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31212S manual/manuel

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One Southwire Drive, Carrollton, GA 30119

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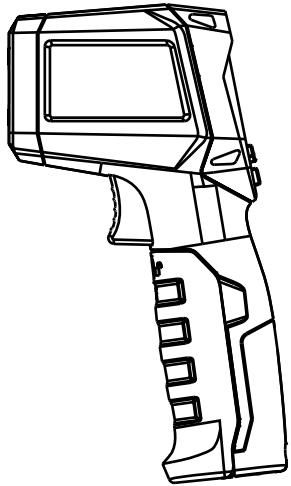
TOOLS & EQUIPMENT

Operating Instructions

31212S Non-Contact Dual-Laser Infrared Thermometer

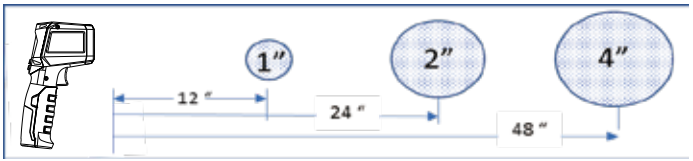


Introduction

Radiation is the transmission of energy in the form of waves or particles through space. One type of radiation is electromagnetic radiation which includes visible light, radio waves, microwaves, and infrared (IR). You cannot see IR radiation but you can feel it as heat. It behaves like visible light - it can be focused, reflected or absorbed.

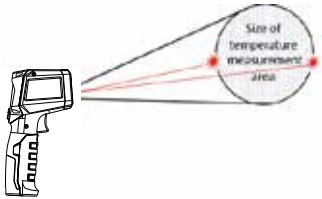
An IR thermometer uses a lens to gather IR radiation and focus it on a detector. The detector converts the IR radiation into electricity which can then be displayed as a temperature measurement.

The Southwire 31212S Infrared (IR) Thermometer measures surface temperature from -26° to 932°F (-32° to 500°C). The IR thermometer has a 12:1 Distance-to-Spot ratio which means that when you aim the thermometer at a surface that is 12-inches away, the thermometer gathers temperature information from a measurement area (“spot” size) of 1 inch in diameter. If the IR thermometer is moved further from the object surface, the measurement area or spot size increases.



When you press the trigger, two laser beams indicate the size of the measurement area. Imagine a circle inside of the two lasers and that is the approximate size of the area the thermometer is collecting date from.

Safety



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

- Use caution when the laser beams are on.
- Do not aim the laser beams at anyone’s eye or allow the laser beams to strike the eye from a reflective surface.
- Do not use the thermometer near explosive gases, vapors or dust.
- To avoid burns, understand that reflective objects can be much hotter than the thermometer indicates.
- Replace the battery as soon as the low battery warning appears on the LCD display.
- Do not use the thermometer if it appears damaged or is operating improperly.
- Before using the thermometer, inspect the case. Protection may be impaired. When in doubt, have the thermometer serviced.
- This product should not be used for medical evaluations.
- If the thermometer is used in a manner not specified by the manufacturer, the protection provided by the thermometer may be impaired.
- Laser used for aiming purposes only.

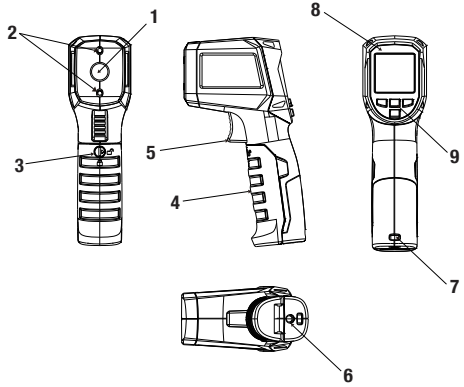
To avoid damaging the thermometer or the equipment under test protect them from the following:
• EMP (electro-magnetic fields) from arc welders, induction heaters, etc Static electricity.
• Thermal shock (caused by abrupt ambient temperature changes).
• Do not leave the thermometer on or near objects of high temperature.

Symbol	Explanation
⚠	Risk of danger. Important information. See manual
⚠	Hazardous voltage. Risk of electrical shock
⚠	Warning. Laser
CE	Conforms to requirements of European Union and European Free Trade Association (EFTA)
	Do not dispose of this product as unsorted municipal waste.
	Battery

Maintenance

This thermometer is designed to provide years of dependable service if the following care instructions are performed:
• KEEP THE THERMOMETER DRY.
• USE AND STORE THE THERMOMETER IN NORMAL TEMPERATURES. Temperature extremes can shorten the life of electronic parts and distort or melt plastic parts.
• HANDLE THE THERMOMETER GENTLY AND CAREFULLY. Dropping it can damage the electronic parts inside.
• KEEP THE THERMOMETER CLEAN. Wipe the housing occasionally with a damp cloth. DO NOT use chemicals, cleaning solvents, or detergents.
• USE ONLY FRESH BATTERIES OF THE RECOMMENDED SIZE AND TYPE. Remove old or weak batteries so they do not leak and damage the unit.
• IF THE THERMOMETER IS TO BE STORED FOR A LONG PERIOD OF TIME, the batteries should be removed to prevent battery leakage which would damage the thermometer.

