

PosiTector[®] *SPG*

Surface Profile Gage

Full Guide v. 1.4



Separate cabled probes for blasted steel, textured coatings and concrete profile

Built-in Probe

DeFelsko[®]
The Measure of Quality

Table of Contents

Introduction	1
Quick Start	1
Probes	4
Why is Measurement Important?	5
How to Measure	5
Calibration & Verification of Accuracy	6
Menu Operation	7
Zero Menu	8
Setup Menu	9
Reset	9
Gage Info	10
Statistics Menu	11
HiLo Alarm	11
Memory Management	12
Standard Models	12
Advanced Models	13
SmartBatch	13
Annotate	15
Display	16
Summaries	17
Screen Capture	17



Accessing Stored Measurement Data	18
PosiSoft USB Drive	18
PosiSoft.net	18
PosiSoft Desktop	18
PosiSoft App	18
Connect Menu	19
WiFi	19
USB Drive	21
Sync Now	23
Bluetooth Smart.....	23
Bluetooth	24
Updates	25
Power Supply / Battery Indicator	25
Technical Data	26
Troubleshooting	26
Returning For Service	27
Warranty	27



Introduction


The **PosiTector Surface Profile Gage (SPG)** is a hand-held electronic Gage that measures the peak-to-valley height of the surface profile of abrasive blast cleaned surfaces. It consists of a body (Standard or Advanced) and probe.

PosiTector SPG Kit Contents

- PosiTector body (*Standard or Advanced*)
- PosiTector probe (SPG)
- Glass zero plate and metal shim
- Protective rubber holster with belt clip
- Protective cap for probe
- Protective lens shield
- Wrist strap
- 3 AAA alkaline batteries
- Quick Guide instruction booklet
- Nylon carrying case with shoulder strap
- USB Cable
- Certificate of Calibration traceable to NIST
- PosiSoft.net account
- Two (2) year warranty on Body and Probe

Quick Start

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

1. Remove the protective plastic cap from probe.
2. Power-up Gage by pressing the center navigation  button.
3. Place the glass zero plate onto a stable, flat surface. Take several measurements. If the average of several readings is greater than $\pm 5 \mu\text{m}$ (0.2 mil), **Zero** the Gage (see pg. 8).
4. Place the probe FLAT on the surface to be measured such that the tip of the probe reaches into the bottom of a profile valley. HOLD STEADY. The Gage will BEEP twice and display the measurement.
5. Lift the probe from the surface between measurements.

Protective Cap

PosiTector SPG models are shipped with a protective plastic cap over the probe. Remove this cap prior to use. Replace it when the Gage is not in use to protect the probe.

Wrist Strap

We recommend attaching and wearing the supplied wrist strap.



Plastic Lens Shield

The LCD is covered with a thin plastic film for protection against fingerprints and other marks during shipment. This film, while usually removed before using the Gage, can be left in place to protect against paint overspray or debris. Replacements can be purchased.

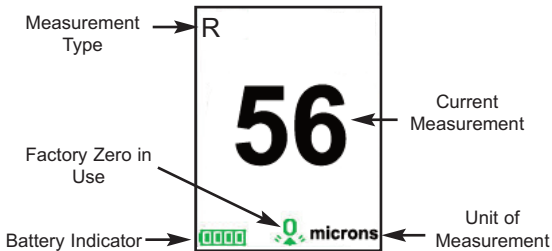
Certification

All probes include a Certificate of Calibration. For organizations with re-certification requirements, instruments may be returned at regular intervals for calibration. DeFelsko recommends that customers establish calibration intervals based upon their own experience and work environment. Based on our product knowledge, data and customer feedback, a one year calibration interval from either the date of calibration, date of purchase, or date of receipt is a typical starting point. Written calibration procedures are available from DeFelsko Corporation at no charge.

