GP01149P/00/EN/03.24-00
71647903
2024-03-26
Valid as of version
01.00.zz (Device firmware)

Description of Device Parameters
Cerabar PMC51B
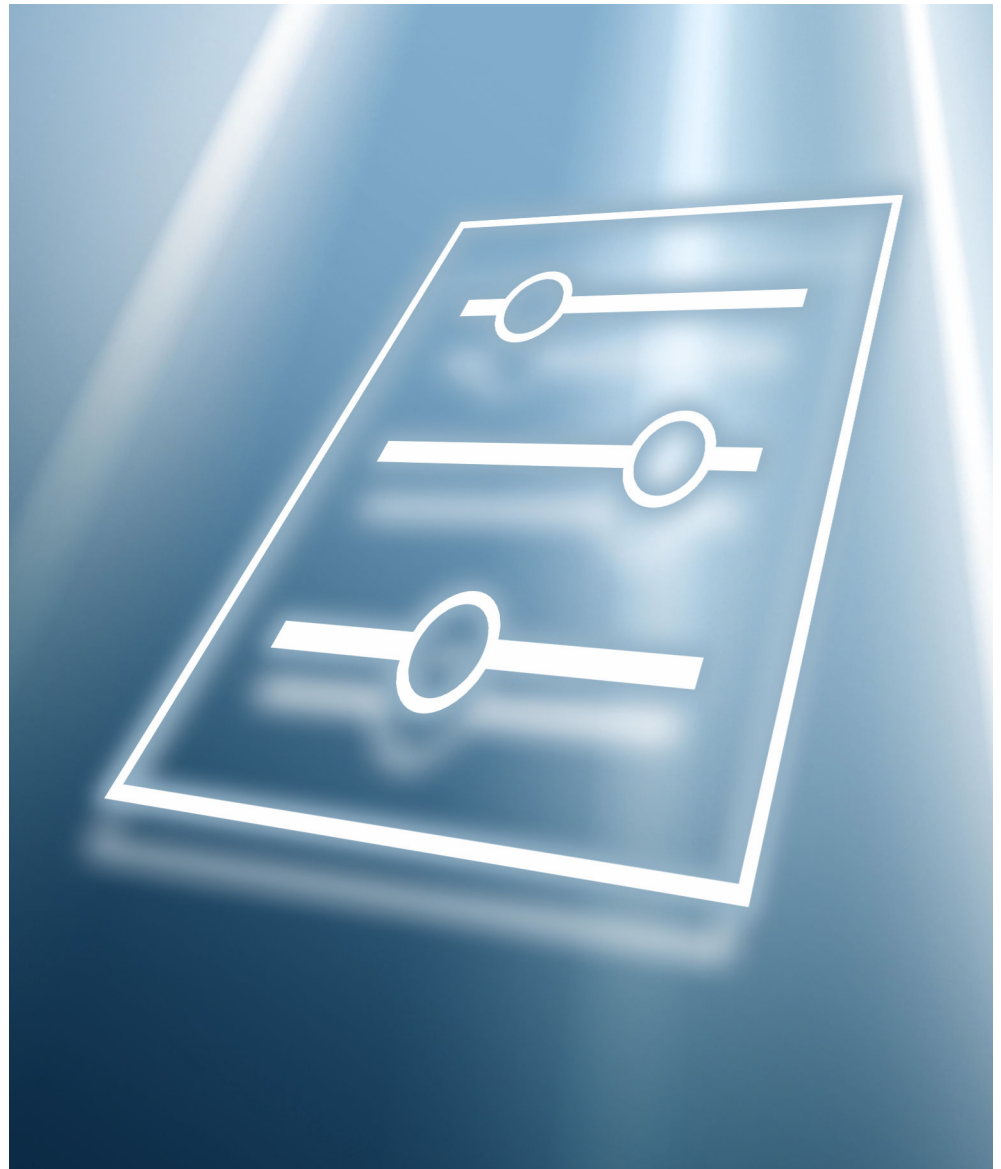
Process pressure measurement
HART

HART
COMMUNICATION PROTOCOL

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

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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 (→ 🗎 44)
- Event logbook (→ 🗎 46)
- Minimum/maximum values (→ 🗎 47)
- Simulation (→ 🗎 51)
- Diagnostic settings (→ 🗎 52)

"Application" menu
- Measuring units (→ 🗎 65)
- Measured values (→ 🗎 68)
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- Device management (→ 🗎 96)
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- Bluetooth configuration
- Display (→ 🗎 100)
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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.

ℹ️   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)
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- 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)
  - Lower Range Limit (→ 🖺 33)
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  - Pressure value 1 (→ 🖺 36)
  - Current range output (→ 🖺 38)
  - Failure behavior current output (→ 🖺 38)
  - Failure current (→ 🖺 38)
  - Loop current mode (→ 🖺 39)
  - Assign HART variables? (→ 🖺 39)
  - Process variable output current (→ 🖺 39)
  - Assign PV (→ 🖺 27)
  - Assign SV (→ 🖺 42)
  - Assign TV (→ 🖺 42)
  - Assign QV (→ 🖺 43)

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.
	ℹ 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

ℹ️ 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	psi	▪ inH2O
▪ kPa		▪ inH2O (4℃)
▪ Pa		▪ mmH2O
▪ bar		▪ mmH2O (4℃)
▪ mbar		▪ mH2O
▪ torr		▪ mH2O (4℃)
▪ atm		▪ ftH2O
▪ kgf/cm²		▪ inHg
▪ gf/cm²		▪ 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*
▪ ℃	℉
▪ K	

