

MESTEK 800A

MESTEK 800A Infrared Thermometer Instruction Manual

Model: 800A | Brand: MESTEK

1. INTRODUCTION

The MESTEK 800A Digital IR Laser Thermometer is a non-contact infrared temperature measuring device designed for accurate and rapid surface temperature readings. It features a wide temperature range from -58°F to 1472°F (-50°C to 800°C), adjustable emissivity, and a 13-point laser guidance system for precise targeting. This instrument is ideal for various industrial, household, and commercial applications, including cooking, HVAC, engine diagnostics, and more.

Important Note: This infrared thermometer is specifically designed for inanimate objects and is **NOT** intended for measuring the temperature of humans or animals.



Figure 1: MESTEK 800A Infrared Thermometer with included accessories.

2. SAFETY INFORMATION

Please read and understand all safety warnings and operating instructions before using this device. Failure to do so may result in injury or damage to the device.

- **Laser Safety:** This device uses a Class II laser. Do not stare directly into the laser beam or point it at people or animals. Avoid direct eye exposure. Laser power is less than 1mW, and wavelength is 620~690 um.
- **Non-Contact Use:** This thermometer measures surface temperature from a distance. It is not designed for internal temperature measurement.
- **Temperature Limits:** Do not expose the device to extreme temperatures outside its operating range or to high humidity.
- **Cleaning:** Use a soft, damp cloth to clean the device. Do not use abrasive cleaners or immerse the device in water.
- **Battery Safety:** Ensure correct battery polarity when installing. Remove batteries if the device will not be used for an extended period. Do not mix old and new batteries or different types of batteries.

NON-CONTACT SAFETY MEASUREMENT

Suitable for measuring the surface temperature of objects with high and low temperature and inaccessible

Measurement Range: $-58 \sim 1472^{\circ}\text{F}$ ($-50 \sim 800^{\circ}\text{C}$)

Accuracy: $-50 \sim 0^{\circ}\text{C}(\pm 3^{\circ}\text{C}) / -0 \sim 800^{\circ}\text{C}(\pm 1.5\% + 2^{\circ}\text{C} / 4^{\circ}\text{F})$



Figure 2: The thermometer is designed for non-contact surface temperature measurement.

3. PRODUCT FEATURES

- **High Accuracy & Adjustable Emissivity:** Provides accurate measurements from -58°F to 1472°F (-50°C to 800°C) with a 13-point laser guidance system. Emissivity is adjustable from 0.1 to 1.0, allowing for precise readings on various materials. Features a French HTU20 high-quality sensor for dependable measurements within 0.5 seconds.
- **Easy to Use:** Simple point-and-shoot operation. The 12:1 Distance to Spot (D:S) ratio allows for accurate measurements from a safe distance.
- **Multi-functional Display:** Equipped with a color LCD backlight display for clear data visibility, even in low-light conditions.
- **Advanced Functions:** Includes Data Hold, Low Battery Indicator, Celsius/Fahrenheit conversion, 20-second Auto Power-off, MAX mode, and user-settable High/Low temperature alarms for quick anomaly detection.
- **Wide Applications:** Suitable for surface temperature testing in diverse environments such as cooking, baking, BBQ, pizza ovens, grilling, frozen food, HVAC systems, engines, and home inspections.

HIGH-PRESION SENSOR

Multi point laser pointer measurement



- Higher Stability
- Anti-interference
- Fast Response Time: <math>< 0.5s</math>

Figure 3: High-precision sensor ensures stability, anti-interference, and fast response time.



Figure 4: Key components and display indicators of the MESTEK 800A.

4. PACKAGE CONTENTS

Upon opening the package, please verify that all items listed below are present and in good condition:

- 1 x MESTEK 800A Digital Infrared Thermometer
- 1 x Storage Bag
- 2 x 1.5V AAA Batteries
- 1 x User Manual

5. SETUP

5.1 Battery Installation

The MESTEK 800A Infrared Thermometer requires two 1.5V AAA batteries for operation.

1. Locate the battery compartment cover on the handle of the thermometer.
2. Slide or open the battery compartment cover.
3. Insert the two 1.5V AAA batteries, ensuring correct polarity (+ and -) as indicated inside the compartment.
4. Close the battery compartment cover securely.

The device is now ready for use. If the low battery indicator appears on the display, replace the batteries promptly.

6. OPERATING INSTRUCTIONS

6.1 Basic Measurement

To take a temperature reading:

1. Point the infrared thermometer gun at the object you wish to measure.
2. Press and hold the trigger button. The laser pointer will activate, indicating the measurement area.
3. The temperature reading will be displayed instantly on the LCD screen.
4. Release the trigger to hold the measurement on the screen (Data Hold function).

