QUICK START GUIDE

GEMORO XRF Gold & Precious Metal Analyzer

GEMORO®

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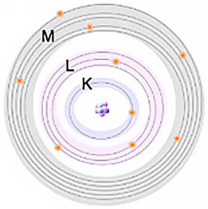
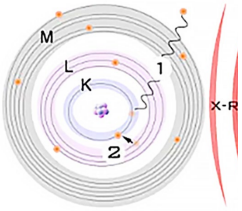
1. TECHNOLOGY

Sample analysis is broken down into four steps from the atomic level and 3 steps from the instrument level:

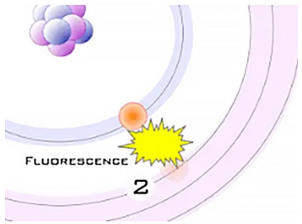
1. All atoms have a fixed number of electrons. These electrons are arranged in orbitals around the nucleus. Energy Dispersive XRF (EDXRF) typically captures activity in the three electron orbitals closest to the nucleus, the K, L, and M shells.



2. The primary photons from the X-ray tube have high enough energy that it knocks electrons out of the innermost orbitals, creating a vacancy (1). An electron from an outer orbital will move into the newly vacant space at the inner orbital to regain stability within the atom (2).

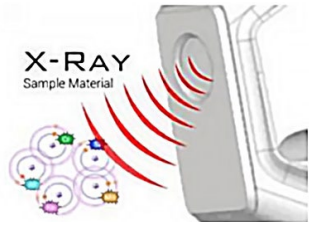


3. As the electron from the outer orbital moves into the inner orbital, it releases energy in the form of a secondary X-ray photon. This energy release is known as fluorescence. All elements produce fluorescence "characteristic" to themselves, meaning that the energy of the X-ray photon released is characteristic of that element.

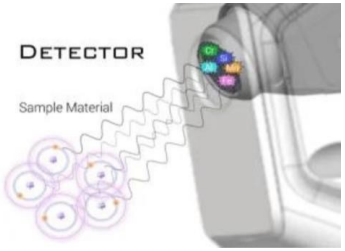


4. From the analyzer side, high-energy primary X-ray photons are emitted from an X-ray tube and strike the sample.

5. The fluorescent photons arrive at the detector, where they are absorbed and transferred into an electrical signal. The analyzer electronics and software produce a spectrum of energies detected.



6. Results can be viewed in the form of percentages, or as spectrum. The XRF can process (digitize, count) about 200,000 or more X-rays every second. These detected X-rays form a spectrum. Each peak in the spectrum is from a characteristic X-ray that was emitted by a specific element, like Cr, or Ni, etc. The height of the peak is proportional to concentration of the element. The peak height is converted to a percentage or ppm of that element via a calibration method – either fundamental parameters or factory or user-derived empirical calibrations.



2. WHAT'S IN THE BOX?

1. XRF with Wrist Lanyard
2. Calibration Piece—used once the machine is powered on. DO NOT LOSE THIS—it is required every time you turn on your device.
3. Flash Drive—this contains digital copies of both the instruction manual and application set up for your desktop computer.
4. Replacement Camera Lens
5. Screwdriver
6. Power Adapter + 2 Rechargeable Batteries
7. Computer Connecting Cable
8. Power Cables for the Power Adapter
9. Pelican Case

3. ANALYZER OVERVIEW

4. SAFETY

GENERAL SAFETY WARNINGS:

The main compartment contains high voltage electronics. Opening the main compartment will void the warranty and could potentially be hazardous to a user.

Do not attempt to service the XRF. If there is a malfunction, contact the factory for assistance. Users may replace batteries, and replace the analyzer window, but all other maintenance and repair procedures must be done with factory support or at the factory.

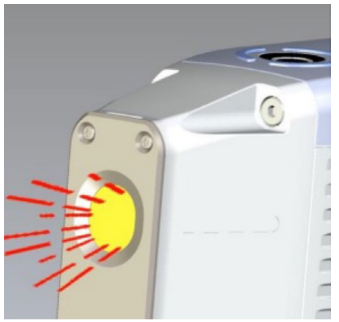
If the XRF is damaged, do not attempt to operate it. Contact the factory for service.

Ensure that the correct external power source is used for operating the analyzer or charging the battery. Voltage should be (100V-240 V/ 50-60 Hz). Do not overload an electrical outlet.

BATTERY SAFETY

The **GEM**ORO XRF analyzers use a 14.4V Li ion rechargeable battery pack. Care should be taken with this battery. Avoid shorting it. Do not immerse it in water. Store in a cool, dry, and well-ventilated area. Avoid excessive physical shock or vibration. Do not dispose of battery in fire.

Never use a damaged battery. Only charge batteries in the approved charger or in the analyzer. Never use a modified or damaged charger.



X-RAY SAFETY

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

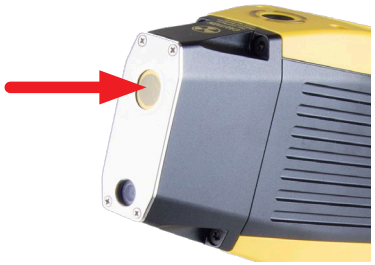
BEST PRACTICES FOR SAFE OPERATION:

- 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.

ELEMENTS THAT CAN BE DETECTED

- Titanium (Ti)
- Vanadium (V)
- Chromium (Cr)
- Manganese (Mn)
- Iron (Fe)
- Cobalt (Co)
- Nickel (Ni)
- Copper (Cu)
- Zinc (Zn)
- Tungsten (W)
- Iridium (Ir)
- Platinum (Pt)
- Gold (Au)
- Lead (Pb)
- Bismuth (Bi)
- Zirconium (Zr)
- Molybdenum (Mo)
- Ruthenium (Ru)
- Rhodium (Rh)
- Palladium (Pd)
- Silver (Ag)
- Cadmium (Cd)
- Tin (Sn)
- Antimony (Sb)

Does not measure for Aluminum (Al), Magnesium (Mg), or Silicon (Si).



CAUTION: TO AVOID DAMAGING THE XRF SENSOR – LIGHTLY TOUCH XRF NOZZLE TO TESTING PIECE.

5. GETTING STARTED

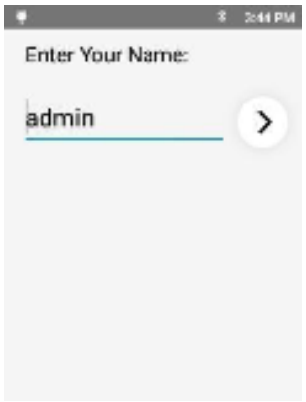
The XRF is battery operated.
The battery is housed in the handle and forms the bottom of the handle.
Insert the battery into the handle, until the connectors click into place.
The battery is directional and keyed to only go in one way, so don't force it.

TURNING ON THE UNIT

The **on/off** button is on the top of the unit. Press the button until it flashes green.

SYSTEM LOGIN

After the analyzer starts, you will need to login. The default account is admin. Simply press the > Icon to continue. Additional accounts may be generated when logged into the account. The Admin passcode is **1 2 3 4 5.** The administrator can change this later on.



WARNING SCREEN

The X-Ray warning screen appears after login. Tapping **OK** on this screen means you understand that, and that you will not use this XRF unit improperly.
WARNING :X-Rays can cause serious harm to people and animals!

LAUNCH SCREEN

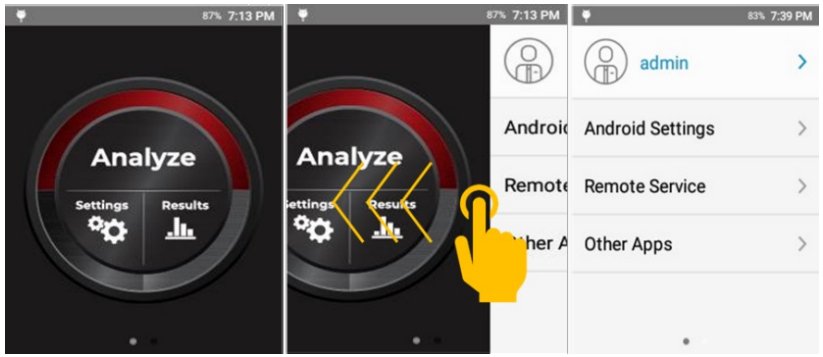
Features 3 primary functions:

- **Analyze**
- **Settings**
- **Results**

Analyze is used for all analytical testing and data collection. **Settings** controls the analyzer settings. **Results** allows you to view, review, export, and manage previously captured data. There are additional settings in the Android Settings menu. Swipe to the left to access additional features and options.

Additional options include:

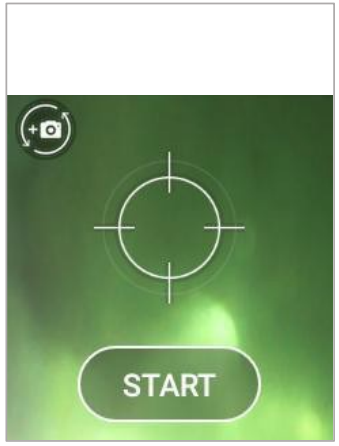
- User Management **(admin)**: change password, manage users
- **Android Settings:** Access Wi-Fi settings, Date and Time, and other non-analytical system settings
- **Remote Service for connection to Profile Builder PC Software**
- **Other Apps:** Includes Updater, and 3rd party apps such as Email or Contacts



6. ENERGY CALIBRATION

If this is the first time the unit is being used (or the first time the unit is being used for the day), the unit will need calibrating. Select **Analyze**. The unit will automatically bring up the **Calibration** window. Place the 316-keychain that came with the unit on the nose, covering the analysis window completely. Tap **Calibrate** to begin the process. Calibration takes 15 seconds. 1 of 15 means the first second of the 15 seconds of the calibration.

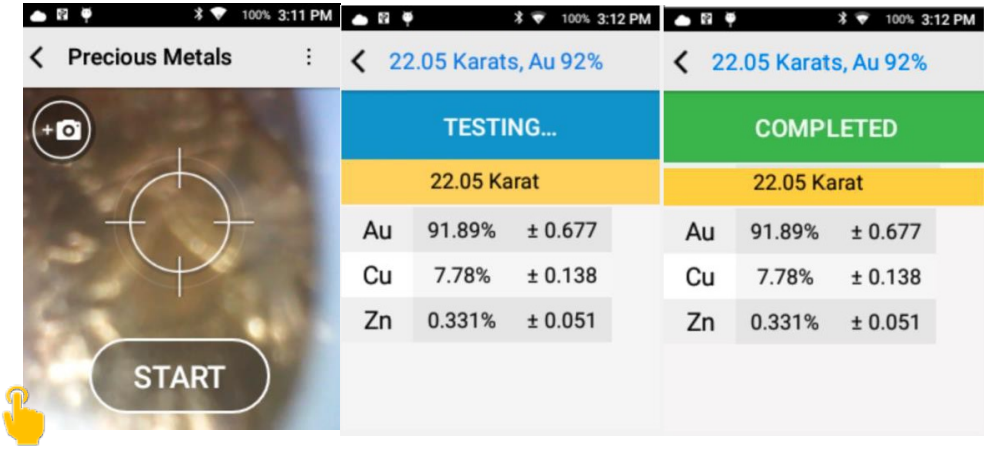
When the calibration is successful, the **Start** screen appears. Remove the 316-keychain. You can now use the instrument to test your samples.



7. TAKING A TEST

Align a sample with the window. Make sure you are making contact with the piece you are testing and you can see it in the camera. Tap **START**, OR squeeze (and release) the trigger at the top of the handle. Hold the analyzer still for the duration of the test

During a test, the system will deliver live updates to the chemistry as data is collected and processed. This phase is indicated by the test status bar. While the status bar reads **TESTING**... the test is still in progress. The sample should be kept in the same location throughout this phase. A complete test is indicated on screen by the test status bar turning GREEN and reading **COMPLETED**.

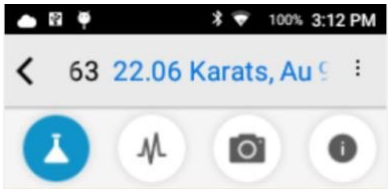


8. PRECIOUS METALS

PRECIOUS METALS RESULTS SCREEN

Results will appear when the test is complete. Elements will be on the left, their concentrations in the middle, and then uncertainties in the right column. It also shows the gold Karat value in the yellow bar. The top portion of the **Results Screen** is comprised of 5 primary components:

1. Test Number (#63 in example)
2. Chemistry
3. Spectrum
4. Camera
5. Test Info



TEST NUMBER

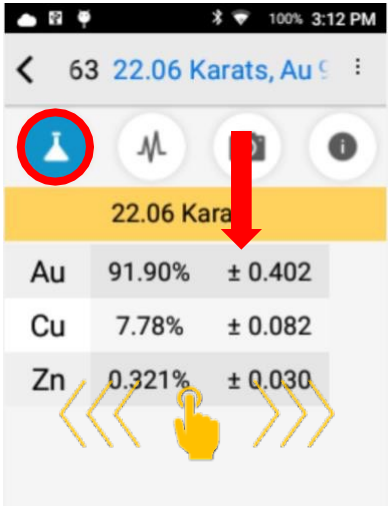
Each test is tagged with a unique **Test Number** which is incremented by one with every new test. Test number is shown at the top of screen.

NAVIGATING RESULTS

Swipe left to go to an earlier result or swipe right to go to a more recent result.

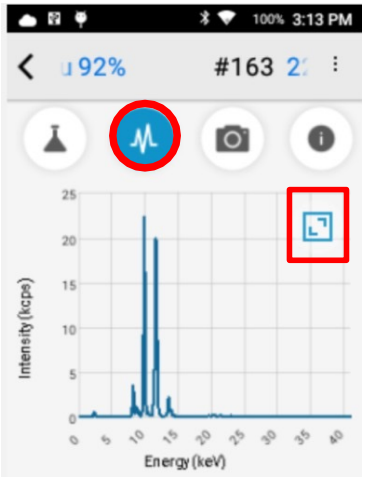
CHEMISTRY

Chemistry lives on the first page and lists all measured elements including their concentration and the precision of the measurement (±). If an element is not present it will display ND and then show the LOD of the test for that specific element in the precision column.



