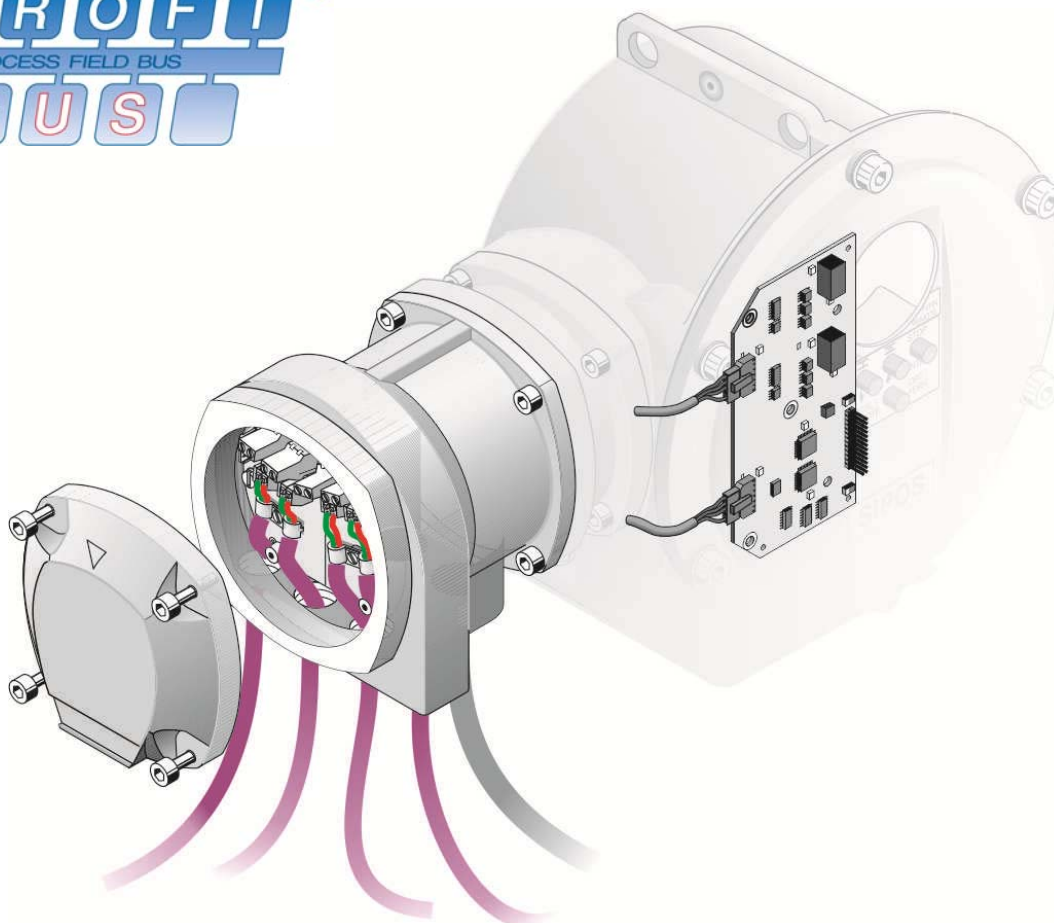


## PROFIBUS DP-Interface for Electric Actuators

Instructions

with V0, V1 and V2 services



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# 1. General information

## 1.1 Safety instructions: Used symbols and their meanings



**Warning** marks activities which, if not carried out correctly, can affect the safety of persons or property.



**Notice** marks activities which have major influence on the correct operation. Non-observance of these notes may lead to consequential damage.

## 1.2 Notes to the operation instructions

This manual describes the PROFIBUS interface for SIPOS 5 Flash/HiMod electric actuators.

You can find more detailed information about the electric actuators, including the electrical and mechanical connections, parameterization and commissioning in the Y070.020/GB (PROFITRON/HiMod) and Y070.019/GB (ECOTRON) manuals



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

**The safety information contained in the instruction manuals must be heeded at all times when working with the actuators. This manual only contains specific information about the PROFIBUS interface!**

# 2 The PROFIBUS Interface for SIPOS 5 Flash/HiMod



The PROFIBUS interface is pre-installed and tested in all devices that leave the factory "PROFIBUS-capable".

## 2.1 General description

### ■ General information about PROFIBUS-DP

For the interchange of information among automation systems and between automation systems and connected decentral field devices, serial fieldbuses are mainly used as the communication system today. Thousands of applications have proved impressively that cost savings of up to 40 % in wiring, commissioning and maintenance are achieved by using field bus technology.

Just two wires are needed to transmit all relevant information for the field devices, such as input and output data, parameters and diagnosis data. While in the past the fieldbuses used were often manufacturer specific and incompatible with other bus systems, the systems employed today are almost exclusively open and standardized. This means that the user is independent of individual suppliers and can choose the best product for the most reasonable price.

PROFIBUS DP is the leading open fieldbus system in Europe, which is also used successfully throughout the world. The application range includes automation in the areas of manufacturing, processing and building.

PROFIBUS DP is an international, open fieldbus standard, which has been standardized in the fieldbus standard EN 50 170. This standardization ensures that the investments of manufacturers and users are protected to the best possible degree and the independence of the manufacturer is guaranteed.

### ■ Basic characteristics

PROFIBUS DP determines the technical and functional features of a serial fieldbus system with which distributed digital automation devices can be interconnected.

PROFIBUS DP distinguishes between master and slave devices.

PROFIBUS DP is designed for fast data transmission in the field level. Here central control devices, such as a PLC or PC, communicate via a fast serial connection with peripheral field stations with binary and/or analog inputs and outputs. The interchange of data among the field devices takes place cyclically, in combination with PROFIBUS DP and V1 services also acyclic data transfer is possible. The necessary communication functions are established by the PROFIBUS DP basic functions according to EN 50 170.

- **Master devices** control the data traffic on the Bus. A master is allowed to send messages without an external request. Masters are also called "active stations" in the PROFIBUS protocol.
- **Slave devices** such as SIPOS 5 Flash/HiMod actuators for example are peripheral devices. Typical slave devices are input/output devices, valves, actuators and measuring transmitters. They do not have bus access, i.e. they may only acknowledge received messages or, at the request of a master, transmit messages to that master. Slaves are also called "passive stations".

## ■ Basic functions of PROFIBUS DP

The master reads the input information cyclically from the slaves and writes the output information cyclically to the slaves. In addition to this cyclic data transfer of the process-representation PROFIBUS DP also provides powerful functions for diagnosis and commissioning purposes. The data traffic is monitored through the monitoring functions on the master and slave side.

### • Functionality

- Peer-to-peer (net data transfer) or Multicast (control commands to all slaves).
- Cyclic net data transfer between DP-master and DP-slaves.
- Additional acyclic data transfer between DP-master and DP-slaves via PROFIBUS DP with V1 services.
- DP-V2 redundancy in accordance with PNO 2.212.
- DP-V2 timestamp in accordance with PNO 2.192.
- Dynamic activation or de-activation of individual DP-slaves.
- Checking of the configuration of the DP-slaves.
- Synchronization of inputs and/or outputs.

### • Protection functions

- All messages are transmitted with Hamming Distance HD=4.
- Watch-dog timer at DP-slaves.
- Access protection for the inputs/outputs of the DP-slaves.
- Net data transfer monitoring with configurable timer interval at the master.
- Adjustable safety behavior.

## 2.2 PROFIBUS-DP: certification

SIPOS 5 Flash/HiMod and PROFIBUS-DP have been certified by the PROFIBUS Trade Organization. The certification numbers are as follows:

**Z01420 / Z01421** (1- / 2- channel)

## 2.3 PROFIBUS-DP: identification numbers

Each DP slave and each DPM1 master has its own identification number. This is necessary in order for a DP master to be able to identify the types of the connected devices without any significant protocol overheads. The master compares the identification numbers of the connected DP devices with the identification numbers in the configuration data specified by the DPM2. The user data transfer only begins if the correct device types with the correct station addresses have been connected on the bus. This improves the quality of protection against configuration errors.

The PROFIBUS Trade Organization (PNO / PTO) administers the identification numbers together with the device data (GSD).

SIPOS 5 Flash/HiMod has been assigned the following identification numbers by the PROFIBUS Users Organization:

- Component 1-channel: **0x56D**
- Component 2-channel: **0x56E** (PROFITRON/HiMod only)

## 2.4 Device data (GSD)

The performance features of the devices connected to the PROFIBUS-DP are documented by the manufacturers in the form of a device data sheet and a device master file (GSD file), and made available to users. The structure, contents and code of the GSD file are standardized. Any DP slave can thus be configured conveniently using configuration equipment from different manufacturers. The PNO archives this information in a manufacturer-neutral database and supplies details of the device data on request.

The following valid GSD files exist for SIPOS 5 Flash/HiMod with PROFIBUS:

- Actuators with DP-V0/-V1 (ECOTRON, PROFITRON and HiMod):  
**SIP\_056D.GSD** (1 channel) und **SIP\_056E.GSD** (2 channel; not for ECOTRON)
- Actuators with DP-V2 (PROFITRON and HiMod only, delivered with firmware version 2.55 and higher):  
**SIPP056D.GSD** (1 channel) and **SIPP056E.GSD** (2 channel)



The GSD files can be downloaded from our website [www.sipos.de](http://www.sipos.de).

### 3 Using actuators with PROFIBUS-interface

#### 3.1 Inhibiting of the local control unit

The switch function for changing between remote control and local control by pressing the button on the local control unit can be disabled by means of a PROFIBUS command. The function is automatically activated again, depending on the parameterized function of the watch-dog, if communication via the bus is interrupted.

#### 3.2 Fault messages on display

Error messages concerning the PROFIBUS interface and communication via the PROFIBUS are output in plain text on the display of the local control unit (SIPOS 5 PROFITRON/HiMod only). Select "state of unit" in the "observing" menu.

These error messages must either be dealt with by the owner of the plant (parameters and settings, ambient temperature too high, electrical connections not made properly, etc.), or they are due to circumstances outside his control (voltage fluctuations, power failures, etc.).

Display (1. line)	Display (2. line)	Remark
com. via bus	Yes	Commissioning via bus active
local disabled	Yes	Local access via local control unit disabled
bus comm. fault	Yes	PROFIBUS-Communication fault, check PROFIBUS interface cable

### 3.3 Display of PROFIBUS status

- with COM-SIPOS: Read parameter, status is displayed in the "State of bus" tab sheet
- with PROFIBUS: can be read via parameters 22 (channel 1), 23 (channel 2) with regard to redundancy and timestamp via parameters 400 – 405
- SIPOS 5 ECOTRON: "Fail-Safe"/"GC-Clear"-status of the active channel with flashing pattern  
"fault cable break"
- SIPOS 5 PROFITRON/HiMod: "observing" menu item of the LC display

#### Menu observing

Display 1. line	Display 2. line	Comments
redundancy PB		Redundancy behavior (2-channel version only); see 6.8
	SIPOS	SIPOS redundancy
	PNO-SR	System redundancy
	PNO-FR	Flying redundancy
PB source	no channel act. active channel:	Indicates the active channel to be used for actuator operation (PRIMARY)
PROFIBUS address	channel 1: ...	<b>PNO redundancy only</b> (PNO system or PNO flying redundancy) The current address is displayed.
PB channel:1	no transmission ... kBits /s	Baud rate in Kbit/s
state PB chan. 1	Wait Prm Wait Cfg Data Exchange Failsafe GC Clear	DP state
state red. ch. 1		<b>PNO redundancy only</b> PNO redundancy status of channel 1
	POWER_ON S_WAITING S_PRIMARY C_CONFIGURE BACKUP BTP_PARTNER_ACK BTP_SWITCHOVER BTP_PRM_CMD BTP_DX PRIMARY PTB_PARTNER_ACK PTB_SWITCHOVER NIL	Initializing Channel is offline and not ready for communication Channel is online and ready for communication MS2 connection active Channel is backup Start channel switchover (offline for address change) Waiting for SwitchoverDone message Waiting for PrmCmd with primary request Waiting for first Data Exchange-Telegr. Master Channel is primary Start channel switchover (channel is offline) Waiting for SwitchoverDone message Transition state - PTB stands for <b>P</b> rimary to <b>B</b> ackup switchover - BTP stands for <b>B</b> ackup to <b>P</b> rimary switchover
PROFIBUS address	channel 2: ...	<b>PNO redundancy only</b> The current address is displayed.
PB channel:2	no transmission ... kBits /s	Baud rate in kBit/s
state PB chan. 2	Wait Prm Wait Cfg Data Exchange Failsafe GC Clear	DP state
state red. ch. 2		<b>PNO redundancy only</b> PNO redundancy status of channel 2
	POWER_ON S_WAITING S_PRIMARY C_CONFIGURE BACKUP BTP_PARTNER_ACK BTP_SWITCHOVER BTP_PRM_CMD BTP_DX PRIMARY PTB_PARTNER_ACK PTB_SWITCHOVER NIL	Initializing Channel is offline and not ready for communication Channel is online and ready for communication MS2 connection active Channel is backup Start channel switchover (offline for address change) Waiting for SwitchoverDone message Waiting for PrmCmd with primary request Waiting for first Data Exchange-Telegr. Master Channel is primary Start channel switchover (channel is offline) Waiting for SwitchoverDone message Transition state - PTB stands for <b>P</b> rimary to <b>B</b> ackup switchover - BTP stands for <b>B</b> ackup to <b>P</b> rimary switchover
Output Hold Time	y.xx s	<b>PNO redundancy only</b> During the channel switchover, the outputs are held for this time.

## 4 Technical Data

### 4.1 SIPOS 5 Flash/HiMod with PROFIBUS DP interface

Electrical connection / Fieldbus connection		
Supply voltage	1-ph AC 110 - 115 V 1-ph AC 220 - 230 V 3-ph AC 380 - 460 V	
Tolerances	Permissible voltage tolerances: -10 %/+15 % Frequency range: 40 – 70 Hz	
Automatic phase sequence correction	The direction of rotation of the output shaft is independent of the phase sequence	
Optional external power supply of the electronics	24 V DC ± 25 % (protected against polarity reversal)  Current consumption of the electronics: PROFIBUS 1 channel: max. 145 mA; PROFIBUS 2 channel: max. 190 mA	
Voltage output	24 V DC, max. 100 mA (floating and protected against polarity reversal)	
Electrical connection with PROFIBUS DP interface	Round plug connector with 50-pin screw connections. PROFIBUS connection on integrated bus termination board with switchable bus termination resistors. Max. lead cross section - PROFIBUS: 1.5 mm² - analog / binary signals: 2.5 mm² - mains: 6 mm²	
RS 485-interface	EIA-485 (RS 485) ➔ details see “Communication parameters of the PROFIBUS DP interface”	
Fiber optic interface (option)	Fiber optic interface for the realization of star, line and ring structures. ➔ details see “Communication parameters of the PROFIBUS DP interface”	
Overvoltage protection (option)	Protection of the electronics and motor against over voltage up to 6 kV on the bus terminals, at a guaranteed PROFIBUS communication up to baud rate 1.5 MBits/s	
Inputs, outputs / other features		
Control	Control and feedback signal via PROFIBUS ➔ details see “Parameterizing of PROFIBUS”	
analog / binary inputs	ECOTRON - 3 binary 24V DC inputs (OPEN, CLOSE, STOP)	PROFITRON/HiMod - 4 binary 24V DC inputs (OPEN, CLOSE, STOP, EMERGENCY) - 1 analog 0/4..20 mA input AI1 for positioner (option PROFITRON only) - 1 analog 0/4..20 mA input AI2 (option) for process controller, speed setpoint etc.
analog / binary outputs	Status transmission possible via PROFIBUS. - 5 binary outputs (programmable) - 1 analog output (only modulating) for actual position value	Status transmission possible via PROFIBUS. - 8 binary outputs (programmable) - 1 analog output for actual position value
Galvanic separation	- Binary inputs and outputs - 1 analog input (option) - 1 analog output (option)	
PROFIBUS redundancy (option)	Hardware (separate ASICs and DC/DC-converters)	
Local controls	Standard: - Push buttons for OPEN, CLOSE, STOP and LOCAL/REMOTE (lockable) - 2 indication lights (yellow) for LOCAL and REMOTE - Indication lights for CLOSE (yellow) and OPEN (green): run and end position indication - 2 indication lights (green and red) for status and fault signals (ECOTRON only) - Plain text status display on LC display (PROFITRON/HiMod only) - Serial interface  Option: - Bluetooth interface for parameterizing and controlling - Protection cover for push buttons	
Remote control	Control by remote depending on the parameter setting of “remote control” and “remote reconnect”: - Conventional interface (24V binary or 0/4-20mA analog) - PROFIBUS interface	

