CONFIGURATION
MANUAL

KH 8384-4 EN

Translation of original instructions

Type 3730-4 Electropneumatic Positioner

Configuration and operation over PROFIBUS-PA

Firmware version K 2.02/R 1.53

Edition March 2021

Note on these mounting and operating instructions

These mounting and operating instructions assist you in mounting and operating the device safely. The instructions are binding for handling SAMSON devices. The images shown in these instructions are for illustration purposes only. The actual product may vary.

➔ For the safe and proper use of these instructions, read them carefully and keep them for later reference.

➔ If you have any questions about these instructions, contact SAMSON's After-sales Service (aftersalesservice@samsongroup.com).

Documents relating to the device, such as the mounting and operating instructions, are available on our website at ***www.samsongroup.com > Service & Support > Downloads > Documentation***.

Note

Installation, start-up and on-site operation of the positioner are described in the Mounting and Operating Instructions ▶ EB 8384-4.

Definition of signal words

DANGER

Hazardous situations which, if not avoided, will result in death or serious injury

WARNING

Hazardous situations which, if not avoided, could result in death or serious injury

NOTICE

Property damage message or malfunction

Note

Additional information

Tip

Recommended action

1 PROFIBUS-PA 5

2 Profile 5

3 Cyclic data transfer 5

1.1 GSD files and automatic ID number adaptation 7

1.2 Data exchange 8

3.1 Integration for PCS7 control system 12

3.2 General instructions to start up the positioner 12

4 CHECKBACK – Device status 12

5 Measured value status and valve diagnostics 15

1.3 Extended EXPERTplus diagnostics 15

5.1 Classification of status messages and the condensed state 16

1.1 Status messages according to Profile 3.01 19

5.2 Status messages according to Profile 3.01 - Condensed status 22

5.3 Standard diagnostics with PROFIBUS-DP protocol 27

6 Acyclic data exchange 33

7 Partial stroke testing over DP-V0 33

8 Parameter lists 36

8.1 Physical Block, Slot 0 · Profile-specific parameters 37

8.2 Physical Block, Slot 0 · Manufacturer-specific parameters 44

8.3 AO Function Block, Slot 1 · Profile-specific parameters 60

8.4 AO Transducer Block, Slot 1 · Profile-specific parameters 65

8.5 AO Transducer Block, Slot 1 · Manufacturer-specific parameters 73

8.6 DI1/2 Function Block, Slot 2/3 · Profile-specific parameters 89

8.7 DI1/2 Transducer Block, Slot 2/3 · Profile-specific parameters 92

Firmware revisions (Communication K)
K 1.01 Internal revisions
K 1.10 The FEATURE_SELECT parameter allows you to set whether an active diagnostic function is to be reported by a GOOD_FUNCTION_CHECK or a BAD_FUNCTION_CHECK (see page 51).
K 1.11 • More trigger conditions in the data logger (see page 50). • More additional functions (FEATURE_SELECT) (see page 51). • The limits of the discrete valve position (POS_D_LIMIT_LOW, POS_D_LIMIT_UP) can now be defined as required (see page 5).
K 1.12 Resetting the identification parameters resets all the parameters saved in the controller. The parameters saved in the controller are, however, not reset when just the start-up parameters are reset (see page 40).
K 1.13 Internal revisions
K 1.15 Feature of ID number adaptation according to PROFIBUS PA Profile 3.02 added. It allows a Type 3785 Positioner (Profile 2.0 and Profile 3.0) to be directly replaced with a Type 3730-4 Positioner in the compatibility mode (see page 7).
K 1.16 The function to suppress extended diagnostic messages allows messages for the PROFIBUS diagnosis protocol to be suppressed. The messages are still included in the condensed state according to their classification. The parameter to suppress the diagnostic messages exists in the following integrations: DD: 2.2.007 TROVIS-VIEW: >3.60.005 (device module) DTM: 1.3.0.1
K 1.17 The versions K 1.12 to K 1.16 do not save a set point received in acyclic data exchange as the valid value for the fail-safe action 'Last valid set point is used'. In the affected modules for data exchange, the polling for a valid set point has been changed to GOOD_NON_SPECIFIC.
K 2.00 Partial stroke test (PST) and full stroke test (FST) added
K 2.01 Internal revisions
K 2.02 Correction of cyclic communication of negative valve positions

1 PROFIBUS-PA

The PROFIBUS-PA is a fieldbus version for process automation based on the widely used PROFIBUS-DP. The transmission technique conforms with the IEC 61158-2 standard and therefore fulfills the requirements for the type of protection, intrinsic safety.

PROFIBUS-DP defines two types of masters:

– Class 1 master exchanges the data with the configured slaves.
– Class 2 master is used for acyclic data exchange for commissioning and diagnostics purposes.

2 Profile

Basic device functions have been described in profiles by PNO (PROFIBUS user organization) to supplement the EN 50170 standard.

The scope of functions of the Type 3730-4 Positioner is consistent with Profile 3.01 for final control elements. However, it still fulfills all obligatory functions of Profile 3.02, e.g. the automatic implementation on replacing old device models and versions or concerning the condensed state according to the NAMUR Recommendation NE 107.

3 Cyclic data transfer

Cyclically transmitted parameters

The following parameters that are transmitted in cyclic data transfer. They are marked with an asterisk (*) in the parameter lists on page 36 onwards.

– **POS_D**

  Current position of the valve (discrete)
  0: Not initialized
  1: Closed (x < 0.5 %)
  2: Open (x > 99.5 %)
  3: Intermediate position

– **RCAS_IN**

  Set point with status: set point w in RCAS mode

  Provided by a supervisory host, e.g. PID Block or master class 1. Depending on the mode of the function block.

  Range of values defined in PV_SCALE

– **RCAS_OUT**

  Set point with status: set point w in RCAS mode

  Provided to a supervisory host, e.g. PID Block or master class 1. Depending on the mode of the function block.

  Range of values defined in PV_SCALE

– **READBACK**

  Current position of the valve and status

  Controlled variable x in relation to travel range/angle of rotation (OUT_SCALE)

  Range of values defined in PV_SCALE

– **SP**

  The set point SP is transmitted to the positioner. It defines the position of the valve between the open and closed positions.

  Range of values defined in PV_SCALE

– **DI_OUT**

  Output of the DI Function Block

Status of the device and measured values

– **Checkback**

  See section 4for the device status.

– **Status**

  Each process value is assigned a status according to the PROFIBUS-PA Profile

  Status of set point (hex):

  0-3f Bad
  40-7f Uncertain
  80-bf Good

  See section 5 for the measured value status.

1.1 GSD files and automatic ID number adaptation

The General Station Description file (GSD file) is included in the scope of delivery for every PROFIBUS positioner and supplies all information required for the cyclic exchange of process data (set point, status, etc.) with the host system and for configuring the PROFIBUS network. Each positioner and its GSD file has a unique ID number (ident number) assigned to it. This allows the host to check the compatibility between the configuration in the system and the actual device.

The ID number (ident number) of the GSD file must be the same as the ID number of the device to ensure successful integration.

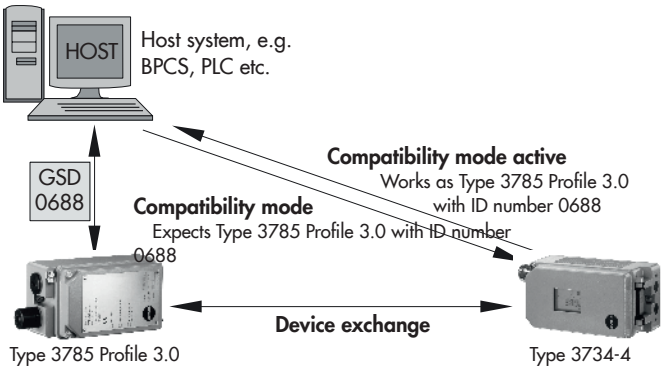

Fig. 1: Replacing positioners with automatic adaptation of the ID number

The Automatic Ident Number Adaption function allows a Type 3785 Positioner to be replaced by a Type 3730-4 Positioner without having to replace the GSD file in the host system: The configured GSD file/ID number of the positioner is checked by the host (compatibility test) during the transition to cyclic data exchange. If the positioner is in the compatibility mode, the GSD file/ID number of the Type 3785 Positioner (Profile 2.0 and Profile 3.0) is also accepted by the positioner. The positioner changes to cyclic data exchange.

The functions of the active positioner model (active ID number) are only supported by the process control system for communication.

Example: If the Type 3730-4 Positioner is operated in the compatibility mode for Type 3785 Profile 3.0, the diagnosis telegram then communicates as with Type 3785. Diagnosis bits, which were first introduced with Profile 3.01, are not set. Additionally, the DI Blocks of Type 3730-4 cannot be used as they are not available in Type 3785.

Proceed as follows to replace the Type 3785 Positioner with the Type 3730-4 Positioner:

Configuration over PROFIBUS must be performed with the associated EDD or DTM of Type 3730-4 as this is the only way to access the device parameters.

1. The Type 3730-4 Positioner must be mounted and connected properly (▶ EB 8384-4).
2. Change the bus address of Type 3730-4 to the same bus address as Type 3785. This can be done over the PROFIBUS protocol (DEVICE_ADDRESS parameter), using the TROVIS-VIEW software or in Code 46 in the positioner.
3. Start up the positioner (▶ EB 8384-4).

i ***Note***

After initialization (in step 2), the positioner is in compatibility (adaptation) mode (IDENT_NUMBER_SELECTOR parameter in the Physical Block). Do not change this setting.

1.2 Data exchange

The relationship between output and input is based on the control system/master class 1.

Slot 1

– **Version 1:** Modul = SP
0x4A or 0x82, 0x84, 0x08, 0x05

Output

Byte 0	1	2	3	4
Octet 1 Sign Exponent	Octet 2 Exponent Fraction	Octet 3 Fraction	Octet 4 Fraction	Octet 5 Fraction
SP, value (floating point, IEEE)				Status

– **Version 2: Module** = RCAS_IN, RCAS_OUT
0xC4, 0x84, 0x84, 0x08, 0x05, 0x08, 0x05

Output

Byte 0	1	2	3	4
Octet 1 Sign Exponent	Octet 2 Exponent Fraction	Octet 3 Fraction	Octet 4 Fraction	Octet 5 Fraction
RCAS_IN, value (floating point, IEEE)				Status

Input

Byte 0	1	2	3	4
Octet 1 Sign Exponent	Octet 2 Exponent Fraction	Octet 3 Fraction	Octet 4 Fraction	Octet 5 Fraction
RCAS_OUT, value (floating point, IEEE)				Status

– **Version 3:** Module = SP, READBACK + POS_D
0xC6, 0x84, 0x86, 0x08, 0x05, 0x08, 0x05, 0x05, 0x05

Output

Byte 0	1	2	3	4
Octet 1 Sign Exponent	Octet 2 Exponent Fraction	Octet 3 Fraction	Octet 4 Fraction	Octet 5 Fraction
SP, value (floating point, IEEE)				Status

Input

Byte 0	1	2	3	4	5	6
Octet 1 Sign Expo- nent	Octet 2 Expo- nent Fraction	Octet 3 Fraction	Octet 4 Fraction	Octet 5 Fraction	Octet 1	Octet 2
READBACK, value (floating point, IEEE)				Status	POS_D value	POS_D status

– **Version 4:** Module = SP, CHECKBACK
0xC3, 0x84, 0x82, 0x08, 0x05, 0x0A

Output

Byte 0	1	2	3	4
Octet 1 Sign Exponent	Octet 2 Exponent Fraction	Octet 3 Fraction	Octet 4 Fraction	Octet 5 Fraction
SP, value (floating point, IEEE)				Status

Input

Byte 0	1	2
Octet 1	Octet 2	Octet 3
BACK[0]	BACK[1]	BACK[2]

– **Version 5:** Modul = SP, READBACK + POS_D + CHECKBACK
0xC7, 0x84, 0x89, 0x08, 0x05, 0x08, 0x05, 0x05, 0x05, 0x0A

Output

Byte 0	1	2	3	4
Octet 1 Sign Exponent	Octet 2 Exponent Fraction	Octet 3 Fraction	Octet 4 Fraction	Octet 5 Fraction
SP, value (floating point, IEEE)				Status

Input

Byte 0	1	2	3	4	5	6	7	8	9
Octet 1 Sign Exponent	Octet 2 Exponent Fraction	Octet 3 Fraction	Octet 4 Fraction	Octet 5 Fraction	Octet 1	Octet 2	Octet 1	Octet 2	Octet 3
READBACK, value (floating point, IEEE)				Status	POS_D value	POS_D status	CHECK_ BACK[0]	CHECK_ BACK[1]	CHECK_ BACK[2]

– **Version 6:** Module = RCAS_IN, RCAS_OUT + CHECKBACK
0xC5, 0x84, 0x87, 0x08, 0x05, 0x08, 0x05, 0x0A

Output

Byte 0	1	2	3	4
Octet 1 Sign Exponent	Octet 2 Exponent Fraction	Octet 3 Fraction	Octet 4 Fraction	Octet 5 Fraction
RCAS_IN, value (floating point, IEEE)				Status

Input

Byte 0	1	2	3	4	5	6	7
Octet 1 Sign Exponent	Octet 2 Exponent Fraction	Octet 3 Fraction	Octet 4 Fraction	Octet 5 Fraction	Octet 1	Octet 2	Octet 1
RCAS_OUT, value (floating point, IEEE)				Status	CHECK_ BACK[0]	CHECK_ BACK[1]	CHECK_ BACK[2]

– **Version 7:**
Module = SP + RCAS_IN, READBACK + RCAS_OUT + POS_D + CHECKBACK
0xCB, 0x89, 0x8E, 0x08, 0x05, 0x08, 0x05, 0x08, 0x05, 0x08, 0x05, 0x05, 0x05, 0x0A

Output

Byte 0	1	2	3	4	5	6	7	8	9
Octet 1 Sign Exponent	Octet 2 Exponent Fraction	Octet 3 Fraction	Octet 4 Fraction	Octet 5 Fraction	Octet 1 Sign Exponent	Octet 2 Exponent Fraction	Octet 3 Fraction	Octet 4 Fraction	Octet 5 Fraction
SP, value (floating point, IEEE)				Status	RCAS_IN, value (floating point, IEEE)				Status

Input

Byte 0	1	2	3	4	5	6	7	8	9
Octet 1 Sign Exponent	Octet 2 Exponent Fraction	Octet 3 Fraction	Octet 4 Fraction	Octet 5 Fraction	Octet 1 Sign Exponent	Octet 2 Exponent Fraction	Octet 3 Fraction	Octet 4 Fraction	Octet 5 Fraction
READBACK, value (floating point, IEEE)				Status	RCAS_OUT, value (floating point, IEEE)				Status

Byte 10	11	12	13	14
Octet 1	Octet 2	Octet 3	Octet 4	Octet 5
POS_D value	POS_D status	CHECK_ BACK[0]	CHECK_ BACK[1]	CHECK_ BACK[2]

Slot 2, 3

– **Version 1:** Module = Discrete Input (DI)
0x91

Input

Byte 0	1
Octet 1 Value	Octet 2 State
DI_OUT value	DI_OUT status

3.1 Integration for PCS7 control system

The following instructions must be observed on integrating the positioner into a Siemens Simatic S7 control system to ensure that the positioner functions properly:

1. The module in Slot 1 can be read out over the function component SFC 14 DPRD_DAT and, for example, assigned to a data module.
2. Existing modules in Slot 2 and/or Slot 3 need to be allocated over the MOVE command as the use of SFC 14 is not permissible in this case.

i ***Note***

– Data consistency is first provided from a data length of 3 bytes or 5 bytes.
– Use the MOVE command for data types BYTE, WORD and DWORD.
– If the SFC 14 is to be used over several slots, do not forget that the data length is always to be regarded separately for each slot!

3.2 General instructions to start up the positioner

The positioner remains in the fail-safe position until it receives a valid set point from the process control system (status <0x80). S blinks on the positioner display to indicate that the positioner is in the fail-safe position (▶ EB 8384-4). First when a valid set point (status ≥0x80) is set, the positioner leaves the fail-safe position and follows the set point.

4 CHECKBACK – Device status

Each bit can be masked individually for cyclic communication by the class 2 master. This allows a targeted selection to be made from the active alarms.

Byte	Bit	Name	Description	
0	0	CB_FAIL_SAFE	**Fail-safe position:** The fail-safe position has been triggered. **Possible causes:** on-site operation, activation of SET_FAIL_SAFE_POS option or communication failure	R
	1	CB_REQ_LOC_OP	**Request for local operation:** This is set when the initialization key of the local operation is activated.	A
	2	CB_LOCAL_OP	**Local operation:** • The device has been switched to the MAN or SAFE mode by the local operation. • The device is in the self-testing mode (initialization, zero point calibration or diagnostic function active). In this case, the CB_SELFTEST bit is also set.	R
	3	CB_OVERRIDE	**Operating voltage for the optional integrated solenoid valve failed:** The positioner can no longer operate and moves to the fail-safe position determined by the actuator, regardless of the set point.	R
	4…6	Not used		
	7	CB_TRAVE_TIME	**Control loop error:** The control valve no longer follows the controlled variable within tolerable times (see error code 57, ▶ EB 8384-4). This alarm is automatically reset after 10 seconds. The message CHECKBACK byte 1 bit 5 remains, in contrast, until it is confirmed.	A
1	0…1	Not used		
	2	CB_UPDATE_EVENT	**Static data changed:** This is set when the device data have been changed, allowing (unintended/ unauthorized) changes from the originally set values to be monitored.	A

Byte	Bit	Name	Description	
1	3	CB_SIMULATE	**Simulation mode active:** This is set when the simulation mode of at least one Function Block is active. The simulation mode of the AO Function Block allows the controlled variable x to be simulated. The simulation mode of the DI Function Block allows the discrete output to be simulated.	R
	4	Not used		
	5	CB_CONTR_ERR	**Control loop error:** The control valve no longer follows the controlled variable within tolerable times (see error code 57, ▶ EB 8384-4). The error must be reset manually.	R
	6	CB_CONTR_INACT	**Positioner inactive:** This is set when the device is in the OUT OF SERVICE mode or the output of the AO Function Block has a bad status.	R
	7	CB_SELFTEST	**Device is in self-testing mode:** This is set when the initialization routine, the zero point calibration or a diagnostic function of the extended EXPERTplus valve diagnostics is active	R
2	0	CB_TOT_VALVE_ TRAV	**Limit value for total valve travel exceeded:** The current value for the total valve travel is above the entered or pre-determined limit. Reset over SELF_CALIB_CMD = 10 (Reset Total valve travel limit exceeded).	R
	1	CB_ADD_INPUT	**Status of the second optional integrated binary input:** The use of the second binary input must be configured correspondingly with CONFIG_BINARY_ INPUT.	R
	2…6	Not used		
	7	CB_ZERO_POINT_ ERROR	Incorrect zero position (see error code 58 in ▶ EB 8384-4)	R

R Static alarm remains active as long as the reason for the alarm still exists in the device
A Dynamic alarm is automatically reset after 10 seconds

5 Measured value status and valve diagnostics

1.3 Extended EXPERTplus diagnostics

The Type 3730-4 Positioner includes integrated diagnostic functions. Generated alarms are classified and summarized in the PROFIBUS Profile 3.01 and 'Condensed status and diagnostic messages' extension (see section 5.3).

