PosiTector® *IRT*
Infrared Thermometer
Instruction Manual

DeFelsko®
The Measure of Quality

Introduction

The **PosiTector** *Infrared Thermometer (IRT)* is a hand-held electronic instrument that measures surface temperature quickly and accurately. It consists of a body (Standard or Advanced) and probe (pg. 3).
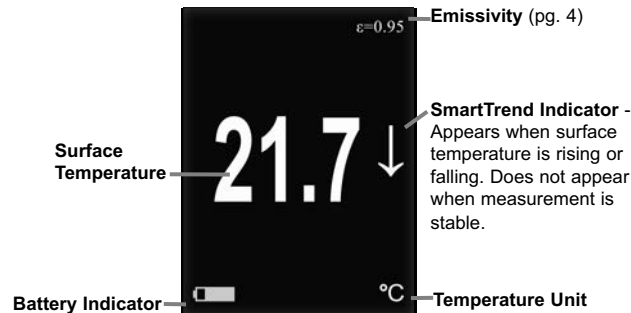
Basic Operation

Press the ≡ button to power up the Gage. To conserve battery life, the gage will automatically go to sleep after 5 minutes of inactivity. While in **Sleep Mode**, the gage powers up significantly faster— convenient when moving between parts or locations. The gage will completely power off after 4 hours of inactivity. Alternatively, select **Power Off** from the main menu. All settings are retained.
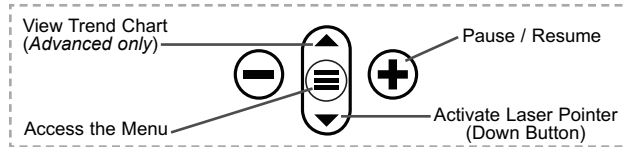
1. Remove the protective rubber cap from the probe.

2. Power-up Gage by pressing the center navigation ≡ button.

3. Verify emissivity setting and adjust if necessary (pg. 4).

The infrared temperature sensor immediately begins measuring. Press the ⊕ button to pause the measurement. Press ⊕ again to resume.

Typical Display

ε=0.95 — **Emissivity** (pg. 4)

21.7 ↓

Surface Temperature

SmartTrend Indicator - Appears when surface temperature is rising or falling. Does not appear when measurement is stable.
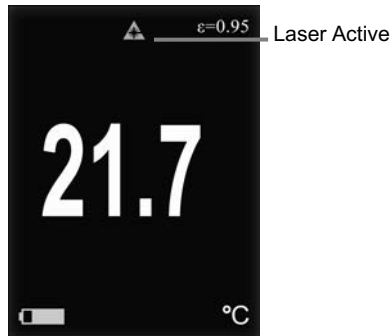
°C

Battery Indicator

Temperature Unit

1

Button Functions — Normal Operation

Laser Pointer

Press the ▼ button to toggle the laser pointer on/off. The laser helps aim the infrared temperature sensor. The ⚠ symbol is displayed on the screen when the laser is active.

Laser Radiation. Do not stare into beam. Class 2 laser product.

Laser Parameters:
Wavelength: 652 nm
Laser power for classification: <1.0 mW
Beam diameter: <2 mm at aperture
Divergence: 1 mRad
Mode of operation: CW
EN/IEC 60825-1:2014 (2007 USA)

2

Menu Operation

To access the Menu, power-up the gage, then press the center navigation button ☰. Either the keypad or touch screen can be used to navigate the menu. If desired, touch screen functionality can be disabled within the Setup menu (See **Touch**, pg. 7).

Select a menu option by touching it, or use the ▲ and ▼ buttons to highlight the desired option and press ☰ to select it.

On menus longer than one page, the current page number is displayed below the menu name. Navigate between pages using ▲ when the first menu item is selected, or ▼ when the last menu item is selected. If using touch, navigate between pages by touching ← or →, or by swiping up or down.

Press the ⊖ button or swipe right to return to a previous screen. Select **Exit** to close the Menu.
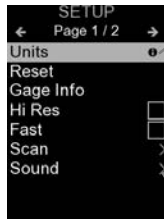
When a Menu option is highlighted, the ⓘ icon indicates on-gage help is available. Press ⊕ or touch the ⓘ icon to display the help.

Update your gage to ensure that you have the latest on-gage help information.

indicates that a sub-menu exists for the Menu option. Select the option to display its sub menu.

Probes

When powered-up, the **PosiTector** automatically determines which probe is attached and does a self-check.