SPECTRUM

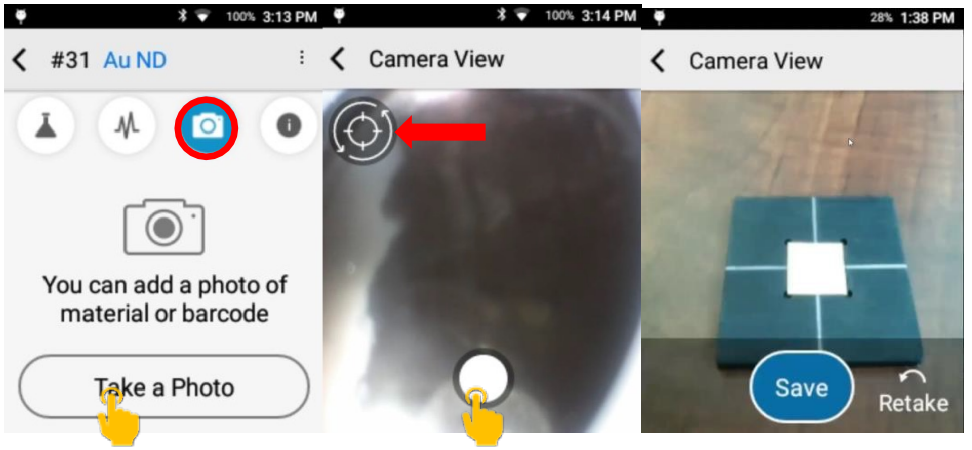
The Spectrum lives on the second page. Tap the **Spectrum Icon** to view the spectrum captured during the test. Once the spectrum is selected it is possible to press the box on the top right corner to further examine and zoom into the spectral lines for verification of results.



CAMERA

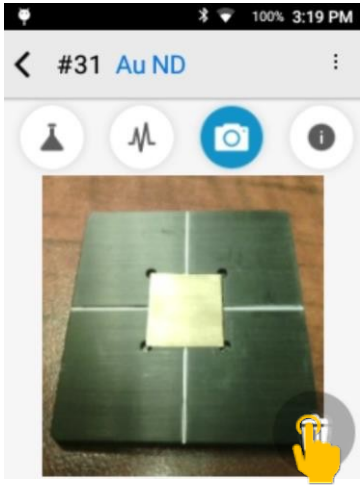
The Camera function lives on the third page and allows the operator to capture and attach a micro or macro image to a result for photo documentation. Tap the **Camera Icon** to enter the camera utility. Simply tap **Take a Photo** to open the camera view.

The camera opens in the sample view to capture an image of the analysis spot. The Switch Icon in the top left corner allows you to switch to the full view (macro) camera to capture a wider field of view.

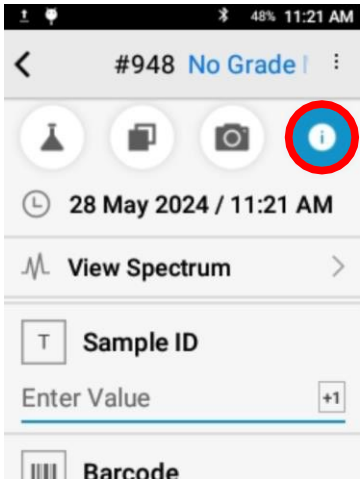


Tap the **White Button** or pull the trigger to capture an image. After capturing an image, you may save the image or retake the image.

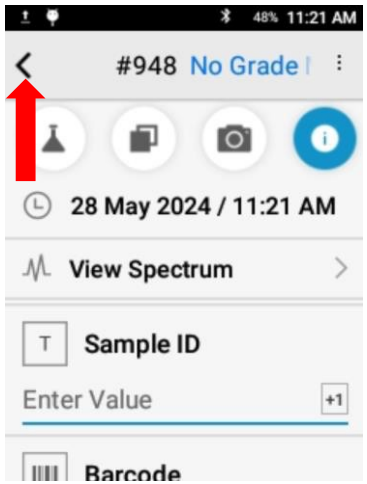
DELETE AN IMAGE
If an image is already present, the image will be displayed in the camera page. Tap the **Trash Can Icon** to delete the image.



TEST INFO PAGE
The Test Info component ⓘ lives on the fourth page. This page includes test metadata including date and time, calibration model used for calculation, and the ability to enter test info for record keeping. Tap the ⓘ Icon to access the page.

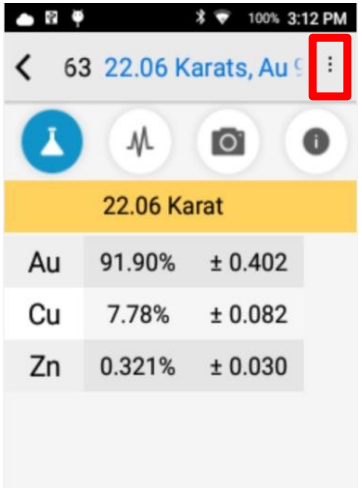


NEXT TEST
To take the next test, pull the trigger or tap the back button (<) to return to the targeting screen.



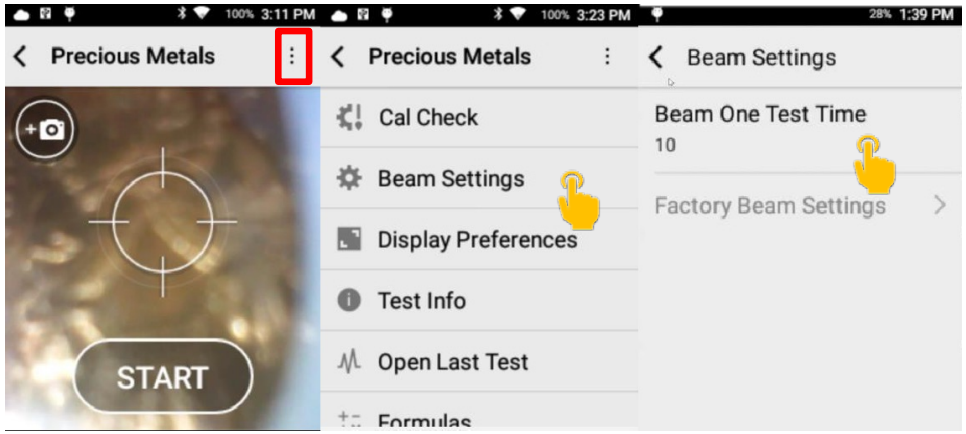
RESULTS SCREEN MENU
From the Results Screen, tap on the 3 dots to access the **Results Screen Menu.**

The following items are the same in the **Results Screen Menu** as they are in the **Testing Screen Menu**: **Display Preferences, Test Info Settings, Formulas,** and **Test Averaging**, so refer to them in the next section.



9. TEST SCREEN MENU
To access the **Test Screen Menu**, tap on the 3 dots from the Testing screen.

BEAM SETTINGS
In the **Beam Settings** you can change the test time in seconds.



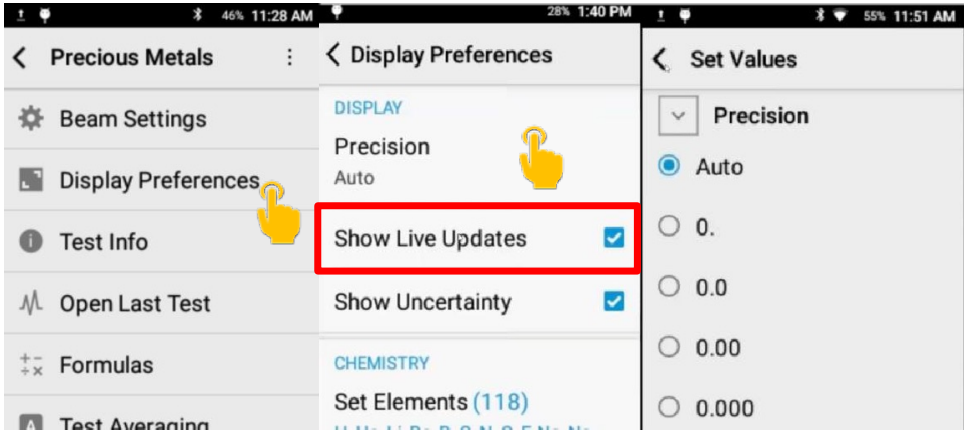
DISPLAY PREFERENCES

Our XRFs designed to be customized to the operator's needs. One of the primary ways we allow customization is the setup of the Display Preferences. This includes element display order, user selectable confidence interval, and customizable limit of detection cutoffs.

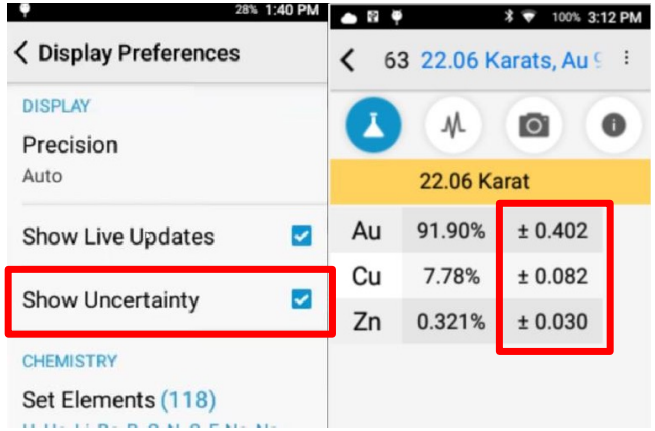
To access Display Preferences, open the Test Screen Menu and tap **Display Preferences.**

Precision controls the number of digits to display after the decimal point. This setting is respected in both the onscreen display and any exported report (CSV or PDF). Auto is the default setting and will dynamically choose, based on how large the number is, how many digits to the right of the decimal.

Show Live Updates is enabled by default, and it shows you the chemistry as it's being calculated throughout the duration of the test. If disabled, no chemistry will be displayed until the test is completed.

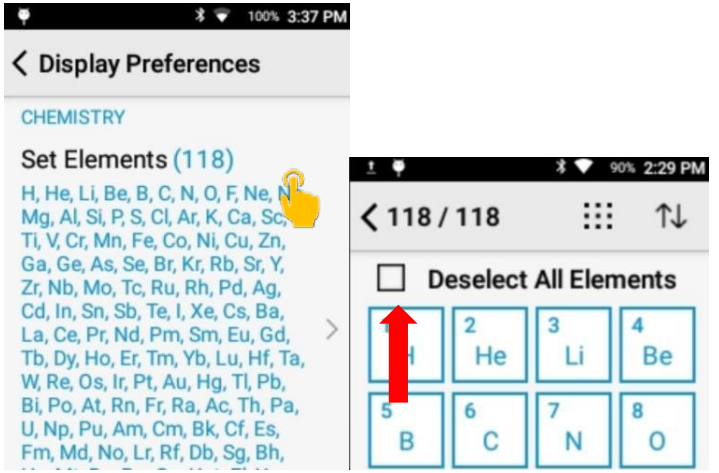


Show Uncertainty
When enabled, it shows the ± results column.



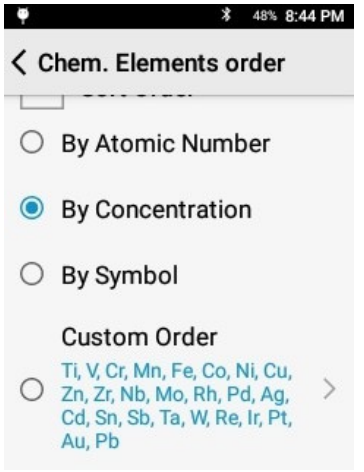
Chemistry

To choose what elements are displayed, tap **Set Elements**. Elements highlighted with blue will be displayed if measured. Use the **Select All Elements/Deselect All Elements** (it toggles between the two) to quickly make bulk changes.

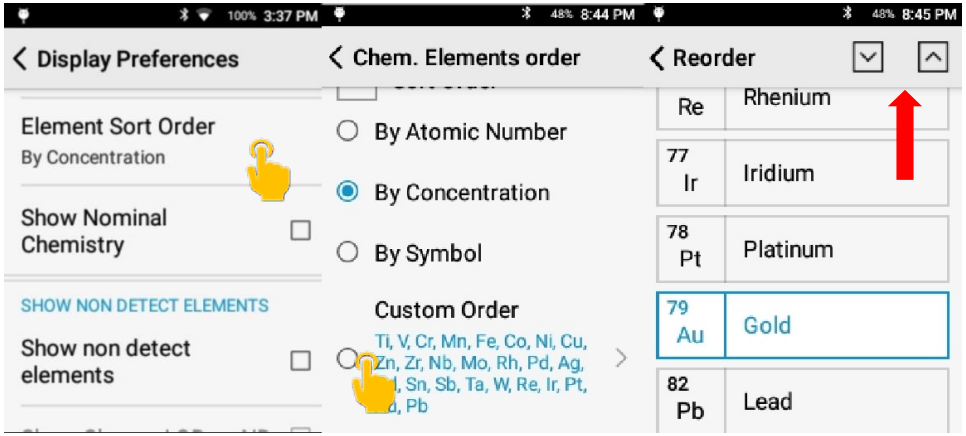


Element Sort Order allows the operator to quickly select the order of appearance for all elements. There are four options in **Element Sort Order**:

- **By Atomic Number** arranges elements by the order in which they appear on the periodic table from lightest to heaviest.
- **By Concentration** sorts the elements by the measured concentration from high to low concentration.
- **By Symbol** sorts elements alphabetically by symbol.
- **Custom Order** allows users to customize the order in which elements appear in the results.

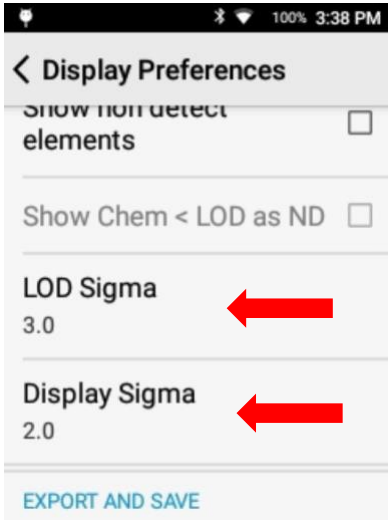


Creating a Custom Element Sort Order
To create a custom order, select **Custom Order** to open the **Reorder** wizard. Then tap the element you want to move and use the up and down arrows in the top right corner to move the element.



The **LOD Sigma** is defined as 3.0.

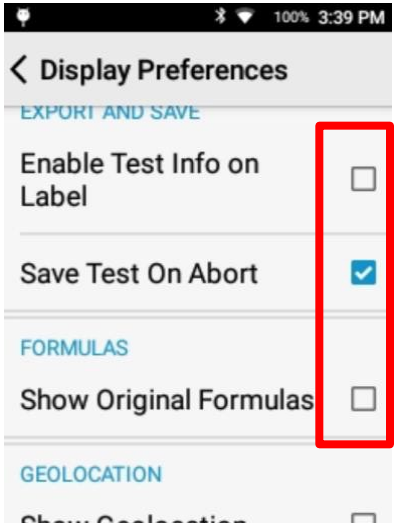
The default value for **Display Sigma** is 2.0 which represents a 95% confidence level that repeat measurements will fall within the ± range. The **Display Sigma** is a multiplier applied to the measurement ±. Decrease this number to show a smaller and lower confidence ± range, and increase this number to show a larger, higher confidence ± range.



