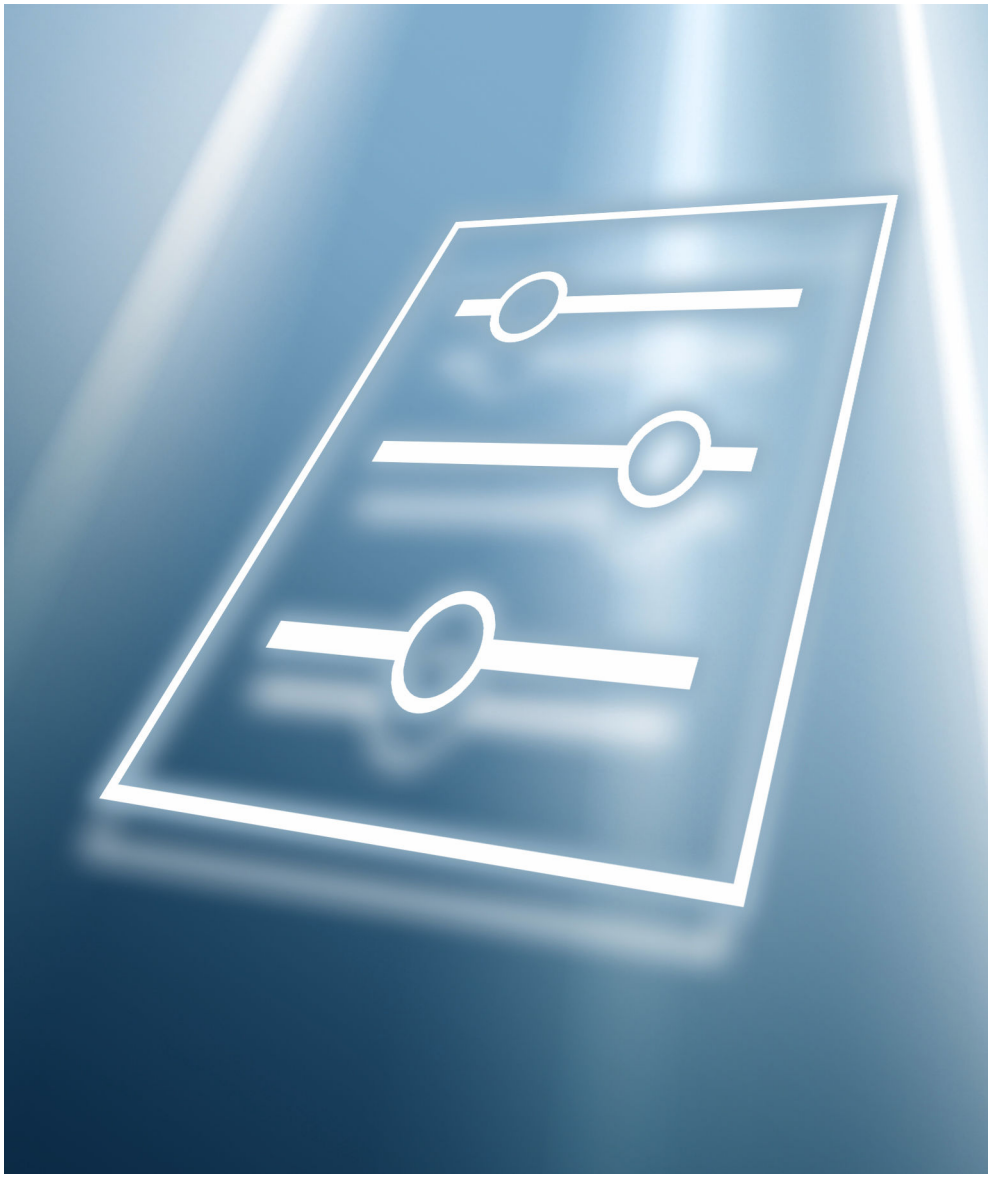
GP01241F/00/EN/01.24-00
71687792
2024-12-06

01.00.zz (Device firmware)

Description of Device Parameters
Micropilot FMR60B, FMR62B, FMR63B, FMR66B, FMR67B

Free-space radar
PROFIBUS PA



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:
- Guidance
- Diagnostics
- Application
- System

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

An operating tool is software, such as FieldCare, which can be used to display and edit the data and parameters stored in the device on a PC or laptop. Compared to operation via the local display, an operating tool offers more options. It provides additional information, such as graphics and help texts, which explain the properties of the parameters.

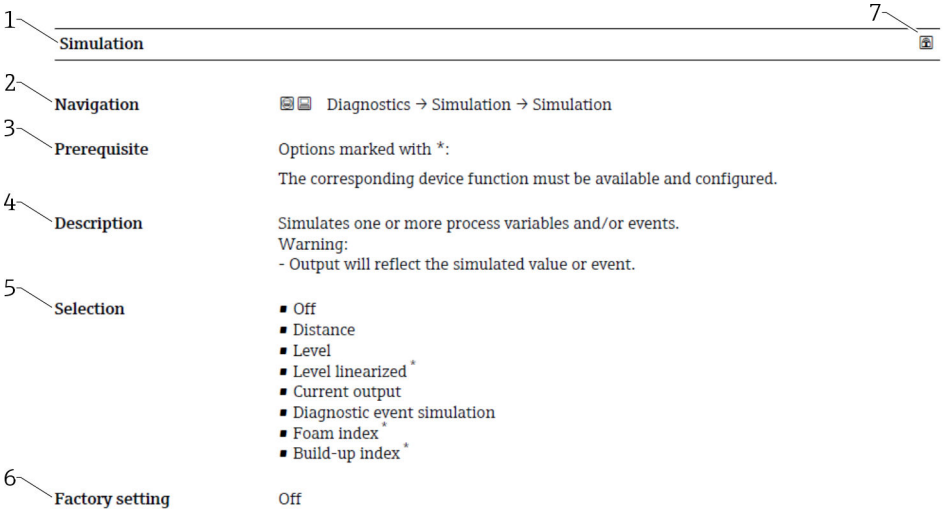
The submenus visible to a user depend on the **User role (→ 79)** they are logged in with. This document lists the submenus and their parameters that are available to the User role **Maintenance**.

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

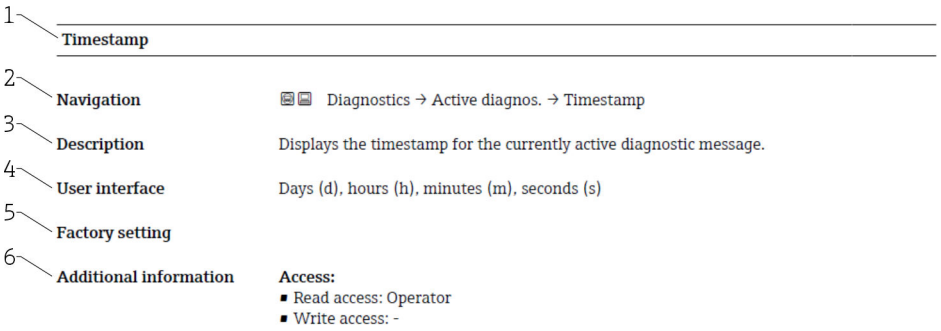
For information on operating options, see the Operating Instructions.

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. Below are 2 examples of 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 all elements of the parameter description and expand them.

1.5 Symbols

1.5.1 Safety symbols

⚠ DANGER
This symbol alerts you to a dangerous situation. Failure to avoid this situation will result in serious or fatal injury.

⚠ WARNING
This symbol alerts you to a potentially dangerous situation. Failure to avoid this situation can result in serious or fatal injury.

⚠ CAUTION
This symbol alerts you to a potentially dangerous situation. Failure to avoid this situation can result in minor or medium injury.

NOTICE
This symbol alerts you to a potentially harmful situation. Failure to avoid this situation can result in damage to the product or something in its vicinity.

1.5.2 Symbols for certain types of Information

- Indicates 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.

