

# twilight

INSTRUMENTOS DE MEDICIÓN INDUSTRIAL

**PosiTector Smart**

**Link**

**DF-SMLINK**

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# PosiTector<sup>®</sup> SmartLink

with PosiTector **6000** probes

Instruction Manual v. 1.0



**DeFelsko<sup>®</sup>**

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# Introduction

**PosiTector 6000** probes non-destructively measure the thickness of coatings on metals, quickly and accurately. This instruction manual specifically covers use with PosiTector *SmartLink*.

The PosiTector *SmartLink* and free mobile app allow you to wirelessly connect a wide selection of PosiTector probes to your smart device. Take full advantage of your device's keyboard, microphone, camera, internet data connection, etc. to simplify and enhance your measurement inspection process.



The PosiTector *SmartLink* measurement solution consists of a PosiTector App, PosiTector *SmartLink* device and compatible PosiTector probe.

In addition to the PosiTector 6000, compatible probes include the PosiTector *SPG/RTR-H* (surface profile) and *DPM* (environmental conditions).

## **Why is Measurement Important?**

Dry film thickness (DFT) is arguably the single most important measurement made during the application and inspection of protective coatings. Coatings are designed to perform their intended function when applied within a tight DFT range as specified by the manufacturer. Correct thickness ensures optimum product performance. Even the most basic specification will require DFT to be measured.

Many physical and appearance properties of the finished coating can be directly affected by the film thickness including the color, gloss, surface profile, adhesion, flexibility, impact resistance, and hardness of the coating. The fit of pieces assembled after coating can be affected when film thickness isn't within tolerance.

Regular film thickness measurement helps control material costs, manage application efficiency, maintain finish quality and ensure compliance with contract specifications. Paint manufacturers recommend target ranges to achieve optimum performance characteristics and clients expect these parameters to be met. Precisely measuring finish thickness has other benefits, too. Whether to meet International Organization for Standardization (ISO), quality, or customer requirements for process control, companies need to verify coating quality to avoid wasting money reworking product.

## **Golden Rule**

Measure your uncoated part first!

This quick zero-check determines if a *Calibration Adjustment* (pg 25) is needed for your substrate.

Next, lay the included plastic shims onto the bare uncoated surface and measure them individually to ensure the PosiTector 6000 measures a known thickness within tolerance.

## Quick Start

The PosiTector *SmartLink* powers-up when the LED button is pressed. To preserve battery life, the PosiTector *SmartLink* powers-down after 3 minutes of no activity. Alternatively, press and hold the LED button until it turns red and shuts off (approximately 5 seconds).

All probe settings and calibration adjustments (pg 25) are retained within the PosiTector *SmartLink*, stored measurement data is retained within the smart device (cell phone, tablet).

Wirelessly connect the PosiTector probe to the smart device using the PosiTector App.

### Measure

- 1 Remove the protective plastic cap (if supplied) from probe.
- 2 Place the probe FLAT on the surface to be measured. HOLD STEADY. When a valid measurement is calculated, the LED button flashes green and the measurement is displayed on the PosiTector App.
- 3 Lift probe AT LEAST 2 INCHES (5cm) from the surface between readings - OR - leave probe on the surface in the same location for continuous readings.

This continuous reading feature is intended to allow careful probe placement on small or odd-shaped surfaces. Ignore all readings taken before the probe is properly placed.

If *Memory* (pg 13) is ON while continuous readings are being taken, only the last value on the display (when the probe is lifted) is stored into memory. *Scan Mode* (pg 32) stores ALL readings into memory.

To ensure best measurement accuracy, see Calibration, Verification and Adjustment (pg 10).

# PosiTector App

The PosiTector App connects a PosiTector *SmartLink* to your iOS device enabling you to use PosiTector *6000*, *DPM*, *SPG* or *RTR-H* probes on your device without the need for a conventional gage body.

Screen fonts, brightness and displayed language are inherited from your smart device settings. Currently, the PosiTector App has language support for English, Spanish, French, German, Chinese and Korean. Screen orientation is fixed to portrait only, rotation to landscape is not supported.

Stored batch readings, images and notes are all stored in the PosiTector App (on your smart device). The number of stored batch readings is only limited by the memory available on your smart device. If the application is removed or a menu **Reset** (pg 32) is performed, all stored measurements and associated data is permanently erased.

**NOTE:** Prior to uninstalling the PosiTector App or performing a **Reset** (pg. 32) it is recommended that you synchronize/copy measurement data to *PosiSoft.net* (pg. 35) or share the batch data (AirPrint or email report). This ensures that the data is saved for future reference.

## Wirelessly Connecting the PosiTector App to a PosiTector 6000 probe

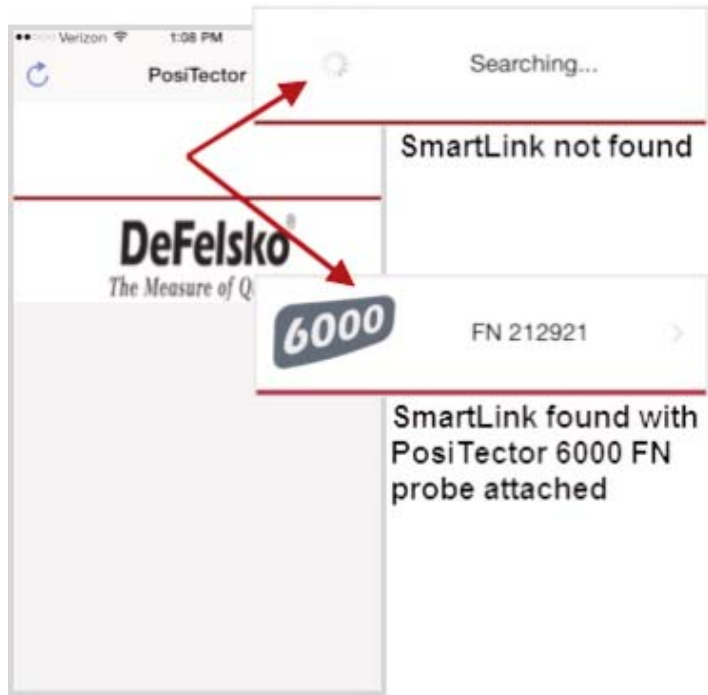
- 1 Power-up the PosiTector *SmartLink* and connected *6000* probe by pressing the LED button. The button will blink blue.
- 2 Select the PosiTector *SmartLink* App icon on your smart device. A menu containing the following options will be displayed:



- 3 Select **Continue**. A list of available PosiTector probes (listed by connected probe type and serial number) will be displayed.



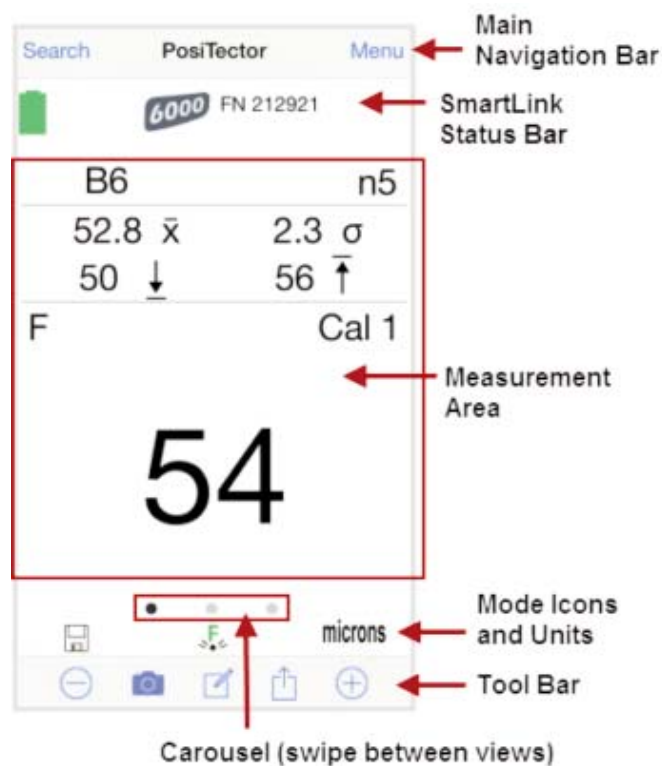
Select the desired PosiTector *SmartLink* to connect. The LED button on the PosiTector *SmartLink* will illuminate solid blue when successfully connected.



The probe model and serial number is engraved on the backside of the plastic probe connector (i.e. FN 212921).

## User Interface

The user interface was designed to combine the proven simplicity of PosiTector gages and the advanced functionality of a smart device's features including touch, swipe, keyboard, camera and more. The interface will be instantly recognizable to those familiar with PosiTector instruments.



## Main Navigation Bar

The Main Navigation section is dynamic and may change from one screen to another.

In the above example, *Search* and *Menu* navigation options are available.

*Search* returns back to the list of available PosiTector *SmartLink* devices. *Menu* accesses the *Main Menu*.

## SmartLink Status Bar

Displays information about the connected PosiTector *SmartLink* and associated probe.



The example indicates that the PosiTector *SmartLink* battery status is full and connected to a PosiTector 6000 FN probe (serial number: 212921).

## Measurement Area

Displays measurement related information. The above coating thickness example shows the last measurement (54 microns) on a ferrous (F) substrate using calibration adjustment Cal 1. *Memory* is ON and measurements are being stored into Batch 6 (B6).

The measurement area will change depending on the connected probe type and selected modes.

## Modes Icons and Units

Displays icons for active modes (such as the disk icon  for *Memory* mode, pg 13), current calibration adjustment type (  Factory), and measurement units (microns).

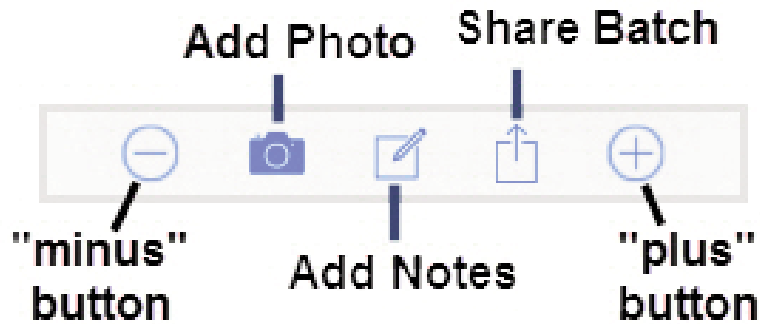
## Carousel

The carousel is displayed when more than a single view (screen) is present. The number of dots represent the number of available views. Swipe your finger horizontally across the screen to switch between views.

*Tip:* Some views contain interactive areas. For this reason we recommend swiping horizontally across the *Mode Icons* and *Units bar*.

## Tool Bar

Displays available actions applicable to current operating modes (i.e. *Memory* (pg 13), *Statistics* (pg 23), *HiLo* (pg 23), etc.)

