

Description of Device Parameters

iTEMP TMT31

Temperature transmitter

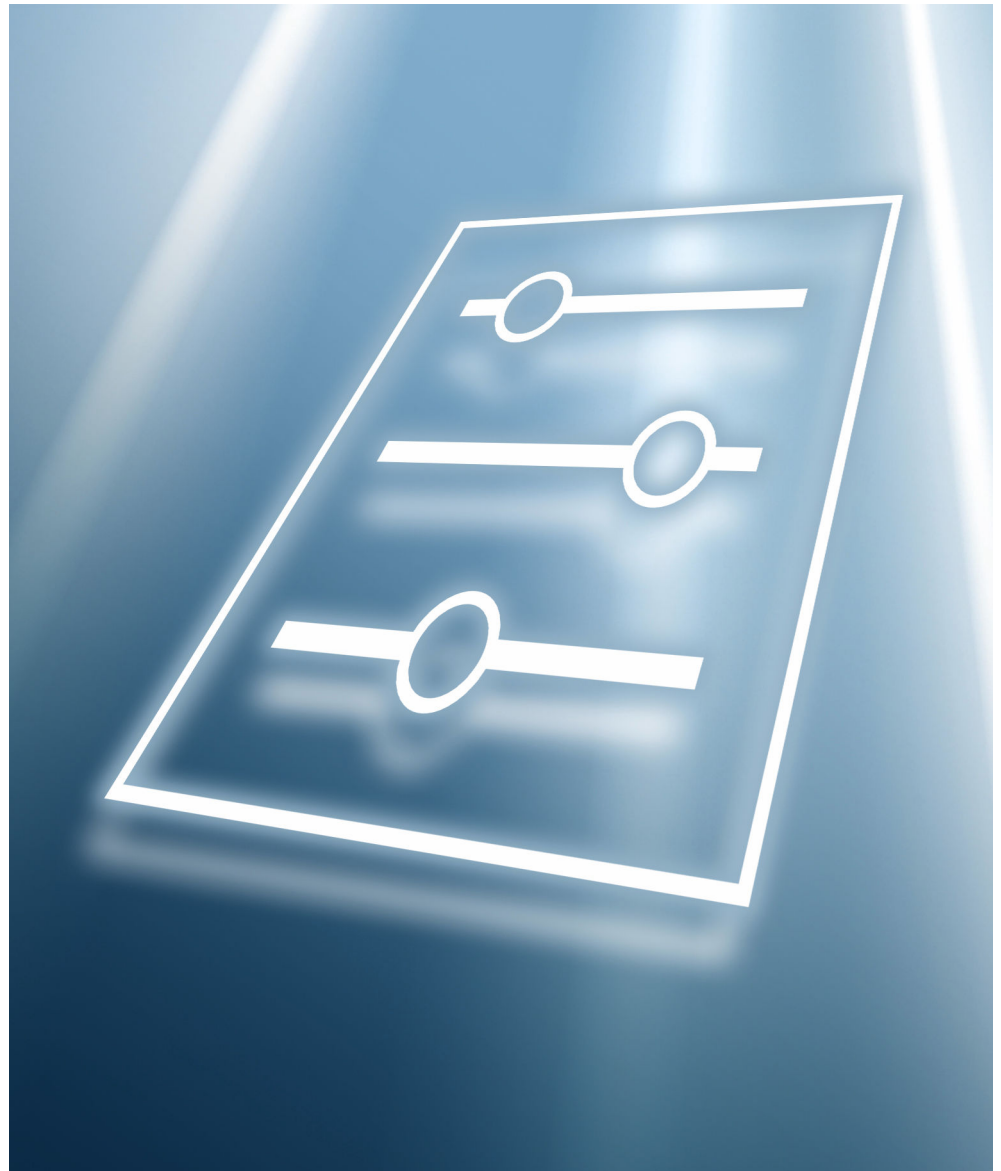


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1 About this document

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:








- Measurement is perfectly matched to the process conditions in each case
- Detailed configuration of the communication interface
- Error diagnostics

