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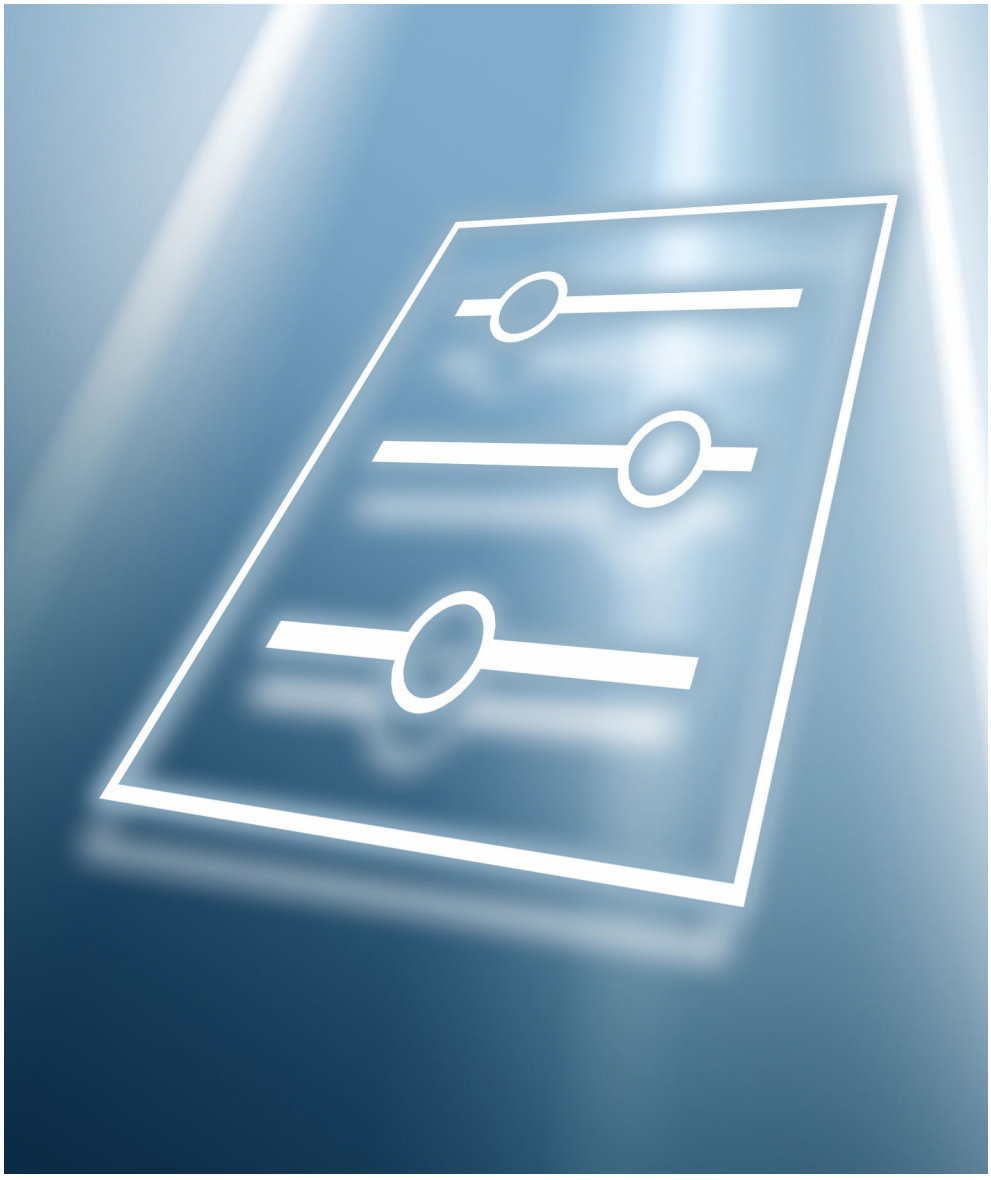
71647904
2024-03-26

Valid as of version
01.00.zz (Device firmware)

Description of Device Parameters
Deltabar PMD55B

Differential pressure measurement
HART



Endress+Hauser
People for Process Automation

Table of contents

1 About this document

1.1 Document function

The document is part of the Operating Instructions and serves as a reference for parameters. The document provides a detailed explanation of each individual parameter.

Performance of tasks that require detailed knowledge of the functioning of the device:
- Commissioning measurements under difficult conditions
- Optimal adaptation of the measurement to difficult conditions
- Detailed configuration of the communication interface
- Error diagnostics in difficult cases

1.2 Target group

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

1.3 Using this document

1.3.1 Information on the document structure

This document lists the submenus and parameters that are available when the **"Maintenance" option** user role is enabled.

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

1.3.2 Structure of a parameter description

The individual parts of a parameter description are described in the following section:

- Navigation: Navigation path to the parameter via the local display
- Prerequisite: The parameter is only available under these specific conditions
- Description: Description of the parameter function
- Selection: List of the individual options for the parameter
- User entry: Input range for the parameter
- User interface: Display value/data of the parameter
- Additional information:
  - On individual options
  - On display values/data
  - On the input range
  - On the factory setting
  - On the parameter function

1.4 Symbols used

1.4.1 Symbols for certain types of Information

Additional information:

Reference to documentation:

Operation via local display:

Operation via operating tool:

Write-protected parameter:

1.5 Documentation

1.5.1 Standard documentation

Operating Instructions

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

1.5.2 Supplementary device-dependent documentation

Special Documentation

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

2 Overview of the operating menu

- Pressure unit → 29
- Scaled variable unit → 29
- Free text → 30
- Temperature unit → 30
- **▶ Measurement adjustments** → 31
  - Zero adjustment → 31
  - Pressure → 32
- **▶ Output settings** → 32
  - Output current transfer function → 32
  - Low flow cut off → 32
- **▶ Output settings** → 33
  - Scaled variable transfer function → 33
  - Low flow cut off → 33
- **▶ Output settings** → 33
  - Lower Range Limit → 33
  - Upper Range Limit → 34
  - Minimum span → 34
- **▶ Output settings** → 34
  - Pressure → 34
  - Scaled variable → 34
- **▶ Output settings** → 35
  - Lower range value output → 35
  - Upper range value output → 35
  - Lower Range Limit → 35

- Failure current → 41
- Loop current mode → 41
- Assign HART variables? → 42
- **▶ Output settings** → 42
  - Assign PV → 42
  - Assign SV → 42
  - Assign TV → 43
  - Assign QV → 44

Diagnostics → 45

- **▶ Active diagnostics** → 45
  - Active diagnostics → 45
  - Timestamp → 45
  - Previous diagnostics → 46
  - Timestamp → 46
  - Operating time from restart → 46
  - Operating time → 47
- **▶ Event logbook** → 47
  - Filter options → 47
- **▶ Minimum/maximum values** → 48
  - Pressure min → 48
  - Counter limit underruns sensor Pmin → 48
  - Counter underruns of user limit Pmin → 48
  - Minimum sensor temperature → 49
  - Counter limit underruns sensor Tmin → 49
  - Counter underruns of user limit Tmin → 49

- Minimum terminal voltage → 49
- Minimum electronics temperature → 49
- Reset user defined counters P and T → 50
- Pressure max → 50
- Counter limit overruns sensor Pmax → 50
- Counter overruns of user limit Pmax → 50
- Maximum sensor temperature → 50
- Counter limit overruns sensor Tmax → 51
- Counter overruns of user limit Tmax → 51
- Maximum terminal voltage → 51
- Maximum electronics temperature → 51

► Simulation → 52

- Simulation → 52
- Value pressure simulation → 52
- Value current output → 52
- Diagnostic event simulation → 52

► Diagnostic settings → 53

► Properties → 53

- SSD Out of range delay time → 53
- SSD Monitoring delay time → 53
- 500 Process alert pressure → 53
- Low alert value → 54
- High alert value → 54
- 501 Process alert scaled variable → 54
- Low alert value → 54

- High alert value → 55
- User temperature process alert → 55
- Low alert value → 55
- High alert value → 55
- 806 Diagnostic behavior → 56
- 806 Diagnostic behavior → 56
- 806 Event category → 56
- 806 Event category → 56
- 806 Event delay → 56

▶ **Configuration** → 57

▶ **Configuration** → 57

- 500 Diagnostic behavior → 57
- 500 Diagnostic behavior → 57
- 500 Diagnostic behavior → 57
- 500 Diagnostic behavior → 57
- 500 Event category → 57
- 500 Event category → 57
- 500 Event category → 57
- 500 Event category → 57
- 501 Diagnostic behavior → 57
- 501 Diagnostic behavior → 57
- 501 Diagnostic behavior → 57
- 501 Diagnostic behavior → 57
- 501 Event category → 58
- 501 Event category → 58

	501 Event category	→ 58
	501 Event category	→ 58
	502 Diagnostic behavior	→ 58
	502 Diagnostic behavior	→ 58
	502 Diagnostic behavior	→ 58
	502 Diagnostic behavior	→ 58
	502 Event category	→ 58
	502 Event category	→ 58
	502 Event category	→ 58
	502 Event category	→ 58
▶ **Process**		→ 59
	806 Diagnostic behavior	→ 59
	806 Diagnostic behavior	→ 59
	806 Diagnostic behavior	→ 59
	806 Diagnostic behavior	→ 59
	806 Diagnostic behavior	→ 59
	806 Diagnostic behavior	→ 59
	806 Event category	→ 59
	806 Event category	→ 59
	806 Event category	→ 59
	806 Event category	→ 59
	806 Event category	→ 59
	806 Event category	→ 59
	822 Diagnostic behavior	→ 59
	822 Event category	→ 60

	Sensor pressure range behavior	→ 60
	841 Event category	→ 60
	900 Event category	→ 61
	900 Event category	→ 61
	900 Event category	→ 61
	900 Event category	→ 61
	900 Diagnostic behavior	→ 61
	900 Diagnostic behavior	→ 61
	900 Diagnostic behavior	→ 61
	900 Diagnostic behavior	→ 61
	906 Diagnostic behavior	→ 61
	906 Diagnostic behavior	→ 61
	906 Diagnostic behavior	→ 61
	906 Diagnostic behavior	→ 61
	906 Event category	→ 61
	906 Event category	→ 61
	906 Event category	→ 61
	906 Event category	→ 61
Application		→ 66
▶ **Measuring units**		→ 66
	Pressure unit	→ 66
	Decimal places pressure	→ 66
	Temperature unit	→ 66
	Scaled variable unit	→ 67

- ▶ **Sensor limits** → 74
  - Lower Range Limit → 74
  - Upper Range Limit → 74
  - Minimum span → 75
  - Sensor temperature lower range limit → 75
  - Sensor temperature upper range limit → 75
- ▶ **Scaled variable** → 75
  - Assign PV → 75
  - Scaled variable unit → 76
  - Free text → 76
  - Pressure → 77
  - Scaled variable transfer function → 77
  - Lower range value output → 77
  - Upper range value output → 77
  - Activate table → 78
  - Pressure value 1 → 78
  - Scaled variable value 1 → 78
  - Pressure value 2 → 78
  - Scaled variable value 2 → 78
  - Low flow cut off → 79
  - Pressure → 79
  - Scaled variable → 79
- ▶ **Wet calibration** → 79
  - Zero → 79
  - Pressure value 1 → 79

- Span → 80
- Pressure value 2 → 80
- Zero → 79
- Lower range value output → 80
- Span → 80
- Upper range value output → 80