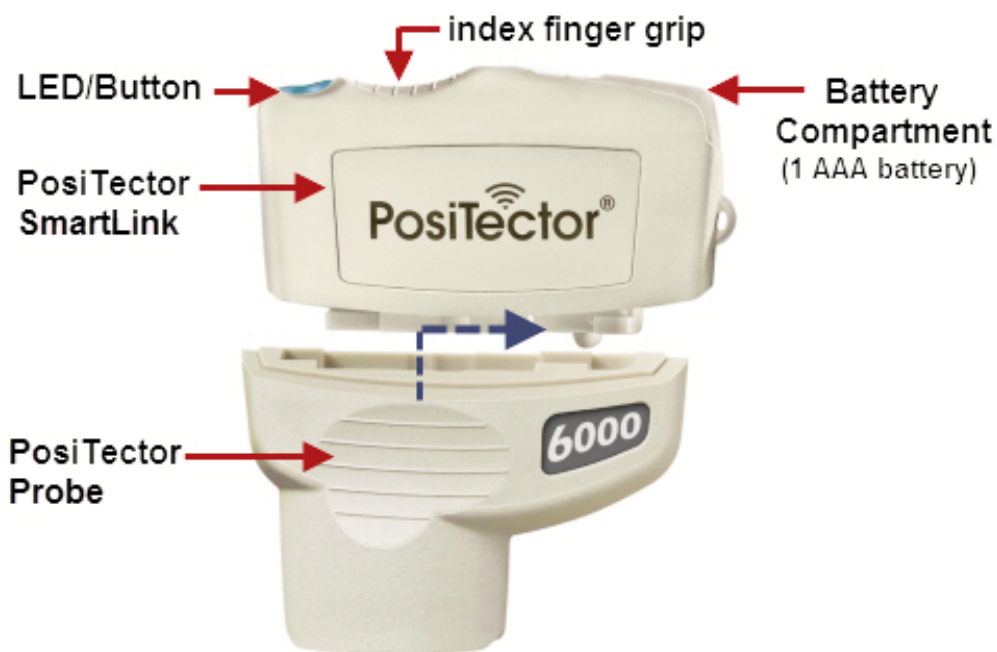


## PosiTector SmartLink

The PosiTector *SmartLink* acts as a relay between the PosiTector probe and PosiTector App using wireless Bluetooth Smart (BLE Bluetooth Low Energy). No pairing required! Auto-pairing Bluetooth connection works up to 10m (30 feet) away.

Information specific to currently selected modes (i.e. Scan mode (pg 32), Fast mode (pg 32), etc.) and user calibration adjustments (specific to each probe) are retained within the PosiTector *SmartLink*. This allows for seamless switching between smart devices (phone and tablet).

**NOTE:** Measurement data is not stored within the PosiTector *SmartLink*. All measurement data (readings, images, notes) is stored within the PosiTector App on your smart device.



## Connect a Probe

To connect a probe, slide the plastic probe connector in the direction of the arrow (shown above) until it locks in place. Reverse for detaching the probe.

When powered-up, the PosiTector *SmartLink* automatically determines what type of probe is attached and does a self-check. The probe type, model and serial number are displayed when found within the app's *Search* screen.



**NOTE:** The PosiTector App features probe hot-swap. During the measurement process, probes can be interchanged without the need to go back to the search screen. Simply swap probes (PosiTector *SmartLink* will power-down) and then power-up the PosiTector *SmartLink*. The PosiTector App will automatically recognize the probe and be ready to measure.

## Power-up / Power-down

The PosiTector *SmartLink* powers-up when the LED button is pressed. To preserve battery life, the PosiTector *SmartLink* powers-down after 3 minutes of no activity. Alternatively, press and hold the LED button until it turns red and shuts off (approximately 5 seconds). All probe settings and calibration adjustments are retained, stored measurement data is retained within the smart device.

## Tri-Color LED Button

The LED visually provides connection and measurement status.

LED Color Status:

*Blue Blink* = Not Connected to PosiTector App

*Blue Solid* = Connected to PosiTector App

*Green Blink* = Successful Measurement

# PosiTector 6000 Probes

## Theory of Operation - Magnetic & Eddy Current

The PosiTector 6000 probes calculate coating thickness measurements using the magnetic principle, eddy current principle or a combination of both principles.

**F** probes use the magnetic principle to measure the thickness of non-magnetic coatings on ferrous metals.

**N** probes use the eddy current principle to measure the thickness of non-conductive coatings on non-ferrous metals.

**FN** probes combine the full abilities of both the "F" and "N" probes.

FN probes first attempt a measurement using the magnetic principle and will display a reading with the letter "F" if the coating is non-magnetic over steel. If the coating is non-conductive over non-ferrous metal, then the probe will automatically attempt a measurement using the eddy current principle and display a reading with the letter "N" (see also *N Lock* - pg 30).

PosiTector 6000 coating thickness probes "sense" when they are near metal and immediately attempt a measurement followed by another every 2 seconds. They stop when removed from the vicinity of metal and power-down after a few minutes of no activity.

More probe information is available at: [www.defelsko.com/p6000](http://www.defelsko.com/p6000)





## Protective Cap

PosiTector 6000 probes are shipped with a protective plastic cap. Remove this cap prior to use. Replace it when the instrument is not in use to protect the probe.

## Factory Calibration

Every PosiTector 6000 probe is factory calibrated and includes a Certificate of Calibration. This factory calibration information is permanently stored within the probe and cannot be overwritten by the user.

## Calibration Adjustment

PosiTector 6000 probes allow the user to make adjustments to the  factory calibration (Zero , 1-Point  and 2-Point ). Calibration adjustments (pg 25) made by the user are stored within the PosiTector *SmartLink*.

## 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 [http://www.defelsko.com/quality/calibration\\_procedures.htm](http://www.defelsko.com/quality/calibration_procedures.htm)

## Calibration, Verification & Adjustment

The **PosiTector 6000** non-destructively measures the thickness of coatings on metals. Three steps ensure best accuracy...

- 1 Calibration - typically done by the manufacturer. All probes include a Certificate of Calibration.
- 2 Verification - typically done by the user on known reference standards such as plastic shims or coated thickness standards.
- 3 Adjustment - to a known thickness

## 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 using known reference standards. A successful verification requires the Gage to read within the combined accuracy of the probe and the reference standards.

A reference standard is a sample of known thickness(es) against which a user may verify probe accuracy. Reference standards may be plastic shims, coated thickness standards, or sample parts whose coating thickness has been determined using other means.

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


## Adjustment

*Adjustment, or Calibration Adjustment* (pg 25), is the physical act of aligning the probe's thickness readings to match those of a known thickness sample (removal of bias) in order to improve the accuracy of the probe on a specific surface or in a specific portion of its measurement range. *Zero* (pg 26), *1-point* (pg 27) or *2-point* (pg 28) *Calibration adjustments* are possible.

Probes are factory calibrated and perform an automatic self-check each time a measurement is taken. The  symbol is displayed when factory calibration setting is in use.

For many applications no further adjustment is necessary. Just check *Zero* on the uncoated substrate, then measure. However, sometimes probe readings can be influenced by changes in substrate shape, composition, and surface roughness or by measuring in a different location on the part. That is why *Cal* adjustments are made possible.

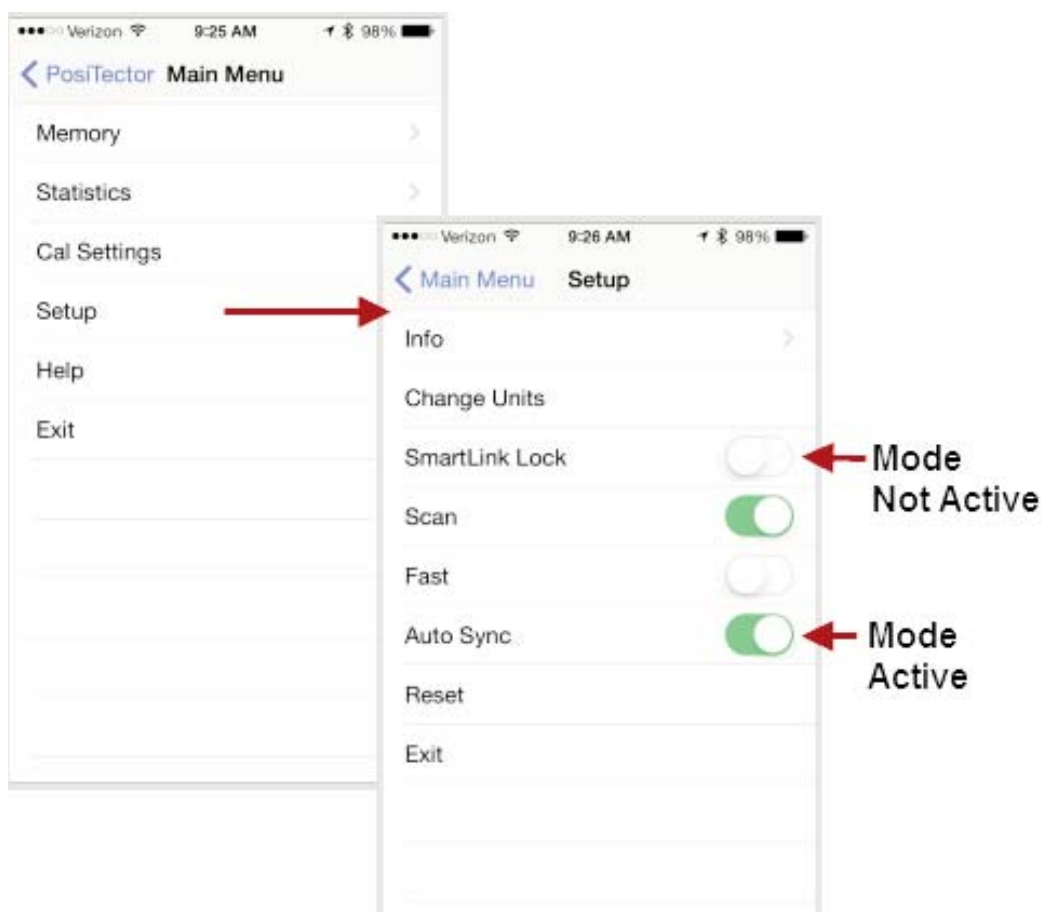
Where a *Cal* adjustment method has not been specified, use a *Zero* or *1-point* method first. If measuring the included shims on your uncoated surface reveals inaccuracies, use the *2-point* method.

Factory Cal settings can be restored at any time by creating a *New Cal* setting (pg 29), by *Resetting the Current Cal* (pg 30) or by performing a **Reset** (LED Button Reset, pg 33). The  symbol appears on the display whenever factory Cal settings are in use.

With “FN” probes, calibration adjustments (pg 25) are made only to either the “F” or “N” mode (stored independently under a particular Cal), whichever was measured last.

## Menu Operation

PosiTector 6000 functions are menu controlled. Access them by selecting **Menu** in the upper right of the PosiTector App display.



The **Main Menu** contains the following **sub-menus**...

- **Memory** (pg 13)
- **Statistics** (pg 23)
- **Cal Settings** (pg 25)
- **Setup** (pg 31)

Select **Exit** to close the menu.




# Memory Menu


The PosiTector App uses your smart device's storage for recording measurement data. Stored measurements can be reviewed on-screen, printed (AirPrint), shared via email (PDF, CSV) or synchronized with cloud-based *PosiSoft.net* (pg 35). Measurements are date and time-stamped (using date/time from smart device).

The following options appear within the *Memory* menu. Additional options may appear depending on the connected PosiTector *SmartLink* and probe type.

## 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 batch names are date-stamped at the time they are created.

**Shortcut:** When a batch is open, press the LED button on the PosiTector *SmartLink* or  icon on the display to create a new batch.

The following 3 screen views are available when a batch is open (*Memory ON*). Swipe your finger horizontally across the screen to switch between views.

