

GENERAL DESCRIPTION

With a temperature measuring range of -40°C to 1200°C and a resolution of 0.1K, this sensor provides the perfect solution for general industrial applications, testing labs, or smart home applications. The entire sensor is powered by USB, making communication and power supply incredibly easy. With the implementation of the sensor through a virtual serial port and simple commands, using the sensor has never been easier.

FEATURES

- Temperature Range -40 ... 1200°C
- Power Supply: Self powered by USB
- Interface: Virtual serial port / USB 2.0
- RoHS/REACH compliant (Pb-free)
- Plug and Play

APPLICATIONS

- Easy Handling with Computer interface
- High temperature range (e.g. heating industry, exhaust temp.)
- Easy machine temperature monitoring
- Monitoring of highly different temperatures
- Interface M14x1,5 female thread (changeable)
- Sensor length can be defined by user



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1 – INTRODUCTION

Discover our brand-new high temperature sensor based on thermocouples with a USB interface! With a temperature measuring range of -40°C to 1200°C and a resolution of 0.1K, this sensor provides the perfect solution for general industrial applications, testing labs, or smart home applications. The entire sensor is powered by USB, making communication and power supply incredibly easy. With the implementation of the sensor through a virtual serial port and simple commands, using the sensor has never been easier.

Purpose and target audience of the user manual

The user manual for the USB high temperature sensor is intended to provide the user with comprehensive instructions for installing, operating, and maintaining the product. The manual is designed to assist the user in using the product safely and effectively and to solve any potential issues that may arise while using the high temperature sensor.

The target audience for this user manual is individuals who wish to use the USB temperature sensor, including both professionals and laypeople. The manual is designed to be understood by individuals with limited technical knowledge, but it is assumed that the user has basic knowledge of computers and USB peripheral devices.

In summary, the user manual for the USB high temperature sensor is intended for anyone who wishes to use the product, regardless of their technical knowledge. The manual is designed to assist the user in using the product safely and effectively and to solve any potential issues that may arise while using the temperature sensor.

Manufacturer of the product

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2 – SAFETY INSTRUCTIONS

- Please observe the usual regulations and safety requirements for electrical installations, low and high current systems (e.g. VDE 0100)!
- Use the product only in enclosed spaces!
- Only use the device outside of potentially explosive areas!
- Please make sure to use the sensor properly to avoid damage. Improper handling can damage the sensor itself and also damage connected devices. Please note that in case of damage caused by improper use of the sensor on your connected devices, no warranty claim can be made. The manufacturer assumes no liability for such damage.
- **Please note that this device is not suitable for safety applications, emergency shutdown devices, or applications where a malfunction could lead to injury or property damage. Do not ignore this notice, as improper use can cause serious health and property damage!**



3 – DESCRIPTION OF THE SENSOR

Structure and functioning of the sensor

The sensor uses the thermocouple principle: two different metals are welded together in the measuring tip, which generate a thermoelectric voltage in the millivolt range due to the Seebeck effect. This voltage is transmitted via the thermocouple wire to an IC which measures, processes and makes it available via USB.

Components of the sensor

The sensor is composed of two main components: the measuring tip and the electronics module. The measuring tip contains the "hot junction", which measures the temperature of the end application (Figure 1). The electronics module takes care of the preparation of the thermocouple voltage and the provision of USB communication. A thermocouple wire connects the two components together.