▶ Current output → 82

- Assign PV → 82
- Measuring mode current output → 82
- Current range output → 83
- Lower range value output → 83
- Upper range value output → 83
- Failure behavior current output → 83
- Failure current → 84
- Output current → 84
- Terminal current → 84

▶ HART output → 85

▶ Configuration → 85

- HART address → 85
- HART short tag → 85
- Device tag → 85
- No. of preambles → 86
- Loop current mode → 86

▶ HART output → 86

- Assign PV → 86

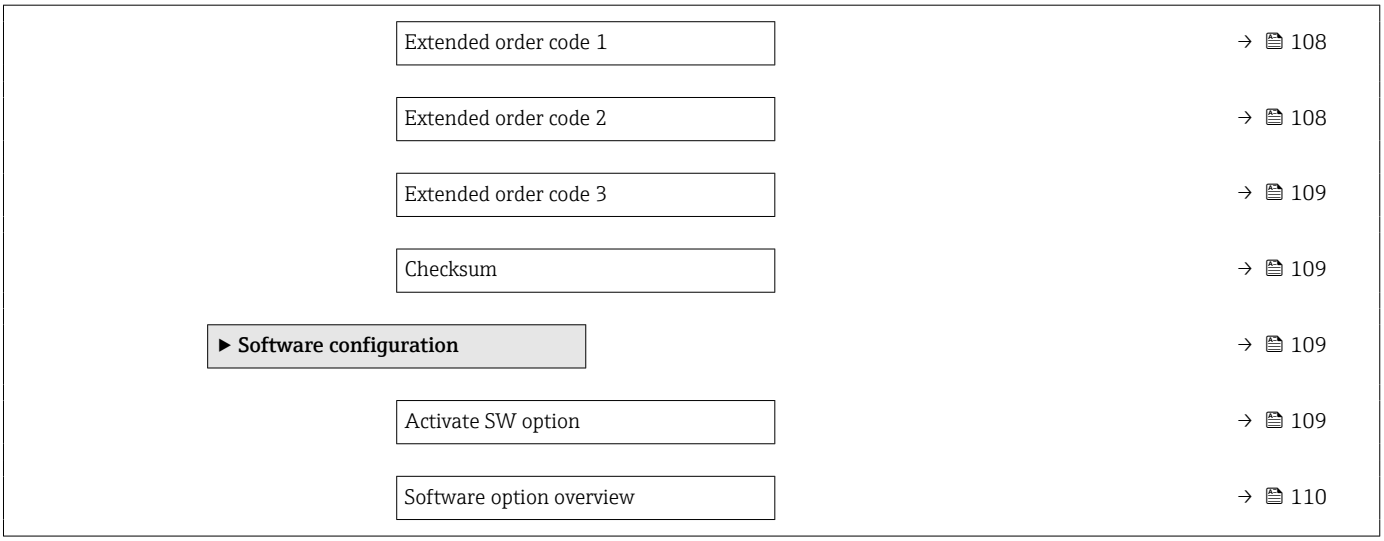
	Primary variable (PV)	→ 87
	Assign SV	→ 87
	Secondary variable (SV)	→ 87
	Assign TV	→ 88
	Tertiary variable (TV)	→ 88
	Assign QV	→ 88
	Quaternary variable (QV)	→ 89
▶ **Burst configuration 1**		→ 89
	Burst mode 1	→ 89
	Burst command 1	→ 90
	Burst variable 0	→ 91
	Burst variable 1	→ 91
	Burst variable 2	→ 91
	Burst variable 3	→ 92
	Burst variable 4	→ 92
	Burst variable 5	→ 92
	Burst variable 6	→ 92
	Burst variable 7	→ 92
	Burst trigger mode	→ 93
	Burst trigger level	→ 93
	Min. update period	→ 93
	Max. update period	→ 94
▶ **Information**		→ 94
	Device ID	→ 94
	Device type	→ 94

- Device revision → 95
- HART short tag → 95
- HART revision → 95
- HART descriptor → 95
- HART message → 96
- HART date code → 96

System → 97

- **▶ Device management** → 97
  - Device tag → 97
  - Locking status → 97
  - Configuration counter → 98
  - Reset device → 98
- **▶ User management** → 99
  - User role → 99
  - Password → 99
  - Enter access code → 99
  - Status password entry → 100
  - New password → 100
  - Confirm new password → 100
  - Status password entry → 100
  - Old password → 100
  - New password → 100
  - Confirm new password → 100
  - Status password entry → 100
  - Reset password → 101

- Status password entry → 100
- Old password → 100
- Status password entry → 100
- ▶ **Display** → 101
  - Language → 101
  - Format display → 102
  - Value 1 display → 102
  - Value 2 display → 103
  - Value 3 display → 103
  - Value 4 display → 104
  - Contrast display → 104
- ▶ **Geolocation** → 105
  - Process Unit Tag → 105
  - Location Description → 105
  - Longitude → 105
  - Latitude → 105
  - Altitude → 106
  - Location method → 106
- ▶ **Information** → 106
  - Device name → 106
  - Manufacturer → 107
  - Serial number → 107
  - Order code → 107
  - Firmware version → 108
  - Hardware version → 108


Extended order code 1
→ 108
Extended order code 2
→ 108
Extended order code 3
→ 109
Checksum
→ 109
▶ Software configuration
→ 109
Activate SW option
→ 109
Software option overview
→ 110

3 Description of device parameters

In the following section, the parameters are listed according to the menu structure of the operating tool.

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

3.1 User navigation

The Guidance main menu contains functions which enable users to perform basic tasks swiftly, e.g. commissioning.
These are primarily guided wizards and cross-subject special functions.

Navigation Guidance

3.1.1 Overview of the operating menu

"Guidance" menu
Commissioning (→ 23)

"Diagnostics" menu
- Active diagnostics (→ 45)
- Event logbook (→ 47)
- Minimum/maximum values (→ 48)
- Simulation (→ 52)
- Diagnostic settings (→ 53)

"Application" menu
- Measuring units (→ 66)
- Measured values (→ 69)
- Sensor (→ 70)
- Current output (→ 82)
- HART output (→ 85)

"System" menu
- Device management (→ 97)
- User management (→ 99)
- Bluetooth configuration
- Display (→ 101)
- Geolocation (→ 105)
- Information (→ 94)
- Software configuration (→ 109)

3.1.2 Commissioning

Run this wizard to put the device into operation. Enter the appropriate value in each parameter or select the appropriate option.

If the wizard is canceled before all the necessary parameters have been configured, any settings already made are saved. For this reason, the device may then be in an undefined state!

In such situations, it is advisable to reset the device to the factory default settings.

The following parameters are configured in the Commissioning wizard:

- Device identification (→ 23)
  - Device tag (→ 23)
  - Device name (→ 23)
  - Serial number (→ 23)
  - Extended order code 1 (→ 24)
  - Extended order code 2 (→ 24)
  - Extended order code 3 (→ 24)
  - Locking status (→ 25)
  - HART short tag (→ 26)
  - HART date code (→ 26)
  - HART descriptor (→ 26)
  - HART message (→ 26)
  - HART address (→ 27)
- Measurement adjustments (→ 27)
  - Assign PV (→ 27)
  - Damping (→ 27)
  - Pressure unit (→ 28)
  - Temperature unit (→ 28)
  - Scaled variable unit (→ 29)
  - Zero adjustment (→ 31)
  - Pressure (→ 32)
- Output settings (→ 32)
  - Output current transfer function (→ 32)
  - Low flow cut off (→ 32)
  - Lower Range Limit (→ 33)
  - Upper Range Limit (→ 34)
  - Minimum span (→ 34)
  - Pressure (→ 34)
  - Scaled variable (→ 34)
  - Lower range value output (→ 35)
  - Upper range value output (→ 35)
  - Scaled variable transfer function (→ 33)
  - Pressure value 1 (→ 36)
  - Current range output (→ 38)
  - Failure behavior current output (→ 39)
  - Failure current (→ 39)
  - Loop current mode (→ 39)
  - Assign HART variables? (→ 39)
  - Process variable output current (→ 40)
  - Assign PV (→ 27)
  - Assign SV (→ 42)
  - Assign TV (→ 43)
  - Assign QV (→ 44)

3.2 "Guidance" menu

Navigation Guidance

3.2.1 "Commissioning" wizard

Navigation Guidance → Commissioning

"Device identification" wizard

Navigation Guidance → Commissioning → Device ident.

Device tag

Navigation Guidance → Commissioning → Device ident. → 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)

Device name

Navigation Guidance → Commissioning → Device ident. → Device name

Description Displays the name of the transmitter. It can also be found on the nameplate of the transmitter.

User interface Max. 32 characters such as letters or numbers.

Serial number

Navigation Guidance → Commissioning → Device ident. → Serial number

Description Displays the serial number of the measuring device.

The number can be found on the nameplate of the sensor and transmitter.

User interface Max. 11-digit character string comprising letters and numbers.

Additional information *Description*

Uses of the serial number
- To identify the measuring device quickly, e.g. when contacting Endress+Hauser.
- To obtain specific information on the measuring device using the Device Viewer: www.endress.com/deviceviewer

Extended order code 1

Navigation Guidance → Commissioning → Device ident. → 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

Factory setting –

Additional information *Description*

The extended order code indicates the version of all the features of the product structure for the measuring device and thus uniquely identifies the measuring device.

Extended order code 2

Navigation Guidance → Commissioning → Device ident. → Ext. order cd. 2

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

The extended order code can also be found on the nameplate of the sensor and transmitter in the "Ext. ord. cd." field.

User interface Character string

Factory setting –

Extended order code 3

Navigation Guidance → Commissioning → Device ident. → Ext. order cd. 3

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

The extended order code can also be found on the nameplate of the sensor and transmitter in the "Ext. ord. cd." field.

User interface Character string

Factory setting –

"Device identification" wizard

Navigation Guidance → Commissioning → Device ident.

Locking status

Navigation Guidance → Commissioning → Device ident. → Locking status

Description Displays the active write protection.

User interface
- Hardware locked
- Safety locked
- Temporarily locked

Additional information *User interface*

If two or more types of write protection are active, the write protection with the highest priority is shown on the local display. In the operating tool all active types of write protection are displayed.

Detailed information on access authorization is provided in the "User roles and associated access authorization" and "Operating concept" sections of the Operations Instructions for the device.

Selection

Function scope of the "Locking status" parameter

Options	Description
None	The access status displayed in the **Access status display** parameter applies. Only appears on local display.
Hardware locked	The DIP switch for hardware locking is activated on the main electronics module. This prevents write access to the parameters (e.g. via the local display or operating tool).
Temporarily locked	Write access to the parameters is temporarily locked due to device-internal processing (e.g. data upload/download, reset). Once the internal processing has been completed, the parameters can be changed once again.

"Device identification" wizard

Navigation Guidance → Commissioning → Device ident.

HART short tag

Navigation Guidance → Commissioning → Device ident. → HART short tag

Description Defines the short tag for the measuring point.

Maximum length: 8 characters
Allowed characters: A-Z, 0-9, certain special characters

User entry Max. 8 characters: A to Z, 0 to 9 and certain special characters (e.g. punctuation marks, @, %).

HART date code

Navigation Guidance → Commissioning → Device ident. → HART date code

Description Date of the last configuration change

User entry Character string comprising numbers, letters and special characters (10)

Additional information Date format: YYYY-MM-DD

Make sure you adhere to this format when entering the date. Otherwise errors may occur in individual HART commands.