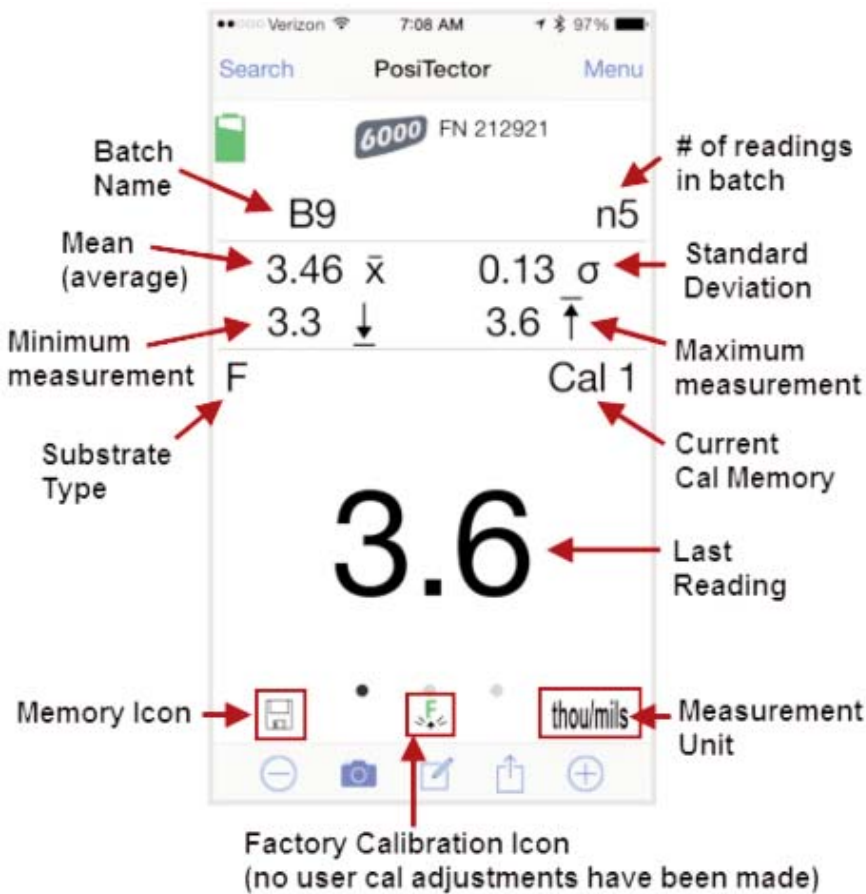


A carousel is displayed when more than a single view (screen) is present. The number of dots represent the number of views.

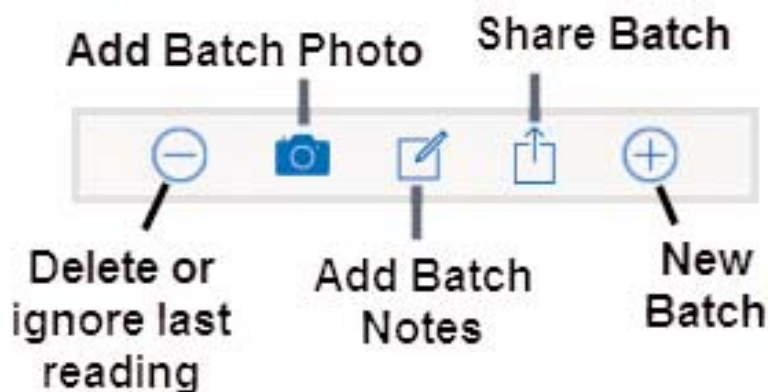
Swipe your finger horizontally across the screen to switch between views.

## Batch Summary View

In the PosiTector 6000 memory example below, the batch name is B9 and contains 5 measurements.



Use the **Tool bar icons** to add notes and change the batch name (pg17), add new batch (pg 15) and add an image (pg 16).



⊖ **Delete or Ignore** last reading from the current open batch.

When selected, the following menu appears.

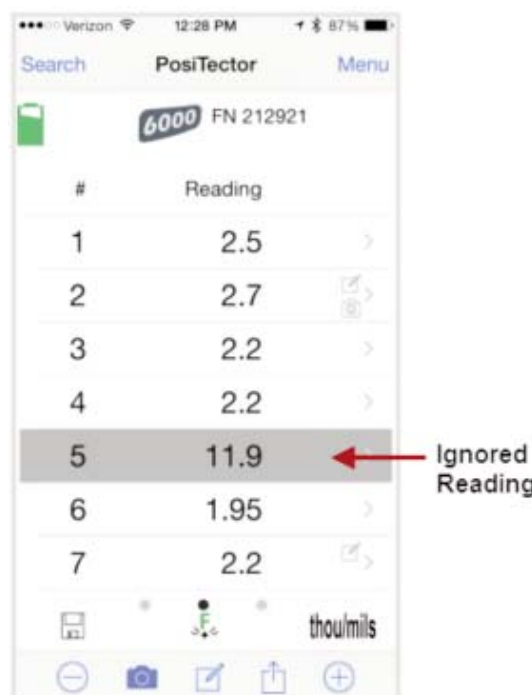
Ignore Readings are retained within the batch but are excluded from the report's statistical summaries and charts.

The ignored readings are highlighted within the *Batch Readings View* (Shown here. See also pg 18).



By default Ignored Readings are not included on reports. For inclusion, toggle the Hide Ignored Readings within the *Batch Report Configuration* (pg 21). Ignored Readings will display as highlighted within the readings section of the report, but are excluded from the statistical summary and chart.

*Delete Reading* permanently removes the selected measurement from the current batch.



**NOTE:** Readings that have been synchronized (automatically or manually) with *PosiSoft.net* (pg 35) cannot be deleted. To exclude them from report summaries and charts select *Ignore Reading*.

*Cancel* exits the menu.

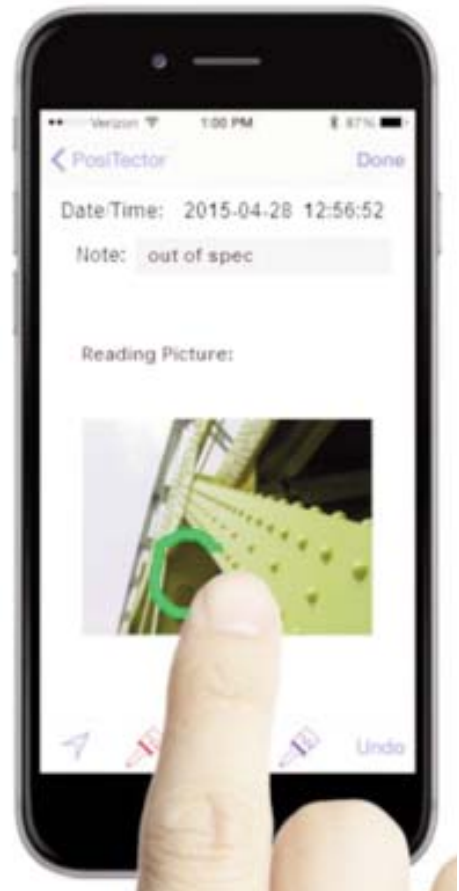
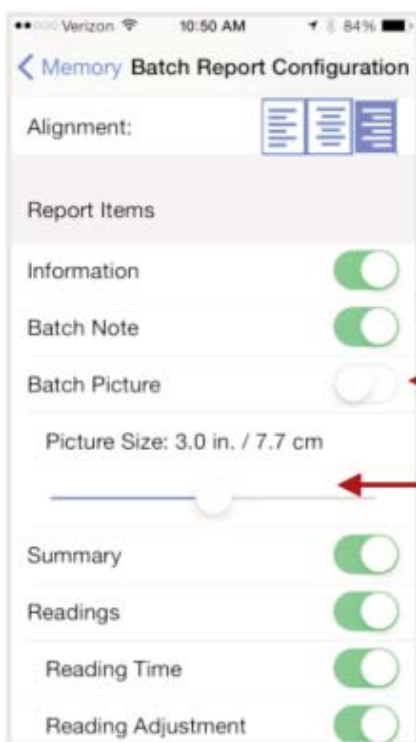
## ⊕ **New Batch**

Closes any open batch and creates a new batch name using the lowest available number.

## **Add Photo** to the currently opened batch or dataset.

Batch Photo, Reading Photos and Image Annotations can be included in reports (default) and synchronized with *PosiSoft.net* (pg 35).

The photo can be resized or hidden from reports within the *Memory >> Batch Report Configuration* menu (pg 21).




## **Add Image Annotation**

This drawing tool is ideal for identifying a specific location or area within an image. Choose from three paint brush colors - Red, Green or Blue.

Use finger or stylus to draw over the displayed image.

**NOTE:** Connection to a PosiTector *SmartLink* is not required to add a photo or image annotation to an existing batch.

 **Add Notes** to currently opened batch or dataset.

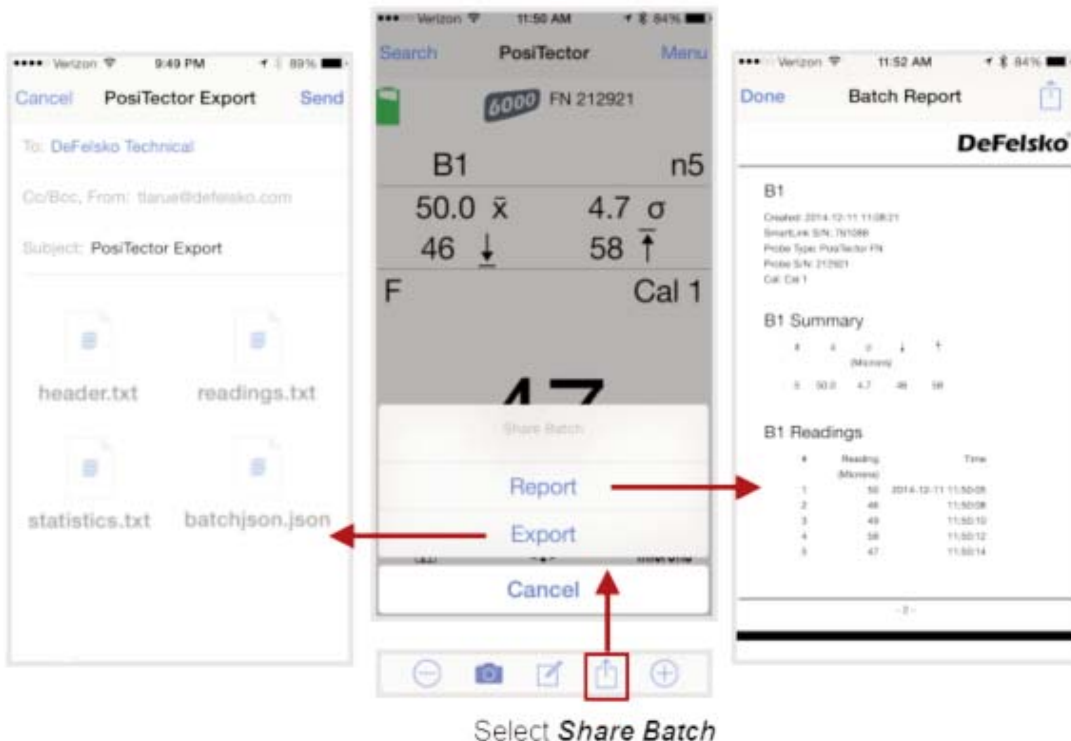
Change the batch name and add batch notes using your smart device's keyboard or dictation tools.

Batch names/notes appear on reports and are included when measurement data is synchronized with *PosiSoft.net* (pg 35).



## **Share Batch**

Share/view professional PDF reports and CSV data instantly via email, AirPrint, Dropbox or other applications on the smart device.



## **Report**

Generate PDF reports instantly and share via email, Dropbox or other applications on your smart device.

Batch reports can be customized within the *Batch Report Configuration* menu (pg 21).