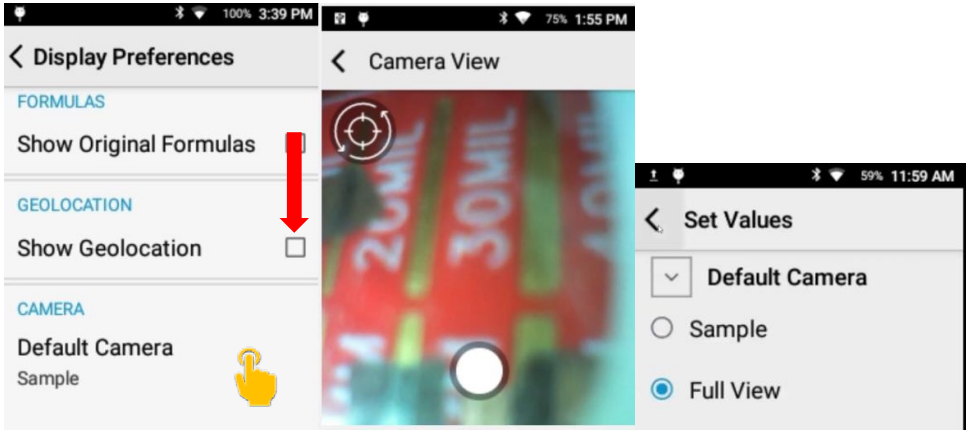
ENABLE TEST INFO ON LABEL
Enable this option to include test info on printed labels.

SAVE TEST ON ABORT
Enabled by default. When enabled, this feature ensures that tests are saved even when aborted early by pulling the trigger. When the feature is disabled, tests are only saved when run to completion.

SHOW ORIGINAL FORMULAS
When enabled, this option ensures that the original formulas used when test was acquired will be displayed. If disabled, only formulas that are currently configured will be displayed.



GEOLOCATION AND CAMERA
If you are connected to a GPS and would like to show your GPS coordinates on the test info screen, check the **Show Geolocation** box. Tap on **Default Camera** view to set to your preference. Example screen is set at “Sample.” The other option is “Full View.”



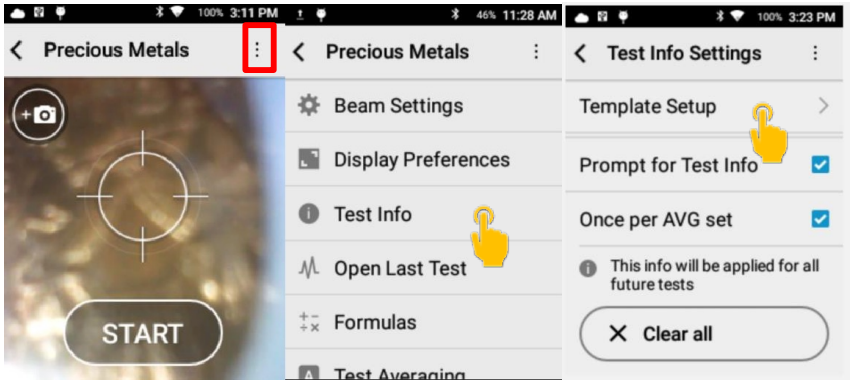
TEST INFO SETTINGS

Test Info customization is done through **Test Info Settings**. Test Info is driven by a template.

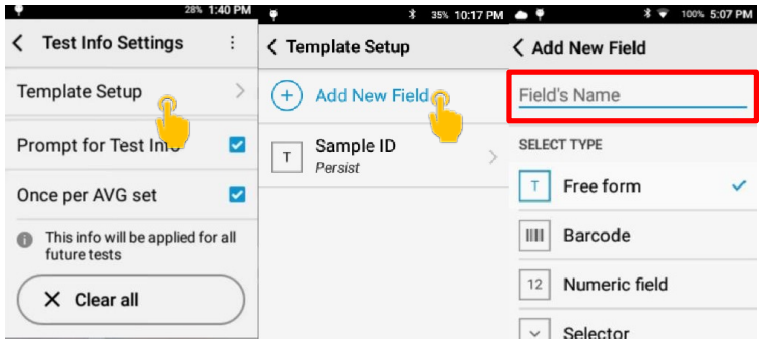
Test Info Fields are a useful tool for attaching metadata or testing notes to a result. The software supports up to eight different test info fields. Each field can be customized to have its own field name, field type and test data. To customize Test Info Fields, tap **Template Setup**.

Prompt for Test Info, when checked, will prompt you before each test to populate the Test Info Fields.

Clear All will reset all Test Info fields except for Sample ID.



Template Setup
Modify existing fields or add new fields. Users may add a maximum of 8 fields. To add a new field, tap **Add New Field**. To modify an existing field, scroll through the list and select the target field. **Sample ID** is a factory enabled field that can be removed.

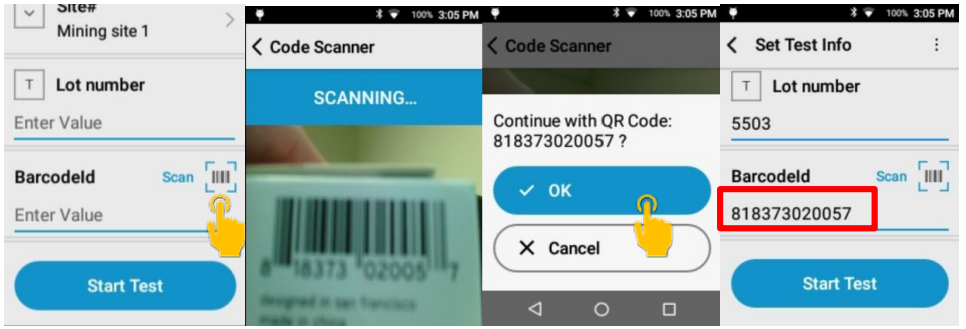


Enter Field Name
Each field must have a name. The name will appear in the test info page and on exported data. The field name describes what type of data will be saved to the field. For example, common field names are “Sample Name”, “Lot Number”, “Part Type”, “Depth”, etc.

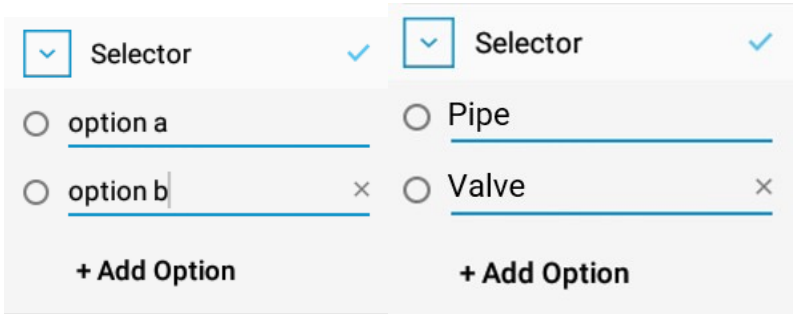
Select Field Type
Field types allow you choose a field configuration that works best for the type of data you need to enter:

- **Free form** fields are for general text entry. This is best used for notes, sample names, or any data that is a mix of letters and numbers
- **Barcode** fields are for barcode entry. This field includes a barcode scan button which opens the camera for scanning a barcode

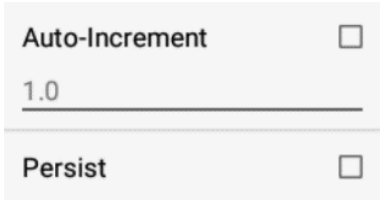
For Barcode enabled Fields, tap the **Scan Icon** button to bring up the camera and scan the barcode. Once scanned, tap **OK** to automatically add the barcode into the field.



- **Numeric** fields are for entering data that only contain numbers. When entering data into a numeric field, a simplified number-only keyboard is used. Numeric fields are good for entering data like sample numbers, lot numbers or sample depths.
- **Selector** fields allow you to create a prepopulated dropdown list of commonly used labels. For example, if all of your samples fa¬ll into categories like “Pipe” and “Valve” you could create a selector field with these two labels. Then, when entering test info during test time, you can simply select one of the three labels from the dropdown list rather than manually typing the label each test.



Field Rules
After Selecting a Field Type, you have the option to apply a rule.



Auto-Increment will increment the input for a field by a user defined increment for each subsequent test. Increments can be positive or negative.

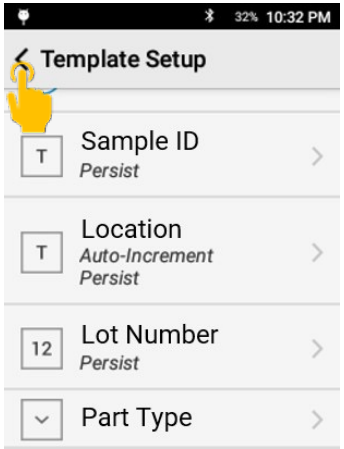
Persist will maintain the data for a field until you change that field.

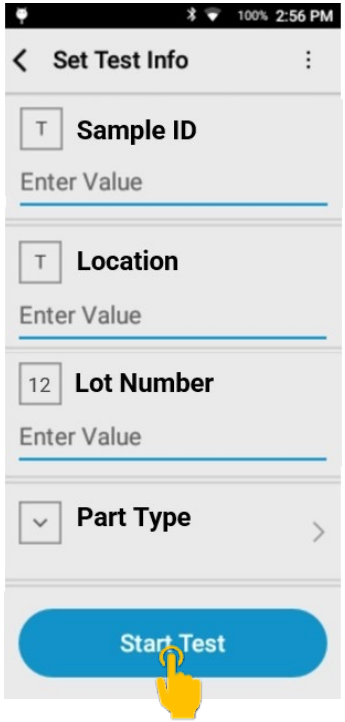
Once you have finished configuring your Template, tap the back button to save and exit.

Using Test Info
After configuring the Test Info Template, Test Info Fields are ready to be used. There are two ways to enter test info data during testing.

Using the **Prompt for Test Info** option to enter test info prior the test, or by tapping on the Test Info (Icon) from the test result screen.

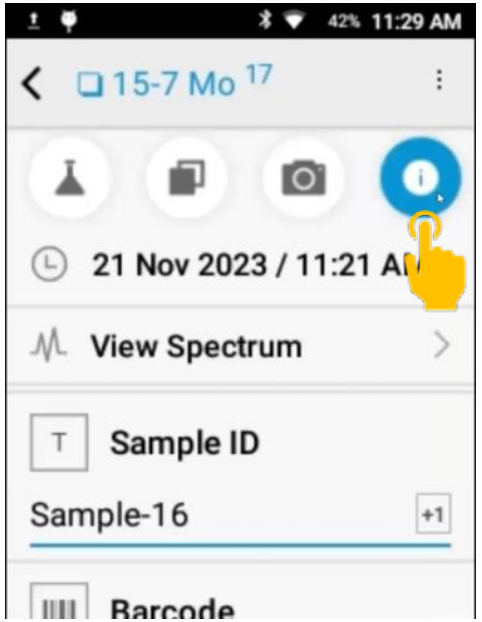
With **Prompt For Test Info** enabled, after pulling the trigger or pressing the **Start** button, the software will immediately prompt you to review/modify **Test Info** prior to the test beginning. Some Info Fields can be entered by tapping on the field, then typing in the information (e.g. Sample ID, Location, Lot Number). Other fields can be entered by selecting the option from the prepopulated list (e.g. Part Type)



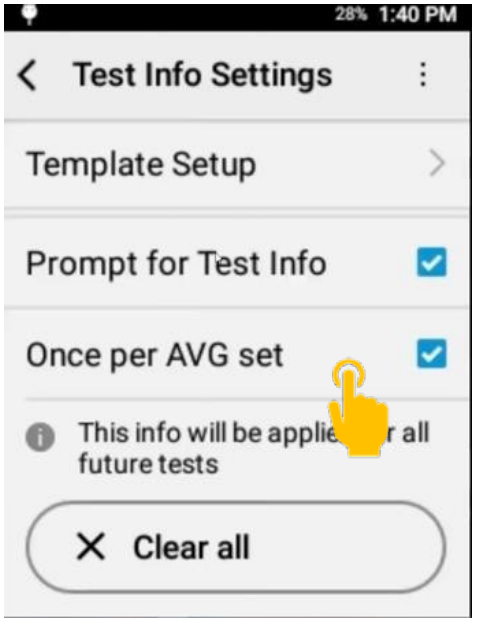


Once the test info data has been entered, tap **Start Test** to save the test info and begin the test.

After a test has completed, test info data can be entered or modified through the Test Info ( ).



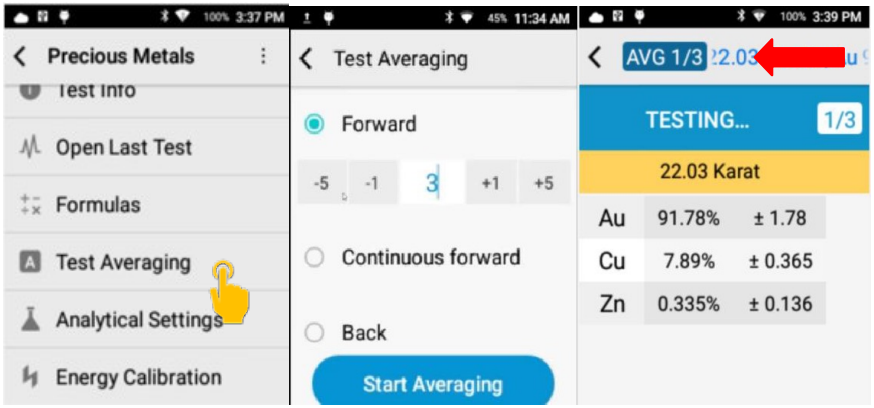
Once per AVG set: This feature is used in conjunction with the **Prompt for Test Info** feature. When enabled, and running in **Forward Averaging** mode, you will only be prompted to enter test info at the first test of the averaging set. **Clear All** will reset all Test Info fields except for Sample ID



10. TEST AVERAGING

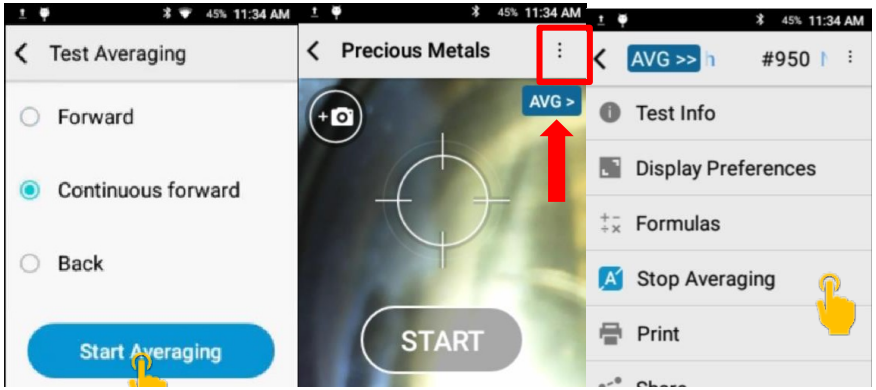
Test Averaging allows users testing inhomogeneous samples to average the tests to get a better idea of the overall sample without having to grind the sample into a powder to make the sample more homogeneous. Once in **Test Averaging** there are three options for averaging

If you want to run multiple tests and get an average, select **Forward**, which means the analyzer will take a certain number of tests (3 tests in the example) and then, after the last test, will calculate the average automatically. In this mode, the **AVG Icon** will keep track of the number of tests.