6.2 Distance to Spot (D:S) Ratio

The MESTEK 800A has a D:S ratio of 12:1. This means that at a distance of 12 units, the measurement spot diameter will be 1 unit. For optimal accuracy, the recommended distance between the thermometer and the measurement object is approximately 7.8 to 19 inches (20 to 50 cm). Measuring closer to the object will result in a smaller measurement spot and potentially more precise readings for smaller targets.

12-POINT CIRCULAR TECH LASER POSITIONING

Non-contact laser measurement for the safety



Figure 5: Understanding the Distance to Spot (D:S) ratio for accurate measurements.

6.3 Adjustable Emissivity

Emissivity (ϵ) is a measure of an object's ability to emit infrared energy. Different materials have different emissivity values. The MESTEK 800A allows you to adjust the emissivity from 0.1 to 1.0 to ensure accurate temperature readings for various surfaces. The default emissivity setting is 0.95, which is suitable for most organic materials, painted surfaces, and plastics. For highly reflective surfaces like polished metals, a lower emissivity setting may be required, or the surface can be covered with a non-reflective material (e.g., matte black paint or tape) and measured on that spot.

To adjust emissivity:

1. Press the "MODE" button until the emissivity symbol (ϵ) is displayed and flashing.
2. Use the Up (\blacktriangle) and Down (\blacktriangledown) buttons to adjust the emissivity value.
3. Press the "MODE" button again to confirm the setting or wait for a few seconds for it to auto-save.

ADJUSTABLE EMISSIVITY: 0.1~1.0

It means the default emissivity preset is 0.95, the emissivity can be adjusted according to the measuring object.

$\epsilon = 0.95$



Emissivity Table

Measured	Radiance	Measured	Radiance
Carbon	0.9	Metallic	0.3
Graphite	0.7	Brass	0.5
Carborundum	0.9	Copper	0.6
Pottery	0.95	Hastelloy B-2	0.7
Clay	0.95	Nickalloy	0.65
Concrete	0.95	Iron	0.6
Cloth	0.95	Iron (casting)	0.45
Glass plate	0.85	Passivation	0.9
Gravel	0.95	Lead	0.4
Plaster	0.9	Molybdenum	0.5
Ice	0.98	Nickel oxidation	0.35
Limestone	0.98	Platinum black	0.5
Paper	0.95	Steel	0.9
Plastic	0.95	Zinc (Zn)	0.8
Soil	0.98	Asbestos	0.1
Water	0.93	Asphalt	0.95
Wood	0.9	Basalt	0.95
Asbestos	0.95	Carbon	0.7
Asphalt	0.95	Graphite	0.9
Basalt	0.7	Carborundum	0.7
Zinc (Zn)	0.1	Pottery	0.9
Steel	0.6	Clay	0.95

Figure 6: Adjustable emissivity setting and a sample emissivity table for common materials.

Common Emissivity Values (Approximate)

Material	Emissivity (ε)	Material	Emissivity (ε)
Carbon	0.9	Metallic	0.3
Graphite	0.7	Brass	0.5
Carborundum	0.9	Copper	0.6
Pottery	0.95	Hastelloy B-2	0.7
Clay	0.95	Nickalloy	0.65
Concrete	0.95	Iron	0.6
Cloth	0.95	Iron (casting)	0.45
Glass plate	0.85	Passivation	0.9

Material	Emissivity (ε)	Material	Emissivity (ε)
Gravel	0.95	Lead	0.4
Plaster	0.9	Molybdenum	0.5
Ice	0.98	Nickel oxidation	0.35
Limestone	0.98	Platinum black	0.95
Paper	0.95	Steel	0.9
Plastic	0.95	Zinc (Zn)	0.8
Soil	0.98	Asbestos	0.1
Water	0.93	Asphalt	0.95
Wood	0.9	Basalt	0.95
Asbestos	0.95	Carbon	0.7
Asphalt	0.95	Graphite	0.9
Basalt	0.95	Carborundum	0.7
Zinc (Zn)	0.1	Pottery	0.9
Steel	0.6	Clay	0.95

6.4 MAX Measurement Mode

The MAX mode displays the maximum temperature detected during a continuous measurement. This is useful for scanning an area to find the hottest spot.

1. Press the "MODE" button repeatedly until "MAX" appears on the display.
2. While holding the trigger, scan the area. The display will continuously update to show the highest temperature recorded during that scan.
3. Release the trigger to hold the MAX value.

