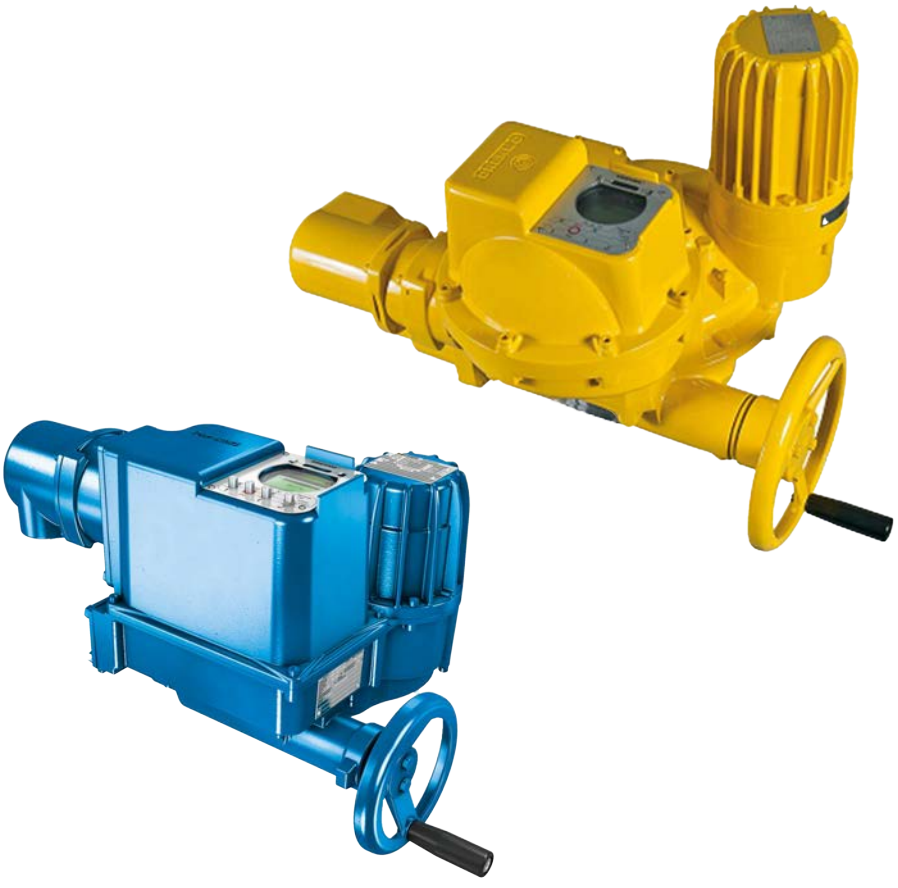
DREHMO
VALVE ACTUATORS

Description of the integral controls type IMC

V2.02.0020



Operation instructions
Operation and setting

Read operation instructions first.

- Heed safety instructions.
- These operation instructions are part of the product.
- Store operation instructions during product life.
- Pass on instructions to any subsequent user or owner of the product.

Target group:

This document contains information for assembly, commissioning and maintenance staff.

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1 Menu structure at the device

- Selection menu
  - LOCAL
  - OFF
  - REMOTE
  - Commissioning
    - Commissioning (chapter: 4)
    - Parameter (chapter: 8)
  - Menu
    - Electronic name plate (chapter: 5)
    - Operating data logging (chapter: 6)
    - Actual values/diagnostics (chapter: 7)
    - Parameter (chapter: 8)
  - Acknowledge fault
  - System menu
    - PC interface
    - System reset
    - Version display
    - Hardware flags
  - User management (chapter: 3)
  - Info
  - Language (chapter: 8.2.1)
  - Torque progress chart

These operation instructions include all parameters!

Depending on the equipment/version, parameters can be hidden on the device.

2 Warnings and notes

The following warnings draw special attention to safety-relevant procedures in these operation instructions, each marked by the appropriate signal word (DANGER, WARNING, CAUTION, NOTICE).

DANGER — **Indicates an imminently hazardous situation with a high level of risk. Failure to observe this warning results in death or serious injury.**

WARNING — **Indicates a potentially hazardous situation with a medium level of risk. Failure to observe this warning could result in death or serious injury.**

CAUTION — **Indicates a potentially hazardous situation with a low level of risk. Failure to observe this warning could result in minor or moderate injury. May also be used with property damage.**

NOTICE — **Potentially hazardous situation. Failure to observe this warning could result in property damage. Is not used for personal injury.**

The ⚠ safety symbol warns of a potential personal injury hazard.

The signal word (e.g. DANGER) indicates the level of hazard.

3 User management

User Login

User level: User

Default setting: None

Description:

Selection is made here of the user to be logged in.

Enter password

User level: User

Default setting: 0

Description:

Enter password for the respective user level. It consists of max. 4 digits.

Current user

Can be read as of: User

Default setting: Manufacturer

Description:

Output of user currently logged in.

Password below user

User level: Specialist

Default setting: Manufacturer

Description:

Setting the password prompt. Any user below preset user level does not have to enter password.

User password

User level: User

Default setting: 1234

Description:

Definition of user password.

Mainten. staff password

User level: Maintenance staff

Default setting: 1234

Description:

Definition of password for Maintenance staff.

Specialist password

User level: Specialist

Default setting: 1234

Description:

Definition of password for the Specialist.

4 Commissioning

4.1 Short commissioning

Closing direction

User level: Maintenance staff

Default setting: Clockwise CW

Description:

Actuator direction of rotation for closing valve.

Seating mode

User level: Maintenance staff

Default setting: Final position limit sw.

Description:

Indicates which conditions must be fulfilled for actuator end position seating. Set this parameter to “final positions” as the reference points for all setting values are position values 0 % and 100 %. The torque increases at the valve seals only occur outside this range.

Tripping torque CLOSE

User level: Maintenance staff

Default setting: minimum tripping torque

Description:

Maximum permissible torque for automatic actuator tripping.

Tripping torque OPEN

User level: Maintenance staff

Default setting: minimum tripping torque

Description:

Maximum permissible torque for automatic actuator tripping.

Clear position CLOSED

User level: Maintenance staff

Default setting: No

Description:

Clears end position CLOSED. The end position CLOSED is shifted by 90 turns.

Clear position OPEN

User level: Maintenance staff

Default setting: No

Description:

Clears end position OPEN. The end position OPEN is shifted by 90 turns.

Set position CLOSED

User level: Maintenance staff

Description:

The actuator can be operated using ARROW UP and ARROW DOWN keys in operation mode LOCAL. Confirm the end position with the ENTER key. Use the ESC key to abort the procedure without setting the limit position.

Set position OPEN

User level: Maintenance staff

Description:

The actuator can be operated using ARROW UP and ARROW DOWN keys in operation mode LOCAL. Confirm the end position with the ENTER key. Use the ESC key to abort the procedure without setting the limit position.

4.2 Change end positions

Clear position CLOSED

User level: Maintenance staff

Default setting: No

Description:

Clears end position CLOSED. The end position CLOSED is shifted by 90 turns.

Clear position OPEN

User level: Maintenance staff

Default setting: No

Description:

Clears end position OPEN. The end position OPEN is shifted by 90 turns.

Set position CLOSED

User level: Maintenance staff

Description:

The actuator can be operated using ARROW UP and ARROW DOWN keys in operation mode LOCAL. Confirm the end position with the ENTER key. Use the ESC key to abort the procedure without setting the limit position.

Set position OPEN

User level: Maintenance staff

Description:

The actuator can be operated using ARROW UP and ARROW DOWN keys in operation mode LOCAL. Confirm the end position with the ENTER key. Use the ESC key to abort the procedure without setting the limit position.

4.3 Analogue position value

4.3.1 Input

Set OPEN position

User level: Maintenance staff

Default setting: No change

Description:

Adopts the present input current value as setpoint for position 100 %. When using this function, value OPEN is automatically adapted.

Set position CLOSED

User level: Maintenance staff

Default setting: No change

Description:

Adopts the present input current value as setpoint for position 0 %. When using this function, value CLOSED is automatically adapted.

Value OPEN

User level: Maintenance staff

Default setting: 978

Description:

Defines the value of the A/D converter of setpoint input corresponding to position 100 %.

Value CLOSED

User level: Maintenance staff

Default setting: 194

Description:

Defines the value of the A/D converter of setpoint input corresponding to position 0 %.

4.3.2 Output 1

Value 100%

User level: Maintenance staff

Default setting: 947

Description:

Defines the value of the A/D converter of actual value output providing the requested value for position 100% (20 mA).

Value 0%

User level: Maintenance staff

Default setting: 188

Description:

Defines the value of the A/D converter of actual value output providing the requested value for position 0% (4 mA).

4.3.3 Output 2-3

Value 100%

User level: Maintenance staff

Default setting: 928

Description:

Defines the value of the A/D converter of actual value output providing the requested value for position 100% (20 mA).

Value 0%

User level: Maintenance staff

Default setting: 186

Description:

Defines the value of the A/D converter of actual value output providing the requested value for position 0% (4 mA).

4.4 Torque calibration

Delete torque OPEN

User level: Specialist

Default setting: No

Description:

Deletes all calibrated values of torque recording in direction OPEN. Then perform torque calibration again using torque OPEN 50 % and 100 %.

Delete torque CLOSE

User level: Specialist

Default setting: No

Description:

Deletes all calibration values of torque recording in direction CLOSE. Then perform torque calibration again using torque CLOSE 50 % and 100 %.

Zero point adjust

User level: Maintenance staff

Default setting: No

Description:

Adopts the present torque as 0 Nm value.

Torque OPEN 50%

User level: Specialist

Description:

Sets the calibration value for an output torque of 50 %. Actuator runs in direction OPEN once the ARROW UP key is pressed and until the key is operated once again. Thus, it is signalled to the actuator that a torque of 50 % is present at the output drive. The actuator switches off automatically. The actuator must be set for calibration in clockwise closing direction. Furthermore, the maximum tripping torque must be set!

Torque OPEN 100%

User level: Specialist

Description:

Sets the calibration value for an output torque of 100 %. Actuator runs in direction OPEN once the ARROW UP key is pressed and until the key is operated once again. Thus, it is signalled to the actuator that a torque of 100 % is present at the output drive. The actuator switches off automatically. The actuator must be set for calibration in clockwise closing direction. Furthermore, the maximum tripping torque must be set!

Torque CLOSE 50%

User level: Specialist

Description:

Sets the calibration value for an output torque of 50 %. Actuator runs in direction CLOSE once the ARROW DOWN key is pressed and until the key is operated once again. Thus, it is signalled to the actuator that a torque of 50 % is present at the output drive. The actuator switches off automatically. The actuator must be set for calibration in clockwise closing direction. Furthermore, the maximum tripping torque must be set!

Torque CLOSE 100%

User level: Specialist

Description:

Sets the calibration value for an output torque of 100 %. Actuator runs in direction CLOSE once the ARROW DOWN key is pressed and until the key is operated once again. Thus, it is signalled to the actuator that a torque of 100 % is present at the output drive. The actuator switches off automatically. The actuator must be set for calibration in clockwise closing direction. Furthermore, the maximum tripping torque must be set!

Torque centered

Can be read as of: User

Description:

Displays the current value of the deviation of the torque recording wheel.

4.5 Maintenance comb.sensor

Upload calibration

User level: Maintenance staff

Default setting: No

Description:

Transfer of sensor calibration data into the controls.

Download calibration

User level: Maintenance staff

Default setting: No

Description:

Transfer of the sensor calibration data from the actuator controls to the sensor.

Default calibration

User level: Maintenance staff

Default setting: No

Description:

Load default settings for calibration of individual actuator types to sensor.

Mechanical tolerances can lead to value deviations whereby the actual torque values might differ.

Calibr. gradient CLOSE

User level: Manufacturer

Default setting: 0

Description:

On the basis of the two points set up for torque in direction CLOSE, the gradient m is determined according to the formula: y = mx + b.

Calibr. gradient OPEN

User level: Manufacturer

Default setting: 0

Description:

On the basis of the two points set up for torque in direction OPEN, the gradient m is determined according to the formula: y = mx + b.

Calibr. offset CLOSE

User level: Manufacturer

Default setting: 0

Description:

On the basis of the two points set up for torque in direction CLOSE, the deviation b is determined according to the formula: y = mx + b.

Calibr. offset OPEN

User level: Manufacturer

Default setting: 0

Description:

On the basis of the two points set up for torque in direction OPEN, the deviation b is determined according to the formula: y = mx + b.

5 Electronic name plate

5.1 Identification

Bluetooth name

Can be read as of: User

Default setting: Serial number of the actuator

Description:

Indicates the current Bluetooth actuator name displayed when performing a Bluetooth search. The Bluetooth name can be set under Bluetooth name [▶ 55].

Bluetooth address

Can be read as of: User

Default setting: 0

Description:

Indicates the Bluetooth MAC address displayed when performing a Bluetooth search.

5.2 Description

TAG/KKS-ID

User level: Maintenance staff

Default setting: _TAG_KKS_

Description:

Process-specific identification of the actuator.

Application

User level: Maintenance staff

Default setting: _APPLICATION_

Description:

Functional actuator marking.

Installation area

User level: Maintenance staff

Default setting: _INSTAREA_

Description:

Process-specific section into which the actuator is installed.

Assembly date

User level: Maintenance staff

Default setting: _MOUNTDATE_

Description:

Date at which the actuator was integrated within the installation.

Commission no.

User level: Specialist

Default setting: _KOMNR_

Description:

Commission number of the manufacturer.

5.3 Actuator

Manufacturer

User level: Specialist
Default setting: Manufacturer
Description:
Indication about the actuator manufacturer.

Actuator ident no.

User level: Specialist
Default setting: _DRIVEIDENT_
Description:
Indication of the actuator type including output drive and speed (e.g. IM 30 A-25).

Actuator type

User level: Specialist
Default setting: electrical
Description:
Actuator operation mode.

Serial number

Can be read as of: User
Default setting: -/-
Description:
Serial number of the actuator. Definition using the device key.

Device certifications

User level: Specialist
Default setting: NA
Description:
Device certifications

Mech. output form

User level: Specialist
Default setting: _DROUTPUT_
Description:
Mechanical actuator output drive.

Rpm

User level: Specialist
Default setting: 0 rpm
Description:
Actuator output speed in rpm.

Time / 90°

User level: Specialist

Default setting: 0 s

Description:

Indication of operating time for a 90° output drive rotation.

Protection class

User level: Specialist

Default setting: IP67

Description:

Protection class indication.

Type of duty

User level: Specialist

Default setting: S4 - 35 % on time

Description:

Indicator of the permissible actuator operation mode (e.g. S2 - 10 min).

max. tripping torque

Can be read as of: User

Description:

Indication of the maximum permissible tripping torque (Md max.). Defined using the Device key [▶ 16].

min. tripping torque

Can be read as of: User

Description:

Indication of the minimum permissible tripping torque (Md min.). Torques below this value cannot be detected! Defined using the Device key [▶ 16].

max. modulating torque

Can be read as of: User

Description:

Indication of the maximum permissible modulating torque. Setting via device key.

min. ambient temp.

User level: Specialist

Default setting: –25 °C

Description:

Minimum permissible ambient temperature when electronic unit is powered.

max. ambient temp.

User level: Specialist

Default setting: 60 °C

Description:

Maximum permissible ambient temperature of actuator.

5.4 Controls

5.4.1 Basics

Device key

User level: User

Description:

Defines the equipment of the actuator controls with options, e.g. internal positioner or stepping mode. A new key becomes only valid after a subsequent actuator controls reset. The device key includes the lower and the upper limit of the torque measurement in encrypted form.

