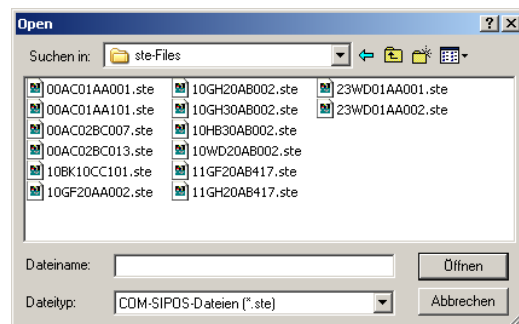

Fig. 1: Open STE-files

Fig. 2: Select actuator parameter file

6. **Write actuator parameters of the original actuator to replacement electronics.**
    Upload complete actuator parameters via "Actuator" menu, "Factory parameter" submenu,
    "**Write EEPROM parameter**" menu item, see Fig. 3.

☞   For further information, please refer to the mounting instructions for replacement electronics Y070.402/EN!
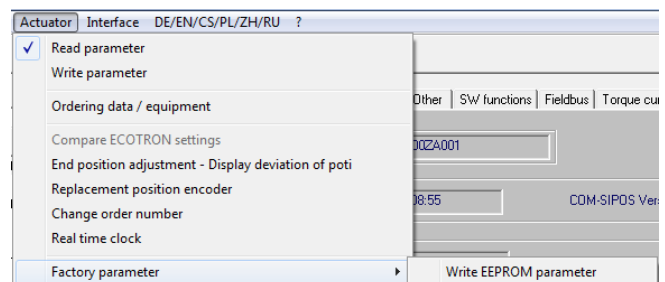

Fig. 3: Write actuator parameters

4 Update firmware

A firmware update is performed via the "**Actuator**" menu, see Fig.

☞
- ■ Firmware update is only possible in LOCAL mode!
- ■ Firmware updates can always be performed even if the actuator parameters were not read (downloaded) previously!
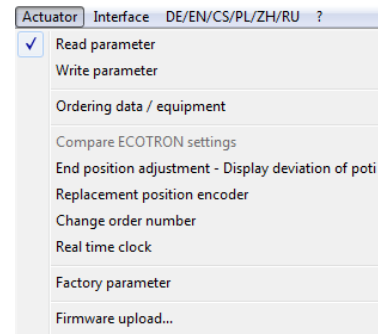- ■ Communication to the DCS is interrupted during a firmware update!

Actuator	Interface	DE/EN/CS/PL/ZH/RU	?
✓ Read parameter
Write parameter
Ordering data / equipment
Compare ECOTRON settings
End position adjustment - Display deviation of poti
Replacement position encoder
Change order number
Real time clock
Factory parameter
Firmware upload...

Fig.: Firmware upload

Procedure:

1. If necessary, select the correct interface (see chapter 5.5).

2. **Select option for firmware update.**
   Select menu item for firmware update in the "Actuator" menu:

   - ■ "**Firmware upload**"
     Select "Firmware upload" for ECOTRON as well as PROFITRON and HiMod if the firmware update is to be performed via USB cable.
     → Continue with **chapter 4.1**

4

Update firmware

4.1 Firmware upload with USB cable

Procedure:

1. Set control mode to „LOCAL".

2. Connect USB cable (see chapter 2.5):.

   a. for ECOTRON, after unscrewing the electronics cover at the internal USB port (type B) on the control PCB,

   b. for PROFITRON/HiMod, after unscrewing the protective cap at the external USB port (type A).

3. Select the "**Firmware upload**" command in the "Actuator" menu, press **File** button and select desired firmware, e.g. 7PR_ vxxx.sev for PROFITRON and HiMod actuators or 7EC_ vxxx.sev for ECOTRON, see Fig.

☞ | **The desired firmware must be located in a directory which can be accessed via laptop**!

4. Click **Start** button in the dialog window (Start button is locked for the duration of the data transfer).

   Transmission of the new firmware is shown in the progress bar.
   The new firmware is automatically started after the report „**Successfully done**" in the text window.

5. **Close** button closes the dialog window.

6. Disconnect USB cable.

7. Fit the cover of the electronics housing with screws resp. fit protective cap.
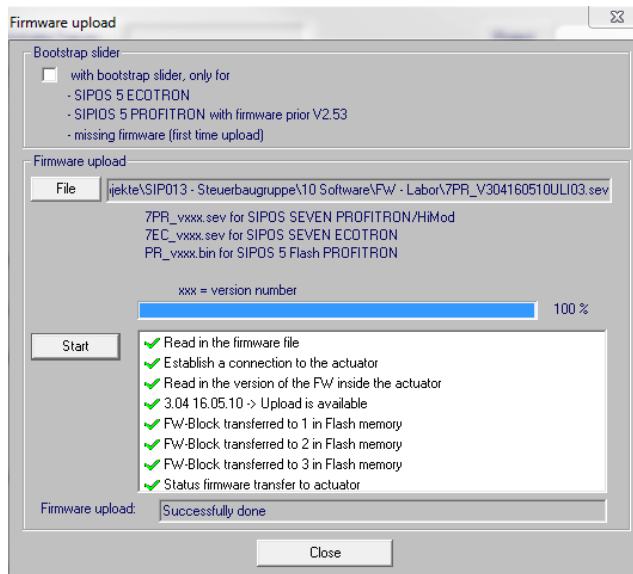
Fig.: Firmware upload USB cable

After the firmware is uploaded to the actuator, the current parameters can be downloaded with **Actuator ➔ Read parameter**. The firmware version is displayed in the "Actuator info" tab sheet.

☞ | If the firmware update is aborted (power supply of the actuator is switched off, USB cable is disconnected etc.), this is indicated by a red cross and information in the text window. In this case, repeat upload of the new firmware version by pressing the **Start** button!
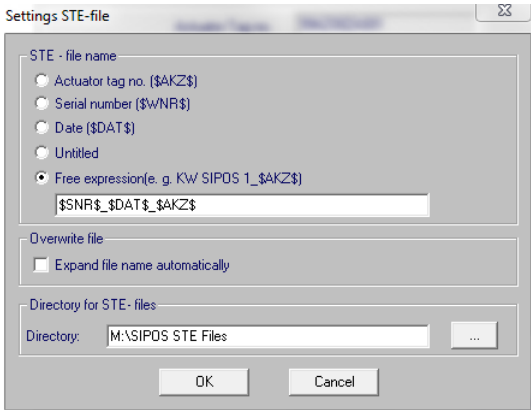
5   Menus

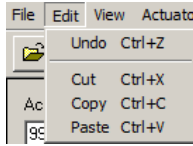File   Edit   View   Actuator   Interface   DE/EN/CS/PL/ZH/RU   ?

5.1   File
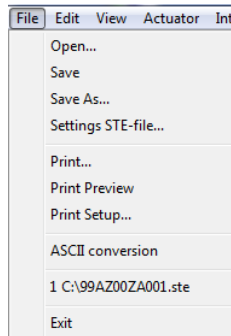
The **File** menu contains the following commands:

Open	Opens a parameter file stored on the laptop (*.ste).
Save	Once customer parameters have been changed, the actuator parameter file opened/downloaded from the actuator under the same name or in accordance with the settings under "**Settings STE-file**" on the laptop.
Save As	Saves the opened/ downloaded actuator parameter file under a defined file name and directory on the laptop.
Settings STE-file	File name, revision history (extension of the file name with a, b, …) and storage location of the actuator parameter files *.ste can be preset here. Free texts, e.g. plant designations and/or combinations of the suggested names can be selected. In the entered example, the file name consists of serial number, date and actuator TAG no.
Print	Prints a summary of the actuator settings and diagnosis data. Example, see chapter 10.
Print Preview	Shows the summary document as it will be printed.
Print Setup	Selects a printer and a printer port.
ASCII conversion	Saves the actuator parameters to a text file (*.txt) (see chapter 9).
Recent File	Shows up to 4 most recently opened actuator parameter files (*.ste).
Exit	Ends COM-SIPOS.

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Menus

5.2 Edit

The **Edit** menu contains the following commands:

| Undo	Cancels the last operation.
Cut	Deletes data from the document and transfers it to the clipboard.
Copy	Copies data from the document to the clipboard.
Paste	Inserts data from the clipboard into the document.

5.3 View
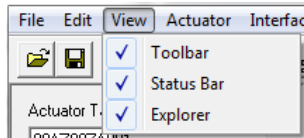
The **View** menu contains the following commands:

Toolbar	Switches the toolbar on and off.	Switching off is not recommended!
Status Bar	Switches the status bar on and off.	
Explorer	Switches the explorer on and off.	

5.4 Actuator
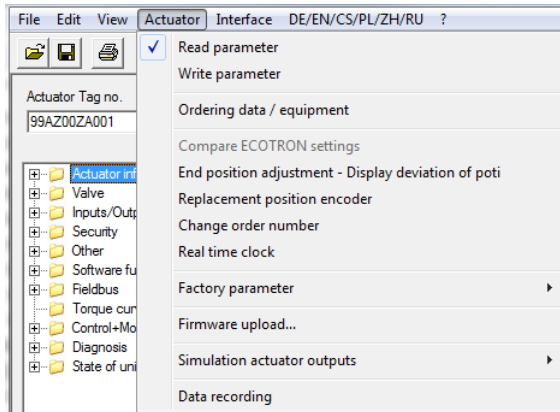
The **Actuator** menu contains the following commands:
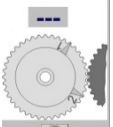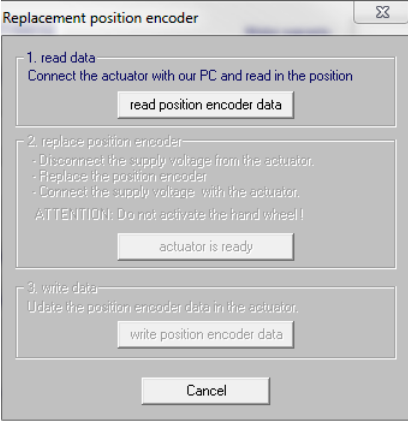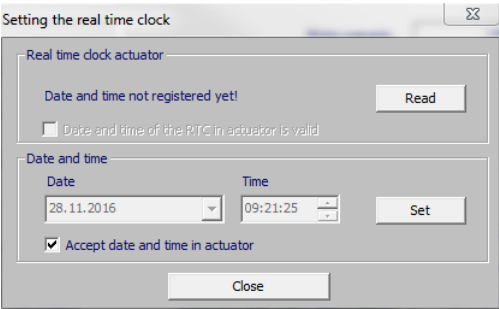
☞ These commands cannot be executed if cyclic data update "Polling" is activated under the "C+M" tab sheet (chapter 7.9)!
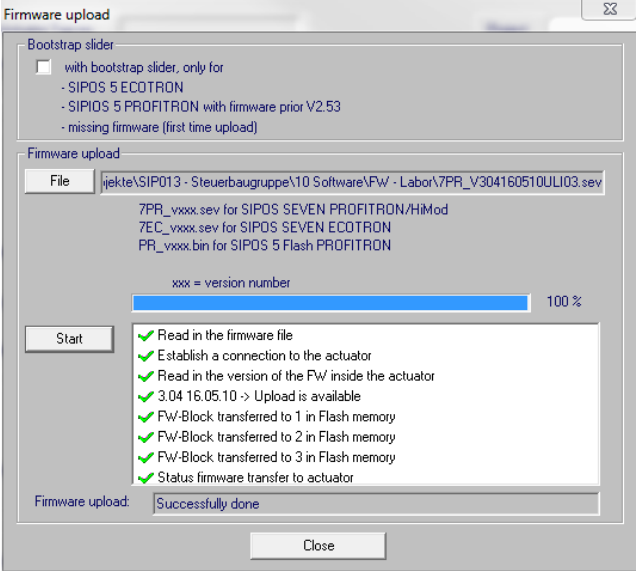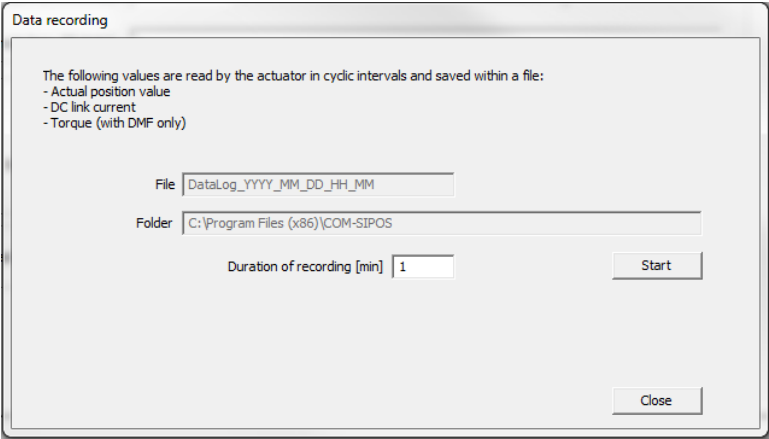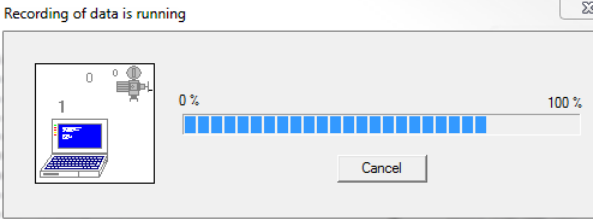Cyclic data update is indicated in the status bar via "POLLING":

Read parameter	Reads (downloads) actuator parameters from actuator (customer parameters, factory parameters including end position adjustment and operating data) via COM-SIPOS.
Write parameter	Writes (uploads) customer parameters modified via COM-SIPOS to the actuator. Customer parameters comprises all parameters that can be changed via the actuator display, via the tabs of the COM-SIPOS PC parameterization program or via fieldbus.
Ordering data / equipment	Displays the actuator equipment delivered ex works. Software-functions activated at a later date (activated using a PIN code) and which automatically change the 15th digit of the order code have been taken into account. Subsequent changes of the mechanics as well as of the electrical connection are not accounted for. Retrofitting of a fieldbus interface or a "non-intrusive" position encoder is detected and displayed in red letters in the **Additional information** field, e.g. "MODBUS RTU double channel (redundant) retrofitted".

