Description of Device Parameters
iTEMP TMT31

Temperature transmitter
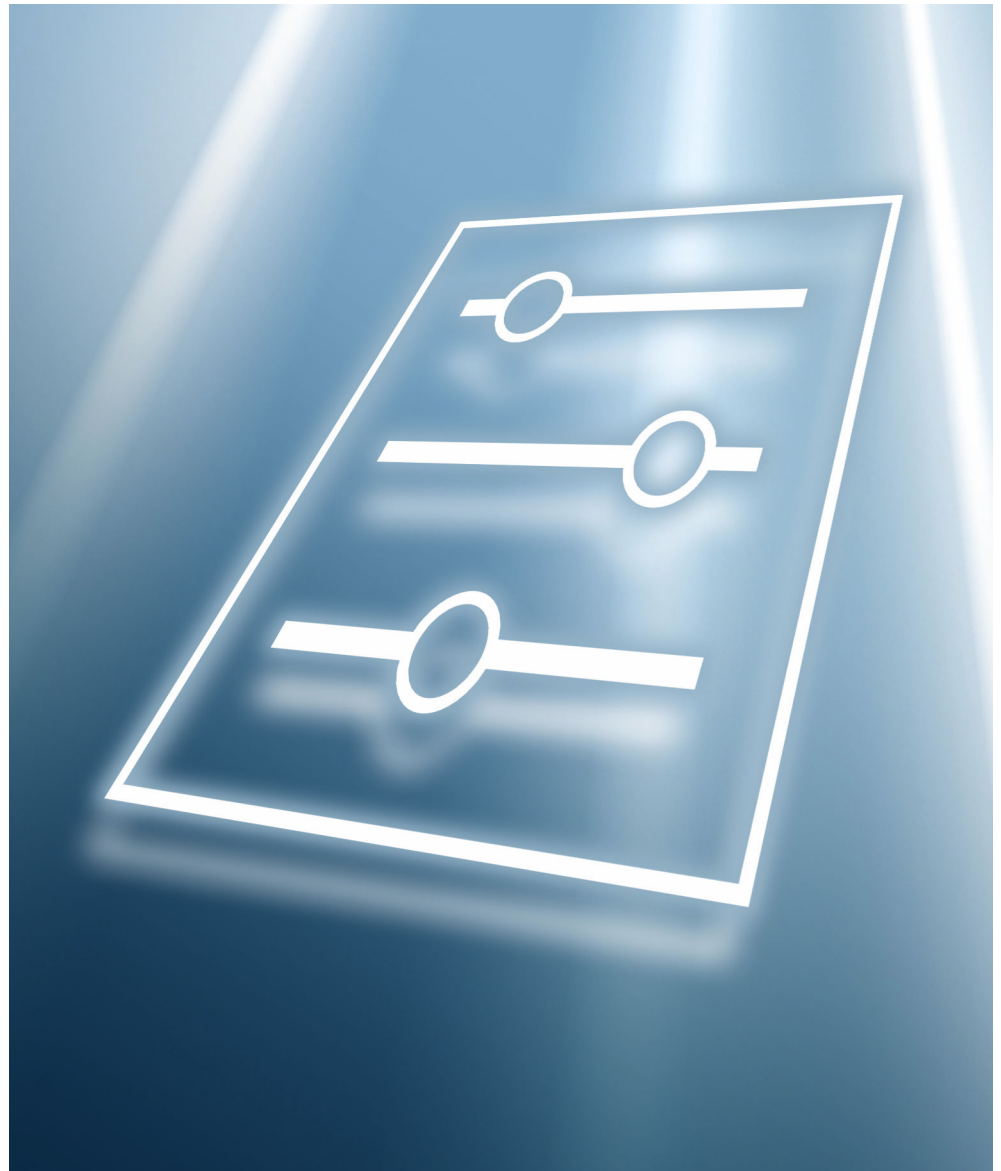
Endress+Hauser

People for Process Automation

Table of contents

1   About this document

1.1   Document function

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

It is used to perform tasks that require detailed knowledge of the function of the device:
• 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   Symbols for certain types of information

Symbol	Meaning
	Tip Indicates additional information.
	Reference to documentation
	Reference to page
	Reference to graphic
 A0028662	Operation via local display
 A0028663	Operation via operating tool
 A0028665	Write-protected parameter

1.3.2   Information on the document structure

The parameters of all the operating menus and the commissioning wizard are described in this document.

