



QuickStart Guide
X-550 and X-505
Handheld XRF Analyzers



CALL GEOTECH TODAY
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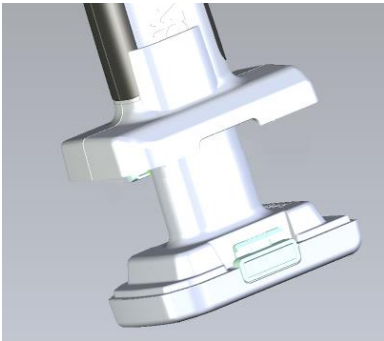
1. Powering up the unit

1.1 Inserting the battery

The X-550 is battery operated. The battery is part of the bottom of the handle.



The battery is housed in the handle and forms the bottom of the handle.



Insert the battery into the handle, until the connectors click into place.

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

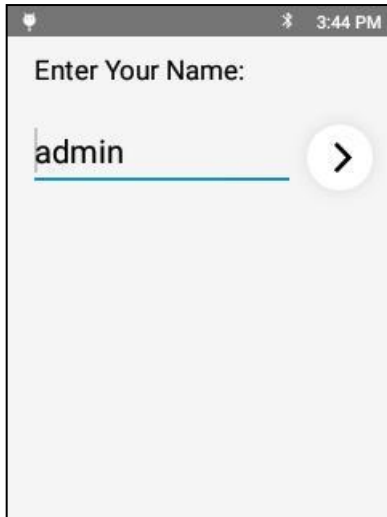
1.2 Turning on the unit



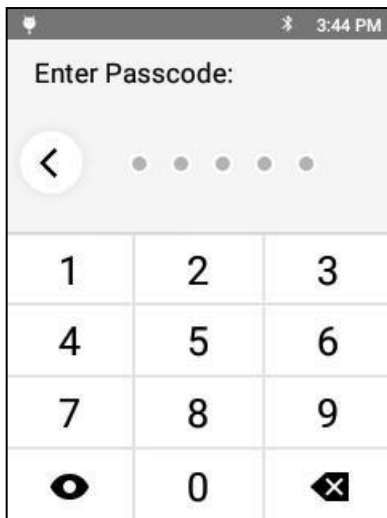
The on/off button is on the top of the unit.

Press it to turn the unit on.

2. Logging in



The factory-set name is *admin*.



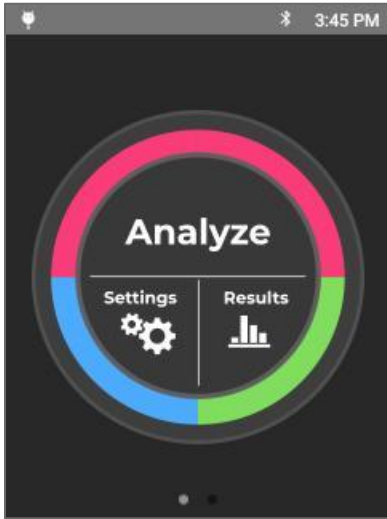
The factory-set passcode is **12345**.
The administrator can change this later on.



The *X-Ray warning* screen appears.

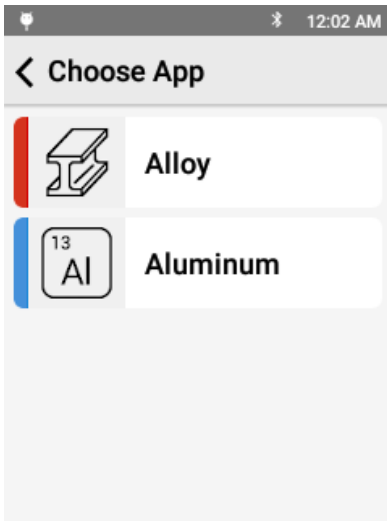
X-Rays can cause serious harm to people and animals!

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



The Analyze screen appears.

Tap **Analyze** to start your first analysis of a sample.

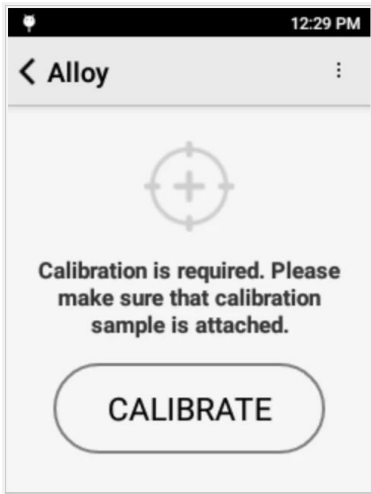


The screen listing the applications installed on your unit will appear.