<b>Parameters / functions actuator</b>	
<b>Parameter settings</b>	<ul style="list-style-type: none"> <li>- via PROFIBUS</li> <li>- menu based, via illuminated LC display with plain text display (PROFITRON/HiMod only) (operation with password-protection via push buttons of the local controls)</li> <li>- via the programming software COM-SIPOS</li> </ul>
<b>Language settings</b> (PROFITRON/HiMod only)	German, English, French, Spanish, Italian, Polish, Czech, Swedish, Dutch, Portuguese and Finnish → other languages on request
<b>Output speed / positioning speed / positioning time steps</b>	<ul style="list-style-type: none"> <li>- 7 settings, changeable</li> <li>- different settings possible for OPEN, CLOSE, EMERGENCY OPEN and EMERGENCY CLOSE (PROFITRON/HiMod only)</li> </ul>
<b>Soft start</b>	Constant torque with reduced speed in to and out of the end positions: <ul style="list-style-type: none"> <li>- no overtorque</li> <li>- Starting current <math>\leq</math> rated current</li> </ul>
<b>Positioner</b> (option PROFITRON only)  (PROFITRON/HiMod only)	Adaptive three-step controller Setpoint via PROFIBUS or analog 0/4...20 mA signal, (rising/falling slope) Adjustable automatic adaptation of the dead band based on the quality of the setpoint and feedback signals. Speed reduction before reaching the setpoint
<b>Process controller</b> (option) (PROFITRON/HiMod only)	Setpoint via: analog input AI1 (0/4 ... 20 mA), via PROFIBUS or fixed setpoint Actual process value via analog input AI2 (0/4 ... 20 mA, rising/falling slope)
<b>Programmable travel dependent output speed</b> (option) (PROFITRON/HiMod only)	Travel dependent speed setting via up to 10 interpolation points (value pairs): travel [% OPEN] in 1 % steps – speed [rpm]
<b>External output speed setting</b> (option) (PROFITRON/HiMod only)	Speed setpoint via PROFIBUS or analog 0/4 ... 20 mA signal
<b>Travel dependent freely adjustable positioning times</b> (option) (PROFITRON/HiMod only)	The positioning times between up to 10 intermediate positions can be programmed independently: travel 0...100 [% OPEN], positioning time 0 ... 60000 [sec] For EMERGENCY operation via positioning time curve possible with adjustable factor.
<b>Torque-curve recording from the valve</b> (not for 2SG5)  (PROFITRON/HiMod only)	Recording of up to 3 torque reference curves for pre-emptive valve monitoring: sampling rate in 1 % travel increments; can be saved and downloaded. The recorded values are reference values and can deviate from the absolute values especially in the end positions and when changing output speeds.
<b>Retry torque block</b>	Automatic retry to get over torque block (max. 5 x programmable)
<b>Diagnostics</b>	
<b>Diagnosis data</b>	<ul style="list-style-type: none"> <li>- switching cycles/hour</li> <li>- number of switching cycles / travel dependent and torque dependent cut-offs</li> <li>- relative operating time</li> <li>- operating hours of electronics unit and motor</li> </ul>
<b>Maintenance limits /maintenance intervals</b> (regarding valve) (only PROFITRON/HiMod)	<ul style="list-style-type: none"> <li>- switching cycles</li> <li>- torque dependent cut-offs</li> <li>- motor operating hours</li> </ul>
<b>Fault memory</b>	former five faults are displayed
<b>Electronic rating-plate</b>	<ul style="list-style-type: none"> <li>- manufacturer</li> <li>- ordering no.</li> <li>- works number</li> <li>- original works number</li> <li>- tag number actuator</li> </ul>
<b>Monitoring and safety functions</b>	internal diagnosis: <ul style="list-style-type: none"> <li>- runtime</li> <li>- motor protection</li> <li>- travel sensor</li> </ul>



Settings / Parameterizing of PROFIBUS DP interface				
Supported PROFIBUS DP-services (standard)	DP-V0: cyclic data exchange, fail-safe mode			
	DP-V1: Access to all commissioning parameters, observing and diagnosis data with acyclic and cyclic read/write services.			
	DP-V2: Time stamp acc. to PNO 2.192, redundancy acc. to PNO 2.212 (PROFITRON/HiMod only)			
Baudrate recognition	automatic			
Process-representation output (command signals)	- OPEN - CLOSE - EMERGENCY (PROFITRON/HiMod only) - setpoint for position, process or output speed (PROFITRON/HiMod only) - fault signal reset - maintenance acknowledge			
Master → Slave				
Process-representation input (feedback)	e.g. - actual position value (0.01 % steps) (not with ECOTRON for standard duty) - ready + remote - actuator in end position "OPEN"/"CLOSE" - travel position "OPEN"/"CLOSE" active - running indication "OPEN"/"CLOSE" - output speed/positioning speed/positioning time - end position OK - hand wheel/crank operated - local active - remote active - command "EMERGENCY" active - motor temperature warning (not for 2SG5) - motor temperature (not for 2SG5) - electronics temperature (PROFITRON/HiMod only) - maintenance necessary (PROFITRON/HiMod only) - diagnosis data (PROFITRON/HiMod only) - maintenance limits (PROFITRON/HiMod only) - PROFIBUS channel 1 or 2 is active channel - PROFIBUS channel 1 or 2 is present - etc.			
Slave → Master				
Process-representation input (fault signals)	e.g. - sum fault signal - not ready - end positions not OK - main supply voltage fault - high voltage - low voltage - internal voltage faulty - moved too far - travel sensor signal fault - setpoint input I > 21 mA or I < 3.6 mA (live zero) (PROFITRON/HiMod only) - blocked in move - positioning time too high (runtime) - motor temperature too high - etc.			
Slave → Master				
Behaviour in case of communication breakdown	the reaction of the actuator is programmable: - keep position - approach emergency position (PROFITRON/HiMod only) - keep actual process value (PROFITRON/HiMod with process controller only) - approach fixed process setpoint (PROFITRON/HiMod with process controller only)			
PTO certificate No.	Z01420 / Z01421 (1 / 2 channel)			
Ambient conditions				
Ambient temperature	-20 °C to +60 °C			
Enclosure protection according to EN 60529	standard: IP 67 option: IP 68			
Vibration resistance		acceleration	frequency range	duration
	KTA 3504, para. 10.3.4	0.75 g	5 ... 200 Hz 1 octave/min	20 sweeps (10 cycles) in 3 directions
	Germanischer Lloyd	0.7 g	5 ... 200 Hz , in the resonance frequencies	min. 1.5 h in 3 directions
	EN 60068-2-6	2 g	5 ... 500 Hz 1 octave/min	20 sweeps (10 cycles) in 3 directions
	Loads according to EN 60068-2-6 up to 5 g for separate mounting of electronics and gear unit on request. The actuators can withstand a continuous load caused by plant-generated vibrations within a frequency range of 5 ... 200 Hz at up to 0.5 g.			

## 4.2 Communication parameters of the PROFIBUS DP interface

### ■ Connection via copper cable – 1 and 2 channel (redundant)

<b>Communication log</b>	PROFIBUS DP according to EN 50170-2, DIN 19245		
<b>Network topology</b>	Line (BUS) structure. Tree structures can also be realized. Coupling and uncoupling of stations during operation without affecting other stations is possible.		
<b>Transmission medium</b>	twisted, screened 2-wire copper cable according to EN 50170		
<b>Interface</b>	EIA-485 (RS 485)		
<b>Transmission speed / Cable length</b>	baudrate (kbit/s)	max. cable length <b>without</b> repeater	max. cable length <b>with</b> repeater
	9.6	1,200 m	approx. 10 km
	19.2	1,200 m	approx. 10 km
	45.45	1,200 m	approx. 10 km
	93.75	1,200 m	approx. 10 km
	187.5	1,000 m	approx. 10 km
	500	400 m	approx. 4 km
	1,500	200 m	approx. 2 km
<b>Station types</b>	- DP-Master class 1, e.g. central controllers such as PLC, PC, - DP-Master class 2, e.g. programming / configuration tools - DP-Slave, e.g. SIPOS 5 Flash/HiMod actuators, devices with binary and/or analog inputs/outputs, sensors.		
<b>Number of stations</b>	32 stations without repeater; with repeaters expandable up to 126 stations		
<b>Bus access</b>	Token-passing between the masters and polling for slaves. Mono-master or multi-master systems are possible.		

### ■ Connection via fiber optics (FO)

Fiber optic interface for the realization of star, line and ring structures.

➔ Details see supplement to operation instructions:

- „Fieldbus connection with fiber optics (FO) in line/star topology“ Y070.134/GB,
- „PROFIBUS DP with fiber optics (FO) in loop topology“ Y070.051/GB.

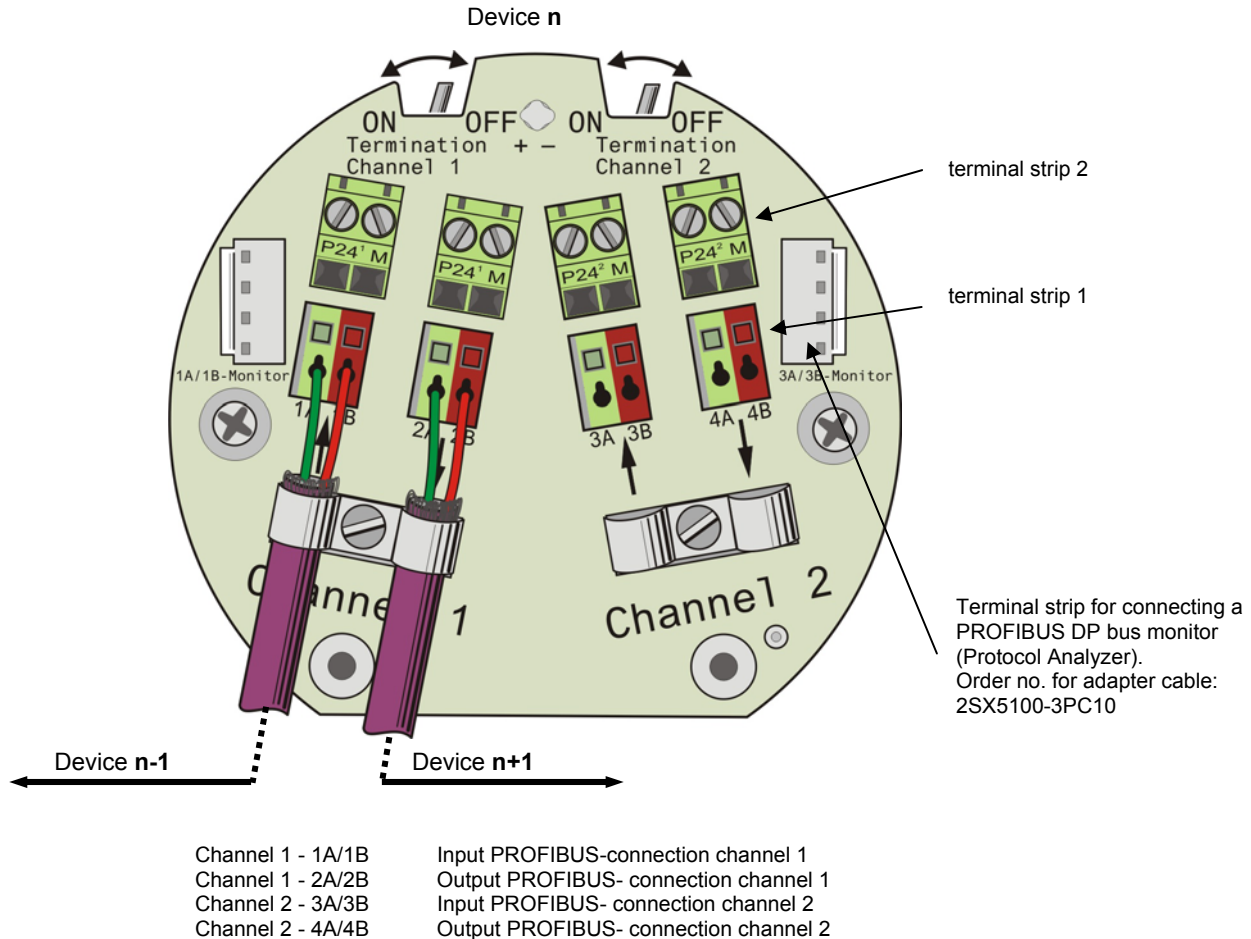
## 4.3 Electric connection (copper or FO)

### Connection via copper cable – 1 and 2 channel (redundant)

To comply with the RFI regulations, the shield has to be connected flatly with the housing by means of the screen strap.

This applies analogously to both channels of the version with a redundant PROFIBUS interface.

Correct pole-connection of the data-wire on terminal strip 1 is necessary for PROFIBUS data exchange. Please make sure that .A or .B connections are always done with the same lead: the .A connection with the green lead and .B connection with the red lead.



The 24 V DC external supply can be realized via the terminal strip 2. By doing this, the bus data exchange can be continued even if the main power supply (110-115V, 220-230V resp. 380-460V) is disconnected. The 24 V is internally connected with the pins 38 and 39 of the round plug.

#### Adjustment of the DIP-switches

Termination: **OFF** no bus termination resistor  
**ON** bus termination resistor switched on and 2A/2B or 4A/4B separated from 1A/1B or 3A/3B

#### Bus cable

Only cables according to standard DIN 19245 or EN 50170-2, cable type A, may be used for PROFIBUS DP wiring.

The bus cable must be laid at a distance of at least 20 cm from other cables. It should be laid in a separate, conductive and earthed cable trunking.

It must be ensured that there are no potential differences between the individual stations on the PROFIBUS.

Cable specification cable type A for PROFIBUS DP:

Impedance	135 to 165 Ohm, at a frequency of 3 to 20 MHz
Cable capacity	< 30 pF per meter
Cable diameter	> 0.64 mm
Core diameter	> 0.34 mm <sup>2</sup> (corresponds to AWG 22), max. 1.5 mm <sup>2</sup>
Loop resistance	< 110 Ohm per km
Screening	Cu shielding braid or shielding braid and shielding foil

## 5 Setup of the DP-Slave address

Each device on the bus is handled via the bus address. This address must be unique on one bus line. SIPOS 5 Flash electric actuators are delivered with the default bus address 126. If the actuators are ordered with customer specific parameterization (order code "Y11"), the bus address is set to the specified value. In case of actuators with redundant PROFIBUS interface, both channels are set to the default address 126.

The bus address is stored in the EEPROM located on the microcontroller board (non volatile).

The bus address can be setup as follows:

- via local control unit (PROFITRON/HiMod only). To setup the bus address, see manual instructions Y070.020/GB.
- with the PC-parameterization program COM-SIPOS (connection via RS232 interface or Bluetooth (option) via Bluetooth adapter).

COM-SIPOS is available as accessory including software, data cable and description, order-no.: **2SX5100-3PC02**.



The newest COM-SIPOS version can be downloaded from our website  
[www.sipos.de](http://www.sipos.de).

- via PROFIBUS. For that, the SIPOS 5 Flash actuator must be connected to the bus. Please take care, that only one single actuator with default address 126 is connected to the bus at a time. The actuator may then be assigned a new bus address using SAP 55 (Service-access-point set slave address).



- For actuators with firmware version earlier than 2.35:  
After changing the slave address, the actuator has to be turned OFF and ON for accepting the new address.  
**Voltage-reset; also turn off the 24 V DC supply!**
- Actuators with DP-V2 (new device) and redundant PROFIBUS interface:  
Due to the start-up behavior of the actuator - only one channel is available for communication (see 6.8.2) - a command for changing the address might not be executed: If required, repeat telegram within an interval of approx. 30s.  
By sending a "set slave address" telegram each, the addresses of both channels are changed!

## 6 Setup of the communications and devices parameter

Following chapters (6.1 to 6.10) describe the necessary information for programming the individual application software for the communication with the control system.

The chapters 6.1 to 6.10 can be disregarded if the integration is performed via one of the following software tools:

- **Actuator control system SIMA**  
SIMA, by SIPOS Aktorik, is a centrally operating Master Station for operation, parameterization, monitoring and diagnosis.
- **Functions blocks** for higher-level control systems:
  - SIMATIC S7-300,
  - SIMATIC PCS7-400 (S7-400) with/without faceplate for WIN-CC,
  - SPPA-T2000 and SPPA-T3000 (Teleperm XP).
- **Cross-manufacturer project and parameterization tools:**
  - SIMATIC PDM (Process Device Manager)  
The SIPOS 5 Flash/HiMod electronic device description (EDD) is integrated in this parameterizing and project tool.
  - FDT/DTM (Field Device Tool/ Device Type Manager)  
For integration in the parameterizing tool FDT the SIPOS 5 Flash/HiMod device description DTM is available.