The EXPERTplus extended diagnostics provides the following in-service monitoring and out-of-service tests to provide significant statements on the condition of the entire control valve.

Statistical information (in-service monitoring)

- Data logger
- Histograms
- Cycle counter
- Trend of travel end position
- Drive signal diagram
- Hysteresis measurement

Tests (out-of-service tests)

- Drive signal diagram over the full range of the valve
- Hysteresis test diagram over the full range of the valve
- Static characteristic
- Partial stroke test (PST)

The diagnostic tests are completely integrated into the positioner. The PROFIBUS-PA protocol allows parameters to be entered and test results to be read. The graphs depend on the process control system used.

Further status alarms are generated from the extensive information compiled during the diagnostic tests performed by EXPERTplus, which provide users with information covering the entire control valve.

The required reference graphs are automatically plotted after initialization and saved in the positioner, provided automatic recording is activated with Code 48 - h0 in EXPERTplus.

5.1 Classification of status messages and the condensed state

i ***Note***

The following description only applies to positioners configured corresponding to the Profile 3.01 with the 'Condensed status and diagnostic messages' extension (set in the COND_ STATUS_ DIAG parameter of the Physical Block).

The alarms are classified in the positioner, i.e. when an alarm is issued, it is assigned a status. The classification of the states can be changed.

To provide a better overview, all status messages are summarized in a condensed state, which is made up from a summary of all classified messages in the positioner. The condensed state is summary of all status messages.

If an event is classified as “No message”, this event does not have any affect on the condensed state. If the classification “No message” is assigned for a diagnostic alarm, this alarm is not included in the diagnostic parameters. To be able to read all diagnostic alarms regardless of their assigned classification, they are entered in DIAGNOSIS_EXT_1_RAW and DIAGNOSIS_EXT_2_RAW parameters.

The following states can be selected (see Fig. 2):

– **Maintenance alarm:** The positioner cannot perform its control task due to a malfunction in the positioner itself or in one of its peripherals or the positioner has not yet been successfully initialized.
– **Maintenance required:** The positioner still performs its control task (with restrictions). A maintenance demand or above average wear has been determined. The wear tolerance will soon be exhausted or is reducing at a faster rate than expected. Maintenance is necessary in the medium term.
– **Maintenance required:** The positioner still performs its control task (with restrictions). A maintenance requirement or above average wear has been determined. The wear tolerance will soon be exhausted or is reducing at a faster rate than expected. Maintenance is necessary in the short term.
– **Process-related fault/Out of specification:** The current process conditions do not allow a valid calculation of values.
– **Function check:** Test or calibration procedures are performed in the positioner. The positioner is temporarily unable to perform its control task as long as the procedure is taking place.

The condensed state is displayed in the engineering tool and on the positioner display (see table below).

Condensed state

Status message	Engineering tool/ TROVIS-VIEW (version 3.40 and higher)	Display reading
No message, OK	green	
Function check	orange	***tEsting, tunE or tEst***
Maintenance required Maintenance demanded	blue	
Process-related malfunction Out of specification	yellow	
Maintenance alarm	red	

Status modification

The classification of the status alarms can be assigned as required using the TROVIS-VIEW software connected to the local SSP interface of the positioner or over the PA parameters.

All extended alarms generated by the EXPERTplus diagnostics are assigned the "No message" status by default.

Logging and displaying diagnostic functions/alarms

The last 30 alarms are logged in the positioner. An alarm that is generated repeatedly is only logged once when it first occurs.

The alarms and the condensed state appear on the display as described in the code list (▶ EB 8384-4). In addition, the diagnostic parameters are available over the communication interface of the positioner. The diagnostic functions can easily be displayed and configured using the TROVIS-VIEW software connected over the local interface (SSP) or over the PROFIBUS protocol.

The COND_STATUS_DIAG parameter in the Physical Block allows you to select whether the measured value status is to be set according to Profile 3.01 or according to the 'Condensed status and diagnostic messages' profile extension.

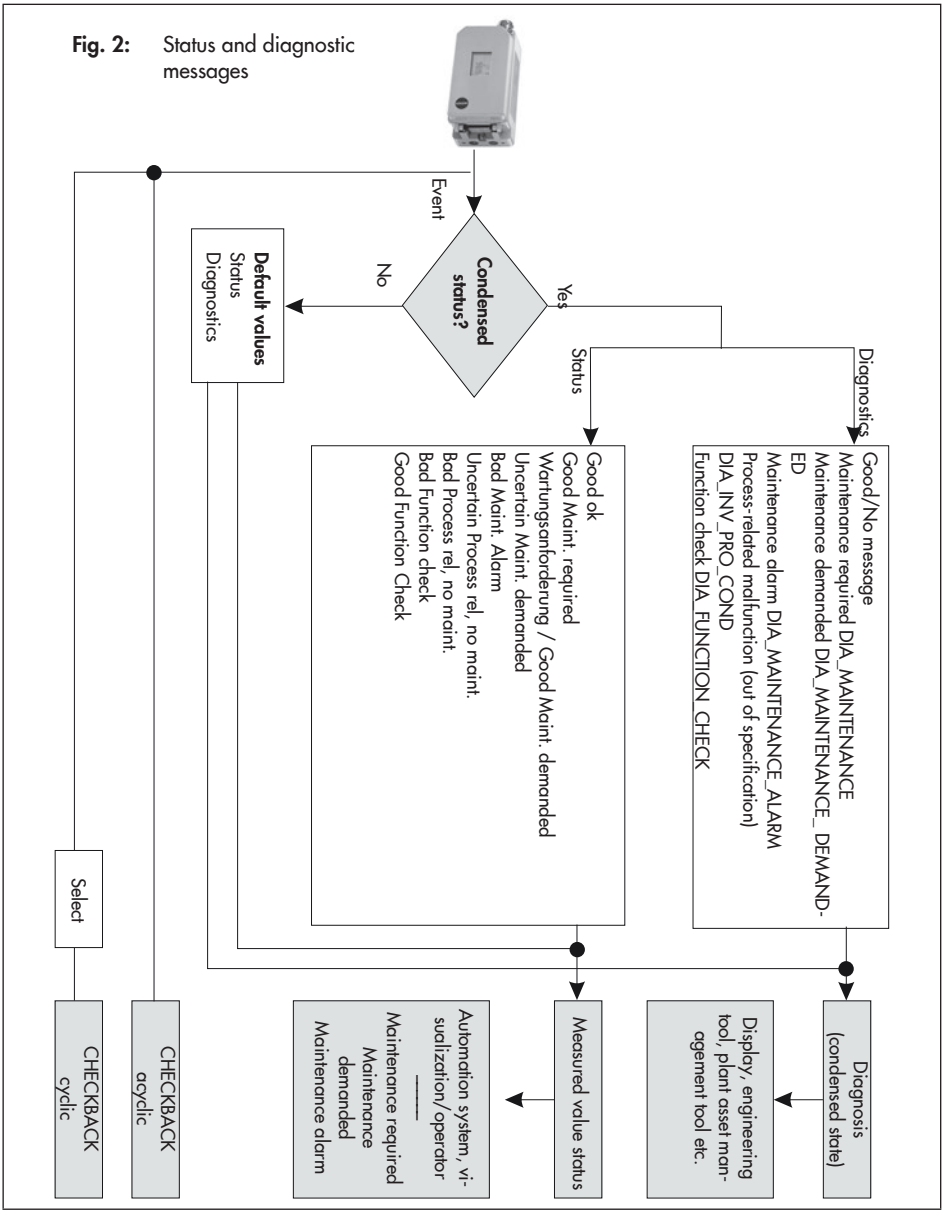

Fig. 2: Status and diagnostic messages

1.1 Status messages according to Profile 3.01

Error/diagnostic message	Value (hex)	Status message according to Profile 3.01
Operational error		
Device not initialized	0x1C	BAD_OUT_OF_SERVICE
Solenoid valve active	0x80	GOOD_NON_SPECIFIC
Total valve travel >	0xA4	GOOD_MAINT_REQ
Control loop error	0x4A	GOOD_MAINT_REQ
Zero error	0xA4	GOOD_MAINT_REQ
Auto-correction	0x80	GOOD_NON_SPECIFIC
Fatal error	0x0C	BAD_DEVICE_FAILURE
Emergency mode	0xA4	GOOD_MAINT_REQ
Reference test canceled	0x80	GOOD_NON_SPECIFIC
Temperature < –40 °C	0x80	GOOD_NON_SPECIFIC
Temperature > 80 °C	0x80	GOOD_NON_SPECIFIC
Initialization error		
x > range	0x80	GOOD_NON_SPECIFIC
Δx < range	0x80	GOOD_NON_SPECIFIC
Incorrect attachment (mechanics/pneumatics)	0x80	GOOD_NON_SPECIFIC
Initialization time exceeded (Init time >)	0x80	GOOD_NON_SPECIFIC
Solenoid valve	0x80	GOOD_NON_SPECIFIC
Transit time too short (transit time <)	0x80	GOOD_NON_SPECIFIC
Pin position	0x80	GOOD_NON_SPECIFIC
Initialization in progress	0x80	GOOD_NON_SPECIFIC
Hardware fault		
x signal	0x0C	BAD_DEVICE_FAILURE
i/p converter	0x0C	BAD_DEVICE_FAILURE
Hardware	0x0C	BAD_DEVICE_FAILURE
Data memory	0xA4	GOOD_MAINT_REQ
Check calculation	0x0C	BAD_DEVICE_FAILURE
Program loading error	0x0C	BAD_DEVICE_FAILURE

Error/diagnostic message	Value (hex)	Status message according to Profile 3.01
Data error		
Control parameters	0xA4	GOOD_MAINT_REQ
Potentiometer parameter	0xA4	GOOD_MAINT_REQ
Calibration error	0xA4	GOOD_MAINT_REQ
Internal device error	0x0C	BAD_DEVICE_FAILURE
General parameters	0xA4	GOOD_MAINT_REQ
Options parameter	0xA4	GOOD_MAINT_REQ
Info parameter	0xA4	GOOD_MAINT_REQ
PA parameters	0xA4	GOOD_MAINT_REQ
Diagnosis parameter	0xA4	GOOD_MAINT_REQ
Extended diagnostics – EXPERTplus		
Air supply		
Perhaps modified TEST	0x80	GOOD_NON_SPECIFIC
Perhaps not enough TEST	0x80	GOOD_NON_SPECIFIC
Perhaps not enough	0x80	GOOD_NON_SPECIFIC
Working at full capacity	0x80	GOOD_NON_SPECIFIC
Working at full capacity TEST	0x80	GOOD_NON_SPECIFIC
Perhaps modified	0x80	GOOD_NON_SPECIFIC
Actuator spring		
Perhaps spring stiffness reduced TEST	0x80	GOOD_NON_SPECIFIC
Perhaps bias reduced TEST	0x80	GOOD_NON_SPECIFIC
Perhaps bias increased TEST	0x80	GOOD_NON_SPECIFIC
Working at full capacity	0x80	GOOD_NON_SPECIFIC
Working at full capacity TEST	0x80	GOOD_NON_SPECIFIC
Shifting working range		
Shifting working range close	0x80	GOOD_NON_SPECIFIC
Shifting working range open	0x80	GOOD_NON_SPECIFIC
Friction		
Much higher over whole range	0x80	GOOD_NON_SPECIFIC
Much lower over whole range	0x80	GOOD_NON_SPECIFIC
Much higher over partition	0x80	GOOD_NON_SPECIFIC

Error/diagnostic message	Value (hex)	Status message according to Profile 3.01
Much lower over partition	0x80	GOOD_NON_SPECIFIC
Much higher over whole range TEST	0x80	GOOD_NON_SPECIFIC
Much lower over whole range TEST	0x80	GOOD_NON_SPECIFIC
Much higher over partition TEST	0x80	GOOD_NON_SPECIFIC
Much lower over partition TEST	0x80	GOOD_NON_SPECIFIC
Leakage pneumatic		
Perhaps existing TEST	0x80	GOOD_NON_SPECIFIC
Perhaps existing	0x80	GOOD_NON_SPECIFIC
Perhaps too large TEST	0x80	GOOD_NON_SPECIFIC
Perhaps too large	0x80	GOOD_NON_SPECIFIC
Limit range		
Down	0x80	GOOD_NON_SPECIFIC
Up	0x80	GOOD_NON_SPECIFIC
Modification impossible	0x80	GOOD_NON_SPECIFIC
Dynamic stress factor		
Stress factor > 90 %	0x80	GOOD_NON_SPECIFIC
Inner leakage		
Perhaps existing	0x80	GOOD_NON_SPECIFIC
Perhaps larger than origin TEST	0x80	GOOD_NON_SPECIFIC
Perhaps larger than origin	0x80	GOOD_NON_SPECIFIC
External leakage		
Perhaps soon expected	0x80	GOOD_NON_SPECIFIC
Perhaps existing	0x80	GOOD_NON_SPECIFIC
Existing	0x80	GOOD_NON_SPECIFIC
Observing end position		
ZP-shift monotone down aver. over ref.	0x80	GOOD_NON_SPECIFIC
ZP-shift monotone up aver. over ref.	0x80	GOOD_NON_SPECIFIC
ZP-shift alternate aver. over ref.	0x80	GOOD_NON_SPECIFIC
ZP-shift monotone down aver. under ref.	0x80	GOOD_NON_SPECIFIC
ZP-shift monotone up aver. under ref.	0x80	GOOD_NON_SPECIFIC
ZP-alternate aver. under ref.	0x80	GOOD_NON_SPECIFIC

Error/diagnostic message	Value (hex)	Status message according to Profile 3.01
Connection positioner valve		
No optimal travel transmission (TEST)	0x80	GOOD_NON_SPECIFIC
Perhaps loose	0x80	GOOD_NON_SPECIFIC
Perhaps limit. range	0x80	GOOD_NON_SPECIFIC
Perhaps loose TEST	0x80	GOOD_NON_SPECIFIC
Range		
Mostly near closing pos.	0x80	GOOD_NON_SPECIFIC
Mostly near max. opening	0x80	GOOD_NON_SPECIFIC
Mostly closing pos.	0x80	GOOD_NON_SPECIFIC
Mostly max. opening	0x80	GOOD_NON_SPECIFIC
Temperature error		
Lower limit exceeded	0x80	GOOD_NON_SPECIFIC
Higher limit exceeded	0x80	GOOD_NON_SPECIFIC
Reference test		
Reference test canceled	0x80	GOOD_NON_SPECIFIC
ESD		
Movement actuator possible	0x80	GOOD_NON_SPECIFIC
Movement actuator impossible	0x80	GOOD_NON_SPECIFIC
Error solenoid valve	0x80	GOOD_NON_SPECIFIC
Function active		
Initialization active	0x80	GOOD_NON_SPECIFIC
Diagnostic function active	0x80	GOOD_NON_SPECIFIC

5.2 Status messages according to Profile 3.01 - Condensed status

Error/diagnostic message		Default setting according to Profile 3.01 - Condensed status	Possible status classification		Diagnosis
			Yes	No	
Operational error					
Device not initialized	0x24	BAD_MAINT_ALARM		•	DIA_INIT_ERR
Solenoid valve active	0x80	GOOD_NON_SPECIFIC	•		–

Error/diagnostic message		Default setting according to Profile 3.01 - Condensed status	Possible status classification		Diagnosis
			Yes	No	
Total valve travel >	0xA4	GOOD_MAINT_REQ	•		DIA_MAINTENANCE
Control loop error	0xA4	GOOD_MAINT_REQ	•		DIA_MAINTENANCE
Zero error	0xA4	GOOD_MAINT_REQ	•		DIA_ZERO_ERR
Auto-correction	0x80	GOOD_NON_SPECIFIC	•		DIA_MAINTENANCE DIA_MEM_CHECKSUM
Fatal error	0x24	BAD_MAINT_ALARM		•	DIA_HW_ELECTR
Extended diagnostics available	0x80	GOOD_NON_SPECIFIC		•	DIA_MAINTENANCE EXTENSION_AVAILABLE
Emergency mode	0xA4	GOOD_MAINT_REQ	•		DIA_MEM_CHECKSUM
Temperature < –40 °C	0x80	GOOD_NON_SPECIFIC	•		–
Temperature > 80 °C	0x80	GOOD_NON_SPECIFIC	•		–
Initialization error					
x > range	0xA4	GOOD_MAINT_REQ	•		DIA_INIT_ERR
Δx < range	0xA4	GOOD_MAINT_REQ	•		DIA_INIT_ERR
Incorrect attachment (mechanics/ pneumatics)	0xA4	GOOD_MAINT_REQ	•		DIA_INIT_ERR
Initialization time exceeded (Init time >)	0xA4	GOOD_MAINT_REQ	•		DIA_INIT_ERR
Solenoid valve	0xA4	GOOD_MAINT_REQ	•		DIA_INIT_ERR
Transit time too short (transit time <)	0xA4	GOOD_MAINT_REQ	•		DIA_INIT_ERR
Pin position	0xA4	GOOD_MAINT_REQ	•		DIA_INIT_ERR
Initialization in progress	0xA4	GOOD_MAINT_REQ	•		–
Hardware fault					
x signal	0xA8	GOOD_MAIN_DEMANDED	•		DIA_MEASUREMENT
i/p converter	0x24	BAD_MAINT_ALARM		•	DIA_HW_ELECTR
Hardware	0x24	BAD_MAINT_ALARM		•	DIA_HW_ELECTR
Data memory	0xA4	GOOD_MAINT_REQ		•	DIA_MEM_CHECKSUM
Check calculation	0x24	BAD_MAINT_ALARM		•	DIA_MEM_CHECKSUM
Program loading error	0x24	BAD_MAINT_ALARM		•	DIA_MEM_CHECKSUM
Data error					
Control parameters	0xA4	GOOD_MAINT_REQ	•		DIA_MEM_CHECKSUM