Tap the mode intended for the type of analysis you intend to do.

- The rest of the screenshots in this QuickStart are from the Alloy App.*

3. Calibrating the unit



If this is the first time the unit is being used (or the first time the unit being used for the day), the unit will need calibrating.

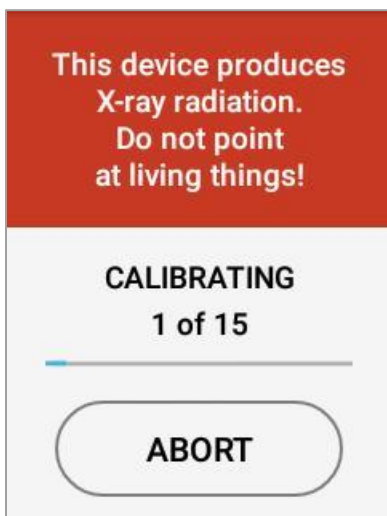
If calibration is required, the unit will automatically bring up the *Calibration window*.



Place the 316 coupon that came with the unit on the nose. If the coupon is not available, use a clean, known 316 steel sample.

Make sure the 316 coupon completely covers the analysis window

Tap *Calibrate* to begin the process.



Calibration takes 15 seconds.

1 of 15 means the first second of the 15 seconds of the calibration.

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When the calibration is successful, the Start screen appears.

Remove the coupon from in front of the aperture.

You can now use the instrument to test your samples.

If the calibration fails, an error message will be displayed. Confirm the piece of 316 coupon is positioned correctly in front of the window and retry the calibration.

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

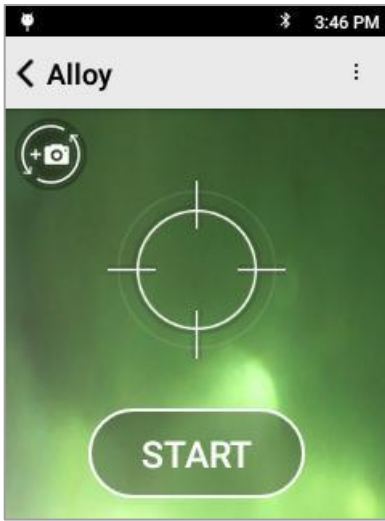
4. Taking a test

Align a sample with the window and tap **START**.

—OR—

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

The test will start.



| SWITCHING BEAMS... | | | |
|--------------------|--------|--------|--|
| Cr | 16.89% | 0.379% | |
| Mn | 1.43% | 0.177% | |
| Fe | 69.49% | 1.14% | |
| Ni | 10.60% | 0.410% | |
| Mo | 1.59% | 0.053% | |

| SWITCHING BEAMS... | | | |
|--------------------|--------|--------|--|
| Cr | 16.76% | 0.248% | |
| Mn | 1.39% | 0.106% | |
| Fe | 69.69% | 0.937% | |
| Ni | 10.47% | 0.241% | |
| Cu | 0.146% | 0.046% | |
| Mo | 1.56% | 0.032% | |

| TESTING... | | | |
|------------|--------|--------|--|
| Si | 0.108% | 0.019% | |
| Cr | 16.87% | 0.249% | |
| Mn | 1.39% | 0.107% | |
| Fe | 69.58% | 0.935% | |
| Ni | 10.37% | 0.239% | |
| Cu | 0.144% | 0.046% | |

| COMPLETED | | | |
|-----------|--------|--------|---------|
| Si | 0.108% | 0.019% | 0.0-1.0 |
| Cr | 16.87% | 0.249% | 16.0-1 |
| Mn | 1.39% | 0.107% | 0.0-2.0 |
| Fe | 69.58% | 0.935% | 64.25- |
| Ni | 10.37% | 0.239% | 10.0-1 |
| Cu | 0.144% | 0.046% | 0.0-0.7 |

Tests report findings in real time, so as the test continues and more information is obtained, the data on the screen will be updated.

When the **COMPLETED** screen appears, the test is done and the final values are given.