HART descriptor

Navigation Guidance → Commissioning → Device ident. → HART descriptor

Description Description for the measuring point.

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

HART message

Navigation Guidance → Commissioning → Device ident. → HART message

Description A HART message which is sent via the HART protocol when requested by the master.

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

HART address

Navigation Guidance → Commissioning → Device ident. → HART address

Description Define the HART address of the device.

User entry 0 to 63

Additional information
- The measured value can only be transmitted via the current value if the address is set to "0". The current is fixed at 4.0 mA for all other addresses (Multidrop mode).
- Only addresses in the range 0 to 15 are permitted for a system according to HART 5.0.
- All addresses in the range 0 to 63 are permitted for a system with HART 6.0 and higher.

"Measurement adjustments" wizard

Navigation Guidance → Commissioning → Meas. adjust.

Assign PV

Navigation Guidance → Commissioning → Meas. adjust. → Assign PV

Description Use this function to select a measured variable (HART device variable) for the primary dynamic variable (PV).

Selection
- Pressure
- Scaled variable

Damping

Navigation Guidance → Commissioning → Meas. adjust. → Damping

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 to 999.0 s

"Measurement adjustments" wizard

Navigation Guidance → Commissioning → Meas. adjust.

Pressure unit

Navigation Guidance → Commissioning → Meas. adjust. → Pressure unit

Selection

SI units	*US units*	*Other units*
▪ MPa ▪ kPa ▪ Pa ▪ bar ▪ mbar ▪ torr ▪ atm ▪ kgf/cm² ▪ gf/cm²	psi	▪ inH2O ▪ inH2O (4°C) ▪ mmH2O ▪ mmH2O (4°C) ▪ mH2O ▪ mH2O (4°C) ▪ ftH2O ▪ inHg ▪ mmHg

Temperature unit

Navigation Guidance → Commissioning → Meas. adjust. → Temperature unit

Description Use this function to select the unit for the temperature.

Selection

SI units	*US units*
▪ °C ▪ K	°F

Factory setting Country-specific:
▪ °C
▪ °F

Additional information *Selection*

"Measurement adjustments" wizard

Navigation Guidance → Commissioning → Meas. adjust.

Pressure unit

Navigation Guidance → Commissioning → Meas. adjust. → Pressure unit

Selection

SI units	*US units*	*Other units*
▪ MPa	psi	▪ inH2O
▪ kPa		▪ inH2O (4°C)
▪ Pa		▪ mmH2O
▪ bar		▪ mmH2O (4°C)
▪ mbar		▪ mH2O
▪ torr		▪ mH2O (4°C)
▪ atm		▪ ftH2O
▪ kgf/cm²		▪ inHg
▪ gf/cm²		▪ mmHg

Scaled variable unit

Navigation Guidance → Commissioning → Meas. adjust. → Scaled Unit

Description Use "Free text", first selection, if the desired unit is not available in the selection list. It is possible to define a customer specific unit with another parameter.

Selection

SI units
- %
- mm
- cm
- m
- l
- hl
- m^3
- g
- kg
- t
- g/s
- kg/s
- kg/min
- kg/h
- t/min
- t/h
- t/d
- m^3/s
- m^3/min
- m^3/h
- m^3/d
- l/s
- l/min
- l/h
- Nm^3/h
- Nl/h
- Sm^3/s
- Sm^3/min
- Sm^3/h
- Sm^3/d
- Nm^3/s
- g/cm^3
- kg/m^3
- Nm^3/min
- Nm^3/d

US units
- ft
- in
- ft^3
- gal (us)
- bbl (us;oil)
- oz
- lb
- STon
- lb/s
- lb/min
- lb/h
- STon/min
- STon/h
- STon/d
- ft^3/s
- ft^3/min
- ft^3/h
- ft^3/d
- gal/s (us)
- gal/min (us)
- gal/h (us)
- gal/d (us)
- bbl/s (us;oil)
- bbl/min (us;oil)
- bbl/h (us;oil)
- bbl/d (us;oil)
- Sft^3/min
- Sft^3/h
- Sft^3/d

Imperial units
- gal (imp)
- gal/s (imp)
- gal/min (imp)
- gal/h (imp)

Custom-specific units
Free text

Free text

Navigation Guidance → Commissioning → Meas. adjust. → Free text

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

Temperature unit

Navigation Guidance → Commissioning → Meas. adjust. → Temperature unit

Description Use this function to select the unit for the temperature.

Selection

SI units
- ℃
- K

US units
℉

Factory setting

Country-specific:
- ℃
- ℉

Additional information

Selection

"Measurement adjustments" wizard

Navigation Guidance → Commissioning → Meas. adjust.

Zero adjustment

Navigation

Guidance → Commissioning → Meas. adjust. → Zero adjustment

Description

Due to the mounting position of the measuring instrument, a pressure shift may occur. The pressure shift can be corrected with the zero adjustment.

Selection

- No
- Confirm

Pressure

Navigation Guidance → Commissioning → Meas. adjust. → Pressure

"Output settings" wizard

Navigation Guidance → Commissioning → Output settings

Output current transfer function

Navigation Guidance → Commissioning → Output settings → Curr. trans.func

Description

Linear
The linear pressure signal is used for the current output. The flow must be calculated in the evaluation unit.

Square root - differential pressure only
The root flow signal is used for the current output. The 'Flow (square root)' current signal is indicated on the on-site display with a root symbol.

User interface

- Linear
- Square root *

Low flow cut off

Navigation Guidance → Commissioning → Output settings → Low flow cut off

Description When activated, this function suppresses small flows which can lead to large fluctuations in the measured value.

User entry 0.0 to 50.0 %

* Visibility depends on order options or device settings

"Output settings" wizard

Navigation Guidance → Commissioning → Output settings

Scaled variable transfer function

Navigation Guidance → Commissioning → Output settings → Scaled function

Description

"Linear'
The linear pressure signal is used for the output signal. The flow must be calculated in the evaluation unit.

"Square root" (Deltabar)
The root flow signal is used for the output signal. The "Flow (square root)' output signal is indicated on the on-site display with a root symbol.

'Table'
The output is defined according to the scaled variable / pressure table entered.

Selection

- Linear
- Square root *
- Table

Low flow cut off

Navigation Guidance → Commissioning → Output settings → Low flow cut off

Description When activated, this function suppresses small flows which can lead to large fluctuations in the measured value.

User entry 0.0 to 50.0 %

"Output settings" wizard

Navigation Guidance → Commissioning → Output settings

Lower Range Limit

Navigation Guidance → Commissioning → Output settings → LRL

Description Indicates the lower measuring limit of the sensor.

* Visibility depends on order options or device settings

User interface Signed floating-point number

Upper Range Limit

Navigation Guidance → Commissioning → Output settings → URL

Description Indicates the upper measuring limit of the sensor.

User interface Signed floating-point number

Minimum span

Navigation Guidance → Commissioning → Output settings → Minimum span

Description Specifies the smallest possible measuring span of the sensor.

User interface Signed floating-point number

"Output settings" wizard

Navigation Guidance → Commissioning → Output settings

Pressure

Navigation Guidance → Commissioning → Output settings → Pressure

User entry Signed floating-point number

Scaled variable

Navigation Guidance → Commissioning → Output settings → Scaled variable

User entry Signed floating-point number

"Output settings" wizard

Navigation Guidance → Commissioning → Output settings

Lower range value output

Navigation Guidance → Commissioning → Output settings → 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).

User entry Signed floating-point number

Upper range value output

Navigation Guidance → Commissioning → Output settings → 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).

User entry Signed floating-point number

Lower Range Limit

Navigation Guidance → Commissioning → Output settings → LRL

Description Indicates the lower measuring limit of the sensor.

User interface Signed floating-point number

Upper Range Limit

Navigation Guidance → Commissioning → Output settings → URL

Description Indicates the upper measuring limit of the sensor.

User interface Signed floating-point number

Minimum span

Navigation Guidance → Commissioning → Output settings → Minimum span

Description Specifies the smallest possible measuring span of the sensor.

User interface Signed floating-point number

"Output settings" wizard

Navigation Guidance → Commissioning → Output settings

Scaled variable transfer function

Navigation Guidance → Commissioning → Output settings → Scaled function

Description
"Linear'
The linear pressure signal is used for the output signal. The flow must be calculated in the evaluation unit.

"Square root" (Deltabar)
The root flow signal is used for the output signal. The "Flow (square root)' output signal is indicated on the on-site display with a root symbol.

"Table'
The output is defined according to the scaled variable / pressure table entered.

Selection
- Linear
- Square root *
- Table

Pressure value 1

Navigation Guidance → Commissioning → Output settings → Pressure 1

Description Enter pressure for the first scaling point. "Scaled variable value 1" will be allocated to this pressure.

User entry Signed floating-point number

* Visibility depends on order options or device settings

Scaled variable value 1

Navigation Guidance → Commissioning → Output settings → Scaled 1

Description Enter value for the first scaling point. This value is allocated to "Pressure value 1".

User interface Signed floating-point number

Pressure value 2

Navigation Guidance → Commissioning → Output settings → Pressure 2

Description Enter pressure for the second scaling point. "Scaled variable value 2" will be allocated to this pressure.

User entry Signed floating-point number

Scaled variable value 2

Navigation Guidance → Commissioning → Output settings → Scaled 2

Description Enter value for the second scaling point. This value is allocated to "Pressure value 2".

User entry Signed floating-point number

Lower Range Limit

Navigation Guidance → Commissioning → Output settings → LRL

Description Indicates the lower measuring limit of the sensor.

User interface Signed floating-point number

Upper Range Limit

Navigation Guidance → Commissioning → Output settings → URL

Description Indicates the upper measuring limit of the sensor.

User interface Signed floating-point number

Minimum span

Navigation Guidance → Commissioning → Output settings → Minimum span

Description Specifies the smallest possible measuring span of the sensor.

User interface Signed floating-point number

"Output settings" wizard

Navigation Guidance → Commissioning → Output settings

Lower range value output

Navigation Guidance → Commissioning → Output settings → 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).

User entry Signed floating-point number

Upper range value output

Navigation Guidance → Commissioning → Output settings → 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).

User entry Signed floating-point number

Current range output

Navigation Guidance → Commissioning → Output settings → 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)

Failure behavior current output

Navigation Guidance → Commissioning → Output settings → 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 Guidance → Commissioning → Output settings → Failure current

Description Enter current output value in alarm condition

User entry 21.5 to 23 mA

Loop current mode

Navigation Guidance → Commissioning → Output settings → Loop curr mode

Description If Loop current mode is disabled, Multi-drop communication mode is activated. Multi-drop is a HART digital communication mode where multiple devices may share the same pair of wires for power and communications.
In this mode the output current is fixed.

User interface
- Disable
- Enable

Assign HART variables?

Navigation Guidance → Commissioning → Output settings → Assign HART var?

Description Up to four HART variables can be transmitted via the HART protocol.

Select "Yes" to show/assign measuring variables to these HART variables.

Selection
- No
- Yes

"Output settings" wizard

Navigation Guidance → Commissioning → Output settings

Process variable output current

Navigation Guidance → Commissioning → Output settings → Proc.var.curr.

Description Determines which process variable is transmitted via the current output.

User interface
- Pressure
- Scaled variable

Current range output

Navigation Guidance → Commissioning → Output settings → 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 Guidance → Commissioning → Output settings → 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).

User entry Signed floating-point number

Upper range value output

Navigation Guidance → Commissioning → Output settings → 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).

