

GENERAL<sup>®</sup>

**TOOLSMART<sup>™</sup>**

CONNECTED PRECISION

# INFRARED THERMOMETER

*USER'S MANUAL*



Laser Targeting Ring

## TS05

**Test Equipment  
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## INTRODUCTION

Thank you for purchasing General Tools & Instruments' TS05 ToolSmart™ Infrared Thermometer. Please read this user's manual carefully and thoroughly before using the thermometer.

The TS05 is a compact, non-contact (infrared) thermometer (IRT) with a 12:1 distance-to-spot (D:S) ratio and a wide measurement range of -40° to 1076°F (-40° to 580°C). Those two key specifications give the instrument the ability to measure the temperature of very hot or cold surfaces, hard-to-reach objects and toxic substances from a safe distance.

The TS05 can operate as a standalone IRT, or with General's free ToolSmart™ app running on your mobile phone. When used in concert with an iPhone® or Android™ smartphone, the TS05 can stream—via Bluetooth®—to the phone all measurements it makes. The phone initiates the data transfer using the ToolSmart™ app, which can be downloaded from the iTunes® App Store or Google Play Store. The measurements can then be used to tag photos taken by the phone's camera. For example, the app can apply temperature readings to icons of door and window frames in a rendering of a room to indicate where weatherstripping is most needed.

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## SAFETY INSTRUCTION

The TS05 is a Class 3R laser product that emits less than 3mW of radiation. Avoid looking directly at the laser pointer. U.S. law prohibits pointing a laser beam at aircraft; doing so is punishable by a fine of up to \$10,000 and imprisonment.

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## KEY FEATURES

- Measurement range of  $-40^{\circ}$  to  $1076^{\circ}\text{F}$  ( $-40^{\circ}$  to  $580^{\circ}\text{C}$ )
- 12:1 distance-to-spot (D:S) ratio
- Emissivity fixed at 0.95
- Measurements accurate within  $\pm 3^{\circ}\text{F}$  ( $2^{\circ}\text{C}$ ) or  $\pm 2\%$  of reading (whichever is greater) for readings above  $32^{\circ}\text{F}$  ( $0^{\circ}\text{C}$ ); within  $\pm 5^{\circ}\text{F}$  ( $3^{\circ}\text{C}$ ) or  $\pm 2\%$  of reading (whichever is greater) for readings below  $32^{\circ}\text{F}$  ( $0^{\circ}\text{C}$ )
- $^{\circ}\text{F}$  or  $^{\circ}\text{C}$  unit selectable on front panel
- Large (1.6 in. diagonal) backlit LCD
- Meets CE, RoHS and U.S. FDA standards

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## WHAT'S IN THE PACKAGE

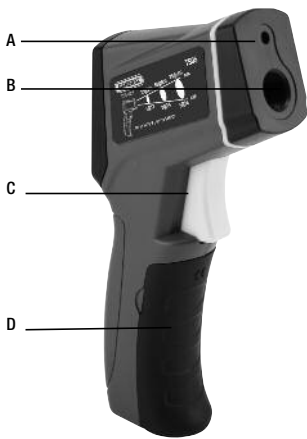
The TS05 comes in a display box along with a “9V” battery.



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## PRODUCT OVERVIEW

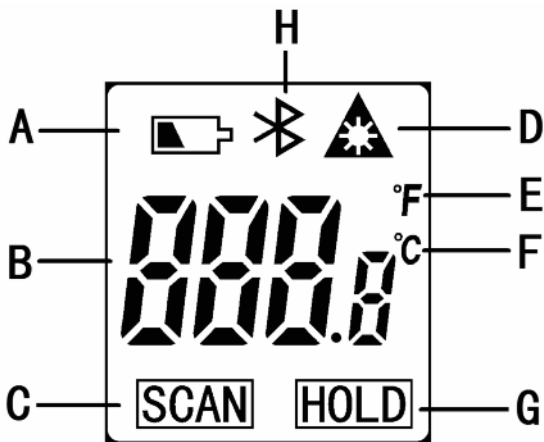
Figure 1 shows all of the controls, indicators and physical features of the TS05. Figure 2 shows most of the icons and text that may appear on the display. Familiarize yourself with the locations and functions of these controls and the meanings of these display icons before moving on to the setup and operating instructions.

**Fig 1. The TS05's controls, indicators and physical features**



- A. Laser pointer
- B. Infrared sensor/lens
- C. Measurement trigger
- D. Battery compartment
- E. Backlit white-on-black (reverse-type) LCD
- F.  button. Turns laser on and off.
- G.  button. **Pressed briefly**, sends measurement data to smartphone app via Bluetooth. **Pressed and held**, activates/deactivates Bluetooth transmission.
- H. °C/°F button. Selects temperature unit
- I. Laser Identification/Certification/Warning/Safety Labels (on left side); see below





**Fig. 2. All possible display indications**

- A. Low battery
- B. Measured temperature
- C. Measurement in progress
- D. Laser on
- E. Fahrenheit unit selected
- F. Celsius unit selected
- G. Data being held (for 60 seconds, max, after trigger is released)
- H. Bluetooth connection activated

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## **SETUP INSTRUCTIONS**

### ***INSTALL BATTERY***

Open the battery compartment (callout D of Fig. 1) by pulling its cover away from the grip. Then plug the “9V” battery that comes with the TS05 into the wired socket inside the compartment. The terminals of the battery and the socket mate in only one way, with the smaller male terminal plugging into the larger female terminal. Close the battery compartment by snapping it shut.