## Export

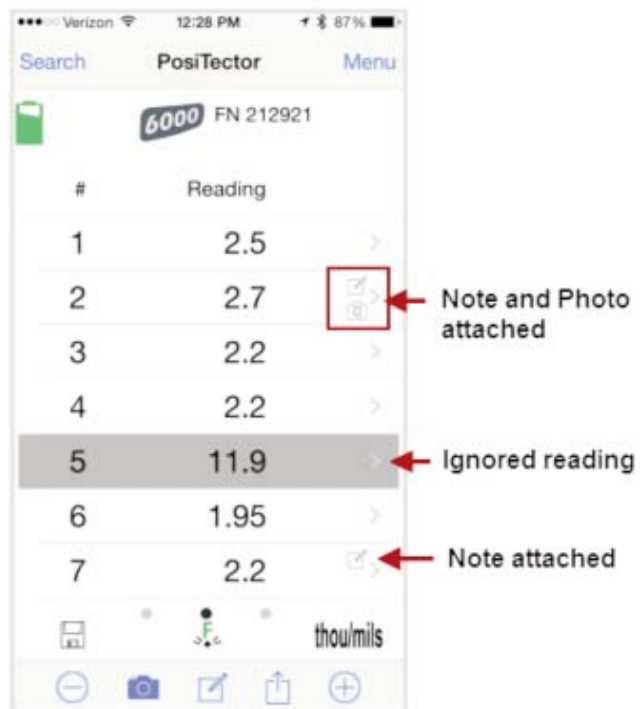
Email CSV (comma-delimited) comma-separated text files which can easily be imported into supporting applications such as spreadsheets and databases. A .json formatted file is also included.

## Batch Readings View

Lists all readings contained in the current batch. New readings are added to the list instantly as they are taken.

A note and/or photo can be added to each individual reading.

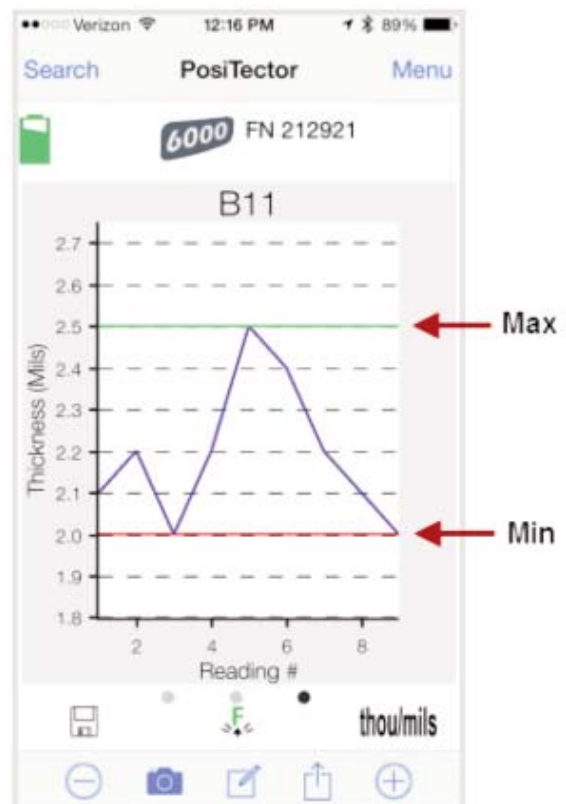
Notes and photos can be displayed in batch reports and synchronized with *PosiSoft.net* (pg 35).



## Batch Chart View

Lists all readings contained in the current batch. New readings are added to the list instantly as they are taken.

Pinch the active region of the chart to zoom the view.



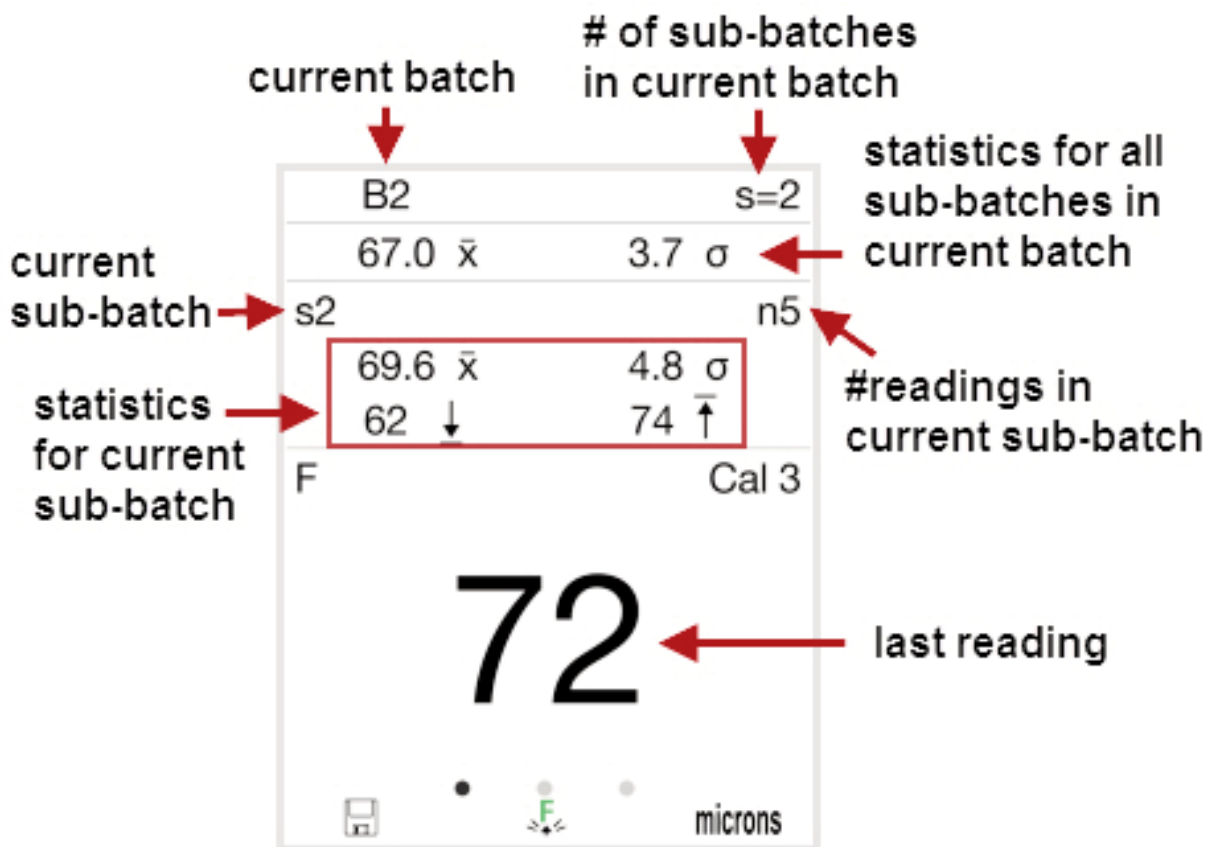
**New Sub-Batch** (appears only if a batch is currently open)

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

**Shortcut:**

When a sub-batch is open, create a new sub-batch by pressing ⊕ or the LED button.

In the following example, B2 s2 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 B2 s1 and B2 s2. Ideal for obtaining the average of averages.



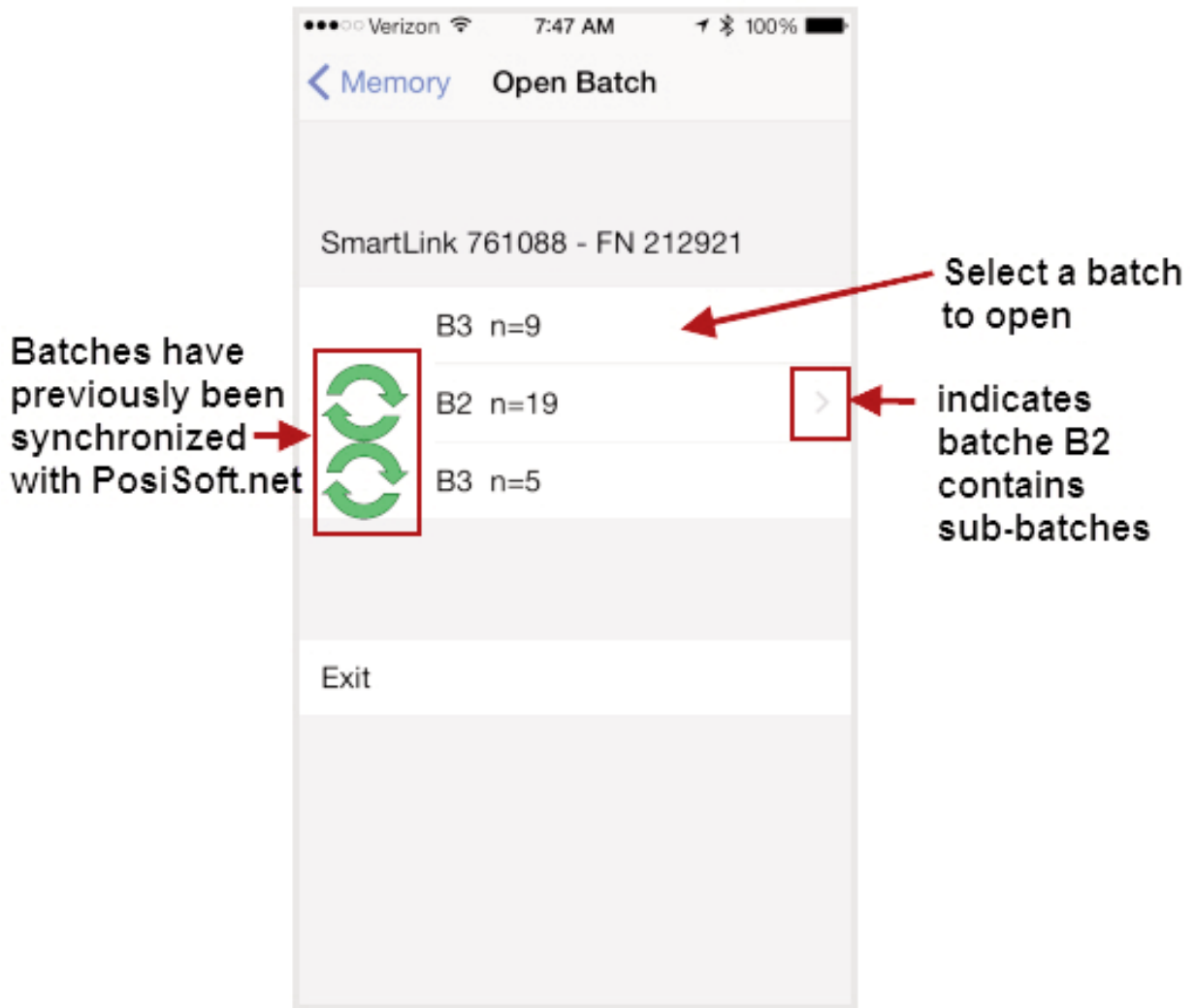
**New PA2**

Helps determine if film thickness over a large area conforms to user specified min/max levels. Ideal for conforming with SSPC-PA2.

See PA2 Instruction Guide for step-by-step details :  
<http://www.defelsko.com/smartlink/manuals/6000/pa2/>

## Open

Lists all stored batches. Select the desired batch to open.



Additional measurements can be added to existing batches only if the original probe is attached to the PosiTector *SmartLink*.

**NOTE:** Opening a batch that was not created with the currently attached probe will disconnect the PosiTector *SmartLink* from the PosiTector App. You will still be able to add notes, photos, etc. to the batch.

## Close

Closes the current batch and turns *Memory* OFF.

