Infrared Thermometer

NONCONTACT THERMOMETER

GEN-MSP-MA-D-E2005-06-C

Introduction

Thank you for choosing our infrared thermometer!

Infrared thermometers measure the object surface temperature without touching it. They determine the temperature on the basis of the emitted infrared radiation from an object.
Because of their ability to measure the surface temperature contactless, these thermometers enable the user to detect the temperature of inaccessible or moving objects without difficulties.
The infrared thermometer can follow you wherever you are as it is lightweight and fits easily into your shirt pocket.
Infrared thermometers combine a convenient operation with precise measurement and an informative display. They can be used in ambient temperatures ranging from 0 up to 50°C. Laser sighting helps to aim at objects.
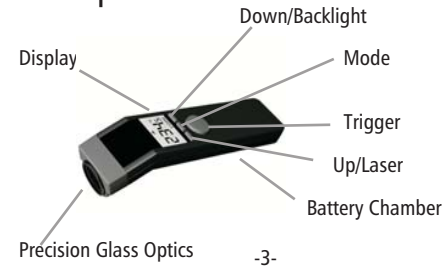
Various measurement functions like minimum and maximum value, hold function, high and low alarm provide you with all necessary information on a three-line backlit display.

Please read the manual completely before the initial operation.

Specifications

Temperature range	-32 - 530 °C (-20 - 980 °F)	
System accuracy	± 1 % or ± 1 °C	from 0 °C up to 530 °C
	± 1 °C ± 0,07 °C/°C	from 0 °C up to -32 °C
Repeatibility	± 0,5 % or ± 0,7 °C	from 0 °C up to 530 °C
	± 0,7 °C ± 0,05 °C/°C	from 0 °C up to -32 °C
Optical resolution (D:S)	20:1	
Display resolution	0,1 °C (0,1 °F)	
Response Time (95%)	300 ms	
Ambient temperature	0 - 50 °C	
Storage temperature	-20 - 60 °C without battery	
Spectral range	8 - 14 μm	
Emissivity	0,100 – 1,000	
Configuration	Min/Max/Scan/Hold/Offset/°C/°F	
Display Backlight	Yes	
Alarm functions	Visual and acoustic HIGH-/LOW-Alarm	
Laser	< 1 mW laser class IIa, laser beam with 9 mm offset	
Weight/Dimensions	150 g; 190 x 38 x 45 mm	
Battery	9 V alkaline battery	
Battery life	20 hours with laser and backlight on 50%; 40 hours with laser and backlight off	
Low battery alarm	Yes	
Relative humidity	10 – 95 % RH non condensing with < 30 °C ambient temperature	

Product picture and description

Display
Down/Backlight
Mode
Trigger
Up/Laser
Battery Chamber
Precision Glass Optics

Some noncontact thermometer applications

Maintenance of electrical equipment

Hot spot detection on bearings, transmissions and motors

Temperature measurement of moving objects/products in the manufacturing process

Detection of energy losses on heat insulations

Inspection of critical components on vehicles

Accessories

Included:
1) Manual/Warranty
2) 9V alkaline battery
3) Wrist strap
4) Pouch: Make sure, that you insert the thermometer into the pouch like shown in order to avoid unintended operation.
Optional:
DKD traceable calibration certificate

Distance and spot size

Due to the precision glass optics and its focusing, the measuring beam of the instrument has a diameter of 13 mm at any distance within 140 mm. The spot size grows with increasing distance. At the distance of 1 m the spot size achieves a diameter of 5 cm. The ratio of distance to spot size, also called optical resolution, is 20:1 within the close focus point at a distance of 1 m.
The spot size of longer distances can be calculated by dividing the distance by factor 20.

Optical Diagram

| SPOT SIZE in mm | 13 | 20 | 37 | 50 |
| DISTANCE in mm | 140 | 300 | 700 | 1000 |

Spot Size

The target area must be at least as large as the spot size. The thermometer enables you to measure objects as small as 13 mm.

