PosiTector® RTR

Replica Tape Reader

On-Gage Help Reference

Ayuda en el Medidor | On-Gerät-Hilfe | Aide sur l'instrumentation

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Introduction

This Reference is a compilation of the On-Gage Help that is available on your PosiTector gage. To view these help items on the gage, enter the gage menu and touch the ⓘ icon or press the ⊕ button with the desired menu item selected.

For an overview of the use and operation of your instrument, refer to its included Instruction Manual or download a digital PDF at www.defelsko.com/manuals.

Update your gage to ensure your PosiTector includes these latest help references. Instructions are available at www.defelsko.com/updates.

Contents

Memory

The PosiTector RTR Standard has internal memory storage for recording measurement data. Stored measurements can be reviewed on-screen or downloaded to a computer. Measurements are date and time-stamped. Store up to 1000 readings (per probe) into a single batch.

The memory icon appears when the Gage is set to store measurement data.

View

Use the Up or Down buttons to scroll through information, statistical summary, and a list of each reading in the currently opened batch. Press the center navigation button to exit.

Off

Turns memory off and stops recording (stored readings remain in memory)

On

Turns memory on and begins recording measurements.

Clear

Removes all stored readings from memory.

Statistics
(PosiTector RTR-H probes only)
Menu option for configuring Statistics and HiLo Alarm modes.

Statistics
Statistics mode continually displays/updates average, standard deviation, min/max thickness and number of readings while measuring.

When selected, the statistics icon and statistical summary will appear on the display.

Ignore the last measurement by pressing the (-) button. Press (+) to clear statistics.

Clear
Clears all on-screen Statistics and HiLo tabulations.

HiLo Alarm
Allows the Gage to visibly and audibly alert the user when measurements exceed user-specified limits.

When HiLo Alarm is selected, the current Lo setting is displayed. Adjust using the (-) or (+) buttons. Select Next to accept this value. The current Hi setting is now displayed. Repeat to adjust the Hi setting.

Each measurement will be compared to the defined Hi and Lo limits. The Gage beeps if results are within those limits. A single low tone will sound if the reading is below the Lo limit, and a high tone if it is above the Hi limit. Press (+) to clear HiLo readings.

The Statistics icon will appear on the display.

Calibration Settings

Calibration and Verification

Calibration
Gage calibration is typically performed by the manufacturer or accredited lab. All PosiTector RTR probes include a Certificate of Calibration.

Verification
Ensure that the probe has been cleaned with the included cleaning card and that the probe has been zeroed.

Verify accuracy of the digital micrometer measuring system.

Place the PosiTector RTR Check Shim into the probe opening. The average of several measurements should be within the combined tolerance of both the Gage and the shim. If not, the Gage may need to be returned for service.

The check shim is specifically intended for all PosiTector RTR probes. The Gage is designed to measure burnished replica tape within a limited measuring range and automatically subtracts 50.8 microns (2 mils) from height measurements to account for the incompressible polyester film. Therefore plastic shims intended for other instruments such as coating thickness gages will not be measured properly.

Verify the optical measuring system

(PosiTector RTR-3D probes only)

Place the Peak Density Check Tape into the probe opening. The peak density (Spd) result should be within tolerance specified on the tape. If not, the Gage may need to be returned for service.

Ignore the peak height (H) result when using the Peak Density Check Tape.

Zero

The probe should be zeroed regularly to ensure best accuracy. The user will be prompted to zero the probe every time the Gage is powered up. The Zero menu item allows the procedure to be performed at more regular intervals. It is particularly useful during long measurement sessions.

Important:
Clean the probe with the included cleaning card before performing a probe zero.

Simultaneously press and hold both probe buttons firmly until the Gage beeps and the arrows point outward. Do not place anything in the measurement opening during this procedure.

SHORTCUT:
Simultaneously press and hold both probe buttons firmly until the Gage beeps and displays 0. This can be performed from the main measurement screen without having to access the menu.

Tape Grade
Selects a replica tape grade. Required when Linearize mode (HL) is ON.

C - Coarse

XC - Extra Coarse (default)

NOTE:
Coarse Minus and X-Coarse Plus grades are not supported in Linearize mode since the only function of these two grades is to improve upon the accuracy of C tape at its low end and XC tape at its high end, something the PosiTector RTR H will automatically do when measuring HL. When Linearize mode is OFF, the PosiTector RTR H will measure all grades of replica tape just like a conventional spring micrometer.