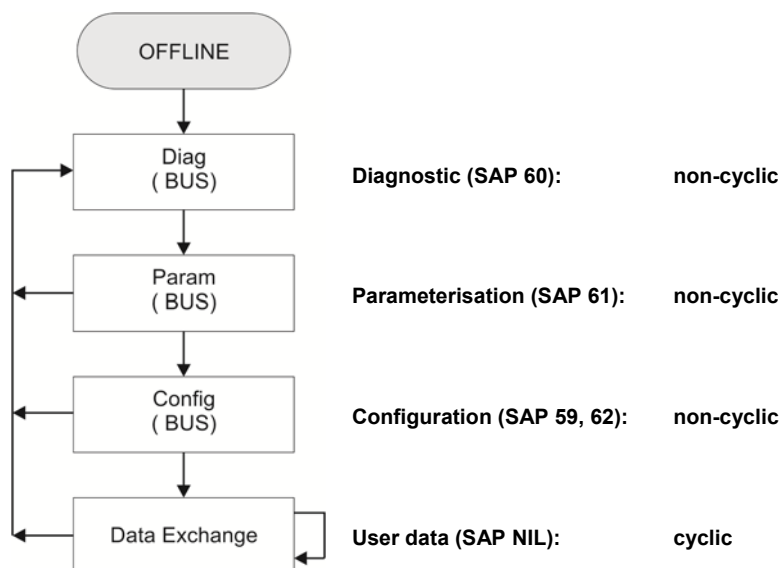
All software tools are available as accessories.

### 6.1 DP-state

The manufacturer-specific data is exchanged via the SAP NIL.

The data transmission when the equipment is started up is shown in the simplified diagram below. The actuator (slave) behaves in accordance with DIN 19245-3.

**Data exchange Master – Slave (actuator SIPOS 5 Flash/HiMod)**  
DSAP 61 and 60 not used for actuator data



## 6.2 Parameterization of the DP-Slave

### ■ Actuator parameterizing

The DP slave must be parameterized separately for each channel by the master. You must therefore parameterize both channels of the 2-channel version of the PROFIBUS module.

The parameterization message has the following structure:

Byte	Bit position								Comment
	7	6	5	4	3	2	1	0	
0	Lock Req	Unlo. Rep	0	0	WD ON	res	res	res	Station Status
1									WD Fact 1
2									WD Fact 2
3									MinTSDR
4									Ident Nr High
5									Ident Nr Low
6									Group Ident
7	DPV1 enable	0	0	0	0	WD Base	0	0	DPV1 Status 1
8	0	Enable Proc.-alarm	0	0	0	0	0	0	DPV1 Status 2
9	Prm-Cmd	0	0	0	Prm-Struct.	AlarmMode			DPV1 Status 3

WD Base WD Base = 0 (time base 10ms)  
WD Base = 1 (time base 1ms)

The calculating the watchdog time  $T_{WD} = (1 \text{ resp. } 10\text{ms}) \times \text{„WD Fact 1“} \times \text{„WD Fact 2“}$

The following bits are evaluated for DP-V2:

- Enable Proc. Alarm      Process alarm enabled (required for DP-V2 timestamp)
- AlarmMode              Number of alarms: only the value 0 is accepted by the actuator (0=1 alarm per type)
- PrmStruct              Structured parameters possible
- PrmCmd                Parameter command activated

For a description of the parameter blocks, see 6.10.1.2 and 6.10.2.2.



- “WD Fact 1” = 1 and “WD Fact 2” = 1 are not allowed in combination!
- Even when no DP-V1 services are used, the parameterizing telegram always has to consist of 10 bytes!

### ■ Master monitoring parameterizing

A watchdog must be parameterized for monitoring the master and the connection between the master and the actuator.

If the monitoring time expires due to a communication failure, the consequences are dependent on certain default settings, as shown in the table below.

row	Settings				Consequences				
	SlaveNr =126	WD on =1	Mode controlled via bus (PNU 110)	Wire break causes emergency position (PNU 108)	Ready	Approach to emergency position	Position held	Fault bus comm.	DP-state
1	N	Y	Y	Y	N	Y	N	Y	Wait Prm
2	N	Y	Y	N	N	N	Y	Y	Wait Prm
3	N	Y	N	X	X	X	X	Y	Wait Prm
4	N	N	X	X	X	X	X	X	X
5	Y	X	X	X	X	X	X	X	X

X = don't care; Y = Yes; N = No

### 6.3 Configuration of the DP-Slave

The DP slave must be configured separately for each channel by the master. You must therefore configure both channels of the 2-channel version of the PROFIBUS module.

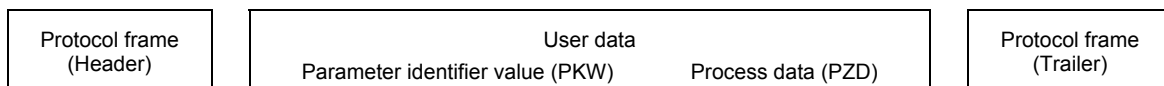
The two channels can also be configured differently, though the configuration message must always have three identification bytes (see "GSD files").

### 6.4 User data (Data Exchange) PPO-Types

The structure of user data is named **parameter-process-data-object (PPO)**.

2 PPO types (PPO1 and PPO2) are defined for SIPOS 5 Flash/HiMod actuators.

Adjustment of this data structure for the cyclic data exchange via the indication bytes 0xF2, 0xF1 and 0x00 resp. 0xD3 (see "GSD-files").



#### ■ PPO-Type

The PPO type is selected during the configuration procedure by the PROFIBUS-DP master.

		PKW			PZD					
		Word 1	Word 2	Word 3	Word 1	Word 2	Word 3	Word 4	Word 5	Word 6
PPO1	Outputs	PKE	PWE		STW1	HSW	—	—	—	—
	Inputs	PKE	PWE		ZSW1	HIW	—	—	—	—
PPO2	Outputs	PKE	PWE		STW1	HSW	—	—	—	—
	Inputs	PKE	PWE		ZSW1	HIW	PZD3	PZD4	PZD5	PZD6

PKW	Parameter identifier value
PZD	Process data
PKE	Parameter identifier
PWE	Parameter value
STW1	Control word 1
ZSW1	Status word 1
HSW	Main setpoint (position setpoint)
HIW	Main actual value (position actual value)

#### ■ Job/response processing

- A job or an order only refers to one parameter value.
- The master must continue repeating a job until it receives the required response.
- The following information from the master must be evaluated, in order to determine whether or not a job has been completed:
  - Response identifier
  - Parameter number
  - Parameter value (if any)

## 6.4.1 Inputs (Actuator => Master)



All unused bytes/bits are sent with "0"!

	Byte.Bit	Meaning	Value range
PKW	1.0 – 1.2	parameter number (high-byte)	
	1.3	unused	
	1.4 – 1.7	response identifier 0 = no response 1 = parameter transfer 2 = command not executable: - write/read of not defined parameters - parameter not writeable - write of invalid parameter values 3 = no PKW rights for this parameter: - channel is not active channel - commissioning local active	0 - 3
	2.0 – 2.7	parameter number (low-byte)	
	3.0 – 3.7	parameter value (high-byte of high-word)	dependent on parameter number (see parameter list)
	4.0 – 4.7	parameter value (low-byte of high-word)	
	5.0 – 5.7	parameter value (high-byte of low-word)	
	6.0 – 6.7	parameter value (low-byte of low-word)	
PZD	7.0	hand wheel/crank operated	0 - 1
	7.1	remote active	0 - 1
	7.2	actuator in end position CLOSE	0 - 1
	7.3	actuator in end position OPEN	0 - 1
	7.4	tripping torque/force CLOSE reached (torque/force dependent cut-off)	0 - 1
	7.5	tripping torque/force OPEN reached (torque/force dependent cut-off)	0 - 1
	7.6	actuator running in CLOSE direction	0 - 1
	7.7	actuator running in OPEN direction	0 - 1
	8.0	ready + remote	0 - 1
	8.1	EMERGENCY operating possible	0 - 1
	8.2	sum fault signal	0 - 1
	8.3	unused	0 - 1
	8.4	factory programming OK	0 - 1
	8.5	end position OK	0 - 1
	8.6	actuator parameterization OK	0 - 1
	8.7	commissioning local OK	0 - 1
	9.0 – 9.7	actual position value (high-byte)	0 - 10000
	10.0 – 10.7	actual position value (low-byte)	

Only with PPO2 the following data are included in the cyclic telegram from the actuator to the master!

	Byte.Bit	Meaning	Value range
PZD	11.0 – 11.7	PZD 3 (high-byte)	dependent on parameter number (see parameter list)
	12.0 – 12.7	PZD 3 (low-byte)	
	13.0 – 13.7	PZD 4 (high-byte)	
	14.0 – 14.7	PZD 4 (low-byte)	
	15.0 – 15.7	PZD 5 (high-byte)	
	16.0 – 16.7	PZD 5 (low-byte)	
	17.0 – 17.7	PZD 6 (high-byte)	
	18.0 – 18.7	PZD 6 (low-byte)	

The selection of the parameters, which will be transferred as PZD 3 to 6, can be programmed using the COM-SIPOS software or writing the parameters 125 to 128!

The following parameter settings are necessary to transfer 32-bit values: P125 = P126 and P127 = P128.



## 6.4.2 Outputs (Master => Actuator)



All unused bytes/bits are sent with "0"!

	Byte.Bit	Meaning	Value range
PKW	1.0 – 1.2	parameter number (high-byte)	
	1.3	unused	
	1.4 – 1.7	job identifier 0 = no response 1 = parameter read 2 = parameter write	0 - 2
	2.0 – 2.7	parameter number (low-byte)	dependent on parameter number (see parameter list)
	3.0 – 3.7	parameter value (high-byte of high-word)	
	4.0 – 4.7	parameter value (low-byte of high-word)	
	5.0 – 5.7	parameter value (high-byte of low-word)	
	6.0 – 6.7	parameter value (low-byte of low-word)	
PZD	7.0 – 7.7	unused	
	8.0	control command OPEN	0 - 1
	8.1	control command CLOSE	0 - 1
	8.2	control command EMERGENCY	0 - 1
	8.3	fault signal reset	0 - 1
	8.4	maintenance carried out	0 - 1
	8.5	setpoint valid (Bit will be ignored, if the "Setpoint valid (bit)" user parameter was set to 0 (disable/unused) for the bus configuration.)	0 - 1
	8.6-8.7	unused	
	9.0 – 9.7	setpoint (high-byte)	0 - 10000
	10.0 – 10.7	setpoint (low-byte)	

## 6.5 User data (Data Exchange) “AUMA-process representation “

Adjustment of this data structure for the cyclic data exchange via the indication bytes:

- 0x97 and 0xA3, resp. 0x53 and 0x61 for a total of 8 byte input data and 4 byte output data (see “GSD-files”)
- 0x9B und 0xA3 für 12 Byte Eingangsdaten und 4 Byte Ausgangsdaten (see “GSD-files”)



All unused bytes/bits are sent with “0”!

### 6.5.1 Inputs (Actuator => Master)

Byte.Bit	SIPOS meaning	Value range
1.0	End position OPEN	0 - 1
1.1	End position CLOSE	0 - 1
1.2	Always “0”	
1.3	Always “0”	
1.4	Remote active and traveling OPEN	0 - 1
1.5	Remote active and traveling CLOSE	0 - 1
1.7	Not (ready + remote)	0 - 1
2.0	Fault motor temperature	0 - 1
2.1	Sum fault (without blocked in move) or end position adjustment not OK or parameterization not OK	0 - 1
2.2	Remote active	0 - 1
2.3	Local active	0 - 1
2.4	Position intermediate contact OPEN	0 - 1
2.5	Position intermediate contact CLOSE	0 - 1
2.6	Tripping torque/force OPEN reached	0 - 1
2.7	Tripping torque/force CLOSE reached	0 - 1
3.0-3.7	Position actual value (high-byte)	0 - 1000
4.0-4.7	Position actual value (low-byte)	
5.0	Always “0”	
5.1	Not remote active	0 - 1
5.2	Fault motor temperature	0 - 1
5.3	Low voltage or excessive voltage or external power supply fault	0 - 1
5.4	Fault "blocked in move + tripping torque/force OPEN reached	0 - 1
5.5	Fault "blocked in move + tripping torque/force CLOSE reached	0 - 1
5.6	Always “0”	
5.7	Always “0”	
6.0	Always “0”	
6.1	Channel 2 active	0 - 1
6.2	Always “0”	
6.3	Always “0”	
6.4	Always “0”	
6.5	No end position adjustment	0 - 1
6.7	Runtime error (not automatic reset)	0 - 1
7.4	Remote active and traveling OPEN	0 - 1
7.5	Remote active and traveling CLOSE	0 - 1
7.6	Hand wheel/crank or actuator running OPEN dir. locally controlled	0 - 1
7.7	Hand wheel/crank or actuator running CLOSE dir. locally controlled	0 - 1
8.0	Warning motor temperature	0 - 1
8.4	ClockSynchronization telegram received	0 - 1
8.5	Open circuit signal analog input 1 (setpoint)	0 - 1
8.6	Open circuit signal analog input 2 (proc.act.value)	0 - 1
8.7	Maintenance necessary	0 - 1
9.0-9.7	Analog input 1 (high-byte)	0 - 1000
10.0-10.7	Analog input 1 (low-byte)	
11.0-11.7	Analog input 2 (high-byte)	0 - 1000
12.0-12.7	Analog input 2 (low-byte)	

### 6.5.2 Outputs (Master => Actuator)

Byte.Bit	SIPOS meaning	Value range
1.0	control command OPEN	0 - 1
1.1	control command CLOSE	0 - 1
1.2	Setpoint valid (bit will be ignored, if the "Setpoint valid (bit)" user parameter was set to 0 (disable/unused) for the bus configuration.)	0 - 1
1.3	Fault signal reset	0 - 1
3.0-3.7	Setpoint (high-byte)	0 - 1000
4.0-4.7	Setpoint (low-byte)	

## 6.6 Monitoring methods

### ■ Master monitoring

see 6.2 "Parameterization of the DP-Slave – Master monitoring parameterizing"

### ■ „Fail-Safe” and „Global-Control-Clear“

One way to ensure that the slave is set to a safe condition (or changed over to the other channel) in the event of an error is with a "Fail-Safe" message (user data length = 0). This method is described in the DP-V1 recommendation and not in the basic DP standard.

If a "Fail-Safe" message is received, the slave remains in "Data Exchange" mode.

If a master fails, it sends a "Fail-Safe" message rather than changing to STOP mode.

If the actuator receives "Global-Control-Clear" (GC-Clear), it responds in exactly the same way as to a "Fail-Safe" message.

The response to the "Fail-Safe" message/„Global-Control-Clear" is shown in section 6.2 "Parameterization of the DP-Slave - Master monitoring parameterizing, table, rows 1 to 3".

The setting of "WD ON" is not relevant.

The slave leaves the "Fail-Safe" condition again when a valid user data message with a length > 0 is received.

### ■ Actuator monitoring

A watchdog is activated in the PROFIBUS interface of the actuator (slave) for monitoring the latter. This watchdog is reset cyclically by the microcontroller of the actuator control electronics.

If the watchdog is not reset by the microcontroller, the PROFIBUS interface of the actuator changes to the "Wait Prm" state after 300 Write-Read-Data messages have been received.

## 6.7 DP-V1 extension

With the DP-V1 extension it is possible to have an acyclic data exchange in addition to the cyclic data exchange.

For addressing the data records slot and index are used. By specifying the record length, it is possible to read and write parts of the data record. To exchange as much of the same kind of information as possible via one access, up to 244 bytes can be transferred. Due to the data record shape of the SIPOS 5 Flash/HiMod (see attachment „Data records PROFIBUS DP-V1“) max. 240 bytes are transferred.

The MSAC1-connection (master-slave-acyclic-communication of Class 1, SPS) is automatically established when the slave is defined as DP-V1 slave from the master (Set Prm).

The MSAC2-connection (engineering and control tools) is dynamic. Only one connection can be established.

### ■ Master Class services

#### • Master Class 1 services

Following services are supported:

- „MSAC1 Read“ read data record (addressed by slot and index)
- „MSAC1 Write“ write data record (addressed by slot and index)
- „MSAC1 Alarm“ transfer of alarm from slave to master (DP-V2 timestamp)

Following services aren't supported:

- „MSAC1 Status“ transfer of status signal from slave to master

#### • Master Class 2 services

Following services are supported:

- „MSAC2 Initiate“ connection build-up
- „MSAC2 Abort“ connection termination
- „MSAC2 Read“ read data record (addressed by slot and index)
- „MSAC2 Write“ write data record (addressed by slot and index)

This service „MSAC2DataTransport“ is not supported yet. This service is thought for a acyclic data exchange and is defined by general profiles (manufacturer independent).