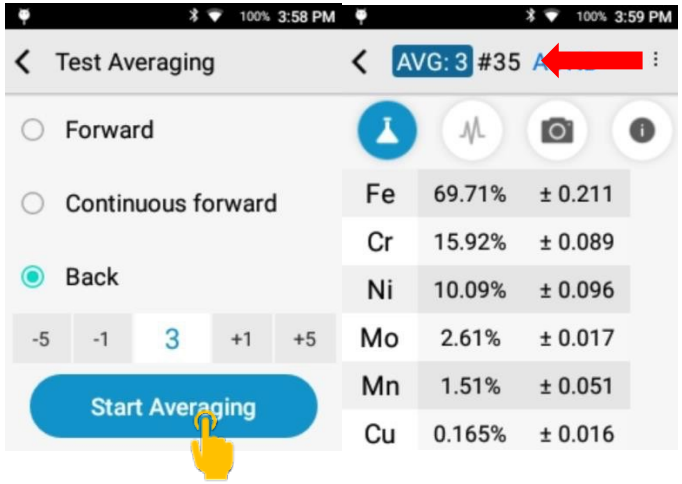


Continuous forward takes as many tests as you want until you are done testing (5, 10, 20 tests—however many you want). After selecting this option, tap Start Averaging to begin testing.

When you are in an averaging sequence, you will see the blue **AVG> Icon** on the screen. It will calculate the average of however many tests you take in that sequence. If you run 2 tests, the **Ave Icon** will state how many tests were averaged together. When you want to Stop Averaging, tap on the 3 dots to access the options menu again, and you will tap **Stop Averaging.**

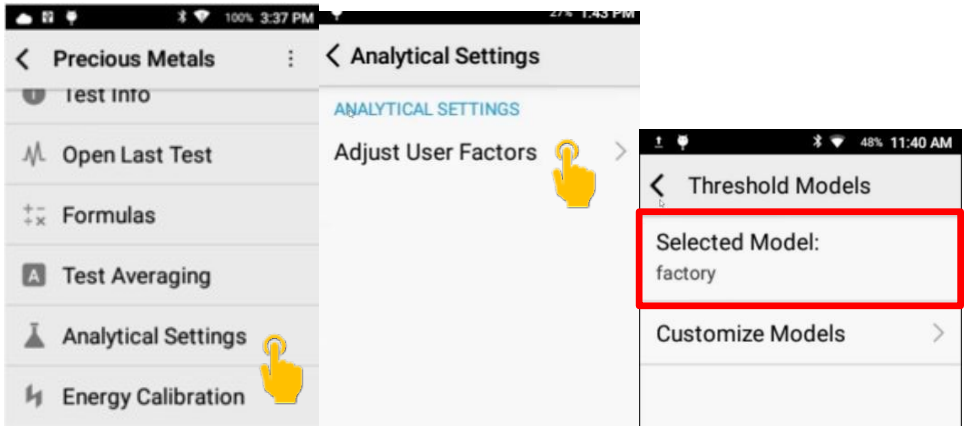


Back will average a set number of tests you previously took. The default is 3. You can add to or subtract from 3 with the + or – options. Then tap **Start Averaging**. The analyzer will go back to the previous 3 tests and average them together.



11. ANALYTICAL SETTINGS

Adjust User Factors is a way to fine tune the accuracy. **CAUTION: GEMORO** recommends only adjusting factors based on several well characterized, lab analyzed samples. Please consult with your GemOro representative or customer support before adjusting User Factors.



The “factory” model is the default selection. No adjustments can be made to the factory calibration.

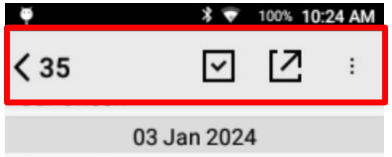
12. RESULTS MANAGEMENT AND SHARING

All results are stored in the Results App. Use **Results** to review data, generate PDF reports, export data to CSV, delete data, and update Test Info.

Access **Results** from the main home screen.

The **Results** header contains:

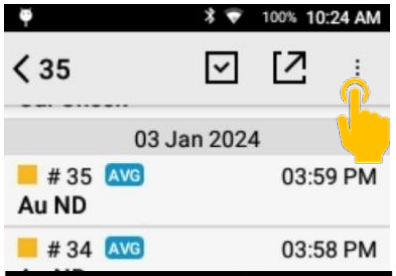
- Total number of tests (**35** in example)
- Multi-result **Selector Icon**
- **Share Icon**
- Options Menu (3 dots)



Results will be grouped under a header date. (03 Jan 2024 in example)

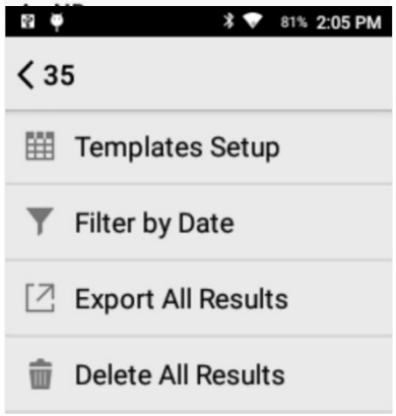
Each result line will contain:

- The measured value (Au in the example—ND means non-detect))
- **AVG Icon** for calculated average tests
- **Camera Icon** for results with a photo attached
- Time Stamp



Tap on the 3 dots to access the Options menu. The **Options Menu includes**:

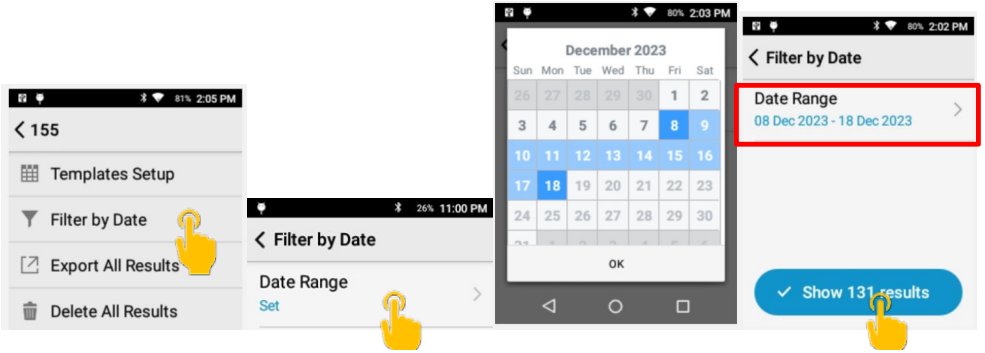
- **Templates Setup** for configuring data export
- **Filter by Date** to filter results by a date or date range
- **Export All Results** for a quick export
- **Delete All Results**



In **Templates Setup** you can configure the data export. Both PDF and CSV/Excel data are customizable. For more on customizing your export, jump to **Export Templates**.

Filter by Date

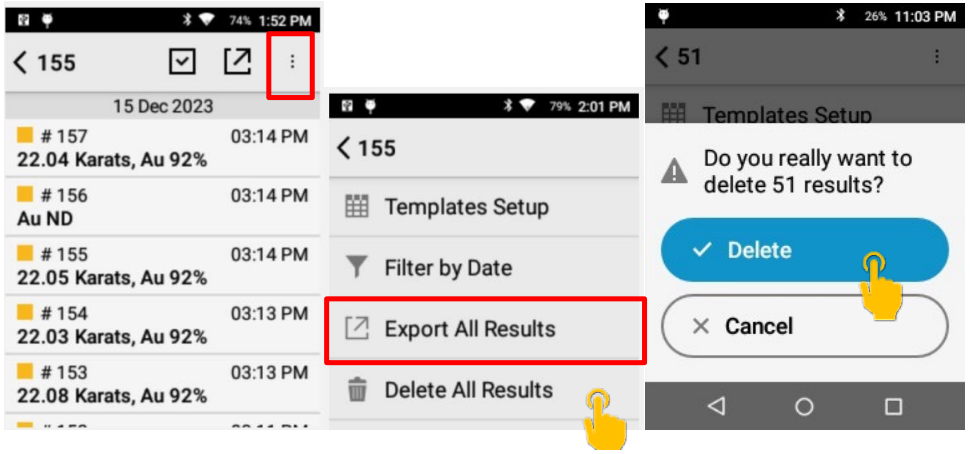
Tap **Date Range Set** then select either a range or a single date and tap okay. This will limit results to those taken on the days in the date range. Once applied, the list will be limited to those specific results. Exporting all results or deleting all results from the filtered view will only include tests in the specified date range. **Export All Results** will export all results on the analyzer For instance, where the analyzer has hundreds or thousands



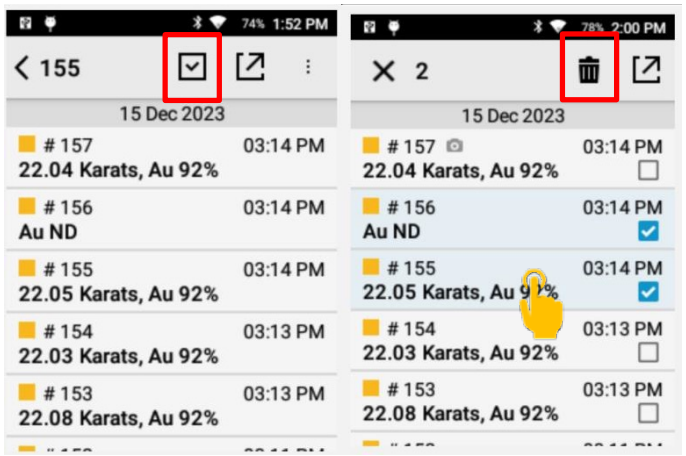
of tests, this could take minutes to complete.

Delete All Results

To Delete all test results, open the options menu (3 dots). Then select **Delete All Results**. Tapping **Delete** will permanently delete the selected results

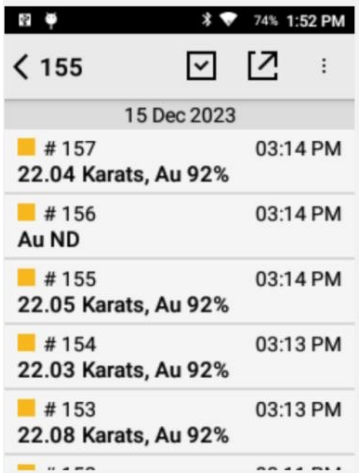


To Delete a subset of results, use the **Selector Icon** in the header row. Select the results to delete by tapping the row then tap the **Trash Can** Icon to permanently delete those results.



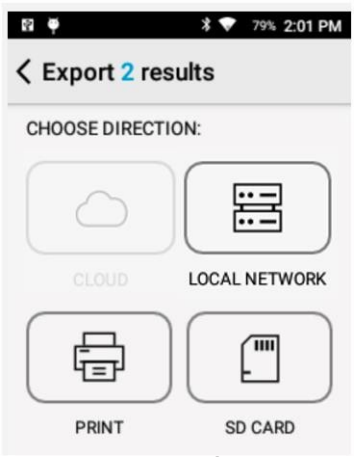
Exporting Results
Tap the **Share Icon** to export results.

You may first select a subset of the results using the **Filter by Date** feature or the **Selector Icon**.

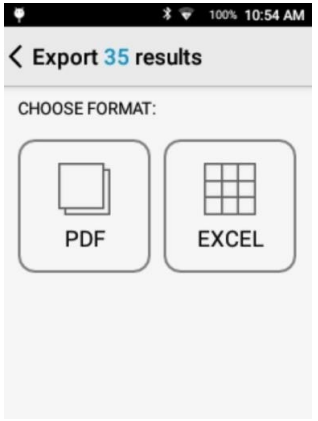


Choose one of the three destinations for export:

- Send to **Local Network** location. This feature must first be configured through the Global Settings → Local Network option.
- Send to Bluetooth **Printer.**
- Send to internal SD Card to be transferred to computer later via USB cable.

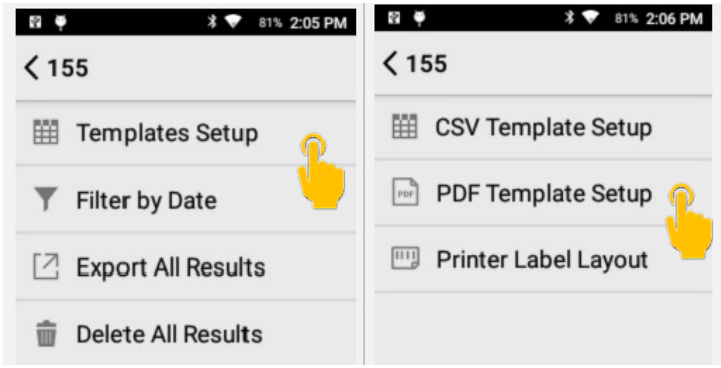


If sending export to **Local Network** or **SD Card**, you have the option of exporting as **PDF** files or EXCEL compatible CSV files.

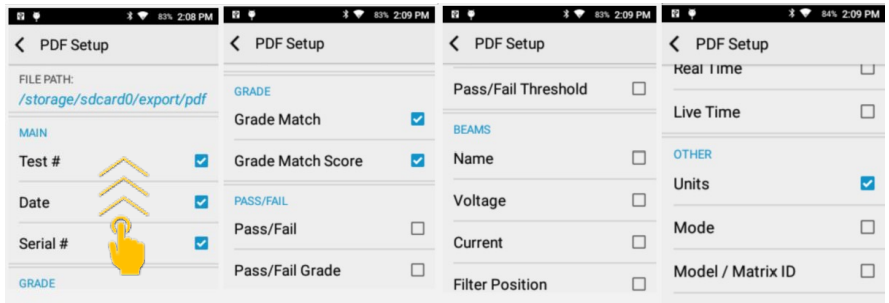


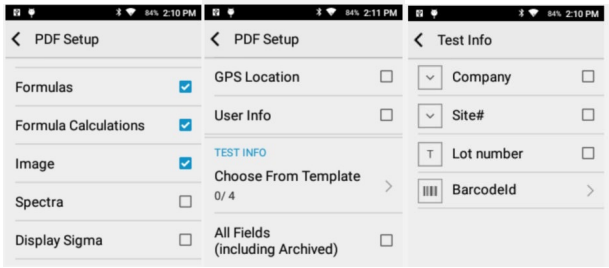
Export Templates
PDF and CSV exports can be configured through export templates. The export templates allow you to customize the elements and meta data included in the export.