Cal Reset
Resets all user calibration adjustments and restores factory calibration for the connected probe.

Linearize
This is the default measurement mode. Linearize mode is ON when this box is ticked and the HL appears on the display.

An undesirable characteristic of replica tape is that measurements made with analog spring micrometers are most accurate near the middle of each grade's range and least accurate at the outer ends of each grade's range. That is why two other grades, Coarse Minus and X-Coarse Plus, are used to check and, if necessary, adjust measurements

at the lower and upper ends of the primary range of 20-115 microns (0.8-4.5 mils).

Inside the primary range, the upper end of the Coarse grade range and the lower end of the X-Coarse grade range share a 38 - 64 micron (1.5 -2.5 mils) overlap region. Current Testex instructions describe a relatively complicated and time consuming procedure (the average of one reading using Coarse grade and one reading using X-Coarse grade) that is used to knit the Coarse and X-Coarse subranges together to achieve reasonably accurate readings over the primary range. This method is a compromise between accuracy and ease of use.

When the Linearize box is NOT ticked, the PosiTector RTR displays a height value of H comparable to the value an analog spring micrometer would display after the 50.8 microns (2 mils) of incompressible polyester film has been subtracted. In other words, it is the average of the maximum peak-to-valley distances obtained by measuring the thickness of the replica tape without any correction.

When the Linearize box IS ticked, the PosiTector RTR displays a more accurate peak-to-valley height measurement HL that has been adjusted for the non-linearity of replica tape. There is no need to average 2 or more replicas from different grades of tape AND there is no need to subtract the 50.8 microns (2 mils) of incompressible polyester film. Ensure the proper tape grade, C or XC, has been selected and appears in the upper left corner of the display.

During measurement, if the linearized measurement falls outside of the selected tape grade's range, the Gage will suggest a more suitable tape grade to perform the measurement.

Setup
Set configuration options for the Gage.

Set Clock
All measurements are date and time stamped (24 hour format) when stored into memory. It is therefore important to keep both the date and time current using this menu option. Use the Up and Down buttons to scroll, and the (-) and (+) buttons to adjust value. The Gage's date and time can also be viewed in Gage Info and on top of the main menu.

Reset
Restores factory settings and returns the Gage to a known condition. The following occurs:

All batches, batch names, and screen captures are erased.

Menu settings are returned to the following:

Memory = OFF
Statistics Mode = OFF
Display = None
Bluetooth = OFF
WiFi & Access Point = OFF
USB Keyboard & Stream = OFF
Bluetooth BLE Keyboard = OFF
Tape Grade = XC
Linearize = ON
Auto Dim = ON

Perform a more thorough Hard Reset by powering down the Gage, waiting several seconds, then simultaneously holding both the center navigation and (+) buttons until the Reset symbol appears. This returns the instrument 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 status:

Units = Microns
Flip Lock = OFF
Sound = Medium
Touch = ON

Language = English
Battery Type = Alkaline
Backlight = Normal
USB Drive = ON
Auto Sync .net = ON
Bluetooth Smart = OFF

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

Units
Converts the display from thou/mils to microns and vice versa.

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.

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

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

Backlight
Selects display brightness (Sun, Normal or Night). If Auto Dim is enabled (default), the display dim slightly after a period of no activity to conserve battery life. Press the Down button to brighten the display.

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

Language
Converts displayed and printed words to the selected language.

Gage Info
Displays the model number and serial number, probe type and serial number, PosiSoft.net registration key, the amount of remaining memory for storage of readings, date and time, and software packages.

For security purposes, the registration key is required to add the Gage to your free PosiSoft.net account.

Analysis Setup

(PosiTector RTR-3D probes only)
Setup 2D and 3D analysis parameters.

2D Parameters

(PosiTector RTR-3D probes only)
2D parameters are calculated from a virtual trace across the image area. When the Orientation is set to Horizontal X or Vertical Y directions, the Evaluation Length is equal to 3.8mm, minus double the length of the selected discard filter. When the Orientation is set to Diagonal XY or Diagonal YX directions, the Evaluation Length is equal to 5.4mm, minus double the length of the selected discard filter.

