FLUKE®

574

Precision Infrared Thermometer

Users Manual

March 2005

LIMITED WARRANTY AND LIMITATION OF LIABILITY

This Fluke product will be free from defects in material and workmanship for one year from the date of purchase. This warranty does not cover fuses, disposable batteries, or damage from accident, neglect, misuse, alteration, contamination, or abnormal conditions of operation or handling. Resellers are not authorized to extend any other warranty on Fluke's behalf. To obtain service during the warranty period, contact your nearest Fluke authorized service center to obtain return authorization information, then send the product to that Service Center with a description of the problem.
THIS WARRANTY IS YOUR ONLY REMEDY. NO OTHER WARRANTIES, SUCH AS FITNESS FOR A PARTICULAR PURPOSE, ARE EXPRESSED OR IMPLIED. FLUKE IS NOT LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LOSSES, ARISING FROM ANY CAUSE OR THEORY. Since some states or countries do not allow the exclusion or limitation of an implied warranty or of incidental or consequential damages, this limitation of liability may not apply to you.

Safety Information

⚠⚠ Warning

A Warning identifies conditions and actions that pose hazards to the user. To avoid electrical shock or personal injury, follow these guidelines:

- ⚠ Do not point laser directly at eye or indirectly off reflective surfaces.
- Before using the thermometer inspect the case. Do not use the thermometer if it appears damaged. Look for cracks or missing plastic.
- Replace the batteries as soon as the battery indicator two or less segments.
- Do not use the thermometer if it operates abnormally. Protection may be impaired. When in doubt, have the thermometer serviced.
- Do not operate the thermometer around explosive gas, vapor, or dust.
- Do not connect the optional external probe to live electrical circuits.
- To avoid a burn hazard, remember that highly reflective objects will result in lower than actual temperature measurements.
- Do not use in a manner not specified by this manual or the protection supplied by the equipment may be impaired.

⚠ Caution

To avoid damaging the thermometer or the equipment under test protect them from the following:

- EMF (electro-magnetic fields) from arc welders, induction heaters, etc.
- Static electricity
- Thermal shock (caused by large or abrupt ambient temperature changes- allow 30 minutes for thermometer to stabilize before use).
- Do not leave the thermometer on or near objects of high temperature.

Table of Contents

Introduction

The Fluke Model 574 Infrared Thermometer (the thermometer) is for non-contact temperature measurement. This thermometer determines an object‘s surface temperature by measuring the amount of infrared energy radiated by the object‘s surface.

Contacting Fluke

To contact Fluke, call one of the following telephone numbers:

USA: 1-888-44-FLUKE (1-888-443-5853)
Canada: 1-800-36-FLUKE (1-800-363-5853)
Europe: +31 402-675-200
Japan: +81-3-3434-0181
Singapore: +65-738-5655
Anywhere in the world: +1-425-446-5500
For USA Service: 1-888-99-FLUKE (1-888-993-5853)

Or, visit Fluke's Web site at www.fluke.com.
To register your product, visit register.fluke.com.

Warning for the Model 574 NI

Concerning Factory Mutual Approved Nonincendive Devices: Operation in Environments that Require Nonincendive Devices

⚠ WARNING ⚠

IN HAZARDOUS LOCATIONS DO NOT use serial port connections, change batteries or open serial port cover. To reduce risk of explosion in hazardous locations, use only Fluke temp probe part 2432508 and do not use other accessories, such as power supply and cables.

A nonincendive rating (NI) indicates that this infrared thermometer has been tested to standards for preventing explosions in hazardous areas by limiting the ability of equipment to ignite a specified flammable gas or vapor-in-air mixture. Nonincendive equipment is incapable of releasing sufficient electrical or thermal energy to ignite flammable gases or vapors under NORMAL operation and environmental conditions.

This noncontact thermometer has a Factory Mutual Nonincendive rating. The rating from this USA organization reads: "Nonincendive, Class I, Division 2, Groups A, B, C, D; Class I, Zone 2 IIC; T4 Ta = 50ºC when used with 1.5V alkaline batteries."

A Class I, Division 2 location is a location:

- where volatile flammable liquids or flammable gases or vapors exist, but are normally confined within closed containers;
- where ignitable concentrations of gases, vapors or liquids are normally prevented by positive mechanical ventilation; or

- where ignitable concentrations might be occasionally communicated
- groups A, B, C, D refers to: Acetylene, Hydrogen, Ethylene, and Propane.