PDF Export Setup
To set up PDF Export, tap Templates Setup then tap PDF Template Setup.



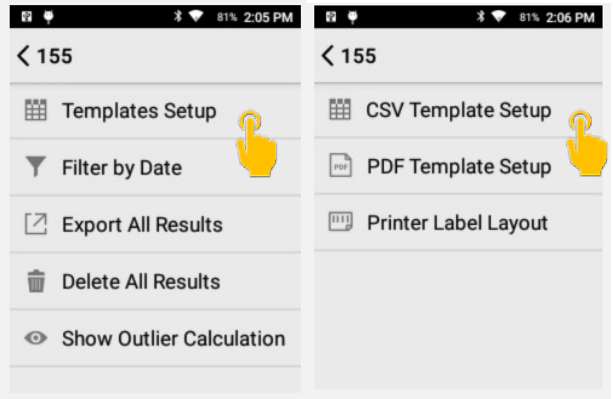
Choose information to include in the PDF.



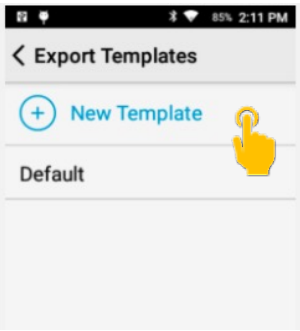


CSV Export Setup

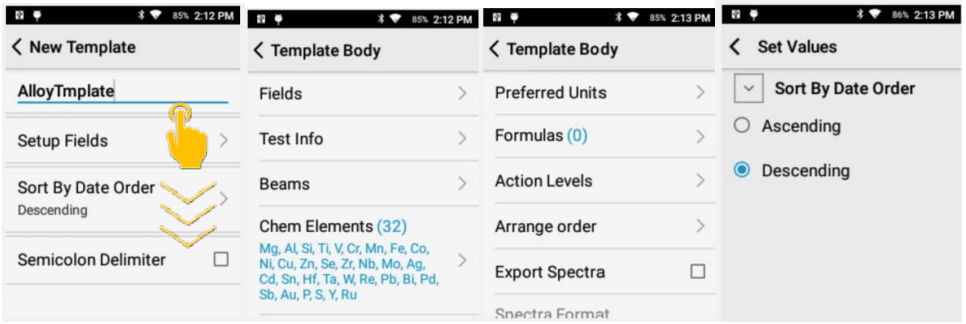
To set up CSV Export, tap **Templates Setup** then tap **CSV Template Setup**.



Choose to create a **New Template** or edit the **Default** template.

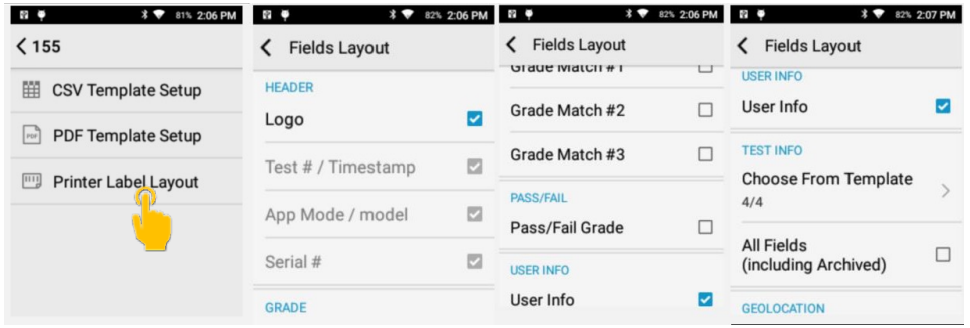


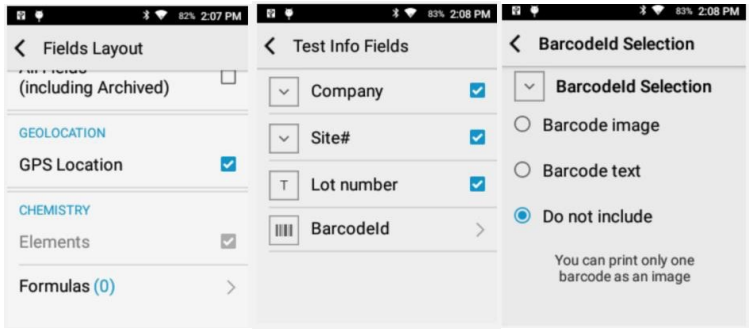
Select which fields and information you want included in the CSV export.



Configuring the Label

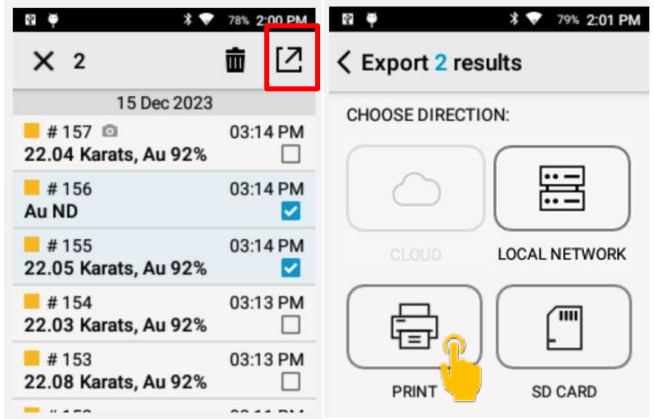
The test label is configurable. Tap **Printer Label Layout**. All options can be turned on or off: **Logo, Grade Matches** (1, 2, 3), **Pass/Fail Grade**, **User Info** (who was logged in to the device when the test was taken), **All Fields** (test info fields), **GPS Location**, and **Barcode ID**.



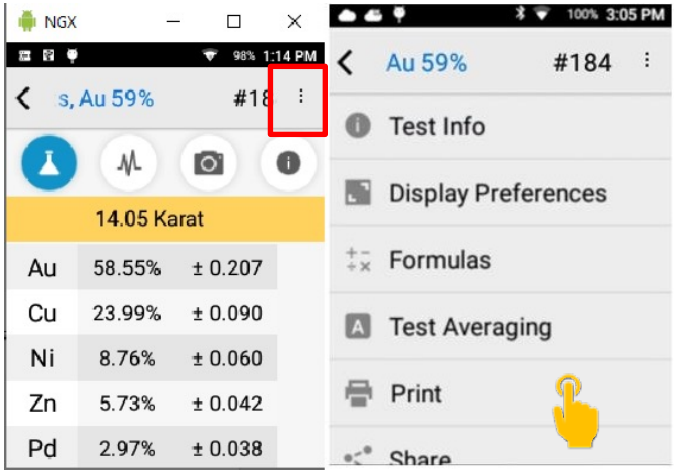


Printing

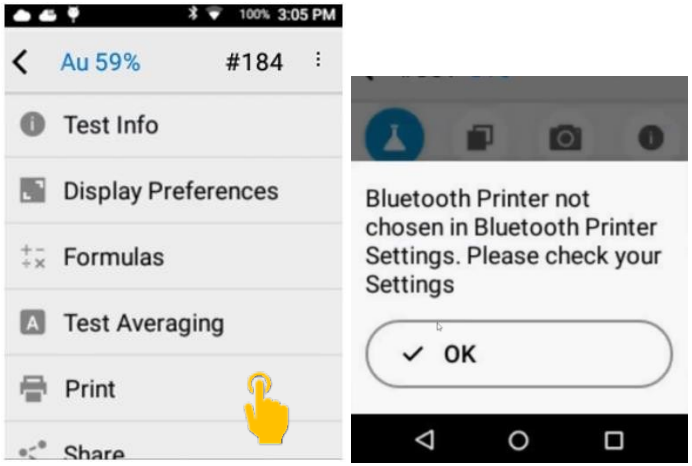
There are two ways to print results: one way is through the results list. After selecting or filtering the results you want to print, tap the **Export Icon** and tap **Print**.



You can also print single test results from the Test Screen menu. Tap the 3 dots and tap Print. That will print only the result that you're viewing at the time.



The **Print** option allows you to send a result to the **Bluetooth Printer**. The results will print on a label that you can adhere to your sample. For more information about connecting a Bluetooth Printer to your analyzer, go to **Section 7. Settings and Utilities**.



Sharing

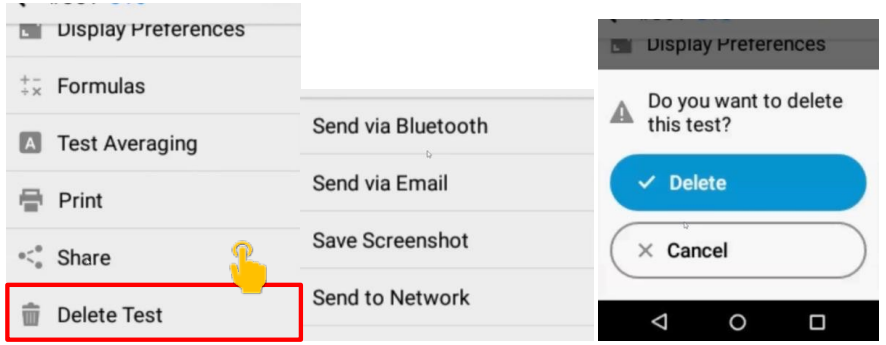
The **Share** option allows you to send the results to different options. **Send via Bluetooth** allows you to send the result to any device you've connected to over Bluetooth.

Send via Email will send an email with the result as an attachment. Tap this option to send the email or two walk through the email account setup.

Save Screenshot will save a screenshot to a designated folder on the SD Card*, sdcard/export/. The location will be displayed on the screen before it saves.

Send to Network will share results to a shared drive, if you are connected to a local network.

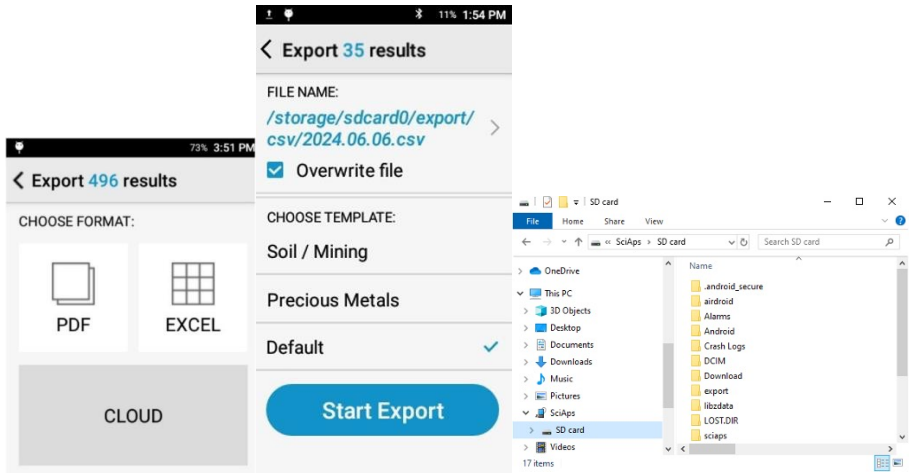
Delete Test You can delete a test from this screen as well. Tap on Delete Test and follow the prompts.



* The analyzer uses an embedded SD card to store test results.

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

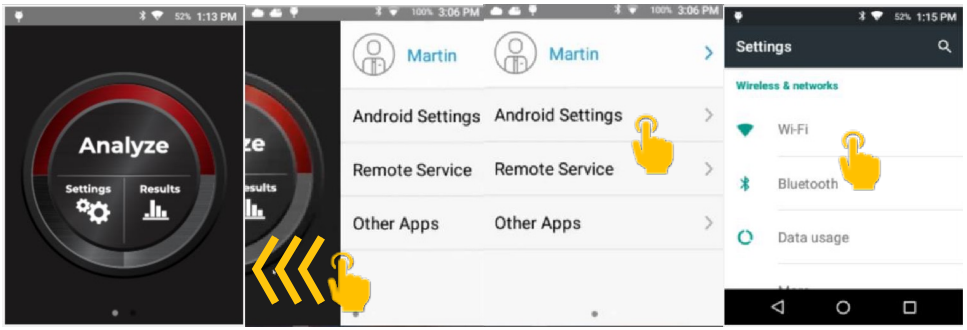
Navigate to the export location selected at time of export (default export location is *SD card\export*). Drag the exported files over from the SD Card to the desktop to save copies locally on the computer. Drag the exported files over from the SD Card to the desktop to save copies locally on the computer



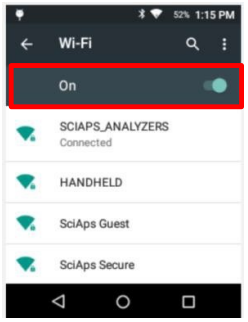
13. SETTINGS AND UTILITIES

Enabling WiFi/Bluetooth

From the **Home Screen**, swipe to the left to get to the second **Home Screen**. Tap on **Android Settings**. Tap on **Wi-fi.**



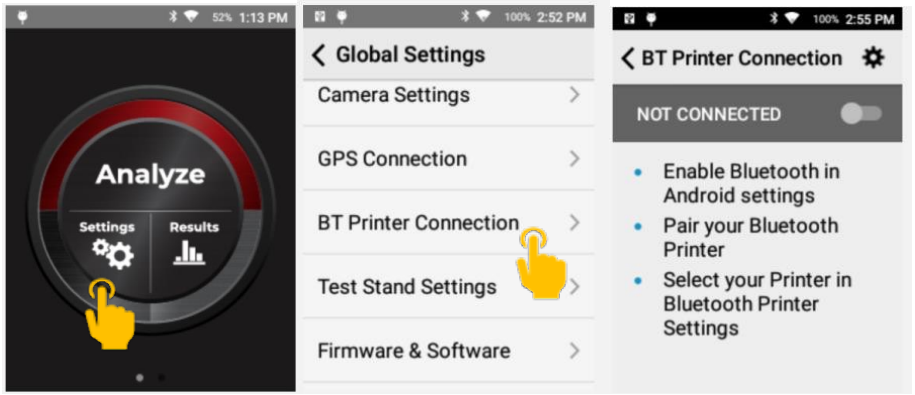
Ensure the slider is turned **On.** Then choose your Wi-fi network. Select your device from the list of **Available Devices.** For more information on Bluetooth Printers, go to **Global Settings**.