The 2D Parameters Menu allows the operator to select 2D analysis parameters to be displayed by the gage (a maximum of 6 parameters can be selected from the 2D and 3D Parameter lists).

Rpc Boundary C1

(PosiTector RTR-3D probes only)
Defines the boundary lines located equidistant above and below the profile mean line. A peak is counted after the trace goes below the lower boundary line and above the upper boundary line. The default is 0.5 microns.

Rpc Peak count

(PosiTector RTR-3D probes only)
The number of peaks per unit length within the evaluation length.

Ra

(PosiTector RTR-3D probes only)
Ra Roughness average: arithmetic average of the absolute values of the profile height deviations within the evaluation length measured from the mean line.

Rv

(PosiTector RTR-3D probes only)
Rv Maximum profile valley depth: the distance between the deepest valley and the mean line within the evaluation length.

Rt

(PosiTector RTR-3D probes only)
Rt Total profile height: the distance between the highest peak and the deepest valley within the evaluation length.

Rz

(PosiTector RTR-3D probes only)
Rz Average maximum height of the profile: arithmetic average of the successive values of the maximum peak to deepest valley within each sampling interval calculated over the evaluation length. The length of the sampling interval is equal to the cutoff length and the number of sampling intervals is the number of whole cutoff lengths that can fit within the evaluation length.

Rq

(PosiTector RTR-3D probes only)
Rq RMS roughness: root mean square average of the profile heights within the evaluation length measured from the mean line.

Rp

(PosiTector RTR-3D probes only)
Rp Maximum profile peak height: the distance between the highest point of the profile and the mean line within the evaluation length.

3D Parameters

(PosiTector RTR-3D probes only)
3D parameters are calculated across the image area. When calculating 3D parameters, an evaluation area is determined by removing an area around the outside edge of the image area equal to the width of the discard length.

The 3D Parameter Menu allows the operator to select 3D analysis parameters to be displayed by the gage (a maximum of 6 parameters can be selected from the 2D and 3D Parameter lists).

H

(PosiTector RTR-3D probes only)
H Average maximum peak-to-valley height: the distance between the anvils minus the 2 mils (50.8 μm) of incompressible film. When selected an optional linearization can be performed by selecting the linearization checkbox in the Cal Settings Menu.

Sa

(PosiTector RTR-3D probes only)
Sa Average roughness: the arithmetic average of the absolute values of the measured height deviations from the mean surface taken within the evaluation area.

Sv

(PosiTector RTR-3D probes only)
Sv Maximum valley depth: the absolute value of the minimum height in the evaluation area with respect to the mean surface.

Sz Root

(PosiTector RTR-3D probes only)
Sq Root mean square roughness: the root mean square average of the measured height deviations from the mean surface taken within the evaluation area.

Sz Maximum area peak-to-valley height: the vertical distance between the maximum peak height and the maximum valley depth. Commonly referred to as St.

Sp Maximum area peak height: the maximum height in the evaluation area with respect to the mean surface.

Sv Maximum valley depth: the absolute value of the minimum height in the evaluation area with respect to the mean surface.

Sp

(PosiTector RTR-3D probes only)
Sp Maximum area peak height: the maximum height in the evaluation area with respect to the mean surface.

Sq

(PosiTector RTR-3D probes only)
Sq Root mean square roughness: the root mean square average of the measured height deviations from the mean surface taken within the evaluation area.

3D Parameters

(PosiTector RTR-3D probes only)
Spd Areal peak density: the number of peaks per unit area (formerly known as Pd).

Sa Average roughness: the arithmetic average of the absolute values of the measured height deviations from the mean surface taken within the evaluation area.

Sq Root mean square roughness: the root mean square average of the measured height deviations from the mean surface taken within the evaluation area.

Sz Maximum area peak-to-valley height: the vertical distance between the maximum peak height and the maximum valley depth. Commonly referred to as St.

Sp Maximum area peak height: the maximum height in the evaluation area with respect to the mean surface.

Sv Maximum valley depth: the absolute value of the minimum height in the evaluation area with respect to the mean surface.

Short Filter

(PosiTector RTR-3D probes only)
To optimize the analysis for a specific application, filters may be applied to the raw image to remove undesirable profile characteristics prior to calculating the 2D and 3D parameters. The short wavelength Gaussian filter attenuates features that have a wavelength shorter than the selected size.

