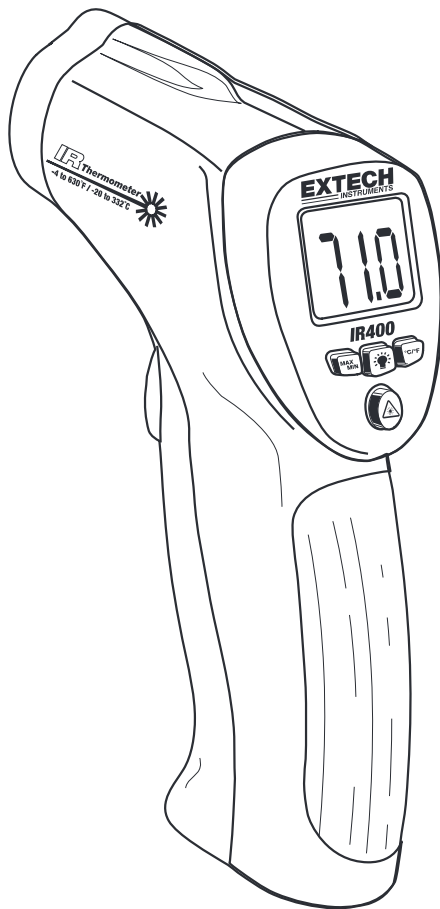# EXTECH®
INSTRUMENTS

InfraRed Thermometer
with Laser Pointer

MODEL IR400

Introduction

Congratulations on your purchase of the Model IR400 IR Thermometer. The IR400 is capable of non-contact (infrared) temperature measurements at the touch of a button. The built-in laser pointer increases target accuracy while the backlit LCD and handy push-buttons combine for convenient, ergonomic operation. This meter is shipped fully tested and calibrated and, with proper use, will provide years of reliable service.

Safety

- Use extreme caution when the laser pointer beam is on

- Do not point the beam toward anyone's eye or allow the beam to strike the eye from a reflective surface

- Do not use the laser near explosive gases or in other potentially explosive areas

CAUTION
LASER RADIATION
DO NOT STARE INTO BEAM
DIODE LASER
1 mW MAX OUTPUT at 635-670 nm
CLASS II LASER PRODUCT

Meter Description

Meter Description

1. Laser pointer beam
2. IR Sensor
3. Measurement Trigger
4. Battery Compartment
5. LCD Display
6. Push-buttons
7. Handle Grip
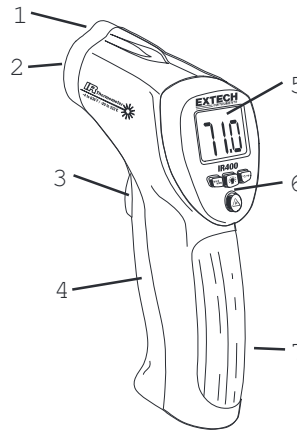
Display Description

1. Temperature scan in progress (trigger held)
2. Last reading held (trigger released)
3. Laser pointer ON
4. Emissivity (0.95 fixed)
5. Max or MIN value displayed
6. Temperature display
7. Low battery icon (replace battery)
8. Temperature units
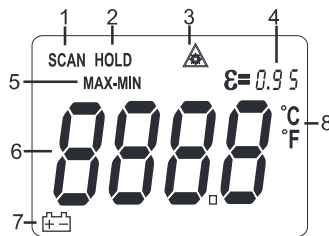
Operating Instructions

Basic IR Measurements

1. Hold the meter by its handle and point it toward the surface to be measured.

2. Pull and hold the trigger to turn the meter on and begin testing. The temperature reading, the flashing 'SCAN' icon, the unit of measure, and € = 0.95 will appear.

3. Release the Trigger and the reading will hold for approximately 10 seconds (HOLD will appear on the LCD) after which the meter will automatically shut off..

Laser Pointer

1. When the trigger is pressed, the laser pointer will turn on and identify the spot being measured. The △ icon on the display indicates that the pointer is on.

2. To turn the laser pointer off, press the △ button while scanning. Press the button again to turn the pointer back on.

MAX - MIN

The Max / Min feature provides a means to display the highest (MAX) or lowest (MIN) temperature measured during a scan.

1. While the trigger is pressed, press the MAX/MIN button. The "MAX" icon will appear and the maximum measured temperature will appear in the display. The displayed temperature will not change until a higher temperature is measured.

2. Press the MAX/MIN button again and the "MIN" icon will appear. The minimum temperature only will be displayed

3. Press the MAX/MIN button again to return to a real time display.

Temperature Units C/F

To change the temperature units, press and release the trigger. Momentarily press the C/F button and the temperature unit will change.

