QuickStart Guide

X-550 Pb

Lead Paint Handheld XRF Analyzers

Contents

1. Powering up the unit

Inserting the battery

The X-550 Pb is battery operated.

It comes with a wall charger. The charger light is red when it is plugged in and empty.

The battery is directional and keyed to go in only one way, so don't force it.

When the battery is plugged in, the light blinks green when it is charging, and it is solid green when it is done charging.

The battery fits into the handle of the analyzer, forming the bottom of the handle. It is also keyed.
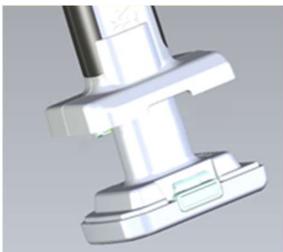
Insert the battery into the handle, until the connectors click into place.

Turning on the unit

The on/off button is on the top of the unit.

Press it to turn the unit on

It takes about 20 seconds to boot up.

The light is green when it is ready.

Wrist Strap

We recommend operators wear the wrist strap. It easily expands and tightens.

Analyzer ports

The ports underneath the analyzer:

On the far right is where you plug in if you want to run on AC power. Battery must be installed to run on AC power (the battery will charge while plugged in)
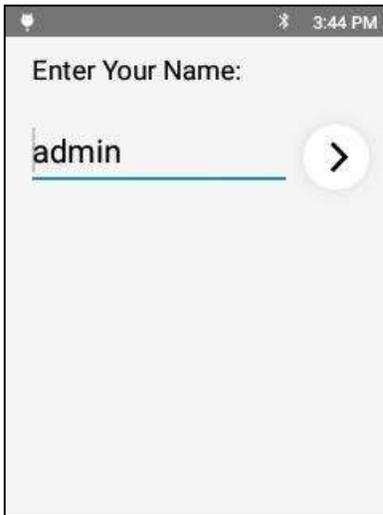
On the far left is a Micro USB-B port to download data. The analyzer has Wi-Fi and Bluetooth as well.

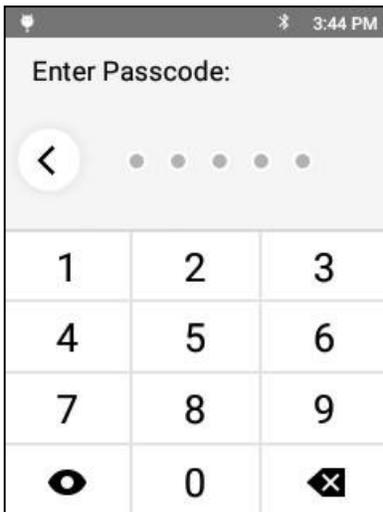The middle port is for factory firmware updates and test stand use.

2. Logging in

When the analyzer boots up, you will need to enter name and passcode.

The factory-set name is **admin**.

The factory-set passcode is **12345**.

The administrator can change this later.

The **X-Ray warning** screen appears.

*X-Rays can cause serious harm to people and animals!*

Tapping **OK** on this screen means you understand that, and that you will not use this XRF unit improperly.

It is recommended that operators wear two badges: one on the torso and one on the finger. The badges make sure operators are using the analyzer properly.

The main screen appears. Operators can choose **Analyze**, **Settings**, and **Results**.
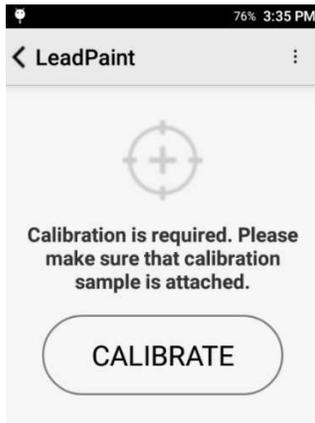
Tap **Analyze** to prepare for the calibration process.
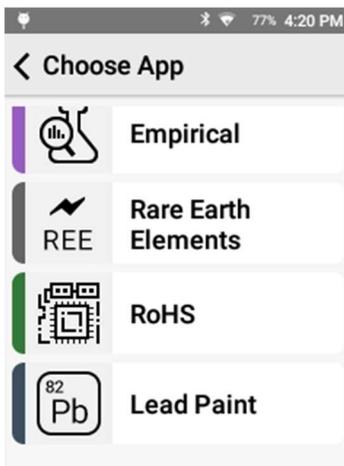
The screen listing the applications installed on your unit will appear. This list depends on how the analyzer was configured at the factory.

