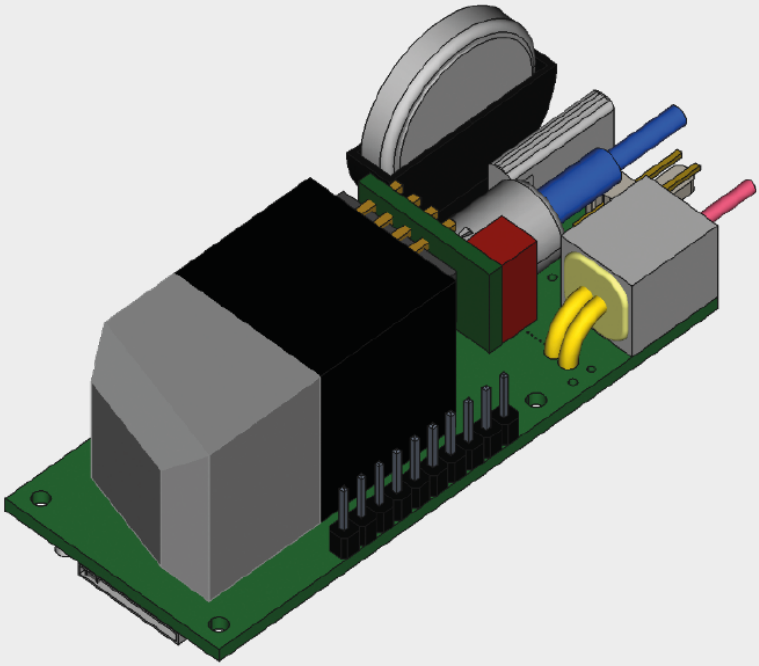
INSTRUCTION MANUAL

FOTEMP MN30



Content index

General

The fiber optic thermometer described in this instruction manual has been designed and manufactured using state-of-the-art technology.

All components undergo strict quality and environmental criteria during production. This manual contains important information on how to handle the device.

Follow all safety and work instructions to ensure safe use. Please adhere also to the relevant local accident prevention and general safety regulations for the device's range of use.

The operating instructions are an essential part of the product and should be kept near the device and readily accessible to trained personnel at all times. Qualified personnel must carefully read and understand the operating instructions before using the device.

The manufacturer's liability is void if the device is misused, operating instructions are not followed, unqualified personnel are assigned, or unauthorized modifications are made.

General terms and conditions contained apply. Subject to technical changes.

Safety

Safety instructions

This manual contains important information to ensure personal safety and to prevent damage.
Safety instructions in this manual are shown in three different forms to emphasize important information.

WARNING

Indicates a potentially dangerous situation that can result in equipment damage, injury or death if not avoided.

CAUTION

Indicates a potentially dangerous situation that can result in minor injuries or damage to equipment or the environment if not avoided.

NOTE

Points out useful tips, recommendations, and information for efficient and trouble-free operation.

Skilled personnel:

Only qualified personnel should commission and operate the devices.
Skilled personnel are those with technical training, knowledge of measurement and control technology, and experience and knowledge of country-specific regulations, current standards, and directives.

Intended use:

The device has been designed and built solely for the described intended use and must only be used accordingly. The technical specifications contained in this manual must be observed.

Unpacking, inspection, service

Please make sure to follow these instructions when unpacking and inspecting your system components:

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. If you notice any damage upon unpacking, contact us immediately.
5. In case of a malfunction or service request, please contact us.

Technical support
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Equipment return address
COMEM Optocon GmbH
Washingtonstrasse 16/16a
01139 Dresden, Germany

Disposal

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

Product description

The FOTEMP MN30 fiber optic temperature measurement system with its minimalist design is specially intended for use in customer projects. With fiber optic sensors it is ideal for measuring temperatures in microwave, high frequency, high voltage and magnetic field environments or aggressive environments where the use of metallic sensors (RTC, TC, capillary, etc.) is not possible.

FOTEMP MN30 is a minimalistic device for many fields of application, e.g.:
- EMI, RFI and microwave environments
- Aerospace applications
- Process monitoring
- Medical applications
- MRI and other magnetic field applications.

The probes used for temperature measurement consist of a PTFE-housed glass fiber with a GaAs crystal (gallium arsenide) at the tip, the probe is completely non-metallic and therefore completely non-conductive.