PosiTector Body



Typical Screen



Probes

To disconnect a probe from a body, power-down the Gage and slide the plastic probe connector horizontally (in the direction of the arrow) away from the body. Reverse these steps to attach a new probe.



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

The supplied probe tip has a 60° angle to comply with most test standards including ASTM D 4417 B. An optional 30° angle tip with replacement tool is available for special applications or to comply with Australian Standard AS 3894.5.

A replacement tool is included with the purchase of either the 60° or 30° angle tips. Insert the two legs of the replacement tool into the probe tip and turn counter clockwise to remove the tip. Insert the new tip and tighten clockwise. Do not over tighten. Since the factory zero setting may not always be precise after a probe tip exchange, the gage should be checked on the included glass plate and zeroed if necessary.

The **PosiTector** body accepts a wide variety of probe types including magnetic, eddy current and ultrasonic coating thickness, surface profile, shore hardness durometer, salt contamination and ultrasonic wall thickness probes. See www.defelsko.com/probes



PosiTector bodies accept all PosiTector DPM, 6000, 200, SPG, RTR, SST, SHD and UTG probes

PosiTector SPG probes include a 60° (ASTM D 4417 B) or 30° (Australian Standard AS 3894.5) angle tip (50 µm/2 mil radius) with a measurement range of 0 to 500 µm (20 mils).

PosiTector SPG CS probes measure the profile of textured coatings up to 1500 µm (60 mils) with a 500 µm (20 mil) radius 60° angle tip.

PosiTector SPG TS probes measure concrete surface profile up to 6 mm (250 mils) with a 500 µm (20 mil) radius 60° angle tip.


Why is Measurement Important?

Steel is often abrasive blast cleaned or otherwise roughened prior to painting. The peak-to-valley height of the resultant surface profile is an important factor in the performance of applied protective coatings.

Low profile may reduce coating bond strength (adhesion). Too high and the peaks may receive insufficient coverage and possibly rust prematurely. The costly application of more coating may be required if the profile is too high.

For these reasons, surface profile should be measured prior to coating application to ensure that it meets contract specifications.

How to Measure

1. Remove the protective rubber cap from probe.
2. Power-up Gage by pressing the center navigation  button.
3. Place the probe FLAT on the surface and press down.
4. Lift the probe when you hear a double BEEP.
6. When completely finished, return the Gage to the protective pouch. There is no need to disconnect the probe from the **PosiTector** during storage.

Calibration & Verification of Accuracy

Calibration

Instrument calibration is typically done by the manufacturer or qualified lab. All probes include a Certificate of Calibration showing traceability to a national standard. For organizations with re-certification requirements, the **PosiTector SPG** may be returned at regular intervals for calibration.

DeFelsko recommends that our customers establish Gage calibration intervals based upon their own experience and work environment. Based on our product knowledge, data and customer feedback, a one year calibration interval from either the date of calibration, date of purchase, or date of receipt is a typical starting point.

Written Calibration Procedures are available online at no charge.

Verification of Accuracy

Instrument accuracy is verified using the included metal shim and glass zero plate.

Place the plate onto a stable, flat surface. Take several measurements. If the average is greater than $\pm 5 \mu\text{m}$ (0.2 mil), **Zero** the Gage (pg. 8).

Next, place the metal shim over the glass plate and measure ensuring the probe needle touches the glass plate in the area between the shim's "legs". The average of several measurements should be within the combined tolerances of both the shim and the gage ($\pm 10\%$). For example, measuring a $75 \mu\text{m}$ (3 mil) shim should result in values between $67.5 \mu\text{m}$ (2.7 mils) and $82.5 \mu\text{m}$ (3.3 mils). If not, see **Returning for Service** (pg. 31).