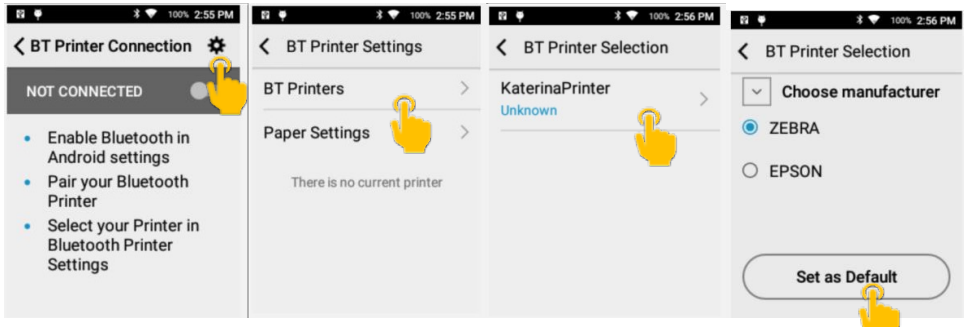
Connecting to a Bluetooth Printer

To connect to your Bluetooth devices and pair to a printer, tap on **Settings** from the **Home Screen**.

Tap on **BT Printer Connection**. If not yet paired with a printer, you will need to proceed to **Bluetooth Pairing in Android Settings** and **Pair Your Bluetooth Printer**.

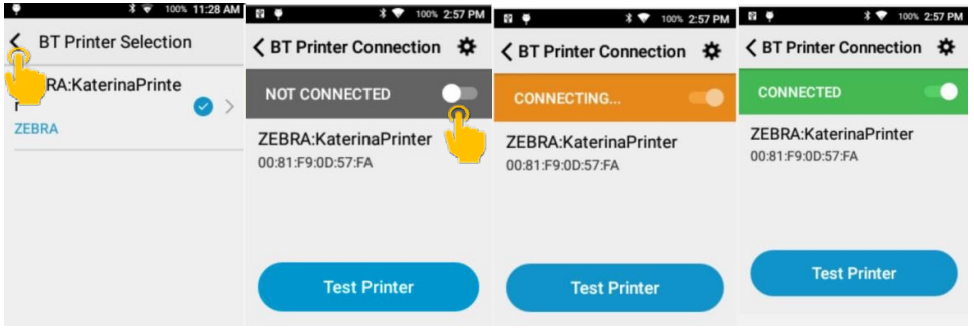


After pairing to a printer, return to BT Printer Connection and tap the Gear Icon to configure BT Printer Settings. Tap on **BT Printers.** Your paired printer will be listed. Select the printer then choose the manufacturer of the printer, Zebra or Epson. After selecting the manufacturer tap **Set as Default**



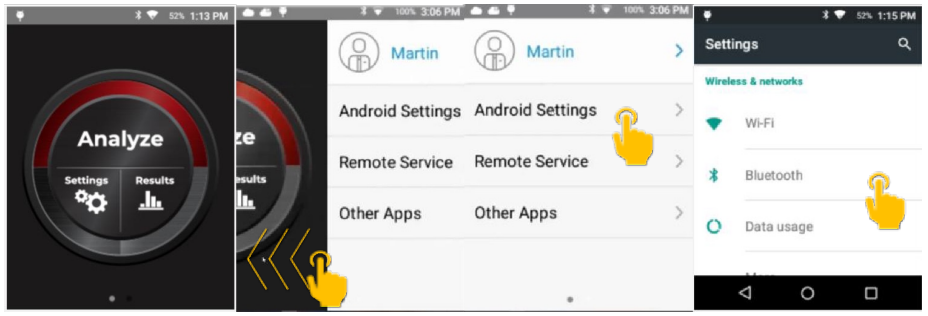
Tap the back button (>) to return to the connection screen.

Tap the connection switch to establish connection with printer. When you are connected, you will see a green **"Connected"** message. You can test the printer, with a test page.



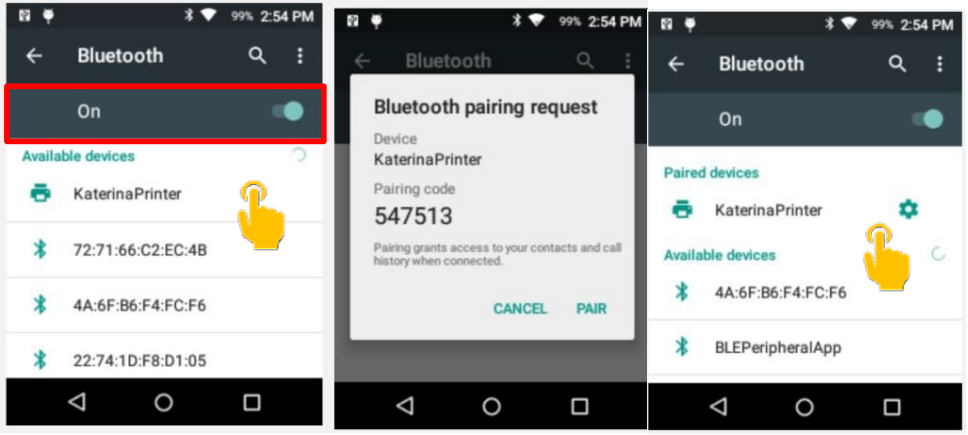
Bluetooth Pairing in Android Settings

To enable Bluetooth from the **Home Screen** swipe to the left to get to the second Home Screen. Tap on **Android Settings.** Tap on **Bluetooth**.



Ensure the slider is turned **On**. Then tap your printer to pair following prompts on screen. Note you may also have to accept pairing on the printer.

If it's successful, you'll see you have a printer under your paired devices.

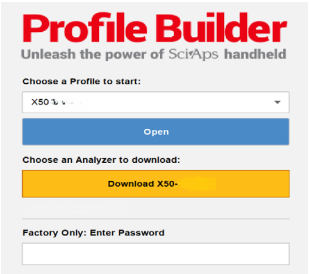


Connecting to Profile Builder
To complete this step, your analyzer must be turned on and calibrated.
*Note-This software is not compatible with Apple devices. WINDOWS ONLY.

The software is available on the USB that was sent with your unit or on the **GEM**ORO website.

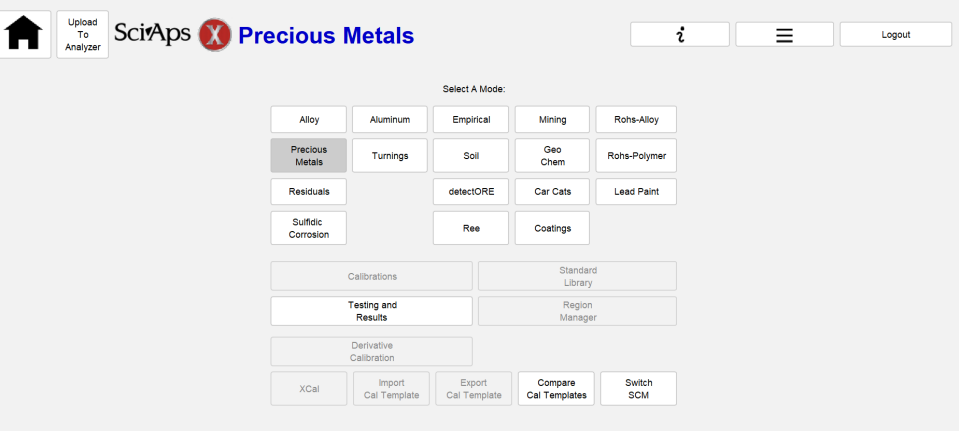
Download onto your PC desktop.
Connect the instrument to the computer via USB-C cable. The USB port on the instrument is located on the underside of the instrument, below the touch screen. Your XRF should be on the home screen (shown here):

Next, open Profile Builder software on the computer.

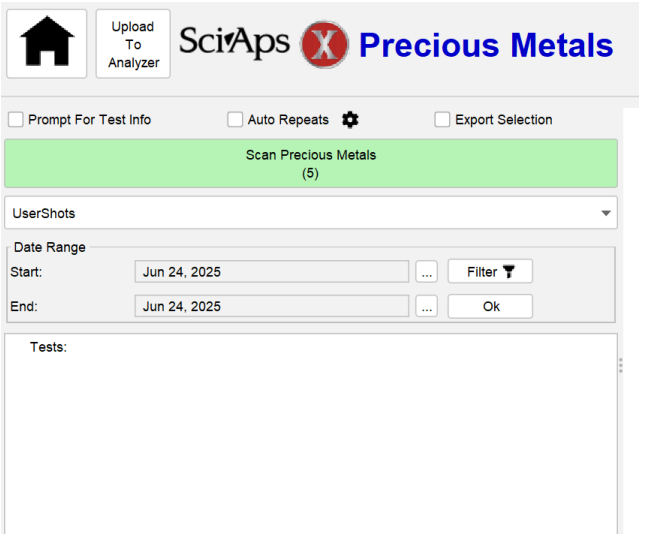


When complete, this page will be displayed.

Make sure the Precious Metals tab is selected



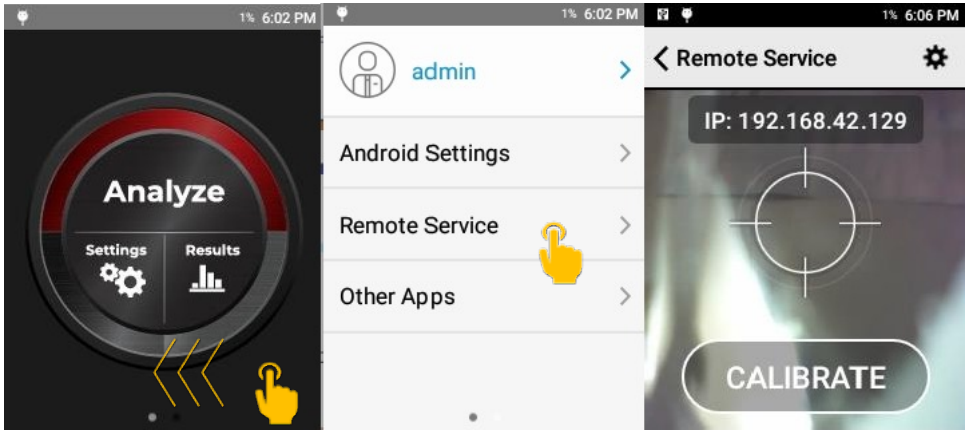
Then select 'Testing and Results'. The following page will be displayed.



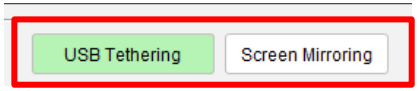
14. SCREEN MIRRORING

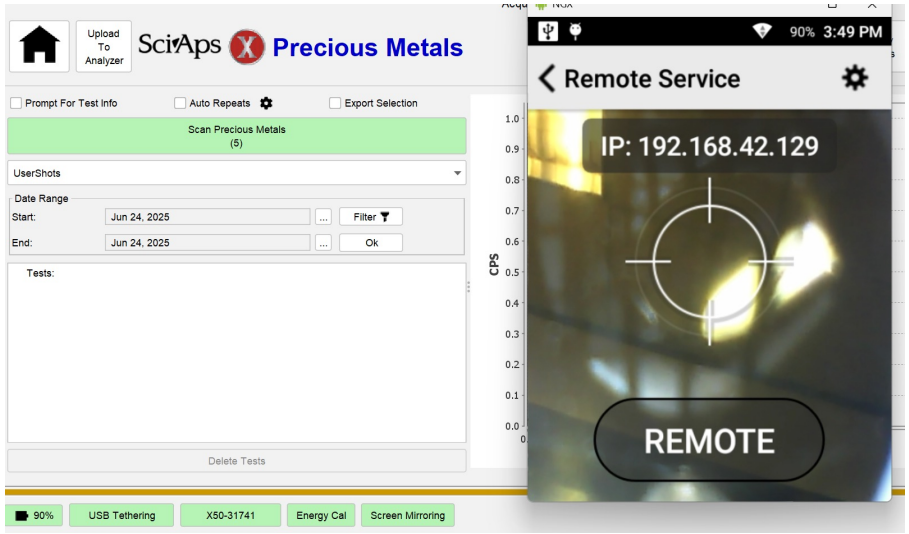
The XRF software may be controlled through a PC using screen mirroring in Profile Builder. This feature allows users to see what is on the screen and control it through mouse clicks.

Start Remote Service
First, swipe right from the Home Screen of the X. Tap **Remote Service**. The screen will look like this. You will be able to see the default camera view and initiate an Energy Calibration if needed.

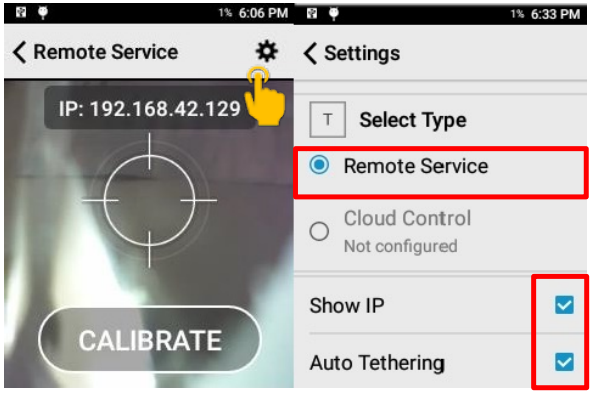


Open Profile Builder software. In the lower left, **USB Tethering** should be green, and the **Screen Mirroring** button should appear.





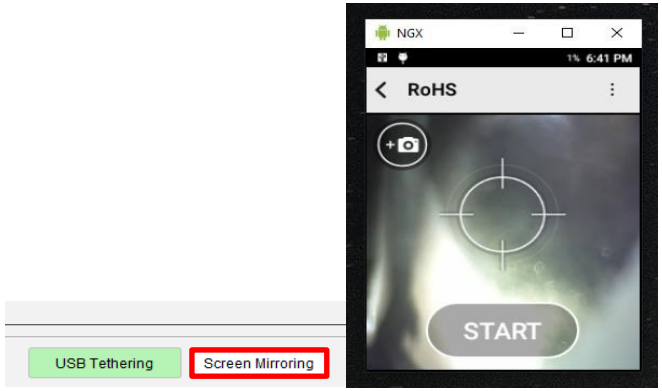
Click 'Screen Mirroring' and another camera window should pop up.



Troubleshooting: If the tethering button does not turn green, tap the **Gear Icon** in the upper right of the Remote Service screen. Select **Remote Service**. **Show IP** and **Auto Tethering** should be checked. Tap back (<) twice to exit **Remote Service** and return to the Home Panel. Tap **Remote Service** on the **"admin"** screen to reenter remote service. Tethering should now be established.

When tethering is established and Remote Service screen is up, the SD Card may not appear in the Windows My Computer view. Exit Remote Service and Unplug/replug USB cable to reset tethering status.

Tap **Screen Mirroring** in Profile Builder. You may now operate the X software through the NGX window. This window should stay up even if tethering is lost, which it usually is when you leave the Remote Service screen.