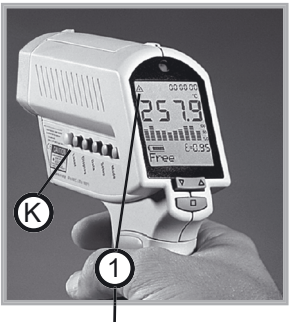
Symbols and Safety Markings

Symbol	Explanation
⚠	Risk of danger. Important information. See Manual.
⚠	Hazardous voltage. Precedes warning
⚠	Warning. Laser.
CE	Conforms to requirements of European Union and European Free Trade Association (EFTA)
°C	Celsius
°F	Fahrenheit
	Battery

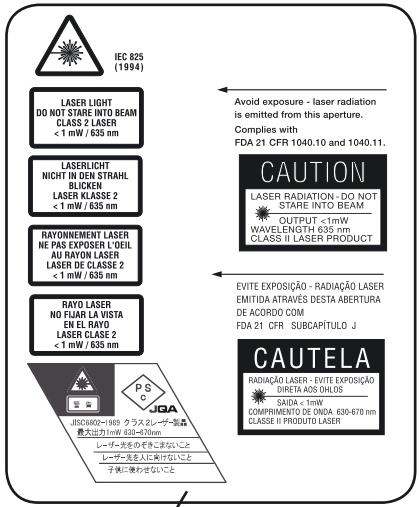
LASER

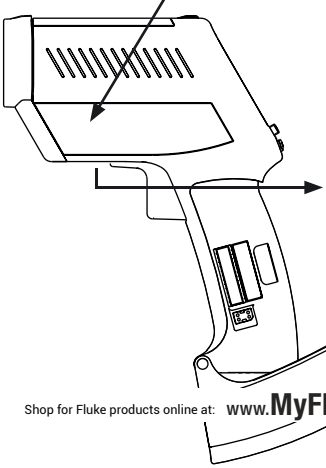
The laser sight simplifies sighting of the measurement object. It shows the spot size that includes the measured target.

To turn the laser on or off press the LASER button (K) when the trigger is pulled. A laser symbol (1) appears when the laser is on. The laser automatically trigger.



Laser Warning and Serial Number Labels





Fluke Corporation
www.fluke.com

Made in Germany Month Year
Model: Fluke xxx
Serial: xxxx xxx
Power Requirements: 3V

Delivery Content

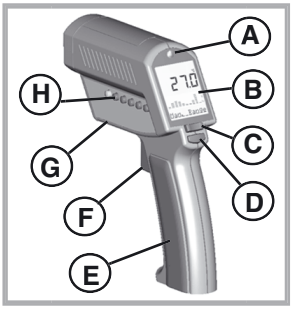
- The unit
- Getting Started
- Two AA batteries
- Manual on CD
- Thermocouple type K probe
- Windows-based software on CD
- RS232 cable
- Power supply

Functions and Display

FUNCTIONS

USER INTERFACE

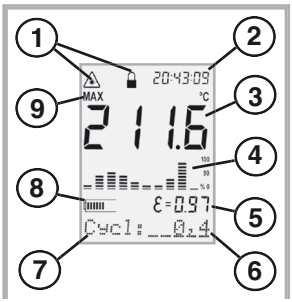
Function keys and display:



(A) Visual and audible alarm
(B) Display
(C) Up and Down keys
(D) Enter
(E) Handle and battery compartment (DIP switches for adjustments are inside handle)
(F) Trigger
(G) Tripod mount
(H) 6 main function keys

DISPLAY

Displayed functions:



(1) Laser condition / Lock symbol
(2) Time (or date)
(3) Main temperature display
(4) Graphic display
(5) Emissivity value
(6) Status bar
(7) Mode indicator

(9) MAX, MIN, DIF, AVG symbols

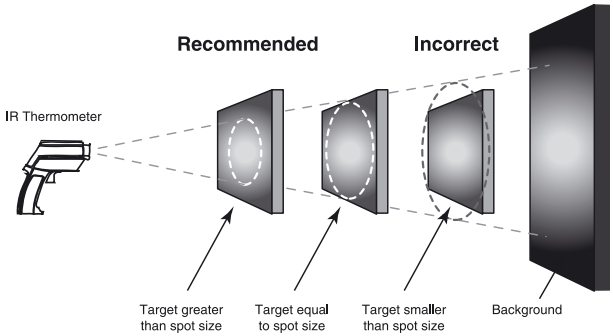
Batteries and Measurement

To open the battery compartment, press gently on the top part of the handle to release the catch and pivot the grip as shown in the figure. Orient the batteries (two alkaline R6 (AA, UM3)) positive side up as shown on the housing.