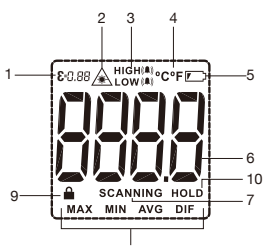
Major Components of the IR Thermometer



Major Components of the IR Thermometer

1. Infrared (IR) sensor
2. Laser pointers
3. Battery cover screw
4. Battery compartment cover
5. Trigger
6. Tripod mount
7. Lanyard attachment
8. LCD display
9. Function buttons

Words & Symbols Shown on the LCD Display



1. Emissivity Setting
2. Laser ON Indicator
3. High & Low Alarm Indicators
4. Temperature Units
5. Low Battery Indicator
6. 4-Digit Temperature Display
7. Infrared Scanning Indicator
8. Mode Settings
9. Lock Indicator
10. HOLD indicator

Data Hold

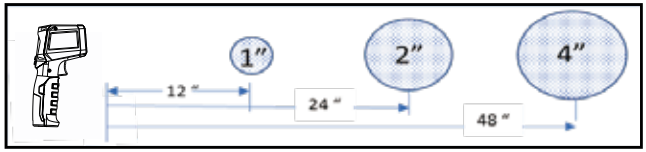
When you aim the IR thermometer at an object and press the trigger, the temperature of that object is displayed on the LCD screen. When you release the trigger, the HOLD indicator will appear on the LCD display. The HOLD indicator means that the IR thermometer is "holding" the last measured temperature and displaying it on the LCD display. The temperature will remain on the display until either a) the IR thermometer turns off or b) the trigger is pressed again.

Laser ON Symbol

Whenever you press the trigger and the lasers are on, the IR thermometer will display the laser symbol on the LCD display.

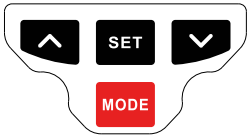
Distance -To-Spot Ratio

The Distance-to-Spot ratio is one of the most important parameters of an infrared thermometer. Generally, the larger the distance-to-spot ratio, the more accurate the IR thermometer will be. For example, the 31212S IR thermometer has a distance-to-spot ratio of 12:1. If the IR thermometer is exactly 12 inches from a wall ("distance"), the area on the wall from which the thermometer is gathering data ("spot") is 1 inch in diameter. If you move the IR thermometer 24 inches from the wall, the size of the area being measured increases to 2 inches. Keep this concept in mind as you use your thermometer.



IR Thermometer Operation

Your 31212S IR Thermometer provides for several user programmable settings which can be programmed using the MODE and SET Buttons.



SET Button

The SET buttons allows you to access the following parameters

Emissivity Setting

Fahrenheit or Celsius Setting

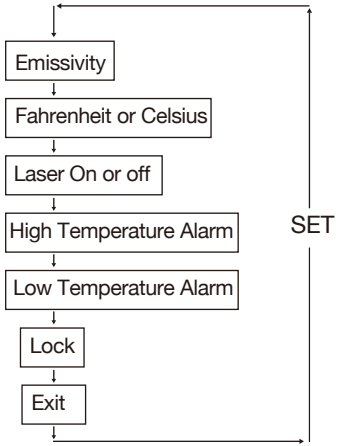
Laser ON or OFF setting

High Temperature Alarm

Low Temperature Alarm

Lock Mode

Each time the SET button is pressed, it will move to the next function as shown on the diagram below. The SET button only operates after the trigger is released. Each function is described below.



Emissivity Setting

Emissivity is a number which describes a materials ability to emit thermal radiation. It is a number between 0.1 and 1. A number like 0.1 represents a perfect reflector (like aluminum foil) whereas the number 1 represents a perfect emitter (like black cloth). The Southwire 31212S allows you to adjust the emissivity setting of the thermometer to match the material being measured. Using the correct emissivity setting will ensure that your temperature measurements are as accurate as possible. For example, if you're monitoring the temperature of concrete as it cures, you would set emissivity to 0.94 (see chart below) so your measurement is as accurate as possible.

To change the emissivity setting of the IR thermometer, first use the chart below to determine the emissivity number of the material you are measuring.