• **Guidance** menu with the **Commissioning** wizard (→ 🗐 7), which guides the user automatically through all the device parameters that are needed for commissioning
• **Diagnostics** menu (→ 🗐 10)
• **Application** menu (→ 🗐 12)
• **System** menu (→ 🗐 21)

1.3.3   Structure of a parameter description

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

Complete parameter name	Write-protected parameter = 🔒

Navigation	🖳 Navigation path to the parameter via the operating tool 🖳 The names of the menus, submenus and parameters are abbreviated to the form in which they appear on the display and in the operating tool.
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 • Option 1 • Option 2
User entry	Input range for the parameter
User interface	Display value/data for the parameter
Factory setting	Default setting ex works (if not explicitly selected)
Additional information	Additional explanations (e.g. in examples): • For individual options • For display values/data • For the input range • For the factory setting • For the parameter function

1.4   Documentation

The Description of Device Parameters is part of the following documentation:

📖 Measuring device iTEMP TMT31: **BA02157T**

2   Overview of the operating menu

Guidance	→ 🖹 7
Diagnostics	→ 🖹 10
Application	→ 🖹 12
System	→ 🖹 21

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3 "Guidance" menu

The Guidance main menu contains functions enable users to perform basic tasks swiftly, e.g. commissioning.

These are primarily guided wizards and cross-subject special functions.

Navigation 🖳 Guidance

Guidance		
▶ Commissioning	→ 🖺 7	
Unit	→ 🖺 7	
Sensor type	→ 🖺 8	
Connection type	→ 🖺 8	
2-wire compensation	→ 🖺 8	
Lower range value output	→ 🖺 9	
Upper range value output	→ 🖺 9	
Failure mode	→ 🖺 9	

Documentation [1]
Save/restore [1]
Compare datasets [1]

[1] These parameters only appear in FDT/DTM-based operating tools, such as Endress+Hauser's FieldCare and DeviceCare

3.1 "Commissioning" submenu

Navigation 🖳 Guidance → Commissioning

Unit

Navigation 🖳 Guidance → Commissioning → Unit

Description Selection of the unit for all measured values.

Selection	*SI units* • ℃ • K
	Custom-specific units ℉

Sensor type

Navigation	⊟ Guidance → Commissioning → Sensor type
Description	Use this function to select the sensor type for the sensor input.
	Info:
	Please observe the terminal assignment when connecting the sensor.
Selection	• Pt100 IEC60751, a=0.00385 (1) • Pt1000 IEC60751, a=0.00385 (4) • Pt100 JIS C1604, a=0.003916 (5) • Pt100 GOST 6651-94, a=0.00391 (9) • RTD Platinium (Callendar/van Dusen)
Factory setting	Pt100 IEC60751, a=0.00385 (1)

Connection type

Navigation	⊟ Guidance → Commissioning → Connection type
Description	Use this function to select the connection type for the sensor.
Selection	• 2- wire • 3- wire • 4- wire
Factory setting	4- wire

2-wire compensation

Navigation	⊟ Guidance → Commissioning → 2-wire compensation
Description	Use this function to specify the resistance value for two-wire compensation in RTDs.
User entry	0.0 to 30.0 Ohm
Factory setting	0 Ohm

Lower range value output

Navigation	▣	Guidance → Commissioning → Lower range value output

Description   Use this function to assign a measured value to the current value 4 mA.

Info:
The set point that can be set depends on the sensor type used in the Sensor type parameter.

User entry   −50 000.0 to 50 000.0

Factory setting   0.0

Upper range value output

Navigation	▣	Guidance → Commissioning → Upper range value output

Description   Use this function to assign a measured value to the current value 20 mA.

Info:
The set point that can be set depends on the sensor type used in the Sensor type parameter.