MEASUREMENT

To take a temperature measurement, hold the unit as shown. Aim at the target. Pull the trigger (F). The temperature of the object being measured is shown on the display (B). The temperature will be displayed for seven released.

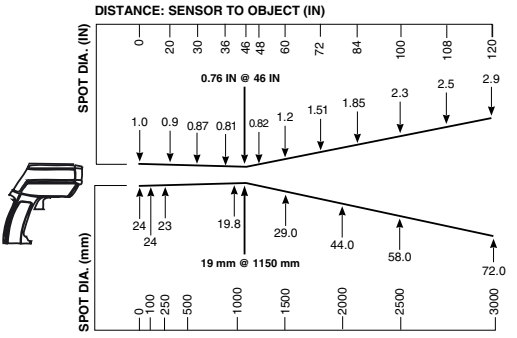
Field of View



Make sure that the target is larger than the unit's spot size. The smaller the target, the closer you should be to it.

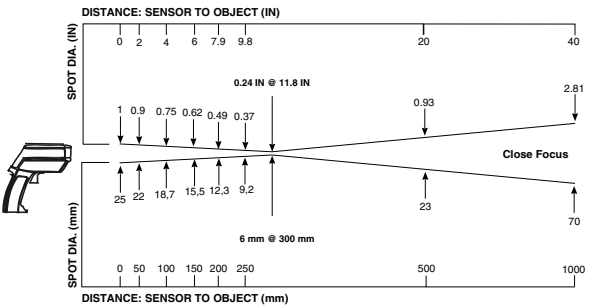
Spot Size

STANDARD MODEL
Optical Chart



FOCUS POINT D:S = 60:1 FAR FIELD D:S = 35:1

CLOSE FOCUS MODEL
Optical Chart



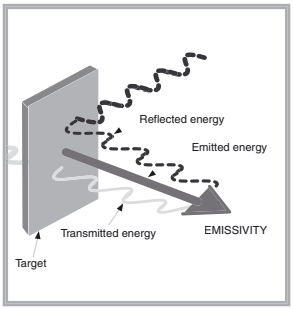
FOCUS POINT D:S = 50:1 FAR FIELD D:S = 12:1

The measured spot size depends on the distance between the object you are measuring and the infrared thermometer.

is 60:1(Standard Focus) or 50:1 (Close Focus) at the focus point. The D:S in the far field (>33ft/ 10m) is 35:1 (Standard) or 12:1 (Close Focus).

Emissivity - Explanation and Adjust

The amount of infrared energy radiated by an object depends on its emissivity and its temperature.
The emissivity depends on the material and its surface characteristics. For more accurate readings, adjust the emissivity value for the type of material being measured.



ADJUST EMISSIVITY

To adjust the emissivity value, press EMISS (P). Use the Up and Down keys to select “Free“ (“Free” will have a flashing underline) (7). Press EMISS again. “Free” is not underlined, and the emissivity icon (5) flashes. Use the Up and Down keys (C) to adjust. Press ENTER (D) to activate this setting.

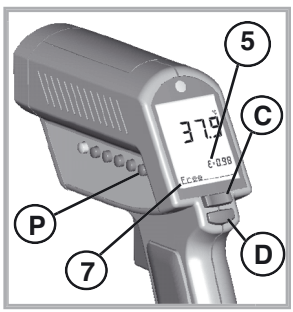
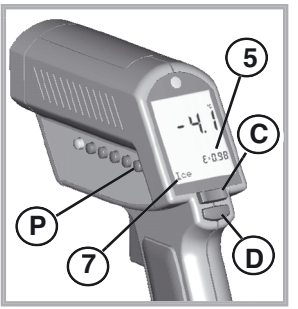


TABLE → Free → ε → ADJUST

Emissivity - Table and Unknown Value

TABLE OF VALUES

To choose the emissivity of a material, press EMISS (P). The display shows a material name (7), an emissivity value, and the calculated temperature value (5). To choose another material, use the Up and Down keys (C). Press ENTER (D) to activate this setting.