Error/diagnostic message		Default setting according to Profile 3.01 - Condensed status	Possible status classification		Diagnosis
			Yes	No	
Potentiometer parameter	0xA4	GOOD_MAINT_REQ	•		DIA_MEM_CHECKSUM
Calibration error	0xA4	GOOD_MAINT_REQ	•		DIA_MEM_CHECKSUM
Internal device error	0xA4	GOOD_MAINT_REQ	•		DIA_MEM_CHECKSUM
General parameters	0xA4	GOOD_MAINT_REQ	•		DIA_MEM_CHECKSUM
Options parameter	0xA4	GOOD_MAINT_REQ	•		DIA_MEM_CHECKSUM
Info parameter	0xA4	GOOD_MAINT_REQ	•		DIA_MEM_CHECKSUM
PA parameters	0xA4	GOOD_MAINT_REQ	•		DIA_MEM_CHECKSUM
Diagnosis parameter	0xA4	GOOD_MAINT_REQ	•		DIA_MEM_CHECKSUM
Extended EXPERTplus diagnostics					
Air supply					
Perhaps modified TEST	0x80	GOOD_NON_SPECIFIC	•		–
Perhaps not enough TEST	0x80	GOOD_NON_SPECIFIC	•		–
Perhaps not enough	0x80	GOOD_NON_SPECIFIC	•		–
Working at full capacity	0x80	GOOD_NON_SPECIFIC	•		–
Working at full capacity TEST	0x80	GOOD_NON_SPECIFIC	•		–
Perhaps modified	0x80	GOOD_NON_SPECIFIC	•		–
Actuator spring					
Perhaps spring stiffness reduced TEST		GOOD_NON_SPECIFIC	•		–
Perhaps bias reduced TEST	0x80	GOOD_NON_SPECIFIC	•		–
Perhaps bias increased TEST	0x80	GOOD_NON_SPECIFIC	•		–
Working at full capacity	0x80	GOOD_NON_SPECIFIC	•		–
Working at full capacity TEST	0x80	GOOD_NON_SPECIFIC	•		–
Shifting working range					
Shifting working range close	0x80	GOOD_NON_SPECIFIC	•		–
Shifting working range open	0x80	GOOD_NON_SPECIFIC	•		–
Friction					
Much higher over whole range	0x80	GOOD_NON_SPECIFIC	•		–
Much lower over whole range	0x80	GOOD_NON_SPECIFIC	•		–
Much higher over partition	0x80	GOOD_NON_SPECIFIC	•		–

Error/diagnostic message		Default setting according to Profile 3.01 - Condensed status	Possible status classification		Diagnosis
			Yes	No	
Much lower over partition	0x80	GOOD_NON_SPECIFIC	•		–
Much higher over whole range TEST	0x80	GOOD_NON_SPECIFIC	•		–
Much lower over whole range TEST	0x80	GOOD_NON_SPECIFIC	•		–
Much higher over partition TEST	0x80	GOOD_NON_SPECIFIC	•		–
Much lower over partition TEST	0x80	GOOD_NON_SPECIFIC	•		–
Leakage pneuatic					
Perhaps existing TEST	0x80	GOOD_NON_SPECIFIC	•		–
Perhaps existing	0x80	GOOD_NON_SPECIFIC	•		–
Perhaps too large TEST	0x80	GOOD_NON_SPECIFIC	•		–
Perhaps too large	0x80	GOOD_NON_SPECIFIC	•		–
Limit range					
Down	0x80	GOOD_NON_SPECIFIC	•		–
Up	0x80	GOOD_NON_SPECIFIC	•		–
Modification impossible	0x80	GOOD_NON_SPECIFIC			–
Dynamic stress factor					
Dynamic stress factor > 90 %	0x80	GOOD_NON_SPECIFIC	•		–
Inner leakage					–
Perhaps existing	0x80	GOOD_NON_SPECIFIC	•		–
Perhaps larger than origin TEST	0x80	GOOD_NON_SPECIFIC	•		–
Perhaps larger than origin	0x80	GOOD_NON_SPECIFIC	•		–
External leakage					
Perhaps soon expected	0x80	GOOD_NON_SPECIFIC	•		–
Perhaps existing	0x80	GOOD_NON_SPECIFIC	•		–
Existing	0x80	GOOD_NON_SPECIFIC	•		–
Observing end position					
ZP-shift monotone down aver. over ref.	0x80	GOOD_NON_SPECIFC	•		–
ZP-shift monotone up aver. over ref.	0x80	GOOD_NON_SPECIFIC	•		–

Error/diagnostic message		Default setting according to Profile 3.01 - Condensed status	Possible status classification		Diagnosis
			Yes	No	
ZP-shift alternate aver. over ref.	0x80	GOOD_NON_SPECIFIC	•		–
ZP-shift monotone down aver. under ref.	0x80	GOOD_NON_SPECIFIC	•		–
ZP-shift monotone up aver. under ref.	0x80	GOOD_NON_SPECIFIC	•		–
ZP-alternate aver. under ref.			•		–
Zero alternates, mean below reference graph	0x80	GOOD_NON_SPECIFIC	•		–
Connection positioner valve					
No opt. travel transm. TEST	0x80	GOOD_NON_SPECIFIC	•		–
Perhaps loose – evtl. lose	0x80	GOOD_NON_SPECIFIC	•		–
Perhaps limit. range	0x80	GOOD_NON_SPECIFIC			–
Perhaps loose TEST	0x80	GOOD_NON_SPECIFIC	•		–
Range					
Mostly near closing pos.	0x80	GOOD_NON_SPECIFIC	•		–
Mostly near max. opening	0x80	GOOD_NON_SPECIFIC	•		–
Mostly closing pos.	0x80	GOOD_NON_SPECIFIC	•		–
Mostly max. opening	0x80	GOOD_NON_SPECIFIC	•		–
Temperature error					
Lower limit exceeded	0x80	GOOD_NON_SPECIFIC	•		–
Higher limit exceeded	0x80	GOOD_NON_SPECIFIC	•		–
Reference test					
Reference test canceled	0x80	GOOD_NON_SPECIFIC	•		–
ESD					
Movement actuator possible	0x80	GOOD_NON_SPECIFIC	•		–
Movement actuator impossible	0x80	GOOD_NON_SPECIFIC	•		–
Error solenoid valve	0x80	GOOD_NON_SPECIFIC	•		–
Function active					
Initialization active	0xBC	GOOD_NON_SPECIFIC	• [1)]		–
Diagnostic function active	0xBC	GOOD_NON_SPECIFIC	• [1)]		–

[1)] Can be classified either as GOOD_FUNCTION_CHECK or BAD_FUNCTION_CHECK in firmware K 1.10 and higher. See FEATURE_SELECT parameter on page 51.

5.3 Standard diagnostics with PROFIBUS-DP protocol

Generated alarms are classified and summarized in the PROFIBUS Profile 3.01 and 'Condensed status and diagnostic messages' extension.

The diagnostic approach complying with PROFIBUS-DP includes the following types of diagnostic transfer:

– The DP master class 1 reads the diagnosis of the DP slave while the cyclic data exchange is being set up.
– in case of an active diagnostic alarm, the slave responds during the data exchange with a high-prioritized response telegram.

  The master requests a diagnosis as a result to continue afterwards with the normal data exchange.

The diagnostic alarm is made up of the standard diagnosis according to PROFIBUS-DP protocol and the user-specific diagnosis. The first six octets of the diagnostic alarm are as-signed to the standard diagnosis, essentially providing a statement about the state of the cyclic connection. Special attention is given to the DIAG.ext bit (octet 1). The slave uses this bit to indicate to the master that the output data are invalid. As a result, the master interrupts the cyclic data exchange to read out the diagnostic data. The master first returns to cyclic data exchange when the DIAG.ext bit is reset by the slave.

If, however, the DIAG.ext bit is set to 0, the existing data are treated as status information by the system. For the Type 3730-4 Positioner, this behavior can be determined by the FEATURE_SELECT parameter. By selecting the option “DIA_MAINTENANCE_ALARM sets DIAG_EXT bit“, the DIAG_EXT bit is set when the DIA_MAINTENANCE_ALARM bit has been determined.

Deactivate this option if all the data of the positioner should be used as status information.

On using the Profile 3.01 the DIAG_EXT bit can be set when the measured value status has been assigned to BAD_DEVICE_FAILURE. This only happens when the following errors, which lead to device failure, occur:

– Check calculation
– Fatal error
– Program loading error
– No production calibration
– Hardware
– i/p converter

On using the 'Condensed status and diagnostic messages' extension, the assignment can be selected as required.

The first four bytes of the manufacturer-specific diagnosis are used for diagnostic alarms according to Profile 3.01. On using the 'Condensed status and diagnostic messages' extension, these condensed diagnostic alarms are also included in these bytes. The manufacturer-specific diagnosis listed in the following table is transmitted in the eleventh byte and higher. The contents of both parameters of the Physical Block, DIAGNOSIS and DIAGNOSIS_EXT, are sent.

Standard diagnosis according to PROFIBUS-DP protocol

Regardless of whether the positioner has been integrated according to Profile 3.01 or using manufacturer specifications, the diagnosis can be restricted to six bytes. For this purpose, the FEATURE_SELECT parameter provides the option “Use DP standard diagnosis (6 bytes)” (see page page 51). The default setting causes the positioner to provide a manufacturer-specific diagnosis of 26 bytes and a diagnosis of 14 bytes according to Profile 3.01.

Octet	Bit	Meaning	Note
1	0…7	Standard slave diagnostics	
2	0…7		
3	0…7		
4	0…7		
5	0…7		
6	0…7		
7	0…7	Definition of manufacturer-specific diagnostic alarms	
8	0…7		
9	0…7		
10	0…7		
11	0	DIA_HW_ELECTR (hardware error: electronics)	
	1	DIA_HW_MECH (hardware error: mechanics)	
	2	Not used	
	3	Not used	
	4	DIA_MEM_CHCKSUM (checksum error in data memory)	
	5	DIA_MEASUREMENT (error in measured value recording)	
	6	DIA_NOT_INIT (positioner not initialized/no auto-tuning)	
	7	DIA_INIT_ERR (faulty auto-tuning)	

Octet	Bit	Meaning	Note
12	0	DIA_ZERO_ERR (zero error, end position)	
	1	Not used	
	2	DIA_CONF_INVAL (configuration not plausible/invalid address)	
	3	DIA_WARMSTART (restart/soft reset performed)	
	4	DIA_COLDSTART (restart/cold start performed)	
	5	DIA_MAINTENANCE (maintenance required)	1
	6	DIA_CHARACT (invalid characteristic)	
	7	IDENT_NUMBER_VIOLATION (selected ID number not yet implemented by the positioner)	
13	0	DIA_MAINTENANCE_ALARM (device error exists)	1
	1	DIA_MAINTENANCE_DEMANDED (maintenance required)	1
	2	DIA_FUNCTION_CHECK (device in function check, simulation or MODE_LO)	1
	3	DIA_INV_PRO_COND (process-related malfunction/out of specification)	1
	4…7	Reserved according to Profile 3.01	
14	0…6	Reserved according to Profile 3.01	
	7	EXTENSION_AVAILABLE (further diagnostic information available)	
15 [3)]	0	Device not initialized	
	1	Solenoid valve active	
	2	Tot. valve travel limit exceeded (see Code 24)	
	3	Control loop (see Code 57)	
	4	Zero point (see Code 58)	
	5	Autocorrection (see Code 59)	
	6	Fatal error (see Code 60)	
	7	Extended diagnosis (only with EXPERT+)	2
16 [3)]	0	x > range (see Code 50)	
	1	Delta x < range (see Code 51)	
	2	Attachment (see Code 52)	
	3	Initialization time exceeded (see Code 53)	
	4	Initialization/solenoid valve (see Code 54)	
	5	Travel time too short (see Code 55)	
	6	Pin position (see Code 56)	
	7	Test or calibration running	

Octet	Bit	Meaning	Note
17 [3)]	0	x-signal (see Code 62)	
	1	i/p-converter (see Code 64)	
	2	Hardware (see Code 65)	
	3	Control parameter (see Code 68)	
	4	Poti parameter (see Code 69)	
	5	Adjustment parameter (see Code 70)	
	6	Internal device error 1 (see Code 73)	
	7	General parameter (see Code 71)	
18 [3)]	0	No emergency mode (see Code 76)	
	1	Program load error (see Code 77)	
	2	Options parameter (see Code 78)	
	3	Info parameter (see Code 75)	
	4	Data memory (see Code 66)	
	5	Control calculation (see Code 67)	
	6	PA parameter (see Code 74)	
	7	DIAG parameter (see Code 80)	
19 [3)]	0	Reset communication controller	
	1	Reset comm HW interface	
	2	Bin Input 2 deactivated	
	3	Reset application controller	
	4…7	Not used	
20 [3)]	0	Air supply: modified TEST	2
	1	Air supply: not enough TEST	2
	2	Air supply: not enough	2
	3	Air supply: at full capacity	2
	4	Air supply: at full cap. TEST	2
	5	Air supply: modified	2
	6	Act. Spring: stiffness red. TEST	2
	7	Act. Spring: bias reduced TEST	2

Octet	Bit	Meaning	Note
21 [3]	0	Act. Spring: bias increased TEST	2
	1	Act. Spring: at full cap.	2
	2	Act Spring: at full cap. TEST	2
	3	Shifting working range: close	2
	4	Shifting working range: open	2
	5	Fric.: higher over whole range	2
	6	Fric.: lower over whole range	2
	7	Fric.: higher over part.	2
22 [3]	0	Fric.: lower over part.	2
	1	Fric.: higher whole range TEST	2
	2	Fric.: lower whole range TEST	2
22 [3]	3	Fric.: higher over part. TEST	2
	4	Fric.: lower over part. TEST	2
	5	Leak pneum: existing TEST	2
	6	Leak pneum: existing	2
	7	Leak pneum: too large TEST	2
23 [3]	0	Leak pneum: too large	2
	1	Limit range: Down	2
	2	Limit range: Up	2
	3	Limit range: Mod. imposs.	2
	4	Dyn. stress factor > than 90 %	2
	5	Inner leak.: > origin	2
	6	Inner leak.: > origin TEST	2
	7	Inner leak.: Perhaps present	2

Octet	Bit	Meaning	Note
24 [3]	0	Ext. leakage: Perhaps soon expected	2
	1	Ext. leakage: Perhaps existing	2
	2	Ext. leakage: existing	2
	3	Zp monotone down, aver. over ref	2
	4	Zp monotone up, aver. over ref	2
	5	Zp alternating, aver. over ref	2
	6	Zp monotone down, aver under ref	2
	7	Zp monotone up, aver. under ref	2
25 [3]	0	Zp alternating, aver under ref	2
	1	Attachment no opt. travel transm	2
	2	Attachment perhaps loose	2
	3	Attachment perhaps limit. range	2
	4	Attachment perhaps loose TEST	2
25 [3]	5	Range: mostly near closing pos.	2
	6	Range: mostly near max. opening	2
	7	Range: mostly closing position	2
26 [3]	0	Range: mostly max. opening	2
	1	Temperature exceeding (Temperatur überschritten)	2
	2	Temperature above +80°C	2
	3	Reference test aborted	2
	4	PST: Movement actuator poss.	2
	5	PST: Movement actuator imposs.	2
	6	PST: Error solenoid valve	2
	7	Not used	2

[1] Only on using the 'Condensed status und diagnostic messages' profile extension. The following diagnostic messages indicate the condensed state (see section 5.1):

DIA_MAINTENANCE_ALARM:	Maintenance alarm
DIA_MAINTENANCE_DEMAND:	Maintenance demanded
DIA_MAINTENANCE:	Maintenance required
DIA_FUNCTION_CHECK:	Function check
DIA_INV_PRO_COND:	Process-related malfunction/out of specification

[2] Diagnostic messages generated by the EXPERTplus extended diagnostics

[3] The default setting causes the positioner to provide a manufacturer-specific diagnosis of 26 bytes and a diagnosis of 14 bytes according to Profile 3.01.

6 Acyclic data exchange

i ***Note***

All parameters in the parameter list on page 36 onwards, which are not marked, are included in the acyclic data exchange.

The acyclic data exchange complying to DP-V1 with a master class 2 (MS2) is mainly used for commissioning, parameter settings and for diagnostic purposes.

The DD (Device Description) file can be downloaded from SAMSON's website (www.samsongroup.com) to configure parameters in Type 3730-4 Positioner over Siemens PDM (Process Device Manager). Depending on the firmware version, some parameters make it necessary to use the corresponding DD revision as specified in the table below to access the device parameters:

Communication firmware	DD revision
K 1.00 to K 1.10	1
K 1.11 to K 1.17	2
K 2.00 and higher	3

7 Partial stroke testing over DP-V0

The partial stroke test (PST) can be started in the following ways:

Operating mode	PST mode	Start triggered by the binary input	Start triggered by auto test time	Start triggered by set point
AUTO	PST Man	•	–	• [1]
	PST Auto	•	•	• [1]
MAN	PST Man	•	–	–
	PST Auto	•	•	–

[1] The partial stroke test is started by defining SP with status value (9C hexadecimal). This function must be enabled by the FEATURE_SELECT parameter.