Device Manufacturer ID

Can be read as of: User

Default setting: 305

Description:

Indicates the Ident number as assigned by the Profibus User Organisation.

Device ID

Can be read as of: User

Default setting: i-matic DiM

Description:

Indication of device controls.

Original works number

Can be read as of: User

Description:

Serial number (works number) of the originally device use for the actuator controls.

Serial number

Can be read as of: User

Description:

Serial number of electronic unit/application.

Wiring diagram

User level: Specialist

Default setting: iM00X-XX-X X-X XX/X

Description:

Indication of actuator terminal plan.

Electrical specification

User level: Specialist

Default setting: iM00X-XX-X X-X XX/X

Description:

Lists the electronic components of the actuator.

Motor monitoring

Can be read as of: User

Default setting: unknown

Description:

Information about the version of the thermal motor protection.

- PTC: The microcontroller takes on the motor monitoring.
- TMS: The base board has a certified additional module for motor monitoring. The microcontroller does not have any impact.

min. electronics temp.

User level: Specialist

Default setting: –25 °C

Description:

The minimum permissible temperature of electronics.

max. electr. temp.

User level: Specialist

Default setting: 85 °C

Description:

The maximum permissible temperature of electronics.

5.4.2 Components

Ser.no. base

Can be read as of: User

Description:

Serial number of base board.

SW version base

Can be read as of: User

Description:

Software version of the base board.

HW version base

Can be read as of: User

Description:

Hardware version of the base board.

Ser.no. display

Can be read as of: User

Description:

Serial number of display board.

SW version display

Can be read as of: User

Description:

Software version of the display board.

HW version display

Can be read as of: User

Description:

Hardware version of the display board.

Serial number EM6

Can be read as of: User

Description:

Serial number of combined sensor EM6.

Ser.no. EM6 Remote

Can be read as of: User

Description:

Serial number of additional board in actuator for detached controls.

SW version EM6 Remote

Can be read as of: User

Description:

Shows the software version of the detached sensor module. Requirement for this function will be that the actuator is equipped with detached controls.

Ser.no. interface 1

Can be read as of: User

Description:

Serial number of interface board 1.

SW version interf. 1

Can be read as of: User

Description:

Software version of interface sub-assembly 1.

HW version interf. 1

Can be read as of: User

Description:

Hardware version of interface board 1.

Ser.no. interface 2

Can be read as of: User

Description:

Serial number of optional second interface board.

SW version interf. 2

Can be read as of: User

Description:

Software version of interface sub-assembly 1.

HW version interf. 2

Can be read as of: User

Description:

Hardware version of optional second interface board.

5.4.3 Features

Internal positioner

Can be read as of: User

Default setting: Disabled V003

Description:

Indicates whether the actuator is equipped with 3-point positioner or not. Definition using the device key.

Analogue output

Can be read as of: User

Default setting: Disabled

Description:

Indicates whether the actuator is equipped with an analogue output in the factory. Definition using the device key.

Local remote control

Can be read as of: User

Default setting: Disabled

Description:

Indicates whether the actuator can be operated in the stimulated “Force LOCAL” operation mode using the “Force LOCAL” inputs.

Enhanced controller

Can be read as of: User

Default setting: Disabled

Description:

Indicates whether the function of the enhanced controller is available within the actuator. This enables position control with enhanced parameter options. Definition using the device key.

Programmer

Can be read as of: User

Default setting: Disabled

Description:

Indicates whether the actuator is equipped with an operation profile for internal setpoint generation. Definition using the device key.

Fieldbus redundancy

Can be read as of: User

Default setting: Disabled

Description:

Indicates whether the actuator is equipped with fieldbus redundancy. Definition using the device key.

Timer

Can be read as of: User

Default setting: Disabled

Description:

Indicates whether the actuator is equipped with a timer. Definition using the device key.

Process controller

Can be read as of: User

Default setting: Disabled

Description:

Indicates whether the actuator is equipped with a process controller. Definition using the device key.

External 24V

Can be read as of: User

Default setting: Disabled

Description:

Indicates whether the actuator is equipped with external 24 V supply. Definition using the device key.

Multiport valve

Can be read as of: User

Default setting: Disabled

Description:

Indicates whether the actuator is equipped with multiport valve control. Definition using the device key.

Extended diagnostics

Can be read as of: User

Default setting: Disabled

Description:

Indicates whether the actuator is equipped with extended diagnostic parameters. Definition using the device key.

5.5 Motor

Motor type

User level: Specialist

Default setting: _MOTORTYPE_

Description:

Motor type indication.

Motor serial no.

User level: Specialist

Default setting: 123456
Description:
Indication of actuator motor serial number.

Insulation class

User level: Specialist
Default setting: F
Description:
Indication of actuator motor insulation class.

Rated voltage

User level: Specialist
Default setting: 400 V
Description:
Indication of supply voltage.

Phases

User level: Specialist
Default setting: 3
Description:
Indication of phase number of power supply system.

Rated frequency

User level: Specialist
Default setting: 50 Hz
Description:
Indication of frequency of power supply system.

Rated current

User level: Specialist
Default setting: 0.75 A
Description:
Indication of rated current.

Starting current

User level: Specialist
Default setting: 1.1 A
Description:
Indication of maximum current during motor start.

Rated power

User level: Specialist
Default setting: 1.1 kW
Description:
Indication of rated power.

Phase shift (cos phi)

User level: Specialist
Default setting: 0.65°
Description:
Indication of cosine phi for rated variable presence.

Motor protection

User level: Specialist
Default setting: PTC
Description:
Indication of motor temperature recording type.

Output speed / rpm

User level: Specialist
Default setting: 1,360 rpm
Description:
Indication of motor speed for rated variable presence.

5.6 Gear / thrust unit

Manufacturer

User level: Maintenance staff
Default setting: _GEARMANUF_
Description:
Specification of manufacturer.

Add. gear model

User level: Maintenance staff
Default setting: _GEARTYPE_
Description:
Indication of additional gearbox designation.

Serial number

User level: Maintenance staff
Default setting: _GEARSERNR_
Description:
Indication of serial number of gearbox.

Gearbox assembly date

User level: Maintenance staff
Default setting: _GEARMOUNTDATE_
Description:
Time indication when additional gearbox was flanged to actuator.

max. input torque

User level: Maintenance staff
Default setting: 0.0 Nm

Description:

Indication of the maximum permissible gearbox input torque. Value 0 corresponds to no restriction.

Gear ratio

User level: Maintenance staff

Default setting: 1.0

Description:

Indication of reduction ratio of additional gearbox.

Gear factor

User level: Maintenance staff

Default setting: 1.0

Description:

Indication of gear factor.

Mech. output form

User level: Maintenance staff

Default setting: _GEAROUTPUT_

Description:

Mechanical output drive of gearbox/thrust unit.

5.7 Valve

Manufacturer

User level: Maintenance staff

Default setting: _VALVEMANUF_

Description:

Manufacturer of the valve delivered with the actuator.

Valve type

User level: Maintenance staff

Default setting: linear

Description:

Indication on valve movement.

Adjustment range

User level: Maintenance staff

Default setting: 90.0

Description:

Indication of overall valve stroke in the unit used for position indication (refer to Position unit [▶ 57]).

Serial number

User level: Maintenance staff

Default setting: _VALVESERNR_

Description:

Serial number of valve.

max. torque OPEN

User level: Maintenance staff

Default setting: 0.0 Nm

Description:

Definition of the permissible torque, limited by additional components (e.g. gearbox). Value 0 corresponds to no restriction.

max. torque CLOSE

User level: Maintenance staff

Default setting: 0.0 Nm

Description:

Definition of the permissible torque, limited by additional components (e.g. gearbox). Value 0 corresponds to no restriction.

6 Oper. data recording

6.1 General

Calibration date

User level: Specialist

Default setting: 2003-08-08

Description:

Date indication of last actuator calibration.

Configuration date

User level: Maintenance staff

Default setting: 2002-08-08

Description:

This field can be used to store the date of the last configuration change.

Maintenance date

User level: Maintenance staff

Default setting: 2002-08-08

Description:

This field can be used to store the date of the last maintenance.

6.2 Operation data

Valve stroke

User level: Specialist

Default setting: 0.0

Description:

Indicates the accumulated valve travel as a multiple of the total stroke (1 = complete stroke).

> Limit valve stroke

User level: Maintenance staff

Default setting: 0.0

Description:

Specification of maximum number of valve operations (1 = complete stroke). Value 0 corresponds to no restriction.

Motor oper. time total

Can be read as of: User

Default setting: 0.0 h

Description:

Indicates total running time of actuator motor in hours. This value cannot be reset.

Motor operation time

User level: Specialist

Default setting: 0.0 h

Description:

Indicates total running time of actuator motor in hours.

Position trippings total

Can be read as of: User

Default setting: 0

Description:

Number of limit trippings after reaching the end position. This value cannot be reset.

Position trippings

User level: Specialist

Default setting: 0

Description:

Indicates the number of limit trippings after reaching the end position.

Operation cycles

User level: Specialist

Default setting: 0

Description:

Indicates the total number of starts of the power control unit.

> Limit cycles

User level: Maintenance staff

Default setting: 0

Description:

Indicates the maximum permissible number of cycles which is issued following the "Maintenance required" signal. Value 0 corresponds to no restriction.

Actual op. cycles/h

Can be read as of: User

Default setting: 0 1/h

Description:

Indicates the number of cycles during the previous hour. The value is continuously updated.

max. cycles / hour

User level: Specialist

Default setting: 0 1/h

Description:

Indicates the maximum occurred number of cycles per hour.

> Limit cycles / hour

User level: Maintenance staff

Default setting: 0 1/h

Description:

Indicates the maximum permissible number of cycles per hour. Value 0 corresponds to no restriction.

Operation time CLOSE

Can be read as of: User

Default setting: 0.0 s

Description:

Indicates the time required for last operation without stop from one final position to the other.

Operation time OPEN

Can be read as of: User

Default setting: 0.0 s

Description:

Indicates the time required for last operation without stop from one final position to the other.

Actual operation time

Can be read as of: User

Default setting: 0.0 s

Description:

Indicates the duration of last executed operation.

Actual duty cycle value

Can be read as of: User

Default setting: 0.0 %

Description:

Indicates the on time of the motor in relation to the last hour in percent. Value is continuously updated.

max. duty cycle value

User level: Specialist

Default setting: 0.0 %

Description:

Indicates the maximum occurred on time per hour in percent.

> Limit duty cycle

User level: Specialist

Default setting: 0.0 %

Description:

Limit value for the maximum occurred on time per hour in percent. When exceeding, a signal is issued. Value 0.0 deactivates the monitoring.

6.3 Dynamic maintenance

Thermal ageing

User level: Specialist

Default setting: 0 h

Description:

Calculates the ageing process of sealing elements from the measured electronics temperature.

> Limit thermal ageing

User level: Maintenance staff

Default setting: 87,600 h

Description:

Defines the limit for thermal ageing. If this value is exceeded, "Maintenance required" and "Seal replacement recommended" are issued. Value 0 corresponds to no restriction.

Temperature corr. value

User level: Maintenance staff

Default setting: –10 °C

Description:

Defines the difference between measured electronics temperature and the ambient temperature required for ageing algorithms, e.g. –10 °C => electronics is 10 °C higher than ambient temperature.

Mechanical ageing

User level: Specialist

Default setting: 0

Description:

Calculates the wear of internal gearing components.

Type mech. ageing

User level: Maintenance staff

Default setting: No

Description:

This parameter defines the algorithm used for the calculation of the mechanical ageing values. It is required to select the adequate actuator size in order to use the correct calculation algorithm. Setting of the value to "NO" results in deactivation of the mechanical ageing calculation algorithm.

> Limit mechanical ageing

User level: Maintenance staff

Default setting: 0

Description:

If this value is exceeded, the indications "Maintenance required" and "Gearbox overhaul recommended" are issued. Value 0 corresponds to no restriction.

> Preset mechanical ageing

User level: Maintenance staff

Default setting: No

Description:

Indicates the "Limit mechanical ageing" depending on the actuator type.

Dyn. Consumptionvar.

Can be read as of: User

Default setting: 0

Description:

0 – 100 % consumption of dynamic maintenance collective of the dynamic maintenance indication. This variable indicates the highest relative consumption with regard to the respective limit value of thermal ageing or mechanical ageing.

6.4 Faults

Torque tripping

User level: Specialist

Default setting: 0

Description:

Indicates the total number of trippings due to excess of permissible torque.

Torque warnings

User level: Specialist

Default setting: 0

Description:

Indicates the total number of torque warnings.

Thermal overload

Can be read as of: User

Default setting: 0

Description:

Indicates the number of trippings due to excessive motor temperature.

Actuator start failures

Can be read as of: User

Default setting: 0

Description:

Indicates how often the actuator has not detected a position change within the Dead time limit monitoring [▶ 66] in spite of motor control.

6.5 System data

Up time electronic

Can be read as of: User

Default setting: 0

Description:

Indicates the duration of electronics power supply.

Number of power-on

Can be read as of: User

Default setting: 0

Description:

Indicates the number of system reset.

Electronics overtemp.

Can be read as of: User

Default setting: 0 min

Description:

Indicates the time of electronics temperature excess with regards to the admissible limit.

7 Actual values/diagnosis

7.1 Pending faults

Can be read as of: User

Default setting:

Description:

This parameter includes the list of pending failures indicated in the display as soon as they occur.

7.2 Error stack

Error t-X [0 – 9]

Can be read as of: User

Default setting: None

Description:

Indicates the causes of the last 10 errors.

Time t-X [0 – 9]

Can be read as of: User

Default setting: 0

Description:

Indicates the time at which the fault occurred.

7.3 Process data

Operation mode

Can be read as of: User

Default setting: OFF

Description:

Displays the active operation mode.

Actual position

Can be read as of: User

Default setting: 0.0

Description:

Indicates the current position in the selected unit under Position unit [▶ 57].

Setpoint position

Can be read as of: User

Default setting: 0

Description:

Indicates the current setpoint in the selected unit under Position unit [▶ 57].

Torque

Can be read as of: User

Default setting: 0

Description:

Indicates the current torque present under Position unit [▶ 57].

Fail safe

Can be read as of: User

Default setting: Disabled

Description:

Indicates information about the current status of the fail safe function.

Emerg. shutdown (ESD)

Can be read as of: User

Default setting: Disabled

Description:

Indicates the status of the currently applied command for emergency shutdown.

Enabled: External emergency shutdown is requested.

Disabled: External emergency shutdown is not requested.

7.4 Power supply

Phase sequence

Can be read as of: User

Default setting: Failure

Description:

Indicates the current status of phase sequence correction.

Phase 1

Can be read as of: User

Default setting: Failure

Description:

Indicates the state of phase L1. The indication is reset with the next operation or with a fault acknowledgement.

Phase 2

Can be read as of: User

Default setting: Failure

Description:

Indicates the state of phase L2. The indication is reset with the next operation or with a fault acknowledgement.

Phase 3

Can be read as of: User

Default setting: Failure

Description:

Indicates the state of phase L3. The indication is reset with the next operation or with a fault acknowledgement.

24V internal

Can be read as of: User

Default setting: Failure

Description:

Indicates the status of the internal 24 V supply.

24V external

Can be read as of: User

Default setting: Failure

Description:

Indicates the status of the external 24 V supply.

