

User's Guide



Mini IR Thermometer with Type K Input

Model 42535



Introduction

Congratulations on your purchase of Extech's 42535 IR Thermometer. This device offers non-contact infrared temperature measurement capability. The built-in laser pointer increases target accuracy. Type K thermocouple functionality is also built-in. Proper use and care of this meter will provide years of reliable service.

Safety

1. Use extreme caution when the laser beam is ON
2. Do not point the beam toward anyone's eyes
3. Be careful not to let the beam strike the eye from a reflective surface
4. Do not use the laser near explosive gases or in other potentially explosive areas



CAUTION



Laser Radiation

One Year Limited Warranty

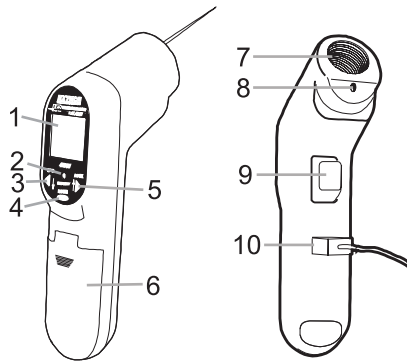
EXTECH INSTRUMENTS CORPORATION warrants the basic instrument to be free of defects in parts and workmanship for one year from date of shipment (a six month limited warranty applies on sensors and cables). If it should become necessary to return the instrument for service during or beyond the warranty period, contact the Customer Service Department at (781) 890-7440 EXTENSION 210 for authorization or visit www.extech.com for more information. A Return Authorization (RA) number must be issued before any product is returned to Extech. The sender is responsible for shipping charges, freight, insurance and proper packaging to prevent damage in transit. This warranty does not apply to defects resulting from action of the user such as misuse, improper wiring, operation outside of specification, improper maintenance or repair, or unauthorized modification. Extech specifically disclaims any implied warranties or merchantability or fitness for a specific purpose and will not be liable for any direct, indirect, incidental or consequential damages. Extech's total liability is limited to repair or replacement of the product. The warranty set forth above is inclusive and no other warranty, whether written or oral, is expressed or implied.

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Meter Description

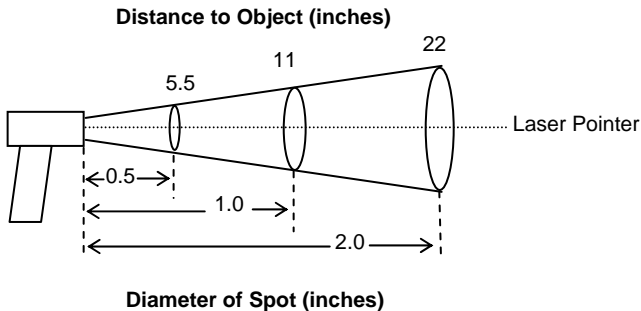
1. LCD Display
2. Emissivity button
3. Down button/°F°C
4. Mode button
5. Up button/Lock
6. Battery cover
7. Infrared lens
8. Laser pointer
9. Measuring trigger
10. Thermocouple input



Operating Instructions

Infrared Temperature

1. Point the meter toward the surface to be measured.
2. Pull and hold the trigger to turn the meter on and begin testing. "SCAN" and a blinking  icon will appear in the display while the trigger is held.
3. Release the trigger and "HOLD" will appear. The last reading will remain in the display for 60 seconds and then the meter will shut off.
4. While measuring, press the °C/°F button to turn the laser pointer on or off. When the laser is on, the  icon will appear on the top left of the display.
5. While in the HOLD mode, press the °C/°F button to change the temperature units.
6. Momentarily press the **Mode** button to step through and view the **MAX** (maximum), **MIN** (minimum), **dIF** (difference between the max and min), **AVG** (average), **HAL** (high alarm), **LAL** (low alarm), **PRB** (type k probe) or **E** (emissivity).
7. While in the HOLD mode, momentarily press the **LOCK** button to allow the meter to run continuously for 60 minutes without holding the trigger. The "LOCK" and "SCAN" icons will appear in the display. Press the **LOCK** button again to exit Lock mode.



Type K Thermocouple Temperature Measurements

1. Connect a K-Type temperature probe into the socket on the front of the handle.
2. Press the Mode button until **PRB** appears on the display.
3. Read the temperature on the display.
4. To see the minimum temperature recorded using the probe, press and hold the **°C/°F** button.
5. To see the maximum temperature recorded, press and hold the **LOCK** button.
6. In this mode, the meter will automatically power off if left idle for more than 12 minutes.