Tap Lead Paint.

3. Calibrating the Analyzer

There are two steps to the calibration process after you turn the unit on. If calibration is required, the unit will automatically bring up the *Calibration Window.*

First, perform the *clip* calibration. Then perform the 1.0 *lead paint standard* calibration check with the NIST (National Institute of Standards Technology) SRM 2573.
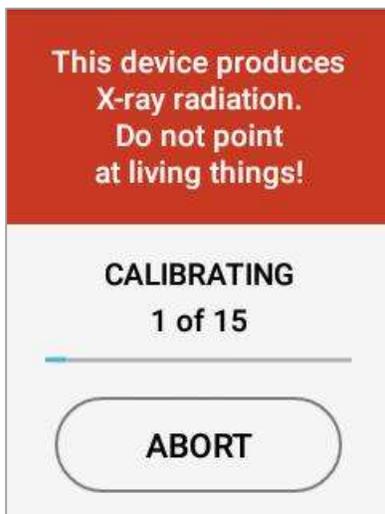
The *clip* and *lead paint standard* come with every analyzer.

We recommend that after four hours of continuous use, operators repeat those two steps.

Place the *clip* on the nose as shown.

Tap **Calibrate** on the screen to begin the process.
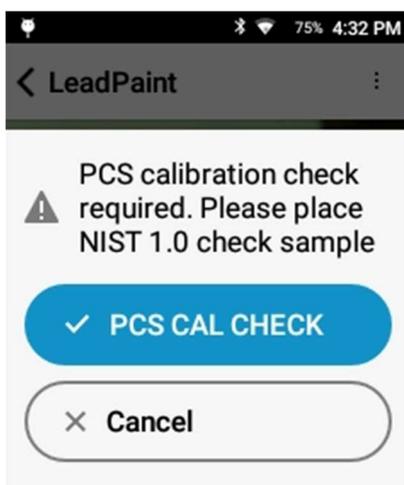
Calibration takes 15 seconds.

1 of 15 means the first second of the 15 seconds of the calibration. It is doing an "energy scale calibration."

When the instrument is emitting X-rays, the light on top will be blinking red.


When the tube is not energized, it is green.

When the clip calibration is successful, the *PCS Cal Check* screen appears.

Remove the *clip* from the front of the aperture.

Next, perform the *1.0 lead paint standard* check. Place the analyzer window on the red square of your lead paint calibration check block. The square must cover the window.

User starts test by pressing **PCS Cal Check** or pulling trigger. A second trigger pull before set test time has elapsed will end the test.

The test takes 10 seconds.
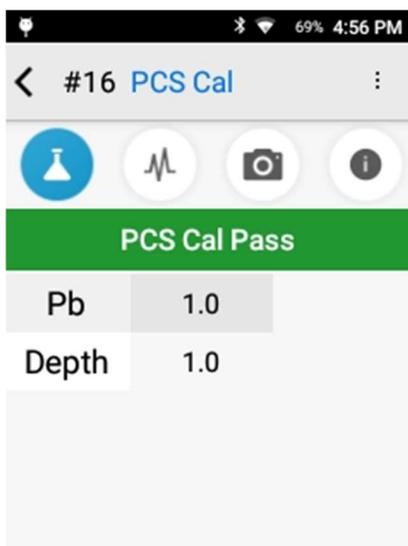
At end of test, the screen will give the lead paint reading (top left), which will include *lead*, *the value*, and whether it is a *PCS Cal Check* test. If the Pb result is not within **0.8 – 1.2**, the software will indicate the instrument calibration has failed.

A passing calibration means the instrument is ready for use.

If the calibration fails, an error message will be displayed. Confirm the standard is positioned correctly in front of the window and retry the calibration. PCS Cal Check must pass before user can take tests in Lead Paint Mode.

If the calibration continues to fail, please contact SciAps technical support at +1 339-927-9455

4. Taking a Test

When ready to begin testing material, make sure the analyzer is flush to the surface.

