

IRT2 Dual Laser IR Thermometer - User Guide



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INTRODUCTION

The IRT2 is a handheld, dual laser, non-contact Infrared Thermometer with 12:1 distance to spot ratio and audible and visible high/low set point alarms. It is used to measure and display surface temperatures within the range of -50°C to 650°C (-58°F to 1202°F) and has an accuracy of approximately 1 to 1.5% (see Specifications for details). The IRT2 has a fast response time (0.15 sec) and is powered with a 9V battery and complies with Class II UK/EU laser safety standard EN60285.

KEY FEATURES

- Rapid detection function
- Precise non-contact measurements
- Dual laser sighting
- Automatic Data Hold
- User selectable °C or °F
- Emissivity digitally adjustable from 0.10 to 1.0
- MAX temperature display
- Backlight LCD display
- Trigger LOCK for continuous use
- Set high and low alarms
- Unique flat surface, modern housing design

OPERATING INSTRUCTIONS

Abbreviations:

EMS – Emissivity

HAL – High Alarm

LAL – Low Alarm

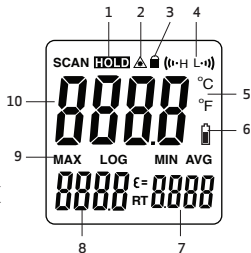
FRONT PANEL CONTROLS

- 1. IR sensor
- 2. LCD Display Laser pointer beam
- 3. Up button (for EMS, HAL, LAL)
- 4. Down button (for EMS, HAL, LAL)
- 5. Mode button
- 6. Measurement Trigger
- 7. Battery Cover
- 8. Handle Grip



FRONT PANEL INDICATORS

- 1. Data Hold
- 2. Laser “on” symbols
- 3. Lock Symbol
- 4. High alarm and Low alarm symbol
- 5. °C/°F symbol
- 6. Low Power Symbols
- 7. Emissivity Symbol and value
- 8. Temperature values for the MAX
- 9. Symbols for the MAX
- 10. Current temperature value



SWITCHING °C/°F

Select the temperature units (°C or °F) using the °C/°F switch (1)



ON / OFF

Press and release the measurement trigger to turn the IRT2 on.

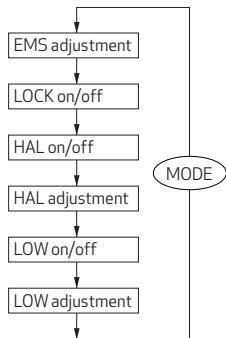
The IRT2 automatically turns off after 8 seconds of non-use.

The 'LOCK on' function allows the IRT2 to remain on beyond the automatic off-time of 8 seconds (see LOCK ON/OFF below).

MODE SETTINGS MENU

Having pressed and released the measurement trigger, the MODE button can be pressed to access the following settings:

- Emissivity (EMS);
- LOCK on/off ;
- High Alarm (HAL) on/off;
- High Alarm temperature adjustment;
- Low Alarm (LAL) on/off;
- Low Alarm temperature adjustment.



Press the MODE button to scroll through the MODE menu cycle. The diagram shows the sequence of functions in the MODE menu cycle.

EMISSIONS ϵ

Emissivity (EMS) adjustment:

When first scrolling through MODE the ϵ will flash and the Up▲ / Down▼ buttons can be used to change the Emissivity value. Press the measurement trigger to confirm selected emissivity, or continue through the MODE menu cycle for other options.

Alternatively, adjust the Emissivity during measurement: while holding the measurement trigger, using the Up▲ / Down▼ buttons. The Emissivity is adjustable from 0.10 to 1.0.

The selected emissivity value will remain after turning off and until another value is selected.

Note on Emissivity:

Emissivity is a term used to describe the energy-emitting characteristics of materials. 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.

Typical 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

LOCK ON/OFF

The lock mode is useful for continuous monitoring of temperatures. Scroll through MODE until the  icon flashes and press the Up or Down buttons to turn on or off the LOCK mode. Press the measurement trigger to confirm the lock measurement mode.

‘LOCK on’ allows for continuous measurement reading, beyond the 8-second automatic time-off.

Continuous measurements are taken without the trigger being pressed. Pressing the trigger will cancel the HOLD command. [The IR Thermometer will continuously display the temperature until the measurement trigger is pressed again.]

“Lock off” means the IRT2 will automatically turn off after 8 seconds on non-use.

Emissivity can be adjusted while in ‘LOCK on’ mode by pressing the Up or Down button.

ALARM – HIGH & LOW TEMPERATURE

The High / Low Alarm settings allow for the audio and visual alarm turned on or off and for the high and low temperatures to be adjusted according to your needs. The audio alarm is a continuous beep. The visual alarm is a flashing red backlight and flashing  icon for a high reading, or  icon for a low reading.

HAL ON/OFF (High Alarm)

Scroll through MODE until the  icon flashes with ON or OFF showing on the screen. Press either the Up or Down button to turn HAL ON or OFF. Press the Measurement Trigger to confirm the High alarm on or off mode, or continue scrolling through Mode for high temperature adjustment and for other options.

HAL Adjustment (High Alarm)

Scroll through MODE until the  icon flashes with previous High temperature alarm setting value showing on the screen. Press the Up or Down button to adjust the High temperature alarm setting. Press the Measurement Trigger to confirm the High temperature alarm setting.

The High / Low alarm is adjustable from -50°C to +650 °C (-58°F to +1202°F) Adjustments can be made in increments of 0.1. If the Up▲ / Down▼ buttons are continually pressed, adjustments will be made in increments of 1, 10 and 100.

