WEIDMANN

InsuLogix® T Portable One Channel Temperature Measurement System Manual

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Version 1.2

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Contents

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1. General

The fiber optical thermometer described in the operating instructions has been designed and manufactured using state-of-the-art technology.

All components are subject to stringent quality and environmental criteria during production. These operating instructions contain important information on handling the instrument. Working safely requires that all safety instructions and work instructions are observed.
Observe the relevant local accident prevention regulations and general safety regulations for the instrument‘s range of use.

The operating instructions are part of the product and must be kept in the immediate vicinity of the instrument and readily accessible to skilled personnel at any time. Skilled personnel must have carefully read and understood the operating instructions prior to beginning any work.

The manufacturer‘s liability is void in the case of any damage caused by using the product contrary to its intended use, non-compliance with these operating instructions, assignment of insufficiently qualified skilled personnel or unauthorized modifications to the instrument. The general terms and conditions contained in
The sales documentation shall apply. Subject to modifications.

Further information: internet-adress: www.optocon.de

2. Safety

Skilled personnel
Skilled personnel are understood to be personnel who, based on their technical training, knowledge of measurement and control technology and their experience and knowledge of country-specific regulations, current standards and directives, are capable of carrying out the work described and independently recognizing potential hazards.

3. Unpacking, Inspection, Service

When unpacking and inspecting your system components, you need to do the following:
1. Check all materials against the enclosed packing list.
2. Carefully unpack and inspect all components for visible damage.
3. Save all packing materials, until you have inspected all components and find that there is no obvious or hidden damage.
4. Before shipment, each instrument is assembled, calibrated, and tested. If you note any damage or suspect damage, immediately contact us.

In case of a malfunction or service request please use our technical support which can be contacted by telephone Monday-Friday between 8:30 to 17:00 CET: +49 (351) 8435990 or email: info@optocon.de

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Send RMA shipments to:

Weidmann Technologies Deutschland GMBH
Washingtonstrasse 16/16a17, 01139 Dresden,
Germany

Disposal
Inoperable instruments must be disposed of in compliance with local regulations for electronic materials.

4. Introduction

The InsuLogix® T FoTemp 1 channel-optical fiber thermometer is used for measuring temperature in an environment with High electromagnetic interference, or with the presence of high power microwave fields. It can also be used in places where measurement with an electric temperature probe is not possible.
With the InsuLogix® T Fotemp1 handheld you are able to operate a comfortable and safe temperature measurement, even in difficult situations, with an overwhelming aggregated system accuracy of ± 0.2°c.
Fotemp1 handheld is a compact, user-friendly, and easy to operate instrument for many fields of application, e.g.:

- medical engineering such as nuclear spin tomography
- high frequency heating processes
- microwave power heating processes
- electric motors
- generators and transformers
- aeronautical engineering
- chemistry and petro chemistry

The outer jacket of the fiber optic temperature sensors is made out of Teflon, at the sensor tip a GaAs crystal (Gallium Arsenide) is attached. The probe sensor is completely non-conductive. Weidmann's fiber optic sensors offer complete immunity to RF and microwave radiation with high temperature operating capability, intrinsic safety, and non-invasive use. The probes are also designed to withstand harsh and corrosive environments.

Starting at a light wave length of 850nm GaAs becomes optical translucent. Since the position of the band gap is temperature dependent, it shifts about 0.4nm/kelvin. The measurement device contains a light source and a device for the spectral detection of the band gap. This guaranties fast, repeatable and reproducible measurements. The measurement results can be easily monitored via the analog outputs and "FoTemp-Assistant" software. Over the entire life of the system calibration is not required to remain within the specifications.

5. Product specifications

Instrument specifications	
Number of channels	1
Power Requirements	9 VDC, power pack included
Current	1.5 A
Display range	0 to 300°C
Accuracy	up to ± 0.2°C
Resolution	0.1°C
Communication	RS-232
Display:	LCD display 1x8 digits, background lighting
Storage temperature:	-20°C to +50°C
Operating temperature:	0°C to +40°C
Probe specifications	
Accuracy	± 0.2°C
Length	2m, 5m or 10 m, different probe lengths and configurations on request
Diameter	1,3 mm (probe tip 2cm, OD 1,7mm), totally made of nonmetallic material
Time constant	< 1°C in case of temperature-fluctuations
Temperature range (probe):	0°C to 300°C
Connector	ST-Connector
System-accuracy (Instrument and probe)	± 2°C in the temperature range 0°C - 300°C
Calibration	One-point temperature calibration by the user possible
Accuracy close to the calibration point	± 0,1°C

Table 1 Instrument and probes specifications

6. Calibration

To ensure an accurate temperature measurement in critical areas, we offer a comprehensive calibration service for our fiber optic temperature measurement instruments. Through our modern labs and our qualified staff we can guarantee you a very accurate and fast calibration. Within a few days you get your unit back and can start your fiber optic measurement projects. For each calibrated measurement instrument by us, a full certificate of test results is supplied. Your fiber optical thermometer comes factory calibrated.
An annual re-calibration is not necessary, except for internal company regulations. All calibrations are performed at our factory. For each calibrated measurement instrument by us, a full certificate of test results is supplied.

