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71659816
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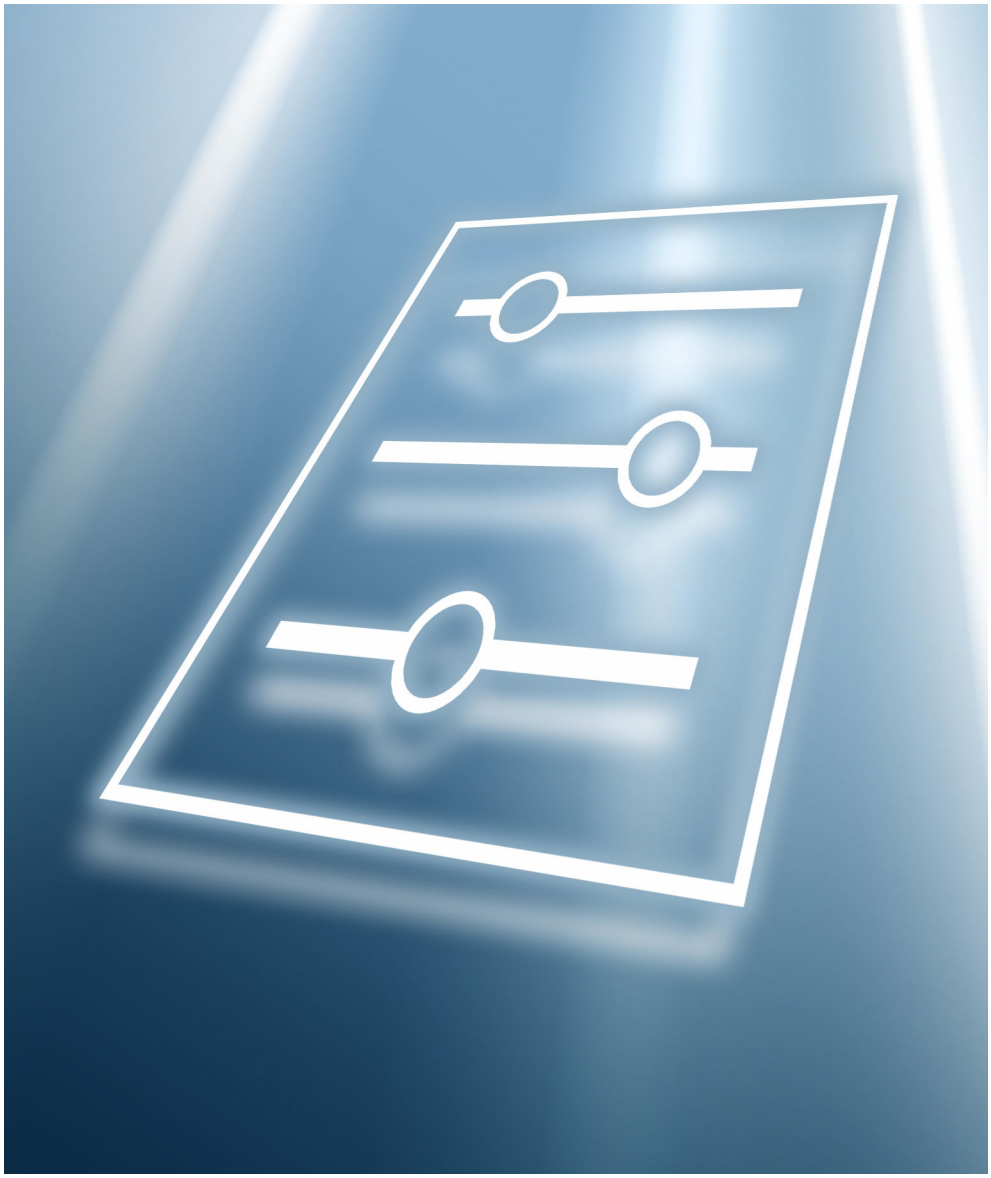
Description of Device Parameters
Micropilot FMR43
IO-Link

Free space radar

IO-Link



Endress+Hauser
People for Process Automation

1 About this document

1.1 Document function

The document is part of the Operating Instructions and serves as a reference for parameters.

Tasks that require detailed knowledge of the function of the device:
- Starting up measurements under difficult conditions
- Optimal adjustment of measurements to difficult conditions
- Detailed configuration of communication interface
- Fault diagnosis in difficult cases

1.2 Target group

This document is aimed at specialists who work with the device over the entire life cycle and perform specific configurations.

1.3 Document structure

The document consists of a general part and a specific part.

The structure of the document and its components are explained in the general part (section 1).

The specific part starts with an overview of the device operating menu, which is the focus of this manual.

The description of the device parameters follows the overview of the operating menu. The description is divided into 4 main menus and their submenus.

The 4 main menus:
- Identification
- Parameter
- Observation
- Diagnosis

In the **Description of device parameters** section, the menus, submenus and parameters are displayed in the same way that they are laid out in the menu structure for the operating tool.

The submenus that are visible to users depend on the **user role** they are logged in on. This document lists the submenus and parameters that are available to the **Maintenance** user role.

The operating menu is dynamic and adapts the choice of parameters to the selected options.

For the operating concept of the operating menu, see the Operating Instructions.

The device-specific parameters are configured via IO-Link. There are specific configuration or operating programs from different manufacturers available to the user for this purpose. The device description file (IODD) is provided for the device

IODD download
Two options for downloading the IODD:
- www.endress.com/download
- https://ioddfinder.io-link.com/

www.endress.com/download

1. Select "Device drivers".

2. Under "Type", select the "IO Device Description (IODD)" item.
3. Select "Product root".
4. Click "Search ".
   ↳ A list of search results is displayed.

Select and download the appropriate version.

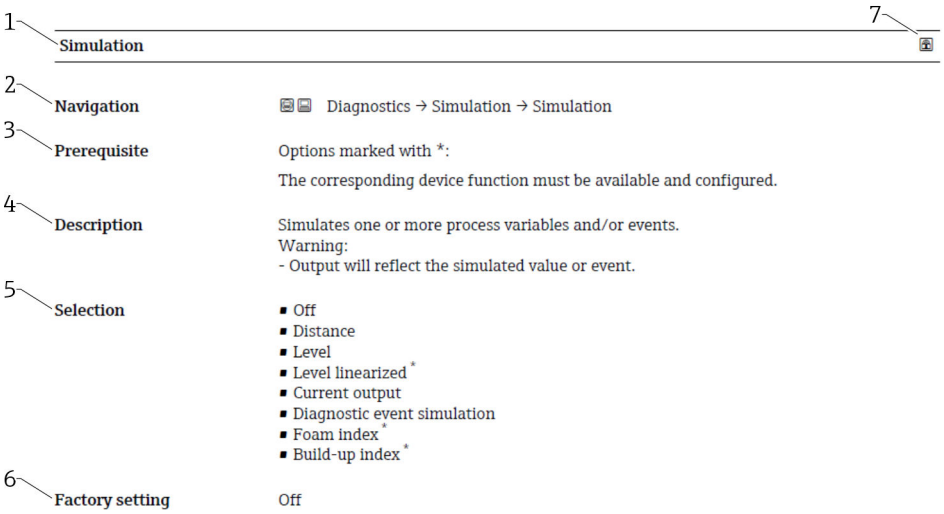
https://ioddfinder.io-link.com/

1. Enter and select "Endress" as the manufacturer.
2. Select product name.
   ↳ A list of search results is displayed.

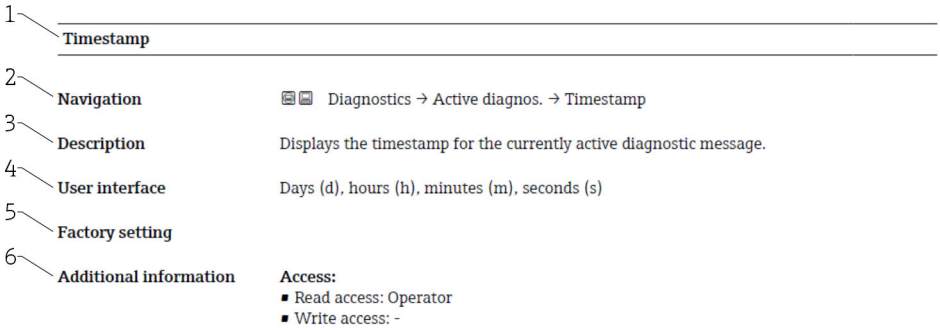
Select and download the appropriate version.

1.4 Elements of parameter descriptions

Parameter descriptions are structured and made up of a number of elements. Depending on the parameter, more or fewer elements may be available. Two examples are provided here for different parameters:



1 Name: Parameter designation (Label)
2 Navigation: Navigation path to the parameter. The graphics indicate whether the path applies to the onsite display, the operating tool or both.
3 Prerequisite: The marked options can only be selected under the condition specified in each case
4 Description: Description of the parameter function
5 Selection: List of the individual options for the parameter
6 Factory setting: Default setting on leaving the factory
7 The lock symbol indicates that the parameter is write-protected



1 *Name: Parameter designation (Label)*
2 *Navigation: Navigation path to the parameter. The graphics indicate whether the path applies to the onsite display, the operating tool or both.*
3 *Description: Description of the parameter function*
4 *User interface: Display value/data of the parameter*
5 *Factory setting: Default setting on leaving the factory*
6 *Additional information:*
Read and write access: Information on access rights that users with certain roles have to the parameter

Additional information at the end of the parameter description can refer to, and expand, all elements of the parameter description.

1.5 Symbols

1.5.1 Symbols for certain types of information

Additional information:

Reference to documentation:

Operation via local display:

Operation via operating tool:

Write-protected parameter:

1.6 Documentation

For an overview of the scope of the associated Technical Documentation, refer to the following:
- *Device Viewer* (www.endress.com/deviceviewer): Enter the serial number from the nameplate
- *Endress+Hauser Operations app*: Enter serial number from nameplate or scan matrix code on nameplate.

1.6.1 Standard documentation

Operating Instructions

The Operating Instructions are available via the Internet: www.endress.com → Download