1.2 Target group

The document is aimed at experts 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 (→  9): The wizard guides the user automatically through all the device parameters that are required for commissioning.
- **Diagnostics** menu
- **Application** menu
- **System** menu

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 <ul style="list-style-type: none"> ■ Option 1 ■ Option 2
User entry	Input range for the parameter
User interface	Display value/data from parameter
Factory setting	Default setting ex works
Additional information	Additional explanations, e.g.: <ul style="list-style-type: none"> ■ On individual options ■ On display value/data ■ On the input range ■ On the factory setting ■ On the parameter function

1.4 Documentation

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

 Temperature transmitter iTEMP TMT31: **BA02157T**

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3 "Guidance" menu

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

Navigation  Guidance

Create documentation

Navigation  Guidance → Create documentation

User entry Create a PDF document with the parameter configuration of the device.

Save/Restore

Navigation  Guidance → Save/Restore

User entry Save or restore device settings.

Compare datasets


Navigation  Guidance → Compare datasets

User entry Compare data records for device settings.

3.1 "Commissioning" submenu

Navigation  Guidance → Commissioning

Unit

Navigation  Guidance → Commissioning → Unit

Description Selection of the unit for all measured values.

Selection	<i>SI units</i> <ul style="list-style-type: none"> ■ °C ■ K <i>Custom-specific units</i> <ul style="list-style-type: none"> °F
Factory setting	°C

Sensor type


Navigation Guidance → Commissioning → Sensor type

Description Use this function to select the sensor type for the sensor input.

Additional information:

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)
 - Type A (W5Re-W20Re) IEC60584 (30)
 - Type B (PtRh30-PtRh6) IEC60584 (31)
 - Type C (W5Re-W26Re) IEC60584 (32)
 - Type D (W3Re-W25Re) ASTM E988-96 (33)
 - Type E (NiCr-CuNi) IEC60584 (34)
 - Type J (Fe-CuNi) IEC60584 (35)
 - Type K (NiCr-Ni) IEC60584 (36)
 - Type N (NiCrSi-NiSi) IEC60584 (37)
 - Type R (PtRh13-Pt) IEC60584 (38)
 - Type S (PtRh10-Pt) IEC60584 (39)
 - Type T (Cu-CuNi) IEC60584 (40)
 - Type L (Fe-CuNi) DIN43710 (41)
 - Pt100 GOST 6651-94, a=0.00391 (9)
 - RTD Platinum (Callendar/van Dusen)

Factory setting Depending on the device configuration:

- Pt100 IEC60751, a=0.00385 (1)
- Type K (NiCr-Ni) IEC60584 (36)



Reference junction


Navigation Guidance → Commissioning → Reference junction


Prerequisite A thermocouple (TC) sensor must be selected as the sensor type.

Description	Use this function to select reference junction measurement for temperature compensation of thermocouples (TC). Info: - If "Fixed value" is selected, the compensation value is specified via the RJ preset value parameter. - If "Measured value ext. sensor" is selected, an RTD must also be connected in accordance with the specifications in the operating manual.
Selection	<ul style="list-style-type: none"> ■ Internal measurement ■ Fixed Value ■ Measured value ext. sensor
Factory setting	Internal measurement


RJ preset value

Navigation	 Guidance → Commissioning → RJ preset value
Prerequisite	In the Reference junction parameter (→  10), the Fixed Value option must be set.
Description	The Fixed value parameter must be set if the Reference junction n option is selected.
User entry	-50.0 to 360.0
Factory setting	0.0 °C

Connection type

Navigation	 Guidance → Commissioning → Connection type
Prerequisite	An RTD sensor must be specified as the sensor type.
Description	Use this function to select the connection type for the sensor.
Selection	<ul style="list-style-type: none"> ■ 2- wire ■ 3- wire ■ 4- wire
Factory setting	4- wire

2-wire compensation

Navigation	 Guidance → Commissioning → 2-wire compensation
Prerequisite	An RTD sensor with a 2-wire connection type must be specified as the sensor type.