5. Looking at Results

| Element | Concentration 1 | Concentration 2 | Specification |
|---------|-----------------|-----------------|---------------|
| Si | 0.108% | 0.019% | 0.0-1.0 |
| Cr | 16.87% | 0.249% | 16.0-1 |
| Mn | 1.39% | 0.107% | 0.0-2.0 |
| Fe | 69.58% | 0.935% | 64.25- |
| Ni | 10.37% | 0.239% | 10.0-1 |
| Cu | 0.144% | 0.046% | 0.0-0.7 |

The top portion of the screen lists:

- Test Number
- Top Grade Match
- Grade Match Score where 100 is a perfect score meaning that all elements measured fit within the alloy grade specification.

| Element | Concentration 1 | Concentration 2 | Specification |
|---------|-----------------|-----------------|---------------|
| Si | 0.108% | 0.019% | 0.0-1.0 |
| Cr | 16.87% | 0.249% | 16.0-1 |
| Mn | 1.39% | 0.107% | 0.0-2.0 |
| Fe | 69.58% | 0.935% | 64.25- |
| Ni | 10.37% | 0.239% | 10.0-1 |
| Cu | 0.144% | 0.046% | 0.0-0.7 |

The first column on the left lists all detected elements. Scroll down to see additional elements.

The second column is the concentration of that element.

The third column is the “confidence” or “uncertainty” of the measurement.

The green column on the right is the *Specifications* column.

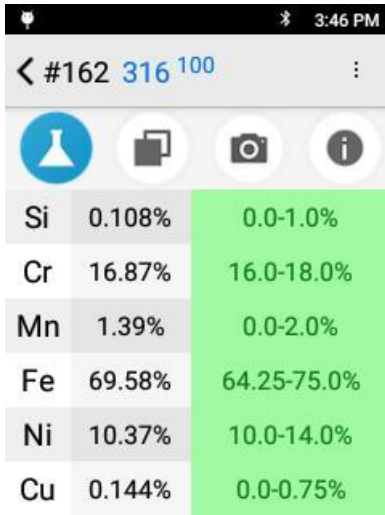
| Element | Concentration 1 | Concentration 2 | Specification |
|---------|-----------------|-----------------|---------------|
| Si | 0.108% | 0.019% | 0.0-1.0 |
| Cr | 16.87% | 0.249% | 16.0-1 |
| Mn | 1.39% | 0.107% | 0.0-2.0 |
| Fe | 69.58% | 0.935% | 64.25- |
| Ni | 10.37% | 0.239% | 10.0-1 |
| Cu | 0.144% | 0.046% | 0.0-0.7 |

Specifications column lists the specification of the best alloy grade match for the determined chemistry of the sample.

The grade specification will be highlighted in green if a detected element is specified in the alloy grade *and* the amount detected is within the grade’s specification.

In this example test, all elements found in the sample are in grade 316 and are within spec for that grade.

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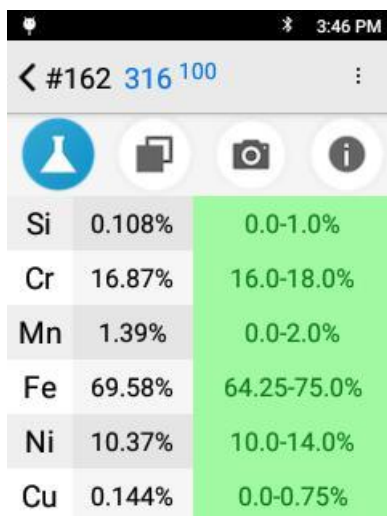
| Element | Detected Value | Specification Range |
|---------|----------------|---------------------|
| Si | 0.108% | 0.0-1.0% |
| Cr | 16.87% | 16.0-18.0% |
| Mn | 1.39% | 0.0-2.0% |
| Fe | 69.58% | 64.25-75.0% |
| Ni | 10.37% | 10.0-14.0% |
| Cu | 0.144% | 0.0-0.75% |

To see the complete information in the *Specification* column, tap it.

The column will expand, showing the range of the spec for the detected element for that grade.

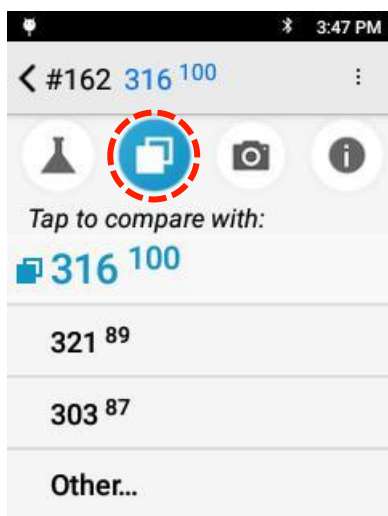
In this test, all the detected elements are both found in SS 316, and are within range for SS 316, so all the ranges are green.