1.6.2 Supplementary device-dependent documentation

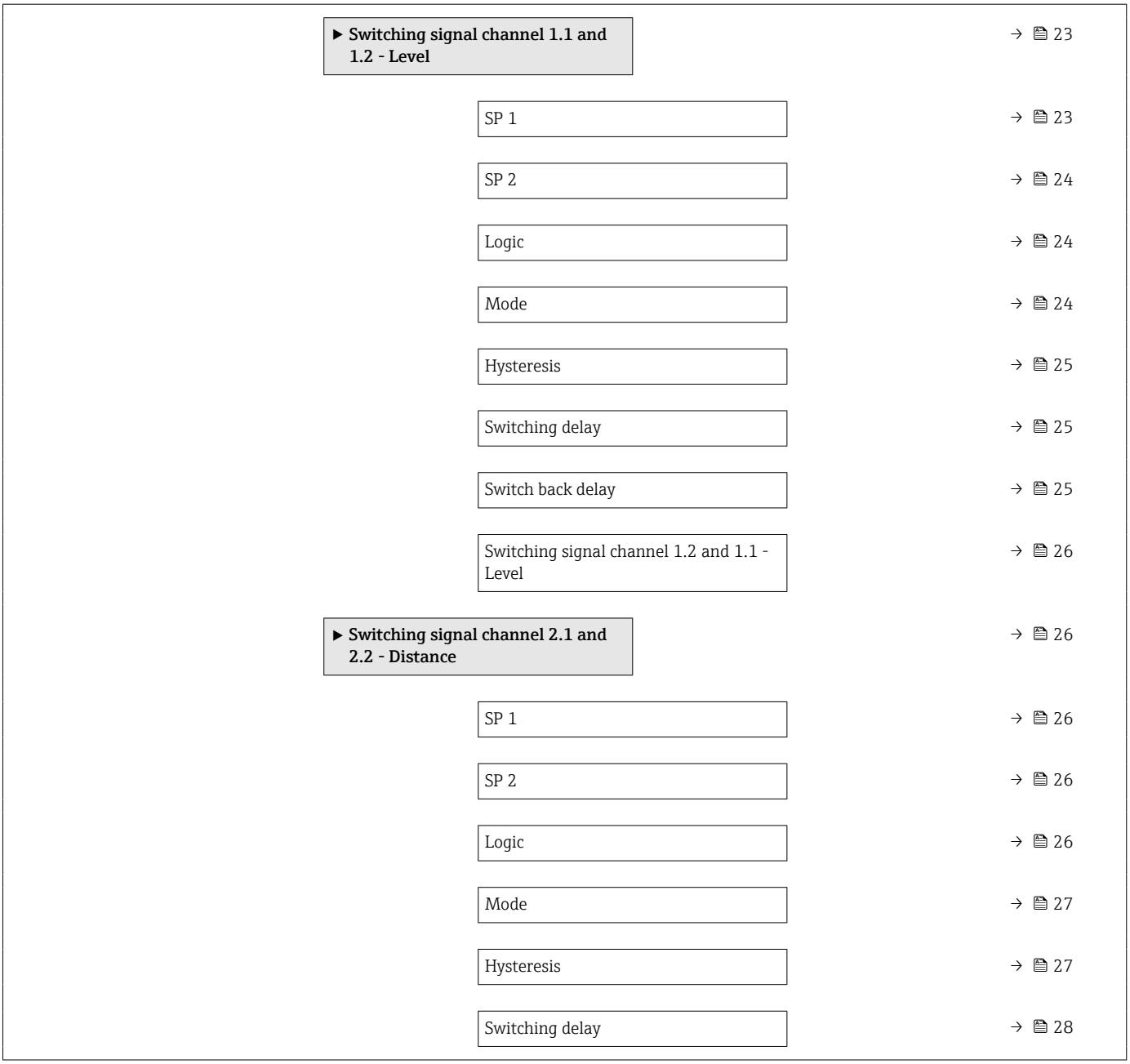
Special Documentation

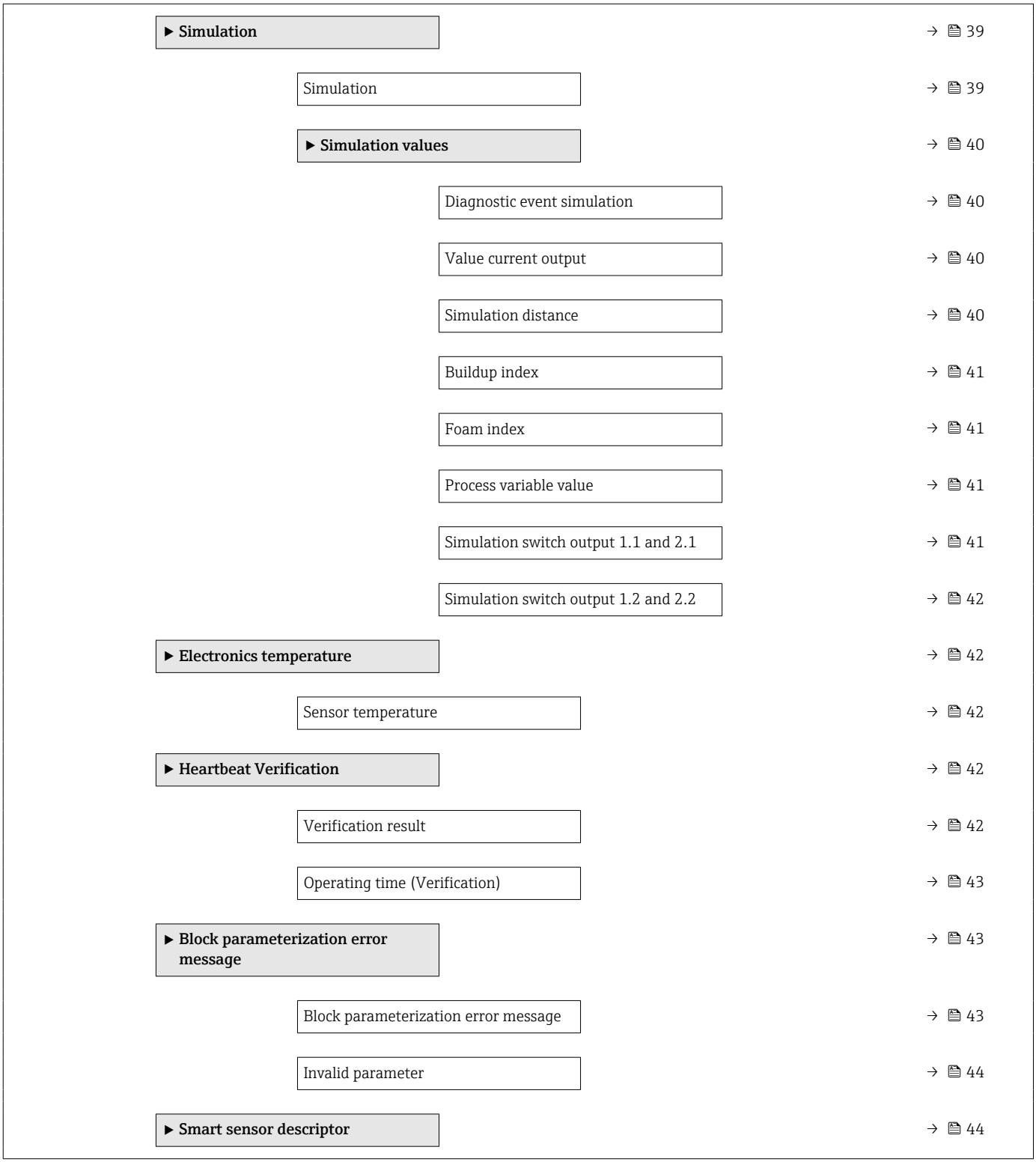
The Special Documentation is available via the Internet: www.endress.com → Download

2 Overview of the operating menu

Navigation Operating menu

- **Identification** → 12
  - Vendor name → 12
  - Vendor text → 12
  - Product name → 12
  - Product text → 12
  - Product ID → 13
  - Serial number → 13
  - Hardware version → 13
  - Firmware version → 13
  - Application specific tag → 13
  - Function tag → 14
  - Location tag → 14
  - Order code → 14
  - Device search → 14
- **Parameter** → 15
  - ▶ **Application** → 15
    - ▶ **Measuring units** → 15
      - Length unit → 15
      - Temperature unit → 15
    - ▶ **Basic settings** → 16
      - Medium type → 16
      - Empty calibration → 16
      - Full calibration → 16


▶ Switching signal channel 1.1 and 1.2 - Level
→ 23
SP 1
→ 23
SP 2
→ 24
Logic
→ 24
Mode
→ 24
Hysteresis
→ 25
Switching delay
→ 25
Switch back delay
→ 25
Switching signal channel 1.2 and 1.1 - Level
→ 26
▶ Switching signal channel 2.1 and 2.2 - Distance
→ 26
SP 1
→ 26
SP 2
→ 26
Logic
→ 26
Mode
→ 27
Hysteresis
→ 27
Switching delay
→ 28


▶ Simulation → 39
Simulation → 39
▶ Simulation values → 40
Diagnostic event simulation → 40
Value current output → 40
Simulation distance → 40
Buildup index → 41
Foam index → 41
Process variable value → 41
Simulation switch output 1.1 and 2.1 → 41
Simulation switch output 1.2 and 2.2 → 42
▶ Electronics temperature → 42
Sensor temperature → 42
▶ Heartbeat Verification → 42
Verification result → 42
Operating time (Verification) → 43
▶ Block parameterization error message → 43
Block parameterization error message → 43
Invalid parameter → 44
▶ Smart sensor descriptor → 44

3 Description of device parameters

3.1 Identification

Navigation Identification

Vendor name

Navigation Identification → Vendor name

Description Displays the manufacturer.

User interface Character string comprising numbers, letters and special characters

Vendor text

Navigation Identification → Vendor text

Description Displays the manufacturer's claim.

User interface Character string comprising numbers, letters and special characters

Product name

Navigation Identification → Product name

User interface Character string comprising numbers, letters and special characters

Product text

Navigation Identification → Product text

Description Displays manufacturer-specific short description of the device.

User interface Character string comprising numbers, letters and special characters

Product ID

Navigation Identification → Product ID

Description Displays the product root.

User interface Character string comprising numbers, letters and special characters

Serial number

Navigation Identification → Serial number

Description The serial number is a unique alphanumerical code identifying the device.
It is printed on the nameplate.
In combination with the Operations app it allows to access all device related documentation.

User interface Character string comprising numbers, letters and special characters

Hardware version

Navigation Identification → Hardware version

User interface Character string comprising numbers, letters and special characters

Firmware version

Navigation Identification → Firmware version

Description Displays the device firmware version installed.

User interface Character string comprising numbers, letters and special characters

Application specific tag

Navigation Identification → Application tag

Description Enter the tag of the application in which the device is used, e.g. the designation of the production process or step (max. 32 characters).

User entry Character string comprising numbers, letters and special characters (32)

Function tag

Navigation Identification → Function tag

Description Enter the tag of the function the device performs in the application (max. 32 characters).

User entry Character string comprising numbers, letters and special characters (32)

Location tag

Navigation Identification → Location tag

Description Enter the tag of the device location in the plant (max. 32 characters).

User entry Character string comprising numbers, letters and special characters (32)

Order code

Navigation Identification → Order code

Description Shows the device order code.

User interface Character string comprising numbers, letters and special characters

Device search

Navigation Identification → Device search

Description Activate the device search to locate the device in the application. When the function is activated, the device emits visual signals (e.g. a flashing LED or local display).

Selection
- Off
- On

3.2 Parameter

Navigation Parameter

3.2.1 Application

Navigation Parameter → Application

Measuring units

Navigation Parameter → Application → Measuring units

Length unit

Navigation Parameter → Application → Measuring units → Length unit

Description Used for the basic calibration (Empty / Full).

Selection

SI units	*US units*
▪ mm	in
▪ m	

Additional information Select the length unit for distance measurement.

It is used, e.g., for the basic calibration ("Empty calibration" or "Full calibration").

Temperature unit

Navigation Parameter → Application → Measuring units → Temperature unit

Description Select the temperature unit.

Selection

SI units	*US units*
▪ ℃	℉
▪ K	

Basic settings

Navigation Parameter → Application → Basic settings

Medium type

Navigation Parameter → Application → Basic settings → Medium type

Description Select whether the measured medium is liquid or solid.

Selection
- Liquid
- Solid

Empty calibration

Navigation Parameter → Application → Basic settings → Empty calibr.

Description Enter the distance from the reference point of the measurement to the minimum level (0 %).

Note:
The reference point is specified in the respective Operating Instructions.

User entry 0 to 125 000 mm

Full calibration

Navigation Parameter → Application → Basic settings → Full calibr.

Description Distance between minimum level (0 %) and maximum level (100 %).

User entry 1 to 125 000 mm

Application settings

Navigation Parameter → Application → Applications

Application

Navigation Parameter → Application → Applications → Application

Description Select application type.

Selection
- Dosing vessel *
- Stirred vessel *
- Storage vessel *
- Workbench test

Additional information *Selection*
- **Dosing vessel** option
  Vessel in a dosing application with very fast level change.
- **Stirred vessel** option
  Vessel with agitator
- **Storage vessel** option
  Vessel for storage with slow level change.
- **Workbench test** option
  All signal filters are deactivated. This mode should only be used for test purposes.

Application settings

Navigation Parameter → Application → Applications

Application

Navigation Parameter → Application → Applications → Application

Selection
- Silo
- Feed hopper *
- Workbench test

* Visibility depends on order options or device settings

Additional information *Selection*

- **Silo** option
  Silo for bulk material (tall and narrow)
- **Feed hopper** option
  Funnel shaped hopper
- **Workbench test** option
  All signal filters are deactivated. This mode should only be used for test purposes.

Additional settings

Navigation Parameter → Application → Add. settings

Upper blank out

Navigation Parameter → Application → Add. settings → Upper blank out

Description Displays the distance from the reference point to slightly above the maximum level (100 %).
The value is calculated by the device to suppress signals in this range.
The value can also be adjusted manually.

Note:
No evaluation takes place in the upper blank out area.

User entry 0 to 125 000 mm

Maximum measuring distance

Navigation Parameter → Application → Add. settings → Max. meas. dist.

Description If the preset measuring range differs significantly from the maximum measuring distance, it is recommended to enter the maximum measuring distance here.

Example:
Continuous level monitoring in the upper third of a tank/silo.

Note:
For tanks or silos with a conical outlet, this parameter should not be changed, as in this type of applications Empty calibration is usually not much smaller than the tank/silo height.

User entry 0 to 125 000 mm

Damping output

Navigation Parameter → Application → Add. settings → Damping out.

Description The damping is effective before the measured value is further processed, i.e., before the following processes:
- Scaling
- Limit value monitoring
- Forwarding to display
- Forwarding to Analog Input Block

Note:
The Analog Input Block has its own “Damping” parameter. In the measurement chain, only one of the two attenuation parameters shall have a value other than 0.
Otherwise, the signal will be attenuated several times.

User entry 0.0 to 1 200.0 s

Evaluation sensitivity

Navigation Parameter → Application → Add. settings → Evaluation sens.

Description Selection of the evaluation sensitivity

Options to select from:

- "Low"
Interferers but also small level signals are not recognized. The weighting curve is located high.

- "Medium"
The weighting curve is in a medium region.

- "High"
Small level signals but also interferers can be reliably detected. The weighting curve is located low.

Selection
- Low
- Medium
- High

First echo sensitivity

Navigation Parameter → Application → Add. settings → First echo sens.