Emissivity Setting

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

Press the SET button until the Emissivity indicator " ε " begins flashing. Press the Up button to increase the value. Press the Down button to decrease the value. To save the setting, press the SET button until all words or symbols on the LCD screen stop flashing or press the trigger to save the setting and exit the emissivity setting.

Fahrenheit or Celsius Setting – To change the units the temperature is displayed in, press the SET button until °C or °F begins flashing. Press the Up or Down button to change from °C to °F or vice versa. To save the setting, press the SET button until all words or symbols on the LCD screen stop flashing or press the trigger to save the setting and exit.

Laser On or Off – The function of the lasers is to help identify where the IR thermometer is gathering data but the lasers are not required to scan and record temperatures. Therefore, the lasers may be turned off. To turn the lasers off, press the SET button until " " begins flashing. Press the Up or Down button to turn the lasers ON or OFF. To save the setting, press the SET button until all words or symbols on the LCD screen stop flashing or press the trigger to save the setting and exit.

High Temperature Alarm– The High Temperature Alarm allows you to set a specific temperature at which a buzzer alarm will sound if the thermometer measures a temperature above the setting. To set the High Temperature Alarm press the SET button until the HIGH alarm symbol begins flashing. Press the Up or Down arrow to change the setting. To save the setting, press the SET button until all words or symbols on the LCD screen stop flashing or press the trigger to save the setting and exit.

Low Temperature Alarm – The Low Temperature Alarm allows you to set a specific temperature at which a buzzer alarm will sound if the thermometer measures a temperature below the setting. To set the Low Temperature Alarm press the SET button until the LOW alarm symbol begins flashing. Press the Up or Down arrow to change the setting. To save the setting, press the SET button until all words or symbols on the LCD screen stop flashing or press the trigger to save the setting and exit.

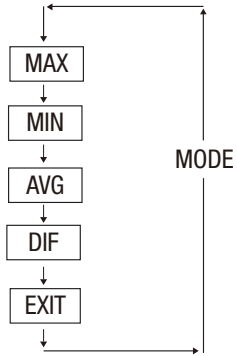
LOCK on/off– The 31212S IR thermometer can be mounted on a tripod for continuous operation. The LOCK feature allows you to "lock" the IR thermometer in the SCANNING mode and measure temperature continuously.
Press the SET button until the lock symbol begins flashing. Press the Up button or Down button to turn the LOCK on. Pull the trigger and release. The meter will stay on continuously until the trigger is pulled again.

MODE Button

The IR thermometer can operate in five different modes.

1) MAX – displays the maximum temperature recorded between the time the trigger is pulled and released.
2) MIN– displays the minimum temperature recorded between the time the trigger is pulled and released.
3) AVG– displays the average temperature recorded between the time the trigger is pulled and released.
4) DIF– indicates the difference between the maximum temperature recorded and the minimum temperature recorded between the time the trigger is pulled and released.
5) All MODES OFF (default setting).

Each time the MODE button is pressed, the display will move to the next MODE or none.



IR Thermometer Operation

1. Hold the thermometer by the handle and point it towards the desired surface to be measured.

2. Press and hold the trigger to turn the IR thermometer on. The two red laser dots indicate the diameter of the circular measurement area. Aim the lasers at the surface you wish to measure. The LCD display will display the temperature of the surface.
As long as you press and hold the trigger, the IR thermometer will continue to gather temperature data and display it on the LCD screen. It may take a few seconds to get a stable reading.

3. Release the trigger. When you release the trigger, the IR thermometer will stop gathering temperature data but will continue to display the last temperature the thermometer measured.

To conserve batteries, the meter will turn off 15 seconds after the trigger is released.

NOTE:

1. For greater accuracy, ensure that the surface you wish to measure is larger than the spot size measured by the meter. Reference the spot diagram above or printed on the side of the meter.
2. If the surface is highly reflective, apply electrical tape or flat black paint to the surface before attempting to take measurements. Allow time for the tape or paint to reach the same temperature as the surface.
3. The meter cannot measure through transparent surfaces such as glass. It will measure the surface temperature of the glass instead.
4. Steam, dust, smoke, etc., can interfere with IR thermometer measurements.
5. Make sure the surface being measured is clean and free of frost, dirt, oil, etc.
6. The meter automatically corrects for changes in ambient temperature. However, it can take up to 30 minutes to adjust to wide variations.

Battery Replacement

1. The LCD screen will display the low battery symbol when it's time to replace the batteries.
2. Note the two depressions on either side of the meter handle, near the trigger. Turn the screw to unlock the battery cover and pull the battery cover open. Remove and properly discard the old 9V battery.Replace with a new 9V and close the battery compartment cover securely.