7.5 System

Electronic temperature

Can be read as of: User

Default setting: 0 °C

Description:

Indicates the electronics temperature. The first value describes the temperature of the display and the second value describes the mean value of the base board. Only the second value is displayed in the i matic explorer.

Sensor temperature

Can be read as of: User

Default setting: 0 °C

Description:

Indicates the current temperature of the detached sensor module (detached control unit). If no remote sensor module is connected the mean value of the temperature of the base board will be indicated.

NV memory failure

Can be read as of: User

Default setting: No

Description:

Indicates the status of the non-volatile memory.

EM6 Error code

Can be read as of: User

Default setting: 0

Description:

The actuator controls permanently check the combined sensor (EM6) during the automatically performed self-check. If errors are detected, the actuator controls activate signal 10, Encoder error. This parameter describes which kind of error was detected. The EM6 is checked in several steps which generate different error code groups.

EM6 error codes similar to that of local sensor:

1: Read error of serial number from persistent sensor memory.
2: Read error of offset of angle from persistent sensor memory.
3: Read error of correction factor for analogue values from persistent sensor memory.
4: Read error of logic values from persistent sensor memory.
5: Read error of torque value from persistent sensor memory.
6: Read error of limit positions (OPEN and CLOSED) from persistent sensor memory.
7: Read error of checksum flag from persistent sensor memory.
8: Read error of calibrated values from persistent sensor memory.

9: Request error of EEPROM access.
10: Access error of persistent memory.
11: Internal error. An invalid function argument has been provided.
12: The EM6 reference values of the sensor are out of the tolerance.

41: Timeout during communication to EM6.

Blinking code of CAL light emitting diode on iMC06 sub-assembly Z119.105:
IMC06 – Combined sensor communication board within the actuator for detached actuator controls.

Code Major 1
Code Minor X
Signification: Value according to listing in EM6 error code.

Code Major 2
Code Minor 1
Signification: Torque calibration in the sensor is not available or was deleted.

Code Major 2
Code Minor 2
Signification: Limit/end position calibration in the sensor is not available or was deleted.

IMC16 – Detached limit switch/potentiometer sensor on CAN interface

51: Error limit switch pair. Both final position OPEN and final position CLOSED are indicated simultaneously.
52: Error torque switch pair. Both torque OPEN and torque CLOSED are indicated simultaneously.
53: Line break potentiometer. Potentiometer wiper resistance is too high.
54: Short circuit potentiometer. Potentiometer wiper resistance is too low.
55: Resolution of potentiometer is too low. The stroke between end positions OPEN and CLOSED is too low.

Blinking codes of CAL light emitting diode on sub-assembly iMC16 Z121.784:

Code Major 1
Code Minor 1
Signification: Error limit switch pair. Both final position OPEN and final position CLOSED are indicated simultaneously.

Code Major 1
Code Minor 2
Signification: Error torque switch pair. Both torque OPEN and torque CLOSED are indicated simultaneously.

Code Major 2
Code Minor 1
Signification: Line break potentiometer. Potentiometer wiper resistance is too high.

Code Major 2
Code Minor 2
Signification: Short circuit potentiometer. Potentiometer wiper resistance is too low.

Code Major 3
Code Minor 1
Signification: Resolution of potentiometer is too low. The stroke between end positions OPEN and CLOSED is too low.

HW interface failure

Can be read as of: User

Default setting: No

Description:

Indicates whether additional board is placed and can be perfectly accessed.

System test error code

Can be read as of: User

Default setting: 0

Description:

Display the error detected during self-test.

Depending on the type of error, the system generates a reset and after power up assumes the state failsafe or just activates the indication.

0 - (0x00) - no error detected
1 - (0x01) - error during master routine
2 - (0x02) - watchdog (hardware) was tripped
3 - (0x03) - watchdog (software) was tripped
8 - (0x08) - stack overflow
9 - (0x09) - stack underflow
10 - (0x0A) - unrecoverable hardware error - controls perform reset until error no longer occurs!
17 - (0x11) - error during flash test routine
18 - (0x12) - error when reading flash start signature
19 - (0x13) - error when reading flash end signature
20 - (0x14) - error during checksum flash test

System test duration

Can be read as of: User

Default setting: 0 ms

Description:

Indicates in which time in milliseconds the last system test procedure was executed.

Discrepancy error code

Can be read as of: User

Default setting: 0

Description:

Indicates the error code describing the fault detected during discrepancy analysis of the power control unit. When an error is detected, actuator operation is no longer possible.

Error code can only be evaluated by the manufacturer.

7.6 Interface

7.6.1 Overview

Interface type

Can be read as of: User

Default setting: Relays

Description:

Information about the type of additional board.

Baud rate

Can be read as of: User

Description:

Indicates the actual transmission speed of the fieldbus interface.

Addresses

Can be read as of: User

Description:

Shows the current address of the actuator.

Data to host

Can be read as of: User

Description:

Displays the data of the telegram to the fieldbus master in hexadecimal numbers. See also supplementary operation instructions on fieldbus.

Data from host

Can be read as of: User

Description:

Displays the data of the telegram from the fieldbus master in hexadecimal numbers. See also supplementary operation instructions on fieldbus.

7.6.2 HART

7.6.2.1 Version

APP FW-Version

Can be read as of: User

Default setting: Vx.xx.xxxx

Description:

Firmware version of the application of the HART sub-assembly.

IAP FW-Version

Can be read as of: User

Default setting: Vx.xx.xxxx

Description:

Firmware version of the STM application (In application program IAP) of HART sub-assembly.

Stack FW-Version

Can be read as of: User

Default setting: Vx.xx.xxxx

Description:

Firmware version of HART stack.

7.6.2.2 Device Identification

Manufacturer ID

Can be read as of: User

Default setting: 24700

Description:

Indicates the company that produces the device. Manufacturer IDs are assigned by the HART Communication Foundation. Only the designated manufacturer may use this ID.

Device ID

Can be read as of: User

Default setting: 0

Description:

Defines an unambiguous number for a specific field device. This number must be different for every device produced with a given Device Type.

Expanded Device Type

Can be read as of: User

Default setting: 58037

Description:

Describes the device type (e.g. the product name). The parameter “Expanded Device Type” indicates the set of commands and data items supported by the field device. This value will be set from the HART Communication Foundation per device.

Device Conn. Type

Can be read as of: User

Default setting: Actuator

Description:

Defines the device connection type of the actuator. As standard the DREHMO actuator is assigned the type: Actuator.

The following type exists:

0 = Not defined
1 = Current Input
2 = Current Output
3 = Voltage Input
4 = Voltage Output
5 = Secondary
6 = Transmitter
7 = Actuator
8 = Non-DC Isolated Bus Device
9 = DC Isolated Bus Device

Wireless HART Adapter

Can be read as of: User

Default setting: Disabled

Description:

If the parameter “WirelessHART adapter” is set to value 0 (disabled), the power supply of 24 V for the wireless adapter will be interrupted. If the system is ready for operation, the power will be supplied.

CurrentOut Resistor

Can be read as of: User

Default setting: Disabled

Description:

If the parameter “Current output resistor” has the value 0 (disabled) the additional resistor is disabled by the switch S2 on the HART module. Otherwise, it is enabled.

Device Revision Level

Can be read as of: User

Default setting: 1

Description:

The number defines the revision level of commands and data items of a certain device type.

Software Revision Level

Can be read as of: User

Default setting: 1

Description:

The number defines the revision level for the firmware in the field device. An increment of the revision number must occur for every released version of the field device's firmware.

Hardware Revision Level

Can be read as of: User

Default setting: 1

Description:

The number defines the revision level of the hardware in the field device.

Protocol Major Rev. Nr.

Can be read as of: User

Default setting: 7

Description:

The HART stack is compatible with the protocol revision 7.4 (Major Revision 7).

7.6.2.3 Plant Identification

Date Code

Can be read as of: User

Default setting: 1900-01-01

Description:

Describes a date code, which can only be written by the DCS.

Descriptor

Can be read as of: User

Default setting: ??????????????

Description:

Describes a 16 Byte Device Description value in ASCII format. 12 byte ASCII packed format are transmitted via HART.

7.6.2.4 Communication State

Current Flow

Can be read as of: User

Default setting: No Impedance

Description:

Signals if a current source (low Impedance) is connected as Actuator connection type or if current destination (high Impedance) is connected as Current Output connection type. If no current signal is detected, the value 0 (no impedance) is signalled.

Config. Change Counter

Can be read as of: User

Default setting: 0

Description:

The Configuration Change Counter must be incremented once for every command received that changes the device configuration. The counter must also be incremented once for every user action that changes the device's configuration or calibration (e.g., from local operator interface). This value is never reset and must be maintained even if power supply is removed from the device or a device reset is performed.

Config. Changed Bit PM

Can be read as of: User

Default setting: 0

Description:

If Configuration Change Counter has been incremented, then the Configuration Changed bits for Primary Master (PM) and the Secondary Master (SM) will be set.

Config. Changed Bit SM

Can be read as of: User

Default setting: 0

Description:

If Configuration Change Counter has been incremented, then the Configuration Changed bits for Primary Master (PM) and the Secondary Master (SM) will be set.

7.6.3 Foundation Fieldbus

7.6.3.1 Device Identification

Device ID

Can be read as of: User

Default setting:

Description:

The device ID is set during the start of the FF module and will not be changed afterwards. After the start, the Device ID is transmitted once via the application interface from the FF module to the device.

Module FW-Version

Can be read as of: User

Default setting: FF-Vx.xx AP-x.xx.xx

Description:

The FW version of the FF module is fixed. When starting the FF module, the FW version for the FF-H1 stack and the application is transmitted to the device.

Module HW-Version

Can be read as of: User

Default setting: FF-Vx.xx AP-x.xx.xx

Description:

The HW version is stored in the security EEPROM on the FF module. When starting the FF module, the function is called by the FF module application and transmitted via the application interface to the device.

Compatibility Rev

Can be read as of: User

Default setting: 1

Description:

The Compatibility revision parameter indicates the lowest device version. The replacement device may be equipped with this or any higher revision in order to ensure compatibility within the FF-H1 network. Example: DEV_TYPE = 0x0007, DEV_REV = 0x03, COMPATIBILITY_REV = 0x02 → means that the device can only be used in Revision 0x03 or 0x02.

7.6.3.2 Communication State

Active Channel

Can be read as of: User

Default setting: No channel

Description:

Displays the active channel which communicates with the DCS.

Data Exchange 1

Can be read as of: User

Default setting: FALSE

Description:

A valid data exchange occurs between the corresponding stack and the device.

Data Exchange 2

Can be read as of: User

Default setting: FALSE

Description:

A valid data exchange occurs between the corresponding stack and the device.

Bus Activity 1

Can be read as of: User

Default setting: FALSE

Description:

The purpose of the Bus activity information is whether the electrical wiring is ready to communicate via fieldbus cables.

Bus Activity 2

Can be read as of: User

Default setting: FALSE

Description:

The purpose of the Bus activity information is whether the electrical wiring is ready to communicate via fieldbus cables.

Bus State

Can be read as of: User

Default setting: Undefined

Description:

Indicates whether the electric wiring is OK.

Station Mode

Can be read as of: User

Default setting: Undefined

Description:

Indicates the current type of FF. Any change of Station mode is transmitted by the FF module via the application interface to the device.

Live List 1

Can be read as of: User

Default setting:

Description:

Displays the available devices within the Foundation Fieldbus system (only possible if the local FF interface sub-assembly is operated as LM). The Live List is only valid if the FF module operates as Link Master. The Live List is transmitted as U8 [32] on the application interface to the device. At start-up the live list is transmitted once, otherwise only in case of changes.
Node Address = 0 corresponds to live_list_buffer [0] = 0x80
Node Address = 7 corresponds to live_list_buffer [0] = 0x01, etc.

Live List 2

Can be read as of: User

Default setting:

Description:

Displays the available devices within the Foundation Fieldbus system (only possible if the local FF interface sub-assembly is operated as LM). The Live List is only valid if the FF module operates as Link Master. The Live List is transmitted as U8 [32] on the application interface to the device. At start-up the live list is transmitted once, otherwise only in case of changes.
Node Address = 0 corresponds to live_list_buffer [0] = 0x80
Node Address = 7 corresponds to live_list_buffer [0] = 0x01, etc.

Live List 3

Can be read as of: User

Default setting:

Description:

Displays the available devices within the Foundation Fieldbus system (only possible if the local FF interface sub-assembly is operated as LM). The Live List is only valid if the FF module operates as Link Master. The Live List is transmitted as U8 [32] on the application interface to the device. At start-up the live list is transmitted once, otherwise only in case of changes.
Node Address = 0 corresponds to live_list_buffer [0] = 0x80
Node Address = 7 corresponds to live_list_buffer [0] = 0x01, etc.

Live List 4

Can be read as of: User

Default setting:

Description:

Displays the available devices within the Foundation Fieldbus system (only possible if the local FF interface sub-assembly is operated as LM). The Live List is only valid if the FF module operates as Link Master. The Live List is transmitted as U8 [32] on the application interface to the device. At start-up the live list is transmitted once, otherwise only in case of changes.
Node Address = 0 corresponds to live_list_buffer [0] = 0x80
Node Address = 7 corresponds to live_list_buffer [0] = 0x01, etc.

Macrocycle

Can be read as of: User

Default setting: 0

Description:

When starting the FF module, the configured Macro Cycle is read from the FF-H1 stack once and transferred from the FF-module via the application interface. Any other changes to the Macro Cycle are transferred from the FF module via the application interface.

Schedule List

Can be read as of: User

Default setting:

Description:

The schedule list shows the running function blocks of the FBK2 (scheduled) on the device display. When starting, the FF module creates a list and transmits it via the application interface to the device. The list is subject to cyclic (500ms) updates and only changes will be transmitted. The Block IDs are used as an index in the list. Value "1" indicates block is within schedule. Value "0" means block is not within schedule. The Schedule list contains information about the schedule status (block within schedule/ block not within schedule) of 27 function blocks. Starting with DO1 in low byte and DO2 in high byte of Modbus Holding Reg., etc.

Simulation State

Can be read as of: User

Default setting: OFF

Description:

When starting, the FF module reads whether the Simulate mode on the FF module is active or not. The value SIMULATE_ON/SIMULATE_OFF is then transferred once from the FF module via the application interface to the device. Other transfers only occur when changes have been made. The simulate mode on the FF module is activated if the Simulate jumper is set on the FF module or the command CMD_SIMU-

LATE_ON is transmitted via the application interface from the device to the FF module. A simulate mode activated by jumper cannot be deactivated with command CMD_SIMULATE_OFF.

XD_ERROR Positioner

Can be read as of: User

Default setting: NOERR

Description:

Indicates an error in Positioner TB.

XD_ERREXT Positioner

Can be read as of: User

Default setting: NOERR

Description:

Indicates the exact error description once an error occurs.

7.6.3.3 Block Modes

Block Select

User level: User

Default setting: RB

Description:

Block selection of indicating the block mode: Target/Actual.

Block Mode Target

Can be read as of: User

Default setting: MODE_OOS

Description:

Block mode target of the currently selected block (Block Select).

Block Mode Actual

Can be read as of: User

Default setting: MODE_OOS

Description:

Actual block mode of the currently selected block (Block Select).

7.6.3.4 TB_Channels

TB_DO Select

User level: User

Default setting: CFG_OUT1

Description:

Selection of a Digital Output Block.

