### Warnings
- Connect the power supply and the display/output device according to the safety regulations for electrical equipment.
- Risk of injury, damage to or destruction of the sensor and/or the controller.
- Avoid shocks and impacts to the sensor and the controller.
- Damage to or destruction of the sensor.
- Never kink the sensor cable, do not bend the sensor cable in tight radii. The minimum bending radius is 14 mm (static). A dynamic movement is not allowed.
- Damage to the sensor cable, failure of the measuring device.
- Avoid exposure of sensor (both optics and housing) to cleaning agents that contain solvents.
- Damage to or destruction of the sensor.
- Avoid abrupt changes of the operating temperature.
- Inaccurate or incorrect measurements.

### Proper Environment
- **Protection class:**
  - Sensor: IP 65 (NEMA 4)
  - Controller: IP 65 (NEMA 4)
- **Operating temperature:**
  - Sensor: Depending on the sensor model between -20°C ... 250°C (-4°F ... +482°F)
  - Controller: 0 ... 85°C (+32°F ... +185°F)
- **Ground (0 V) of internal inputs and outputs:**
- **Power supply:**
- **Analog output object temperature (mV or mA):**
- **EU Directive 2014/30/EU:**
- **Detector signal (-):**
- **Detector signal (+):**
- **Humidity:** 10 - 95% non-condensing.

### Mechanical Installation
- The thermoMETER CT sensors are equipped with a metrical M12x1-thread and can be installed either directly via the sensor thread or by means of the hex nut (included in scope of supply) to the mounting bracket available. Various mounting brackets which make the adjustment of the sensor easier can be ordered additionally as accessories, also see operating instructions.
- The thermoMETER CTH and CTP sensors are delivered with massive housing and can be installed via the M12x1-thread.

### Unpacking/Included in Delivery
- 1 thermoMETER CT sensor with sensor cable.
- 1 Controller.
- 1 Connection cable.
- 1 Connection cable.
- 1 Assembly instruction.
- 1 thermoMETER CTH and CTP sensors are delivered with massive housing and can be installed either directly via the sensor thread or by means of hex nut. A dynamic movement is not allowed. The minimum bending radius is 14 mm (static). A dynamic movement is not allowed.

### Electrical Installation
- **Cable Connections:**
- For the electrical installation of the thermoMETER CT, please open at first the cover of the controller (4 screws).
- For the connection cable, you will find the screw terminals in the lower section of the controller.

### Pin Assignment for CTM-1, CTM-2, CTM-3 Models

<table>
<thead>
<tr>
<th>Pin</th>
<th>Designation</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>+8 ... 36 VDC</td>
<td>Power supply</td>
<td></td>
</tr>
<tr>
<td>GND</td>
<td>Ground (0 V) of power supply</td>
<td></td>
</tr>
<tr>
<td>OUT/AMB</td>
<td>Analog output sensor temperature (mV)</td>
<td></td>
</tr>
<tr>
<td>OUT/TCA</td>
<td>Analog output thermocouple (J or K)</td>
<td></td>
</tr>
<tr>
<td>OUT/mV/ma</td>
<td>Analog output object temperature (mV or mA)</td>
<td></td>
</tr>
<tr>
<td>FI-F3</td>
<td>Functional inputs</td>
<td></td>
</tr>
<tr>
<td>GND</td>
<td>Ground (0 V)</td>
<td></td>
</tr>
<tr>
<td>5V SW</td>
<td>3 VDC, switchable for laser sighting tool</td>
<td></td>
</tr>
<tr>
<td>BROWN</td>
<td>Temperature probe (sensor)</td>
<td></td>
</tr>
<tr>
<td>WHITE</td>
<td>Temperature probe (sensor)</td>
<td></td>
</tr>
<tr>
<td>GREEN</td>
<td>Power supply (sensor)</td>
<td></td>
</tr>
<tr>
<td>YELLOW</td>
<td>Detector signal (+)</td>
<td></td>
</tr>
</tbody>
</table>

### Ground Connection
- At the bottom side of the main board PCB, you will find a plug connector (jumper). Depending on the position, the ground connections (GND power supply/output) are connected with the ground of the controller housing, see Fig. 7. To avoid ground loops and related signal interferences, in industrial environments it might be necessary to interrupt this connection.
- The jumper in the corresponding position, see Fig. 8, Fig. 10.
- If the thermocouple output is used, the ground connection GND - housing should generally be interrupted.

### Power Supply
- Please use a power supply unit with an output voltage of 8 - 36 VDC/100 mA. The residual ripple should be max. 200 mV.
- Please do never connect a supply voltage to the analog outputs.

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**Notes on CE Marking**
- Avoid abrupt changes of the operating temperature.
- Contain solvents.
- Not allowed.
- The minimum bending radius is 14 mm (static). A dynamic movement is not allowed.
- Protect the sensor cable against damage.
- Avoid shocks and impacts to the sensor and the controller.
- Connect the power supply and the display/output device according to the guidelines in the operating instructions. Warnings and other notes apply to the thermoMETER CT measuring system:
- EU Directive 2014/30/EU
- Functional inputs
- EU Directive 2011/65/EU, “RoHS” Category 9
- The sensor satisfies the requirements if the guidelines in the operating instructions are followed in installation and operation.

You can download a PDF of detailed operating instructions from our website:
Shutting down the Signal Source
With all CT models (except for CTM-3, CTP-7), the sensor cable can be shut down if necessary. With the models CTM-1, CTM-2 and CT, the sensor cable can be shut down by pressing the [Mode Up/Down] button again. In this case, the signal processing is not interrupted. The operator obtains the chosen feature, with [9] and [F1-F3] (digital) the functional parameters can be selected – a change of parameters will have immediate effect. If no key is pressed for more than 10 seconds the display automatically shows the calculated object temperature (according to the signal processing).

Display Mode (Example) Adjustment range

* M 01 Multi-drop address [1] only (with multi-drop configuration) 01 ... 32
B 9.6 Baud rate in kbit/s [9.6] 6/19.2/38.4/57.6/115.2 kbit/s
ON OFF Alarm 2

Error Messages
The display of the thermoMETER CT can show the following error messages:

CTM-CT2, CTM-CT3 Models

The respective output channel has to be switched into digital mode for activation. For this the CompactConnect software is required.

Ratio D = Distance from the front edge of the device to the measuring object / S = Spot Size
The size of the object to be measured and the optical resolution of the infrared thermometer determine the maximum distance between sensor and object. In order to prevent measuring errors, the object should fill out the field of view of the sensor lens completely. Consequently, the spot should at all times have at least the same size as the object or should be smaller than that.

CompactConnect Software
Insert the CompactConnect installation CD into the appropriate drive of your PC or download the software from our website at: https://www.micro-epsilon.de/download/software/thermoMETER-CompactConnect/. If the auto run option is activated, the installation wizard will start automatically. Otherwise, please start CDsetup.exe from the CD-ROM.

Please follow the instructions of the wizard until the installation is finished.

After installation, you will find the CompactConnect software on your desktop (as a program icon) and in the start menu. If you want to uninstall the CompactConnect software from your system, please use the Uninstall icon in the start menu.

You will find detailed software manuals on the CompactConnect CD.

Main Features
- Graphic display and recording of temperature readings for subsequent analysis and documentation
- Complete set up of parameters and remote control of the sensor
- Sophisticated signal processing features
- Output scaling and parameter set up of functional inputs

A detailed description of the commands you will find on the CompactConnect software CD in the directory: Commands.