User entry   −50 000.0 to 50 000.0

Factory setting   100

Failure mode
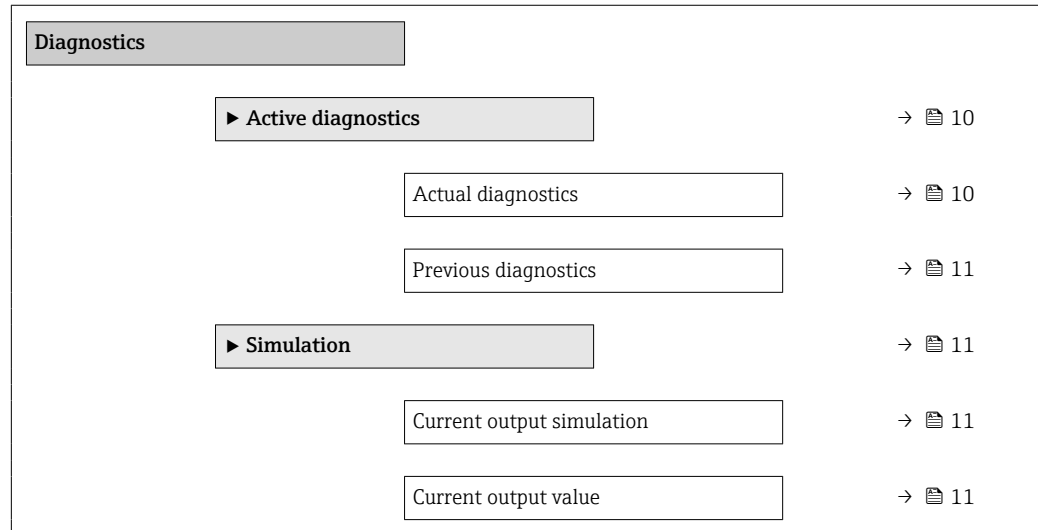
Navigation	▣	Guidance → Commissioning → Failure mode

Description   Use this function to select the signal on alarm level of the current output in the event of an error.

Selection   ▪ Max.
                      ▪ Min.

Factory setting   Low alarm

4 "Diagnostics" menu

Settings and information concerning diagnostics as well as help for troubleshooting

Navigation   ▤   Diagnostics

Diagnostics	
▸ Active diagnostics	→ 🖹 10
Actual diagnostics	→ 🖹 10
Previous diagnostics	→ 🖹 11
▸ Simulation	→ 🖹 11
Current output simulation	→ 🖹 11
Current output value	→ 🖹 11

4.1 "Active diagnostics" submenu

Navigation   ▤   Diagnostics → Active diagnostics

▸ Active diagnostics	
Actual diagnostics	→ 🖹 10
Previous diagnostics	→ 🖹 11
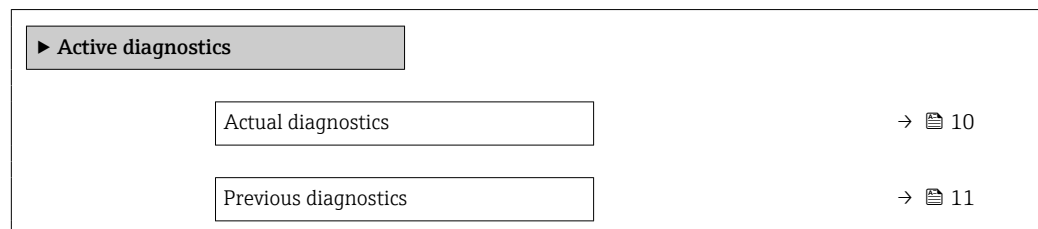
Actual diagnostics

Navigation	▤	Diagnostics → Active diagnostics → Actual diagnostics

Description   Displays the currently active diagnostic message.

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

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

Previous diagnostics

Navigation   ▣   Diagnostics → Active diagnostics → Previous diagnostics

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

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

4.2   "Simulation" submenu

Navigation   ▣   Diagnostics → Simulation

▸ Simulation	
Current output simulation	→ 🕮 11
Current output value	→ 🕮 11
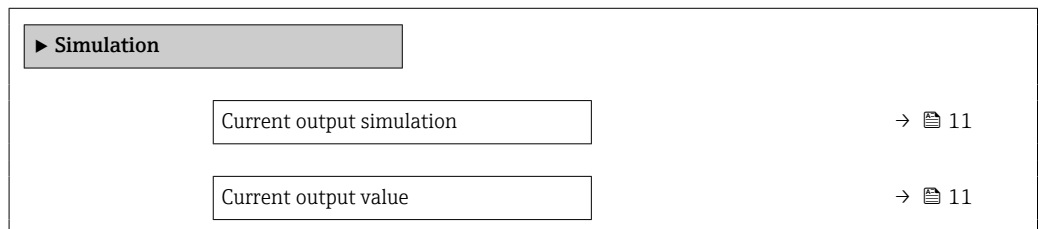
Current output simulation

Navigation   ▣   Diagnostics → Simulation → Current output simulation

Description   Use this function to switch simulation of the current output on and off. While simulation is in progress the display a diagnostics message of the "function check" category (C).