The partial stroke test is analyzed by the DI Function Block (Discrete Input) of the positioner. One of the following messages is assigned to the discrete information:

0: Test not completed successfully

1: Test OK

2: PST was not performed

3: Test analysis not successful

For further analysis, the condensed state can be analyzed with the second DI Function Block (see section 5.1).

---

i ***Note***

Partial stroke testing is described in detail in the Operating Instructions ▶ EB 8389 (EXPERT-plus valve diagnostics).

---

8 Parameter lists

Legend

The parameter index is listed in brackets following the parameter name in the following tables.

Storage class:	S	Static parameter
	D	Dynamic parameter
	N	Non-volatile parameter
Access:	r	Read capability
	w	Write capability
Mode:	O	O/S (out of service) mode
	M	MAN mode
	A	AUTO mode
	CAS	Cascade mode
	RCAS	External cascade mode
	ALL	O/M/A/CAS/RCAS

i Note

– Parameters marked with an asterisk (*) are included in the cyclic data exchange.
– Values/settings in square brackets [ ] are default settings.
– More information on the parameters in the EXPERTplus diagnostics can be found in the Operating Instructions ▶ EB 8389.

8.1 Physical Block, Slot 0 · Profile-specific parameters

ALERT_KEY (20)
Storage class S; read/write capability (r/w); supported modes ALL

ID number of the plant section

ALM_SUM (23)
Storage class –; read capability (r)

Current status of process alarms in the Physical Block

BLOCK_OBJ (16)
Storage class –; read capability (r)

COND_STATUS_DIAG (43)
Storage class S; read/write capability (r/w); supported modes ALL

Use of positioner
– According to Profile 3.01 or
– With condensed state
A change is not permissible in the DATA_EXCHANGE (cyclic) state.

DESCRIPTOR (36)
Storage class S; read/write capability (r/w); supported modes ALL

Any desired text to describe the application. The text is saved in the field device.
• Max. 32 characters, [no text]

DEVICE_CERTIFICATION (33)
Storage class –; read capability (r)

Certification · Specifies whether explosion protection certificates are available for the Type 3730-4.

DEVICE_ID (27)
Storage class –; read capability (r)

Type designation of the positioner

DEVICE_INSTAL_DATE (38)
Storage class N; read/write capability (r/w); supported modes ALL

Date when the positioner was installed

DEVICE_MAN_ID (26)
Storage class –; read capability (r)

Manufacturer of the positioner

DEVICE_MESSAGE (37)
Storage class S; read/write capability (r/w); supported modes ALL

Any desired text. The text is saved in the field device.
• Max. 32 characters, [no text]

DEVICE_SER_NUM (28)
Storage class –; read capability (r)

Positioner's serial number: enables the clear identification of the field device in combination with descriptions entered in DEVICE_MAN_ID and DEVICE_ID

DIAG_EVENT_SWITCH (44)
Storage class S; read/write capability (r/w); supported modes ALL

Classification of diagnostic and status alarms

DIAGNOSIS (29)
Storage class –; read capability (r)

Detailed information of the device, coded bitwise. More than one alarm possible at one time. Alarms remain active as long as the event still exists (static alarms)
Bit: 0 = false · 1 = true

Byte	Bit	According to PA V3.01	Description
0	0	DIA_HW_ELECTR	Hardware error: electronics
0	1	DIA_HW_MECH	Hardware error: mechanics
0	2	–	
0	3	DIA_TEMP_ELECTR	Temperature in the electronics too high
0	4	DIA_MEM_CHKSUM	Checksum error in data memory
0	5	DIA_MEASUREMENT	Error in measured value recording
0	6	DIA_NOT_INIT	Device not initialized
0	7	DIA_INIT_ERR	Initialization not performed correctly
1	0	DIA_ZERO_ERR	Zero error (end position)
1	1	–	
1	2	DIA_CONF_INVAL	Configuration not plausible/invalid address
1	3	DIA_WARMSTART	Restart (soft reset) performed
1	4	DIA_COLDSTART	Cold start performed
1	5	DIA_MAINTENANCE	Maintenance required
1	6	DIA_CHARACT	Invalid characteristic
1	7	IDENT_NUMBER_VIOLATION	Selected ID number not yet implemented by the positioner
2	0	DIA_MAINTENANCE_ALARM	Device error
2	1	DIA_MAINTENANCE_DEMANDED	Maintenance required
2	2	DIA_FUNCTION_CHECK	Device in function check, simulation or MODE_LO
2	3	DIA_INV_PRO_COND	The current process conditions do not allow a valid calculation of values
2	4…7	–	
3	0…7	–	

Byte	Bit	According to PA V3.01	Description
4	0…6	–	
4	7	EXTENSION_AVAILABLE	Further diagnostic information available, see DIAGNOSIS_EXT/DIAGNOSIS_EXTENSION_2

DIAGNOSIS_EXT (30)
Storage class –; read capability (r)

Byte	Bit	Description	
0	0	Device not initialized	
0	1	Solenoid valve active	
0	2	LV total valve travel	(Code 24)
0	3	Control loop error	(Code 57)
0	4	Zero error	(Code 58)
0	5	Auto-correction	(Code 59)
0	6	Fatal error	(Code 60)
0	7	Extended diagnostics available · Only with EXPERTplus	
1	0	x > permissible range	(Code 50)
1	1	Delta x < permissible range	(Code 51)
1	2	Attachment	(Code 52)
1	3	Initialization time exceeded (Init time >)	(Code 53)
1	4	Initialization – solenoid valve	(Code 54)
1	5	Transit time too short (transit time <)	(Code 55)
1	6	Pin position	(Code 56)
1	7	Test or calibration in progress	
2	0	x signal	(Code 62)
2	1	i/p converter	(Code 64)
2	2	Hardware	(Code 65)
2	3	Control parameters	(Code 68)
2	4	Potentiometer parameters	(Code 69)
2	5	Calibration	(Code 70)
2	6	No production calibration	
2	7	General parameters	(Code 71)
3	0	Emergency mode · Not an error	(Code 76)
3	1	Software loading error	(Code 77)
3	2	Option parameters	(Code 78)
3	3	Info parameters	(Code 75)
3	4	Data memory	(Code 66)
3	5	Check calculation	(Code 67)
3	6	PA parameters	(Code 74)
3	7	Diagnostic parameters	(Code 80)
4	0	Reset communication controller	
4	1	Reset error message for bus connection	
4	2	Bin2 deactivated	
4	3	Reset closed-loop controller	

DIAGNOSIS_EXT (30) (continued)
Storage class –; read capability (r)

Byte	Bit	Description
4	4…7	–
5	0	Air supply – Perhaps modified (TEST)
5	1	Air supply – Perhaps not enough (TEST)
5	2	Air supply – Perhaps not enough
5	3	Air supply - Working at full capacity
5	4	Air supply - Working at full capacity (TEST)
5	5	Air supply – Perhaps modified
5	6	Actuator springs – Spring stiffness reduced (TEST)
5	7	Actuator springs – Perhaps bias reduced (TEST)

DIAGNOSIS_MASK (31)
Storage class –; read capability (r)

Availability of the status bit in DIAGNOSIS parameter
- Bit value = 0: Status not available
- Bit value = 1: Status available

DIAGNOSIS_MASK_EXT (32)
Storage class –; read capability (r)

Availability of the status bit in DIAGNOSIS_EXT parameter
- Bit value = 0: Status not available
- Bit value = 1: Status available

FACTORY_RESET (35)
Storage class S; read/write capability (r/w); supported modes ALL

Command to reset the positioner to default settings
- 1 (0x0001) · Resets the start-up, identification and function block parameters as well as the status classification. After a reset, the positioner must be re-initialized.
- 2506 (0x09CA) · Soft reset
- 2712 (0x0A98) · Resets the bus address to the default value of 126. The positioner restarts after the reset. The bus address is not reset by resetting the the identification parameters. The bus address can only be reset with this command in firmware version K 1.11 and higher.
- 32768 (0x8000) · Resets the identification parameters
- 32769 (0x8001) · Resets the start-up and function block parameters as well as the status classification. After the reset, the positioner must be re-initialized.
- 32770 (0x8002) · Resets the start-up parameters. After the reset, the positioner must be re-initialized.

Identification parameters (without bus address, valve and actuator data) include:
- Physical Block: CONFIG_BINARY_INPUT_2 1), DEVICE_INSTAL_DATE, DEVICE_MESSAGE, DESCRIPTOR, IDENT_ LIMIT_SWITCHES 1), IDENT_NUMBER_SELECTOR, TAG_DESC, TEXT_INPUT 1…5 1)
- AO Function Block: TAG_DESC

FACTORY_RESET (35) (continued)
Storage class S; read/write capability (r/w); supported modes ALL

- AO Transducer Block: ACTUATOR_MAN, ACTUATOR_SER_NUM, ADD_GEAR_ID, ADD_GEAR_ INST_DATE, ADD_ GEAR_MAN, ADD_GEAR_SER_NUM, DEVICE_CALIB_DATE, DEVICE_ CHAR-ACT 1), DEVICE_ CONFIG_DATE, TAG_DESC VALVE_MAINT_DATE, VALVE_MAN, VALVE_SER_ NUM, VALVE_TYPE
- DI1/2 Function Block: TAG_DESC
- DI1/2 Transducer Block: SENSOR_ID, SENSOR_MAN, SENSOR_SER_NUM, TAG_DESC

Start-up parameters (status classification, analysis of condensed state (Code 36) include:
- Physical Block: COND_STATUS_DIAG, DIAG_EVENT_SWITCH, DIAG_EVENT_SWITCH_2 1), FEA-TURE

Function block parameters include:
- Physical Block: ALERT_KEY, FACTORY_RESET, FEATURE_SELECT, LOCAL_OP_ENA, ST_REV, STRATE-GY, TARGET_MODE, WRITE_LOCKING
- AO Function Block: ALERT_KEY, BATCH, CHECK_BACK_OPT, FSAFE_TIME, FSAFE_TYPE, FSAFE_ VALUE, IN_CHANNEL, INCREASE_CLOSE, OUT_CHANNEL, OUT_SCALE, PV_SCALE, SIMULATE, ST_REV, STRATEGY, TARGET_MODE
- AO Transducer Block: ACTUATOR_ACTION, ALERT_KEY, CHARACT_TYPE1), SELF_CALIB_CMD, SELF_CALIB_STATUS, ST_REV, STRATEGY, TARGET_MODE
- DI1/2 Function Block: ALERT_KEY, BATCH, CHANNEL, FSAFE_TYPE, FSAFE_VAL_D, INVERT, SIMU-LATE, ST_REV, STRATEGY, TARGET_MODE
- DI1/2 Transducer Block: ALERT_KEY, SENSOR_WIRE_CHECK, ST_REV, STRATEGY, TARGET_MODE

1) Manufacturer-specific parameter

FEATURE (42)
Storage class –; read capability (r)

Existence and state of optional features integrated in the device
Supported/enabled (Note: The structure of 'supported' and 'enabled' are identical)
- 0 = Not supported/not enabled
- 1 = Supported/enabled

Byte	Bit	Element	[Default]	Description
0	0	CONDENSED_STATUS	[1]	Status and diagnosis according to 'Condensed status and diagnostic messages' extension
0	1	EXPANDED_STATUS/ DIAGNOSIS	[1]	Status and diagnosis according to Pro-file 3.01
0	2…7	Reserved	[0]	
1	0…7	Reserved	[0]	
2	0…7	Reserved	[0]	
3	0…7	Reserved	[0]	

HARDWARE_REVISION (25)
Storage class –; read capability (r)

Hardware release for electronics and mechanics

HW_WRITE_PROTECTION (41)
Storage class –; read capability (r)

Switching state of the write protection switch in the positioner.
- 0 · Not write protected
- 1 · Write protected

IDENT_NUMBER_SELECTOR (40)
Storage class S; read/write capability (r/w); supported modes ALL

ID number
- 0 · Profile-specific ID (0x9710), PA139710.GSD
- 1 · Manufacturer-specific ID (0x07ID), SAMS071D.GSD
- 2 · Compatibility mode

LOCAL_OP_ENA (39)
Storage class S; read/write capability (r/w); supported modes ALL

On-site operation enabled
Upon communication failure lasting longer than 30 seconds, local operation is enabled automatically.
- 0 · No
- 1 · Yes

MODE_BLK (22)
Storage class –; read capability (r)

Current mode of the Physical Block

SOFTWARE_REVISION (24)
Storage class –; read capability (r)

Firmware version (communication · Code 48 F0/control · Code 43)

ST_REV (17)
Storage class –; read capability (r)

Revision of static data

STRATEGY (19)
Storage class S; read/write capability (r/w); supported modes ALL

Grouping of blocks to allow faster processing of blocks.

Blocks are grouped by entering the same number in the STRATEGY parameter of each block.

TAG_DESC (18)
Storage class S; read/write capability (r/w); supported modes ALL

User-specific text for unique identification and assignment of the block
- Max. 32 characters, [no text]

TARGET_MODE (21)
Storage class S; read/write capability (r/w); supported modes ALL

Target operating mode

WRITE_LOCKING (34)
Storage class S; read/write capability (r/w); supported modes ALL

Software write protection
- 0 · Writing access locked
- 2457 · Writing access permitted

Index and parameter assignment: Physical Block, Slot 0 · Profile-specific parameters

Index	Parameters
16	BLOCK_OBJ
17	ST_REV
18	TAG_DESC
19	STRATEGY
20	ALERT_KEY
21	TARGET_MODE
22	MODE_BLK
23	ALM_SUM
24	SOFTWARE_REVISION
25	HARDWARE_REVISION
26	DEVICE_MAN_ID
27	DEVICE_ID
28	DEVICE_SER_NUM
29	DIAGNOSIS
30	DIAGNOSIS_EXT

Index	Parameters
31	DIAGNOSIS_MASK
32	DIAGNOSIS_MASK_EXT
33	DEVICE_CERTIFICATION
34	WRITE_LOCKING
35	FACTORY_RESET
36	DESCRIPTOR
37	DEVICE_MESSAGE
38	DEVICE_INSTAL_DATE
39	LOCAL_OP_ENA
40	IDENT_NUMBER_SELECTOR
41	HW_WRITE_PROTECTION
42	FEATURE
43	COND_STATUS_DIAG
44	DIAG_EVENT_SWITCH

8.2 Physical Block, Slot 0 · Manufacturer-specific parameters

ACTIVE_IDENT_NUMBER (137)
Storage class –; read capability (r)

GSD file used to run the positioner
If the positioner is in the compatibility mode, it can run using the following GSD files:
- 3785: 3785 Profile 2
- 071D: 3785 Profile 3
- 0688: 3730-4 Profile 3.01

CONDENSED_STATUS (133)
Storage class –; read capability (r)

NAMUR condensed state

CONFIG_BINARY_INPUT_2 (59)
Storage class S; read/write capability (r/w); supported modes ALL

Configuration of the second binary input
- 0 · Floating contact – DI2 · The input is analyzed with the second DI Function Block.
- 1 · Actively open – Diagnosis leakage sensor – DI2 · A leakage sensor is operated at the input as actively open. This information is reported by the extended diagnostics as "External leakage may exist" and can be analyzed with Function Block DI2.
- 2 · Actively closed – Diagnosis leakage sensor – DI2 · A leakage sensor is operated at the input as actively closed. This information is reported by the extended diagnostics as "External leakage may exist" and can be analyzed with Function Block DI2.
- 3 · Solenoid valve – CB_FAIL_SAFE/DI2 · The internal solenoid valve is used and the information (solenoid valve wired same as 1) is analyzed with Function Block DI2. This information is also transmitted cyclically with CHECKBACK (CB_FAIL_SAFE). The input is not switched.
- 4 · Actively open – Diagnosis leakage sensor/CB_ADD_INPUT/Solenoid valve – DI2 · A leakage sensor is operated at the input as actively open. This information is also transmitted cyclically with CHECKBACK (CB_ADD_INPUT). Additionally, the state of the internal solenoid valve is switched to Function Block DI2.
- 5 · Actively closed – Diagnosis leakage sensor/CB_ADD_INPUT/Solenoid valve – DI2 · A leakage sensor is operated at the input as actively closed. This information is also transmitted cyclically with CHECKBACK (CB_ADD_INPUT). Additionally, the state of the internal solenoid valve is switched to Function Block DI2.
- 6 · Actively open – Diagnosis leakage sensor/CB_ADD_INPUT/Solenoid valve – DI2 · A leakage sensor is operated at the input as actively open. This information can be analyzed with Function Block DI2. Additionally, the state of the internal solenoid valve is also transmitted cyclically with CHECKBACK (CB_ADD_INPUT).
- 7 · Actively closed – Diagnosis leakage sensor/CB_ADD_INPUT/Solenoid valve – DI2 · A leakage sensor is operated at the input as actively closed. This information can be analyzed with Function Block DI2. Additionally, the state of the internal solenoid valve is also transmitted cyclically with CHECKBACK (CB_ADD_INPUT).

CONFIG_DI_1 (157)
Storage class S; read/write capability (r/w); supported modes ALL

Information communicated cyclically over the discrete input DI1
- Status of discrete input 1:
  1 = Voltage signal applied
  0 = De-energized

Status of last PST:
  0 = Error
  1 = OK
  2 = Not performed

CONFIG_DI_2 (158)
Storage class S; read/write capability (r/w); supported modes ALL

Information communicated cyclically over the discrete input DI2
- Status of discrete input 2:
  1 = Voltage signal applied
  0 = De-energized
- Status of last PST:
  0 = Error
  1 = OK
  2 = Not performed

DATALOGGER_DS_1 (111) to DATALOGGER_DS_14 (124)
Storage class –; read capability (r)

Statistical information: Data logger measured values 1 to 14

Element	Parameter name
0	SOLLWERT_W_1
1	ISTWERT_X_1
2	STELLSIGNAL_Y_1
3	REGELABWEICH_E_1
4	ZEIT_T_1
…	
30	SOLLWERT_W_14
31	ISTWERT_X_14
32	STELLSIGNAL_Y_14
33	REGELABWEICH_E_14
34	ZEIT_T_14

DATALOGGER_DS_15 (125)
Storage class –; read capability (r)

Statistical information: Data logger measured values 1 to 14

Element	Parameter name
0	SOLLWERT_W_1
1	ISTWERT_X_1
2	STELLSIGNAL_Y_1
3	REGELABWEICH_E_1
4	ZEIT_T_1
5	SOLLWERT_W_2
6	ISTWERT_X_2
7	STELLSIGNAL_Y_2
8	REGELABWEICH_E_2
9	ZEIT_T_2

DEV_REVISION (135)
Storage class –; read capability (r)

Device revision

DEV_REVISION_COMP (134)
Storage class –; read capability (r)

Lowest positioner revision with which the device revision (DEV_REVISION) is compatible.