Specifications

Temperature Measurement Range	-32°C- 500°C (-26°F - 932°F)		
Working Temperature	0°C - 50°C (32°F - 122°F)		
Working Relative Humidity	＜90%RH （non-condensing）		
Storage Temperature	-20°C- 60.0°C (-4°F - 140°F)		
Accuracy	Surface Temperature	Accuracy	Ambient Temperature
	-32°C≤ t ≤0°C	±（1.8°C+0.1°C/°C）	21°C - 25°C
	0°C＜ t ≤500°C	±1.8°C or ±1.8% of reading, whichever is greater	
	-26°F≤ t ≤32°F	±（3.6°F+0.1°F/°F）	69.8°F - 77°F
	32°F＜ t ≤932°F	±3.6°F or ±1.8% of reading, whichever is greater	
Temperature Coefficient	±0.1°C/°C or ±0.1%/°C of reading, whichever is greater （±0.1°F/°F or ±0.1%/°F of reading, whichever is greater）		
D:S Ratio (Distance to Spot)	12:1 (Applies for 90% for the measuring signal)		
Emissivity	0.1~1.0（Adjustable）		
Spectral Response	8um - 14um		
Response Time	≤250ms(95% of reading)		
Display Resolution	0.1°C（0.1°F）		
Laser Power	＜1mW		
Laser Wavelength	630nm - 670nm		
Laser Class level	CLASS 2, Conform to EN 60825-1:2014		
Auto Power off time	15s±1s(HOLD mode)		
Battery	1*6F22 9V Zn-Mn battery		
EMC Standard	RE:30MHz - 1GHz CLASS A Standard EN 61326-1:2013		
	RS:80MHz - 2.7GHz 3V/m CLASS A Standard EN 61326-1:2013 Refer EN61000-4-3:2006+A1:2008+A2:2010+EN 61326-2-3:2013		
	ESD: Contact-discharge 4kv; Air-discharge 8kv; CLASS B Standard EN 61326-1:2013 Refer EN61000-4-2:2009		
Certification	CE; CA65		

In the presence of a strong vertical electromagnetic field, 550MHz ~ 700MHz 3V/m applied to the product will result in a 20% to 30% variation of the measured value. If this variation is observed, move from the area and allow the meter to recover

Customer Service

For technical questions related to your IR thermometer contact Southwire Customer Service at 1-855-SW-TOOLS

Professional Thermometer Calibration

For information on Southwire's meter calibration service, visit our website at southwiretools.com. Once there, click on the Test and Measurement page. Then find the product page for your IR thermometer. There you'll find a link to our Meter Calibration service.

Register Your Meter

To register your thermometer with Southwire, visit our web site at southwire-tools.com and click on Log In/Register to register. After registering, click on Register Product to register your product.

Product Compliance

LIMITED WARRANTY AND LIMITATION OF LIABILITY ON SOUTHWIRE METERS & TESTERS

Southwire Company, LLC. warrants this product to be free from defects in material and workmanship for five years from the date of purchase. This warranty does not cover fuses, disposable batteries, or damage arising from an accident, neglect, misapplication, contamination, modification, improper maintenance or repair, operation outside of specifications, or abnormal handling of the product. Southwire's sole liability, and the purchaser's exclusive remedy, for any breach of this warranty is expressly limited to Southwire's repair or replacement of the product. Whether Southwire repairs or replaces the product will be a determination that Southwire makes at its sole discretion.

SOUTHWIRE MAKES NO WARRANTY THAT THE PRODUCT WILL BE MERCHANTABLE OR FIT FOR ANY PARTICULAR PURPOSE. SOUTHWIRE MAKES NO OTHER WARRANTY, EXPRESSED OR IMPLIED, OTHER THAN THE WARRANTY SPECIFICALLY SET FORTH HEREIN. SOUTHWIRE WILL NOT BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL, INDIRECT, SPECIAL, OR PUNITIVE DAMAGES FOR ANY BREACH OF THIS WARRANTY.

This warranty is void if this product is used for rental purposes. No product reseller is authorized to extend any other warranty on Southwire's behalf relating to this product, and no such reseller warranty will be binding on Southwire. If you have a warranty claim, or if the product needs to be serviced during or after the warranty period set forth above, please contact the Customer Service Department at 855-SWTOOLS (855-798-6657). The sender is responsible for all shipping, freight, insurance, and packaging costs associated with sending a product to Southwire. Southwire will not be responsible for lost or damaged products returned pursuant to this warranty.

All products returned to Southwire under this warranty should be mailed to:

Southwire Company, LLC.
Attention: Tool Warranty Return
840 Old Bremen Road
Carrollton, GA 30117