Description This parameter describes the band for First Echo evaluation.
Is measured / calculated down from the peak of the current level echo.

Options to select from:

"Low"
The band for the first echo evaluation is very narrow. The evaluation stays longer at the found echo respectively does not jump to the next Echo or distortion signal.

"Medium"
The band for the first echo evaluation has an average width.

"High"
The band for the first echo evaluation is broad. The evaluation jumps earlier to the next echo or distortion signal.

Selection
- Low
- Medium
- High

Frequency mode

Navigation Parameter → Application → Add. settings → Frequency mode

Description Displays the device-specific measurement configuration.

Selection
- Mode 1 *
- Mode 2 *
- Mode 3 *
- Mode 4 *
- Mode 5 *
- Mode 9 *
- Mode 10 *

* Visibility depends on order options or device settings

Output 1

Navigation Parameter → Application → Output 1

Output 1 operating mode

Navigation Parameter → Application → Output 1 → Output 1 mode

Description Select the operating mode for output 1.

User interface PNP SSC 1.1 - Level

Output 2

Navigation Parameter → Application → Output 2

Output 2 operating mode

Navigation Parameter → Application → Output 2 → Output 2 mode

Description Select the operating mode for output 2.

Selection
- Off
- 4...20 mA MDC 1 - Level *
- PNP SSC 1.2 - Level *

Current output

Navigation Parameter → Application → Curr.output

Measuring mode current output

Navigation Parameter → Application → Curr.output → Output mode

Description Select curve of current output.

* Visibility depends on order options or device settings

Selection
- Standard
- Inverse

Current range output

Navigation Parameter → Application → Curr.output → Current range

Description Defines the current range used to transmit the measured or calculated value.
In brackets are indicated the “low saturation value” and the “high saturation value”.
If Measured value ≤ “low saturation”, the output current is set to “low saturation”.
If Measured value ≥ “high saturation”, the output current is set to ”high saturation”.

Note:
Currents below 3.6 mA or above 21.5 mA can be used to signal an alarm.

Selection
- 4...20 mA (4...20.5 mA)
- 4...20 mA NE (3.8...20.5 mA)
- 4...20 mA US (3.9...20.8 mA)

Lower range value output

Navigation Parameter → Application → Curr.output → Low.range outp

Description Depending on which variable has been selected as "Process variable output current ", define the related lower (4 mA) and upper range values (20 mA).

Upper range value output

Navigation Parameter → Application → Curr.output → Upp.range outp

Description Depending on which variable has been selected as "Process variable output current ", define the related lower (4 mA) and upper range values (20 mA).

Failure behavior current output

Navigation Parameter → Application → Curr.output → Failure behav.

Description Defines which current the output assumes in the case of an error.
Min: < 3.6 mA
Max: >21.5 mA

Note: The hardware DIP Switch for alarm current has priority over software setting.

Selection
- Min.
- Max.

Failure current

Navigation Parameter → Application → Curr.output → Failure current

Description Enter current output value in alarm condition

User entry 21.5 to 23 mA

Output current

Navigation Parameter → Application → Curr.output → Output curr.

Description Shows the value currently calculated for the current output

User interface 3.59 to 23 mA

Terminal current

Navigation Parameter → Application → Curr.output → Terminal curr.

Description Shows the current value of the current output which is currently measured

User interface 0 to 30 mA

Switching signal channel 1.1 and 1.2 - Level

Navigation Parameter → Application → SSC 1

SP 1

Navigation Parameter → Application → SSC 1 → SP 1

Description Enter setpoint 1.

User entry 0 to 125 000 mm

SP 2

Navigation Parameter → Application → SSC 1 → SP 2

Description Enter setpoint 2.

Additional information:
When the "Single point" option is selected in the "Mode" parameter, setpoint 2 is ignored.

User entry 0 to 125 000 mm

Logic

Navigation Parameter → Application → SSC 1 → Logic

Description Select the switching logic.

Selection
- High active
- Low active

Additional information *Selection*
- **High active** option
  When the measured value is within the active range, the channel reports the value "1". Otherwise the channel reports the value "0".
- **Low active** option
  When the measured value is within the active range, the channel reports the value "0". Otherwise the channel reports the value "1".

Mode

Navigation Parameter → Application → SSC 1 → Mode

Description Select the switching mode.

Selection
- Deactivated
- Single point
- Window
- Two point

Additional information *Selection*

- **Deactivated** option
  The channel is not used.
- **Single point** option
  Only setpoint 1 ("SP 1") is used. When the measured value exceeds setpoint 1 ("SP 1"), the switching signal is active.
- **Window** option
  Setpoint 1 ("SP 1") and setpoint 2 ("SP 2") specify the range within which the switching signal is active.
- **Two point** option
  Setpoint 1 and 2 ("SP 1" and "SP 2") are both used. When the measured value exceeds setpoint 1 ("SP 1"), the switching signal is active. The switching signal remains active until the measured value drops below setpoint 2 ("SP 2").

Hysteresis

Navigation Parameter → Application → SSC 1 → Hysteresis

Description Enter a value. The hysteresis is applied to the setpoints. The hysteresis prevents constant changes of the switching state if the measured value fluctuates near a setpoint.

User entry 0 to 125 000 mm

Switching delay

Navigation Parameter → Application → SSC 1 → Switching delay

Description Enter the delay for the setpoint until the output switches.

User entry 0 to 50 s

Switch back delay

Navigation Parameter → Application → SSC 1 → SwitchBackDelay

Description Enter the delay for the setpoint until the output switches back.

User entry 0 to 50 s

Switching signal channel .1 - Level

Navigation Parameter → Application → SSC 1 → Switching signal channel .1 - Level

Description Displays the state of the switching signal channel (SSC).

User interface High

Additional information *User interface*

"High" option
The switching signal channel reports the value "1".

Switching signal channel 2.1 and 2.2 - Distance

Navigation Parameter → Application → SSC 2.1 and 2.2

SP 1

Navigation Parameter → Application → SSC 2.1 and 2.2 → SP 1

Description Enter setpoint 1.

User entry 0 to 125 000 mm

SP 2

Navigation Parameter → Application → SSC 2.1 and 2.2 → SP 2

Description Enter setpoint 2.

Additional information:
When the "Single point" option is selected in the "Mode" parameter, setpoint 2 is ignored.

User entry 0 to 125 000 mm

Logic

Navigation Parameter → Application → SSC 2.1 and 2.2 → Logic

Description Select the switching logic.

Selection
- High active
- Low active

Additional information *Selection*
- **High active** option
  When the measured value is within the active range, the channel reports the value "1". Otherwise the channel reports the value "0".
- **Low active** option
  When the measured value is within the active range, the channel reports the value "0". Otherwise the channel reports the value "1".

Mode

Navigation Parameter → Application → SSC 2.1 and 2.2 → Mode

Description Select the switching mode.

Selection
- Deactivated
- Single point
- Window
- Two point

Additional information *Selection*
- **Deactivated** option
  The channel is not used.
- **Single point** option
  Only setpoint 1 ("SP 1") is used. When the measured value exceeds setpoint 1 ("SP 1"), the switching signal is active.
- **Window** option
  Setpoint 1 ("SP 1") and setpoint 2 ("SP 2") specify the range within which the switching signal is active.
- **Two point** option
  Setpoint 1 and 2 ("SP 1" and "SP 2") are both used. When the measured value exceeds setpoint 1 ("SP 1"), the switching signal is active. The switching signal remains active until the measured value drops below setpoint 2 ("SP 2").

Hysteresis

Navigation Parameter → Application → SSC 2.1 and 2.2 → Hysteresis

Description Enter a value. The hysteresis is applied to the setpoints. The hysteresis prevents constant changes of the switching state if the measured value fluctuates near a setpoint.

User entry 0 to 125 000 mm

Switching delay

Navigation Parameter → Application → SSC 2.1 and 2.2 → Switching delay

Description Enter the delay for the setpoint until the output switches.

User entry 0 to 50 s

Switch back delay

Navigation Parameter → Application → SSC 2.1 and 2.2 → SwitchBackDelay

Description Enter the delay for the setpoint until the output switches back.

User entry 0 to 50 s

Switching signal channel 2.1 and 2.2 - Distance

Navigation Parameter → Application → SSC 2.1 and 2.2 → Switching signal channel .2 - Level

Description Displays the state of the switching signal channel (SSC).

User interface High

Additional information *User interface*

"High" option
The switching signal channel reports the value "1".

Teach single value

Navigation Parameter → Application → TeachSingleValue

Teach select

Navigation Parameter → Application → TeachSingleValue → Teach select

Description Select the switching signal channel (SSC) for the next teach procedure.

Selection
- SSC 1.1
- SSC 1.2
- SSC 2.1
- SSC 2.2

Teach result

Navigation Parameter → Application → TeachSingleValue → Teach result

Description Displays the status of the teach process.

User interface
- Idle
- SP 1 success
- SP 2 success
- SP 1, SP2 success
- Wait for command
- Busy
- Error

Additional information *User interface*
- **Idle** option
  There is currently no teach process in progress.
- **SP 1 success** option
  The teach process for setpoint 1 ("SP 1") was successful.
- **SP 2 success** option
  The teach process for setpoint 2 ("SP 2") was successful.
- **SP 1, SP2 success** option
  The teach process for setpoints 1 and 2 ("SP 1" and "SP 2") was successful.
- **Wait for command** option
  The setpoint for the teach process is not yet selected in the "System command" parameter.
- **Busy** option
  The teach process is in progress.
- **Error** option
  The teach process has failed. The value has not been applied.

3.2.2 System

Navigation Parameter → System

Bluetooth configuration

Navigation Parameter → System → Bluetooth conf.

Bluetooth activation

Navigation Parameter → System → Bluetooth conf. → Bluetooth active

Description If Bluetooth is deactivated, it can only be reactivated via the display or the operating tool. Reactivating via the SmartBlue app is not possible.

Selection
- Disable
- Enable

Device management

Navigation Parameter → System → Device manag.

Safety locked

Navigation Parameter → System → Device manag. → Safety locked

User interface
- Off
- On

Temporarily locked

Navigation Parameter → System → Device manag. → Temp. locked

User interface
- Off
- On

Operating time

Navigation Parameter → System → Device manag. → Operating time

Description Indicates how long the device has been in operation.

User interface Days (d), hours (h), minutes (m), seconds (s)

Configuration counter

Navigation Parameter → System → Device manag. → Config. counter

Description Displays the counter for changes to the device parameters.

Additional information:
- If the value for a static parameter is changed when optimizing or configuring the parameter, the counter is incremented by 1. This is to enable tracking different parameter versions.
- When multiple parameters are changed simultaneously, e.g. when loading parameters into the device from an external source such as FieldCare, the counter may display a higher value. The counter cannot be reset, nor is it reset to a default value on performing a device reset.
- Once the counter has reached the value 65535, it restarts at 0.

User interface 0 to 65 535

Display

Navigation Parameter → System → Display

Language

Navigation Parameter → System → Display → Language

Description Set display language

Selection
- English
- Deutsch *
- Français *
- Español *
- Italiano *
- Nederlands *
- Portuguesa *
- Polski *

* Visibility depends on order options or device settings

- русский язык (Russian) *
- Svenska *
- Türkçe *
- 中文 (Chinese) *
- 日本語 (Japanese) *
- 한국어 (Korean) *
- čeština (Czech) *

Format display

Navigation Parameter → System → Display → Format display

Description Select how measured values are shown on the display

Selection
- 1 value, max. size
- Bargraph
- 2 values
- Switch output

Value 1 display

Navigation Parameter → System → Display → Value 1 display

Description Select the measured value that is shown on the local display

Selection
- Level linearized
- Distance
- Absolute echo amplitude
- Relative echo amplitude
- Area of incoupling
- Buildup index *
- Current output *
- Foam index *
- Terminal voltage
- Electronics temperature
- Sensor temperature
- Unfiltered distance

Decimal places 1

Navigation Parameter → System → Display → Decimal places 1

Description This selection does not affect the measurement and calculation accuracy of the device.

* Visibility depends on order options or device settings

Selection
- x
- x.x
- x.xx
- x.xxx
- x.xxxx

Value 2 display

Navigation Parameter → System → Display → Value 2 display

Description Select the measured value that is shown on the local display

Selection
- None
- Level linearized
- Distance
- Absolute echo amplitude
- Relative echo amplitude
- Area of incoupling
- Buildup index*
- Foam index*
- Terminal voltage
- Electronics temperature
- Sensor temperature
- Current output*
- Unfiltered distance

Decimal places 2

Navigation Parameter → System → Display → Decimal places 2

Description This selection does not affect the measurement and calculation accuracy of the device.

Selection
- x
- x.x
- x.xx
- x.xxx
- x.xxxx

Rotation display

Navigation Parameter → System → Display → Rotation display

Description Select rotation angle of the display text to optimize local display readability.