DEVICE_DP_STATUS (126)
Storage class –; read capability (r)

Current status of the PROFIBUS-DP state machine
The state machine runs through the following states during the transition to cyclic data exchange:
- Wait prm: Parameterization telegram not yet receive
- Wait cfg: Configuration telegram not yet received
- Data exchg: Cyclic data exchange taking place

This information serves to pinpoint problems.

DEVICE_PRODUCT_NUM (51)
Storage class S; read/write capability (r/w); supported modes ALL

Product number of the positioner.

DIAG_EVENT_SWITCH_2 (61)
Storage class S; read/write capability (r/w); supported modes ALL

DIAGNOSIS_DATA_1 (131)
Storage class –; read capability (r)

Diagnostic messages
- 0x01 Inconsistent data memory
- 0x02 Potentiometer parameter
- 0x04 Calibration parameter
- 0x08 General parameters
- 0x10 Internal device error
- 0x20 PA parameters
- 0x40 Info parameters
- 0x80 Option parameters

DIAGNOSIS_DATA_2 (132)
Storage class –; read capability (r)

Diagnostic messages
- 0x01 Diagnostic parameters

DIAGNOSIS_EXT (60)
Storage class –; read capability (r)

Further detailed information of the device, coded bitwise. More than one alarm possible at one time.
Bit: 0 = false · 1 = true

Byte	Bit	Description
0	0	Actuator springs: spring compression may be increased TEST
0	1	Actuator springs: severe load
0	2	Actuator springs: severe load TEST
0	3	Operating range shifted to CLOSED position
0	4	Operating range shifted to max. OPEN position
0	5	Friction: considerably higher across working range
0	6	Friction: considerably lower across working range
0	7	Friction: considerably higher across part of range
1	0	Friction: considerably lower across part of range
1	1	Friction: considerably higher across working range TEST
1	2	Friction: considerably lower across working range TEST
1	3	Friction: considerably higher across part of range TEST
1	4	Friction: considerably lower across part of range TEST
1	5	Pneumatic leakage: may exist TEST
1	6	Pneumatic leakage: may exist
1	7	Pneumatic leakage: excessive TEST

DIAGNOSIS_EXT (60) (continued)
Storage class –; read capability (r)

Byte	Bit	Description
2	0	Pneumatic leakage: may be excessive
2	1	Manipulated variable range limitation: at lower range value
2	2	Manipulated variable range limitation: at upper range value
2	3	Manipulated variable range limitation: no change possible
2	4	Dynamic stress factor > 90 %
2	5	Seat leakage: may exist
2	6	Seat leakage: higher than when new TEST
2	7	Seat leakage: higher than when new
3	0	External leakage: possibly to be expected soon
3	1	External leakage: may exist
3	2	External leakage: exists
3	3	Zero point: Shift monotonously downwards, average value above reference graph
3	4	Zero point: Shift monotonously upwards, average value above reference graph
3	5	Zero point: alternates, mean above reference graph
3	6	Zero point: Shift monotonously downwards, average value below reference graph
3	7	Zero point: Shift monotonously upwards, average value below reference graph
4	0	Zero point: Alternates, mean below reference graph
4	1	Positioner/valve linkage: travel transmission not optimal (TEST)
4	2	Positioner-valve linkage: may be loose
4	3	Positioner-valve linkage: working range may be restricted
4	4	Positioner-valve linkage: may be loose TEST
4	5	Manipulated variable range: mainly near CLOSED position
4	6	Manipulated variable range: mainly near max. OPEN position
4	7	Manipulated variable range: mainly CLOSED position
5	0	Manipulated variable range: mainly max. OPEN position
5	1	Working range: Temperature below –40 °C
5	2	Working range: Temperature above 80 °C
5	3	Working range: Reference test canceled
5	4	Working range: Actuator motion possible
5	5	Working range: Actuator motion not possible
5	6	Working range: Solenoid valve failure
5	7	–

DIAGNOSIS_EXT_1_RAW (62) and DIAGNOSIS_EXT_2_RAW (63)
Storage class –; read capability (r)

Diagnostic messages regardless of the selected classification

DIAGNOSIS_HW (130)
Storage class –; read capability (r)

Diagnostic messages
- 0x01 x signal
- 0x02 i/p converter
- 0x04 Hardware
- 0x08 Data memory
- 0x10 Check calculation
- 0x20 Program load error

DIAGNOSIS_INIT_1 (128)
Storage class –; read capability (r)

Diagnostic messages
- 0x01 x > range
- 0x02 Delta x < range
- 0x04 Attachment
- 0x08 Initialization time exceeded
- 0x10 Initialization/internal solenoid valve/forced venting
- 0x20 Transit time not reached
- 0x40 Pin position
- 0x80 Testing or calibration in progress

DIAGNOSIS_INIT_2 (129)
Storage class –; read capability (r)

Diagnostic messages
- 0x01 No emergency mode

DIAGNOSIS_OPERATION (127)
Storage class –; read capability (r)

Diagnostic messages
0x01 Device not initialized
0x02 Internal solenoid valve not active
0x04 Total valve travel exceeded
0x08 Control loop
0x10 Zero point
0x20 Auto-correction
0x40 Fatal error
0x80 Extended diagnostics

DL_TRIGGER_SELECT_BIN (136)
Storage class S; read/write capability (r/w); supported modes ALL

Binary input for triggering in data logger (can be selected with firmware version K 1.11 or higher)
- 0 · Binary input 1
- 1 · Binary input 2

ET_BSZ (78)
Storage class –; read capability (r)

Statistical information: Structure for end position trend – operating hours counter

Element	Parameter name
0	Measured value 0
…	
29	Measured value 29
30	Reference value

ET_ENDLAGE (79)
Storage class –; read capability (r)

Statistical information: Structure for end position trend – drive signal

Element	Parameter name
0	Measured value 0
…	
29	Measured value 29
30	Reference value

ET_VENTILSTELLUNG (77)
Storage class –; read capability (r)

Statistical information: Structure for end position trend – valve position x

Element	Parameter name
0	Measured value 0
…	
29	Measured value 29
30	Reference value

FEATURE_SELECT (64)
Storage class S; read/write capability (r/w); supported modes ALL

Coded bitwise. More than one alarm possible at one time.
Bit: 0 = false · 1 = true

Byte	Bit	Description
0	0	BAD_DEVICE_FAILURE sets DIAG_EXT bit · By using the 'Condensed status and diagnostic messages' profile extension, the DIAG.ext bit (Octet 1) is set when a maintenance alarm or the corresponding diagnostic alarm DIA_MAINTENANCE_ ALARM has been generated by the positioner. According to Profile 3.01, the DIAG. ext bit is set when one of the following errors is detected by the positioner: Test calculation, fatal error, program loading error, no production calibration, hardware, i/p converter
0	1	Test function activated · The activation of this function allows errors to be simulated in TROVIS-VIEW (Positioner (AO, TRD) folder (> Simulation) (firmware version K 1.11 and higher).
0	2	LO and active diagnostic function set GOOD_FUNCTION_CHECK · During a diagnostic test, a BAD_FUNCTION_CHECK would be set according to the profile. This can be prevented by activating this additional function, which sets GOOD_FUNCTION_ CHECK (firmware version K 1.11 and higher).
0	3	Use DP standard diagnosis (6 bytes) · Select whether the positioner responds to a GET_DIAG telegram with the full diagnosis (14 using as Profile or 26 as manufacturer specification) or only with 6 bytes for DP standard diagnosis (firmware version K 1.11 or higher).
0	4	Allow PST messages only · Diagnostic messages of the valve diagnostics are suppressed with the exception of the PST diagnosis.
0	5	Perform PST with SP status · Activates the option to start a partial stroke test by defining the set point SP with status value 0x9C (hexadecimal).
0	6	Start PST with binary input 1 · Activates the option to start a partial stroke test over the binary input.

FST_E_1 (148) to FST_E_4 (151)
Storage class –; read capability (r)

Tests MAN: Full stroke test (FST) – Set point deviation data set 1 to 4
- FST_E_1: Data set 1 (measuring points 1 to 25)
- FST_E_2: Data set 2 (measuring points 26 to 50)
- FST_E_3: Data set 3 (measuring points 51 to 75)
- FST_E_4: Data set 4 (measuring points 76 to 100)

FST_SS_1 (146) and FST_SS_2 (147)
Storage class –; read capability (r)

Tests MAN: Full stroke test (FST) – Drive signal data set 1 and 2
- FST_SS_1: Data set 1 (measuring points 1 to 50)
- FST_SS_2: Data set 2 (measuring points 51 to 100)

FST_SW_1 (142) to FST_SW_4 (145)
Storage class –; read capability (r)

Tests MAN: Full stroke test (FST) – Set point data set 1 to 4
- FST_SW_1: Data set 1 (measuring points 1 to 25)
- FST_SW_2: Data set 2 (measuring points 26 to 50)
- FST_SW_3: Data set 3 (measuring points 51 to 75)
- FST_SW_4: Data set 4 (measuring points 76 to 100)

FST_VS_1 (138) to FST_VS_4 (141)
Storage class –; read capability (r)

Tests MAN: Full stroke test (FST) – Valve position data set 1 to 4
- FST_VS_1: Data set 1 (measuring points 1 to 25)
- FST_VS_2: Data set 2 (measuring points 26 to 50)
- FST_VS_3: Data set 3 (measuring points 51 to 75)
- FST_VS_4: Data set 4 (measuring points 76 to 100)

FST_ZEIT_1 (152) to FST_ZEIT_4 (155)
Storage class –; read capability (r)

Tests MAN: Full stroke test (FST) – Time data set 1 to 4
- FST_ZEIT_1: Data set 1 (measuring points 1 to 25)
- FST_ZEIT_2: Data set 2 (measuring points 26 to 50)
- FST_ZEIT_3: Data set 3 (measuring points 51 to 75)
- FST_ZEIT_4: Data set 4 (measuring points 76 to 100)

HISTOGRAMM_E_KURZ (70)
Storage class –; read capability (r)

Statistical information: Structure for short-term set point deviation histogram

Element	Parameter name
0	E_INTERVAL_VALUE_0 (set point deviation interval 0)
…	
11	E_INTERVAL_VALUE_11 (set point deviation interval 11)
12	E_AVERAGE (mean e short)

HISTOGRAMM_E_LANG (67)
Storage class –; read capability (r)

Statistical information: Structure for long-term set point deviation histogram

Element	Parameter name
0	E_INTERVAL_VALUE_0 (set point deviation interval 0)
…	
11	E_INTERVAL_VALUE_11 (set point deviation interval 11)
12	E_AVERAGE (mean e long)
13	NUMBER_MESS_POINTS (number of measuring points)
14	DEVIATION_MIN (min. system deviation)
15	DEVIATION_MAX (max. system deviation)

HISTOGRAMM_X_KURZ (69)
Storage class –; read capability (r)

Statistical information: Structure for short-term travel x histogram

Element	Parameter name
0	X_INTERVAL_VALUE_0 (valve position interval 0)
…	
21	X_INTERVAL_VALUE_21 (valve position interval 21)
22	X_AVERAGE (mean x short)

HISTOGRAMM_X_LANG (66)
Storage class –; read capability (r)

Statistical information: Structure for long-term travel x histogram

Element	Parameter name
0	X_INTERVAL_VALUE_0 (valve position interval 0)
…	
21	X_INTERVAL_VALUE_21 (valve position interval 21)
22	X_AVERAGE (mean x long)
23	NUMBER_MESS_POINTS (number of measuring points)

HISTOGRAMM_X_LANG2 (156)
Storage class –; read capability (r)

HISTOGRAMM_Z_KURZ (71)
Storage class –; read capability (r)

Statistical information: Structure for short-term cycle counter histogram

Element	Parameter name
0	Z_INTERVAL_VALUE_0 (cycle counter interval 0)
…	
12	Z_INTERVAL_VALUE_12 (cycle counter interval 12)
13	Z_AVERAGE (mean z short)

HISTOGRAMM_Z_LANG (68)
Storage class –; read capability (r)

Statistical information: Structure for long-term cycle counter histogram

Element	Parameter name
0	Z_INTERVAL_VALUE_0 (cycle counter interval 0)
…	
12	Z_INTERVAL_VALUE_11 (cycle counter interval 12)
13	Z_AVERAGE (mean z long)
14	TOTAL_NUMBER (number of measuring points)
15	DYNAMIC_FACTOR (dynamic stress factor)

HYS_STELLSIGNAL (83)
Storage class –; read capability (r)

Tests MAN: Drive signal diagram hysteresis

Element	Parameter name
0	REFERENZZEITSTEMPEL
1	TESTINFO
2	FORTSCHRITT
3	REFERENZWERT_VS_0
4	REFERENZWERT_HYST_0
5	WIEDERHOLUNGSWERT_HYST_0
…	
36	REFERENZWERT_VS_11
37	REFERENZWERT_HYST_11
38	WIEDERHOLUNGSWERT_HYST_11

HYSTERESE_KURZ (76)
Storage class –; read capability (r)

Statistical information: structure for drive signal diagram - Hysteresis - Short-term

Element	Parameter name
0	STELLSIGNAL_0
0	VENTILSTELLUNG_0
…	
9	STELLSIGNAL_9
9	VENTILSTELLUNG_9

HYSTERESE_LANG (75)
Storage class –; read capability (r)

Statistical information: structure for drive signal diagram - Hysteresis - Long-term

Element	Parameter name
0	MITTELWERT_0
…	
18	MITTELWERT_18

IDENT_LIMIT_SWITCHES (50)
Storage class S; read/write capability (r/w); supported modes ALL

Optional inductive limit switches (not automatically recognized)
- 0 · Not installed
- 1 · Installed

IDENT_OPTIONS (49)
Storage class –; read capability (r)

Optional solenoid valve and binary input 2
- 0 · Not installed
- 1 · Binary input 2
- 2 · Solenoid valve
- 3 · Inductive limit contact

PRODUCTION_ID (57)
Storage class S; read/write capability (r/w); supported modes ALL

Production ID

PST_E_1 (103) to PST_E_4 (106)
Storage class –; read capability (r)

Tests MAN: Partial stroke test (PST) – Set point deviation data set 1 to 4

PST_SS_1 (101) and PST_SS_2 (102)
Storage class –; read capability (r)

Tests MAN: Partial stroke test (PST) – Drive signal data set 1 and 2

PST_SW_1 (97) to PST_SW_4 (100)
Storage class –; read capability (r)

Tests MAN: Partial stroke test (PST) – Set point data set 1 to 4

PST_VS_1 (93) to PST_VS_4 (96)
Storage class –; read capability (r)

Tests MAN: Partial stroke test (PST) – Valve position data set 1 to 4

PST_ZEIT_1 (107) to PST_ZEIT_4 (110)
Storage class –; read capability (r)

Tests MAN: Partial stroke test (PST) – Time data set 1 to 4

READING_DIRECTION (58)
Storage class S; read/write capability (r/w); supported modes ALL

Turns the reading direction of the display by 180°

STAT_AGAIN_VS (81)
Storage class –; read capability (r)

Tests: Control signal y, steady-state – Valve position proof test value

STAT_KENNLINIE_R (84)
Storage class –; read capability (r)

Tests: Static characteristic

Element	Parameters
0	Test information
1	SPRUNGHOEHE
2	MIN_TOTE_ZONE
3	DURCHSCHNITT_TOTE_ZONE
4	MAX_TOTE_ZONE
5	FORTSCHRITTSANZEIGE

STAT_KENNLINIE_SW_1 (89) to STAT_KENNLINIE_SW_4 (92)
Storage class –; read capability (r)

Tests: Static characteristic – Set point data set 1 to 4

STAT_KENNLINIE_VS_1 (85) to STAT_KENNLINIE_VS_4 (88)
Storage class –; read capability (r)

Tests: Static characteristic – Valve position data set 1 to 4
- STAT_KENNLINIE_VS_1: Data set 1 (measuring points 1 to 25)
- STAT_KENNLINIE_VS_2: Data set 2 (measuring points 26 to 50)
- STAT_KENNLINIE_VS_3: Data set 3 (measuring points 51 to 75)
- STAT_KENNLINIE_VS_4: Data set 3 (measuring points 76 to 100)

STAT_REV_VS (80)
Storage class –; read capability (r)

Tests: Control signal y, steady-state – Valve position reference value

STAT_STELLSIGNAL (82)
Storage class –; read capability (r)

Tests: Control signal y, steady-state – reference value and proof test value of control signal

Element	Parameters
0	REFERENZZEITSTEMPEL
1	TESTINFO
2	FORTSCHRITT
3	REFERENZWERT_0
4	WIEDERHOLUNGSWERT_0
…	
51	REFERENZWERT_24
52	WIEDERHOLUNGSWERT_24

STATIONAER_KURZ (73)
Storage class –; read capability (r)

Statistical information: structure for drive signal diagram - Steady-state - Short-term

Element	Parameters
0	MITTELWERT_0
…	
21	MITTELWERT_21

STATIONAER_KURZ_RP (74)
Storage class –; read capability (r)

Statistical information: structure for drive signal diagram - Steady-state - Short-term, circular buffer values (containing drive signal and valve position)

Element	Parameters
0	STELLSIGNAL_0
0	VENTILSTELLUNG_0
…	
9	STELLSIGNAL_9
9	VENTILSTELLUNG_9

STATIONAER_LANG (72)
Storage class –; read capability (r)

