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:
- 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

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="a0028663" alt="Tip" /></td>
<td>Tip Indicates additional information.</td>
</tr>
<tr>
<td><img src="a0028662" alt="Reference to documentation" /></td>
<td>Reference to documentation</td>
</tr>
<tr>
<td><img src="a0028664" alt="Reference to page" /></td>
<td>Reference to page</td>
</tr>
<tr>
<td><img src="a0028665" alt="Reference to graphic" /></td>
<td>Reference to graphic</td>
</tr>
<tr>
<td><img src="a0028666" alt="Operation via local display" /></td>
<td>Operation via local display</td>
</tr>
<tr>
<td><img src="a0028667" alt="Operation via operating tool" /></td>
<td>Operation via operating tool</td>
</tr>
<tr>
<td><img src="a0028668" alt="Write-protected parameter" /></td>
<td>Write-protected parameter</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>Complete parameter name</th>
<th>Write-protected parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Navigation</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Navigation path to the parameter via the operating tool</td>
</tr>
<tr>
<td></td>
<td>- 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.</td>
</tr>
<tr>
<td><strong>Prerequisite</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- The parameter is only available under these specific conditions</td>
</tr>
<tr>
<td><strong>Description</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Description of the parameter function</td>
</tr>
<tr>
<td><strong>Selection</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- List of the individual options for the parameter</td>
</tr>
<tr>
<td></td>
<td>- Option 1</td>
</tr>
<tr>
<td></td>
<td>- Option 2</td>
</tr>
<tr>
<td><strong>User entry</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Input range for the parameter</td>
</tr>
<tr>
<td><strong>User interface</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Display value/data for the parameter</td>
</tr>
<tr>
<td><strong>Factory setting</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Default setting ex works (if not explicitly selected)</td>
</tr>
<tr>
<td><strong>Additional information</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Additional explanations (e.g. in examples):</td>
</tr>
<tr>
<td></td>
<td>- For individual options</td>
</tr>
<tr>
<td></td>
<td>- For display values/data</td>
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<tr>
<td></td>
<td>- For the input range</td>
</tr>
<tr>
<td></td>
<td>- For the factory setting</td>
</tr>
<tr>
<td></td>
<td>- For the parameter function</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Guidance</th>
<th>→ 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnostics</td>
<td>→ 10</td>
</tr>
<tr>
<td>Application</td>
<td>→ 12</td>
</tr>
<tr>
<td>System</td>
<td>→ 21</td>
</tr>
</tbody>
</table>
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 menu

- **Commissioning**
  - Unit
  - Sensor type
  - Connection type
  - 2-wire compensation
  - Lower range value output
  - Upper range value output
  - Failure mode

- **Documentation**
  - Save/restore
  - Compare datasets

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.
**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
-50000.0 to 50000.0

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
-50000.0 to 50000.0

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

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
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

#### 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

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<tbody>
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<td>▶ Measured values</td>
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<td>Sensor value</td>
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<tr>
<td>Output current</td>
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<tr>
<td>Percent of range</td>
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<tr>
<td>Device temperature</td>
</tr>
<tr>
<td>▶ Sensor</td>
</tr>
<tr>
<td>Unit</td>
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<td>Sensor type</td>
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<td>Connection type</td>
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<tr>
<td>2-wire compensation</td>
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<tr>
<td>Sensor offset</td>
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<tr>
<td>Damping</td>
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<tr>
<td>Call./v. Dusen coeff. R0</td>
</tr>
<tr>
<td>Call./v. Dusen coeff. A</td>
</tr>
<tr>
<td>Call./v. Dusen coeff. B</td>
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<tr>
<td>Call./v. Dusen coeff. C</td>
</tr>
<tr>
<td>Sensor lower limit</td>
</tr>
<tr>
<td>Sensor upper limit</td>
</tr>
<tr>
<td>▶ Current output</td>
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<tr>
<td>Lower range value output</td>
</tr>
<tr>
<td>Upper range value output</td>
</tr>
</tbody>
</table>
5.1 "Measured values" submenu

**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.
"Application" menu

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

<table>
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<th>Sensor</th>
<th></th>
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<td>Unit</td>
<td>→ 15</td>
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<tr>
<td>Sensor type</td>
<td>→ 15</td>
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<tr>
<td>Connection type</td>
<td>→ 15</td>
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<tr>
<td>2-wire compensation</td>
<td>→ 16</td>
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<tr>
<td>Sensor offset</td>
<td>→ 16</td>
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<tr>
<td>Damping</td>
<td>→ 16</td>
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<tr>
<td>Call./v. Dusen coeff. R0</td>
<td>→ 16</td>
</tr>
<tr>
<td>Call./v. Dusen coeff. A</td>
<td>→ 17</td>
</tr>
<tr>
<td>Call./v. Dusen coeff. B</td>
<td>→ 17</td>
</tr>
<tr>
<td>Call./v. Dusen coeff. C</td>
<td>→ 17</td>
</tr>
<tr>
<td>Sensor lower limit</td>
<td>→ 17</td>
</tr>
<tr>
<td>Sensor upper limit</td>
<td>→ 18</td>
</tr>
</tbody>
</table>
## Unit

### Navigation

Application → Sensor → Unit

### Description

Selection of the unit for all measured values.

### Selection

**SI units**
- °C
- K

**Custom-specific units**
- °F

## 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 4000.0 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

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**  
  -50000.0 to 50000.0

- **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*  

<table>
<thead>
<tr>
<th>System</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Device management</strong></td>
</tr>
<tr>
<td>Device tag</td>
</tr>
<tr>
<td>Device reset</td>
</tr>
<tr>
<td><strong>User management</strong></td>
</tr>
<tr>
<td>Access status</td>
</tr>
<tr>
<td>Define software write protection code</td>
</tr>
<tr>
<td>Enter access code</td>
</tr>
<tr>
<td><strong>Information</strong></td>
</tr>
<tr>
<td><strong>Device</strong></td>
</tr>
<tr>
<td>Serial number</td>
</tr>
<tr>
<td>Order code</td>
</tr>
<tr>
<td>Firmware version</td>
</tr>
<tr>
<td>Hardware revision</td>
</tr>
<tr>
<td>Extended order code 1</td>
</tr>
<tr>
<td>Extended order code 2</td>
</tr>
<tr>
<td>Device name</td>
</tr>
</tbody>
</table>

6.1 "Device management" submenu

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

| 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

| Description | |
| Access status | |
| Define software write protection code | |
| Enter access code | |
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
```
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

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

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**  
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

### 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

### 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 |