Type K Measurement Considerations

When a Type K Thermocouple is first connected to the meter and the thermocouple and meter temperatures are different, several minutes should be allotted so that the temperature of the socket matches the temperature of the thermocouple.


High and Low Alarms

1. To set the high alarm press the Mode button until **HAL** (high alarm) appears in the display. Use the Up and Down arrow buttons to set the alarm temperature.
2. To set the Low alarm, press the Mode button until **LAL** (low alarm) appears in the display. Use the Up and Down buttons to set the alarm temperature.
3. When the measured temperature exceeds the settings, the alarm will sound and the “**HI**” or “**LOW**” icon will be displayed ((t_{LOW}^{HI})).

Emissivity adjustment

The emissivity is factory set to 0.95, which covers 90% of all applications. However, the closer the meter's emissivity setting is to the actual emissivity of the object under test, the more accurate the temperature measurements will be. To calculate the emissivity of an object: Measure an object's temperature using a Type K Thermocouple and note the reading. Measure the object again using the IR sensor. Now, press the Mode button until the E symbol (emissivity) appears on the screen. Using a small screwdriver or paper clip, press and hold down the Emissivity button. Use the UP and Down arrow buttons to set the Emissivity. Release the Emissivity button. Press the Mode button to confirm the setting.




Back Light Display

To turn the Back Light On/Off, press and hold the measuring trigger. While continuing to pull the trigger, press the **LOCK** button to turn the light on/off. When the back light is on, the  icon will appear on the display.

Error Message

If the **Er** symbol is displayed, it is necessary to reset the thermometer. To reset it, turn the instrument off, remove the battery and wait for a minimum of one minute, reinsert the battery and turn on. If the error message remains repair/replacement of the meter is necessary.

Battery Replacement

This symbol  indicates that the battery is OK. When the low battery symbol  appears on the LCD, measurements are still possible but the meter's 2 AAA batteries should be replaced. This symbol  indicates that the battery is exhausted and no measurements can be taken. The hinged battery compartment is located on the bottom of the meter's handle. Open the compartment by sliding the battery compartment cover down and lifting it from the bottom. Replace the batteries and close the battery compartment cover.



Infrared Measurement Considerations

1. The 42535 automatically compensates for ambient temperature deviations, however it may take up to 30 minutes to adjust to extremely wide ambient temperature changes.
2. When low temperature measurements are taken followed by high temperature measurements, several minutes are required for stabilization before the high temperature measurements can be made accurately.
3. Measurement Field / Distance: The object under test should be larger than the spot size shown in the above diagram. For optimum accuracy, the object should be 1.5 to 2 times larger.
4. Measurement Interference: Objects having low emissivity or objects with low temperature yet high emissivity emit little IR energy. Such objects are adversely affected by IR energy radiated from nearby objects having high emissivity and temperature. For example, when such objects are measured in sunlight, erratic readings occur because of the powerful radiation (sunlight) reflected off of the object's surface into the 42535 sensor.
5. If an object's surface is highly reflective, apply masking tape or flat black paint before measuring.

Specifications

Display	0.31" (7.87mm) 4-digit LCD display
Sample rate	1 sec. approx.
Laser power	Laser power less than 1mW (red), 645-660nm
Operating Temperature	32°F to 122°F (0°C to 50°C)
Operating Humidity	Max. 80% RH.
Power Supply	2 AAA batteries
Battery Life	180 hrs typical (without Laser and Back Light)
Weight	6.3oz / 179g
Size	6.9 x 1.5 x 2.8" (175 x 39 x 72 mm)

Infrared Thermometer Specifications

Range / Resolution	-76 to 932°F (-60 to 500°C)	0.1°C/F
Accuracy	± 2% of reading or ± 4°F (2°C) whichever is greater	
Accuracy notes	1. Accuracy specified for ambient temperature 2. Accuracy specified for emissivity of 0.95	
Emissivity settings	0.95 default value (0.1 to 1.00 adjustable)	
Distance to spot ratio	D/S = Approx. 11:1 ratio (D = distance, S = spot)	
Wavelength	8 to 14 μm	

Type K Thermocouple Specifications

Range / Resolution	-83 to 1999°F (-64 to 1400°C)	0.1°C/F
Accuracy	± (1% reading) or ±1.8°F/1°C (whichever is greater)	
Accuracy note	Stated accuracy does not include thermocouple probe accuracy	
Sensor type	Type K (NiCr – NiAl) Thermocouple (sold separately)	

⚠ EMC/RFI

Readings may be affected if the unit is operated within radio frequency electromagnetic field strength of approximately 3 volts per meter, but the performance of the instrument will not be permanently affected.