Selection   • Off
                            • On

Factory setting   Off

Current output value

Navigation   ▣   Diagnostics → Simulation → Current output value

Description   Use this function to set a current value for the simulation. In this way, users can verify the correct adjustment of the current output and the correct function of downstream switching units.

User entry   3.58 to 23.0 mA

Factory setting   3.58 mA

5   "Application" menu

Functions for detailed process adaptation to integrate the device optimally into your application

Navigation   ▣   Application

Application	
▶ Measured values	→ 🖺 13
Sensor value	→ 🖺 13
Output current	→ 🖺 13
Percent of range	→ 🖺 13
Device temperature	→ 🖺 14
▶ Sensor	→ 🖺 14
Unit	→ 🖺 15
Sensor type	→ 🖺 15
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2-wire compensation	→ 🖺 16
Sensor offset	→ 🖺 16
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Call./v. Dusen coeff. R0	→ 🖺 16
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▶ Current output	→ 🖺 18
Lower range value output	→ 🖺 18
Upper range value output	→ 🖺 19

Failure mode	→ 🖹 19
Current trimming 4 mA	→ 🖹 19
Current trimming 20 mA	→ 🖹 19

5.1   "Measured values" submenu

Navigation   🖳   Application → Measured values

▶ Measured values	
Sensor value	→ 🖹 13
Output current	→ 🖹 13
Percent of range	→ 🖹 13
Device temperature	→ 🖹 14

Sensor value

Navigation   🖳   Application → Measured values → Sensor value

Description   Use this function to display the current measured value at the sensor input.

User interface   Signed floating-point number

Output current

Navigation   🖳   Application → Measured values → Output current

Description   Use this function to view the calculated output current in mA.

User interface   3.58 to 23.0 mA

Percent of range

Navigation   🖳   Application → Measured values → Percent of range

Description   Use this function to display the measured value in % of the span.

User interface	Signed floating-point number

Device temperature

Navigation	🖳	Application → Measured values → Device temperature

Description	Use this function to display the current electronics temperature.

User interface	Signed floating-point number

5.2 "Sensor" submenu

Navigation   🖳   Application → Sensor

▶ Sensor	
Unit	→ 🕮 15
Sensor type	→ 🕮 15
Connection type	→ 🕮 15
2-wire compensation	→ 🕮 16
Sensor offset	→ 🕮 16
Damping	→ 🕮 16
Call./v. Dusen coeff. R0	→ 🕮 16
Call./v. Dusen coeff. A	→ 🕮 17
Call./v. Dusen coeff. B	→ 🕮 17
Call./v. Dusen coeff. C	→ 🕮 17
Sensor lower limit	→ 🕮 17
Sensor upper limit	→ 🕮 18

Unit

Navigation	▣ Application → Sensor → Unit
Description	Selection of the unit for all measured values.
Selection	*SI units* • ℃ • K *Custom-specific units* ℉

Sensor type

Navigation	▣ Application → Sensor → Sensor type
Description	Use this function to select the sensor type for the sensor input. Info: Please observe the terminal assignment when connecting the sensor.
Selection	• Pt100 IEC60751, a=0.00385 (1) • Pt1000 IEC60751, a=0.00385 (4) • Pt100 JIS C1604, a=0.003916 (5) • Pt100 GOST 6651-94, a=0.00391 (9) • RTD Platinium (Callendar/van Dusen)
Factory setting	Pt100 IEC60751, a=0.00385 (1)

Connection type

Navigation	▣ Application → Sensor → Connection type
Description	Use this function to select the connection type for the sensor.
Selection	• 2- wire • 3- wire • 4- wire
Factory setting	4- wire

2-wire compensation

Navigation	▣ Application → Sensor → 2-wire compensation
Description	Use this function to specify the resistance value for two-wire compensation in RTDs.
User entry	0.0 to 30.0 Ohm
Factory setting	0 Ohm

Sensor offset

Navigation	▣ Application → Sensor → Sensor offset
Description	Use this function to set the zero point correction (offset) of the sensor measured value. The value indicated is added to the measured value.
User entry	−10.0 to 10.0
Factory setting	0

Damping

Navigation	▣ Application → Sensor → Damping
Description	Use this function to set the time constant for the damping of the measured value.
User entry	0 to 120 s
Factory setting	0 s