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

2 Overview of the operating menu

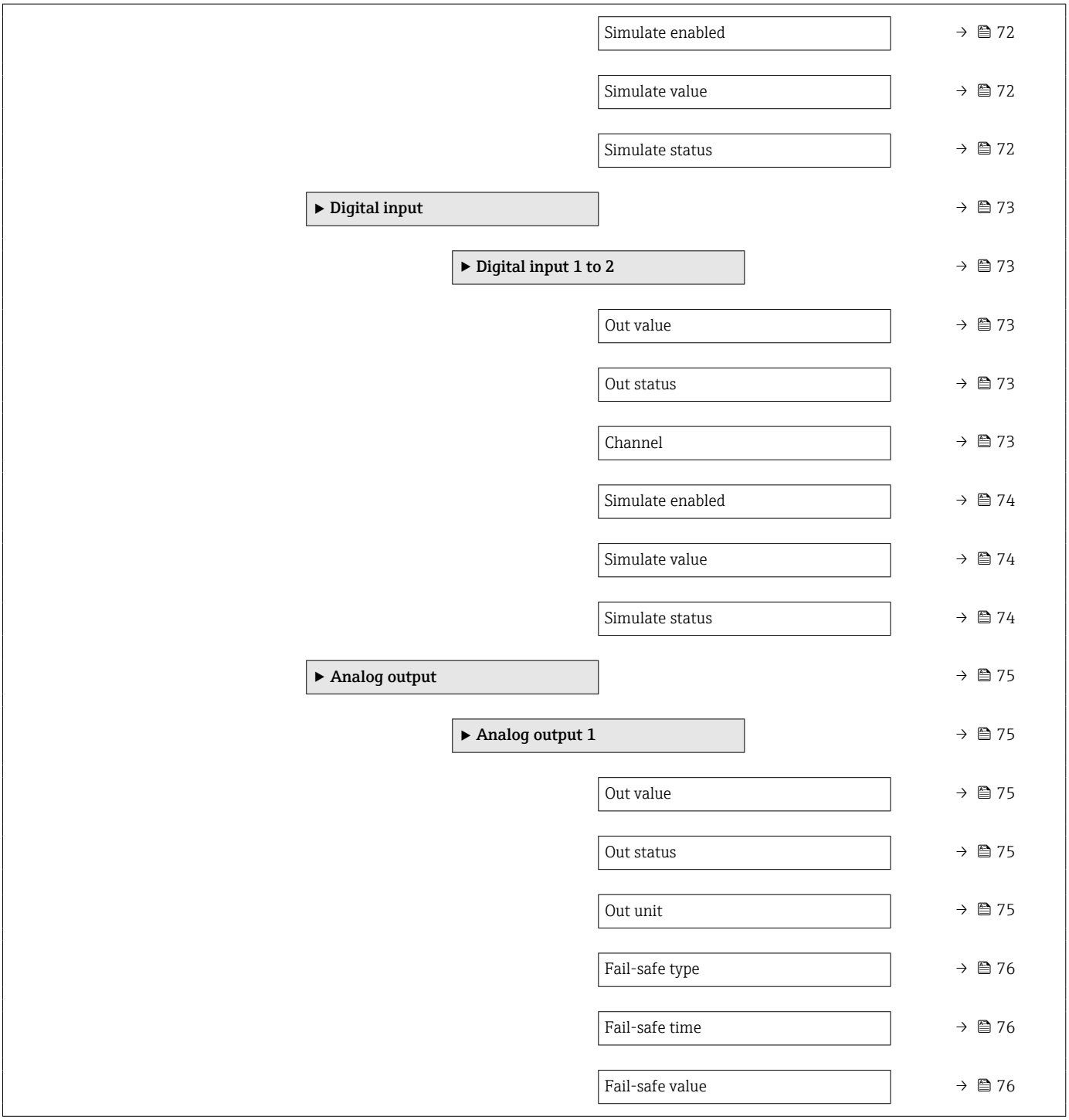
Navigation Operating tool

- Verification result → 29
- Status → 29
- ▶ **Foam detection** → 29
  - Foam detection → 29
  - Foam index → 30
  - Foam detec. threshold → 30
  - Foam detec. threshold value → 30
  - Lower level range limit → 30
  - Upper level range limit → 31
  - Distance at foam zero adjustment → 31
  - 0% foam value → 31
- ▶ **Buildup detection** → 31
  - Buildup detection → 31
  - Buildup index → 32
  - Buildup detection threshold → 32
  - Buildup detection threshold value → 32
  - Minimum distance for buildup detection → 32
  - Maximum distance for buildup detection → 33
  - 0 % buildup value → 33
  - Area of incoupling → 33
  - Limit offset for buildup detection → 33
- ▶ **Echo curve** → 34
  - Save reference curve → 34

- ▶ **Measuring units** → 42
  - Level unit → 42
  - Distance unit → 43
  - Temperature unit → 43
- ▶ **Measured values** → 43
  - Level linearized → 43
  - Level → 44
  - Distance → 44
  - Unfiltered distance → 44
  - Sensor temperature → 44
  - Terminal voltage 1 → 45
  - Electronics temperature → 45
- ▶ **Sensor** → 45
  - ▶ **Basic settings** → 45
    - Tank type → 45
    - Bin type → 46
    - Empty calibration → 46
    - Full calibration → 46
    - Maximum draining speed solid → 47
    - Maximum filling speed solid → 47
    - Maximum draining speed liquid → 48
    - Maximum filling speed liquid → 48
    - Tank/silo height → 49
    - Damping output → 49
    - Distance → 49

- Confirm distance → 50
- Record map → 50
- Mapping end point → 50
- Active map → 52
- ▶ **Additional settings** → 52
  - Medium type → 52
  - Medium group → 53
  - Medium property → 53
  - Upper blank out → 54
  - Output mode → 54
  - Level limit mode → 55
  - High limit → 55
  - Low limit → 55
  - Level correction → 56
  - ▶ **Echo evaluation** → 56
    - Tank bottom range → 59
    - Evaluation mode → 60
    - Reset evaluation → 60
- ▶ **Linearization** → 63
  - Linearization type → 63
  - Unit after linearization → 63
  - Free text → 64
  - Level linearized → 64
  - Maximum value → 64
  - Diameter → 64

- Intermediate height → 65
- Table mode → 65
- Table number → 65
- Level → 66
- Level → 66
- Customer value → 66
- Activate table → 67
- ▶ **Signal information** → 67
  - Signal quality → 67
  - Absolute echo amplitude → 67
  - Relative echo amplitude → 68
- ▶ **Profibus** → 69
  - ▶ **Configuration** → 69
    - Device tag → 69
    - Ident number selector → 69
    - PROFIBUS ident number → 69
    - Address mode → 70
    - Device address → 70
  - ▶ **Analog input** → 70
    - ▶ **Analog input 1 to 6** → 70
      - Out value → 70
      - Out status → 71
      - Out unit text → 71
      - Channel → 71
      - PV filter time → 72

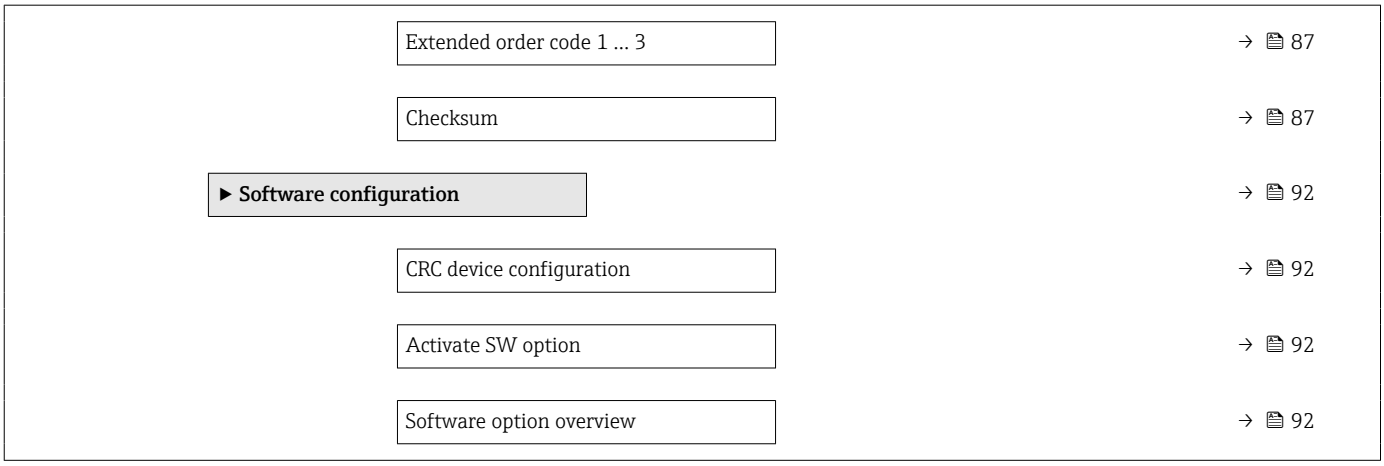

Simulate enabled → 72
Simulate value → 72
Simulate status → 72
▶ Digital input → 73
▶ Digital input 1 to 2 → 73
Out value → 73
Out status → 73
Channel → 73
Simulate enabled → 74
Simulate value → 74
Simulate status → 74
▶ Analog output → 75
▶ Analog output 1 → 75
Out value → 75
Out status → 75
Out unit → 75
Fail-safe type → 76
Fail-safe time → 76
Fail-safe value → 76

- ▶ **Information** → 76
  - Device ID → 76
  - Profile version → 77
- ▶ **Statistics** → 77
  - CRC Count OK → 77
  - CRC Count Failed → 77

System → 78

- ▶ **Device management** → 78
  - Device tag → 78
  - Locking status → 78
  - Static revision → 78
  - Reset device → 79
- ▶ **User management** → 79
  - User role → 79
  - Change user role → 79
  - Password → 80
  - Enter access code → 80
  - Status password entry → 80
  - Define password → 80
  - New password → 81
  - Confirm new password → 81
  - Status password entry → 80
  - Change password → 81
  - Old password → 81
  - New password → 81

Confirm new password	→ 81
Status password entry	→ 80
Delete password	→ 82
Old password	→ 81
Status password entry	→ 80
Forgot password?	→ 82
Reset password	→ 82
Status password entry	→ 80
▶ Bluetooth configuration	→ 82
Bluetooth activation	→ 82
▶ Display	→ 83
Language	→ 83
Format display	→ 83
Value 1 display	→ 84
Value 2 … 4 display	→ 84
Decimal places 1 … 4	→ 85
Contrast display	→ 85
▶ Information	→ 85
Device name	→ 85
Manufacturer	→ 86
Serial number	→ 86
Order code	→ 86
Firmware version	→ 86
Hardware version	→ 87


Extended order code 1 ... 3
→ 87
Checksum
→ 87
▶ Software configuration
→ 92
CRC device configuration
→ 92
Activate SW option
→ 92
Software option overview
→ 92

3 Description of device parameters

3.1 Guidance

In the **Guidance** menu, the user can quickly perform basic tasks, such as commissioning. These primarily consist of guided wizards and cross-thematic special functions.

Navigation Guidance

3.1.1 Overview

The **Guidance** menu contains the following submenus and wizards:
- Commissioning
- Heartbeat Technology
  - Heartbeat Verification
  - Foam detection
  - Buildup detection
- WHG mode
- Import / Export
- Compare

3.1.2 Commissioning

Run the **Commissioning** wizard to commission the device. Enter the appropriate value in each parameter or select the appropriate option.

⚠ WARNING

If the wizard is canceled before all the necessary parameters have been configured, any settings already set are saved.
The device may be in an undefined state!
▶ Reset the device to factory settings.

Navigation Guidance → Commissioning

Parameters for the "Commissioning" wizard

The following parameters are configured in this wizard:
- **Device identification**
  - Device tag
  - Device name
  - Serial number
  - Extended order code 1 ... 3
  - Locking status
  - Device ID
  - Device address
- **Measurement adjustments**
  - Level unit
  - Distance unit
  - Temperature unit
  - Bin type
  - Tank type
  - Medium group
  - Empty calibration
  - Full calibration
  - Level
  - Displayed level/distance correct?
  - Show possible signals in?
  - Distance
  - Level
  - Is a linearization required?
  - Linearization type
  - Unit after linearization
  - Maximum value
  - Diameter
  - Intermediate height
  - Level linearized
  - Table mode
  - Table number
  - Level
  - Customer value
  - Activate table
- **Output settings**
  Channel

3.1.3 Heartbeat Technology

Heartbeat Technology offers the following functions:
- Diagnostics through continuous self-monitoring
- Additional measured variables output to an external condition monitoring system
- In situ verification of measuring instruments in the application

Special Documentation on Heartbeat Technology is available via the Internet:
www.endress.com → Download

Navigation Guidance → Heartbeat Techn.

