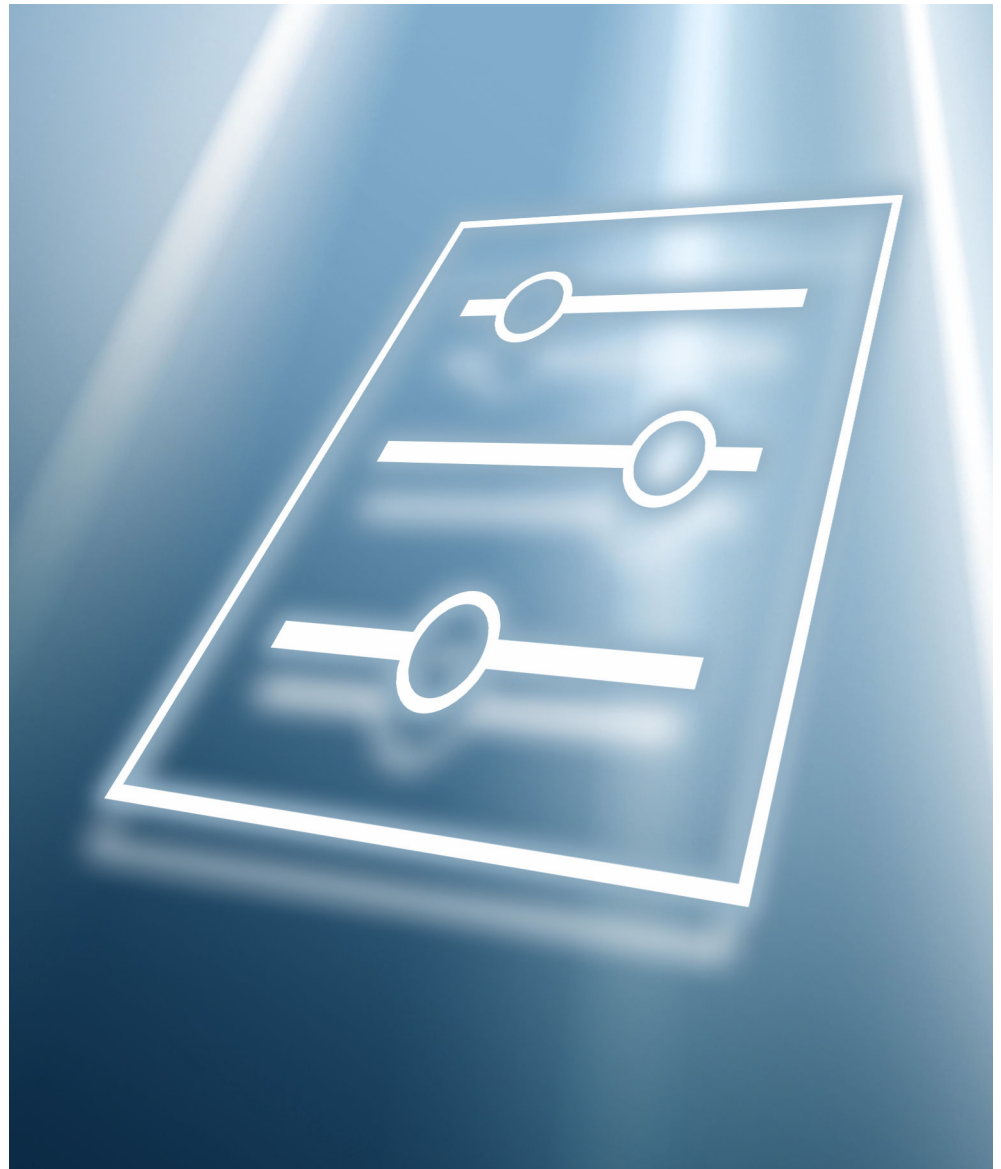


# Description of Device Parameters

## **Deltabar PMD78B**

Differential pressure measurement  
HART





## Table of contents

|                    |   |            |
|--------------------|---|------------|
| <b>1</b>           | <b>About this document .....</b>            | <b>4</b>   |
| 1.1                | Document function .....                     | 4          |
| 1.2                | Target group .....                          | 4          |
| 1.3                | Using this document .....                   | 4          |
| 1.4                | Symbols used .....                          | 5          |
| 1.5                | Documentation .....                         | 5          |
| <b>2</b>           | <b>Overview of the operating menu .....</b> | <b>6</b>   |
| <b>3</b>           | <b>Description of device parameters ...</b> | <b>31</b>  |
| 3.1                | User navigation .....                       | 31         |
| 3.2                | "Guidance" menu .....                       | 34         |
| 3.3                | "Diagnostics" menu .....                    | 107        |
| 3.4                | "Application" menu .....                    | 132        |
| 3.5                | "System" menu .....                         | 163        |
| <b>Index</b> ..... |   | <b>178</b> |

# 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](http://www.endress.com) →  
Download

### 1.5.2 Supplementary device-dependent documentation

#### Special Documentation

 The Special Documentation is available via the Internet: [www.endress.com](http://www.endress.com) →  
Download

## 2 Overview of the operating menu

|                                  |      |
|----------------------------------|------|
| <b>Guidance</b>                  | → 31 |
| <b>► Commissioning</b>           | → 34 |
| <b>► Device identification</b>   | → 34 |
| Device tag                       | → 34 |
| Device name                      | → 34 |
| Serial number                    | → 34 |
| Extended order code 1            | → 35 |
| Extended order code 2            | → 35 |
| Extended order code 3            | → 35 |
| <b>► Device identification</b>   | → 36 |
| Locking status                   | → 36 |
| <b>► Device identification</b>   | → 37 |
| HART short tag                   | → 37 |
| HART date code                   | → 37 |
| HART descriptor                  | → 37 |
| HART message                     | → 37 |
| HART address                     | → 38 |
| <b>► Measurement adjustments</b> | → 38 |
| Assign PV                        | → 38 |
| Damping                          | → 38 |
| <b>► Measurement adjustments</b> | → 39 |
| Pressure unit                    | → 39 |
| Temperature unit                 | → 39 |
| <b>► Measurement adjustments</b> | → 40 |

|                                   |      |
|-----------------------------------|------|
| Pressure unit                     | → 40 |
| Scaled variable unit              | → 40 |
| Free text                         | → 41 |
| Temperature unit                  | → 41 |
| <b>► Measurement adjustments</b>  | → 42 |
| Zero adjustment                   | → 42 |
| Pressure                          | → 43 |
| <b>► Output settings</b>          | → 43 |
| Output current transfer function  | → 43 |
| Low flow cut off                  | → 43 |
| <b>► Output settings</b>          | → 44 |
| Scaled variable transfer function | → 44 |
| <b>► Output settings</b>          | → 44 |
| Lower Range Limit                 | → 44 |
| Upper Range Limit                 | → 44 |
| Minimum span                      | → 45 |
| <b>► Output settings</b>          | → 45 |
| Pressure                          | → 45 |
| Scaled variable                   | → 45 |
| <b>► Output settings</b>          | → 45 |
| Lower range value output          | → 45 |
| Upper range value output          | → 46 |
| Lower Range Limit                 | → 46 |
| Upper Range Limit                 | → 46 |
| Minimum span                      | → 46 |

|                                   |      |
|-----------------------------------|------|
| ▶ Output settings                 | → 47 |
| Scaled variable transfer function | → 47 |
| Pressure value 1                  | → 47 |
| Scaled variable value 1           | → 47 |
| Pressure value 2                  | → 48 |
| Scaled variable value 2           | → 48 |
| Lower Range Limit                 | → 48 |
| Upper Range Limit                 | → 48 |
| Minimum span                      | → 48 |
| ▶ Output settings                 | → 49 |
| Lower range value output          | → 49 |
| Upper range value output          | → 49 |
| Current range output              | → 49 |
| Failure behavior current output   | → 50 |
| Failure current                   | → 50 |
| Loop current mode                 | → 50 |
| Assign HART variables?            | → 50 |
| ▶ Output settings                 | → 51 |
| Process variable output current   | → 51 |
| Current range output              | → 51 |
| Lower range value output          | → 51 |
| Upper range value output          | → 51 |
| Failure behavior current output   | → 52 |
| Failure current                   | → 52 |



|                                  |       |
|----------------------------------|-------|
| Loop current mode                | → 52  |
| Assign HART variables?           | → 52  |
| <b>► Output settings</b>         | → 53  |
| Assign PV                        | → 53  |
| Assign SV                        | → 53  |
| Assign TV                        | → 54  |
| Assign QV                        | → 55  |
| <b>► Heartbeat Technology</b>    | → 115 |
| <b>► Heartbeat Verification</b>  | → 56  |
| <b>► Heartbeat Configuration</b> | → 56  |
| Heartbeat Verification           | → 56  |
| <b>► Mainboard module</b>        | → 56  |
| System status                    | → 56  |
| Output current                   | → 56  |
| Software integrity               | → 57  |
| RAM check                        | → 57  |
| ROM check                        | → 57  |
| Loop diagnostics                 | → 58  |
| <b>► Sensor module</b>           | → 58  |
| Sensor integrity                 | → 58  |
| Membrane integrity               | → 58  |
| Sensor/membrane integrity        | → 59  |
| Statistical Sensor Diagnostics   | → 59  |
| Analog path integrity            | → 59  |
| <b>► Verification result</b>     | → 60  |

|  |      |
|--|------|
| Verification result                          | → 60 |
| Save protocol?                               | → 60 |
| ► <b>Finish</b>                              | → 60 |
| Inspector                                    | → 60 |
| Location                                     | → 60 |
| Notes  | → 61 |
| Plant operator                               | → 61 |
| Operating time (Verification)                | → 61 |
| Date/time Heartbeat Verification             | → 61 |
| ► <b>SSD: Statistical Sensor Diagnostics</b> | → 61 |
| ► <b>Configuration</b>                       | → 62 |
| Status summary                               | → 62 |
| Status summary                               | → 62 |
| Status summary                               | → 62 |
| Status summary                               | → 63 |
| Status summary                               | → 63 |
| Status summary                               | → 63 |
| Status summary                               | → 64 |
| Status summary                               | → 64 |
| Status summary                               | → 64 |
| System status                                | → 65 |
| Signal status                                | → 65 |
| Signal noise status                          | → 65 |
| Baseline build process                       | → 65 |
| Sample rate                                  | → 66 |

|  |      |
|--|------|
| ► Monitoring                             | → 67 |
| Signal status                            | → 67 |
| Current Baseline signal                  | → 67 |
| Baseline Signal Upper Control Line       | → 67 |
| Baseline Signal Control Line             | → 67 |
| Baseline Signal Lower Control Line       | → 68 |
| Signal minimum value                     | → 68 |
| Signal maximum value                     | → 68 |
| ► Monitoring                             | → 68 |
| Signal noise status                      | → 68 |
| Current Baseline noise                   | → 69 |
| Baseline Signal Noise Upper Control Line | → 69 |
| Baseline Signal Noise Control Line       | → 69 |
| Baseline Signal Noise Lower Control Line | → 69 |
| Baseline Signal Noise Minimum            | → 70 |
| Signal noise minimum value               | → 70 |
| Signal noise maximum value               | → 70 |
| ► Diagnostic settings                    | → 70 |
| SSD Monitoring delay time                | → 70 |
| 900 Event category                       | → 70 |
| 900 Event category                       | → 70 |
| 900 Diagnostic behavior                  | → 71 |
| 900 Diagnostic behavior                  | → 71 |
| SSD Out of range delay time              | → 71 |

|                                     |      |
|-------------------------------------|------|
| 906 Event category                  | → 71 |
| 906 Event category                  | → 71 |
| ▶ Activate/Deactivate               | → 72 |
| SSD: Statistical Sensor Diagnostics | → 72 |
| ▶ Loop diagnostics                  | → 72 |
| ▶ Configuration                     | → 72 |
| I have read the warning texts.      | → 72 |
| ▶ Configuration                     | → 72 |
| Baseline status                     | → 72 |
| Baseline build process              | → 73 |
| ▶ Configuration                     | → 73 |
| Timestamp Baseline                  | → 73 |
| Resistance Baseline                 | → 73 |
| Supply voltage Baseline             | → 73 |
| Timestamp previous Baseline         | → 74 |
| Resistance previous Baseline        | → 74 |
| Supply voltage previous Baseline    | → 74 |
| ▶ Monitoring                        | → 74 |
| Tolerated deviation +/-             | → 74 |
| ▶ Diagnostic settings               | → 75 |
| 806 Event delay                     | → 75 |
| 806 Event category                  | → 75 |
| 806 Event category                  | → 75 |

|                                      |      |
|--------------------------------------|------|
| 806 Diagnostic behavior              | → 75 |
| 806 Diagnostic behavior              | → 75 |
| ▶ Activate/Deactivate                | → 76 |
| Loop diagnostics                     | → 76 |
| ▶ Process window                     | → 76 |
| ▶ Pressure range                     | → 76 |
| 500 Process alert pressure           | → 76 |
| Low alert value                      | → 76 |
| High alert value                     | → 77 |
| Counter underruns of user limit Pmin | → 77 |
| Counter overruns of user limit Pmax  | → 77 |
| 500 Diagnostic behavior              | → 78 |
| 500 Diagnostic behavior              | → 78 |
| 500 Event category                   | → 78 |
| 500 Event category                   | → 78 |
| ▶ Pressure range                     | → 78 |
| 501 Process alert scaled variable    | → 78 |
| Low alert value                      | → 79 |
| High alert value                     | → 79 |
| 501 Diagnostic behavior              | → 79 |
| 501 Diagnostic behavior              | → 79 |
| 501 Event category                   | → 80 |
| 501 Event category                   | → 80 |
| ▶ Temperature range                  | → 80 |
| User temperature process alert       | → 80 |

|               |                                      |      |
|---------------|--------------------------------------|------|
|               | Low alert value                      | → 80 |
|               | High alert value                     | → 80 |
|               | Counter underruns of user limit Tmin | → 81 |
|               | Counter overruns of user limit Tmax  | → 81 |
|               | 502 Diagnostic behavior              | → 81 |
|               | 502 Diagnostic behavior              | → 81 |
|               | 502 Event category                   | → 81 |
|               | 502 Event category                   | → 81 |
| ▶ Safety mode |                                      | → 82 |
| ▶ Preparation |                                      | → 82 |
|               | I have read the warning texts.       | → 82 |
| ▶ Preparation |                                      | → 82 |
|               | Enter safety unlocking code          | → 82 |
|               | Locking status                       | → 82 |
| ▶ Preparation |                                      | → 84 |
|               | Character test string                | → 84 |
|               | Confirm                              | → 84 |
| ▶ Preparation |                                      | → 85 |
|               | Device tag                           | → 85 |
|               | Device name                          | → 85 |
|               | Serial number                        | → 86 |
|               | Firmware version                     | → 86 |
|               | Hardware version                     | → 86 |
|               | Confirm                              | → 86 |
| ▶ Preparation |                                      | → 87 |


























|                                     |      |
|-------------------------------------|------|
| CRC device configuration            | → 87 |
| Stored CRC device configuration     | → 87 |
| Timestamp stored CRC device config. | → 87 |
| Operating time                      | → 87 |
| Configuration counter               | → 88 |
| <b>► Confirmation</b>               | → 88 |
| Zero adjustment offset              | → 88 |
| HP/LP swap                          | → 88 |
| Damping                             | → 89 |
| Sensor pressure range behavior      | → 89 |
| Confirm                             | → 89 |
| <b>► Confirmation</b>               | → 89 |
| Output current transfer function    | → 89 |
| Low cutoff                          | → 90 |
| Confirm                             | → 90 |
| <b>► Confirmation</b>               | → 90 |
| Measuring mode current output       | → 90 |
| Failure behavior current output     | → 90 |
| Current range output                | → 91 |
| Lower range value output            | → 91 |
| Upper range value output            | → 91 |
| Assign PV                           | → 91 |
| Confirm                             | → 92 |
| <b>► Confirmation</b>               | → 92 |

|                                 |      |
|---------------------------------|------|
| Zero adjustment offset          | → 92 |
| Confirm                         | → 92 |
| <b>▶ Locking</b>                | → 92 |
| Enter safety locking code       | → 92 |
| Locking status                  | → 93 |
| Save protocol?                  | → 93 |
| <b>▶ Result</b>                 | → 94 |
| Inspector                       | → 94 |
| Location                        | → 94 |
| Date/time                       | → 94 |
| Notes                           | → 94 |
| Plant operator                  | → 95 |
| <b>▶ Proof test</b>             | → 95 |
| <b>▶ Preparation Proof test</b> | → 95 |
| I have read the warning texts.  | → 95 |
| <b>▶ Preparation Proof test</b> | → 96 |
| Visual inspection               | → 96 |
| Notes                           | → 96 |
| <b>▶ Preparation Proof test</b> | → 96 |
| Device tag                      | → 96 |
| Device name                     | → 97 |
| Serial number                   | → 97 |
| Firmware version                | → 97 |
| Hardware version                | → 98 |




























|  |       |
|--|-------|
| ▶ Preparation Proof test               | → 98  |
| CRC device configuration               | → 98  |
| Stored CRC device configuration        | → 98  |
| Timestamp stored CRC device config.    | → 98  |
| Operating time                         | → 99  |
| Configuration counter                  | → 99  |
| ▶ Preparation Proof test               | → 100 |
| Select test procedure                  | → 100 |
| Safety function?                       | → 100 |
| ▶ Simulation and check failure current | → 100 |
| Failure current (high alarm)           | → 100 |
| Confirm                                | → 101 |
| (High) Is safety function triggered?   | → 101 |
| Terminal current (high alarm)          | → 101 |
| Confirm                                | → 101 |
| (Low) Is safety function triggered?    | → 102 |
| ▶ Proof test                           | → 102 |
| Setpoint 1                             | → 102 |
| Pressure 1                             | → 102 |
| Terminal current 1                     | → 102 |
| Current deviation 1                    | → 103 |
| Setpoint 2                             | → 103 |
| Pressure 2                             | → 103 |

|                                      |         |
|--------------------------------------|---------|
| Terminal current 2                   | → 📄 103 |
| Current deviation 2                  | → 📄 103 |
| <b>► Finish</b>                      | → 📄 104 |
| Active diagnostics                   | → 📄 104 |
| Summary                              | → 📄 104 |
| Decision of inspector                | → 📄 104 |
| Inspector                            | → 📄 105 |
| Location                             | → 📄 105 |
| Date/time proof test                 | → 📄 105 |
| Notes                                | → 📄 105 |
| Plant operator                       | → 📄 106 |
| <b>Diagnostics</b>                   | → 📄 107 |
| <b>► Active diagnostics</b>          | → 📄 107 |
| Active diagnostics                   | → 📄 107 |
| Timestamp                            | → 📄 107 |
| Previous diagnostics                 | → 📄 108 |
| Timestamp                            | → 📄 108 |
| Operating time from restart          | → 📄 108 |
| Operating time                       | → 📄 109 |
| <b>► Event logbook</b>               | → 📄 109 |
| Filter options                       | → 📄 109 |
| <b>► Minimum/maximum values</b>      | → 📄 110 |
| Pressure min                         | → 📄 110 |
| Counter limit underruns sensor Pmin  | → 📄 110 |
| Counter underruns of user limit Pmin | → 📄 110 |

|                                      |   |
|--------------------------------------|---|
| Minimum sensor temperature           | →  111   |
| Counter limit underruns sensor Tmin  | →  111   |
| Counter underruns of user limit Tmin | →  111   |
| Minimum terminal voltage             | →  111   |
| Minimum electronics temperature      | →  111   |
| Reset user defined counters P and T  | →  112   |
| Pressure max                         | →  112   |
| Counter limit overruns sensor Pmax   | →  112   |
| Counter overruns of user limit Pmax  | →  112   |
| Maximum sensor temperature           | →  112   |
| Counter limit overruns sensor Tmax   | →  113   |
| Counter overruns of user limit Tmax  | →  113 |
| Maximum terminal voltage             | →  113 |
| Maximum electronics temperature      | →  113 |
| <b>► Simulation</b>                  | →  114 |
| Simulation                           | →  114 |
| Value pressure simulation            | →  114 |
| Value current output                 | →  114 |
| Diagnostic event simulation          | →  114 |
| <b>► Heartbeat Technology</b>        | →  115 |
| <b>► Heartbeat Verification</b>      | →  115 |
| Date/time Heartbeat Verification     | →  115 |
| Operating time (Verification)        | →  115 |
| Verification result                  | →  115 |
| Status                               | →  116 |

|                                     |         |
|-------------------------------------|---------|
| ▶ Loop diagnostics                  | → 📖 116 |
| Rebuild baseline                    | → 📖 116 |
| Tolerated deviation +/-             | → 📖 116 |
| Baseline status                     | → 📖 117 |
| Loop diagnostics                    | → 📖 117 |
| Terminal voltage 1                  | → 📖 117 |
| Clamping voltage lower threshold    | → 📖 117 |
| Clamping voltage upper threshold    | → 📖 117 |
| 806 Event delay                     | → 📖 118 |
| ▶ Statistical Sensor Diagnostics    | → 📖 118 |
| SSD: Statistical Sensor Diagnostics | → 📖 118 |
| System status                       | → 📖 118 |
| Signal status                       | → 📖 118 |
| Signal noise status                 | → 📖 119 |
| ▶ Diagnostic settings               | → 📖 119 |
| ▶ Properties                        | → 📖 119 |
| SSD Out of range delay time         | → 📖 119 |
| SSD Monitoring delay time           | → 📖 120 |
| 500 Process alert pressure          | → 📖 120 |
| Low alert value                     | → 📖 120 |
| High alert value                    | → 📖 120 |
| 501 Process alert scaled variable   | → 📖 120 |
| Low alert value                     | → 📖 121 |
| High alert value                    | → 📖 121 |
| User temperature process alert      | → 📖 121 |


























|                         |       |
|-------------------------|-------|
| Low alert value         | → 121 |
| High alert value        | → 122 |
| 806 Diagnostic behavior | → 122 |
| 806 Diagnostic behavior | → 122 |
| 806 Event category      | → 122 |
| 806 Event category      | → 122 |
| 806 Event delay         | → 122 |
| <b>► Configuration</b>  | → 62  |
| <b>► Configuration</b>  | → 123 |
| 500 Diagnostic behavior | → 123 |
| 500 Diagnostic behavior | → 123 |
| 500 Diagnostic behavior | → 123 |
| 500 Diagnostic behavior | → 123 |
| 500 Event category      | → 123 |
| 500 Event category      | → 123 |
| 500 Event category      | → 123 |
| 500 Event category      | → 123 |
| 501 Diagnostic behavior | → 123 |
| 501 Diagnostic behavior | → 123 |
| 501 Diagnostic behavior | → 123 |
| 501 Diagnostic behavior | → 123 |
| 501 Event category      | → 124 |
| 501 Event category      | → 124 |
| 501 Event category      | → 124 |
| 501 Event category      | → 124 |

|                                |   |
|--------------------------------|---|
| 502 Diagnostic behavior        | →  124   |
| 502 Diagnostic behavior        | →  124   |
| 502 Diagnostic behavior        | →  124   |
| 502 Diagnostic behavior        | →  124   |
| 502 Event category             | →  124   |
| 502 Event category             | →  124   |
| 502 Event category             | →  124   |
| 502 Event category             | →  124   |
| <b>► Process</b>               | →  125   |
| 806 Diagnostic behavior        | →  125   |
| 806 Diagnostic behavior        | →  125 |
| 806 Diagnostic behavior        | →  125 |
| 806 Diagnostic behavior        | →  125 |
| 806 Diagnostic behavior        | →  125 |
| 806 Diagnostic behavior        | →  125 |
| 806 Event category             | →  125 |
| 806 Event category             | →  125 |
| 806 Event category             | →  125 |
| 806 Event category             | →  125 |
| 806 Event category             | →  125 |
| 806 Event category             | →  125 |
| 822 Diagnostic behavior        | →  125 |
| 822 Event category             | →  126 |
| Sensor pressure range behavior | →  126 |
| 841 Event category             | →  126 |