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Menus

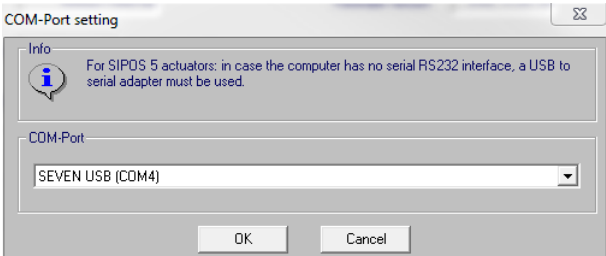|		
End position adjustment – Display deviation of potentiometer		This function is useful for separate actuator set-up, if the display of the electronics unit is not accessible. The value deviation of the potentiometer during end position adjustment as well as the direction of rotation of the central wheel required for zero adjustment are displayed.
Replacement position encoder	Replacement of a position encoder is supported by a dialog. Required working steps are defined: ☞ Recommissioning is not required!	
Change order number	This function is password protected. ☞ Changing an order number may only be carried out by authorized persons!	
Real time clock	A real time clock is only available for PROFITRON and HiMod. On delivery, date and time match the time zone of the manufacturer. Date and time can be taken over from the laptop (default setting) or be set individually by entries in the "Date" and "Time" fields. 	
Factory parameters	Writes with the "Write EEPROM parameter" command all parameters of the original parameter (customer parameters, works parameters including end position adjustment and operating data such as motor operating hours, number of cut-offs etc.) to the replacement electronics unit. After replacing the electronics unit, this function allows for easy and swift commissioning.	

|	
Firmware upload	The "Firmware upload" function allows for simple and fast firmware update. Opening the electronics housing is not required for PROFITRON/HiMod. Settings (customer and factory parameters) in the actuator remain unchanged. The dialog box for uploading the new firmware to the actuator appears.
	For the procedure for updating firmware, see chapter 4.1
Simulation actuator outputs	Check interface to the control system, see chapter 8.
Data recording	Records the respective actuator position value including the pertaining DC link current with connected DMF torque measurement flange as well as the torque in intervals of approx. 1 s for a duration of recording adjustable between 1 to max. 1,000 min within a CSV file.
	File name „DataLog_year_month_day_hour_minute" and file location are predefined.

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Menus
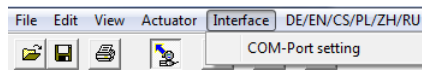
5.5   Interface

☞ | The set interface are stored until the next change!

The **Interface** menu contains the following command:

COM-Port setting	Setting of the port where the USB cable is connected to the laptop or the Bluetooth communication is to be established at laptop, PC or programming device.
	COM port must be selected here (refer also to Start\Device and Printers\...\Hardware).
	For connection via USB cable, the required COM port is indicated as "SEVEN USB (COM..)".

5.6   DE/EN/CS/PL/ZH/RU
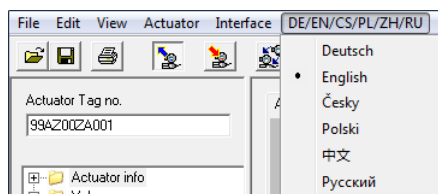
Use the **DE/EN/CS/PL/ZH/RU** menu to select the language.

Currently the German, English, Czech, Polish, Chinese and the Russian language are supported.

After installing the COM-SIPOS PC Parameterization program, the language of the operating system is set as default. If the language of the operating system is not available, English is selected.

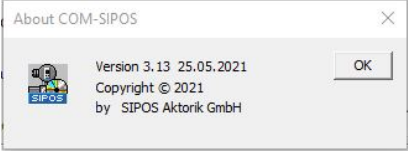If required, perform language setting on laptop:
Start /Control Panel/All Control Panel Items/Region and Language.

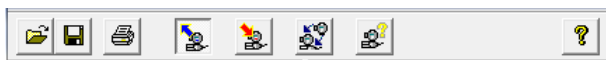The selected language is stored as default.

5.7 "?" (help)
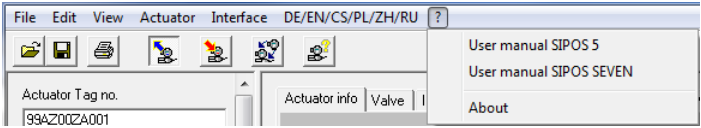
The **?** menu contains the following commands:

User manual …	PDF file of the COM-SIPOS user manual.
About	Indicates the status of the installed COM-SIPOS version:

6 Direct commands via symbols

Frequently used commands can directly be executed with a single mouse-click on the icons in the icon bar.

	Opens an actuator parameter file stored on the laptop (*.ste). < equals "File" ➔ "Open" >
	Once customer parameters have been changed, the actuator parameter file opened/downloaded from the actuator under the same name or in accordance with the settings made using the "**Settings STE-file**" command in the "**File**" menu is saved on the laptop**.** < equals "File " ➔ "Save" >
	Prints a summary of the actuator settings and diagnosis data. Example, **see chapter 10.** Prior to printout, the actuator parameter file must be opened or read from the actuator connected selecting "Read Parameter" in the "Actuator" menu. < equals "File " ➔ "Print" >
	Reads the actuator parameters from the actuator (customer parameters, works parameters including end position adjustment and operating data) in COM-SIPOS. < equals "Actuator" ➔ "Read Parameter" >
	Writes the customer parameters modified via COM-SIPOS to the actuator. < equals "Actuator" ➔ "Write Parameter" >
	Writes all actuator parameters from the original actuator (customer parameters, works parameters including end position adjustment and operating data) to the replacement electronics unit. After replacing the electronics unit, this function allows for easy and swift commissioning. < equals "Actuator" ➔ "Factory parameter" ➔ "Write EEPROM parameter" >
	Shows information on the actuator equipment delivered ex works incl. subsequently activated software functions. Retrofitting of a fieldbus interface or the "non-intrusive" position encoder was detected and displayed. < equals "Actuator" ➔ "Ordering data / equipment" >
	Shows information on the current COM-SIPOS version. < equals "?" ➔ "About" >

7 Tab sheets for parameters and current values

The actuator parameters and current values are shown on topic-specific tab sheets.

Click on the label to open the corresponding tab sheet.

| Actuator info | Valve | Inputs/Outputs | Security | Other | SW functions | Fieldbus | Torque curve | C+M | Diagnosis | State of unit |

☞ | Parameters can only be displayed once the connection between actuator and COM-SIPOS has been established (see chapter 2.5) and the actuator parameters have been read in COM-SIPOS (see chapter 3.1)!
Depending on the purpose, it can either be a file stored on the laptop and opened with COM-SIPOS (see chapter 5.1, "File" menu, "Open" command) or the actuator parameter file read from the actuator (see chapter 5.4, "Actuator" menu, "Read Parameter" command)!

Direct selection of the selection of the searched parameters/current values can be made quickly via the lateral explorer navigation.
Clicking the desired topic in the explorer opens the respective tab and highlights the corresponding topic in yellow.

Actuator Tag no.	Actuator plant identification number.
	The Actuator TAG no. stored in the actuator is shown as identification in the field above the explorer and in most tabs.
	If the Actuator TAG no. has not yet been assigned, it can be entered in the field above the explorer or, if the explorer is closed, in the Actuator info tab.
	Select "Write Parameter" in the "Actuator" menu to accept the Actuator TAG no. and display it in all tabs.

7.1 Actuator info

| Project | Project name |

Parameter set creation

Date	Date on which the actuator parameters were downloaded.
Time	Time at which the actuator parameters were downloaded.
COM-SIPOS Version	Actuator parameters were downloaded with this COM-SIPOS version.
Origin	Indicates the origin of the current data record: PC = data read from the actuator using COM-SIPOS. flash drive = data from the actuator saved on USB flash drive.

General

Order number	Actuator order number.
Type	Duty classification of the actuator: ON-OFF, Inching, Modulating or continuous Modulating.
Serial number	13-digit number of the electronics unit for manufacturer identification of the actuator.
Motor warranty	"valid" or "not valid".
Original serial number	13- digit number of the originally delivered electronics unit (only in case of replacement). On delivery of an actuator serial number and original serial number are identical.
Firmware version	Version no. of the firmware (e.g. 3.04 10.05.16 ➔ Version 3.04 as of 10.05.2016).
Adjustment signaling gear [rev./stroke]	After successful commissioning, the user can enter the signaling gear adjustment for documentation purposes in the STE-file.
Travel [rev./stroke]	The exact travel is shown for version with "non-intrusive" position encoder.
Remark [max. 60 digits]	The customer can enter a remark. The max. number of digits that can be entered is 60.

Software functions

Positioner	"enabled" or "not enabled".
Process controller	
Travel dependent output speed adjustment	☞ Each software function can be activated at the device itself at a later date, using a PIN code (PROFITRON and HiMod only)! Some functions require additional hardware options e.g. a second analog input!
Travel dependent freely adjustable positioning times	
External analog output-speed-setpoint	
Split-range function	

Tab sheets for parameters and current values

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7.2 Valve

☞
■ The ECOTRON version has no "Speed emergency" and different speeds for operation in CLOSE and OPEN directions can also not be set!
The speed set under "Closing speed" is also applied for operation in direction OPEN.

■ For 2SG7 part-turn actuator, the tripping torque cannot be changed, for 2SQ7 part-turn actuator, the tripping torque cannot be changed via parameter!

■ An additional gear can only be entered for PROFITRON-/HiMod version (not for 2SG7 and 2SQ7)!

CLOSE direction	"clockwise" or "anti-clockwise" (not for 2SQ7).
	☞ If this parameter is changed and stored, new end position adjustment of the actuator must be performed!

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Tab sheets for parameters and current values

Additional gear

☞ | Once an additional gear is entered, the actuator software will use the physical units of the actuator – additional gear combination for calculation, e.g. positioning speed [mm/min] and tripping force [kN] when mounting a linear thrust unit!
The new valve-related parameter values are also shown in the actuator display!

Gear type	
• No additional gear	Either no additional gear is mounted or the additional gear mounted to the actuator shall not be considered by the actuator software.
• Rotary gearbox	Selection of the gearbox type to be considered by the actuator software.
• Part-turn gearbox	
• Linear thrust unit	
Model	
• User-defined	Select "User-defined" if the additional gear mounted is not included in the gear selection list.
• GS … " 2SP78..	Selection of known, already predefined gear types which can basically be mounted to the actuator.

The following four indication fields show the gear data of the known, predefined gearbox type (cannot be modified) or must be used for entering the data of user-defined gearbox types:

Reduction ratio
 resp.
 Spindle pitch [mm]
	The reduction ratio is the ratio between speed at gearbox input and speed at gearbox output.
	 The following values can be set for
	   - rotary gearboxes: 1.0 to 100,
	   - part-turn gearboxes: 1 to 10000.
	 For linear thrust units a spindle pitch [mm] between 1 and 100 can be set.

