

# Infrared-LC™ Thermometer

## Instructions and Usage Guidelines

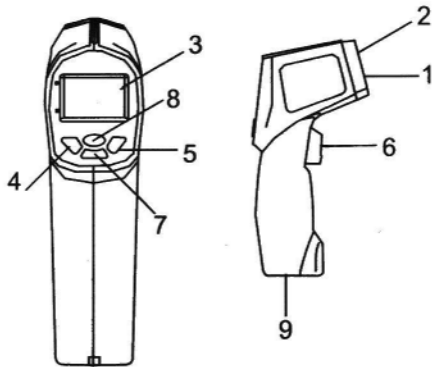
### Laser Beam Warning

The Global-Sensors Infrared-LC™ localizes its temperature measurement target using a laser beam. Laser beams should be used with caution:

- 1) Do not point the laser at the face or eyes of a person or animal. Laser beams contain sufficient energy to cause damage to eyes or sensitive skin areas.
- 2) Laser beams are coherent light...this means that they are still concentrated and potentially dangerous even hundreds of feet from the source of the beam.
- 3) Be careful when operating near mirrors or highly reflective surfaces, as the beam can be reflected back and strike your face or eye unexpectedly.
- 4) Laser light has the potential to ignite explosive or flammable fumes or gases.

When the unit is in use, the laser beam appears as a red dot of light that can be aimed at the object of temperature measurement. The laser dot only appears when the trigger button is depressed.

### Description of Display and Controls



- 1) Laser Pointer Beam Exit Point
- 2) IR Sensor Portal
- 3) LCD Display
- 4) C/F Select Key
- 5) Backlight Select Key
- 6) Trigger (Measure Temperature)
- 7) Laser ON/OFF Key
- 8) Mode Key
- 9) Battery Compartment

### LCD Display

The LCD display permits 4 numbers and decimal points to be displayed. The icon on the upper left indicates battery life. The triangular icon on the upper right indicates laser is in operation. The four triangular "tick marks" running at the base of the LCD display point to the current emissivity setting.

When the unit is turned on, the emissivity is pre-set to 0.95.



### Operation

- 1) The Infrared-LC™ is automatically powered up and ready to use when the trigger is pulled. If the laser light is set to "on" it will be operational with the trigger pull. The unit automatically turns off after 4 seconds after the trigger is released.
- 2) Select Fahrenheit or Celsius by pressing the C/F Select Key (see diagram). The LCD display will indicate which scale is being displayed.
- 3) When the trigger is released, the last reading is held on the display until the unit powers down automatically.
- 4) The backlight allows better visibility in dim light. To turn on the backlight, pull the trigger and at the same time press the Backlight Select Key.
- 5) The laser can be toggled on and off by pulling the trigger and pressing the Laser ON/OFF Key.
- 6) Emissivity can be changed from the default setting of 0.95 by pulling the trigger and at the same time pressing the Mode Key. The LCD will indicate which emissivity mode is active. Repeated pressing of the Mode Key will cause the unit to cycle through the preset emissivity modes: 0.95 – 0.90 – 0.85.

### Battery Installation and Replacement

The unit is supplied with a battery in the battery compartment. When this battery wears out after continued usage, you need to obtain and install a new 9V alkaline battery. Flip open the battery compartment at the base of pistol handle (see diagram) and click the 9V alkaline battery into place.

A low battery indication is signaled by a flashing LCD display. Battery voltage drops during the span of an installed battery. The battery warning will be displayed when the voltage is between 6.5 and 7.5V. Reliable readings can be obtained for several hours after this warning first appears.

### CE Certification

The Infrared-LC™ conforms to EN 50081-1/1992 : EN 55022; EN 50082 : EN 55024, and EN 6100-4-2/-3/-8, ENV 50204, and complies with Council Directive 89/336/EEC with regard to electromagnetic compatibility.

### Warranty and Repair

The unit is warranted for 90 days after shipment date for defects in manufacture. The warranty does not cover the battery itself, instrument misuse, abuse, alteration, tampering, neglect, improper maintenance or damage from leaking batteries. Transit damage claims must be made to the shipping company. We do not repair damaged or defective units past the warranty date.