* Visibility depends on order options or device settings

Selection
- Auto
- 0 degree
- 90 degree
- 180 degree
- 270 degree

Color scheme

Navigation Parameter → System → Display → Color scheme

Description Select the preferred color scheme.

Selection
- Light
- Dark

Software configuration

Navigation Parameter → System → Softw. config.

Activate SW option

Navigation Parameter → System → Softw. config. → Activate SW opt.

Description Enter the application package code or code of another re-ordered functionality to enable it

User entry Positive integer

Heartbeat Monitoring

Navigation Parameter → System → Softw. config. → Heartbeat Mon.

User interface
- Off
- On

Heartbeat Verification

Navigation Parameter → System → Softw. config. → Heartbeat Verif.

User interface
- Off
- On

WHG

Navigation Parameter → System → Softw. config. → WHG

User interface
- Off
- On

Bluetooth

Navigation Parameter → System → Softw. config. → Bluetooth

User interface
- Off
- On

3.3 Observation

Navigation Observation

3.3.1 Process data input

Navigation Observation → Data input

Extended device status

Navigation Observation → Data input → Ext.DeviceStatus

Description Displays the extended device status:
- 0: Not specified
- 36: Failure
- 37: Failure - simulation
- 60: Function check
- 61: Function check - simulation
- 120: Out of specification
- 121: Out of specification - simulation
- 164: Maintenance required
- 165: Maintenance required - simulation
- 128: Good
- 129: Good - simulation

User interface
- Failure
- Failure - simulation
- Function check
- Function check - simulation
- Out of specification

- Out of specification - simulation
- Good
- Maintenance required
- Maintenance required - simulation
- Good - simulation
- Not specified

Switching signal channel .1 - Level

Navigation
Observation → Data input → Switching signal channel .1 - Level
Observation → Data input → Switching signal channel .1 - Level

Description
Displays the state of the switching signal channel (SSC).

User interface
High

Additional information
User interface

"High" option
The switching signal channel reports the value "1".

Switching signal channel 2.1 and 2.2 - Distance

Navigation
Observation → Data input → Switching signal channel .2 - Level
Observation → Data input → Switching signal channel .2 - Level

Description
Displays the state of the switching signal channel (SSC).

User interface
High

Additional information
User interface

"High" option
The switching signal channel reports the value "1".

Switching signal channel .1 - Level

Navigation
Observation → Data input → Switching signal channel .1 - Level
Observation → Data input → Switching signal channel .1 - Level

Description
Displays the state of the switching signal channel (SSC).

User interface
High

Additional information *User interface*

"High" option
The switching signal channel reports the value "1".

Level linearized

Navigation Observation → Data input → Level linearized

Level linearized

Navigation Observation → Data input → Level linearized → Level linearized

Description Displays the linearized level.

User interface Signed floating-point number

Distance

Navigation Observation → Data input → Distance

Distance

Navigation Observation → Data input → Distance → Distance

Description Distance from reference point to medium surface.

Note:
The reference point is specified in the respective Operating Instructions.

User interface Signed floating-point number

3.4 Diagnosis

Navigation Diagnosis

Device Status

Navigation Diagnosis → Device Status

User interface 0 to 255

Detailed device status

Navigation Diagnosis → DetailDeviceStat

Description Displays the currently active diagnostic messages, starting with the highest priority (up to 5).

User interface Character string comprising numbers, letters and special characters

3.4.1 Active diagnostics

Navigation Diagnosis → Active diagnos.

Active diagnostics

Navigation Diagnosis → Active diagnos. → Active diagnos.

Description Displays the currently active diagnostic message.

If there is more than one pending diagnostic event, the message for the diagnostic event with the highest priority is displayed.

User interface Positive integer

Active diagnostic IO-Link

Navigation Diagnosis → Active diagnos. → ActDiag IO-Link

Description Displays the IO-Link event code for the currently active diagnostic message. If there is more than one pending diagnostic event, the code for the diagnostic message with the highest priority is displayed.

User interface 0 to 65 535

Previous diagnostics

Navigation Diagnosis → Active diagnos. → Prev.diagnostics

Description Displays the diagnostic message for the last diagnostic event that has ended.

User interface Positive integer

Last diagnostic IO-Link

Navigation Diagnosis → Active diagnos. → LastDiag IO-Link

Description Displays the IO-Link event code for the last diagnostic event that has ended.

User interface 0 to 65 535

3.4.2 Simulation

Navigation Diagnosis → Simulation

Simulation

Navigation Diagnosis → Simulation → Simulation

Description Simulates one or more process variables and/or events.

Warning:
Output will reflect the simulated value or event.

Selection
- Off
- Distance
- Level

- Current output *
- Diagnostic event simulation
- Foam index *
- Buildup index *
- Switch output

Simulation values

Navigation Diagnosis → Simulation → Simulation values → Diagnostic event

Diagnostic event simulation	
Navigation	Diagnosis → Simulation → Simulation values → Diagnostic event
Description	Select the diagnostic event to be simulated. Note: To terminate the simulation, select "Off".
Selection	Off

Value current output	
Navigation	Diagnosis → Simulation → Simulation values → Current output
Description	Defines the value of the simulated output current.
User entry	3.59 to 23 mA

Simulation distance	
Navigation	Diagnosis → Simulation → Simulation values → Sim distance
User entry	−999 900 to 999 900 mm

* Visibility depends on order options or device settings

Buildup index

Navigation Diagnosis → Simulation → Simulation values → Buildup index

User entry 0 to 100.0 %

Foam index

Navigation Diagnosis → Simulation → Simulation values → Foam index

User entry 0 to 100.0 %

Process variable value

Navigation Diagnosis → Simulation → Simulation values → Proc. var. value

Description Defines the value of the selected variable.
The outputs assume values or states according to this value.

User entry Positive floating-point number

Simulation switch output .1

Navigation Diagnosis → Simulation → Simulation values → Sim. switch .1
Diagnosis → Simulation → Simulation values → Sim. switch .1

Description Select the switching state to simulate. The simulation affects the switch output.

Additional information:
If the simulation is active, the "494 - Switch output simulation active" diagnostic message is displayed. In the event of a supply voltage interruption, the simulation is not continued. The device then operates in operating mode again.

Selection
- High
- Low

Simulation switch output .2

Navigation
Diagnosis → Simulation → Simulation values → Sim. switch .2
Diagnosis → Simulation → Simulation values → Sim. switch .2

Description
Select the switching state to simulate. The simulation affects the switch output.

Additional information:
If the simulation is active, the "494 - Switch output simulation active" diagnostic message is displayed. In the event of a supply voltage interruption, the simulation is not continued. The device then operates in operating mode again.

Selection
- High
- Low

3.4.3 Electronics temperature

Navigation Diagnosis → Electronics temp

Sensor temperature

Navigation
Diagnosis → Electronics temp → Sensor temp.

Description
Displays the current temperature of the sensor electronics.

User interface
−150 to 200 °C

3.4.4 Heartbeat Verification

Navigation Diagnostics → Heartbeat Techn. → Heartbeat Verif.

Verification result

Navigation
Diagnostics → Heartbeat Techn. → Heartbeat Verif. → Verific. result

User interface
- Not done
- Passed
- Not done
- Failed

Operating time (Verification)

Navigation Diagnostics → Heartbeat Techn. → Heartbeat Verif. → Operating time

User interface Days (d), hours (h), minutes (m), seconds (s)

3.4.5 Block parameterization error message

Navigation Diagnosis → BlockPar. error

Block parameterization error message

Navigation Diagnosis → BlockPar. error → BlockPar. error

Description Displays the block parameterization error, e. g. value is out of range.

Additional information:
With block parameterization, a set of parameters is written to the device in one block. In the event of an error, the parameterization is not applied.

User interface
- --------
- Index not available
- Subindex not available
- Service temporarily not available
- Service blocked by local operation
- Service blocked by remote operation
- Access denied
- Parameter out of range
- Value above limit
- Value below limit
- Data length above maximum
- Data length below minimum
- Command not supported
- Dev. function temporarily not available
- Parameter invalid
- Parameter block inconsistent
- Application not ready
- Unknown error

Invalid parameter

Navigation Diagnosis → BlockPar. error → Invalid param.

Description Displays the block parameter with the invalid setting, e. g. value is out of range.

Additional information:
With block parameterization, a set of parameters is written to the device in one block. In the event of an error, the parameterization is not applied.

User interface 0 to 65 535

3.4.6 Smart sensor descriptor

Navigation Diagnosis → SmartSensorDescr

4 Reading out and writing device data (ISDU – Indexed Service Data Unit)

Device data are always exchanged acyclically and at the request of the IO-Link master. Using the device data, the following parameter values or device statuses can be read out:

4.1 IO-Link-specific device data

Used abbreviations in the following table:
- OPR - Operator
- MAINT - Maintenance
- PROD - Production
- DEV - Development

Parameter	ISDU Index	Data Type	Size [Byte]	Access	Visibility	Write	Default value	Range	Data Storage
System command	2 (0x2)	Enum8	1	r/-	OPR	OPR	Application reset	1 : ParamUploadStart 2 : ParamUploadEnd 3 : ParamDownloadStart 4 : ParamDownloadEnd 5 : ParamDownloadStore 6 : ParamBreak 65 : Teach SP 1 66 : Teach SP 2 129 : Application reset 131 : Back-to-box 164 : To delivery settings 240 : SystemTestCommand240 241 : SystemTestCommand241 242 : SystemTestCommand242 243 : SystemTestCommand243	false
Device access locking	12 (0xC)	BitEnum16	2	r/w	OPR	MAINT		4 : Local parameterization 8 : Local user interface	false
Data storage index	3 (0x3)	Uint8	1	r/w	OPR	MAINT	0	0...255	false
Vendor name	16 (0x10)	String	32	r/-	OPR	PROD	Endress +Hauser		false
Product name	18 (0x12)	String	32	r/-	OPR	PROD	Micropilot		false
Device Status	36 (0x24)	Uint8	1	r/-	OPR	PROD	0	0...255	false
Master Command	8932 (0x22E4)	Uint8	1	r/w	OPR	MAINT	0	0...255	false
Master Cycle Time	8931 (0x22E3)	Uint8	1	r/w	OPR	MAINT	0	0...255	false
M-Sequence Capability	8930 (0x22E2)	Uint8	1	r/-	OPR		0	0...255	false
Revision ID	8929 (0x22E1)	Uint8	1	r/w	OPR	MAINT	0	0...255	false
Process Data Input	4096 (0x1000)	Uint8	1	r/-	OPR		0	0...255	false
Vendor ID 1	8928 (0x22E0)	Uint8	1	r/-	OPR	PROD	0	0...255	false
Vendor ID 2	8927 (0x22DF)	Uint8	1	r/-	OPR	PROD	17	0...255	false
Device ID 1	8924 (0x22DC)	Uint8	1	r/-	OPR	PROD	145	0...255	false
Device ID 2	8923 (0x22DB)	Uint8	1	r/-	OPR	PROD	198	0...255	false
Device ID 3	8925 (0x22DD)	Uint8	1	r/-	OPR	PROD	1	0...255	false

Parameter	ISDU Index	Data Type	Size [Byte]	Access	Visibility	Write	Default value	Range	Data Storage
Device type	256 (0x100)	Uint16	2	r/-	MAINT		37318	0...65535	false
Active diagnostic	260 (0x104)	Uint16	2	r/-	OPR		0	0...65535	false
Last diagnostic	261 (0x105)	Uint16	2	r/-	OPR		0	0...65535	false
MinCycTime	8926 (0x22DE)	Uint8	1	r/-	OPR		0	0...255	false
Revision ID	8916 (0x22D4)	String	3	r/-	OPR		1.1		false
Vendor text	17 (0x11)	String	32	r/-	OPR		People for Process Automation		false
Product ID	19 (0x13)	String	64	r/-	OPR		FMR43		false
Transmission quality	1522 (0x5F2)	Float	4	r/-	OPR		0	-3.0e+38...3.0e+38 (Percent)	false
Profile Characteristic	13 (0xD)	Uint16	2	r/-	OPR		16384	0...65535	false
PDInputDescriptor	14 (0xE)	ByteArray	3	r/-	OPR		1,4,0		false
Detailed device status	37 (0x25)	ByteArray	3	r/-	OPR		0x00		false
Product text	20 (0x14)	String	64	r/-	OPR		Non-contact level transmitter		false
Direct Parameter Page 1	0 (0x0)	Record	11	r/-			-		false
Application specific tag	24 (0x18)	String	32	r/w	OPR	MAINT	***		true
Device search	12399 (0x306F)	Enum16	2	r/w	OPR	MAINT	Off	33004 : Off 33006 : On	false
Configuration counter	1503 (0x5DF)	Uint16	2	r/-	OPR		0	0...65535	false
Teach select	58 (0x3A)	Enum8	1	r/w	MAINT	MAINT	SSC 1.1	1 : SSC 1.1 2 : SSC 1.2 11 : SSC 2.1 12 : SSC 2.2	false
Process data input	350 (0x15E)	Record	13	r/-			-		false
Teach result	59 (0x3B)	Enum8	1	r/-	MAINT	DEV	Idle	0 : Idle 1 : SP 1 success 2 : SP 2 success 3 : SP 1, SP2 success 4 : Wait for command 5 : Busy 7 : Error	false
Lower value	8935 (0x22E7)	Float	4	r/-	OPR	DEV	0	0.0...125.0 (Meter)	false
Lower value	8936 (0x22E8)	Float	4	r/-	OPR	DEV	0	0.0...125.0 (Meter)	false
Upper value	8937 (0x22E9)	Float	4	r/-	OPR	DEV	20	0.0...125.0 (Meter)	false
Function tag	25 (0x19)	String	32	r/w	OPR	MAINT	***		true
Location tag	26 (0x1A)	String	32	r/w	OPR	MAINT	***		true
Upper value	8938 (0x22EA)	Float	4	r/-	OPR	DEV	20	0.0...125.0 (Meter)	false
Unit	8941 (0x22ED)	Enum16	2	r/-	OPR	DEV	m	1013 : mm 1010 : m 1018 : ft 1019 : in	false