Factor output/input torque
 resp.
 Factor output/input force
	The "output/input …" factor indicates the amount by which the torque or force at the gearbox output exceeds the torque or force at the gearbox input.
	 The following values can be set for
	   - rotary gearboxes: 0.1 to 500,
	   - part-turn gearboxes: 1.0 to 5000,
	   - linear thrust units: 1.0 to 100.

Max. output torque [Nm]
 resp.
 Max. output force [kN]
	Maximum permissible torque or force that can be applied to the additional gear.
	 The following values can be set for
	   - rotary gearboxes (Nm): 1 to 50000,
	   - part-turn gearboxes (Nm): 10 to 500000,
	   - linear thrust unit (kN): 1 to 1000.

Max. input speed [rpm]	Maximum permissible input speed at additional gear.

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The following two indication fields are not relevant for version with "non-intrusive" position encoder and are therefore not shown:

Rev./stroke
 resp.
 Positioning angle [°]
 resp.
 Stroke [mm]
	Valve-related indication describing the travel from OPEN to CLOSE.
	 The following values can be set for
	   - rotary gearboxes (Rev./stroke): 0.1 to 9900,
	   - part-turn gearboxes (°): 1 to 360,
	   - linear thrust unit (mm): 1 to 10000.

Signaling gear setting [rev./stroke]	When entering an additional gear, the signaling gear setting is adjusted to zero.This also applies if the value for rev./stroke, positioning angle or stroke was subsequently modified. ☞ The required signaling gear setting can only be calculated by the actuator software. The required signaling gear setting will only be displayed after the "Write parameter" command!

Speed normal

Closing speed [rpm] / [s/90°]	Speed values (2SA7) or positioning time values (2SG7 and 2SQ7) can be set within the type-dependent range (see actuator rating plate).
Opening speed [rpm] / [s/90°]	

Speed EMERGENCY

EMERGENCY speed CLOSE [rpm] / [s/90°]	EMERGENCY speed (2SA7) or EMERGENCY positioning time (2SG7 and 2SQ7) in close direction.
EMERGENCY speed OPEN [rpm] / [s/90°]	EMERGENCY speed (2SA7) or EMERGENCY positioning time (2SG7 and 2SQ7) in open direction.

Tripping torque

CLOSE [Nm]	Tripping-torque can be set in steps of 10 % of T_{Cmax}:
OPEN [Nm]	2SA7**0**/2SA7**3**: $T_{Cmin.}$ = 30 % $T_{Cmax.}$ 2SA7**5**/2SA7**8**: $T_{Cmin.}$ = 50 % $T_{Cmax.}$

End position range

End position range CLOSE [%]	Within the end position range, speed set to a predefined (slow) end position speed. In torque-dependent cut-off mode, a torque tripping within this range signals a valid torque cut-off, whilst outside the range, a fault will be signaled.
End position range OPEN [%]	

Cut-off mode

Cut-off mode CLOSE	"travel-dependent" or "torque dependent".
Cut-off mode OPEN	☞ If this parameter is changed and stored, new end position adjustment of the actuator must be performed!

☞ For parameterized additional gears, the respective physical units will be displayed!

Indication for
- Rotary gearbox: Speed [rpm] and Tripping torque [Nm],
- Part-turn gearbox: Positioning time [s/90°] and Tripping torque [Nm],
- Linear thrust unit: Positioning speed [mm/min] and Tripping force [kN].

7.3   Inputs/Outputs

☞ | For the ECOTRON version, only the "Signaling set" and the "Remote control" can be changed!

Binary inputs
(OPEN, CLOSE, STOP, Mode)
	The level for the binary inputs can be set to:
	    NO (normally open) = 24/48 V DC (high active)
	    NC (normally closed) = 0 V DC (low active).

EMERGENCY input	The level for the EMERGENCY binary input can be set separately.

Mode input	
• No function	Binary "Mode" input is not used.

• Interlock LOCAL/REMOTE	This control system prevents control mode change-over of the actuator between REMOTE and LOCAL.
	    Signal = active: Change-over interlocked.
	    Signal = not active: Change-over possible.

• Enable motor operation	From the control system, motor operation of the actuator can be enabled or disabled (motor lock).
	    Signal = high (24/48 V): Actuator can be operated.
	    Signal = low (0 V): The actuator is not ready for operation.

• Enable LOCAL	The DCS can enable or restrict local actuator operation.
	    Signal = active: Operation possible.
	    Signal = not active: Only observing possible.

Tab sheets for parameters and current values **7**

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Tab sheets for parameters and current values

Remote control	Possible modes:
• Binary: Permanent contact	Permanent contact signal with OPEN and CLOSE commands.
• Binary: Pulse contact	Pulse contact signal with OPEN, CLOSE and STOP commands. ☞ Control with remote pulse contact is available only if the mode "Alternative control mode" is set to "non-active"!
• Binary: Proportional move	Change of position proportional to pulse length: $$\text{Change of position } [\%] = \frac{\text{puls length}}{\text{run time}} \times 100\ \%$$ Run time setting is made within "Other" tab sheet.
• Analog: Positioner AI1	Positioner with setpoint via analog input AI1.
• Analog: Positioner AI2	Positioner with setpoint via analog input AI2.
• Analog: Process controller AI1	Process controller with setpoint via analog input AI1.
• Analog: Process controller AI2	Process controller with setpoint via analog input AI2.
• Internal: Process controller fixed setpoint	Process controller with fixed setpoint.
• Internal: Time control	Control of the actuator at specified times. Up to 10 switching points can be parameterized here. Time: Hour and minute Operation command: Deactivated, CLOSE, OPEN
• Fieldbus: Permanent contact	Permanent contact signal via fieldbus with OPEN and CLOSE commands.
• Fieldbus: Proportional move	Description, see "Binary: Proportional move".
• Fieldbus: Positioner	Positioner with setpoint value via fieldbus.
• Fieldbus: Process controller	Process controller with setpoint value via fieldbus.
Alternative control mode (STOP-signal active)	Possible second control mode:
• non-active	The control mode chosen via parameter "Remote control" is active - independent of the STOP signal.

• Binary: Permanent contact
• Binary: Proportional move
• Analog: Positioner AI1
• Analog: Positioner AI2
• Analog: Process controller AI1
• Analog: Process controller AI2
• Internal: Process controller fixed setpoint
• Internal: Time control
• Fieldbus: Permanent contact
• Fieldbus: Proportional move
• Fieldbus: Positioner
• Fieldbus: Process controller
	Binary STOP signal is active and parameter "Remote control" is not set to "Binary: Pulse contact":
	
	    The control mode chosen here, via parameter "Alternative control mode" is active.
	
	Binary STOP signal is not active:
	
	    The control mode chosen via parameter "Remote control" is active.

Analog input 1 (AI1)

Depending on the application and activated software function, this analog input can be used e.g. for the **position setpoint, external analog output speed setpoint** or for **process setpoint.**

☞   For the control modes "Internal: Process controller fixed setpoint" and "Fieldbus: Process controller" a process controller can be activated subsequently, even if the actuator does not have an additional analog interface (AI2 + AO2).
In this case the process actual value has to be connected to the analog input 1!

Range:	
• 4 – 20 mA	Detection of open-circuit behavior is possible (live zero).
• 0 – 20 mA	Detection of open-circuit behavior not possible (dead zero).
Slope:	
• rising	20 mA corresponds to 100 % OPEN.
• falling	20 mA corresponds to 0 % OPEN.

Analog input 2 (AI2)

Depending on the application and activated software function, this analog input can be used e.g. for **input for the actual process value.**

Range:	
• 4 – 20 mA	Detection of open-circuit behavior is possible (live zero).
• 0 – 20 mA	Detection of open-circuit behavior not possible (dead zero).
Slope:	
• rising	20 mA corresponds to 100 %.
• falling	20 mA corresponds to 0 %.

Threshold open circuit analog inputs

Detection of open circuit is only possible for analog current signal 4 – 20 mA.
Without adaptation, open circuit behavior will only be detected if the current signal is outside the range of 3.6 – 21 mA.

Lower threshold (mA)	Possible setting for the lower threshold: 0 to 3.6 mA. Default setting is **3.6 mA**.
Upper threshold (mA)	Possible setting for the upper threshold: 20 to 22 mA. Default setting is **21 mA**.

Adaptation valve flow charateristics

This function is only available for positioners with set control mode "Analog: Positioner AI." or "Fieldbus: Positioner"! Curve adaptation is only possible with one of the two stored valve curves "Equal percentage" or "Quick opening"!

Valve curve adaptation	
• Without	Default setpoint curve.
• Equal percentage	Exponential increase of the flowrate with the travel. Same relative changes of the stroke result in same relative change of the flowrate.
• Quick opening	A large change in flowrate for a small valve lift from the CLOSED end position. Moving towards OPEN, the change in the flowrate is reduced in a nonlinear manner.
Feedback	If the "Valve curve adaptation" parameter was set to "Equal percentage" or "Quick opening", the actual value can be adapted accordingly:
• Valve position	The actual value signaled to the DCS corresponds to the valve position.
• Flow rate	The actual value signaled to the DCS corresponds to the flowrate [%] according to the the predefined characteristic curve.

Binary outputs

The "Output 1" to "Output 8" signal outputs can be adjusted as follows:

Signal:	
• Not used	Output is not used.
	The signal is active when:
• End position CLOSED	the actuator has cut-off in the CLOSED end position.
• End position OPEN	the actuator has cut-off in the OPEN end position.
• Torque CLOSE reached	the actuator has cut-off in CLOSE direction torque-dependently.
• Torque OPEN reached	the actuator has cut-off in OPEN direction torque-dependently.
• Torque CL/OP reached	the actuator has cut-off in OPEN or CLOSE direction torque-dependently.
• Fault	a fault has occurred.
• Blinker	the actuator operates. During operation the signal changes between "high" and "low" state every 2 sec.
• Ready	the actuator can be operated.
• Ready + REMOTE	the actuator can be operated from REMOTE.
• Local	the actuator is in "Local operation" mode.
• Intermediate contact CL	the position of the actuator is between 0 % and the position set in the "Intermediate contacts CLOSE [%] 0 % to" parameter.
• Intermediate contact OP	the position of the actuator is between the position set in the "Intermediate contacts OPEN [%]" parameter and 100 %.
• Fault motor temperature	the maximum motor temperature has been exceeded.
• Warning motor temp.	the motor warning temperature has been exceeded (not for 2SG7).
• Fault external voltage	low voltage or high voltage has been detected, or power supply has been failed.
• Maintenance	a maintenance period has elapsed.
• Run indication CLOSE	the actuator operates in direction CLOSE.
• Run indication OPEN	the actuator operates in direction OPEN.
• Run indication OPEN/CLOSE	the actuator operates in direction OPEN or CLOSE.
• Blinker + end position CL	the actuator operates in direction CLOSE and when the actuator has cut-off in the CLOSED end position. During operation the signal changes between "high" and "low" state every 2 sec.
• Blinker + end position OP	the actuator operates in direction OPEN and when the actuator has cut-off in the OPEN end position. During operation the signal changes between "high" and "low" state every 2 sec.
• Travel end CLOSE	For travel dependent cut-off : Position 0 %, resp. 100 % reached, or
• Travel end OPEN	For torque dependent cut-off: inside the respective end position range.
Level:	
• NO	i.e. 24/48 V DC signal = active.
• NC	i.e. 0 V signal = active.

Signaling set:	For ECOTRON, it is possible to choose between four different output signal sets with five fixed signals each.
	Level NO (i.e. 24/48 V DC signal = active) or NC (i.e. 0 V signal = active) defined for each signal cannot be changed.
• [1] [2] [3] [4]	Signals and levels are displayed under "Output 1" to "Output 5":

	1		2		3		4	
	Travel end OPEN	NO	End position OPEN	NO	End position OPEN	NO	Travel end OPEN	NO
	Travel end CLOSE	NO	End position CLOSED	NO	End position CLOSED	NO	Travel end CLOSE	NO
	Torque CL/OP reached	NC	Blinker	NO	Fault	NC	Ready + Remote	NO
	Ready + Remote	NO	Ready + Remote	NO	Local	NO	Torque OPEN reached	NC
	Warning motor temp.*	NC	Warning motor temp.*	NC	Warning motor temp.*	NC	Torque CLOSE reached	NC
	* for 2SG7 "Fault motor temperature"							

Hold setting	
• ☐	Parameterization of the signal outputs can be changed.
• ☑	Adjusted parameterization of the signal outputs is retained until COM-SIPOS PC parameterization program is quit or deactivated. During "Read parameter" of another actuator, the parameterization of the signal outputs of the latter is not considered and the stored parameterization is accepted.

Intermediate contacts

CLOSE [%] 0 % to	The output signal "Intermediate contact CL" is active within the range between 0 % and the set value.
OPEN [%] … to 100 %	The output signal "Intermediate contact OP" is active within the range between the set value and 100 %.