### Maintenance

Clean the case periodically with a damp cloth. Do not use solvents or allow any fluid to enter the Laser Pointer Beam Exit Point or the IR Sensor Portal.

Depending upon the amount of dust and debris in the working environment, the lens should be cleaned periodically for best accuracy. The lens is located within the IR Sensor Portal. Dust can be removed from the lens with a blast of low pressure compressed air (an aerosol can used for cleaning computer parts is ideal). An alternative method is to use a clean cotton swab wetted with pure water, using light pressure. Do not use solvents.

# Guidelines for Operation

The beam from the IR Sensor is conical. This means that the closer the unit is placed to the target, the smaller the region actually measured. The cone has a ratio of ten to one. This means that at 10 feet of distance between the target and the Infrared-LC™, there is a circle that is one foot in diameter that is being "viewed" by the sensor. The unit will report an average temperature for this surface. The goal of accurate, non-contact thermometry is to always pay close attention to this relationship; never let "non target" surfaces become part of the area that is being scanned by the unit. The general rule is "the closer the better".

Using an IR gun thermometer is convenient and fast. Getting reliable results, however, depends upon knowing the nature and size of the target, and realizing that the unit only measures the skin of the object, not the interior. Usually, the exterior surface of an object has a temperature that is strongly related to the whole object.

The relationship between the skin temperature and the deeper object temperature can be verified by using a contact thermometer and the Infrared-LC™ in combination. Here is the procedure:

- 1) Using a probe "contact type" thermometer (thermocouple or thermistor digital thermometer), measure the target object at least 5 times by probing and recording the temperatures. Compute the average temperature.
- 2) Immediately do a scan on the probed target object with the Infrared-LC™ and record that temperature.
- 3) Repeat this cross calibration exercise unit you have established a good relationship between the two types of measurements.
- 4) When you use the Infrared-LC™ with this specific type of target object, either add or subtract a standard number of degrees from the Infrared-LC™ reading to adjust to match the reading that would have been obtained by the contact probe thermometer.

There are other technical issues with non-contact thermometry that may be of interest to you. Please call +704-825-8282 for more detailed information.

## About Emissivity

The Infrared-LC™ is very unique among low cost IR thermometers in that it is designed with adjustable emissivity. Emissivity is a characteristic of objects and materials that expresses how much infrared radiation comes from the object at a given temperature. Clearly, this is important if you are going to measure temperature by measuring how much infrared radiation is coming from a target object.

Most food items are generally in the range of 0.95 emissivity, so it is possible to just leave the setting alone if you are just doing general survey work in the food industry.

Material	Emissivity
Ceramics and brick	0.80 to 0.95
Cloth	0.95
Concrete	0.94 to 0.95
Glass	0.76 to 0.85
Shiny Metals	0.02 to 0.21
Painted surfaces	0.74 to 0.96
Paper	0.50 to 0.95
Ice	0.82 to 0.89
Soil	0.90 to 0.98

Steel, stainless	0.10 to 0.80
Water	0.93
Wood	0.89 to 0.94

Some helpful hints to remember: if you are trying to measure something in a glass container, use 0.85. Do not attempt to determine the temperature of a glossy metal surface or reflective surface of any kind (it won't work). Use 0.90 for freezers and very cold surfaces that may be frosty.

## Specifications

Measurement Range	-40°F to +500°F (-40°C to +200°C)
Distance Ratio	10:1
Response time	less than one second
Ambient Range	+32°F to +120°F (0°C to +50°C)
Power	9V alkaline battery
Dimensions	6 x 4 x 1.5 inches (152 x 101 x 38 mm)
Weight	11 ounces (320 grams)

## Accuracy Test Certificate

Instrument Serial Number	
Date of Test	
Technician	

The above instrument was tested in the calibration laboratory of Global Sensors. An average temperature was obtained by aiming at a distance of 1.5 feet (0.5 meter) at a calibrated test targets. The actual temperature of the test target is obtained by digital thermometric instruments that are NIST traceable.

The emissivity setting of the unit during tests was set at 0.95.

Test Range	Temperature of Calibrated Target	Temperature Reading of Infrared-LC™
Ambient		
Chill		
High		

Signature of Certifying Technician

Please address all questions about certification, retesting, and other requirements to [calibration@global-sensors.com](mailto:calibration@global-sensors.com)