MAX (MAXIMUM) MEASUREMENT

The default measurement value at startup is the maximum value, and continuous measurement can lock the higher temperature point



Figure 7: Using MAX mode to identify the highest temperature point.

6.5 Temperature Alarm Setting (High/Low)

You can set high and low temperature alarms. The thermometer will alert you if the measured temperature goes above the high limit or below the low limit.

1. Long press the "MODE" button to enter the alarm setting function.
2. Use the Up (▲) and Down (▼) buttons to adjust the High Alarm (HI) value. Press "MODE" to confirm and move to the Low Alarm (LO) setting.
3. Adjust the Low Alarm (LO) value using the Up (▲) and Down (▼) buttons. Press "MODE" to confirm and exit the alarm setting.
4. When a measured temperature exceeds the set high limit or falls below the set low limit, the alarm indicator light will flash, and an audible alert may sound.



Figure 8: Setting high and low temperature alarms.

6.6 Celsius/Fahrenheit Conversion

To switch between Celsius (°C) and Fahrenheit (°F) temperature units:

- Press the "MODE" button repeatedly until the °C/°F symbol flashes.
- Use the Up (▲) or Down (▼) button to toggle between °C and °F.
- The display will immediately show the temperature in the selected unit.



Figure 9: Switching between Celsius and Fahrenheit units.

6.7 Data Hold and Auto Power-off

- **Data Hold:** When you release the trigger after a measurement, the last reading will automatically be held on the display for easy viewing.
- **Auto Power-off:** To conserve battery life, the thermometer will automatically shut off after approximately 20 seconds of inactivity.



Figure 10: Automatic shutdown and data hold features.

7. MAINTENANCE

- **Cleaning the Lens:** The most critical part of the thermometer is the lens. Keep it clean to ensure accurate readings. Use a soft, clean cloth or cotton swab with a small amount of medical alcohol or lens cleaner. Wipe gently.
- **Cleaning the Housing:** Clean the device housing with a damp cloth and mild soap. Do not use abrasive cleaners or solvents.
- **Storage:** Store the thermometer in its provided storage bag in a cool, dry place when not in use. Avoid exposing it to direct sunlight, high temperatures, or high humidity.
- **Battery Replacement:** Replace batteries when the low battery indicator appears on the display. Remove batteries if storing the device for an extended period to prevent leakage.

8. TROUBLESHOOTING

Problem	Possible Cause	Solution
Device does not turn on.	Dead or incorrectly installed batteries.	Check battery polarity or replace with new 1.5V AAA batteries.
Inaccurate readings.	Incorrect emissivity setting; lens is dirty; distance to spot ratio not optimal; target object is too small or too far.	Adjust emissivity for the material being measured; clean the lens; ensure measurement is within the optimal D:S ratio (7.8-19 inches); ensure target is large enough for the spot size at the given distance.
Laser not visible.	Laser function is off; bright ambient light.	Check if the laser is enabled via the MODE button; move to a less brightly lit area if possible.
Alarm constantly triggers.	Alarm limits set too close to ambient temperature or target temperature.	Adjust the high/low alarm limits to appropriate values for your application.

9. SPECIFICATIONS

Feature	Detail
Product Dimensions	3.7 x 1.26 x 5.51 inches; 7.05 ounces
Item Model Number	800A
Batteries	2 x 1.5V AAA batteries (included)
Manufacturer	MESTEK
Brand	MESTEK
Special Features	12:1 Distance Spot Ratio, Adjustable Emissivity, High/Low Alarm, MAX Value, Non-Contact Measurement
Color	Yellow
Included Components	Infrared Thermometer, Storage Bag, 2*1.5V AAA batteries
Display Type	Digital (Color LCD Backlight)

Feature	Detail
Product Care Instructions	Wipe Clean
Power Source	Battery Powered
Temperature Range	-58°F to 1472°F (-50°C to 800°C)
Accuracy	-50~0°C (±3°C) / 0~800°C (±1.5%+2°C/4°F)
Response Time	<0.5 seconds
Laser Class	Class II, optical power <1mW, Wavelength 620~690 um



Figure 11: Physical dimensions of the MESTEK 800A Infrared Thermometer.

10. WARRANTY AND SUPPORT

MESTEK provides a **36-month manufacturer warranty** for the 800A Digital Infrared Thermometer. Additionally, lifetime customer support is available to ensure your satisfaction. For any inquiries, technical assistance, or warranty

claims, please contact MESTEK customer service through the official channels provided with your purchase or visit the [MESTEK Store on Amazon](#).