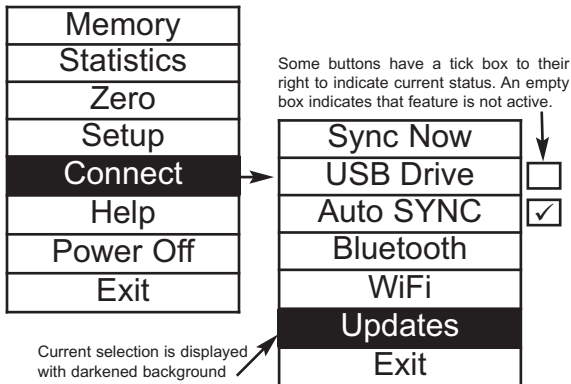
To guard against measuring with an improperly adjusted Gage, verify the Gage at the beginning and the end of each work shift. During the work shift, if the Gage is dropped or suspected of giving erroneous readings, its accuracy should be re-verified.

In the event of physical damage, wear, high usage, or after an established calibration interval, the gage should be returned to the manufacturer for repair or calibration.

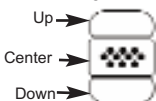
Menu Operation

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

Below is a sample menu for a **PosiTector SPG** Advanced Model:




Navigation Button



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

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

NOTE: The center **[** button is purposely recessed to help eliminate unintentional powering-up of the gage.

Zero Menu

The **PosiTector SPG** has only one adjustment point at zero. The zero point can be set using one of two methods. Both methods are found under the Zero menu option.



Glass Plate Zero

Setting the Gage to zero on the glass plate is the preferred zero adjustment method:

1. Select from the menu.
2. Press the (+) button to select the number of readings to be used to obtain an average, typically 3.
3. Repeatedly measure the glass plate. After the last measurement the gage will calculate a Zero which represents the average of all the Zero readings taken.

Factory Zero

If a glass plate or suitable smooth, hard surface is not available, the factory zero setting can be restored:

1. Select from the menu.
2. Press the down button to select "Reset" and press the center navigation button . The factory calibration icon  will appear on the LCD.

NOTE: -The factory zero setting is restored during a RESET (below)

-The factory zero setting may not always be precise, particularly after a probe tip exchange. For best accuracy, the gage should be zeroed on the included glass plate.

Setup Menu

Reset



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

- All batches, stored datasets, images and batch names are erased.
- Menu settings are returned to the following:

Memory = OFF
Auto Log = OFF
Trend Chart = None
Auto Dim = ON

Bluetooth & Stream = OFF
WiFi & Access Point = 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  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** plus:

- Bluetooth Pairing info is cleared.
- Alarm values are set to default.
- Menu settings are returned to the following:

Units = Microns
Flip Display = Normal
Auto Sync .net = ON
Alarms = OFF
Alarm Sound = OFF
Language = English

Battery Type = Alkaline
Backlight = Normal
Bluetooth Smart = OFF
USB Drive = ON
Sound = ON

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

Language

Converts displayed and printed words to the selected language.

Flip Display

This option causes the display to rotate 180°. Ideal for right-side-up viewing when the sensors are pointed away from the user.

Backlight

(Advanced models only)

Selects display brightness (Sun, Normal or Night). All settings will dim slightly after a period of no activity to conserve battery life. Press the **Down** button to brighten the display.

Set Clock

All batches are *date*-stamped when created, and all readings are *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 a value. The Gage's data and time can also be viewed in **Gage Info** (pg. 9).

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 charger. The battery state indicator icon is calibrated for the selected battery type. No damage will occur if the wrong battery type is selected.

NOTE: DeFelsko recommends the use of *eneloop* (NiMH) rechargeable batteries.

Units

Converts the display from inch to metric or vice versa. Stored measurements in memory are not converted.

NOTE: Switching units will turn off Statistics, HiLo Alarm, and closes Memory.

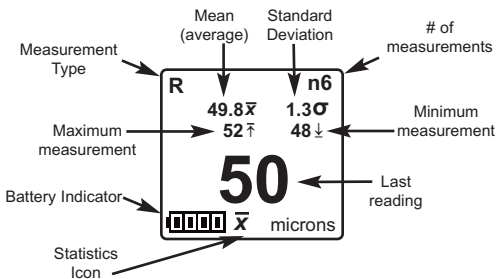
Gage Info

Displays the model number & serial number, probe type & 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.

