

PosiTector[®] **BHI**

Barcol Hardness Impressor

Quick Guide v. 1.0



DeFelsko[®]
The Measure of Quality

Introduction

The **PosiTector Barcol Hardness Impressor (BHI)** is a hand-held electronic instrument that measures the indentation hardness of soft metals (aluminum, copper, brass), harder plastics and fiberglass. It consists of a PosiTector body (Standard or Advanced) and an interchangeable probe.

This Quick Guide summarizes the basic functions of the gage.

Quick Start

The **PosiTector BHI** powers-up when the center navigation  button is pressed. To preserve battery life, the Gage powers-down after approximately 5 minutes of no activity. All settings are retained.

1. Power-up the Gage by pressing the center navigation  button. Ensure the probe indenter (pg. 2) is not in contact with any surface.
2. To take a measurement:
 - a) Ensure the probe is perpendicular to the surface being tested. Press the probe down onto the material to be measured until the indenter foot is in full, flat contact with the surface. HOLD STEADY against the surface.
 - b) The Gage will emit a single BEEP and display a ▼ symbol indicating a reading is being taken. The test timer will begin counting down (see **Test Time**, pg. 7). When the timer reaches **0s**, the Gage will BEEP twice and display the measurement value.
3. Lift the probe from the surface between readings.

Verify accuracy (pg. 3) on test disks at the beginning and the end of each shift, or if the gage is dropped or suspected of giving erroneous readings. Be sure to place the leg on the included leveling plate when testing disks to maintain perpendicularity.

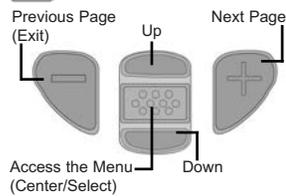
IMPORTANT: Test disks should be replaced when they become worn or visibly pitted.



Menu Operation

Gage functions are menu controlled. To access the Menu, power-up the gage, then press the center navigation button.

To navigate, use the **Up** and **Down** buttons to scroll vertically and **SELECT** to **SELECT**.



Press the (+) button to switch pages in a multipage menu.

Press the (-) button to return to the previous menu or page.

Select **Exit** to exit from any menu.

Probes

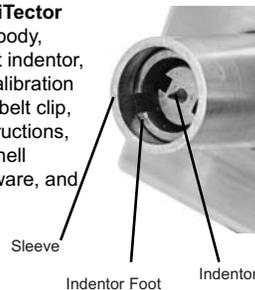
When powered-up, the **PosiTector** automatically determines which probe is attached and does a self-check.

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, surface profile, environmental, hardness, salt contamination and ultrasonic wall thickness probes.

The **PosiTector BHI** consists of the **PosiTector BHI** probe, Standard or Advanced gage body, leveling plate, test disks (2), replacement indenter, replacement indenter tool, glass plate, calibration certificate, protective rubber holster with belt clip, wrist strap, 3 AAA alkaline batteries, instructions, protective lens shield, convenient hard shell carrying case, USB cable, PosiSoft Software, and two (2) year warranty.



Calibration, Verification and Adjustment

Three steps ensure best accuracy...

1. **Calibration** - typically performed by the manufacturer. All probes include a Certificate of Calibration.
2. **Verification of Accuracy** - typically performed by the user on known reference standards such as the included test disk.
3. **Adjustment** - to a known hardness

Calibration

Calibration is the high-level, controlled and documented process of measuring traceable calibration standards over the full operating range of the probe, and verifying that the results are within the stated accuracy of the probe. Calibrations are performed by the manufacturer, their authorized agent, or by an accredited calibration laboratory in a controlled environment using a documented process.

Verification

Verification is an accuracy check performed by the user on known reference standards. A successful verification requires the Gage to read within the combined accuracy of the probe and the Test Disks. Instrument operation may be verified with the included Test Disks and Leveling Plate. Position the Leveling Plate under the Leg and place the Test Disks on a flat, hard surface (as shown). Take three to five readings on each disk. The measurement points should be at least 6mm (0.24") apart. If the average of those readings is outside the combined accuracy of the Test Disk and gage, service may be required.



3

Some causes for the gage to not read properly are the indenter being damaged, incorrect pressure being applied to the test disk or temperatures beyond normal conditions.

Verify accuracy at the beginning and the end of each work shift. During the work shift, if the Gage is dropped or suspected of giving erroneous readings, its accuracy should be re-verified.