6. Compare results to a different grade



| Element | Measured Percentage | Match Range |
|---------|---------------------|-------------|
| Si | 0.108% | 0.0-1.0% |
| Cr | 16.87% | 16.0-18.0% |
| Mn | 1.39% | 0.0-2.0% |
| Fe | 69.58% | 64.25-75.0% |
| Ni | 10.37% | 10.0-14.0% |
| Cu | 0.144% | 0.0-0.75% |

The *best match* is always shown when a test completes. You can look at other grades to see why they are not the best match.



Tap to compare with:

| |
|--------------------|
| 316 ¹⁰⁰ |
| 321 ⁸⁹ |
| 303 ⁸⁷ |
| Other... |

Tap the **Compare** icon.

The top three (3) matches will be listed.

The superscripted numbers after the grades is the grade match score for that grade.

Tapping **Other...** will show you additional grades that have lower grade scores than the three listed.

In this image, the grade match score for the top three (3) results are:

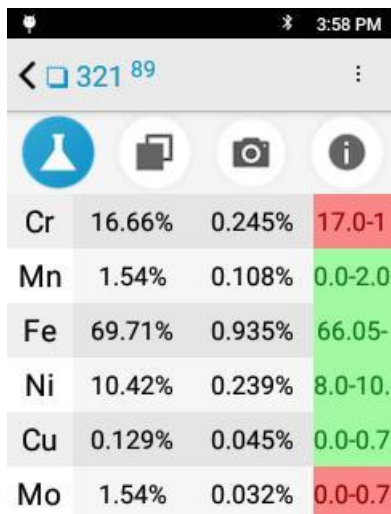
100 for 316

89 for 321

87 for 303

Tap on a grade listed to see why it is not the best match.

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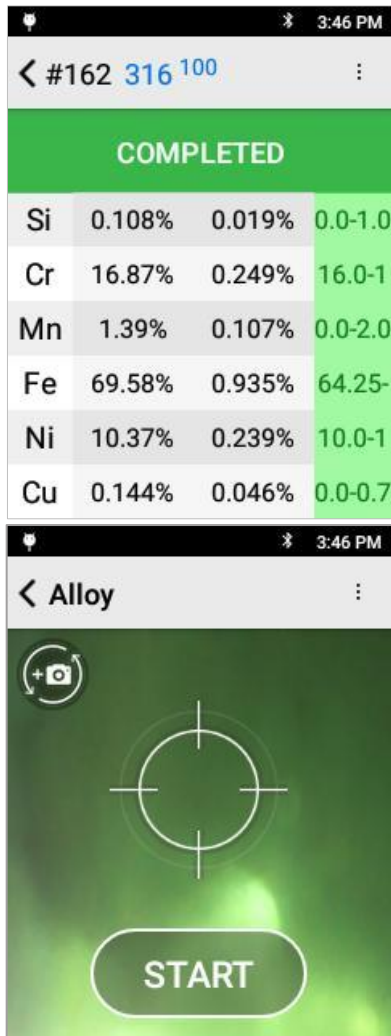


| Element | Value 1 | Value 2 | Specification |
|---------|---------|---------|---------------|
| Cr | 16.66% | 0.245% | 17.0-1 |
| Mn | 1.54% | 0.108% | 0.0-2.0 |
| Fe | 69.71% | 0.935% | 66.05- |
| Ni | 10.42% | 0.239% | 8.0-10. |
| Cu | 0.129% | 0.045% | 0.0-0.7 |
| Mo | 1.54% | 0.032% | 0.0-0.7 |

In this example, 321 was selected.

Cr and Mo are not within specification for 321.

7. Taking the next test



Taking additional tests is the same as taking the first test. You may start another test from the result screen or use the back button to return to the targeting screen

From the current result:

Align a sample with the window and squeeze (and release) the trigger.

OR

From the start screen, align a sample and tap **START**

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

The test will start.