Use the camera display on the screen to align the properly align the analyzer with respect to the sample.
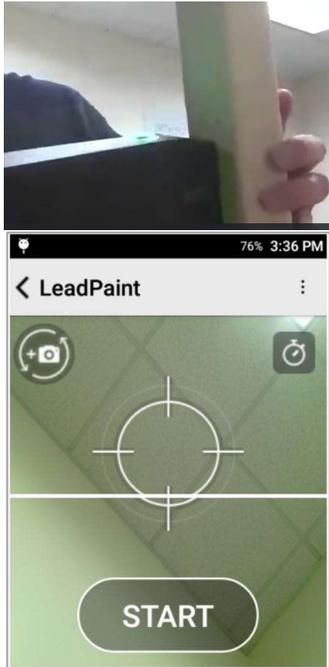
Once sample is aligned, tap **START**.

—OR—

Squeeze (and release) the trigger at the top of the handle.

The test will start.

During test, result looks like this. Live updates will show as test progresses.

Test will end when max test time is reached (Timed) or once a Positive or Negative determination can be made (Quick). See section 7 for more information on Timed and Quick Mode.

User may abort test at any time by pressing the trigger or clicking the back button (top left) from the live update.

5. Looking at Results
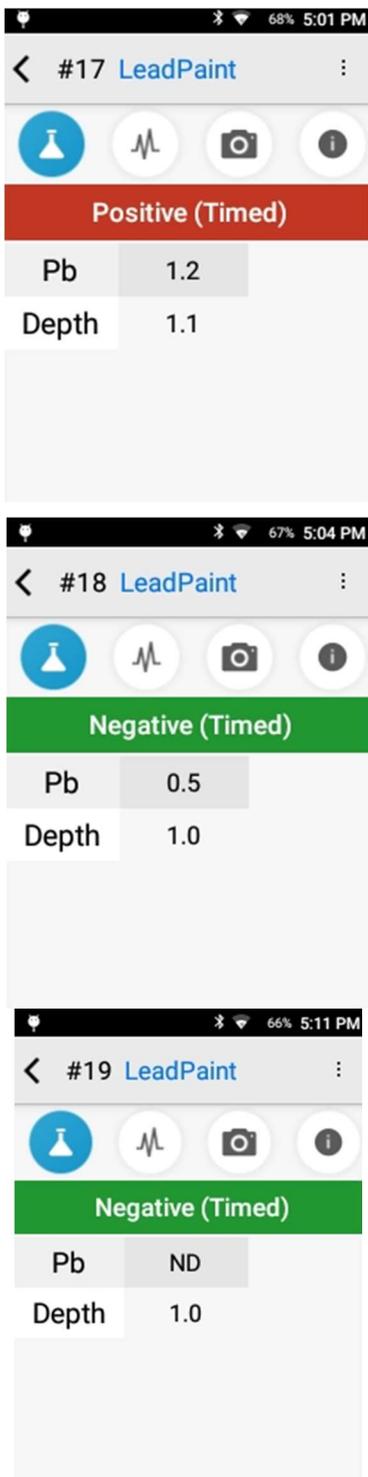
5.1 Positive and Negative results

Once the test is completed, result will get a reading number (top left) and the *Positive* or *Negative* determination will show.

The Federal Action Level for lead paint is 1.0 units or milligrams of lead per square centimeter (mg/cm^2).

Lead Paint Mode reports Pb result in mg/cm^2 if Pb is detected. It rounds the Pb result to the nearest 0.1.

The *Positive* result means the instrument has calculated that the concentration of lead is equal to or greater than the classification level.

The *Negative* result means the instrument has calculated that the concentration of lead is less than the classification level.

As some locales have different action levels, local ordinances should be consulted.

Operators will have the opportunity to change the **Classification Level**, if needed, in the Settings menu (Section 7.4).

If lead is not detected, the analyzer will show ND.

Test Mode (Timed vs Quick) will be noted on the screen as well. See Section 7.5 for more information on these two test modes.

5.2 Depth results

The *Depth* calculation tells the operator if the paint being analyzed is non-lead paint or if lead is on the surface.