Parameter	ISDU Index	Data Type	Size [Byte]	Access	Visibility	Write	Default value	Range	Data Storage
Unit	8942 (0x22EE)	Enum16	2	r/-	OPR	DEV	m	1013 : mm 1010 : m 1018 : ft 1019 : in	false
Scale	8939 (0x22EB)	Sint8	1	r/-	OPR	DEV	0	-128...127	false
Scale	8940 (0x22EC)	Sint8	1	r/-	OPR	DEV	0	-128...127	false
Measurement data channel 1	16512 (0x4080)	Record	11	r/-			-		false
Measurement data channel 2	16513 (0x4081)	Record	11	r/-			-		false
Output 1 operating mode	1504 (0x5E0)	Enum16	2	r/-	OPR		PNP SSC 1.1 - Level	5383 : PNP SSC 1.1 - Level	false
Output 2 operating mode	1505 (0x5E1)	Enum16	2	r/w	OPR	MAINT	Off	33004 : Off 5391 : 4...20 mA MDC 1 - Level 5384 : PNP SSC 1.2 - Level	true
Invalid parameter	12338 (0x3032)	Uint16	2	r/-	OPR		0	0...65535	false
Block parameterization error message	12339 (0x3033)	Enum8	1	r/-	OPR		--------	0 : -------- 17 : Index not available 18 : Subindex not available 32 : Service temporarily not available 33 : Service blocked by local operation 34 : Service blocked by remote operation 35 : Access denied 48 : Parameter out of range 49 : Value above limit 50 : Value below limit 51 : Data length above maximum 52 : Data length below minimum 53 : Command not supported 54 : Dev. function temporarily not available 64 : Parameter invalid 65 : Parameter block inconsistent 130 : Application not ready 255 : Unknown error	false
Extended device status	9000 (0x2328)	Enum8	1	r/-	OPR		Not specified	36 : Failure 37 : Failure - simulation 60 : Function check 61 : Function check - simulation 120 : Out of specification 121 : Out of specification - simulation 128 : Good 164 : Maintenance required 165 : Maintenance required - simulation 129 : Good - simulation 0 : Not specified	false
Active diagnostic IO-Link	12345 (0x3039)	Uint16	2	r/-	OPR		0	0...65535	false
Last diagnostic IO-Link	12346 (0x303A)	Uint16	2	r/-	OPR		0	0...65535	false
Temporarily locked	12341 (0x3035)	Enum8	1	r/-	OPR		Off	0 : Off 1 : On	false
Heartbeat Verification	12342 (0x3036)	Enum8	1	r/-	OPR		Off	0 : Off 1 : On	false
Heartbeat Monitoring	12343 (0x3037)	Enum8	1	r/-	OPR		Off	0 : Off 1 : On	false
Process data input	40 (0x28)	Uint8	1	r/-	OPR		0	0...255	false
WHG	1524 (0x5F4)	Enum8	1	r/-	OPR		Off	0 : Off 1 : On	false
Safety locked	12356 (0x3044)	Enum8	1	r/-	OPR		Off	0 : Off 1 : On	false

Parameter	ISDU Index	Data Type	Size [Byte]	Access	Visibility	Write	Default value	Range	Data Storage
Bluetooth	1525 (0x5F5)	Enum8	1	r/-	OPR		Off	0 : Off 1 : On	false
Switch back delay	1512 (0x5E8); 1513 (0x5E9)	Float	4	r/w	OPR	MAINT	0	0...50 (Second)	true
Logic	8588 (0x218C); 8589 (0x218D)	Enum8	1	r/w	OPR	MAINT	High active	0 : High active 1 : Low active	true
Mode	8590 (0x218E); 8591 (0x218F)	Enum8	1	r/w	OPR	MAINT	Two point	0 : Deactivated 1 : Single point 2 : Window 3 : Two point	true
Switching signal channel .1 - Level	12326 (0x3026); 12327 (0x3027)	BitEnum8	1	r/-	OPR		High	1 : High	false
Simulation switch output .1	1514 (0x5EA); 1515 (0x5EB)	Enum16	2	r/w	OPR	MAINT	High	4167 : High 4168 : Low	false
SSC .1 param	60 (0x3C); 16396 (0x400C)	Record	8	r/-			-		false
SSC .2 param	62 (0x3E); 16398 (0x400E)	Record	8	r/-			-		false
SP 1	8596 (0x2194); 8597 (0x2195)	Float	4	r/w	OPR	MAINT	11000		true
SP 2	8598 (0x2196); 8599 (0x2197)	Float	4	r/w	OPR	MAINT	10900		true
Hysteresis	8600 (0x2198); 8601 (0x2199)	Float	4	r/w	MAINT	MAINT	0		true
Logic	8602 (0x219A); 8603 (0x219B)	Enum8	1	r/w	OPR	MAINT	High active	0 : High active 1 : Low active	true
Mode	8604 (0x219C); 8605 (0x219D)	Enum8	1	r/w	OPR	MAINT	Two point	0 : Deactivated 1 : Single point 2 : Window 3 : Two point	true
Hysteresis	8606 (0x219E); 8607 (0x219F)	Float	4	r/w	MAINT	MAINT	0		true
SSC .1 config	61 (0x3D); 16397 (0x400D)	Record	6	r/-			-		false

Parameter	ISDU Index	Data Type	Size [Byte]	Access	Visibility	Write	Default value	Range	Data Storage
SSC .2 config	63 (0x3F); 16399 (0x400F)	Record	6	r/-			-		false
Switching delay	1510 (0x5E6); 1511 (0x5E7)	Float	4	r/w	OPR	MAINT	0	0...50 (Second)	true
Simulation switch output	1506 (0x5E2); 1507 (0x5E3)	Enum16	2	r/-	OPR	OPR	Off	33004 : Off 33006 : On	false
Switching signal channel .2 - Level	12330 (0x302A); 12331 (0x302B)	BitEnum8	1	r/-	OPR		High	1 : High	false
Switching delay	1516 (0x5EC); 1517 (0x5ED)	Float	4	r/w	OPR	MAINT	0	0...50 (Second)	true
Switch back delay	1518 (0x5EE); 1519 (0x5EF)	Float	4	r/w	OPR	MAINT	0	0...50 (Second)	true
Simulation switch output .2	1520 (0x5F0); 1521 (0x5F1)	Enum16	2	r/w	OPR	MAINT	High	4167 : High 4168 : Low	false
SP 1	8881 (0x22B1); 8882 (0x22B2)	Float	4	r/w	OPR	MAINT	9000		true
SP 2	8883 (0x22B3); 8884 (0x22B4)	Float	4	r/w	OPR	MAINT	8900		true

4.2 Endress+Hauser-specific device data

Used abbreviations in the following table:
- OPR - Operator
- MAINT - Maintenance
- PROD - Production
- DEV - Development

Parameter	ISDU Index	Data Type	Size [Byte]	Access	Visibility	Write	Default value	Range	Data Storage
Configuration counter	8300 (0x206C)	Uint16	2	r/-	OPR		0	0...65535	false
Restart device	8281 (0x2059)	Uint8	1	r/-	OPR	OPR	0	0...1	false
Device name	12295 (0x3007)	String	16	r/-	OPR	PROD	FMR43		false
Device name	12374 (0x3056)	String	16	r/-	OPR	PROD	Micropilot		false

Parameter	ISDU Index	Data Type	Size [Byte]	Access	Visibility	Write	Default value	Range	Data Storage
Manufacturer ID	12290 (0x3002)	Uint16	2	r/-	OPR	PROD	17	0...65535	false
Manufacturer	12291 (0x3003)	String	32	r/-	OPR	PROD	Endress +Hauser		false
Firmware version	23 (0x17)	String	8	r/-	OPR		01.00		false
Firmware version	12292 (0x3004)	Uint32	4	r/-	OPR		10000	0...4294967295	false
Serial number	21 (0x15)	String	11	r/-	OPR	PROD	AAFFFFAA FFF		false
Extended order code	259 (0x103)	Record	60	r/-			-		false
Order code	12375 (0x3057)	String	20	r/-	OPR	EXPER T	- none -		false
Device tag	12293 (0x3005)	String	32	r/-	OPR		FMR43		false
ENP version	257 (0x101)	String	16	r/-	OPR		2.02.00		false
Load bootloader	8275 (0x2053)	Uint8	1	r/-	OPR	OPR	0	0...1	false
Languages supported	274 (0x112)	BitEnum32	4	r/-	OPR		中文 (Chinese) čeština (Czech) Nederlands English Français Deutsch Bahasa Indonesia Italiano 日本語 (Japanese) 한국어 (Korean) Polski Portuguesa русский язык (Russian) Español Svenska Türkçe	1 : English 2 : Deutsch 8 : 中文 (Chinese) 16 : čeština (Czech) 32 : Nederlands 64 : Français 128 : Bahasa Indonesia 256 : Italiano 512 : 日本語 (Japanese) 1024 : 한국어 (Korean) 2048 : Polski 65536 : Portuguesa 8192 : русский язык (Russian) 16384 : Español 1048576 : Svenska 131072 : Türkçe	false
Enter access code	12289 (0x3001)	Uint16	2	r/w	MAINT	MAINT	0	0...9999	false
User role	258 (0x102)	Enum16	2	r/-	OPR		Maintenan ce	33014 : Operator 32959 : Maintenance 33064 : Expert 32807 : Production 32791 : Development	false
Locking status	12362 (0x304A)	BitEnum16	2	r/-	OPR			256 : Hardware locked 1024 : Safety locked 2048 : CT active - defined parameters 4096 : WHG locked 8192 : FDA locked 512 : Temporarily locked	false
Enter safety locking code	318 (0x13E)	Uint16	2	r/w	OPR	MAINT	0	0...65535	false
Enter safety unlocking code	317 (0x13D)	Uint16	2	r/w	OPR	MAINT	0	0...65535	false

Parameter	ISDU Index	Data Type	Size [Byte]	Access	Visibility	Write	Default value	Range	Data Storage
Reset device	12288 (0x3000)	Enum16	2	r/w	MAINT	MAINT	Cancel	32823 : Cancel 33056 : To SW-defaults 3392 : To service defaults 33054 : To fieldbus defaults 33053 : To factory defaults 33052 : To delivery settings 33125 : Restart device 33089 : Start factory default 33087 : Start customer settings 598 : Start append to factory default 599 : Start append to Customer settings 33096 : Stop 5342 : Application reset	false
Extended order code 1	12389 (0x3065)	String	20	r/-	OPR	EXPERT			false
Extended order code 2	12390 (0x3066)	String	20	r/-	OPR	EXPERT	-		false
Extended order code 3	12391 (0x3067)	String	20	r/-	OPR	EXPERT	-		false
UDL features	12371 (0x3053)	BitEnum16	2	r/-	OPR		Upload support	1 : Upload support 2 : Download support 4 : Multibuffer support	false
UDL operation	12372 (0x3054)	Enum16	2	r/w	OPR	MAINT	Terminate up-/ download	33116 : Initiate upload 32868 : Download to different device 33426 : Download to identical device 33113 : Abort up-/download 33114 : Terminate up-/download 33462 : Confirm download status	false
UDL status	12373 (0x3055)	Enum16	2	r/-	OPR		Up-/ download inactive	33111 : Up-/download inactive 32866 : Download temporary impossible 33115 : Upload active 32863 : Download active 33112 : Up-/Download verification active 32865 : Download succeeded 32867 : Download terminated with warnings 32864 : Download failed	false
UDL verify delay	12369 (0x3051)	Uint16	2	r/-	OPR		5	0...65535 (Second)	false
Activate SW option	277 (0x115)	Uint32	4	r/w	OPR	MAINT	0	0...4294967295	false
SW option enabled overview	278 (0x116)	BitEnum32	4	r/-	OPR			8 : SIL 16 : WHG 32 : Heartbeat Verification 64 : Heartbeat Monitoring 256 : Bluetooth	false
Software option overview	280 (0x118)	BitEnum32	4	r/-	OPR			8 : SIL 16 : WHG 32 : Heartbeat Verification 64 : Heartbeat Monitoring 256 : Bluetooth	false
Hardware version	22 (0x16)	String	16	r/-	OPR	PROD	01.00.00		false
Parameter dependency status	1299 (0x513)	ByteArray	6	r/-	MAINT	DEV	0xff		false
Messages	1300 (0x514)	BitEnum32	4	r/-	OPR	OPR		1 : Commissioning done 2 : DIP switch status 4 : Set date/time 8 : 3-wire	false
Password	1301 (0x515)	String	16	r/-	OPR	OPR			false