UNKNOWN VALUE

To adjust the unit's emissivity value for a material with unknown emissivity, plug in the probe.
Pull the unit's trigger.
Place the measuring tip of the probe on the area to be measured.
Wait for the reading to stabilize.

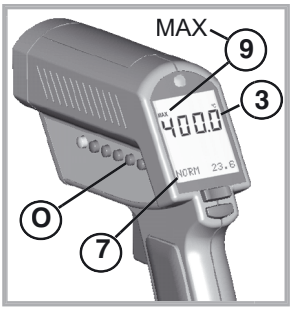
Note the indicated probe temperature reading. Release the trigger. Pull the trigger again. Measure the same area using infrared measurement. Press the emissivity button (P). Use the Up and Down keys

shown in the display (7). Press the emissivity button (P) again until the emissivity sign (5) flashes. Use the arrow keys (C) to change the emissivity value until the temperature matches the probe's reading.

Mode - Maximum and Minimum

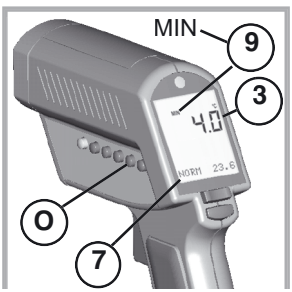
MAXIMUM

To activate the MAX mode, press MODE (O) until the MAX symbol appears (9). The measured maximum temperature is displayed (3) as long as the trigger is pulled or locked on. The real time temperature is shown in the lower part of the display (NORM) (7).



MINIMUM

To activate the MIN mode, press MODE (O) until the MIN symbol (9) appears. The measured minimum temperature (3) is displayed as long as the trigger is pulled or locked on.
The real time temperature is shown in the lower part



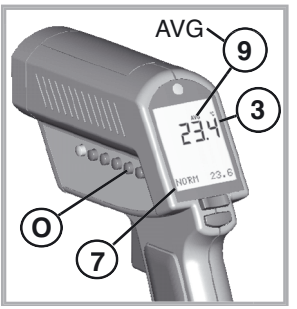
Mode - Difference and Avarage

DIFFERENCE

To activate the DIF mode, press MODE (O) until the DIF symbol (9) appears. The difference between the measured max and min temperatures is displayed (3) as long as the trigger is pulled or locked on. The real time temperature is shown in the lower part of the display (NORM) (7).

AVERAGE

To activate the AVG mode, press MODE (O) until the AVG symbol (9) appears. The average value of measured temperatures (3) is displayed as long as the trigger is pulled or locked on. The real time temperature is shown in the lower part of the display (NORM) (7).

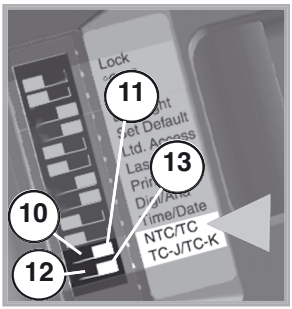


Probe Connections

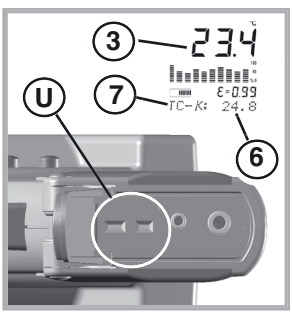
PROBE
CONNECTIONS

Open the battery compartment and set the switches ON or Off according to the desired probe type.

(10) NTC - thermistor
(11) TC - thermocouple
(12) Thermocouple type J
(13) Thermocouple type K



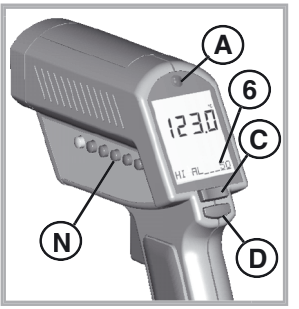
Connect the probe to the input (U). Press MODE, until the desired probe symbol (7) appears. The probe temperature is shown in the lower part of the display (6). The real time infrared temperature is shown in the main display (3).