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. Additional information: 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 °C
Factory setting	0.0 °C

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. Additional information: 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 °C
Factory setting	Depending on the sensor type selected: <ul style="list-style-type: none"> ■ RTD Pt100: 100 °C ■ TC type K: 500 °C

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	<ul style="list-style-type: none"> ■ Max. ■ Min.

Factory setting Min.


4 "Diagnostics" menu

Troubleshooting and maintenance: Device behavior settings for process and device events and help and measures for diagnostic purposes.

4.1 "Active diagnostics" submenu

Navigation  Diagnostics → Active diagnostics

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 Identification for diagnostic behavior, diagnostic code and event text.

Previous diagnostics

Navigation  Diagnostics → Active diagnostics → Previous diagnostics


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

User interface Identification for diagnostic behavior, diagnostic code and event text.


4.2 "Simulation" submenu

Navigation  Diagnostics → Simulation

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	<ul style="list-style-type: none"> ■ 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

Targeted optimization of application - comprehensive device settings from sensors to system integration for optimum application adjustment.

5.1 "Measured values" submenu

Navigation  Application → Measured values

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 Current value between 3.58 to 23 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

Unit



Navigation  Application → Sensor → Unit

Description Selection of the unit for all measured values.

Selection	<i>SI units</i> <ul style="list-style-type: none"> ■ °C ■ K <i>Custom-specific units</i> <ul style="list-style-type: none"> °F
Factory setting	°C

Sensor type


Navigation Application → Sensor → Sensor type

Description Use this function to select the sensor type for the sensor input.

Additional information:

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)
- Type A (W5Re-W20Re) IEC60584 (30)
- Type B (PtRh30-PtRh6) IEC60584 (31)
- Type C (W5Re-W26Re) IEC60584 (32)
- Type D (W3Re-W25Re) ASTM E988-96 (33)
- Type E (NiCr-CuNi) IEC60584 (34)
- Type J (Fe-CuNi) IEC60584 (35)
- Type K (NiCr-Ni) IEC60584 (36)
- Type N (NiCrSi-NiSi) IEC60584 (37)
- Type R (PtRh13-Pt) IEC60584 (38)
- Type S (PtRh10-Pt) IEC60584 (39)
- Type T (Cu-CuNi) IEC60584 (40)
- Type L (Fe-CuNi) DIN43710 (41)
- Pt100 GOST 6651-94, a=0.00391 (9)
- RTD Platinum (Callendar/van Dusen)

Factory setting Depending on the device configuration:

- Pt100 IEC60751, a=0.00385 (1)
- Type K (NiCr-Ni) IEC60584 (36)

Connection type


Navigation Application → Sensor → Connection type

Prerequisite An RTD sensor must be specified as the sensor 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

Prerequisite An RTD sensor with a **2-wire** connection type must be specified as the sensor type.

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

Reference junction

Navigation  Application → Sensor → Reference junction

Prerequisite A thermocouple (TC) sensor must be selected as the sensor type.

Description Use this function to select reference junction measurement for temperature compensation of thermocouples (TC).

Info:

- If "Fixed value" is selected, the compensation value is specified via the RJ preset value parameter.
- If "Measured value ext. sensor" is selected, an RTD must also be connected in accordance with the specifications in the operating manual.


Selection

- Internal measurement
- Fixed Value
- Measured value ext. sensor

Factory setting Internal measurement

RJ preset value

Navigation  Application → Sensor → RJ preset value


Prerequisite In the **Reference junction** parameter (→  10), the **Fixed Value** option must be set.

Description The Fixed value parameter must be set if the Reference junction n option is selected.

User entry -50.0 to 360.0

Factory setting 0.0

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 0.00

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

Prerequisite The **RTD Platinum (Callendar/van Dusen)** option is enabled in the **Sensor type** parameter (→  10).


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

Prerequisite The **RTD Platinum (Callendar/van Dusen)** option is enabled in the **Sensor type** parameter (→  10).