Your account manager is available Monday to Friday 8:30 to 17:00 personally by phone +49 (351) 8435990. In addition, you are welcome to send an email message to tell us your concern. We will get in touch with you as soon as possible.

7. Getting started

1. Plug the provided optical fiber temperature sensors to the ST-connector on the upper of the instrument, where the ON/OFF switch in located.

2. Connect the provided RS-232 interface cable to the thermometer and a free serial port of the pc or notebook.

3. Use the provided power supply to power up the system.

4. After powering and switching the thermometer on, temperature values will be displayed if sensor‘s level is above 20% signal strength

5. The thermometer is ready for measurement.

Caution! The fiber optical thermometer only functions with Weidmann fiber optic temperature sensors. Please do not use temperature sensors of other brands.

Please read the instructions for installing the fiber optic instrument carefully.

Sensor handling

The sensor consists of a ST-connector at the end and a gallium arsenide crystal at the tip of the sensor. The crystal is sensitive and should not be exposed to excessive mechanical stress. Please please note the information about the bending radius of the sensor on page 16. A forcible bending of the sensor leads to breakage of the fiber. In this case the sensor is damaged and needs to be repaired / replaced.

Connection with PC

Before establishing the first connection, please check whether the InsuLogix T device is connected to the power supply and the pc via the rs-232 cable respectively.

Connecting the probes

The temperature sensors are connected via the ST-connectors to the BNC sockets at the back panel. Please note to insert the plugs pushing slightly against the spring pressure and to turn with a clockwise rotation. All fiber optical temperature probes can be connected.

Important: All channels and probes not in use must be protected with supplied dust caps.

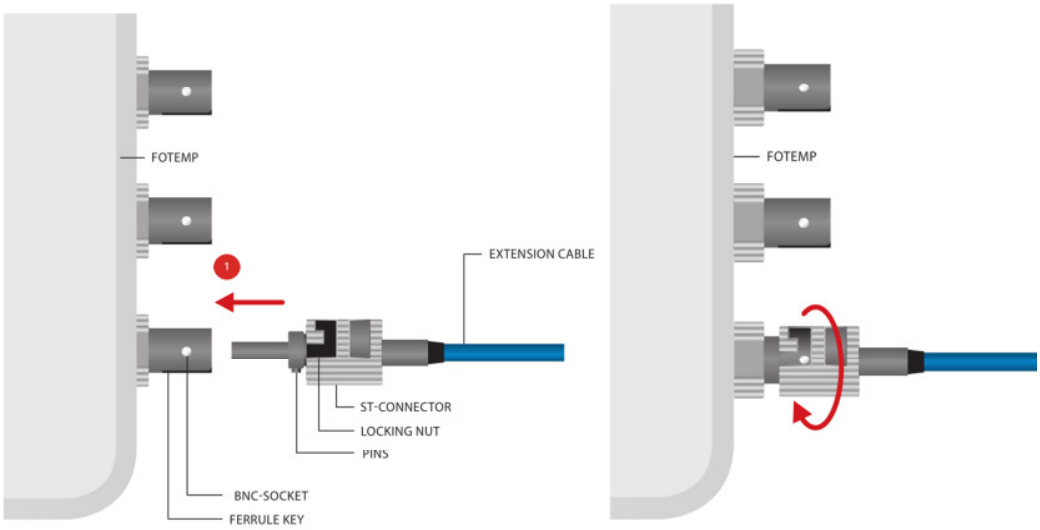

Figure 1 Connecting the fiber optic probe to instrument

To ensure accurate measurements and long life of the fiber optic sensors and instruments, it is necessary to clean them regularly. More information about cleaning can be found in a later chapter.

Testing the temperature probe

To test the functionality of the sensor, you can place the sensor into a test liquid, of which the temperature is known (e.g. boiling water). The sensor will respond with the given temperature within a few seconds.
If no temperature is displayed please re-install the software and check if the sensor has contact to the measuring object

Temperature probe handling

200µm silica core fiber
Short time (max. 24h) bending radius: not less than 4 cm.
Permanent installation bending radius: not less than 8cm.

400µm silica core fiber
Short time (max. 24h) bending radius: not less than 8 cm.
Permanent installation bending radius: not less than 16 cm.