Heartbeat Verification

This wizard is used to start an automatic verification of the device functionality.
The results can be documented as a verification report.

Navigation Guidance → Heartbeat Techn. → Heartbeat Verif.

Foam detection

This wizard configures the automatic foam detection.

Foam detection can be linked to an output variable or status information e.g. to control a sprinkler used to dissolve the foam. It is also possible to monitor the foam increase in a so called foam index. The foam index can also be linked to an output variable and can be shown on the display.

Preparation:
The Foam monitoring initialization should only be done without or less foam.

Navigation Guidance → Heartbeat Techn. → Foam detection

Buildup detection

This wizard configures the build-up detection.

Basic idea:
The build-up detection can, for example, be linked to a compressed-air system to clean the antenna.
With the build-up monitoring the maintenance cycles can be optimized.

Preparation:
The build-up monitoring initialization should only be done without or less build-up.

Navigation Guidance → Heartbeat Techn. → Buildup detect.

3.1.4 WHG mode

For WHG applications, the device can be protected against manipulation using the WHG wizard. After using this confirmation, the device is marked as WHG locked to indicate the device mode.

To unlock the WHG locking the sequence needs to be restarted. After entering the safety unlocking code (= Safety locking code) the device is unlocked.

Navigation Guidance → WHG mode

3.1.5 Import / Export

Save / Restore
- The device settings can be saved in a .deh file.
- The device settings saved in a .deh file can be written to the device.

Create configuration report
Device documentation can be saved in PDF format under Create configuration report. This device documentation contains the following general device information:
- Information on device parameters
- Information on Linearization
- Echo curve
- Event list
- Diagnostic list

Navigation Guidance → Import / Export

3.1.6 Compare

Compare datasets
This function can be used to compare the following datasets:
- Data records in the .deh file format from the function Import / Export
- Datasets with the configuration currently in the device

Navigation Guidance → Compare

3.2 Diagnostics

Navigation Diagnostics

3.2.1 Active diagnostics

Navigation Diagnostics → Active diagnos.

Active diagnostics

Navigation Diagnostics → 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
- Operating time of the device until the event occurs
- Symbol for diagnostic behavior
- Code for diagnostic behavior
- Event text
- Corrective measure

Timestamp

Navigation Diagnostics → Active diagnos. → Timestamp

Description Displays the timestamp for the currently active diagnostic message.

User interface Date, time

Previous diagnostics

Navigation Diagnostics → Active diagnos. → Prev.diagnostics

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

User interface
- Operating time of the device until the event occurs
- Symbol for diagnostic behavior
- Code for diagnostic behavior
- Event text
- Corrective measure

Timestamp

Navigation Diagnostics → Active diagnos. → Timestamp

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

User interface Date, time

Operating time from restart

Navigation Diagnostics → Active diagnos. → Time fr. restart

Description Indicates how long the device has been in operation since the last time the device was restarted.

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

Operating time

Navigation Diagnostics → Active diagnos. → Operating time

Description Indicates how long the device has been in operation.

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

3.2.2 Diagnostic list

Navigation Diagnostics → Diagnostic list

3.2.3 Event logbook

Navigation Diagnostics → Event logbook

Clear event list

Navigation Diagnostics → Event logbook → Clear event list

Description Delete all entries of the event list.

Selection
- Cancel
- Clear data

Factory setting Cancel

Additional information
Access:
- Read access: Expert
- Write access: Expert

3.2.4 Minimum/maximum values

Navigation Diagnostics → Min/max val.

Min. level value

Navigation Diagnostics → Min/max val. → Min. level value

Description Minimum or maximum value measured by device.

User interface Signed floating-point number

Time min. level

Navigation Diagnostics → Min/max val. → Time min. level

User interface Character string comprising numbers, letters and special characters

Max. level value

Navigation Diagnostics → Min/max val. → Max. level value

Description Minimum or maximum value measured by device.

User interface Signed floating-point number

Time max. level

Navigation Diagnostics → Min/max val. → Time max. level

User interface Character string comprising numbers, letters and special characters

Max. draining speed

Navigation Diagnostics → Min/max val. → Max.drain.speed

User interface Positive floating-point number

Factory setting 0.0 %/min

Max. filling speed

Navigation Diagnostics → Min/max val. → Max. fill. speed

User interface Positive floating-point number

Factory setting 0.0 %/min

Counter underfilling

Navigation Diagnostics → Min/max val. → Count underfill.

User interface 0 to 65 535

Factory setting 0

Counter overfilling

Navigation Diagnostics → Min/max val. → Count overfill.

User interface 0 to 65 535

Factory setting 0

Minimum sensor temperature

Navigation Diagnostics → Min/max val. → Min. sensor temp

User interface −150 to 200 °C

Time min. sensor temperature

Navigation Diagnostics → Min/max val. → Time min s. temp

User interface Character string comprising numbers, letters and special characters

Maximum sensor temperature

Navigation Diagnostics → Min/max val. → Max. sensor temp

User interface −150 to 200 °C

Time max. sensor temperature

Navigation Diagnostics → Min/max val. → Time max s. temp

User interface Character string comprising numbers, letters and special characters

Minimum terminal voltage

Navigation Diagnostics → Min/max val. → Min.term.volt.

Description Minimum or maximum measured terminal (supply) voltage.

User interface 0.0 to 50.0 V

Maximum terminal voltage

Navigation Diagnostics → Min/max val. → Max.term.voltage

Description Minimum or maximum measured terminal (supply) voltage.

User interface 0.0 to 50.0 V

Minimum electronics temperature

Navigation Diagnostics → Min/max val. → Min.electr.temp.

Description Minimum or maximum measured main electronics temperature.

User interface Signed floating-point number

Maximum electronics temperature

Navigation Diagnostics → Min/max val. → Max.electr.temp.

Description Minimum or maximum measured main electronics temperature.

User interface Signed floating-point number

Reset min./max.

Navigation Diagnostics → Min/max val. → Reset min/max

Description Resets the drag indicator of the selected process variable.

Selection
- None
- Drain/fill speed
- Level
- Reset all

Factory setting None

3.2.5 Simulation

Navigation Diagnostics → Simulation

Simulation

Navigation Diagnostics → Simulation → Simulation

Prerequisite Selection options marked with *:

The corresponding device function must be available and configured.

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

Warning:
Output will reflect the simulated value or event.

Selection
- Off
- Distance
- Level
- Level linearized *

* Visibility depends on order options or device settings

- Diagnostic event simulation
- Foam index *
- Buildup index *

Factory setting Off

Simulation distance

Navigation Diagnostics → Simulation → Sim distance

Prerequisite Simulation = Distance (→ 44)

User entry −999 900 to 999 900 mm

Factory setting 0 mm

Buildup index

Navigation Diagnostics → Simulation → Buildup index

Prerequisite Simulation = Buildup index

User entry 0 to 100.0 %

Factory setting 0 %

Foam index

Navigation Diagnostics → Simulation → Foam index

Prerequisite Simulation = Foam index (→ 30)

User entry 0 to 100.0 %

Factory setting 0 %

Process variable value

Navigation Diagnostics → Simulation → Proc. var. value

Prerequisite Simulation = Level linearized (→ 43)

* Visibility depends on order options or device settings

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

User entry Signed floating-point number

Factory setting 0

Diagnostic event simulation

Navigation Diagnostics → Simulation → Diagnostic event

Prerequisite Simulation = Diagnostic event simulation

Description Select the diagnostic event to be simulated.

Note:
To terminate the simulation, select "Off".

Selection

- Buildup detected
- Foam detected
- Record map
- Dataset different
- Data storage inconsistent
- Data transfer failed
- Date/time incorrect
- Processing download
- Echo lost
- Real time clock defective
- Electronics and HistoROM defective
- Electronics temperature
- Firmware incompatible
- Firmware update failed
- Level limited
- Main electronics defective
- Main electronics faulty
- In safety distance
- Configuration incompatible
- Configuration Sensor Unit invalid
- Linearization faulty
- Module incompatible
- Trim required
- Sensor electronic failure
- Sensor temperature out of range
- Sensor connection faulty

Diagnostic event simulation active
Simulation distance
Failure mode simulation active
Process variable simulation active
Memory content inconsistent
Supply voltage too high
Supply voltage too low

Factory setting Off

3.2.6 Heartbeat Technology

Navigation Diagnostics → Heartbeat Techn.

Heartbeat Verification

Navigation Diagnostics → Heartbeat Techn. → Heartbeat Verif.

Date/time Heartbeat Verification

Navigation Diagnostics → Heartbeat Techn. → Heartbeat Verif. → Date/time Heartbeat Verification

Description Date and time of last Heartbeat Verification.
This value is updated with every Heartbeat verification.
Note:
If time information is not available, e.g. Heartbeat verification is started from display, '--------' is shown.

User interface Character string comprising numbers, letters and special characters

Factory setting 01.01.1970 00:00:00

Operating time (Verification)

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

Description Value of the operating hours counter at the time of verification.

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

Verification result

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

Description Result of Heartbeat Verification.

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

Factory setting Not done

Status

Navigation Diagnostics → Heartbeat Techn. → Heartbeat Verif. → Status

Description Shows the actual status.

User interface
- Done
- Busy
- Failed
- Not done

Factory setting Not done

Foam detection

Navigation Diagnostics → Heartbeat Techn. → Foam detection

Foam detection

Navigation Diagnostics → Heartbeat Techn. → Foam detection → Foam detection

Selection
- Off
- On

Factory setting Off

Foam index

Navigation Diagnostics → Heartbeat Techn. → Foam detection → Foam index

Description Foam index 0 % means: no foam.
Foam index 100 % means: maximum detectable foam.

User interface 0 to 100 %

Factory setting 0 %

Foam detec. threshold

Navigation Diagnostics → Heartbeat Techn. → Foam detection → Foam threshold

Description Enter the threshold for the foam detection. As soon as the foam index has reached the preset switching point, an event is triggered.

Selection
- Sensitive (20%)
- Middle (40%)
- Insensitive (80%)
- User defined (xx%)

Factory setting Middle (40%)

Foam detec. threshold value

Navigation Diagnostics → Heartbeat Techn. → Foam detection → Foam detect val.