COMEM'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 wavelength 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 guarantees fast, repeatable, and reproducible measurements.

Thanks to its accompanying software FOTEMP Assistant 2, measurement results can be easily controlled and monitored. Over the entire life of the system re-calibration is not required to remain within the specifications.
Inoperable instruments must be disposed of in compliance with local regulations for electronic materials.

Measurement	
Measurement Range	-200 °C to 300 °C
Measuring Time	< 250 ms per Channel
Accuracy (Standard Deviation)	0.2 K
Resolution	0.1 K
Probes	Compatible with all COMEM fiber optic temperature probes

Environment	
Communication Protocols	ASCII
Interfaces	TTL, RS232, RS485, USB
Operating Temperature	-20 °C to 60 °C
Storage Temperature	-20 °C to 70 °C
Connector Type	ST

Device	
Channel	1
Display	Not available
Additional Interfaces	Not available
Data Logging	Continuous or timed temperature logging on micro SD
Power Supply	9 -24 VDC or USB
Dimension	70 x 30 x 29 mm
Weight	0,2 kg

Calibration

For accurate temperature measurements in critical areas, we provide a comprehensive calibration service for our fiber optic temperature measurement devices. Our modern labs and our qualified staff ensure very accurate and fast calibration.

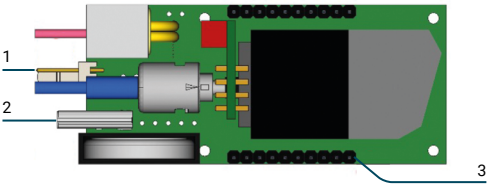
You will receive your unit back within a few days, ready to start your fiber optic measurement projects. Your fiber optic thermometer comes factory-calibrated. An annual re-calibration is not necessary, unless required by internal company regulations. All calibrations are performed at our factory.

We provide a full certificate of test results for each calibrated device.
For more information contact us:
customerservice@it.comem.com

Quick start

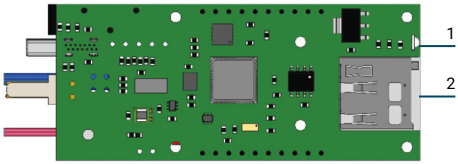
This quick reference guide provides an overview for quick usage. However, it can not replace comprehensive literature containing important information and safety warnings.

Top view



1. USB interface
   USB-C Port for communication and power supply.
2. Power supply (Optional)
   Connector for external power supply. Ensure that you only use power supply units that comply with the specifications.
3. Pin header
   20 pins for all functions such as communication, LEDs, and power supply.

Bottom View



1. Status LED
   The Sensor-LED indicates the status of the channel. In case of damage, sensor either defective or nonexistence, the LED flashes red. In normal operation, sensor is available, measurements are carried out, it flashes green.
2. Micro SD-Card slot.

NOTE

If no sensor is connected or the signal quality is too low, the LED will light up red.

CAUTION

FOTEMP MN30 is only compatible with COMEM optocon fiber optic sensors.
Do not use temperature sensors from other brands.

General installation guidelines:

When installing the fiber optic device, carefully follow the installation instructions, paying close attention to the order of the instructions.

Sensor connection (Page 6)
The temperature sensors are connected to the ST socket using ST plugs. When inserting the plugs, apply slight pressure against the spring and turn them clockwise. All COMEM fiber optic temperature sensors can be connected.

Sensor handling (Page 7)
The sensor comprises an ST plug at one end and a gallium arsenide crystal at the tip. The crystal is sensitive and should not be subjected to excessive mechanical stress. Please refer to the information regarding the bending radius of the sensor. Forcefully bending the sensor can lead to fiber breakage, resulting in damage that will require repair or replacement.

External power (Page 8)
The device supports an optional external power supply.

Header (Page 9)
The device offers 20 pins for all functions such as communication, LEDs, and power supply.

Logging (Page 9)
It is possible to write all measured values to an SD card.

Serial communication (Page 9)
The device can be connected to a PC via RS232 (TTL), RS485, or USB.