Parameter	ISDU Index	Data Type	Size [Byte]	Access	Visibility	Write	Default value	Range	Data Storage
Status password entry	1302 (0x516)	Enum16	2	r/-	OPR		--------	33296 : -------- 3277 : Wrong password 3278 : Password rule violated 3279 : Password accepted 3280 : Permission denied 3462 : Confirm PW mismatch 3282 : Reset password accepted 3487 : Invalid user role 3514 : Wrong sequence of entry	false
Old password	1303 (0x517)	String	16	r/w	MAINT	MAINT			false
New password	1304 (0x518)	String	16	r/w	MAINT	MAINT			false
Confirm new password	1305 (0x519)	String	16	r/w	MAINT	MAINT			false
Reset password	1307 (0x51B)	String	16	r/-	OPR	OPR			false
Select user role	1308 (0x51C)	Enum16	2	r/-	OPR	OPR	Operator	33014 : Operator 32959 : Maintenance 3283 : Logout	false
Password management	1310 (0x51E)	Enum16	2	r/-	OPR	OPR	Please select	33296 : Please select 3383 : Define password 3412 : Enter password 3384 : Change password 3385 : Delete password 3386 : Forgot password?	false
Start	1311 (0x51F)	String	14	r/-	OPR	DEV	Start Sequence		false

Parameter	ISDU Index	Data Type	Size [Byte]	Access	Visibility	Write	Default value	Range	Data Storage
Display interval	1490 (0x5D2)	Float	4	r/-	OPR	OPR	5	1...10 (Second)	false
Decimal places 1	1492 (0x5D4)	Enum16	2	r/w	OPR	MAINT	x	33132 : x 33133 : x.x 33134 : x.xx 33135 : x.xxx 33136 : x.xxxx	false
Value 1 display	1501 (0x5DD)	Enum16	2	r/w	OPR	MAINT	Level linearized	32949 : Level linearized 32856 : Distance 32786 : Absolute echo amplitude 33044 : Relative echo amplitude 32937 : Area of incoupling 4207 : Buildup index 1505 : Current output 4208 : Foam index 211 : Terminal voltage 32885 : Electronics temperature 33191 : Sensor temperature 4271 : Unfiltered distance	true
Value 2 display	1496 (0x5D8)	Enum16	2	r/w	OPR	MAINT	Distance	32989 : None 32949 : Level linearized 32856 : Distance 32786 : Absolute echo amplitude 33044 : Relative echo amplitude 32937 : Area of incoupling 4207 : Buildup index 4208 : Foam index 211 : Terminal voltage 32885 : Electronics temperature 33191 : Sensor temperature 1505 : Current output 4271 : Unfiltered distance	true

Parameter	ISDU Index	Data Type	Size [Byte]	Access	Visibility	Write	Default value	Range	Data Storage
Language	1312 (0x520)	Enum16	2	r/-	OPR	OPR	English	32888 : English 32920 : Deutsch 32917 : Français 33083 : Español 32945 : Italiano 32881 : Nederlands 33027 : Portuguesa 33026 : Polski 33062 : русский язык (Russian) 1263 : Svenska 33166 : Türkçe 32824 : 中文 (Chinese) 32946 : 日本語 (Japanese) 32948 : 한국어 (Korean) 33155 : Bahasa Indonesia 32842 : čeština (Czech)	true
Format display	1491 (0x5D3)	Enum16	2	r/-	OPR	OPR	1 value, max. size	32771 : 1 value, max. size 32770 : Bargraph 32773 : 2 values 32776 : 1 value large + 2 values 32783 : 4 values 4267 : Switch output	true
Decimal places 2	1493 (0x5D5)	Enum16	2	r/w	OPR	MAINT	x	33132 : x 33133 : x.x 33134 : x.xx 33135 : x.xxx 33136 : x.xxxx	false
Measured values 1	1502 (0x5DE)	Float	4	r/-	OPR		0		false
Measured values 2	1485 (0x5CD)	Float	4	r/-	OPR		0		false
Bluetooth activation	1313 (0x521)	Enum16	2	r/-	OPR	OPR	Enable	32852 : Disable 32887 : Enable	true
Color scheme	1508 (0x5E4)	Enum16	2	r/w	OPR	MAINT	Dark	3893 : Light 3896 : Dark	true
Rotation display	1316 (0x524)	Enum16	2	r/w	OPR	MAINT	0 degree	32809 : Auto 3687 : 0 degree 3688 : 90 degree 3689 : 180 degree 3690 : 270 degree	true
Output current	1357 (0x54D)	Float	4	r/-	OPR		3.59	3.59...23 (mA)	false
Loop current mode	1359 (0x54F)	Enum16	2	r/w	OPR	MAINT	Enable	32852 : Disable 32887 : Enable	false
Failure behavior current output	1360 (0x550)	Enum16	2	r/w	OPR	MAINT	Min.	32972 : Min. 32962 : Max.	true
Failure current	1361 (0x551)	Float	4	r/w	OPR	MAINT	22.5	21.5...23 (mA)	true
Fixed current	1362 (0x552)	Float	4	r/w	OPR	MAINT	4	3.59...23 (mA)	false
Process variable output current	1363 (0x553)	Enum16	2	r/w	OPR	MAINT	Level linearized	32949 : Level linearized	false
Terminal current	1364 (0x554)	Float	4	r/-	OPR		0	0...30 (mA)	false
Measuring mode current output	1365 (0x555)	Enum16	2	r/w	OPR	MAINT	Standard	33106 : Standard 32942 : Inverse 2941 : Bi-directional	true
Current range output	1366 (0x556)	Enum16	2	r/w	OPR	MAINT	4...20 mA NE (3.8...20.5 mA)	32778 : 4...20 mA (4...20.5 mA) 32780 : 4...20 mA NE (3.8...20.5 mA) 32781 : 4...20 mA US (3.9...20.8 mA) 3343 : Customer specific	true
Current output simulation	1367 (0x557)	Enum16	2	r/w	OPR	MAINT	Off	33004 : Off 33006 : On	false
Value current output	1368 (0x558)	Float	4	r/w	OPR	MAINT	3.59	3.59...23 (mA)	false
Internal	1371 (0x55B)	Float	4	r/-	OPR	EXPERT	1	-2...2	false

Parameter	ISDU Index	Data Type	Size [Byte]	Access	Visibility	Write	Default value	Range	Data Storage
Internal	1372 (0x55C)	Float	4	r/-	OPR	EXPERT	0	-5...5 (mA)	false
Lower range value output	1373 (0x55D)	Float	4	r/w	OPR	MAINT	0		true
Upper range value output	1374 (0x55E)	Float	4	r/w	OPR	MAINT	20000		true
Higher saturation value	1377 (0x561)	Float	4	r/-	OPR		20.8	3.8...20.8 (mA)	false
Lower saturation value	1378 (0x562)	Float	4	r/-	OPR		3.8	3.8...20.8 (mA)	false

Parameter	ISDU Index	Data Type	Size [Byte]	Access	Visibility	Write	Default value	Range	Data Storage
Volume	8211 (0x2013)	Float	4	r/w	MAINT	MAINT	0.0	-3.4E+38...3.4E+38 (milliMeter / Unit after linearization)	false
Level	8212 (0x2014)	Float	4	r/w	MAINT	MAINT	0.0	-3.4E+38...3.4E+38 (milliMeterPercentWithConversion / Level unit)	false
Process variable value	8213 (0x2015)	Float	4	r/w	OPR	MAINT	0	0...1.4E+21 (milliMeter / Length unit)	false
Assign measurement variable	8214 (0x2016)	Enum16	2	r/w	MAINT	MAINT	Off	33004 : Off 33230 : Level 33228 : Interface 33231 : Thickness upper layer 33224 : Level linearized 33225 : Interface linearized 33227 : Thickness linearized	false
Reset min./max.	8215 (0x2017)	Enum16	2	r/w	OPR	MAINT	None	32989 : None 33220 : Drain/fill speed 33219 : Level 32909 : Flow 33221 : Reset all	false
Ramp at echo lost	8216 (0x2018)	Float	4	r/w	OPR	MAINT	0.0	-9999999.0...9999999.0 (ToFES_LevSpeedUnit_PercPerMin)	false
Min. level value	8203 (0x200B)	Float	4	r/-	OPR	DEV	9999999.0		false
Max. level value	8202 (0x200A)	Float	4	r/-	OPR	DEV	-9999999.0		false
Maximum filling speed	8204 (0x200C)	Float	4	r/-	OPR	DEV	0.0	0.0...9999999.0 (ToFES_LevSpeedUnit_PercPerMin)	false
Maximum draining speed	8197 (0x2005)	Float	4	r/-	OPR	DEV	0.0	0.0...9999999.0 (ToFES_LevSpeedUnit_PercPerMin)	false
Level	8219 (0x201B)	Float	4	r/-	OPR		0.0	-99999.9...200000.0 (milliMeterPercentWithConversion / Level unit)	false
Status of primary level output	8220 (0x201C)	Uint8	1	r/-	OPR		0	0...255	false
Sensor offset	8221 (0x201D)	Float	4	r/w	MAINT	MAINT	0	-200000000...200000000 (milliMeter / Length unit)	false
Status of the primary input value	8222 (0x201E)	Uint8	1	r/-	OPR		0	0...255	false
Level linearized	8223 (0x201F)	Float	4	r/-	OPR		0	-1.4E+21...1.4E+21 (milliMeterPercent / Unit after linearization)	false
Status of primary customized value	8224 (0x2020)	Uint8	1	r/-	OPR		0	0...255	false

Parameter	ISDU Index	Data Type	Size [Byte]	Access	Visibility	Write	Default value	Range	Data Storage
Output mode	8210 (0x2012)	Enum16	2	r/w	OPR	MAINT	Level linearized	33197 : Ullage 32949 : Level linearized	false
Value echo lost	8225 (0x2021)	Float	4	r/w	OPR	MAINT	0	-3.0E+38...3.0E+38 (milliMeterPercentWithConversion / Level unit)	false
Maximum value	8226 (0x2022)	Float	4	r/w	OPR	MAINT	100.0	-200000...200000.0 (milliMeterPercent / Unit after linearization)	false
Low limit	8227 (0x2023)	Float	4	r/w	OPR	MAINT	0.0	-200000.0...200000.0 (milliMeterPercentWithConversion / Level unit)	false
High limit	8228 (0x2024)	Float	4	r/w	OPR	MAINT	0	-3.0e+38...3.0e+38 (milliMeterPercentWithConversion / Level unit)	false
Level limit mode	8229 (0x2025)	Enum16	2	r/w	OPR	MAINT	Low limit	33004 : Off 33193 : Low limit 33192 : High limit 33212 : Low and High Limit	false
Time max. level	8205 (0x200D)	String	14	r/-	OPR				false
Level correction	8230 (0x2026)	Float	4	r/w	OPR	MAINT	0.0	-200000.0...200000.0 (milliMeterPercentWithConversion / Level unit)	false
Intermediate height	8231 (0x2027)	Float	4	r/w	OPR	MAINT	0	0...125000 (milliMeter / Length unit)	false
Full calibration	8232 (0x2028)	Float	4	r/w	OPR	MAINT	20000	1...125000 (milliMeter / Length unit)	true
941 Diagnostic behavior	8233 (0x2029)	Enum16	2	r/w	OPR	MAINT	Last valid value	32928 : Last valid value 33177 : Ramp at echo lost 33175 : Value echo lost 32794 : Alarm	false
Empty calibration	8234 (0x202A)	Float	4	r/w	OPR	MAINT	20000	0...125000 (milliMeter / Length unit)	true
Diameter	8235 (0x202B)	Float	4	r/w	OPR	MAINT	20000	...125000 (milliMeter / Length unit)	false
Unit after linearization	8236 (0x202C)	Enum16	2	r/w	OPR	MAINT	mm	1342 : % 32782 : kg 32787 : m^3 32784 : gal (imp) 32781 : l 1013 : mm 1010 : m 1018 : ft 1019 : in 32779 : ton 32775 : t 32776 : lb 32769 : UsGal 32790 : cm^3 32788 : ft^3 32789 : dm^3 32785 : hl	false
Table number	8237 (0x202D)	Uint8	1	r/w	OPR	MAINT	1	1...32	false
Counter overfilling	8208 (0x2010)	Uint16	2	r/-	OPR	DEV	0	0...65535	false
Table mode	8238 (0x202E)	Enum16	2	r/w	OPR	MAINT	Manual	32890 : Manual 32891 : Semiautomatic 32889 : Clear table 32892 : Sort table	false
Activate table	8239 (0x202F)	Enum16	2	r/w	OPR	MAINT	Disable	32852 : Disable 32887 : Enable	false
Unit after linearization	8240 (0x2030)	Enum16	2	r/w	OPR	MAINT	mm	1342 : % 32782 : kg 32787 : m^3 32784 : gal (imp) 32781 : l 1013 : mm 1010 : m 1018 : ft 1019 : in 32778 : mm 32850 : m 32849 : ft 32779 : ton 32851 : in 32775 : t 32776 : lb 32769 : UsGal 32790 : cm^3 32789 : dm^3 32788 : ft^3 32785 : hl	false