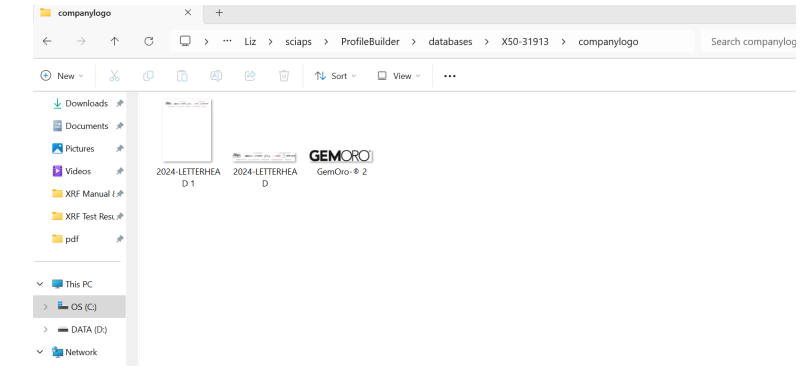


Screen Mirroring Tips

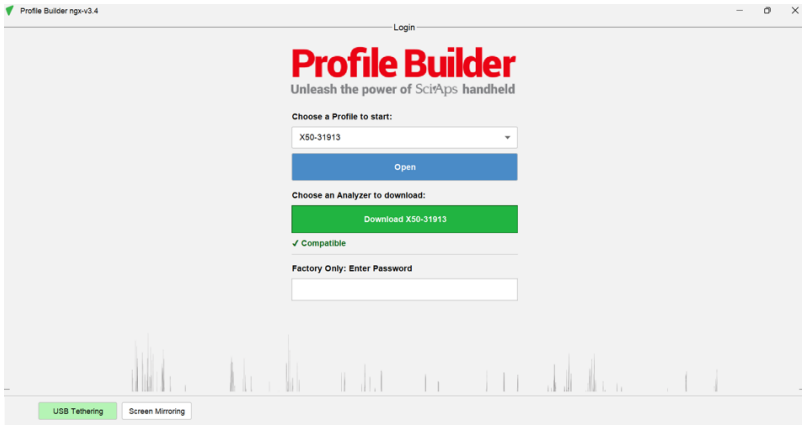
- User may type with PC keyboard and use mouse scroll wheel on X screen.
- Right Click registers as Back.
- Left/Right swipe with mouse cursor is possible but can be tricky.

15. CREATING A PERSONALIZED XRF REPORT

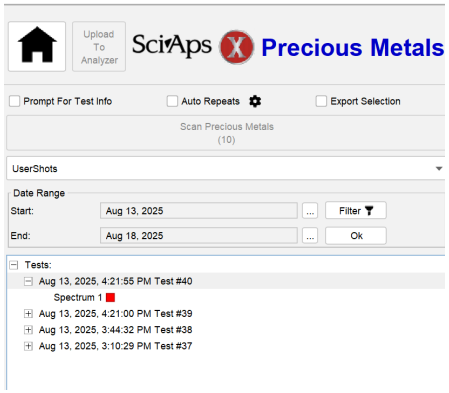
First Save a .jpg file in C:/Users/Customer user/sciaps/Profile Builder/ databases/Analyzer Serial Number/company logo folder



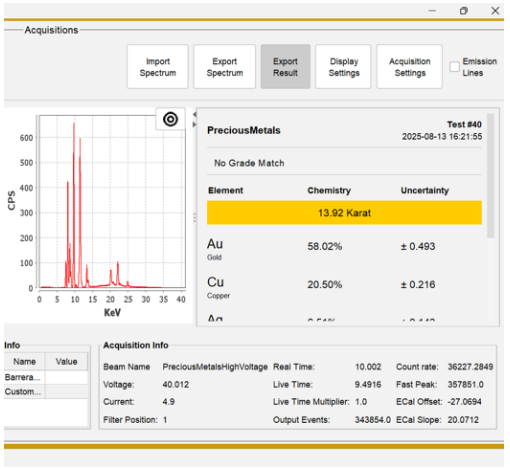
Connect your XRF to your computer using the USB-C cable. Establish remote service on your XRF (see Section 13). Open Profile Builder and wait for the green “download” box to appear then click ‘download’.



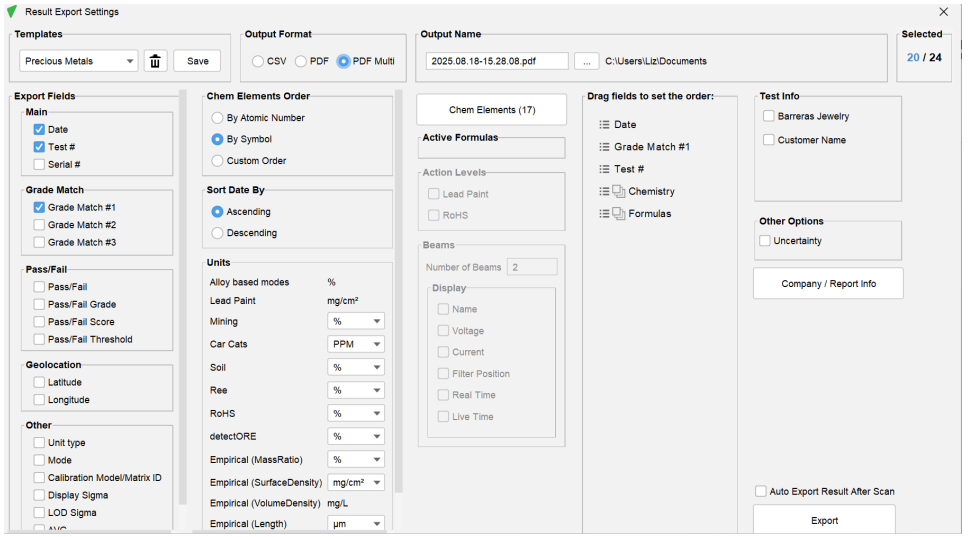
If you have previously downloaded it will say “Do you want to overwrite and continue?” Press, yes. (By doing this, you are updating Profile builder with the tests you have recently taken on XRF)
Click on Precious Metals and Testing and Results
Then select the test you would like to personalize.



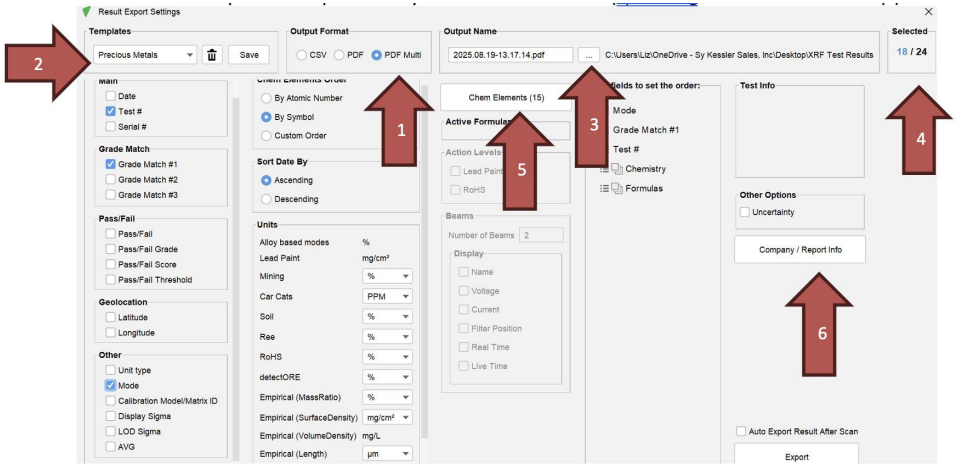
Next, click on ‘Export Results’



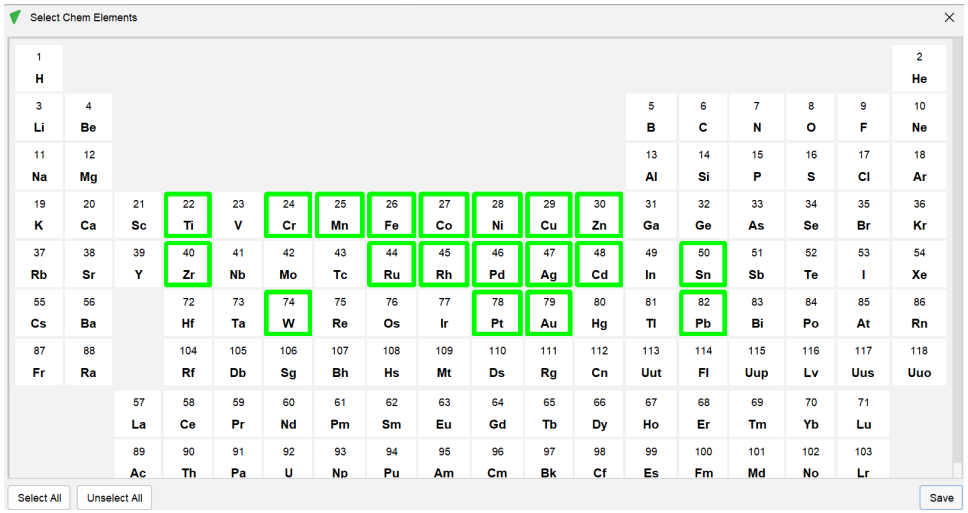
Your Export Results settings page should be displayed



1. First select ‘PDF Multi’ (1)
2. Next, make sure ‘Precious Metals’ is selected under the ‘Templates’ tab (2)
3. Under ‘Output Name’ click the 3 dots and select a location on your computer for your reports to be saved (3)
4. The ‘Precious Metals’ template comes with preselected categories; however, it exceeds the number of selected units the user can export. Each report can only contain 24 selected units (4)
5. including the number of elements(5).



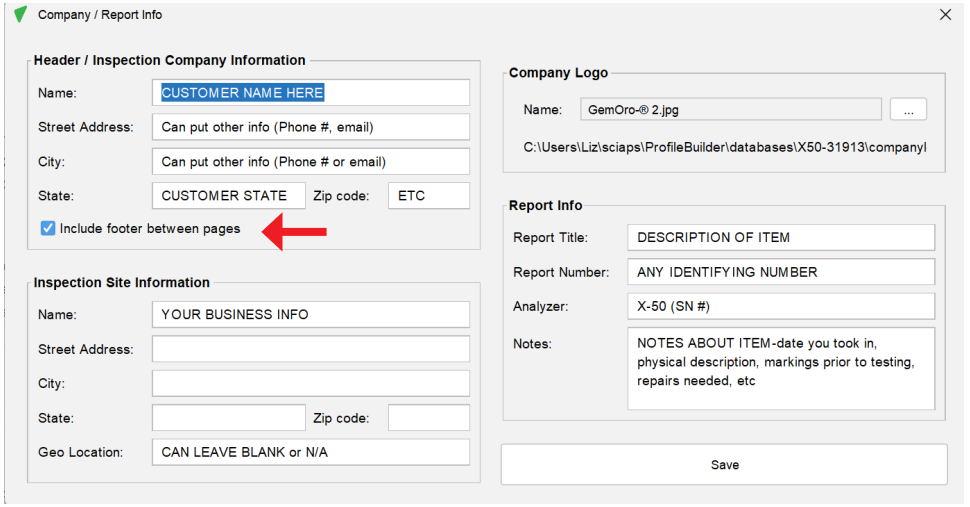
Select the Precious Metals you are looking for (Example below)

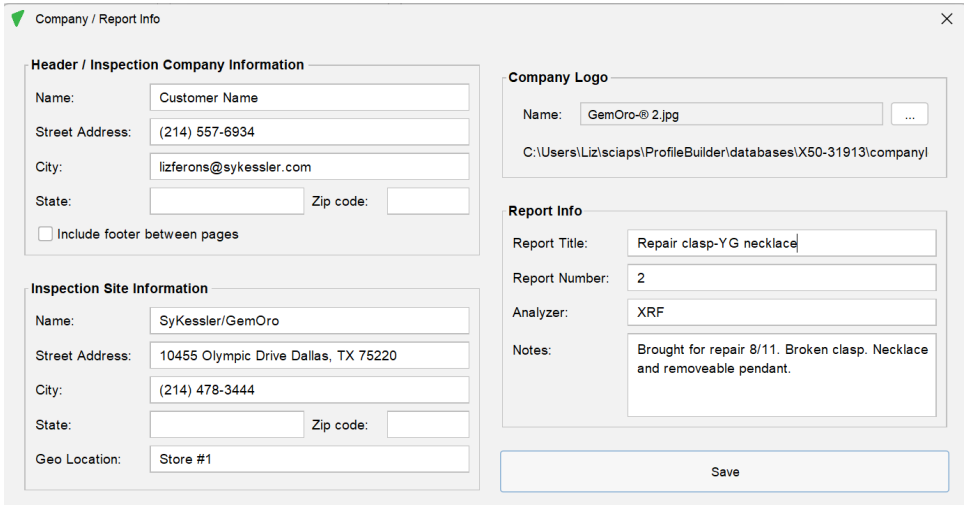


Click ‘Save’

6. Then click on ‘Company/Report Info’ (6)

Enter your information and customer information like the examples shown. If you select ‘Include footer between pages’, the report will show the ‘Customer info’. If you do not want it displayed, you can deselect it.





Before you ‘Save’, click on the three dots beside ‘Name’ located under ‘Company Logo’. To retrieve your image, you will need to follow the same file path used to save your image. Once you have all relevant information entered and your Company logo is attached, click ‘Save’ Finally, click Export.

16. HOW TO CLEAR THE CACHE

Clearing The Existing Test Data and Show Battery Life Remaining

- Start at the Circle Analyze Screen
- Go to Results in the lower right of the circle
- Go to the three dots in the upper right corner
- Select delete all

17. IDENTIFYING GOLD PLATED MATERIAL

Understanding Element Concentration Ranges by Gold Type: Why This Is Critical for Accurate Precious Metal Identification with Your GEMORO XRF

To ensure accurate analysis and avoid misidentifying **gold-plated** materials, it's important to understand how **karat gold alloys** are composed and how the **GEMORO XRF** interprets them.

All XRF analyzers, including your **GEMORO XRF,** are **surface testers**—they scan only the outermost layer of the material being analyzed. The **GEMORO XRF** provides a **detailed elemental breakdown**, showing each element detected at the surface and its **percentage concentration**.

SPOT FILING HELPS REVEAL HIDDEN LAYERS

Since XRF reads surface composition, plated items—especially gold-plated silver, copper, or base metals—can appear to be solid gold if only the outer layer is analyzed.
To improve accuracy:

- Test the original surface first
- Then, file a small spot and re-test that exact location

This second test gives the analyzer better **penetration through any plating** allowing you to measure **Zinc (Zn), Copper (Cu), Nickel (Ni),** or **Silver (Ag)** that may be **present in higher-than-normal concentrations** that exceed the typical manufacturing standards. In addition to elevated Zn, Cu, Ni, or Ag concentrations to indicate potential plating, one must also be cognizant if/when Tungsten (W) is present at any concentration as this is a direct indicator that the sample is plated. Tungsten is widely used for gold-filed materials.