User entry Signed floating-point number

Failure behavior current output

Navigation Guidance → Commissioning → Output settings → 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 Guidance → Commissioning → Output settings → Failure current

Description Enter current output value in alarm condition

User entry 21.5 to 23 mA

Loop current mode

Navigation Guidance → Commissioning → Output settings → Loop curr mode

Description If Loop current mode is disabled, Multi-drop communication mode is activated. Multi-drop is a HART digital communication mode where multiple devices may share the same pair of wires for power and communications.
In this mode the output current is fixed.

User interface
- Disable
- Enable

Assign HART variables?

Navigation Guidance → Commissioning → Output settings → Assign HART var?

Description Up to four HART variables can be transmitted via the HART protocol.
Select "Yes" to show/assign measuring variables to these HART variables.

Selection
- No
- Yes

"Output settings" wizard

Navigation Guidance → Commissioning → Output settings

Assign PV

Navigation Guidance → Commissioning → Output settings → Assign PV

Description Use this function to select a measured variable (HART device variable) for the primary dynamic variable (PV).

Selection
- Pressure
- Scaled variable

Assign SV

Navigation Guidance → Commissioning → Output settings → Assign SV

Description Use this function to select a measured variable (HART device variable) for the secondary dynamic variable (SV).

Selection
- Pressure
- Scaled variable
- Sensor temperature
- Sensor pressure
- Electronics temperature
- Terminal current *
- Terminal voltage *
- Median of pressure signal *
- Noise of pressure signal *
- Signal noise detected *

* Visibility depends on order options or device settings

- Percent of range
- Loop current
- Not used

Additional information *Selection*

- **Sensor pressure** option
  Sensor Pressure is the raw signal from sensor before damping and position adjustment.
- **Terminal current** option
  The terminal current is the read-back current on terminal block.
- **Signal noise detected** option
  0 % - Signal noise is within the permissible range.
  100 % - Signal noise is outside of the permissible range.
- **Loop current** option
  The loop current is the output current set by the applied pressure.

Assign TV

Navigation Guidance → Commissioning → Output settings → Assign TV

Description Use this function to select a measured variable (HART device variable) for the tertiary (third) dynamic variable (TV).

Selection

- Pressure
- Scaled variable
- Sensor temperature
- Sensor pressure
- Electronics temperature
- Terminal current *
- Terminal voltage *
- Median of pressure signal *
- Noise of pressure signal *
- Signal noise detected *
- Percent of range
- Loop current
- Not used

Additional information *Selection*

- **Sensor pressure** option
  Sensor Pressure is the raw signal from sensor before damping and position adjustment.
- **Terminal current** option
  The terminal current is the read-back current on terminal block.
- **Signal noise detected** option
  0 % - Signal noise is within the permissible range.
  100 % - Signal noise is outside of the permissible range.
- **Loop current** option
  The loop current is the output current set by the applied pressure.

* Visibility depends on order options or device settings

Assign QV

Navigation Guidance → Commissioning → Output settings → Assign QV

Description Use this function to select a measured variable (HART device variable) for the quaternary (fourth) dynamic variable (QV).

Selection
- Pressure
- Scaled variable
- Sensor temperature
- Sensor pressure
- Electronics temperature
- Terminal current *
- Terminal voltage *
- Median of pressure signal *
- Noise of pressure signal *
- Signal noise detected *
- Percent of range
- Loop current
- Not used

Additional information *Selection*
- **Sensor pressure** option
  Sensor Pressure is the raw signal from sensor before damping and position adjustment.
- **Terminal current** option
  The terminal current is the read-back current on terminal block.
- **Signal noise detected** option
  0 % - Signal noise is within the permissible range.
  100 % - Signal noise is outside of the permissible range.
- **Loop current** option
  The loop current is the output current set by the applied pressure.

* Visibility depends on order options or device settings

3.3 "Diagnostics" menu

Navigation Diagnostics

3.3.1 "Active diagnostics" submenu

Navigation Diagnostics → Active diagnos.

Active diagnostics

Navigation Diagnostics → Active diagnos. → Active diagnos.

Prerequisite A diagnostic event has occurred.

Description Displays the current diagnostic message. If two or more messages occur simultaneously, the message with the highest priority is shown on the display.

User interface Symbol for diagnostic behavior, diagnostic code and short message.

Additional information *User interface*

Additional pending diagnostic messages can be viewed in the **Diagnostic list** submenu.

Example

For the display format:
⊗F271 Main electronic failure

Timestamp

Navigation Diagnostics → Active diagnos. → Timestamp

Description Displays the operating time when the current diagnostic message occurred.

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

Additional information *User interface*

The diagnostic message can be viewed via the **Actual diagnostics** parameter (→ 45).

Example

For the display format:
24d12h13m00s

Previous diagnostics

Navigation Diagnostics → Active diagnos. → Prev.diagnostics

Prerequisite Two diagnostic events have already occurred.

Description Displays the diagnostic message that occurred before the current message.

User interface Symbol for diagnostic behavior, diagnostic code and short message.

Additional information *User interface*

Via the local display: the time stamp and corrective measures referring to the cause of the diagnostic message can be accessed via the E key.

Example

For the display format:
⊗F271 Main electronic failure

Timestamp

Navigation Diagnostics → Active diagnos. → Timestamp

Description Displays the operating time when the last diagnostic message before the current message occurred.

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

Additional information *User interface*

The diagnostic message can be viewed via the **Previous diagnostics** parameter (→ 46).

Example

For the display format:
24d12h13m00s

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.

Additional information Maximum time: 9 999 d (≈ 27 years)

3.3.2 "Event logbook" submenu

Navigation Diagnostics → Event logbook

Filter options

Navigation Diagnostics → Event logbook → Filter options

Description Use this function to select the category whose event messages are displayed in the event list of the operating tool.

Selection
- All
- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- Information (I)
- Not categorized

Additional information *Description*

The status signals are categorized in accordance with VDI/VDE 2650 and NAMUR Recommendation NE 107:
- F = Failure
- C = Function Check
- S = Out of Specification
- M = Maintenance Required

Clear event list

Navigation Diagnostics → Event logbook → Clear event list

Description Use this function to process the current values in the event logbook.

Selection
- Cancel
- Clear data

Additional information *Description*

Once this function has been executed, the events list is empty and all the events are deleted.

The events list can be exported using an operating tool (e.g. FieldCare.

3.3.3 "Minimum/maximum values" submenu

Navigation Diagnostics → Min/max val.

Pressure min

Navigation Diagnostics → Min/max val. → Pressure min

Description Minimum or maximum value measured by device.

User interface Signed floating-point number

Counter limit underruns sensor Pmin

Navigation Diagnostics → Min/max val. → Counter P < Pmin

Description Counts how many times the value underruns the sensor specific minimum values. Sensor specific minimum values are shown in Application/Sensor menu.

User interface 0 to 65 535

Counter underruns of user limit Pmin

Navigation Diagnostics → Min/max val. → Counter < P user

Description Counts how many times the value underruns the minimum values defined by the user. User defined minimum values are shown in Diagnostic/Diagnostic settings/Properties menu.

User interface 0 to 65 535

Minimum sensor temperature

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

Description Minimum or maximum value measured by device.
Users cannot reset this value.

User interface −273.15 to 9 726.85 °C

Counter limit underruns sensor Tmin

Navigation Diagnostics → Min/max val. → Counter T < Tmin

Description Counts how many times the value underruns/overruns the sensor specific minimum/maximum values.
Sensor specific minimum/maximum values are shown in Application/Sensor menu.

User interface 0 to 65 535

Counter underruns of user limit Tmin

Navigation Diagnostics → Min/max val. → Counter < T user

User interface 0 to 65 535

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

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

Reset user defined counters P and T

Navigation Diagnostics → Min/max val. → Reset count. P T

Selection
- Cancel
- Confirm

Pressure max

Navigation Diagnostics → Min/max val. → Pressure max

Description Minimum or maximum value measured by device.

User interface Signed floating-point number

Counter limit overruns sensor Pmax

Navigation Diagnostics → Min/max val. → Counter P > Pmax

Description Counts how many times the value overruns the sensor specific maximum values.
Sensor specific maximum values are shown in Application/Sensor menu.

User interface 0 to 65 535

Counter overruns of user limit Pmax

Navigation Diagnostics → Min/max val. → Counter > P user

Description Counts how many times the value overruns the maximum values defined by the user.
User defined maximum values are shown in Diagnostic/Diagnostic settings/Properties menu.

User interface 0 to 65 535

Maximum sensor temperature

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

Description Minimum or maximum value measured by device.
Users cannot reset this value.

User interface −273.15 to 9 726.85 °C

Counter limit overruns sensor Tmax

Navigation Diagnostics → Min/max val. → Counter T > Tmax

Description Counts how many times the value underruns/overruns the sensor specific minimum/ maximum values.
Sensor specific minimum/maximum values are shown in Application/Sensor menu.

User interface 0 to 65 535

Counter overruns of user limit Tmax

Navigation Diagnostics → Min/max val. → Counter > T user

User interface 0 to 65 535

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

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

3.3.4 "Simulation" submenu

Navigation Diagnostics → Simulation

Simulation

Navigation Diagnostics → Simulation → Simulation

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

Warning:
Output will reflect the simulated value or event.

Selection
- Off
- Current output
- Diagnostic event simulation
- Pressure

Value pressure simulation

Navigation Diagnostics → Simulation → Pressure

User entry Signed floating-point number

Value current output

Navigation Diagnostics → Simulation → Current output

Description Defines the value of the simulated output current.

User entry 3.59 to 23 mA

Diagnostic event simulation

Navigation Diagnostics → Simulation → Diagnostic event

Description Use this function to select a diagnostic event for the simulation process that is activated.

Selection
- Off
- Diagnostic event picklist (depends on the category selected)

Additional information *Description*

For the simulation, you can choose from the diagnostic events of the category selected in the **Diagnostic event category** parameter.

3.3.5 "Diagnostic settings" submenu

Navigation Diagnostics → Diag. settings

"Properties" submenu

Navigation Diagnostics → Diag. settings → Properties

SSD Out of range delay time

Navigation Diagnostics → Diag. settings → Properties → SSD Delay time

User entry 0 to 604 800 s

SSD Monitoring delay time

Navigation Diagnostics → Diag. settings → Properties → SSD Verz. Zeit

User entry 0 to 86 400 s

500 Process alert pressure

Navigation Diagnostics → Diag. settings → Properties → 500 Pressure

Description Define whether user-defined pressure limits should be set.
If "Off" is selected, no analysis will take place and no event message will be generated.

Selection
- Off
- On

Low alert value

Navigation Diagnostics → Diag. settings → Properties → Low alert value

Description Set range.
If this limit value is exceeded or undercut, a diagnostic event is generated. There is no hysteresis.

User entry Signed floating-point number

High alert value

Navigation Diagnostics → Diag. settings → Properties → High alert value

Description Set range.
If this limit value is exceeded or undercut, a diagnostic event is generated. There is no hysteresis.

User entry Signed floating-point number

501 Process alert scaled variable

Navigation Diagnostics → Diag. settings → Properties → 501 Scaled var.

Description Define whether user-defined limits should be set.
If "Off" is selected, no analysis will take place and no event message will be generated.

Selection
- Off
- On

Low alert value

Navigation Diagnostics → Diag. settings → Properties → Low alert value

Description Set range.
If this limit value is exceeded or undercut, a diagnostic event is generated. There is no hysteresis.