Setup Alarm

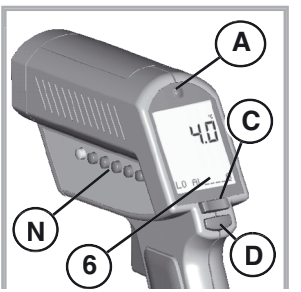
HIGH ALARM

The high alarm (HiAl) generates an audible and visual (flashing LED (A) and laser) alarm if the temperature is above the setpoint.
To set the alarm value (6), Press SETUP (N) once, and use the Up and Down keys (C).
Then press ENTER (D) to activate this setpoint.



LOW ALARM

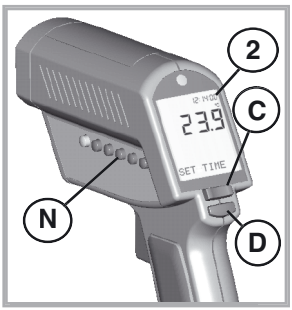
The low alarm (LoAl) generates an audible and visual (flashing LED (A) and laser) alarm if the temperature is below the setpoint. To set the alarm value (6), Press SETUP (N) twice and use the Up and Down keys (C).
Then press ENTER (D) to activate this setpoint.



Setup - Time and Date

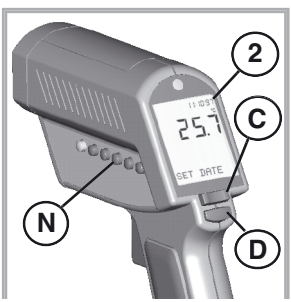
TIME

To set the time, press SETUP (N) three times. Change the time (2) using the Up and Down keys (C).
Then press ENTER (D) for each time segment to activate this time setting. The time appears on the display and is stored within the data logger.



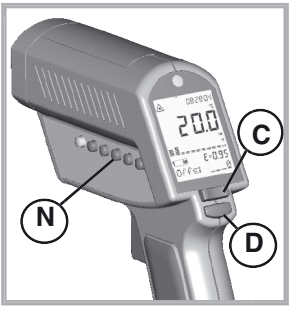
DATE

To set the date, press SETUP (N) four times. Change the date using the Up and Down keys (C).
Then press ENTER (D) for each date segment to activate this date setting. The date (2) is stored within the data logger.



Setup - Offset and Min-Max Values

OFFSET

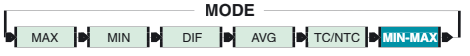


This function is used with a selected emissivity to add or subtract an offset value (±10°C/±18°F) to the temperature value. Press the Setup button (N) until "Offset" appears in the display. With the arrow keys (C) adjust the display to the corrected value. Press ENTER (D) to confirm. The OFFSET feature allows the temperature values for several units to be matched, correcting for the allowed temperature tolerance difference between units. The OFFSET function can also be used to increase the accuracy for a narrow temperature range.

MODE

MIN-MAX VALUES

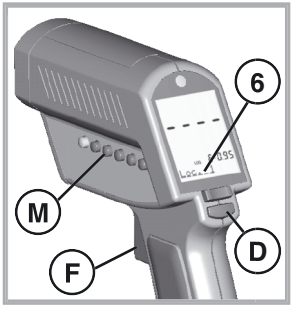
To show the minimum and maximum temperature values during a measurement at the bottom of the display, press MODE (O) until the two values appear (6).



Data Logging and Recall

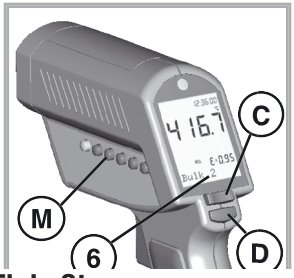
HOW TO STORE DATA

By pressing the ENTER button (D) the LOG function (6) appears on the display. Pull the trigger (F) and hold it. Aim at the target. Be sure that the laser sighting is inside the target. Gently release the trigger to record the temperature. The next location will be shown on the display.
This function is also initiated by pressing the DATA button (M) once.