Statistics Menu

Statistics

When selected, a \bar{x} icon and statistical summary will appear on the display.



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

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 down (-) or up (+). Alternatively, measure a coating with a thickness close to the required value and make final adjustments with the buttons. Select **NEXT** to accept this value. The current **Hi** setting is now displayed. Follow the same procedure to adjust the **Hi** setting.

The **HL** icon will appear on the display.

Measurements will be compared to your defined **HiLo** 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.

Clear

Clears all on-screen **Statistics** and **HiLo** tabulations.

Memory Management

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

Button functions with **Memory ON**:




Standard models store up to 250 readings in one batch.

The **Memory** Menu includes the following options...

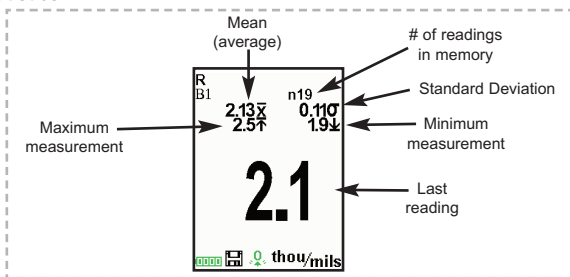
On: turns memory on and begins recording

Off: stops recording (stored readings remain in memory)

Clear: removes all readings from memory


View: lists group statistics and all stored readings on the display. It will begin by showing statistics based on all readings in memory. Use the **Up** and **Down** buttons to scroll through all readings. Press  to exit.

Standard Model display with **Memory ON** shows measurement statistics:



Advanced models store 100,000 readings in up to 1,000 batches. The **Memory** Menu includes the following options...

New Batch

Closes any currently opened batch and creates a new batch name using the lowest available number. For example, if only **Batch 1** and **Batch 3** exist, then **Batch 2** would be created and made the current batch. The  icon appears and basic statistics are displayed. Each measurement will be displayed and stored into this new batch. On screen statistics are immediately updated with each measurement. New batches are date stamped when they are created. Each reading is also data/time stamped.

Shortcut: When a batch is open, press **(+)** to create a new batch.

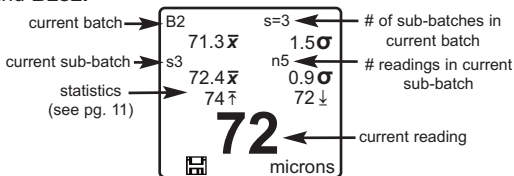
New Sub-Batch

(appears only if a batch is currently open)

Creates a new sub-batch within the currently opened batch.

Shortcut: When a sub-batch is open, create a new sub-batch by pressing **(+)**.

In the following example, **B2s2** is a sub-batch of **Batch 2**. Sub-batching allows the user to group related batches so that statistics can be accumulated for them. **Batch 2** contains the statistics for **B2s1** and **B2s2**.



SmartBatch



The **PosiTector SPG** measures the depth of a single valley in relation to the height of the surrounding peaks using a pointed, cone-shaped probe.

A single depth measurement generally does not adequately characterize the surface profile of an abrasive blast cleaned surface. Repeated gage readings often differ due to surface irregularities even at points close together.


Therefore most organizations and contract specifications require multiple measurements be taken and analyzed to produce a final result that better characterizes the surface.

The Smart Batch menu option sets-up the **PosiTector SPG** to comply with the statistical approaches defined in various standards and test methods published by organizations such as ASTM, SSPC, ISO, IMO, US Navy, SANS and AS.

For instructions on how to use the Smart Batch™ feature, see www.defelsko.com/smartbatch

Open

Selects a previously created batch or sub-batch name to open and make current. If it contains measurements, on-screen statistics will immediately reflect values calculated from this batch. The calibration setting (i.e. Cal 2) associated with this batch is also opened.