Description User-defined threshold value for the foam detection.

User entry 0 to 100.0 %

Factory setting 40 %

Lower level range limit

Navigation Diagnostics → Heartbeat Techn. → Foam detection → LLR limit

Description Assign lower limit of foam monitoring area.

Factory setting 0 %

Upper level range limit

Navigation Diagnostics → Heartbeat Techn. → Foam detection → ULR limit

Description Assign upper limit of foam monitoring area.

Factory setting 100.0 %

Distance at foam zero adjustment

Navigation Diagnostics → Heartbeat Techn. → Foam detection → Dist. @zero foam

User entry Signed floating-point number

Factory setting 0 mm

0% foam value

Navigation Diagnostics → Heartbeat Techn. → Foam detection → 0% foam value

User entry −999 999.9 to 999 999.9 dB

Factory setting 0 dB

Buildup detection

Navigation Diagnostics → Heartbeat Techn. → Buildup detect.

Buildup detection

Navigation Diagnostics → Heartbeat Techn. → Buildup detect. → Buildup detect.

Description Activate or deactivate build-up detection.

Selection
- Off
- On

Factory setting Off

Buildup index

Navigation Diagnostics → Heartbeat Techn. → Buildup detect. → Buildup index

Description Build-up index 0% means: no build-up.
Build-up index 100% means: maximum detectable build-up.

User interface 0 to 100 %

Factory setting 0 %

Buildup detection threshold

Navigation Diagnostics → Heartbeat Techn. → Buildup detect. → Buildup detec.

Description Enter the threshold for the build-up detection. As soon as the build-up index has reached the preset switching point, an event is triggered.

Selection
- Sensitive (20%)
- Middle (40%)
- Insensitive (80%)
- User defined (xx%)

Factory setting Middle (40%)

Buildup detection threshold value

Navigation Diagnostics → Heartbeat Techn. → Buildup detect. → Buildup value

Description User-defined threshold value for the build-up detection.

User entry 0 to 100.0 %

Factory setting 40 %

Minimum distance for buildup detection

Navigation Diagnostics → Heartbeat Techn. → Buildup detect. → Min dist buildup

User entry −999 900 to 999 900 mm

Factory setting 0 mm

Maximum distance for buildup detection

Navigation Diagnostics → Heartbeat Techn. → Buildup detect. → Max dist buildup

User entry –999 900 to 999 900 mm

Factory setting 1 000 mm

0 % buildup value

Navigation Diagnostics → Heartbeat Techn. → Buildup detect. → 0 % buildup val

User entry Positive floating-point number

Factory setting 0

Area of incoupling

Navigation Diagnostics → Heartbeat Techn. → Buildup detect. → Area incoupling

Description Ringing integral within the detection area.

User interface Positive floating-point number

Factory setting 0.0

Limit offset for buildup detection

Navigation Diagnostics → Heartbeat Techn. → Buildup detect. → Offset buildup

User entry –999 999.9 to 999 999.9 dB

Factory setting 10 dB

3.2.7 Echo curve

Navigation Diagnostics → Echo curve

Save reference curve

Navigation Diagnostics → Echo curve → Save ref. curve

Selection
- Customer reference curve
- Not active

Factory setting Not active

Additional information

Access:
- Read access: Maintenance
- Write access: Maintenance

Time reference curve

Navigation Diagnostics → Echo curve → Time ref. curve

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

Additional information Timestamp of the recording of the reference curve.

Access:
- Read access: Operator
- Write access: -

Reference curve active

Navigation Diagnostics → Echo curve → Ref.curve active

User interface
- Delivery reference curve available
- Customer reference curve available

Factory setting Customer reference curve available

Additional information The delivery reference curve is recorded at the factory before delivery.

A customer reference curve is recorded as standard at the end of the Guidance → Commissioning . These reference curves can be used for diagnosing problems when troubleshooting.

Access:
- Read access: Maintenance
- Write access: -

3.2.8 Diagnostic settings

Navigation Diagnostics → Diag. settings

Properties

Navigation Diagnostics → Diag. settings → Properties

941 Diagnostic behavior

Navigation Diagnostics → Diag. settings → Properties → 941Diag. behav.

Description Defines the behavior of the output in case of an echo loss.

"Last valid value"
Last valid value is kept.

"Ramp at echo lost"
Output value is continuously shifted towards 0 % or 100 %.

"Value echo lost"
Output assumes a defined value.

"Alarm"
Device generates an alarm.

Selection
- Last valid value
- Ramp at echo lost
- Value echo lost
- Alarm

Factory setting Last valid value

941 Event category

Navigation Diagnostics → Diag. settings → Properties → 941Event categ.

Selection
- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)

Factory setting Out of specification (S)

Value echo lost

Navigation Diagnostics → Diag. settings → Properties → Value echo lost

Description Value of the output in case of an echo loss.

User entry Signed floating-point number

Factory setting 0 %

Ramp at echo lost

Navigation Diagnostics → Diag. settings → Properties → Ramp echo lost

Description Slope of the ramp in the case of an echo loss.

Note:
If the slope is positive (+), the output increases until it reaches 100%.

If the slope is negative (-), the output decreases until it reaches 0%.

User entry Signed floating-point number

Factory setting 0.0 %/min

Jump delay echo lost

Navigation Diagnostics → Diag. settings → Properties → Jump del. echol.

Description Activate or deactivate the delay time in case of echo loss.
After an echo loss, the device allows the delay time to pass before the reaction defined in parameter "941 Diagnostic behavior" occurs. This way it can be avoided that temporary disturbances interrupt the measurement unnecessarily.

Selection
- Off
- On

Factory setting On

Additional information **Access:**
- Read access: Expert
- Write access: Expert

Delay time echo lost

Navigation Diagnostics → Diag. settings → Properties → Delay echo lost

Description Time between the echo loss and the reaction defined for the output.

User entry 0 to 99 999.9 s

Factory setting 900 s

Echo jump delay

Navigation Diagnostics → Diag. settings → Properties → Echo jump delay

User entry 0 to 99 999.9 s

Factory setting 60.0 s

Additional information **Access:**
- Read access: Expert
- Write access: Expert

Echo lost window right

Navigation Diagnostics → Diag. settings → Properties → Echo l.win.right

User entry 0 to 99 900 mm

Factory setting 4 000 mm

Additional information **Access:**
- Read access: Expert
- Write access: Expert

Echo lost window left

Navigation Diagnostics → Diag. settings → Properties → Echo l.win.left

User entry 0 to 99 000 mm

Factory setting 4 000 mm

Additional information **Access:**
- Read access: Expert
- Write access: Expert

Draining speed

Navigation Diagnostics → Diag. settings → Properties → Draining speed

User entry Signed floating-point number

Factory setting 100 cm/min

Additional information **Access:**
- Read access: Expert
- Write access: Expert

Filling speed

Navigation Diagnostics → Diag. settings → Properties → Filling speed

User entry Signed floating-point number

Factory setting 100 cm/min

Additional information **Access:**
- Read access: Expert
- Write access: Expert

942 Diagnostic behavior

Navigation Diagnostics → Diag. settings → Properties → 942Diag. behav.

Selection
- Off
- Alarm
- Warning
- Self holding

Factory setting Warning

942 Event category

Navigation Diagnostics → Diag. settings → Properties → 942Event categ.

Selection
- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)

Factory setting Out of specification (S)

Safety distance

Navigation Diagnostics → Diag. settings → Properties → Safety distance

User entry −200 000 to 125 000 mm

Factory setting 0 mm

Acknowledge alarm

Navigation Diagnostics → Diag. settings → Properties → Acknowl. alarm

Selection
- No
- Yes

Factory setting No

Configuration

Navigation Diagnostics → Diag. settings → Configuration

Sensor

Navigation Diagnostics → Diag. settings → Configuration → Sensor

168 Diagnostic behavior

Navigation Diagnostics → Diag. settings → Configuration → Sensor → 168Diag. behav.

Description Select event behavior

"Logbook entry only":
No forwarding of the message via the fieldbus.

"Warning": Warning message is transmitted via the fieldbus (default setting).

Regardless of the setting, the message appears on the display. If the permissible conditions are reached again, the warning is no longer available in the instrument.

Selection
- Off
- Alarm
- Warning
- Logbook entry only

Factory setting Warning

168 Event category

Navigation Diagnostics → Diag. settings → Configuration → Sensor → 168Event categ.

Description

Selection
- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)

Factory setting Maintenance required (M)

Process

Navigation Diagnostics → Diag. settings → Configuration → Process

941 Diagnostic behavior

Navigation Diagnostics → Diag. settings → Configuration → Process → 941Diag. behav.

Description Defines the behavior of the output in case of an echo loss.

"Last valid value"
Last valid value is kept.

"Ramp at echo lost"
Output value is continuously shifted towards 0 % or 100 %.

"Value echo lost"
Output assumes a defined value.

"Alarm"
Device generates an alarm.

Selection
- Last valid value
- Ramp at echo lost
- Value echo lost
- Alarm

Factory setting Last valid value

941 Event category

Navigation Diagnostics → Diag. settings → Configuration → Process → 941Event categ.

Selection
- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)

Factory setting Out of specification (S)

942 Diagnostic behavior

Navigation Diagnostics → Diag. settings → Configuration → Process → 942Diag. behav.

Selection
- Off
- Alarm
- Warning
- Self holding

Factory setting Warning

942 Event category

Navigation Diagnostics → Diag. settings → Configuration → Process → 942Event categ.

Selection
- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)

Factory setting Out of specification (S)

952 Diagnostic behavior

Navigation Diagnostics → Diag. settings → Configuration → Process → 952Diag. behav.

Description Select event behavior

"Logbook entry only":
No forwarding of the message via the fieldbus.

"Warning": Warning message is transmitted via the fieldbus (default setting).

Regardless of the setting, the message appears on the display. If the permissible conditions are reached again, the warning is no longer available in the instrument.

Selection
- Off
- Alarm
- Warning
- Logbook entry only

Factory setting Warning

952 Event category

Navigation Diagnostics → Diag. settings → Configuration → Process → 952Event categ.

Description Display diagnostic message category.