Statistical information: structure for drive signal diagram - Steady-state - Long-term

Index and parameter assignment: Physical Block

Index	Parameters
49	IDENT_OPTIONS
50	IDENT_LIMIT_SWITCHES
51	DEVICE_PRODUCT_NUM
52	TEXT_INPUT_1
53	TEXT_INPUT_2
54	TEXT_INPUT_3
55	TEXT_INPUT_4
56	TEXT_INPUT_5
57	PRODUCTION_ID
58	READING_DIRECTION
59	CONFIG_BINARY_INPUT_2
60	DIAGNOSIS_EXT_2
61	DIAG_EVENT_SWITCH_2
62	DIAGNOSIS_EXT_1_RAW
63	DIAGNOSIS_EXT_2_RAW
64	FEATURE_SELECT
65	TEST_FUNCTION
66	HISTOGRAMM_X_LANG
67	HISTOGRAMM_E_LANG

Index	Parameters
68	HISTOGRAMM_Z_LANG
69	HISTOGRAMM_X_KURZ
70	HISTOGRAMM_E_KURZ
71	HISTOGRAMM_Z_KURZ
72	STATIONAER_LANG
73	STATIONAER_KURZ
74	STATIONAER_KURZ_RP
75	HYSTERESE_LANG
76	HYSTERESE_KURZ
77	ET_VENTILSTELLUNG
78	ET_BSZ
79	ET_ENDLAGE
80	STAT_REF_VS
81	STAT_AGAIN_VS
82	STAT_STELLSIGNAL
83	HYS_STELLSIGNAL
84	STAT_KENNLINIE_R
85	STAT_KENNLINIE_VS_1
86	STAT_KENNLINIE_VS_2

Index	Parameters
87	STAT_KENNLINIE_VS_3
88	STAT_KENNLINIE_VS_4
89	STAT_KENNLINIE_SW_1
90	STAT_KENNLINIE_SW_2
91	STAT_KENNLINIE_SW_3
92	STAT_KENNLINIE_SW_4
93	PST_VS_1
94	PST_VS_2
95	PST_VS_3
96	PST_VS_4
97	PST_SW_1
98	PST_SW_2
99	PST_SW_3
100	PST_SW_4
101	PST_SS_1
102	PST_SS_2
103	PST_E_1
104	PST_E_2
105	PST_E_3
106	PST_E_4
107	PST_ZEIT_1
108	PST_ZEIT_2
109	PST_ZEIT_3
110	PST_ZEIT_4
111	DATALOGGER_DS_1
112	DATALOGGER_DS_2
113	DATALOGGER_DS_3
114	DATALOGGER_DS_4
115	DATALOGGER_DS_5
116	DATALOGGER_DS_6
117	DATALOGGER_DS_7
118	DATALOGGER_DS_8
119	DATALOGGER_DS_9
120	DATALOGGER_DS_10
121	DATALOGGER_DS_11
122	DATALOGGER_DS_12

Index	Parameters
123	DATALOGGER_DS_13
124	DATALOGGER_DS_14
125	DATALOGGER_DS_15
126	DEVICE_DP_STATUS
127	DIAGNOSIS_OPERATION
128	DIAGNOSIS_INIT_1
129	DIAGNOSIS_INIT_2
130	DIAGNOSIS_HW
131	DIAGNOSIS_DATA_1
132	DIAGNOSIS_DATA_2
133	CONDENSED_STATUS
134	DEV_REVISION_COMP
135	DEV_REVISION
136	DL_TRIGGER_SELECT_BIN
137	ACTIVE_IDENT_NUMBER
138	FST_VS_1
139	FST_VS_2
140	FST_VS_3
141	FST_VS_4
142	FST_SW_1
143	FST_SW_2
144	FST_SW_3
145	FST_SW_4
146	FST_SS_1
147	FST_SS_2
148	FST_E_1
149	FST_E_2
150	FST_E_3
151	FST_E_4
152	FST_ZEIT_1
153	FST_ZEIT_2
154	FST_ZEIT_3
155	FST_ZEIT_4
156	HISTOGRAMM_X_LANG2
157	CONFIG_DI_1
158	CONFIG_DI_2

8.3 AO Function Block, Slot 1 · Profile-specific parameters

ALERT_KEY (20)
Storage class S; read/write capability (r/w); supported modes ALL

ID number of the plant section

ALM_SUM (23)
Storage class –; read capability (r)

Current status of process alarms in the AO Function Block

BATCH (24)
Storage class S; read/write capability (r/w); supported modes ALL

ID number of batch process

BLOCK_OBJ (16)
Storage class –; read capability (r)

CHECK_BACK* (49)
Storage class –; read capability (r)

Detailed information of the device, coded bitwise. See section 4.

CHECK_BACK_MASK (50)
Storage class –; read capability (r)

Availability of the status bit in CHECK_BACK parameter
- Bit value = 0: Status not available
- Bit value = 1: Status available

CHECK_BACK_OPT (65)
Storage class S; read/write capability (r/w); supported modes ALL
The message is not effective when acyclic access is used.

Availability of the status bit in CHECK_BACK parameter for cyclic transmission
- [0x8F, 0xEC, 0x83]
- Bit value = 0: Status not available
- Bit value = 1: Status available

FSAFE_TIME (39)
Storage class S; read/write capability (r/w); supported modes ALL

Fault state time [s]
Time between an error in the set point valid for the AO Function Block in the current operating mode is detected and the fault state is activated.
- [0]

Fail-safe action is triggered if the error persists after this time has elapsed. The fault state of the AO Function Block is determined in the FSAFE_TYPE parameter of this block.

FSAFE_TYPE (40)
Storage class S; read/write capability (r/w); supported modes ALL

Fail-safe action
Defines the reaction to be taken when a communication failure is detected or after a warm start.
- 0 · The default value FSAFE_VALUE is used
- The last valid set point is used/The last valid set point is saved
- 2 · Actuator moves to the fail-safe position defined by the actuator springs

FSAFE_VALUE (41)
Storage class S; read/write capability (r/w); supported modes ALL

Fail-safe value
Default value for set point when a communication failure is detected or after a warm start.

IN_CHANNEL (37)
Storage class S; read/write capability (r/w); supported modes ALL

Assignment between the Transducer Block and the Function Block
- 0 · Not active
- 0x013A · Active (FEEDBACK_VALUE is written to READBACK)

INCREASE_CLOSE (52)
Storage class S; read/write capability (r/w); supported modes ALL

Determines the direction of action, i.e. how the set point is assigned to the controlled variable
- Increasing/increasing
- Increasing/decreasing

MODE_BLK (22)
Storage class –; read capability (r)

Current operating mode

OUT (53)
Storage class S; read/write capability (r/w); supported modes ALL

Positioning value
This output value is calculated by the Function Block from the SETPOINT for the Transducer Block in [mm], [degrees] or [%]

OUT_CHANNEL (38)
Storage class S; read/write capability (r/w); supported modes ALL

Assignment between the Transducer Block and the Function Block
- 0 · Not active
- 0x0139 · Active (OUT is written to POSITIONING_VALUE)

OUT_SCALE (54)
Storage class S; read/write capability (r/w); supported modes O

Travel/angle range
Lower and upper setting value of the actual operating range in [mm] or [degree]. A non-linear characteristic is adapted to the reduced travel.
Maximum value for upper value = rated travel

POS_D* (47)
Storage class –; read capability (r)

Position of the valve plug (discrete)
- 0: Not initialized
- 1: Closed (x < 0.5 %)
- 2: Open (x > 99.5 %)
- 3: Intermediate position

PV_SCALE (27)
Storage class S; read/write capability (r/w); supported modes ALL

Set point range

RCAS_IN* (30)
Storage class S; read/write capability (r/w); supported modes ALL

Set point with status: set point w in RCAS mode
Provided by a supervisory host, e.g. PID Block or master class 1. Depending on the mode of the function block.
Range defined in PV_SCALE

RCAS_OUT* (43)
Storage class –; read capability (r)

Set point with status: set point w in RCAS mode
Provided to a supervisory host, e.g. PID Block or master class 1. Depending on the mode of the function block.
Range defined in PV_SCALE

READBACK (28)
Storage class –; read capability (r)

Controlled variable x in relation to the travel range/angle of rotation (PV_SCALE) and status of the controlled variable range defined in PV_SCALE

SETP_DEVIATION (48)
Storage class –; read capability (r)

Set point deviation [%]

SIMULATE (51)
Storage class –; read/write capability (r/w); supported modes ALL

Simulation
- Value/status of READBACK

SP (25)
Storage class S; read/write capability (r/w); supported modes ALL

Upper set point limit
- Value and range from PV_SCALE ±10 %, [100 %]

Adapt this value accordingly if the end-of-scale value in the PV_SCALE parameter is changed.

ST_REV (17)
Storage class –; read capability (r)

Revision of static data

STRATEGY (19)
Storage class S; read/write capability (r/w); supported modes ALL

Permits strategic grouping and thus faster processing of blocks
- [0]

Blocks are grouped by entering the same number in the STRATEGY parameter of each block.
These data are neither checked nor processed by the AO Function Block.

TAG_DESC (18)
Storage class S; read/write capability (r/w); supported modes ALL

User-specific text for unique identification and assignment of the block
Max. 32 characters, [no text]

TARGET_MODE (21)
Storage class S; read/write capability (r/w); supported modes ALL

Target operating mode of positioner
- 8 · AUTO (automatic mode)
- 16 · MAN (manual mode)
- 128 · O/S (out of service)

Index and parameter assignment: AO Transducer Block

Index	Parameters
16	BLOCK_OBJ
17	ST_REV
18	TAG_DESC
19	STRATEGY
20	ALERT_KEY
21	TARGET_MODE
22	MODE_BLK
23	ALM_SUM
24	BATCH
25	SP
27	PV_SCALE
28	READBACK
30	RCAS_IN
37	IN_CHANNEL
38	OUT_CHANNEL

Index	Parameters
39	FSAFE_TIME
40	FSAFE_TYPE
41	FSAFE_VALUE
43	RCAS_OUT
47	POS_D
48	SETP_DEVIATION
49	CHECK_BACK
50	CHECK_BACK_MASK
51	SIMULATE
52	INCREASE_CLOSE
53	OUT
54	OUT_SCALE
65	CHECK_BACK_OPT
66	POS_D_LIMITS

8.4 AO Transducer Block, Slot 1 · Profile-specific parameters

ACT_STROKE_TIME_DEC (89)
Storage class –; read capability (r)

Minimum transit time CLOSED [s] (Code 41)
The minimum transit time CLOSED (towards the 0 % position) is the actual time required by the system (positioner, actuator and valve) to move through the rated travel/angle in the direction to close the valve (measured during initialization).
- [1.0 s]

ACT_STROKE_TIME_INC (90)
Storage class –; read capability (r)

Minimum transit time OPEN [s] (Code 40)
The minimum transit time OPEN (towards the 100 % position) is the actual time required by the system (positioner, actuator and valve) to move through the rated travel/angle in the direction to open the valve (measured during initialization).
- [1.0 s]

ACTUATOR_ACTION (143)
Storage class S; read/write capability (r/w); supported modes ALL

The fail-safe action of the actuator in the event of supply air failure is detected automatically.
- 0: Not initialized
- 1: Opening (towards 100 % position)
- 2: Closing (towards 0 % position)
- 3: None/saving (position is retained)

ACTUATOR_MAN (140)
Storage class S; read/write capability (r/w); supported modes ALL

Actuator manufacturer

ACTUATOR_SER_NUM (145)
Storage class S; read/write capability (r/w); supported modes ALL

Actuator serial number

ACTUATOR_TYPE (142)
Storage class –; read capability (r)

Type of actuator
- 0 · Electropneumatic
- 1 · Electric
- 2 · Electrohydraulic
- 3 · Other

ADD_GEAR_ID (148)
Storage class S; read/write capability (r/w); supported modes ALL

Manufacturer ID of additional components

ADD_GEAR_SER_NUM (146)
Storage class S; read/write capability (r/w); supported modes ALL

Additional component serial no.

ALARM_SUM (87)
Storage class –; read capability (r)

Current status of process alarms in the AO Transducer Block
- [0]

ALARM_KEY (84)
Storage class S; read/write capability (r/w); supported modes ALL

ID of the plant section
- [0]

BLOCK_OBJ (80)
Storage class –; read capability (r)

DEVICE_CALIB_DATE (103)
Storage class S; read/write capability (r/w); supported modes O

Date of last positioner calibration [XX.XX.20XX]

DEVICE_CONFIG_DATE (104)
Storage class S; read/write capability (r/w); supported modes ALL

Date of last positioner configuration [XX.XX.20XX]

FEADBACK_VALUE (138)
Storage class –; read capability (r)

Current valve position
Unit of OUT_SCALE

LIN_TYPE (105)
Storage class S; read/write capability (r/w); supported modes ALL

Type of characteristic (Code 20)
- 0 · Linear
- 1 · Equal percentage
- 2 · Reverse equal percentage
- 3 · User-defined (currently not supported)
- 4 · SAMSON control butterfly valve, linear
- 5 · SAMSON control butterfly valve, equal percentage
- 6 · VETEC rotary plug valve, linear
- 7 · VETEC rotary plug valve, equal percentage

MODE_BLK (86)
Storage class –; read capability (r)

Operating mode of positioner

POSITIONING_VALUE (137)
Storage class –; read capability (r)

Current manipulated variable
Unit of OUT_SCALE

RATED_TRAVEL (112)
Storage class S; read/write capability (r/w); supported modes ALL

Rated travel [mm] or nominal angle [degree] of the valve
- [15 mm]

SELF_CALIB_CMD (113)
Storage class S; read/write capability (r/w); supported modes ALL

Start manufacturer-specific calibration in the positioner
- 0 · No test, normal operating status
- 1 · –
- 2 · Start initialization
- 3 · Cancel initialization
- 4 · Start zero calibration
- 5 · Cancel zero calibration
- 6 · Search for device, display: 'HERE I AM'
- 7 · Reset 'limit for total valve travel exceeded'
- 8 to 22 · –
- 23 · Reset 'control loop error'
- 24 · Reset 'Zero error'
- 25 · Reset 'autocorrection'
- 26 · Reset 'Fatal error'
- 27 · No function
- 28 · Reset 'x > permissible range'
- 29 · Reset 'delta x < permissible range'
- 30 · Reset 'attachment'
- 31 · Reset 'initialization time exceeded'
- 32 · Reset 'initialization solenoid valve'
- 33 · Reset 'travel time too short'
- 34 · Reset 'pin position'
- 35 to 39 · –
- 40 · Reset 'x signal'
- 41 · Reset 'i/p converter'
- 42 · Reset 'hardware'
- 43 · Reset 'control parameters'
- 44 · Reset 'potentiometer parameters'

SELF_CALIB_CMD (113) (continued)
Storage class S; read/write capability (r/w); supported modes ALL

- 45 · Reset 'Calibration'
- 46 · Reset 'General parameters'
- 47 · Reset 'Internal device error 1'
- 48 · Reset 'No emergency mode'
- 49 · Reset 'Program load error'
- 50 · Reset 'Option parameters'
- 51 · Reset 'Info parameters'
- 52 · Reset 'Data memory'
- 53 · Reset 'Check calculation'
- 54 · No function
- 55 · Reset 'Diagnostic parameter'
- 56 to 59 = –
- 60 · Reset 'Counter device start-up reset'
- 61 · Reset 'Communication controller'
- 62 · Reset 'Reset communication controller counter' –> SW_W_DOG triggered
- 63 · Reset 'Control parameter'
- 64 · Reset 'Counter closed-loop controller reset'
- 65 · Reset 'Error message for bus connection'
- 66 · Reset 'Counter bus connection reset'

SELF_CALIB_STATUS (114)
Storage class –; read capability (r)

Manufacturer-specific status of the sequence started with SELF_CALIB_CMD
During the zero key test, this parameter has the status of the zero key.

- 0 · Not defined
- 1 · In progress
- 2 · Canceled
- 3 · Faulty range
- 4 · Error in mechanics/pneumatics
- 5 · Gain error
- 6 · Offset error
- 7 · Switched calibration sequence
- 8 to 10 · –
- 11 · Timeout
- 12 · Proportional band limited too severely
- 13 · Improper selection for rated travel or ratio
- 14 · Mechanical system jammed (during initialization)
- 15 · Leak in pneumatic system (during initialization)
- 16 · Action canceled since no successful production test has yet been performed
- 17 · Initialization status: Detect mechanical stops
- 18 · Initialization status: Detect min. control pulses
- 19 · Initialization status: Detect min. transit times

SELF_CALIB_STATUS (114) (continued)
Storage class –; read capability (r)

- 20 · Initialization canceled by the activation of the solenoid valve
- 21 to 29 · –
- 30 = Zero error
- 31 to 253 · –
- 254 = Successful
- 255 = No valid data from application

SERVO_GAIN_1 (115)
Storage class S; read/write capability (r/w); supported modes ALL

K_P level (Code 17)
- [7]

SERVO_RATE_1 (116)
Storage class S; read/write capability (r/w); supported modes ALL

T_V level (Code 18)
- [2]

SETP_CUTOFF_DEC (118)
Storage class S; read/write capability (r/w); supported modes ALL

Setpoint cutoff decrease (Code 14)
If the set point falls below the entered value, the valve is moved towards the end position (corresponding to 0 % of the set point).
To do so, the electropneumatic actuator is either completely filled with air or completely vented depending on the fail-safe action.
- [0.0 %]

SETP_CUTOFF_INC (119)
Storage class S; read/write capability (r/w); supported modes ALL

Setpoint cutoff increase (Code 15)
If the set point exceeds the entered value, the valve is moved towards the end position (corresponding to 100 % of the set point).
To do so, the electropneumatic actuator is either completely filled with air or completely vented depending on the fail-safe action.
- [125]

ST_REV (81)
Storage class –; read capability (r)

Revision of static data

STRATEGY (83)
Storage class S; read/write capability (r/w); supported modes ALL

Permits strategic grouping and thus faster processing of blocks
- [0]

Blocks are grouped by entering the same number in the STRATEGY parameter of each block.