A *Depth* value of 1.00 means lead is on the surface. A depth value greater than 1.0 tells the operator it is underneath unleaded paint. A larger number (like 8, 10, 20) indicates a greater number of layers of unleaded paint are present on top of the leaded paint. The Depth value will not be less than 1.0.

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6. Test Screen
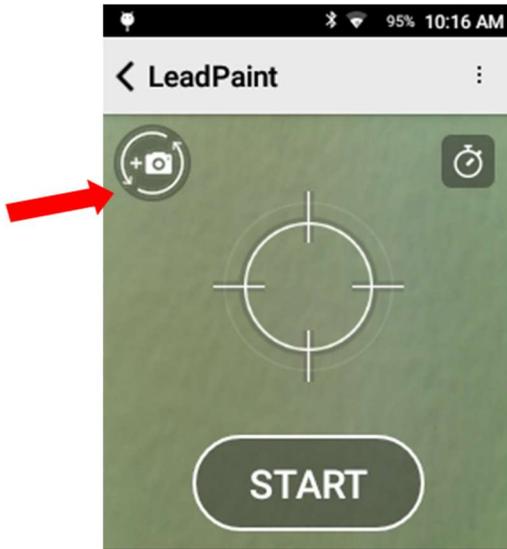
6.1 Photo icon

Tap the **Photo** icon for the camera. Operators can choose to take a photo of an exterior item. This *image* flips between the micro camera inside the nose, looking at the sample area tested, and the macro camera, which has a wider field of view. Operators can take a picture of the surface tested and store it with the test results.

Tap this *image* to take a picture. Then operators can tap **Retake** or **Save** to save picture with test results.
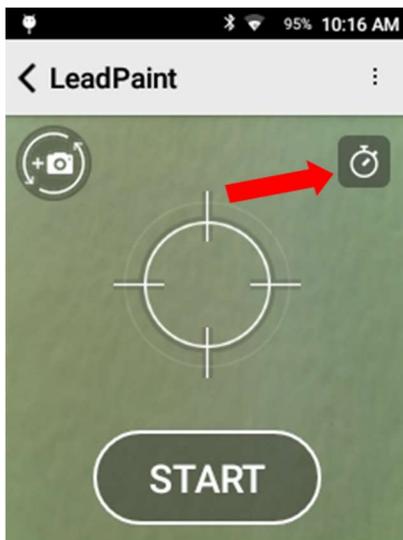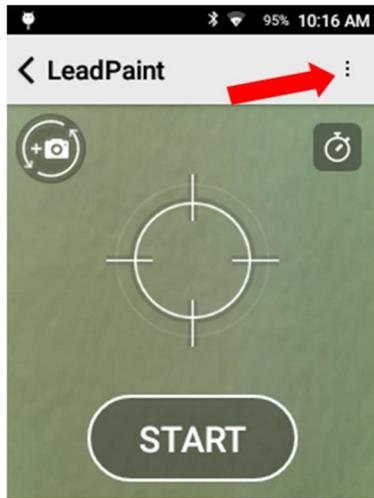
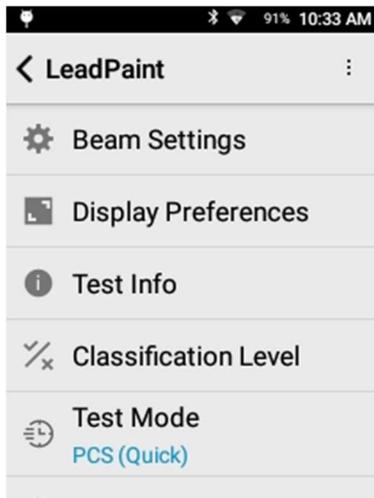## 6.2 Test Mode

The clock icon indicates analyzer Test Mode

Timed

Quick
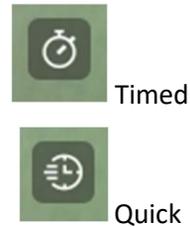
See Section 7 for more information on these modes.