Backlight

When the meter is on, press the ☼ backlight button to turn the backlight on. Press the button again to turn the backlight off.

Note: Constant use of the backlight feature will reduce battery life.

Over-Range Indication

If the temperature measurement exceeds the specified temperature range, the thermometer will display "HI" or "LO" in place of a temperature reading.

Field of View
The meter's field of view is 8:1. For example, if the meter is 8 inches from the target (spot), the diameter of the target must be at least 1 inch. Other distances are shown in the field of view diagram. Note that measurements should normally be made as close as possible to the device under test. The meter can measure from moderate distances but the measurement may be affected by external sources of light. In addition, the spot size may be so large that it encompasses surface areas not intended to be measured.
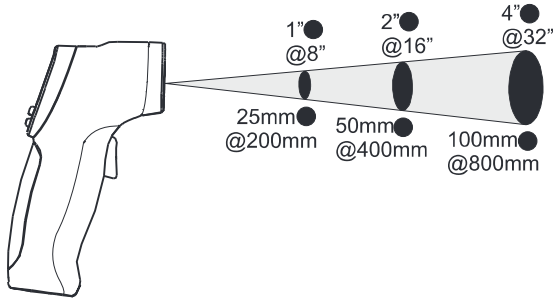
Battery Replacement

When the battery symbol ▭ appears in the display, replace the meter's 9V battery. The battery compartment is located behind the panel that surrounds the meter's trigger. The panel can be pried open near the trigger and folded down as shown in the diagram. Replace the 9V battery and close the battery compartment cover.

You, as the end user, are legally bound (EU Battery ordinance) to return all used batteries, disposal in the household garbage is prohibited! You can hand over your used batteries / accumulators at collection points in your community or wherever batteries / accumulators are sold!

Disposal: Follow the valid legal stipulations in respect of the disposal of the device at the end of its lifecycle

IR Measurement Notes

1. The object under test should be larger than the spot (target) size calculated by the field of view diagram (printed on the side of the meter and in this guide).

2. Before measuring, be sure to clean surfaces that are covered with frost, oil, grime, etc.

3. If an object's surface is highly reflective, apply masking tape or flat black paint to the surface before measuring. Allow time for the paint or tape to adjust to the temperature of the surface it is covering.

4. Measurements can not be made through transparent surfaces such as glass. The surface temperature of the glass will be measured.

5. Steam, dust, smoke, etc. can obscure measurements.

6. The meter automatically compensates for deviations in ambient temperature. However, it can take up to 30 minutes for the meter to adjust to extremely wide changes.

7. To find a hot spot, aim the meter outside the area of interest then scan across (in an up and down motion) until the hot spot is located.


Emissivity and IR Measurement Theory

IR Thermometers measure the surface temperature of an object. The thermometer's optics sense emitted, reflected, and transmitted energy. The thermometer's electronics translate the information into a temperature reading which is then displayed on the LCD.

The amount of IR energy emitted by an object is proportional to an object's temperature and its ability to emit energy. This ability is known as emissivity and is based upon the material of the object and its surface finish. Emissivity values range from 0.1 for a very reflective object to 1.00 for a flat black finish. For the Model IR400, the emissivity is set to 0.95 which is correct for 90% of typical IR measurement applications.

Specifications

Display	3-1/2 digit (1999count) LCD with backlighting
Response time	Less than 1 second
Over range indication	LCD will show "HI"/"LO"
Polarity	Automatic (no indication for positive polarity); Minus (-) sign for negative polarity.
Emissivity	0.95 fixed value
Field of view	D/S = Approx. 8:1 ratio (D = distance, S = spot) (Has 90% encircled energy at the focal point)
Diode Laser	Output <1mW, Wavelength 630~670nm, Class 2 (II) Laser product
Spectral response	6~14um
Auto power off	Automatic shut off after 10 seconds, approx.
Operating temperature	0°C to 50°C (32°F to 122°F)
Storage temperature	-20°C to 60°C (-4°F to 140°F)
Relative humidity	10%~90%RH operating, <80%RH storage
Power supply	9V battery, NEDA 1604A or IEC 6LR61, or equivalent
Weight	180g (6.3oz)
Dimensions	82 x 41.5 x 160mm (3.2 x 1.6 x 6.3")

Range	Resolution	Accuracy
-20C to -7℃ -4F to 20℉	0.1℉/℃	±4℃ (7.5℉)
-7C to 332℃ 20 to 630℉	0.1℉/℃	±2% of reading + 2℃/4℉
Note: Accuracy is given at 18 ℃ to 28 ℃ (64 ℉ to 82 ℉), less than 80%RH		