Analog output 1 (AO1)

Depending on the application and activated software function, this analog output can be used e.g. for the **position actual value** or for **process actual value** (if process controller is active)**.**

Output value:	
• Position actual value	
Range:	
• 4 – 20 mA	Detection of open-circuit is possible (live zero).
• 0 – 20 mA	Detection of open-circuit not possible (dead zero).
Slope:	
• rising	0 % = 0/4 mA, 100 % = 20 mA.
• falling	0 % = 20 mA, 100 % = 0/4 mA.

Analog output 2 (AO2)

Depending on the application and activated software function, this analog output can be used e.g. for **output for the process actual value.**

Output value:	
• Process actual value	
Range:	
• 4 – 20 mA	Detection of open-circuit is possible (live zero).
• 0 – 20 mA	Detection of open-circuit not possible (dead zero).
Slope:	
• rising	0 % = 0/4 mA, 100 % = 20 mA.
• falling	0 % = 20 mA, 100 % = 0/4 mA.

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Tab sheets for parameters and current values

7.4 Security

Motor temperature warning (max. 155 °C)	Limit temperature for the "Warning motor temperature" signal (not for 2SG7).
Motor temperature protection	Indicates whether the motor protection is active or not active (not for 2SG7). ☞ The motor protection can only be switched off for PROFITRON/HiMod und only via the Drive Controller at the actuator!

Motor heating	Here, you can activate the motor heating that ensures an average temperature of the motor of approx. 5 degrees C above the ambient temperature, thus preventing condensation. ☞ The motor heating is recommended if the actuator is used in extremely fluctuating climatic conditions!
Error remote source	Here you can program the response to a detected open circuit. All inputs of the current remote control source (analog or fieldbus) are monitored. The possible settings are:
• keep position	Stay in current position.
• move to em. pos.	Move to parameterized EMERGENCY position.
• keep process act. value	The current actual process value is retained (process controller only).
• move to fixed proc. setp.	The fixed process setpoint is approached and retained (with process controller only).
• Execute last command	Last command is executed. This setting is only useful for control via fieldbus.
EMERGENCY position [%]	When the emergency command is active or open circuit is detected, if the "Error remote source". parameter is set to "**move to em. pos.**", the actuator automatically moves the valve to this position.

Close tightly	If within an end position range of the remote control command in direction of this end position is activated, the internal travel command remains activated until torque-dependent cut-off has been effected or until a remote control command in the opposite direction has been given. The "close tightly" function is only possible in conjunction with the "torque-dependent cut-off" mode. ☞ If the internal positioner "…: Positioner …"or process controller "…: Process controller …" is used in conjunction with "travel-dependent cut-off", the control pulse is also extended until the end position (0 %/100 %) is reached, in the same way as with the "Close tightly " function!
Move again, **if blocked in move**	Automatic retry (max. 5x) to get over torque block (when outside travel limit range), 0 – 5 adjustable, 0 ➔ no repeated start.

Valve maintenance periods

☞ These maintenance limits have nothing to do with maintenance for the actuator and are only intended for maintenance planning of the valve!

Switching cycles	These settings can be used to define maintenance intervals at which the actuator should activate the "maintenance" signal. Intervals can be set for "**Switching cycles**" and/or "**Torque cut-offs**" and/or "**Motor operation hours**".
Torque cut-offs	
Motor operation hours	

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Tab sheets for parameters and current values

7.5   Other

Display language	Language of the texts in the actuator display.
Display orientation	
• 0°	Depending on the mounting position, the display content can be turned for easier readability.
• 90° clockwise	Default setting is 0°.
• 180°	
• 90° anticlockwise	
Standby screen	If the Drive Controller is not operated for the set standby time, the display illumination will be reduced and the display will change to the standby screen:
• Standard	Status display
• Position	Display of the position in% or symbol for OPEN or CLOSE in an end position.
• Position+Filling	Display of the position in% and with a level indicator.
• Position+Bar+Status	Display of the position in % and of a position bar and display of the actuator status.
• Fast to LOCAL	Pressing the Drive Controller in standby mode causes a switch-over to LOCAL mode and the travel direction can be selected immediately and the actuator operated.
• Latching function	If the Drive Controller is held down for longer than 3 seconds during local operation, 'Latching' appears in the display and the actuator continues to operate after the drive controller is released until the end position or the target position is reached or the Drive Controller is pressed again.
If the actuator is not to continue moving after the Drive Controller is released, then deactivate the Latching function.
Default setting is not active.
Standby time [min]	Time from the last operation until switching to the standby screen. Default setting is **10 min**.

DC brake [%]	A value not equal to „0 %" triggers the DC brake via the integral frequency converter. The higher the value, the higher the DC braking current is set. For a value of „0 %", the speed of the motor is reduced as quickly as possible to a standstill via the frequency converter. For nearly all operation points, this is the quickest way to achieve a standstill. We therefore recommend maintaining the default settings.
• 0 – 250	Default setting is **0 %**.
Rise time [s]	Ramp-up time from standstill to a predefined frequency. The shorter the time, the higher the acceleration of the motor (→ fast control, higher load on actuator and valve) and the higher the line current.
• 0.1 – 1 (2SA70/3) • 0.1 – 2 (2SA75/8)	Time from motor switch-on to reaching a reference speed; influences the control accuracy/ switch-on duration. Default setting is **0.5 s**.

Deadband positioner

The positioner is an adaptive positioner, i.e. the deadband (response threshold) is continuously and automatically adapted to the controlled system. Depending on the process requirement, the minimum and maximum values of the dead band can be set.

Deadband min. [%]	0.2 – 5 Default setting is **0.2 %**.
Deadband max. [%]	0.2 – 5 Default setting is **2.5 %**.

Proportional move

☞ This function is only available with positioner with set control mode "Binary: Proportional move" or "Fieldbus: Proportional move"!

The run time (positioning time from one end position to another) is required for proportional move. The actuator is able to determine this value, or the user performs a measurement and presets the value.

Runtime for proportional move:	
• Autom. detection	Automatic determination of run time.
• User-defined	Run time is defined by the user.
Determined CLOSE [s] **Determined OPEN [s]**	After a new end position adjustment or change of the ramp-up time, the run time is determined anew. For correct determination, the actuator must be operated at least 3 % in one direction of the total travel.
User-defined CLOSE [s] **User-defined OPEN [s]**	The run times for OPEN and CLOSE can be subject to different settings. Possible setting for the operating time: 5 to 3276 s. Default setting is **60 s**.

Fault signal power supply

Delay time until "Low voltage" or "Power supply fault" fault signal is set.

Delay time [s]	If the mains voltage exceeds the tolerance of -30 % / +15 % the fault signal will not be set until the delay time has expired. Possible setting for the delay time: 0 to 25 s. Default setting is **6 s**.

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Separate mounting

☞ ┃ Correct parameterization is important for fault-free operation of the actuator!

Cable length exceeding 10 m and connection via LC filter	For incorrect setting, a block might not be detected and the actuator switches off at lower torque.
• ☐	Setting if no separate mounting or separate mounting of less than 10 m is used.
• ☑	Setting for separate mounting with cable length larger than 10 m with LC.

End position speed

• Normal	Depending on the type, the actuator operates at fixed speed within the end position ranges.
• Quick Start	The actuator immediately operates at the parameterized speed OPEN or CLOSE from an end position. If the end position cut-off mode is set to "torque-dependent", this happens after approx. 1 sec.
• Quick Start/Stop	Leaving an end position is identical to the"Quick Start" setting. When approaching an end position, the actuator operates at the parameterized OPEN or CLOSE speed within the end position ranges until close to the end position and comes to standstill at reduced speed without overriding the end position. ☞ ┃ "Quick Stop" is not active for torque-dependent cut-off mode! If the end position cut-off mode is set to "torque-dependent", the actuator operates to this end position at a fixed speed (type dependent).

DCS Acceptance time

Should the DCS cancel an operation command, the actuator may still continue its operation if e.g. the "Close tightly" function is activated or "Remote control" is set to "Proportional move".
Should the end position be reached due to the continued operation or torque-dependent cut-off mode occur both within the end position range and the set acceptance time, the respective indication ("End position …" or "Torque … reached") is signaled to the DCS.
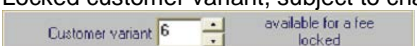
Outside the set acceptance time and for "0" setting, a signal to the DCS will only be sent once an operation command in the same direction is issued.

Acceptance time (s)	Possible setting for acceptance time: 0 to 25,5 s. Default setting is **25.5 s**.

Customer variant

⚠ | **Unauthorized setting of customer variants can lead to damage to the actuator/valve/plant!**

Customer variant	Customer specific programming varying from standard firmware is coded with a number different from "0" (see appendix to instruction manual for specific customer variant).
	Some customer-specific software programming is not free of charge.
	The activation of such a customer variant is stored in the firmware on actuator delivery and remains available after a firmware update!
	Customer variants subject to charges are displayed and whether they are activated or not:
	- Unlocked customer variant, subject to charges: Customer variant 6 ▲▼ available for a fee unlocked
	- Locked customer variant, subject to charges: Customer variant 6 ▲▼ available for a fee locked
	Any locked customer variant may be activated at a later date by entering the appropriate PIN (subject to charges!) at the actuator.
Parameter 1	Certain customer-specific programming options have variable setting values. Via "**Parameter 1**" to "**Parameter 4**", the variables can be set in accordance with the specifications in the supplementary operation instructions of the customer variant.
Parameter 2	
Parameter 3	
Parameter 4	

Special parameters

Limitation DC-link voltage	During actuator standstill, the continuously high connection voltage (operating voltage exploiting the voltage tolerance of up to +15%) will increase the DC-link voltage. This is limited electronically to a permissible value.
	☞ | Deactivating this function is only useful for very specific plant conditions and should only be performed after consulting SIPOS!
	Default setting is **on**.
• on	switched on.
• off	switched off.
Runtime monitoring	The maximum run time for completing the travel is determined during the first operation after end position setting and is saved in the actuator.
	During future operation, it will be checked whether the position reached in a certain run time is plausible. If this is not the case, the actuator signals a „Run time error".
	Default setting is **on**.
• on	switched on.
• off	switched off.

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Tab sheets for parameters and current values

Bluetooth

Bluetooth	PROFITRON/HiMod are equipped with Bluetooth. It is possible to activate or deactivate Bluetooth. Bluetooth is active by default.
• not active	Bluetooth-Modul is not active.
• active	Bluetooth-Modul is active.
USB	PROFITRON/HiMod are equipped with a USB interface. It is possible to activate or deactivate the USB interface. By default, the USB interface is active.
• not active	USB-Interface is not active.
• active	USB-Interface is active.

Torque measurement flange

If a torque measurement flange is mounted, the analog input for connection to the actuator and the torque measurement flange type can be selected.

Connection	
• not available	No torque measurement flange mounted or the signal is not evaluated via the actuator despite a mounted torque measurement flange.
• Analog input AI1 • Analog input AI2	Signal evaluation and visualization of the torque curve are performed via the actuator. The analog input, to which the signal cable was connected, must be entered here. The current torque is shown in the "C+M" tab sheet. In the "Torque curve" tab sheet, the torque characteristics CLOSE to OPEN and from OPEN to CLOSE can be recorded, saved and represented via "Read torque curve".
Type • 120 Nm (2SX7100-6A..) • 500 Nm (2SX7100-6B..) • 1000 Nm (2SX7100-6C..)	Selection of the torque measurement flange to be considered by the actuator software.

Remote control unit

The remote control unit RCU provides the option to operate an actuator from a distance of up to 100 m and thus has the function of a second local control unit.

The actuator must be prepared for using a remote control unit.
Data exchange between actuator and remote control unit is made via a RS485 connection with just one 2/4-wire fieldbus cable.

☞ | When connecting the remote control unit, the two termination resistors must be set to ON!

Mode	Activate the "Remote control unit" function both at the actuator and the remote control unit.
• Actuator	The device set here is the actuator.
• Remote control unit	The device set here is the Remote Control Unit.
Baudrate • 6 Mbit/s • 3 Mbit/s • 2 Mbit/s	Depending on the connection quality of the data exchange between the actuator and the remote control unit, 3 transmission speeds can be selected. ☞ | Should the connection quality not be sufficient reduce baud rate! Default setting is **6 Mbit/s**.
Active	The function „Remote Control Unit" can be switched ON and OFF.
• no	The function „Remote Control Unit" is switched OFF.

• yes	The function „Remote Control Unit" is switched ON.

7.6   Software functions

Process controller

The process controller is implemented as PI-controller. The process controller output is used as setpoint for the internal positioner.