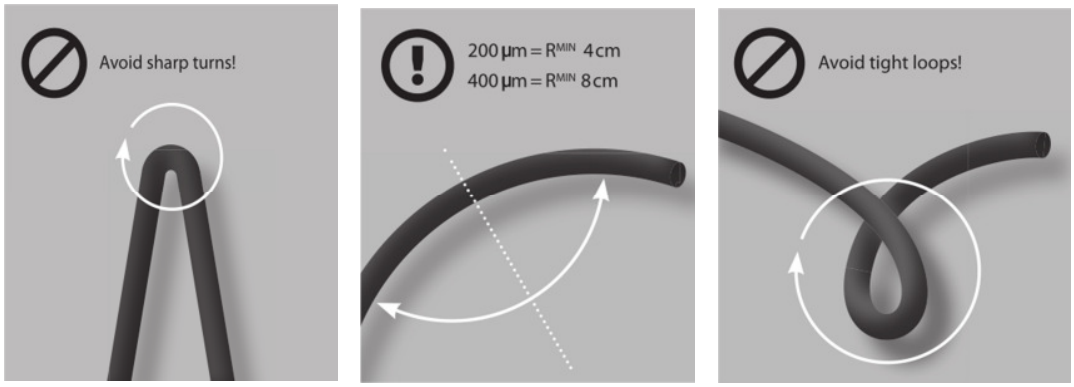

Figure 2 Bending restrictions

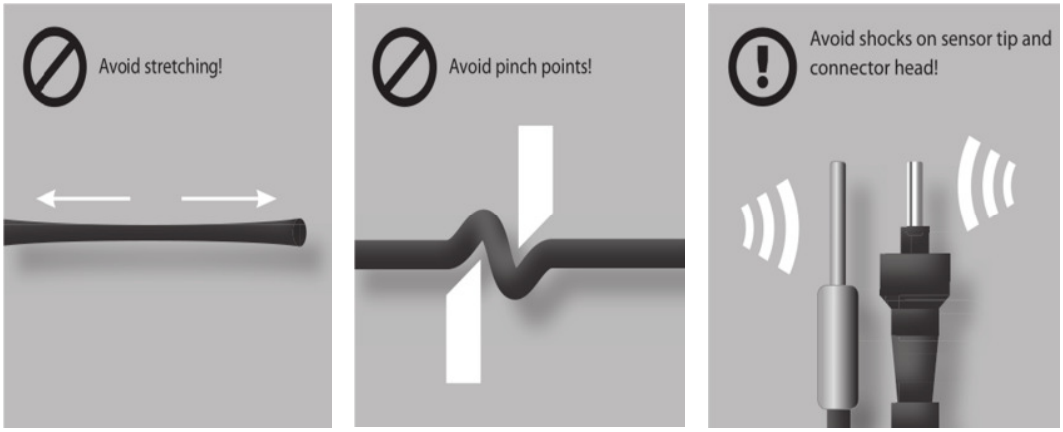

Figure 3 Mechanical restrictions

Cleaning of sensor connectors and plugs

Weidmann is optionally supplying a fiber optic one-click cleaner. The tool is simple and quick to use as is shown in image below.

Figure 4 Fiber optic connector cleaning tool

8. Software

For a description of usable software read the following documents:
- InsuLogixT_Manual_FOTEMP_Assistent_EN_Rev01.pdf (English version)
- InsuLogixT_Manual_FOTEMP_Assistent_DE_rev01.pdf (German version)

9. Using the InsuLogix® T FoTemp one channel handheld device

Figure 5 Connect the fiber optic probe is connected to handheld device

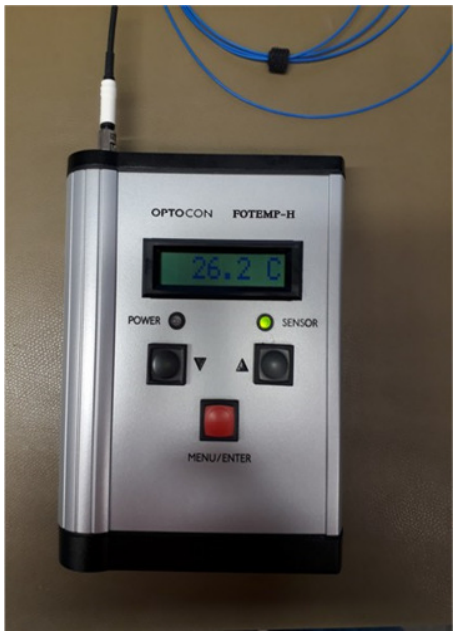

Figure 6 Instrument switched on and reading the temperature

Note: The signal level received from sensor must be at least 20% in order for instrument to calculate the temperature.

Figure 7 Press Menu/Enter key longer than one second to display Menu option

Use the UP and DOWN keys to enter the desired OFFSET. Save and exit menu pressing the „MENU/ENTER“ key

Figure 8 Switching ON/OFF the LCD backlight

Press key „UP“ to see second menu option „Light“ (press UP or DOWN key to switch backlight on or off, execute with „MENU/ENTER“ key)