TB_DO CFG_OUT

Can be read as of: User

Default setting: Not used

Description:
Configurable channel of the Digital Output TB.

TB_DI Select

User level: User
Default setting: CFG_IN1
Description:
Selection of a Digital Input Block.

TB_DI CFG_IN

Can be read as of: User
Default setting: Not used
Description:
Configurable channel of the Digital Input TB.

TB_AO Select

User level: User
Default setting: CFG_AOUT1
Description:
Selection of an Analog Output Block.

TB_AO CFG_AOUT

Can be read as of: User
Default setting: Fieldbus setpoint position
Description:
Configurable channel of the Analog Output TB.

TB_AI Select

User level: User
Default setting: CFG_AIN1
Description:
Selection of an Analog Input Block.

TB_AI CFG_AIN

Can be read as of: User
Default setting: Actual position
Description:
Configurable channel of the Analog Input TB.

7.6.3.5 FB_Channels

FB_DO Select

User level: User
Default setting: DO_1
Description:
Selection of a Digital Output Block.

FB_DO Channel

Can be read as of: User

Default setting: Ch not used

Description:

Assignment of the channel of a selected DO FB.

FB_DI Select

User level: User

Default setting: DI_1

Description:

Selection of a Digital Input Block.

FB_DI Channel

Can be read as of: User

Default setting: Ch not used

Description:

Assignment of the channel of a selected DI FB.

FB_AO Select

User level: User

Default setting: AO_1

Description:

Selection of an Analog Output Block.

FB_AO Channel

Can be read as of: User

Default setting: Ch not used

Description:

Assignment of the channel of a selected AO FB.

FB_AI Select

User level: User

Default setting: AI_1

Description:

Selection of an Analog Input Block.

FB_AI Channel

Can be read as of: User

Default setting: Ch not used

Description:

Assignment of the channel of a selected AI FB.

7.6.3.6 Other Signals

Testsignal DigOut

Can be read as of: User

Default setting: FALSE

Description:

Test signal for testing digital output signals.

Testsignal DigIn

User level: Maintenance staff

Default setting: FALSE

Description:

Test signal for digital input signals.

Testsignal AnaOut

Can be read as of: User

Default setting: 0000.0

Description:

Test signal for analogue output signals.

Testsignal AnaIn

User level: Maintenance staff

Default setting: 0000.0

Description:

Test signal for analogue input signals.

7.6.4 Profibus

Bus profile

Can be read as of: User

Default setting: DP-V1

Description:

Indicates the services available when equipped with a Profibus interface. Definition using the device key.

Param. Error code

Can be read as of: User

Default setting: 0

Description:

Provides a coded output of a fault for further diagnostics. The following error codes could occur:

0: No error occurred.
1: An invalid bit in one of the 3 DP-V1 bytes of the parameter telegram is set.
2: Invalid length of parametrisation telegram.
3: PRM_CMD part for DP-V2 redundancy parametrisation is invalid.
4: The PRM_CMD part has an invalid length or the actuator has no DP-V2 functionality.
5: The TIME_AR part for the parametrisation of time-stamp and distribution is invalid.
6: The TIME_AR part for the timestamp and distribution parameter has an invalid length or the actuator has no DP-V2 functionality.
8: The D_DEVICE part for F-Device parameter has an invalid length or the actuator has no Profisafe functionality.
9: Within the extended parametrisation, one block exists with unsupported block ID.
10: Within the expanded parameters the length of the blocks are inconsistent.

7.6.5 Modbus

Bus profile

Can be read as of: User

Default setting: Redundant

Description:

Defines whether the actuator is equipped with one or two transmission channels. Definition via the device key.

7.6.6 I/O interface

Extension relays

Can be read as of: User

Default setting: 4 latching relays

Description:

Indicates whether and which additional relays are equipped on the relay board.

7.6.7 Profinet

Status

Can be read as of: User

Default setting:

Description:

Provides information on the status.

Device Name

Can be read as of: User

Default setting:

Description:

Indicates the device name.

IP address

Can be read as of: User

Default setting: 0.0.0.0

Description:

Indicates the IP address.

Subnet mask

Can be read as of: User

Default setting: 0.0.0.0

Description:

Indicates the subnet mask.

Gateway

Can be read as of: User

Default setting: 0.0.0.0

Description:

Gateway

MAC address module

Can be read as of: User

Default setting: A0-D3-85-00-00-01

Description:

Indicates the MAC address of the module.

MAC address port 1

Can be read as of: User

Default setting: A0-D3-85-00-00-02

Description:

Indicates the MAC address of port 1.

MAC address port 2

Can be read as of: User

Default setting: A0-D3-85-00-00-03

Description:

Indicates the MAC address of port 2.

7.7 Battery Backup

State

Can be read as of: User

Default setting: not present

Description:

Indicates the status of the internal actuator accumulator. The battery pack must be enabled by software to allow collecting information.

Temperature

Can be read as of: User

Default setting: unknown

Description:

Indicates the temperature of the internal accumulator pack.

- Charge/discharge range: 0 – 45 °C electronic temperature
- Discharge range: -30 – 60 °C electronic temperature
- Overtemperature/undertemperature: outside the discharge range

7.8 Torque curves

During each actuator operation from OPEN to CLOSED or CLOSED to OPEN, the actuator controls store the torque curves including the recorded run time. This information can be transferred to the non-volatile curve memory 0 to 4. Each curve memory can be assigned an individual name. The torque curves can be read out and displayed using a parametrisation and diagnostic tool.

7.8.1 Curve X [0 – 4]

Curve 0 → curve X [0 – 4]

User level: Maintenance staff

Default setting: -/-

Description:

Stores the last recorded torque curve as curve X [0 – 4].

Show

User level: Maintenance staff

Description:

Allows display of corresponding torque curve.

Description of curve X [0 – 4]

User level: Maintenance staff

Default setting: Default 0

Description:

Descriptive test for curve x.

T CLOSE_OPEN - X [0 – 4]

Can be read as of: User

Description:

Time stamp of curve X [0 – 4] from CLOSE to OPEN.

T OPEN_CLOSE - X [0 – 4]

Can be read as of: User

Description:

Time stamp of curve X [0 – 4] from OPEN to CLOSE.

7.9 Simulation

LED Test

User level: User

Default setting: Test LEDs

Description:

The five local lamps can be checked for functionality by using the buttons ARROW UP and ARROW DOWN. Use the ESC key to change the colour of the individual LEDs. Quit the test using the ENTER button.

Simulate alarm

User level: Specialist

Default setting: 0

Description:

This parameter can be used to simulate alarm signals for the DCS. The available alarms are:

2: Torque OPEN
3: Torque CLOSE
6: Torque bypass

7: Thermal overload tripping
8: HW fault
9: Encoder failure
10: Phase1, phase 2 or phase 3 failure
11: Phase correction failure
13: 24 V internal failure
14: 24 V external failure
15: Collective failure 1
16: Collective failure 2
17: End position OPEN
18: End position CLOSED
19: Mode not REMOTE

8 Parameters

8.1 Power supply

Phase correction

User level: Maintenance staff

Default setting: Enabled

Description:

Defines the detection of the rotary field of the connected power system. If set to “Activated”, the rotary field is continuously checked.

Phase monitoring

User level: Maintenance staff

Default setting: Disabled

Description:

If the phase failure monitoring is activated, this leads to actuator cut-off and the respective signal is issued. The signal is reset depending on the configuration, as soon as the phase is restored (enabled non-latching) and remains active until an operation command is executed or an acknowledgement is made (enabled latching).

Phase monitoring delay

User level: Maintenance staff

Default setting: 1 s

Description:

Defines the delay time with which a phase failure is signalled.

Indication range mains failure

User level: Maintenance staff

Default setting: Extended

Description:

Filtered: Only the mains power failure is signalled. Motor temperature and phase 1 – 3 faults as well as internal 24 V DC faults are suppressed.

Extended: Mains failure signals compatible to firmware versions up to V 2.02.0016. Motor temperature, phase 1 – 3 fault and int. 24 V DC faults are signalled independent of each other, depending on the status of the signal source.

8.2 Display unit

8.2.1 Language

Language

User level: User

Default setting: German

Description:

Sets the selected display language.

Loaded language

User level: User

Default setting: German

Description:

Selects a language out of a list of available languages.

8.2.2 Date and Time

RTC Enabled

User level: Maintenance staff

Default setting: Enabled

Description:

Activation and deactivation of the real time clock.

Time

User level: User

Default setting: 12:00

Description:

Setting the system time.

Date

User level: User

Default setting: 01.01.2015

Description:

Setting the current date.

DST

User level: User

Default setting: Automatic

Description:

Automatic selection between summer time and winter time.

Time zone GMT

User level: User

Default setting: 1

Description:

Time zone for selection between summer and winter time.

Time format

User level: User

Default setting: 24 h

Description:

Time format can be switched from 12 h to 24 h.

Date format

User level: User

Default setting: YYYY-MM-DD

Description:

Selection of the date format (DD-MM-YYYY/YYYY-MM-DD/MM-DD-YYYY).

Show date/time

User level: User

Default setting: Enabled

Description:

Indication of time and date on the display are enabled or disabled with this parameter.

Time sync. fieldbus

User level: User

Default setting: Disabled

Description:

This parameter defines whether actuator controls accept a default time via a fieldbus and thus overwrites the current system time.

8.2.3 LEDs

The LED colour can be parametrised. 8 colours are available: blue, green, red, orange, cyan, pink and white.

Running indication

User level: Maintenance staff

Default setting: directional flashing

Description:

This parameter sets the indication behaviour of the indication lights during motor operation.

Position indication

User level: Maintenance staff

Default setting: Final positions

Description:

This parameter sets the indication behaviour of outer indication lights in final positions and intermediate positions.

Colour LED OPEN

User level: Maintenance staff

Default setting: Green

Description:

Selection of the LED colour for signalling end position OPEN.

Colour LED Torque OPEN

User level: Maintenance staff

Default setting: Orange

Description:

Selection of the LED colour for signalling the torque in direction OPEN.

Colour LED Fault

User level: Maintenance staff

Default setting: Red

Description:

Selection of the LED colour for signalling a failure.

Colour LED Torque CLOSE

User level: Maintenance staff

Default setting: Orange

Description:

Selection of the LED colour for signalling the torque in direction CLOSE.

Colour LED CLOSE

User level: Maintenance staff

Default setting: Yellow

Description:

Selection of the LED colour for signalling end position CLOSED.

8.2.4 View

Position output

User level: Maintenance staff

Default setting: Over-/underflow

Description:

Defines how the position is displayed:

- Overflow/underflow: The position value is displayed beyond the value range defined between low scale value (end position OPEN) and high scale value (end position CLOSED) under Data logging.
- Limited: The position value is limited to the value range between OPEN and CLOSED.

LCD backlight delay

User level: User

Default setting: 30 s

Description:

Setting when the time for LCD illumination to be switched off following the last key operation.

Orientation

User level: Maintenance staff

Default setting: Normal

Description:

Specifies if the display content is shown in standard position or rotated by 180°.

8.2.5 Usage

Lock display unit

User level: Maintenance staff

Default setting: Ignore signal

Description:

Defines how the “Enable LOCAL” command from REMOTE works:

- Completely disable: Will only process key operations if the command is activated (identical effect to using a padlock in the Enter key).
- Disable local operation: Allows for full menu operation. Only disables the motor operation.
- Ignore signal: identical effect to not having a command input configured with the “Enable LOCAL” command.

Auto keylock

User level: Maintenance staff

Default setting: 0 s

Description:

Allows for an automatic locking of keys following the preset time in seconds.

PC interface

User level: Maintenance staff

Default setting: Enabled

Description:

Can be used to disable the infrared or Bluetooth interface.

PC interf. timeout

User level: Maintenance staff

Default setting: 0 min

Description:

Automatically deactivates the PC interface after the set time in minutes. A value of 0 disables the function.

Bluetooth PIN

User level: Maintenance staff

Default setting: 0

Description:

This parameter is used for setting the four-digit PIN of the optionally available Bluetooth interface. The PIN is used for authentication of the actuator during establishing the connection with the master.

Bluetooth name

User level: Maintenance staff

Default setting: Serial number

Description:

Configure the parameter used for the unambiguous identification of the actuator with regard to the Bluetooth interface.

Automatic logout

User level: Maintenance staff

Default setting: Disabled

Description:

Defines whether and how an automatic logout is accomplished.

Logout delay time

User level: Maintenance staff

Default setting: 10 min

Description:

If an automatic logout shall occur after a certain time, the automatic logout is performed according to the preset time.

Maintain mode LOCAL

User level: Maintenance staff

Default setting: Disabled

Description:

Push-to-run operation or self-retaining of local commands using the buttons OPEN and CLOSE.

8.3 Data logging

Torque unit

User level: Maintenance staff

Default setting: Nm

Description:

Indicates the unit for the actuator torque.

Output Torque

User level: Maintenance staff

Default setting: Current value

Description:

Defines how the displayed torque value is formed.

- Current value: The current torque is output. When using slow fieldbus or DCS systems, peaks of the torque might not be detected.
- Maximum value: Outputs the maximum torque of the last movement. A new movement resets the value of the torque. The maximum value calculation for output will be restarted.
- Max. value wo. fin. pos.: Is identical to “maximum value”, except that the value of the torque within the range of the final positions is not taken into account.
- Trend value: It is a floating maximum value output determination with dead time. Torque peak values are kept at the output for a short period of time (approx. 300 ms). We recommend this function for slow DCS systems.

High scale value

User level: Maintenance staff

Default setting: 100

Description:

Indicates which value corresponds to the end position OPEN. Unit according to Position unit [▶ 57]

Low scale value

User level: Maintenance staff

Default setting: 0

Description:

Indicates which value corresponds to the end position CLOSED. Unit according to Position unit [▶ 57]

Position unit

User level: Maintenance staff

Default setting: %

Description:

Sets the unit for position in the local display. When changing the unit, the position values (final and initial position values) are not automatically converted but must be adapted by the user.

Decimal position

User level: Maintenance staff

Default setting: 1

Description:

Indicates the number of digits after the decimal point in the local display for current position values.

8.4 Operation data logging

8.4.1 Event report

Operation commands

User level: Maintenance staff

Default setting: Ignore

Description:

Indicates whether operation commands are included within the event report. Risk of increased write cycles.

8.5 Valve

8.5.1 Basic settings

Closing direction

User level: Maintenance staff

Default setting: Clockwise CW

Description:

Output drive direction of rotation for closing valve.

Seating mode

User level: Maintenance staff

Default setting: Final position limit sw.

Description:

Indicates which conditions must be fulfilled for actuator end position seating.

Limit to max. Torque

User level: Maintenance staff

Default setting: Enabled

Description:

Defines whether the actuator monitors the delay time for the torque in spite of exceeding the maximum torque or whether stall torque operation is made.

Tripping torque CLOSE

User level: Maintenance staff

Default setting: minimum actuator tripping torque (refer to min. tripping torque [▶ 15])

Description:

Maximum permissible torque for automatic actuator tripping.

Tripping torque OPEN

User level: Maintenance staff

Default setting: minimum actuator tripping torque (refer to min. tripping torque [▶ 15])

Description:

Maximum permissible torque for automatic actuator tripping.

Delay torque monitoring

User level: Maintenance staff

Default setting: 0 ms

Description:

Time during which an actuator ignores a torque excess to filter peaks.

Torque warning CLOSE

User level: Maintenance staff

Default setting: maximum actuator tripping torque (refer to max. tripping torque [▶ 15])

Description:

Torque value for which a torque warning is issued when exceeded.