7. Menu Options

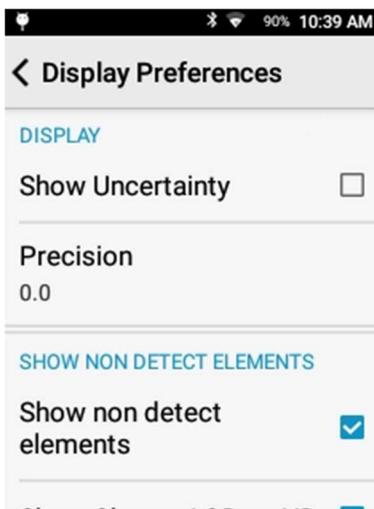More information about these menu options can be found in the full X550 Manual.

Click the (…) menu in the top left to see the menu options.

7.1 Beam Settings

Set test time

7.2 Display Preferences

Show Uncertainty – Show the ± value on the Pb measurement. Off by default. Showing this will also show Limit of Detection (LOD) when Pb is ND

Precision – Round Pb value to nearest 0.1 decimal place. User may adjust this but the PCS specifies rounding to nearest tenth (0.1) when comparing to threshold value.
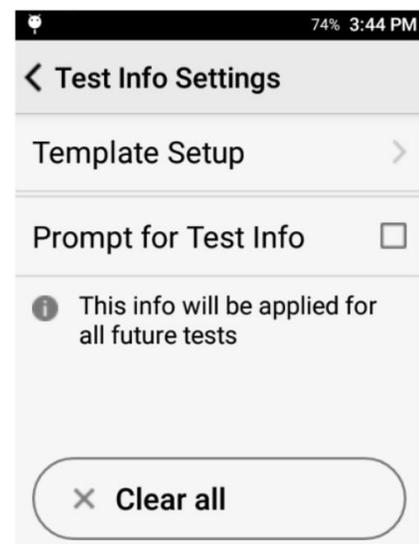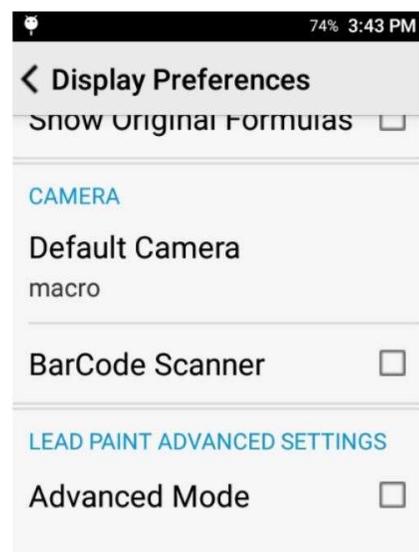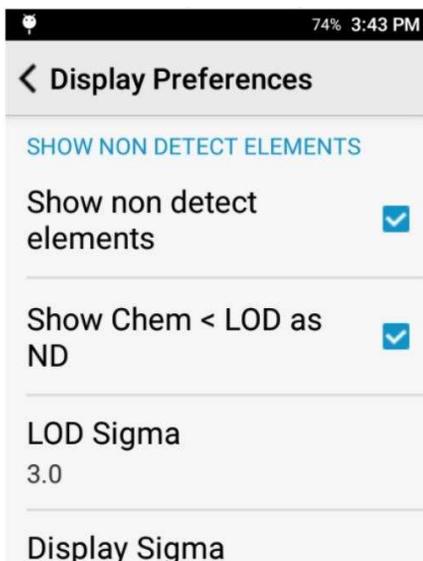
Show non detect elements and **Show Chem < LOD as ND** – these options should be checked. This will show list Pb even when not detected (ND).

LOD Sigma – 3.0. When Pb is ND and Show Uncertainty is checked, the screen will show the estimated Limit of Detection (LOD) of Pb as 3 x uncertainty.

**Display Sigma** – 1.0. If uncertainty (±) is shown, this is the 1-sigma confidence of the Pb measurement.

Advanced Mode

OFF – Show Pb (mg/cm^2) and Depth Factor only

ON – Show other elements calibrated in mg/cm^2 (Cd, Zn, Ba) and Intensities (in cps) of the 3 Pb lines alpha, beta, gamma. These additional elements must be configured separately at the factory.