|                                |                         |       |
|--------------------------------|-------------------------|-------|
|                                | 900 Event category      | → 127 |
|                                | 900 Event category      | → 127 |
|                                | 900 Event category      | → 127 |
|                                | 900 Event category      | → 127 |
|                                | 900 Diagnostic behavior | → 127 |
|                                | 900 Diagnostic behavior | → 127 |
|                                | 900 Diagnostic behavior | → 127 |
|                                | 900 Diagnostic behavior | → 127 |
|                                | 906 Diagnostic behavior | → 127 |
|                                | 906 Diagnostic behavior | → 127 |
|                                | 906 Diagnostic behavior | → 127 |
|                                | 906 Diagnostic behavior | → 127 |
|                                | 906 Event category      | → 127 |
|                                | 906 Event category      | → 127 |
|                                | 906 Event category      | → 127 |
|                                | 906 Event category      | → 127 |
| <b>Application</b>             |                         | → 132 |
| <b>► Measuring units</b>       |                         | → 132 |
| Pressure unit                  |                         | → 132 |
| Decimal places pressure        |                         | → 132 |
| Temperature unit               |                         | → 132 |
| Scaled variable unit           |                         | → 133 |
| Free text                      |                         | → 134 |
| Decimal places scaled variable |                         | → 134 |

























|                                  |       |
|----------------------------------|-------|
| ▶ Measured values                | → 135 |
| Pressure                         | → 135 |
| Scaled variable                  | → 135 |
| Sensor temperature               | → 135 |
| Terminal voltage 1               | → 135 |
| Terminal current                 | → 136 |
| Electronics temperature          | → 136 |
| ▶ Sensor                         | → 136 |
| ▶ Basic settings                 | → 136 |
| Output current transfer function | → 136 |
| Damping                          | → 137 |
| HP/LP swap                       | → 137 |
| Low flow cut off                 | → 137 |
| ▶ Sensor calibration             | → 138 |
| Zero adjustment                  | → 138 |
| Calibration offset               | → 138 |
| Zero adjustment offset           | → 138 |
| Sensor Trim Reset                | → 138 |
| Lower sensor trim measured value | → 139 |
| Lower sensor trim                | → 139 |
| Upper sensor trim measured value | → 139 |
| Upper sensor trim                | → 140 |
| ▶ Sensor limits                  | → 140 |
| Lower Range Limit                | → 140 |
| Upper Range Limit                | → 140 |




























|                                      |   |
|--------------------------------------|---|
| Minimum span                         | →  141   |
| Sensor temperature lower range limit | →  141   |
| Sensor temperature upper range limit | →  141   |
| <b>► Scaled variable</b>             | →  141   |
| Assign PV                            | →  141   |
| Scaled variable unit                 | →  142   |
| Free text                            | →  142   |
| Pressure                             | →  143   |
| Scaled variable transfer function    | →  143   |
| Lower range value output             | →  143   |
| Upper range value output             | →  143   |
| Activate table                       | →  144 |
| Pressure value 1                     | →  144 |
| Scaled variable value 1              | →  144 |
| Pressure value 2                     | →  144 |
| Scaled variable value 2              | →  144 |
| Pressure                             | →  145 |
| Scaled variable                      | →  145 |
| <b>► Wet calibration</b>             | →  145 |
| Zero                                 | →  145 |
| Pressure value 1                     | →  145 |
| Span                                 | →  145 |
| Pressure value 2                     | →  146 |
| Zero                                 | →  145 |
| Lower range value output             | →  146 |

|                                 |       |
|---------------------------------|-------|
| Span                            | → 145 |
| Upper range value output        | → 146 |
| <b>► Current output</b>         | → 148 |
| Assign PV                       | → 148 |
| Measuring mode current output   | → 148 |
| Current range output            | → 148 |
| Lower range value output        | → 149 |
| Upper range value output        | → 149 |
| Failure behavior current output | → 149 |
| Failure current                 | → 149 |
| Output current                  | → 150 |
| Terminal current                | → 150 |
| <b>► HART output</b>            | → 151 |
| <b>► Configuration</b>          | → 151 |
| HART address                    | → 151 |
| HART short tag                  | → 151 |
| Device tag                      | → 151 |
| No. of preambles                | → 152 |
| Loop current mode               | → 152 |
| <b>► HART output</b>            | → 152 |
| Assign PV                       | → 152 |
| Primary variable (PV)           | → 152 |
| Assign SV                       | → 153 |
| Secondary variable (SV)         | → 153 |
| Assign TV                       | → 153 |

|                                |       |
|--------------------------------|-------|
| Tertiary variable (TV)         | → 154 |
| Assign QV                      | → 154 |
| Quaternary variable (QV)       | → 155 |
| <b>► Burst configuration 1</b> | → 155 |
| Burst mode 1                   | → 155 |
| Burst command 1                | → 156 |
| Burst variable 0               | → 156 |
| Burst variable 1               | → 157 |
| Burst variable 2               | → 157 |
| Burst variable 3               | → 157 |
| Burst variable 4               | → 157 |
| Burst variable 5               | → 158 |
| Burst variable 6               | → 158 |
| Burst variable 7               | → 158 |
| Burst trigger mode             | → 158 |
| Burst trigger level            | → 159 |
| Min. update period             | → 159 |
| Max. update period             | → 159 |
| <b>► Information</b>           | → 160 |
| Device ID                      | → 160 |
| Device type                    | → 160 |
| Device revision                | → 160 |
| HART short tag                 | → 161 |
| HART revision                  | → 161 |
| HART descriptor                | → 161 |

|                            |                       |   |
|----------------------------|-----------------------|---|
|                            | HART message          | →  161   |
|                            | HART date code        | →  162   |
| <b>System</b>              |                       | →  163   |
| ▶ <b>Device management</b> |                       | →  163   |
|                            | Device tag            | →  163   |
|                            | Locking status        | →  163   |
|                            | Configuration counter | →  164   |
|                            | Reset device          | →  164   |
| ▶ <b>User management</b>   |                       | →  165   |
|                            | User role             | →  165   |
|                            | Password              | →  165 |
|                            | Enter access code     | →  165 |
|                            | Status password entry | →  166 |
|                            | New password          | →  166 |
|                            | Confirm new password  | →  166 |
|                            | Status password entry | →  166 |
|                            | Old password          | →  166 |
|                            | New password          | →  166 |
|                            | Confirm new password  | →  166 |
|                            | Status password entry | →  166 |
|                            | Reset password        | →  167 |
|                            | Status password entry | →  166 |
|                            | Old password          | →  166 |
|                            | Status password entry | →  166 |

|                                  |   |
|----------------------------------|---|
| ▶ <b>Bluetooth configuration</b> | →  167   |
| Bluetooth activation             | →  167   |
| ▶ <b>Display</b>                 | →  167   |
| Language                         | →  167   |
| Format display                   | →  168   |
| Value 1 display                  | →  168   |
| Value 2 display                  | →  169   |
| Value 3 display                  | →  169   |
| Value 4 display                  | →  170   |
| Contrast display                 | →  170   |
| ▶ <b>Geolocation</b>             | →  171   |
| Process Unit Tag                 | →  171 |
| Location Description             | →  171 |
| Longitude                        | →  171 |
| Latitude                         | →  171 |
| Altitude                         | →  172 |
| Location method                  | →  172 |
| ▶ <b>Information</b>             | →  172 |
| Device name                      | →  172 |
| Manufacturer                     | →  173 |
| Serial number                    | →  173 |
| Order code                       | →  173 |
| Firmware version                 | →  174 |
| Hardware version                 | →  174 |
| Extended order code 1            | →  174 |

|                                     |       |
|-------------------------------------|-------|
| Extended order code 2               | → 174 |
| Extended order code 3               | → 175 |
| Checksum                            | → 175 |
| <b>► Software configuration</b>     | → 176 |
| CRC device configuration            | → 176 |
| Stored CRC device configuration     | → 176 |
| Timestamp stored CRC device config. | → 176 |
| Activate SW option                  | → 176 |
| Software option overview            | → 177 |

## 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 (→  34)
- Heartbeat Technology (→  56)
- Safety mode (→  82)
- Proof test (→  95)








##### "Diagnostics" menu

- Active diagnostics (→  107)
- Event logbook (→  109)
- Minimum/maximum values (→  110)
- Simulation (→  114)
- Heartbeat Technology (→  115)
- Diagnostic settings (→  70)

##### "Application" menu


- Measuring units (→  132)
- Measured values (→  135)
- Sensor (→  136)
- Current output (→  148)
- HART output (→  151)

##### "System" menu

- Device management (→  163)
- User management (→  165)
- Bluetooth configuration (→  167)
- Display (→  167)
- Geolocation (→  171)
- Information (→  160)
- Software configuration (→  176)












































### 3.1.2 Commissioning

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

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

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

#### The following parameters are configured in the Commissioning wizard:

- Device identification (→  34)
  - Device tag (→  34)
  - Device name (→  34)
  - Serial number (→  34)
  - Extended order code 1 (→  35)
  - Extended order code 2 (→  35)
  - Extended order code 3 (→  35)
  - Locking status (→  36)
  - HART short tag (→  37)
  - HART date code (→  37)
  - HART descriptor (→  37)
  - HART message (→  37)
  - HART address (→  38)
- Measurement adjustments (→  38)
  - Assign PV (→  38)
  - Damping (→  38)
  - Pressure unit (→  39)
  - Temperature unit (→  39)
  - Scaled variable unit (→  40)
  - Zero adjustment (→  42)
  - Pressure (→  43)
- Output settings (→  43)
  - Output current transfer function (→  43)
  - Low flow cut off (→  43)
  - Lower Range Limit (→  44)
  - Upper Range Limit (→  44)
  - Minimum span (→  45)
  - Pressure (→  45)
  - Scaled variable (→  45)
  - Lower range value output (→  45)
  - Upper range value output (→  46)
  - Scaled variable transfer function (→  44)
  - Pressure value 1 (→  47)
  - Current range output (→  49)
  - Failure behavior current output (→  50)
  - Failure current (→  50)
  - Loop current mode (→  50)
  - Assign HART variables? (→  50)
  - Process variable output current (→  51)
  - Assign PV (→  38)
  - Assign SV (→  53)
  - Assign TV (→  54)
  - Assign QV (→  55)



### 3.1.3 Heartbeat Technology

Heartbeat Technology offers diagnostic functionality through continuous self-monitoring, the transmission of additional measured variables to an external Condition Monitoring system and the in-situ verification of measuring devices in the application.

Special Documentation "Heartbeat Monitoring + Verification"



SD02525P

#### "Heartbeat Verification" wizard

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

#### "SSD: Statistical Sensor Diagnostics" wizard

Using statistical analysis of the pressure signal, process anomalies such as plugged impulse lines can be detected. This wizard supports the settings and thresholds that should lead to a diagnostic message.

#### "Loop diagnostics" wizard

Using this wizard, changes in the current-voltage loop characteristics (baseline) can be used to detect unwanted installation anomalies such as creep currents caused by terminal corrosion or a deteriorating power supply that can lead to an incorrect 4-20 mA measured value.

#### "Process window" wizard

This wizard uses user-defined limits for pressure and temperature to detect unwanted installation or application anomalies.

Applications:

- Defective heat tracer or insulation
- Frozen process connections
- Dynamic pressure peaks etc.

### 3.1.4 Safety mode

The write protection guards the device settings against overwriting. In addition, it is recommended for safety applications to confirm the safety relevant device settings. This ensures that the correct values have been entered and downloaded to device.

This input can be used as the confirmation sequence instead of manual checklists. After the safety relevant device settings have been confirmed, the device is marked with the property Safety-locked. This indicates that the safety relevant parameter settings have been checked and evaluated as correct.

To unlock the safety locking the sequence needs to be restarted. The safety locking is deactivated when the safety unlocking code (= safety locking code) is entered.

### 3.1.5 Proof testing

The proof test will simulate the current output.

The safety function is not guaranteed during proof test. Alternative process control in manual must be taken to ensure process safety.

Note: It is only possible to perform a proof test when the device has no alarm and the hardware write protection switch is off.


## 3.2 "Guidance" menu







Navigation  Guidance










### 3.2.1 "Commissioning" wizard

Navigation  Guidance → Commissioning

#### "Device identification" wizard


Navigation  Guidance → Commissioning → Device ident.

|                       |  |   |
|-----------------------|--|---|
| <b>Device tag</b>     |  |    |
| <b>Navigation</b>     |  Guidance → Commissioning → Device ident. → Device tag  |   |
| <b>Description</b>    | Enter a unique name for the measuring point to identify the device quickly within the plant.   |   |
| <b>User entry</b>     | Character string comprising numbers, letters and special characters (32)   |   |
| <hr/>                 |  |   |
| <b>Device name</b>    |  |   |
| <b>Navigation</b>     |  Guidance → Commissioning → Device ident. → Device name   |   |
| <b>Description</b>    | Displays the name of the transmitter. It can also be found on the nameplate of the transmitter.  |   |
| <b>User interface</b> | Max. 32 characters such as letters or numbers.   |   |
| <hr/>                 |  |   |
| <b>Serial number</b>  |  |  |
| <b>Navigation</b>     |  Guidance → Commissioning → Device ident. → Serial number   |   |
| <b>Description</b>    | Displays the serial number of the measuring device.<br> The number can be found on the nameplate of the sensor and transmitter. |   |
| <b>User interface</b> | Max. 11-digit character string comprising letters and numbers.   |   |

|                               |   |
|-------------------------------|---|
| <b>Additional information</b> | <i>Description</i>  |
|                               |  <b>Uses of the serial number</b> <ul style="list-style-type: none"> <li>▪ To identify the measuring device quickly, e.g. when contacting Endress+Hauser.</li> <li>▪ To obtain specific information on the measuring device using the Device Viewer: <a href="http://www.endress.com/deviceviewer">www.endress.com/deviceviewer</a></li> </ul> |
| <hr/>                         |   |
| <b>Extended order code 1</b>  |    |
| <b>Navigation</b>             |  Guidance → Commissioning → Device ident. → Ext. order cd. 1   |
| <b>Description</b>            | The extended order code is an alphanumeric code containing all information to identify the device and its options.  |
| <b>User interface</b>         | Character string  |
| <b>Factory setting</b>        | –   |
| <b>Additional information</b> | <i>Description</i>  |
|                               | 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.  |
| <hr/>                         |   |
| <b>Extended order code 2</b>  |    |
| <b>Navigation</b>             |  Guidance → Commissioning → Device ident. → Ext. order cd. 2   |
| <b>Description</b>            | 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.  |
| <b>User interface</b>         | Character string  |
| <b>Factory setting</b>        | –   |
| <hr/>                         |   |
| <b>Extended order code 3</b>  |    |
| <b>Navigation</b>             |  Guidance → Commissioning → Device ident. → Ext. order cd. 3   |
| <b>Description</b>            | 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.  |
| <b>User interface</b>         | 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 <b>Access status display</b> 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** 


|                    |  |
|--------------------|--|
| <b>Navigation</b>  |  Guidance → Commissioning → Device ident. → HART short tag    |
| <b>Description</b> | Defines the short tag for the measuring point.<br><br>Maximum length: 8 characters<br>Allowed characters: A-Z, 0-9, certain special characters |
| <b>User entry</b>  | Max. 8 characters: A to Z, 0 to 9 and certain special characters (e.g. punctuation marks, @, %).   |


**HART date code** 

|                               |  |
|-------------------------------|--|
| <b>Navigation</b>             |  Guidance → Commissioning → Device ident. → HART date code  |
| <b>Description</b>            | Date of the last configuration change  |
| <b>User entry</b>             | Character string comprising numbers, letters and special characters (10)   |
| <b>Additional information</b> | Date format: YYYY-MM-DD<br><br> Make sure you adhere to this format when entering the date. Otherwise errors may occur in individual HART commands. |

**HART descriptor** 

|                    |  |
|--------------------|--|
| <b>Navigation</b>  |  Guidance → Commissioning → Device ident. → HART descriptor |
| <b>Description</b> | Description for the measuring point.   |
| <b>User entry</b>  | Character string comprising numbers, letters and special characters (16)   |


**HART message** 

|                    |   |
|--------------------|---|
| <b>Navigation</b>  |  Guidance → Commissioning → Device ident. → HART message |
| <b>Description</b> | A HART message which is sent via the HART protocol when requested by the master.  |
| <b>User entry</b>  | Character string comprising numbers, letters and special characters (32)  |


---

**HART address** 


---

|                               |   |
|-------------------------------|---|
| <b>Navigation</b>             |  Guidance → Commissioning → Device ident. → HART address   |
| <b>Description</b>            | Define the HART address of the device.  |
| <b>User entry</b>             | 0 to 63   |
| <b>Additional information</b> | <ul style="list-style-type: none"> <li>■ 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).</li> <li>■ Only addresses in the range 0 to 15 are permitted for a system according to HART 5.0.</li> <li>■ All addresses in the range 0 to 63 are permitted for a system with HART 6.0 and higher.</li> </ul> |


**"Measurement adjustments" wizard**

*Navigation*  Guidance → Commissioning → Meas. adjust.


---

**Assign PV** 



---

|                    |  |
|--------------------|--|
| <b>Navigation</b>  |  Guidance → Commissioning → Meas. adjust. → Assign PV |
| <b>Description</b> | Use this function to select a measured variable (HART device variable) for the primary dynamic variable (PV).                            |
| <b>Selection</b>   | <ul style="list-style-type: none"> <li>■ Pressure</li> <li>■ Scaled variable</li> </ul>  |


---

**Damping** 



---

|                    |   |
|--------------------|---|
| <b>Navigation</b>  |  Guidance → Commissioning → Meas. adjust. → Damping  |
| <b>Description</b> | <p>The damping is effective before the measured value is further processed, i.e., before the following processes:</p> <ul style="list-style-type: none"> <li>- Scaling</li> <li>- Limit value monitoring</li> <li>- Forwarding to display</li> <li>- Forwarding to Analog Input Block</li> </ul> <p>Note:<br/>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.</p> |
| <b>User entry</b>  | 0 to 999.0 s  |

**"Measurement adjustments" wizard**

*Navigation*  Guidance → Commissioning → Meas. adjust.

**Pressure unit**

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

| <b>Selection</b> | <i>SI units</i>   | <i>US units</i>                                       | <i>Other units</i>   |
|------------------|---|---|--|
|                  | <ul style="list-style-type: none"> <li>■ MPa</li> <li>■ kPa</li> <li>■ Pa</li> <li>■ bar</li> <li>■ mbar</li> <li>■ torr</li> <li>■ atm</li> <li>■ kgf/cm<sup>2</sup></li> <li>■ gf/cm<sup>2</sup></li> </ul> | <ul style="list-style-type: none"> <li>psi</li> </ul> | <ul style="list-style-type: none"> <li>■ inH<sub>2</sub>O</li> <li>■ inH<sub>2</sub>O (4°C)</li> <li>■ mmH<sub>2</sub>O</li> <li>■ mmH<sub>2</sub>O (4°C)</li> <li>■ mH<sub>2</sub>O</li> <li>■ mH<sub>2</sub>O (4°C)</li> <li>■ ftH<sub>2</sub>O</li> <li>■ inHg</li> <li>■ mmHg</li> </ul> |

**Temperature unit**

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

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


| <b>Selection</b> | <i>SI units</i>   | <i>US units</i>                                      |
|------------------|---|--|
|                  | <ul style="list-style-type: none"> <li>■ °C</li> <li>■ K</li> </ul> | <ul style="list-style-type: none"> <li>°F</li> </ul> |


**Factory setting** Country-specific:


- °C
- °F

**Additional information** *Selection*


**"Measurement adjustments" wizard**


*Navigation*  Guidance → Commissioning → Meas. adjust.

**Pressure unit** 

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

| <b>Selection</b> | <i>SI units</i>   | <i>US units</i>                                       | <i>Other units</i>   |
|------------------|---|---|--|
|                  | <ul style="list-style-type: none"> <li>▪ MPa</li> <li>▪ kPa</li> <li>▪ Pa</li> <li>▪ bar</li> <li>▪ mbar</li> <li>▪ torr</li> <li>▪ atm</li> <li>▪ kgf/cm<sup>2</sup></li> <li>▪ gf/cm<sup>2</sup></li> </ul> | <ul style="list-style-type: none"> <li>psi</li> </ul> | <ul style="list-style-type: none"> <li>▪ inH<sub>2</sub>O</li> <li>▪ inH<sub>2</sub>O (4°C)</li> <li>▪ mmH<sub>2</sub>O</li> <li>▪ mmH<sub>2</sub>O (4°C)</li> <li>▪ mH<sub>2</sub>O</li> <li>▪ mH<sub>2</sub>O (4°C)</li> <li>▪ ftH<sub>2</sub>O</li> <li>▪ inHg</li> <li>▪ mmHg</li> </ul> |

**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 | <i>SI units</i>   | <i>US units</i>   | <i>Imperial units</i>  |
|-----------|---|---|--|
|           | <ul style="list-style-type: none"> <li>▪ %</li> <li>▪ mm</li> <li>▪ cm</li> <li>▪ m</li> <li>▪ l</li> <li>▪ hl</li> <li>▪ m<sup>3</sup></li> <li>▪ g</li> <li>▪ kg</li> <li>▪ t</li> <li>▪ g/s</li> <li>▪ kg/s</li> <li>▪ kg/min</li> <li>▪ kg/h</li> <li>▪ t/min</li> <li>▪ t/h</li> <li>▪ t/d</li> <li>▪ m<sup>3</sup>/s</li> <li>▪ m<sup>3</sup>/min</li> <li>▪ m<sup>3</sup>/h</li> <li>▪ m<sup>3</sup>/d</li> <li>▪ l/s</li> <li>▪ l/min</li> <li>▪ l/h</li> <li>▪ Nm<sup>3</sup>/h</li> <li>▪ NI/h</li> <li>▪ Sm<sup>3</sup>/s</li> <li>▪ Sm<sup>3</sup>/min</li> <li>▪ Sm<sup>3</sup>/h</li> <li>▪ Sm<sup>3</sup>/d</li> <li>▪ Nm<sup>3</sup>/s</li> <li>▪ g/cm<sup>3</sup></li> <li>▪ kg/m<sup>3</sup></li> <li>▪ Nm<sup>3</sup>/min</li> <li>▪ Nm<sup>3</sup>/d</li> </ul> | <ul style="list-style-type: none"> <li>▪ ft</li> <li>▪ in</li> <li>▪ ft<sup>3</sup></li> <li>▪ gal (us)</li> <li>▪ bbl (us;oil)</li> <li>▪ oz</li> <li>▪ lb</li> <li>▪ STon</li> <li>▪ lb/s</li> <li>▪ lb/min</li> <li>▪ lb/h</li> <li>▪ STon/min</li> <li>▪ STon/h</li> <li>▪ STon/d</li> <li>▪ ft<sup>3</sup>/s</li> <li>▪ ft<sup>3</sup>/min</li> <li>▪ ft<sup>3</sup>/h</li> <li>▪ ft<sup>3</sup>/d</li> <li>▪ gal/s (us)</li> <li>▪ gal/min (us)</li> <li>▪ gal/h (us)</li> <li>▪ gal/d (us)</li> <li>▪ bbl/s (us;oil)</li> <li>▪ bbl/min (us;oil)</li> <li>▪ bbl/h (us;oil)</li> <li>▪ bbl/d (us;oil)</li> <li>▪ Sft<sup>3</sup>/min</li> <li>▪ Sft<sup>3</sup>/h</li> <li>▪ Sft<sup>3</sup>/d</li> </ul> | <ul style="list-style-type: none"> <li>▪ gal (imp)</li> <li>▪ gal/s (imp)</li> <li>▪ gal/min (imp)</li> <li>▪ gal/h (imp)</li> </ul> |
|           | <i>Custom-specific units</i>  |   |  |
|           | 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.

|                  |   |                 |
|------------------|---|-----------------|
| <b>Selection</b> | <i>SI units</i>   | <i>US units</i> |
|                  | <ul style="list-style-type: none"> <li>■ °C</li> <li>■ K</li> </ul> | °F              |

|                        |  |
|------------------------|--|
| <b>Factory setting</b> | Country-specific:  |
|                        | <ul style="list-style-type: none"> <li>■ °C</li> <li>■ °F</li> </ul> |

|                               |                  |
|-------------------------------|------------------|
| <b>Additional information</b> | <i>Selection</i> |
|-------------------------------|------------------|

### "Measurement adjustments" wizard

*Navigation*  Guidance → Commissioning → Meas. adjust.