Installation

1. Plug the fiber optic temperature sensors into the ST socket.
2. Connect the USB for communication and power supply.
3. If you want to supply the device with power externally, please connect it to an appropriate power supply. (This step is optional)
4. After you have connected the power supply, the device will start and the LED will light up green.
5. Now the device is ready for measurement.

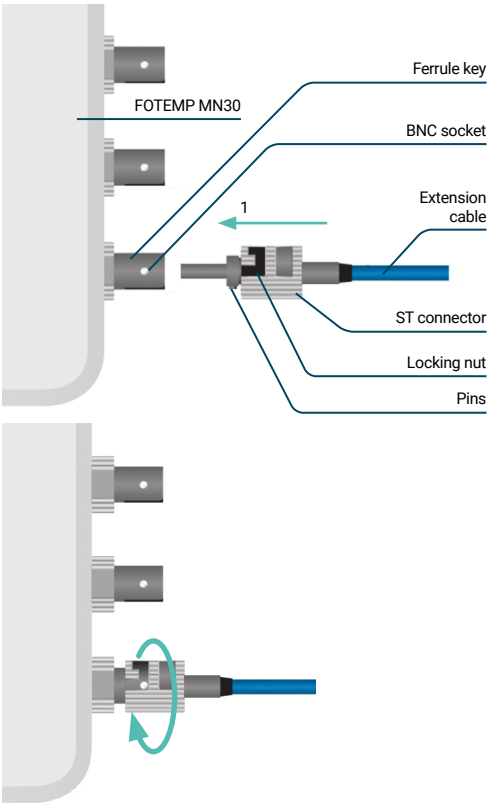
Automatic Integration Time Adjustment

Due to factors such as excessive bending/looping of the fiber or mechanical damage, the light signal received by the measuring device may be reduced (below 50%), which is usually a limiting factor for measuring devices. However, to ensure accurate measurements even with high attenuation, FOTEMP devices are equipped with a special function that automatically maintains a high signal strength.

With the "Automatic Integration Time Adjustment" function, highly attenuated signals can be optimized and maintained within a range of 35% to 100% and continue to be used for temperature measurement. Signal levels can be monitored via the FOTEMP Assistant software or, for devices with an integrated display, are shown directly on the user interface.

If the signal strength falls below 35%, an error is displayed in the FOTEMP Assistant software or on the device display (if available). In this case, the sensor or device must be checked for troubleshooting. Please refer to document AN206_FO-TEMP_Device_Troubleshooting for more information.

Sensor connection



For accurate measurements and to ensure the long life of fiber optic sensors and instruments, it is necessary to clean them regularly.
More information about cleaning can be found on page 7.

NOTE

Any unused channels must be protected with supplied dust caps.

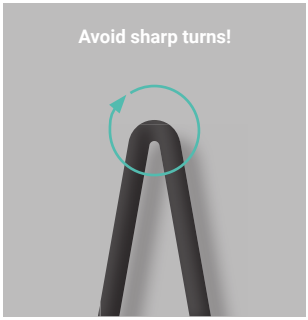
Test of sensor functionality

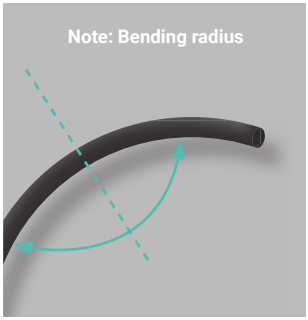
To test the functionality of the sensor, you can place the sensor into a test liquid with a known temperature (e.g. boiling water). The sensor will respond to the temperature within a few seconds.

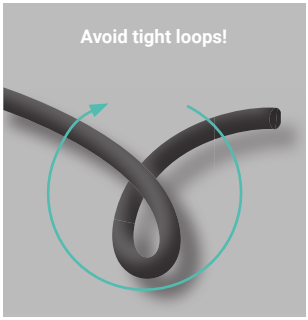
Sensor handling

Bending radius:

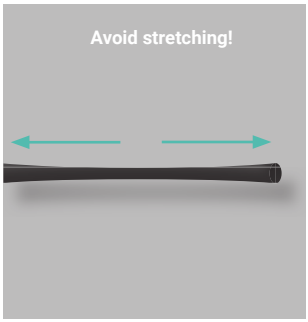
Fibers with a core diameter of 200 µm have a short time (≤10 min) bending radius of 10,0 mm and a long time (>10 min) bending radius of 27,0 mm.