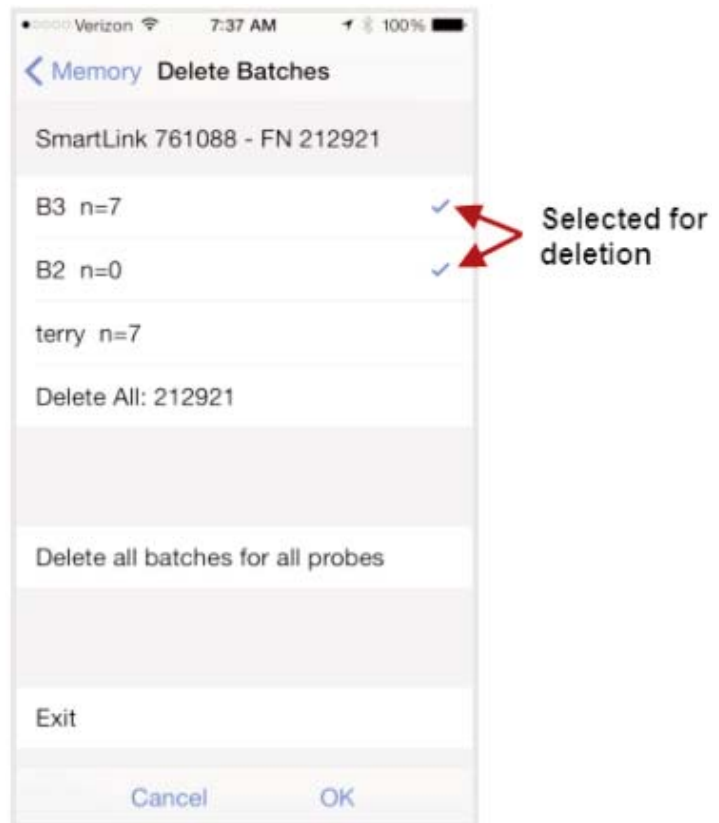
Batch measurement data is retained when a batch is closed.



## Delete

**Permanently** remove a batch or sub-batch from the PosiTector App. If the batch has been synchronized or copied to PosiSoft.net (pg 35), a copy will remain there.

Select batches for deletion, then select **OK**. Or select **Delete** all batches for all probes to **permanently** delete all measurement data from the smart device (phone/tablet).



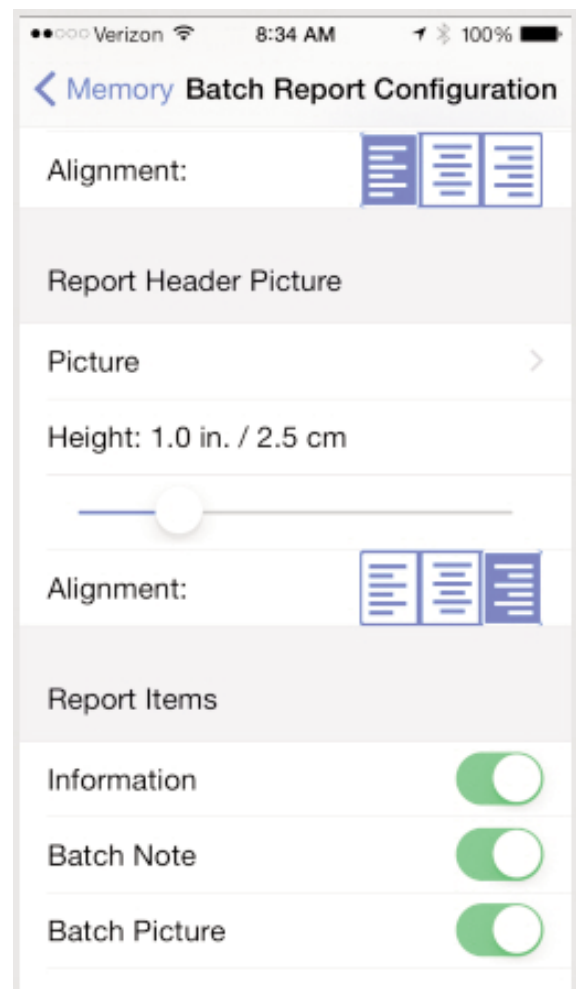
## Batch Report Configuration

Customize reports using the *Batch Report Configuration* to include/exclude notes, images, logo, company/report name, fonts, alignment, image sizes and more.

Select **Preview Report** to review your changes.

### NOTE:

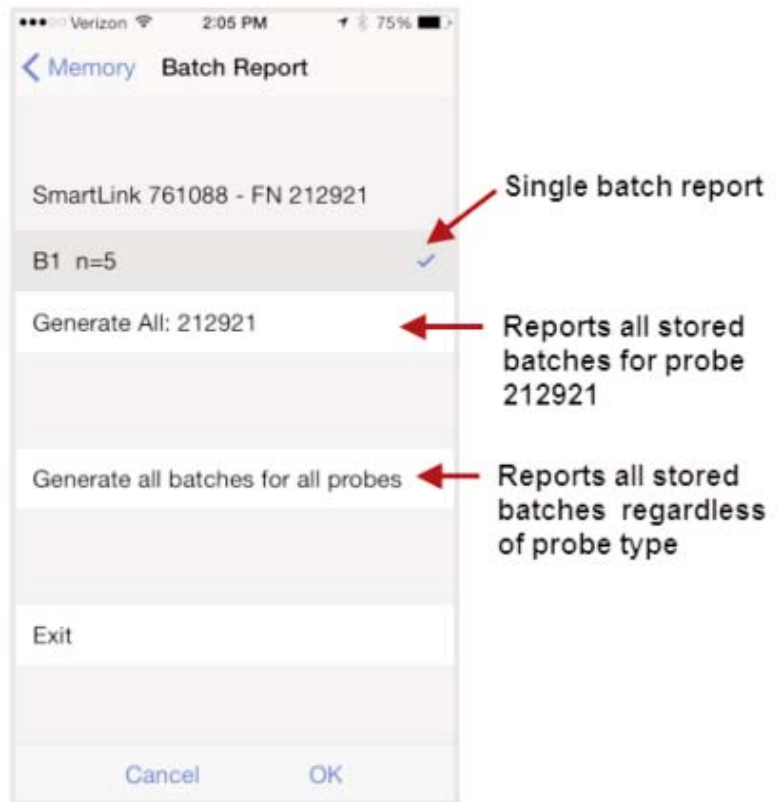
The *Preview Report* displays sample batch data (not your actual batch data).



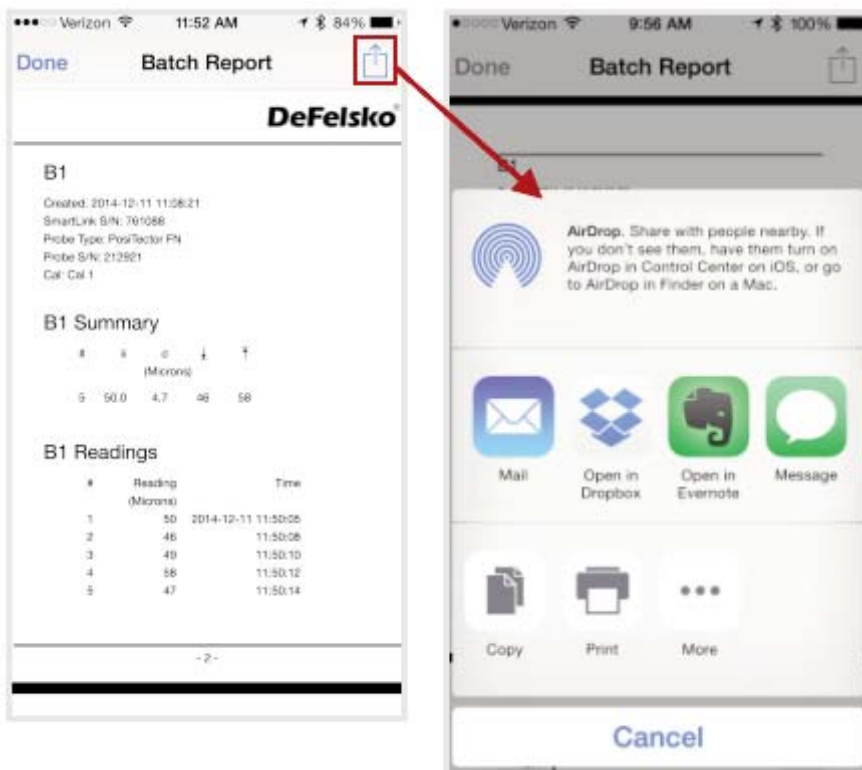
## Batch Report

Generate a report summarizing an individual batch or multiple batches.

Select desired batch or batches to include in the report and press OK.



Share the report instantly via email, AirPrint, Dropbox or other applications on your device.



**Sync Now (pg 36) \***

**Copy from PosiSoft.net (pg 39) \***

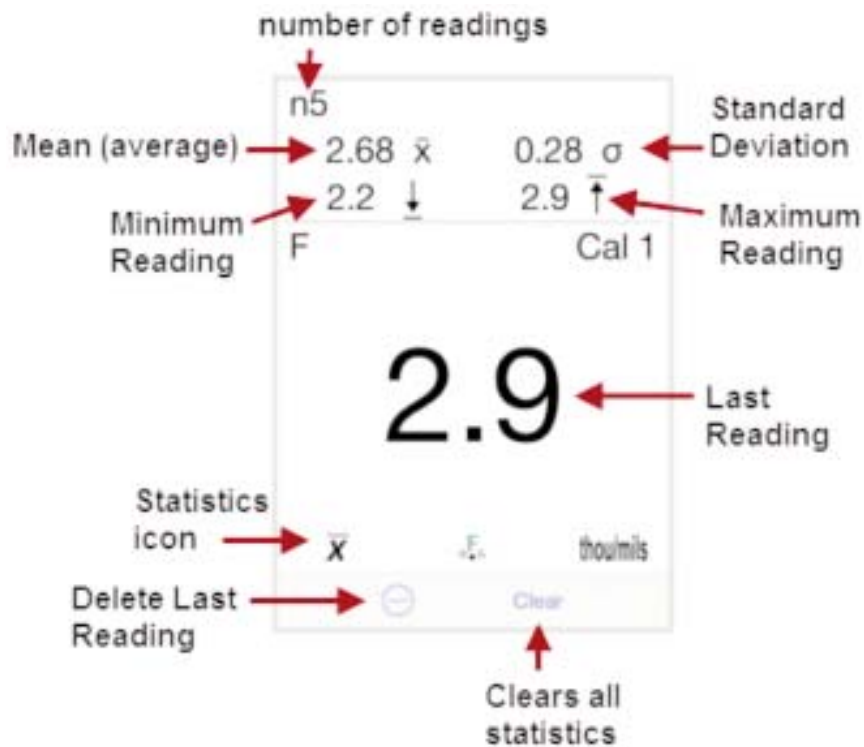
**Copy to PosiSoft.net (pg 38) \***

\* For details see, *Synchronize (Sync) with PosiSoft.net* (pg 36)

# Statistics Menu

## Statistics

When toggled ON, the  $\bar{x}$  icon appears and a statistical summary is displayed.



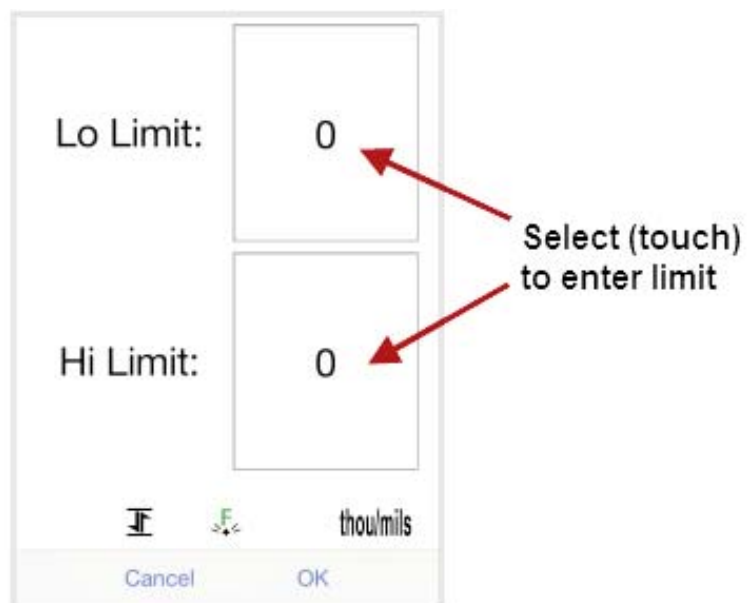
$\ominus$  Deletes the last reading. Press **Clear** or the **LED button** on the PosiTector *SmartLink* to clear statistics.

