

FIRT 550

Features:

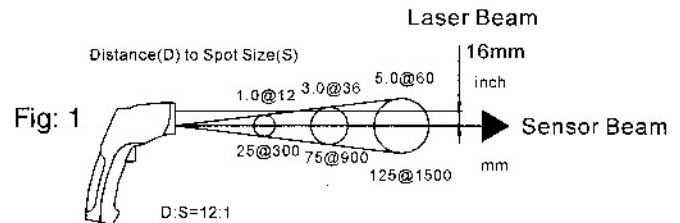
- Precise non-contact measurements
- Built-in laser pointer
- Automatic selection range and Resolution to 0.1° or 1°
- $^{\circ}\text{C}/^{\circ}\text{F}$ switch able button
- Automatic Data Hold & Auto power off
- The meter at 12 inches away measure 1 inch target
- Backlit LCD display

Wide range application:

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

Field of View

The meter's field of view is 12:1, meaning that if the meter is 12 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.



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 on a reflective surface 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	-50.0°C to 550.0°C/-58.0°F to 1022°F
SAMPLE RATE	2.5 times/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. 12:1 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	8-14um
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	290g.
SIZE	100 x 56 x 230mm

● Infrared thermometer specifications

Range (Automatic selection 0.1 °C/ 1 °°C)	Resolution	Accuracy
-50.0°C to 200.0 °C	-50.0°C to -20.0 °C	± 5 °C;
	-20.0°C to 200.0 °C	± 1.5% of reading ± 2°C;
201 °C to 550 °C	1 °C	± 1.5% of reading ± 2°C ;

Range (Automatic selection 0.1 °F/ 1°F)	Resolution	Accuracy
-58.0°F to 200.0 °F	-58.0 °F to -4.0 °F	± 9 °F
	-4.0 °F to 200.0 °F	± 1.5% of reading ± 4 °F
201°F to 1022°F	1 °F	± 1.5% of reading ± 4 °F

Note:

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

Field of View:

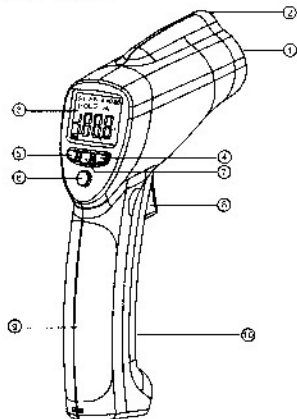
Make sure that the target is larger than the unit's spot size. The smaller the target, the closer you should be to it. When accuracy is critical, make sure the target is at least twice as large as the spot size.

Emissivity:

0.95 fixed value

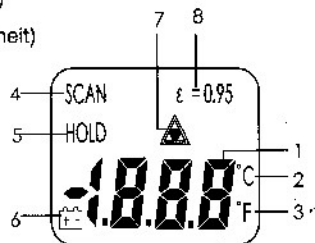
3. FRONT PANEL DESCRIPTION

- 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 Handle Grip
- ⑩ Battery Cover




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. MEASUREMENT OPERATION


- ① Hold the meter by its **Handle Grip** and point it toward the surface to be measured.
- ② Pull and hold the **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 While measuring, the SCAN display icon will appear in the upper left hand corner of the LCD.
- ④ While continuing to pull 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** and **°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.

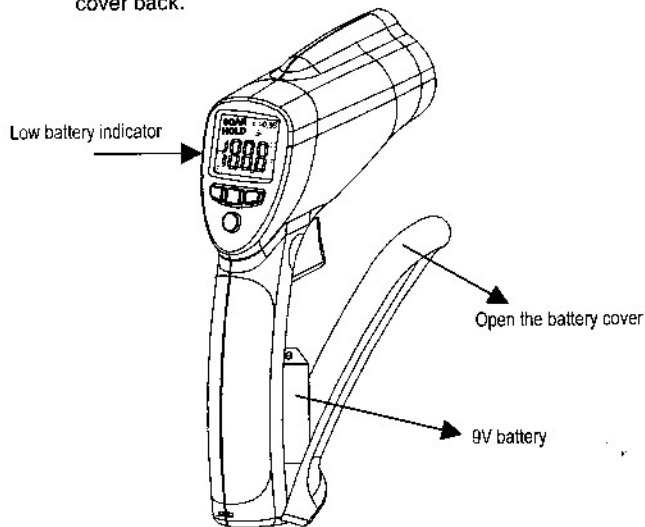
Note: Measurement considerations

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 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.

6. 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, then 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: **Fig. 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**
- 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

FIRT 1000

INTRODUCTION

Thank you for purchase of the IR Thermometer. This is capable of non-contact (infrared) temperature measurements at the touch of a button. The built-in laser pointer increases target accuracy while the backlight LCD and handy push-buttons combine for convenient, ergonomic operation.