### ■ Supported fault message

	Error code 1	Fault reason
read	Access.Invalid slot	access to wrong slot
	Access.Invalid index	access to wrong index
write	Access.Invalid slot	access to inadmissible slot
	Access.Invalid index	access to inadmissible index
	Access.write length	data record length too small or too long
	Access.invalid parameter	invalid write value
	Access.access denied	no write access allowed (EEPROM inaccessible), commissioning active: <ul style="list-style-type: none"><li>• on local control station or</li><li>• over serial interface or</li><li>• on other PROFIBUS channel</li></ul>
	Application write error	slot.Index can only be read

## ■ Slot and index assignment

Assignment slot 1			
slot	index	write	data record
1	0	no	manufacturer
	1		data of actuator
	2		firmware version
	3-5	-----	unused
	6	yes	tag number actuator
	7-9	-----	unused
	10	yes	speed and torque
	11		control and structure code
	12		PROFIBUS
	13		control signals
	14		Stroke-speed curve (only PROFITRON/HiMod)
	15		process controller (only PROFITRON/HiMod)
	16		positioner with proportional/split range functionality (only PROFITRON/HiMod)
	17		travel-positioning time-curve (only PROFITRON/HiMod)
	18		Customer variant (only PROFITRON/HiMod)
	19		acknowledgment
	20	no	observing standard assignment
	21		observing "PG-assignment"
	22		former errors
	23		binary and analog inputs
	24		PNO redundancy and timestamp (only PROFITRON/HiMod)
	25		actual diagnosis data
	26		maintenance limits for diagnosis data
	27	yes	maintenance intervals (only PROFITRON/HiMod)

Assignment Slot 2 (only with PROFITRON/HiMod)			
slot	index	write	data record
2	0	no	travel position in direction CLOSE
	1		output torque in direction CLOSE
	2		travel position in direction OPEN
	3		output torque in direction OPEN
	4		travel position in direction CLOSE
	5		output torque in direction CLOSE
	6		travel position in direction OPEN
	7		output torque in direction OPEN
	8		travel position in direction CLOSE
	9		output torque in direction CLOSE
	10		travel position in direction OPEN
	11		output torque in direction OPEN
	12	yes	torque graph recording control
	13	no	torque graph recording status

For the composition of the data records see attachment "Data records PROFIBUS DP-V1".

## ■ Write permissions

Depending on the redundancy type, there are different write access rights for Master Class 1 "MSAC1 Write":

- for SIPOS redundancy, both channels have write access,
- for PNO redundancy, only the PRIMARY channel has write access.

For "MSAC1 Write"/"MSAC2 Write" every participant has write access.

Control over the access shall be performed via the observing and control system (e.g. SIMATIC PDM via authorization: maintenance and specialist).

Simultaneous access via "MSAC1 Write"/"MSAC2 Write" is not possible.

### 6.7.1 I&M Function (Identification and maintenance function)

The I&M data can be read using index 255 (any slot).  
The data can be read via MSAC1 and MSAC2.

In the I&M 0 block, the following data can be read.

Designation	Size [byte]	Data type	Value
HEADER	10	Manufacturer-specific	Is not used => assign with 0x00
MANUFACTURER_ID	2	Unsigned 16	321
ORDER_ID	20	Visible String	Order no.
SERIAL_ID	16	Visible String	Works number
HARDWARE_REVISION	2	Unsigned 16	Low-Byte (Byte 1): Bit 0 = 1-channel Bit 1 = 2-channel Bit 2 = SPC3 Bit 3 = VPC3 Bit 4 = MPI Bit 5-7 = 0  HighByte (Byte 0)= 0
SOFTWARE_REVISION	4	1 char, 3 unsigned 8	Firmware version e.g. 2.54 Byte 0 = ,V' Byte 1 = 2 Byte 2 = 54
REV_COUNTER	2	Unsigned 16	Counter for write access to customer parameters.
PROFIL_ID	2	Unsigned 16	0xF600 (does not support any profile)
PROFIL_SPECIFIC_TYPE	2	Unsigned 16	0x0000 (does not support any profile)
IM_VERSION	2	2 unsigned 8	Version of the I&M function profile (1.1) Byte 0: 1 Byte 1: 1
IM_SUPPORTED	2	Unsigned 16	Bit 0 to 15: 0 (I&M 0 only)

## 6.8 Redundancy

In order to increase the reliability of the installation when actuators are used with PROFIBUS interface, the PROFIBUS board can be supplied in a 2-channel version (redundant) as an option.

In this case, the ASIC, the driver devices, the opto isolator and the DC/DC converter are separately provided on the PROFIBUS board for each channel.

SIPOS 5 Flash supports two different redundancy types:

- **SIPOS redundancy** (see 6.9)  
**Actuator decides** which channel is active (PRIMARY) and may operate the actuator.  
This redundancy type is selected if no PrmCmd telegram was received within the SetPrm telegram.
- **PNO redundancy** (see 6.10.1)  
**The master decides** which channel is active (PRIMARY) and may operate the actuator.  
This redundancy type is selected if a Prm\_Cmd block was received within the SetPrm telegram.  
Switching over to SIPOS redundancy is only possible via software reset or via power off/on.

After switching on, the actuator is always in the "SIPOS redundancy" mode.

### 6.8.1 Telegrams and bus addresses

The two channels can be configured for different user data telegrams.  
The station address for both channels can be selected freely (even the same address for both channels is possible).

### 6.8.2 Start-up behavior

After switching on the actuator, the PROFIBUS communication is in the "start-up" state.

In this state, there is only one actuator communicating on the bus. The channels cyclically change between "communicates at the bus" and "does not communicate at the bus".

The communicating channel is always assigned the address of channel 1 (PRIMARY address).

The change first occurs after 2s. This interval doubles after each change until the maximum interval of 32s has been reached.

The PROFIBUS communication remains in the "start-up" state, until the master switches one of the channels to the "Data Exchange" state. This channel will then become the active channel (PRIMARY).

Once the first channel is in the "Data Exchange" state, the second channel on the bus will also be active.

During the "Start-up" state, an MSAC2 connection may be established. The change over to the other channel is only performed once the MSAC2 connection was terminated.

### 6.8.3 PZD area (process data) and "AUMA-process image"

Only the active channel (PRIMARY) can write to outputs. The outputs which the passive channel (BACKUP) writes to are only stored and are not passed on to the control electronics until a changeover is made to this channel.

Inputs, on the other hand, can be read by both channels.

### 6.8.4 PKW area (parameter ID value of PPO1 and PPO2)

The PKW area of the outputs can be written by both channels. The PKW areas of both channels are evaluated.

#### ■ Writing parameters

Write access to parameters is only allowed to the active channel (PRIMARY).

Exception: If the data in the PKW area are identical, the passive channel (BACKUP) receives the same read back via the PKW area of the inputs as the active channel (PRIMARY).

#### ■ Reading parameters

Both channels can read out parameters. It is also possible that channel 1 reads different parameters than channel 2.

If both channels read the same parameters, they receive the same data in the PKW area of the inputs.

## 6.9 SIPOS redundancy

The channel which is the first to enter the cyclic user data communication ("Data Exchange") when the actuator is switched on is the active channel (PRIMARY). Via this channel, read and write access to the actuator is possible. This includes process mode, i.e. the drive is moved via this channel. The second channel is the passive channel (BACKUP), via which only data is sent from the actuator to the digital control system. The digital control system therefore can only observe the actuator via this passive channel but cannot move it.

By means of the status word, the digital control system is able to determine which channel is the active one.

### 6.9.1 MSAC1 (Master slave acyclic-communication of class 1)

If both channels are parameterized with "DP-V1 Enable" (see section 6.2) 2 acyclic connections are active. However writing an index on both channels simultaneously is not possible.

### 6.9.2 Changeover criteria

A changeover to the other channel is necessary whenever data is no longer being exchanged over the active channel.

This is the case if the following conditions apply:

- Set Prm" or "Set Cfg" during "Data Exchange"  
(In order to avoid changeover collisions, a changeover delay is provided (approx. 60 ms delay time), i.e. if the active channel leaves the user data exchange mode with "Set Prm"/"Set Cfg" and returns to user data exchange within the changeover delay time, a changeover is not performed.)
- Master failure
- Loss of DP connection (cable break)
- ASIC defect
- Fail-Safe or Global-Control-Clear (Actuator remain "Data Exchange")



A response monitoring function has to be parameterized to ensure that failure of the master or a cable break is detected (see section 6.2)!

#### Sequence:

If a changeover criterion occurs, a changeover to the passive channel is performed, if a user data communication is possible on this channel.

If no channel is selected as the active channel, the actuator behaves as described in section 6.2.



## 6.10 DP-V2 extension

### 6.10.1 PNO- redundancy

The PNO redundancy is described in the "Specification Slave redundancy", order no. 2.212.

This redundancy type has two communication channels. One channel is the so-called PRIMARY, the other channel is the BACKUP:

#### ■ PRIMARY

- Evaluates the input data of the cyclic data exchange. The actuator can be controlled via this channel.
- The MSAC1 connection is active.
- An MSAC2 connection can be established; MSAC2-Read and MSAC2-Write are supported.
- The BACKUP channel also sends diagnosis data.

#### ■ BACKUP

- Does **not** evaluate the input data of the cyclic data exchange. The actuator **cannot** be controlled via this channel.
- The MSAC1 connection is **not** active.
- An MSAC2 connection can be established; MSAC2-Read and MSAC2-Write are supported.

Via a PrmCmd block in the SetPrm telegram (see 6.10.1.2), the master indicates which channel will be the PRIMARY.

There are two redundancy types within the PNO redundancy:

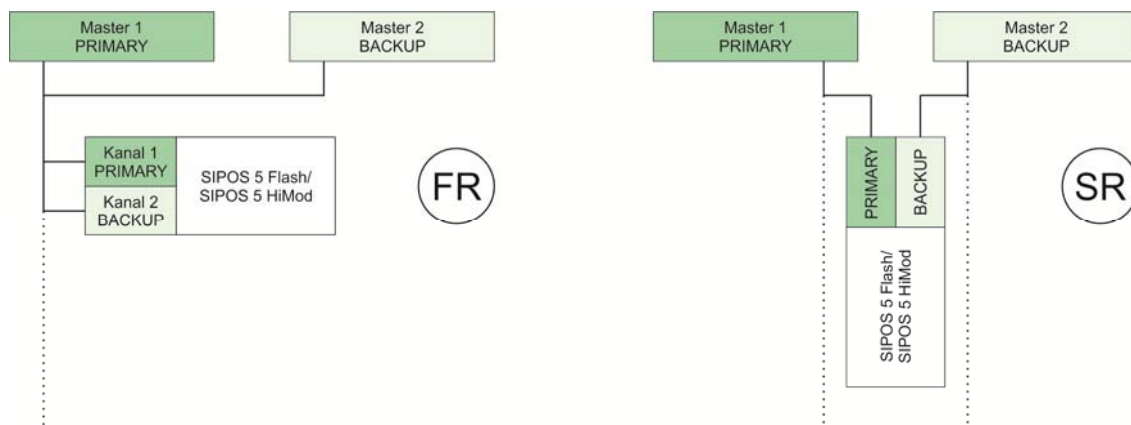
#### ■ Flying Redundancy (FR)

- No cable redundancy, master redundancy possible.
- The master never communicates via the BACKUP channel.
- The BACKUP address is: PRIMARY address + 64  
→ PRIMARY address must be less than 62.

#### ■ System Redundancy (SR)

- Cable redundancy and master redundancy possible.
- The master can communicate with both the PRIMARY and the BACKUP slave.
- The addresses of BACKUP and PRIMARY may be identical.

System redundancy (SR) is set as default. The flying redundancy is set via the PrmCmd block (see 6.10.1.2).



Example of the structure for FR or SR, in this case shown with master redundancy. The PRIMARY master communicates with the slaves and forwards the data to the BACKUP master. Should the PRIMARY master fail, the masters swap roles and the BACKUP master becomes PRIMARY master.

Communication start-up behavior, see section 6.8.2.

### 6.10.1.1 Setup of the slave address

Setup of the slave address (see chapter 5).

Note the following for PNO redundancy:

- Address channel 1 = PRIMARY address
- Address channel 2 = BACKUP address

### 6.10.1.2 Prm Cmd

The PrmCmd block is part of the SetPrm telegram.

Byte	Bit position								Designation
	7	6	5	4	3	2	1	0	
0	0	0	0	0	1	0	0	0	Block length = 0x08
1	0	0	0	0	0	0	1	0	Structure type = 0x02
2	0	0	0	0	0	0	0	0	Slot = 0x0
3	seq	seq	seq	seq	seq	reserve	reserve	reserve	Specifier
4	reserve	Master State Clear	reserve	Check Properties	Start_MSAC1S	Stop_MSAC1S	Primary Request	reserve	Function
5	reserve	reserve	reserve	reserve	Address Offset64	Address Change	Start/Stop MSAC1S used	PrimaryReq MS0_MS1 used	Properties
6									Output_Hold_Time high-byte
7									Output_Hold_Time low-byte

Output\_Hold\_Time: 1 = 10ms

- **Flying Redundancy (FR)**  
Selected by AddressOffset64=1 and AddressChange=1.
- **System Redundancy (SR)**  
Selected by AddressOffset64=0 and AddressChange=1.

System redundancy (SR) is set as default.

### 6.10.1.3 Extended diagnosis (Red\_Status, Prm\_Cmd\_Ack)

If the PNO redundancy is active, the actuator sends the extended diagnosis (Red\_Status and Prm\_Cmd\_Ack).

Within the Red\_Status, the states of both PRIMARY and BACKUP channel are described.

As soon as the status of one of the two channels changes, the PRIMARY channel sends a top priority response telegram within the cyclic data exchange. The master then reads the diagnosis data with the new states.

If the master sends a PrmCmd, the slave responds with a PrmCmdAck in the diagnosis data.

Byte	Red_Status	Prm_Cmd_Ack
0	Headerbyte = 0x08	Headerbyte = 0x08
1	Status_Type = 0x9F	Status_Type = 0x9E
2	Slot_Number = 0	Slot_Number = 0
3	Specifier	Specifier
4	Function	Function
5	Red_State_1 (this channel)	Red_State_1 (this channel)
6	Red_State_2 (other channel)	Red_State_2 (other channel)
7	Red_State_3 (not used)	Red_State_3 (not used)

#### Function

Bit 0:	Reserve
Bit 1:	PrimaryRequest
Bit 2:	Stop_MSAC1S
Bit 3:	Start_MSAC1S
Bit 4:	Check_Properties
Bit 5:	Reserve
Bit 6:	Master_State_Clear
Bit 7:	Reserve

#### Red\_State\_1 and Red\_State\_2

Bit 0:	This channel is BACKUP
Bit 1:	This channel is PRIMARY
Bit 2:	Hardware is defective
Bit 3:	This channel is in Data Exchange
Bit 4:	Master_State_Clear
Bit 5:	Baud rate was found
Bit 6:	Time monitoring for switchover is active: OutputHoldTime (TOH) was started.

## 6.10.2 Clock synchronization and timestamp

Events within the actuator can be assigned a timestamp and be sent to the master with a process alarm.

To ensure that all messages within a plant can be sorted chronologically, the clocks of all devices have to be synchronized. Therefore, the master cyclically sends the current time to all slaves.

Activation of timestamp and clock synchronization:

1. Master activates timestamp and selects messages for timestamp via UserParameter block
2. Master sends ClockSync interval via structured parameter block (time AR)
3. Master cyclically sends TimeEvent and ClockValue telegrams (clock synchronization)
4. Actuator (slave) sends start-up data of the timestamp (current status of the messages)

Sending timestamped messages:

1. Actuator (slaves) sends top priority response telegram in Data Exchange mode
2. Master reads diagnosis data with the process alarm and the sent data record (slot/index)
3. Master acknowledges the alarm
4. Master reads the sent data record and evaluates timestamped information

### 6.10.2.1 Activating the timestamp

The UserPrmData block is part of the SetPrm telegram.

The timestamp is activated via byte 1 of the user data in the UserPrmData block.

The UserPrmData is embedded in a structured block (see GSD file).

The following data is defined within the user data of the block:

Byte. Bit	Value	Name of parameters	Type	Value range
0	<b>Setpoint valid</b>		Unsigned8	0 ... 1
	0	deactivated		
	1	activated		
1	<b>Activate timestamp</b>		Unsigned8	0 ... 1
	0	deactivated		
	1	activated		
2	<b>Enable individual messages</b>			
2.0		End position CLOSE	Bit	0 ... 1
2.1		End position OPEN	Bit	0 ... 1
2.2		tripping torque/force CLOSE reached	Bit	0 ... 1
2.3		tripping torque/force OPEN reached	Bit	0 ... 1
2.4		Ready+remote	Bit	0 ... 1
2.5		Sum fault	Bit	0 ... 1
2.6		Fault power supply (low or excessive voltage)	Bit	0 ... 1
2.7		Reserve	Bit	0 ... 1
3	<b>Reserve</b>		Unsigned8	

The individual messages are stored within the data record as follows:

- **incoming message** at flank 0 → 1
- **outgoing message** at flank 1 → 0

### 6.10.2.2 Time AR parameter block

The "Time AR" parameter block is part of the SetPrm telegram.