LAL ON/OFF (Low Alarm)

Scroll through MODE until the  icon flashes with ON or OFF showing on the screen. Press either the Up or Down button to turn LAL on or off. Press the Measurement Trigger to confirm the High alarm on or off mode, or continue scrolling through Mode for low temperature adjustment and for other options.

LAL Adjustment (Low Alarm)

Scroll through MODE until the  icon flashes with previous Low temperature alarm setting value showing on the screen. Press the Up or Down button to adjust the Low temperature alarm setting. Press the Measurement Trigger to confirm the Low temperature.

The High / Low alarm is adjustable form -50°C to +650 °C (-58°F to +1202°F)

Adjustments can be made in increments of 0.1. If the Up▲ / Down▼ buttons are continually pressed, adjustments will be made in increments of 1, 10 and 100.

MAX TEMPERATURE INDICATION

The maximum temperature recorded between the pressing and releasing the measurement trigger each time is displayed on the screen face.

MEASUREMENT OPERATION

- 1) Hold the meter by its Handle Grip and point it toward the surface to be measured.
- 2) Pull and hold the measurement trigger to turn the meter on and begin testing. The display will light if the battery is good. Replace the battery if the display does not light.
- 3) Release the measurement trigger and the HOLD display icon will appear on the LCD indicating that the reading is being held. In HOLD status, press the UP button to turn on or off the laser. And press the DOWN button to turn on or off the backlight.
- 4) The meter will automatically power down after approximately 7 seconds after the measurement trigger is released, unless the unit is set to LOCK mode.

NOTES on Operation

Measurement and ambient temperature:

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 are to be measured followed by high temperature measurements, some time (several minutes) is required after the low (and before the high) temperature measurements are made. This is a result of the cooling process, which must take place for the IR sensor.

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.

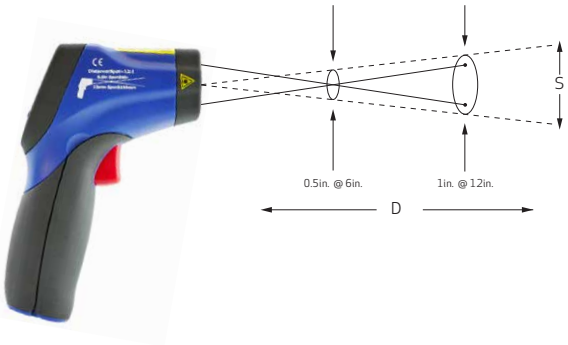
Field of View

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.

$$D:S = 12:1$$



The relationship between distance and spot size for each unit is listed below (in SPECIFICATIONS). The focal point for each unit is 914mm (36"). The spot sizes indicate 90% encircled energy. The focal point for each unit is 914mm (36"). The spot sizes indicate 90% encircled energy.

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
- 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.

BATTERY REPLACEMENT

- 1) As battery power is not sufficient, LCD will display replacement with one new battery type 9V is required.
- 2) Open battery cover, take the battery out of the instrument and replace with a new 9-Volt battery, then replace the battery cover.



MAINTENANCE

Clean the lens often, but never use a solvent. Abrupt temperature changes will cause condensation and possible vapor penetration.

Clean after the vapor evaporates. Blow off loose particles with clean, compressed air. Gently brush remaining debris away with a lens hair brush.

Carefully wipe the surface with a moist cotton swab.

Avoid water, moisture and corrosive gas or liquids. The housing can be cleaned with a damp sponge. Remove the battery when storing this product for an extended period of time.

Do not drop or disassemble the instrument or immerse it in water.

Repairs or service are not covered in this manual and should only be carried out by qualified trained technician.

For service, use only manufacturer's specified parts.

SAFETY INSTRUCTIONS

- Keep this instrument out of the reach of children.
- Do not point laser near or into eyes.
- Do not stare at the laser beam through binoculars or a magnifying glass!
- Do not operate this instrument in the presence of flammable/explosive gases!
- Do not operate in environments full of dust or static electricity.
- Do not operate near sources of strong electromagnetic fields, such as arc welders or induction heaters.

Finally, be aware that it is an offence to point a laser beam at aircraft.

SPECIFICATIONS

Temperature range -50 to 650 °C (-58°F ~ 1202°F)

Distance to Spot ratio D:S = 12:1

Display resolution 0.1 °C(0.1°F) <1000

1°C >1000

Accuracy for targets:

Assumes ambient operating temperature of 23 to 25 °C (73 to 77°F)

-50 ~ 20°C (-58°F ~ 68°F) ±2.5°C(4.5°F)

20°C ~300°C (68°F ~572°F) ±1.0% ±1.0°C (1.8°F)

300°C ~650°C (572°F ~ 1202°F) ±1.5%

Repeatability

-50~20°C (-58~68°F) : ±1.3°C (2.3°F)

20~650°C (68~1202°F): ±0.5% or ±0.5°C (0.9°F)

Response time 150ms

Spectral response 8~14µm

Emissivity Digitally adjustable from 0.10 to 1.0

Over range indication LCD will show "----"

Polarity Automatic

(no indication for positive polarity);

Minus (-) sign for negative polarity

Diode laser output <1mW,Wavelength 630~670nm,
Class 2 laser product

Operating temp. 0 to 50°C(32 to 122°F)

Storage temp. -10 to 60°C (14 to 140°F)

Relative humidity 10%~90%RH operating,
<80%RH storage

Power supply 9V battery, NEDA 1604A or IEC 6LR61,
or equivalent

Safety "CE" Comply with EMC