Selection
- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)

Factory setting Out of specification (S)

3.3 Application

Navigation Application

3.3.1 Measuring units

Navigation Application → Measuring units

Level unit

Navigation Application → Measuring units → Level unit

Description Used to display the level.

Selection

SI units
- %
- m
- mm

US units
- ft
- in

Factory setting %

Distance unit

Navigation Application → Measuring units → Distance unit

Description Select the length unit for distance measurement.
It is used, e.g., for the basic calibration ("Empty calibration" or "Full calibration").

Selection

SI units	*US units*
▪ mm	▪ ft
▪ m	▪ in

Factory setting mm

Temperature unit

Navigation Application → Measuring units → Temperature unit

Description Select the temperature unit.

Selection

SI units	*US units*
▪ °C	°F
▪ K	

Factory setting °C

3.3.2 Measured values

Navigation Application → Measured values

Level linearized

Navigation Application → Measured values → Level linearized

Description Displays the linearized level.

User interface Signed floating-point number

Factory setting 0 %

Level

Navigation Application → Measured values → Level

Description Displays the actual measured level.

User interface −99 999.9 to 200 000.0 %

Factory setting 0.0 %

Distance

Navigation Application → Measured values → Distance

Description Distance from lower edge of device flange to product surface.

User interface Signed floating-point number

Factory setting 0 mm

Unfiltered distance

Navigation Application → Measured values → Unfiltered dist.

User interface Signed floating-point number

Factory setting 0 mm

Sensor temperature

Navigation Application → Measured values → Sensor temp.

Description Displays the current temperature of the sensor electronics.

User interface −150 to 200 °C

Factory setting −150 °C

Terminal voltage 1

Navigation Application → Measured values → Terminal volt. 1

Description Shows the current terminal voltage that is applied at the output

User interface 0.0 to 50.0 V

Electronics temperature

Navigation Application → Measured values → Electronics temp

Description Displays the current temperature of the main electronics.

User interface Signed floating-point number

Factory setting 0 °C

3.3.3 Sensor

Navigation Application → Sensor

Basic settings

Navigation Application → Sensor → Basic settings

Tank type

Navigation Application → Sensor → Basic settings → Tank type

Description Optimizes the signal filters for the respective tank type.

Note:
"Workbench test" deactivates all filters. This option should exclusively be used for tests.

Selection
- Stilling well
- Workbench test
- Open channel
- Sphere
- Storage vessel
- Process vessel standard
- Process vessel with agitator

Factory setting Process vessel standard

Bin type

Navigation Application → Sensor → Basic settings → Bin type

Description Optimizes the signal filters for the respective bin type.

Note:
"Workbench test" deactivates all filters. This option should exclusively be used for tests.

Selection
- Buffer silo (fast)
- Bin/Pile
- Crusher/belt
- Silo
- Workbench test

Factory setting Silo

Empty calibration

Navigation Application → Sensor → Basic settings → Empty calibr.

Description Distance between process connection and minimum level (0 %).

User entry 0 to 125 000 mm

Factory setting 20 000 mm

Full calibration

Navigation Application → Sensor → Basic settings → Full calibr.

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

User entry 1 to 125 000 mm

Factory setting 20 000 mm

Maximum draining speed solid

Navigation Application → Sensor → Basic settings → Max.drain solid

Description By selecting the maximum expected filling and draining speed the signal evaluation is automatically optimized for the process.

Note:
The filling and draining speeds can be set separately as the filling and draining procedures may be different.

Note:
With the "No filter/test" option all signal evaluation filters are deactivated. This option should exclusively be used for tests.

Selection
- Very slow < 0.5 m (1.6 ft)/h
- Slow < 1 m (3.3 ft)/h
- Standard < 2m (6,5ft) /h
- Medium < 4m (13ft) /h
- Fast < 8 m (26 ft)/h
- Very fast > 8 m (26 ft)/h
- No filter/test

Factory setting No filter/test

Maximum filling speed solid

Navigation Application → Sensor → Basic settings → Max. fill. solid

Description By selecting the maximum expected filling and draining speed the signal evaluation is automatically optimized for the process.

Note:
The filling and draining speeds can be set separately as the filling and draining procedures may be different.

Note:
With the "No filter/ test" option all signal evaluation filters are deactivated. This option should exclusively be used for tests.

Selection
- Very slow < 0.5 m (1.6 ft)/h
- Slow < 1 m (3.3 ft)/h
- Standard < 2m (6,5ft) /h
- Medium < 4m (13ft) /h
- Fast < 8 m (26 ft)/h
- Very fast > 8 m (26 ft)/h
- No filter/test

Factory setting No filter/test

Maximum draining speed liquid

Navigation Application → Sensor → Basic settings → Max drain liquid

Description By selecting the maximum expected filling and draining speed the signal evaluation is automatically optimized for the process.

Note:
The filling and draining speeds can be set separately as the filling and draining procedures may be different.

Note:
With the "No filter/test" option all signal evaluation filters are deactivated. This option should exclusively be used for tests.

Selection
- Slow < 1 cm (0.4 in)/min
- Medium < 10 cm (4 in)/min
- Standard < 1 m (40 in)/min
- Fast < 2 m (80 in)/min
- Very fast > 2 m (80 in)/min
- No filter/test

Factory setting Standard < 1 m (40 in)/min

Maximum filling speed liquid

Navigation Application → Sensor → Basic settings → Max. fill liquid

Description By selecting the maximum expected filling and draining speed the signal evaluation is automatically optimized for the process.

Note:
The filling and draining speeds can be set separately as the filling and draining procedures may be different.

Note:
With the "No filter/test" option all signal evaluation filters are deactivated. This option should exclusively be used for tests.

Selection
- Slow < 1 cm (0.4 in)/min
- Medium < 10 cm (4 in)/min
- Standard < 1 m (40 in)/min
- Fast < 2 m (80 in)/min
- Very fast > 2 m (80 in)/min
- No filter/test

Factory setting Standard < 1 m (40 in)/min

Tank/silo height

Navigation Application → Sensor → Basic settings → Tank/silo height

Description If the parametrized measuring range (Empty calibration) differs significantly from the tank or silo height, it is recommended to enter the tank or silo height in this parameter.

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

Note:
For tanks with conical outlet, this parameter should not be changed as in this type of applications "Empty calibration" is usually not << the tank or silo height.

User entry 0 to 125 000 mm

Factory setting 20 000 mm

Damping output

Navigation Application → Sensor → Basic 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

Factory setting 0.0 s

Distance

Navigation Application → Sensor → Basic settings → Distance

Description Distance from lower edge of device flange to product surface.

User interface Signed floating-point number

Factory setting 0 mm

Confirm distance

Navigation Application → Sensor → Basic settings → Confirm distance

Selection
- Modify map
- Distance ok
- Distance unknown
- Tank empty

Factory setting Distance unknown

Record map

Navigation Application → Sensor → Basic settings → Record map

Selection
- No
- Overlay map
- Delete cust map

Factory setting No

Mapping start point

Navigation Application → Sensor → Basic settings → Map. start point

User entry −999 900 to 999 900 mm

Factory setting −250 mm

Additional information **Access:**
- Read access: Expert
- Write access: Expert

Mapping end point

Navigation Application → Sensor → Basic settings → Map. end point

Description Defines up to which distance the new mapping has to be recorded.

Remark: Make sure the level signal is not covered by the mapping.

User entry 0.1 to 125 mm

Factory setting 100 mm

Mapping overlay time

Navigation Application → Sensor → Basic settings → Map overlay time

User entry 1 to 600 s

Factory setting 5 s

Additional information **Access:**
- Read access: Expert
- Write access: Expert

Map gap

Navigation Application → Sensor → Basic settings → Map gap

User entry 0 to 100 000 mm

Factory setting 235 mm

Additional information **Access:**
- Read access: Expert
- Write access: Expert

End of mapping

Navigation Application → Sensor → Basic settings → End of mapping

Description Defines the behavior of the mapping curve in the tank bottom area.

Selection
- Adjustable
- Last map value

Factory setting Adjustable

Additional information **Access:**
- Read access: Expert
- Write access: Expert

End map. ampl.

Navigation Application → Sensor → Basic settings → End map. ampl.

Description Amplitude of the mapping curve in the tank bottom area.

User entry −99 999.0 to 99 999.0 dB

Factory setting −100 dB

Additional information **Access:**
- Read access: Expert
- Write access: Expert

Active map

Navigation Application → Sensor → Basic settings → Active map

Description Select the mapping curve that is to be active. Alternatively, the option "No map" can be selected.

Selection
- Factory map
- Customer map
- No map

Factory setting Factory map

Additional information
- Factory map: The device activates the mapping curve recorded in the factory. This curve cannot be edited or deleted.
- Customer map: If a customer map has been recorded, this can be activated in order to minimize distortions in the application. This curve can be edited.
- No map

Additional settings

Navigation Application → Sensor → Add. settings

Medium type

Navigation Application → Sensor → Add. settings → Medium type

Description Select whether the measured medium is liquid or solid.

Selection
- Liquid
- Solid

Factory setting Liquid

Medium group

Navigation Application → Sensor → Add. settings → Medium group

Description Rough specification of the dielectric constant (DC).

This parameter presets the "Medium property" parameter as follows:

"Others"
->"Medium property" = "Unknown"

"Water based (DC >= 4)"
-> "Medium property" = "DC 4 … 7"

Note:
If "Medium property" is changed afterwards, "Medium group" retains its value. Only "Medium property" is relevant for the signal evaluation.

Note:
The measuring range may be reduced for small dielectric constants. For details refer to the Technical Information (TI) of the respective device.

Selection
- Others
- Water based (DC >= 4)

Factory setting Others

Medium property

Navigation Application → Sensor → Add. settings → Medium property

Description Specify the dielectric costant (DC) of the medium.

Note:
For multiple-phase systems this value refers to the upper medium.

Selection
- Unknown
- DC 1.2 … 1.6
- DC 1.6 … 1.9
- DC 1.9 … 2.5
- DC 2.5 … 4
- DC 4 … 7
- DC 7 … 15
- DC > 15

Factory setting DC 1.9 … 2.5

Upper blank out

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

Description This parameter describes a line segment between reference point and close to maximum level (100%). The value is calculated by the device to blanket potentially disturbing signals coming from this space. The value can be adapted manually.