RECALL

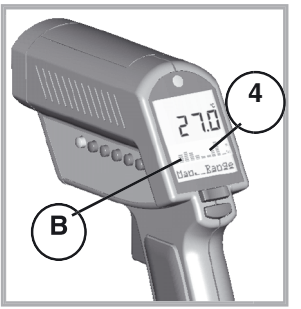
To Recall stored data, press the ENTER button (D), without pulling the trigger. Then press the DATA button (M) until RCL appears on the display. A log location will be shown (6).
To select another log location, use the arrow keys (C).

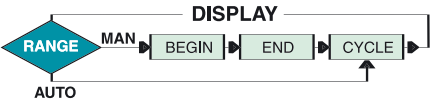


Display

GRAPHIC DISPLAY

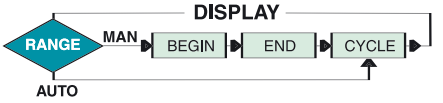
The graphic display (4) shows the temperature as a picture. The last ten measurements are shown (B). It is possible to choose between Auto Range and Manual Range. In manual range the user defines the beginning and ending temperature points of the graph.





AUTO OR MAN RANGE

Press DISPLAY (L) once. Use the Up and Down keys (C) to toggle between ranges. Auto Range is automatically defined by the measured maximum and minimum value. Manual Range (Man Range) is user defined (see DISPLAY, BEGIN section).



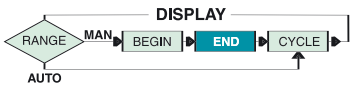
Display - Man. Range

DISPLAY
BEGIN
(Man. Range)

To set the BEGIN value for the graphic display (Man Range is activated), press DISPLAY (L) until “Begin” is shown at the status bar. Use the Up and Down keys (C) to select the value (6).

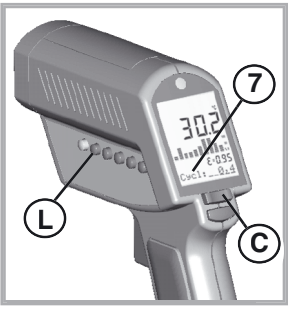
DISPLAY
END
(Man. Range)

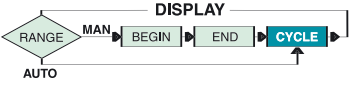
To set the END value of the graphic display (Man. Range), press DISPLAY (L) until ”End” is shown at the status bar. Use the Up and Down keys (C) to select the value (6).



Display - Cycle

CYCLE allows the adjustment of the display interval. Press DISPLAY (L) until Cycl.: (7) is shown at the status bar. To select the interval time, use the Up and Down keys (C). The default value is pre-set for 0.2 sec.

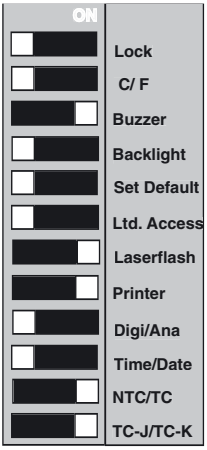




DIP Switches

Change the setting in the unit by using the DIP switches located in the battery compartment (see BATTERIES section).

Factory Defaults DIP-Switch Settings



Lock: Trigger locked (on) or unlocked (off).

°C/°F: changes between °C and °F and date and time format.

Buzzer: Audible alarm On or Off.

Backlight: Backlight On or Off.

Set Default: Activates the factory defaults by overwriting listed settings (see specifications).

Ltd. Access: No function buttons will work.

Laserflash: The laser flashes in case of over- or underranging of the alarm values.

Digi/Ana: Digital or Analog output.

Time/Date: Time or date shown on the display.

NTC/TC: Thermistor (NTC) or thermocouple (TC).

TC-J/TC-K: Type of thermocouples.

Troubleshooting

Code	Problem	Action
-O- -U-	Target temp. is over or under range	Select target within unit's specs
EEPROM-Err	EEPROM error	Contact factory
CalAreaErr ProbCalErr	Calibration errors	Contact factory
Battery icon flashes or LowBatt on Status line	Battery is low	Replace batteries
Blank display	Battery is dead	Replace batteries
Laser won't work	Low or dead battery	Replace batteries
	Ambient above 45°C (113°F)	Operate unit in 45°C (113°F) ambient or below

Maintenance

Lens Cleaning:
Blow off loose particles using clean compressed air. Brush remaining debris away with a camel's hair brush.
Wipe the surface with a moist cotton swab. The swab may be moistened with water or a water based glass cleaner.
NOTE: DO NOT use solvents to clean the plastic lens.