User entry Signed floating-point number

High alert value

Navigation Diagnostics → Diag. settings → Properties → High alert value

Description Set range.
If this limit value is exceeded or undercut, a diagnostic event is generated. There is no hysteresis.

User entry Signed floating-point number

User temperature process alert

Navigation Diagnostics → Diag. settings → Properties → UserTemp alert

Description Define whether the user-defined sensor temperature limits should be set. If "Off" no analysis and therefore no event message will take place.

Selection
- Off
- On

Low alert value

Navigation Diagnostics → Diag. settings → Properties → Low alert value

Description Set range.
If this limit value is exceeded or undercut, a diagnostic event is generated. There is no hysteresis.

User entry −50 to 150 °C

High alert value

Navigation Diagnostics → Diag. settings → Properties → High alert value

Description Set range.
If this limit value is exceeded or undercut, a diagnostic event is generated. There is no hysteresis.

User entry −50 to 150 °C

806 Diagnostic behavior

Navigation Diagnostics → Diag. settings → Properties → 806 Diag. behav.

Description Select event behavior

"Logbook entry only": no digital or analog transmission of the message.

"Warning": Current output unchanged. Message is output digitally (default).

If the permissible conditions are reached again, the warning is no longer available in the instrument.

Selection
- Warning
- Logbook entry only

806 Event category

Navigation Diagnostics → Diag. settings → Properties → 806Event category

Description Select category for diagnostic message.

Selection
- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

806 Event delay

Navigation Diagnostics → Diag. settings → Properties → 806 Event delay

Description Displays how long the triggering status must be present until an event message is issued. Used to filter out short-term signal interference.

User entry 0 to 60 s

"Configuration" submenu

Navigation Diagnostics → Diag. settings → Configuration → Configuration

500 Diagnostic behavior

Navigation Diagnostics → Diag. settings → Configuration → Configuration → 500 Diag. behav.

Description Select event behavior

"Logbook entry only":
no digital or analog transmission of the message

"Warning": Current output unchanged. Message is output digitally (default).

"Alarm": Current output assumes the set alarm current.

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

500 Event category

Navigation Diagnostics → Diag. settings → Configuration → Configuration → 500Event category

Selection
- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

501 Diagnostic behavior

Navigation Diagnostics → Diag. settings → Configuration → Configuration → 501 Diag. behav.

Description Select event behavior

"Logbook entry only":
no digital or analog transmission of the message

"Warning": Current output unchanged. Message is output digitally (default).

"Alarm": Current output assumes the set alarm current.

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

501 Event category

Navigation Diagnostics → Diag. settings → Configuration → Configuration → 501Event category

Selection
- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

502 Diagnostic behavior

Navigation Diagnostics → Diag. settings → Configuration → Configuration → 502 Diag. behav.

Description

Select event behavior

"Logbook entry only":
no digital or analog transmission of the message

"Warning": Current output unchanged. Message is output digitally (default).

"Alarm": Current output assumes the set alarm current.

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

502 Event category

Navigation Diagnostics → Diag. settings → Configuration → Configuration → 502Event category

Selection
- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

"Process" submenu

Navigation Diagnostics → Diag. settings → Configuration → Process

806 Diagnostic behavior

Navigation Diagnostics → Diag. settings → Configuration → Process → 806 Diag. behav.

Description Select event behavior

"Logbook entry only": no digital or analog transmission of the message.

"Warning": Current output unchanged. Message is output digitally (default).

If the permissible conditions are reached again, the warning is no longer available in the instrument.

Selection
- Warning
- Logbook entry only

806 Event category

Navigation Diagnostics → Diag. settings → Configuration → Process → 806Event category

Description Select category for diagnostic message.

Selection
- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

822 Diagnostic behavior

Navigation Diagnostics → Diag. settings → Configuration → Process → 822 Diag. behav.

User interface
- Alarm
- Warning
- Logbook entry only

822 Event category

Navigation Diagnostics → Diag. settings → Configuration → Process → 822 Event category

Selection
- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

Sensor pressure range behavior

Navigation Diagnostics → Diag. settings → Configuration → Process → P-range behavior

Description

Select event behavior

"Alarm":
Current output adopts the set alarm current.

"Warning":
Current output unchanged. Message is displayed digitally (factory setting).

"Logbook entry only":
No digital or analog forwarding of the message.

"Special":
– Lower sensor limit undercut: Current output < 3.6 mA.
– Upper sensor limit exceeded: Current output 21 to 23 mA, depending on the setting.

Regardless of the setting, the message appears on the display. If the permissible conditions are reached again, the warning message disappears.

Selection
- Alarm
- Warning
- Logbook entry only
- Special

841 Event category

Navigation Diagnostics → Diag. settings → Configuration → Process → 841 Event category

Selection
- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

900 Event category

Navigation Diagnostics → Diag. settings → Configuration → Process → 900Event category

Description Select category for diagnostic message.

Selection
- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

900 Diagnostic behavior

Navigation Diagnostics → Diag. settings → Configuration → Process → 900 Diag. behav.

Description Select event behavior

"Logbook entry only": no digital or analog transmission of the message.

"Warning": Current output unchanged. Message is output digitally (default).

If the permissible conditions are reached again, the warning is no longer available in the instrument.

Selection
- Warning
- Logbook entry only

906 Diagnostic behavior

Navigation Diagnostics → Diag. settings → Configuration → Process → 906 Diag. behav.

Description Select event behavior

"Logbook entry only": no digital or analog transmission of the message.

"Warning": Current output unchanged. Message is output digitally (default).

If the permissible conditions are reached again, the warning is no longer available in the instrument.

Selection
- Off
- Warning
- Logbook entry only

906 Event category

Navigation Diagnostics → Diag. settings → Configuration → Process → 906Event category

Description Select category for diagnostic message.

Selection
- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

"Process" submenu

Navigation Diagnostics → Diag. settings → Configuration → Process

806 Diagnostic behavior

Navigation Diagnostics → Diag. settings → Configuration → Process → 806 Diag. behav.

Description Select event behavior

"Logbook entry only": no digital or analog transmission of the message.

"Warning": Current output unchanged. Message is output digitally (default).

If the permissible conditions are reached again, the warning is no longer available in the instrument.

Selection
- Warning
- Logbook entry only

806 Event category

Navigation Diagnostics → Diag. settings → Configuration → Process → 806Event category

Description Select category for diagnostic message.

Selection
- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

822 Diagnostic behavior

Navigation Diagnostics → Diag. settings → Configuration → Process → 822 Diag. behav.

User interface
- Alarm
- Warning
- Logbook entry only

822 Event category

Navigation Diagnostics → Diag. settings → Configuration → Process → 822 Event category

Selection
- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

Sensor pressure range behavior

Navigation Diagnostics → Diag. settings → Configuration → Process → P-range behavior

Description

Select event behavior

"Alarm":
Current output adopts the set alarm current.

"Warning":
Current output unchanged. Message is displayed digitally (factory setting).

"Logbook entry only":
No digital or analog forwarding of the message.

"Special":
– Lower sensor limit undercut: Current output < 3.6 mA.
– Upper sensor limit exceeded: Current output 21 to 23 mA, depending on the setting.

Regardless of the setting, the message appears on the display. If the permissible conditions are reached again, the warning message disappears.

Selection
- Alarm
- Warning
- Logbook entry only
- Special

841 Event category

Navigation Diagnostics → Diag. settings → Configuration → Process → 841 Event category

Selection
- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

900 Event category

Navigation Diagnostics → Diag. settings → Configuration → Process → 900Event category

Description Select category for diagnostic message.

Selection
- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

900 Diagnostic behavior

Navigation Diagnostics → Diag. settings → Configuration → Process → 900 Diag. behav.

Description Select event behavior

"Logbook entry only": no digital or analog transmission of the message.

"Warning": Current output unchanged. Message is output digitally (default).

If the permissible conditions are reached again, the warning is no longer available in the instrument.

Selection
- Warning
- Logbook entry only

906 Diagnostic behavior

Navigation Diagnostics → Diag. settings → Configuration → Process → 906 Diag. behav.

Description Select event behavior

"Logbook entry only": no digital or analog transmission of the message.

"Warning": Current output unchanged. Message is output digitally (default).

If the permissible conditions are reached again, the warning is no longer available in the instrument.

Selection
- Off
- Warning
- Logbook entry only

906 Event category

Navigation Diagnostics → Diag. settings → Configuration → Process → 906Event category

Description Select category for diagnostic message.

Selection

- Failure (F)
- Function check (C)
- Out of specification (S)
- Maintenance required (M)
- No effect (N)

3.4 "Application" menu

Navigation Application

3.4.1 "Measuring units" submenu

Navigation Application → Measuring units

Pressure unit

Navigation Application → Measuring units → Pressure unit

Selection

SI units	*US units*	*Other units*
▪ MPa	psi	▪ inH2O
▪ kPa		▪ inH2O (4°C)
▪ Pa		▪ mmH2O
▪ bar		▪ mmH2O (4°C)
▪ mbar		▪ mH2O
▪ torr		▪ mH2O (4°C)
▪ atm		▪ ftH2O
▪ kgf/cm²		▪ inHg
▪ gf/cm²		▪ mmHg

Decimal places pressure

Navigation Application → Measuring units → Decimal pressure

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

Selection

- Automatic
  The decimal place is configured automatically.
  Example: Unit mbar: one decimal place. Unit bar: four decimal places
- x
- x.x
- x.xx
- x.xxx
- x.xxxx

Temperature unit

Navigation Application → Measuring units → Temperature unit

Description Use this function to select the unit for the temperature.

Selection	*SI units* ▪ °C ▪ K	*US units* °F
Factory setting	Country-specific: ▪ °C ▪ °F	
Additional information	*Selection*	

Scaled variable unit

Navigation Application → Measuring units → Scaled Unit

Description Use "Free text", first selection, if the desired unit is not available in the selection list. It is possible to define a customer specific unit with another parameter.

Selection

SI units
- %
- mm
- cm
- m
- l
- hl
- m^3
- g
- kg
- t
- g/s
- kg/s
- kg/min
- kg/h
- t/min
- t/h
- t/d
- m^3/s
- m^3/min
- m^3/h
- m^3/d
- l/s
- l/min
- l/h
- Nm^3/h
- Nl/h
- Sm^3/s
- Sm^3/min
- Sm^3/h
- Sm^3/d
- Nm^3/s
- g/cm^3
- kg/m^3
- Nm^3/min
- Nm^3/d

US units
- ft
- in
- ft^3
- gal (us)
- bbl (us;oil)
- oz
- lb
- STon
- lb/s
- lb/min
- lb/h
- STon/min
- STon/h
- STon/d
- ft^3/s
- ft^3/min
- ft^3/h
- ft^3/d
- gal/s (us)
- gal/min (us)
- gal/h (us)
- gal/d (us)
- bbl/s (us;oil)
- bbl/min (us;oil)
- bbl/h (us;oil)
- bbl/d (us;oil)
- Sft^3/min
- Sft^3/h
- Sft^3/d

Imperial units
- gal (imp)
- gal/s (imp)
- gal/min (imp)
- gal/h (imp)

Custom-specific units
Free text

Free text

Navigation Application → Measuring units → Free text

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

Decimal places scaled variable

Navigation Application → Measuring units → Decimal scaled

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

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

3.4.2 "Measured values" submenu

Navigation Application → Measured values

Sensor pressure

Navigation Application → Measured values → Sensor pressure

User interface Signed floating-point number

Pressure

Navigation Application → Measured values → Pressure

Scaled variable

Navigation Application → Measured values → Scaled variable

User interface Signed floating-point number

Sensor temperature

Navigation Application → Measured values → Sensor temp.