User entry 0 to 125 000 mm

Factory setting 50 mm

Output mode

Navigation Application → Sensor → Add. settings → Output mode

Description Select output mode between:

Ullage =
The remaining space in the tank or silo is indicated.

or

Level linearized =
The level is indicated (more precisely: the linearized value if a linearization has been activated).

Selection
- Ullage
- Level linearized

Factory setting Level linearized

L max. drain speed

Navigation Application → Sensor → Add. settings → L max draining

User entry 0.0 to 50 000.0 %/min

Factory setting 0.0 %/min

Additional information

Access:
- Read access: Expert
- Write access: Expert

L max. fill speed

Navigation Application → Sensor → Add. settings → L max.fill speed

User entry 0.0 to 50 000.0 %/min

Factory setting 0.0 %/min

Additional information **Access:**
- Read access: Expert
- Write access: Expert

Level limit mode

Navigation Application → Sensor → Add. settings → Level limit mode

Description Determines whether the output value is limited by an upper or lower limit (or by both).

Selection
- Off
- Low limit
- High limit
- Low and High Limit

Factory setting Low limit

High limit

Navigation Application → Sensor → Add. settings → High limit

Description Defines the upper limit of the output value.

User entry Signed floating-point number

Factory setting 0 %

Low limit

Navigation Application → Sensor → Add. settings → Low limit

Description Defines the lower limit of the output value.

User entry −200 000.0 to 200 000.0 %

Factory setting 0.0 %

Level correction

Navigation Application → Sensor → Add. settings → Level correction

Description The measured level is corrected by this value to compensate for a constant level error.

Level correction > 0:
The level is increased by this value.

Level correction < 0:
The level is decreased by this value.

User entry −200 000.0 to 200 000.0 %

Factory setting 0.0 %

Echo evaluation

Navigation Application → Sensor → Add. settings → Echo evaluation

Echo curve statistic

Navigation Application → Sensor → Add. settings → Echo evaluation → Ec. curve stat.

Description Activate or deactivate the weighted echo curve statistics.

Selection
- Off
- On

Factory setting On

Additional information **Access:**
- Read access: Expert
- Write access: Expert

Echo curve statistics up

Navigation Application → Sensor → Add. settings → Echo evaluation → EC. stat. up

Description Enter the number of measuring cycles to define the weighting of the last echo curve for ascending signals.

User entry 0 to 30

Factory setting 3

Additional information **Access:**
- Read access: Expert
- Write access: Expert

Echo curve statistic down

Navigation Application → Sensor → Add. settings → Echo evaluation → ECS in down

Description Enter the number of measuring cycles to define the weighting of the last echo curve for descending signals.

User entry 0 to 30

Factory setting 5

Additional information **Access:**
- Read access: Expert
- Write access: Expert

Echo curve smoothing mode

Navigation Application → Sensor → Add. settings → Echo evaluation → EC. smooth.mode

Selection
- Off
- SG smoothing
- Symmetric smoothing
- Asymmetric smoothing

Factory setting Symmetric smoothing

Additional information **Access:**
- Read access: Expert
- Write access: Expert

Echo curve smoothing

Navigation Application → Sensor → Add. settings → Echo evaluation → EC. smoothing

User entry 0 to 9 900 mm

Factory setting 0 mm

Additional information **Access:**
- Read access: Expert
- Write access: Expert

FAC offset

Navigation Application → Sensor → Add. settings → Echo evaluation → FAC offset

Description Enter offset of the weighting curve.

User entry −9 999.0 to 9 999.0 dB

Factory setting 12 dB

Additional information **Access:**
- Read access: Expert
- Write access: Expert

FAC window size

Navigation Application → Sensor → Add. settings → Echo evaluation → FAC window size

Description Enter width of the weighting curve window.

User entry 0 to 9 900 mm

Factory setting 1 600 mm

Additional information **Access:**
- Read access: Expert
- Write access: Expert

Max Value EWC

Navigation Application → Sensor → Add. settings → Echo evaluation → Max Value EWC

Description Enter maximum amplitude of the weighting curve.

User entry −9 999.0 to 9 999.0 dB

Factory setting 100 dB

Additional information **Access:**
- Read access: Expert
- Write access: Expert

First echo factor

Navigation Application → Sensor → Add. settings → Echo evaluation → First echo fact.

Description Enter width of the first echo band.

User entry 0.0 to 100.0 dB

Factory setting 10 dB

Additional information **Access:**
- Read access: Expert
- Write access: Expert

Parabolic fit window size

Navigation Application → Sensor → Add. settings → Echo evaluation → Parab fit window

User entry 0 to 9 900 mm

Factory setting 120 mm

Additional information **Access:**
- Read access: Expert
- Write access: Expert

Tank bottom range

Navigation Application → Sensor → Add. settings → Echo evaluation → TB range

Description Determines the range in which the physical bottom echo is searched for.
The bottom range extends downwards and starts at level 0 % "Empty calibration". It ends at the entered value.

Note: If the level 0 % "Empty calibration" is far above the physical bottom, the bottom range starts at the entered "Tank/silo height".

User entry 0 to 312 500 mm

Factory setting 15 000 mm

Min. amplitude TBD

Navigation Application → Sensor → Add. settings → Echo evaluation → Min. ampl. TBD

Description Enter the minimum amplitude for tank bottom detection.

User entry 0 to 9 999.0 dB

Factory setting 3 dB

Additional information **Access:**
- Read access: Expert
- Write access: Expert

Lower level area

Navigation Application → Sensor → Add. settings → Echo evaluation → Lower level area

Description Enter lower level area.
In this defined range, the first echo band is lowered to the weighting curve.

User entry 0 to 125 000 mm

Factory setting 1 000 mm

Additional information **Access:**
- Read access: Expert
- Write access: Expert

Evaluation mode

Navigation Application → Sensor → Add. settings → Echo evaluation → Evaluation mode

Description Defines the evaluation mode for the echo tracking.

Selection
- FlexTracking
- FlexTracking - Weak signals
- FixTracking
- FixTracking - Weak signals

Factory setting FlexTracking

Reset evaluation

Navigation Application → Sensor → Add. settings → Echo evaluation → Reset evaluation

Description Restarts level determination.

Selection
- Reset done
- Yes

Factory setting Reset done

Window size tracking

Navigation Application → Sensor → Add. settings → Echo evaluation → Wind.size track.

User entry 0 to 20 500 mm

Factory setting 500 mm

Additional information **Access:**
- Read access: Expert
- Write access: Expert

Maximal track counter

Navigation Application → Sensor → Add. settings → Echo evaluation → Max track count

User entry 0 to 100

Factory setting 2

Additional information **Access:**
- Read access: Expert
- Write access: Expert

Debug parameter index

Navigation Application → Sensor → Add. settings → Echo evaluation → Debug parm. idx

User entry 0 to 65 535

Factory setting 2

Additional information **Access:**
- Read access: Expert
- Write access: Expert

Debug array index

Navigation Application → Sensor → Add. settings → Echo evaluation → Debug array indx

User entry 0 to 255

Factory setting 0

Additional information **Access:**
- Read access: Expert
- Write access: Expert

Status

Navigation Application → Sensor → Add. settings → Echo evaluation → Status

User entry 0 to 255

Factory setting 0

Additional information **Access:**
- Read access: Expert
- Write access: Expert

Debug value

Navigation Application → Sensor → Add. settings → Echo evaluation → Debug value

User interface Signed floating-point number

Factory setting 4.0

Additional information **Access:**
- Read access: Expert
- Write access: -

Debug value integer32

Navigation Application → Sensor → Add. settings → Echo evaluation → Debug val. int32

User interface Positive integer

Factory setting 0

Additional information **Access:**
- Read access: Expert
- Write access: -

Linearization

Navigation Application → Sensor → Linearization

Linearization type

Navigation Application → Sensor → Linearization → Lineariz. type

Description Select type of linearization.

Selection
- None
- Linear
- Table
- Pyramid bottom
- Conical bottom
- Angled bottom
- Horizontal cylinder
- Sphere

Factory setting None

Unit after linearization

Navigation Application → Sensor → Linearization → Unit lineariz.

Description Defines the unit of the linearized value.

Note:
The selected unit is only used to be indicated on the display. The measured value is not transformed according to the selected unit.

Note:
If "Free text" is selected, an additional parameter "Free text" appears in which the designation of the unit can be defined.

Selection

SI units
- STon
- t
- kg
- cm^3
- dm^3
- m^3
- hl
- l
- %
- mm
- m

US units
- lb
- UsGal
- ft^3
- ft
- in

Imperial units
impGal

Custom-specific units
Free text

Factory setting %

Free text

Navigation Application → Sensor → Linearization → Free text

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

Factory setting Free text

Level linearized

Navigation Application → Sensor → Linearization → Level linearized

Description Displays the linearized level.

User interface Signed floating-point number

Factory setting 0 %

Maximum value

Navigation Application → Sensor → Linearization → Maximum value

Description Linearized value corresponding to a level of 100 %.

User entry −200 000 to 200 000.0 %

Factory setting 100.0 %

Diameter

Navigation Application → Sensor → Linearization → Diameter

Description Diameter of the spherical tank or horizontal cylinder tank.

User entry 0.001 to 125 000 mm

Factory setting 20 000 mm

Intermediate height

Navigation Application → Sensor → Linearization → Intermed. height

Description Height of the pyramid, conical or angled bottom

User entry 0 to 125 000 mm

Factory setting 0 mm

Table mode

Navigation Application → Sensor → Linearization → Table mode

Description Defines the editing mode of the linearization table.

"Manual'
The level and the associated linearized value are entered manually for each linearization point.

"Semiautomatic'
The level is measured by the device for each linearization point. The associated linearized value is entered manually.

"Clear table'
Deletes the existing linearization table.

"Sort table'
Rearranges the linerization points into an ascending order.

Note:
DeviceCare and FieldCare contain a graphical tool for the easy creation of a linearization table.
Device Care: "Additional functions" -> "Linearization table'
FieldCare: "Device Operation" -> "Device Functions" -> "Additional functions" -> "Linearization table"

Selection
- Manual
- Semiautomatic *
- Clear table
- Sort table *

Factory setting Manual

Table number

Navigation Application → Sensor → Linearization → Table number

Description Enter or change the table point.

* Visibility depends on order options or device settings

User entry 1 to 32

Factory setting 1

Level

Navigation Application → Sensor → Linearization → Level

Description Enter level value of the table point (value before linearization).