NOTE: A solid triangle ► is displayed to the right of the batch name when sub-batches are present. Press  to view sub-batches. This also applies to the *Delete*, *View* and *Print* options.


Close

Stops the recording process, closes the current batch, and removes batch information from the display.

Delete

Removes a batch or sub-batch completely from memory. The name is deleted and all measurements are erased. Sub-batches can be deleted individually. To delete all related sub-batches, simply delete the top-level batch.

View

Scroll using the **Up** or **Down** buttons through information, statistical summary, and a list of each reading in the currently opened batch. Press  to exit.

Annotate

(Advanced models only)

Create meaningful batch names and enter notes directly on the Gage using a familiar onscreen *QWERTY* keyboard.

Use the Gages navigation and (-)(+) buttons to enter annotations.

Annotations can be synchronized with PosiSoft.net and are included in all PosiSoft reports (see **Accessing Stored Measurement Data**, pg. 18).



NOTE: Annotations can also be created using PosiSoft.net (pg. 19) or PosiSoft Mobile (pg. 20).

Print


Sends a statistical summary and individual measurements to the optional Bluetooth wireless printer.

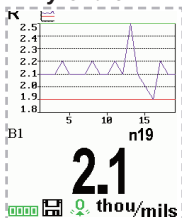
NOTE: To cancel printing, press and hold the (-) and (+) buttons simultaneously


Display

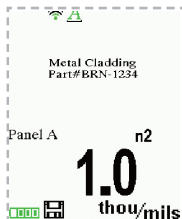
(appears only if a batch is currently open)

The following user selectable display options are available:

 **Chart:** A real-time chart of batch or sub-batch readings
x-y Chart



 **Notes:** Instructions, descriptions or notes (see **Annotate**, pg.15)



None: Default screen shows statistics

Shortcut: When a batch is open, press **Up** to scroll through the above display options.

NOTE: PosiSoft.net (pg. 19) and PosiSoft Mobile (pg. 20) are used to insert an **Image** and **Notes** into a batch.

NOTES: Remove the last reading from the current open batch by pressing (-).

Calibration adjustments cannot be made if any measurements were taken with that Cal setting and stored into a batch.

Each batch can contain a maximum of 10,000 readings.

Summaries

(Advanced models only)

Displays a summary of all stored batches including the name, probe type, number of readings and type.

In the following example, Batch 3 (B3) indicates an "F" 6000 coating thickness probe was used to record a total of "6" readings in "PA2" mode.

Batch Summaries

Page 1/1

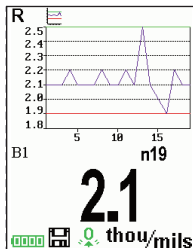
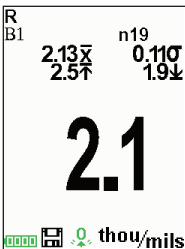
Batch Name	Probe Type	#	Type
B4	SPG	20	
B3	F	6	PA2
B2	F	10	
B1	UTG-C	5	

OK

Screen Capture

Press both (-)(+) 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. 21).

Sample Screen Captures



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. 24).



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, s/n 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.

Learn more at <http://www.defelsko.com/posisoft/posisoft.htm>

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.19). See www.defelsko.com/wifi

Enable




Turns WiFi functionality **ON**. When selected, the  icon will appear on the display. To deactivate WiFi, uncheck the Enable box.

Access Point




Connect your smart device/computer to a PosiTector Advanced body wirelessly without the need for a separate network. Allows wireless access to the gages built-in PosiSoft USB drive whenever WiFi network is not available

To enable, select **Access Point** from the **Connect > WiFi** menu. The Access Point icon  will display in the upper left of the PosiTector display.