User interface –273.15 to 9 726.85 °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

Terminal current

Navigation Application → Measured values → Terminal curr.

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

User interface 0 to 30 mA

Electronics temperature

Navigation Application → Measured values → Electronics temp

Description Displays the current temperature of the main electronics.

User interface Signed floating-point number

3.4.3 "Sensor" submenu

Navigation Application → Sensor

"Basic settings" submenu

Navigation Application → Sensor → Basic settings

Output current transfer function

Navigation Application → Sensor → Basic settings → Curr. trans.func

Description Linear
The linear pressure signal is used for the current output. The flow must be calculated in the evaluation unit.

Square root - differential pressure only
The root flow signal is used for the current output. The 'Flow (square root)' current signal is indicated on the on-site display with a root symbol.

User interface
- Linear
- Square root *

Damping

Navigation Application → Sensor → Basic settings → Damping

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 to 999.0 s

HP/LP swap

Navigation Application → Sensor → Basic settings → HP/LP swap

Description With this parameter the high and low pressure side of the differential pressure transmitter can be interchanged.

Selection
- No
- Yes

Low flow cut off

Navigation Application → Sensor → Basic settings → Low flow cut off

Description When activated, this function suppresses small flows which can lead to large fluctuations in the measured value.

User entry 0.0 to 50.0 %

* Visibility depends on order options or device settings

"Sensor calibration" submenu

Navigation Application → Sensor → Sensor cal.

Zero adjustment

Navigation Application → Sensor → Sensor cal. → Zero adjustment

Description Due to the mounting position of the measuring instrument, a pressure shift may occur. The pressure shift can be corrected with the zero adjustment.

Selection
- No
- Confirm

Calibration offset

Navigation Application → Sensor → Sensor cal. → Calibr offset

Prerequisite Absolute pressure sensor

Description Enter the value by which the measured value should be corrected, e.g., a position adjustment for absolute pressure sensors.

User entry Signed floating-point number

Zero adjustment offset

Navigation Application → Sensor → Sensor cal. → Zero offset

User entry Signed floating-point number

Sensor Trim Reset

Navigation Application → Sensor → Sensor cal. → Sen. Trim Reset

Selection
- No
- Confirm

Lower sensor trim measured value

Navigation Application → Sensor → Sensor cal. → LowerTrimMeasVal

User interface Signed floating-point number

Lower sensor trim

Navigation Application → Sensor → Sensor cal. → LowerSensor trim

Description These two parameters allow a recalibration of the sensor, i.e., if you want to fit the sensor to the measuring range. The highest accuracy is obtained when the value for the "Lower sensor trim" is as close as possible to "LRV" (lower range value) and the value for "Upper sensor trim" as close as possible to "URV" (upper range value).

There must be a known reference pressure when setting a new lower or upper sensor characteristic curve value. The more accurate the reference pressure is during recalibration, the higher the accuracy of the pressure transmitter later. A new value is assigned to the applied pressure using "Lower sensor trim" and "Upper sensor trim" parameters.

Note:

The value entered can be at maximum "Sensor pressure" +/- 10 % of the permitted maximum pressure (URL).

Proceed as follows:
- Apply reference pressure for lower range value ("LRV")
- Enter the measured reference pressure at "Lower sensor trim" and confirm
- Apply reference pressure for upper range value ("URV")
- Enter the measured reference pressure at "Upper sensor trim" and confirm
- The sensor is now calibrated

User entry Signed floating-point number

Upper sensor trim measured value

Navigation Application → Sensor → Sensor cal. → UpperTrimMeasVal

User interface Signed floating-point number

Upper sensor trim

Navigation Application → Sensor → Sensor cal. → UpperSensor trim

Description These two parameters allow a recalibration of the sensor, i.e., if you want to fit the sensor to the measuring range. The highest accuracy is obtained when the value for the "Lower sensor trim" is as close as possible to "LRV" (lower range value) and the value for "Upper sensor trim" as close as possible to "URV" (upper range value).

There must be a known reference pressure when setting a new lower or upper sensor characteristic curve value. The more accurate the reference pressure is during recalibration, the higher the accuracy of the pressure transmitter later. A new value is assigned to the applied pressure using "Lower sensor trim" and "Upper sensor trim" parameters.

Note:

The value entered can be at maximum "Sensor pressure" +/- 10 % of the permitted maximum pressure (URL).

Proceed as follows:
- Apply reference pressure for lower range value ("LRV")
- Enter the measured reference pressure at "Lower sensor trim" and confirm
- Apply reference pressure for upper range value ("URV")
- Enter the measured reference pressure at "Upper sensor trim" and confirm
- The sensor is now calibrated

User entry Signed floating-point number

"Sensor limits" submenu

Navigation Application → Sensor → Sensor limits

Lower Range Limit

Navigation Application → Sensor → Sensor limits → LRL

Description Indicates the lower measuring limit of the sensor.

User interface Signed floating-point number

Upper Range Limit

Navigation Application → Sensor → Sensor limits → URL

Description Indicates the upper measuring limit of the sensor.

User interface Signed floating-point number

Minimum span

Navigation Application → Sensor → Sensor limits → Minimum span

Description Specifies the smallest possible measuring span of the sensor.

User interface Signed floating-point number

Sensor temperature lower range limit

Navigation Application → Sensor → Sensor limits → Sens.temp.lo.lim

User interface −273.15 to 9 726.85 °C

Sensor temperature upper range limit

Navigation Application → Sensor → Sensor limits → Sens.temp.up.lim

User interface −273.15 to 9 726.85 °C

"Scaled variable" submenu

Navigation Application → Sensor → Scaled variable

Assign PV

Navigation Application → Sensor → Scaled variable → Assign PV

Description Use this function to select a measured variable (HART device variable) for the primary dynamic variable (PV).

Selection
- Pressure
- Scaled variable

Scaled variable unit

Navigation Application → Sensor → Scaled variable → Scaled Unit

Description Use "Free text", first selection, if the desired unit is not available in the selection list. It is possible to define a customer specific unit with another parameter.

Selection

SI units
- %
- mm
- cm
- m
- l
- hl
- m^3
- g
- kg
- t
- g/s
- kg/s
- kg/min
- kg/h
- t/min
- t/h
- t/d
- m^3/s
- m^3/min
- m^3/h
- m^3/d
- l/s
- l/min
- l/h
- Nm^3/h
- Nl/h
- Sm^3/s
- Sm^3/min
- Sm^3/h
- Sm^3/d
- Nm^3/s
- g/cm^3
- kg/m^3
- Nm^3/min
- Nm^3/d

US units
- ft
- in
- ft^3
- gal (us)
- bbl (us;oil)
- oz
- lb
- STon
- lb/s
- lb/min
- lb/h
- STon/min
- STon/h
- STon/d
- ft^3/s
- ft^3/min
- ft^3/h
- ft^3/d
- gal/s (us)
- gal/min (us)
- gal/h (us)
- gal/d (us)
- bbl/s (us;oil)
- bbl/min (us;oil)
- bbl/h (us;oil)
- bbl/d (us;oil)
- Sft^3/min
- Sft^3/h
- Sft^3/d

Imperial units
- gal (imp)
- gal/s (imp)
- gal/min (imp)
- gal/h (imp)

Custom-specific units
Free text

Free text

Navigation Application → Sensor → Scaled variable → Free text

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

Pressure

Navigation Application → Sensor → Scaled variable → Pressure

Scaled variable transfer function

Navigation Application → Sensor → Scaled variable → Scaled function

Description

"Linear'
The linear pressure signal is used for the output signal. The flow must be calculated in the evaluation unit.

"Square root" (Deltabar)
The root flow signal is used for the output signal. The "Flow (square root)'
output signal is indicated on the on-site display with a root symbol.

"Table'
The output is defined according to the scaled variable / pressure table entered.

Selection

- Linear
- Square root *
- Table

Lower range value output

Navigation Application → Sensor → Scaled variable → 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).

User entry Signed floating-point number

Upper range value output

Navigation Application → Sensor → Scaled variable → 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).

User entry Signed floating-point number

* Visibility depends on order options or device settings

Activate table

Navigation Application → Sensor → Scaled variable → Activate table

Selection
- Disable
- Enable

Pressure value 1

Navigation Application → Sensor → Scaled variable → Pressure 1

Description Enter pressure for the first scaling point. "Scaled variable value 1" will be allocated to this pressure.

User entry Signed floating-point number

Scaled variable value 1

Navigation Application → Sensor → Scaled variable → Scaled 1

Description Enter value for the first scaling point. This value is allocated to "Pressure value 1".

User interface Signed floating-point number

Pressure value 2

Navigation Application → Sensor → Scaled variable → Pressure 2

Description Enter pressure for the second scaling point. "Scaled variable value 2" will be allocated to this pressure.

User entry Signed floating-point number

Scaled variable value 2

Navigation Application → Sensor → Scaled variable → Scaled 2

Description Enter value for the second scaling point. This value is allocated to "Pressure value 2".

User entry Signed floating-point number

Low flow cut off

Navigation Application → Sensor → Scaled variable → Low flow cut off

Description When activated, this function suppresses small flows which can lead to large fluctuations in the measured value.

User entry 0.0 to 50.0 %

Pressure

Navigation Application → Sensor → Scaled variable → Pressure

User entry Signed floating-point number

Scaled variable

Navigation Application → Sensor → Scaled variable → Scaled variable

User entry Signed floating-point number

"Wet calibration" submenu

Navigation Application → Sensor → Wet calibration

Zero

Navigation Application → Sensor → Wet calibration → Zero

Selection
- No
- Confirm

Pressure value 1

Navigation Application → Sensor → Wet calibration → Pressure 1

Description Enter pressure for the first scaling point. "Scaled variable value 1" will be allocated to this pressure.

User entry Signed floating-point number

Span

Navigation Application → Sensor → Wet calibration → Span

Selection
- No
- Confirm

Pressure value 2

Navigation Application → Sensor → Wet calibration → Pressure 2

Description Enter pressure for the second scaling point. "Scaled variable value 2" will be allocated to this pressure.

User entry Signed floating-point number

Lower range value output

Navigation Application → Sensor → Wet calibration → 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).

User entry Signed floating-point number

Upper range value output

Navigation Application → Sensor → Wet calibration → 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).

User entry Signed floating-point number

"Wet calibration" submenu

Navigation Application → Sensor → Wet calibration

Zero

Navigation Application → Sensor → Wet calibration → Zero

Selection
- No
- Confirm

Pressure value 1

Navigation Application → Sensor → Wet calibration → Pressure 1

Description Enter pressure for the first scaling point. "Scaled variable value 1" will be allocated to this pressure.

User entry Signed floating-point number

Span

Navigation Application → Sensor → Wet calibration → Span

Selection
- No
- Confirm

Pressure value 2

Navigation Application → Sensor → Wet calibration → Pressure 2

Description Enter pressure for the second scaling point. "Scaled variable value 2" will be allocated to this pressure.

User entry Signed floating-point number

Lower range value output

Navigation Application → Sensor → Wet calibration → 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).

User entry Signed floating-point number

Upper range value output

Navigation Application → Sensor → Wet calibration → 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).

User entry Signed floating-point number

3.4.4 "Current output" submenu

Navigation Application → Curr.output

Assign PV

Navigation Application → Curr.output → Assign PV

Description Use this function to select a measured variable (HART device variable) for the primary dynamic variable (PV).