7.3 Test Info

Configure template to type additional information to save with each reading.
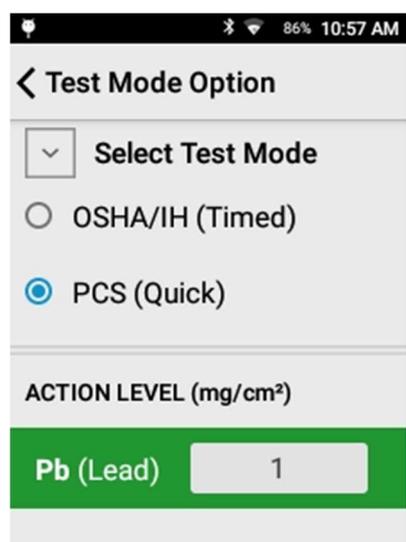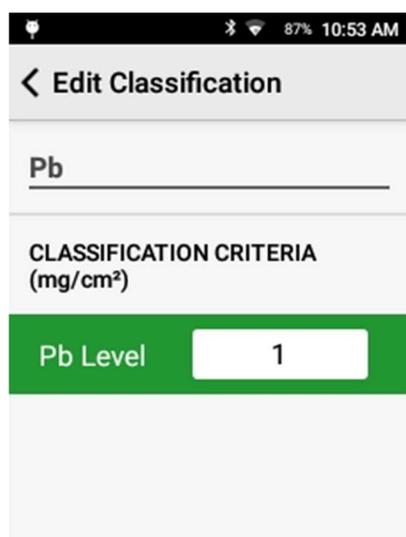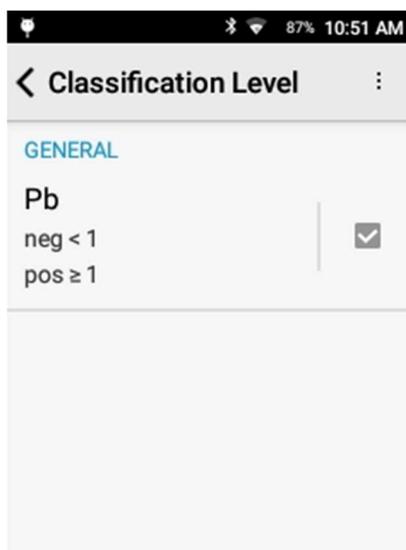
7.4 Classification Level

This level controls whether the analyzer determines a Positive or Negative classification on the screen. Tap to change.

Default is the Federal Pb level of 1.0. User may change this based on local Pb limits.

Note: This is NOT the Action Level setting that controls use of Quick Mode. The PCS specifies that the action level must be set to 1.0 regardless of classification level. In the Lead Paint application, the action level is fixed at 1.0 and user cannot change it.

7.5 Test Mode

OSHA/IH (Timed) – Test will run until set time has elapsed (default 10sec).

PCS (Quick) – Test will run until analyzer can make a clear Positive or Negative determination, up to a maximum of the set test time.

Note: This setting may affect what Pb screening threshold applies or whether an inconclusive range applies. Please consult PCS for more information.

Action Level on this screen is shown for informational purposes. User cannot change this as all X550Pb PCS require this to be set to 1.0.
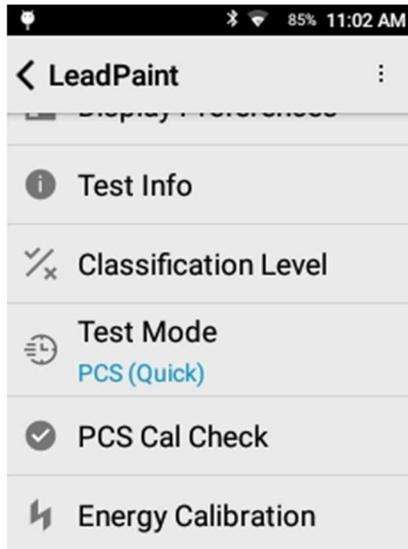
7.6 PCS Cal Check