Parameter	ISDU Index	Data Type	Size [Byte]	Access	Visibility	Write	Default value	Range	Data Storage
Linearization type	8241 (0x2031)	Enum16	2	r/w	OPR	MAINT	None	32989 : None 33183 : Linear 33171 : Table 33188 : Pyramid bottom 33170 : Conical bottom 33169 : Angled bottom 32929 : Horizontal cylinder 33084 : Sphere	false
Command to set in a default stat	8244 (0x2034)	Enum16	2	r/w	MAINT	MAINT	Off	33004 : Off 33006 : On	false
Time min. level	8206 (0x200E)	String	14	r/-	OPR				false
Linearization	8870 (0x22A6)	Record	8	r/-			-		false
Level	8245 (0x2035)	Float	4	r/w	OPR	MAINT	0	-3.4E+38...3.4E+38 (milliMeterPercentWithConversion / Level unit)	false
Customer value	8246 (0x2036)	Float	4	r/w	OPR	MAINT	0	-3.0e+38...3.0e+38 (milliMeter / Unit after linearization)	false
Counter underfilling	8209 (0x2011)	Uint16	2	r/-	OPR	DEV	0	0...65535	false
Level 1	8608 (0x21A0)	Float	4	r/-	OPR		0.0	-99999.9...200000.0 (milliMeterPercentWithConversion / Level unit)	false
Level 2	8609 (0x21A1)	Float	4	r/-	OPR		0.0	-99999.9...200000.0 (milliMeterPercentWithConversion / Level unit)	false
Level 3	8610 (0x21A2)	Float	4	r/-	OPR		0.0	-99999.9...200000.0 (milliMeterPercentWithConversion / Level unit)	false
Level	8247 (0x2037)	Float	4	r/-	OPR		0.0	-9999999.0...9999999.0 (milliMeterPercentWithConversion / Level unit)	false
Level 4	8611 (0x21A3)	Float	4	r/-	OPR		0.0	-99999.9...200000.0 (milliMeterPercentWithConversion / Level unit)	false
Level 5	8612 (0x21A4)	Float	4	r/-	OPR		0.0	-99999.9...200000.0 (milliMeterPercentWithConversion / Level unit)	false
CRC linearization table	9016 (0x2338)	Uint16	2	r/-	OPR		0	0...65535	false
Length unit	321 (0x141)	Enum16	2	r/w	OPR	MAINT	mm	1013 : mm 1010 : m 1018 : ft 1019 : in	true
Level	319 (0x13F)	Enum16	2	r/w	OPR	MAINT	m	1342 : % 32850 : m 32778 : mm 32849 : ft 32851 : in	false
Decimal places menu	8307 (0x2073)	Enum16	2	r/w	OPR	MAINT	x	33132 : x 33133 : x.x 33134 : x.xx 33135 : x.xxx 33136 : x.xxxx	false
Temperature unit	315 (0x13B)	Enum16	2	r/w	OPR	MAINT	°C	1001 : °C 1002 : °F 1000 : K	true
Custom Unit	8309 (0x2075)	String	10	r/w	OPR	MAINT	UserUnit		false
Velocity unit	322 (0x142)	Enum16	2	r/w	OPR	MAINT	cm/min	1062 : mm/s 1073 : ft/h 1069 : in/min 32818 : cm/min 1063 : m/h	false
Level unit	8310 (0x2076)	Enum16	2	r/w	OPR	MAINT	mm	32847 : % 32786 : m 32846 : mm 32780 : ft 32783 : in	false
Status	8306 (0x2072)	Uint8	1	r/-	OPR		192	0...255	false

Parameter	ISDU Index	Data Type	Size [Byte]	Access	Visibility	Write	Default value	Range	Data Storage
Decimal places	8311 (0x2077)	Enum16	2	r/w	OPR	MAINT	x	33132 : x 33133 : x.x 33134 : x.xx 33135 : x.xxx 33136 : x.xxxx	false
Decimal places	8619 (0x21AB)	Enum16	2	r/w	OPR	MAINT	x	33132 : x 33133 : x.x 33134 : x.xx 33135 : x.xxx 33136 : x.xxxx	false

Parameter	ISDU Index	Data Type	Size [Byte]	Access	Visibility	Write	Default value	Range	Data Storage
Assembly Information 1	1465 (0x5B9); 1466 (0x5BA); 1467 (0x5BB); 1468 (0x5BC)	String	10	r/-	OPR	PROD	Assembly		false
Resource available	12317 (0x301D); 12318 (0x301E); 12319 (0x301F); 12320 (0x3020)	Uint8	1	r/-	OPR		1	0...1	false
Checksum	1449 (0x5A9); 1450 (0x5AA); 1451 (0x5AB); 1452 (0x5AC)	Uint32	4	r/-	OPR		0	0...4294967295	false
None	283 (0x11B)	Uint8	1	r/-	OPR	OPR	0	0...255	false
Filter options	1320 (0x528)	Enum8	1	r/-	OPR	OPR	All	255 : All 0 : Failure (F) 8 : Function check (C) 12 : Out of specification (S) 4 : Maintenance required (M) 16 : Information (I) 20 : Not categorized	false
Device alarm simulation	284 (0x11C)	Enum16	2	r/w	OPR	MAINT	Off	33004 : Off 33006 : On	false
Timestamp	313 (0x139)	String	14	r/-	OPR				false
Operating time from restart	285 (0x11D)	String	14	r/-	OPR				false
Operating time	331 (0x14B)	String	14	r/-	OPR				false
Entries list	286 (0x11E)	Uint16	2	r/-	OPR		0	0...65535	false
Filter options	287 (0x11F)	Enum8	1	r/-	OPR	OPR	All	255 : All 0 : Failure (F) 8 : Function check (C) 12 : Out of specification (S) 4 : Maintenance required (M) 16 : Information (I) 20 : Not categorized	false
Prepare state	288 (0x120)	Uint8	1	r/-	OPR		0	0...255	false
Offset position	290 (0x122)	Uint16	2	r/-	OPR	OPR	0	0...65535	false
Eventlist data size	291 (0x123)	Uint8	1	r/-	OPR	OPR	60	1...60	false

Parameter	ISDU Index	Data Type	Size [Byte]	Access	Visibility	Write	Default value	Range	Data Storage
Event list	292 (0x124)	ByteArray	60	r/-	OPR		0		false
Quit data transfer	293 (0x125)	Uint8	1	r/-	OPR	OPR	0	0...255	false
Timestamp	314 (0x13A)	String	14	r/-	OPR				false
Event category	295 (0x127)	Enum8	1	r/-	OPR		OK	0 : OK 1 : Failure (F) 2 : Function check (C) 8 : Out of specification (S) 4 : Maintenance required (M) 16 : --- 32 : Not categorized	false
Maximum terminal voltage	1321 (0x529)	Float	4	r/-	OPR	DEV	0.0	0.0...50.0 (Volt)	false
Terminal voltage 1	1322 (0x52A)	Float	4	r/-	OPR		0	0.0...50.0 (Volt)	false
Maximum electronics temperature	1323 (0x52B)	Float	4	r/-	OPR	DEV	-1000	-3.4E+38...3.4E+38 (Celsius / Temperature unit)	false
Electronics temperature	1324 (0x52C)	Float	4	r/-	OPR		0	-3.4E+38...3.4E+38 (Celsius / Temperature unit)	false
Alarm delay	296 (0x128)	Float	4	r/w	OPR	MAINT	0	0...60 (Second)	false
Minimum electronics temperature	1325 (0x52D)	Float	4	r/-	OPR	DEV	1000	-3.4E+38...3.4E+38 (Celsius / Temperature unit)	false
Minimum terminal voltage	1326 (0x52E)	Float	4	r/-	OPR	DEV	50.0	0.0...50.0 (Volt)	false
Active diagnostics	297 (0x129)	Uint32	4	r/-	OPR		0	0...4294967295	false
Previous diagnostics	298 (0x12A)	Uint32	4	r/-	OPR		0	0...4294967295	false
Eventlist max.data size	300 (0x12C)	Uint8	1	r/-	OPR		60	1...255	false
Failure mode simulation	1327 (0x52F)	Enum16	2	r/w	OPR	MAINT	Warning	33298 : Off 33299 : Alarm 33297 : Warning 185 : Logbook entry only	false
Update Event	302 (0x12E)	Uint32	4	r/-	OPR		0	0...4294967295	false
Status signal	303 (0x12F)	Enum8	1	r/-	OPR		---	0 : OK 1 : Failure (F) 2 : Function check (C) 8 : Out of specification (S) 4 : Maintenance required (M) 16 : --- 32 : Not categorized	false
Diagnostic event simulation	304 (0x130)	Enum32	4	r/w	OPR	MAINT	Off	33004 : Off	false
Diagnostic event category	305 (0x131)	Enum8	1	r/w	OPR	MAINT	Process	0 : Sensor 1 : Electronics 2 : Configuration 3 : Process	false
Minimum terminal voltage	1328 (0x530)	Float	4	r/-	OPR	DEV	50.0	-3.0e+38...3.0e+38 (Volt)	false
Maximum terminal voltage	1329 (0x531)	Float	4	r/-	OPR	DEV	0	-3.0e+38...3.0e+38 (Volt)	false
Loop diagnostics	1330 (0x532)	Enum16	2	r/w	OPR	MAINT	Disable	32852 : Disable 32887 : Enable	false
Terminal voltage	1331 (0x533)	Float	4	r/-	OPR		0	-3.0e+38...3.0e+38 (Volt)	false

Parameter	ISDU Index	Data Type	Size [Byte]	Access	Visibility	Write	Default value	Range	Data Storage
Simulation	1332 (0x534)	Enum16	2	r/w	OPR	MAINT	Off	33004 : Off 32856 : Distance 33230 : Level 33224 : Level linearized 1505 : Current output 3459 : Diagnostic event simulation 4208 : Foam index 4207 : Buildup index 5457 : Switch output	false
Rebuild baseline	1333 (0x535)	Enum16	2	r/w	OPR	MAINT	No	32979 : No 33138 : Yes	false
Resistance Baseline	1334 (0x536)	Float	4	r/-	OPR	DEV	0	0...3.0e+38 (Ohm)	false
Resistance previous Baseline	1335 (0x537)	Float	4	r/-	OPR	DEV	0	0...3.0e+38 (Ohm)	false
Supply voltage previous Baseline	1336 (0x538)	Float	4	r/-	OPR	DEV	0	0.0...50.0 (Volt)	false
Supply voltage Baseline	1337 (0x539)	Float	4	r/-	OPR	DEV	0	0.0...50.0 (Volt)	false
Timestamp Baseline	1338 (0x53A)	String	14	r/-	OPR	DEV			false
Timestamp previous Baseline	1339 (0x53B)	String	14	r/-	OPR	DEV			false
Tolerated deviation +/-	1340 (0x53C)	Float	4	r/w	OPR	MAINT	1.5	0.5...3.0 (Volt)	false
806 Event delay	1341 (0x53D)	Uint32	4	r/w	OPR	MAINT	1	0...60 (Second)	false
806 Diagnostic behavior	1342 (0x53E)	Enum16	2	r/w	OPR	MAINT	Warning	33297 : Warning 185 : Logbook entry only	false
806 Event category	1343 (0x53F)	Enum16	2	r/w	OPR	MAINT	Maintenance required (M)	163 : Failure (F) 162 : Function check (C) 192 : Out of specification (S) 191 : Maintenance required (M) 1337 : Not categorized	false
Baseline is available	1344 (0x540)	Enum16	2	r/-	OPR	DEV	No	451 : Please select 32979 : No 33138 : Yes	false
Previous baseline	1345 (0x541)	Record	22	r/-			-		false
Actual baseline	1346 (0x542)	Record	22	r/-			-		false
Electronic temperature lower range limit	1347 (0x543)	Float	4	r/-	OPR	DEV	-40	-3.0e+37...3.0e+37 (Celsius / Temperature unit)	false
Electronic temperature upper range limit	1348 (0x544)	Float	4	r/-	OPR	DEV	85	-3.0e+37...3.0e+37 (Celsius / Temperature unit)	false
Internal	1350 (0x546)	Uint32	4	r/-	OPR	DEV	0	0...4294967295	false
Clamping voltage upper threshold	1351 (0x547)	Float	4	r/-	OPR	DEV	0	0.0...50.0 (Volt)	false
Clamping voltage lower threshold	1352 (0x548)	Float	4	r/-	OPR	DEV	0	0.0...50.0 (Volt)	false
Baseline status	1353 (0x549)	Enum16	2	r/-	OPR	DEV	Failed	3240 : Failed 3250 : Success	false
Baseline build process	1354 (0x54A)	Float	4	r/-	OPR		0	0...100 (Percent)	false
Loop diagnostics	4103 (0x1007)	Float	4	r/-	OPR		0	0...100 (Percent)	false