By means of this telegram, the master indicates the intervals for time synchronization.

The structure of the telegram conforms to the DP-V1 standard.

Byte	Bit position								Designation
	7	6	5	4	3	2	1	0	
0									Structure length
1	0	0	0	0	1	0	0	0	Structure type
2	0	0	0	0	0	0	0	0	Slot
3	0	0	0	0	0	0	0	0	Reserved
4-5									Clock_Sync_Interval Zeitbasis 10 ms
6-9	Seconds ( $2^{31}..0$ )								CS Delay Time (kann entfallen)
10-13	Split seconds ( $2^{31}..0$ ) Unit $1/(2^{32})$ seconds								

Clock\_Sync\_Interval: The interval times (1 s, 10 s, 1 min and 10 min) are supported.

### 6.10.2.3 ClockValue telegram

The time synchronization is transmitted in 2 steps:

- Master sends TimEvent
- Master sends ClockValue telegram with the time specification when the TimeEvent telegram was sent.

Byte	Bit position								Description
	7	6	5	4	3	2	1	0	
0-3	Seconds ( $2^{31}..0$ ) since 1.1.1900 0:00.00 or since 7.2.2036 6:28:16 if value < 0x9dff4400								Clock_Value of Time_Event (TE)
4-7	Split seconds ( $2^{31}..0$ ) Unit $1/(2^{32})$ seconds								
8-11	Seconds ( $2^{31}..0$ ) since 1.1.1900 0:00.00 or since 7.2.2036 6:28:16 if value < 0x9dff4400								Clock_Value previous TE
12-15	Split seconds ( $2^{31}..0$ ) Unit $1/(2^{32})$ seconds								
16	C	CV					Reserved		Clock_Value_Status1
17	ANH	SWT	Reserve d	CR		Reserve d		SYF	Clock_Value_Status2

#### 6.10.2.4 Process alarm

The alarm is sent with the diagnosis telegram.

The actuator only supports the process alarm.

Byte	Meaning	Value range
0	Header byte Bit 0...5: Block length including the header byte Bit 6...7: Alarm message ID	Fixed 08
1	Alarm type = process alarm	Fixed 2
2	Slot	Fixed 0
3	Alarm specifier Bit 0...2: Alarm type Bit 3...7: Sequence number	Bit 0...2 = 00
4	Timestamp state Bit 2: Buffer overflow Bit 5: Timestamp reset	
5	Data record to be read	100...115
6	Number of messages within the data record	1...17
7	Data structure Delta_Trigger_Discrete	Fixed 13

### 6.10.2.5 Reading the data record

The data record (slot 0 index 100 to 115) indicated in the process alarm can be read after acknowledging the alarm.

Up to 17 messages can be contained in a data record.

A message within the data record consists of 14 bytes.

A message either contains

- a timestamped message (byte 0 = 1) or
- a special message (byte 0 >= 128).

Byte.Bit	Value	Name of parameters	Type	Value range
0	<b>Type of message</b>		Unsigned8	1, 2, 128 ... 135
	1 0x01	Delta_Trigger_Discrete (timestamped message)		
	2 0x02	Time_Trigger_Discrete (timestamped message)		
	128 0x80	Startup data Status (coded in byte 3) = 1 => start Status = 0 => end		
	132 0x84	Timestamp end Status (in byte 3) = 1 => start of timestamp interruption Status = 0 => end of timestamp interruption		
	133 0x85	Buffer overflow Status (in byte 3) = 1 => no buffer for messages available Status = 0 => buffers available		
	134 0x86	Channel switchover for redundancy Status (in byte 3) = 1 => start of switchover Status = 0 => end of switchover		
	135 0x87	Information loss for redundancy Status (in byte 3) = 1 => start of information loss Status = 0 => end of information loss		
1	<b>Slot</b>		Unsigned8	0
2	<b>Message (for byte 0 = 1)</b>		Unsigned8	0 ... 7
	1	End position CLOSE		
	2	End position OPEN		
	3	tripping torque/force CLOSE reached		
	4	tripping torque/force OPEN reached		
	5	Ready+remote		
	6	Sum fault		
	7	Fault power supply (low or excessive voltage)		
3.7	<b>Special message status</b>		Bit	0 / 1
	0	Message not active (outgoing)		
	1	Message active (incoming)		
4...5	<b>Not used</b>		Unsigned8	0
6	<b>Seconds since 1.1.1900 (bit 24...31)</b>		Unsigned8	0 ... 255
7	Seconds since 1.1.1900 (bit 16...23)		Unsigned8	0 ... 255
8	Seconds since 1.1.1900 (bit 8...15)		Unsigned8	0 ... 255
9	Seconds since 1.1.1900 (bit 0...7)		Unsigned8	0 ... 255
10	<b>Split seconds <math>1/2^{32}</math> (Bit 24...31)</b>		Unsigned8	0 ... 255
11	Split seconds $1/2^{32}$ (Bit 16...23)		Unsigned8	0 ... 255
12	Split seconds $1/2^{32}$ (Bit 8...15)		Unsigned8	0 ... 255
13	Split seconds $1/2^{32}$ (Bit 0...7)		Unsigned8	0 ... 255

### 6.10.2.6 Timestamp and redundancy

Timestamped messages are sent on the PRIMARY channel only.

Timestamped messages are buffered during a channel switchover and sent to the master once the switchover is complete. In case of buffer overflow, the startup data is sent.





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ParNo	Value	Name of parameters		Rotary Actuator 2SA5		Linear Actuator 2SB5		Part-turn Actuator						Type	ECOTRON 1)		PROFITRON 1)		HiMod	Remark
				2SA5		2SB5		2SC50	2SC55	2SC55	2SG5	2SG5			2S.50	2S.55	2S.50	2S.55		
12	0 ... 9	actual duty (see ParNo 110)												unsigned8	r	r	r	r	r	
13		actual position value												integer16	r	r	r	r	r	
14		0.01% OPEN												integer16					r	only with enabled process controller
15		actual process value (0.01%)												unsigned8	r	r	r	r	r	
		actual output speed												actual positioning speed [mm/min] or positioning time [sec]						
	0	1.25 rpm																		
	1	1.75 rpm																		
	2	2.50 rpm																		
	3	3.50 rpm																		
	4	5.00 rpm																		
	5	7.00 rpm																		
	6	10.0 rpm																		
	7	14.0 rpm																		
	8	20.0 rpm																		
	9	28.0 rpm																		
	10	40.0 rpm																		
	11	56.0 rpm																		
	12	80.0 rpm																		
	13	112 rpm																		
	14	160 rpm																		
	15	0 rpm																		
16		motor temperature 2)												integer16	r	r	r	r	r	
		0.01°C																		
17		DC-link voltage converter [V]												unsigned16	r	r	r	r	r	
18		analog input 1 (setpoint) + analog input 2												unsigned32						from firmware 2.30
	0 .. 15	analog input 1: 0-10000 scaling, 0=0mA, 10000=20mA, independent of parameterization																		
	16 .. 31	analog input 2: 0-10000 scaling, 0=0mA, 10000=20mA, independent of parameterization																		
19		binary input , independent of parameterization high/low active												unsigned16						
	0	binary input Close													r	r	r	r	r	
	1	binary input Open													r	r	r	r	r	
	2	binary input Stop													r	r	r	r	r	
	3	binary input Emergency													r	r	r	r	r	
20		baudrate channel 1												unsigned8	r	r	r	r	r	
	0	no data exchange																		
	1	9.6 kbit/s																		
	2	19.2 kbit/s																		
	3	45.45 kbit/s																		
	4	93.75 kbit/s																		
	5	187.5 kbit/s																		
	6	500 kbit/s																		
	7	1500 kbit/s																		

1) r = read; w = write; r+w = read+write

2) not for 2SG5

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ParNo	Value	Name of parameters	Rotary Actuator 2SA5		Linear Actuator 2SB5		Part-turn Actuator				Type	ECOTRON 1)		PROFITRON 1)		HiMod	Remark
			1/2	3	4/5	6	0	1	2	3	4/5/6	2SC50	2SC55	2SG5	2S.58	2S.55	
21	0 ... 7	baudrate channel 2 (see ParNo)										r	r	r	r	r	
22	0	status channel 1										r	r	r	r	r	
	1	„Wait Prm“ (no bus parameterization)															
	2	„Wait Cfg“ (no bus configuration)															
	6	„Data Exchange“ (user data)															
	10	„Fail-Safe“															
23	0 ... 10	status channel 2 (see ParNo 22)										r	r	r	r	r	
24	0.65535	PROFIBUS identification number										r	r	r	r	r	
25	0	binary input , according parameterization high/low active										r	r	r	r	r	from firmware 2.28
	1	binary input Close										r	r	r	r	r	
	2	binary input Open										r	r	r	r	r	
	3	binary input Stop										r	r	r	r	r	
	5	binary input Emergency															
	6	open circuit analog input 1															
26	0	open circuit analog input 2															
27	0-10000	analog input 1 (setpoint)															
	0-10000	analog input 2															
29	0-10000	scaling, according parameterization (ParNo. 108 or LCD)															
	electronics temperature																
	(1 = 0.1°C)																
30	0	switching cycles per hour															
31	0	relative operational time															
32	0	number of switching cycles															
33	0	number of travel dependence cut-offs															
34	0	number of torque dependence cut-offs															
35	0	electronics unit operating hours															
36	0	motor/gear unit operating hours															
38	0	number of write access attempts to customer parameters															
46	0-10000	setpoint from DCS (setpoint before adaptation to valve curve)															
47	0-10000	scaling (1 = 0.01% OPEN)															
	actual value to DCS (actual value after adaptation to valve curve)																
	0-10000	scaling (1 = 0.01% OPEN)															
50	0	maintenance limit switching cycles															
51	0	maintenance limit torque dependence cut-offs															
52	0	maintenance limit motor operating hours															
60	bit 0	torque curves recording possible 2)															
	bit 1	curve recording curve 1 active															
	bit 2	curve recording curve 2 active															
	bit 2	curve recording curve 2 active															

1) r = read; w = write; r+w = read+write

2) not for 2SG5

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Name of parameters		Rotary Actuator 2SA5										Linear Actuator 2SB5				Part-turn Actuator 2SC50    2SC55    2SG5						Type	ECOTRON 1) 2S.50    2S.55    standard    modul.		PROFITRON 1) 2S.50    2S.55    standard    modul.		HiMod 2S.58 2S.55	Remark																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
ParNo	Value	1/2	3	4/5	6	0	1	2	3	4/5/6	0	1/2/3/4					2S.50	2S.55	standard	modul.		2S.50	2S.55	standard	modul.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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# List of parameters PROFIBUS DP

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ParNo	Value	Name of parameters		Rotary Actuator 2SA5		Linear Actuator 2SB5		Part-turn Actuator						Type	ECOTRON 1)		PROFITRON 1)		HiMod	Remark			
				2SA5		2SB5		2SC50		2SC55		2SG5			2S.50		2S.55				2S.58 2S.55		
		1/2	3	4/5	6	0	1	2	3	4/5/6	0	1/2/3/4			standard	modul.	standard	modul.					
100	output speed in direction CLOSE 2)																						
	0	1.25 rpm																		80			
	1	1.75 rpm																		56			
	2	2.50 rpm																		40			
	3	3.50 rpm																		28			
	4	5.00 rpm																		20			
	5	7.00 rpm																		14			
	6	10.0 rpm																		10			
	7	14.0 rpm																		96			
	8	20.0 rpm																		40			
	9	28.0 rpm																		28			
	10	40.0 rpm																		11			
	11	56.0 rpm																		8			
	12	80.0 rpm																		20			
101	output speed in direction OPEN 2)																						
	0 ... 14	(see ParNo 100)																		output speed [mmv/min] or positioning time [sec] in direction CLOSE		positioning speed [mmv/min] or time [sec] in direction OPEN	
102	EMERGENCY output speed in direction CLOSE 2)																						
103	0 ... 14	(see ParNo 100)																		positioning speed [mmv/min] or time [sec] in direction CLOSE by EMERGENCY		positioning speed [mmv/min] or time [sec] in direction OPEN by EMERGENCY	
	0 ... 14	(see ParNo 100)																		positioning speed [mmv/min] or time [sec] in direction CLOSE by EMERGENCY		positioning speed [mmv/min] or time [sec] in direction OPEN by EMERGENCY	
104	tripping torque in end position CLOSE in % of ParNo 199 2)																						
	0	100% Tmax																		100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100			
	1	90% Tmax																		90 90 90 90 90 90 90 90 90 90 90 90 90 90 90 90 90 90			
	2	80% Tmax																		80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80			
	3	70% Tmax																		70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70			
	4	60% Tmax																		60 60 60 60 60 60 60 60 60 60 60 60 60 60 60 60 60 60			
	5	50% Tmax																		50 50 50 50 50 50 50 50 50 50 50 50 50 50 50 50 50 50			
	6	40% Tmax (only 2S.50..)																		40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40			
105	7	30% Tmax (only 2S.50..)																		30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30			
	tripping torque in end position OPEN in % of ParNo 199 2)																						
	0 ... 7	(see ParNo 104)																		tripping force or tripping torque in end position OPEN in % of ParNo 199		(see ParNo 104)	
	end position range CLOSE from 0% to parameter value 2)																						
106	200 ... 2000 (0.01% OPEN)																						
107	end position range OPEN from 100% to parameter value 2)																						
	8000 ... 9800 (0.01% OPEN)																						
1) r = read; w = write; r+w = read+write																							
3) for 2SG5 read only																							
2) changeable, if not commissioning locally. Actuator is "not ready" during changing!																							

2) changeable, if not commissioning locally. Actuator is "not ready" during changing!



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ParNo	Value	Name of parameters		Rotary Actuator 2SA5	Linear Actuator 2SB5		Part-turn Actuator						Type	ECOTRON 1)		PROFITRON 1)		Remark
					1/2	3	4/5	6	0	1	2	3	4/5/6	0	1/2/3/4	2SG5		
112		emergency position 2)																
		0 ... 10000 (0.01% OPEN)																
113		position intermediate contact CLOSE 2)																
		0 ... 10000 (0.01% OPEN)																
114		position intermediate contact OPEN 2)																
		0 ... 10000 (0.01% OPEN)																
115		rise time 2)																
		1 ... 100 (0.1 sec), for modulating actuators 1 ... 200																
116		dc-brake 2)																
		0 ... 250 %																
117		retry to get over torque block when out of travel limit areas 2)																
		0 ... 5 (0 = no repeated start)																
118	bit 0	separate mounting																
120		slave-no. channel 1																
		0 – 125 (default address = 126)																
121		slave-no. channel 2 (see ParNo 120)																
125		PZD 3 = ParNo transfer 2)																
126		PZD 4 = ParNo transfer 2)																
127		PZD 5 = ParNo transfer 2)																
128		PZD 6 = ParNo transfer 2)																
130	bit 0-6	output 1 2)																
	0	no output																
	1	end position CLOSE																
	2	end position OPEN																
	3	tripping torque/force CLOSE reached (torque/force dependent cut-off)																
	4	tripping torque/force OPEN reached (torque/force dependent cut-off)																
	5	tripping torque/force OPEN or CLOSE reached (torque/force dependent cut-off)																
	6	sum fault																
	7	blinker																
	8	ready																
	9	ready + remote																
	10	local																
	11	position intermediate contact CLOSE																
	12	position intermediate contact OPEN																
	13	fault motor temperature																
	14	warning motor temperature 3)																
	15	fault low/ high voltage																
	16	maintenance necessary																
	17	running indication in direction CLOSE																
	18	running indication in direction OPEN																
	bit 7	NC (low-active)																
		1 = yes; 0 = NO (high active)																
		2) changeable, if not commissioning locally. Actuator is "not ready" during changing!																
		3) not for 2SG5																

1) r = read; w = write; r+w = read+write  
3) not for 2SG5

# List of parameters PROFIBUS DP

## SIPOS 5 Flash /HiMod

Issue 05/13

ParNo	Value	Name of parameters	Rotary Actuator 2SA5				Linear Actuator 2SB5				Part-turn Actuator				Type	ECOTRON 1)		PROFITRON 1)		HiMod	Remark
			1/2	3	4/5	6	0	1	2	3	4/5/6	2SC50	2SC55	2SG5		2S.50 standard	2S.55 modul.	2S.50 standard	2S.55 modul.		
131		output 2 2) (see ParNo 130)													unsigned8	r	r	r+w	r+w	r+w	
132		output 3 2) (see ParNo 130)													unsigned8	r	r	r+w	r+w	r+w	
133		output 4 2) (see ParNo 130)													unsigned8	r	r	r+w	r+w	r+w	
134		output 5 2) (see ParNo 130)													unsigned8	r	r	r+w	r+w	r+w	
135		output 6 2) (see ParNo 130)													unsigned8			r+w	r+w	r+w	
136		output 7 2) (see ParNo 130)													unsigned8			r+w	r+w	r+w	
137		output 8 2) (see ParNo 130)													unsigned8			r+w	r+w	r+w	
138		warning "motor temperature" at ... °C 2) 3) -20°C ... 155°C (0.01°C)													integer16	r+w	r+w	r+w	r+w	r+w	
139		language on the LCD 2)													unsigned8			r+w	r+w	r+w	
	0	German																			from firmware 2.14
	1	English																			from firmware 2.32
	2	French																			
	3	Spanish																			
	4	Italian																			
	5	Polish																			
	6	Czech																			from firmware 2.35
	7	Swedish																			
	8	Netherlands																			from firmware 2.61
	9	Portuguese																			
	10	Finnish																			
140		customer variant 0 ... 127																			
150		interval value switching cycles 2)													unsigned8	r+w	r+w	r+w	r+w	r+w	from firmware 2.22
	0 ... 30 Mio. (modulating duty)														unsigned32						
	0 ... 100000 (standard version)																				
151		interval value torque dependent cut-offs 2)													unsigned16						
	0 ... 20000 (modulating duty)																				
	0 ... 10000 (standard version)																				
152		interval value motor operating hours 2)													unsigned16						
	0 ... 2500																				
160		tag number actuator													Visible-String	r+w	r+w	r+w	r+w	r+w	
161		0. - 3. digit 2)																			
162		4. - 7. digit 2)																			
163		8. - 11. digit 2)																			
164		12. - 15. digit 2)																			
		16. - 19. digit 2)																			

1) r = read; w = write; r+w = read+write

3) not for 2SG5

2) changeable, if not commissioning locally. Actuator is "not ready" during changing!