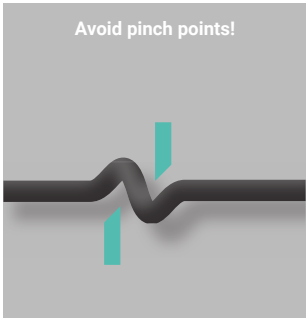






Mechanical load:

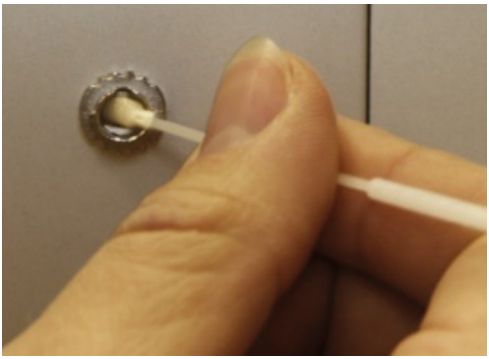




Storage:

When not in use, the sensor should be carefully stored in its delivery box or suitable storage container to prevent bending or crushing.

Sensor/connector cleaning

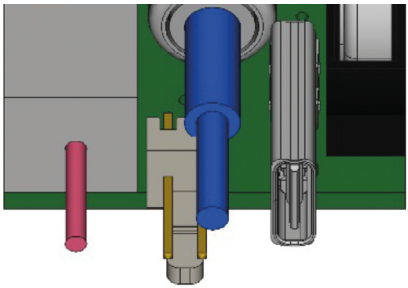


Instructions

Clean the ST sensor's connector with the connector cleaner. Softly press the connector on the cloth tape and rotate across the tape while rotating the connector.
You can clean up to 6 connectors before advancing the tape. Tear off excess tape as required.
Take a swab and wet it with the isopropanol wipes. Insert the swab into the internal connector of the conditioner by rotating it smoothly. Avoid using cotton swabs.

Optional external power

The FOTEMP MN30 has the possibility to power the device with a voltage range of 9-24V using the front connector. Alternatively, you can also utilize the corresponding pins (refer to the picture below).



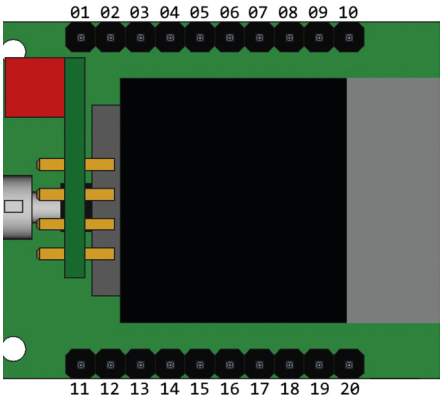
NOTE

This feature must be explicitly ordered in order to use it.

CAUTION

Using a voltage outside of the specified range will cause damage to your device. Please pay attention to the polarity!

Pin header



Nr	Function	Nr	Function
1	9–24V INPUT	11	5V IN/OUT
2	5V IN/OUT	12	3,3V OUTPUT
3	GND	13	GND
4	GND	14	TTL TX
5	GND	15	TTL RX
6	GND	16	GND
7	GND	17	RS485 A
8	3,3V OUTPUT	18	RS485 B
9	LED OK (Katode)	19	RS232 TX
10	LED Error (Katode)	20	RS232 RX

Logging

Temperature logging

The device can store the temperature data either at a certain time intervals or continuously after each measurement. The recorded values are saved to a CSV file on the SD card. The time interval can be set using Modbus, our ASCII protocol, or with our dedicated software, FOTEMP Assistant 2.

Serial communication

You can connect the device to your computer using a USB-C cable. Once connected, you can use our free software FOTEMP Assistant 2, to view temperatures on your computer, customize settings, log temperatures, and display them in charts.

Alternatively, you can communicate with the device using our open ASCII protocol or Modbus.

Troubleshooting

For more information please contact us or consult the Application note AN206: FOTEMP Device Troubleshooting https://comem.com/en/library/.

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This installation manual contains essential information for the user required to install & operate the product.
In case you need any further information, contact us at customerservice@it.comem.com

www.comem.com

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