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## OPERATING INSTRUCTIONS

**To make a quick temperature measurement**, squeeze the measurement trigger on the front of the grip and hold it for at least one second while pointing the laser at the target. Note that the **SCAN** icon appears along with the measured temperature while you are squeezing the trigger. When you release the trigger, the **SCAN** icon disappears and is replaced by the **HOLD** icon. Twenty seconds later, the LCD backlight dims by 50% to extend battery life. Sixty seconds after the trigger is released (assuming no front-panel buttons are pressed), the TS05's auto power off function kicks in and shuts off the thermometer to prevent battery discharge.





The TS05 will not make accurate measurements if there is glass or plastic between the thermometer and the target.

**To change the TS05's measurement unit** from degrees Fahrenheit (°F) to degrees Celsius (°C), press the °C/°F button to make the icon °C appear on the right side of the display. To return to Fahrenheit readings, press the °C/°F button again.

**To turn off the laser pointer**, press the  button (Fig. 1, Callout F).

### ***USING THE IRT WITH THE ToolSmart™ APP AND AN APPLE iOS OR ANDROID SMARTPHONE***

To stream measurements made by the TS05 to an Apple iOS or Android smartphone, begin by downloading the free ToolSmart™ app from the iTunes Store or Google Play Store to your phone.

Once you have downloaded the app, install it. Then: 1) Press and hold the  button on the IRT to activate Bluetooth transmission for 30 seconds, and 2) Briefly press the  button once for each temperature measurement you wish to send to your smartphone. Each brief press will extend Bluetooth transmission for another 30 seconds. While Bluetooth transmission is activated, the  icon on the LCD will flash. To deactivate Bluetooth transmission, press and hold the  button.

A tutorial on the app explains how to use it to save TS05 measurements to your phone and integrate them with data from other ToolSmart™ products.

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## SPECIFICATIONS

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Measurement Range	-40° to 1076°F (-40° to 580°C)
Distance-To-Spot (D:S) Ratio	12:1
Measurement Accuracy	±3°F (2°C) or ±2% of reading (whichever is greater) for readings above 32°F (0°C); ±5°F (3°C) or ±2% of reading (whichever is greater) for readings below 32°F (0°C)
Measurement Repeatability	1% of reading or 1°
Response Time	500 msec for 95% response
Emissivity	Fixed at 0.95
Laser Class/Power/Wavelength	Class 3R/<3mW/665nm
Backlight Auto Dimming	To half brightness after 20 seconds of front-panel activity
Auto Power Off Trigger	Inactivity for 60 seconds
Current Consumption	<50mA, max
Operating Temperature	32° to 104°F (0° to 40°C) @ <75% relative humidity (RH)
Storage Temperature (without battery)	-4° to 140°F (-20° to 60°C) @<85% RH
Power Source	One “9V” battery (included)
Dimensions	6.7 x 5.3 x 1.4 in. (170 x 135 x 36mm)
Weight	5.6 oz. (158g)

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## MAINTENANCE AND TROUBLESHOOTING TIPS

After subjecting the IRT to a sudden change in ambient temperature, you must wait 30 minutes before measurements are within specifications.

The infrared lens on the front of the unit is the TS05's most sensitive component. To clean the lens, first use compressed air to blow off loose particles and then brush any remaining debris away with a camel's hair brush. If necessary, carefully wipe the lens with a cotton swab moistened with water.



NEVER use a solvent, such as alcohol, to clean the lens.

To clean the thermometer's housing, use soap and water and a sponge or soft cloth.

When the icon appears in the upper left corner of the display, it's time to change the thermometer's "9V" battery. To do so, refer to the Setup Instructions on p. 6.

If the text "OH" or "OL" appears on the display, the target's temperature is outside the measurement range of the TS05.

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## **WARRANTY INFORMATION**

General warrants its instruments and accessories, and digital tools products against defects in material or workmanship for one year from the date of purchase unless otherwise stated on the packaging, manual, and/or marketing materials. General also warrants its non-digital tools products against defects in material or workmanship on a limited lifetime term.

General will replace or repair the defective unit, at its option, subject to verification of the defect.

This warranty does not apply to defects resulting from abuse, neglect, accident, unauthorized repair, alteration, or unreasonable use of the product. It also does not cover products purchased from unauthorized distributors. A proof of purchase must accompany each warranty claim.

Any implied warranties arising from the sale of a General product, including but not limited to implied warranties of merchantability and fitness for a particular purpose, are limited to the above. General shall not be liable for loss of use of the product or other incidental or consequential damages, expenses, or economic loss, or for any claim of such damage, expenses, or economic loss.

State laws vary. The above limitations or exclusions may not apply to you.

For more details or to file a warranty claim, contact General Tools & Instruments Technical Support at [techsupport@generatools.com](mailto:techsupport@generatools.com).

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## **RETURN FOR REPAIR POLICY**

Every effort has been made to provide you with a reliable product of superior quality. However, in the event your instrument requires repair, please contact our Customer Service to obtain an RGA (Return Goods Authorization) number before forwarding the unit via prepaid freight to the attention of our Service Center at this address:

Remember to include a copy of your proof of purchase, your return address, and your phone number and/or e-mail address.

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## FCC STATEMENT

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to a different circuit than the one the receiver is connected to.
- Consult your supplier or an experienced radio/TV technician for help.

**Caution:** Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.



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Specifications subject to change without notice

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