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| SWITCHING BEAMS... | | | |
|--------------------|--------|--------|--|
| Cr | 16.89% | 0.379% | |
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| SWITCHING BEAMS... | | | |
|--------------------|--------|--------|--|
| Cr | 16.76% | 0.248% | |
| Mn | 1.39% | 0.106% | |
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| Ni | 10.47% | 0.241% | |
| Cu | 0.146% | 0.046% | |
| Mo | 1.56% | 0.032% | |

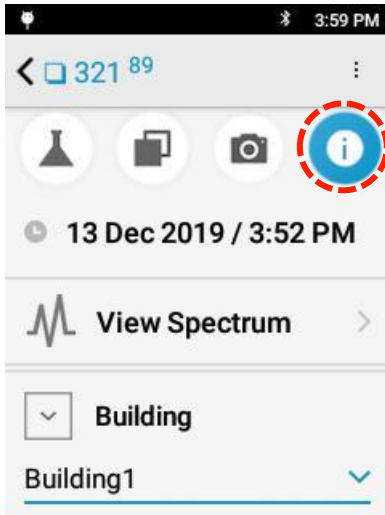
| TESTING... | | | |
|------------|--------|--------|--|
| Si | 0.108% | 0.019% | |
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| Mn | 1.39% | 0.107% | 0.0-2.0 |
| Fe | 69.58% | 0.935% | 64.25- |
| Ni | 10.37% | 0.239% | 10.0-1 |
| Cu | 0.144% | 0.046% | 0.0-0.7 |

Tests report findings in real time, so as the test continues and more information is obtained, the data on the screen will be updated.

When the *COMPLETED* screen appears, the test is done and the final values are given.

8. Information about the test



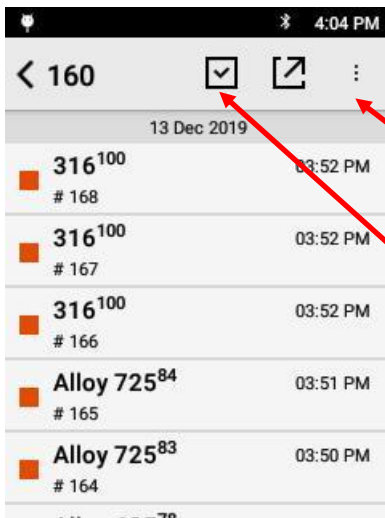
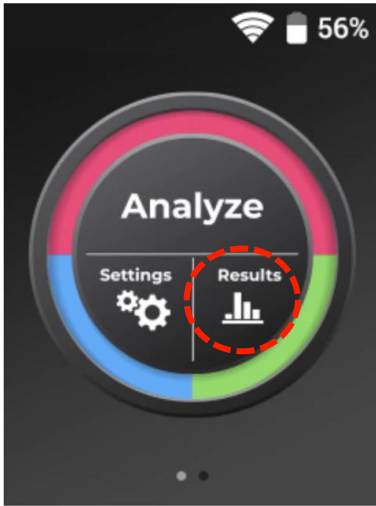
Tap the “i” icon to see the available information about the specific test.

You can view

- Date and time,
- Spectrum, and
- Other user-created information of the test

9. Exporting tests

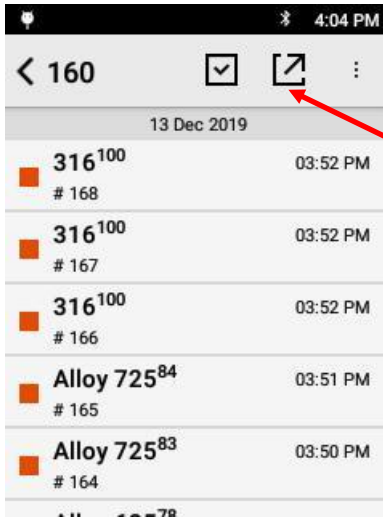
From the Home Screen, tap **Results**



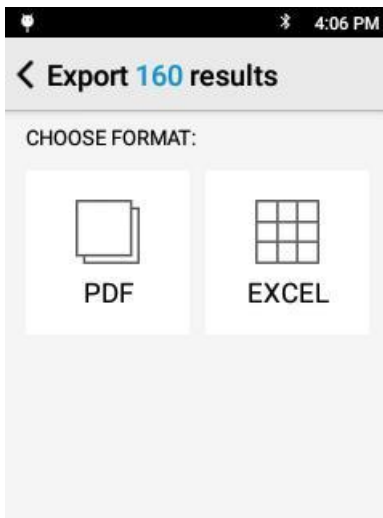
The default screen will list all of the tests taken on the instrument.

