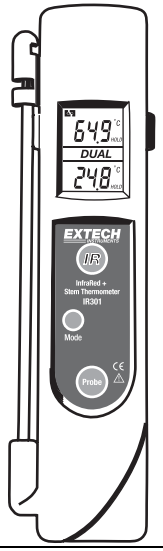
User's Guide

EXTECH INSTRUMENTS

Combination IR + Stem Thermometer

Model IR301



Introduction

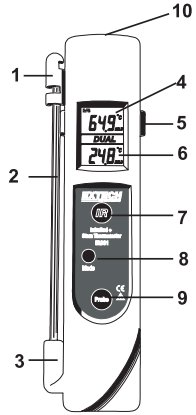
Congratulations on your purchase of the Extech IR301. The IR301 is a combination non-contact infrared thermometer *and* probe thermometer. Careful use of this instrument will provide years of reliable service.

Specifications

Display	2000 count Dual LCD display.
Thermocouple probe	4.5” (114mm) stainless steel stem type K
Measurement ranges	Non-contact Infrared (IR) mode: -27 to 428°F (-33 to 220°C) Contact temperature probe mode: -67 to 626°F (-55 to 330°C)
Resolution	0.1° to 199.9°; 1° >200
Accuracy	IR: ±3% of reading or 6°F (3°C)* Probe: ±1% of reading or 2°F (1.2°C)* * whichever is greater
IR Distance/Spot ratio	1:1 (the meter’s distance from object equals the size of the measurement spot)
Out of range indicators	‘Hi’ or ‘Lo’ appears on the LCD
Low battery indication	
EMC/FRI	Readings may be affected if the unit is operated within radio frequency electromagnetic field strengths of 3V per meter (approx.). Note that the meter will not be permanently affected.
Power supply	CR2032 button battery
Battery life	30 hours of continuous use (minimum)
Dimensions	1.0 x 1.6 x 6.1" (24.2 x 39.8 x 156mm)
Weight	Approx. 2.6 oz. (70g) with battery

Meter Description

1. Probe Holder
2. Probe
3. Probe swivel arm
4. IR display
5. Pocket clip
6. Probe display
7. IR button
8. MODE button
9. Thermocouple probe button
10. Infrared sensor



Note that the battery compartment is located on the rear of the instrument.

Operation

Non-contact InfraRed (IR) Temperature Measurements

1. Aim the meter’s IR lens (top of meter) toward the surface under test; hold the meter as close as safely possible to the surface under test.
2. Press and hold the IR button to continuously measure temperature. The IR measurement reading appears on the upper display.
3. When the IR button is released, the HOLD display icon switches on, indicating that the last reading is now being held (frozen).
4. The meter will automatically turn OFF after approximately 10 seconds.

Contact Temperature Probe Measurements

1. Carefully release the probe from its latch and rotate it to the desired position. Do NOT attempt to rotate the probe arm more than 180°.
2. Press the PROBE button momentarily to begin taking readings. The lower display will indicate the measured temperature.
3. Press the PROBE button again to hold the reading. The HOLD icon will switch on indicating that the reading is held (frozen). Press the PROBE button again to exit the HOLD mode.
4. The meter will automatically turn OFF after approximately 4 minutes.
5. Keep the probe in the latched position when not in use.

°C / °F Temperature units selection

To change the temperature units press the IR button once, the MODE button four (4) times, & the IR button once again.

Minimum / Maximum IR Readings (IR measurements only)

1. The MIN and MAX modes allow the user to take measurements while only viewing the highest (MAX) or lowest (MIN) reading.
2. Press the IR button to turn on the IR measurement mode
3. Press the MODE button once to select the flashing “MIN” icon or press the MODE button twice to select the flashing “MAX” icon.
4. Press and hold the IR button to take a continuous IR measurement. As long as the IR button is held down, only the lowest (MIN) or the highest (MAX) reading will display. Subsequent measurements will only update the display if a lower or higher reading is encountered.
5. To exit this mode, press and hold the MODE button.

IR Lock Mode

1. In the LOCK mode, the user can take a continuous IR measurement (for up to 60 minutes) without having to press and hold the IR button.
2. Press the IR button, press the MODE button three (3) times and then press the IR button again. The “LOCK” display icon will appear on the LCD.
3. The meter will now measure temperature continuously for up to 60 minutes or until the IR button is pressed.