To disconnect a probe from a body, slide the plastic probe connector horizontally (in the direction of the arrow) away from the body. Reverse these steps to attach a different probe. It is not necessary to power-down the Gage when switching probes.

The **PosiTector** gage body accepts a wide variety of probe types

including magnetic, eddy current and ultrasonic coating thickness, environmental, surface profile, shore hardness durometer, salt contamination, and ultrasonic wall thickness probes.

Emissivity

Emissivity refers to a material's ability to emit infrared energy, compared to an ideal black surface at the same temperature. The ratio varies from 0 to 1, and each material has a specific emissivity associated with it. The **PosiTector** *IRT* has built in emissivity settings for certain materials as well as a user-adjustable emissivity option (pg. 6).

Most organic and painted surfaces have an emissivity of around 0.95, and are ideal surfaces for accurate infrared temperature readings. Shiny or reflective surfaces can be difficult to measure with an infrared thermometer, as they tend to reflect ambient infrared energy instead of their own. To compensate for this, cover such surfaces with flat paint or a piece of electrical tape. Allow the paint or tape to acclimate to the surface's temperature, and take a measurement over the paint or tape.

Distance to Spot Ratio (D:S)

The distance to spot ratio refers to the relationship between the diameter of the area being measured compared to the instrument's distance from the area. As the distance (D) from the target increases, the spot size (S) of the area being measured by the unit becomes larger. The D:S ratio of the **PosiTector** *IRT* is 5.7:1. For example, when the instrument is 100 cm (40 inches) from the target, the spot size will be about 18 cm (7 inches) in diameter.

4

Setup Menu

Units

Converts the display from Celsius (°C) to Fahrenheit (°F) and vice versa.

Reset

Reset (menu reset) restores factory settings and returns the Gage to a known condition. The following occurs:

- All batches and stored readings, batch names and screen captures are erased.
- Menu settings are returned to the following:

Memory = OFF   **Bluetooth & Stream** = OFF
Statistics = OFF   **WiFi & Access Point** = OFF
HiLo Alarm = OFF   **USB Keyboard & Stream** = OFF
Trend Chart = None   **BLE Keyboard** = OFF
Display = None

Perform a more thorough **Hard Reset** as follows:

1. Power down the Gage and wait 5 seconds.

2. Simultaneously press and hold the ⊕ and ☰ buttons until the **Reset** symbol ↻ appears.

This returns the Gage to a known, "out-of-the-box" condition. It performs the same function as a menu **Reset** with the addition of:

- Bluetooth pairing info is cleared.
- Menu settings are returned to the following:

Units = Celsius   **Emissivity** = 0.95
Touch = ON   **Battery Type** = Alkaline
Flip Lock = OFF   **Backlight** = Normal
Auto Sync .net = ON   **Bluetooth Smart** = OFF
Sound = Medium   **USB Drive** = ON
Language = English

NOTE:
Date, Time and WiFi settings are not affected by either **Reset**.

5

Gage Info

Displays information on the gage body and attached probe.

Trend Chart

Turns the trend chart on. The trend chart can also be turned on by pressing the **Up** navigation button from the main screen.

Emissivity

Sets the emissivity ratio for the **PosiTector** *IRT* infrared temperature sensor.

Select **Custom** to manually adjust the emissivity value or to adjust to a known temperature. Emissivity is automatically calculated when adjusting to a temperature. *See **NOTE** below.*

Alternatively, use one of the following preset options:

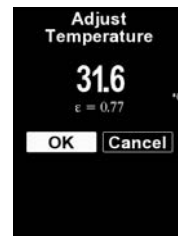**Aluminum (rough)** = 0.07   **Plastics** = 0.94
Zinc (Galvanized) = 0.25   **Steel (Oxidized)** = 0.95
Concrete = 0.54   **Wood** = 0.95
Paint = 0.96

Emissivity	Adjust Emissivity	Adjust Temperature
Zinc Galv. 0.25		
Steel Ox. 0.95	0.95	31.6
Al Rough 0.07		$\varepsilon = 0.77$ °C
Concrete 0.54	OK Cancel	OK Cancel
Wood 0.95		
Paint 0.96		
Plastics 0.94		
Custom		
Exit		
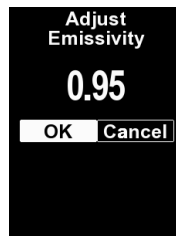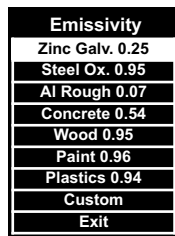
NOTE:

Depending on surface treatment, metals such as blasted steel can have a broad range of emissivity values. Adjusting to a known temperature (measured by a direct contact surface temperature probe) on a representative sample will assist in obtaining an accurate emissivity value.

