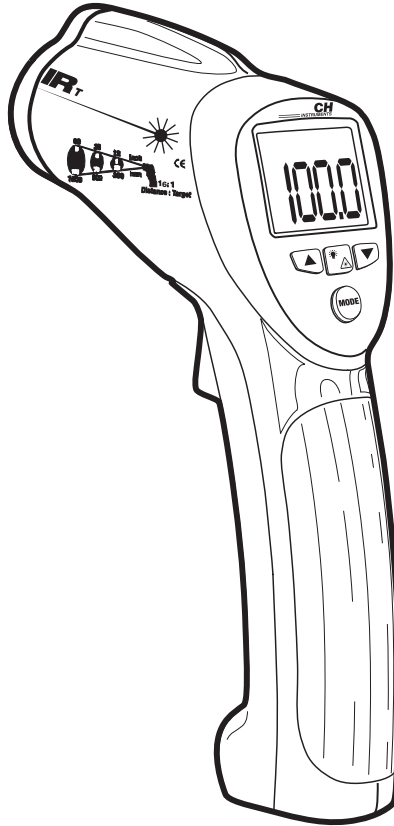


# User's Manual



## High Temperature InfraRed Thermometer with Laser Pointer

MODEL 42540A



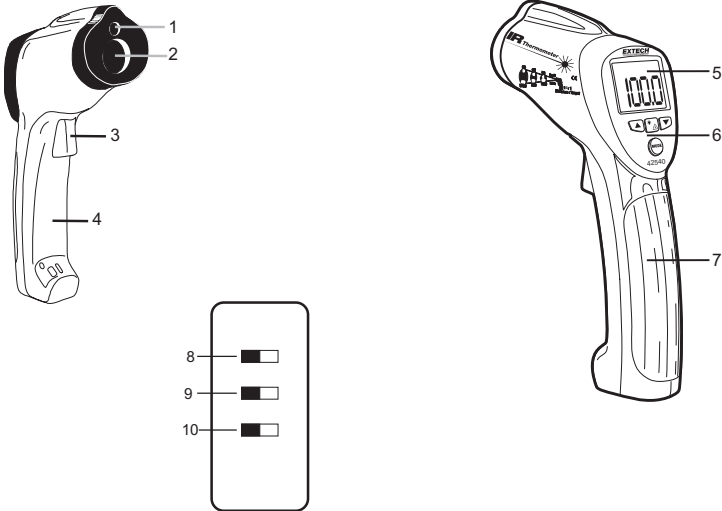


## Meter Description

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1. Laser pointer beam
2. IR Sensor
3. Measurement Trigger
4. Battery and Switch Compartment
5. LCD Display
6. Push-buttons
7. Handle Grip
8. Temperature Units (°C/°F) Switch
9. Test Lock ON/OFF Switch
10. Alarm ON/OFF Switch

Note: There is a tripod mount on the bottom of the handle



## Operating Instructions



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### Basic IR Measurements

1. Hold the meter by its handle and point it toward the surface to be measured.
2. Pull and hold the trigger to turn the meter on and begin testing. The temperature reading, the flashing 'SCAN' icon, the emissivity, and the unit of measure will appear. Note: Replace the 9V battery if the display does not switch on.
3. Release the Trigger and the reading will hold for approximately 7 seconds (HOLD will appear on the LCD) after which the meter will automatically shut off. The only exception to this is if the TEST LOCK switch is set to ON.

**Note:** Select the temperature units ( $^{\circ}\text{F}/^{\circ}\text{C}$ ) using the top switch inside the battery compartment

### Backlight/Laser Pointer

1. While pulling the Trigger, push the backlight/laser button  once to turn on the backlight.
2. Press it again to turn on the laser pointer. When the laser is ON the laser icon  will appear in the LCD.
3. Press the laser button to turn the backlight off.
4. Pressing it again turns the laser off.

**Note:** Backlight and Laser settings will be retained after the meter powers down.

### Over-range Indication

If the temperature measurement exceeds the specified temperature range, the thermometer will display dashes in place of a temperature reading.