If these elements show up in levels **exceeding typical manufacturing standards**, it strongly indicates that the item is **not solid gold**—but rather **gold-plated**.

ELEMENT CONCENTRATION RANGES BY GOLD TYPE

Below are general industry standards for the elemental composition of commonly used gold alloys. These ranges are used in manufacturing but may vary slightly based on manufacturer, country, or formulation. Use these charts as a **reference point when interpreting GEMORO XRF results**:

ELEMENT CONCENTRATION RANGES BY TYPE

These are approximations used in jewelry manufacturing and can vary slightly by manufacturer or country.

14K Yellow Gold (Nickel-Free)

Gold Content: 58.5%

Element	% Range
Au (Gold)	57% – 59%
Ag (Silver)	8% – 12%
Cu (Copper)	27% – 33%
Zn (Zinc)	2% – 4%
Ni (Nickel)	0%
Pd (Palladium)	0%
Rh (Rhodium)	0%

14K Yellow Gold (Nickel-Containing)

Gold Content: 58.5%

Element	% Range
Au (Gold)	57% – 59%
Ag (Silver)	5% – 10%
Cu (Copper)	25% – 32%
Zn (Zinc)	2% – 5%
Ni (Nickel)	1% – 5%
Pd (Palladium)	0%
Rh (Rhodium)	0%

14K White Gold (Nickel-Free)

Gold Content: 58.5%

Element	% Range
Au (Gold)	57% – 59%
Ag (Silver)	8% – 12%
Cu (Copper)	4% – 10%
Zn (Zinc)	1% – 3%
Ni (Nickel)	0%
Pd (Palladium)	18% – 25%
Rh (Rhodium)	Trace (usually surface-plated only: <0.1%)

14K White Gold (Nickel-Containing)

Gold Content: 58.5%

Element	% Range
Au (Gold)	57% – 59%
Ag (Silver)	3% – 6%
Cu (Copper)	8% – 12%
Zn (Zinc)	3% – 6%
Ni (Nickel)	12% – 20%
Pd (Palladium)	0%
Rh (Rhodium)	Trace (surface plating common: <0.1%)

ELEMENT CONCENTRATION RANGES BY TYPE

These are approximations used in jewelry manufacturing and can vary slightly by manufacturer or country.

18K Yellow Gold (Nickel-Free)

Gold Content: 75%

Element	% Range
Au (Gold)	74% – 76%
Ag (Silver)	4% – 10%
Cu (Copper)	12% – 20%
Ni (Nickel)	0%
Zn (Zinc)	1% – 4%
Pd (Palladium)	0%
Rh (Rhodium)	0% (not used or plated)

18K Yellow Gold (Nickel-Containing)

Gold Content: 75%

Element	% Range
Au (Gold)	74% – 76%
Ag (Silver)	4% – 8%
Cu (Copper)	10% – 18%
Ni (Nickel)	1% – 5%
Zn (Zinc)	1% – 3%
Pd (Palladium)	0%
Rh (Rhodium)	0% (not used or plated)

18K White Gold (Nickel-Free)

Gold Content: 75%

Element	% Range
Au (Gold)	74% – 76%
Ag (Silver)	5% – 9%
Cu (Copper)	3% – 6%
Zn (Zinc)	1% – 3%
Ni (Nickel)	0%
Pd (Palladium)	12% – 20%
Rh (Rhodium)	Trace (surface plated: <0.1%)

18K White Gold (Nickel-Containing)

Gold Content: 75%

Element	% Range
Au (Gold)	74% – 76%
Ag (Silver)	3% – 6%
Cu (Copper)	5% – 10%
Zn (Zinc)	2% – 5%
Ni (Nickel)	10% – 15%
Pd (Palladium)	0%
Rh (Rhodium)	Trace (surface plating common: <0.1%)

18. SOFTWARE UPDATES

Periodically, the factory releases software updates that add features, fix software bugs, and offer other general improvements. Some updates may require the instrument to be returned to the factory, but generally, software updates can be completed remotely. **GEM**ORO will contact you if an update is available.

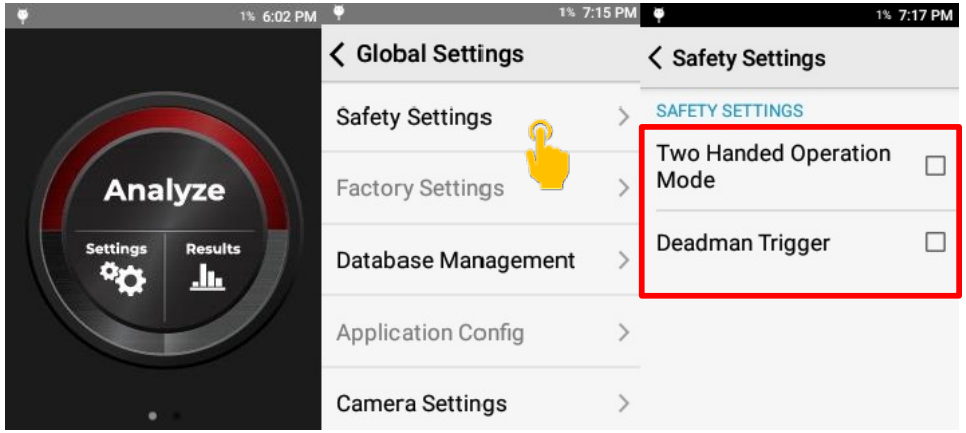
19. GLOBAL SETTINGS

Some Global Settings are available from the Home Screen. Note: Some settings are only available to factory-level users. Those that are unavailable will be greyed out.

SAFETY SETTINGS

Two Handed Operation Mode – Require user to hold trigger and Start button on screen during a test. This is a safety feature that discourages holding the sample while testing.

Deadman Trigger – Trigger must be held while testing. Releasing trigger before test time has elapsed will abort the test.



DATABASE MANAGEMENT

Create/Restore User Backup – Back up custom calibrations, settings, etc. Note: User can also accomplish this by downloading instrument database to PC in Profile Builder.

Reset User Data – Delete all results, delete custom settings.

Reset User Permissions – Delete user-created logins

Reset Formulas – Delete action level models. Can be useful if Pass/Fail/Inconclusive determination does not show as expected

20. ROUTINE MAINTENANCE

Users may wish to establish a routine performance qualification program by testing one or more check samples and confirming that results remain within some predetermined range.

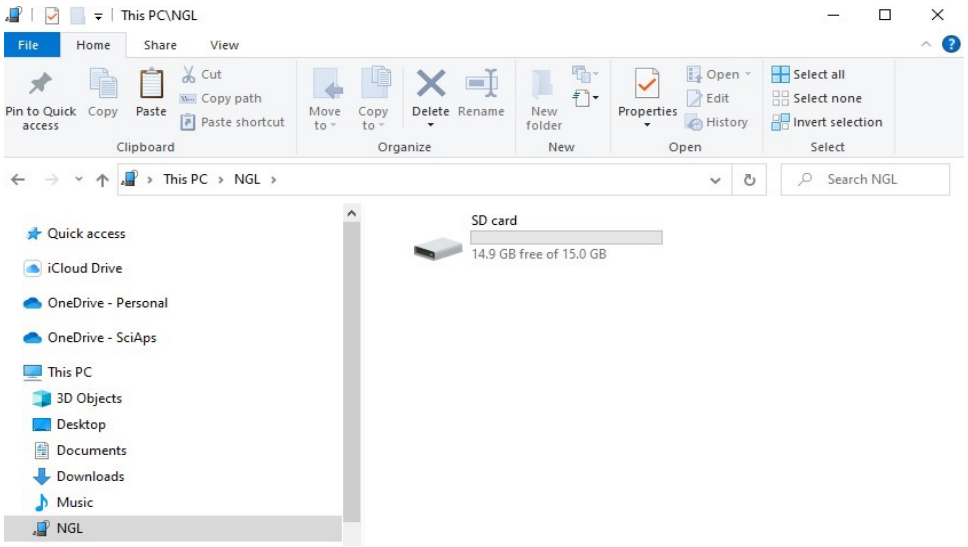
The analyzer should be kept clean. Never use solvents or other liquid cleaners on the analyzer. The touchscreen may be cleaned with a lint free cloth. Do not use compressed air, especially near the measurement window, as this could damage the detector.

The detector, x-ray tube, and electronics are protected by a thin plastic window of either Prolene or Kapton. The window should be visibly clean with no tears or punctures. As needed, the window can be replaced by removing the wear plate by its four screws, peeling off the old window, and affixing a new one. The analyzer ships with several spare windows; more may be purchased from **GEM**ORO.

21. SYSTEM FEATURES

USB CONNECTIVITY

Connecting by USB is the simplest way to transfer data from your system to a computer. Connect the provided USB-C to USB-A cable to both the analyzer and the target computer. The device will appear under /This PC/ NGL/ SD Card.

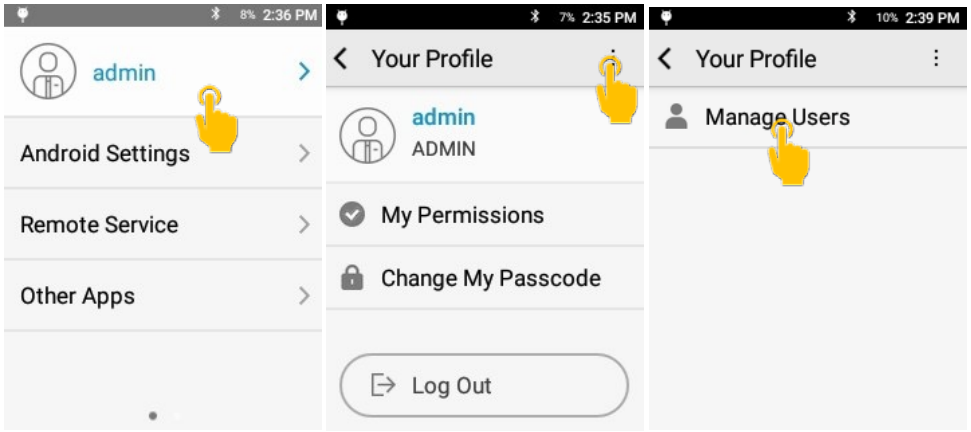


USER MANAGEMENT

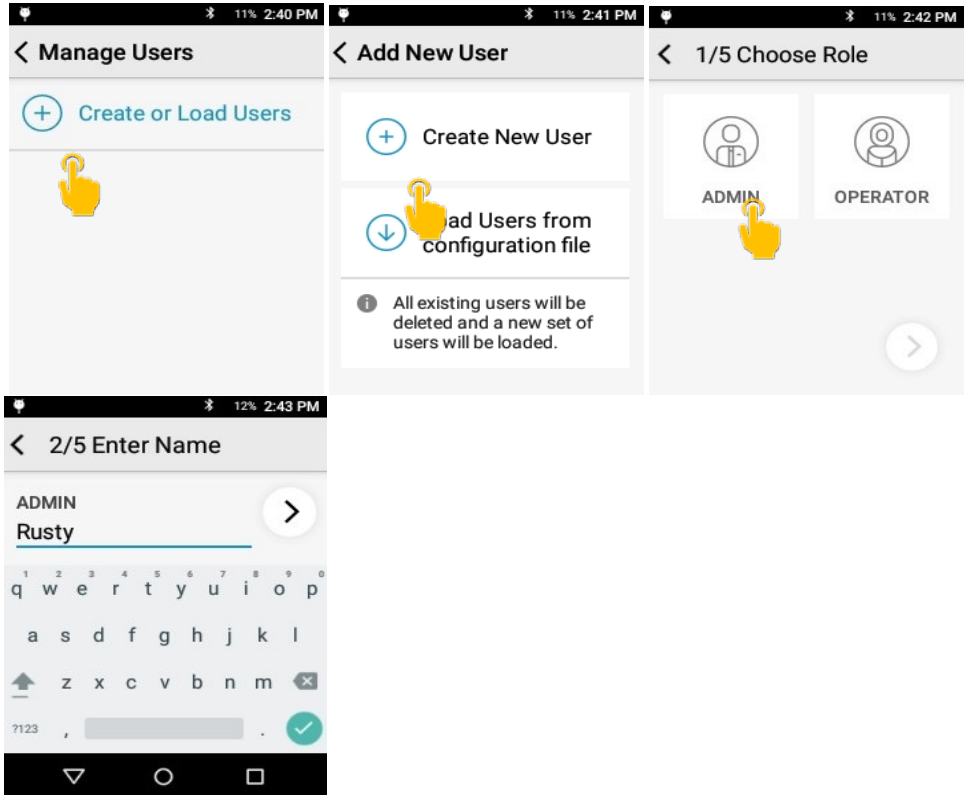
User Management allows the admin to create additional accounts, manage permissions, and reset passwords. Only an Admin can create and manage accounts unless specific permissions are given to an account.

Accessing User Management

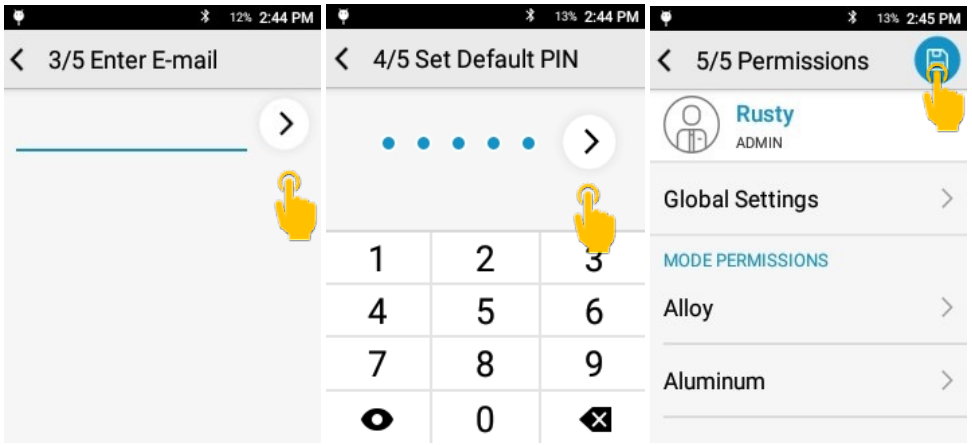
Navigate to the settings page and tap **admin**. Tap the menu, then tap **Manage Users** to create or manage additional user profiles. Tap **Create or Load Users**.



Tap Create or Load Users then tap Create New User. Select Operator or Admin then press > to continue. Enter Operator Name then press > to continue.



Optional: Enter Email then press > to continue. Enter 5-digit PIN then press > to continue. Select Permissions and click the save button.



GEMORO®

SY KESSLER SALES, INC.
10455 Olympic Drive
Dallas, TX 75220 USA

www.sykessler.com

For technical support:

800.527.0719 or 214.351.0380
sales@sykessler.com