Depending on the version, the setpoint feed for the process controller differs (process setpoint) and is programmed via the "Remote control" and/or "Alternative control mode" parameter, see chapter 7.3.

Gain (Kp)	Gain K_p can be set within the range of -1.00 to +1.00. Default setting is **0.**
Reset time (Tn)	Reset time T_n can be set within the range of 0.1 – 3000.0 s. Default setting is **100 s**.
Fix setpoint [%]	Fixed percentage specification of the process setpoint for the process controller.

Split range function

The split range function controls two and more actuators in series with just one analog signal 0/4 – 20 mA. A programmable portion of the analog signal is attributed to each actuator. The most prominent application is the bypass setup of two actuators.

With the split range function, the analog signal 0/4 – 20 mA can also be used for control in a parameterizable part of the travel.

The range is specified by entering a value pair (input current [mA] and the respective position [%]) for the start and another value pair for the end of range.

Position [% open]	Current value 1 for position 1
	(current value 1 has to be less than current value 2)
Current value [mA]	Current value 2 for position 2
	(position 2 has to be not equal to position 1)

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Tab sheets for parameters and current values

External analog output-speed-setpoint

Setting of the output speed setpoint (positioning time) via an analog input according to the settings in the "Inputs/Outputs" tab sheet.

The output speed follows the analog signal within the output speed range.

☞ | The **fixed** end position speed applies inside the **end position ranges** (type-dependent speed step)!

Speed LOCAL	The external analog output speed setpoint can be chosen separately for REMOTE and LOCAL operation.
• std. OPEN/CLOSE	With the "**std. OPEN/CLOSE**" parameter value the actuator operates
• via speed input	with set parameters **"closing speed"** and "**opening speed**".
Speed REMOTE	With the parameter value "**via speed input**" the actuator operates according to the setpoint signal 0/4 – 20 mA.
• std. OPEN/CLOSE	
• via speed input	☞ If the **EMERGENCY command** is present, the actuator is operated at the parameterized speed "Emergency speed CLOSE" or "Emergency speed OPEN" in the "Valve" tab according to the behavior set under "Error remote source" in "Security" tab!
Speed input	
• Analog input 1 (AI1)	If an analog input AI2 is available, you may decide at your own discretion whether the setpoint is to be defined via AI1 or AI2.
• Analog input 2 (AI2)	

Travel-dep. freely adjustable positioning times

This function enables positioning time definition with an accuracy of seconds of up to 10 consecutive sections of the travel.

The subdivision of the travel for operation in OPEN and CLOSE directions can be equal to "**One curve**" or different to "**Separate curves**".

"Separate curves" is activated in the following representation:

○ **One curve:** **CLOSE <-> OPEN**	Programming is performed from direction CLOSE to direction OPEN.
◉ **Separate curves:** **OPEN -> CLOSE -> OPEN**	Parameterization is performed from 100 % OPEN to CLOSED and then back to 100 % OPEN again.

By defining up to 10 value pairs ("position [% OPEN]" and "Pos.time [s]") the required positioning times may be set according to the process. An entered positioning time t_n describes the time from the last entered position x_{n-1} to position x_n.

Position [% open]	Position in % of travel.
Pos.time [s]	Operating time in seconds for operation from the last to the position of this value pair.
Speed LOCAL	The positioning time settings can be specified separately for LOCAL, REMOTE and EMERGENCY mode.
• std. OPEN/CLOSE	The operating times set "**via positioning time curve**" or
• via positioning time curve	"**via EMERGENCY curve**" are achieved using "soft pulsing".
Speed REMOTE	Actuator operates according to the mean speed, calculated on the basis of the curve data.
• std. OPEN/CLOSE	For setting "**std. OPEN/CLOSE**" or "**emerg.speed OPEN/CLOSE**", the actuator operates at the speeds parameterized in the "Valve" tab.
• via positioning time curve	
Speed EMERG.	
• emerg.speed OPEN/CLOSE	
• via EMERGENCY curve	
factor emerg. curve	Factor for faster (values < 1) or slower (values > 1) operation during EMERGENCY control. All positioning times adjusted in the curve are multiplied by this factor.
Curve	Click this button to view the evolution of the travel-operating time curve.
Positioning time curve in the actuator is valid	
• ☐	Settings are not yet stored within the actuator.
• ☑	Settings were read out from the actuator.

Tab sheets for parameters and current values

Travel dependent output speed adjustment

The function enables linearization of the valve curve by defining different speeds during operation from CLOSED to OPEN and vice versa.

☞ The **fixed** end position speed applies inside the **end position ranges** (type-dependent speed step)!

The speed curve is specified by entering up to ten value pairs:
Position [% open] in 1 % increments and output speed [rpm].

The speed curve is completely parameterized when the next interpolation point produces a lower percentage value for the actuating distance (e.g. default value 0 %).The speed of the last active interpolation point is valid until reaching the end position range OPEN.

Position [% open]	Position in % of travel.
Output speed [rpm]	Output speed selectable within the speed range: - for ECOTRON out of 7 possible speeds - for PROFITRON continuously in 2.5% increments between 12.5 to 100% n_{max}.
Speed LOCAL • std. OPEN/CLOSE • via n curve **Speed REMOTE** • std. OPEN/CLOSE • via n curve	The speed settings can be defined separately for LOCAL and REMOTE mode. For "**via n curve**" setting, the actuator runs at travel-dependent parameterized speeds. For setting "**std. OPEN/CLOSE**", the actuator operates at the speeds parameterized in the "Valve" tab. ☞ If the **EMERGENCY command** is present, the actuator is operated at the parameterized speed "Emergency speed CLOSE" or "Emergency speed OPEN" in the "Valve" tab according to the behavior set under "Error remote source" in "Security" tab!

7.7 Fieldbus

Indications for version with PROFIBUS:

For detailed descriptions on the indicated values, see operation instructions for PROFIBUS DP (order no. Y070.401/EN) or Modbus RTU (order no. Y070.400/EN).

Settings

The following communication parameters can be set separately for each channel:

MODBUS

Address	Enter the bus address (default works setting is 247).
Baudrate [bit/s]	Possible setting for the transmission rate: 300 to 115200 Baud. Default setting is **19200 Baud**.
Parity	
• even 1 stop bit	Even parity or odd parity with 1 stop bit or no parity with 2 stop bits can be set.
• odd 1 stop bit	Default setting is **even 1 stop bit**.
• none 2 stop bits	
Moni.time [s]	The connection control time can be adjusted between 0 and 25.5 s. Default setting is **3 s**.

PROFIBUS

Address	Enter the bus address (default works setting is 126).
PZD 3	Process data range: When choosing the PROFIBUS telegram PPO2, here the data can be defined that is always to be transferred in the cyclic PROFIBUS telegram as PZD 3 to PZD 6.
PZD 4	
PZD 5	
PZD 6	

HART

Address	Enter the bus address (default works setting is 0).
Moni.time [s]	The connection control time can be adjusted between 0 and 3600 s. Default setting is **0 s**.

State of Fieldbus

☞ | Cyclic data update "**Polling**" must be activated!
The cyclic data update is signaled by "POLLING" in the status bar:

POLLING

The fieldbus status is monitored during bus operation and indicates the cyclically updated bus communication status.

MODBUS

Active BUS channel	Indicates the active channel during data exchange; otherwise 0.
BUS channel …	For each channel, "BUS channel 1" and "BUS channel 2", the status of the respective channel is displayed:
• No communication	No communication established.
• Baud rate OK	Set communication parameters are OK.
• Data Exchange	Cyclic data exchange with Modbus-Master.

HART

HART Connection Type	
• Current Output	Communication via analog output AO2.
• Actuator	Communication via analog input AI2.
Wireless-Mode	Wireless-Mode is possible if the actuator has a wireless adapter on the customer connection and the setting "Current Output" is chosen.
• no	Wired communication.
• yes	Wireless communication.
Communication	
• not active	The communication viaHART is not active.
• active	The communication viaHART is active.
• Data Exchange	Cyclic data exchange with the actuator ongoing.

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Tab sheets for parameters and current values

PROFIBUS

Active BUS channel	Indicates the active channel during data exchange; otherwise 0.
BUS channel … kbit/s	For each channel, "BUS channel 1" and "BUS channel 2", the transmission rate in kbit/s and the status of the respective channel is displayed:
• Wait Prm	Waiting for parameterization telegram.
• Wait Cfg	Waiting for configuration telegram.
• Data Exchange	Cyclic data exchange with PROFIBUS-Master.
• Fail Safe	Safety telegrams from the master. The actuator remains in the "Data Exchange" state and reacts according to its parameterization.
• GC-Clear	(Global-Control-Clear): Status message by the master. Actuator behavior identical to "Fail Safe".

PROFIBUS DP-V2 redundancy

Redundancy in accordance with PNO 2.212.

Type of redundancy	The following redundancy types are supported:
• SIPOS redundancy	The actuator decides which channel is active (primary).

• PNO redundancy	The master decides which channel is active (primary).
	Within the PNO redundancy, the following distinction is made:
	  - Flying redundancy (no cable redundancy etc.).
	  - System redundancy (cable redundancy is possible and the master can also communicate with the passive channel (backup) etc.).
	After switching on, the actuator is always in the SIPOS redundancy mode.

State of redundancy channel …	The states for "Channel 1" and "Channel 2" are only indicated for PNO redundancy:
	  - PTB stands for **P**rimary **t**o **B**ackup switchover.
	  - BTP stands for **B**ackup **t**o **P**rimary switchover.

• POWER_ON	Initializing.
• S_WAITING	Channel is offline and not ready for communication.
• S_PRIMARY	Channel is online and ready for communication.
• C_CONFIGURE	MS2 connection active.
• BACKUP	Channel is backup.
• BTP_PARTNER_ACK	Start channel switchover (offline for address change).
• BTP_SWITCHOVER	Waiting for SwitchoverDone message.
• BTP_PRM_CMD	Waiting for PrmCmd with primary request.
• BTP_DX	Waiting for first DataExchange-Telegr. Master.
• PRIMARY	Channel is primary.
• PTB_PARTNER_ACK	Start channel switchover (channel is offline).
• PTB_SWITCHOVER	Waiting for SwitchoverDone message.
• NIL	Transition state.
Output Holdtime [ms]	Time for channel switchover (PNO redundancy only). During the channel switchover, the outputs are held for this time.

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Tab sheets for parameters and current values

PROFIBUS DP-V2 timestamp [TS]

Timestamp in accordance with PNO 2.192.

State TS Primary channel [ ]
State of the timestamp for the active channel (primary) [channel 1] or [channel 2] is indicated in the following:

Time synchronization OK	Time synchronization received and timestamp started.
• 🟢	OK.
• ⬜	not OK
Timestamp started	Requirements for timestamp fulfilled, i.e. "Time AR Block received", and "Master in operate" have been received and "User - PRM - Data with TS-enable" is activated.
• 🟢	started
• ⬜	not started
Time AR Block received	By means of the "Time AR" parameter block included in the SetPrm telegram, the master indicates the intervals for time synchronization.
• 🟢	received
• ⬜	not received
User - PRM - Data with TS-enable	By means of the "User_Prm_Data" parameter block included in the SetPrm telegram, the master indicates whether the timestamp is activated.
• 🟢	activated
• ⬜	not activated
Master in operate	Master is in the "Operate" state and the actuator (slave) has received the "Global control operate" telegram.
• 🟢	received
• ⬜	not received
Time synchronization received	The time synchronization is transmitted in 2 steps: - Master sends TimeEvent and - Master sends ClockValue telegram stating the time when the TimeEvent telegram was sent.
• 🟢	Time synchronization received within the given time interval.
• ⬜	Time interval not observed.
Buffer overflow	Time stamped messages are buffered during a channel switchover since data exchange between master and slave is not possible during that time. Simultaneous messages (max. 17 messages) are written to a data record. Should more than 15 data records be written during switchover, this will be indicated in red. Only the first 15 data records are transmitted.
• 🔴	Buffer overflow
• ⬜	No buffer overflow
TS state Ch…	Internal information only! Indicates states/faults for "TS state Ch1" and "state Ch 2"in the firmware.

7.8 Torque curve

Torque reference curves

Pre-emptive valve maintenance is possible through comparison of up to 3 recorded torque reference curves recorded in time intervals. The recorded values are not the absolute torque values, only reference values. They can deviate from the absolute values especially in the end positions and when changing output speeds.

The torque reference curves can be displayed with COM-SIPOS.

A comparison of the reference curves is only possible for identical actuator settings and the same conditions in the valve.

In the example shown below a significant increase of the required torque can be seen for CLOSE direction (curve 3 blue).