User entry Signed floating-point number

Factory setting 0 %

Level

Navigation Application → Sensor → Linearization → Level

Description Displays measured level (value before linearization). This value is transmitted to the table.

User interface Signed floating-point number

Factory setting 0.0 %

Customer value

Navigation Application → Sensor → Linearization → Customer value

Description Enter linearized value for the table point.

User entry Signed floating-point number

Factory setting 0 %

Activate table

Navigation Application → Sensor → Linearization → Activate table

Description Activate or deactivate table.
The table can only be activated if the table values:
- are present in at least 2 value pairs
- do not exceed the sensor limits
- represent a function which is monotonically ascending or descending

Selection
- Disable
- Enable

Factory setting Disable

Signal information

Navigation Application → Sensor → Signal inform.

Signal quality

Navigation Application → Sensor → Signal inform. → Signal quality

Description Shows the quality of the evaluated level signal.

User interface
- Strong
- Medium
- Weak
- No signal

Factory setting Strong

Absolute echo amplitude

Navigation Application → Sensor → Signal inform. → Abs. echo ampl.

Description Shows the absolute amplitude of the evaluated level signal.

User interface −150.0 to 32.0 dB

Factory setting 0.0 dB

Relative echo amplitude

Navigation Application → Sensor → Signal inform. → Relat.echo ampl.

Description Shows the relative amplitude (i.e. the distance to the evaluation curve) of the evaluated level signal.

User interface 0.0 to 150.0 dB

Factory setting 0.0 dB

Sensor cycle time

Navigation Application → Sensor → Signal inform. → Sens. cycle time

User interface 0 to 65 535 ms

Factory setting 0 ms

Additional information **Access:**
- Read access: Expert
- Write access: -

Actual IF gain

Navigation Application → Sensor → Signal inform. → Actual IF gain

User interface 0 to 1 000

Factory setting 0

Additional information **Access:**
- Read access: Expert
- Write access: -

3.3.4 Profibus

Navigation Application → Profibus

Configuration

Navigation Application → Profibus → Configuration

Device tag

Navigation Application → Profibus → Configuration → Device tag

Description Enter a unique name for the measuring point to identify the device quickly within the plant.

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

Factory setting Micropilot 6xB

Ident number selector

Navigation Application → Profibus → Configuration → Ident num select

Description In order to integrate the field devices into the bus system, the PROFIBUS system needs a description of the device parameters, such as output data, input data, data format, data volume and supported transmission rate. These data are available in the general station description (GSD) which is provided to the PROFIBUS Master when the communication system is commissioned.

Selection
- 0x9700 (1AI)
- FMR6xB 0x1568
- Automatic mode

Factory setting Automatic mode

PROFIBUS ident number

Navigation Application → Profibus → Configuration → Ident number

Description Shows the Profibus Ident number of the device. Which Ident number is used can be defined in the parameter Ident number selector.

User interface 0 to 65 535

Factory setting 5 480

Address mode

Navigation Application → Profibus → Configuration → Address mode

Description Shows the address mode that applies to the device address, e.g. 'Hardware' if set via DIP switch

User interface
- Hardware
- Software

Factory setting Software

Device address

Navigation Application → Profibus → Configuration → Device address

Description The device address must always be configured for a PROFIBUS device. The valid address range is
between 1 and 126. In a PROFIBUS network, each address can only be assigned once. If an address is not configured correctly, the device is not recognized by the master. All measuring devices are delivered ex works with device address 126 and software addressing.
The address can only be written here if it has not already been set via the DIP switches.

User entry 0 to 126

Factory setting 126

Analog input

Navigation Application → Profibus → Analog input

Analog input 1 to 6

Navigation Application → Profibus → Analog input → Analog input 1 to 6

Out value

Navigation Application → Profibus → Analog input → Analog input 1 to 6 → Out value

Description Shows the process value reported to the controller for further processing

User entry Signed floating-point number

Factory setting 0

Out status

Navigation Application → Profibus → Analog input → Analog input 1 to 6 → Out status

Description Shows the status of the measured value reported to the controller for further processing (Hex). Writeable in Manual mode.

User entry 0 to 255

Factory setting 128

Out unit text

Navigation Application → Profibus → Analog input → Analog input 1 to 6 → Out unit text

Description If a specific unit of OUT parameter is not in the code list the user has the possibility to write the specific text into this parameter. The unit code is then equal to "textual unit definition".

User entry Character string comprising numbers, letters and special characters (16)

Factory setting %

Channel

Navigation Application → Profibus → Analog input → Analog input 1 to 6 → Channel

Description Assigns a measured variable to the AI block.

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

Factory setting Level

* Visibility depends on order options or device settings

PV filter time

Navigation Application → Profibus → Analog input → Analog input 1 to 6 → PV filter time

Description Enter time constant for input damping (PT1 element). Damping reduces the effect of fluctuations in the measured value on the output signal.

User entry Positive floating-point number

Factory setting 0

Simulate enabled

Navigation Application → Profibus → Analog input → Analog input 1 to 6 → Simulate enabled

Description The simulation is used to bypass the physical I/O channel. In this way the block remains in the normal mode and using the simulated discrete I/O channel during operation.

Selection
- Disable
- Enable

Factory setting Disable

Simulate value

Navigation Application → Profibus → Analog input → Analog input 1 to 6 → Simulate value

Description The simulation value is used to bypass the physical I/O channel. In this way, the block remains in
the normal mode and using the simulated value during operation.

User entry Signed floating-point number

Factory setting 0

Simulate status

Navigation Application → Profibus → Analog input → Analog input 1 to 6 → Simulate status

Description To simulate a process status for this block. Possible input values can be taken from the PA profile used, see there under the chapter "Process variable status and diagnosis".

Examples for status values are:

0x80 (decimal 128) for status "GOOD"
0x24 (decimal 36) for status "BAD

User entry 0 to 255

Factory setting 0

Digital input

Navigation Application → Profibus → Digital input

Digital input 1 to 2

Navigation Application → Profibus → Digital input → Digital input 1 to 2

Out value

Navigation Application → Profibus → Digital input → Digital input 1 to 2 → Out value

Description Shows the state of the device function, which is transmitted to the controller for further processing.

User entry 0 to 255

Factory setting 0

Out status

Navigation Application → Profibus → Digital input → Digital input 1 to 2 → Out status

Description Shows the status of the device function state reported to the controller (Hex). Writeable in Manual mode.

User entry 0 to 255

Factory setting 128

Channel

Navigation Application → Profibus → Digital input → Digital input 1 to 2 → Channel

Description Select the device function

Selection
- None
- Buildup detected *
- Foam detected *

Factory setting None

Simulate enabled

Navigation Application → Profibus → Digital input → Digital input 1 to 2 → Simulate enabled

Selection
- Disable
- Enable

Factory setting Disable

Simulate value

Navigation Application → Profibus → Digital input → Digital input 1 to 2 → Simulate value

Description The simulation value is used to bypass the physical I/O channel. In this way, the block remains in
the normal mode and using the simulated value during operation.

User entry 0 to 255

Factory setting 0

Simulate status

Navigation Application → Profibus → Digital input → Digital input 1 to 2 → Simulate status

Description To simulate a process status for this block. Possible input values can be taken from the PA profile used, see there under the chapter "Process variable status and diagnosis".

Examples for status values are:

0x80 (decimal 128) for status "GOOD"
0x24 (decimal 36) for status "BAD

User entry 0 to 255

Factory setting 0

* Visibility depends on order options or device settings

Analog output

Navigation Application → Profibus → Analog output

Analog output 1

Navigation Application → Profibus → Analog output → Analog output 1

Out value

Navigation Application → Profibus → Analog output → Analog output 1 → Out value

Description Shows an analog output value (AO) that is output from the controller to the device and can be shown on the local display. To show the AO on the local display, it must be assigned to a display output parameter as a value. This assignment is made in the menu under "System-Display".

User entry Signed floating-point number

Factory setting 0

Out status

Navigation Application → Profibus → Analog output → Analog output 1 → Out status

Description Shows the status of the external compensation value reported to the measuring device for further processing (Hex). Writeable in Manual mode.

User entry 0 to 255

Factory setting 128

Out unit

Navigation Application → Profibus → Analog output → Analog output 1 → Out unit

User entry 0 to 65 535

Factory setting 1 997

Fail-safe type

Navigation Application → Profibus → Analog output → Analog output 1 → Fail-safe type

Description Select fail-safe behavior in the event of a failure (value with status 'Bad')

Selection
- Fixed value
- Last valid value
- Off

Factory setting Last valid value

Fail-safe time

Navigation Application → Profibus → Analog output → Analog output 1 → Fail-safe time

Description Enter a delay until in the event of a failure (value with status 'Bad') the fail-safe behavior specified applies

User entry 0 to 999.0

Factory setting 0

Fail-safe value

Navigation Application → Profibus → Analog output → Analog output 1 → Fail-safe value

Description Enter value to report in the event of a failure (value with status 'Bad')

User entry Signed floating-point number

Factory setting 0

Information

Navigation Application → Profibus → Information

Device ID

Navigation Application → Profibus → Information → Device ID

Description Shows the device ID used by the manufacturer to identify the measuring device type

User interface Character string comprising numbers, letters and special characters

Factory setting Micropilot 6xB

Profile version

Navigation Application → Profibus → Information → Profile version

Description Shows the profile version

User interface Character string comprising numbers, letters and special characters

Factory setting 3.02

Statistics

Navigation Application → Profibus → Statistics

CRC Count OK

Navigation Application → Profibus → Statistics → CRC Count OK

Description Indicates how often the checksum test of the cyclic data telegram was successful.

User interface Positive integer

Factory setting 0

CRC Count Failed

Navigation Application → Profibus → Statistics → CRC Count Failed

Description Indicates how often the checksum test of the cyclic data telegram detected an error.

User interface Positive integer

Factory setting 0

3.4 System

Navigation System

3.4.1 Device management

Navigation System → Device manag.

Device tag

Navigation System → Device manag. → Device tag

Description Enter a unique name for the measuring point to identify the device quickly within the plant.

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

Factory setting Micropilot 6xB

Locking status

Navigation System → Device manag. → Locking status

Description Indicates the type of locking.