Tap the Menu button to open additional export options, including “Filter by Date” for quickly exporting a batch of results

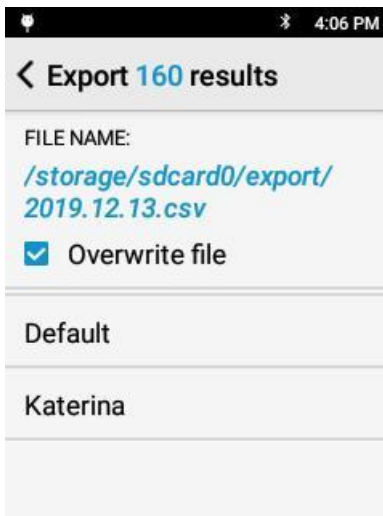
Tap the Checkbox button to individually select multiple tests for export



Tap the Export button when ready to finalize the export



Tap to select the desired export format.

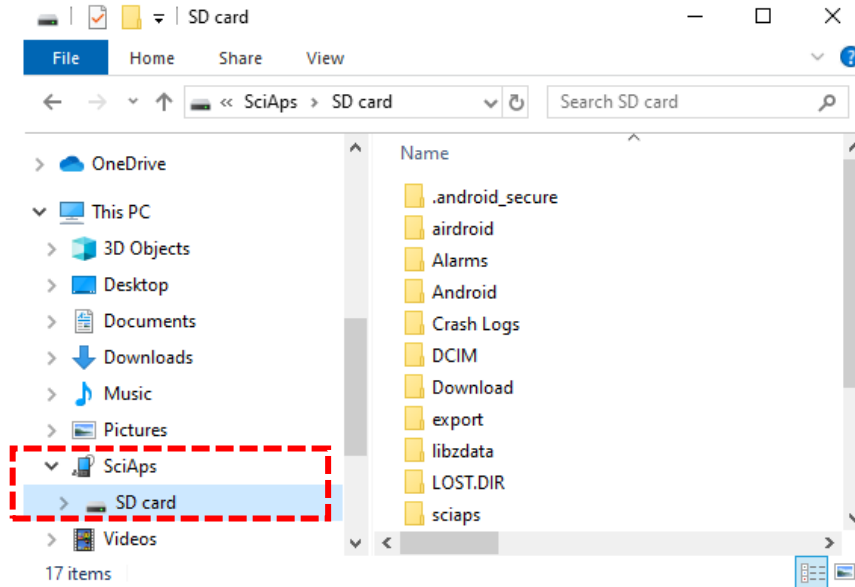


Tap the filename to change the export location or tap the template name (Default) to finish the export

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

The SD Card can be accessed by connecting the analyzer to a computer using the micro-USB cable



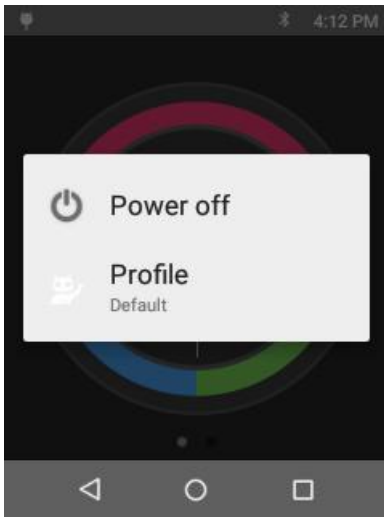
Once connected, the analyzer's SD Card will show as a new drive from the computer's file explorer

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

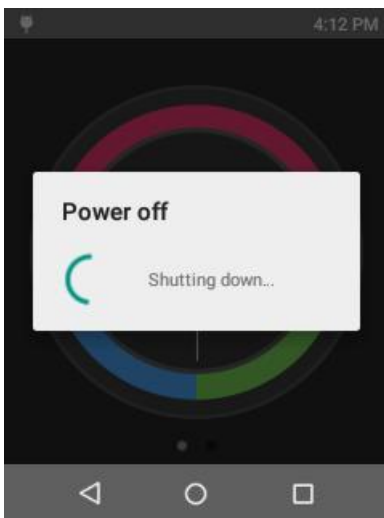
10. Turning off the Unit

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



The *Power off* screen appears.

Tap *Power off*.



The unit will power off.

11. 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 is not actively testing samples, no X-rays are emitted.

When the X-550 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 other people

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

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