REED

Model ST-880

Infrared Thermometer

struction Manual

www.reedinstruments.com

Features:

- Precise non-contact measurements
- Built-in laser pointer
- °C/°F switchable button
- Automatic Data Hold & Auto power off
- Measures a 1 inch target from a distance of 8 inches
- Backlit LCD display

Wide range application:

Food preparation, Safety and Fire inspectors, Plastic molding, Asphalt, Marine and screen printing, measures ink and dryer temperatures, Diesel and Fleet maintenance.

Field of View:

Meter's field of view is 8:1, meaning that if the meter is 8 inches from the target, the diameter of the object under test must be at least 1 inch. Other distances are shown below in the field of view diagram. Refer to the chart printed on the meter for more information.

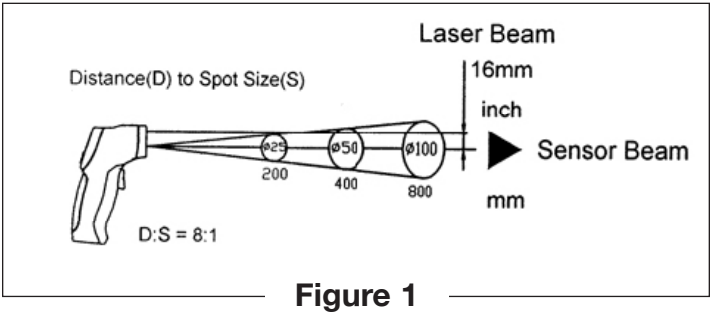


Figure 1

1. SAFETY

- Use extreme caution when the laser beam is turned on.
- Do not let the beam enter your eye, another person's eye or the eye of an animal.
- Be careful no to let the beam deflect off reflective surface which could strike your eye.
- Do not allow the laser light beam impinge on any gas which can explode.

2. SPECIFICATIONS

General specifications

DISPLAY	3-1/2 digit (1999count) LCD with backlighting
MEAS. RANGES	-50°C to 280°C/-58°F to 536°F
RESPONSE TIME	Less than 1 second
OVER RANGE INDICATION	LCD will show "1"
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
POWER OFF	Automatic shut off after 7 seconds, approx.
OPERATING TEMP.	0°C to 50°C (32°F to 122°F)
STORAGE TEMP.	-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.
SIZE	82 x 41.5 x 160mm

Infrared thermometer specifications

Range	Resolution	Accuracy
-5°C to -20°C (-58°F to -4°F)	1°C/1°F	±5°C/±9°F;
-20°C to 280°C (-4 °F to 536°F)		±2% of reading or ±2ºC /±4°F

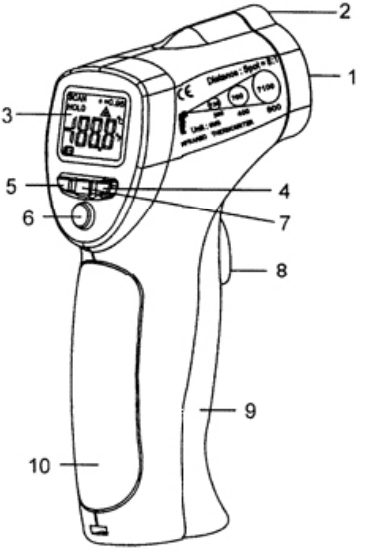
Note: Accuracy is given at 18°C to 28°C (64°F to 82°F), less than 80%RH.

Emissivity: 0.95 fixed value

Field of View: Make sure that the target is larger than the unit's spot size. The smaller the target, the closer you should be to it. When accuracy is critical, make sure the target is at least twice as large as the spot size.

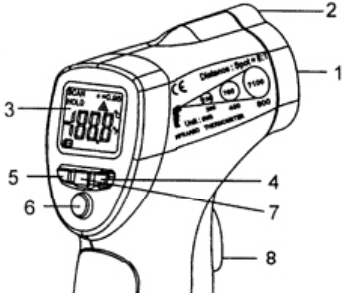
3. FRONT PANEL DESCRIPTION

1 — IR sensor
2 — Laser pointer beam
3 — LCD Display
4 — °F select key
5 — °C select key
6 — Laser select key
7 — Backlight select key
8 — Measurement Trigger
9 — Battery Cover
10 — Handle Grip



4. INDICATOR

1 — Digital readout
2 — Temperature °C (Celsius)
3 — Temperature °F (Fahrenheit)
4 — Measuring indication
5 — Data Hold
6 — LOW battery indicator
7 — Laser Point
8 — Fixed emissivity (0.95)



5. MEASURMENT OPERATION

1 — Hold the meter by its Handle Grip and point it toward the surface to be measured.

2 — Squeeze and hold the Trigger to turn the meter on and begin testing. The display will light if the battery is still good. Replace the battery if the display does not light up.

