

**Infrared thermometer  
Instruction manual**



Version: GM321/GM531-EN-00  
7160321005 A0

**A. Introduction**

This infrared thermometer is used for measuring the temperature of the object's surface, which is applicable for various hot, hazardous or hard-to-reach objects without contact safely and quickly.

This unit consists of Optics, Temperature Sensor Signal amplifier, Processing circuit and LCD Display. The Optics collect the infrared energy emitted by the object and focus it onto the Sensor. Then the sensor translates the energy into an electricity signal. This signal will be turned out to be digital shown on the LCD after the signal amplifier and processing circuit.

**B. Warning & Cautions**

**1. Warning:**

To avoid the potential situation that may cause harm or damage to people, please pay attention to the following items:

- 1). Do not point the laser directly at the eye or indirectly at reflective surfaces.
- 2). The unit cannot measure through transparent surfaces such as glass or plastic. It will measure the surface temperature of these materials instead.
- 3). Steam, dust, smoke, or other particles can prevent accurate measurement by obstructing the unit's optics.

**2. Cautions:**

Infrared thermometers should be protected for the following:

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

**C. Distance to spot size**

- 1). When taking measurement, pay attention to the Distance to Spot Size. As the Distance (D) from the target surface increases, the spot size (S) of the area measured by the unit becomes larger. The Distance to Spot size of the unit is 12:1. (Figure 1)

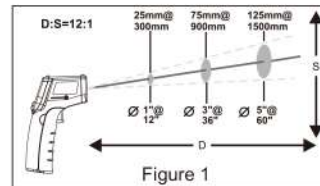


Figure 1

**2. Field of view:**

Make sure the target is larger than the unit's spot size. The smaller the target the closer the measure distance. When accuracy is critical, make sure the target is at least twice as large as the spot size.

**D. Emissivity**

**Emissivity:** Most organic materials and painted or oxidized surfaces have an emissivity of 0.95 (preset in the unit). Inaccurate readings will result from measuring shiny or polished metal surfaces. To compensate for this, adjust the unit's emissivity reading or cover the surface to be measured with masking tape or flat black paint. Measure the tape or painted surface when the tape or painted reach the same temperature as the material underneath.

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

**E. Operation**

**1. Operating the unit : Figure 2**

- 1) Open the battery door and insert the battery.
- 2) Pull the trigger to turn on the unit;
- 3) Aim at the target surface and pull the trigger, then temperature will be shown on the LCD.

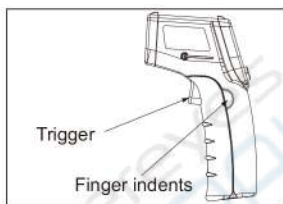


Figure 2

**2. Locating a Hot Spot : Figure 3**

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

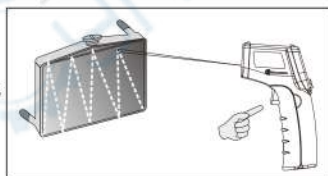


Figure 3

**F. LCD display & buttons**

**1. LCD display: Figure 4**

- A: data hold icon
- B: scanning icon
- C: laser on icon
- D: back light on icon
- E: battery power icon
- F: self-calibration icon
- G: emissivity icon
- H: environmental temperature icon
- I: maximum icon
- J: minimum icon

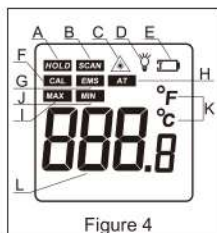


Figure 4

- K: measuring unit
- L: measuring reading

**2. Diagram description : Figure 5**

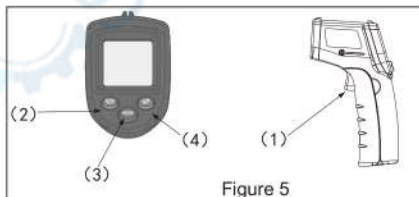


Figure 5

- (1) Trigger: press it to display temperature value with SCAN appears at meantime. Release the trigger and enter into HOLD mode to save the data automatically, and the unit turns off automatically if there is no further operation.

- (2) key for switching between Celsius and Fahrenheit as well as the up-rolling view for emissivity and self calibration.

- (3) Mode switch key: press Mode key to switch modes in turn among MAX → MIN → AT → EMS → CAL → MEASURING INTERFACE

- a. MAX: measuring maximum temperature
- b. MIN: measuring minimum temperature
- Note: In measuring, hold on the Mode key to switch to Max or Min review.
- c. AT: current environment temperature
- d. EMS: emissivity that can be set between 0.10 and 1.00 with the °C / °F key and laser locating key
- e. CAL: Under self calibration mode, to calibrate the unit between -5.0°C and +5.0°C

For example: if the temperature is 26.3°C and the temperature value measured is 25°C, then 1.3°C should be increased as a calibration value, and after calibration press the mode key to return to the measuring mode.

- (4) laser locating key and backlight switch key (press the 2 keys simultaneously for backlight on/off. this key can also be used as a self calibration value decrease key.

**G. Maintenance**

1. Lens Cleaning: Blow off loose particles using clean compressed air. Gently brush remaining debris away with a moist cotton swab. The swab may be moistened with water.
2. Case cleaning: Clean the case with a damp sponge/cloth and mild soap.

**Note:**

- 1) Do not use solvent to clean plastic lens.
- 2) Do not submerge the unit in water.

**H. Specification**

Temperature range	GM321: -50~400°C (-58~752°F)
	GM531: -50~530°C (-58~986°F)
Accuracy	0~400°C(32~752°F): ±1.5°C(±2.7°F) or ±1.5%
	-50~0°C(-58~32°F): ±3°C(±5°F) Whichever is greater
Repeatability	1% of reading or 1°C
Response time	500 mSec, 95% response
Spectral response	5~14 μm
Emissivity	0.10~1.00 optional (0.95 Preset)
Distance to Spot size	12:1
Operating Temperature	0~40°C (32~104°F)
Operating Humidity	10~95%RH non-condensing, up to 30°C(86°F)
Storage Temperature	-20~60°C (-4~140°F)
Power	3V (1.5V AAA battery * 2)
Typical battery life (Alkaline)	Laser Models: 12 hrs

**Specific Declarations:**

Our company shall hold no any responsibility resulting from using output from this product as an direct or indirect evidence. We reserves the right to modify product design and specification without notice.