Sound

Adjusts the volume of built-in speaker (Off, Low, Medium, High).

6

Flip Lock ✓

Disables the **Auto Rotate** feature by locking the display in its current orientation.

Touch ✓

Allows the touch screen functionality to be disabled. All gage functions can also be controlled using the navigation buttons.

Set Clock

All measurements are date and time stamped (24-hour format) when stored into memory. It is therefore important to set the correct date and time. Use the ▲ and ▼ buttons to select a value, and the ⊖ and ⊕ buttons to adjust it. The current date and time setting can also be viewed at the top of the main menu.

Battery Type

Selects the type of batteries used in the Gage from a choice of "Alkaline", "Lithium" or "NiMH" (nickel-metal hydride rechargeable). The battery state indicator symbol is calibrated for the selected battery type. No damage will occur if the battery type used in the Gage does not match the selected battery type.

Statistics Mode

Statistics ✓ X̄

A statistical summary will appear on the display. Reset Statistics by pressing the ⊖ button. Press ⊕ to pause statistics.

X̄ – Average   σ – Standard Deviation
⊼ – Maximum Value   ⊥ – Minimum Value
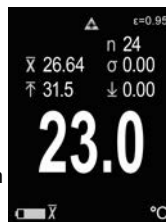
HiLo Alarm ✓ ⥮

Allows Gage to visibly and audibly alert the user when readings exceed user-specified limits.

7

Memory Management

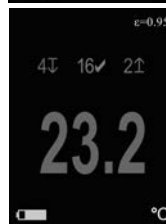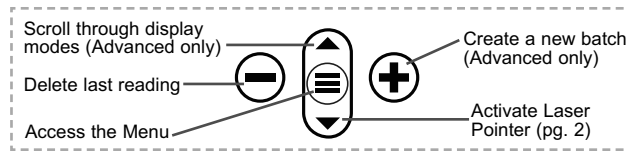The **PosiTector** *IRT* has internal memory storage for recording measurement data. Stored readings can be reviewed on-screen or accessed via computers, tablets and smart phones. Each reading is date and time-stamped. Press the ⊕ button to store a measurement.

The 💾 symbol appears when the Gage is set to store readings.

__Standard models__ store up to 1,000 readings in one batch.

__Advanced models__ store 250,000 readings in up to 1,000 batches. "New Batch" closes any open batch and creates a new batch name using the lowest available number. New batch names are date stamped when they are created.

Scroll through display modes (Advanced only)

Delete last reading

Access the Menu

Create a new batch (Advanced only)

Activate Laser Pointer (pg. 2)

Screen Capture
Press both ⊖ and ⊕ buttons simultaneously to save an image of the current display. The last 100 screen captures are stored in memory and can be accessed when connected to a computer (see **PosiSoft USB Drive** below).

Accessing Stored Measurement Data

DeFelsko offers the following free solutions for viewing, analyzing and reporting data:

PosiSoft USB Drive - Connect the Gage to a PC/Mac using the supplied USB-C cable. View and print readings and graphs using universal PC/Mac web browsers or file explorers. No software or internet connection required.

PosiSoft Desktop - Powerful desktop software (PC/Mac) for downloading, viewing, printing and storing measurement data. Includes a customizable, templated PDF Report Generator. No internet connection required.

8

| WiFi | *(Advanced models only)*

| USB |

When **USB Drive** is enabled ✓, the **PosiTector** gage uses a USB mass storage device class which provides users with a simple interface to retrieve stored data in a manner similar to USB flash drives and digital cameras. **USB Drive** is also required to import stored measurements into **PosiSoft Desktop** software (pg. 9).

NOTE: While connected, power is supplied through the included USB-C cable. The batteries are not used and the body will not automatically power down.

| Keyboard | *(Advanced models only)*

When enabled and connected to a computer, the PosiTector will be recognized as a *Keyboard*. Readings are sent to the computer as they are taken, emulating keystrokes, followed by a carriage return.

| Stream | *(Advanced models only)*

Stream individual readings to a USB connected computer via a serial protocol. Ideal for use with serial compatible SPC data collection software.