Cleaning the Housing:
To clean the exterior housing, use soap and water or a mild commercial cleaner. Wipe with a damp sponge or soft rag.

Emissivity Table (Selected Values)

Aluminum*	0.30
Asbesto	0.95
Asphalt	0.95
Basalt	0.70
Brass*	0.50
Brick	0.90
Carbon	0.85
Ceramic	0.95
Concrete	0.95
Copper*	0.95
Dirt	0.94
Frozen food,	0.90
Hot food	0.93
Glass (plate)	0.85
Ice	0.98
Iron*	0.70
Lead*	0.50
Limestone	0.98
Oil	0.94
Paint	0.93
Paper	0.95
Plastic**	0.95
Rubber	0.95
Sand	0.90
Skin	0.98
Snow	0.90
Steel*	0.80
Textiles	0.94
Water	0.93
Wood***	0.94

* oxidized

** opaque, over 20 mils

*** natural

CE Conformity

CE

This instrument conforms to the following standards:
EMC: - EN 61326-1:1997+A1:1998+A2:2001
Safety: - EN 61010-1:2001
- EN 60825-1:2001
This product herewith complies with the requirements of the EMC Directive 89/336/EEC and the Low Voltage Directive 73/23/EEC.
This instrument conforms to the Standards of the European Community.

Certification

The temperature sources used to calibrate this instrument are traceable to the U.S. National Institute of Standards and Technology (NIST) and the Deutscher Kalibrierdienst (DKD). Calibration certificates are available as an option.

Specifications

Temperature Range	- 30 to 900°C (- 25 to 1600°F)
Display Resolution	0.1°C (0.2°F)
Accuracy (Infrared)	± 0.75% of reading or ± 0.75K (± 1,5°F), whichever is greater at 25°C (77°F) ambient temperature, ± 2K (± 4°F) for targets below -5°C (23°F)
Ambient derating	< 0.05K/K or < 0.05%/K, whichever is greater at + 25°C (77°F) ± 25K (± 45°F)
Optical Resolution (Standard Focus)	60:1 (19mm spot size at 1.15 M.) (0.75in. spot size at 3.8 feet)
Optical Resolution (Close Focus)	50:1(6mm spot size at 0.3 M.) (0.24in. spot size at 0.98 feet)
Accuracy (Thermocouple K & J)	± 2K or ± 0.75%, whichever is greater
Accuracy (Thermistor)	
-30 to 0°C (-22 to 32°F)	± 0.6K
0 to 70°C (32 to 158°F)	± 0.4K
70 to 100°C (158 to 212°F)	± 1K
100 to 120°C (212 to 248°F)	± 1.5K
Repeatability (Infrared)	± 0.5% of reading or ± 0.5°C (1°F), whichever is greater, ± 1°C (± 2°F) for targets below -5°C (23°F)
Response Time (95%)	250 mSec
Hot Spot Detection (30%)	85 mSec
Spectral Range	8 to 14 µm
Ambient Operating Range	0 to 50°C (32 to 122°F)
Storage Temperature (without batteries)	-20 to 50°C (-4 to 122°F)
Analog output	1 mV/°C(°F)

Power	2 x 1.5 V Alkaline Type AA
Battery Life	13 hrs. (50% laser and 50% backlight on)
Power supply (External)	7.5 V ≥ 200 mA (Using the power supply the display automatically switches on)
Dimensions	200 x 170 x 50 mm (7.9 x 6.7 x 2 inches)
Tripod Mount	1/4”-20 UNC

Factory Defaults

	Default	Range
Emissivity/Gain	0.95	0.10 to 1.50 in steps of 0.01
Emissivity Table	Free	30 materials
Mode	normal	
Hi Alarm	50°C (100°F)	-30 to 900°C (-25 to 1600°F)
Lo Alarm	0°C (32°F)	-30 to 900°C (-25 to 1600°F)
Offset Adjust	0°C (0°F)	-10 to 10°C (-18 to 18°F)
Graphic Display	Auto Range	Auto Range / Man Range
Cycle Time	0.2 sec	0.1 sec to 300 sec
Data logger	100 points pre-set with emissivity 0.95 Lo-Al: 0°C Hi-Al: 50°C adjustable only via Software Accessory	