# List of parameters PROFIBUS DP

## SIPOS 5 Flash /HiMod

Issue 05/13

Name of parameters		Rotary Actuator 2SA5										Linear Actuator 2SB5				Part-turn Actuator 2SC50						ECOTRON 1)		PROFITRON 1)		HiMod	Remark
ParNo	Value	1/2		3	4/5	6	0	1	2	3	4/5/6	0	1/2/3/4	2SG5	2S.50 standard	2S.55 modul.	2S.58 2S.55 modul.	from firmware 2.55b									
181		run time in direction CLOSE for control via proportional operation "proportion. conv/bus" 0 or 50 ... 32760 (1=0.1s) 0 = run time determined by the actuator (ParNo 65) is used																				unsigned16		r+w	r+w	from firmware 2.55b	
182		run time in direction OPEN for control via proportional operation "proportion. conv/bus" 0 or 50 ... 32760 (1=0.1s) 0 = run time determined by the actuator (ParNo 66) is used																				unsigned16		r+w	r+w		
185		process controller: amplification vp 2) -100 ... 100 (1 = 0.01%)																				signed16		r+w	r+w	from firmware 2.66	
186		process controller: reset time tn 2) 0 ... 30000 (1 = 0.1 s)																				unsigned16		r+w	r+w	from firmware 2.20	
187		process controller: fixed setpoint value 2) 0 ... 200 (1 = 0.5 %)																				unsigned8		r+w	r+w		
197	1	function control delete former errors																				unsigned8	w	w	w	from firmware 2.32	
199		max. output torque (Tmax [Nm]) or cut-off force (Fmax [kN]) (1 = 1 Nm or 0.1 kN)																				unsigned16	r	r	r		
200		manufacturer 0. - 3. digit																				Visible-String	r	r	r		
201		4. - 7. digit																									
202		8. - 11. digit																				unsigned32	r	r	r	r	
203		0. - 8. digit																									
204		9. - 12. digit																				unsigned16	r	r	r	r	
205		0. - 3. digit																									
206		4. - 7. digit																				Visible-String	r	r	r	r	
207		8. - 11. digit																									
208		12. - 15. digit																				Visible-String	r	r	r	r	
211		firmware version electronics unit 0. - 3. digit																									
212		4. - 7. digit																				Visible-String	r	r	r	r	
213		8. - 11. digit																									
215		original works number 0. - 8. digit																				unsigned32	r	r	r	r	from firmware 2.35
216		9. - 12. digit																									
221		speed curve - position 1 2) 0 ... 100 (% OPEN; 0 = end position CLOSE)																				unsigned16	r	r	r	r	from firmware 2.14
222-		speed curve - position 2-10 2) see ParNo 221)																				unsigned8		r+w	r+w	r+w	
230																						unsigned8		r+w	r+w	r+w	
2) changeable, if not commissioning locally. Actuator is "not ready" during changing!																											

1) r = read; w = write; r+w = read+write 2) changeable, if not commissioning locally. Actuator is "not ready" during changing!



Name of parameters		Rotary Actuator 2SA5		Linear Actuator 2SB5		Part-turn Actuator						Type	ECOTRON 1)		PROFITRON 1)		HIMod							
ParNo	Value			1/2	3	4/5	6	0	1	2	3	4/5/6	0	1/2/3/4	2SG5	2S.50	2S.55	2S.58 2S.55	Remark					
231	speed curve - speed 1 2)																			unsigned8			r+w	from firmware 2.14
	0	positioning speed [mm/min] or positioning time [sec]																						
	1																							
	2																							
	3																							
	4																							
	5																							
	6																							
	7																							
	8																							
	9																							
	10																							
	11																							
	12																							
	13																							
14																								
232-	speed curve - speed 2-10 2)																			unsigned8			r+w	
240	(see ParNo 231)																							
241	speed – function selection 2)																			unsigned8			r+w	
	bit 0	speed curve setting: local via speed curve																						
	bit 1	speed curve setting: remote via speed curve																						
	bit 2	speed curve setting: local via external speed setpoint (2 <sup>nd</sup> analog input)																						
	bit 3	speed curve setting: remote via external speed setpoint (2 <sup>nd</sup> analog input)																						
	bit 7	activate curve position / curve speed																						
245	proportional / split-range: current value 1																			unsigned8			r+w	from firmware 2.34
	0 ... 200 (1 = 0.1mA)																							
	proportional / split-range: position value 1																							
	0 ... 100 (1 = 1% Open)																							
246	proportional / split-range: current value 2																			unsigned8			r+w	unequal position 2
	0 ... 200 (1 = 0.1mA)																							
247	proportional / split-range: position value 2																			unsigned8			r+w	larger than current value 1
	0 ... 100 (1 = 1% Open)																							
248	travel-positioning time-curve 2)																			unsigned8			r+w	from firmware 2.34
	0 ... 100 (1 = 1% Open)																							
250	travel-positioning time-curve local																			unsigned8			r+w	from firmware 2.35
	bit 1																							
	travel-positioning time-curve emergency operation																							
	bit 7																							
	travel-positioning time-curve: position 1																							
251	0 ... 100 (% OPEN, 0 = endposition CLOSE)																			unsigned8			r+w	from firmware 2.37
	travel-positioning time-curve: position 2 up to position 5																							
252-	see ParNo 251																			unsigned8			r+w	from firmware 2.35
255																				unsigned8			r+w	from firmware 2.35
1) r = read; w = write; r+w = read+write																				2) changeable, if not commissioning locally. Actuator is “not ready” during changing!				

## List of parameters PROFIBUS DP

## SIPOS 5 Flash /HiMod

Issue 05/13

Name of parameters		Rotary Actuator 2SA5										Linear Actuator 2SB5				Part-turn Actuator				Type	ECOTRON 1)			PROFITRON 1)		HiMod	Remark																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
ParNo	Value	1/2	3	4/5	6	0	1	2	3	4/5/6	2SC50	2SC55	1/2/3/4	2SG5	2S.50	2S.55	standard	modul.	standard	modul.	2S.50	2S.55	2S.58	2S.55	modul.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
256	travel-positioning time-curve: positioning time 1																								unsigned16				r+w	r+w	from firmware 2.35																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
257-	0 ... 60000 (1 = 1 sec)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
260	travel-positioning time-curve: positioning time 2 up to positioning time 5																								unsigned16																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
261-	see ParNo 256																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
265	travel-positioning time-curve: position 6 up to position 10																								unsigned8																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
266-	see ParNo 251																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
270	travel-positioning time-curve: positioning time 6 up to positioning time 10																								unsigned16																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
271	see ParNo 256																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
271	travel-positioning time-curve: emergency factor																								unsigned16																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
280	1 ... 100 (1 = 0.1)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
280	minimum dead zone positioner																								unsigned16																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
280	0.2 ... 5 (1 = 0.01%)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
281	maximum dead zone positioner																								unsigned16																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
281	0.2 ... 5 (1 = 0.01%)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
282	delay time undervoltage signal																								unsigned8																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
282	0 ... 25 ( 1 = 0.1 sec)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
283	masking value for ZSW1																								unsigned16																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
284	masking value for ZSW2																								unsigned16																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
300	customer parameter 1 for customer variant 2)																								unsigned16																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			

1) r = read; w = write; r+w = read+write 2) changeable, if not commissioning locally. Actuator is "not ready" during changing!

# List of parameters PROFIBUS DP

## SIPOS 5 Flash /HiMod

Issue 05/13

Name of parameters		Rotary Actuator 2SA5		Linear Actuator 2SB5		Part-turn Actuator					Type		ECOTRON 1)		PROFITRON 1)		HiMod	Remark	
ParNo	Value			1/2	3	4/5	6	0	1	2	3	4/5/6	0	1/2/3/4	2SG5	2S.50	2S.55		2S.58 2S.55 modul.
402		redundancy status channel 2																	from firmware 2.55
	0 ... 12	(see ParNo 401)																	
	403	OutputHoldTime (1 = 1ms)																	
	404	status timestamp channel 1																	
		bit 0	timestamp started																
		bit 1	buffer overflow																
		bit 13	time AR parameter block included																
		bit 14	master in "OPERATE" status																
		bit 15	USER_PRM_DATA received with TS-Enable																
		bit 16	time synchronization received (ClockValue telegram), primary only																
	405	status timestamp channel 2																	
		bit 0	timestamp started																
		bit 1	buffer overflow																
		bit 13	time AR parameter block included																
	bit 14	master in "OPERATE" status																	
	bit 15	USER_PRM_DATA received with TS-Enable																	
	bit 16	time synchronization received (ClockValue telegram), primary only																	
410	lowest adjustable tripping torque/force																		from firmware 2.59
	30 ... 100 (1 = 1% max. tripping torque/force)																		
411	highest adjustable tripping torque/force																		
	30 ... 100 (1 = 1% max. tripping torque/force)																		
1) r = read; w = write; r+w = read+write																			

Byte.Bit	Value	Name of parameters														Value range
		Rotary actuator														
		2SA5														
		Linear Actuator			Part-turn Actuator			Type		ECOTRON 1)		PROFITRON 1)		HiMod		
		2SB5			2SC50			2SG5				2S.50		2S.58		2S.55
		1/2	3	4/5	6	0	1	2	3	4/5/6	0	1/2/3/4	standard	modul.	standard	modul.

Data record (slot 1, index 0), "Manufacturer"

0.0	manufacturer	string [10]																
total length 10 byte																		

Data record (slot 1, index 1), "Data of actuator"

0.0	ordering no.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															</
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1) r = read; w = write; r+w = read+write

Name of parameters		Rotary actuator 2SA5										HiMod			
Byte.Bit	Value	Linear Actuator 2SB5				Part-turn Actuator 2SC50				2SG5		ECOTRON 1)	PROFITRON 1)	Value range	
		1/2	3	4/5	6	0	1	2	3	4/5/ 6	0	1/2/ 3/4	2S.50 standard	2S.55 modul.	2S.58 2S.55 standard modul.

Data record (slot 1, index 2), "Firmware version"[illegible]

total length 10 byte
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Data record (slot 1, index 6), "Tag number actuator"

0.0	tag number actuator 2)		string [20]	r+w	r+w	r+w
total length 20 byte						

total length 20 byte
----------------------

Data record (slot 1, index 10), "Speed and torque"

0.0	output speed in direction CLOSE 2)		positioning speed [mm/min] or positioning time [sec] in direction CLOSE												unsigned8	r	r	r+W	r+W	0 ... 14																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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total length 7 byte
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- 1)  $r = \text{read}; w = \text{write}; r+w = \text{read+write}$
- 2) changeable, if not commissioning locally. Actuator is "not ready" during changing.
- 3) for 2SG5 read only

Name of parameters		Linear Actuator			Part-turn Actuator			Type		ECOTRON 1)		PROFITRON 1)		HiMod
Byte.Bit	Value	Rotary actuator 2SA5			2SB5			2SC50		2SC55		2SG5		
		1/2	3	4/5	6	0	1	2	3	4/5/6	0	1/2/3/4		
0.0	end position range CLOSE from 0% to parameter value 2)													
2.0	end position range OPEN from 100% to parameter value 2)													
4.1	structure code 1 2)													
4.2	setpoint input with live zero 4 to 20 mA (1 <sup>st</sup> analog input)	1 = yes; 0 = with dead zero 0 to 20 mA												
4.3	setpoint with slope rising (1 <sup>st</sup> analog input)	1 = yes; 0 = with slope falling												
4.4	actual process value resp. speed setpoint with live zero 4 to 20 mA (2 <sup>nd</sup> analog input)	1 = yes; 0 = with dead zero 0 to 20 mA												
4.5	actual process value resp. speed setpoint input with rising slope (2 <sup>nd</sup> analog input)	1 = yes; 0 = with slope falling												
4.6	analog output with actual process value	1 = yes; 0 = with actual position value												
4.7	analog output with live zero 4 to 20mA	1 = yes; 0 = with dead zero 0 to 20 mA												
5.0	analog output with rising slope	1 = yes; 0 = with slope falling												
5.1	clockwise rotation CLOSE	1 = yes; 0 = anti-clockwise												
5.2	travel dependence cut-off in end position CLOSE	1 = yes; 0 = torque dependence cut-off												
5.3	travel dependence cut-off in end position OPEN	1 = yes; 0 = torque dependence cut-off												
5.4-5	close tightly	1 = yes; 0 = no												
	control source fault													
	0 keep position													
	1 approach emergency position													
	2 keep actual process value													
	3 approach fixed process setpoint													
5.6	„NC“ on EMERGENCY input	1 = yes; 0 = "NO"												
5.7	„NC“ on binary inputs (OPEN, CLOSE, STOP)	1 = yes; 0 = "NO"												
6.0-3	adapt setpoint from DCS to valve curve													
	0 linear (no adaptation)													
	1 slow opening (low flow rate for wide valve opening = long travel)													
	2 quick opening (high flow rate for small valve opening = short travel)													
6.4	actual value signal to DCS	1 = actual value according to setpoint; 0 = actual value according to valve position (travel)												
	structure code 2 2)													
7.0	motor heating ON	1 = yes; 0 = no												
7.1	ZSW1 with Siemens PG assignment	1 = yes; 0 = standard												
7.2	"changeover on local" on local control station blocked	1 = yes; 0 = no												
8.0	remote control 2)													
	0 process controller conventional													
	1 process controller BUS													
	2 process controller with fixed setpoint value													
	3 positioner conventional (1 <sup>st</sup> analog input)													
	4 positioner BUS													
	5 tri-threshold (1 <sup>st</sup> analog input)													
	6 permanent contact signal conventional													
	7 permanent contact signal BUS													
	8 pulse contact signal conventional													
	9 two-wire-control conventional													
	10 proportional operation conventional													
	11 proportional operation bus													
9.0	remote reconnect 2)													
	255 not active (else, see byte.bit 8.0)													
10.0	emergency position 2)													

1) r = read; w = write; r+w = read+write  
3) only the duty adjusted via DIP-switch S6 is adjustable!

2) changeable, if not commissioning locally. Actuator is "not ready" during changing!