Torque warning OPEN

User level: Maintenance staff

Default setting: maximum actuator tripping torque (refer to max. tripping torque [▶ 15])

Description:

Torque value for which a torque warning is issued when exceeded.

Tolerance pos. OPEN

User level: Maintenance staff

Default setting: 0.5 %

Description:

The end position signal is only reset once the tolerance is left. When using the internal 2-point position controller, this parameter indicates which range of end position OPEN will be interpreted as end position. When reaching the range, the actuator runs to the end position. It will only leave the end position if the setpoint point positions is outside the range enlarged by parameter Xp.

Tolerance pos. CLOSE

User level: Maintenance staff

Default setting: 0.5 %

Description:

The end position signal is only reset once the tolerance is left. When using the internal 2-point position controller, this parameter indicates which range of end position CLOSED will be interpreted as end position. When reaching the range, the actuator runs to the end position. It will only leave the end position if the setpoint point positions is outside the range enlarged by parameter Xp.

8.5.2 Starting-up aids

Torque bypass end pos.

User level: Maintenance staff

Default setting: Disabled

Description:

Activation of a starting-up aid for leaving the respective final position. For activated starting up aid, the actuator can start up in stall torque. The permissible exceeding of the tripping torque will be terminated at the end of the monitoring time - defined via the parameter “Delay time final pos.” - or when leaving the final position.

Delay time final pos.

User level: Maintenance staff

Default setting: 3,000 ms

Description:

Time during which the actuator can operate at stall torque to leave the final positions.

Torque byp. interm. pos.

User level: Maintenance staff

Default setting: Disabled

Description:

Activation of a starting up aid between the end positions. For activated starting up aid, the actuator can start up in stall torque. The permissible exceeding of the tripping torque will be terminated at the end of the monitoring time - defined via the parameter “Dead time interm. pos.”.

Delay time interm. pos.

User level: Maintenance staff

Default setting: 400 ms

Description:

Time during which the actuator can operate at stall torque to approach the range between the final positions.

8.5.3 Intermediate positions

Up to 8 intermediate positions can be defined. For each intermediate position there is one operation command and one signal each. For each intermediate position signal, the hysteresis and the signalling behaviour can be individually set. The existing parametrisation options are the basic requirement for the simple operation of multiport valves.

8.5.3.1 Pivot points

Intermediate position 1

User level: Maintenance staff
Default setting: 15
Description:
Position of intermediate position 1 in the position unit.

Intermediate position 2

User level: Maintenance staff
Default setting: 25
Description:
Position of intermediate position 2 in the position unit.

Intermediate position 3

User level: Maintenance staff
Default setting: 35
Description:
Position of intermediate position 3 in the position unit.

Intermediate position 4

User level: Maintenance staff
Default setting: 45
Description:
Position of intermediate position 4 in the position unit.

Intermediate position 5

User level: Maintenance staff
Default setting: 55
Description:
Position of intermediate position 5 in the position unit.

Intermediate position 6

User level: Maintenance staff
Default setting: 65
Description:
Position of intermediate position 6 in the position unit.

Intermediate position 7

User level: Maintenance staff
Default setting: 75
Description:
Position of intermediate position 7 in the position unit.

Intermediate position 8

User level: Maintenance staff
Default setting: 85

Description:
Position of intermediate position 8 in the position unit.

8.5.3.2 Hysteresis

Hysteresis 1
User level: Maintenance staff
Default setting: 0.5 %
Description:
Hysteresis for signalling intermediate position 1.

Hysteresis 2
User level: Maintenance staff
Default setting: 0.5 %
Description:
Hysteresis for signalling intermediate position 2.

Hysteresis 3
User level: Maintenance staff
Default setting: 0.5 %
Description:
Hysteresis for signalling intermediate position 3.

Hysteresis 4
User level: Maintenance staff
Default setting: 0.5 %
Description:
Hysteresis for signalling intermediate position 4.

Hysteresis 5
User level: Maintenance staff
Default setting: 0.5 %
Description:
Hysteresis for signalling intermediate position 5.

Hysteresis 6
User level: Maintenance staff
Default setting: 0.5 %
Description:
Hysteresis for signalling intermediate position 6.

Hysteresis 7
User level: Maintenance staff
Default setting: 0.5 %
Description:
Hysteresis for signalling intermediate position 7.

Hysteresis 8

User level: Maintenance staff

Default setting: 0.5 %

Description:

Hysteresis for signalling intermediate position 8.

8.5.3.3 Signal behaviour

Signal behaviour 1

User level: Maintenance staff

Default setting: No signal

Description:

Defines the signalling behaviour of intermediate position 1.

No signal:
Intermediate position is not signalled.

C____——O:
The signal of the intermediate position will be high in between the specified intermediate position and the end position OPEN.

C——____O:
The signal of the intermediate position will be high in between the specified intermediate position and the end position CLOSED.

C___—___O:
The signal of the intermediate position will be high in a range specified by the hysteresis around the specified intermediate position.

Signal behaviour 2

User level: Maintenance staff

Default setting: No signal

Description:

Defines the signalling behaviour of intermediate position 2.

No signal:
Intermediate position is not signalled.

C____——O:
The signal of the intermediate position will be high in between the specified intermediate position and the end position OPEN.

C——____O:
The signal of the intermediate position will be high in between the specified intermediate position and the end position CLOSED.

C___—___O:
The signal of the intermediate position will be high in a range specified by the hysteresis around the specified intermediate position.

Signal behaviour 3

User level: Maintenance staff

Default setting: No signal

Description:

Defines the signalling behaviour of intermediate position 3.

No signal:
Intermediate position is not signalled.

C____——O:
The signal of the intermediate position will be high in between the specified intermediate position and the end position OPEN.

C——____O:
The signal of the intermediate position will be high in between the specified intermediate position and the end position CLOSED.

C___—___O:
The signal of the intermediate position will be high in a range specified by the hysteresis around the specified intermediate position.

Signal behaviour 4

User level: Maintenance staff

Default setting: No signal

Description:

Defines the signalling behaviour of intermediate position 4.

No signal:
Intermediate position is not signalled.

C____——O:
The signal of the intermediate position will be high in between the specified intermediate position and the end position OPEN.

C——____O:
The signal of the intermediate position will be high in between the specified intermediate position and the end position CLOSED.

C___—___O:
The signal of the intermediate position will be high in a range specified by the hysteresis around the specified intermediate position.

Signal behaviour 5

User level: Maintenance staff

Default setting: No signal

Description:

Defines the signalling behaviour of intermediate position 5.

No signal:
Intermediate position is not signalled.

C____——O:
The signal of the intermediate position will be high in between the specified intermediate position and the end position OPEN.

C——____O:
The signal of the intermediate position will be high in between the specified intermediate position and the end position CLOSED.

C___—___O:
The signal of the intermediate position will be high in a range specified by the hysteresis around the specified intermediate position.

Signal behaviour 6

User level: Maintenance staff

Default setting: No signal

Description:

Defines the signalling behaviour of intermediate position 6.

No signal:
Intermediate position is not signalled.

C____——O:
The signal of the intermediate position will be high in between the specified intermediate position and the end position OPEN.

C——____O:
The signal of the intermediate position will be high in between the specified intermediate position and the end position CLOSED.

C___—___O:
The signal of the intermediate position will be high in a range specified by the hysteresis around the specified intermediate position.

Signal behaviour 7

User level: Maintenance staff

Default setting: No signal

Description:

Defines the signalling behaviour of intermediate position 7.

No signal:
Intermediate position is not signalled.

C____——O:
The signal of the intermediate position will be high in between the specified intermediate position and the end position OPEN.

C——____O:
The signal of the intermediate position will be high in between the specified intermediate position and the end position CLOSED.

C___—___O:
The signal of the intermediate position will be high in a range specified by the hysteresis around the specified intermediate position.

Signal behaviour 8

User level: Maintenance staff

Default setting: No signal

Description:

Defines the signalling behaviour of intermediate position 8.

No signal:
Intermediate position is not signalled.

C____——O:
The signal of the intermediate position will be high in between the specified intermediate position and the end position OPEN.

C——____O:
The signal of the intermediate position will be high in between the specified intermediate position and the end position CLOSED.

C___—___O:
The signal of the intermediate position will be high in a range specified by the hysteresis around the specified intermediate position.

8.5.4 Monitoring

Max. runtime torque cut off

User level: Maintenance staff

Default setting: 0 s

Description:

Within this time, the actuator must operate from the end position into the torque. Otherwise, a mechanical failure is assumed, the actuator stops and signals a failure.

Op-time survey CLOSE

User level: Maintenance staff

Default setting: 0 s

Description:

Setting the effect of a running time monitoring from end position OPEN to end position CLOSED. The current running time is compared with the time set here. If the current running time is longer than this value, the indication “Operating time monitoring” is activated. If this value is 0, the running time monitoring is disabled.

Op-time survey OPEN

User level: Maintenance staff

Default setting: 0 s

Description:

Setting the effect of a running time monitoring from end position CLOSED to end position OPEN. The current running time is compared with the time set here. If the current running time is longer than this value, the indication “Operating time monitoring” is activated. If this value is 0, the running time monitoring is disabled.

8.6 Actuator

Thermal failure reset

User level: Maintenance staff

Default setting: Automatic

Description:

A tripped motor protection requires the motor to cool down to a valid operating temperature range. A reset of the failure indication and thus a new motor run is possible by:

1. Automatic failure reset: “Automatic” parametrisation
2. An explicit required manual confirmation: Set parametrisation to “Manual”. A failure confirmation can be done at the local controls as well as from remote via the Acknowledge failure mechanism.

Thermal failure delay

User level: Maintenance staff

Default setting: 1 s

Description:

Time value available for delayed motor switch off in the event of excessive temperature and issue of the signal. The evaluation of the motor temperature is fed by an own transformer winding. Therefore, the actuator signals for external supply with 24 V DC an excessive motor temperature as soon as the motor supply voltage fails. To ignore this signal for shorter power failures, the parameter can be used as well.

Actuator run monitor.

User level: Maintenance staff

Default setting: Enabled

Description:

Switches the actuator auto-monitoring during start on or off. This signal is reset by a new operation command or acknowledgement.

Delay run monit.

User level: Maintenance staff

Default setting: 1,000 ms

Description:

Time after which a significant position change must have been made following a command to the power control unit. Otherwise, the “Actuator not starting” message will be issued.

Reversing delay

User level: Specialist

Default setting: 400 ms

Description:

Defines the waiting time in milliseconds between reversal of rotation direction.

Power unit

User level: Specialist

Default setting: Contactors or SSR

Description:

Determines the type of the deployed power control unit. Distinction is made between the type contactors for a normal reversing contactor or SSR for an electronic load relay. As an alternative, the option Ex SSR can be selected for all-pole disconnection solid state relay.

Battery Backup

User level: Specialist

Default setting: No

Description:

Indicates whether the actuator is equipped with a battery backup module. The battery backup module is able to supply the control unit for a certain time. If this parameter is activated, the battery backup module is monitored by the actuator controls. The status is displayed and an indication will be generated if the module fails.

Increased detachment

User level: Specialist

Default setting: Disabled

Description:

Activates the enhanced detachment of the actuator controls by decreasing the communication speed to the torque/position sensor.

8.7 DCS / PLC system

8.7.1 Emerg. shutdown (ESD)

Emerg. shutdown (ESD)

User level: Maintenance staff

Default setting: Disabled

Description:

Sets the action of this function. If this parameter is activated, the actuator runs to the parametrised end position.

Motor overtemperature

User level: Maintenance staff

Default setting: Respect

Description:

Indicates whether an excessive overheating of the motor results in motor cut-off in case of an emergency operation. For Ex actuators, the value “Respect" has to be specified for this parameter.

⚠WARNING

Parameter setting “Ignore” is not permissible for devices in potentially explosive atmospheres!

Death or serious injury as well as irreversible motor damage is possible.

→ Set parameter setting to “Respect”.

Torque indication

User level: Maintenance staff

Default setting: Respect

Description:

This parameter specifies the torque monitoring behaviour during an externally received emergency shutdown command during operation.

Respect: Torque monitoring is operating normal. In case of a torque tripping in intermediate positions the actuator will stop with a fault indication.

Ignore: Torque monitoring is disabled during external emergency shutdown request. The actuator will drive into the specified direction without monitoring the torque. This will result in an actuator movement with stall torque. If a torque end position tripping is specified in the respective direction, the actuator will not stop in end position. In this case the value “Respect in final positions” should be specified.

Respect in end positions: Torque monitoring in intermediate positions is disabled during emergency shutdown. The torque monitoring will be activated if the end position setting is reached.

LOCAL mode

User level: Maintenance staff

Default setting: Respect

Description:

Indicates whether an emergency shutdown is executed even if actuator is in LOCAL mode.

⚠WARNING

Motor start without local operation!

Personal or consequential damage may occur.

→ Set parameter setting to “Respect”.

NOTICE

For parameter setting “Ignore”, motor start without local operation is possible.

→ Disconnect actuator from mains to securely prevent motor start.

OFF mode

User level: Maintenance staff

Default setting: Respect

Description:

Indicates whether an emergency shutdown is executed even if the actuator is in OFF mode.

⚠WARNING

Motor start without local operation!

Personal or consequential damage may occur.

→ Set parameter setting to “Respect”.

NOTICE

For parameter setting “Ignore”, motor start without local operation is possible.

→ Disconnect actuator from mains to securely prevent motor start.

8.7.2 Fail safe

Reaction

User level: Maintenance staff

Default setting: Disabled

Description:

Indicates how the actuator reaction should be if either the setpoint (3.0 – 22 mA) or the fieldbus fail for a longer period than the Failure delay time.

Position modulating act.

User level: Maintenance staff

Default setting: 0.0

Description:

Indicates the fail safe position for an actuator with integral 3-point positioner in the position unit.

Position on-off actuator

User level: Maintenance staff

Default setting: 0% CLOSE

Description:

Indicates the fail safe end position for an actuator without integral 3-point positioner.

Breakdown delay

User level: Maintenance staff

Default setting: 1 s

Description:

Indicates the delay time after which the setting for fail safe becomes effective following fieldbus communication failure.

Tripping threshold

User level: Maintenance staff

Default setting: 2.0 mA

Description:

Determines the tripping threshold for the analogue setpoint signal. If falling below this threshold, the fail safe function is activated.

8.7.3 Collective fault 1 – 2

Failure of internal 24V

User level: Maintenance staff

Default setting: Enabled

Description:

Indicates whether the internal power of 24 V DC (generated from mains power L1, L2) is available. This signal only makes sense if the actuator has a supply with 24 V DC (externally or via battery backup) in addition to the motor power supply. Otherwise, the electronics will be dead for a failure of the internal 24 V and without function.

Failure of external 24V

User level: Maintenance staff

Default setting: Disabled

Description:

Indicates whether the external power of 24 V DC is available.

Phase failure

User level: Maintenance staff

Default setting: Enabled

Description:

Indicates whether a phase of the mains power is missing. The signal is reset depending on the configuration as soon as the phase is re-established. It remains active until the execution of an operation command or the issue of an acknowledgement. Phase 1 or phase 2 failure also generates a failure of the internal 24 V supply. In such a case, the signal can only be actively displayed if actuator controls are additionally supplied by means of an external 24 V DC supply or via battery backup.

Actuator not starting

User level: Maintenance staff

Default setting: Enabled

Description:

Is set if the time "Delay run monit." has elapsed during motor command without actuator position change. Is reset by a renewed operation command or acknowledgement.