Factory setting   Country-specific:
▪ ℃
▪ ℉

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℃)
• Pa		• mmH2O
• bar		• mmH2O (4℃)
• mbar		• mH2O
• torr		• mH2O (4℃)
• 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 • m³ • g • kg • t • g/s • kg/s • kg/min • kg/h • t/min • t/h • t/d • m³/s • m³/min • m³/h • m³/d • l/s • l/min • l/h • Nm³/h • Nl/h • Sm³/s • Sm³/min • Sm³/h • Sm³/d • Nm³/s • g/cm³ • kg/m³ • Nm³/min • Nm³/d	*US units* • ft • in • ft³ • gal (us) • bbl (us;oil) • oz • lb • STon • lb/s • lb/min • lb/h • STon/min • STon/h • STon/d • ft³/s • ft³/min • ft³/h • ft³/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) • Sft³/min • Sft³/h • Sft³/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 *

"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.

---

*   Visibility depends on order options or device settings

Selection   • Linear
                                 • Square root *
                                 • Table

"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.

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

---

*   Visibility depends on order options or device settings

"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

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

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* Visibility depends on order options or device settings

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 *
                                   • 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 *

---

*   Visibility depends on order options or device settings

- 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.

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*

ℹ 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*

ℹ The diagnostic message can be viewed via the **Actual diagnostics** parameter
(→ 🕮 44).

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*

User interface

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

User interface

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

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* ℹ️ 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 ℃

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 ℃

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*

ℹ️ 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 ℃

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 ℃

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℃)
• Pa   • mmH2O
• bar   • mmH2O (4℃)
• mbar   • mH2O
• torr   • mH2O (4℃)
• 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*	*US units*
	▪ ℃	℉
	▪ K	

Factory setting	Country-specific:
	▪ ℃
	▪ ℉

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
- m³
- g
- kg
- t
- g/s
- kg/s
- kg/min
- kg/h
- t/min
- t/h
- t/d
- m³/s
- m³/min
- m³/h
- m³/d
- l/s
- l/min
- l/h
- Nm³/h
- Nl/h
- Sm³/s
- Sm³/min
- Sm³/h
- Sm³/d
- Nm³/s
- g/cm³
- kg/m³
- Nm³/min
- Nm³/d

Custom-specific units
Free text

US units
- ft
- in
- ft³
- gal (us)
- bbl (us;oil)
- oz
- lb
- STon
- lb/s
- lb/min
- lb/h
- STon/min
- STon/h
- STon/d
- ft³/s
- ft³/min
- ft³/h
- ft³/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)
- Sft³/min
- Sft³/h
- Sft³/d

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

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 ℃

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 |

"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 |

---

[*] Visibility depends on order options or device settings

    Endress+Hauser

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 the "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 ℃

Sensor temperature upper range limit

Navigation	▣ Application → Sensor → Sensor limits → Sens.temp.up.lim
User interface	–273.15 to 9 726.85 ℃

"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
- m³
- g
- kg
- t
- g/s
- kg/s
- kg/min
- kg/h
- t/min
- t/h
- t/d
- m³/s
- m³/min
- m³/h
- m³/d
- l/s
- l/min
- l/h
- Nm³/h
- Nl/h
- Sm³/s
- Sm³/min
- Sm³/h
- Sm³/d
- Nm³/s
- g/cm³
- kg/m³
- Nm³/min
- Nm³/d

Custom-specific units
Free text

US units
- ft
- in
- ft³
- gal (us)
- bbl (us;oil)
- oz
- lb
- STon
- lb/s
- lb/min
- lb/h
- STon/min
- STon/h
- STon/d
- ft³/s
- ft³/min
- ft³/h
- ft³/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)
- Sft³/min
- Sft³/h
- Sft³/d

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

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

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).

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).

---

*   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.

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).

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.

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.

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

ℹ️ • 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 *

---

* Visibility depends on order options or device settings

- 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 (→ 🖺 89).


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 (→ 🖺 89).

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 (→ 🖺 89).

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.

---

[*]   Visibility depends on order options or device settings

Selection   Please refer to the **Burst variable 0** parameter (→ 🖥 89).

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 (→ 🖥 89).

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 (→ 🖥 89).

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 (→ 🖥 89).

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

---

[*]   Visibility depends on order options or device settings

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 (→ 🗎 92).
- **Window**
  The message is sent if the specified measured value has changed by the value in the **Burst trigger level** parameter (→ 🗎 92).
- **Rising**
  The message is sent if the specified measured value exceeds the value in the **Burst trigger level** parameter (→ 🗎 92).
- **Falling**
  The message is sent if the specified measured value drops below the value in the **Burst trigger level** parameter (→ 🗎 92).
- **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 (→ 🗎 91) 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.
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*

ℹ️ 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

> ℹ️ 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*

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	回目 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 (→ 🖹 101)...**Value 8 display** parameter **Value 4 display** parameter (→ 🖹 103) 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	回目 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 (→ 🖹 101) 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.

ℹ️ The **Format display** parameter (→ 🖺 101) is used to specify how many measured values are displayed simultaneously and how.

Dependency

ℹ️ 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.

ℹ️ The **Format display** parameter (→ 🖺 101) is used to specify how many measured values are displayed simultaneously and how.

Selection

ℹ️ 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.

ℹ The **Format display** parameter (→ 🕮 101) is used to specify how many measured values are displayed simultaneously and how.

Selection

ℹ 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	ℹ 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.
	ℹ 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*
	ℹ 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.
	ℹ 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.

ℹ️ 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

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