Parameter	ISDU Index	Data Type	Size [Byte]	Access	Visibility	Write	Default value	Range	Data Storage
Verification version	12324 (0x3024)	Uint8	1	r/-	OPR		1	0...255	false
Overall result	12322 (0x3022)	Enum16	2	r/-	OPR		Not done	32996 : Not done 809 : Passed 33161 : Not done 275 : Failed	false
Verification ID	12321 (0x3021)	Uint16	2	r/-	OPR	DEV	0	0...65535	false
Start verification	12325 (0x3025)	Enum16	2	r/-	OPR	OPR	Cancel	32823 : Cancel 1429 : Start 32846 : Clear data	false
Status	12323 (0x3023)	Enum16	2	r/-	OPR		Not done	1280 : Done 33242 : Busy 275 : Failed 33161 : Not done	false
Operating time (Verification)	1397 (0x575)	String	14	r/-	OPR				false
Mainboard module	1394 (0x572)	Enum16	2	r/-	OPR		Not done	32996 : Not done 809 : Passed 33161 : Not done 275 : Failed	false
Electronics temperature	1398 (0x576)	Float	4	r/-	OPR		0	-3.0e+38...3.0e+38 (Celsius / Temperature unit)	false
Verification ID	1391 (0x56F)	Uint16	2	r/-	OPR		0	0...65535	false
Verification result	1396 (0x574)	Enum16	2	r/-	OPR		Not done	32996 : Not done 809 : Passed 33161 : Not done 275 : Failed	false
Sensor module	1390 (0x56E)	Enum16	2	r/-	OPR		Not done	32996 : Not done 809 : Passed 33161 : Not done 275 : Failed	false
System status	1392 (0x570)	Enum16	2	r/-	OPR		Not done	32996 : Not done 809 : Passed 33161 : Not done 275 : Failed	false
Terminal voltage	1395 (0x573)	Enum16	2	r/-	OPR		Not done	32996 : Not done 809 : Passed 33161 : Not done 275 : Failed	false
RAM check	1379 (0x563)	Enum16	2	r/-	OPR		Not done	32996 : Not done 809 : Passed 33161 : Not done 275 : Failed	false
ROM check	1380 (0x564)	Enum16	2	r/-	OPR		Not done	32996 : Not done 809 : Passed 33161 : Not done 275 : Failed	false
Output current	1381 (0x565)	Enum16	2	r/-	OPR		Not done	32996 : Not done 809 : Passed 33161 : Not done 275 : Failed	false
Software integrity	1382 (0x566)	Enum16	2	r/-	OPR		Not done	32996 : Not done 809 : Passed 33161 : Not done 275 : Failed	false
Sensor integrity	1383 (0x567)	Enum16	2	r/-	OPR		Not done	32996 : Not done 809 : Passed 33161 : Not done 275 : Failed	false
Terminal voltage value	1389 (0x56D)	Float	4	r/-	OPR		0	0.0...50.0 (Volt)	false
Sensor temperature	1403 (0x57B)	Float	4	r/-	OPR		0	-3.0e+37...353.15 (Celsius / Temperature unit)	false
Minimum terminal voltage	1384 (0x568)	Float	4	r/-	OPR		50.0	0.0...50.0 (Volt)	false
Maximum terminal voltage	1385 (0x569)	Float	4	r/-	OPR		0.0	0.0...50.0 (Volt)	false
Maximum electronics temperature	1387 (0x56B)	Float	4	r/-	OPR		-1000	-3.4E+38...3.4E+38 (Celsius / Temperature unit)	false
Minimum electronics temperature	1386 (0x56A)	Float	4	r/-	OPR		1000	-3.4E+38...3.4E+38 (Celsius / Temperature unit)	false
Output current deviation	1388 (0x56C)	Float	4	r/-	OPR		0	-1...1 (mA)	false
IO-Link Signal Quality	1393 (0x571)	Float	4	r/-	OPR		100	0...100 (Percent)	false

Parameter	ISDU Index	Data Type	Size [Byte]	Access	Visibility	Write	Default value	Range	Data Storage
Loop diagnostics	1399 (0x577)	Enum16	2	r/-	OPR		Not done	32996 : Not done 809 : Passed 33161 : Not done 275 : Failed	false
Lower voltage signal loop diagnostics	1400 (0x578)	Float	4	r/-	OPR		0.0	0.0...50.0 (Volt)	false
Upper voltage signal loop diagnostics	1401 (0x579)	Float	4	r/-	OPR		50.0	0.0...50.0 (Volt)	false
Loop diagnostics	1402 (0x57A)	Enum16	2	r/-	OPR		Disable	32852 : Disable 32887 : Enable	false
Counter power on	8526 (0x214E)	Uint32	4	r/-	OPR		0	0...4294967295	false
Counter overfilling	8528 (0x2150)	Uint16	2	r/-	OPR		0	0...65535	false
Counter underfilling	8529 (0x2151)	Uint16	2	r/-	OPR		0	0...65535	false
Active diagnostics	8527 (0x214F)	Uint32	4	r/-	OPR		0	0...4294967295	false
Max. filling speed	8530 (0x2152)	Float	4	r/-	OPR		0	-3.0e+38...3.0e+38 (ToFES_LevSpeedUnit_PercPerMin)	false
Max. draining speed	8531 (0x2153)	Float	4	r/-	OPR		0	-3.0e+38...3.0e+38 (ToFES_LevSpeedUnit_PercPerMin)	false
Max. level value	8532 (0x2154)	Float	4	r/-	OPR		0		false
Absolute echo amplitude	8533 (0x2155)	Float	4	r/-	OPR		0	-3.0e+38...3.0e+38 (deciBel)	false
Relative echo amplitude	8534 (0x2156)	Float	4	r/-	OPR		0	-3.0e+38...3.0e+38 (deciBel)	false
Radar Accuracy Index deviation	8535 (0x2157)	Float	4	r/-	OPR		0	-3.0e+38...3.0e+38 (PartsPerMillion)	false
Date/time	8536 (0x2158)	Uint64	8	r/-	OPR	OPR	0	0...18446744073709551615	false
Date/time Heartbeat Verification	8537 (0x2159)	String	22	r/-	OPR		01.01.1970 00:00:00		false
Clock and analog path	8538 (0x215A)	Enum16	2	r/-	OPR		Not done	32996 : Not done 809 : Passed 33161 : Not done 275 : Failed	false
IF signal	8539 (0x215B)	Enum16	2	r/-	OPR		Not done	32996 : Not done 809 : Passed 33161 : Not done 275 : Failed	false
Radar Accuracy Index (RAI)	8540 (0x215C)	Enum16	2	r/-	OPR		Not done	32996 : Not done 809 : Passed 33161 : Not done 275 : Failed	false
Energy boundaries	8541 (0x215D)	Enum16	2	r/-	OPR		Not done	32996 : Not done 809 : Passed 33161 : Not done 275 : Failed	false
Sensor module voltage	8542 (0x215E)	Enum16	2	r/-	OPR		Not done	32996 : Not done 809 : Passed 33161 : Not done 275 : Failed	false
RAM check	8543 (0x215F)	Enum16	2	r/-	OPR		Not done	32996 : Not done 809 : Passed 33161 : Not done 275 : Failed	false
Level linearized	8544 (0x2160)	Float	4	r/-	OPR		0		false
Time max. level	8545 (0x2161)	String	14	r/-	OPR				false
Signal quality	8546 (0x2162)	Enum16	2	r/-	OPR		Strong	194 : Strong 195 : Medium 196 : Weak 197 : No signal 243 : (Strong) 244 : (Medium) 245 : (Weak)	false

Parameter	ISDU Index	Data Type	Size [Byte]	Access	Visibility	Write	Default value	Range	Data Storage
Signal quality	8547 (0x2163)	Enum16	2	r/-	OPR		Not done	32996 : Not done 809 : Passed 33161 : Not done 275 : Failed	false
Reference echo frequency	8548 (0x2164)	Float	4	r/-	OPR		1000000	0...2000000 (Hertz)	false
Reference echo amplitude	8551 (0x2167)	Float	4	r/-	OPR		-20	-25...-15 (deciBel)	false
IF amplitude span value	8554 (0x216A)	Uint16	2	r/-	OPR		2109	1950...2150 (Digit)	false
Maximum value IF amplitude	8557 (0x216D)	Uint16	2	r/-	OPR		2900	2148...4095 (Digit)	false
Minimum value IF amplitude	8560 (0x2170)	Uint16	2	r/-	OPR		1352	0...1948 (Digit)	false
Value for supply voltage 1,8 V	8563 (0x2173)	Float	4	r/-	OPR		1.81	1.69...1.99 (Volt)	false
Value for supply voltage DCS	8564 (0x2174)	Float	4	r/-	OPR		12	8...17 (Volt)	false
Minimum value of radar signal accuracy	8565 (0x2175)	Float	4	r/-	OPR		2	-3.0e+38...3.0e+38 (PartsPerMillion)	false
Maximum value of radar signal accuracy	8566 (0x2176)	Float	4	r/-	OPR		2	-3.0e+38...3.0e+38 (PartsPerMillion)	false
Energy storage capacity	8567 (0x2177)	Float	4	r/-	OPR		1000	-3.0e+38...3.0e+38 (microFarad)	false
Radar signal incoming power	8568 (0x2178)	Float	4	r/-	OPR		0.02583	-3.0e+38...3.0e+38 (milliWatt)	false
ROM check	8571 (0x217B)	Enum16	2	r/-	OPR		Not done	32996 : Not done 809 : Passed 33161 : Not done 275 : Failed	false
Energy consumption of measurement	8569 (0x2179)	Float	4	r/-	OPR		2.18	-3.0e+38...3.0e+38 (milliWattSecond)	false
Energy monitoring	8570 (0x217A)	Enum16	2	r/-	OPR		Not done	32996 : Not done 809 : Passed 33161 : Not done 275 : Failed	false
Buildup detection	8572 (0x217C)	Enum16	2	r/-	OPR		Not done	32996 : Not done 809 : Passed 33161 : Not done 275 : Failed	false
Foam detection	8573 (0x217D)	Enum16	2	r/-	OPR		Not done	32996 : Not done 809 : Passed 33161 : Not done 275 : Failed	false
Buildup index	8574 (0x217E)	Float	4	r/w	OPR	MAINT	0	-3.0e+38...3.0e+38 (Percent)	false
Buildup detection threshold value	8575 (0x217F)	Float	4	r/w	OPR	MAINT	85	0...100.0 (Percent)	false
Foam index	8576 (0x2180)	Float	4	r/-	OPR		0	-999999.9...999999.9 (Percent)	false
Foam detec. threshold value	8577 (0x2181)	Float	4	r/w	OPR	MAINT	85	0...100.0 (Percent)	false
Time max. sensor temperature	8855 (0x2297)	String	14	r/-	OPR				false
Time min. sensor temperature	8856 (0x2298)	String	14	r/-	OPR				false
Time min. level	8857 (0x2299)	String	14	r/-	OPR				false
Min. level value	8858 (0x229A)	Float	4	r/-	OPR		0		false
Maximum sensor temperature	8859 (0x229B)	Float	4	r/-	OPR		-150	-150...200 (Celsius / Temperature unit)	false

Parameter	ISDU Index	Data Type	Size [Byte]	Access	Visibility	Write	Default value	Range	Data Storage
Minimum sensor temperature	8860 (0x229C)	Float	4	r/-	OPR		-150	-150...200 (Celsius / Temperature unit)	false
Relative echo amplitude	4097 (0x1001)	Enum16	2	r/-	OPR		Not done	32996 : Not done 809 : Passed 33161 : Not done 275 : Failed	false

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