Torque failure

User level: Maintenance staff

Default setting: Enabled

Description:

Represents an OR operation of both signals torque CLOSE and OPEN.

Torque CLOSE

User level: Maintenance staff

Default setting: Disabled

Description:

Indicates that an excessive torque in direction CLOSE has occurred. Reset possible by an operation command in the opposite direction or acknowledgement.

Torque OPEN

User level: Maintenance staff

Default setting: Disabled

Description:

Indicates that an excessive torque in direction OPEN has occurred. Reset possible by an operation command in the opposite direction or acknowledgement.

Torque warning

User level: Maintenance staff

Default setting: Disabled

Description:

Represents an OR operation of both signals torque warning CLOSE and OPEN.

Torque warning CLOSE

User level: Maintenance staff

Default setting: Disabled

Description:

Set if the current torque exceeds the torque warning level CLOSE. Is reset if an operation command is issued in opposite direction or on acknowledgement.

Torque warning OPEN

User level: Maintenance staff

Default setting: Disabled

Description:

Set if the current torque exceeds the torque warning level OPEN. Is reset if an operation command is issued in opposite direction or on acknowledgement.

Motor overtemperature

User level: Maintenance staff

Default setting: Enabled

Description:

Is activated if the motor winding temperature exceeds the permissible limit.

Discrepancy power unit

User level: Maintenance staff

Default setting: Enabled

Description:

Program the power control unit version for the actuator (refer to Power unit [▶ 66]). Depending on the parametrised power control unit, the control electronics will be autonomously monitored. Once irregularities are detected, a fault signal is generated.

EMERGENCY STOP

User level: Maintenance staff

Default setting: Enabled

Description:

Indicates the presence of an external EMERGENCY STOP signal.

OFF mode

User level: Maintenance staff

Default setting: Disabled

Description:

Indicates that the actuator is in OFF mode.

LOCAL mode

User level: Maintenance staff

Default setting: Disabled

Description:

Indicates that the actuator can be controlled in LOCAL mode.

Emerg. shutdown tripped

User level: Maintenance staff

Default setting: Disabled

Description:

Is set for the duration of the actuator ESD operation.

Fail safe

User level: Maintenance staff

Default setting: Enabled

Description:

Is active as long as the actuator is in fail safe mode.

Hardware failure

User level: Maintenance staff

Default setting: Enabled

Description:

Indicates that electronics detected defective hardware.

Comb.sensor failure

User level: Maintenance staff

Default setting: Enabled

Description:

Indicates that the combined sensor does not work anymore. This signal is indicated during active fault. Actuator controls try independently to remedy the error by neutralisation. Until successful failure remedy, the failure remains active and actuator operation is not possible.

Int. positioner disabled

User level: Maintenance staff

Default setting: Disabled

Description:

Indicates if the three-position controller of actuator type V005 is inactive – the AUTOMATIC command is not set.

Maintenance required

User level: Maintenance staff

Default setting: Disabled

Description:

Is an OR-operation from operation data if limit values are exceeded.

Mode not REMOTE

User level: Maintenance staff

Default setting: Disabled

Description:

Indicates that the actuator is not in operation mode REMOTE.

Configuration invalid

User level: Maintenance staff

Default setting: Disabled

Description:

Indicates, that at least one of the tripping torques exceeds the maximum permissible torque values of either additional components or valve.

Electronic overtemp.

User level: Maintenance staff

Default setting: Disabled

Description:

Indicates, that the electronics temperature is exceeding the permissible range.

Rot. dir. monitoring

User level: Maintenance staff

Default setting: Enabled

Description:

Indicates that the actuator’s direction of rotation is incorrect. This indication is reset by a renewed operation command or by acknowledgement.

Handwheel operation

User level: Maintenance staff

Default setting: Disabled

Description:

Indicates, that the actuator position is changing without the issue of a motor command. The indication is active until position change is complete.

Op-time survey

User level: Maintenance staff

Default setting: Disabled

Description:

Indicates, that the current running time exceeds one of the two values of "Op.time monit. CLOSE" or "Op.time monit. OPEN".

Battery backup malf.

User level: Maintenance staff

Default setting: Disabled

Description:

Indicates, that the internal accumulator cannot ensure electrical supply to electronics.

8.7.4 Control

Control mode

User level: Maintenance staff

Default setting: Inching operation

Description:

Setting how the control commands have to act from REMOTE. In push-to-run operation, the actuator operates during active command. In self-retaining, the actuator operates due to an operation edge until:

- reaching an end position
- an operation command in the opposite direction is issued
- a stop command is issued or
- the actuator is stopped because of a fault.

Maintain in end pos.

User level: Maintenance staff

Default setting: Enabled

Description:

Indicates if the actuator shall operate following reaching the end position in self-retaining until reaching the torque irrespective of the reception of an operation command. Makes only sense in combination with torque seating in at least one end position.

Remote priority

User level: Maintenance staff

Default setting: Add on board

Description:

Defines the interaction of the interface board and the binary inputs on the base board, in accordance with the device equipment.

- Additional board: Commands of the binary inputs are ignored
- Binary inputs: Commands of the additional board are ignored
- Equitable: The commands of the additional board are linked either logically or via OR operation with the binary inputs.

In the configuration "Equitable" a limited usage for the prioritisation of the setpoint value and therefore also for the fail safe exists. Once a binary input is configured as AUTOMATIC, the analogue input is binding, otherwise, the setpoint specification via fieldbus is binding (if available).

The priority of the commands is as follows:
Open-close actuator: ESD > STOP > operation commands
Modulating actuator: ESD > Automatic Bit > Automatic binary input > Automatic fieldbus > STOP > operation commands
In case of contradictory commands with same priority, the first activated command prevails!

Edge detection remote

User level: Maintenance staff

Default setting: Enabled

Description:

This parameter is relevant for the actuator behaviour in case of a change of the operation mode into REMOTE. If the parameter is set to “Activated”, a new actuator command from REMOTE must be initiated (edge behaviour), to initiate actuator operation. If the parameter is set to “Deactivated”, the actuator operation starts immediately when changing to REMOTE control mode in case an operation command is present.

Automatic Bit

User level: Maintenance staff

Default setting: According Remote

Description:

This parameter can be used to avoid the required automatic bit for the activation of the internal positioner. Instead of the usage of the automatic bit it is possible:

- to permanently enable the internal positioner: Force active, thus setpoint operation
- to permanently disable the internal positioner: Force inactive, thus operation via discrete commands OPEN, CLOSE.

8.7.5 Indications

Final position indication

User level: Maintenance staff

Default setting: Position

Description:

Sets the signalling of end positions:

- If set to POSITION: as soon as the actuator reaches the end position, the indication is activated if the limit positions are reached.
- If set to Acc. tripping mode: as soon as all conditions of the final position are reached.

Torque indication

User level: Maintenance staff

Default setting: Retained in final position

Description:

Indicates whether a torque excess within the end positions is to be signalled.

Torque fault

User level: Maintenance staff

Default setting: No ind. in final positions

Description:

Indicates whether torque excess within the end positions is to be signalled as fault or not.

8.7.6 Interface

8.7.6.1 HART

8.7.6.1.1 Plant Configuration

Identity Tag

User level: Maintenance staff

Default setting: ?

Description:

8 character label defined by the end user based on local conditions and field applications. The tag supports only the Packed ASCII character set.

Long Tag

User level: Maintenance staff

Default setting: DREHMO i-matic xxxxxxx

Description:

32-character label defined by the user based on position and application of the end device. The long tag supports ISO Latin-1 characters.

Message

User level: Maintenance staff

Default setting: ?

Description:

During commissioning, the configurator can write a message into the device for documentation purpose. The procedure is called “As-installed record keeping“.

Final Assembly No.

User level: Maintenance staff

Default setting: 0

Description:

The final assembly number is a 24-bit number (0 – 16,777,215) and is provided for device management within a plant.

8.7.6.1.2 Comm. Config

Polling Address

User level: Maintenance staff

Default setting: 0

Description:

Unambiguous identification of all HART participants. The address values are between 0 and 64.

Req. Msg. Preamble Len.

User level: Maintenance staff

Default setting: 5

Description:

Minimum number of preambles required for the request messages from master to slave.

Res. Msg. Preamble Len.

User level: Maintenance staff

Default setting: 5

Description:

Minimum number of Preambles required for the response messages from slave to master.

BusAct Timeout

User level: Maintenance staff

Default setting: 15 s

Description:

Configure the HART connection monitoring in a range from 1 to 3,600 sec. (default: 15 sec.).

Loop Current Mode

User level: Maintenance staff

Default setting: Enabled

Description:

With connection type Actuator and parameter value of Loop Current Mode = “Enabled” (default value), the actuator will be operated by the analogue 4 – 20 mA input signal. For the Loop Current Mode = “Deactivated”, the actuator is operated via the HART commands OPEN, CLOSE and SETPOINT.

8.7.6.1.3 Calibrat. values

AnaIn Current Zero

User level: Maintenance staff

Default setting: 4,000 µA

Description:

Reference value for 4 mA, required to calculate the loop current (calibration) from the physical input current.

AnaIn Current Span

User level: Maintenance staff

Default setting: 20,000 µA

Description:

Reference value for 20 mA, required to calculate the loop current (calibration) from the physical input current.

AnaOut Current Zero

User level: Maintenance staff

Default setting: 4,000 µA

Description:

Reference value for 4 mA required for correcting (calibration) the physical output current generated from the internal loop current.

AnaOut Current Span

User level: Maintenance staff

Default setting: 20,000 µA

Description:

Reference value for 20 mA required for correcting (calibration) the physical output current generated from the internal loop current.

AnaIn LRV

User level: Maintenance staff

Default setting: 0 %

Description:

This function allows to show any input current range for any setting range between –250 % and +250 % and/or to configure an inverse operation.

AnaIn URV

User level: Maintenance staff

Default setting: 100 %

Description:

This function allows to show any input current range for any setting range between –250 % and +250 % and/or to configure an inverse operation.

AnaOut LRV

User level: Maintenance staff

Default setting: 0 %

Description:

This function allows to show any output current range for any setting range between –250 % and +250 % and/or to configure an inverse operation.

AnaOut URV

User level: Maintenance staff

Default setting: 100 %

Description:

This function allows to show any output current range for any setting range between –250 % and +250 % and/or to configure an inverse operation.

8.7.6.2 Foundation Fieldbus

8.7.6.2.1 Device Ident

PD-TAG

User level: Maintenance staff

Default setting: DREHMO i-matic xxxxxxx

Description:

The FF module responds after first start via Default_PD_Tag at FF-H1 bus. During FF module commissioning, the PD_Tag from DCS can be modified. A modified PD_Tag via FF-H1 is transmitted by the FF module via the application interface. When starting the FF module, the persistently saved PD_Tag is read once from the base board and sent to the DCS.

Node Address

User level: Maintenance staff

Default setting: 248

Description:

On first FF module start, the default node address signs in at the FF-H1 bus. The change of the node address of the FF module is performed by the DCS. Changing the node address is transmitted to the device by the FF module via the application interface. When starting the FF module, the persistently saved node address is read once from the base board and sent to the DCS.

Config Rev

User level: Maintenance staff

Default setting: Rev_2

Description:

This parameter is used to select a new object directory with another function block sequence for the connection to an Emerson DCS. The reason is that not all function blocks can be displayed within an Emerson DCS due to missing resources. The Rev_1 value is used for older field devices (until end of 2014). Rev_2 values are used for recent devices and particularly with Emerson DCS.

8.7.6.2.2 TB_Channel Config

DigOut Other X [1 – 6]

User level: Maintenance staff

Default setting: Undefined

Description:

Foundation Fieldbus DigitalOut-TransducerBlock Channel configuration.

DigIn Other X [1 – 6]

User level: Maintenance staff

Default setting: Undefined

Description:

Foundation Fieldbus DigitalIn-TransducerBlock Channel configuration.

AnaOut Other X [1 – 2]

User level: Maintenance staff

Default setting: Undefined

Description:

Foundation Fieldbus AnalogOut-TransducerBlock Channel configuration.

AnaIn Other X [1 – 4]

User level: Maintenance staff

Default setting: Undefined

Description:

Foundation Fieldbus AnalogIn-TransducerBlock Channel configuration.

8.7.6.2.3 Commands

Delete NVRAM

User level: Maintenance staff

Default setting: OFF

Description:

NV RAM on the FF module can be deleted via the application interface with the command CMD_DELETE_NVRAM. The FF module confirms the command by writing the result in DEV_COMMAND_RESULT. Then the CONFIG_REVISION is incremented in NV RAM and the FF module is restarted. On reboot, the NV RAM is reinitialised with default values.

Simulation Mode

User level: Maintenance staff

Default setting: OFF

Description:

Sets the simulation mode in the module.

Reset Modul

User level: Maintenance staff

Default setting: OFF

Description:

The FF module (FBK 2) initiates a reboot.

Redundancy Mode

User level: Maintenance staff

Default setting: No Redundancy

Description:

Activates or deactivates redundancy.

8.7.6.3 Profibus

Primary slave address

User level: Maintenance staff

Default setting: 126

Description:

Sets the valid primary fieldbus address within a range of 2 to 125.

Sec. slave address

User level: Maintenance staff

Default setting: 126

Description:

Sets the valid secondary fieldbus address within a range of 2 to 125.

PNO-Ident number

User level: Maintenance staff

Default setting: i-matic (0824/0825)

Description:

Setting for the Profibus emulation mode. During standard operation this value should be kept at the PNO certified setting "i-matic (0824/0825)".

Redundancy reply

User level: Maintenance staff

Default setting: Active channel

Description:

Defines whether for devices with cable redundancy, the response is transmitted on both or only on the active channel.

Redundancy type

User level: Maintenance staff

Default setting: DREHMO

Description:

Specifies the redundancy type used for master slave redundancy boards.

DREHMO:
The interface sub-assembly behaves as 2-channel, fully autonomously implemented slave, i.e. two independent Profibus slaves are active within the device. Selection of the primary channel is internal, depending on which channel has been configured by the master first. In case of communication loss of the primary channel, an automatic change-over to the backup channel is made. The slave addresses of both channels can be set independently of each other.

DP-V2:
The board acts as a system-redundant interface according to PNO specification 2212. The Profibus address of both channel can be set independently for both channels within a range of 2 to 125. According to specification, the setting should be identical.

ABB:
The board as interface behaves with flying redundancy according to PNO specification 2212. The Profibus address of the primary channel can be set in a range between 2 and 63. Address offset of 64 is automatically assigned for the backup channel.

Line:
The sub-assembly works in line redundancy mode and receives telegrams via both channels. Whether the sub-assembly responds on one or both channels is specified by the redundancy response parameter. From the communication relationship point of view, only the transmission medium is doubled.

Alarms/Diagnostics

User level: Maintenance staff

Default setting: None

Description:

Defines the diagnostic indications issued by the actuator.

None:
The actuator issues no extended diagnostic signals.

Extended diagnostics:
Extended diagnostic signals according to DP-V0 specification and time-stamped alarm signals are issued. Definition of the signal content is made by the GSD file.

Alarms:
Time-stamped alarm signals are issued.

Both:
Extended diagnostic signals and time-stamped alarm signals are issued.

Fail safe on GCC

User level: Maintenance staff

Default setting: Disabled

Description:

This parameter specifies whether the fail safe state is also entered if the master sends a Global Control Clear. If the master is not able to process its control program (PLC in STOP state), it generally sends this signal.