Description	Use this function to set the coefficients for sensor linearization with the Callendar/Van Dusen polynomial.
User entry	0.003 to 0.004
Factory setting	0.0039083

Call./v. Dusen coeff. B


Navigation	Application → Sensor → Call./v. Dusen coeff. B
Prerequisite	The RTD Platinum (Callendar/van Dusen) option is enabled in the Sensor type parameter (→ 10).
Description	Use this function to set the coefficients for sensor linearization with the Callendar/Van Dusen polynomial.
User entry	$-2.0 \cdot 10^{-06}$ to $2.0 \cdot 10^{-06}$
Factory setting	-5.775E-07

Call./v. Dusen coeff. C


Navigation	Application → Sensor → Call./v. Dusen coeff. C
Prerequisite	The RTD Platinum (Callendar/van Dusen) option is enabled in the Sensor type parameter (→ 10).
Description	Use this function to set the coefficients for sensor linearization with the Callendar/Van Dusen polynomial.
User entry	$-1.0 \cdot 10^{-09}$ to $1.0 \cdot 10^{-09}$
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 (→ 10).
Description	Use this function to set the lower calculation limit for special sensor linearization.
User entry	-10 000.0 to 10 000.0 °C

Factory setting -200.0 °C

Sensor upper limit

Navigation  Application → Sensor → Sensor upper limit

Prerequisite The **RTD Platinum (Callendar/van Dusen)** option is enabled in the **Sensor type** parameter (→  10).

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

User entry -10 000.0 to 10 000.0 °C

Factory setting 850.0 °C

5.3 "Current output" submenu

Navigation  Application → Current output

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.


Additional information:


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 °C


Factory setting 0.0 °C


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. Additional information: 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 °C
Factory setting	Depending on the sensor type selected: <ul style="list-style-type: none"> ■ RTD Pt100: 100 °C ■ TC type K: 500 °C


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	<ul style="list-style-type: none"> ■ Max. ■ Min.
Factory setting	Min.

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.

6.1 "Device management" submenu

Navigation  System → Device management

Device tag	
Navigation	 System → Device management → Device tag
Description	Use this function to enter the tag name, a maximum of 32 alphanumeric characters
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	<ul style="list-style-type: none"> ■ Not active ■ Restart device ■ To factory defaults
Factory setting	Not active

Reset password	
Navigation	 System → Device management → Reset password
Prerequisite	A software write protection code has already been defined and entered. The Operator user role must be active.
User entry	Enable the Reset password button


6.2 "User management" submenu

Navigation  System → User management


Access status

Navigation	 System → User management → Access status
Description	Shows the access authorization to the parameters via the operating tool
User interface	<ul style="list-style-type: none"> ■ 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 9999
Factory setting	0

Logout


Navigation	 System → User management → Logout
Prerequisite	A software write protection code has already been defined and entered. The Maintenance user role must be active.
Description	"Logout" will change to a lower user role.
User entry	Enable the Logout button

Delete password

Navigation	 System → User management → Delete password
Prerequisite	A software write protection code has already been defined and entered. The Maintenance user role must be active.

Description	Deletes the "Maintenance" password. After deleting, the "Operator" role will be no more available. All users have read/write access rights.
User entry	Activate the Delete password button


Enter access code

Navigation	 System → User management → Enter access code
Prerequisite	The Operator user role is active and a software write protection code has been defined.
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


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 via the Device Viewer or Operations app, such as the related documentation. 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


Order code

Navigation	 System → Information → Device → Order code
Description	<p>Displays the device order code.</p> <p>Additional information:</p> <p>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.</p>
User interface	Character string comprising numbers, letters and special characters


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


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

Extended order code 1

Navigation	 System → Information → Device → Extended order code 1
Description	<p>Displays the first, second and/or third part of the extended order code.</p> <p>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.</p> <p>The extended order code can also be found on the nameplate.</p>
User interface	Character string comprising numbers, letters and special characters

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.

The extended order code can also be found on the nameplate.

User interface

Character string comprising numbers, letters and special characters

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

Factory setting

iTEMP TMT31



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