Buttons

Trigger:
The round button is the trigger for the temperature measurement. By activating it you start the temperature measurement. As soon as you release the trigger, the temperature value will be held for 7 seconds. The MAX- or MIN-value of the measurement is displayed.
Mode-Button:
The centre button – marked with a circle – is the mode button. Each time you press it, you enter another function interface, e.g. one time to call emissivity, afterwards press it one time to store it, two times to call MIN/MAX function, press it one more time to store this function a.s.o.
Up/Laser:
With this button you set the laser and increase the chosen value.
Down/Display Backlight:
Use this button to activate the backlight and to reduce the chosen value.

Display

A Symbol for display backlight
B MAX/MIN: current & last vlaue
C Laser symbol
D HIGH/LOW alarm
E Current temperature value
F Emissivity
G HOLD-function

Operation

Temperature Measurement:
Aim the thermometer at a target and touch the trigger. On the basis of all carried out settings the display shows the current temperature value.
Hold-Function:
If you release the trigger, the hold mode will show the temperature value for 7 seconds.
Shut Down:
The temperature data will be kept for 7 seconds before the instrument shuts down automatically.
Measuring Mode Setting:
You may choose between the following mode settings: maximum/minimum temperature value, high/low alarm, emissivity adjustment, offset function on/off, display backlight on/off.

Each time you release the trigger button, the hold function will enable you to activate a new mode with the button. Press the mode button once: by flashing the display will indicate the mode which is activated.
Now choose and modify the requested value by using the up and down buttons. Store the chosen setting by pressing the mode button a second time. With the second pressing of the mode button you simultaneously move into the next mode setting. Now proceed like before.
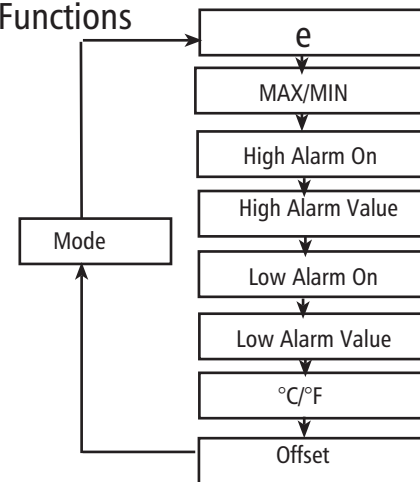If you have not activated any button for 7 seconds, the instrument will save the current modification value and shut down. By pressing the trigger anew you will activate the last stored function settings on the display.

Changing the battery

In order to exchange the battery, just press the cover lid on the bottom side of the thermometer downwards – see illustration. Exchange the battery and close the cover lid.

Functions

e
MAX/MIN
High Alarm On
High Alarm Value
Low Alarm On
Low Alarm Value
°C/°F
Offset
Mode

The mode cycle illustrates the sequence of mode settings. The flashing icon on the display shows which mode is being activated and ready for modification.
Setting the emissivity
HOLD-Mode:
Press the mode button once and enter the „emissivity setting":
1) Emissivity e flashing
2) Press Up to increase the emissivity value
3) Press Down to reduce emissivity value
4) The temperature value displayed corresponds to the emissivity adjustment.
Press the mode button a second time to store the setting.

Setting the MIN-/MAX-HOLD-function:
While you set the adjusted emissivity with mode, you simultaneously activate the next function: the minimum and maximum hold function. MAX indicates the maximum temperature value, MIN the minimum value of the current measurement.
Setting high and low alarms:
The alarm function is activated as soon as the display reads the sign: ▽
High and low alarms can be set by additionally activate H or L on the display with Up or Down.
Setting the °C/°F function:
You may choose to read the temperatures either with Celsius or Fahrenheit.
Setting the Laser:
The laser supports you in aiming at your target. Activate it by pressing the Trigger and Up buttons simultaneously.
Setting the display backlight:
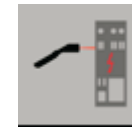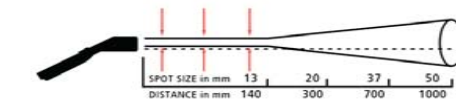The display backlight will be activated by pressing Up during measuring as well as during Hold mode.
Fast scanning function:
The instrument helps to quickly scan objects and afterwards read the minimum and maximum temperature value in the Hold function by simply activating the Up button.
Battery icon indication:
Replace the battery as soon as the battery status is shown as low.