8.7.6.4 Modbus

Primary slave address

User level: Maintenance staff

Default setting: 247

Description:

Sets the valid primary fieldbus address within a range of 1 to 247.

Any changes are only active after a reboot.

Sec. slave address

User level: Maintenance staff

Default setting: 247

Description:

Sets the valid secondary fieldbus address within a range of 1 to 247.

Any changes are only active after a reboot.

Autom. configuration

User level: Maintenance staff

Default setting: Disabled

Description:

The bus parameters are automatically detected and set. Only in combination with SIMA Master Station!

Reset autom. config.

User level: Maintenance staff

Default setting: No

Description:

Manual deleting of the bus address to allow Master Station new address assignment for the respective actuator.

Baud rate

User level: Maintenance staff

Default setting: 38400

Description:

Defines the transmission speed.

Any changes are only active after a reboot.

Parity

User level: Maintenance staff

Default setting: Even

Description:

Defines parity.

Any changes are only active after a reboot.

Stopbits

User level: Maintenance staff

Default setting: 1

Description:

Defines the format for the telegrams (frame structure).

Timeout

User level: Maintenance staff

Default setting: 50 x 0.1 s

Description:

Sets the timeout in units of 0.1 s.

Redundancy

User level: Maintenance staff

Default setting: Line reply act. channel

Description:

Defines the redundancy type.

- Ring: The interface works as loop redundant interface with repeater functionality.
- Line reply act. channel: Line redundant implementation. Reply will be sent over active channel.
- Line reply both channels: Replies will be sent via both channels.
- Master/slave: The board works with complete 2-channel slave implementation.

8.7.6.5 I/O interface

8.7.6.5.1 Outputs

Output O1

User level: Maintenance staff

Default setting: End position CLOSED

Description:

Defines the signal assignment of the signal output. The signal outputs can be assigned as desired with the available signals.

Logic Output O1

User level: Maintenance staff

Default setting: NO contact

Description:

Since signal outputs are physically equipped with NO contacts, the contact position can be set in case of active output signal ⇒ required for cable break monitoring or power failure.

Output O2

User level: Maintenance staff

Default setting: End position OPEN

Description:

Defines the signal assignment of the signal output. The signal outputs can be assigned as desired with the available signals.

Logic Output O2

User level: Maintenance staff

Default setting: NO contact

Description:

Since signal outputs are physically equipped with NO contacts, the contact position can be set in case of active output signal ⇒ required for cable break monitoring or power failure.

Output O3

User level: Maintenance staff

Default setting: Torque tripping CLOSE

Description:

Defines the signal assignment of the signal output. The signal outputs can be assigned as desired with the available signals.

Logic Output O3

User level: Maintenance staff

Default setting: NO contact

Description:

Since signal outputs are physically equipped with NO contacts, the contact position can be set in case of active output signal ⇒ required for cable break monitoring or power failure.

Output O4

User level: Maintenance staff

Default setting: Torque tripping OPEN

Description:

Defines the signal assignment of the signal output. The signal outputs can be assigned as desired with the available signals.

Logic Output O4

User level: Maintenance staff

Default setting: NO contact

Description:

Since signal outputs are physically equipped with NO contacts, the contact position can be set in case of active output signal ⇒ required for cable break monitoring or power failure.

Output O5

User level: Maintenance staff

Default setting: Remote control

Description:

Defines the signal assignment of the signal output. The signal outputs can be assigned as desired with the available signals.

Logic Output O5

User level: Maintenance staff

Default setting: NO contact

Description:

Since signal outputs are physically equipped with NO contacts, the contact position can be set in case of active output signal ⇒ required for cable break monitoring or power failure.

Output O6

User level: Maintenance staff

Default setting: Local control

Description:

Defines the signal assignment of the signal output. The signal outputs can be assigned as desired with the available signals.

Logic Output O6

User level: Maintenance staff

Default setting: NO contact

Description:

Since signal outputs are physically equipped with NO contacts, the contact position can be set in case of active output signal ⇒ required for cable break monitoring or power failure.

Output O7

User level: Maintenance staff

Default setting: Collective failure 1

Description:

Defines the signal assignment of the signal output. The signal outputs can be assigned as desired with the available signals.

Logic Output O7

User level: Maintenance staff

Default setting: NC contact

Description:

Since signal outputs are physically equipped with NO contacts, the contact position can be set in case of active output signal ⇒ required for cable break monitoring or power failure.

Output O9

User level: Maintenance staff

Default setting: Disabled

Description:

Defines the signal assignment of the signal output. The signal outputs can be assigned as desired with the available signals.

Logic Output O9

User level: Maintenance staff

Default setting: NO contact

Description:

Since signal outputs are physically equipped with NO contacts, the contact position can be set in case of active output signal ⇒ required for cable break monitoring or power failure.

Output O10

User level: Maintenance staff

Default setting: Disabled

Description:

Defines the signal assignment of the signal output. The signal outputs can be assigned as desired with the available signals.

Logic Output O10

User level: Maintenance staff

Default setting: NO contact

Description:

Since signal outputs are physically equipped with NO contacts, the contact position can be set in case of active output signal ⇒ required for cable break monitoring or power failure.

Output O11

User level: Maintenance staff

Default setting: Disabled

Description:

Defines the signal assignment of the signal output. The signal outputs can be assigned as desired with the available signals.

Logic Output O11

User level: Maintenance staff

Default setting: NO contact

Description:

Since signal outputs are physically equipped with NO contacts, the contact position can be set in case of active output signal ⇒ required for cable break monitoring or power failure.

Output O12

User level: Maintenance staff

Default setting: Disabled

Description:

Defines the signal assignment of the signal output. The signal outputs can be assigned as desired with the available signals.

Logic Output O12

User level: Maintenance staff

Default setting: NO contact

Description:

Since signal outputs are physically equipped with NO contacts, the contact position can be set in case of active output signal ⇒ required for cable break monitoring or power failure.

Output O13

User level: Maintenance staff

Default setting: Disabled

Description:

Defines the signal assignment of the signal output. The signal outputs can be assigned as desired with the available signals.

Logic Output O13

User level: Maintenance staff

Default setting: NO contact

Description:

Since signal outputs are physically equipped with NO contacts, the contact position can be set in case of active output signal ⇒ required for cable break monitoring or power failure.

Output O14

User level: Maintenance staff

Default setting: Disabled

Description:

Defines the signal assignment of the signal output. The signal outputs can be assigned as desired with the available signals.

Logic Output O14

User level: Maintenance staff

Default setting: NO contact

Description:

Since signal outputs are physically equipped with NO contacts, the contact position can be set in case of active output signal ⇒ required for cable break monitoring or power failure.

8.7.6.5.2 Analogue outputs

Analogue output 1

User level: Maintenance staff

Default setting: Position

Description:

Defines which actuator information should be output as analogue 4 – 20 mA signal. The exact adaptation of the output range – only possible for the position signal – may be either executed via the commissioning parameter in the submenu Analogue signal > Output > Value 100 % or VALUE 0 %. The output range for possible analogue signals is:

- Position: CLOSE/OPEN
- Torque: depending on the parameter Data logging > Torque sign either –100 % – +100 % or 0 – 100 %
- Electronic temperature: –25 °C – +100 °C

Analogue output 2

User level: Maintenance staff

Default setting: Position

Description:

Defines which actuator information should be output as analogue 4 – 20 mA signal. The exact adaptation of the output range – only possible for the position signal – may be either executed via the commissioning parameter in the submenu Analogue signal > Output > Value 100 % or VALUE 0 %. The commissioning parameters apply simultaneously for both analogue outputs 2 and 3. The output range for possible analogue signals is:

- Position: CLOSE/OPEN
- Torque: depending on the parameter Data logging > Torque sign either –100 % – +100 % or 0 – 100 %
- Electronic temperature: –25 °C – +100 °C

Analogue output 3

User level: Maintenance staff

Default setting: Torque

Description:

Defines which actuator information should be output as analogue 4 – 20 mA signal. The exact adaptation of the output range – only possible for the position signal – may be either executed via the commissioning parameter in the submenu Analogue signal > Output > Value 100 % or VALUE 0 %. The commissioning parameters apply simultaneously for both analogue outputs 2 and 3. The output range for possible analogue signals is:

- Position: CLOSE/OPEN
- Torque: depending on the parameter Data logging > Torque sign either –100 % – +100 % or 0 – 100 %
- Electronic temperature: –25 °C – +100 °C

8.7.6.5.3 Command inputs

Dead time

User level: Maintenance staff

Default setting: 0 ms

Description:

Defines the minimum pulse time for the command inputs. A command must be at least valid for the duration of the preset dead time in order to take effect.

Command input 1

User level: Maintenance staff

Default setting: STOP

Description:

Defines the assignment of the commands to the command input. The command inputs can be freely assigned with the available commands.

Logic Command inp.1

User level: Maintenance staff

Default setting: high-active

Description:

Defines whether the command is active with 24 V DC (high-active) or with 0 V (low-active).

Command input 2

User level: Maintenance staff

Default setting: CLOSE

Description:

Defines the assignment of the commands to the command input. The command inputs can be freely assigned with the available commands.

Logic Command inp. 2

User level: Maintenance staff

Default setting: high-active

Description:

Defines whether the command is active with 24 V DC (high-active) or with 0 V (low-active).

Command input 3

User level: Maintenance staff

Default setting: OPEN

Description:

Defines the assignment of the commands to the command input. The command inputs can be freely assigned with the available commands.

Logic Command inp. 3

User level: Maintenance staff

Default setting: high-active

Description:

Defines whether the command is active with 24 V DC (high-active) or with 0 V (low-active).

Command input 4

User level: Maintenance staff

Default setting: Automatic

Description:

Defines the assignment of the commands to the command input. The command inputs can be freely assigned with the available commands.

Logic Command inp. 4

User level: Maintenance staff

Default setting: high-active

Description:

Defines whether the command is active with 24 V DC (high-active) or with 0 V (low-active).

Command input 5

User level: Maintenance staff

Default setting: Disabled

Description:

Defines the assignment of the commands to the command input. The command inputs can be freely assigned with the available commands.

Logic Command inp.5

User level: Maintenance staff

Default setting: high-active

Description:

Defines whether the command is active with 24 V DC (high-active) or with 0 V (low-active).

Command input 6

User level: Maintenance staff

Default setting: Disabled

Description:

Defines the assignment of the commands to the command input. The command inputs can be freely assigned with the available commands.

Logic Command inp.6

User level: Maintenance staff

Default setting: high-active

Description:

Defines whether the command is active with 24 V DC (high-active) or with 0 V (low-active).

Command input 7

User level: Maintenance staff

Default setting: Disabled

Description:

Defines the assignment of the commands to the command input. The command inputs can be freely assigned with the available commands.

Logic Command inp.7

User level: Maintenance staff

Default setting: high-active

Description:

Defines whether the command is active with 24 V DC (high-active) or with 0 V (low-active).

Command input 8

User level: Maintenance staff

Default setting: Disabled

Description:

Defines the assignment of the commands to the command input. The command inputs can be freely assigned with the available commands.

Logic Command inp.8

User level: Maintenance staff

Default setting: high-active

Description:

Defines whether the command is active with 24 V DC (high-active) or with 0 V (low-active).

Command input 9

User level: Maintenance staff

Default setting: Disabled

Description:

Defines the assignment of the commands to the command input. The command inputs can be freely assigned with the available commands.

Logic Command inp.9

User level: Maintenance staff

Default setting: high-active

Description:

Defines whether the command is active with 24 V DC (high-active) or with 0 V (low-active).

Command input 10

User level: Maintenance staff

Default setting: Disabled

Description:

Defines the assignment of the commands to the command input. The command inputs can be freely assigned with the available commands.

Logic Command inp.10

User level: Maintenance staff

Default setting: high-active

Description:

Defines whether the command is active with 24 V DC (high-active) or with 0 V (low-active).

8.7.6.5.4 Other

Fail safe behaviour

User level: Maintenance staff

Default setting: Ignore Automatic

Description:

Defines whether the fail safe function for actuators with integral positioner is only performed if the AUTOMATIC command is active or in any case.

8.7.6.6 Basic settings

Interface board

User level: Maintenance staff

Default setting: No

Description:

This parameter specifies whether an additional board taking the form of a fieldbus board or similar is available. If an additional board was detected, the parameter has the value YES. If the additional board is removed set parameter manually to NO.

Position output

User level: Maintenance staff

Default setting: Over-/underflow

Description:

Defines how the position is output:

- Overflow/underflow: The position value is displayed beyond the value range defined under Data logging -> high scale value (position OPEN) and low scale value (position CLOSED).
- Limited: The position value is limited to the value range between OPEN and CLOSED.

8.7.6.7 Profinet

Ethernet Port 1

User level: Maintenance staff

Default setting: Enabled

Description:

Activates or deactivates port 1 on the connection board.

Ethernet Port 2

User level: Maintenance staff

Default setting: Enabled

Description:

Activates or deactivates port 2 on the connection board.

System redundancy

User level: Maintenance staff

Default setting: Disabled

Description:

Activates or deactivates S2 system redundancy.

Web server

User level: Maintenance staff

Default setting: Enabled

Description:

Activates or deactivates the integral web server.

FTP server

User level: Maintenance staff

Default setting: Enabled

Description:

Activates or deactivates the integral FTP server.

Admin mode

User level: Maintenance staff

Default setting: Disabled

Description:

Activates or deactivates the Admin mode of the sub-assembly.

8.8 Process

8.8.1 Modulation behaviour

Deadband OPEN

User level: Maintenance staff

Default setting: 1.0 %

Description:

Modulating tolerance in direction OPEN.

Deadband CLOSE

User level: Maintenance staff

Default setting: 1.0 %

Description:

Modulating tolerance in direction CLOSE.

Outer deadband

User level: Maintenance staff

Default setting: 2.5 %

Description:

Reaction delay until the actuator reacts on a renewed setpoint change, provided it came previously to a standstill.

Dead time

User level: Maintenance staff

Default setting: 500 ms

Description:

Delay of the reaction of the actuator in milliseconds to a change of a setpoint.

8.8.2 Stepping mode

Programmer

User level: User

Default setting: Disabled

Description:

Activates the operation profile function for internal setpoint generation. Provided the function is enabled via device key.

Step. mode pulse source

User level: Maintenance staff

Default setting: Internal

Description:

Indicates the control source of the stepping mode:

- Internal: The stepping mode is active as long as the actuator turns into the direction for which the internal start of stepping mode has been parametrised.
- External: The stepping mode is active as long as the command is available and the actuator turns into the direction for which the stepping mode has been activated.

Stepping mode select

User level: Maintenance staff

Default setting: linear

Description:

Set the on time to a constant value (linear) or reduces the on-time from the value “Stepping mode on time” to the minimum value of 0.5 s. For decreasing stepping mode, the minimum value – for both directions of operation – is respectively reached in final position CLOSED.

Start pulse internal

User level: Maintenance staff

Default setting: 25.0

Description:

Indicates the stepping mode range from end position CLOSED to the specified position in the unit selected.

Stepping mode opening

User level: Maintenance staff

Default setting: Disabled

Description:

Enables the stepping mode when actuator opens the valve.

Stepping mode closing

User level: Maintenance staff

Default setting: Disabled

Description:

Enables the stepping mode when the actuator closes the valve.

Stepping mode T on

User level: Maintenance staff

Default setting: 500 ms

Description:

Indicates the duration in milliseconds for which the motor is switched in stepping mode.