"Hardware locked" (HW)
The device is locked by the "WP" switch on the main electronics module. To unlock, set the switch into the OFF position.

"WHG locked" (SW)
Unlock the device by entering the appropriate access code in "Enter safety unlocking code".

"Temporarily locked" (SW)
The device is temporarily locked by processes in the device (e.g. data upload/download, reset). The device will automatically be unlocked after completion of these processes.

User interface
- Hardware locked
- WHG locked
- Temporarily locked

Static revision

Navigation System → Device manag. → Static revision

Description Shows the number of changes made to static parameters (e.g. configuration parameters)

User interface 0 to 65 535

Factory setting 0

Reset device

Navigation System → Device manag. → Reset device

Description Reset the device configuration - either entirely or in part - to a defined state

Selection
- Cancel
- To factory defaults *
- To delivery settings *
- Restart device

Factory setting Cancel

3.4.2 User management

Navigation System → User manag.

User role

Navigation System → User manag. → User role

Description Shows the access authorization to the parameters via the operating tool

User interface
- Operator
- Maintenance
- Expert

Factory setting Maintenance

Change user role

Navigation System → User manag. → Change user role

Description It is possible to change the user role.
If the actual role is 'Maintenance', the 'Enter access code' will be prompted.
If the actual role is 'Operator', a 'Maintenance' password will be required.

User entry Character string comprising numbers, letters and special characters (1)

* Visibility depends on order options or device settings

Password

Navigation System → User manag. → Password

Description Enter the password for the "Maintenance" user role to get access to the functionality of this role.

User entry Character string comprising numbers, letters and special characters (16)

Enter access code

Navigation System → User manag. → Ent. access code

Description For authorized service personnel only.

User entry 0 to 9 999

Factory setting 0

Status password entry

Navigation System → User manag. → Status pw entry

Description Use this function to display the status of the password verification.

User interface
- --------
- Wrong password
- Password rule violated
- Password accepted
- Permission denied
- Confirm PW mismatch
- Reset password accepted
- Invalid user role
- Wrong sequence of entry

Factory setting --------

Define password

Navigation System → User manag. → Define password

User entry Character string comprising numbers, letters and special characters (1)

New password

Navigation System → User manag. → New password

Description Define the new "Maintenance" password.
A new password is valid after it has been confirmed within the "Confirm new password" parameter.
Any valid password consists of 4 to 16 characters and can contain letters and numbers.

User entry Character string comprising numbers, letters and special characters (16)

Confirm new password

Navigation System → User manag. → Confirm password

Description Enter the new password again to confirm.

User entry Character string comprising numbers, letters and special characters (16)

Change password

Navigation System → User manag. → Change password

Description Changes the 'Maintenance' password.

User entry Character string comprising numbers, letters and special characters (1)

Old password

Navigation System → User manag. → Old password

Description Enter the current password, to subsequently change the existing password.

User entry Character string comprising numbers, letters and special characters (16)

Delete password

Navigation System → User manag. → Delete password

Description Deletes the 'Maintenance' password.
After deleting, the 'Operator' role will be no more available.
All users have read/write access rights.

User entry Character string comprising numbers, letters and special characters (1)

Forgot password?

Navigation System → User manag. → Forgot password?

User entry Character string comprising numbers, letters and special characters (1)

Reset password

Navigation System → User manag. → Reset password

Description Enter a code to reset the current "Maintenance" password.
The code is delivered by your local support.

User entry Character string comprising numbers, letters and special characters (16)

3.4.3 Bluetooth configuration

Navigation System → Bluetooth conf.

Bluetooth activation

Navigation 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

Factory setting Depends on the order option

3.4.4 Display

Navigation System → Display

Language

Navigation System → Display → Language

Description Set display language

Selection
- English
- Deutsch *
- Français *
- Español *
- Italiano *
- Nederlands *
- Portuguesa *
- Polski *
- русский язык (Russian) *
- Svenska *
- Türkçe *
- 中文 (Chinese) *
- 日本語 (Japanese) *
- 한국어 (Korean) *
- العَرَبيّة (Arabic) *
- Bahasa Indonesia *
- ภาษาไทย (Thai) *
- tiếng Việt (Vietnamese) *
- čeština (Czech) *

Factory setting English

Format display

Navigation System → Display → Format display

Description Select how measured values are shown on the display

Selection
- 1 value, max. size
- 1 bargraph + 1 value
- 2 values

* Visibility depends on order options or device settings

Factory setting 1 value, max. size

Value 1 display

Navigation System → Display → Value 1 display

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

Selection
- Level
- Level linearized
- Distance
- Absolute echo amplitude
- Relative echo amplitude
- Area of incoupling
- Buildup index*
- Foam index*
- Terminal voltage
- Electronics temperature
- Sensor temperature
- Unfiltered distance
- Analog output 1

Factory setting Level

Value 2 ... 4 display

Navigation System → Display → Value 2 display

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

Selection
- None
- Level
- Level linearized
- Distance
- Absolute echo amplitude
- Relative echo amplitude
- Area of incoupling
- Buildup index*
- Foam index*
- Terminal voltage
- Electronics temperature
- Sensor temperature
- Analog output 1

Factory setting None

* Visibility depends on order options or device settings

Decimal places 1 ... 4

Navigation System → Display → Decimal places 1

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

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

Factory setting x.xx

Contrast display

Navigation System → Display → Contrast display

Description Adjust local display contrast setting to ambient conditions (e.g. lighting or reading angle)

User entry 20 to 80 %

Factory setting 30 %

3.4.5 Information

Navigation System → Information

Device name

Navigation System → Information → Device name

Description Use this function to display the device name. It can also be found on the nameplate.

User interface Character string comprising numbers, letters and special characters

Factory setting Micropilot 6xB

Manufacturer

Navigation System → Information → Manufacturer

User interface Character string comprising numbers, letters and special characters

Factory setting Endress+Hauser

Serial number

Navigation System → Information → 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

Order code

Navigation System → Information → Order code

Description Shows the device order code.

User interface Character string comprising numbers, letters and special characters

Factory setting - none -

Additional information **Access:**
- Read access: Operator
- Write access: Expert

Firmware version

Navigation System → Information → Firmware version

Description Displays the device firmware version installed.

User interface Character string comprising numbers, letters and special characters

Hardware version

Navigation System → Information → Hardware version

User interface Character string comprising numbers, letters and special characters

Extended order code 1 ... 3

Navigation System → Information → Ext. order cd. 1

Description The extended order code is an alphanumeric code containing all information to identify the device and its options.

User interface Character string comprising numbers, letters and special characters

Additional information **Access:**
- Read access: Operator
- Write access: Expert

XML build number

Navigation System → Information → XML build no.

User interface Positive integer

Additional information **Access:**
- Read access: Expert
- Write access: -

Checksum

Navigation System → Information → Checksum

Description Checksum for Firmware version.

User interface Positive integer

3.4.6 Additional information

Navigation System → Additional info

Sensor

Navigation System → Additional info → Sensor

Serial number

Navigation System → Additional info → Sensor → Serial number

Description Shows the serial number of the module

User interface Character string comprising numbers, letters and special characters

Additional information **Access:**
- Read access: Expert
- Write access: -

Firmware version

Navigation System → Additional info → Sensor → Firmware version

Description Displays the firmware version of the module.

User interface Positive integer

Additional information **Access:**
- Read access: Expert
- Write access: -

Build no. software

Navigation System → Additional info → Sensor → Build no. softw.

Description Shows the build number of the module firmware

User interface 0 to 65 535

Additional information **Access:**
- Read access: Expert
- Write access: -

Hardware version

Navigation System → Additional info → Sensor → Hardware version

Description Displays the hardware version of the module.

User interface Character string comprising numbers, letters and special characters

Additional information **Access:**
- Read access: Expert
- Write access: -

Checksum

Navigation System → Additional info → Sensor → Checksum

Description Checksum for Firmware version.

User interface Positive integer

Factory setting 0

Additional information **Access:**
- Read access: Expert
- Write access: -

Electronics

Navigation System → Additional info → Electronics

Serial number

Navigation System → Additional info → Electronics → Serial number

Description Shows the serial number of the module

User interface Character string comprising numbers, letters and special characters

Additional information **Access:**
- Read access: Expert
- Write access: -

Firmware version

Navigation System → Additional info → Electronics → Firmware version

Description Displays the firmware version of the module.

User interface Positive integer

Additional information **Access:**
- Read access: Expert
- Write access: -

Build no. software

Navigation System → Additional info → Electronics → Build no. softw.

Description Shows the build number of the module firmware

User interface 0 to 65 535

Additional information **Access:**
- Read access: Expert
- Write access: -

Hardware version

Navigation System → Additional info → Electronics → Hardware version

Description Displays the hardware version of the module.

User interface Character string comprising numbers, letters and special characters

Additional information **Access:**
- Read access: Expert
- Write access: -

Display/Bluetooth

Navigation System → Additional info → Displ./Bluetooth

Serial number

Navigation System → Additional info → Displ./Bluetooth → Serial number

Description Shows the serial number of the module

User interface Character string comprising numbers, letters and special characters

Additional information **Access:**
- Read access: Expert
- Write access: -

Firmware version

Navigation System → Additional info → Displ./Bluetooth → Firmware version

Description Displays the firmware version of the module.

User interface Positive integer

Additional information **Access:**
- Read access: Expert
- Write access: -

Build no. software

Navigation System → Additional info → Displ./Bluetooth → Build no. softw.

Description Shows the build number of the module firmware

User interface 0 to 65 535

Additional information **Access:**
- Read access: Expert
- Write access: -

Hardware version

Navigation System → Additional info → Displ./Bluetooth → Hardware version

Description Displays the hardware version of the module.

User interface Character string comprising numbers, letters and special characters

Additional information **Access:**
- Read access: Expert
- Write access: -

3.4.7 Software configuration

Navigation System → Softw. config.

CRC device configuration

Navigation System → Softw. config. → CRC device conf.

Description CRC device configuration based on current settings of safety relevant parameters. The CRC device configuration is unique and can be used to detect changes in safety relevant parameter settings.

User interface 0 to 65 535

Activate SW option

Navigation 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

Software option overview

Navigation System → Softw. config. → SW option overv.

Description Shows all enabled software options

User interface

- SIL
- WHG
- Heartbeat Verification
- Heartbeat Monitoring

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