☞ **Prerequisites are:**

■ Actuator type: 2SA7 in PROFITRON or HiMod version!

■ The actuator is mounted on the valve!

■ Actuator is ready for operation!
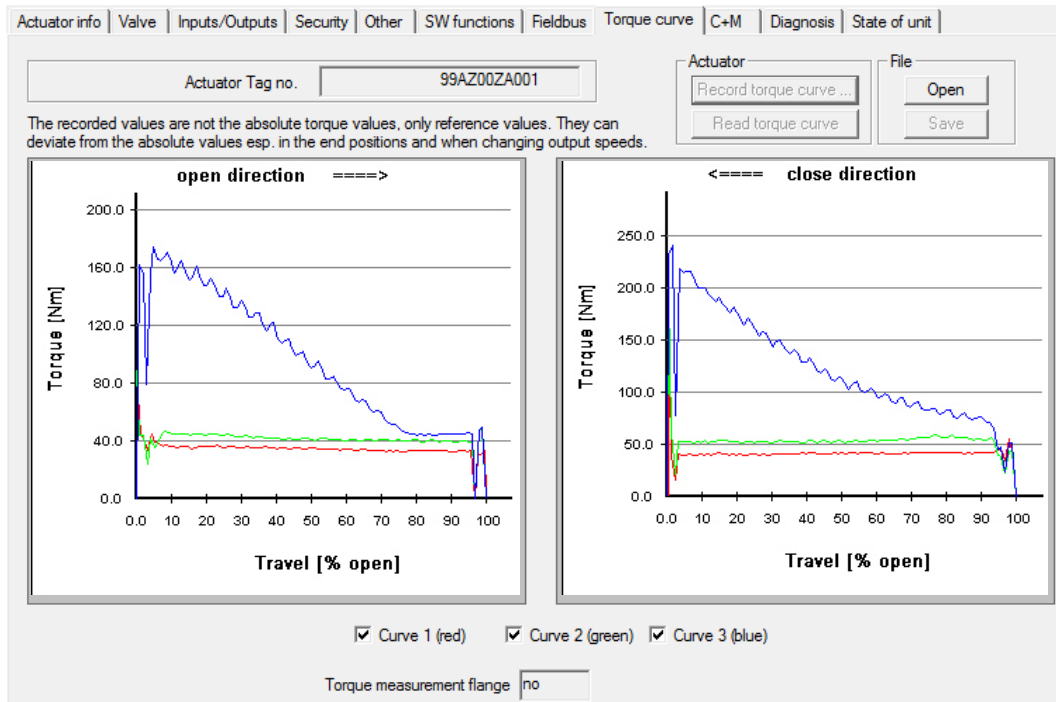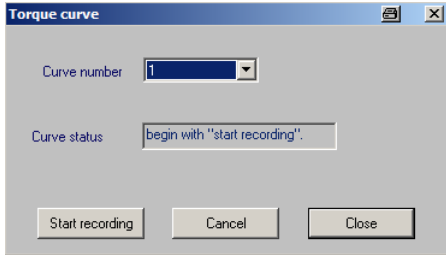
Torque measurement flange	Indicates whether a torque measurement flange is connected.
	If a torque measurement flange is connected, the highly precise values measured by the torque measurement flange are used to determine the torque curve.
	The settings for recording the torque curve using a torque measurement flange are performed in the "Other" tab sheet.

Actuator

Record torque curve	Click "**Record torque curve**" to open the dialog window for recording torque reference curves.
	After "**Start recording**", the actuator runs to the CLOSED end position then to the OPEN end position and back to CLOSED end position. The status of the recording is displayed in the "Curve status" field. In case of a fault: "**is not possible**" is displayed. After recording, the data is stored in the actuator memory and must be read for visualization via "**Read torque curve**".

Read torque curve	After clicking on "**read torque curve**" all 3 possible torque reference curves are read out (not recorded curves are neglected) and then displayed in the "Torque curve" tab sheet.

File

With this option, recorded torque curves can be saved or opened for viewing under the "Torque curve" tab sheet.

Open	**Open torque curve file** Standard file menu box appears. The data is read out from the file and displayed as torque curve in the "Torque curve" tab sheet.
Save	**Save torque curve as file** The curve data is saved in ASCII format.

7.9   C+M (Control and Monitoring)

| Actuator info | Valve | Inputs/Outputs | Security | Other | SW functions | Fieldbus | Torque curve | C+M | Diagnosis | State of unit |

DCS
DCS-Setpoint	82.0 %
DCS-Actual value	82.0 %

Position
Setpoint	82.0 % OPEN
Actual value	82.0 % OPEN

Analog inputs
AI1	-0.2 mA
AI2	0.1 mA

Current control by	local
Control	no
Actual output speed	0 rpm
Cut-off	no
Intermediate contact CLOSE	not active
Intermediate contact OPEN	not active
Failure behaviour	not active

Process actual value	0.0 %
Motor temperature	32 °C
Motor temperature warning	not active
D.C. link voltage	333 V
Motor current	0.0 A
Electronics temperature	36 °C

Binary inputs
CLOSE	low
OPEN	low
STOP	low
EMERG.	low
Mode	low

Analog output
AO2	0.0 mA

[Polling]

Operate
[CLOSE] [OPEN] [STOP]   [EM]
[LOCAL / REMOTE]

ATTENTION! Actuator also operates in case of communication interruption!

Torque measurement flange
Current value	Offset
0.0 Nm	-243.3 Nm

[Zero adjust]
[Reset Zero adjust]

DCS

☞ This field is only displayed for control with positioner with parameterized "Valve curve adaptation" to "**Equal percentage**" or "**Quickt opening**", see "**Inputs/Outputs**" tab!

DCS-Setpoint %	The setpoint definition of the DCS is proportional to the desired flow rate in accordance with the fixed valve curve.
DCS-Actual value %	The actual value signaled to the DCS either corresponds to the valve position or the flow rate within the valve, depending on the parameterization.

Position

Setpoint % OPEN	Setpoint definition for the travel position in % OPEN.
Actual value % OPEN	Current position value in % OPEN.

Current control by	
• remote	Current control mode of the actuator (REMOTE / LOCAL).
• local	
Control	
• close	Operation command in CLOSE direction is present.
• open	Operation command in OPEN direction is present.
• no	No operation command is present.
Actual output speed rpm / sec/90°	Actual output speed (2SA7) or actual positioning time (2SG7 and 2SQ7). ☞ If an additional gear was parameterized, the following unit will be displayed - Rotary gearbox: … speed [rpm], - Part-turn gearbox: … positioning time [sec/90°], - Linear thrust unit: … positioning speed [mm/min]!

Cut-off	
• End position …	Indication "End position CLOSED" or "End position OPEN" for travel- or torque-dependent cut-off within the end position range.
• Torque … reached	Indication "Torque CLOSE reached" or "Torque OPEN reached", if blocked in move.
• no	Indication "no", if actuator is operated or stopped.
Intermediate contact …	"Intermediate contact CLOSE" or "Intermediate contact OPEN".
• active	Indication whether the intermediate contact for OPEN or CLOSE parameterized for PROFITRON/HiMod has been exceeded or fallen short of. The indication is displayed for ECOTRON if 2 % have been fallen short of or 98 % of the travel haven been exceeded.
• not active	Intermediate contact was not exceeded or fallen short of.
Failure behavior	
• not active	Connection to the DCS is OK.
• active - move to em.pos.	"**active-…**" is indicated once a fault at the control source has occurred, e.g. for open circuit behavior (see "**Security**" tab under "**Error remote source".**
• active - keep process act. value	
• active - move to fixed proc. setp.	
Process actual value %	Actual process value in %.
Motor temperature °C	Indicates the current motor temperature in °C (not for 2SG7).
Motor temperature warning (not for 2SG7)	
• active	Indicates that the motor warning temperature has been exceeded
• not active	Indicated until the parameterized motor warning temperature has been reached (see "**Security**" tab "**Motor temperature warning at [°C]**").
D.C. link voltage V	The supply voltage applied is first rectified and smoothed. The resulting voltage is the DC link voltage (≈ supply voltage x 1.41 (1 phase) or x 1.35 (3 phase)).
Motor current A	Current DC voltage link current in A.
Electronics temperature °C	Indicates the current electronics temperature in °C.

Analog inputs

AI1 mA	Analog inputs for PROFITRON/HiMod (input current in mA) are displayed independent of their use, if available as hardware. This helps during commissioning and troubleshooting (e.g. normalization of analog signals, disturbed signals, wiring check).
AI2 mA	Analog input 2 (AI2) is located on an additional module only fitted on the control PCB for a certain software function or combinations of software functions, e.g. passive supply of actual position value, process controllers, etc.!

Binary inputs

CLOSE	Binary inputs (states "low"/"high") are displayed independent of their use. This helps during commissioning and troubleshooting (e.g. disturbed signals, wiring check).
OPEN	
STOP	
EMERG.	
Mode	

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Tab sheets for parameters and current values

Analog output

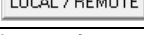| AO2 mA	Analog output 2 for PROFITRON/HiMod (output current in mA) is displayed independent of its use, if available as hardware. This helps during commissioning and troubleshooting (e.g. normalization of analog signals, disturbed signals, wiring check).
	☞ Analog output 2 (AO2) is located on an additional module only fitted on the control PCB for a certain software function or combinations of software functions, e.g. passive supply of actual position value, process controllers, etc.!

Cyclic data update

Polling	After the download of the actuator parameters using "Read parameters", the current parameters at the time of reading out are displayed. Use the "**Polling**" button to request the data of the "C+M" tab sheet cyclically from the actuator and to have them displayed as current values in "C+M". The cyclic data update is signaled by "**POLLING**" in the status bar:
	POLLING
	This function is of particular interest when diagnosing the actuator during remote operation. Click the respective button once again to stop the cyclic data update.

Operate

☞   A cyclic data update is signaled by "POLLING" in the status bar:
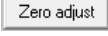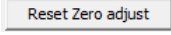
POLLING

CLOSE OPEN STOP LOCAL / REMOTE	It is possible to control the actuator via the displayed buttons when the actuator is set to LOCAL mode.
EM	Click the "**EM**" button to approach the EMERGENCY position.

Torque measurement flange

Current value Nm	Indicates the current torque in Nm.
	☞ Depending on both mounting conditions and temperature, a zero shift might occur so that even under no-load conditions, a torque, the so-called offset, is applied. Under no-load condition, this value can be set to "0" using the "Zero adjust" button!
Offset Nm	Indicates the offset in Nm after completed zero adjustment.
Zero adjust	Click button to perform zero adjustment for zero offset (torque indication under no-load condition).
Reset Zero adjust	Reset to default value (12 mA = 0 Nm).

7.10   Diagnosis

All diagnostic data is displayed.

Operating data actuator

This data is collected and permanently stored in the RAM. Every 24 hours the data is written to the internal EEPROM for backup purposes; all data is safe, even in case of power failure.

Switching cycles	Total number of switching cycles since first start-up
Switching cycles/h	Average number of switching cycles/hour calculated from the last 10 minutes
Torque cut-offs	Total number of torque-dependent cut-offs since first start-up
Travel cut-offs	Total number of travel-dependent cut-offs since first start-up
Motor operation hours	Total number of motor operating hours since first start-up
Electronics operation hours	Total number of electronics unit operating hours since first start-up
Cycles per hour	Relative operational time during the last 10 minutes

Valve maintenance limits

Switching cycles	When reaching one of the 3 maintenance interval limits, the **Valve maintenance** "**necessary**" signal is generated:
Torque cut-offs	- Number of switching cycles reached,
Motor operation hours	- Number of torque dependent cut-offs reached, - Number of motor operation hours reached.

Valve maintenance

• not necessary	Indicates whether a maintenance limit has been exceeded or not.
• necessary	☞ | The maintenance limits have nothing to do with maintenance for the actuator and are only intended for maintenance planning of the valve!
Maintenance reset	Performed maintenance must be confirmed by clicking the "**Maintenance reset**" button. After a maintenance reset, the threshold value "Valve maintenance limits" for a new maintenance signal is increased by adding the current value "Actual data" to the previously set "Value maintenance periods". The "Value maintenance periods". can be defined on the "**Security**" tab sheet (see chapter 7.4).

7.11   State of unit

Status indication

Ready + REMOTE	
• 🟢	The actuator is ready for operation can be operated from "REMOTE" 🔧🖥⏻. ☞ | However, the "03 Blocked in move" fault may have occurred!
• ⬜	The indication is without color signal, if - the actuator is in control mode "LOCAL" 🔧🖥⏻, - one of the fault signals below is present.

Fault signals

⬜ (without color signal): There is no fault present.