The Non-contact Infrared Thermometers can be used to measure the temperature of objects' surface that is improper to be measured by traditional (contact) thermometer (such as moving object, the surface with electricity current or the objects which are uneasy to be touched.)

Proper use and care of this meter will provide years of reliable service.

FEATURES:

- Precise non-contact measurements
- High distance to target ratio measures smaller surface areas at greater distances
- Widest temperature range
- Unique flat surface, modern housing design
- Built-in laser pointer

- Automatic Data Hold
- °C/°F switch
- Emissivity Digitally adjustable from 0.10 to 1.0
- MAX, MIN, DIF, AVG temperature displays
- Backlight LCD display
- Built-in laser pointer
- Automatic selection range and Display Resolution 0.1° C(0.1° F)
- Trigger lock
- Set high and low alarms

WIDE RANGE APPLICATION:

Food preparation, Safety and Fire inspectors, Plastic molding, Asphalt, Marine and Screen printing, measure ink and Dryer temperature, HVAC/R, Diesel and Fleet maintenance.

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 on a reflective surface strike your eye.

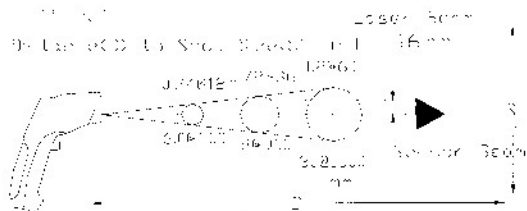
- Do not allow the laser light beam impinge on any gas which can explode.



Distance & Spot Size

As the distance (D) from the object increases, the spot size (S) of the area measured by the unit becomes larger. The relationship between distance and spot size for each unit is listed below. The focal point for each unit is 914mm (36"). The spot sizes indicate 90% encircled energy.

Fig: 1



2. SPECIFICATIONS

Temperature range	D: S
-50 to 1000 °C (-58 to 1832°F)	50:1
Display resolution	0.1 °C(0.1°F)
Accuracy	for targets:
Assumes ambient operating temperature of 23 to 25 °C (73 to 77°F)	
-50 to -20°C (-58 to -4°F):	±5 °C(±9°F)
-20 to 200°C(-4 to 392°F):	± 1.5% of reading ± 2°C (±3.6°F);
200 to 538°C (392 to 1000°F):	± 2.0% of reading ±2°C (±3.6°F);
538 to 1000°C(1000 to 1832°F):	± 3.5% of reading ± 5°C (±9°F)
Response time	less than 1 second
Spectral response	8~14um
Emissivity	Digitally adjustable from 0.10 to 1.0
Over range indication	LCD will show "-OL", "OL"
Polarity	Automatic (no indication for positive polarity);

Minus (-) sign for negative

polarity

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

Class 2(II) laser product

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

Storage temp. -20 to 60°C (-4 to 140°F)

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

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

Weight 290g (10.2 oz.)

Size 100 x 56 x 230mm (3.9 x 2.2 x
9.0")

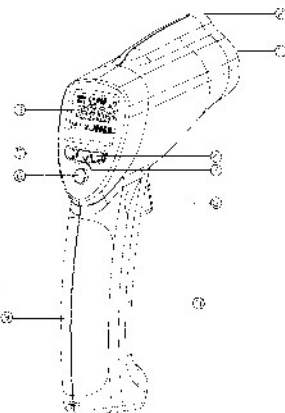
Safety " CE " Comply with EMC

Note:

- **Accuracy:** Given at 18 to 28 °C (64 to 82 °F), less than 80 % RH.
- **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.

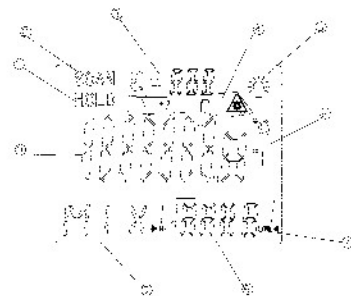
3. FRONT PANEL DESCRIPTION

- ① IR sensor
- ② Laser pointer beam
- ③ LCD Display
- ④ down button
- ⑤ up button
- ⑥ mode button
- ⑦ laser/backlight button
- ⑧ Measurement Trigger
- ⑨ Handle Grip
- ⑩ Battery Cover



4. INDICATOR

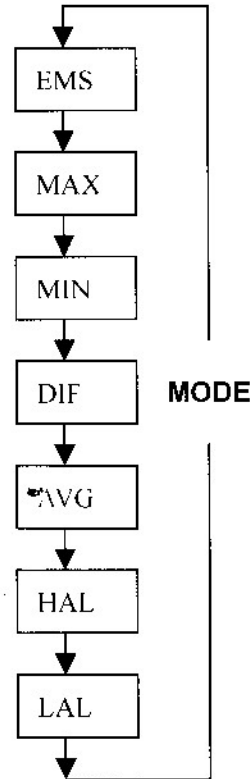
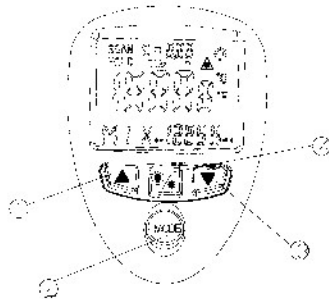
- ① Data hold
- ② Measuring indication
- ③ Emissivity symbol and value
- ④ Low battery, lock and laser " on " symbols
- ⑤ Backlight "on" symbol