Securing your Access Point -

To ensure the PosiTector is only accessible to authorized devices, it is important that you enter a passphrase (password) for the Access Point. The default Passphrase is **password**.

In the **Connect > WiFi > Setup** menu, select **AP Passphrase**.


Press  button to display on-screen keyboard. Enter a Passphrase for the Access Point. The Passphrase will be required for all devices connecting to the PosiTectors Access Point.

The PosiTector is now visible to all WiFi enabled devices. Simply connect your devices WiFi to the new PosiTector Access point. All PosiTectors are uniquely identified by their respective gage body serial numbers.

AP Channel - Default Channel: 6

For most users the default channel will not have to be altered. If you are experiencing poor connection or are unable to connect, try another channel.

In the **Connect > WiFi > Setup** menu, select **AP Channel**.

Press the **UP** center navigation button to highlight the channel. Use the (-) or (+) buttons to change the channel. Press the **DOWN** navigation button and select **OK**. Press the  button.

Networks: With WiFi Enabled (pg. 20) the Gage will allow the user to add a new network and will automatically check for available local networks. Available networks detected by the Gage are listed on the screen along with any networks that the Gage has previously been connected to that are not currently within connection range.

Information: Gage displays information about the local WiFi network connection including...

- **SSID:** the network's name
- **State:** displays if the Gage is connected to the network or not
- **IP Address:** the network's IP Address

Setup: Allows user to setup a WiFi connection

- **IP Settings:** enter the IP information as follows...

IP Type (DHCP or Static), IP Address,
Gateway, Netmask, DNS1, DNS2

Information (continued):

- **Server Enable:** enables a connection between the network and the Gage

- **Gage Name:** enter a name for the Gage (up to 14 Characters).

AP Channel: The access point channel corresponding to a frequency range. (Default Channel: 6)

AP Passphrase: A series of characters, numbers or symbols used to log on to a WiFi network. (Default Passphrase: password)

- **WiFi Reset:** erases all WiFi settings

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.19). Once connected, any computer can view measurements stored in memory by navigating a virtual drive labeled "PosiTector" using the included USB cable.

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 datasets and graphs can be viewed or copied using universal PC/Mac web browsers or file explorers.

Measurement data is stored in comma-separated text files which can easily be imported into supporting applications such as spreadsheets and databases.

Retrieving stored screen captures:

The last 10 screen captures stored in memory can be accessed by navigating to the "screen capture" directory within the "PosiTector" virtual drive.

NOTES:

- When your **PosiTector** is first connected to your Windows PC via a USB cable, an enumeration process is started that installs device drivers without re-booting your computer. You may see several pop-up windows in the taskbar at the bottom right of your screen. Wait for the entire process to be completed before proceeding.
- 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.

Serial Streaming via USB

(Advanced models only, serial numbers 784000 and greater)

Advanced gage bodies have the ability to live stream datasets to a USB connected computer. Using 3rd party data collection or SPC software, datasets can be captured as they are taken.

This following guide provides step-by-step directions for establishing communication between the PosiTector Advanced and a USB connected computer.

PosiTector Advanced USB Serial Streaming Instructions

<http://www.defelsko.com/usb/PosiTectorAdvanced-USBserial.pdf>

Sync .net Now

The below **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** (pg. 19) is required when using a **USB** connection to synchronize measurements with PosiSoft.net.

Bluetooth Smart

(Advanced models only, serial numbers 784000 and greater)



When **Enabled** , allows communication with a smart device running the PosiTector App (pg. 19) via auto-pairing Bluetooth Smart (BLE) wireless technology.

Select batches to flag them for synchronization to the PosiTector App. New batches created while **Bluetooth Smart** is enabled are automatically selected.

Sync Batches

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.

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. See www.defelsko.com/bluetooth

Pairing

The instrument and receiving device must be paired before stored or streamed datasets can be transmitted. For pairing instructions, see <http://www.defelsko.com/bluetooth>

Info

Lists information about your current Bluetooth connection, including the currently paired device and MAC address.