Call./v. Dusen coeff. R0

Navigation	▣ Application → Sensor → Call./v. Dusen coeff. R0
Description	Use this function to set the R0 value for sensor linearization with the Callendar/Van Dusen polynomial.
User entry	10.0 to 4 000.0 Ohm
Factory setting	100 Ohm

Call./v. Dusen coeff. A

Navigation	▣ Application → Sensor → Call./v. Dusen coeff. A
Description	Use this function to set the coefficients for sensor linearization with the Callendar/Van Dusen polynomial.
User entry	3.0E-03 to 4.0E-03
Factory setting	3.9083E-03

Call./v. Dusen coeff. B

Navigation	▣ Application → Sensor → Call./v. Dusen coeff. B
Description	Use this function to set the coefficients for sensor linearization with the Callendar/Van Dusen polynomial.
User entry	−2.0E-06 to 2.0E-06
Factory setting	−5.775E-07

Call./v. Dusen coeff. C

Navigation	▣ Application → Sensor → Call./v. Dusen coeff. C
Description	Use this function to set the coefficients for sensor linearization with the Callendar/Van Dusen polynomial.
User entry	−1.0E-09 to 1.0E-09
Factory setting	−4.183E-12

Sensor lower limit

Navigation	▣ Application → Sensor → Sensor lower limit
Prerequisite	The RTD platinum (Callendar/Van Dusen) option is enabled in the Sensor type parameter
Description	Use this function to set the lower calculation limit for special sensor linearization.
User entry	Depends on the **sensor type** selected
Factory setting	Depends on the **sensor type** selected

Sensor upper limit

Navigation   ▣   Application → Sensor → Sensor upper limit

Prerequisite   The RTD platinum (Callendar/Van Dusen) option is enabled in the Sensor type parameter

Description   Use this function to set the upper calculation limit for special sensor linearization.

User entry   Depends on the **sensor type** selected

Factory setting   Depends on the **sensor type** selected

5.3   "Current output" submenu

Navigation   ▣   Application → Current output

► Current output	
Lower range value output	→ 🕮 18
Upper range value output	→ 🕮 19
Failure mode	→ 🕮 19
Current trimming 4 mA	→ 🕮 19
Current trimming 20 mA	→ 🕮 19

Lower range value output

Navigation   ▣   Application → Current output → Lower range value output

Description   Use this function to assign a measured value to the current value 4 mA.

                            Info:

                            The set point that can be set depends on the sensor type used in the Sensor type parameter.

User entry   −50 000.0 to 50 000.0

Factory setting   0.0

Upper range value output

Navigation	▣ Application → Current output → Upper range value output
Description	Use this function to assign a measured value to the current value 20 mA.
	Info: The set point that can be set depends on the sensor type used in the Sensor type parameter.
User entry	−50 000.0 to 50 000.0
Factory setting	100

Failure mode

Navigation	▣ Application → Current output → Failure mode
Description	Use this function to select the signal on alarm level of the current output in the event of an error.
Selection	• Max. • Min.
Factory setting	Low alarm

Current trimming 4 mA

Navigation	▣ Application → Current output → Current trimming 4 mA
Description	Use this function to set the correction value for the current output at the start of the measuring range at 4 mA.
User entry	3.85 to 4.15 mA
Factory setting	4 mA

Current trimming 20 mA

Navigation	▣ Application → Current output → Current trimming 20 mA
Description	Use this function to set the correction value for the current output at the end of the measuring range at 20 mA.
User entry	19.85 to 20.15 mA

Factory setting   20 mA

6   "System" menu

System settings concerning device management, user administration or safety

Navigation   ▤   System

System	
▶ Device management	→ 🗎 22
Device tag	→ 🗎 22
Device reset	→ 🗎 22
▶ User management	→ 🗎 22
Access status	→ 🗎 23
Define software write protection code	→ 🗎 23
Enter access code	→ 🗎 23
▶ Information	
▶ Device	→ 🗎 23
Serial number	→ 🗎 24
Order code	→ 🗎 24
Firmware version	→ 🗎 24
Hardware revision	→ 🗎 25
Extended order code 1	→ 🗎 25
Extended order code 2	→ 🗎 25
Device name	→ 🗎 25

6.1   "Device management" submenu

Navigation   ▤   System → Device management

▶ Device management	
Device tag	→ 🖹 22
Device reset	→ 🖹 22

Device tag

Navigation   ▤   System → Device management → Device tag

Description   Displays the name for the measuring point.