🔴 (red):   An **error** is present.
                            ➔ action required to solve problems (see below).

The figures in front of the message refers to the type of fault and allows unambiguous identification by the service staff.

The first digit of the figure signifies:

0   = operational state;
1   = self-resetting fault;
2   = acknowledgeable fault;
3   = fault due to external causes;
4 / **5** / **6** = fault within the device.

For a detailed description of possible fault signals, refer to the table below.

7

Tab sheets for parameters and current values

01 Manual operation	Indication is displayed if: - Hand wheel/ crank is pressed or - Cable to the hand wheel is defective. → Pull hand wheel/crank and/or → Check cables and contact points electronics/gear (refer to the following assignment overview)!
02 EMERGENCY operation	An EMERGENCY signal is present. The parameterized EMERGENCY position is being approached.
03 Blocked in move	A blockage of has been detected in the travel. The actually required torque exceeds the tripping torque, or "Separate mount." parameter is set to ">10m with filter" although there is no LC-filter available. ☞ | The actuator can still be moved electrically in the opposite direction! → Check valve and torque setting, increase tripping torque if necessary or use the"Move again, if blocked in move" function and → Check MOV for sluggishness and → Check "Separate mounting" parameter!
04 Local blocked	Status signal only! LOCAL control can be disabled via field bus. In case of a fieldbus communication error, LOCAL control is automatically re-enabled.
11 Motor temp. too high	The motor has exceeded the maximum temperature of 155 °C. Possible reasons, e.g.: - Excessive ambient temperature, - Excessive run time, - Too many switching cycles, - Actually required torque too high, - Short- circuited motor coil or connection to the motor temperature sensor interrupted (2SG7 only), - Parameter for separate mounting ">10m with filter" not set. ☞ | The motor temperature monitoring can be deactivated by programming at the actuator (PROFITRON/HiMod only) (plant protection has priority over motor protection). However, the warranty for the motor immediately becomes void! → Check service conditions, valve and motor and → Check "Separate mounting" parameter!
12 Overvoltage	Mains voltage outside the tolerance +15 % → Check mains voltage and → Check mains voltage for variations!
13 Undervoltage	Mains voltage outside the tolerance -30 % → Check mains voltage and → Check mains voltage for variations!
14 Mains voltage	Mains failure or too low. → Check mains voltage! → Check power supply cable!

21 Run time error	After 3 % of the commissioning time, the actuator has cover less than 0.5 % travel. The positioning time is measured and saved for the set output speed for end position adjustment.
	Possible reasons:
	  - Potentiometer contacts in the plug/ socket connector were ejected (refer to the following assignment overview),
	  - Incorrect assembly and/or setting of the potentiometer after an exchange,
	  - Motor cable interrupted (motor is not running).
	  - Fault in position recording (the gear backlash between potentiometer and central wheel is too small or too large: no change of position is detected although the motor is running),
	  - Signaling gear ratio was changed:
	    - Signaling gear turns in the opposite direction or
	    - setting of the slidewheel (revs/stroke) in the signaling gear is to high,
	  - Actuator is blocked (actuator cannot be operated from position/end position),
	  - Faulty potentiometer (film is interrupted),
	  - Parameter for separate mounting ">10 m with filter" not set,
	→ Check valve, signaling gear, motor and potentiometer!
	→ Check "Separate mounting" parameter!

31 Set end positions	The indication may have the following reasons:
	  - End position adjustment has not yet been performed,
	  - End position was passed due to hand wheel operation,
	  - Friction coupling of the signaling gear was twisted or the signal gear ratio was changed or
	  - Cut-off type was changed (e.g. from torque-dependent to travel-dependent)
	→ Perform end position adjustment!

32 No signal AI1	This message is only possible for (4 – 20 mA) live-zero setting. Threshold I: 21 mA exceeded or below 3.6 mA. → Check input current!
33 Fault fieldbus	In fieldbus communication, an interruption has occurred (timeout). This error status is only signaled as a fault, if the remote control is performed via fieldbus. ☞ The bus address must deviate from the default setting (126 for PROFIBUS and 247 for Modbus)! → Check fieldbus communication and connection!
34 No signal – Pos. held	No signal from control source (cable break). The actuator holds position. The actuator is operable in „LOCAL" (e.g. hand wheel, emergency operation, alternative control mode). → Check cables and contact points in the round plug!
35 No signal – EMERGENCY pos.	No signal from control source (cable break). The actuator operates to EMERGENCY position. The actuator is operable in „LOCAL" (e.g. hand wheel, emergency operation, alternative control mode). → Check cables and contact points in the round plug!

7

Tab sheets for parameters and current values

36 Keep actual process value	No signal from control source (cable break). The actual process value detected during wire break is still controlled. The actuator can be operated in position "local" (e.g. hand wheel, emergency operation, alternative remote control mode). ☞ | After change-over to "REMOTE", the available actual process value will be controlled! ➔ Check cables and contact points in the round plug!
37 Move to fixed setpoit	No signal from control source (cable break). The actuator operates to the process controller's fixed setpoint and holds this. The actuator is operable in „LOCAL" (e.g. hand wheel, emergency operation, alternative control mode). ➔ Check cables and contact points in the round plug!
38 No signal AI2	This message is only possible for (4 – 20 mA) live-zero setting. Threshold I: 21 mA exceeded or below 3.6 mA. ➔ Check input current!
39 No signal FO	For fieldbus with ring-topology: No telegram received from one or both sides. ➔ Check cables and contact points!
41 No signal motor temp.	Connection to the temperature indicator interrupted. ➔ Check cables and contact points electronics/gear (refer to the following assignment overview)!
42 No signal potentiometer	No data is received from potentiometer. ➔ Check cables and contact points electronics/gear (refer to the following assignment overview) and ➔ Check cables for separate installation! ➔ Replace signaling gear!
43 No signal position encoder	No data is received from the position encoder (niP). ➔ Check cables and contact points electronics/gear (refer to the following assignment overview) and ➔ Check cables for separate installation! ➔ Replace non-intrusive position encoder!

44 End position overrun	Position of the central wheel is too close to the mechanical end stop of the signaling gear:
	   - The end positions have been exceeded by hand wheel operation or
	   - the friction coupling in the signaling gear was twisted or the signaling gear ratio was changed.
	 ➔ End position re-adjustment required!

45 No signal standstill sensor	No data is received by standstill sensor. ➔ Check cables and contact points electronics/gear (refer to the following assignment overview) and ➔ Check cables for separate installation!
46 Fault analog module	No signal is received from the analog add-on module. ➔ Check ribbon cable to analog add-on module, ➔ Turn power supply off and on (AC/DC)! If message persists, replace electronics unit.
47 Failure HART communication	Analog module defect. No HART communication possible. ➔ Turn power supply off and on (AC/DC)! If message persists, replace electronics unit.
48 Failure AO2	No output possible via AO2. ➔ Turn power supply off and on (AC/DC)! If message persists, replace electronics unit.
49 No signal AO2	Connection from AO2 to control system interupted. ➔ Check cables and contact points!

50 Fault hardware	Fault in the electronics. ➔ Turn power supply off and on (AC/DC)! If message persists, replace electronics unit.
55 EEPROM reset to default	Error in the parameter memory. Due to a fault (abort, power failure, USB cable pulled, etc.), not all changed settings were accepted when saving to the actuator. The relevant settings have been reset to the default value. ➔ Check settings!
60 Fault Bluetooth	Communication fault with Bluetooth module. The actuator still is ready for operation and can be programmed using the local controls or COM-SIPOS. ➔ Turn power supply off and on (AC/DC)! If message persists, replace electronics unit.
61 Fault electronics temperature	Elektronics temperature sensor defective. The actuator can still be operated. ➔ Turn power supply off and on (AC/DC)! If message persists, replace electronics unit.
62 Fault position encoder	Signal from the non intrusive position encoder (niP) is faulty; Position can not be detected. ➔ Check cables and contact points electronics/gear (refer to the following assignment overview) and ➔ Check cables for separate installation!
63 Fault DE switch	Signals from both torque switches are not recognized. ➔ Check cables and contact points electronics/gear (refer to the following assignment overview) and ➔ Check cables for separate installation!
80 Fault Remote control unit	No connection to the remote control unit. ➔ Check cables and contact points and ➔ Verify parameterization of the remote control unit at the actuator and at the remote control unit.!
90 Fault hardware	The signature of the control electronics PCB is either missing or faulty. If, for example, older actuators are equipped with firmware version V3.12 or higher, this fault signal will be displayed due to missing signature. ➔ Request a current control PCB version via service@sipos.de, stating the current parameterization (COM-SIPOS file).

Tab sheets for parameters and current values

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7

Tab sheets for parameters and current values

Former errors (no Polling)

Former errors	1 = last error 2 = error before last etc.
• 1	The last 5 errors are stored in the actuator.
• 2	
• 3	
• 4	
• 5	
Delete former errors	After successful reset of the current error, the error log can be deleted by clicking the "Delete former errors" button.

PC

Error reset	If an error is present, click this button to reset the error. Only errors which can be acknowledged, such as "Runtime error" are deleted. If there are no other faults, the actuator returns to the "Ready + Remote" signal, indicated by the green color.
Polling	After the download of the actuator parameters using "Read parameters", the current status of the unit at the time the parameters are read out is indicated. Use the "**Polling**" button to cyclically request parameters from the actuator and to indicate the current status of the unit. The cyclic data update is signaled by "**POLLING**" in the status bar: POLLING This function is of particular interest when diagnosing the actuator during remote operation. Click the respective button once again to stop the cyclic data update.

Assignment overview – plug element for gear unit connection
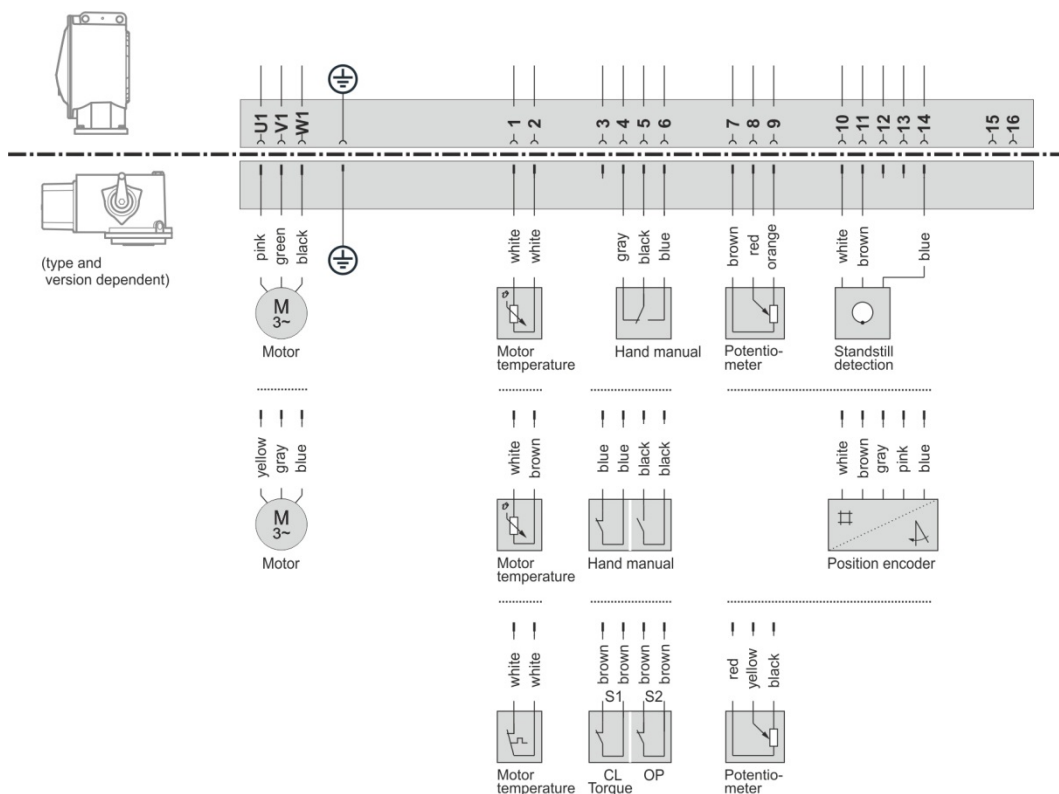
8 Checking the interface to DCS

The interface to the DCS can be checked by simulating the actuator outputs.

Use the "**Simulation actuator outputs**" command in the "**Actuator**" menu to select "DCS conv.", where you can check the connection to the DCS by means of simulated binary and analog output signals. Select "PROFIBUS telegram" to check the evaluation of telegrams within the DCS by means of freely programmable, simulated PROFIBUS telegrams.