## HiLo Alarm

When toggled ON, user is visibly alerted when measurements exceed user-specified limits defined in *HiLo Alarm Limits*. The  $\bar{x}$  icon will appear on the display.

## HiLo Alarm Limits

Define Lo and Hi alarm limits by selecting (touching) the appropriate box.



When selected, the Lo Limit is highlighted and a number pad appears. Enter the desired Lo Limit value.

Alternatively, measure a coating with a thickness close to the required value and make final adjustments with the number pad.

Select **Apply** to accept the value.



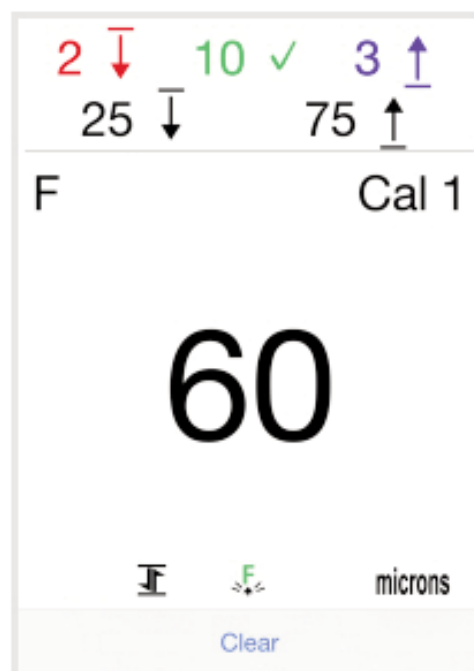
The Hi Limit is now highlighted.

Enter the desired Hi Limit value.

Select **Apply** to accept this value.

When HiLo Alarm is toggled ON, measurements will be compared to your defined HiLo limits.

Press **Clear** to clear HiLo tabulations.




**Clear**


Clears all on-screen HiLo tabulations.

## Cal Settings Menu

Calibration Adjustment is the physical act of aligning the probe's thickness readings to match those of a known thickness sample (removal of bias) in order to improve the accuracy of the probe on a specific surface or in a specific portion of its measurement range. *Zero* (pg 26), *1-point* (pg 27) or *2-point* (pg 28) *Calibration adjustments* are possible.

Probes are factory calibrated and perform an automatic self-check each time a measurement is taken. The  symbol is displayed when factory calibration setting is in use. For many applications no further adjustment is necessary. Just check Zero on the uncoated substrate, then measure. However, sometimes probe readings can be influenced by changes in substrate shape, composition, and surface roughness or by measuring in a different location on the part. That is why Cal adjustments are made possible.

Where a Cal adjustment method has not been specified, use a *Zero* or *1-point* method first. If measuring the included shims on your uncoated surface reveals inaccuracies, use the *2-point* method.

Factory Cal settings can be restored at any time by creating a *New Cal setting* (pg 29), by *Resetting the Current Cal* (pg 30) or performing a *Reset* (LED Button Reset, pg 33). The  symbol appears on the display whenever factory Cal settings is in use.



With "FN" probes, calibration adjustments are made only to the "F" or "N" mode (stored independently under a particular Cal), whichever was measured last.

## Zero Calibration Adjustment

Measure your uncoated part. If the average of several readings is not close to “0” (within the tolerance of the probe being used), a zero adjustment should be made.

For many surfaces a single zero measurement should suffice.

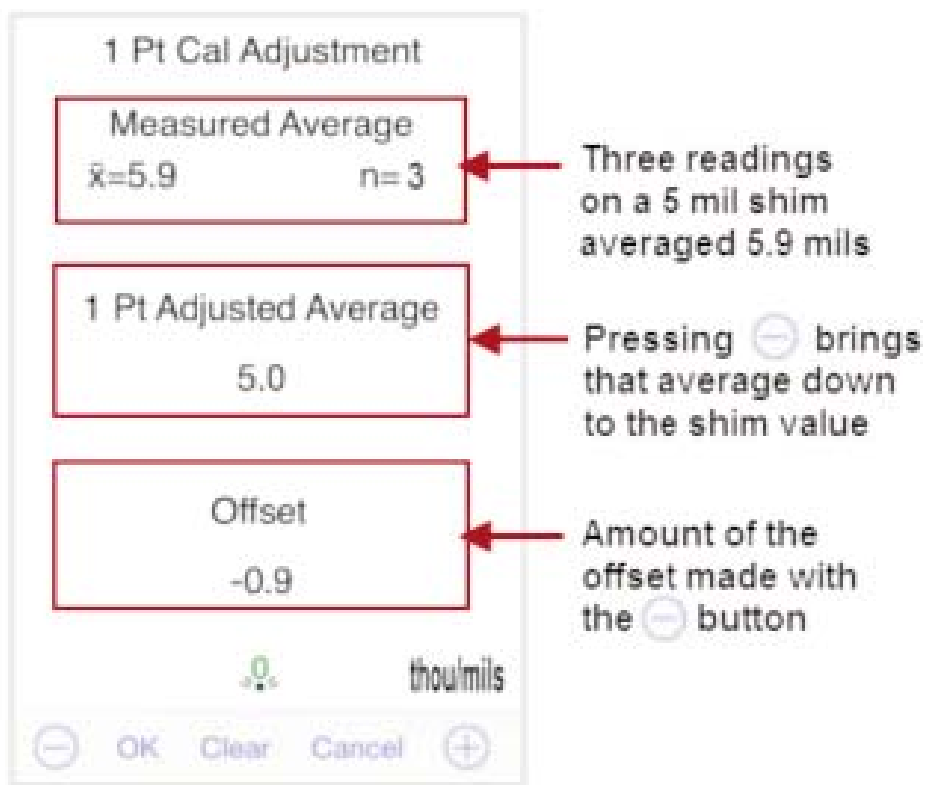
To establish “0” on a rough or curved surface, a preferred method is to take several readings on the uncoated part and average the result.

- 1 Select **Zero** from the *Cal Settings* menu.
- 2 Press  to select the number of readings to be used to obtain an average, typically 1 to 3 readings.
- 3 Repeatedly measure the uncoated part. The Gage will wait 2 seconds after placing the probe on the surface to allow the user to correctly position the probe on the surface. After the last reading the Gage will calculate a Zero which represents the average of all the Zero readings taken. The  icon will display.
- 4 Check that the Gage now reads within tolerance of Zero.

## 1-point Calibration Adjustment

It is sometimes desirable to adjust the Gage to a known thickness, such as a shim, rather than adjusting it to zero.

- 1 Select **1 Pt Cal Adjustment** from the *Cal Settings* menu.
- 2 Repeatedly measure the known reference thickness 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. The Gage will calculate and display the measurement which represents the average of all the readings taken.
- 3 If the expected reading is not obtained (within tolerance) lift the probe from the surface and adjust the reading down  $\ominus$  or up  $\oplus$  to match the expected thickness. The adjustment, also known as an offset or correction value is displayed.




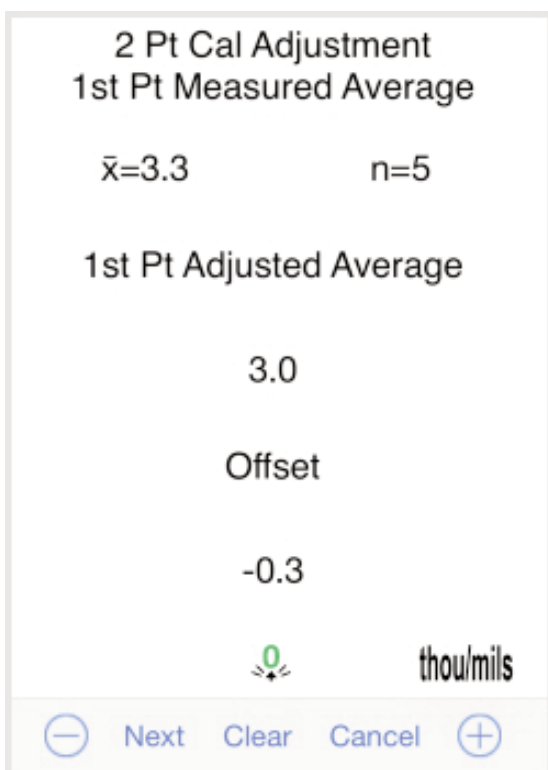
- 4 Select **OK** to accept the adjustment, **Clear** to start over or **Cancel** to exit without making any adjustments.


The  icon will display.

## 2-point Calibration Adjustment

Preferred method for very unusual substrate materials, shapes or conditions. Provides greater accuracy within a limited, defined range.

- 1 Select **2 Pt Cal Adjustment** from the *Cal Settings* menu.
- 2 Repeatedly measure thinner item 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. The Gage will calculate and display the measurement which represents the average of all the readings taken.
- 3 If the expected measurement is not obtained (within tolerance) lift the probe from the surface and adjust the reading down  $\ominus$  or up  $\oplus$  to match the expected thickness. The first point offset is displayed.
- 4 Select **OK** to accept the adjustment, **Clear** to start over or **Cancel** to exit without making any adjustments.
- 5 Repeat steps 2 - 4 for the thicker item.  
When complete, the  icon will display.



2 Pt Cal Adjustment  
1st Pt Measured Average  
 $\bar{x}=3.3$        $n=5$   
1st Pt Adjusted Average  
3.0  
Offset  
-0.3  
      thou/mils  
⊖   Next   Clear   Cancel   ⊕

### NOTE:

Calibration Adjustment information can be included in batch reports.

To include, ensure Reading Adjustment is toggled ON with the Batch Report Configuration (pg 21).




## Calibration Memory

It is often convenient to store a particular calibration adjustment before making another. Then, if you return to that part, the corresponding calibration setting can be restored.

A “setting” is any calibration adjustment. The PosiTector 6000 always displays the current calibration setting (ex. Cal 3) in the upper right corner of the display.

The default calibration setting is called Cal 1. It can only be deleted after another Cal setting has been created. It is restored as default with factory settings after a *Reset* (LED Button Reset, pg 33).

### New

Creates a new calibration setting using the next available number. By default, these new Cal settings are initially created with the probes factory settings. This is indicated with the  icon which appears at the bottom of the display.

### Open

Loads an existing Cal setting.

### Delete

Removes a setting completely from the list. That Cal number can be reused later with the *New* command. A setting cannot be deleted if it is currently in use. The default Cal 1 cannot be deleted unless another Cal has been created.

## **N Lock** (FN ferrous/non-ferrous probes only)

Select Non-Ferrous Lock (***N Lock***) when operating regularly on non-ferrous substrates. The icon will appear and the probe will only use the eddy current principle to shorten measurement time and extend battery life.


*N Lock* is useful when measuring coatings on plated steel. Normally the probe measures both the coating plus plating over the steel using the magnetic principle.

*N Lock* makes the probe measure the coating over the plating only.

Select *N Lock* to measure over slightly magnetic substrates; i.e. clear-coat on gold over nickel-plated brass. Although the probe's magnet is used for the magnetic principle, it is also used in *N Lock* to magnetically saturate a slightly magnetic substrate and allow the eddy current principle to operate unhindered.

**CAUTION:** With *N Lock* engaged it is possible to obtain a reading when measuring non-conductive coatings on steel. This is not recommended.

## **Lock Current Cal**

When toggled, the  icon will appear and all calibration settings are “locked” for the current *Cal Memory* (pg 29) to prevent further user adjustments. Uncheck to make adjustments.