---

## Zero adjustment

---

|                   |  |
|-------------------|--|
| <b>Navigation</b> |  Guidance → Commissioning → Meas. adjust. → Zero adjustment |
|-------------------|--|


|                    |   |
|--------------------|---|
| <b>Description</b> | Due to the mounting position of the measuring instrument, a pressure shift may occur. The pressure shift can be corrected with the zero adjustment. |
|--------------------|---|

|                  |   |
|------------------|---|
| <b>Selection</b> | <ul style="list-style-type: none"> <li>■ No</li> <li>■ Confirm</li> </ul> |
|------------------|---|


---

**Pressure**


---

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

**"Output settings" wizard**

*Navigation*  Guidance → Commissioning → Output settings

---

**Output current transfer function**


---

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

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

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

**User interface**

- Linear
- Square root \*

---

**Low flow cut off**


---



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


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


**User entry** 0.0 to 50.0 %

---

\* Visibility depends on order options or device settings

**"Output settings" wizard**

*Navigation*  Guidance → Commissioning → Output settings

**Scaled variable transfer function** 

**Navigation**  Guidance → Commissioning → Output settings → Scaled function

**Description**

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


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

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

**Selection**

- Linear
- Square root \*
- Table

**"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

\* Visibility depends on order options or device settings


---

**Minimum span**

---

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |  Guidance → Commissioning → Output settings → Minimum span |
| <b>Description</b>    | Specifies the smallest possible measuring span of the sensor.   |
| <b>User interface</b> | Signed floating-point number  |


**"Output settings" wizard**


*Navigation*  Guidance → Commissioning → Output settings

---

**Pressure**

---





|                   |   |
|-------------------|---|
| <b>Navigation</b> |  Guidance → Commissioning → Output settings → Pressure |
| <b>User entry</b> | Signed floating-point number  |

---


**Scaled variable**

---



|                   |  |
|-------------------|--|
| <b>Navigation</b> |  Guidance → Commissioning → Output settings → Scaled variable |
| <b>User entry</b> | Signed floating-point number   |


**"Output settings" wizard**


*Navigation*  Guidance → Commissioning → Output settings

---

**Lower range value output**

---



|                    |   |
|--------------------|---|
| <b>Navigation</b>  |  Guidance → Commissioning → Output settings → Low.range outp     |
| <b>Description</b> | Depending on which variable has been selected as "Process variable output current", define the related lower (4 mA) and upper range values (20 mA). |
| <b>User entry</b>  | Signed floating-point number  |

---

**Upper range value output**

---



|                    |   |
|--------------------|---|
| <b>Navigation</b>  | Guidance → Commissioning → Output settings → Upp.range outp   |
| <b>Description</b> | Depending on which variable has been selected as "Process variable output current", define the related lower (4 mA) and upper range values (20 mA). |
| <b>User entry</b>  | Signed floating-point number  |

---

**Lower Range Limit**

---

|                       |  |
|-----------------------|--|
| <b>Navigation</b>     | Guidance → Commissioning → Output settings → LRL   |
| <b>Description</b>    | Indicates the lower measuring limit of the sensor. |
| <b>User interface</b> | Signed floating-point number                       |

---

**Upper Range Limit**

---

|                       |  |
|-----------------------|--|
| <b>Navigation</b>     | Guidance → Commissioning → Output settings → URL   |
| <b>Description</b>    | Indicates the upper measuring limit of the sensor. |
| <b>User interface</b> | Signed floating-point number                       |


---

**Minimum span**

---

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     | Guidance → Commissioning → Output settings → Minimum span     |
| <b>Description</b>    | Specifies the smallest possible measuring span of the sensor. |
| <b>User interface</b> | 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

\* Visibility depends on order options or device settings

| Pressure value 2         |   |
|---|---|
| <b>Navigation</b>   |  Guidance → Commissioning → Output settings → Pressure 2     |
| <b>Description</b>  | Enter pressure for the second scaling point. "Scaled variable value 2" will be allocated to this pressure.                                    |
| <b>User entry</b>   | Signed floating-point number  |
| Scaled variable value 2  |   |
| <b>Navigation</b>   |  Guidance → Commissioning → Output settings → Scaled 2       |
| <b>Description</b>  | Enter value for the second scaling point. This value is allocated to "Pressure value 2".  |
| <b>User entry</b>   | Signed floating-point number  |
| Lower Range Limit   |   |
| <b>Navigation</b>   |  Guidance → Commissioning → Output settings → LRL          |
| <b>Description</b>  | Indicates the lower measuring limit of the sensor.  |
| <b>User interface</b>   | Signed floating-point number  |
| Upper Range Limit   |   |
| <b>Navigation</b>   |  Guidance → Commissioning → Output settings → URL          |
| <b>Description</b>  | Indicates the upper measuring limit of the sensor.  |
| <b>User interface</b>   | Signed floating-point number  |
| Minimum span  |   |
| <b>Navigation</b>   |  Guidance → Commissioning → Output settings → Minimum span |
| <b>Description</b>  | Specifies the smallest possible measuring span of the sensor.   |
| <b>User interface</b>   | 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  $\leq$  "low saturation", the output current is set to "low saturation". If Measured value  $\geq$  "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**

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |  Guidance → Commissioning → Output settings → Proc.var.curr. |
| <b>Description</b>    | Determines which process variable is transmitted via the current output.  |
| <b>User interface</b> | <ul style="list-style-type: none"> <li>■ Pressure</li> <li>■ Scaled variable</li> </ul>   |


**Current range output**

|                    |   |
|--------------------|---|
| <b>Navigation</b>  |  Guidance → Commissioning → Output settings → Current range  |
| <b>Description</b> | <p>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”.</p> <p>Note:<br/>Currents below 3.6 mA or above 21.5 mA can be used to signal an alarm.</p> |
| <b>Selection</b>   | <ul style="list-style-type: none"> <li>■ 4...20 mA (4...20.5 mA)</li> <li>■ 4...20 mA NE (3.8...20.5 mA)</li> <li>■ 4...20 mA US (3.9...20.8 mA)</li> </ul>   |

**Lower range value output**

|                    |   |
|--------------------|---|
| <b>Navigation</b>  |  Guidance → Commissioning → Output settings → Low.range outp     |
| <b>Description</b> | Depending on which variable has been selected as "Process variable output current", define the related lower (4 mA) and upper range values (20 mA). |
| <b>User entry</b>  | Signed floating-point number  |

**Upper range value output**


|                    |   |
|--------------------|---|
| <b>Navigation</b>  |  Guidance → Commissioning → Output settings → Upp.range outp     |
| <b>Description</b> | 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<sup>\*</sup>
  - Terminal voltage<sup>\*</sup>
  - Median of pressure signal<sup>\*</sup>
  - Noise of pressure signal<sup>\*</sup>
  - Signal noise detected<sup>\*</sup>
  - Percent of range
  - Loop current
  - Not used


---

\* Visibility depends on order options or device settings

|                               |  |
|-------------------------------|--|
| <b>Additional information</b> | <i>Selection</i> <ul style="list-style-type: none"> <li>▪ <b>Sensor pressure</b> option<br/>Sensor Pressure is the raw signal from sensor before damping and position adjustment.</li> <li>▪ <b>Terminal current</b> option<br/>The terminal current is the read-back current on terminal block.</li> <li>▪ <b>Signal noise detected</b> option<br/>0 % - Signal noise is within the permissible range.<br/>100 % - Signal noise is outside of the permissible range.</li> <li>▪ <b>Loop current</b> option<br/>The loop current is the output current set by the applied pressure.</li> </ul> |
|-------------------------------|--|

---

**Assign TV**


**Navigation**  Guidance → Commissioning → Output settings → Assign TV

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

**Selection**

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

|                               |  |
|-------------------------------|--|
| <b>Additional information</b> | <i>Selection</i> <ul style="list-style-type: none"> <li>▪ <b>Sensor pressure</b> option<br/>Sensor Pressure is the raw signal from sensor before damping and position adjustment.</li> <li>▪ <b>Terminal current</b> option<br/>The terminal current is the read-back current on terminal block.</li> <li>▪ <b>Signal noise detected</b> option<br/>0 % - Signal noise is within the permissible range.<br/>100 % - Signal noise is outside of the permissible range.</li> <li>▪ <b>Loop current</b> option<br/>The loop current is the output current set by the applied pressure.</li> </ul> |
|-------------------------------|--|

---

\* Visibility depends on order options or device settings

---

**Assign QV**



|                               |   |
|-------------------------------|---|
| <b>Navigation</b>             | Guidance → Commissioning → Output settings → Assign QV  |
| <b>Description</b>            | Use this function to select a measured variable (HART device variable) for the quaternary (fourth) dynamic variable (QV).   |
| <b>Selection</b>              | <ul style="list-style-type: none"> <li>■ Pressure</li> <li>■ Scaled variable</li> <li>■ Sensor temperature</li> <li>■ Sensor pressure</li> <li>■ Electronics temperature</li> <li>■ Terminal current<sup>*</sup></li> <li>■ Terminal voltage<sup>*</sup></li> <li>■ Median of pressure signal<sup>*</sup></li> <li>■ Noise of pressure signal<sup>*</sup></li> <li>■ Signal noise detected<sup>*</sup></li> <li>■ Percent of range</li> <li>■ Loop current</li> <li>■ Not used</li> </ul>   |
| <b>Additional information</b> | <p><i>Selection</i></p> <ul style="list-style-type: none"> <li>■ <b>Sensor pressure</b> option<br/>Sensor Pressure is the raw signal from sensor before damping and position adjustment.</li> <li>■ <b>Terminal current</b> option<br/>The terminal current is the read-back current on terminal block.</li> <li>■ <b>Signal noise detected</b> option<br/>0 % - Signal noise is within the permissible range.<br/>100 % - Signal noise is outside of the permissible range.</li> <li>■ <b>Loop current</b> option<br/>The loop current is the output current set by the applied pressure.</li> </ul> |

---

\* Visibility depends on order options or device settings

### 3.2.2 "Heartbeat Technology" submenu


#### "Heartbeat Verification" wizard

*Navigation*  Guidance → Heartbeat Techn. → Heartbeat Verif.

---

#### Heartbeat Verification

---

|                   |  |
|-------------------|--|
| <b>Navigation</b> |  Guidance → Heartbeat Techn. → Heartbeat Verif. → Heartbeat Config → Heartbeat Verif. |
| <b>Selection</b>  | <ul style="list-style-type: none"> <li>■ Start verification</li> <li>■ Show results</li> </ul>   |


#### "Mainboard module" wizard

*Navigation*  Guidance → Heartbeat Techn. → Heartbeat Verif. → Mainboard module

---

#### System status


---

|                       |  |
|-----------------------|--|
| <b>Navigation</b>     |  Guidance → Heartbeat Techn. → Heartbeat Verif. → Mainboard module → System status                            |
| <b>Description</b>    | Checks active measurement device errors at diagnostical behavior "alarm".<br>If an active error is detected, then verification will be performed but the overall result will always be "Failed". |
| <b>User interface</b> | <ul style="list-style-type: none"> <li>■ Not done</li> <li>■ Passed</li> <li>■ Not done</li> <li>■ Failed</li> </ul>   |

---

#### Output current

---

|                    |  |
|--------------------|--|
| <b>Navigation</b>  |  Guidance → Heartbeat Techn. → Heartbeat Verif. → Mainboard module → Output curr. |
| <b>Description</b> | Checks whether read-back current at the output matches the current set by the device.  |




---

|                       |  |
|-----------------------|--|
| <b>User interface</b> | <ul style="list-style-type: none"> <li>■ Not done</li> <li>■ Passed</li> <li>■ Not done</li> <li>■ Failed</li> </ul> |
|-----------------------|--|

---

### Software integrity

---

|                   |   |
|-------------------|---|
| <b>Navigation</b> |  Guidance → Heartbeat Techn. → Heartbeat Verif. → Mainboard module → Software integ. |
|-------------------|---|


**Description** Checks whether the function blocks of the software are executed in the correct order.

|                       |  |
|-----------------------|--|
| <b>User interface</b> | <ul style="list-style-type: none"> <li>■ Not done</li> <li>■ Passed</li> <li>■ Not done</li> <li>■ Failed</li> </ul> |
|-----------------------|--|

---

### RAM check

---

|                   |   |
|-------------------|---|
| <b>Navigation</b> |  Guidance → Heartbeat Techn. → Heartbeat Verif. → Mainboard module → RAM check |
|-------------------|---|


**Description** Checks the correct function of the RAM (Random Access Memory).

|                       |  |
|-----------------------|--|
| <b>User interface</b> | <ul style="list-style-type: none"> <li>■ Not done</li> <li>■ Passed</li> <li>■ Not done</li> <li>■ Failed</li> </ul> |
|-----------------------|--|

---

### ROM check

---

|                   |   |
|-------------------|---|
| <b>Navigation</b> |  Guidance → Heartbeat Techn. → Heartbeat Verif. → Mainboard module → ROM check |
|-------------------|---|


**Description** Checks the correct function of the ROM memory (Read-Only-Memory).

|                       |  |
|-----------------------|--|
| <b>User interface</b> | <ul style="list-style-type: none"> <li>■ Not done</li> <li>■ Passed</li> <li>■ Not done</li> <li>■ Failed</li> </ul> |
|-----------------------|--|

---

**Loop diagnostics**



---

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |  Guidance → Heartbeat Techn. → Heartbeat Verif. → Mainboard module → Loop diagn.                   |
| <b>Description</b>    | Checks whether the voltage/current values are within range or the voltage/current baseline defined with wizard.<br>"Failed" can indicate faulty power supply or grounding / wiring. |
| <b>User interface</b> | <ul style="list-style-type: none"> <li>■ Not done</li> <li>■ Passed</li> <li>■ Not done</li> <li>■ Failed</li> </ul>  |

---

**Sensor integrity**



---

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |  Guidance → Heartbeat Techn. → Heartbeat Verif. → Sensor module → Sensor integrity |
| <b>Description</b>    | Checks the integrity of the sensor. Scope of check depends on sensor type used.   |
| <b>User interface</b> | <ul style="list-style-type: none"> <li>■ Not done</li> <li>■ Passed</li> <li>■ Not done</li> <li>■ Failed</li> </ul>  |

---

**Membrane integrity**



---

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |  Guidance → Heartbeat Techn. → Heartbeat Verif. → Sensor module → Membrane integr. |
| <b>Description</b>    | Checks the integrity of the membrane.<br>Notice:<br>Not included in the scope of testing for metallic membranes.  |
| <b>User interface</b> | <ul style="list-style-type: none"> <li>■ Not done</li> <li>■ Passed</li> <li>■ Not done</li> <li>■ Failed</li> </ul>  |

---

**Sensor/membrane integrity**



---

|                       |  |
|-----------------------|--|
| <b>Navigation</b>     |  Guidance → Heartbeat Techn. → Heartbeat Verif. → Sensor module → Sensor/membrane |
| <b>Description</b>    | Checks the integrity of the sensor and membrane.   |
| <b>User interface</b> | <ul style="list-style-type: none"> <li>■ Not done</li> <li>■ Passed</li> <li>■ Not done</li> <li>■ Failed</li> </ul>   |

---

**Statistical Sensor Diagnostics**



---

|                       |  |
|-----------------------|--|
| <b>Navigation</b>     |  Guidance → Heartbeat Techn. → Heartbeat Verif. → Sensor module → SSD |
| <b>Description</b>    | Checks whether the actual values are within the defined signal noise thresholds.   |
| <b>User interface</b> | <ul style="list-style-type: none"> <li>■ Not done</li> <li>■ Passed</li> <li>■ Not done</li> <li>■ Failed</li> </ul>                                   |

---

**Analog path integrity**



---

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |  Guidance → Heartbeat Techn. → Heartbeat Verif. → Sensor module → Path integrity |
| <b>Description</b>    | Checks if the analog path of the sensor has changed from state of delivery.   |
| <b>User interface</b> | <ul style="list-style-type: none"> <li>■ Not done</li> <li>■ Passed</li> <li>■ Not done</li> <li>■ Failed</li> </ul>  |

---

**Verification result**



---

|                       |  |
|-----------------------|--|
| <b>Navigation</b>     |  Guidance → Heartbeat Techn. → Heartbeat Verif. → Verific. result → Verific. result |
| <b>User interface</b> | <ul style="list-style-type: none"> <li>▪ Not done</li> <li>▪ Passed</li> <li>▪ Not done</li> <li>▪ Failed</li> </ul>   |

---

**Save protocol?**



---

|                    |   |
|--------------------|---|
| <b>Navigation</b>  |  Guidance → Heartbeat Techn. → Heartbeat Verif. → Verific. result → Save protocol? |
| <b>Description</b> | The Report can be saved for archiving.  |
| <b>Selection</b>   | <ul style="list-style-type: none"> <li>▪ No</li> <li>▪ Yes</li> </ul>   |

---

**Inspector**



---

|                    |   |
|--------------------|---|
| <b>Navigation</b>  |  Guidance → Heartbeat Techn. → Heartbeat Verif. → Finish → Inspector |
| <b>Description</b> | The entered inspector name will be included in the report.  |
| <b>User entry</b>  | Character string comprising numbers, letters and special characters (96)  |

---

**Location**



---

|                    |  |
|--------------------|--|
| <b>Navigation</b>  |  Guidance → Heartbeat Techn. → Heartbeat Verif. → Finish → Location |
| <b>Description</b> | The entered value will be included in the report.  |
| <b>User entry</b>  | Character string comprising numbers, letters and special characters (96)   |

---

**Notes**



---

|                    |   |
|--------------------|---|
| <b>Navigation</b>  |  Guidance → Heartbeat Techn. → Heartbeat Verif. → Finish → Notes |
| <b>Description</b> | The entered value will be included in the report.   |
| <b>User entry</b>  | Character string comprising numbers, letters and special characters (255)   |

---

**Plant operator**



---

|                    |  |
|--------------------|--|
| <b>Navigation</b>  |  Guidance → Heartbeat Techn. → Heartbeat Verif. → Finish → Plant operator |
| <b>Description</b> | The entered value will be included in the report.  |
| <b>User entry</b>  | Character string comprising numbers, letters and special characters (96)   |

---

**Operating time (Verification)**



---

|                       |  |
|-----------------------|--|
| <b>Navigation</b>     |  Guidance → Heartbeat Techn. → Heartbeat Verif. → Finish → Operating time |
| <b>User interface</b> | Days (d), hours (h), minutes (m), seconds (s)  |

---

**Date/time Heartbeat Verification**



---

|                       |  |
|-----------------------|--|
| <b>Navigation</b>     |  Guidance → Heartbeat Techn. → Heartbeat Verif. → Finish → Date/time Heartbeat Verification   |
| <b>Description</b>    | Date and time of last Heartbeat Verification.<br>This value is updated with every Heartbeat verification.<br>Note:<br>If time information is not available, e.g. Heartbeat verification is started from display, '-----' is shown. |
| <b>User interface</b> | Character string comprising numbers, letters and special characters  |

---

**Status summary**



---

|                       |  |
|-----------------------|--|
| <b>Navigation</b>     |  Guidance → Heartbeat Techn. → Stat. Sens. Diag → Configuration → Status summary  |
| <b>Description</b>    | Activate SSD.  |
| <b>User interface</b> | <ul style="list-style-type: none"> <li>■ Deactivated</li> <li>■ Learning phase</li> <li>■ Monitoring inactive</li> <li>■ Monitoring active</li> <li>■ Monitoring active with event</li> <li>■ No baseline</li> </ul> |

---

**Status summary**



---

|                       |  |
|-----------------------|--|
| <b>Navigation</b>     |  Guidance → Heartbeat Techn. → Stat. Sens. Diag → Configuration → Status summary  |
| <b>Description</b>    | Please wait. Function is not ready.  |
| <b>User interface</b> | <ul style="list-style-type: none"> <li>■ Deactivated</li> <li>■ Learning phase</li> <li>■ Monitoring inactive</li> <li>■ Monitoring active</li> <li>■ Monitoring active with event</li> <li>■ No baseline</li> </ul> |

---

**Status summary**



---

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |  Guidance → Heartbeat Techn. → Stat. Sens. Diag → Configuration → Status summary   |
| <b>Description</b>    | <p>The signal noise is too small for the teach-in phase.</p> <p>Note:<br/>Teach-in is only possible while the process is running.</p> <p>Measures:<br/>Check valve position.<br/>If necessary, perform the teach-in procedure later while the process is running.</p> |
| <b>User interface</b> | <ul style="list-style-type: none"> <li>■ Deactivated</li> <li>■ Learning phase</li> <li>■ Monitoring inactive</li> <li>■ Monitoring active</li> <li>■ Monitoring active with event</li> <li>■ No baseline</li> </ul>  |

---

**Status summary**



---

|                       |  |
|-----------------------|--|
| <b>Navigation</b>     |  Guidance → Heartbeat Techn. → Stat. Sens. Diag → Configuration → Status summary  |
| <b>Description</b>    | The teach-in phase is completed. Continue or terminate the configuration.  |
| <b>User interface</b> | <ul style="list-style-type: none"> <li>■ Deactivated</li> <li>■ Learning phase</li> <li>■ Monitoring inactive</li> <li>■ Monitoring active</li> <li>■ Monitoring active with event</li> <li>■ No baseline</li> </ul> |

---

**Status summary**



---

|                       |  |
|-----------------------|--|
| <b>Navigation</b>     |  Guidance → Heartbeat Techn. → Stat. Sens. Diag → Configuration → Status summary  |
| <b>Description</b>    | The SSD is not active because the average value of the raw signal is outside the limits. The SSD is reactivated as soon as the average value is within the limits again. Adjust the limits if necessary.             |
| <b>User interface</b> | <ul style="list-style-type: none"> <li>■ Deactivated</li> <li>■ Learning phase</li> <li>■ Monitoring inactive</li> <li>■ Monitoring active</li> <li>■ Monitoring active with event</li> <li>■ No baseline</li> </ul> |

---

**Status summary**



---

|                       |  |
|-----------------------|--|
| <b>Navigation</b>     |  Guidance → Heartbeat Techn. → Stat. Sens. Diag → Configuration → Status summary  |
| <b>Description</b>    | The SSD has detected an event (e.g. blocked impulse line). Check whether maintenance work is required.   |
| <b>User interface</b> | <ul style="list-style-type: none"> <li>■ Deactivated</li> <li>■ Learning phase</li> <li>■ Monitoring inactive</li> <li>■ Monitoring active</li> <li>■ Monitoring active with event</li> <li>■ No baseline</li> </ul> |

---

**Status summary**



---

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |  Guidance → Heartbeat Techn. → Stat. Sens. Diag → Configuration → Status summary   |
| <b>Description</b>    | <p>The SSD is not active because the process conditions are too dynamic for reliable operation. If necessary, teach in a new baseline or adjust the sampling rate.</p> <p>The SSD is reactivated as soon as the average value of the raw signal is within the limits.</p> |
| <b>User interface</b> | <ul style="list-style-type: none"> <li>■ Deactivated</li> <li>■ Learning phase</li> <li>■ Monitoring inactive</li> <li>■ Monitoring active</li> <li>■ Monitoring active with event</li> <li>■ No baseline</li> </ul>  |

---

**Status summary**



---

|                       |  |
|-----------------------|--|
| <b>Navigation</b>     |  Guidance → Heartbeat Techn. → Stat. Sens. Diag → Configuration → Status summary  |
| <b>Description</b>    | The current signal noise is too small to activate the SSD.   |
| <b>User interface</b> | <ul style="list-style-type: none"> <li>■ Deactivated</li> <li>■ Learning phase</li> <li>■ Monitoring inactive</li> <li>■ Monitoring active</li> <li>■ Monitoring active with event</li> <li>■ No baseline</li> </ul> |

---

**Status summary**


---


|                       |  |
|-----------------------|--|
| <b>Navigation</b>     |  Guidance → Heartbeat Techn. → Stat. Sens. Diag → Configuration → Status summary  |
| <b>Description</b>    | <p>Baseline could not be created with following reasons:</p> <ul style="list-style-type: none"> <li>- There is not enough signal noise during building baseline phase.</li> <li>- There is a process change during building baseline phase.</li> </ul> |
| <b>User interface</b> | <ul style="list-style-type: none"> <li>■ Deactivated</li> <li>■ Learning phase</li> <li>■ Monitoring inactive</li> <li>■ Monitoring active</li> <li>■ Monitoring active with event</li> <li>■ No baseline</li> </ul>                                   |



---

**System status**


---

**Navigation**  Guidance → Heartbeat Techn. → Stat. Sens. Diag → Configuration → System status

**User interface**

- Idle
- No sufficient signal noise
- Stable
- Not stable
- Verify System Dynamics
- Process dynamic too high

---

**Signal status**


---

**Navigation**  Guidance → Heartbeat Techn. → Stat. Sens. Diag → Configuration → Signal status

**User interface**

- Idle
- Building Baseline
- Verifying Baseline
- Verifying baseline failed
- Monitoring
- Out of range
- Monitoring inactive

---

**Signal noise status**


---

**Navigation**  Guidance → Heartbeat Techn. → Stat. Sens. Diag → Configuration → Noise status

**User interface**

- Idle
- Building Baseline
- Verifying Baseline
- Verifying baseline failed
- Monitoring
- Out of range
- Monitoring inactive

---

**Baseline build process**


---

**Navigation**  Guidance → Heartbeat Techn. → Stat. Sens. Diag → Configuration → Baseline process

**User interface** 0 to 100 %

---

**Sample rate**


**Navigation** Guidance → Heartbeat Techn. → Stat. Sens. Diag → Configuration → Sample rate

**Description** Determines the sampling rate depending on the process conditions:

"Fast"  
homogeneous stable process with Gauss distribution.