Adjustment

Adjustment, or Calibration Adjustment, is the act of aligning the Gage's readings to match that of a known reference in order to improve accuracy of a gage on a specific material. (see **Cal Settings**, pg. 4)

Cal Settings Menu

The **PosiTector BHI** is factory calibrated and for most applications no calibration adjustment is required. However, there may be times when a zero, one or two point adjustment is necessary including after indenter replacement or to compensate for indenter wear.

Zero

Zeroing the Gage may be necessary after indenter replacement or when the indenter is worn. For best accuracy, the Gage should be zeroed on the included glass plate.

1. Select **Zero** from the menu.
2. Press the **(+)** button to select the number of readings
3. Measure on the glass plate, ensuring that both the indenter foot and leg are resting on the glass plate. After the last measurement, the Gage will calculate a Zero which represents the average of all the Zero readings taken.

1 Pt Adjust

Adjusts the Gage to a known material hardness.

Step 1: Select **1 Pt Adjust** from the **Cal Settings** menu.

Step 2: Press the **(+)** button to select the number of readings to be used to obtain an average, typically 3 to 10 readings. The greater the variation between readings, the more readings should be taken to obtain an average.

Step 3: Repeatedly measure the known hardness sample using the on-screen green arrows as a guide. After the final reading, the Gage will calculate and display an average measurement value of all readings taken on the sample. If the expected hardness value is not obtained (within tolerance), adjust the displayed value up **(+)** or down **(-)** to the known hardness value and press  to save the value.

2 Pt Adjust

Adjusts the Gage within a range of two material hardnesses.

Step 1: Select **2 Pt Adjust** from the **Cal Settings** menu.

Step 2: Press the **(+)** button to select the number of readings to be used to obtain an average for the first point, typically 3 to 10 readings.

Step 3: Repeatedly measure the known hardness sample using the on-screen green arrows as a guide. After the final reading, the Gage will calculate and display an average measurement value of all readings taken on the sample.

Step 4: Repeat Step 2 and 3 for second point.

Setup Menu

Reset

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

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

Memory = OFF	Bluetooth & Stream = OFF
Auto Sub-Batch = OFF	WiFi & Access Point = OFF
Statistics = OFF	Auto Dim = ON
Hi Lo Alarm = OFF	Hi Res = OFF

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

1. Power down the Gage and wait 5 seconds.
2. Simultaneously press and hold the (+) and  center 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 status:

Bluetooth Smart = OFF	Auto Sync .net = ON
Test Time = 1 second	USB Drive = ON
Sound = ON	Language = English
Backlight = Normal	Battery Type = Alkaline
Flip Display = Normal	

NOTE:

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

Test Time

The **PosiTector BHI** has an on-screen timer to measure the hardness of a material after a given period of time.

Use the (-) and (+) buttons to adjust the test duration. When taking a reading, the timer starts automatically once the indenter is on the surface and the ▼ symbol appears on the display.

Hi Res



Increases the displayed resolution. Accuracy is not affected.

Cont. Reading (Continuous Reading)

When enabled, the Gage will continuously display probe readings. Ideal when a test timer is not required or when performing a calibration verification. Cont. Reading is not available when **Memory**, **Statistics** or **HiLo Alarm** modes are enabled.

Battery Type

Selects the type of batteries used in the Gage from a choice of "Alkaline", "Lithium" or "NiMH" (nickel-metal hydride rechargeable). If "NiMH" is selected, the Gage will trickle charge the batteries while connected via USB to a PC or optional AC power supply (USBAC). 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



A statistical summary will appear on the display. Remove the last reading by pressing the (-) button. Press (+) to clear statistics.

\bar{x} – Average

\uparrow – Maximum Value

σ – Standard Deviation

\downarrow – Minimum Value

HiLo Alarm



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

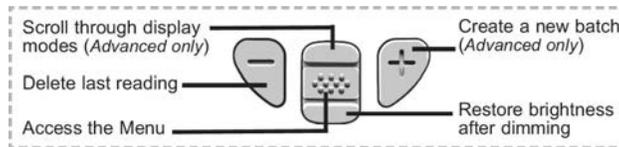
Memory Management

The **PosiTector BHI** has internal memory storage for recording measurement data. Stored measurements can be reviewed on-screen or accessed via computers, tablets and smart phones. All stored measurements are date and time-stamped.