TAG_DESC (82)
Storage class S; read/write capability (r/w); supported modes ALL

User-specific text for unique identification and assignment of the block
- Max. 32 characters, [no text]

TARGET_MODE (85)
Storage class S; read/write capability (r/w); supported modes ALL

Target operating mode
- [8] · AUTO (automatic mode)
- 16 · MAN (manual mode)
- 128 · O/S (out of service)

TOT_VALVE_TRAV_LIM (126)
Storage class S; read/write capability (r/w); supported modes ALL

Limit value total valve travel (Code 24)
- [1000000.0]

TOTAL_VALVE_TRAVEL (125)
Storage class –; read capability (r)

Total valve travel: totaled double valve travel (Code 23)

TRAVEL_LIMIT_LOW (127)
Storage class S; read/write capability (r/w); supported modes ALL

Lower travel/angle limit [% of PV_SCALE] (Code 10)
Limits travel/opening angle to the entered value (lower limit), characteristic not adapted.
- [0.0 %]

TRAVEL_LIMIT_UP (128)
Storage class S; read/write capability (r/w); supported modes ALL

Upper travel/angle limit [% of PV_SCALE] (Code 11)
Limits travel/opening angle to the entered value (upper limit), characteristic not adapted.
- [100.0 %]

TRAVEL_RATE_DEC (129)
Storage class S; read/write capability (r/w); supported modes ALL

Required transit time CLOSED [s]
Minimum time required to travel through the manipulated variable range towards the 0 % position.
- [0.0 s]

TRAVEL_RATE_INC (130)
Storage class S; read/write capability (r/w); supported modes ALL

Required transit time OPEN [s]
Minimum transit time required to travel through the manipulated variable range towards the 100 % position.
- [0.0 s]

VALVE_MAINT_DATE (131)
Storage class S; read/write capability (r/w); supported modes ALL

Date of last positioner maintenance [XX.XX.20XX]

VALVE_MAN (139)
Storage class S; read/write capability (r/w); supported modes ALL

Valve manufacturer

VALVE_SER_NUM (144)
Storage class S; read/write capability (r/w); supported modes ALL

Seriennummer des Ventils am Stellventil mit Stellungsregler

VALVE_TYPE (141)
Storage class S; read/write capability (r/w); supported modes ALL

Type of valve
- 0 · Control valve with straight moving plug
- 1 · Control valve with rotating closure member, e.g. part-turn, rotary motion
- 2 · Control valve with rotating closure member, e.g. multi-turn, rotary motion

Index and parameter assignment: AO Transducer Block, Slot 1 · Profile-specific parameters

Index	Parameters
80	BLOCK_OBJ
81	ST_REV
82	TAG_DESC
83	STRATEGY
84	ALERT_KEY
85	TARGET_MODE
86	MODE_BLK
87	ALARM_SUM
89	ACT_STROKE_TIME_DEC
90	ACT_STROKE_TIME_INC
103	DEVICE_CALIB_DATE
104	DEVICE_CONFIG_DATE
105	LIN_TYPE
112	RATED_TRAVEL
113	SELF_CALIB_CMD
114	SELF_CALIB_STATUS
115	SERVO_GAIN_1
116	SERVO_RATE_1
118	SETP_CUTOFF_DEC
119	SETP_CUTOFF_INC

Index	Parameters
125	TOTAL_VALVE_TRAVEL
126	TOT_VALVE_TRAV_LIM
127	TRAVEL_LIMIT_LOW
128	TRAVEL_LIMIT_UP
129	TRAVEL_RATE_DEC
130	TRAVEL_RATE_INC
131	VALVE_MAINT_DATE
137	POSITIONING_VALUE
138	FEEDBACK_VALUE
139	VALVE_MAN
140	ACTUATOR_MAN
141	VALVE_TYPE
142	ACTUATOR_TYPE
143	ACTUATOR_ACTION
144	VALVE_SER_NUM
145	ACTUATOR_SER_NUM
146	ADD_GEAR_SER_NUM
147	ADD_GEAR_MAN
148	ADD_GEAR_ID
149	ADD_GEAR_INST_DATE

8.5 AO Transducer Block, Slot 1 · Manufacturer-specific parameters

ACTIVE_IDENT_NUMBER (205)
Storage class –; read capability (r)

GSD file used to run the positioner
If the positioner is in the compatibility mode, it can run using the following GSD files:
- 3785: 3785 Profile 2
- 071D: 3785 Profile 3
- 0688: 3730-4 Profile 3.01

AUTOSTART_HYS (194)
Storage class S; read/write capability (r/w); supported modes ALL

Minimum time period after which the hysteresis test is performed (EXPERTplus)

BLOCKING_POSITION (166)
Storage class S; read/write capability (r/w); supported modes ALL

Blocking position

CHARACT_TYPE (173)
Storage class S; read/write capability (r/w); supported modes ALL

Characteristic type
- Max. 32 characters, [no text]

CLOSING_DIRECTION (165)
Storage class S; read/write capability (r/w); supported modes ALL

Closing direction

COUNTER_INIT_START (198)
Storage class –; read capability (r)

The total number of initializations that have been performed since the last reset.

CYCLE_COUNTER_LIMIT (210)
Storage class S; read/write capability (r/w); supported modes ALL

Max. cycle count limit

DATALOGGER (185)
Storage class –; read capability (r)

Structure of read and write parameters for the data logger (EXPERTplus)

Element	Parameters
0	DATALOGGER_SELECT
1	TRIGGER_SELECT
2	SAMPLE_RATE
3	START_VALUE
4	LOGGING_LIMIT
5	PRETRIGGER_TIME

DATALOGGER_2 (211)
Storage class –; read capability (r)

DATALOGGER_READ (186)
Storage class –; read capability (r)

Structure of read parameters for the data logger (EXPERTplus)

Element	Parameters
0	TESTINFO
1	MAX_PRETRIGGERZEIT
2	FORTSCHRITT
3	ZÄHLER_TAGE
4	ZÄHLER_STUNDEN
5	ZÄHLER_MINUTEN
6	ZÄHLER_SEKUNDEN
7	ZÄHLER_100MS_TAKT

DATA_READ_2 (212)
Storage class –; read capability (r)

DELAY_TIME (181)
Storage class S; read/write capability (r/w); supported modes ALL

Lag time
Resets active control loop monitoring. A control loop error is reported when entered lag time (DELAY_TIME) is exceeded and the system deviation is not within the entered tolerance band (TOLERANCE_BAND). It is determined during initialization from the minimum transit time.
• [30]

DEVICE_CHARACT (202) and DEVICE_CHARACT_2 (231)
Storage class S; read/write capability (r/w); supported modes ALL

Structure of the device properties

Element	Parameters
0	Effective actuator area
1	Design
2	Attachment
3	Lower signal pressure range value
4	Upper signal pressure range value
5	Supply pressure
6	Booster
7	Stem seal
8	Facing (leakage class)
9	Pressure balancing
10	Valve characteristic
11	Flow direction
12	Valve standard
13	Valve size DN
14	K_{VS} unit
15	K_{VS} coefficient
16	Valve seat diameter

DEVICE_INIT_STATE (163)
Storage class –; read capability (r)

Initialization status

DIAG_MONITORING (187)
Storage class –; read capability (r)

Temperature-specific parameters

Element	Parameters
0	CURRENT_TEMP
1	MAX_TEMP
2	TIME_MAX_TEMP
3	MIN_TEMP
4	TIME_MIN_TEMP
5	TEMP_PERIOD_TIME_HIGH (time the temperature remained at maximum temperature)
6	TEMP_PERIOD_TIME_LOW (time the temperature remained at minimum temperature)

DIAG_TESTINFO (201)
Storage class –; read capability (r)

Info parameter concerning a diagnostic test in progress (EXPERTplus)
- 0 · d1 Drive signal diagram steady-state
- 2 · d2 Drive signal diagram hysteresis
- 4 · d3 Static characteristic
- 8 · d4 Partial stroke test (PST)
- 16 · d5 Drive signal diagram hysteresis – activated
- 32 · d5 Drive signal diagram hysteresis – running
- 64 · Permanent data logger
- 128 · Data logger triggered
- 256 · Reference test
- 516 · All tests started automatically in sequence

DIAGNOSE_LEVEL (195)
Storage class –; read capability (r)

Diagnosis level
- EXPERT
- EXPERTplus
- Safety shut-off

ELAPSED_HOURS_METERS (193)
Storage class –; read capability (r)

Operating hours counter

Element	Parameters
0	ELAPSED_HOURS_METER (device is switched on)
1	DEVICE_IN_CLOSED_LOOP
2	POWER_ON_SINCE_INIT (device switched on since last initialization)
3	DEVICE_IN_CLOSED_LOOP_SINCE_LAST_INIT (device in closed-loop operation since last initialization)

ENHANCED_DIAG_CMD (192)
Storage class S; read/write capability (r/w); supported modes ALL

Advanced diagnostics tests
- 0 · No function
- 1 · Start data logger
- 2 · Stop data logger
- 3 · Start online hysteresis test
- 4 · Stop online hysteresis test
- 5 · Start partial stroke test (PST)
- 6 · Stop partial stroke test (PST)
- 7 · Start tests one after the other
- 8 · Stop tests
- 9 · Start drive signal test steady-state

ENHANCED_DIAG_CMD (192) (continued)
Storage class S; read/write capability (r/w); supported modes ALL

- 10 · Stop drive signal test steady-state
- 11 · Start drive signal test hysteresis
- 12 · Stop drive signal test hysteresis
- 13 · Start static characteristic test
- 14 · Stop static characteristic test
- 15 · Start reference test
- 12 · Stop reference test
- 17 · Reset 'Logging'
- 18 · Reset all diagnostic information
- 19 · Reset 'Operating hours counter'
- 20 · Reset temperature information
- 21 · Reset 'Valve position x histogram - long-term'
- 22 · Reset 'Cycle counter histogram - long-term'
- 23 · Reset 'Set point deviation e histogram - long-term'
- 24 · Reset 'Y - X – long-term'
- 25 · Reset 'Y - X – short-term'
- 26 · Reset 'Drive signal diagram hysteresis - long-term'
- 27 · Reset 'Lower end position trend'
- 28 · Reset 'Lower end position - ref. values'
- 29 · Reset 'Travel histogram x – short-term'
- 30 · Reset 'Set point deviation e histogram - Short-term'
- 31 · Reset 'Cycle counter histogram – short-term'
- 32 · Reset 'Drive signal diagram hysteresis – short-term'
- 33 · Reset 'Y - X – ref. values'
- 34 · Reset 'Hysteresis reference measurement'
- 35 · Reset 'Data logger'
- 36 · Reset 'Static characteristic'
- 37 · Reset PST
- 38 · Reset 'Y - X – measured data'
- 39 · Reset 'Drive signal diagram – hysteresis – measured data'

EVENT_LOGGING_1 (190) and EVENT_LOGGING_2 (191)
Storage class –; read capability (r)

Data sets 1/2 of the event logging (EXPERTplus)

Element	Parameters
0	MESSAGES_0…15
1	ELAPSED_HOURS_METER_0…15
…	
29	MESSAGE_14…29
30	ELAPSED_HOURS_METER_14…29

FINAL_POSITION_VALUE (183)
Storage class –; read capability (r)

Valve position [%] in relation to the working range FINAL_VALUE_RANGE

FINAL_VALUE (184)
Storage class S; read/write capability (r/w); supported modes ALL

Positioning value of upstream Analog Output Function Block

FINAL_VALUE_RANGE (179)
Storage class S; read/write capability (r/w); supported modes ALL

Travel/angle range
- [0.0 to 100.0]
- EU_100 (Code 9)
- EU_0 (Code 8)
- UNIT_INDEX
- DECIMAL

FST_ANALYSIS_1 (222) to FST_ANALYSIS_3 (224)
Storage class –; read capability (r)

Full stroke test (FST) settings
- FST_MEAS_DATA1…3_TIME_STAMP: Time stamp for this test
- FST_MEAS_DATA1…3_BREAK_AWAY_TIME: Detected breakaway time
- FST_MEAS_DATA1…3_OVERSHOOT_RISING: Overshooting (increasing)
- FST_MEAS_DATA1…3_DEAD_TIME_RISING: Dead time (increasing)
- FST_MEAS_DATA1…3_T63_RISING: T63 (increasing)
- FST_MEAS_DATA1…3_T98_RISING: T98 (increasing)
- FST_MEAS_DATA1…3_RISE_TI_RISING: Rise time (increasing)
- FST_MEAS_DATA1…3_SETTL_TI_RISING: Settling time (increasing)
- FST_MEAS_DATA1…3_OVERSHOOT_FALL: Overshooting (decreasing)
- FST_MEAS_DATA1…3_DEAD_TI_FALL: Dead time (decreasing)
- FST_MEAS_DATA1…3_T63_FALLING: T63 (decreasing)
- FST_MEAS_DATA1…3_T98_FALLING: T98 (decreasing)
- FST_MEAS_DATA1…3_RISE_TI_FALLING: Rise time (decreasing)
- FST_MEAS_DATA1…3_SETTL_TI_FALLING: Settling time (decreasing)

FST_CANCEL_CONDITIONS (226)
Storage class S; read/write capability (r/w); supported modes ALL

Cancellation conditions of the full stroke test (FST)

- FST_CANCEL_COND_MAX_TEST_DURA: Max. test duration, user preset
- FST_CANCEL_COND_ACTIV_MAX_TIME: Activate 'Max. breakaway time'
- FST_CANCEL_COND_MAX_BREAK_TIME: Max. breakaway time
- FST_CANCEL_COND_ACTIV_TIME_REACH: Activate 'Perm. time until CLOSED position exceeded'
- FST_CANCEL_COND_TIME_REACH: Perm. time until CLOSED position

FST_DISPLAY (227)
Storage class –; read capability (r)

Information on the full stroke test (FST)

- PROGRESS_FLAG: Progress
- STATUS_FST: FST status
- NUMBER_OF_TESTS: No. of tests
- RECOMMEND_SCAN_RATE: Recommended min. scan rate
- DURATION_OF_TEST: Estimated test duration
- TEST_INFO Test information

FST_SETTTINGS (225)
Storage class S; read/write capability (r/w); supported modes ALL

Full stroke test settings

– FST_SETTINGS_TOL_LIMIT_RESPONSE: Step tolerance limit
- FST_SETTINGS_ACTIV_RAMP_FUNC: Activation of ramp function
- FST_SETTINGS_RAMP_TIME_RISING: Ramp time (rising)
- FST_SETTINGS_RAMP_TIME_FALLING: Ramp time (falling)
- FST_SETTINGS_SETTL_BEFORE_START: Settling time before starting test
- FST_SETTINGS_DELAY_AFTER_STEP: Waiting time after step change
- FST_SETTINGS_SCAN_RATE: Scan rate

FST_TEST_STATUS_1 (228) to FST_TEST_STATUS_3 (230)
Storage class –; read capability (r)

Status of full stroke test (FST) performed

HISTOGRAMM_E_ABTASTRATE (200)
Storage class S; read/write capability (r/w); supported modes ALL

Scan rate for set point deviation histogram for short-term monitoring (EXPERTplus)

HISTOGRAMM_X_ABTASTRATE (199)
Storage class S; read/write capability (r/w); supported modes ALL

Scan rate for travel histogram for short-term monitoring (EXPERTplus)

INIT_METHOD (161)
Storage class S; read/write capability (r/w); supported modes ALL

Initialization mode
- 0 · Maximum range (Maximalbereich)
- 1 · Nominal range (Nennbereich)
- 2 · Manual adjustment (Manuell gew. Bereich)
- 3 · Substitute (Ersatzabgleich)
- 4 · Zero Point (Nullpunkt)

MANUFAC_ACTUATOR_SIZE (209)
Storage class S; read/write capability (r/w); supported modes ALL

MOVING_DIRECTION (164)
Storage class S; read/write capability (r/w); supported modes ALL

Direction of action of the set point w in relation to the controlled variable x

NO_OF_ZERO_POINT_ADJ (196)
Storage class –; read capability (r)

Indicates number of zero calibrations performed since the last initialization

PIN_POSITION (160)
Storage class S; read/write capability (r/w); supported modes ALL

Pin position
Follower pin must be mounted in the proper position depending on the valve travel/opening angle. The pin position needs to be entered for initialization in NOM or SUb initialization mode (▶ EB 8384-4).