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

Device reset

Navigation   ▤   System → Device management → Device reset

Description   Use this function to reset the device configuration to a defined state.

Selection   ▪ Not active
                         ▪ Restart device
                         ▪ To factory defaults

Factory setting   Not active

6.2   "User management" submenu

Navigation   ▤   System → User management

▶ User management	
Access status	→ 🖹 23
Define software write protection code	→ 🖹 23
Enter access code	→ 🖹 23

Access status

Navigation   ▣   System → User management → Access status

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

User interface   • Operator
                            • Maintenance

Factory setting   Maintenance

Define software write protection code

Navigation   ▣   System → User management → Define software write protection code

Description   Enter the code to protect the device from unauthorized access

User entry   0 to 9 999

Factory setting   0

Enter access code

Navigation   ▣   System → User management → Enter access code

Description   Entering the defined code to cancel the device protection

User entry   0 to 9 999

Factory setting   0

6.3   "Device" submenu

Navigation   ▣   System → Information → Device
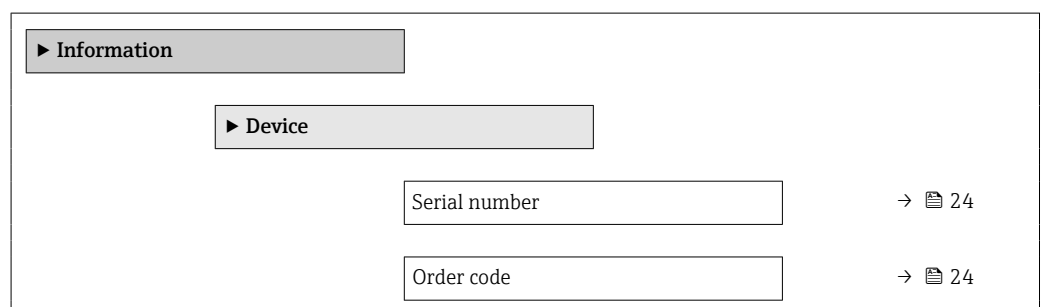
► Information
► Device

Serial number	→ 🖹 24
Order code	→ 🖹 24

Firmware version	→ 🖹 24
Hardware revision	→ 🖹 25
Extended order code 1	→ 🖹 25
Extended order code 2	→ 🖹 25
Device name	→ 🖹 25

Serial number

|	
Navigation	🖳 System → Information → Device → Serial number
Description	Displays the serial number of the measuring device. The serial number can be used to identify the measuring device and to retrieve further information on the measuring device, such as the related documentation, via the Device Viewer or Operations app.
	Additional information:
	The serial number can also be found on the nameplate of the sensor and transmitter.
User interface	Character string comprising numbers, letters and special characters

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Order code

Navigation	🖳 System → Information → Device → Order code
Description	Displays the device order code.
	Additional information:
	The order code can be used for instance to order a replacement or spare device or to verify that the device features specified on the order form match the shipping note.
User interface	Character string comprising numbers, letters and special characters

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Firmware version

Navigation	🖳 System → Information → Device → Firmware version
Description	Use this function to view the device firmware version installed.
User interface	Character string comprising numbers, letters and special characters

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Hardware revision

Navigation	▣	System → Information → Device → Hardware revision
Description		Use this function to display the hardware revision of the device.
User interface		Character string comprising numbers, letters and special characters

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Extended order code 1

Navigation	▣	System → Information → Device → Extended order code 1
Description		Displays the first, second and/or third part of the extended order code. Due to character length restrictions, the extended order code is split into a maximum of 3 parameters. The extended order code indicates for each feature in the product structure the selected option, thereby uniquely identifying the device model.
		Additional information:
		The extended order code can also be found on the nameplate.
User interface		Character string comprising numbers, letters and special characters

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Extended order code 2

Navigation	▣	System → Information → Device → Extended order code 2
Description		Displays the first, second and/or third part of the extended order code. Due to character length restrictions, the extended order code is split into a maximum of 3 parameters. The extended order code indicates for each feature in the product structure the selected option, thereby uniquely identifying the device model.
		Additional information:
		The extended order code can also be found on the nameplate.
User interface		Character string comprising numbers, letters and special characters

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Device name

Navigation	▣	System → Information → Device → Device name
Description		Displays the name of the transmitter.
		Additional information:
		The name can also be found on the transmitter's nameplate.

User interface   Character string comprising numbers, letters and special characters

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