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

Standard models store up to 250 readings in one batch.

Advanced models store 100,000 readings in up to 1,000 batches. "New Batch" closes any currently opened batch and creates a new batch name using the lowest available number. New batch names are date-stamped when they are created.



Screen Capture

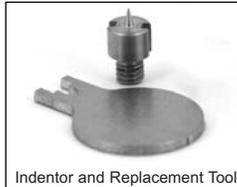
Press both the **(-)** and **(+)** buttons at any time to capture and save an image copy of the current display. The last 10 screen captures are stored in memory and can be accessed when connected to a computer (see PosiSoft USB Drive, pg. 9).

Auto Sub-Batch *(Advanced models only)*

This option will automatically create a new sub-batch after the required number of readings are stored in the current sub-batch. Use the **(-)** and **(+)** buttons to set the number of readings to store in each sub-batch, then select **New** to open the first sub-batch.

Maintenance

The **PosiTector BHI** includes an indenter tip precisely machined with a 26° angled tip. Visually inspect the tip for damage at the beginning of each work shift or if the gage is dropped or suspected of giving erroneous readings



If the indenter becomes worn or damaged, a replacement indenter is included. Using the enclosed indenter replacement tool, unscrew the damaged indenter and replace. Tighten the new indenter and verify gage operation (pg. 3) before testing. A **ZERO**, **1 Pt** or **2 Pt Cal Adjust** may be required (pg. 5).

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 cable. View and print readings and graphs using universal PC/Mac web browsers or file explorers. No software or internet connection required. **USB Drive** must be selected in the Gage's "**Connect > USB**" menu (pg. 10).

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.

PosiSoft.net - Web-based application offering secure, centralized storage of measurement data. Access your data from any web-connected device.

PosiTector App - (*Advanced models only, serial numbers 784000+*) App for compatible iOS and Android smart devices. Permits users to create, save and share professional PDF reports. Add images and notes using the smart device's camera and keyboard.

Connect Menu

WiFi

(Advanced models only)



Allows connection to your local wireless network or mobile hot spot. Ideal for using your network's internet connection for synchronizing stored measurements with PosiSoft.net (pg. 9).

USB

When **USB Drive** is checked , 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, digital cameras and digital audio players. **USB Drive** is also required to import stored measurements into PosiSoft Desktop software (pg. 9).

NOTE: When connected, power is supplied through the USB cable. The batteries are not used and the body will not automatically power down. If rechargeable (NiMH) batteries are installed, the instrument will trickle charge the batteries.

Stream

*(Advanced models only,
serial numbers 784000 and greater)*

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

NOTE: For more information on USB Keyboard and Streaming

Sync .net Now

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 **USB** connections to synchronize measurements with PosiSoft.net.

Bluetooth (Advanced models only)



Allows individual readings to be sent to a computer, printer or compatible device as they are taken using Bluetooth wireless technology.

Bluetooth Smart (Advanced models only, serial numbers 784000 and greater)



When **Enabled** , 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. New batches created while **Bluetooth Smart** is enabled are automatically selected.

With **Bluetooth Smart** enabled, select **Sync Batches** to transfer selected batches to the PosiTector App. This is useful when switching between smart devices, as only readings and batches that have yet to be synchronized with any smart device are synchronized automatically.

NOTE: If **Bluetooth Smart** is disabled, 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 (useful when switching between devices).

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

Updates

Determine if a software update is available for your Gage.

WARNING: The Gage will perform a **Hard Reset** (pg. 6) after an update. All stored measurements will be erased from memory.

Returning for Service

Before returning the Gage for service...

1. Install new or newly recharged batteries in the proper alignment as shown within battery compartment.
2. Examine the indenter tip and indenter foot for dirt or damage.
3. Perform a **Hard Reset**. (pg. 6)
4. Attempt a measurement on the supplied test disk.
(see **Verification**, pg. 3)
5. If issue is not resolved, **Update** your **PosiTector** gage body (pg. 11) and re-attempt measurements.

IMPORTANT:

If you must return the Gage for service, please fill out and include the Service Form with the Gage. Be sure to also include the probe, your company name, company contact, telephone number and fax number or email address.

Limited Warranty, Sole Remedy and Limited Liability

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