- "**DCS conv. "**
  In the "DCS conv." simulation mode, the binary outputs can be set independent of the actuator status and therefore the connection between actuator and DCS can be checked.
  This function is very useful for checking the communication interface, even if the actuator has not been commissioned yet and no mains voltage is connected. E.g. it is possible to test the signal "actuator in end position CLOSED" without effectively moving the valve to the CLOSED end position.

- "**PROFIBUS telegram**"
  In the "PROFIBUS telegram" simulation mode, the output data of the actuator telegram can be set independent of the actuator status.
  Thereby, you can check the evaluation of the telegram in the DCS.

☞
- The correct transmission of binary and analog control system output signals to the actuator can be checked in the "C+M" tab sheet and the fieldbus status of the actuator can be checked on the "Fieldbus" tab sheet (see chapter 7.7 or. 7.9)!
- During simulation, cyclic data polling – indicated by "POLLING" in the status bar – must not be set (refer to chapters 7.7, 7.9 or 7.11)!

8.1 Start simulation
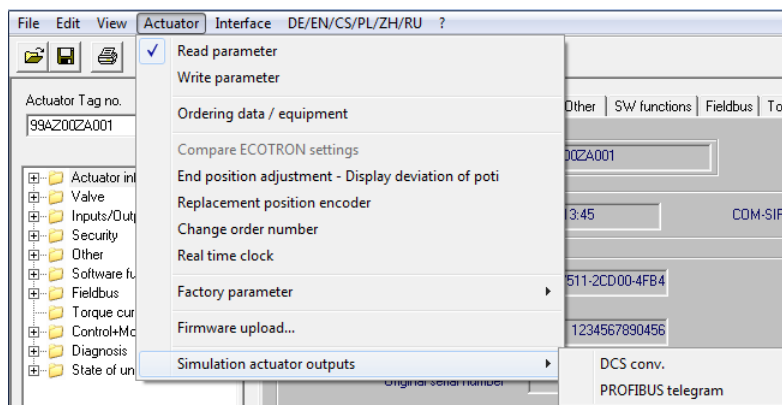
Start of the simulation mode must be confirmed:
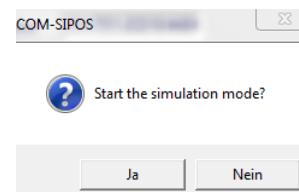
☞
- In the simulation mode, there is a cyclic data exchange between COM-SIPOS and the actuator. If the actuator does not receive a telegram from COM-SIPOS in the simulation mode for 10 seconds, the actuator quits the simulation mode and performs a RESET!
- Status information is changed within the simulation mode; after quitting the simulation mode, the actuator therefore performs a RESET!

8

Checking the interface to DCS

8.2 Simulation mode for conventional DCS

After starting the "DCS conv." simulation mode, the following dialog box appears.

Input field

Input range

Binary outputs

☞ Changes performed on the binary signal outputs in the "Inputs/Outputs" tab will be accepted if the "Hold setting" function was activated!

The following values can be set for the binary actuator outputs:

• orig.	The output is set according to the parameterization.
• high	The output is set to active (24/48 V).
• low	The output is set to not active (0 V).

Analog output 1 (AO1)

The analog actuator output can be set as follows:

Input field	Value to be displayed.
Input range	You may choose between the units "0 – 100 %", "0 – 10000" or "0 – 20 mA".
• 0 – 100 %	
• 0 – 10000	
• 0 – 20 mA	
Original	
• ☑	Current actual position or actual process value is displayed.
• ☐	Value of the input field is displayed (e.g. 9.1 mA).
Set	The analog output is set according to the value of input field and input range.

Close	Click this button to quit the simulation mode.

8.3   Simulation mode for PROFIBUS

After starting the "PROFIBUS telegram" simulation mode, the following dialog box appears.

In the PPO1 and PPO2 telegram, individual bits/ bytes can be changed.

Status word 1 / Fault signal 1 and Fault signal 2

• orig.	The bit is set by the firmware of the actuator according to the status.
• yes	The bit is definitely set to 1.
• no	The bit is definitely set to 0.

Analog output 1 (AO1) (byte 9 and 10)

Input field	Value to be displayed.
Input range	You may choose between the units "0 – 100 %", "0 – 10000" or
• 0 – 100 %	"0 – 20 mA".
• 0 – 10000	
• 0 – 20 mA	
Original	
• ☑	Current actual position or actual process value is displayed.
• ☐	Value of the input field is displayed (e.g. 333).
Set	The analog output is set according to the value of input field and input range.

Close	Click this button to quit the simulation mode.

9   Convert *.ste into *.txt

The "**ASCII-Conversion**" command in the **File** menu allows to convert the parameter data (customer and factory parameters as well as current values) saved as binary file (*.ste), into a text file (*.txt).
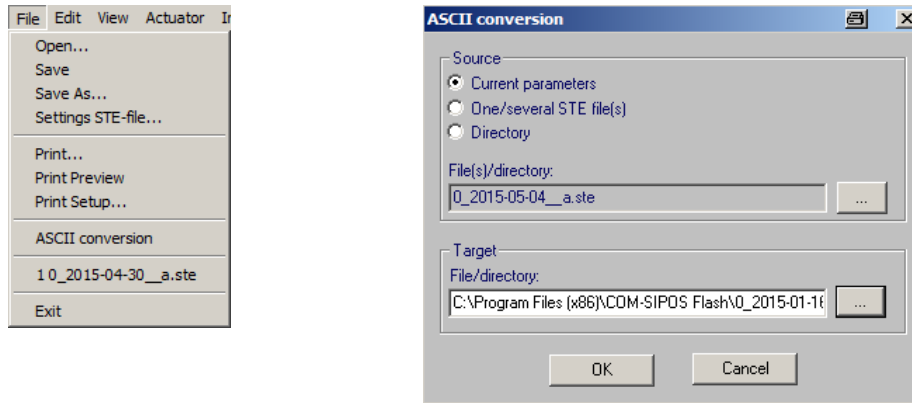
Source

◉ **Current parameters**	Saves the actuator parameters of the actuator currently communicating with COM-SIPOS as text file in txt format. File Edit Format View Help ACTUATOR_TAG_____AKZ 99AZ00ZA001 DATE_____DATUM > 07.04.2016 < TIME_____UHRZEIT > 08:22 < COM-SIPOS_____VERSION > 3.02 < ORDER_NO__BESTELLNUMMER 2SA75112CD104AB4 WORKS_NO____WERKSNUMMER > 6900271500102 < FIRMWARE_____VERSION 302_150000 REMARKS ANMERKUNGEN -- ☞ The file name (with the extension .txt) can be freely selected!
◉ **One/several STE-file(s)**	Converts one or more selected .STE-file(s) into a defined directory in txt format. ☞ The file name cannot be changed (name.ste ➔ name.txt)!
◉ **Directory**	Converts all *.STE-files in a selected directory into a defined directory in txt format. ☞ The file name cannot be changed (name.ste ➔ name.txt)!
File(s)/directory:	Selection of the directory and mark up of the ".ste" file(s) to be converted.

Target

File/directory	Definition of the directory into which the converted ".txt" file(s) is/are to be saved.

Presenting text files in a table

All parameters can be presented in an Excel spreadsheet to give a clear overview of the data of all SIPOS actuators in a plant.

To this end, proceed as follows:

■ Convert COM-SIPOS binary files (.ste files) as described above into text files (.txt files).

■ Start "**ASCII-files-Dateien (MS-Excel)**" Excel table sheet (file) under Start ➔ All Programs ➔ COM-SIPOS using Microsoft Excel. This Excel table sheet has been specially designed for the presentation of several actuator parameter files.

☞ To be able to use this function, Excel has to allow for the execution of so called macros. Please note possible messages during start-up and acknowledge them. If required, the security level with regards to macros in Excel has to be set to a lower level (refer to Excel menu Tools ➔ Options ➔ Security ➔ Macro security…). After acknowledging or changing the security level for macros, the program has to be restarted!

■ Click the "**READ SIPOS ASCII-file (*.txt)**" button with the left mouse-button to start the Excel macro.

■ Select directory with the .txt files to be listed. Click the "OK" button to have all <u>marked up</u> .txt files presented in a table in xls format.

For each actuator, the data is shown in a separate column:

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10 Example: Printout of actuator state

SIPOS Aktorik GmbH

Plant documentation SIPOS SEVEN actuator   Date 13.06.2018

Project:

Actuator info

Actuator Tag no.	*99Z00ZA001*		
Order number	*2SA7511-2CD10-4AB4*	Firmware version	*3.10 13.04.18*
Serial number	*6900271500102*	Type	*Modulation*
Original serial number	*6900271500102*	Motor warranty	*valid*
Adjustment signaling gear [rev./stroke]	*36*		
Remark	*--*		
Positioner	*enabled*	Process controller	*not enabled*
Travel dependent output speed	*not enabled*	External analog output speed setpoint	*not enabled*
Travel- dep. adjustable pos. times	*not enabled*	Split-range function	*not enabled*

Valve

CLOSE direction	*clockwise*	EMERGENCY position [%]	*0*
Additional gear	*Part-turn gearbox*	Model	*GS 63.3 – 51:1*
Reduction ratio	*51*	Factor output/input torque	*16.7*
Max. output torque [Nm]	*1000*	Max. input speed [1/min]	*108*
Positioning angle [°]	*90*	Signaling gear setting	*14*
Closing speed [rpm]	*14*	Opening speed [rpm]	*14*
EMERGENCY speed CLOSE [rpm]	*14*	EMERGENCY speed OPEN [rpm]	*14*
Tripping torque CLOSE [Nm]	*30*	Tripping torque OPEN [Nm]	*30*
Endposition range CLOSE [%]	*0 – 2*	Endposition range OPEN [%]	*98 – 100*
Cut off mode CLOSE	*torque-dependent*	Cut-off mode OPEN	*travel-dependent*

Inputs/Outputs

Binary inputs	*NO*	EMERGENCY input	*NO*
[OPEN,CLOSE,STOP,Mode]			
Mode input	*No function*		
Remote control	*Analog: Positioner AI1*	Alternative control mode	*not active*
Intermediate contact CLOSE [%]	*0 – 2*	Intermediate contact OPEN [%]	*100 – 100*
Analog output 1 (AO1)	*Position actual value*	Analog output 2 (AO2)	*not enabled*
	4 mA – 20 mA		
	rising slope		
Analog input 1 (AI1)	*4 mA – 20 mA*	Analog input 2 (AI2)	*not active*
	rising slope		
Binary output 1	*End position OPEN/NO*	Binary output 5	*Fault/NC*
Binary output 2	*End position CLOSED/NO*	Binary output 6	*Local/NO*
Binary output 3	*Torque OPEN reached/NC*	Binary output 7	*Blinker/NO*
Binary output 4	*Torque CLOSE reached/NC*	Binary output 8	*Warning motor temp./NC*

Security

Motor temperature warning [°C]	*135*	Motor temperature protection	*on*
Motor heating	*off*	Error remote source	*keep position*
Close tightly	*on*	Move again, if blocked in move	*0*
Valve maintenance periods			
Switching cycles	*100000*	Torque cut-offs	*10000*
Motor operation hours	*2500*		

Other

Display language	*English*		
DC brake [%]	*0*	Rise time [s]	*0.5*
Customer variant	*0*	Delay time fault signal power supply [s]	*6.0*
Positioner deadband min. [%]	*0.2*	Positioner deadband max. [%]	*2.5*
LC-Filter (separate mounting)	*not enabled*	Flange with torque measurement	*not enabled*
End position speed	*Normal*	DCS Acceptance time [s]	*25.5*

Fieldbus

The following data is only displayed if the respective fieldbus interface is available!

MODBUS channel 1		MODBUS channel 2	
Address	*247*	Address	*247*
Baudrate	*19200 bit/s*	Baudrate	*19200 bit/s*
Parity	*even*	Parity	*even*
Monitoring time	*3.0 s*	Monitoring time	*3.0 s*

PROFIBUS channel 1		PROFIBUS channel 2	
Address	*126*	Address	*126*
PZD 3	*status word 2*	PZD 5	*fault signal 2*
PZD 4	*fault signal 1*	PZD 6	*actual duty*

Diagnosis

Operating data actuator			
Switching cycles	*25*	Switching cycles/h	*0*
Torque cut-offs	*4*	Travel cut-offs	*6*
Motor operating hours	*0*	Electronic operating hours	*216*
Cycles per hour	*0*		

State of unit

Ready + remote	*-*		
Former errors (1 = last error, 2 = error before last etc.)			
1	*not enabled*	4	*not enabled*
2	*not enabled*	5	*not enabled*
3	*not enabled*		