"Medium"  
dynamic process

"Slow"  
extremely dynamic variable process

**Selection**

- Fast
- Medium
- Slow

---

**Counter Baseline creation SSD**

**Navigation** Guidance → Heartbeat Techn. → Stat. Sens. Diag → Configuration → Counter Baseline

**Description** Specifies how often the baseline has been rebuilt.

**User interface** Positive integer

---

**Baseline is available**

**Navigation** Guidance → Heartbeat Techn. → Stat. Sens. Diag → Configuration → Baseline avail.

**Description** Indicates whether a baseline already exists.


**User interface**

- Please select
- No
- Yes

---

**Signal status**



---

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |  Guidance → Heartbeat Techn. → Stat. Sens. Diag → Monitoring → Signal status   |
| <b>User interface</b> | <ul style="list-style-type: none"> <li>■ Idle</li> <li>■ Building Baseline</li> <li>■ Verifying Baseline</li> <li>■ Verifying baseline failed</li> <li>■ Monitoring</li> <li>■ Out of range</li> <li>■ Monitoring inactive</li> </ul> |

---

**Current Baseline signal**


---


|                       |  |
|-----------------------|--|
| <b>Navigation</b>     |  Guidance → Heartbeat Techn. → Stat. Sens. Diag → Monitoring → Curr. Baseline |
| <b>Description</b>    | Current average of the raw signal.   |
| <b>User interface</b> | Signed floating-point number   |

---

**Baseline Signal Upper Control Line**


---




|                    |   |
|--------------------|---|
| <b>Navigation</b>  |  Guidance → Heartbeat Techn. → Stat. Sens. Diag → Monitoring → Baseline S. UCL   |
| <b>Description</b> | <p>Upper limit for the average value of the raw signal. If the average value is above this limit, the SSD is inactive.</p> <p>Note:<br/>This parameter should not be greater than "Signal maximum value".</p> |
| <b>User entry</b>  | Signed floating-point number  |

---

**Baseline Signal Control Line**


---


|                       |  |
|-----------------------|--|
| <b>Navigation</b>     |  Guidance → Heartbeat Techn. → Stat. Sens. Diag → Monitoring → Baseline S. CL |
| <b>Description</b>    | Learned-in mean of the raw signal.   |
| <b>User interface</b> | Signed floating-point number   |

---

**Baseline Signal Lower Control Line**

---



**Navigation**  Guidance → Heartbeat Techn. → Stat. Sens. Diag → Monitoring → Baseline S. LCL

**Description** Lower limit for the average value of the raw signal. If the average value is below this limit, the SSD is inactive.

Note:

This parameter should not be less than "Signal minimum value".

**User entry** Signed floating-point number

---

**Signal minimum value**

---

**Navigation**  Guidance → Heartbeat Techn. → Stat. Sens. Diag → Monitoring → Minimum value

**Description** Minimum mean of the raw signal during the learning phase.

**User interface** Signed floating-point number

---

**Signal maximum value**

---

**Navigation**  Guidance → Heartbeat Techn. → Stat. Sens. Diag → Monitoring → Maximum value

**Description** Maximum mean of the raw signal during the learning phase.

**User interface** Signed floating-point number

---

**Signal noise status**

---

**Navigation**  Guidance → Heartbeat Techn. → Stat. Sens. Diag → Monitoring → Noise status


**User interface**

- Idle
- Building Baseline
- Verifying Baseline
- Verifying baseline failed
- Monitoring
- Out of range
- Monitoring inactive

---

**Current Baseline noise**


---


|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |  Guidance → Heartbeat Techn. → Stat. Sens. Diag → Monitoring → Current noise |
| <b>Description</b>    | Current signal noise (standard deviation) of the raw signal.  |
| <b>User interface</b> | Signed floating-point number  |

---

**Baseline Signal Noise Upper Control Line**


---




|                    |   |
|--------------------|---|
| <b>Navigation</b>  |  Guidance → Heartbeat Techn. → Stat. Sens. Diag → Monitoring → Baseline SN. UCL                        |
| <b>Description</b> | Upper limit for the noise of the raw signal. If the noise is above this limit, the SSD is inactive.<br>Note:<br>This parameter should not be greater than "Signal noise maximum value". |
| <b>User entry</b>  | Signed floating-point number  |

---

**Baseline Signal Noise Control Line**


---


|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |  Guidance → Heartbeat Techn. → Stat. Sens. Diag → Monitoring → Baseline SN. CL |
| <b>Description</b>    | Learned-in noise of the raw signal.   |
| <b>User interface</b> | Signed floating-point number  |

---

**Baseline Signal Noise Lower Control Line**


---



|                    |  |
|--------------------|--|
| <b>Navigation</b>  |  Guidance → Heartbeat Techn. → Stat. Sens. Diag → Monitoring → Baseline SN. LCL                   |
| <b>Description</b> | Lower limit for the noise of the raw signal. If the noise is below this limit, the SSD is inactive.<br>Note:<br>This parameter should not be less than "Signal noise minimum value". |
| <b>User entry</b>  | Signed floating-point number   |

---

**Baseline Signal Noise Minimum**

---



|                    |  |
|--------------------|--|
| <b>Navigation</b>  | Guidance → Heartbeat Techn. → Stat. Sens. Diag → Monitoring → Baseline SN. Min       |
| <b>Description</b> | Minimum value of the signal noise.<br>Below this value, the SSD cannot be activated. |
| <b>User entry</b>  | Signed floating-point number   |

---

**Signal noise minimum value**

---

|                       |  |
|-----------------------|--|
| <b>Navigation</b>     | Guidance → Heartbeat Techn. → Stat. Sens. Diag → Monitoring → Min. noise value |
| <b>Description</b>    | Minimum measured signal noise during the learning phase.                       |
| <b>User interface</b> | Signed floating-point number   |

---

**Signal noise maximum value**

---

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     | Guidance → Heartbeat Techn. → Stat. Sens. Diag → Monitoring → Max noise value |
| <b>Description</b>    | Maximum measured signal noise during the learning phase.                      |
| <b>User interface</b> | Signed floating-point number  |

---

**SSD Monitoring delay time**

---



|                   |  |
|-------------------|--|
| <b>Navigation</b> | Guidance → Heartbeat Techn. → Stat. Sens. Diag → Diag. settings → SSD Verz. Zeit |
| <b>User entry</b> | 0 to 86 400 s  |

---

**900 Event category**

---




|                    |   |
|--------------------|---|
| <b>Navigation</b>  | Guidance → Heartbeat Techn. → Stat. Sens. Diag → Diag. settings → 900Event category |
| <b>Description</b> | 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**   Guidance → Heartbeat Techn. → Stat. Sens. Diag → Diag. settings → 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

---

### SSD Out of range delay time

---



**Navigation**  Guidance → Heartbeat Techn. → Stat. Sens. Diag → Diag. settings → SSD Delay time

**User entry** 0 to 604800 s

---

### 906 Event category

---

**Navigation**   Guidance → Heartbeat Techn. → Stat. Sens. Diag → Diag. settings → 906Event category

**Description** Select category for diagnostic message.

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

---

**SSD: Statistical Sensor Diagnostics**


|                    |  |
|--------------------|--|
| <b>Navigation</b>  | Guidance → Heartbeat Techn. → Stat. Sens. Diag → Activ./Deactiv. → Stat. Sens. Diag  |
| <b>Description</b> | Enable or disable SSD.<br>After selecting "Disable", no statistical sensor diagnosis takes place. No diagnostic messages are output. |
| <b>Selection</b>   | <ul style="list-style-type: none"> <li>■ Disable</li> <li>■ Enable</li> </ul>  |

---

**I have read the warning texts.**


|                    |   |
|--------------------|---|
| <b>Navigation</b>  | Guidance → Heartbeat Techn. → Loop diagn. → Configuration → warning texts   |
| <b>Description</b> | The characterization of the electrical loop requires intermediate generation of a current output of 4 mA and 20 mA.<br>Therefore, do not use the device in an active current loop during initialization of the Signal Loop Diagnostics. |
| <b>Selection</b>   | Yes   |

---

**Baseline status**


|                       |   |
|-----------------------|---|
| <b>Navigation</b>     | Guidance → Heartbeat Techn. → Loop diagn. → Configuration → Baseline status                                   |
| <b>Description</b>    | "Failed"<br>Means, baseline is not available or creation not possible.<br>"Success"<br>Baseline is available. |
| <b>User interface</b> | <ul style="list-style-type: none"> <li>■ Failed</li> <li>■ Success</li> </ul>                                 |



---

**Baseline build process**



---

|                       |  |
|-----------------------|--|
| <b>Navigation</b>     |  Guidance → Heartbeat Techn. → Loop diagn. → Configuration → Baseline process |
| <b>User interface</b> | 0 to 100 %   |

---

**Timestamp Baseline**



---

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |  Guidance → Heartbeat Techn. → Loop diagn. → Configuration → Timestamp BL  |
| <b>Description</b>    | Time stamp when the baseline was recorded (current-voltage curve).<br>At this time, the upper terminal voltage (U1) was determined at 4 mA and the lower terminal voltage (U2) was determined at 20 mA. |
| <b>User interface</b> | Character string comprising numbers, letters and special characters   |

---

**Resistance Baseline**



---

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |  Guidance → Heartbeat Techn. → Loop diagn. → Configuration → Resistance BL |
| <b>Description</b>    | Displays the resistance value of the baseline (slope of the current-voltage curve).   |
| <b>User interface</b> | Positive floating-point number  |

---

**Supply voltage Baseline**



---

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |  Guidance → Heartbeat Techn. → Loop diagn. → Configuration → Supply volt. BL |
| <b>Description</b>    | Displays the point from which the baseline is built (voltage at the point where the current-voltage curve is generated).  |
| <b>User interface</b> | 0.0 to 50.0 V   |

---

**Timestamp previous Baseline**



---

|                       |  |
|-----------------------|--|
| <b>Navigation</b>     |  Guidance → Heartbeat Techn. → Loop diagn. → Configuration → Timestamp pre BL   |
| <b>Description</b>    | Time stamp when the previous baseline was recorded (current-voltage curve).<br>At this time, the upper terminal voltage (U1) was determined at 4 mA and the lower terminal voltage (U2) was determined at 20 mA. |
| <b>User interface</b> | Character string comprising numbers, letters and special characters  |

---

**Resistance previous Baseline**



---

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |  Guidance → Heartbeat Techn. → Loop diagn. → Configuration → Resist. pre. BL |
| <b>Description</b>    | Displays the resistance value of the previous baseline (slope of the previous current-voltage curve).   |
| <b>User interface</b> | Positive floating-point number  |

---

**Supply voltage previous Baseline**


---


|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |  Guidance → Heartbeat Techn. → Loop diagn. → Configuration → Voltage pre. BL |
| <b>Description</b>    | Displays the point from which the previous baseline is built (voltage at the point where the previous current-voltage curve was generated).                     |
| <b>User interface</b> | 0.0 to 50.0 V   |

---

**Tolerated deviation +/-**


---



|                    |   |
|--------------------|---|
| <b>Navigation</b>  |  Guidance → Heartbeat Techn. → Loop diagn. → Monitoring → Toler. deviation |
| <b>Description</b> | A value should be chosen to ensure that normal voltage deviations do not lead to unwanted messages.<br><br>Default<br>1.5 V DC                                |
| <b>User entry</b>  | 0.5 to 3.0 V  |

---

**806 Event delay**

---



|                    |  |
|--------------------|--|
| <b>Navigation</b>  | Guidance → Heartbeat Techn. → Loop diagn. → Diag. settings → 806 Event delay   |
| <b>Description</b> | Displays how long the triggering status must be present until an event message is issued. Used to filter out short-term signal interference. |
| <b>User entry</b>  | 0 to 60 s  |

---

**806 Event category**

---



|                    |  |
|--------------------|--|
| <b>Navigation</b>  | Guidance → Heartbeat Techn. → Loop diagn. → Diag. settings → 806Event category   |
| <b>Description</b> | Select category for diagnostic message.  |
| <b>Selection</b>   | <ul style="list-style-type: none"> <li>■ Failure (F)</li> <li>■ Function check (C)</li> <li>■ Out of specification (S)</li> <li>■ Maintenance required (M)</li> <li>■ No effect (N)</li> </ul> |

---

**806 Diagnostic behavior**

---



|                    |  |
|--------------------|--|
| <b>Navigation</b>  | Guidance → Heartbeat Techn. → Loop diagn. → Diag. settings → 806 Diag. behav.  |
| <b>Description</b> | <p>Select event behavior</p> <p>"Logbook entry only": no digital or analog transmission of the message.</p> <p>"Warning": Current output unchanged. Message is output digitally (default).</p> <p>If the permissible conditions are reached again, the warning is no longer available in the instrument.</p> |
| <b>Selection</b>   | <ul style="list-style-type: none"> <li>■ Warning</li> <li>■ Logbook entry only</li> </ul>  |

---

**Loop diagnostics**


**Navigation** Guidance → Heartbeat Techn. → Loop diagn. → Activ./Deactiv. → Loop diagn.

**Description** Enable/disable loop diagnostics.  
 Note:  
 If the function is disabled, there is no analysis and no event message.

**Selection**

- Disable
- Enable

---

**500 Process alert pressure**


**Navigation** Guidance → Heartbeat Techn. → Process window → Pressure range → 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** Guidance → Heartbeat Techn. → Process window → Pressure range → 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**


|                    |   |
|--------------------|---|
| <b>Navigation</b>  | Guidance → Heartbeat Techn. → Process window → Pressure range → High alert value                                    |
| <b>Description</b> | Set range.<br>If this limit value is exceeded or undercut, a diagnostic event is generated. There is no hysteresis. |
| <b>User entry</b>  | Signed floating-point number  |

---

**Counter underruns of user limit Pmin**

|                       |  |
|-----------------------|--|
| <b>Navigation</b>     | Guidance → Heartbeat Techn. → Process window → Pressure range → Counter < P user   |
| <b>Description</b>    | 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. |
| <b>User interface</b> | 0 to 65 535  |

---

**Counter overruns of user limit Pmax**

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     | Guidance → Heartbeat Techn. → Process window → Pressure range → Counter > P user  |
| <b>Description</b>    | 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. |
| <b>User interface</b> | 0 to 65 535   |

---

**500 Diagnostic behavior**
**Navigation**

Guidance → Heartbeat Techn. → Process window → Pressure range → 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**

Guidance → Heartbeat Techn. → Process window → Pressure range → 500Event category

**Selection**

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

---

**501 Process alert scaled variable**
**Navigation**

Guidance → Heartbeat Techn. → Process window → Pressure range → 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**

---



|                    |   |
|--------------------|---|
| <b>Navigation</b>  | Guidance → Heartbeat Techn. → Process window → Pressure range → Low alert value                                     |
| <b>Description</b> | Set range.<br>If this limit value is exceeded or undercut, a diagnostic event is generated. There is no hysteresis. |
| <b>User entry</b>  | Signed floating-point number  |

---

**High alert value**

---



|                    |   |
|--------------------|---|
| <b>Navigation</b>  | Guidance → Heartbeat Techn. → Process window → Pressure range → High alert value                                    |
| <b>Description</b> | Set range.<br>If this limit value is exceeded or undercut, a diagnostic event is generated. There is no hysteresis. |
| <b>User entry</b>  | Signed floating-point number  |

---

**501 Diagnostic behavior**

---



|                    |  |
|--------------------|--|
| <b>Navigation</b>  | Guidance → Heartbeat Techn. → Process window → Pressure range → 501 Diag. behav.   |
| <b>Description</b> | Select event behavior<br>"Logbook entry only":<br>no digital or analog transmission of the message<br>"Warning": Current output unchanged. Message is output digitally (default).<br>"Alarm": Current output assumes the set alarm current.<br>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. |
| <b>Selection</b>   | <ul style="list-style-type: none"> <li>■ Off</li> <li>■ Alarm</li> <li>■ Warning</li> <li>■ Logbook entry only</li> </ul>  |

---

**501 Event category**

---

**Navigation**

Guidance → Heartbeat Techn. → Process window → Pressure range → 501Event category

**Selection**

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

---

**User temperature process alert**

---

**Navigation**

Guidance → Heartbeat Techn. → Process window → Temp. range → 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**

Guidance → Heartbeat Techn. → Process window → Temp. range → Low alert value

**Description**

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

**User entry**

-50 to 150 °C

---

**High alert value**

---

**Navigation**

Guidance → Heartbeat Techn. → Process window → Temp. range → High alert value

**Description**

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

**User entry**


-50 to 150 °C



---

**Counter underruns of user limit Tmin**


---

**Navigation**  Guidance → Heartbeat Techn. → Process window → Temp. range → Counter < T user

**User interface** 0 to 65 535

---

**Counter overruns of user limit Tmax**


---

**Navigation**  Guidance → Heartbeat Techn. → Process window → Temp. range → Counter > T user

**User interface** 0 to 65 535

---

**502 Diagnostic behavior** 


---

**Navigation**   Guidance → Heartbeat Techn. → Process window → Temp. range → 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**   Guidance → Heartbeat Techn. → Process window → Temp. range → 502Event category

**Selection**

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

### 3.2.3 "Safety mode" wizard

*Navigation*  Guidance → Safety mode


#### "Preparation" wizard

*Navigation*  Guidance → Safety mode → Preparation

---

#### I have read the warning texts.

---

**Navigation**  Guidance → Safety mode → Preparation → warning texts

**Description**

- Prior to using the wizard, read the Functional Safety Manual or the WHG documentation.
- In the wizard, safety-relevant parameter settings of the device will be shown.
- The user must confirm the correctness of these settings.
- By clicking "Finish" at the end of the wizard, the device is safety locked.
- A documentation of the safety-relevant parameter settings can be generated at the end of the wizard.
- The device can be unlocked via this wizard in case the device is safety locked.
- If the wizard is aborted, the device locking status will not be changed!

**Selection** Yes


#### "Preparation" wizard

*Navigation*  Guidance → Safety mode → Preparation

---

#### Enter safety unlocking code

---

**Navigation**  Guidance → Safety mode → Preparation → Safe.unlock code


**Description** The Safety locking/unlocking code can be found in the corresponding safety manual or the WHG documentation.

**User entry** 0 to 65 535

---

#### Locking status

---

**Navigation**  Guidance → Safety mode → Preparation → 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 <b>Access status display</b> 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. |


**"Preparation" wizard**

*Navigation*  Guidance → Safety mode → Preparation

---

**Proof test via Bluetooth allowed?**



**Navigation**  Guidance → Safety lock → Preparation → BLE proof test

**Description** After completion of the Safety mode wizard, the device will be write protected via software lock.

To use the proof test wizard (optional), the device does not have to be unlocked.


It must be defined, if the proof test wizard via Bluetooth is allowed.

- Selection**
- No
  - Yes

**"Preparation" wizard**

*Navigation*  Guidance → Safety lock → Preparation


**Enter safety locking code** 


|                               |  |
|-------------------------------|--|
| <b>Navigation</b>             |  Guidance → Safety lock → Preparation → Safety code |
| <b>Description</b>            | Enter the locking code to start the SIL/WHG locking sequence.  |
| <b>User entry</b>             | 0 to 65 535  |
| <b>Additional information</b> | <b>Locking codes</b> <ul style="list-style-type: none"> <li>■ WHG: 7450</li> <li>■ SIL: 7452</li> <li>■ SIL and WHG: 7454</li> </ul> |


**"Preparation" wizard**

*Navigation*  Guidance → Safety mode → Preparation

**Character test string**


|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |  Guidance → Safety mode → Preparation → Char.test string   |
| <b>Description</b>    | <p>The following character string is displayed:<br/>0123456789+,-.</p> <p>Set the "Confirm" parameter to "Yes" if this string is rendered correctly.<br/>Set the "Confirm" parameter to "No" if this string is not rendered correctly. Safety locking is not possible in this case.</p> |
| <b>User interface</b> | Character string comprising numbers, letters and special characters   |

**Confirm** 


|                    |   |
|--------------------|---|
| <b>Navigation</b>  |  Guidance → Safety mode → Preparation → Confirm  |
| <b>Description</b> | <p>The following character string is displayed:<br/>0123456789+,-.</p> <p>Set the "Confirm" parameter to "Yes" if this string is rendered correctly.<br/>Set the "Confirm" parameter to "No" if this string is not rendered correctly. Safety locking is not possible in this case.</p> |

- Selection**
- No
  - Yes

**"Preparation" wizard**

*Navigation*  Guidance → Safety mode → Preparation

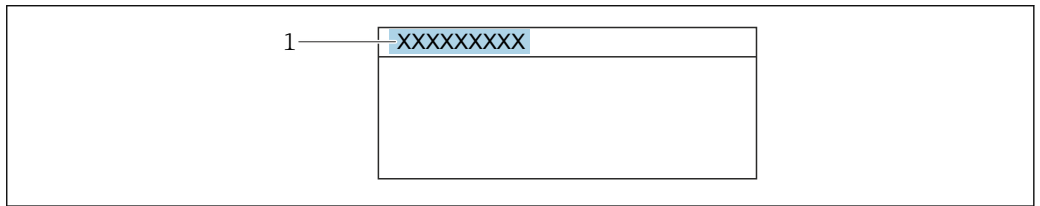
**Device tag**

**Navigation**  Guidance → Safety mode → Preparation → Device tag

**Description** Displays a unique name for the measuring point so it can be identified quickly within the plant. The name is displayed in the header.

**User interface** Max. 32 characters, such as letters, numbers or special characters (e.g. @, %, /).

**Additional information** *User interface*




A0029422

1 Position of the header text on the display

The number of characters displayed depends on the characters used.