- ⑥ °C/°F symbol
- ⑦ High alarm and low alarm symbol
- ⑧ Temperature values for the MAX, MIN, DIF, AVG HAL and LAL.
- ⑨ Symbols for EMS MAX, MIN, DIF, AVG, HAL and LAL.
- ⑩ Current temperature value

5. Buttons

- ① Up button (for EMS,HAL,LAL)
- ② MODE button (for cycling through the mode loop)
- ③ Down button (for EMS,HAL,LAL)
- ④ Laser/Backlight on/off button (pull trigger and press button to activate laser/backlight)



MODE Button Function

The infrared thermometer measures Maximum (MAX), Minimum (MIN), Differential (DIF), and Average (AVG) Temp. Each time you take a reading. This data is stored and can be recalled with the MODE button until a new measurement is taken. When the trigger is pulled again, the unit will begin measuring in the last mode selected.

Pressing the MODE button also allows you to access the High MODE Alarm(HAL), Low Alarm(LAL),Emissivity(EMS).Each time you press you advance through the mode cycle.

The diagram shows the sequence of functions in the MODE cycle.

Switching C/F ,LOCK ON/OFF and SET ALARM.

- ① C/F
- ② LOCK ON/OFF
- ③ SET ALARM

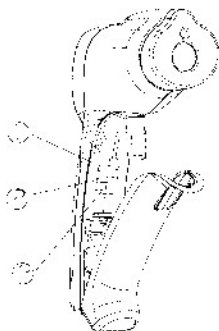
Select the temperature units (°C or °F) using the °C/°F switch

To lock the unit on for continuous measurement, slide the middle switch

LOCK ON/OFF right. If the trigger is pulled while the unit is lock on, the laser and backlight will turn on if they have been activated. When the unit is locked on, the backlight and laser will remain on unless it is turned off using the **Laser/Backlight** button on the keypad.

To activate the alarms, please slide the bottom switch **SET ALARM** right.

To set values for the High Alarm (**HAL**), Low Alarm (**LAL**) and Emissivity (**EMS**), firstly active the display by pulling the trigger or press the **MODE** button, then press the **MODE** button until the appropriate code appears in the lower left corner of the display, press the **UP** and **down** buttons to adjust the desired values.



6. MEASUREMENT OPERATION

- ① Hold the meter by its **Handle Grip** and point it toward the surface to be measured.
- ② Pull and hold the **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 While measuring, the **SCAN** display icon will appear in the upper left hand corner of the LCD.
- ④ Release the **Trigger** and the **HOLD** display icon will appear on the LCD indicating that the reading is being held.
- ⑤ The meter will automatically power down after approximately 7 seconds after the trigger is released. (Unless the unit is locked on)


Note: Measurement considerations

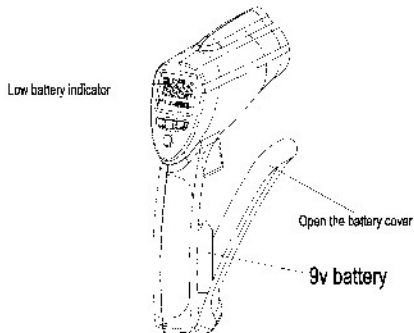
Holding the meter by its handle, point the IR Sensor toward the object whose temperature is to be measured. The meter automatically compensates for temperature deviations from ambient temperature. Keep in mind that it will take up to 30 minutes to adjust to wide ambient temperatures are to be measured 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.

7. 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, then take out the battery from instrument and replace with a new 9-Volt battery and place the battery cover back.



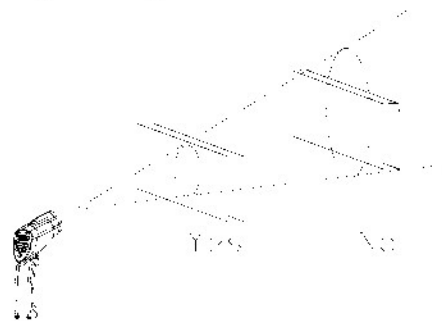
8. NOTES:

● **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 display 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: **Fig: 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**
- 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**

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.

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

9. MAINTENANCE :

- Repairs or service are not covered in this manual and should only be carried out by qualified trained technician.
- Periodically ,wipe the body with a dry cloth. Do not use abrasives or solvents on this instrument.
- For service , use only manufacturer's specified parts.