Name of parameters		Linear Actuator										Part-turn Actuator				Type	ECOTRON 1)		PROFITRON 1)		HiMod	Value range											
Byte.Bit	Value	2SA5		2SB5		1/2		3		4/5		6		0			1		2				3		4/5/6		2SC50		2SC55		2SG5		
12.0		position intermediate contact CLOSE 2)																						r		r		0 ... 10000 (1 = 0.01% OPEN)					
14.0		position intermediate contact OPEN 2)																						r		r		1 ... 100 (1 = 0.1 sec)					
16.0		rise time 2)																						r		r		0 ... 250 %					
17.0		dc-brake 2)																						r		r		-20°C ... 155°C (0.01°C)					
18.0		warning motor temperature at ... °C 2) 3)																						r		r		0 ... 10					
20.0		language on the LCD 2)																						r		r							
	0	German																															
	1	English																															
	2	French																															
	3	Spanish																															
	4	Italian																															
	5	Polish																															
	6	Czech																															
	7	Swedish																															
	8	Netherlands																															
	9	Portuguese																															
	10	Finnish																															
21.0		run time in direction CLOSE for control via proportional operation "proportion, conv/bus"																								r		r		0 or 50 ... 32760 (1 = 0.1sec)			
		0 = Run time determined by the actuator (slot 1, index 20, bytes 30 and 31) is used																								r		r		from firmware 2.55b			
23.0		run time in direction OPEN for control via proportional operation "proportion, conv/bus"																										r		r		20 ... 500 (1 = 0.01%)	
		0 = Run time determined by the actuator (slot 1, index 20, bytes 32 and 33) is used																								r		r		from firmware 2.56			
25.0		minimum dead zone positioner 0.2 ... 5%																										r		r		from firmware 2.56	
27.0		maximum dead zone positioner 0.2 ... 5%																										r		r		from firmware 2.56	
29.0		delay time undervoltage signal 0 ... 25 sec																						r		r		r		0 ... 250 (1 = 0.1 sec)			
		from firmware 2.56																								r		r		from firmware 2.56			
30.0		separate mounting																						r		r		r		0 ... 1			
		1 = >10m with LC filter, 0 = none or <=10m																						r		r		r		from firmware 2.59			
total length 31 byte																																	
Data record (slot 1, index 12), "PROFIBUS"																																	
0.0		PZD 3 = ParNr (see attachment „List of parameters PROFIBUS DP“) transfer 2)																						r		r		r		1 ... 400			
1.0		PZD 4 = ParNr (see attachment „List of parameters PROFIBUS DP“) transfer 2)																						r		r		r					
2.0		PZD 5 = ParNr (see attachment „List of parameters PROFIBUS DP“) transfer 2)																						r		r		r					
3.0		PZD 6 = ParNr (see attachment „List of parameters PROFIBUS DP“) transfer 2)																						r		r		r					
4.0		masking value for ZSW1																						r		r		r		0 ... 65535			
6.0		masking value for ZSW2																						r		r		r					
total length 13 byte																																	

1) r = read; w = write; r+w = read+write

3) not for 2SG5

2) changeable, if not commissioning locally. Actuator is "not ready" during changing!

Byte.Bit	Value	Name of parameters															Value range					
		Rotary actuator																				
		2SA5																				
Linear Actuator			Part-turn Actuator						Type						ECOTRON 1)		PROFITRON 1)		HiMod			
2SB5			2SC50						2SG5						2S.50		2S.58		2S.55			
1/2			3	4/5	6	0	1	2	3	4/5/6	0	1/2/3/4							standard	modul.	standard	modul.

Data record (slot 1, index 13), "Control signals"

0.0	output 1 2)		(bit 0 –6)	unsigned8	r	r	r	r+W	r+W	0 ... 18
	0	no output								
	1	end position CLOSE								
	2	end position OPEN								
	3	tripping torque/force CLOSE reached (torque/force dependent cut-off)								
	4	tripping torque/force OPEN reached (torque/force dependent cut-off)								
	5	tripping torque/force OPEN or CLOSE reached (torque/force dependent cut-off)								
	6	sum fault								
	7	blinker								
	8	ready								
	9	ready + remote								
	10	local								
	11	position intermediate contact CLOSE								
	12	position intermediate contact OPEN								
	13	fault motor temperature								
	14	warning motor temperature 3)								
	15	fault low/ high voltage								
	16	maintenance necessary								
17	running indication in direction CLOSE									
18	running indication in direction OPEN									
0.7	NC (low-active)		1 = yes; 0 = NO (high active) (bit 7)	bit	r	r	r	r+W	r+W	0 1
1.0	output 2 2)		(see byte.bit 0.0)	unsigned8	r	r	r	r+W	r+W	0 ... 18
1.7	NC (low-active)		(see byte.bit 0.7)	bit						0 ... 1
2.0	output 3 2)		(see byte.bit 0.0)	unsigned8	r	r	r	r+W	r+W	0 ... 18
2.7	NC (low-active)		(see byte.bit 0.7)	bit						0 ... 1
3.0	output 4 2)		(see byte.bit 0.0)	unsigned8	r	r	r	r+W	r+W	0 ... 18
3.7	NC (low-active)		(see byte.bit 0.7)	bit						0 ... 1
4.0	output 5 2)		(see byte.bit 0.0)	unsigned8	r	r	r	r+W	r+W	0 ... 18
4.7	NC (low-active)		(see byte.bit 0.7)	bit						0 ... 1
5.0	output 6 2)		(see byte.bit 0.0)	unsigned8				r+W	r+W	0 ... 18
5.7	NC (low-active)		(see byte.bit 0.7)	bit						0 or 1
6.0	output 7 2)		(see byte.bit 0.0)	unsigned8				r+W	r+W	0 ... 18
6.7	NC (low-active)		(see byte.bit 0.7)	bit						0 ... 1
7.0	output 8 2)		(see byte.bit 0.0)	unsigned8				r+W	r+W	0 ... 18
7.7	NC (low-active)		(see byte.bit 0.7)	bit						0 ... 1

total length 8 byte

1) r = read; w = write; r+w = read+write

3) not for 2SG5

2) changeable, if not commissioning locally. Actuator is "not ready" during changing!



Byte.Bit	Value	Name of parameters															Value range
		Rotary actuator															
		2SA5															
		Linear Actuator			Part-turn Actuator						2SG5		ECOTRON 1)		PROFITRON 1)		HiMod
		2SB5			2SC50			2SC55			Type		2S.50		2S.58		
		1/2	3	4/5	6	0	1	2	3	4/5/6	0	1/2/3/4	standard		standard		modul.
		1/2	3	4/5	6	0	1	2	3	4/5/6	0	1/2/3/4	standard		standard		

Data record (slot 1, index 14), "Stroke-speed curve" (from firmware 2.14)

0.0	stroke-speed curve – position 1 2)																		0 ... 100 (% OPEN)
1.0	stroke-speed curve – position 2 2)																		
2.0	stroke-speed curve – position 3 2)																		
3.0	stroke-speed curve – position 4 2)																		
4.0	stroke-speed curve – position 5 2)																		
5.0	stroke-speed curve – position 6 2)																		
6.0	stroke-speed curve – position 7 2)																		
7.0	stroke-speed curve – position 8 2)																		
8.0	stroke-speed curve – position 9 2)																		
9.0	stroke-speed curve – position 10 2)																		
10.0	stroke-speed curve – speed/ positioning time 1 2)																		0 ... 14
	0	1.25 rpm																	
	1	1.75 rpm																	
	2	2.50 rpm																	
	3	3.50 rpm																	
	4	5.00 rpm																	
	5	7.00 rpm																	
	6	10.0 rpm																	
	7	14.0 rpm																	
	8	20.0 rpm																	
	9	28.0 rpm																	
	10	40.0 rpm																	
	11	56.0 rpm																	
	12	80.0 rpm																	
	13	112 rpm																	
	14	160 rpm																	
11.0	stroke-speed curve – speed/ positioning time 2 2)																		
12.0	stroke-speed curve – speed/ positioning time 3 2)																		
13.0	stroke-speed curve – speed/ positioning time 4 2)																		
14.0	stroke-speed curve – speed/ positioning time 5 2)																		
15.0	stroke-speed curve – speed/ positioning time 6 2)																		
16.0	stroke-speed curve – speed/ positioning time 7 2)																		
17.0	stroke-speed curve – speed/ positioning time 8 2)																		
18.0	stroke-speed curve – speed/ positioning time 9 2)																		
19.0	stroke-speed curve – speed/ positioning time 10 2)																		
20.0	stroke-speed curve setting: local via speed curve 2)																		0 ... 1
20.1	stroke-speed curve setting: remote via speed curve 2)																		
20.2	stroke-speed curve setting: local via external speed setpoint (2 <sup>nd</sup> analog input) 2)																		
20.3	stroke-speed curve setting: remote via external speed setpoint (2 <sup>nd</sup> analog input) 2)																		

1) r = read; w = write; r+w = read+write

2) changeable, if not commissioning locally. Actuator is "not ready" during changing!

Name of parameters		Linear Actuator			Part-turn Actuator			Type		ECOTRON 1)		PROFITRON 1)		HiMod
Byte.Bit	Value	2SA5			2SC50			2SG5		2S.50	2S.55	2S.50	2S.55	
		1/2	3	4/5	6	0	1	2	3	4/5/	6	0	1/2/	3/4
										standard	modul.	standard	modul.	
														Value range

Data record (slot 1, index 15), "Process controller"

0.0	fixed setpoint value (1 = 0.5 %) 2)											r+w	r+w	0 ... 200
1.0	amplification vp (1 = 0.01 %) 2)											r+w	r+w	-100 ... 100, from firmware 2.66
3.0	reset time tn (1 = 0.1 sec) 2)											r+w	r+w	0 ... 30000
total length 5 byte														

Data record (slot 1, index 16), "Positioner with proportional control/split range functionality" (from firmware 2.34)

0.0	current value 1 (0.1mA) 2)											r+w	r+w	0 ... 200
1.0	position value 1 (1% Open) 2)											r+w	r+w	0 ... 100
2.0	current value 2 (0.1mA) 2)											r+w	r+w	0 ... 200
3.0	position value 2 (1% Open) 2)											r+w	r+w	0 ... 100
total length 4 byte														

Data record (slot 1, index 17), "Stroke-time-curve" (from firmware 2.35)

0.0	stroke-time curve - position 1 2)											r+w	r+w	0 ... 100 (% OPEN)
1.0	stroke-time curve - position 2 2)											r+w	r+w	
2.0	stroke-time curve - position 3 2)											r+w	r+w	
3.0	stroke-time curve - position 4 2)											r+w	r+w	
4.0	stroke-time curve - position 5 2)											r+w	r+w	
5.0	stroke-time curve - positioning time 1 2)											r+w	r+w	0 ... 60000 (1 = 1 sec)
7.0	stroke-time curve - positioning time 2 2)											r+w	r+w	
9.0	stroke-time curve - positioning time 3 2)											r+w	r+w	
11.0	stroke-time curve - positioning time 4 2)											r+w	r+w	
13.0	stroke-time curve - positioning time 5 2)											r+w	r+w	
15.0	stroke-time setting; local 2)											r+w	r+w	0 ... 1
15.1	stroke-time setting; remote 2)											r+w	r+w	
15.2	stroke-time setting; emergency 2)											r+w	r+w	0 ... 1, from firmware 2.37
15.7	position values/ - positioning times activate 2)											r+w	r+w	0 ... 1
16.0	stroke-time curve - position 6 2)											r+w	r+w	0 ... 100 (% OPEN)
17.0	stroke-time curve - position 7 2)											r+w	r+w	from firmware 2.37
18.0	stroke-time curve - position 8 2)											r+w	r+w	
19.0	stroke-time curve - position 9 2)											r+w	r+w	
20.0	stroke-time curve - position 10 2)											r+w	r+w	
21.0	stroke-time curve - positioning time 6 2)											r+w	r+w	0 ... 60000 (1 = 1 sec)
23.0	stroke-time curve - positioning time 7 2)											r+w	r+w	from firmware 2.37
25.0	stroke-time curve - positioning time 8 2)											r+w	r+w	
27.0	stroke-time curve - positioning time 9 2)											r+w	r+w	
29.0	stroke-time curve - positioning time 10 2)											r+w	r+w	
31.0	emergency factor 2)											r+w	r+w	0 ... 100 (1 = 0.1), from 2.37
total length 32 byte														

Data record (slot 1, index 18), "Customer variant" (from firmware 2.57b)

0.0	customer parameter 1 for customer variant 2)											r+w	r+w	0 ... 65534
2.0	customer parameter 2 for customer variant 2)											r+w	r+w	
4.0	customer parameter 3 for customer variant 2)											r+w	r+w	
6.0	customer parameter 4 for customer variant 2)											r+w	r+w	
total length 8 byte														

1) r = read; w = write; r+w = read+write

2) changeable, if not commissioning locally. Actuator is "not ready" during changing!



Name of parameters		Part-turn Actuator										ECOTRON 1)		PROFITRON 1)		HiMod										
Rotary actuator		Linear Actuator					2SC50					2S.55		2S.50		2S.58										
2SA5		2SB5					2SC50					2S.55		2S.50		2S.55										
Byte.Bit	Value	1/2	3	4/5	6	0	1	2	3	4/5/6	0	1/2/3/4	Type	standard	modul.	standard	modul.	Value range								
9.0	actual output speed		actual positioning speed [mm/min] or positioning time [sec]															unsigned8	r	r	r	0 ... 15				
	0	1.25 rpm																								
	1	1.75 rpm																								
	2	2.50 rpm																								
	3	3.50 rpm																								
	4	5.00 rpm																								
	5	7.00 rpm																								
	6	10.0 rpm																								
	7	14.0 rpm																								
	8	20.0 rpm																								
	9	28.0 rpm																								
	10	40.0 rpm																								
	11	56.0 rpm																								
	12	80.0 rpm																								
	13	112 rpm																								
14	160 rpm																									
15	0 rpm																									
10.0	motor temperature 2)																	integer16	r	r	r	-2562 ... +16500 (1 = 0.01 °C)				
12.0	dc-link voltage converter [V]																						unsigned16	r	r	0 ... 1000
14.0	actual position/process setpoint																						integer16	r	r	0 ... 10000 (1 = 0.01 % OPEN)
16.0	setpoint from DCS (setpoint before adaptation to valve curve)																						integer16	r	r	0 ... 10000 (1 = 0.01 % OPEN) from firmware 2.56c
18.0	baudrate channel 1																	unsigned8	r	r	r	0 ... 7				
	0	no data communication																								
	1	9.6 kbit/s																								
	2	19.2 kbit/s																								
	3	45.45 kbit/s																								
	4	93.75 kbit/s																								
	5	187.5 kbit/s																								
	6	500 kbit/s																								
19.0	baudrate channel 2																	unsigned8	r	r	r	0 ... 10				
	(see byte.bit 18.0)																									
20.0	status channel 1																	unsigned8	r	r	r	0 ... 1				
	0	„Wait Prrm“ (no bus parameterization)																								
	1	„Wait Clfg“ (no bus configuration)																								
	2	„Data Exchange“ (user data)																								
	6	„Fail-Safe“																								
	10	„GC-Clear“																								
21.0	status channel 2																	unsigned8	r	r	r	0 ... 1				
(see byte.bit 20.0)																										
22.0	fault signal 1																	bit	r	r	r	0 ... 1				
	main supply voltage fault																									
	high voltage (converter)																									
	low voltage (converter)																									
	moved too far																									
	travel sensor signal fault																									
	motor temperature signal fault 2)																									
	other converter fault																									