**Device name**

**Navigation**  Guidance → Safety mode → Preparation → 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 → Safety mode → Preparation → Serial number

**Description** Displays the serial number of the measuring device.

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

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

**Additional information** *Description*


 **Uses of the serial number**

- To identify the measuring device quickly, e.g. when contacting Endress+Hauser.
- To obtain specific information on the measuring device using the Device Viewer: [www.endress.com/deviceviewer](http://www.endress.com/deviceviewer)

---

**Firmware version**



---

**Navigation**  Guidance → Safety mode → Preparation → 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**  Guidance → Safety mode → Preparation → Hardware version

**User interface** Character string comprising numbers, letters and special characters

---

**Confirm**


---

**Navigation**  Guidance → Safety mode → Preparation → Confirm

**Description** Confirm connection to the correct device.


**Selection**

- No
- Yes


**"Preparation" wizard**

*Navigation*  Guidance → Safety mode → Preparation


**CRC device configuration**

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |  Guidance → Safety mode → Preparation → CRC device conf.   |
| <b>Description</b>    | CRC device configuration based on current settings of safety relevant parameters. The CRC device configuration is unique and can be used to detect changes in safety relevant parameter settings. |
| <b>User interface</b> | 0 to 65 535   |


**Stored CRC device configuration**

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |  Guidance → Safety mode → Preparation → Stored CRC conf. |
| <b>Description</b>    | Stored CRC after the last safety lock. Factory delivery is 65535 means that the device has not yet been safety locked.                    |
| <b>User interface</b> | 0 to 65 535   |

**Timestamp stored CRC device config.**

|                       |  |
|-----------------------|--|
| <b>Navigation</b>     |  Guidance → Safety mode → Preparation → Time stored CRC |
| <b>Description</b>    | Gives the time stamp when the CRC was last stored following completion of the safety lock wizard.  |
| <b>User interface</b> | Character string comprising numbers, letters and special characters  |


**Operating time**

|                               |   |
|-------------------------------|---|
| <b>Navigation</b>             |  Guidance → Safety mode → Preparation → Operating time |
| <b>Description</b>            | Indicates how long the device has been in operation.  |
| <b>Additional information</b> | Maximum time: 9 999 d (≈ 27 years)  |

---

**Configuration counter**


---

**Navigation**  Guidance → Safety mode → Preparation → 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



**"Confirmation" wizard**

*Navigation*  Guidance → Safety mode → Confirmation

---

**Zero adjustment offset**


---

**Navigation**  Guidance → Safety mode → Confirmation → Zero offset  
 Guidance → Safety mode → Confirmation → Zero offset


**Description** Assigned value of zero adjustment due to mounting position.

**User interface** Character string comprising numbers, letters and special characters

---

**HP/LP swap**


---

**Navigation**  Guidance → Safety mode → Confirmation → HP/LP swap

**Description** Assigned setting high pressure / low pressure.

**User interface**


- No
- Yes



---

## Damping


---

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |  Guidance → Safety mode → Confirmation → Damping |
| <b>Description</b>    | Assigned damping value.   |
| <b>User interface</b> | Character string comprising numbers, letters and special characters   |

---

## Sensor pressure range behavior



---

|                       |  |
|-----------------------|--|
| <b>Navigation</b>     |  Guidance → Safety mode → Confirmation → P-range behavior |
| <b>Description</b>    | Assigned event behavior in case of over/under pressure outside of measuring range.   |
| <b>User interface</b> | <ul style="list-style-type: none"> <li>■ Alarm</li> <li>■ Warning</li> <li>■ Remark</li> <li>■ Special</li> </ul>                          |

---

## Confirm

---

|                   |  |
|-------------------|--|
| <b>Navigation</b> |  Guidance → Safety mode → Confirmation → Confirm<br> Guidance → Safety mode → Confirmation → Confirm |
| <b>Selection</b>  | <ul style="list-style-type: none"> <li>■ No</li> <li>■ Yes</li> </ul>  |


### "Confirmation" wizard

*Navigation*  Guidance → Safety mode → Confirmation

---

## Output current transfer function


---

|                       |  |
|-----------------------|--|
| <b>Navigation</b>     |  Guidance → Safety mode → Confirmation → Curr. trans.func |
| <b>Description</b>    | Assigned transfer function for current output.<br>NOTE<br>"Square root" is only available with differential pressure measurement.            |
| <b>User interface</b> | <ul style="list-style-type: none"> <li>■ Linear</li> <li>■ Square root</li> </ul>  |

---

**Low cutoff**


---



|                       |  |
|-----------------------|--|
| <b>Navigation</b>     |  Guidance → Safety mode → Confirmation → Low cutoff |
| <b>User interface</b> | Character string comprising numbers, letters and special characters  |

---

**Confirm**


---




|                              |   |
|------------------------------|---|
| <b>Navigation</b>            |  Guidance → Safety mode → Confirmation → Confirm |
| <b>Selection</b>             | <ul style="list-style-type: none"> <li>■ No</li> <li>■ Yes</li> </ul>   |
| <b>"Confirmation" wizard</b> |   |
| <i>Navigation</i>            |  Guidance → Safety mode → Confirmation          |

---

**Measuring mode current output**



---

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |  Guidance → Safety mode → Confirmation → Output mode |
| <b>Description</b>    | Assigned setting of curve form of current output.   |
| <b>User interface</b> | <ul style="list-style-type: none"> <li>■ Standard</li> <li>■ Inverse</li> <li>■ Bi-directional</li> </ul>                               |

---

**Failure behavior current output**



---

|                       |  |
|-----------------------|--|
| <b>Navigation</b>     |  Guidance → Safety mode → Confirmation → Failure behav. |
| <b>Description</b>    | Assigned value of current output in case of an error.  |
| <b>User interface</b> | <ul style="list-style-type: none"> <li>■ Min.</li> <li>■ Max.</li> </ul>   |

---

**Current range output**



---

|                       |  |
|-----------------------|--|
| <b>Navigation</b>     |  Guidance → Safety mode → Confirmation → Current range  |
| <b>Description</b>    | Assigned current range used to transmit the measured value.  |
| <b>User interface</b> | <ul style="list-style-type: none"> <li>■ 4...20 mA (4...20.5 mA)</li> <li>■ 4...20 mA NE (3.8...20.5 mA)</li> <li>■ 4...20 mA US (3.9...20.8 mA)</li> <li>■ Customer specific</li> </ul> |

---

**Lower range value output**



---

|                       |  |
|-----------------------|--|
| <b>Navigation</b>     |  Guidance → Safety mode → Confirmation → Low.range outp |
| <b>Description</b>    | Assigned value 4 mA.   |
| <b>User interface</b> | Character string comprising numbers, letters and special characters  |

---

**Upper range value output**



---

|                       |  |
|-----------------------|--|
| <b>Navigation</b>     |  Guidance → Safety mode → Confirmation → Upp.range outp |
| <b>Description</b>    | Assigned value 20 mA.  |
| <b>User interface</b> | Character string comprising numbers, letters and special characters  |

---

**Assign PV**



---

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |  Guidance → Safety mode → Confirmation → Assign PV |
| <b>Description</b>    | Identifies the process variable linked with the primary variable. Primary variable is used in HART as current output.                 |
| <b>User interface</b> | <ul style="list-style-type: none"> <li>■ Pressure</li> <li>■ Scaled variable</li> </ul>   |

---

**Confirm** 


---

**Navigation**  Guidance → Safety mode → Confirmation → Confirm

**Selection**

- No
- Yes


**"Confirmation" wizard**

*Navigation*  Guidance → Safety mode → Confirmation

---

**Zero adjustment offset**


---

**Navigation**  Guidance → Safety mode → Confirmation → Zero offset

**Description** Assigned value of zero adjustment due to mounting position.

**User interface** Character string comprising numbers, letters and special characters

---

**Confirm** 



---

**Navigation**  Guidance → Safety mode → Confirmation → Confirm

**Selection**

- No
- Yes

**"Locking" wizard**

*Navigation*  Guidance → Safety mode → Locking

---

**Enter safety locking code** 


---

**Navigation**  Guidance → Safety mode → Locking → Safety code

**Description** Enter the locking code to start the SIL/WHG locking sequence.

**User entry** 0 to 65 535

- Additional information**
- **Locking codes**
  - WHG: 7450
  - SIL: 7452
  - SIL and WHG: 7454

**Locking status**


**Navigation**  Guidance → Safety mode → Locking → 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 <b>Access status display</b> 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. |

**Save protocol?**

**Navigation**  Guidance → Safety mode → Locking → Save protocol?


**Description** The Report can be saved for archiving.


- Selection**
- No
  - Yes

**"Finish" wizard**

*Navigation*  Guidance → Proof test → Finish

**Inspector****Navigation**

 Guidance → Proof test → Finish → Inspector

 Guidance → Safety mode → Result → Inspector


**Description**


The entered inspector name will be included in the report.

**User entry**

Character string comprising numbers, letters and special characters (96)

**Location****Navigation**

 Guidance → Proof test → Finish → Location

 Guidance → Safety mode → Result → Location

**Description**

The entered value will be included in the report.

**User entry**

Character string comprising numbers, letters and special characters (96)

**Date/time****Navigation**

 Guidance → Safety mode → Result → Date/time

**User interface**

Character string comprising numbers, letters and special characters

**Notes****Navigation**

 Guidance → Proof test → Finish → Notes

 Guidance → Safety mode → Result → Notes

**Description**

The entered value will be included in the report.



**User entry**

Character string comprising numbers, letters and special characters (255)

---

**Plant operator**



---

|                    |   |
|--------------------|---|
| <b>Navigation</b>  |  Guidance → Proof test → Finish → Plant operator<br> Guidance → Safety mode → Result → Plant operator |
| <b>Description</b> | The entered value will be included in the report.   |
| <b>User entry</b>  | Character string comprising numbers, letters and special characters (96)  |

### 3.2.4 "Proof test" wizard

*Navigation*       Guidance → Proof test


#### "Preparation Proof test" wizard

*Navigation*       Guidance → Proof test → Prep. test


---

**I have read the warning texts.**



---

|                    |   |
|--------------------|---|
| <b>Navigation</b>  |  Guidance → Proof test → Prep. test → warning texts  |
| <b>Description</b> | <p>Loss of Safety function of protective system using safety-related output signal 4 to 20 mA</p> <ul style="list-style-type: none"> <li>- Read Functional safety manual or WHG documentation.</li> <li>- Do not use safety-related output signal 4 to 20 mA for Safety function of protective system</li> <li>- Suitable measures must be taken to guarantee process safety during the proof test</li> </ul> |
| <b>Selection</b>   | Yes   |

**"Preparation Proof test" wizard**

*Navigation*  Guidance → Proof test → Prep. test

**Visual inspection**

**Navigation**  Guidance → Proof test → Prep. test → Visual inspect.

**Description** The visual inspection may include:


- Cable gland
- Wiring
- Terminal block
- Housing/ housing lid
- Mechanical and electrical installation

For further information refer to safety manual or WHG documentation.

**Selection**

- Please select
- Failed
- Passed


**Notes**

**Navigation**  Guidance → Proof test → Prep. test → Notes

**Description** The entered value will be included in the report.

**User entry** Character string comprising numbers, letters and special characters (255)

**"Preparation Proof test" wizard**

*Navigation*  Guidance → Proof test → Prep. test

**Device tag**

**Navigation**  Guidance → Proof test → Prep. test → Device tag

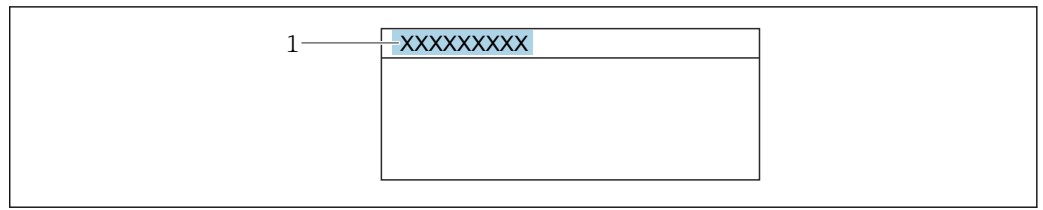
**Description** Displays a unique name for the measuring point so it can be identified quickly within the plant. The name is displayed in the header.

**User interface** Max. 32 characters, such as letters, numbers or special characters (e.g. @, %, /).



**Additional information**

*User interface*



A0029422

1 Position of the header text on the display


The number of characters displayed depends on the characters used.

---

**Device name**

---

**Navigation**

 Guidance → Proof test → Prep. test → 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 → Proof test → Prep. test → Serial number

**Description**

Displays the serial number of the measuring device.


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

**User interface**

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

**Additional information**

*Description*


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

---

**Firmware version**

---

**Navigation**

 Guidance → Proof test → Prep. test → 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**

Guidance → Proof test → Prep. test → Hardware version

**User interface**

Character string comprising numbers, letters and special characters

**"Preparation Proof test" wizard***Navigation*

Guidance → Proof test → Prep. test

---

**CRC device configuration**

---

**Navigation**

Guidance → Proof test → Prep. test → CRC device conf.

**Description**

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

**User interface**

0 to 65 535

---

**Stored CRC device configuration**

---

**Navigation**

Guidance → Proof test → Prep. test → Stored CRC conf.

**Description**

Stored CRC after the last safety lock. Factory delivery is 65535 means that the device has not yet been safety locked.

**User interface**

0 to 65 535

---

**Timestamp stored CRC device config.**

---

**Navigation**

Guidance → Proof test → Prep. test → Time stored CRC

**Description**

Gives the time stamp when the CRC was last stored following completion of the safety lock wizard.


---

**User interface** Character string comprising numbers, letters and special characters

---

### Operating time

---

**Navigation**  Guidance → Proof test → Prep. test → Operating time


**Description** Indicates how long the device has been in operation.

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

---

### Configuration counter

---

**Navigation**  Guidance → Proof test → Prep. test → 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

**"Preparation Proof test" wizard**

*Navigation*  Guidance → Proof test → Prep. test

**Select test procedure**

**Navigation**  Guidance → Proof test → Prep. test → Select test proc

**Description** The proof test of the device can be done using the following test procedures:

Test procedure A with wizard (PTC > 90%):

- Simulate and check the min and max alarm current.
- Approach and check the lower and upper measured value.
- Confirm safety function.

Test procedure B with wizard (PTC > 50%):

- Verify the current measured value with a plausibility check.
- Simulate and check the min and max alarm current.
- Confirm safety function.

For additional test procedures without wizard, refer to safety manual.

**Selection**

- Please select
- Test procedure A
- Test procedure B

**Safety function?**

**Navigation**  Guidance → Proof test → Prep. test → Safety function?


**Selection**

- Please select
- MAX monitoring
- MIN monitoring
- Range monitoring

**"Simulation and check failure current" wizard**

*Navigation*  Guidance → Proof test → Simulation

**Failure current (high alarm)**

**Navigation**  Guidance → Proof test → Simulation → Fail. current (high alarm)

**Description** Actually set value for high failure current.

**User interface** 21.5 to 23 mA

---

### Confirm

---

**Navigation**  Guidance → Proof test → Simulation → Confirm

**Description** Confirm that the displayed value corresponds to the set high failure current.


**Selection**

- Please select
- No
- Yes

---

### (High) Is safety function triggered?

---

**Navigation**  Guidance → Proof test → Simulation → (High)Funct. trigg?


**Description** Confirm that the output current triggers the required safety function.

**Selection** Yes

---

### Terminal current (high alarm)

---

**Navigation**  Guidance → Proof test → Simulation → Term. curr. (HA)

**Description** Internally readback terminal current (high alarm).

**User interface** Signed floating-point number

---

### Confirm

---


**Navigation**  Guidance → Proof test → Simulation → Confirm

**Description** Confirm that the readback terminal current corresponds to the set high failure current within tolerance  $\pm 0,32\text{mA}$ .


**Selection**

- Please select
- No
- Yes


**(Low) Is safety function triggered?**

|                    |   |
|--------------------|---|
| <b>Navigation</b>  |  Guidance → Proof test → Simulation → (Low)Funct. trigg? |
| <b>Description</b> | Confirm that the output current triggers the required safety function.  |
| <b>Selection</b>   | Yes   |


**"Proof test" wizard**

*Navigation*  Guidance → Proof test → Proof test


**Setpoint 1**

|                    |   |
|--------------------|---|
| <b>Navigation</b>  |  Guidance → Proof test → Proof test → Setpoint 1 |
| <b>Description</b> | Physically apply a reference pressure for upper range.  |
| <b>User entry</b>  | Signed floating-point number  |

**Pressure 1**

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |  Guidance → Proof test → Proof test → Pressure 1 |
| <b>Description</b>    | Pressure output   |
| <b>User interface</b> | Signed floating-point number  |


**Terminal current 1**

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |  Guidance → Proof test → Proof test → Terminal curr. 1 |
| <b>Description</b>    | Terminal current for upper range.   |
| <b>User interface</b> | 0 to 30 mA  |

---

**Current deviation 1**



---

|                    |  |
|--------------------|--|
| <b>Navigation</b>  |  Guidance → Proof test → Proof test → Curr. deviati 1 |
| <b>Description</b> | Decide if the terminal current for upper range corresponding to the applied pressure is within tolerance.                              |
| <b>Selection</b>   | <ul style="list-style-type: none"> <li>■ Please select</li> <li>■ Failed</li> <li>■ Passed</li> </ul>                                  |

---

**Setpoint 2**



---

|                    |   |
|--------------------|---|
| <b>Navigation</b>  |  Guidance → Proof test → Proof test → Setpoint 2 |
| <b>Description</b> | Physically apply a reference pressure for lower range.  |
| <b>User entry</b>  | Signed floating-point number  |

---

**Pressure 2**



---

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |  Guidance → Proof test → Proof test → Pressure 2 |
| <b>Description</b>    | Pressure output   |
| <b>User interface</b> | Signed floating-point number  |

---

**Terminal current 2**



---

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |  Guidance → Proof test → Proof test → Terminal curr. 2 |
| <b>Description</b>    | Terminal current for lower range.   |
| <b>User interface</b> | 0 to 30 mA  |

---

**Current deviation 2**


---

|                    |  |
|--------------------|--|
| <b>Navigation</b>  |  Guidance → Proof test → Proof test → Curr. deviati 2 |
| <b>Description</b> | Decide if the terminal current for lower range corresponding to the applied pressure is within tolerance.                                |

- Selection**
- Please select
  - Failed
  - Passed

### "Finish" wizard

*Navigation*  Guidance → Proof test → Finish

---

## Active diagnostics

---


**Navigation**  Guidance → Proof test → Finish → Active diagnos.

**Prerequisite** A diagnostic event has occurred.

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

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

**Additional information** *User interface*

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


#### *Example*

For the display format:  
 ⊗F271 Main electronic failure

---

## Summary

---

**Navigation**  Guidance → Proof test → Finish → Summary

- User interface**
- Passed
  - Failed
  - Unknown

---

## Decision of inspector

---

**Navigation**  Guidance → Proof test → Finish → Decision of insp

**Description** Responsible for the evaluation of the proof test is the inspector. The summary displayed is not a binding inspection decision.




---

|                  |   |
|------------------|---|
| <b>Selection</b> | <ul style="list-style-type: none"> <li>■ Please select</li> <li>■ Failed</li> <li>■ Passed</li> </ul> |
|------------------|---|

---

### Inspector


---

|                    |  |
|--------------------|--|
| <b>Navigation</b>  |  Guidance → Proof test → Finish → Inspector |
| <b>Description</b> | The entered inspector name will be included in the report.   |
| <b>User entry</b>  | Character string comprising numbers, letters and special characters (96)   |

---

### Location


---

|                    |   |
|--------------------|---|
| <b>Navigation</b>  |  Guidance → Proof test → Finish → Location |
| <b>Description</b> | The entered value will be included in the report.   |
| <b>User entry</b>  | Character string comprising numbers, letters and special characters (96)  |

---

### Date/time proof test


---

|                       |  |
|-----------------------|--|
| <b>Navigation</b>     |  Guidance → Proof test → Finish → Date/time |
| <b>Description</b>    | This value is updated with every proof test and with inspector decision „Passed“.  |
| <b>User interface</b> | Character string comprising numbers, letters and special characters  |

---

### Notes


---

|                    |  |
|--------------------|--|
| <b>Navigation</b>  |  Guidance → Proof test → Finish → Notes |
| <b>Description</b> | The entered value will be included in the report.  |
| <b>User entry</b>  | Character string comprising numbers, letters and special characters (255)  |

---

**Plant operator**

---

|                    |   |
|--------------------|---|
| <b>Navigation</b>  |  Guidance → Proof test → Finish → Plant operator |
| <b>Description</b> | The entered value will be included in the report.   |
| <b>User entry</b>  | Character string comprising numbers, letters and special characters (96)  |

### 3.3 "Diagnostics" menu

Navigation  Diagnostics





#### 3.3.1 "Active diagnostics" submenu

Navigation  Diagnostics → Active diagnos.