Stepping mode T off

User level: Maintenance staff

Default setting: 700 ms

Description:

Indicates the duration in milliseconds for which the motor is switched off in stepping mode.

8.9 Factory settings

Load factory settings

User level: Maintenance staff

Default setting: No

Description:

Loads the factory settings.

Store factory settings

User level: Specialist

Default setting: No

Description:

Stores the settings as factory setting.

9 Error log

[1] - Torque OPEN

Set torque in direction OPEN was exceeded.

Solution:

Reset error memory by operation command into opposite direction or by fault acknowledgement.

[2] - Torque CLOSE

Set torque in direction CLOSE was exceeded.

Solution:

Reset error memory by operation command into opposite direction or by fault acknowledgement.

[3] - Actuator start monitor.

Valve position has not changed in spite of powered motor within set time.

Solution:

Check mechanical parts and components of power circuit.

[4] - Rot. dir. monitoring

Actuator is running into wrong direction.

Solution:

Check setting of phase sequence.

[5] - Thermal overload

Excessive motor temperature and operation is not possible.

Solution:

Cool down motor.

[6] - Electronic overtemp.

Electronics temperature has exceeded the permissible level.

Solution:

Cool down electronics. Check the actuator mounting position and displace controls if required.

[7] - Control voltage too low

Indicates that the internal control voltage is too low. Malfunctions are possible.

Solution:

Is automatically reset when leaving emergency shutdown mode.

[8] - Fail safe

Actuator is in the fail safe state i.e. the setpoint is missing or the fieldbus communication is disturbed.

Solution:

Is automatically reset when leaving emergency shutdown mode.

[9] - Hardware failure

Memory fault or hardware interface fault detected.

Solution:

Hardware replacement required.

[10] - Encoder failure

Actuator controls have detected an error of the combined sensor during self-check.

Solution:

Automatic trial of fault remedy by renewed encoder initialisation performed in cycles. If error is still present replace sensor.

[11] - Encoder setup failure

Final position learning has not been correctly performed.

Solution:

Deleting and new setting of end positions.

[12] - Torq. inp. gear exceed.

Additional information on "Configuration invalid" indication.

Solution:

Set tripping torque values lower than the max. set input torque of the gear.

[13] - Valve torque OP exc.

Additional information on "Configuration invalid" indication.

Solution:

Set tripping torque OPEN to a value lower than the max. set input torque of the valve.

[14] - Valve torque CL exc.

Additional information on "Configuration invalid" indication.

Solution:

Set tripping torque CLOSE to a value lower than the max. set input torque of the valve.

[15] - Systemtest fault

Actuator controls have detected an error during self-check.

Solution:

Depending on the detected error.

[16] - 24V internal failure

Failure of internal 24 V DC supply - supplied by mains voltage.

Solution:

Is automatically reset if power is restored. Check fuse F6.

[17] - 24V external failure

Failure of the additional, external 24 V DC power supply.

Solution:

Is automatically reset if power is restored.

[18] - Phase 1 failure

Failure of phase L1.

Solution:

Is reset by subsequent operation command or by fault acknowledgement.

[19] - Phase 2 failure

Failure of phase L2.

Solution:

Is reset by subsequent operation command or by fault acknowledgement.

[20] - Phase 3 failure

Failure of phase L3.

Solution:

Is reset by subsequent operation command or by fault acknowledgement.

[21] - Phase correction failure

Indicates that the automatic phase detection is not working properly.

Solution:

Check mains quality. Change-over to manual setting if required.

[22] - Battery backup malf.

Battery backup is not able to supply the actuator controls.

Solution:

Charge accumulator or replace if defective.

[23] - 24V external overload

Actuator controls are powered by external 24 V power supply although not equipped for this purpose.

Solution:

Disconnect external power supply.

[24] - Emerg. shutdown (ESD)

Actuator is in emergency shutdown mode (external signal).

Solution:

Is automatically reset when leaving emergency shutdown mode.

[25] - Discrepancy error

Discrepancy between the active command and the state/feedback of the power control unit. Indication of an error code.

Solution:

Acknowledgement of the indication once error is remedied.

[26] - Wrong power unit

Configured power unit does not match neither control nor state.

Solution:

If configuration is incorrect, adapt accordingly. If power control unit available is incorrect, replace by correct item.

[27] - Emergency STOP

The EMERGENCY STOP command is active.

Solution:

After remedy of emergency situation, the command can be cleared.

[28] - OFF mode

The actuator is in OFF mode.

Solution:

Change operation mode.

[29] - LOCAL mode

The actuator is in LOCAL mode.

Solution:

Change operation mode.

[30] - Mode not REMOTE

Actuator not in REMOTE mode.

Solution:

Change actuator operation mode to REMOTE.

[31] - Test mode enabled

Manufacturer test mode active.

Solution:

Reset the power supply.

[32] - Simulation mode active

For FF bus only. Actuator mode for actuator commissioning in DCS (operation commands are ignored).

Solution:

Deactivate simulation mode after successful commissioning (reset parameter "Simulation active").

[33] - Configuration invalid

Tripping torque values exceed permissible input torques of additional components. A further option is that the set Profibus profile is higher than specified in device key.

Solution:

Adjust torque settings in Profibus profile accordingly.

[34] - NV memory failure

Actuator controls have detected an error of the non-volatile memory or of EEPROMs during self-check.

Solution:

Replacement of actuator controls.

[35] - HW interface failure

Actuator controls have detected a fault of the interface board during self-check.

Solution:

Replace interface board.

[36] - Device key invalid

The device key is not valid.

Solution:

Contact manufacturer for valid device key and enter accordingly.

[37] - Encoder overflow

Configured stroke is higher than the measurement range.

Solution:

Repeat stroke setting. Check reduction ratio when using a gearbox.

[38] - Encoder range error

Current position is below –25 % or above 125 % of the stroke setting.

Solution:

Check the combined sensor.

[39] - Potentiom. calibr. failure

This error is displayed if the resolution of the potentiometer is too low for limit calibration.

Solution:

Recalibration of limit using the potentiometer.

[40] - Limit valve strokes

The permissible valve limit has been exceeded.

Solution:

Perform valve maintenance.

[41] - Accum. operation cycles

The permitted number of valve operations has been exceeded.

Solution:

Check control. Is reset if the current operating cycles fall below the limit value.

[42] - Current op. cycles/h

The permitted number of operation cycles per hour has been exceeded.

Solution:

Check control. Is reset if the operating cycle frequency falls below the limit value.

[43] - Op-time survey OPEN

The current motor operation time has exceeded the preset running time for direction OPEN.

Solution:

Is reset if current running time is lower than running time in direction OPEN.

[44] - Op-time survey CLOSE

The current motor operation time has exceeded the preset running time for direction CLOSE.

Solution:

Is reset if current running time is lower than running time in direction CLOSE.

[45] - Gasket change recomm.

The value for thermal ageing exceeds the specified limit.

Solution:

Replace sealing elements without delay to ensure leak tightness at actuator. Then reset the thermal ageing value.

[46] - Gear overhaul recomm.

The value for mechanical ageing exceeds the specified limit.

Solution:

Check gear components and replace if required. Then reset the mechanical ageing value.

[47] - Duty cycle exceeded

This fault indication is displayed if the permissible number of operation cycles has been exceeded during process control.

Solution:

Reduce number of operation cycles for process control.

[48] - Torque warning OPEN

The current torque value has exceeded the Torque warning OPEN value.

Solution:

Operation command in opposite direction resets error memory.

[49] - Torque warning CLOSE

The current torque value has exceeded the Torque warning CLOSE value.

Solution:

Operation command in opposite direction resets error memory.

[50] - Handwheel operation

The position of the actuator changes although the motor is not powered.

Solution:

Is automatically reset once actuator position remains unchanged.

[51] - Maintenance required

A limit of the operation data has been exceeded.

Solution:

Reset current value or increase limit.

[52] - Int. positioner disabled

For an actuator with 3-point controller, the AUTOMATIC command is not activated.

Solution:

Is cancelled if the AUTOMATIC command is activated.

[53] - Position calibr. failure

End position was cleared and learning not performed.

Solution:

Perform again end position learning.

[54] - Torque calibr. failure

Calibration of torque was deleted and not set up again.

Solution:

Load default setting from menu item "Write default setting" in item "Maintenance combined sensor" or contact customer service.

[55] - Analog inp. calibr. failure

Bit range for the 4 – 20 mA signal is too low.

Solution:

Set up limits again (4 and 20 mA) while respecting the appropriate current.

[56] - Interlock LOCAL

Local operation is disabled by a fieldbus interface signal.

Solution:

Enable via fieldbus interface or disconnect fieldbus interface.

[57] - Interlock REMOTE

Actuator operation from REMOTE is disabled by a fieldbus interface signal.

Solution:

Enable via fieldbus interface.

[58] - dummy

Reserved

[59] - Programmer data invalid

A special operation profile has been developed. If the position indications with regard to time are incorrectly selected, this error is displayed.

Solution:

Check time and position indications.

[60] - TMS module error

The TMS module performs cyclically a self-test. If this is incorrect, this fault is displayed.

Solution:

Replace base board including TMS module.

[61] - RTC error

RTC could not be read.

Solution:

Check and replace local controls if required.

[62] - RTC not set

Real time clock has not been set.

Solution:

Set RTC.

[63] - RTC battery low

RTC battery empty.

Solution:

Replace battery.

[64] - FO module error

The diagnostic interface of the FO module cannot be accessed.

Solution:

Check the FO module and replace if required.

[65] - FOC budget ch. 1

Reception level insufficient.

Solution:

Check the optical transmission path.

[66] - FO failure ch. 1

Reception level too low.

Solution:

Check the optical transmission path.

[67] - FOC budget ch. 2

Reception level insufficient.

Solution:

Check the optical transmission path.

[68] - FO failure ch. 2

Reception level too low.

Solution:

Check the optical transmission path.

[69] - dummy

Reserved

[70] - dummy

Reserved

[71] - dummy

Reserved

[72] - Mains power failure

Failure of mains power supply.

[73] - dummy

Reserved

[74] - dummy

Reserved

[75] - dummy

Reserved

[76] - dummy

Reserved

[77] - dummy

Reserved

[78] - dummy

Reserved

[79] - dummy

Reserved

10 Collective faults

This chapter describes the meaning and differences between the two collective fault signals.

With the current firmware, **Collective failure 1** and **Collective failure 2** can be used and configured. In both collective signals, a list with states which can be activated have been stored. Each parameter that has been **ACTIVATED**, initiates a collective signal under which it has been parametrised as **ACTIVATED**:

- Failure of internal 24V
- Failure of external 24V
- Phase failure
- Actuator not starting
- Torque failure
- Torque CLOSE
- Torque OPEN
- Torque warning
- Torque warning CLOSE
- Torque warning OPEN
- Motor overtemperature
- Discrepancy power unit
- EMERGENCY STOP
- OFF mode
- LOCAL mode
- Emerg. shutdown tripped
- Fail safe
- Hardware failure
- Comb.sensor failure
- Int. positioner disabled
- Maintenance required
- Mode not REMOTE
- Configuration invalid
- Electronic overtemp.
- Rot. dir. monitoring
- Handwheel operation
- Op-time survey
- Battery backup malf.

If a signal is present which is activated in Collective failure 1, the failure LED is illuminated and a bell can be seen in the display.

Figure 1: Bell

For all other signals from the collective fault list or the error log, a warning triangle is shown in the display.

Figure 2: Warning triangle

11 Digital inputs and outputs

The present chapter presents the options selectable for configuration of process and command inputs as well as signal outputs.

11.1 Configuration of signal outputs

With the current firmware, the signal outputs are freely configurable. For this, select the respective signal output an select the desired signal from the list below.

The selectable states include:

- End position
- End position CLOSED
- End position OPEN
- Pos. b. CLOSE and Int.1
- Pos. b. Int.2 and OPEN
- Act. running-permanent
- Act. running-flashing
- Act. closing-permanent
- Act. closing-flashing
- Act. opening-permanent
- Act. opening-flashing
- Actuator not starting
- Torque tripping
- Torque tripping CLOSE
- Torque tripping OPEN
- Torque warning
- Torque warning CLOSE
- Torque warning OPEN
- Collective failure 1
- Collective failure 2
- Motor overtemperature
- Remote control
- OFF
- Local control
- Emerg. shutdown tripped
- Fail safe
- Hardware failure
- Comb.sensor failure
- Int. positioner disabled
- Maintenance required
- Mode not REMOTE
- Handwheel operation
- Systemtest fault
- Intermediate position 1
- Intermediate position 2
- Intermediate position 3
- Intermediate position 4

- Intermediate position 5
- Intermediate position 6
- Intermediate position 7
- Intermediate position 8
- Fieldbus DOUT1
- Fieldbus DOUT2
- Fieldbus DOUT3
- Fieldbus DOUT4
- PVST active
- PVST error
- PVST abort
- Emergency STOP

Once the output has been assigned a signal, the type of signal output (**NC contact** or **NO contact**) can be selected. Note that contacts parametrised as NC contacts, are NO contacts in terms of hardware and are suitably controlled via the software to achieve the NC contact behaviour. For this reason, the outputs will only work if the actuator controls are active.

11.2 Configuration of process and command inputs

The current firmware version can be used to freely configure the process and command inputs. For this select the respective process and command input and select the desired command from the following list. The number of available inputs can vary depending on the hardware version.

The selectable commands include:

- STOP
- CLOSE
- OPEN
- Automatic
- Emerg. shutdown (ESD)
- Stepping mode active
- Enable LOCAL
- Enable REMOTE
- Enable CLOSE
- Enable OPEN
- Fault acknowledge
- Force LOCAL
- Force LOCAL STOP
- Force LOCAL CLOSE
- Force LOCAL OPEN
- Intermediate position 1
- Intermediate position 2
- Intermediate position 3
- Intermediate position 4
- Intermediate position 5
- Intermediate position 6
- Intermediate position 7
- Intermediate position 8

- Execute PVST
- EMERGENCY STOP

Once the process or command input was assigned a command, the type of command input (**high-active** or **low-active**) can be selected.

12 Notes for explosion-proof actuators

In this chapter, the dependency of some parameters with regard to explosion protection is described. The parameters in question are considered and the correct settings for safeguard explosion protection are described.

12.1 Relevant parameters

⚠WARNING

When modifying these parameters, the explosion protection of the device might be at risk!

Death or serious injury.

→ Thermal failure reset

→ Motor overtemperature

→ Power unit

12.2 Safeguarding the explosion protection

12.2.1 Thermal failure reset

This parameter controls the actuator behaviour after excess motor temperature. To prevent automatic motor start-up after the respective cool down, the parameter must be set to the **MANUAL** value. This corresponds to the factory setting and non-observant will void the explosion protection of the respective actuator. The failure which is issued once excessive motor temperature occurs must be acknowledged manually prior to operating the actuator again.

12.2.2 Motor overtemperature

The excessive motor temperature monitoring must be set to **RESPECT** under the menu item **Emerg. shutdown (ESD)**. When ignored, the motor will overheat and this will void the explosion protection.

12.2.3 Power unit

This parameter is used to adjust the controls to the used power control unit. If the present actuator does not use an Ex SSR (all-pole disconnection solid state relay), the parameter must be set to **CONTACTORS or SSR.** When using an SSR (one phase permanently contacted), an external all-pole disconnection must be used as described in the operation instructions. If an Ex SSR is used, the parameter is to be set to **Ex SSR** to ensure explosion protection.

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383352/en/05