Run additional check of 1.0 standard. The Software will enforce this every 8 hours or every time the analyzer is powered on. Users may prefer to run the check more frequently.
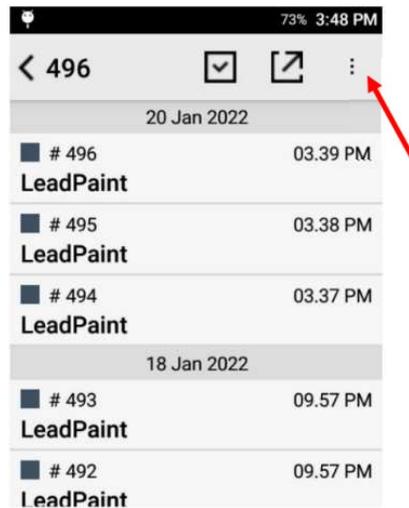
7.7 Energy Calibration

Run additional *clip* calibration. This serves as a system check. Software will require this to run at startup. Users do not have to run this more frequently.

8. Exporting tests
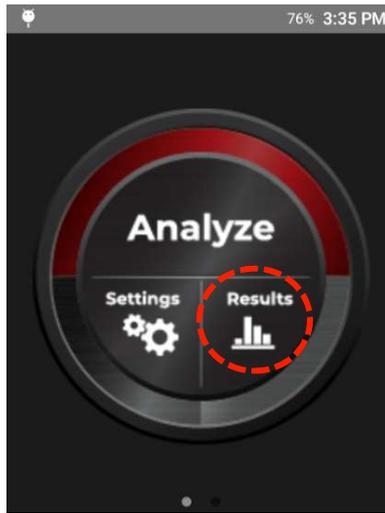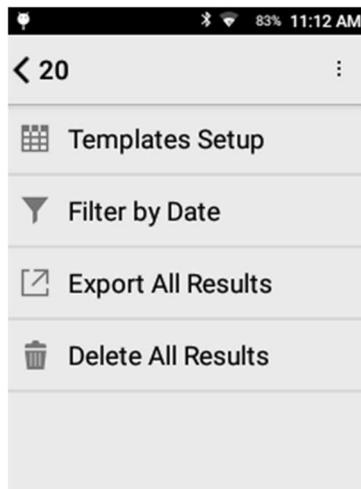
From the Home Screen, tap **Results**.

Tap the **Checkbox** ☑ button to individually select multiple tests for export.

Click on any result to view.

Tap **Export** ↗ button to get to export screen.

Tap the *Menu* button ⋮ to open export options.

**Filter by Date** to quickly export a batch of results.

Templates Setup allows user to select which elements and other fields to export.

Delete All Results will remove all results from the analyzer software. Be sure to export any needed results to csv before taking this step. Delete All Results cannot be undone.

If all results are deleted, the test counter may not reset to 1.
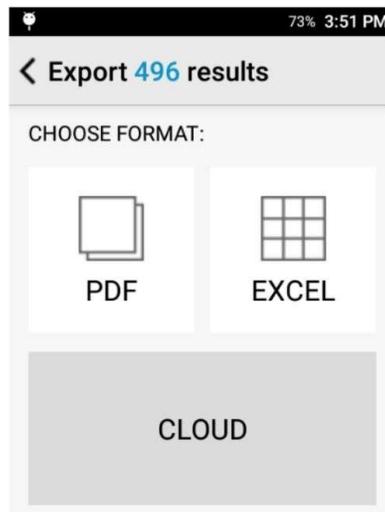
Tap either **PDF** or **EXCEL** to select the desired export format.
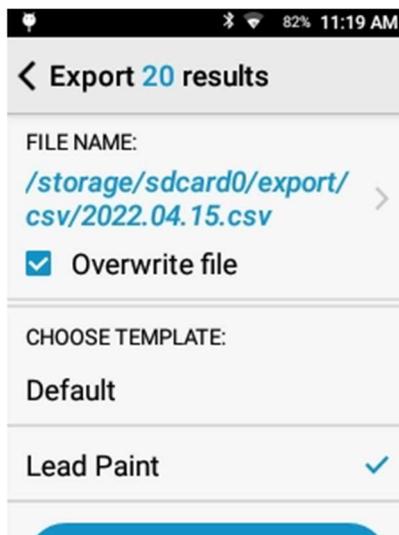
Choose **Excel**

Test results will export to SD card/export/csv.

Or tap the *filename* to change the export location.