---

#### Active diagnostics





---

|                               |  |
|-------------------------------|--|
| <b>Navigation</b>             |   Diagnostics → Active diagnos. → Active diagnos.  |
| <b>Prerequisite</b>           | A diagnostic event has occurred.   |
| <b>Description</b>            | Displays the current diagnostic message. If two or more messages occur simultaneously, the message with the highest priority is shown on the display.  |
| <b>User interface</b>         | Symbol for diagnostic behavior, diagnostic code and short message.   |
| <b>Additional information</b> | <p><i>User interface</i></p> <p> Additional pending diagnostic messages can be viewed in the <b>Diagnostic list</b> submenu.</p> <p><i>Example</i></p> <p>For the display format:<br/>  F271 Main electronic failure</p> |

---

#### Timestamp






---

|                               |  |
|-------------------------------|--|
| <b>Navigation</b>             |   Diagnostics → Active diagnos. → Timestamp  |
| <b>Description</b>            | Displays the operating time when the current diagnostic message occurred.  |
| <b>User interface</b>         | Days (d), hours (h), minutes (m) and seconds (s)   |
| <b>Additional information</b> | <p><i>User interface</i></p> <p> The diagnostic message can be viewed via the <b>Actual diagnostics</b> parameter (→  104).</p> <p><i>Example</i></p> <p>For the display format:<br/> 24d12h13m00s</p> |

---

**Previous diagnostics**






---

|                               |   |
|-------------------------------|---|
| <b>Navigation</b>             |   Diagnostics → Active diagnos. → Prev.diagnostics  |
| <b>Prerequisite</b>           | Two diagnostic events have already occurred.  |
| <b>Description</b>            | Displays the diagnostic message that occurred before the current message.   |
| <b>User interface</b>         | Symbol for diagnostic behavior, diagnostic code and short message.  |
| <b>Additional information</b> | <p><i>User interface</i></p> <p> Via the local display: the time stamp and corrective measures referring to the cause of the diagnostic message can be accessed via the  key.</p> <p><i>Example</i></p> <p>For the display format:<br/> F271 Main electronic failure</p> |

---

**Timestamp**




---

|                               |  |
|-------------------------------|--|
| <b>Navigation</b>             |   Diagnostics → Active diagnos. → Timestamp  |
| <b>Description</b>            | Displays the operating time when the last diagnostic message before the current message occurred.  |
| <b>User interface</b>         | Days (d), hours (h), minutes (m) and seconds (s)   |
| <b>Additional information</b> | <p><i>User interface</i></p> <p> The diagnostic message can be viewed via the <b>Previous diagnostics</b> parameter (→  108).</p> <p><i>Example</i></p> <p>For the display format:<br/> 24d12h13m00s</p> |

---

**Operating time from restart**




---

|                       |  |
|-----------------------|--|
| <b>Navigation</b>     |   Diagnostics → Active diagnos. → Time fr. restart |
| <b>Description</b>    | Indicates how long the device has been in operation since the last time the device was restarted.  |
| <b>User interface</b> | Days (d), hours (h), minutes (m), seconds (s)  |


---

## Operating time

---

|                               |  |
|-------------------------------|--|
| <b>Navigation</b>             |   Diagnostics → Active diagnos. → Operating time |
| <b>Description</b>            | Indicates how long the device has been in operation.   |
| <b>Additional information</b> | Maximum time: 9 999 d (≈ 27 years)   |



### 3.3.2 "Event logbook" submenu

*Navigation*  Diagnostics → Event logbook

---

## Filter options


---


|                               |  |
|-------------------------------|--|
| <b>Navigation</b>             |  Diagnostics → Event logbook → Filter options   |
| <b>Description</b>            | Use this function to select the category whose event messages are displayed in the event list of the operating tool.   |
| <b>Selection</b>              | <ul style="list-style-type: none"> <li>■ All</li> <li>■ Failure (F)</li> <li>■ Function check (C)</li> <li>■ Out of specification (S)</li> <li>■ Maintenance required (M)</li> <li>■ Information (I)</li> <li>■ Not categorized</li> </ul>   |
| <b>Additional information</b> | <p><i>Description</i></p> <p> The status signals are categorized in accordance with VDI/VDE 2650 and NAMUR Recommendation NE 107:</p> <ul style="list-style-type: none"> <li>■ F = Failure</li> <li>■ C = Function Check</li> <li>■ S = Out of Specification</li> <li>■ M = Maintenance Required</li> </ul> |

---

## Clear event list

---

|                    |  |
|--------------------|--|
| <b>Navigation</b>  |  Diagnostics → Event logbook → Clear event list |
| <b>Description</b> | Use this function to process the current values in the event logbook.  |
| <b>Selection</b>   | <ul style="list-style-type: none"> <li>■ Cancel</li> <li>■ Clear data</li> </ul>   |

|                               |   |
|-------------------------------|---|
| <b>Additional information</b> | <i>Description</i>  |
|                               | 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



---

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |   Diagnostics → Min/max val. → Pressure min |
| <b>Description</b>    | Minimum or maximum value measured by device.  |
| <b>User interface</b> | Signed floating-point number  |

---

#### Counter limit underruns sensor Pmin



---

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |   Diagnostics → Min/max val. → Counter P < Pmin |
| <b>Description</b>    | Counts how many times the value underruns the sensor specific minimum values. Sensor specific minimum values are shown in Application/Sensor menu.  |
| <b>User interface</b> | 0 to 65 535   |

---

#### Counter underruns of user limit Pmin



---

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |   Diagnostics → Min/max val. → Counter < P user |
| <b>Description</b>    | 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.  |
| <b>User interface</b> | 0 to 65 535   |

---

**Minimum sensor temperature**



---

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |   Diagnostics → Min/max val. → Min. sensor temp |
| <b>Description</b>    | Minimum or maximum value measured by device.<br>Users cannot reset this value.  |
| <b>User interface</b> | -273.15 to 9726.85 °C   |

---

**Counter limit underruns sensor Tmin**



---

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |   Diagnostics → Min/max val. → Counter T < Tmin |
| <b>Description</b>    | Counts how many times the value underruns/overruns the sensor specific minimum/<br>maximum values.<br>Sensor specific minimum/maximum values are shown in Application/Sensor menu.                                |
| <b>User interface</b> | 0 to 65 535   |

---

**Counter underruns of user limit Tmin**



---

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |   Diagnostics → Min/max val. → Counter < T user |
| <b>User interface</b> | 0 to 65 535   |

---

**Minimum terminal voltage**



---

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |   Diagnostics → Min/max val. → Min.term.volt. |
| <b>Description</b>    | Minimum or maximum measured terminal (supply) voltage.  |
| <b>User interface</b> | 0.0 to 50.0 V   |

---

**Minimum electronics temperature**

---

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |   Diagnostics → Min/max val. → Min.electr.temp. |
| <b>Description</b>    | Minimum or maximum measured main electronics temperature.   |
| <b>User interface</b> | Signed floating-point number  |

---

**Reset user defined counters P and T**

---



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

**Selection**

- Cancel
- Confirm

---

**Pressure max**

---

**Navigation** Diagnostics → Min/max val. → Pressure max

**Description** Minimum or maximum value measured by device.

**User interface** Signed floating-point number

---

**Counter limit overruns sensor Pmax**

---

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

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

**User interface** 0 to 65 535

---

**Counter overruns of user limit Pmax**

---

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

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

**User interface** 0 to 65 535

---

**Maximum sensor temperature**

---

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

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


**User interface** -273.15 to 9 726.85 °C



---

**Counter limit overruns sensor Tmax**


---

|                       |  |
|-----------------------|--|
| <b>Navigation</b>     |  Diagnostics → Min/max val. → Counter T > Tmax  |
| <b>Description</b>    | Counts how many times the value underruns/overruns the sensor specific minimum/maximum values.<br>Sensor specific minimum/maximum values are shown in Application/Sensor menu. |
| <b>User interface</b> | 0 to 65 535  |

---

**Counter overruns of user limit Tmax**


---

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |  Diagnostics → Min/max val. → Counter > T user |
| <b>User interface</b> | 0 to 65 535   |

---

**Maximum terminal voltage**


---

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |  Diagnostics → Min/max val. → Max.term.voltage |
| <b>Description</b>    | Minimum or maximum measured terminal (supply) voltage.  |
| <b>User interface</b> | 0.0 to 50.0 V   |


---

**Maximum electronics temperature**

---

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |  Diagnostics → Min/max val. → Max.electr.temp. |
| <b>Description</b>    | Minimum or maximum measured main electronics temperature.   |
| <b>User interface</b> | Signed floating-point number  |

### 3.3.4 "Simulation" submenu

Navigation  Diagnostics → Simulation

---

#### Simulation

---

**Navigation**   Diagnostics → Simulation → Simulation

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

Warning:  
Output will reflect the simulated value or event.

**Selection**

- Off
- Current output
- Diagnostic event simulation
- Pressure

---

#### Value pressure simulation

---

**Navigation**   Diagnostics → Simulation → Pressure

**User entry** Signed floating-point number

---

#### Value current output

---

**Navigation**   Diagnostics → Simulation → Current output

**Description** Defines the value of the simulated output current.

**User entry** 3.59 to 23 mA

---

#### Diagnostic event simulation

---

**Navigation**   Diagnostics → Simulation → Diagnostic event

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

**Selection**

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

**Additional information***Description*

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

**3.3.5 "Heartbeat Technology" submenu***Navigation*

Diagnostics → Heartbeat Techn.

**"Heartbeat Verification" submenu***Navigation*

Diagnostics → Heartbeat Techn. → Heartbeat Verif.

---

**Date/time Heartbeat Verification**

---

**Navigation**

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

**Description**

Date and time of last Heartbeat Verification.

This value is updated with every Heartbeat verification.

Note:

If time information is not available, e.g. Heartbeat verification is started from display, '-----' is shown.

**User interface**

Character string comprising numbers, letters and special characters

---

**Operating time (Verification)**

---

**Navigation**

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

**User interface**

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

---

**Verification result**

---

**Navigation**

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


**User interface**

- Not done
- Passed
- Not done
- Failed

---

**Status**


---


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

**Description** Displays the current status of the verification.


**User interface**

- Done
- Busy
- Failed
- Not done


**"Loop diagnostics" submenu**

*Navigation*  Diagnostics → Heartbeat Techn. → Loop diagn.

---

**Rebuild baseline** 


---

**Navigation**  Diagnostics → Heartbeat Techn. → Loop diagn. → Reb. baseline

**Description** Notice  
The current output is simulated.  
Bridge the PLC or take other appropriate measures to prevent an erroneous triggering of alarm messages or changes in the control loop behavior.  
The baseline should be rebuilt if planned changes have been made in the loop.


**Selection**

- No
- Yes

---

**Tolerated deviation +/-** 


---

**Navigation**  Diagnostics → Heartbeat Techn. → Loop diagn. → Toler. deviation

**Description** A value should be chosen to ensure that normal voltage deviations do not lead to unwanted messages.


Default  
1.5 V DC

**User entry** 0.5 to 3.0 V

---

**Baseline status**


---


|                       |  |
|-----------------------|--|
| <b>Navigation</b>     |  Diagnostics → Heartbeat Techn. → Loop diagn. → Baseline status |
| <b>Description</b>    | "Failed"<br>Means, baseline is not available or creation not possible.<br><br>"Success"<br>Baseline is available.                                |
| <b>User interface</b> | <ul style="list-style-type: none"> <li>■ Failed</li> <li>■ Success</li> </ul>  |

---

**Loop diagnostics**


---




|                    |  |
|--------------------|--|
| <b>Navigation</b>  |  Diagnostics → Heartbeat Techn. → Loop diagn. → Loop diagn. |
| <b>Description</b> | Enable/disable loop diagnostics.<br><br>Note:<br>If the function is disabled, there is no analysis and no event message.                     |
| <b>Selection</b>   | <ul style="list-style-type: none"> <li>■ Disable</li> <li>■ Enable</li> </ul>  |

---

**Terminal voltage 1**



---

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |  Diagnostics → Heartbeat Techn. → Loop diagn. → Terminal volt. 1 |
| <b>Description</b>    | Shows the current terminal voltage that is applied at the output  |
| <b>User interface</b> | 0.0 to 50.0 V   |

---

**Clamping voltage lower threshold**



---

|                       |  |
|-----------------------|--|
| <b>Navigation</b>     |  Diagnostics → Heartbeat Techn. → Loop diagn. → Lower threshold |
| <b>User interface</b> | 0.0 to 50.0 V  |

---

**Clamping voltage upper threshold**


---

|                       |  |
|-----------------------|--|
| <b>Navigation</b>     |  Diagnostics → Heartbeat Techn. → Loop diagn. → Upper threshold |
| <b>User interface</b> | 0.0 to 50.0 V  |

---

**806 Event delay**

---



**Navigation** Diagnostics → Heartbeat Techn. → Loop diagn. → 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

**"Statistical Sensor Diagnostics" submenu**

*Navigation* Diagnostics → Heartbeat Techn. → SSD

---

**SSD: Statistical Sensor Diagnostics**

---



**Navigation** Diagnostics → Heartbeat Techn. → SSD → Stat. Sens. Diag

**Description** Enable or disable SSD.  
After selecting "Disable", no statistical sensor diagnosis takes place. No diagnostic messages are output.

**Selection**

- Disable
- Enable

---

**System status**

---

**Navigation** Diagnostics → Heartbeat Techn. → SSD → System status

**User interface**

- Idle
- No sufficient signal noise
- Stable
- Not stable
- Verify System Dynamics
- Process dynamic too high

---

**Signal status**

---

**Navigation** Diagnostics → Heartbeat Techn. → SSD → Signal status

**User interface**


- Idle
- Building Baseline
- Verifying Baseline

- Verifying baseline failed
- Monitoring
- Out of range
- Monitoring inactive

---

### Signal noise status


---

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |  Diagnostics → Heartbeat Techn. → SSD → Noise status   |
| <b>User interface</b> | <ul style="list-style-type: none"> <li>■ Idle</li> <li>■ Building Baseline</li> <li>■ Verifying Baseline</li> <li>■ Verifying baseline failed</li> <li>■ Monitoring</li> <li>■ Out of range</li> <li>■ Monitoring inactive</li> </ul> |

---

### Counter Baseline creation SSD

---

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |  Diagnostics → Heartbeat Techn. → SSD → Counter Baseline |
| <b>Description</b>    | Specifies how often the baseline has been rebuilt.  |
| <b>User interface</b> | Positive integer  |

### 3.3.6 "Diagnostic settings" submenu

*Navigation*  Diagnostics → Diag. settings


#### "Properties" submenu

*Navigation*  Diagnostics → Diag. settings → Properties


---

### SSD Out of range delay time

---

|                   |  |
|-------------------|--|
| <b>Navigation</b> |  Diagnostics → Diag. settings → Properties → SSD Delay time |
| <b>User entry</b> | 0 to 604 800 s   |

**SSD Monitoring delay time**

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

**User entry** 0 to 86 400 s

**500 Process alert pressure**


**Navigation**  Diagnostics → Diag. settings → Properties → 500 Pressure

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

**Selection**

- Off
- On


**Low alert value**

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

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

**User entry** Signed floating-point number


**High alert value**

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

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

**User entry** Signed floating-point number

**501 Process alert scaled variable**

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

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




**Selection**

- Off
- On

---

### Low alert value

---

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


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

**User entry** Signed floating-point number

---

### High alert value

---

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


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

**User entry** Signed floating-point number

---

### User temperature process alert

---

**Navigation**  Diagnostics → Diag. settings → Properties → UserTemp alert

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


**Selection**

- Off
- On

---











### Low alert value

---


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


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

**User entry** -50 to 150 °C

|                                |   |   |
|--------------------------------|---|---|
| <b>High alert value</b>        |   |    |
| <b>Navigation</b>              |  Diagnostics → Diag. settings → Properties → High alert value  |   |
| <b>Description</b>             | Set range.<br>If this limit value is exceeded or undercut, a diagnostic event is generated. There is no hysteresis.   |   |
| <b>User entry</b>              | -50 to 150 °C   |   |
| <b>806 Diagnostic behavior</b> |   |    |
| <b>Navigation</b>              |   Diagnostics → Diag. settings → Properties → 806 Diag. behav.  |   |
| <b>Description</b>             | Select event behavior<br>"Logbook entry only": no digital or analog transmission of the message.<br>"Warning": Current output unchanged. Message is output digitally (default).<br>If the permissible conditions are reached again, the warning is no longer available in the instrument. |   |
| <b>Selection</b>               | <ul style="list-style-type: none"> <li>■ Warning</li> <li>■ Logbook entry only</li> </ul>   |   |
| <b>806 Event category</b>      |   |  |
| <b>Navigation</b>              |   Diagnostics → Diag. settings → Properties → 806Event category   |   |
| <b>Description</b>             | Select category for diagnostic message.   |   |
| <b>Selection</b>               | <ul style="list-style-type: none"> <li>■ Failure (F)</li> <li>■ Function check (C)</li> <li>■ Out of specification (S)</li> <li>■ Maintenance required (M)</li> <li>■ No effect (N)</li> </ul>  |   |
| <b>806 Event delay</b>         |   |  |
| <b>Navigation</b>              |  Diagnostics → Diag. settings → Properties → 806 Event delay   |   |
| <b>Description</b>             | Displays how long the triggering status must be present until an event message is issued.<br>Used to filter out short-term signal interference.   |   |
| <b>User entry</b>              | 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 &lt; 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  |
|-----------|---|---|--|
|           | <ul style="list-style-type: none"> <li>■ MPa</li> <li>■ kPa</li> <li>■ Pa</li> <li>■ bar</li> <li>■ mbar</li> <li>■ torr</li> <li>■ atm</li> <li>■ kgf/cm<sup>2</sup></li> <li>■ gf/cm<sup>2</sup></li> </ul> | <ul style="list-style-type: none"> <li>psi</li> </ul> | <ul style="list-style-type: none"> <li>■ inH<sub>2</sub>O</li> <li>■ inH<sub>2</sub>O (4°C)</li> <li>■ mmH<sub>2</sub>O</li> <li>■ mmH<sub>2</sub>O (4°C)</li> <li>■ mH<sub>2</sub>O</li> <li>■ mH<sub>2</sub>O (4°C)</li> <li>■ ftH<sub>2</sub>O</li> <li>■ inHg</li> <li>■ mmHg</li> </ul> |

---

#### 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.

|                               |   |                       |
|-------------------------------|---|-----------------------|
| <b>Selection</b>              | <i>SI units</i><br><ul style="list-style-type: none"> <li>■ °C</li> <li>■ K</li> </ul>    | <i>US units</i><br>°F |
| <b>Factory setting</b>        | Country-specific:<br><ul style="list-style-type: none"> <li>■ °C</li> <li>■ °F</li> </ul> |                       |
| <b>Additional information</b> | <i>Selection</i>  |                       |

---

**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  | US units  | Imperial units   |
|-----------|---|---|--|
|           | <ul style="list-style-type: none"> <li>■ %</li> <li>■ mm</li> <li>■ cm</li> <li>■ m</li> <li>■ l</li> <li>■ hl</li> <li>■ m<sup>3</sup></li> <li>■ g</li> <li>■ kg</li> <li>■ t</li> <li>■ g/s</li> <li>■ kg/s</li> <li>■ kg/min</li> <li>■ kg/h</li> <li>■ t/min</li> <li>■ t/h</li> <li>■ t/d</li> <li>■ m<sup>3</sup>/s</li> <li>■ m<sup>3</sup>/min</li> <li>■ m<sup>3</sup>/h</li> <li>■ m<sup>3</sup>/d</li> <li>■ l/s</li> <li>■ l/min</li> <li>■ l/h</li> <li>■ Nm<sup>3</sup>/h</li> <li>■ NI/h</li> <li>■ Sm<sup>3</sup>/s</li> <li>■ Sm<sup>3</sup>/min</li> <li>■ Sm<sup>3</sup>/h</li> <li>■ Sm<sup>3</sup>/d</li> <li>■ Nm<sup>3</sup>/s</li> <li>■ g/cm<sup>3</sup></li> <li>■ kg/m<sup>3</sup></li> <li>■ Nm<sup>3</sup>/min</li> <li>■ Nm<sup>3</sup>/d</li> </ul> | <ul style="list-style-type: none"> <li>■ ft</li> <li>■ in</li> <li>■ ft<sup>3</sup></li> <li>■ gal (us)</li> <li>■ bbl (us;oil)</li> <li>■ oz</li> <li>■ lb</li> <li>■ STon</li> <li>■ lb/s</li> <li>■ lb/min</li> <li>■ lb/h</li> <li>■ STon/min</li> <li>■ STon/h</li> <li>■ STon/d</li> <li>■ ft<sup>3</sup>/s</li> <li>■ ft<sup>3</sup>/min</li> <li>■ ft<sup>3</sup>/h</li> <li>■ ft<sup>3</sup>/d</li> <li>■ gal/s (us)</li> <li>■ gal/min (us)</li> <li>■ gal/h (us)</li> <li>■ gal/d (us)</li> <li>■ bbl/s (us;oil)</li> <li>■ bbl/min (us;oil)</li> <li>■ bbl/h (us;oil)</li> <li>■ bbl/d (us;oil)</li> <li>■ Sft<sup>3</sup>/min</li> <li>■ Sft<sup>3</sup>/h</li> <li>■ Sft<sup>3</sup>/d</li> </ul> | <ul style="list-style-type: none"> <li>■ gal (imp)</li> <li>■ gal/s (imp)</li> <li>■ gal/min (imp)</li> <li>■ gal/h (imp)</li> </ul> |
|           | <p><i>Custom-specific units</i></p> <p>Free text</p>  |   |  |

---

**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.

|                  |   |
|------------------|---|
| <b>Selection</b> | <ul style="list-style-type: none"> <li>■ X</li> <li>■ X.X</li> <li>■ X.XX</li> <li>■ X.XXX</li> <li>■ X.XXXX</li> </ul> |
|------------------|---|



### 3.4.2 "Measured values" submenu

*Navigation*       Application → Measured values

---

#### Sensor pressure

---

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |   Application → Measured values → Sensor pressure |
| <b>User interface</b> | Signed floating-point number  |

---

#### Pressure



---

|                   |  |
|-------------------|--|
| <b>Navigation</b> |   Application → Measured values → Pressure |
|-------------------|--|

---

#### Scaled variable



---

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |   Application → Measured values → Scaled variable |
| <b>User interface</b> | Signed floating-point number  |

---

#### Sensor temperature



---

|                       |  |
|-----------------------|--|
| <b>Navigation</b>     |   Application → Measured values → Sensor temp. |
| <b>User interface</b> | -273.15 to 9726.85 °C  |

---

#### Terminal voltage 1

---

|                    |  |
|--------------------|--|
| <b>Navigation</b>  |   Application → Measured values → Terminal volt. 1 |
| <b>Description</b> | Shows the current terminal voltage that is applied at the output   |

---

**User interface**                      0.0 to 50.0 V

---

**Terminal current**

---

**Navigation**                       Application → Measured values → Terminal curr.


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

**User interface**                      0 to 30 mA

---

**Electronics temperature**


---

**Navigation**                       Application → Measured values → Electronics temp

**Description**                      Displays the current temperature of the main electronics.

**User interface**                      Signed floating-point number

### 3.4.3 "Sensor" submenu

*Navigation*                       Application → Sensor

#### "Basic settings" submenu

*Navigation*                       Application → Sensor → Basic settings

---

**Output current transfer function**

---

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

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

Square root - differential pressure only

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



**User interface**

- Linear
- Square root \*

---

## Damping



**Navigation** Application → Sensor → Basic settings → Damping

**Description** The damping is effective before the measured value is further processed, i.e., before the following processes:

- Scaling
- Limit value monitoring
- Forwarding to display
- Forwarding to Analog Input Block

Note:

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

**User entry** 0 to 999.0 s

---

## HP/LP swap



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

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

**Selection**

- No
- Yes

---

## Low flow cut off



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

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


**User entry** 0.0 to 50.0 %


---

\* Visibility depends on order options or device settings

**"Sensor calibration" submenu**

*Navigation*  Application → Sensor → Sensor cal.

**Zero adjustment** 

**Navigation**   Application → Sensor → Sensor cal. → Zero adjustment

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

**Selection**

- No
- Confirm


**Calibration offset** 

**Navigation**   Application → Sensor → Sensor cal. → Calibr offset

**Prerequisite** Absolute pressure sensor

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

**User entry** Signed floating-point number

**Zero adjustment offset** 

**Navigation**   Application → Sensor → Sensor cal. → Zero offset

**User entry** Signed floating-point number

**Sensor Trim Reset** 

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


**Selection**

- No
- Confirm

---

**Lower sensor trim measured value**


---

**Navigation**  Application → Sensor → Sensor cal. → LowerTrimMeasVal

**User interface** Signed floating-point number

---

**Lower sensor trim**


---



**Navigation**  Application → Sensor → Sensor cal. → LowerSensor trim

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

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

Note:

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

Proceed as follows:


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

**User entry** Signed floating-point number

---

**Upper sensor trim measured value**


---

**Navigation**  Application → Sensor → Sensor cal. → UpperTrimMeasVal

**User interface** Signed floating-point number

---

**Upper sensor trim**
**Navigation**

Application → Sensor → Sensor cal. → UpperSensor trim

**Description**

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

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

Note:

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

Proceed as follows:

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

**User entry**

Signed floating-point number

**"Sensor limits" submenu**

*Navigation* Application → Sensor → Sensor limits

---

**Lower Range Limit**
**Navigation**

Application → Sensor → Sensor limits → LRL

**Description**

Indicates the lower measuring limit of the sensor.

**User interface**

Signed floating-point number

---

**Upper Range Limit**
**Navigation**

Application → Sensor → Sensor limits → URL

**Description**

Indicates the upper measuring limit of the sensor.