Selection
- Pressure
- Scaled variable

Measuring mode current output

Navigation Application → Curr.output → Output mode

Description Select curve of current output.

Selection
- Standard
- Inverse
- Bi-directional

Current range output

Navigation 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 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).

User entry Signed floating-point number

Upper range value output

Navigation 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).

User entry Signed floating-point number

Failure behavior current output

Navigation 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 Application → Curr.output → Failure current

Description Enter current output value in alarm condition

User entry 21.5 to 23 mA

Output current

Navigation 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 Application → Curr.output → Terminal curr.

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

User interface 0 to 30 mA

4 mA trim value

Navigation Application → Curr.output → 4 mA trim value

Description Enter the trim value for the 4 mA current output.

Note:
Simulation must be active.

User entry 3 to 5 mA

20 mA trim value

Navigation Application → Curr.output → 20 mA trim value

Description Enter the trim value for the 20 mA current output.

Note:
Simulation must be active.

User entry 18 to 22 mA

3.4.5 "HART output" submenu

Navigation Application → HART output

"Configuration" submenu

Navigation Application → HART output → Configuration

HART address

Navigation Application → HART output → Configuration → HART address

Description Define the HART address of the device.

User entry 0 to 63

Additional information
- The measured value can only be transmitted via the current value if the address is set to "0". The current is fixed at 4.0 mA for all other addresses (Multidrop mode).
- Only addresses in the range 0 to 15 are permitted for a system according to HART 5.0.
- All addresses in the range 0 to 63 are permitted for a system with HART 6.0 and higher.

HART short tag

Navigation Application → HART output → Configuration → HART short tag

Description Defines the short tag for the measuring point.

Maximum length: 8 characters
Allowed characters: A-Z, 0-9, certain special characters

User entry Max. 8 characters: A to Z, 0 to 9 and certain special characters (e.g. punctuation marks, @, %).

Device tag

Navigation Application → HART output → 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)

No. of preambles

Navigation Application → HART output → Configuration → No. of preambles

Description Defines the number of preambles in the HART telegram

User entry 5 to 20

Loop current mode

Navigation Application → HART output → Configuration → Loop curr mode

Description If Loop current mode is disabled, Multi-drop communication mode is activated. Multi-drop is a HART digital communication mode where multiple devices may share the same pair of wires for power and communications.
In this mode the output current is fixed.

Selection
- Disable
- Enable

"HART output" submenu

Navigation Application → HART output → HART output

Assign PV

Navigation Application → HART output → HART output → Assign PV

Description Use this function to select a measured variable (HART device variable) for the primary dynamic variable (PV).

Selection
- Pressure
- Scaled variable

Primary variable (PV)

Navigation Application → HART output → HART output → Primary var (PV)

Description Shows the first HART value (PV).

Additional information

Assign SV

Navigation Application → HART output → HART output → Assign SV

Description Use this function to select a measured variable (HART device variable) for the secondary dynamic variable (SV).

Selection
- Pressure
- Scaled variable
- Sensor temperature
- Sensor pressure
- Electronics temperature
- Terminal current *
- Terminal voltage *
- Median of pressure signal *
- Noise of pressure signal *
- Signal noise detected *
- Percent of range
- Loop current
- Not used

Additional information *Selection*
- **Sensor pressure** option
  Sensor Pressure is the raw signal from sensor before damping and position adjustment.
- **Terminal current** option
  The terminal current is the read-back current on terminal block.
- **Signal noise detected** option
  0 % - Signal noise is within the permissible range.
  100 % - Signal noise is outside of the permissible range.
- **Loop current** option
  The loop current is the output current set by the applied pressure.

Secondary variable (SV)

Navigation Application → HART output → HART output → Second.var(SV)

Description Shows the second HART value (SV).

* Visibility depends on order options or device settings

Assign TV

Navigation Application → HART output → HART output → Assign TV

Description Use this function to select a measured variable (HART device variable) for the tertiary (third) dynamic variable (TV).

Selection
- Pressure
- Scaled variable
- Sensor temperature
- Sensor pressure
- Electronics temperature
- Terminal current *
- Terminal voltage *
- Median of pressure signal *
- Noise of pressure signal *
- Signal noise detected *
- Percent of range
- Loop current
- Not used

Additional information *Selection*
- **Sensor pressure** option
  Sensor Pressure is the raw signal from sensor before damping and position adjustment.
- **Terminal current** option
  The terminal current is the read-back current on terminal block.
- **Signal noise detected** option
  0 % - Signal noise is within the permissible range.
  100 % - Signal noise is outside of the permissible range.
- **Loop current** option
  The loop current is the output current set by the applied pressure.

Tertiary variable (TV)

Navigation Application → HART output → HART output → Tertiary var(TV)

Description Shows the third HART value (TV).

Assign QV

Navigation Application → HART output → HART output → Assign QV

Description Use this function to select a measured variable (HART device variable) for the quaternary (fourth) dynamic variable (QV).

* Visibility depends on order options or device settings

Selection

- Pressure
- Scaled variable
- Sensor temperature
- Sensor pressure
- Electronics temperature
- Terminal current *
- Terminal voltage *
- Median of pressure signal *
- Noise of pressure signal *
- Signal noise detected *
- Percent of range
- Loop current
- Not used

Additional information

Selection

- **Sensor pressure** option
  Sensor Pressure is the raw signal from sensor before damping and position adjustment.
- **Terminal current** option
  The terminal current is the read-back current on terminal block.
- **Signal noise detected** option
  0 % - Signal noise is within the permissible range.
  100 % - Signal noise is outside of the permissible range.
- **Loop current** option
  The loop current is the output current set by the applied pressure.

Quaternary variable (QV)

Navigation Application → HART output → HART output → Quaterna.var(QV)

Description Shows the fourth value (QV).

"Burst configuration 1" submenu

Navigation Application → HART output → Burst config. 1

Burst mode 1

Navigation Application → HART output → Burst config. 1 → Burst mode 1

Description Use this function to select whether to activate the HART burst mode for burst message X.

* Visibility depends on order options or device settings

Selection

- Off
  The measuring device transmits data only when requested by the HART master.
- On
  The measuring device transmits data regularly without being requested.

Additional information

Selection

- Off
  The measuring device transmits data only when requested by the HART master.
- On
  The measuring device transmits data regularly without being requested.

Burst command 1

Navigation

Application → HART output → Burst config. 1 → Burst command 1

Description

Use this function to select the HART command that is sent to the HART master.

Selection

- Primary variable (PV)
- Loop Current and Percent of Range
- Dynamic Variables
- Device variables with status
- Device variables
- Additional device status

Additional information

Selection

- Command 1
  Read out the primary variable.
- Command 2
  Read out the current and the main measured value as a percentage.
- Command 3
  Read out the dynamic HART variables and the current.
- Command 9
  Read out the dynamic HART variables including the related status.
- Command 33
  Read out the dynamic HART variables including the related unit.
- Command 48
  Read out the complete device diagnostics.

"Command 33" option

The HART device variables are defined via Command 107.

Commands

- Information about the defined details of the command: HART specifications
- The measured variables (HART device variables) are assigned to the dynamic variables in the **Output** submenu.

Burst variable 0

Navigation Application → HART output → Burst config. 1 → Burst variable 0

Description For HART command 9 and 33: select the HART device variable or the process variable.

Selection
- Pressure
- Scaled variable
- Sensor temperature
- Sensor pressure
- Electronics temperature
- Measured current *
- Terminal voltage 1 *
- Median of pressure signal *
- Noise of pressure signal *
- Signal noise detected *
- Percent of range
- Measured current
- Primary variable (PV)
- Secondary variable (SV)
- Tertiary variable (TV)
- Quaternary variable (QV)
- Not used

Additional information *Selection*

If a burst message is not configured, the **Not used** option is set.

Burst variable 1

Navigation Application → HART output → Burst config. 1 → Burst variable 1

Description For HART command 9 and 33: select the HART device variable or the process variable.

Selection Please refer to the **Burst variable 0** parameter (→ 91).

Burst variable 2

Navigation Application → HART output → Burst config. 1 → Burst variable 2

Description For HART command 9 and 33: select the HART device variable or the process variable.

Selection Please refer to the **Burst variable 0** parameter (→ 91).

* Visibility depends on order options or device settings

Burst variable 3

Navigation Application → HART output → Burst config. 1 → Burst variable 3

Description For HART command 9 and 33: select the HART device variable or the process variable.

Selection Please refer to the **Burst variable 0** parameter (→ 91).

Burst variable 4

Navigation Application → HART output → Burst config. 1 → Burst variable 4

Description For HART command 9: select the HART device variable or the process variable.

Selection Please refer to the **Burst variable 0** parameter (→ 91).

Burst variable 5

Navigation Application → HART output → Burst config. 1 → Burst variable 5

Description For HART command 9: select the HART device variable or the process variable.

Selection Please refer to the **Burst variable 0** parameter (→ 91).

Burst variable 6

Navigation Application → HART output → Burst config. 1 → Burst variable 6

Description For HART command 9: select the HART device variable or the process variable.

Selection Please refer to the **Burst variable 0** parameter (→ 91).

Burst variable 7

Navigation Application → HART output → Burst config. 1 → Burst variable 7

Description For HART command 9: select the HART device variable or the process variable.

Selection Please refer to the **Burst variable 0** parameter (→ 91).

Burst trigger mode

Navigation Application → HART output → Burst config. 1 → Trigger mode

Description Use this function to select the event that triggers burst message X.

Selection
- Continuous
- Window *
- Rising *
- Falling *
- On change

Additional information *Selection*
- Continuous
  The message is sent continuously, at least at intervals corresponding to the time frame specified in the **Burst min period** parameter (→ 93).
- Window
  The message is sent if the specified measured value has changed by the value in the **Burst trigger level** parameter (→ 93).
- Rising
  The message is sent if the specified measured value exceeds the value in the **Burst trigger level** parameter (→ 93).
- Falling
  The message is sent if the specified measured value drops below the value in the **Burst trigger level** parameter (→ 93).
- On change
  The message is sent if a measured value changes in the burst message.

Burst trigger level

Navigation Application → HART output → Burst config. 1 → Trigger level

Description Use this function to enter the burst trigger value.

User entry Signed floating-point number

Additional information *Description*

Together with the option selected in the **Burst trigger mode** parameter (→ 93) the burst trigger value determines the time of burst message X.

Min. update period

Navigation Application → HART output → Burst config. 1 → Min. upd. per.

Description Use this function to enter the minimum time span between two burst commands of burst message X.

* Visibility depends on order options or device settings

User entry Positive integer

Max. update period

Navigation Application → HART output → Burst config. 1 → Max. upd. per.

Description Use this function to enter the maximum time span between two burst commands of burst message X.

User entry Positive integer

"Information" submenu

Navigation Application → HART output → Information

Device ID

Navigation Application → HART output → Information → Device ID

Description Use this function to view the device ID for identifying the measuring device in a HART network.

User interface 6-digit hexadecimal number

Additional information *Description*

In addition to the device type and manufacturer ID, the device ID is part of the unique ID. Each HART device is uniquely identified by the unique device ID.

Device type

Navigation Application → HART output → Information → Device type

Description Displays the device type with which the measuring device is registered with the HART Communication Foundation.

User interface 2-digit hexadecimal number

Factory setting 0x54

Factory setting 0x5A

Additional information *Description*

The device type is specified by the manufacturer. It is needed to assign the appropriate device description file (DD) to the device.