## **View Current Cal**

Provides information regarding the current Cal including offset value.

## **Reset Current Cal**

Restores factory calibration for the currently open Cal (i.e. Cal 2).

# Setup Menu

## SmartLink Info

Provides information about the currently connected PosiTector *SmartLink*, Probe and PosiTector App version.

The PosiTector *SmartLink* Serial Number and unique Key are required to register for a free *PosiSoft.net* account (pg 35). An account is not required for *Copying Batches To/From PosiSoft.net* (pg 38).




## Change Units

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

Switching units will turn off *Statistics* (pg 23), *HiLo Alarm* (pg 23), and close *Memory* (pg 13).

## SmartLink Lock

Locks the PosiTector *SmartLink* to a smart device. This prevents other PosiTector App users within range (10 m / 30 ft) from inadvertently connecting to a *SmartLink*.

Toggle the *SmartLink* Lock  within the *Setup* menu to lock the PosiTector *SmartLink* to a smart device. You will have to unlock it if you want to wirelessly connect to another smart device.



Key icon will appear on search screen to indicate PosiTector SmartLink is locked to your PosiTector App.



Other PosiTector App users (within range) will not have access to your PosiTector SmartLink

**NOTE:** The PosiTector *SmartLink* is not visible on other smart devices while you are connected (once you have selected the PosiTector *SmartLink* from the *Search* screen).

## Scan

In ordinary operation, the PosiTector 6000 probe takes thickness readings every 2 seconds when placed onto a surface. Normally, the user raises the probe after it has taken a single reading and relocates it to a second location. *Scan* mode modifies this behavior in two ways.

First, measurements are taken much faster.

Second, all readings are recorded when memory is on. As the probe slides along the surface in scan mode, single readings are taken in quick succession. This may reduce the life of the probe. Recommended for smooth surfaces only.

## Fast

Increases measurement speed for most probes. Useful for quick inspection or when measuring large areas with thick coatings where proper probe positioning is not critical. Swift up/down probe movement is required. Reduced accuracy may be noted.

## Auto Sync

See *Synchronize (Sync) with PosiSoft.net* (pg 37)

## Reset

Restores factory default settings. Ideal for returning settings to a known condition.

**Suggestion:** It is recommended that you synchronize all stored measurement data to *PosiSoft.net* (pg 35) prior to performing a *Reset*. This provides a backup solution in case measurement data has been deleted in error. Data on *PosiSoft.net* is not affected by a *Reset*.

There are two available reset options. **Menu Reset** (pg 33) and **PosiTector SmartLink (LED Button) Reset** (pg 33).

## Menu Reset (*PosiTector App*)

Select **Reset** from *Setup Menu* (pg 31).

The following occurs after a warning message:

- All stored batches, measurements, images, notes, annotations are deleted.
- All calibration settings (adjustments) and *Cal Memory* are cleared and restored back to factory settings (provided *PosiTector SmartLink* is ON and connected to App). To keep calibration settings, power off the *PosiTector SmartLink* prior to performing this *Menu Reset*.

Settings are returned to the following:

*Memory* = OFF

*Statistics* = OFF

*Units* = Metric

*HiLo Limits* = OFF

*Auto Sync* = OFF

*N Lock* = OFF

*Cal Lock* = OFF

*Report Configuration Settings* = restored to default

## LED Button Reset (*PosiTector SmartLink*)

With the *PosiTector SmartLink* powered-down, press and hold the LED button until it flashes green (approximately 10 seconds).

The following occurs...

- All calibration settings (adjustments) are cleared and restored back to factory settings.

Settings are returned to the following:

*Units* = Metric

*SmartLink* = OFF

*Fast Mode* = OFF

*Scan Mode* = OFF

## Load Sample Batches

Sample measurement data can be loaded into the *PosiTector App* by selecting *Load Sample Batches* when the app is first opened.

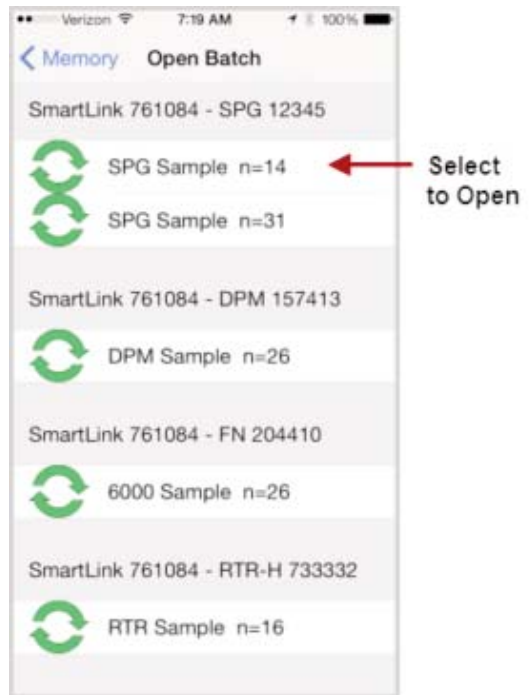


An internet (data) connection is required to load sample batches from the cloud.

To view the sample batches, select **Open** from the *Memory* menu (pg 13).

They are identified with the word "Sample" in the batch name.

- 1 Select **Menu** at the top left of the App.
- 2 Select **Memory >> Open**.  
The following screen will appear:
- 3 Select desired batch to open (touch selection).



Sample batches can be deleted from the PosiTector App by selecting Delete from the *Memory* menu (pg 13).

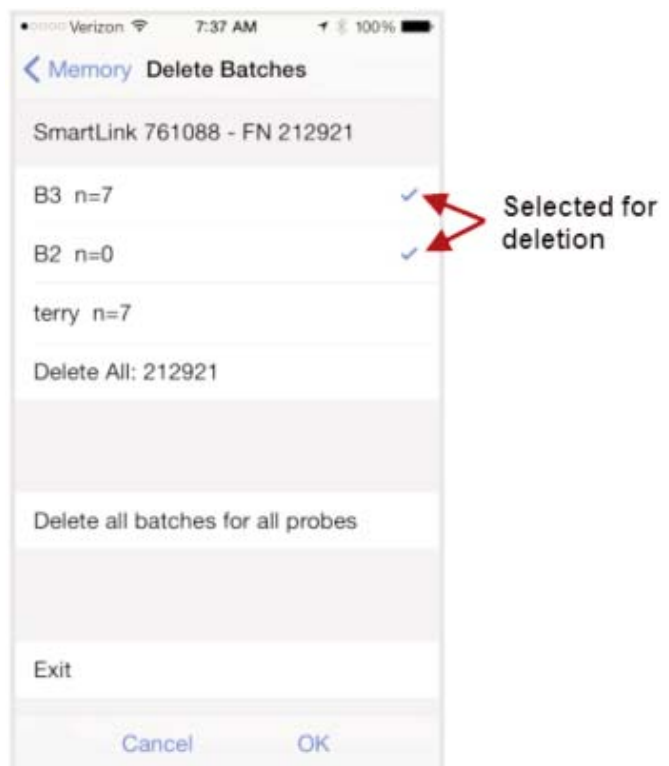
Select individual batches for deletion and select **OK** or select **Delete** all batches for all probes to delete all measurement data.

**NOTE:**

Sample Batches can be altered as desired.

Add pictures, notes, print reports to get comfortable with the app. If you would like to restore the sample batches back to their original state, simply close and re-open the PosiTector App and select **Load Sample Batches**.

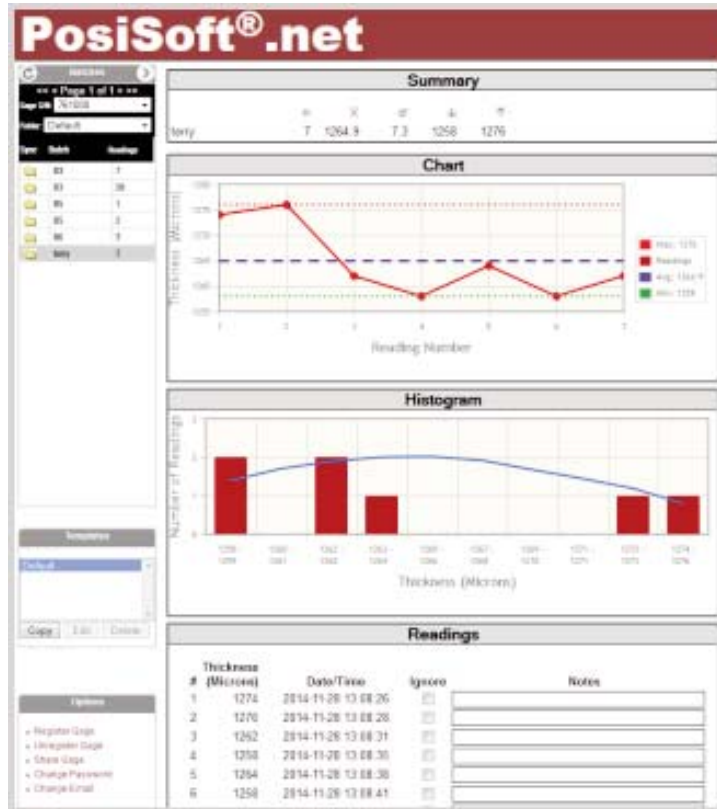
This action will overwrite the previously loaded batches.



Sample Batches cannot be synchronized with *PosiSoft.net* (pg 35).

# PosiSoft.net

**PosiSoft.net** is a free web-based application offering secure centralized management of measurement data. It is accessed using a standard internet browser from any location in the world.



- View and manipulate synchronized measurement data
- Generate reports with graphs, annotations, and images
- Share measurement data with authorized users via a secure login from any computer or web-enabled device
- Export data to popular formats such as XML and CSV (comma-separated values)
- Securely store (backup) all measurement data in the Cloud

## **NOTE:**

An account is not required to synchronize measurement data to *PosiSoft.net*.

## Synchronize (Sync) with PosiSoft.net

Synchronizing (Sync) is a two-way communication process between the PosiTector App and *PosiSoft.net* (no registration required). WiFi/cellular internet data connection required.

Stored batch data including measurements, photos, notes and annotations are included in the synchronization. After synchronization, data on the PosiTector App and *PosiSoft.net* (pg 35) will match (be the same).

New changes made to either will be included and merged during the next synchronization process.

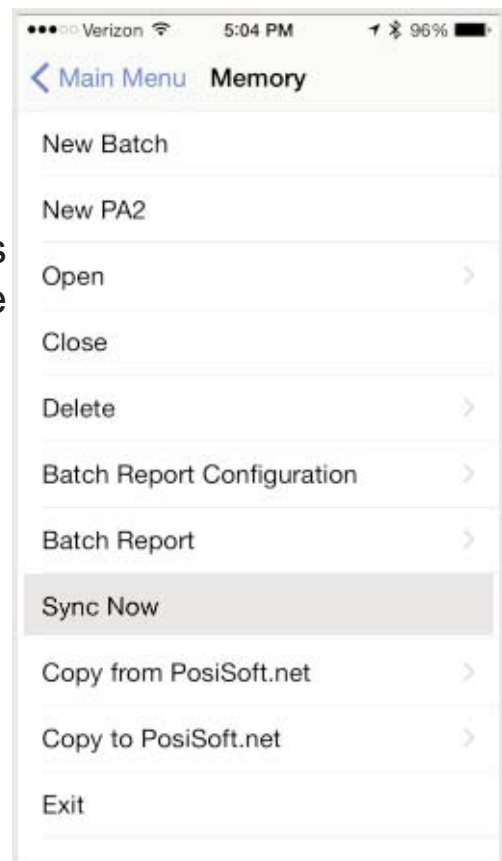
**Tip:** Prior to synchronizing, it is good practice to change batch names to something more meaningful. This helps identify the batch in the future. Example: Rename "B4" to "Job142-14" or "Section83".