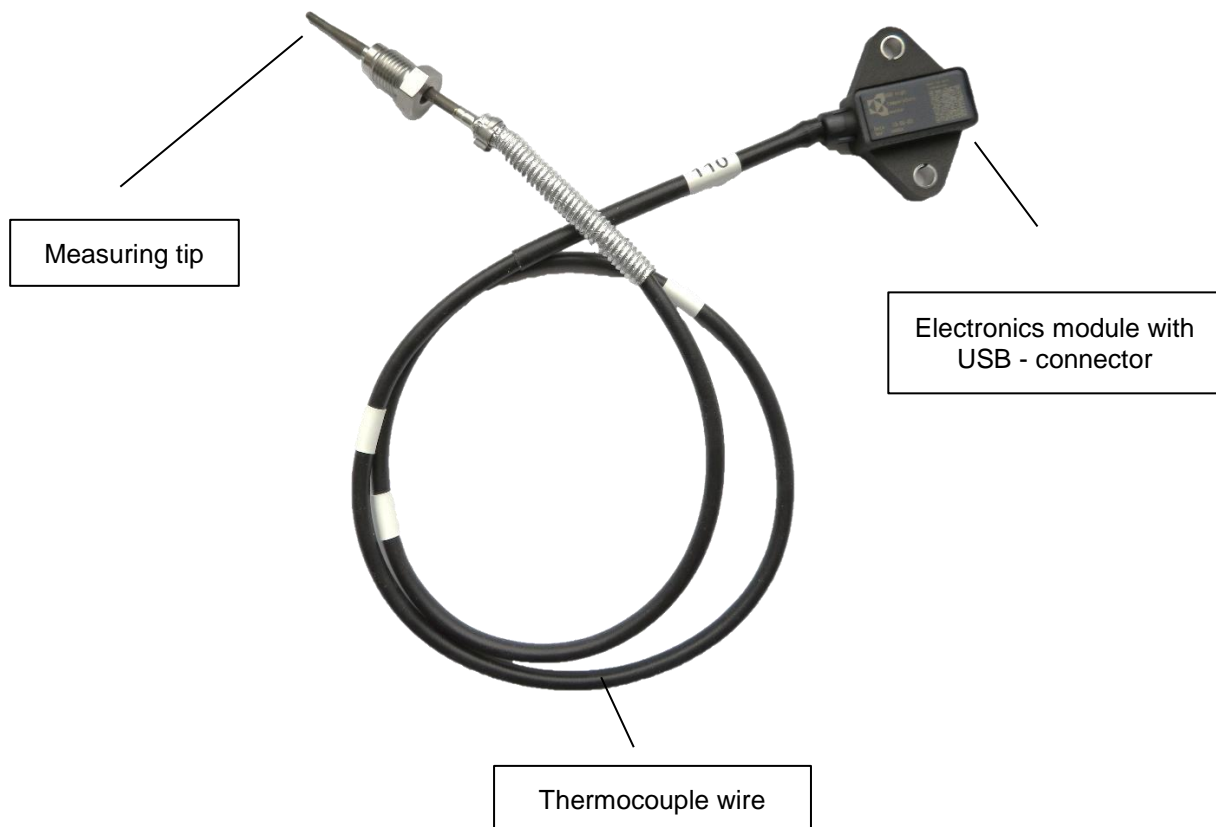


Figure 1: Components of the sensor



4 – TECHNICAL SPECIFICATION

Scope of delivery

The following parts are included in the delivery:

- 1x USB high temperature sensor
- 1x USB cable 2m
- user manual

In addition, various accessories may be included in the delivery.

Weight

The weight of the entire sensor without the USB cable is approximately 80 g.

Dimensions

The dimensions of the electronics module are shown in Figure 3 and the dimensions of the measuring tip in Figure 2. All dimensions are given in millimeters.