Stream

When checked, the instrument will stream datasets to the paired Bluetooth Device as they are taken. Datasets can be streamed as they are taken to the optional Bluetooth printer or third-party computer software.

Powder Probes

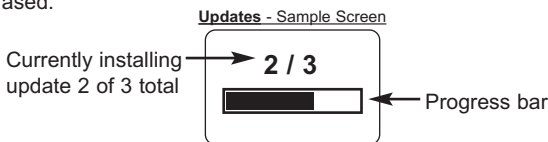
Displays menu options that enable the PosiTector body to communicate with wireless PosiTector PC powder probes. See <http://www.defelsko.com/pc>

Updates

Determines if a software update is available for your Gage. If an update is available, a prompt will appear allowing the user to choose to perform the update at this time or not.

To perform an update the Gage must be connected to an internet connected computer with *PosiSoft Desktop* (pg. 19), or **WiFi** network (pg. 20).



NOTE: Ensure that stored measurements are backed up to a PC or *PosiSoft.net*. The Gage will perform a **Hard Reset** (pg. 11) after completion of the update and ALL readings in memory will be erased.




 **DO NOT** unplug the Gage during the update operation.

Power Supply / Battery Indicator

Power Source: 3 AAA alkaline, Lithium or optional Nickel-metal hydride (NiMH) rechargeable batteries. For best battery indicator results, ensure the appropriate **Battery Type** is selected in the **Setup > Battery Type** menu (pg. 13).

The battery indicator  displays a full bar with fresh alkaline or fully charged batteries installed. As the batteries weaken, the bar will be reduced. When the battery symbol is low  the Gage can still be used, but the batteries should be changed or recharged at the earliest opportunity. The Gage will turn off automatically when batteries are very low, preceded by a Low Battery Warning on the display.

 To retain all user settings and stored memory readings, only replace the batteries after the Gage has powered-down.

Battery performance decreases at low temperatures.

Technical Data

SPG / SPG-S Range:	0 – 500 μm (0 – 20 mils)
SPG CS Range:	0 – 1500 μm (0 – 60 mils)
SPG TS Range:	0 – 6 mm (0 – 250 mils)
Accuracy:	
SPG / SPG S / SPG CS	\pm (5 μm + 5%) of reading \pm (0.2 mils + 5%) of reading
SPG TS	\pm (5 μm + 5%) of reading \pm (0.2 mils + 5%) of reading
Resolution:	1 μm (0.1 mils)
SPG / SPG S Probe tip:	60° angle with a 50 μm radius tip
SPG CS / SPG TS Probe tip:	60° angle with a 500 μm radius tip
Measurement speed:	>40 readings per minute
Weight:	140 g (4.9 oz.) without batteries
Dimensions:	137x61x28 mm (5.4" x 2.4" x 1.1")

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.

Troubleshooting

Most conditions can be cleared with a **Hard Reset** (see pg. 9). If not, visit our Service & Support page for information on sending your Gage to us for a no charge evaluation.

See: <http://www.defelsko.com/service>

Thickness readings are inconsistent:

- Probe tip may be damaged, scratched or worn

Gage will not print to the Bluetooth wireless printer:

- Ensure the gage has been paired for use with the printer and the Gage menu option **Connect > Bluetooth > Stream** box is ticked.

- Check printer batteries. Switch it off and then on again.

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 probe tip for dirt or damage. The probe tip should move up and down freely. The metal plate surrounding the probe tip should be smooth and free from burrs and foreign material.
3. Perform a **Hard Reset**. (pg.4)
4. Place the metal shim over the glass plate and attempt a measurement.
5. If issue is not resolved, **Update** (pg.8) your **PosiTector** gage body and re-attempt measurements.

IMPORTANT:

If you must return the Gage for service, please fill out and include the Service Form located at www.defelsko.com/support 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

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

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