3 — While measuring, the SCAN display icon will appear in the upper left hand corner of the LCD.

4 — While continuing to squeeze the Trigger:

a. Push the Laser button to turn on the laser pointer. When the laser is on the laser icon will appear on the LCD over the temperature. Aim the red beam approximately a half inch above the point of test (pressing the Laser button again turns the laser off).

b. Select the temperature units (°C or °F) using the °C & °F buttons.

c. Push the Backlight key to turn on the LCD backlighting function.

5 — Release the Trigger and the HOLD display icon will appear on the LCD indicating that the reading is being held.

6 — The meter will automatically power down after approximately 7 seconds after the trigger is released.

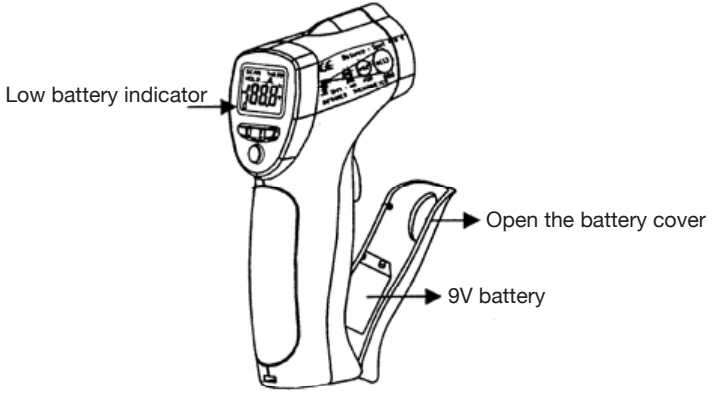
Note: Measurement considerations

Holding the meter by its handle, point the IR Sensor toward the object whose temperature is to be measured. The meter automatically compensates for temperature deviations from ambient temperature. Keep in mind that it will take up to 30 minutes to adjust to wide ambient temperatures. Several minutes is required after a low temperature is measure before a high temperature measurement can be measured. This is a result of the cooling process which must take place for the IR sensor.

6. BATTERY REPLACEMENT

1 — When battery power is not sufficient, the LCD will display "". Replacement with a 9V battery is required.

2 — Open the battery cover, take out the battery from instrument and replace with a new 9-Volt battery and place the battery cover back.



7. NOTES:

- **How it Works**

Infrared thermometers measure the surface temperature of an object. The unit's optics sense emitted, reflected, and transmitted energy, which is collected and focused onto a detector. The unit's electronics translate the information into a temperature reading which is displayed on the unit. In units with a laser, the laser is used for aiming purposes only.

- **Field of View**

Make sure that the target is larger than the unit's spot size. The smaller the target, the closer you should be to it. When accuracy is critical, make sure the target is at least twice as large as the spot size.

- **Distance & Spot Size**

As the distance (D) from the object increases, the spot size (S) of the area measured by the unit becomes larger. See: Figure 1 on Page 1.

- **Locating a Hot Spot**

To find a hot spot, aim the thermometer outside the area of interest, then scan across with an up and down motion until you locate hot spot.

- **Reminders**

1 — Not recommended for use in measuring shiny or polished metal surfaces (stainless steel, aluminum, etc.) See Emissivity below.

2 — The unit cannot measure through transparent surfaces such as glass. It will measure the surface temperature of the glass instead.

3 — Steam, dust, smoke, etc., can prevent accurate measurement by obstructing the unit's optics.

- **Emissivity**

Most (90% of typical applications) organic materials and painted or oxidized surfaces have an emissivity of 0.95 (pre-set in the unit). Inaccurate readings will result from measuring shiny or polished metal surfaces. To compensate, cover the surface to be measured with masking tape or flat black paint. Allow time for the tape to reach the same temperature as the material underneath it. Measure the temperature of the tape or painted surface.

Emissivity Values

Substance	*Thermal Emissivity*	*Substance*	*Thermal Emissivity*
Asphalt	0.90 to 0.98	Cloth (black)	0.98
Concrete	0.94	Human skin	0.98
Cement	0.96	Lather	0.75 to 0.80
Sand	0.90	Charcoal (powder)	0.96
Earth	0.92 to 0.96	Lacquer	0.80 to 0.95
Water	0.92 to 0.96	Lacquer (matt)	0.97
Ice	0.96 to 0.98	Rubber (black)	0.94
Snow	0.83	Plastic	0.85 to 0.95
Glass	0.90 to 0.95	Timber	0.90
Ceramic	0.90 to 0.94	Paper	0.70 to 0.94
Marble	0.94	Chromium oxides	0.81
Plaster	0.80 to 0.90	Copper oxides	0.78
Mortar	0.89 to 0.91	Iron oxides	0.78 to 0.82
Brick	0.93 to 0.96	Textiles	0.90

Notes