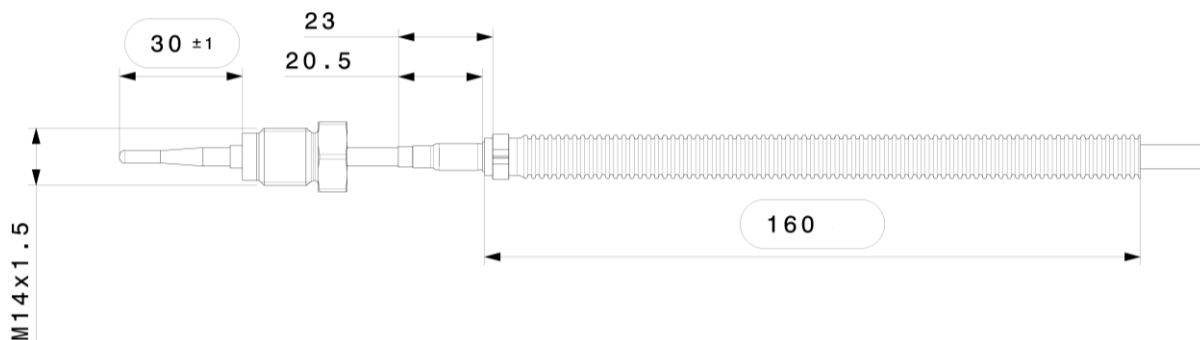


Figure 2: Dimensions of the measuring tip



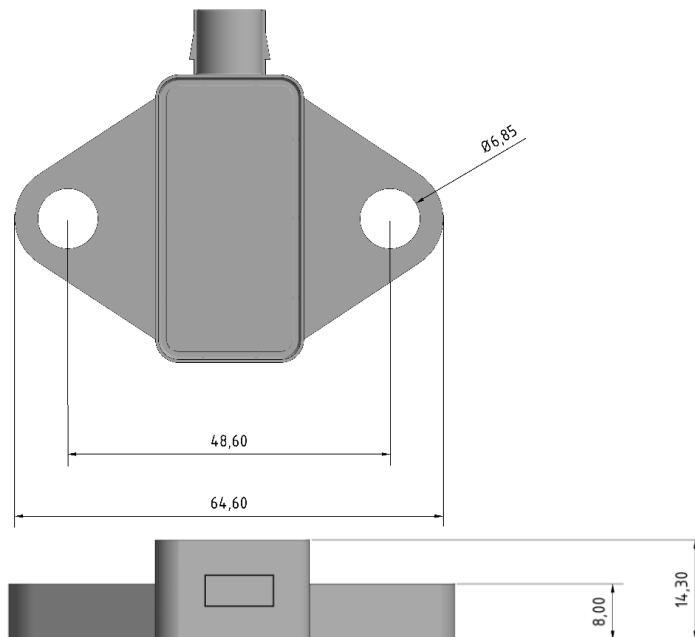


Figure 3: Dimensions electronics module

USB connection / Electrical connection

To connect the sensor to a PC, a USB cable is used which is connected to a USB mini jack on the electronics module of the sensor (see Figure 4). The sensor is fully operated and powered via the USB connection or cable (bus-powered). Communication between the PC and the sensor is also via this cable.

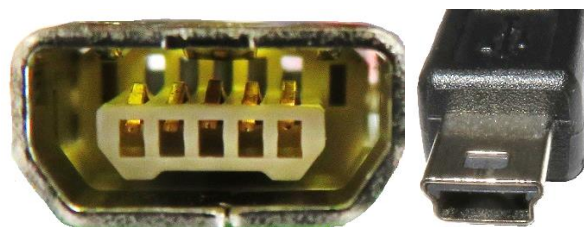


Figure 4: Left mini USB jack on the sensor, right USB plug for mini-USB

Operating temperatures

The operating temperatures of the sensor tip and the evaluation electronics are shown in Table 1.

Table 1: Operating temperatures

SENSOR COMPONENT	LOWER OPERATING TEMPERATURE	UPPER OPERATING TEMPERATURE
Measuring tip	-40°C	1200°C
Electronics module	0°C	60°C



Resolution and accuracy of the output signal

The measuring tip of the sensor has a measuring range of -40°C to 1200°C with a resolution of 0.1K. The accuracies of the output signals are shown in Table 2.

Table 2: Accuracy of the output signal

TEMPERATURE RANGE	MAX. TEMPERATURE TOLERANCE
-40°C to 0°C	typ. +/-7 K
0°C to 1200°C	typ. +/-6 K

5 – COMMUNICATION WITH THE SENSOR (READOUT OF MEASURED VALUES)


Communication with the sensor is done via a virtual COM port, allowing the sensor to be implemented as a simple serial device in the PC application. The sensor has an open command set, which enables independent implementation of measurement software.

6 – DISPOSAL

Dispose of disassembled components for recycling:

- Scrap metallic residual components,
- Give plastic parts for recycling,
- Dispose of other components sorted by material properties.

Caution

	DANGER
	<p>◆ Risk of environmental damage from improper disposal.</p> <p>Electronic waste, electronic components, lubricants, and other auxiliary materials are subject to special waste treatment and may only be disposed of by authorized specialist companies.</p>

Municipal authorities and waste disposal companies provide information on environmentally-friendly disposal



7 – DECLARATION OF CONFORMITY AND DISCLAIMER OF LIABILITY

Declaration of conformity to applicable standards and regulations.

Disclaimer

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8 – VERSION HISTORY

Table 3: Version history

REVISION	RELEASE DATE	DESCRIPTION OF CHANGES
0.1	17.02.2023	Initial release

LEGAL DISCLAIMER

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