Analyzer may have a Lead Paint export template configured. User can modify this in **Templates Setup**

Tap **Start Export**

The **X-550 Pb** uses an embedded SD card to store test results.

The *SD Card* can be accessed by connecting the analyzer to a computer using the micro-USB cable. Once connected, the analyzer's *SD Card* will show as a new drive from the computer's file explorer.

Navigate to the export location selected at time of export (default export location is *SD card\export*). Drag the exported files over from the SD Card to the desktop to save copies locally on the computer. Drag the exported files over from the SD Card to the desktop to save copies locally on the computer.
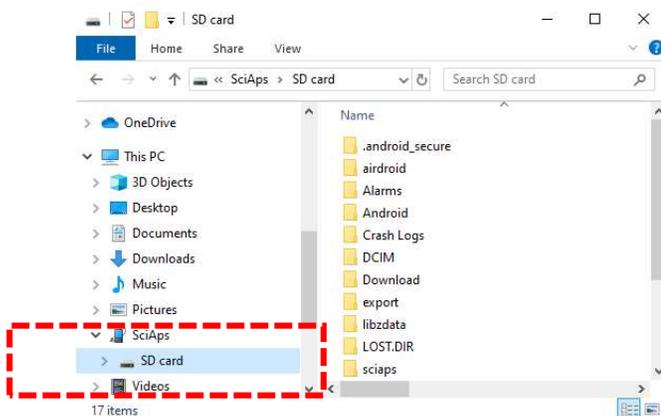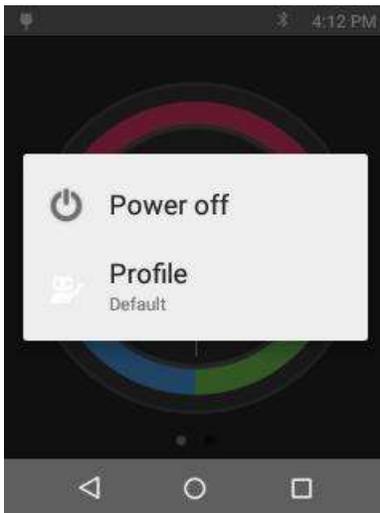
9. Turning off the Unit

Press and hold the *on/off* button for 2 seconds.

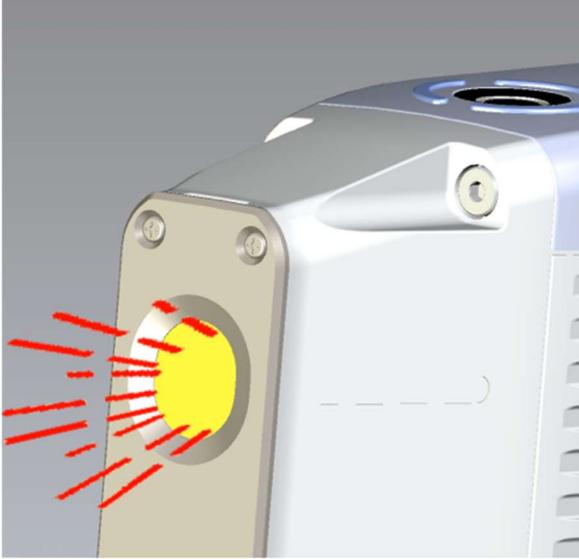The *Power off* screen appears.

Tap ***Power off***.

The unit will power off.

10. How to safely use SciAps XRF instruments

Radiation Safety is up to **you.**

As the owner or operator of an X-Ray tube device, you are responsible for understanding the safety requirements and state regulations for using your X-ray tube equipment.

When the X-550 Pb is not actively testing samples, no X-rays are emitted.

When the X-550 Pb is energized, X-rays are emitted, through the window in the nosecone.

X-rays are invisible to the human eye; you will not see them when they are being emitted.

Stay safe when using handheld XRF instruments:

Best Practices for Safe Operation:

Trigger finger should be the body part closest to the analyzer window

Run tests with the XRF pointed away from yourself and other people

Do not place hand or any other body part near nose while testing

Pay attention to where the beam is pointed

Don't hold samples in your hand

Maintain control of the analyzer

Limit operation to trained personnel