Emissivity

The intensity of infrared radiation, which is emitted bye ach body, depends on the temperature as well as on the radiation features of the surface material of the measuring object.
The emissivity (e = epsilon) is used as a stable factor of the material, with which to describe the ability of the body to emit infrared energy. If the emissivity chosen is too high, the infrared thermometer may display a temperature value which is much lower than the real temperature assuming the measuring object is warmer than its surroundings. The measurement of metallic surfaces, in particular, requires a careful emissivity adjustment on the basis of the relevant values shown in the emissivity table.

Emissivity Table

Material		Emissivity
		8 - 14 μm
Aluminum	oxidized	0,2 - 0,4
Asbestos		0,95
Asphalt		0,95
Basalt		0,7
Ceramic		0,95
Concrete		0,95
Copper	oxidized	0,4 - 0,8
Fabric		0,95
Glass	plate	0,85
Gold		0,01 - 0,1
Gravel		0,95
Ice		0,98
Iron	oxidized	0,5 - 0,9
Karborundum		0,9
Lead	oxidized	0,2 - 0,6
Paper	each color	0,95
Plastics	transparent > 0,5 mm	0,95
Rubber		0,95
Sand		0,9
Snow		0,9
Soil		0,9 - 0,98
Steel	oxidized	0,7 - 0,9
Water		0,93
Wood	natural	0,9 - 0,95

Important Reminders

1) Shiny or polished metallic surfaces may result in inaccurate reading results. Please see „Emissivity" for measuring surfaces.
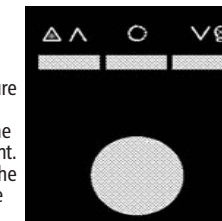
2) Infrared thermometers measure the surface temperature of objects, only. They cannot measure through transparent material such as glass or plastic.
3) Keep the optics clean of steam, dust, smoke or other particles to prevent inaccurate measurement.

Warning

Laser Class 2

Do not point the laser directly at the eye or indirectly off reflective surfaces as this may cause serious damage!

LASER LIGHT
DO NOT STARE INTO BEAM
CLASS 2 LASER
< 1 mW / 650 nm
IEC 825 (1994)

All instruments should be protected from the following conditions:
1) Electromagnetic fields (EMF)
2) Static electricity
3) Thermal shock (caused by large or abrupt ambient temperature changes)

Troubleshooting

CODE	PROBLEM	ACTION
HHH (displayed temperature value)	beyond MAX measuring limit	choose target within measuring specifications
LLL (displayed temperature value)	beyond MIN measuring limit	choose target within measuring specification
Battery indicator	low battery	check/replace battery
Blank display	battery may be empty	check/replace battery
Laser does not work	(1) battery empty	(1) replace battery
	(2) laser deactivated	(2) activate laser

Warranty

Each product passes through a quality process. Nevertheless, if failures occur please contact the customer service at once.
The warranty period covers 24 months starting on the delivery date. After the warranty is expired the manufacturer guarantees additional 6 months warranty for all repaired or substituted product components. Warranty does not apply to electrical circuit breakers, primary batteries and damages, which result from misuse or neglect. The warranty also expires if you open the product. The manufacturer offers a 3 months warranty for rechargeable batteries. The manufacturer is not liable for consequential damage.

If a failure occurs during the warranty period, the product will be replaced, calibrated or repaired without further charges. The freight costs will be paid by the sende. The manufacturer reserves the right to exchange components of the product instead of repairing it. If the failure results from misuse or neglect the user has to pay for the repair. In that case you may ask for a cost estimate beforehand.

CE - Conformity

The product conforms to the following standards:

EMC: EN 61326-1
Safety standards: EN 61010 -1
EN 60825-1

The product accomplishes the requirements of the EMC directive 89/336/EEC and of the low voltage directive 73/23/EEC.

The instrument complies with the standards of the European Union.