**User interface**

Signed floating-point number

---

**Minimum span**



---

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |  Application → Sensor → Sensor limits → Minimum span |
| <b>Description</b>    | Specifies the smallest possible measuring span of the sensor.   |
| <b>User interface</b> | Signed floating-point number  |

---

**Sensor temperature lower range limit**



---

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |  Application → Sensor → Sensor limits → Sens.temp.lo.lim |
| <b>User interface</b> | -273.15 to 9726.85 °C   |

---

**Sensor temperature upper range limit**


---

|                       |  |
|-----------------------|--|
| <b>Navigation</b>     |  Application → Sensor → Sensor limits → Sens.temp.up.lim |
| <b>User interface</b> | -273.15 to 9726.85 °C  |



**"Scaled variable" submenu**

*Navigation*       Application → Sensor → Scaled variable

---

**Assign PV**


---

|                    |  |
|--------------------|--|
| <b>Navigation</b>  |   Application → Sensor → Scaled variable → Assign PV |
| <b>Description</b> | Use this function to select a measured variable (HART device variable) for the primary dynamic variable (PV).  |
| <b>Selection</b>   | <ul style="list-style-type: none"> <li>■ Pressure</li> <li>■ Scaled variable</li> </ul>  |

---

**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**



| <i>SI units</i>        | <i>US units</i>         | <i>Imperial units</i> |
|------------------------|-------------------------|-----------------------|
| ■ %                    | ■ ft                    | ■ gal (imp)           |
| ■ mm                   | ■ in                    | ■ gal/s (imp)         |
| ■ cm                   | ■ ft <sup>3</sup>       | ■ gal/min (imp)       |
| ■ m                    | ■ gal (us)              | ■ gal/h (imp)         |
| ■ l                    | ■ bbl (us;oil)          |                       |
| ■ hl                   | ■ oz                    |                       |
| ■ m <sup>3</sup>       | ■ lb                    |                       |
| ■ g                    | ■ STon                  |                       |
| ■ kg                   | ■ lb/s                  |                       |
| ■ t                    | ■ lb/min                |                       |
| ■ g/s                  | ■ lb/h                  |                       |
| ■ kg/s                 | ■ STon/min              |                       |
| ■ kg/min               | ■ STon/h                |                       |
| ■ kg/h                 | ■ STon/d                |                       |
| ■ t/min                | ■ ft <sup>3</sup> /s    |                       |
| ■ t/h                  | ■ ft <sup>3</sup> /min  |                       |
| ■ t/d                  | ■ ft <sup>3</sup> /h    |                       |
| ■ m <sup>3</sup> /s    | ■ ft <sup>3</sup> /d    |                       |
| ■ m <sup>3</sup> /min  | ■ gal/s (us)            |                       |
| ■ m <sup>3</sup> /h    | ■ gal/min (us)          |                       |
| ■ m <sup>3</sup> /d    | ■ gal/h (us)            |                       |
| ■ l/s                  | ■ gal/d (us)            |                       |
| ■ l/min                | ■ bbl/s (us;oil)        |                       |
| ■ l/h                  | ■ bbl/min (us;oil)      |                       |
| ■ Nm <sup>3</sup> /h   | ■ bbl/h (us;oil)        |                       |
| ■ NI/h                 | ■ bbl/d (us;oil)        |                       |
| ■ Sm <sup>3</sup> /s   | ■ Sft <sup>3</sup> /min |                       |
| ■ Sm <sup>3</sup> /min | ■ Sft <sup>3</sup> /h   |                       |
| ■ Sm <sup>3</sup> /h   | ■ Sft <sup>3</sup> /d   |                       |
| ■ Sm <sup>3</sup> /d   |                         |                       |
| ■ Nm <sup>3</sup> /s   |                         |                       |
| ■ g/cm <sup>3</sup>    |                         |                       |
| ■ kg/m <sup>3</sup>    |                         |                       |
| ■ Nm <sup>3</sup> /min |                         |                       |
| ■ Nm <sup>3</sup> /d   |                         |                       |

*Custom-specific units*  
Free text

---

**Free text** 


---

**Navigation**   Application → Sensor → Scaled variable → Free text

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

---

**Pressure**


---


**Navigation**  Application → Sensor → Scaled variable → Pressure

---

**Scaled variable transfer function**


---



**Navigation**  Application → Sensor → Scaled variable → Scaled function

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

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

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

**Selection**

- Linear
- Square root \*
- Table

---

**Lower range value output**


---



**Navigation**  Application → Sensor → Scaled variable → Low.range outp

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

**User entry** Signed floating-point number

---

**Upper range value output**


---



**Navigation**  Application → Sensor → Scaled variable → Upp.range outp

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

**User entry** Signed floating-point number

---

\* Visibility depends on order options or device settings

---

**Activate table** 


---

**Navigation**  Application → Sensor → Scaled variable → Activate table

**Selection**

- Disable
- Enable

---

**Pressure value 1** 


---

**Navigation**   Application → Sensor → Scaled variable → Pressure 1


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

**User entry** Signed floating-point number

---

**Scaled variable value 1**


---

**Navigation**   Application → Sensor → Scaled variable → Scaled 1

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

**User interface** Signed floating-point number

---

**Pressure value 2** 


---

**Navigation**   Application → Sensor → Scaled variable → Pressure 2

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

**User entry** Signed floating-point number

---

**Scaled variable value 2** 















---

**Navigation**   Application → Sensor → Scaled variable → Scaled 2

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

**User entry** Signed floating-point number



|                                  |   |   |
|----------------------------------|---|---|
| <b>Pressure</b>                  |   |    |
| <b>Navigation</b>                |  Application → Sensor → Scaled variable → Pressure   |   |
| <b>User entry</b>                | Signed floating-point number  |   |
| <b>Scaled variable</b>           |   |    |
| <b>Navigation</b>                |  Application → Sensor → Scaled variable → Scaled variable  |   |
| <b>User entry</b>                | Signed floating-point number  |   |
| <b>"Wet calibration" submenu</b> |   |   |
|                                  | <i>Navigation</i>  Application → Sensor → Wet calibration  |   |
| <b>Zero</b>                      |   |  |
| <b>Navigation</b>                |   Application → Sensor → Wet calibration → Zero |   |
| <b>Selection</b>                 | <ul style="list-style-type: none"> <li>■ No</li> <li>■ Confirm</li> </ul>   |   |
| <b>Pressure value 1</b>          |   |  |
| <b>Navigation</b>                |  Application → Sensor → Wet calibration → Pressure 1   |   |
| <b>Description</b>               | Enter pressure for the first scaling point. "Scaled variable value 1" will be allocated to this pressure.   |   |
| <b>User entry</b>                | Signed floating-point number  |   |
| <b>Span</b>                      |   |  |
| <b>Navigation</b>                |   Application → Sensor → Wet calibration → Span |   |
| <b>Selection</b>                 | <ul style="list-style-type: none"> <li>■ No</li> <li>■ Confirm</li> </ul>   |   |

---

**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

| <b>Pressure value 1</b>         |   |    |
|---------------------------------|---|---|
| <b>Navigation</b>               |  Application → Sensor → Wet calibration → Pressure 1   |   |
| <b>Description</b>              | Enter pressure for the first scaling point. "Scaled variable value 1" will be allocated to this pressure.   |   |
| <b>User entry</b>               | Signed floating-point number  |   |
| <b>Span</b>                     |   |    |
| <b>Navigation</b>               |   Application → Sensor → Wet calibration → Span |   |
| <b>Selection</b>                | <ul style="list-style-type: none"> <li>■ No</li> <li>■ Confirm</li> </ul>   |   |
| <b>Pressure value 2</b>         |   |    |
| <b>Navigation</b>               |  Application → Sensor → Wet calibration → Pressure 2   |   |
| <b>Description</b>              | Enter pressure for the second scaling point. "Scaled variable value 2" will be allocated to this pressure.  |   |
| <b>User entry</b>               | Signed floating-point number  |   |
| <b>Lower range value output</b> |   |  |
| <b>Navigation</b>               |  Application → Sensor → Wet calibration → Low.range outp   |   |
| <b>Description</b>              | Depending on which variable has been selected as "Process variable output current", define the related lower (4 mA) and upper range values (20 mA).   |   |
| <b>User entry</b>               | Signed floating-point number  |   |
| <b>Upper range value output</b> |   |  |
| <b>Navigation</b>               |  Application → Sensor → Wet calibration → Upp.range outp   |   |
| <b>Description</b>              | 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: &lt; 3.6 mA

Max: &gt;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**



---

|                       |  |
|-----------------------|--|
| <b>Navigation</b>     |  Application → Curr.output → Output curr. |
| <b>Description</b>    | Shows the value currently calculated for the current output  |
| <b>User interface</b> | 3.59 to 23 mA  |

---

**Terminal current**



---


|                       |  |
|-----------------------|--|
| <b>Navigation</b>     |  Application → Curr.output → Terminal curr. |
| <b>Description</b>    | Shows the current value of the current output which is currently measured  |
| <b>User interface</b> | 0 to 30 mA   |

---

**4 mA trim value**


---





|                    |   |
|--------------------|---|
| <b>Navigation</b>  |  Application → Curr.output → 4 mA trim value |
| <b>Description</b> | Enter the trim value for the 4 mA current output.<br>Note:<br>Simulation must be active.  |
| <b>User entry</b>  | 3 to 5 mA   |

---

**20 mA trim value**


---



|                    |  |
|--------------------|--|
| <b>Navigation</b>  |  Application → Curr.output → 20 mA trim value |
| <b>Description</b> | Enter the trim value for the 20 mA current output.<br>Note:<br>Simulation must be active.  |
| <b>User entry</b>  | 18 to 22 mA  |

### 3.4.5 "HART output" submenu

*Navigation*  Application → HART output



#### "Configuration" submenu

*Navigation*  Application → HART output → Configuration

---

#### HART address



---

|                               |   |
|-------------------------------|---|
| <b>Navigation</b>             |   Application → HART output → Configuration → HART address  |
| <b>Description</b>            | Define the HART address of the device.  |
| <b>User entry</b>             | 0 to 63   |
| <b>Additional information</b> | <ul style="list-style-type: none"> <li>▪ 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).</li> <li>▪ Only addresses in the range 0 to 15 are permitted for a system according to HART 5.0.</li> <li>▪ All addresses in the range 0 to 63 are permitted for a system with HART 6.0 and higher.</li> </ul> |

---

#### HART short tag



---






|                    |  |
|--------------------|--|
| <b>Navigation</b>  |   Application → HART output → Configuration → HART short tag |
| <b>Description</b> | <p>Defines the short tag for the measuring point.</p> <p>Maximum length: 8 characters<br/>         Allowed characters: A-Z, 0-9, certain special characters</p>  |
| <b>User entry</b>  | Max. 8 characters: A to Z, 0 to 9 and certain special characters (e.g. punctuation marks, @, %).   |

---

#### Device tag

---

|                    |  |
|--------------------|--|
| <b>Navigation</b>  |   Application → HART output → Configuration → Device tag |
| <b>Description</b> | Enter a unique name for the measuring point to identify the device quickly within the plant.   |
| <b>User entry</b>  | Character string comprising numbers, letters and special characters (32)   |

| No. of preambles              |   |
|-------------------------------|---|
| <b>Navigation</b>             |  Application → HART output → Configuration → No. of preambles  |
| <b>Description</b>            | Defines the number of preambles in the HART telegram  |
| <b>User entry</b>             | 5 to 20   |
| Loop current mode             |   |
| <b>Navigation</b>             |  Application → HART output → Configuration → Loop curr mode  |
| <b>Description</b>            | 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. |
| <b>Selection</b>              | <ul style="list-style-type: none"> <li>▪ Disable</li> <li>▪ Enable</li> </ul>   |
| <b>"HART output" submenu</b>  |   |
| <i>Navigation</i>             |  Application → HART output → HART output   |
| Assign PV                     |   |
| <b>Navigation</b>             |  Application → HART output → HART output → Assign PV   |
| <b>Description</b>            | Use this function to select a measured variable (HART device variable) for the primary dynamic variable (PV).   |
| <b>Selection</b>              | <ul style="list-style-type: none"> <li>▪ Pressure</li> <li>▪ Scaled variable</li> </ul>   |
| Primary variable (PV)         |   |
| <b>Navigation</b>             |  Application → HART output → HART output → Primary var (PV)  |
| <b>Description</b>            | Shows the first HART value (PV).  |
| <b>Additional information</b> |   |



---

**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<sup>\*</sup>
- Terminal voltage<sup>\*</sup>
- Median of pressure signal<sup>\*</sup>
- Noise of pressure signal<sup>\*</sup>
- Signal noise detected<sup>\*</sup>
- 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*

- 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 (→ 156).

**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 (→ 156).

**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 (→ 156).


**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 (→  156).

---

### 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 (→  156).

---

### 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 (→  156).

---

### 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 (→  156).

---

### 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<sup>\*</sup>
- Rising<sup>\*</sup>
- Falling<sup>\*</sup>
- On change



---

\* Visibility depends on order options or device settings

|                               |   |
|-------------------------------|---|
| <b>Additional information</b> | <p><i>Selection</i></p> <ul style="list-style-type: none"> <li>■ <b>Continuous</b><br/>The message is sent continuously, at least at intervals corresponding to the time frame specified in the <b>Burst min period</b> parameter (→  159).</li> <li>■ <b>Window</b><br/>The message is sent if the specified measured value has changed by the value in the <b>Burst trigger level</b> parameter (→  159).</li> <li>■ <b>Rising</b><br/>The message is sent if the specified measured value exceeds the value in the <b>Burst trigger level</b> parameter (→  159).</li> <li>■ <b>Falling</b><br/>The message is sent if the specified measured value drops below the value in the <b>Burst trigger level</b> parameter (→  159).</li> <li>■ <b>On change</b><br/>The message is sent if a measured value changes in the burst message.</li> </ul> |
|-------------------------------|---|


---

**Burst trigger level**


|                               |   |
|-------------------------------|---|
| <b>Navigation</b>             |  Application → HART output → Burst config. 1 → Trigger level   |
| <b>Description</b>            | Use this function to enter the burst trigger value.   |
| <b>User entry</b>             | Signed floating-point number  |
| <b>Additional information</b> | <p><i>Description</i></p> <p>Together with the option selected in the <b>Burst trigger mode</b> parameter (→  158) the burst trigger value determines the time of burst message X.</p> |


---

**Min. update period**



|                    |  |
|--------------------|--|
| <b>Navigation</b>  |  Application → HART output → Burst config. 1 → Min. upd. per. |
| <b>Description</b> | Use this function to enter the minimum time span between two burst commands of burst message X.  |
| <b>User entry</b>  | Positive integer   |

---

**Max. update period**


|                    |  |
|--------------------|--|
| <b>Navigation</b>  |  Application → HART output → Burst config. 1 → Max. upd. per. |
| <b>Description</b> | Use this function to enter the maximum time span between two burst commands of burst message X.  |
| <b>User entry</b>  | Positive integer   |

**"Information" submenu**


*Navigation*  Application → HART output → Information

---

**Device ID**

---

**Navigation**

 Application → HART output → Information → Device ID

**Description**


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

**User interface**

6-digit hexadecimal number

**Additional information**

*Description*

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

---

**Device type**

---

**Navigation**

 Application → HART output → Information → Device type

**Description**

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

**User interface**

2-digit hexadecimal number

**Factory setting**


0x54

**Factory setting**

0x5A

**Additional information**

*Description*


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

---

**Device revision**

---

**Navigation**

 Application → HART output → Information → Device revision

**Description**

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

**User interface**

2-digit hexadecimal number



**Additional information***Description*

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

**HART short tag****Navigation**

Application → HART output → Information → HART short tag

**Description**

Defines the short tag for the measuring point.

Maximum length: 8 characters

Allowed characters: A-Z, 0-9, certain special characters

**User entry**

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

**HART revision****Navigation**

Application → HART output → Information → HART revision

**Description**

Shows the HART revision of the device.

**HART descriptor****Navigation**

Application → HART output → Information → HART descriptor

**Description**

Description for the measuring point.

**User entry**

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

**HART message****Navigation**

Application → HART output → Information → HART message

**Description**

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

**User entry**

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

---

**HART date code**

---

**Navigation**

Application → HART output → Information → HART date code

**Description**

Date of the last configuration change

**User entry**

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

**Additional information**

Date format: YYYY-MM-DD







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




## 3.5 "System" menu

Navigation  System

### 3.5.1 "Device management" submenu

Navigation  System → Device manag.

|                    |   |
|--------------------|---|
| <b>Device tag</b>  |    |
| <b>Navigation</b>  |   System → Device manag. → Device tag |
| <b>Description</b> | Enter a unique name for the measuring point to identify the device quickly within the plant.  |
| <b>User entry</b>  | Character string comprising numbers, letters and special characters (32)  |

|                               |  |
|-------------------------------|--|
| <b>Locking status</b>         |  |
| <b>Navigation</b>             |   System → Device manag. → Locking status  |
| <b>Description</b>            | Displays the active write protection.  |
| <b>User interface</b>         | <ul style="list-style-type: none"> <li>■ Hardware locked</li> <li>■ Safety locked</li> <li>■ Temporarily locked</li> </ul>   |
| <b>Additional information</b> | <p><i>User interface</i></p> <p>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.</p> <p> 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.</p> |

#### *Selection*

#### *Function scope of the "Locking status" parameter*

| Options            | Description   |
|--------------------|---|
| None               | The access status displayed in the <b>Access status display</b> 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.<br> 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 9999

---

**Status password entry**


---


|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |  System → User manag. → Status pw entry  |
| <b>Description</b>    | Use this function to display the status of the password verification.   |
| <b>User interface</b> | <ul style="list-style-type: none"> <li>■ -----</li> <li>■ Wrong password</li> <li>■ Password rule violated</li> <li>■ Password accepted</li> <li>■ Permission denied</li> <li>■ Confirm PW mismatch</li> <li>■ Reset password accepted</li> <li>■ Invalid user role</li> <li>■ Wrong sequence of entry</li> </ul> |

---

**New password**


---




|                    |   |
|--------------------|---|
| <b>Navigation</b>  |  System → User manag. → New password   |
| <b>Description</b> | <p>Define the new "Maintenance" password.</p> <p>A new password is valid after it has been confirmed within the "Confirm new password" parameter.</p> <p>Any valid password consists of 4 to 16 characters and can contain letters and numbers.</p> |
| <b>User entry</b>  | Character string comprising numbers, letters and special characters (16)  |

---

**Confirm new password**


---




|                    |   |
|--------------------|---|
| <b>Navigation</b>  |  System → User manag. → Confirm password |
| <b>Description</b> | Enter the new password again to confirm.  |
| <b>User entry</b>  | Character string comprising numbers, letters and special characters (16)  |

---

**Old password**


---




|                    |   |
|--------------------|---|
| <b>Navigation</b>  |  System → User manag. → Old password |
| <b>Description</b> | Enter the current password, to subsequently change the existing password.   |
| <b>User entry</b>  | Character string comprising numbers, letters and special characters (16)  |


---

**Reset password**


---

|                    |   |
|--------------------|---|
| <b>Navigation</b>  |  System → User manag. → Reset password |
| <b>Description</b> | Enter a code to reset the current "Maintenance" password.<br>The code is delivered by your local support.               |
| <b>User entry</b>  | Character string comprising numbers, letters and special characters (16)  |



### 3.5.3 "Bluetooth configuration" submenu

*Navigation*  System → Bluetooth conf.

---

**Bluetooth activation**


---

|                    |   |
|--------------------|---|
| <b>Navigation</b>  |   System → Bluetooth conf. → Bluetooth active |
| <b>Description</b> | If Bluetooth is deactivated, it can only be reactivated via the display or the operating tool.<br>Reactivating via the SmartBlue app is not possible.   |
| <b>Selection</b>   | <ul style="list-style-type: none"> <li>▪ Disable</li> <li>▪ Enable</li> </ul>   |



### 3.5.4 "Display" submenu

*Navigation*  System → Display

---

**Language**


---

|                     |   |
|---------------------|---|
| <b>Navigation</b>   |   System → Display → Language |
| <b>Prerequisite</b> | A local display is provided.  |
| <b>Description</b>  | Use this function to select the configured language on the local display.   |
| <b>Selection</b>    | <ul style="list-style-type: none"> <li>▪ English</li> <li>▪ Deutsch</li> <li>▪ Français</li> <li>▪ Español</li> <li>▪ Italiano</li> <li>▪ Nederlands</li> </ul>                                     |

- Portuguesa
- Polski
- русский язык (Russian)
- Svenska
- Türkçe
- 中文 (Chinese)
- 日本語 (Japanese)
- 한국어 (Korean)
- Bahasa Indonesia
- tiếng Việt (Vietnamese)
- čeština (Czech)

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

---

## Format display

---

**Navigation**  System → Display → Format display




**Prerequisite** A local display is provided.

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

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

**Additional information** *Description*

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

-  ▪ The **Value 1 display** parameter (→  168)...**Value 8 display** parameter **Value 4 display** parameter (→  170) are used to specify which measured values are shown on the local display and in what order.
- If more measured values are specified than the display mode selected permits, then the values alternate on the device display. The display time until the next change is configured using the **Display interval** parameter.

---

## Value 1 display

---

**Navigation**  System → Display → Value 1 display

**Prerequisite** A local display is provided.



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

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




**Additional information***Description*

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

 The **Format display** parameter (→  168) is used to specify how many measured values are displayed simultaneously and how.

*Dependency*

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

**Value 2 display****Navigation**

  System → Display → Value 2 display

**Prerequisite**

A local display is provided.

**Description**



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

**Selection**


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

**Additional information***Description*

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

 The **Format display** parameter (→  168) is used to specify how many measured values are displayed simultaneously and how.

*Dependency*

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

**Value 3 display****Navigation**

  System → Display → Value 3 display

**Prerequisite**




A local display is provided.

**Description**

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

**Selection**






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

|                               |   |
|-------------------------------|---|
| <b>Additional information</b> | <p><i>Description</i></p> <p>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.</p> <p> The <b>Format display</b> parameter (→  168) is used to specify how many measured values are displayed simultaneously and how.</p> <p><i>Selection</i></p> <p> The unit of the displayed measured value is taken from the <b>System units</b> submenu.</p> |
|-------------------------------|---|

---

## Value 4 display



---

|                               |  |
|-------------------------------|--|
| <b>Navigation</b>             |   System → Display → Value 4 display   |
| <b>Prerequisite</b>           | A local display is provided.   |
| <b>Description</b>            | Use this function to select one of the measured values shown on the local display.   |
| <b>Selection</b>              | <ul style="list-style-type: none"> <li>▪ None</li> <li>▪ Pressure</li> <li>▪ Scaled variable</li> <li>▪ Current output</li> <li>▪ Sensor temperature</li> <li>▪ Percent of range</li> </ul>  |
| <b>Additional information</b> | <p><i>Description</i></p> <p>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.</p> <p> The <b>Format display</b> parameter (→  168) is used to specify how many measured values are displayed simultaneously and how.</p> <p><i>Selection</i></p> <p> The unit of the displayed measured value is taken from the <b>System units</b> submenu.</p> |

---

## Contrast display

---

|                        |   |
|------------------------|---|
| <b>Navigation</b>      |   System → Display → Contrast display |
| <b>Description</b>     | Adjust local display contrast setting to ambient conditions (e.g. lighting or reading angle)  |
| <b>User entry</b>      | 20 to 80 %  |
| <b>Factory setting</b> | Depends on the display  |

**Additional information**

Set the contrast via the push-buttons:

- Weaker: Press the and buttons simultaneously
- Stronger: Press the and buttons simultaneously

**3.5.5 "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


### 3.5.6 "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**





---

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |  System → Information → Manufacturer |
| <b>User interface</b> | Character string comprising numbers, letters and special characters   |

---

**Serial number**




---

|                               |  |
|-------------------------------|--|
| <b>Navigation</b>             |  System → Information → Serial number   |
| <b>Description</b>            | Displays the serial number of the measuring device.<br> The number can be found on the nameplate of the sensor and transmitter.   |
| <b>User interface</b>         | Max. 11-digit character string comprising letters and numbers.   |
| <b>Additional information</b> | <p><i>Description</i></p> <p> <b>Uses of the serial number</b></p> <ul style="list-style-type: none"> <li>▪ To identify the measuring device quickly, e.g. when contacting Endress+Hauser.</li> <li>▪ To obtain specific information on the measuring device using the Device Viewer: <a href="http://www.endress.com/deviceviewer">www.endress.com/deviceviewer</a></li> </ul> |

---

**Order code**




---

|                               |   |
|-------------------------------|---|
| <b>Navigation</b>             |  System → Information → Order code   |
| <b>Description</b>            | Shows the device order code.  |
| <b>User interface</b>         | Character string composed of letters, numbers and certain punctuation marks (e.g. /).   |
| <b>Factory setting</b>        | –   |
| <b>Additional information</b> | <p><i>Description</i></p> <p>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.</p> <p> <b>Uses of the order code</b></p> <ul style="list-style-type: none"> <li>▪ To order an identical spare device.</li> <li>▪ To identify the device quickly and easily, e.g. when contacting Endress+Hauser.</li> </ul> |

---

**Firmware version**



---

|                               |   |
|-------------------------------|---|
| <b>Navigation</b>             |  System → Information → Firmware version   |
| <b>Description</b>            | Displays the device firmware version that is installed.   |
| <b>User interface</b>         | Character string in the format xx.yy.zz   |
| <b>Additional information</b> | <p><i>User interface</i></p> <p> The Firmware version is also located:</p> <ul style="list-style-type: none"> <li>▪ On the title page of the Operating instructions</li> <li>▪ On the transmitter nameplate</li> </ul> |

---

**Hardware version**



---


|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |  System → Information → Hardware version |
| <b>User interface</b> | Character string comprising numbers, letters and special characters   |

---

**Extended order code 1**


---






|                               |   |
|-------------------------------|---|
| <b>Navigation</b>             |  System → Information → Ext. order cd. 1   |
| <b>Description</b>            | The extended order code is an alphanumeric code containing all information to identify the device and its options.  |
| <b>User interface</b>         | Character string  |
| <b>Factory setting</b>        | –   |
| <b>Additional information</b> | <p><i>Description</i></p> <p>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.</p> |

---

**Extended order code 2**


---




|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |  System → Information → Ext. order cd. 2   |
| <b>Description</b>    | <p>The extended order code is an alphanumeric code containing all information to identify the device and its options.</p> <p> The extended order code can also be found on the nameplate of the sensor and transmitter in the "Ext. ord. cd." field.</p> |
| <b>User interface</b> | Character string  |

**Factory setting** -


---

### Extended order code 3

---

**Navigation**  System → Information → Ext. order cd. 3

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

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

**User interface** Character string

**Factory setting** -

---

### XML build number

---

**Navigation**   System → Information → XML build no.

**User interface** Positive integer

---

### Checksum

---

**Navigation**   System → Information → Checksum

**Description** Checksum for Firmware version.

**User interface** Positive integer



### 3.5.7 "Software configuration" submenu

*Navigation*  System → Softw. config.