Device revision

Navigation Application → HART output → Information → Device revision

Description Displays the device revision with which the device is registered with the HART Communication Foundation.

User interface 2-digit hexadecimal number

Additional information *Description*

The device revision is needed to assign the appropriate device description file (DD) to the device.

HART short tag

Navigation Application → HART output → Information → HART short tag

Description Defines the short tag for the measuring point.

Maximum length: 8 characters
Allowed characters: A-Z, 0-9, certain special characters

User entry Max. 8 characters: A to Z, 0 to 9 and certain special characters (e.g. punctuation marks, @, %).

HART revision

Navigation Application → HART output → Information → HART revision

Description Shows the HART revision of the device.

HART descriptor

Navigation Application → HART output → Information → HART descriptor

Description Description for the measuring point.

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

HART message

Navigation Application → HART output → Information → HART message

Description A HART message which is sent via the HART protocol when requested by the master.

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

HART date code

Navigation Application → HART output → Information → HART date code

Description Date of the last configuration change

User entry Character string comprising numbers, letters and special characters (10)

Additional information Date format: YYYY-MM-DD

Make sure you adhere to this format when entering the date. Otherwise errors may occur in individual HART commands.

3.5 "System" menu

Navigation System

3.5.1 "Device management" submenu

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)

Locking status

Navigation System → Device manag. → Locking status

Description Displays the active write protection.

User interface
- Hardware locked
- Safety locked
- Temporarily locked

Additional information *User interface*

If two or more types of write protection are active, the write protection with the highest priority is shown on the local display. In the operating tool all active types of write protection are displayed.

Detailed information on access authorization is provided in the "User roles and associated access authorization" and "Operating concept" sections of the Operations Instructions for the device.

Selection

Function scope of the "Locking status" parameter

Options	Description
None	The access status displayed in the **Access status display** parameter applies. Only appears on local display.
Hardware locked	The DIP switch for hardware locking is activated on the main electronics module. This prevents write access to the parameters (e.g. via the local display or operating tool).
Temporarily locked	Write access to the parameters is temporarily locked due to device-internal processing (e.g. data upload/download, reset). Once the internal processing has been completed, the parameters can be changed once again.

Configuration counter

Navigation 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

Reset device

Navigation System → Device manag. → Reset device

Description Use this function to choose whether to reset the device configuration - either entirely or in part - to a defined state.

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

Additional information *Selection*

Options	Description
Cancel	No action is executed and the user exits the parameter.
To factory defaults	Every parameter is reset to its factory setting.
To delivery settings	Every parameter for which a customer-specific default setting was ordered is reset to this customer-specific value. All other parameters are reset to the factory setting. This option is not visible if no customer-specific settings have been ordered.
Restart device	The restart resets every parameter whose data are in the volatile memory (RAM) to the factory setting (e.g. measured value data). The device configuration remains unchanged.

* Visibility depends on order options or device settings

3.5.2 "User management" submenu

Navigation System → User manag.

User role

Navigation System → User manag. → User role

Description Displays the access authorization to the parameters via the operating tool.

User interface
- Operator
- Maintenance
- Expert

Additional information *Description*

Access authorization can be modified via the **Enter access code** parameter.

If additional write protection is active, this restricts the current access authorization even further.

User interface

Detailed information on access authorization is provided in the "User roles and associated access authorization" and "Operating concept" sections of the Operations Instructions for the device.

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 Use this function to enter the user-specific release code to remove parameter write protection in the operating tool.

User entry 0 to 9 999

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

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)

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)

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)

3.5.3 "Display" submenu

Navigation System → Display

Language

Navigation System → Display → Language

Prerequisite A local display is provided.

Description Use this function to select the configured language on the local display.

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

Factory setting English (alternatively, the ordered language is preset in the device)

Format display

Navigation System → Display → Format display

Prerequisite A local display is provided.

Description Use this function to select how the measured value is shown on the local display.

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

Additional information

Description

The display format (size, bar graph etc.) and number of measured values displayed simultaneously (1 to 4) can be configured. This setting only applies to normal operation.

- The **Value 1 display** parameter (→ 102)...**Value 8 display** parameter **Value 4 display** parameter (→ 104) are used to specify which measured values are shown on the local display and in what order.
- If more measured values are specified than the display mode selected permits, then the values alternate on the device display. The display time until the next change is configured using the **Display interval** parameter.

Value 1 display

Navigation System → Display → Value 1 display

Prerequisite A local display is provided.

Description Use this function to select one of the measured values shown on the local display.

Selection
- Pressure
- Scaled variable
- Current output
- Sensor temperature
- Percent of range

Additional information

Description

If several measured values are displayed at once, the measured value selected here will be the first value to be displayed. The value is only displayed during normal operation.

The **Format display** parameter (→ 102) is used to specify how many measured values are displayed simultaneously and how.

Dependency

The unit of the displayed measured value is taken from the **System units** submenu.

Value 2 display

Navigation System → Display → Value 2 display

Prerequisite A local display is provided.

Description Use this function to select one of the measured values shown on the local display.

Selection
- None
- Pressure
- Scaled variable
- Current output
- Sensor temperature
- Percent of range

Additional information

Description

If several measured values are displayed at once, the measured value selected here will be the second value to be displayed. The value is only displayed during normal operation.

The **Format display** parameter (→ 102) is used to specify how many measured values are displayed simultaneously and how.

Dependency

The unit of the displayed measured value is taken from the **System units** submenu.

Value 3 display

Navigation System → Display → Value 3 display

Prerequisite A local display is provided.

Description Use this function to select one of the measured values shown on the local display.

Selection
- None
- Pressure
- Scaled variable
- Current output
- Sensor temperature
- Percent of range

Additional information

Description

If several measured values are displayed at once, the measured value selected here will be the third value to be displayed. The value is only displayed during normal operation.

The **Format display** parameter (→ 102) is used to specify how many measured values are displayed simultaneously and how.

Selection

The unit of the displayed measured value is taken from the **System units** submenu.

Value 4 display

Navigation System → Display → Value 4 display

Prerequisite A local display is provided.

Description Use this function to select one of the measured values shown on the local display.

Selection
- None
- Pressure
- Scaled variable
- Current output
- Sensor temperature
- Percent of range

Additional information

Description

If several measured values are displayed at once, the measured value selected here will be the fourth value to be displayed. The value is only displayed during normal operation.

The **Format display** parameter (→ 102) is used to specify how many measured values are displayed simultaneously and how.

Selection

The unit of the displayed measured value is taken from the **System units** submenu.

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 Depends on the display

Additional information

Set the contrast via the push-buttons:
- Weaker: Press the ⊖ and Ⓔ buttons simultaneously
- Stronger: Press the ⊕ and Ⓔ buttons simultaneously

3.5.4 "Geolocation" submenu

Navigation System → Geolocation

Process Unit Tag

Navigation System → Geolocation → Process Unit Tag

Description Enter the process unit in which the device is installed.

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

Location Description

Navigation System → Geolocation → Location Descr.

Description Use this function to enter a description of the location so that the device can be located in the plant.

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

Longitude

Navigation System → Geolocation → Longitude

Description Use this function to enter the longitude coordinates that describe the device location.

User entry −180 to 180 °

Latitude

Navigation System → Geolocation → Latitude

Description Use this function to enter the latitude coordinates that describe the device location.

User entry −90 to 90 °

Altitude

Navigation System → Geolocation → Altitude

Description Use this function to enter the altitude data that describe the device location.

User entry Signed floating-point number

Location method

Navigation System → Geolocation → Location method

Description Use this function to select the data format for specifying the geographic location. The codes for specifying the location are based on the US National Marine Electronics Association (NMEA) Standard NMEA 0183.

Selection
- No fix
- GPS or Standard Positioning Service fix
- Differential GPS fix
- Precise positioning service (PPS) fix
- Real Time Kinetic (RTK) fixed solution
- Real Time Kinetic (RTK) float solution
- Estimated dead reckoning
- Manual input mode
- Simulation Mode

3.5.5 "Information" submenu

Navigation System → Information

Device name

Navigation System → Information → Device name

Description Displays the name of the transmitter. It can also be found on the nameplate of the transmitter.

User interface Max. 32 characters such as letters or numbers.

Manufacturer

Navigation System → Information → Manufacturer

User interface Character string comprising numbers, letters and special characters

Serial number

Navigation System → Information → Serial number

Description Displays the serial number of the measuring device.

The number can be found on the nameplate of the sensor and transmitter.

User interface Max. 11-digit character string comprising letters and numbers.

Additional information *Description*

Uses of the serial number
- To identify the measuring device quickly, e.g. when contacting Endress+Hauser.
- To obtain specific information on the measuring device using the Device Viewer: www.endress.com/deviceviewer

Order code

Navigation System → Information → Order code

Description Shows the device order code.

User interface Character string composed of letters, numbers and certain punctuation marks (e.g. /).

Factory setting –

Additional information *Description*

The order code is generated from the extended order code through a process of reversible transformation. The extended order code indicates the attributes for all the device features in the product structure. The device features are not directly readable from the order code.

Uses of the order code
- To order an identical spare device.
- To identify the device quickly and easily, e.g. when contacting Endress+Hauser.

Firmware version

Navigation System → Information → Firmware version

Description Displays the device firmware version that is installed.

User interface Character string in the format xx.yy.zz

Additional information *User interface*

The Firmware version is also located:
- On the title page of the Operating instructions
- On the transmitter nameplate

Hardware version

Navigation System → Information → Hardware version

User interface Character string comprising numbers, letters and special characters

Extended order code 1

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

Factory setting –

Additional information *Description*

The extended order code indicates the version of all the features of the product structure for the measuring device and thus uniquely identifies the measuring device.

Extended order code 2

Navigation System → Information → Ext. order cd. 2

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

The extended order code can also be found on the nameplate of the sensor and transmitter in the "Ext. ord. cd." field.

User interface Character string

Factory setting –

Extended order code 3

Navigation System → Information → Ext. order cd. 3

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

The extended order code can also be found on the nameplate of the sensor and transmitter in the "Ext. ord. cd." field.

User interface Character string

Factory setting –

XML build number

Navigation System → Information → XML build no.

User interface Positive integer

Checksum

Navigation System → Information → Checksum

Description Checksum for Firmware version.

User interface Positive integer

3.5.6 "Software configuration" submenu

Navigation System → Softw. config.

Activate SW option

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

Description Use this function to enter an activation code to enable an additional, ordered software option.

User entry Max. 10-digit string of numbers.

Factory setting Depends on the software option ordered

Additional information

Description

If a measuring device was ordered with an additional software option, the activation code is programmed in the device at the factory.

User entry

To activate a software option subsequently, please contact your Endress+Hauser sales organization.

NOTE!

The activation code is linked to the serial number of the measuring device and varies according to the device and software option.

If an incorrect or invalid code is entered, this results in the loss of software options that have already been activated.

▸ Before you enter a new activation code, make a note of the current activation code from the parameter protocol.

▸ Enter the new activation code provided by Endress+Hauser when the new software option was ordered.

▸ If the code entered is incorrect or invalid, enter the old activation code from the parameter protocol.

▸ Have the Endress+Hauser sales organization check the new activation code remembering to specify the serial number or ask for the code again.

Example for a software option

Order code for "Application package", option **EA** "Extended HistoROM"

Software option overview

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

Description Shows all enabled software options

User interface

- SIL
- WHG
- Heartbeat Verification
- Heartbeat Monitoring

Index

T

U

V

W

X

Z

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