## The MODE button options

The MODE button is used to access the programming functions of the instrument. The selected function is displayed on the bottom line of the LCD. Each parameter is listed below with an explanation for its use. Press the MODE button to step from one parameter to the next.

### **EMS** (Emissivity Value)

To change the emissivity value, use the UP and DOWN arrows (the range is 0.10 to 1.00). The current emissivity setting is always shown at the top of the LCD display. A setting of 0.95 covers about 90% of all applications and, when in doubt, should be set as such. Emissivity is discussed in a dedicated section of this manual.

### **MAX** (Maximum function)

In the MAX mode, only the highest reading encountered in the current measurement session is displayed

### **MIN** (Minimum function)

In the MIN mode, only the lowest reading is displayed

### **DIF** (Max minus Min value)

In the DIF mode, the MAX less the MIN is displayed.

### **AVG** (Average value)

In the AVG mode, all of the readings in the current measurement session are averaged and the value is displayed.

### **HAL** (High Alarm setting)

The temperature that, when exceeded, causes the audible/visual alarm to trip.

### **LAL** (Low Alarm setting)

The temperature that, when exceeded high to low, causes the audible/visual alarm to trip.

## High and Low Alarm Feature

The Model 42540a has an alarm feature whereas a High Alarm setting and a Low Alarm setting can be programmed by the user. When either Alarm point is reached the meter will alert the user via an audible beep and LCD display icon. Follow the steps below:

1. Press the MODE button until the HAL (High Alarm) parameter is displayed. Use the UP and DOWN arrow keys to set the desired High Alarm temperature setting.
2. Press the MODE button until the LAL (Low Alarm) parameter is displayed. Use the UP and DOWN arrow keys to set the desired Low Alarm temperature setting.
3. When an alarm limit is reached, the audible alarm will sound and the display icon HIGH or LOW will appear on the LCD.
4. Note that if the bottom switch (located in the battery compartment) is set to OFF, the audible alarm will be disabled.



## Emissivity and IR Measurement Theory

IR Thermometers measure the surface temperature of an object. The thermometer's optics sense emitted, reflected, and transmitted energy. The thermometer's electronics translate the information into a temperature reading which is then displayed on the LCD.

The amount of IR energy emitted by an object is proportional to an object's temperature and its ability to emit energy. This ability is known as emissivity and is based upon the material of the object and its surface finish. Emissivity values range from 0.1 for a very reflective object to 1.00 for a flat black finish. For the Model 42540a, the emissivity is adjustable from 0.1 to 1.00. Most organic materials and painted or oxidized surfaces have an emissivity factor of 0.95. When in doubt, set the emissivity to 0.95.

## Emissivity Factors for Common Materials

Material under test	Emissivity	Material under test	Emissivity
Asphalt	0.90 to 0.98	Cloth (black)	0.98
Concrete	0.94	Skin (human)	0.98
Cement	0.96	Leather	0.75 to 0.80
Sand	0.90	Charcoal (powder)	0.96
Soil	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

## Specifications

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### Infrared Thermometer Specifications

Range / Resolution	-58 to 1400°F (-50 to 760°C)	0.1°C/F over entire range
Accuracy (of reading)	± 2% of reading or 4°F (2°C) whichever is greater < 932°F (500°C) ± (2.5% of reading + 5°) > 932°F (500°C) Note: Accuracy is specified for the following ambient temperature range: 64 to 82°F (18 to 28°C)	
Emissivity	Adjustable from 0.1 to 1.00 (0.95 default value)	
Field of View	D/S = Approx. 16:1 ratio (D = distance, S = spot)	
Laser power	Less than 1mW	
Spectral response	6 to 14 μm (wavelength) Bright Spot 9.0" Dia. 9.0"4(100 x 56 x 230mm)	



#### Support line (781) 890-7440

Technical support: Extension 200; E-mail: [support@extech.com](mailto:support@extech.com)

Repair & Returns: Extension 210; E-mail: [repair@extech.com](mailto:repair@extech.com)

#### Product specifications subject to change without notice

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