---

#### CRC device configuration



---

|                       |  |
|-----------------------|--|
| <b>Navigation</b>     |   System → Softw. config. → CRC device conf. |
| <b>Description</b>    | CRC device configuration based on current settings of safety relevant parameters. The CRC device configuration is unique and can be used to detect changes in safety relevant parameter settings.              |
| <b>User interface</b> | 0 to 65 535  |

---

#### Stored CRC device configuration



---

|                       |  |
|-----------------------|--|
| <b>Navigation</b>     |   System → Softw. config. → Stored CRC conf. |
| <b>Description</b>    | Stored CRC after the last safety lock. Factory delivery is 65535 means that the device has not yet been safety locked.   |
| <b>User interface</b> | 0 to 65 535  |

---

#### Timestamp stored CRC device config.



---

|                       |   |
|-----------------------|---|
| <b>Navigation</b>     |   System → Softw. config. → Time stored CRC |
| <b>Description</b>    | Gives the time stamp when the CRC was last stored following completion of the safety lock wizard.   |
| <b>User interface</b> | Character string comprising numbers, letters and special characters   |

---

#### Activate SW option

---

|                        |  |
|------------------------|--|
| <b>Navigation</b>      |   System → Softw. config. → Activate SW opt. |
| <b>Description</b>     | Use this function to enter an activation code to enable an additional, ordered software option.  |
| <b>User entry</b>      | Max. 10-digit string of numbers.   |
| <b>Factory setting</b> | 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

## Symbols

- (High) Is safety function triggered? (Parameter) . . . . 101
- (Low) Is safety function triggered? (Parameter) . . . . 102

## 0 ... 9

- 4 mA trim value (Parameter) . . . . . 150
- 20 mA trim value (Parameter) . . . . . 150
- 500 Diagnostic behavior (Parameter) . . . . . 78, 123
- 500 Event category (Parameter) . . . . . 78, 123
- 500 Process alert pressure (Parameter) . . . . . 76, 120
- 501 Diagnostic behavior (Parameter) . . . . . 79, 123
- 501 Event category (Parameter) . . . . . 80, 124
- 501 Process alert scaled variable (Parameter) . . . . . 78, 120
- 502 Diagnostic behavior (Parameter) . . . . . 81, 124
- 502 Event category (Parameter) . . . . . 81, 124
- 806 Diagnostic behavior (Parameter) . . . . . 75, 122, 125, 128
- 806 Event category (Parameter) . . . . . 75, 122, 125, 128
- 806 Event delay (Parameter) . . . . . 75, 118, 122
- 822 Diagnostic behavior (Parameter) . . . . . 125, 128
- 822 Event category (Parameter) . . . . . 126, 129
- 841 Event category (Parameter) . . . . . 126, 129
- 900 Diagnostic behavior (Parameter) . . . . . 71, 127, 130
- 900 Event category (Parameter) . . . . . 70, 127, 130
- 906 Diagnostic behavior (Parameter) . . . . . 127, 130
- 906 Event category (Parameter) . . . . . 71, 127, 130

## A

- Activate SW option (Parameter) . . . . . 176
- Activate table (Parameter) . . . . . 144
- Active diagnostics (Parameter) . . . . . 104, 107
- Active diagnostics (Submenu) . . . . . 107
- Altitude (Parameter) . . . . . 172
- Analog path integrity (Parameter) . . . . . 59
- Application (Menu) . . . . . 132
- Assign HART variables? (Parameter) . . . . . 50, 52
- Assign PV (Parameter) . . . . . 38, 53, 91, 141, 148, 152
- Assign QV (Parameter) . . . . . 55, 154
- Assign SV (Parameter) . . . . . 53, 153
- Assign TV (Parameter) . . . . . 54, 153

## B

- Baseline build process (Parameter) . . . . . 65, 73
- Baseline is available (Parameter) . . . . . 66
- Baseline Signal Control Line (Parameter) . . . . . 67
- Baseline Signal Lower Control Line (Parameter) . . . . . 68
- Baseline Signal Noise Control Line (Parameter) . . . . . 69
- Baseline Signal Noise Lower Control Line (Parameter) . . . . . 69
- Baseline Signal Noise Minimum (Parameter) . . . . . 70
- Baseline Signal Noise Upper Control Line (Parameter) . . . . . 69
- Baseline Signal Upper Control Line (Parameter) . . . . . 67
- Baseline status (Parameter) . . . . . 72, 117
- Basic settings (Submenu) . . . . . 136
- Bluetooth activation (Parameter) . . . . . 167
- Bluetooth configuration (Submenu) . . . . . 167
- Burst command 1 (Parameter) . . . . . 156
- Burst configuration 1 (Submenu) . . . . . 155

- Burst mode 1 (Parameter) . . . . . 155
- Burst trigger level (Parameter) . . . . . 159
- Burst trigger mode (Parameter) . . . . . 158
- Burst variable 0 (Parameter) . . . . . 156
- Burst variable 1 (Parameter) . . . . . 157
- Burst variable 2 (Parameter) . . . . . 157
- Burst variable 3 (Parameter) . . . . . 157
- Burst variable 4 (Parameter) . . . . . 157
- Burst variable 5 (Parameter) . . . . . 158
- Burst variable 6 (Parameter) . . . . . 158
- Burst variable 7 (Parameter) . . . . . 158

## C

- Calibration offset (Parameter) . . . . . 138
- Character test string (Parameter) . . . . . 84
- Checksum (Parameter) . . . . . 175
- Clamping voltage lower threshold (Parameter) . . . . . 117
- Clamping voltage upper threshold (Parameter) . . . . . 117
- Clear event list (Parameter) . . . . . 109
- Commissioning (Wizard) . . . . . 34
- Configuration (Submenu) . . . . . 123, 151
- Configuration counter (Parameter) . . . . . 88, 99, 164
- Confirm (Parameter) . . . . . 84, 86, 89, 90, 92, 101
- Confirm new password (Parameter) . . . . . 166
- Confirmation (Wizard) . . . . . 88, 89, 90, 92
- Contrast display (Parameter) . . . . . 170
- Counter Baseline creation SSD (Parameter) . . . . . 66, 119
- Counter limit overruns sensor Pmax (Parameter) . . . . . 112
- Counter limit overruns sensor Tmax (Parameter) . . . . . 113
- Counter limit underruns sensor Pmin (Parameter) . . . . . 110
- Counter limit underruns sensor Tmin (Parameter) . . . . . 111
- Counter overruns of user limit Pmax (Parameter) . . . . . 77, 112
- Counter overruns of user limit Tmax (Parameter) . . . . . 81, 113
- Counter underruns of user limit Pmin (Parameter) . . . . . 77, 110
- Counter underruns of user limit Tmin (Parameter) . . . . . 81, 111
- CRC device configuration (Parameter) . . . . . 87, 98, 176
- Current Baseline noise (Parameter) . . . . . 69
- Current Baseline signal (Parameter) . . . . . 67
- Current deviation 1 (Parameter) . . . . . 103
- Current deviation 2 (Parameter) . . . . . 103
- Current output (Submenu) . . . . . 148
- Current range output (Parameter) . . . . . 49, 51, 91, 148

## D

- Damping (Parameter) . . . . . 38, 89, 137
- Date/time (Parameter) . . . . . 94
- Date/time Heartbeat Verification (Parameter) . . . . . 61, 115
- Date/time proof test (Parameter) . . . . . 105
- Decimal places pressure (Parameter) . . . . . 132
- Decimal places scaled variable (Parameter) . . . . . 134
- Decision of inspector (Parameter) . . . . . 104
- Description of device parameters . . . . . 31

Device ID (Parameter) . . . . . 160  
 Device identification (Wizard) . . . . . 34, 36, 37  
 Device management (Submenu) . . . . . 163  
 Device name (Parameter) . . . . . 34, 85, 97, 172  
 Device revision (Parameter) . . . . . 160  
 Device tag (Parameter) . . . . . 34, 85, 96, 151, 163  
 Device type (Parameter) . . . . . 160  
 Diagnostic event simulation (Parameter) . . . . . 114  
 Diagnostic settings (Submenu) . . . . . 119  
 Diagnostics (Menu) . . . . . 107  
 Display (Submenu) . . . . . 167  
 Document  
   Explanation of the structure of a parameter  
     description . . . . . 4  
     Function . . . . . 4  
     Structure . . . . . 4  
     Symbols used . . . . . 5  
     Target group . . . . . 4  
     Using the document . . . . . 4  
 Document function . . . . . 4

**E**  
 Electronics temperature (Parameter) . . . . . 136  
 Enter access code (Parameter) . . . . . 165  
 Enter safety locking code (Parameter) . . . . . 84, 92  
 Enter safety unlocking code (Parameter) . . . . . 82  
 Event logbook (Submenu) . . . . . 109  
 Extended order code 1 (Parameter) . . . . . 35, 174  
 Extended order code 2 (Parameter) . . . . . 35, 174  
 Extended order code 3 (Parameter) . . . . . 35, 175

**F**  
 Failure behavior current output (Parameter)  
   . . . . . 50, 52, 90, 149  
 Failure current (high alarm) (Parameter) . . . . . 100  
 Failure current (Parameter) . . . . . 50, 52, 149  
 Filter options (Parameter) . . . . . 109  
 Finish (Wizard) . . . . . 94, 104  
 Firmware version (Parameter) . . . . . 86, 97, 174  
 Format display (Parameter) . . . . . 168  
 Free text (Parameter) . . . . . 41, 134, 142  
 Function  
   see Parameter

**G**  
 Geolocation (Submenu) . . . . . 171  
 Guidance (Menu) . . . . . 31, 34

**H**  
 Hardware version (Parameter) . . . . . 86, 98, 174  
 HART address (Parameter) . . . . . 38, 151  
 HART date code (Parameter) . . . . . 37, 162  
 HART descriptor (Parameter) . . . . . 37, 161  
 HART message (Parameter) . . . . . 37, 161  
 HART output (Submenu) . . . . . 151, 152  
 HART revision (Parameter) . . . . . 161  
 HART short tag (Parameter) . . . . . 37, 151, 161  
 Heartbeat Technology (Submenu) . . . . . 115  
 Heartbeat Verification (Parameter) . . . . . 56  
 Heartbeat Verification (Submenu) . . . . . 115

Heartbeat Verification (Wizard) . . . . . 56  
 High alert value (Parameter) . . . . . 77, 79, 80, 120, 121, 122  
 HP/LP swap (Parameter) . . . . . 88, 137

**I**

I have read the warning texts. (Parameter) . . . . . 72, 82, 95  
 Information (Submenu) . . . . . 160, 172  
 Inspector (Parameter) . . . . . 60, 94, 105

**L**

Language (Parameter) . . . . . 167  
 Latitude (Parameter) . . . . . 171  
 Location (Parameter) . . . . . 60, 94, 105  
 Location Description (Parameter) . . . . . 171  
 Location method (Parameter) . . . . . 172  
 Locking (Wizard) . . . . . 92  
 Locking status (Parameter) . . . . . 36, 82, 93, 163  
 Longitude (Parameter) . . . . . 171  
 Loop current mode (Parameter) . . . . . 50, 52, 152  
 Loop diagnostics (Parameter) . . . . . 58, 76, 117  
 Loop diagnostics (Submenu) . . . . . 116  
 Low alert value (Parameter) . . . . . 76, 79, 80, 120, 121  
 Low cutoff (Parameter) . . . . . 90  
 Low flow cut off (Parameter) . . . . . 43, 137  
 Lower Range Limit (Parameter) . . . . . 44, 46, 48, 140  
 Lower range value output (Parameter)  
   . . . . . 45, 49, 51, 91, 143, 146, 147, 149  
 Lower sensor trim (Parameter) . . . . . 139  
 Lower sensor trim measured value (Parameter) . . . . . 139

**M**

Mainboard module (Wizard) . . . . . 56  
 Manufacturer (Parameter) . . . . . 173  
 Max. update period (Parameter) . . . . . 159  
 Maximum electronics temperature (Parameter) . . . . . 113  
 Maximum sensor temperature (Parameter) . . . . . 112  
 Maximum terminal voltage (Parameter) . . . . . 113  
 Measured values (Submenu) . . . . . 135  
 Measurement adjustments (Wizard) . . . . . 38, 39, 40, 42  
 Measuring mode current output (Parameter) . . . . . 90, 148  
 Measuring units (Submenu) . . . . . 132  
 Membrane integrity (Parameter) . . . . . 58  
 Menu  
   Application . . . . . 132  
   Diagnostics . . . . . 107  
   Guidance . . . . . 31, 34  
   System . . . . . 163  
 Min. update period (Parameter) . . . . . 159  
 Minimum electronics temperature (Parameter) . . . . . 111  
 Minimum sensor temperature (Parameter) . . . . . 111  
 Minimum span (Parameter) . . . . . 45, 46, 48, 141  
 Minimum terminal voltage (Parameter) . . . . . 111  
 Minimum/maximum values (Submenu) . . . . . 110

**N**

New password (Parameter) . . . . . 166  
 No. of preambles (Parameter) . . . . . 152  
 Notes (Parameter) . . . . . 61, 94, 96, 105

**O**

Old password (Parameter) . . . . . 166  
 Operating time (Parameter) . . . . . 87, 99, 109  
 Operating time (Verification) (Parameter) . . . . . 61, 115  
 Operating time from restart (Parameter) . . . . . 108  
 Order code (Parameter) . . . . . 173  
 Output current (Parameter) . . . . . 56, 150  
 Output current transfer function (Parameter)  
 . . . . . 43, 89, 136  
 Output settings (Wizard) . . . . . 43, 44, 45, 47, 49, 51, 53

**P**

## Parameter

Structure of a parameter description . . . . . 4  
 Password (Parameter) . . . . . 165  
 Plant operator (Parameter) . . . . . 61, 95, 106  
 Preparation (Wizard) . . . . . 82, 83, 84, 85, 87  
 Preparation Proof test (Wizard) . . . . . 95, 96, 98, 100  
 Pressure (Parameter) . . . . . 43, 45, 135, 143, 145  
 Pressure 1 (Parameter) . . . . . 102  
 Pressure 2 (Parameter) . . . . . 103  
 Pressure max (Parameter) . . . . . 112  
 Pressure min (Parameter) . . . . . 110  
 Pressure unit (Parameter) . . . . . 39, 40, 132  
 Pressure value 1 (Parameter) . . . . . 47, 144, 145, 147  
 Pressure value 2 (Parameter) . . . . . 48, 144, 146, 147  
 Previous diagnostics (Parameter) . . . . . 108  
 Primary variable (PV) (Parameter) . . . . . 152  
 Process (Submenu) . . . . . 125, 128  
 Process Unit Tag (Parameter) . . . . . 171  
 Process variable output current (Parameter) . . . . . 51  
 Proof test (Wizard) . . . . . 95, 102  
 Proof test via Bluetooth allowed? (Parameter) . . . . . 83  
 Properties (Submenu) . . . . . 119

**Q**

Quaternary variable (QV) (Parameter) . . . . . 155

**R**

RAM check (Parameter) . . . . . 57  
 Rebuild baseline (Parameter) . . . . . 116  
 Reset device (Parameter) . . . . . 164  
 Reset password (Parameter) . . . . . 167  
 Reset user defined counters P and T (Parameter) . . . . . 112  
 Resistance Baseline (Parameter) . . . . . 73  
 Resistance previous Baseline (Parameter) . . . . . 74  
 ROM check (Parameter) . . . . . 57

**S**

Safety function? (Parameter) . . . . . 100  
 Safety mode (Wizard) . . . . . 82  
 Sample rate (Parameter) . . . . . 66  
 Save protocol? (Parameter) . . . . . 60, 93  
 Scaled variable (Parameter) . . . . . 45, 135, 145  
 Scaled variable (Submenu) . . . . . 141  
 Scaled variable transfer function (Parameter)  
 . . . . . 44, 47, 143  
 Scaled variable unit (Parameter) . . . . . 40, 133, 142  
 Scaled variable value 1 (Parameter) . . . . . 47, 144

Scaled variable value 2 (Parameter) . . . . . 48, 144  
 Secondary variable (SV) (Parameter) . . . . . 153  
 Select test procedure (Parameter) . . . . . 100  
 Sensor (Submenu) . . . . . 136  
 Sensor calibration (Submenu) . . . . . 138  
 Sensor integrity (Parameter) . . . . . 58  
 Sensor limits (Submenu) . . . . . 140  
 Sensor pressure (Parameter) . . . . . 135  
 Sensor pressure range behavior (Parameter)  
 . . . . . 89, 126, 129  
 Sensor temperature (Parameter) . . . . . 135  
 Sensor temperature lower range limit (Parameter) . . . . . 141  
 Sensor temperature upper range limit (Parameter) . . . . . 141  
 Sensor Trim Reset (Parameter) . . . . . 138  
 Sensor/membrane integrity (Parameter) . . . . . 59  
 Serial number (Parameter) . . . . . 34, 86, 97, 173  
 Setpoint 1 (Parameter) . . . . . 102  
 Setpoint 2 (Parameter) . . . . . 103  
 Signal maximum value (Parameter) . . . . . 68  
 Signal minimum value (Parameter) . . . . . 68  
 Signal noise maximum value (Parameter) . . . . . 70  
 Signal noise minimum value (Parameter) . . . . . 70  
 Signal noise status (Parameter) . . . . . 65, 68, 119  
 Signal status (Parameter) . . . . . 65, 67, 118  
 Simulation (Parameter) . . . . . 114  
 Simulation (Submenu) . . . . . 114  
 Simulation and check failure current (Wizard) . . . . . 100  
 Software configuration (Submenu) . . . . . 176  
 Software integrity (Parameter) . . . . . 57  
 Software option overview (Parameter) . . . . . 177  
 Span (Parameter) . . . . . 145, 147  
 SSD Monitoring delay time (Parameter) . . . . . 70, 120  
 SSD Out of range delay time (Parameter) . . . . . 71, 119  
 SSD: Statistical Sensor Diagnostics (Parameter) . . . . . 72, 118  
 Statistical Sensor Diagnostics (Parameter) . . . . . 59  
 Statistical Sensor Diagnostics (Submenu) . . . . . 118  
 Status (Parameter) . . . . . 116  
 Status password entry (Parameter) . . . . . 166  
 Status summary (Parameter) . . . . . 62, 63, 64  
 Stored CRC device configuration (Parameter) . . . . . 87, 98, 176  
 Submenu

Active diagnostics . . . . . 107  
 Basic settings . . . . . 136  
 Bluetooth configuration . . . . . 167  
 Burst configuration 1 . . . . . 155  
 Configuration . . . . . 123, 151  
 Current output . . . . . 148  
 Device management . . . . . 163  
 Diagnostic settings . . . . . 119  
 Display . . . . . 167  
 Event logbook . . . . . 109  
 Geolocation . . . . . 171  
 HART output . . . . . 151, 152  
 Heartbeat Technology . . . . . 115  
 Heartbeat Verification . . . . . 115  
 Information . . . . . 160, 172  
 Loop diagnostics . . . . . 116  
 Measured values . . . . . 135  
 Measuring units . . . . . 132

Minimum/maximum values . . . . . 110  
 Process . . . . . 125, 128  
 Properties . . . . . 119  
 Scaled variable . . . . . 141  
 Sensor . . . . . 136  
 Sensor calibration . . . . . 138  
 Sensor limits . . . . . 140  
 Simulation . . . . . 114  
 Software configuration . . . . . 176  
 Statistical Sensor Diagnostics . . . . . 118  
 User management . . . . . 165  
 Wet calibration . . . . . 145, 146  
 Summary (Parameter) . . . . . 104  
 Supply voltage Baseline (Parameter) . . . . . 73  
 Supply voltage previous Baseline (Parameter) . . . . . 74  
 System (Menu) . . . . . 163  
 System status (Parameter) . . . . . 56, 65, 118

**T**

Target group . . . . . 4  
 Temperature unit (Parameter) . . . . . 39, 41, 132  
 Terminal current (high alarm) (Parameter) . . . . . 101  
 Terminal current (Parameter) . . . . . 136, 150  
 Terminal current 1 (Parameter) . . . . . 102  
 Terminal current 2 (Parameter) . . . . . 103  
 Terminal voltage 1 (Parameter) . . . . . 117, 135  
 Tertiary variable (TV) (Parameter) . . . . . 154  
 Timestamp (Parameter) . . . . . 107, 108  
 Timestamp Baseline (Parameter) . . . . . 73  
 Timestamp previous Baseline (Parameter) . . . . . 74  
 Timestamp stored CRC device config. (Parameter)  
 . . . . . 87, 98, 176  
 Tolerated deviation +/- (Parameter) . . . . . 74, 116

**U**

Upper Range Limit (Parameter) . . . . . 44, 46, 48, 140  
 Upper range value output (Parameter)  
 . . . . . 46, 49, 51, 91, 143, 146, 147, 149  
 Upper sensor trim (Parameter) . . . . . 140  
 Upper sensor trim measured value (Parameter) . . . . . 139  
 User management (Submenu) . . . . . 165  
 User role (Parameter) . . . . . 165  
 User temperature process alert (Parameter) . . . . . 80, 121

**V**

Value 1 display (Parameter) . . . . . 168  
 Value 2 display (Parameter) . . . . . 169  
 Value 3 display (Parameter) . . . . . 169  
 Value 4 display (Parameter) . . . . . 170  
 Value current output (Parameter) . . . . . 114  
 Value pressure simulation (Parameter) . . . . . 114  
 Verification result (Parameter) . . . . . 60, 115  
 Visual inspection (Parameter) . . . . . 96

**W**

Wet calibration (Submenu) . . . . . 145, 146  
 Wizard  
 Commissioning . . . . . 34  
 Confirmation . . . . . 88, 89, 90, 92  
 Device identification . . . . . 34, 36, 37

Finish . . . . . 94, 104  
 Heartbeat Verification . . . . . 56  
 Locking . . . . . 92  
 Mainboard module . . . . . 56  
 Measurement adjustments . . . . . 38, 39, 40, 42  
 Output settings . . . . . 43, 44, 45, 47, 49, 51, 53  
 Preparation . . . . . 82, 83, 84, 85, 87  
 Preparation Proof test . . . . . 95, 96, 98, 100  
 Proof test . . . . . 95, 102  
 Safety mode . . . . . 82  
 Simulation and check failure current . . . . . 100

**X**

XML build number (Parameter) . . . . . 175

**Z**

Zero (Parameter) . . . . . 145, 146  
 Zero adjustment (Parameter) . . . . . 42, 138  
 Zero adjustment offset (Parameter) . . . . . 88, 92, 138



[www.addresses.endress.com](http://www.addresses.endress.com)

---