PRESSURE_LIMIT (177)
Storage class S; read/write capability (r/w); supported modes ALL

Pressure limit (Code 16)
- 1 · Off
- 2 · 3.7 bar
- 3 · 2.4 bar
- 4 · 1.4 bar

PST_ANALYSIS_1 (213) to PST_ANALYSIS_3 (215)
Storage class –; read capability (r)

Partial stroke test (PST) settings

- PST_MEAS_DATA1…3_TIME_STAMP: Time stamp for this test
- PST_MEAS_DATA1…3_BREAK_AWAY_TIME: Detected breakaway time
- PST_MEAS_DATA1…3_OVERSHOOT_RISING: Overshooting (increasing)
- PST_MEAS_DATA1…3_DEAD_TIME_RISING: Dead time (increasing)
- PST_MEAS_DATA1…3_T63_RISING: T63 (increasing)
- PST_MEAS_DATA1…3_T98_RISING: T98 (increasing)
- PST_MEAS_DATA1…3_RISE_TI_RISING: Rise time (increasing)
- PST_MEAS_DATA1…3_SETTL_TI_RISING: Settling time (increasing)
- PST_MEAS_DATA1…3_OVERSHOOT_FALL: Overshooting (decreasing)
- PST_MEAS_DATA1…3_DEAD_TI_FALL: Dead time (decreasing)
- PST_MEAS_DATA1…3_T63_FALLING: T63 (decreasing)
- PST_MEAS_DATA1…3_T98_FALLING: T98 (decreasing)
- PST_MEAS_DATA1…3_RISE_TI_FALLING: Rise time (decreasing)
- PST_MEAS_DATA1…3_SETTL_TI_FALLING: Settling time (decreasing)
- PST_ MEAS_DATA1…3_DELTA_Y: delta y-monitoring value

PST_CANCEL_CONDITIONS (217)
Storage class –; read/write capability (r/w); supported modes ALL

Cancellation conditions of the partial stroke test (PST)

- PST_CANCEL_COND_ACT_X_CONTROL: Activate x-monitoring
- PST_CANCEL_COND_X_CONTROL_VALUE: x control value
- PST_CANCEL_COND_ACT_DELTA_Y_MON: Activate Δy monitoring
- PST_CANCEL_COND_DELTA_Y_MON_VAL: delta y-monitoring value
- PST_CANCEL_COND_TOL_BAND_CONTR: Activate PST tolerance band monitoring
- PST_CANCEL_COND_TOL_BAND: PST tolerance band
- PST_CANCEL_COND_MAX_TEST_DURA: Max. test duration, user preset
- PST_CANCEL_COND_ACTIV_MAX_TIME: Activate 'Max. breakaway time'
- PST_CANCEL_COND_MAX_BREAK_TIME: Max. breakaway time
- PST_CANCEL_COND_ACTIVE_TIME_REACH: Activate 'Perm. time until step end'
- PST_ CANCEL_COND_TIME_REACH: Perm. time until step end

PST_DISPLAY (218)
Storage class –; read capability (r)

Information on the partial stroke test (PST)

- AUTOSTART_READ: Time until next automatic PST
- PROGRESS_FLAG: Progress
- DELTA_Y_MON_REF_VAL: Δy monitoring reference value
- DELTA_Y_MON_REP_VAL: Δy monitoring proof test value
- STATUS_PST: PST status
- NUMBER_OF_TESTS: No. of tests
- RECOMMEND_SCAN_RATE: Recommended min. scan rate
- DURATION_OF_TEST: Estimated test duration
- TESTMODE_ACTUAL: Current PST mode
- TEST_INFO: Test information

PST_SETTINGS (216)
Storage class S; read/write capability (r/w); supported modes ALL

Partial stroke test (PST) settings

- PST_SETTINGS_AUTOSTART: Auto test time
- PST_SETTINGS_STEP_START: Step start
- PST_SETTINGS_STEP_END: Step stop
- PST_SETTINGS_LIMIT_STEP_RESPONSE: Step tolerance limit
- PST_SETTINGS_ACTIVATION_RAMP_FUN: Activation of ramp function
- PST_SETTINGS_RAMP_TIME_RISING: Ramp time (increasing)
- PST_SETTINGS_RAMP_FALLING: Ramp time (decreasing)
- PST_SETTINGS_SETTLING_TIME: Settling time before starting test
- PST_SETTINGS_DELAY_TI_AFTER_STEP: Waiting time after step change
- PST_SETTINGS_SCAN_RATE: Scan rate
- PST_SETTINGS_STEP_RESPONSE: No. of step changes

PST_TEST_STATUS_1 (219) bis PST_TEST_STATUS_3 (221)
Storage class –; read capability (r)

Status of the partial stroke test (PST)

- PST_TEST_STAT1...3_TEST_START: Test start
- PST_TEST_STAT1...3_no_test_avail: No test available
- PST_TEST_STAT1...3_X_CANCEL: x cancellation
- PST_TEST_STAT1...3_Y_CANCEL: y cancellation
- PST_TEST_STAT1...3_TOL_BAND_EXCEED: Tolerance band exceeded
- PST_TEST_STAT1...3_MAX_TIME_EXCEED: Max. test duration exceeded
- PST_TEST_STAT1...3_TEST_MAN_CANCEL: Test canceled manually
- PST_TEST_STAT1...3_OUT_OF_MEMORY: Measured data memory full
- PST_TEST_STAT1...3_ABO_INT_SOL_VAL: Cancel internal solenoid valve/forced venting
- PST_TEST_STAT1...3_PRESSURE_FRIC: Friction
- PST_TEST_STAT1...3_W_STEP_TOO_HIGH: Difference w, step start too high
- PST_TEST_STAT1...3_ABORT_REF_CHANG: Test canceled – Set point changed
- PST_TEST_STAT1...3_MAX_BREAKTIME_EX: Max. breakaway time exceeded
- PST_TEST_STAT1...3_TIME_EXCEEDED: Perm. time until step end exceeded

RESET_DIAG_FKT (206)
Storage class S; read/write capability (r/w); supported modes ALL

Reset functions

- 0 No function
- 1 Reset diagnostics
- 17 Reset 'Logging'
- 21 Reset 'Valve position x histogram'
- 23 Reset 'Set point deviation histogram e'
- 22 Reset 'Cycle counter histogram'
- 24 Reset 'Drive signal diagram – steady-state'
- 25 Reset 'Drive signal diagram steady-state - short-term'
- 26 Reset 'Drive signal diagram hysteresis'
- 27 Reset 'Lower end position trend'
- 28 Reset 'Lower end position - ref. values'
- 29 Reset 'Travel histogram x – short-term'
- 30 Reset 'Set point deviation histogram e – short-term'
- 31 Reset 'Cycle counter histogram – short-term'
- 32 Reset 'Drive signal diagram hysteresis – short-term'
- 38 Reset 'Drive signal diagram steady-state measured data'
- 39 Reset 'Drive signal diagram – hysteresis – measured data'
- 60 Reset PST
- 61 Reset FST

SELF_CALIB_STATUS_2 (233)
Storage class –; read capability (r)

SELF_CALIB_WARNING (167)
Storage class –; read capability (r)

Initialization error

SET_FAIL_SAFE_POS (178)
Storage class S; read/write capability (r/w); supported modes ALL

Fail-safe position of the valve
The positioner remains in the AUTO operating mode. The fail-safe position is indicated on the positioner display by a blinking 'S'.

- 0 · Not active
- 1 · Set fail-safe position
- 2 · Reset fail-safe position

SETP_CUTOFF_DEC_ON (171)
Storage class S; read/write capability (r/w); supported modes ALL

Activate/deactivate setpoint cutoff decrease

SETP_CUTOFF_INC_ON (170)
Storage class S; read/write capability (r/w); supported modes ALL

Activate/deactivate setpoint cutoff increase

SIGNAL_PRESSURE_ACTION (176)
Storage class S; read/write capability (r/w); supported modes ALL

Position of the slide switch AIR TO OPEN/CLOSE (during initialization). The device must be re-initialized if the switch position is changed.

STARTUP_PARA (207)
Storage class –; read/write capability (r/w); supported modes ALL

Start-up parameters

- TRANS1_INIT_METHOD: Initialization mode (MAX, NOM, MAN, SUB)
- TRANS1_MOVING_DIRECTION: Direction of action
- TRANS1_LIN_TYPE: Valve characteristic selection
- TRANS1_INIT_WITH_REF_TEST: Initialization with reference test (yes/no)
- TRANS1_BLOCKING_POSITION: Blocking position

STAT_KENNLINIE_RW (204)
Storage class N; read/write capability (r/w); supported modes ALL

Structure of the static characteristic

Element	Parameters
0	START
1	ENDE
2	WARTEZEIT_NACH_SPRUNG
3	ANZAHL_BIS_UMKEHR

STAT_KENNLINIE_RW_2 (232)
Storage class –; read/write capability (r/w); supported modes ALL

- START
- ENDE
- WARTEZEIT_NACH_SPRUNG
- ANZAHL_BIS_UMKEHR

STATUS_SOLENOID_VALVE (182)
Storage class –; read capability (r)

Solenoid valve status (Code 45)

STEP_RESPONSE_R (188)
Storage class –; read capability (r)

Step response information parameters (EXPERTplus)

Element	Parameters
0	OVERSHOOT_RISING · Overshoot (rising)
1	OVERSHOOT_FALLING · Overshoot (falling)
2	DEAD_TIME_RISING · Dead time (rising)
3	DEAD_TIME_FALLING · Dead time (falling)
4	TIME_63_RISING · T63 (increasing)
5	TIME_63_FALLING · T63 (falling)
6	TIME_98_RISING · T98 (increasing)
7	TIME_98_FALLING · T98 (falling)
8	STEP_PROGRESS
9	RISE_TIME_FALLING · Rise time (decreasing)
10	SETTLING_TIME_FALLING · Settling time (falling)
11	RISE_TIME_RISING · Rise time (increasing)
12	SETTLING_TIME_RISING · Settling time (increasing)
13	DURATION_OF_TEST
14	TESTINFO · Test information

STEP_RESPONSE_RW (189)
Storage class S; read/write capability (r/w); supported modes ALL

Step response parameters (EXPERTplus)

Element	Parameters
0	STEPSTART
1	STEPEND
2	STEP_SAMPLE_RATE
3	RAMPE_UP · Ramp time (rising)
5	RAMPE_DOWN · Ramp time (falling)
6	LATENCY_AFTER_STEP · Waiting time after step change
7	STEP_SELECTION

SUB_MODE_INIT (162)
Storage class –; read capability (r)

Status of substitute calibration (SUb initialization)

TOLERANCE_BAND (180)
Storage class S; read/write capability (r/w); supported modes ALL

Tolerance band (Code 19)

TRANSDUCER_STATE (172)
Storage class –; read capability (r)

Status of the transducer block
- [0] · See operating mode
- 1 · Solenoid valve active
- 2 · Lower travel limit reached (lower x-limit, Code 10)
- 3 · Upper travel limit reached (upper x-limit, Code 11)
- 4 · Tight-closing of the valve (end position w <, Code 14)
- 5 · Maximum open position of the valve (end position w >, Code 15)
- 7 · Fail-safe position active
- 255 · Normal operation

TRAVEL_LIMIT_LOW_ON (168)
Storage class S; read/write capability (r/w); supported modes ALL

Enable lower x-limit

TRAVEL_LIMIT_UP_ON (169)
Storage class S; read/write capability (r/w); supported modes ALL

Enable upper x-limit

USER_CHARACT (203)
Storage class S; read/write capability (r/w); supported modes ALL

User-defined characteristic

Element	Parameter
0	X_0
1	Y_0
…	
20	X_10
21	Y_10

ZERO_POINT_LIMIT (197)
Storage class S; read/write capability (r/w); supported modes O

Zero limit

Index and parameter assignment: AO Transducer Block, Slot 1 · Manufacturer-specific parameters

Index	Parameters
160	PIN_POSITION
161	INIT_METHOD
162	SUB_MODE_INIT
163	DEVICE_INIT_STATE
164	MOVING_DIRECTION
165	CLOSING_DIRECTION
166	BLOCKING_POSITION
167	SELF_CALIB_WARNING
168	TRAVEL_LIMIT_LOW_ON
169	TRAVEL_LIMIT_UP_ON
170	SETP_CUTOFF_INC_ON
171	SETP_CUTOFF_DEC_ON
172	TRANSDUCER_STATE
173	CHARACT_TYPE
176	SIGNAL_PRESSURE_ACTION
177	PRESSURE_LIMIT
178	SET_FAIL_SAFE_POS
179	FINAL_VALUE_RANGE
180	TOLERANCE_BAND
181	DELAY_TIME
182	STATUS_SOLENOID_VALVE

Index	Parameters
183	FINAL_POSITION_VALUE
184	FINAL_VALUE
185	DATALOGGER
186	DATALOGGER_READ
187	DIAG_MONITORING
188	STEP_RESPONSE_R
189	STEP_RESPONSE_RW
190	EVENT_LOGGING_1
191	EVENT_LOGGING_2
192	ENHANCED_DIAG_CMD
193	ELAPSED_HOURS_METERS
194	AUTOSTART_HYS
195	DIAGNOSE_LEVEL
196	NO_OF_ZERO_POINT_ADJ
197	ZERO_POINT_LIMIT
198	COUNTER_INIT_START
199	HISTOGRAMM_X_ABTASTRATE
200	HISTOGRAM_E_ABTASTRATRE
201	DIAG_TESTINFO
202	DEVICE_CHARACT
203	USER_CHARACT

Index	Parameters
204	STAT_KENNLINIE_RW
205	ACTIVE_IDENT_NUMBER
206	RESET_DIAG_FKT
207	STARTUP_PARA
208	SETP_X_LIMIT_PARA
209	MANUFAC_ACTUATOR_SIZE
210	CYCLE_COUNTER_LIMIT
211	DATALOGGER_2
212	DATALOGGER_READ_2
213	PST_ANALYSIS_1
214	PST_ANALYSIS_2
215	PST_ANALYSIS_3
216	PST_SETTINGS
217	PST_CANCEL_CONDITIONS
218	PST_DISPLAY

Index	Parameters
219	PST_TEST_STATUS_1
220	PST_TEST_STATUS_2
221	PST_TEST_STATUS_3
222	FST_ANALYSIS_1
223	FST_ANALYSIS_2
224	FST_ANALYSIS_3
225	FST_SETTINGS
226	FST_CANCEL_CONDITIONS
227	FST_DISPLAY
228	FST_TEST_STATUS_1
229	FST_TEST_STATUS_2
230	FST_TEST_STATUS_3
231	DEVICE_CHARACT_2
232	STAT_KENNLINIE_RW_2
233	SELF_CALIB_STATUS_2

8.6 DI1/2 Function Block, Slot 2/3 · Profile-specific parameters

ALERT_KEY (20)
Storage class S; read/write capability (r/w); supported modes ALL

ID of the plant section
• [0]

ALM_SUM (23)
Storage class –; read capability (r)

Current status of process alarms in the DI Function Block
• [0]

BATCH (24)
Storage class S; read/write capability (r/w); supported modes ALL

Identification of the batch process

BLOCK_OBJECT (16)
Storage class –; read capability (r)

CHANNEL (30)
Storage class S; read/write capability (r/w); supported modes ALL

Connection of the Function Block with the Transducer Block

DI1: 0 · Not active
780 · Active

DI2: 0 · Not active
524 · Active

FSAFE_TYPE (36)
Storage class S; read/write capability (r/w); supported modes ALL

Reaction when an error occurs.
0 · FSAFE_VALUE is used as OUT_D
[1] · The last valid value of OUT_D is used
2 · OUT_D does not have a valid value

FSAFE_VAL_D (37)
Storage class S; read/write capability (r/w); supported modes ALL

Default value for OUT_D when the sensor/sensor electronics register an error
• [0]

INVERT (31) Storage class S; read/write capability (r/w); supported modes ALL
Inversion of the input value PV_D (from DI Transducer Block) before it is saved in the OUT_D parameter • [0] · Not inverted • 1 · Inverted
MODE_BLK (22) Storage class –; read capability (r)
Current operating mode
OUT_D* (26) Storage class S; read/write capability (r/w); supported modes ALL
Output of the Function Block (only in MAN mode)
SIMULATE (40) Storage class S; read/write capability (r/w); supported modes ALL
Simulation of input value PV_D; the DI Transducer Block and DI Function Block are separated (test)
ST_REV (17) Storage class –; read capability (r)
Revision of static data
STRATEGY (19) Storage class S; read/write capability (r/w); supported modes ALL
Permits strategic grouping and thus faster processing of blocks • [0] Blocks are grouped by entering the same number in the STRATEGY parameter of each block. These data are neither checked nor processed by the DI Function Block.
TAG_DESC (18) Storage class S; read/write capability (r/w); supported modes ALL
User-specific text for unique identification of the block • Max. 32 characters
TARGET_MODE (21) Storage class S; read/write capability (r/w); supported modes ALL
Target operating mode 8 · AUTO 16 · MAN 128 · O/S
VIEW1 (240) Storage class –; read capability (r)
A group of parameters can be read with a read command

Index and parameter assignment: DI1/2 Function Block, Slot 2/3 · Profile-specific parameters

Index	Parameters
16	BLOCK_OBJECT
17	ST_REV
18	TAG_DESC
19	STRATEGY
20	ALERT_KEY
21	TARGET_MODE
22	MODE_BLK
23	ALM_SUM

Index	Parameters
24	BATCH
26	OUT_D
30	CHANNEL
31	INVERT
36	FSAFE_TYPE
37	FSAFE_VAL_D
40	SIMULATE

8.7 DI1/2 Transducer Block, Slot 2/3 · Profile-specific parameters

ALERT_KEY (64) Storage class S; read/write capability (r/w); supported modes ALL
ID of the plant section • [0]
ALM_SUM (67) Storage class –; read capability (r)
Current status of process alarms in the DI Transducer Block • [0]
BLOCK_OBJ (60) Storage class –; read capability (r)
MODE_BLK (66) Storage class –; read capability (r)
Current operating mode
PV_D (72) Storage class –; read capability (r)
Process variable (forwarded to the Function Block including status)
SENSOR_ID (69) Storage class S; read/write capability (r/w); supported modes ALL
Identification of sensor used (model type)
SENSOR_MAN (71) Storage class S; read/write capability (r/w); supported modes ALL
Sensor manufacturer
SENSOR_SER_NUM (70) Storage class S; read/write capability (r/w); supported modes ALL
Serial number of the sensor used
SENSOR_WIRE_CHECK (68) Storage class S; read/write capability (r/w); supported modes ALL
ST_REV (61) Storage class S; read capability (r)
Revision of static data

STRATEGY (63)
Storage class S; read/write capability (r/w); supported modes ALL

Permits strategic grouping and thus faster processing of blocks
- [0]

Blocks are grouped by entering the same number in the STRATEGY parameter of each block.

TAG_DESC (62)
Storage class S; read/write capability (r/w); supported modes ALL

User-specific text for unique identification of the block
- Max. 32 characters

TARGET_MODE (65)
Storage class S; read/write capability (r/w); supported modes ALL

- 8 · AUTO
- 16 · MAN
- 128 · O/S

Index and parameter assignment: DI1/2 Transducer Block, Slot 2/3 · Profile-specific parameters

Index	Parameters
60	BLOCK_OBJ
61	ST_REV
62	TAG_DESC
63	STRATEGY
64	ALERT_KEY
65	TARGET_MODE

Index	Parameters
66	MODE_BLK
67	ALM_SUM
68	SENSOR_WIRE_CHECK
69	SENSOR_ID
70	SENSOR_MAN
71	PV_D

KH 8384-4 EN

SAMSON AKTIENGESELLSCHAFT
Weismüllerstraße 3 · 60314 Frankfurt am Main, Germany
Phone: +49 69 4009-0 · Fax: +49 69 4009-1507
samson@samsongroup.com · www.samsongroup.com

2022-02-10 · English