Synchronization can be triggered either manually (*Sync Now*, pg 36) or automatically when batch data changes (*Auto Sync*, pg 37).

### Sync Now (*Memory Menu*)

Immediately initiates synchronization.

All batches, readings, photos, notes and batch names for all probes will be synchronized.

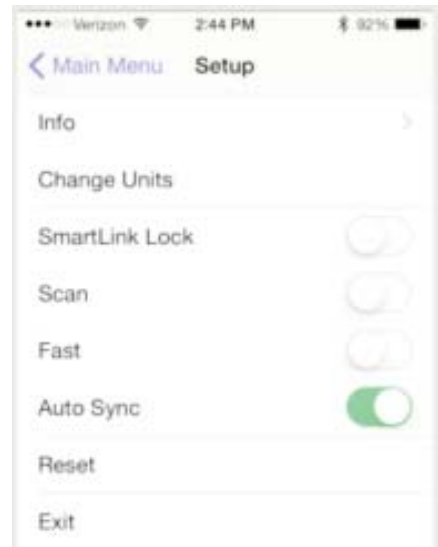




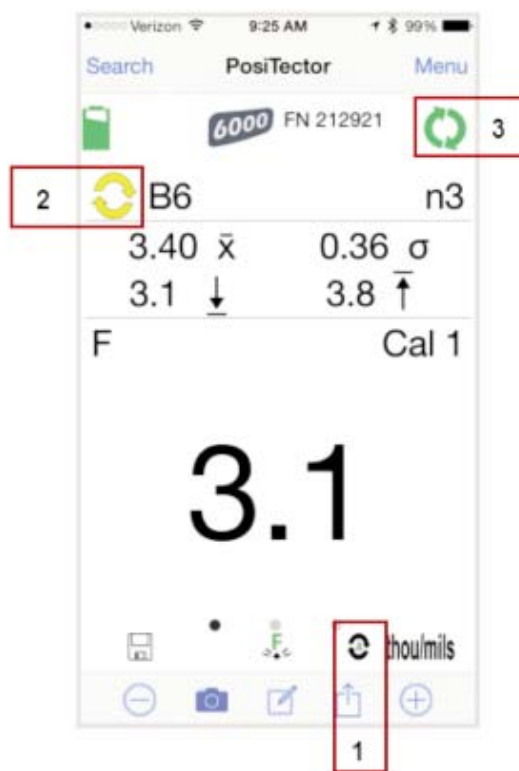
## Auto Sync (Setup Menu)

When toggled ON; measurements, images and notes will automatically synchronize with *PosiSoft.net* (pg 35).

Synchronization occurs every time batch data changes (new reading, note, photo, etc.)



This example demonstrates the PosiTector App with *Memory* and *Auto Sync* ON. A reading has been stored within the app and is in the process of synchronizing with *PosiSoft.net*.



(1) **Auto Sync icon** (appears when mode is ON)

(2) Batch Synchronization status with *PosiSoft.net*

**Yellow icon** = batch data has changed since last sync  
**Green icon** = batch synchronized

(3) Synchronization transfer status with *PosiSoft.net*

**Green icon** = successfully synchronizing  
**Red icon** = attempting synchronization

If successful communication is not established after a period of time, the app will stop trying and the red icon will disappear. Ensure that your smart device has an internet/cellular data connection.

*Auto Sync* (pg 37) is an ideal backup solution for your measurement data. Data can be copied back to the PosiTector App on the same smart device or another (ideal for switching between smart devices).

To view/interact with synchronized data on *PosiSoft.net* (pg 35), registration of your PosiTector *SmartLink* is required (free account). To transfer all stored batches, select **Sync Now**.

## Copy To/From PosiSoft.net (Memory Menu)

*Sync Now* (pg 36) synchronizes all batch data for all probes associated with the connected PosiTector *SmartLink*. Sometimes only a single batch or select batches is desired for transfer.

*Copy to or Copy from PosiSoft.net* allows the selection of single or multiple batches for transfer.

Ideal solution for switching between smart devices (phone and tablet). Pickup exactly where you left off.

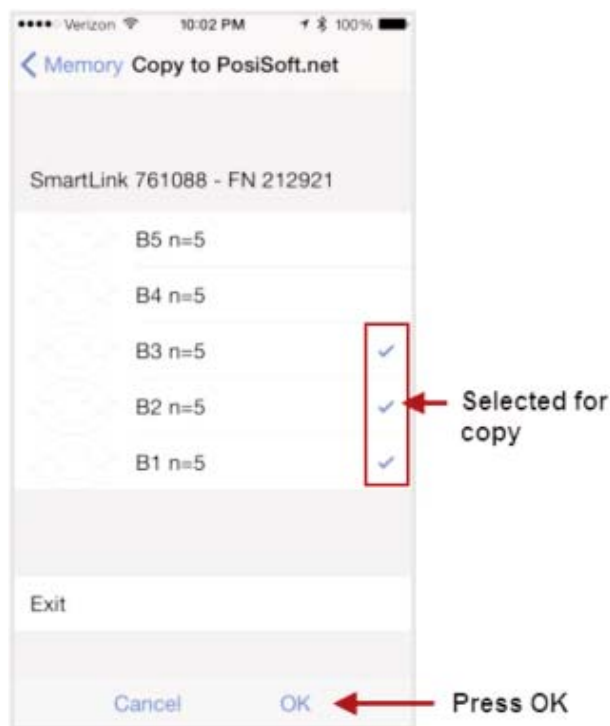
## Copy to PosiSoft.net

Select an individual batch or batches to copy to PosiSoft.net.

Ideal when you don't require transferring or synchronizing all stored batches.


The selected batches will be copied to *PosiSoft.net* (pg 35) and you will be returned back to the main measurement screen.


If the batches already exist on *PosiSoft.net* you will be prompted with an overwrite warning message.



"At least one of the batches you selected already exists on PosiSoft.net (pg 35). Press **OK** to overwrite existing batches. Pressing **Cancel** will not copy the batches"

If **OK** is pressed, the existing batch on *PosiSoft.net* will be overwritten. **This action cannot be un-done.**

The copied batches will be identified with a  symbol within the *Copy to PosiSoft.net* view.


The  means that the batch has been previously copied. It is not an indication that batch data is in sync.

If additional measurements have been taken or batch data has changed, select **Sync Now** to ensure that data is in sync between the smart device and *PosiSoft.net* (pg 35).



## Copy from PosiSoft.net

Select an individual batch or batches to copy from PosiSoft.net to your local PosiTector App.

The  means that the batch has been previously copied. It is not an indication that batch data is in sync.

If additional measurements have been taken or batch data has changed, select **Sync Now** to ensure that data is in sync between the smart device and *PosiSoft.net* (pg 35).



**NOTE:** You must have connected the PosiTector App to a PosiTector *SmartLink* previously to be able *Copy To or From PosiSoft.net* (pg 38). This initial connection associates the PosiTector App with the unique identifiers (serial number and key) stored within the PosiTector *SmartLink*. For security purposes, this information is required for the PosiTector App to communicate with *PosiSoft.net* (pg 35). The PosiTector App will retain this association for all connected PosiTector SmartLinks until a *Reset* (pg 32) has been performed.

Once associated, you can *Copy To and From PosiSoft.net* with or without a PosiTector *SmartLink* connected.

## **Switching between Smart Devices**

The PosiTector *SmartLink* easily switches between multiple smart devices (i.e. phones and tablets). Batch data can be transferred between devices using the *Copy to and Copy from PosiSoft.net* (pg 38) features.

For example, you may wish to collect measurement data in the field with a smart phone and then document and generate reports on a tablet back at the office.

*SmartLink Lock* (pg 31) must be off for other devices to be able to connect to the PosiTector *SmartLink*. Ensure this is off prior to switching smart devices.

### **PosiTector *SmartLink* only (no batch data)**

Ensure the PosiTector *SmartLink* is disconnected from the original smart device. Close the PosiTector App or return to the *Search* screen.

Open the PosiTector App on another smart device. Select the PosiTector *SmartLink* (identified by connected probe type and serial number) from the list.

Batch measurements taken on the previous smart device are not present by default. To get batch data from a previous device see below.

## PosiTector *SmartLink* with batch data

*Sync* (pg 36) or *Copy* (pg 38) batch measurement data to *PosiSoft.net* (pg 35) prior to disconnecting the PosiTector *SmartLink* from the original device.

Ensure the PosiTector *SmartLink* is disconnected from the original smart device. Close the PosiTector App or return to the *Search* screen.

Open the PosiTector App on another smart device. Select the PosiTector *SmartLink* (identified by connected probe type and serial number) from the list.

Select ***Copy from PosiSoft.net*** from the *Memory* menu and choose the desired batches to include in the copy. Press **OK**.

The chosen batches will be copied from *PosiSoft.net* to your smart device. Open a batch by selecting ***Open Batch*** from the *Memory* menu. Continue right where you left off.

**NOTE:** You must have connected the PosiTector App to a PosiTector *SmartLink* previously to be able *Copy To or From PosiSoft.net* (pg 38). This initial connection associates the PosiTector App with the unique identifiers (serial number and key) stored within the PosiTector *SmartLink*. For security purposes, this information is required for the PosiTector App to communicate with *PosiSoft.net* (pg 35). The PosiTector App will retain this association for all connected PosiTector *SmartLinks* until a *Reset* (pg 32) has been performed.

Once associated, you can *Copy To and From PosiSoft.net* with or without a PosiTector *SmartLink* connected.

## Temperature

**Operating Range:** +32° to +120°F (0 to +50°C)

PosiTector 6000 probes compensate automatically for temperature. Allow a few minutes for the probe to reach ambient temperature before measuring.

Discard the first measurement taken in a notably different temperature condition. When measuring surfaces much hotter or colder than ambient, lift the probe at least 6 inches (15cm) and allow 1 second off the surface between measurements.

# Troubleshooting

## **Probe attempts a measurement even while held in the air**

The probe may have been left near metal, including jewelry, during power-up or at rest. Possibly a finger was held over the probe. Try measuring on an uncoated object. Otherwise turn the PosiTector *SmartLink* OFF, and then ON again (pg 8). Finally try a *Reset* (pg 32).

## **Thickness readings are inconsistent**

- Probe tip may be damaged, scratched or worn.
- Make sure you lift the probe well clear of the surface between measurements.
- Try measuring on a different surface with the included plastic shims.
- Hold the probe on the surface and allow it to take several measurements. If the second and subsequent measurements are consistent, you are not putting the probe onto the surface fast enough.
- The substrate and/or coating surface is uneven, in which case inconsistent readings are to be expected. Take several measurements and average them to get a meaningful result.

## **Powers up but will not take any readings**

- Substrate may not be metal. “F” probes measure coatings on ferrous metals such as steel and iron, and “N” probes measure over non-ferrous metals such as aluminum.
- Protective cap must be removed from probe (if outfitted with one).
- An extreme calibration adjustment might have been made.

## **PosiTector *SmartLink* not displaying on search screen.**

Ensure PosiTector *SmartLink* is powered-up, LED is blinking blue and is within range.

Refresh the search using the arrow icon in the upper left of the display.

Verify *Bluetooth* is ON in smart device settings.

### **Synchronization with PosiSoft.net not successful**

Ensure *WiFi* or cellular internet connection is available and retry.

### **Camera does not function when attempting to add photo**

Verify adequate privacy permissions are set for the PosiTector App.

## **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](http://www.defelsko.com/terms)



# **DeFelsko<sup>®</sup>**

**Simple. Durable. Accurate.**

[www.defelsko.com](http://www.defelsko.com)

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Every effort has been made to ensure that the information in this manual is accurate. DeFelsko is not responsible for printing or clerical errors.

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.





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