The following Short Filters are available:

None
0.008mm
0.025mm (default)
0.080mm

Cutoff Filter

(PosiTector RTR-3D probes only)
To optimize the analysis for a specific application, filters may be applied to the raw image to remove undesirable profile characteristics prior to calculating the 2D and 3D parameters. The long wavelength cutoff Gaussian filter attenuates features that have a longer wavelength than the selected size.

The following Cutoff Filters are available:

None
0.08mm
0.25mm
0.8mm (default)
2.5mm

Discard

A side effect of the long wavelength cutoff filter is that values near the edge of the evaluation length or area are skewed. To prevent these skewed values from affecting 2D and 3D parameter calculations, the values near the edges of the evaluation are discarded. The Discard length is calculated from the long wavelength cutoff selected.

The following discard selections are available:

Discard none
Discard 1/2 (default)
Discard 1

2D Orientation

(PosiTector RTR-3D probes only)
2D parameters are calculated from a virtual trace across the image area. By default, this trace is in the Horizontal X direction, parallel to the long axis of the replica tape. This orientation can be changed if desired:

Horiz X (Horizontal X) (default)
Vert Y (Vertical Y)
Diag XY (Diagonal XY)
Diag YX (Diagonal YX)

Connect
Configure communication and connection options for the Gage.

USB
Connect the Gage to a PC/Mac using the supplied USB-C cable. View and print readings and graphs with universal web browsers/file explorers or using PosiSoft Desktop.

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.

Sync.net Now
When selected, the Gage immediately synchronizes stored measurement data to PosiSoft.net (USB connection required to a computer running PosiSoft Desktop).

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.

NOTE:
PosiSoft Desktop is required when using USB connections to synchronize measurements with PosiSoft.net.

USB Drive
When USB Drive is enabled, the PosiTector is recognized as a USB mass storage device which provides 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. Once connected, any computer can view measurements stored in memory by navigating a virtual drive labeled PosiTector using the supplied USB-C cable.

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.

JSON Files
When enabled (default), JSON schema files will be available in PosiSoft USB drive. Files can be parsed in to databases and custom software applications.

NOTE:
Disabling this option may reduce the time required for the computer to recognize the PosiTector when first connected via USB.

HTML Report
When enabled (default), a formatted HTML report is viewed by selecting the index.html or START_HERE.html file found in the root directory. Optionally, text (.txt) files located in each batch folder provide access to measurement values. Stored readings and graphs can be viewed or copied using universal web browsers or file explorers.

NOTE:
Disabling this option may reduce the time required for the computer to recognize the PosiTector when first connected via USB.

Auto Sync .net
When enabled, measurements will automatically synchronize with PosiSoft.net when connected to a computer running PosiSoft Desktop. 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.

NOTE:
PosiSoft Desktop is required when using USB connections to synchronize measurements with PosiSoft.net.

Updates
Determines if a software update is available for your Gage.

To perform an update the Gage must be connected to an internet connected computer running PosiSoft Desktop.

See www.defelsko.com/update

WARNING:
The Gage will perform a Hard Reset after an update. All stored measurements will be erased from memory.

Help

When a Menu option is highlighted, the (i) icon indicates on-gage help is available. Press (+) or touch the (i) icon to display the help. Update your gage to ensure that you have the latest on-gage help information.

A formatted PDF containing all on-gage help items is available at www.defelsko.com/help.

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 > Touch menu.

Select a menu option by touching it, or use the Up and Down buttons to highlight the desired option and press the center navigation button to select it.

On menus longer than one page, the current page number is displayed below the menu name. Navigate between pages using the Up button when the first menu item is selected, or Down button when the last menu item is selected. If using touch, navigate between pages by touching the left or right arrow, or by swiping up or down.

Press the (-) button or swipe right to return to a previous screen. Select Exit to close the Menu.

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

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 via PosiSoft USB Drive.

Power Off

To conserve battery life, the gage will automatically go to sleep after 5 minutes of inactivity and enter Sleep Mode. 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.

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Limited Warranty, Sole Remedy, and Limited Liability

DeFelsko's sole warranty, remedy, and liability are the express limited warranty, remedy, and limited liability that are set forth on it's website: www.defelsko.com/terms

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