NOTE:

The above **WiFi**, **USB** and **Bluetooth** menus contain a **Sync .net Now** option. When selected, the Gage immediately synchronizes stored measurement data via its respective communication method (internet connection required). Alternatively, select **Auto Sync .net** from within the **USB** connect menu to automatically synchronize upon connection to a PC. Additional measurements added to memory while connected are synchronized only when the USB cable is disconnected and reconnected, or when the **Sync .net Now** option is selected. **WiFi** connected gages automatically attempt synchronization upon power-up.

NOTE: **PosiSoft Desktop** is required when using a **USB** connection to synchronize measurements with PosiSoft.net.

Bluetooth   *(Advanced models only)*

Bluetooth Smart   *(Advanced models only)*

Allows communication with a smart device running the PosiTector App (pg. 9) via auto-pairing **Bluetooth Smart** (BLE) wireless technology.

Sync Batches

Select batches to flag them for synchronization to the PosiTector App. **Sync Batches** is useful when connecting a new device to a gage with pre-existing batches, since only batches created while **Bluetooth Smart** is enabled are automatically selected.

Selected batches are synchronized when the next reading is taken in a batch flagged for synchronization, or when the **Sync Batches** option is selected at the bottom of the list of selected batches.

NOTE: If **Bluetooth Smart** is disabled or disconnected, data from batches selected in the **Sync Batches** menu are held in a queue until communication with the PosiTector App is re-established.

Send Batches

Transfers selected batches to the PosiTector App. **Send Batches** is useful when switching between devices, as only readings and batches that have yet to be synchronized with any smart device are synchronized automatically.

The **Send Batches** option is visible in the menu when the Gage is connected to a smart device running the PosiTector App.

BLE Keyboard *(Advanced models only)*

When enabled and connected to a computer, the PosiTector will be recognized as a wireless **Keyboard**. Readings are sent to the computer as they are taken, emulating keystrokes, followed by a carriage return.
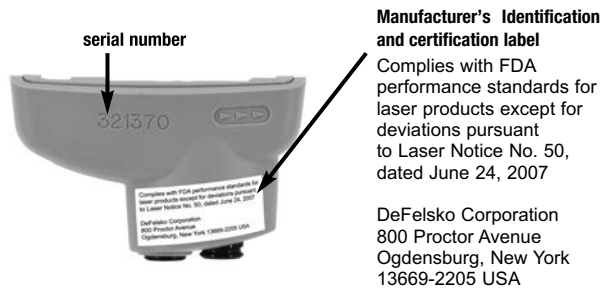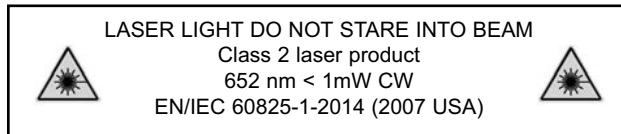
WARNING: The Gage will perform a **Hard Reset** (pg. 5) after an update. All stored measurements will be erased from memory.

Specifications	Range	Accuracy	Resolution
Temperature Range	−70˚ to 380˚ C	± 1˚C + 1% @ 23˚ C ambient	0.1˚ C
	−94˚ to 716˚ F		0.1˚ F

Laser Pointer	Class 2 < 1mW
Distance to Spot Ratio (D:S)	5.7:1
Emissivity	Adjustable
Response Time	<500 µs (95% response)
Spectral Response	2 - 14 µm

_____.

12

Product Labeling

Product Model

Hazard Warning and
Explanatory Label

Aperture

LASER LIGHT DO NOT STARE INTO BEAM
Class 2 laser product
652 nm < 1mW CW
EN/IEC 60825-1-2014 (2007 USA)

serial number

**Manufacturer's Identification
and certification label**
Complies with FDA
performance standards for
laser products except for
deviations pursuant
to Laser Notice No. 50,
dated June 24, 2007

DeFelsko Corporation
800 Proctor Avenue
Ogdensburg, New York
13669-2205 USA

13

Laser Precautions:

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Do not open or modify the product. There are no user serviceable components within the product; any service or repair is to be performed only by DeFelsko Corporation personnel. No scheduled maintenance is necessary to maintain product in compliance with laser safety standards.

To prevent eye damage and personal injury:
- Read all safety information before you use the product.
- Do not use the product if it operates incorrectly.
- Do not use the product if the housing appears cracked or otherwise damaged.
- Use the product only as specified.
- Do not look into the laser. Do not point the laser directly or indirectly (off reflective surfaces) at persons.