IR Emissivity Adjustment

The IR301 has a factory default emissivity setting of 0.95. This is the best setting for most applications. However, for some surfaces, this setting may require adjustment. Emissivity tables are available which include most common materials. To determine the proper emissivity setting for any surface, take a probe measurement and an IR measurement of the surface. If the readings match, the emissivity setting is correct. If the readings are different, the emissivity should be adjusted until the IR reading agrees with the probe measurement.

To adjust the emissivity, press the IR button once and then press the MODE button five (5) times. Now use the IR button to scroll through the emissivity selection range.

The emissivity range is 0.1 to 1.00 (the IR301 display actually shows 10 to 100 representing 0.1 to 1.00).

To exit this mode, press and hold the MODE button.

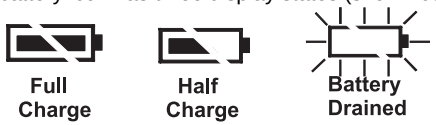
Error Messages

- Hi or Lo appears when the measured temperature is higher (*Hi*) or lower (*Lo*) than the published temperature range.
- Er: Appears when the meter must be reset or serviced. To reset the meter, remove the battery, wait a minimum of one (1) minute, and re-install the battery. If this does not clear the Er message, contact the Extech service department.

Maintenance

Battery status

1. The Battery Status icon appears in the upper left hand corner of the LCD while temperature readings are displayed.
2. The battery icon has three display states (shown below);



Battery replacement

1. Make sure the meter is OFF before replacing the battery.
2. Open the circular battery compartment (located on the rear of the instrument) by rotating the compartment clockwise using a coin or flat-head screwdriver.
3. Replace the CR2032 battery (+ side out) and replace the cover.

Storage and Cleaning

The IR lens is the most delicate part of the IR301; the lens should be kept clean at all times. Care should be taken when cleaning the lens using only a soft cloth or cotton swab with water or isopropyl alcohol. Allow the lens to fully dry before use. Store the IR301 at room temperature.

Safety

- Do not attempt to measure a device whose temperature may exceed the published temperature range (refer to the Specifications section).
- Handle the temperature probe carefully to avoid injury.
- Do not allow children to use this device.
- The probe may remain hot after use. Do not touch the probe until the probe has cooled.

One Year Limited Warranty

EXTECH INSTRUMENTS CORPORATION warrants this instrument to be free of defects in parts and workmanship for one year *from date of shipment (a six month limited warranty applies to 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 ext. 210 for authorization or visit our website www.extech.com for contact 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.*

Calibration and Repair Services

Extech offers repair and calibration services for the products we sell. Extech also provides NIST certification for most products. Call the Customer Service Department for information on calibration services available for this product. Extech recommends that annual calibrations be performed to verify meter performance and accuracy.

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Button-Press - Quick Guide

ACTION	BUTTON-PRESSES
IR Measurements	Press and Hold **IR**
Probe Measurements	Press **PROBE**
MIN display (IR mode only)	Press **IR** – **MODE** – **IR** (hold IR button down)
MAX display (IR mode only)	Press **IR** – **MODE (2x)** – **IR** (hold IR button down)
LOCK Mode	Press **IR** – **MODE (3x)** – **IR**
°C to °F or °F to °C units	Press **IR** – **MODE (4x)** – **IR**

Measurement Considerations:

- The target (spot) to distance ratio is 1:1, meaning that the diameter of the measurement area is equal to the distance the meter's IR lens is from the object. For example, if the meter is held 6 inches from a wall, the measurement area will be a 6" diameter circle on the wall. Moving away from the object causes the measurement spot to proportionately increase in size. Moving closer causes the spot to decrease in size.
- The factory default emissivity setting is 0.95. This setting is adequate for most surfaces; however, for extremely shiny or reflective surfaces the emissivity may require adjustment.
- If the surface of the object under test is covered with frost, oil, grime, etc., clean before taking measurements.
- If an object's surface is highly reflective apply masking tape or flat black paint to the surface before measuring.
- The meter may not make accurate measurements through transparent surfaces such as glass. Also, steam, dust, smoke, etc. can obscure accurate measurements.
- The meter compensates for deviations in ambient temperature. It can, however, take up to 30 minutes for the meter to adjust to extremely wide ambient temperature changes.
- To find a hot spot, aim the meter outside the area of interest then scan across (in an up and down motion) until the hot spot is located.