1) r = read; w = write; r+w = read+write

2) not for 2SG5

Name of parameters		Linear Actuator										Part-turn Actuator				Type		ECOTRON 1)		PROFITRON 1)		HIMod					
Byte.Bit	Value	2SA5					2SB5					2SC50					2SC55				2SG5		2S.50	2S.55	2S.58	2S.55	Value range
		1/2	3	4/5	6	0	1	2	3	4/5/6	0	1/2/3/4					standard	modul.	standard	modul.							
23.0	SPC3 defect											1 = yes; 0 = no	bit				r	r	r	r					0 ... 1		
23.1	Flash Memory defect											1 = yes; 0 = no	bit														
23.2	RAM defect											1 = yes; 0 = no	bit														
23.3	EEPROM defect											1 = yes; 0 = no	bit														
23.4	internal voltage faulty											1 = yes; 0 = no	bit														
23.5	Watchdog active											1 = yes; 0 = no	bit														
23.6	high current converter											1 = yes; 0 = no	bit														
	fault signal 2																										
24.0	open-circuit behavior fiber optics											1 = yes; 0 = no	bit				r	r	r	r					0 ... 1		
24.1	initialization error Bluetooth module												bit														
24.2	open-circuit behavior electronic temperature sensor											1 = yes; 0 = no	bit														
24.3	open-circuit behavior high resolution absolute position encoder „non-intrusive“ (nIP) 2)											1 = yes; 0 = no	bit												0 ... 1		
24.4	no I2C communication to nIP protocol converter 2)											1 = yes; 0 = no	bit												from firmware 2.56		
24.5	I2C bus defective											1 = yes; 0 = no	bit														
25.0	actual process value resp. speed setpoint input (2 <sup>nd</sup> analog input) I > 21 mA or I < 3.6 mA (live zero)											1 = yes; 0 = no	bit				r	r	r	r					0 ... 1		
25.1	setpoint input (1 <sup>st</sup> analog input) I > 21 mA or I < 3.6 mA (live zero)											1 = yes; 0 = no	bit														
25.2	analog output defect											1 = yes; 0 = no	bit														
25.3	open circuit behavior binary inputs											1 = yes; 0 = no	bit														
25.4	no bus communication channel 1 and 2											1 = yes; 0 = no	bit														
25.5	blocked in move											1 = yes; 0 = no	bit														
25.6	positioning time too high (runtime)											1 = yes; 0 = no	bit														
25.7	motor temperature too high											1 = yes; 0 = no	bit														
	status word 3 (ZSW3)																										
26.4	travel-positioning time-curve enabled											1 = yes; 0 = no	bit				r	r	r	r					0 ... 1, from firmware 2.39		
26.5	Bluetooth module available											1 = yes; 0 = no	bit												0 ... 1		
26.6	customer variant, subject to charges											1 = yes; 0 = no	bit												from firmware 2.40d		
26.7	customer variant, subject to charges enabled											1 = yes; 0 = no	bit												0 ... 1		
27.0	electronic temperature sensor available											1 = yes; 0 = no	bit												from firmware 2.56		
27.1	high resolution absolute position encoder „non-intrusive“ (nIP) available 2)											1 = yes; 0 = no	bit												0 ... 1		
27.6	keep actual process value (if the "process setpoint" control source has failed)											1 = yes; 0 = no	bit												from firmware 2.60		
27.7	approach fixed setpoint value (if the "process setpoint" control source has failed)											1 = yes; 0 = no	bit												0 ... 10000 (1 = 0.01 % OPEN)		
28.0	actual value to DCS (actual value after adaptation to value curve: in controlled state = setpoint before adaptation)												signed16				r	r	r	r					from firmware 2.56c		
30.0	run time determined by the actuator in direction CLOSE from 100 % OPEN to 0 % OPEN												unsigned16												0 ... 65535 (1 = 0.1 sec)		
32.0	run time determined by the actuator in direction OPEN from 0% OPEN to 100% OPEN												unsigned16												from firmware 2.55b		
34.0	move in revolutions/stroke or stroke [mm] or positioning angle [°] (for "non-intrusive" position encoder) 2)												unsigned32												0 ... 4294967295		
	0 = no high resolution absolute position encoder or no end position available or set revolutions/stroke / stroke / positioning angle < 0.1																								(1 = 0.1 rev/stroke or 0.1 mm or 0.1°), from firmware 2.56		
38.0	electronics temperature												signed16					r	r	r	r				-32768 ... 32767 (1 = 0.1°C)		
	0 = temperature sensor not available																								from firmware 2.56		

total length 40 byte

1) r = read; w = write; r+w = read+write

2) not for 2SG5

Name of parameters		Rotary actuator										HiMod					
Byte.Bit	Value	2SA5					2SC50					2SG5		Value range			
		Linear Actuator					Part-turn Actuator					Type		ECOTRON 1)		PROFITRON 1)	
		2SB5					2SC50					2SG5		2S.50		2S.58	
		1/2	3	4/5	6		0	1	2	3	4/5/6	0	1/2/3/4	standard	modul.	standard	modul.
								</									

Data record (slot 1, index 22), "Former errors"

	fault memory 1 <sup>st</sup> entry (last fault)		r	r	r	0 ... 1
0.0	open-circuit behavior fiber optics	1 = yes; <b>0</b> = no				
0.1	initialization error Bluetooth module	1 = yes; <b>0</b> = no				
0.2	open-circuit behavior electronic temperature sensor	1 = yes; <b>0</b> = no				
0.3	open-circuit behavior high resolution absolute position encoder „non-intrusive“ (nIP) <b>2)</b>	1 = yes; <b>0</b> = no				
0.4	no I2C communication to nIP protocol converter <b>2)</b>	1 = yes; <b>0</b> = no				
0.5	I2C bus defective	1 = yes; <b>0</b> = no				
1.0	main supply voltage fault	1 = yes; <b>0</b> = no				
1.1	high voltage (converter)	1 = yes; <b>0</b> = no				
1.2	low voltage (converter)	1 = yes; <b>0</b> = no				
1.3	moved too far	1 = yes; <b>0</b> = no				
1.4	travel sensor signal fault	1 = yes; <b>0</b> = no				
1.5	motor temperature signal fault <b>2)</b>	1 = yes; <b>0</b> = no				
1.6	converter temperature too high	1 = yes; <b>0</b> = no				
1.7	other converter fault	1 = yes; <b>0</b> = no				
2.0	SPC3 defect	1 = yes; <b>0</b> = no				
2.1	Flash Memory defect	1 = yes; <b>0</b> = no				
2.2	RAM defect	1 = yes; <b>0</b> = no				
2.3	EEPROM defect	1 = yes; <b>0</b> = no				
2.4	internal voltage faulty	1 = yes; <b>0</b> = no				
2.5	Watchdog active	1 = yes; <b>0</b> = no				
2.6	high current converter	1 = yes; <b>0</b> = no				
3.0	actual process value resp. speed setpoint input ( <b>2<sup>nd</sup></b> analog input)   > 21 mA or   < 3.6 mA (live zero)	1 = yes; <b>0</b> = no				
3.1	setpoint input (1 <sup>st</sup> analog input)   > 21 mA or   < 3.6 mA (live zero)	1 = yes; <b>0</b> = no				
3.2	analog output defect	1 = yes; <b>0</b> = no				
3.3	open circuit behavior binary inputs	1 = yes; <b>0</b> = no				
3.4	no bus communication channel 1 and 2	1 = yes; <b>0</b> = no				
3.5	blocked in move (torque dependent cut-off)	1 = yes; <b>0</b> = no				
3.6	positioning time too high (runtime)	1 = yes; <b>0</b> = no				
3.7	motor temperature too high	1 = yes; <b>0</b> = no				
4.0 – 7.0	fault memory 2 <sup>nd</sup> entry (last but one fault)					
8.0 – 11.0	fault memory 3 <sup>rd</sup> entry					
12.0 – 15.0	fault memory 4 <sup>th</sup> entry					
16.0 – 19.0	fault memory 5 <sup>th</sup> entry					

bit coded see byte.bit 1.0 – 3.7

total length 20 byte
----------------------

1) `r = read; w = write; r+w = read+write`

2) not for 2SG5

Byte.Bit	Value	Name of parameters														Value range	
		Rotary actuator															
2SA5		Linear Actuator			Part-turn Actuator						Type		ECOTRON 1)		PROFITRON 1)		HiMod
2SB5		2SC50			2SC55			2SG5		2S.50		2S.58		standard	modul.		
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58				standard	
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58		standard	modul.		
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58				standard	modul.
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58		standard	modul.		
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58				standard	modul.
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58		standard	modul.		
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58				standard	modul.
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58		standard	modul.		
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58				standard	modul.
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58		standard	modul.		
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58				standard	modul.
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58		standard	modul.		
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58				standard	modul.
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58		standard	modul.		
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58				standard	modul.
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58		standard	modul.		
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58				standard	modul.
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58		standard	modul.		
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58				standard	modul.
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58		standard	modul.		
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58				standard	modul.
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58		standard	modul.		
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58				standard	modul.
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58		standard	modul.		
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58				standard	modul.
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58		standard	modul.		
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58				standard	modul.
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58		standard	modul.		
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58				standard	modul.
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58		standard	modul.		
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58				standard	modul.
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58		standard	modul.		
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58				standard	modul.
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58		standard	modul.		
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58				standard	modul.
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58		standard	modul.		
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58				standard	modul.
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58		standard	modul.		
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58				standard	modul.
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58		standard	modul.		
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58				standard	modul.
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58		standard	modul.		
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58				standard	modul.
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58		standard	modul.		
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58				standard	modul.
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58		standard	modul.		
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58				standard	modul.
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58		standard	modul.		
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58				standard	modul.
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58		standard	modul.		
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58				standard	modul.
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58		standard	modul.		
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58				standard	modul.
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58		standard	modul.		
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58				standard	modul.
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58		standard	modul.		
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58				standard	modul.
2SC55		2SC50			2SC55			2SG5		2S.50		2S.58		standard	modul.		
2SC55		2SC50			2SC55												

Data record (slot 1, index 23), "Binary and analog inputs" (from firmware 2.28)

0.0	binary input , according parameterization high/low active																		
0.1	binary input Close																		
0.2	binary input Open																		
0.3	binary input Stop																		
0.3	binary input Emergency																		
0.5	open circuit analog input 1																		
0.6	open circuit analog input 2																		
1.0	analog input 1 (setpoint)																		
	0-10000 scaling, according parameterization																		
3.0	analog input 2																		
	0-10000 scaling, according parameterization																		
5.0	binary inputs, irrespective of high/low active parameterization																		
5.1	binary input CLOSE																		
5.1	binary input OPEN																		
5.2	binary input Stop																		
5.3	binary input Emergency																		
6.0	analog input 1 (setpoint)																		
	0-10000 scaling, 0=0mA, 10000=20mA, irrespective of parameterization																		
8.0	analog input 2																		
	0-10000 scaling, 0=0mA, 10000=20mA, irrespective of parameterization																		
total length 10 byte																			

1) r = read; w = write; r+w = read+write

Byte.Bit	Value	Name of parameters														Value range		
		Rotary actuator																
		2SA5																
Linear Actuator				Part-turn Actuator				Type						ECOTRON 1)		PROFITRON 1)		HiMod
2SB5				2SC50				2SC55		2SG5		2S.50		2S.55		standard	modul.	
1/2	3	4/5	6	0	1	2	3	4/5/6	0	1/2/3/4								

Data record (slot 1, index 24), „PNO redundancy and timestamp“ (from firmware 2.55)

0.0	redundancy type	PNO redundancy	1 = yes; 0 = SIPOS redundancy															
0.1	PNO system redundancy	redundancy status channel 1	1 = yes; 0 = PNO flying redundancy															0 ... 1
1.0	0	POWER_ON																0 ... 12
	1	S_WAITING																
	2	S_PRIMARY																
	3	C_CONFIGURE																
	4	BACKUP																
	5	BTP_PARTNER_ACK																
	6	BTP_SWITCHOVER																
	7	BTP_PRM_CMD																
	8	BTP_DX																
	9	PRIMARY																
	10	PTB_PARTNER_ACK																
	11	PTB_SWITCHOVER																
	12	NIL																
2.0	redundancy status channel 2																	
3.0	0 ... 12	(similar to byte.bit 1.0)																0 ... 65535
	status timestamp channel 1																	
5.0	timestamp started		1 = yes; 0 = no															0 ... 1
5.1	buffer overflow		1 = yes; 0 = no															
5.2	time AR parameter block included		1 = yes; 0 = no															
5.3	master in "OPERATE" status		1 = yes; 0 = no															
5.4	USER_PRM_DATA received with TS-Enable		1 = yes; 0 = no															
5.5	time synchronization received (ClockValue telegram), primary only		1 = yes; 0 = no															
	status timestamp channel 2																	
6.0	timestamp started		1 = yes; 0 = no															
6.1	buffer overflow		1 = yes; 0 = no															
6.2	time AR parameter block included		1 = yes; 0 = no															
6.3	master in "OPERATE" status		1 = yes; 0 = no															
6.4	USER_PRM_DATA received with TS-Enable		1 = yes; 0 = no															
6.5	time synchronization received (ClockValue telegram), primary only		1 = yes; 0 = no															
total length 7 byte																		

1) r = read; w = write; r+w = read+write



Byte.Bit	Value	Name of parameters		Linear Actuator			Part-turn Actuator				Type		ECOTRON 1)		PROFITRON 1)		HiMod	Value range
		Rotary actuator		2SB5			2SC50		2SC55		2SG5		2S.50		2S.58		2S.55	
		2SA5		1/2	3	4/5	6	0	1	2	3	4/5/6	0	1/2/3/4	standard	modul.	standard	modul.

Data record (slot 1, index 25), "Actual diagnosis data"

0.0	switching cycles per hour	unsigned16	r	r	r	r	r	0 ... 65535
2.0	relative operational time	unsigned8	r	r	r	r	r	0 ... 100
3.0	number of switching cycles	unsigned32	r	r	r	r	r	0 or 4294967295
7.0	number of travel dependence cut-offs	unsigned16	r	r	r	r	r	0 ... 65535
9.0	number of torque dependence cut-offs	unsigned16	r	r	r	r	r	
11.0	electronics unit operating hours	unsigned32	r	r	r	r	r	0 ... 4294967295
15.0	motor/gear unit operating hours	unsigned16	r	r	r	r	r	0 ... 65535
total length 17 byte								

Data record (slot 1, index 26), "Maintenance limits for diagnosis data"

0.0	maintenance limit switching cycles	unsigned32	r	r	r	r	r	0 ... 4.294.967.295
4.0	maintenance limit torque dependence cut-offs	unsigned16	r	r	r	r	r	0 ... 65535
6.0	maintenance limit motor operating hours	unsigned16	r	r	r	r	r	
total length 8 byte								

Data record (slot 1, index 27), "Maintenance intervals"

0.0	interval value switching cycles 2)	unsigned32					r+w	r+w	0 ... 30 Mio. (Modulating)
4.0	interval value torque dependent cut-offs 2)	unsigned16					r+w	r+w	0 ... 100000 (Standard version)
6.0	interval value motor operating hours 2)	unsigned16					r+w	r+w	0 ... 20000 (Modulating)
total length 8 byte									0 ... 10000 (Standard version)

1) r = read; w = write; r+w = read+write

2) changeable, if not commissioning locally. Actuator is "not ready" during changing!

Byte.Bit	Value	Name of parameters													Type	Value range	
		Rotary actuator															
		2SA5															
		Linear Actuator			Part-turn Actuator							ECOTRON 1)		PROFITRON 1)		HiMod	
		2SB5			2SC50			2SC55			2SG5		2S.50	2S.55	2S.50	2S.55	
		1/2	3	4/5	6	0	1	2	3	4/5/6	0	1/2/3/4	standard	modul.	standard	modul.	

Data record (slot 2, index 0/2/4/6/8/10), "Output torque graph x travel position in direction CLOSE/OPEN" 3)

0.0	travel position in direction CLOSE/OPEN [0]	signed 16	r	r	-50 ... 10050 (1 = 0.01% OPEN)
2.0	travel position in direction CLOSE/OPEN [1]	signed 16	r	r	
n.0	travel position in direction CLOSE/OPEN [n/2]	signed 16	r	r	
n+2.0	travel position in direction CLOSE/OPEN [(n+2)/2]	signed 16	r	r	
218.0	travel position in direction CLOSE/OPEN [109]	signed 16	r	r	

total length 220 byte

Data record (slot 2, index 1/3/5/7/9/11), "Output torque graph x output torque in direction CLOSE/OPEN" 3)

0.0	output torque in direction CLOSE/OPEN [0]	unsigned 16	r	r	0 ... 60000 (1 = 0.1Nm)
2.0	output torque in direction CLOSE/OPEN [1]	unsigned 16	r	r	
n.0	output torque in direction CLOSE/OPEN [n/2]	unsigned 16	r	r	
n+2.0	output torque in direction CLOSE/OPEN [(n+2)/2]	unsigned 16	r	r	
218.0	output torque in direction CLOSE/OPEN [109]	unsigned 16	r	r	

total length 220 byte

Data record (slot 2, index 12), "Torque graph recording control" 3)

0.0	start graph recording 2)	bit	w	w	0 ... 1
0.1	recording stop running graph recording 2)	bit	w	w	
1.0	graph no., which shall be recorded 2)	unsigned 16	w	w	1 ... 3

total length 3 byte

Data record (slot 2, index 13), "Torque graph recording status" 3)

0.0	graph recording possible	bit	r	r	0 ... 1
0.1	graph recording graph 1 in progress	bit	r	r	
0.2	graph recording graph 2 in progress	bit	r	r	
0.3	graph recording graph 3 in progress	bit	r	r	
1.0	number of recorded graphs (graph 1)	unsigned 16	r	r	0 ... 65535
3.0	number of recorded graphs (graph 2)	unsigned 16	r	r	
5.0	number of recorded graphs (graph 3)	unsigned 16	r	r	

total length 7 byte

r = read; w = write; r+w = read+write Actuator is "not ready" during changing!

3) not for 2SG5

## 7 Literature reference

### ■ PROFIBUS DP with copper cable connection (RS 485)

- **As an introduction to PROFIBUS DP**

Manfred Popp: PROFIBUS DP,  
Principles,  
Tips and Tricks for Users  
Hüthig Verlag, ISBN 3-7785-2676-6

- **Guidelines for electrician**

Installation guide PROFIBUS DP/FMS,  
order no. 2.111  
available from:  
PROFIBUS Nutzerorganisation  
Haid-und-Neu-Str. 7  
D-76131 Karlsruhe  
Tel. +49 721 9658590  
Fax +49 721 9658589  
[www.profibus.com](http://www.profibus.com)

### ■ PROFIBUS DP with FO connection

- **Booklet about fibre optic technology:**

Fa. Ch.BEHA GmbH  
Tel. +49 7684 8009-0  
[www.beha.de](http://www.beha.de)

