Metrohm Spectro, Inc.
313 Enterprise Dr
Plainsboro Township, NJ 08536
(732) 230-1601
www.metrohm.com

TacticID®-1064 ST

Handheld Raman System

User Manual

8.0953.8101EN
Version 2.0

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TacticID-1064 ST Safety Overview

The TacticID-1064 ST is a handheld Raman instrument designed for rapid identifications of unknown materials based on their Raman signal. The instrument has a touch screen with intuitive software for easy operation by specialists and non-specialists alike. The functions, general instrument configurations, and scanning and identification of samples are done through the embedded software TOS-XM (TacticID-1064 ST Operating System), while data management and reporting are done by either direct report export, or synchronizing the instrument data onto a PC via the TacticID-1064 ST PC software TID21. The instrument is housed in an IP68-rated case that provides protection from ingress of dust and protection in water up to 1.5m deep for up to 30 minutes without harmful effect.

Safety Warning and Labels

The TacticID-1064 ST system contains one Class 3B laser light source of 1064 nm laser excitation. The product complies with the US Federal Code of Regulations 21 CFR 1040.10, Laser Products.

Read through this user manual before operating the system.

Figure 1: Laser warnings for the device

The NOHD (Nominal Ocular Hazard Distance) of TacticID-1064 ST is 9 inches (23 cm) when there is no sample attachment on the lens shaft. The laser warning label is located on the rear panel of the system, together with the manufacturer's identification. The laser warning label displays the laser safety, wavelength, and power of the laser source.

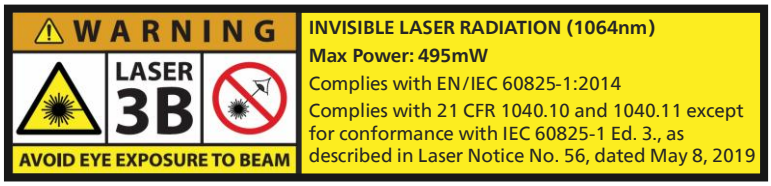


Figure 2: Laser warning label on rear panel

The manufacturer's general identification includes warning information and displays the manufacturer's name, address, model number, maximum laser power, serial number, manufacturing date, and power supply specifications.

Figure 3: Manufacturer's general identification

Laser Emission Aperture and Beam Shutter

Located at the laser emission aperture, the laser emission label indicates that the laser energy emission occurs at the corresponding port. The device is equipped with CDRH-compliant laser safety measures.

The laser emission aperture is located on the top of the device where the sampling accessory is also installed.

Figure 4: Laser emission aperture

CAUTION: The shaft of the device should never be removed. If the shaft is loose, contact Metrohm for service. Removal of the shaft can void the warranty.

Precautions

- The 1064 nm laser is not visible to the human eye, but can still impose serious ocular damage or ignite samples if proper Laser Safety precautions are not followed. Operate with caution.
- Never point the device directly at a person.
- Never look directly into the laser beam path or scattered laser light from any reflective surface.
- Never look directly into the laser source.
- Maintain low beam level when performing experimental setup to prevent inadvertent beam-eye contact.
- Avoid wearing jewelry and watches with shiny and highly reflective surfaces.
- Post the laser danger sign in the working area.
- As a precaution against accidental exposures to the laser beam or its reflection, always wear laser safety glasses with sufficient attenuation for the laser.
- 1064 nm laser is not visible. Do not look directly into laser emission aperture. Never point the laser at a person. Do not perform scans while installing adaptors.
- Lower laser power settings are recommended when measuring dark, flammable, or explosive samples as they may heat up and potentially burn or ignite.

Sources for additional information and assistance on laser safety:

CDRH-Radiological Health Program

Office of Communication, Education and Radiation Programs

Center for Devices and Radiological Health

US Food and Drug Administration

10903 New Hampshire Avenue W066-4613, Silver Spring, MD 20993 USA

Tel: 1-800-638-2041

Fax: 1-301-847-8149

dsmica@fda.hhs.gov

Laser Institute of America

13501 Ingenuity Drive, Suite 128, Orlando, FL 32826 USA

Tel: 1-407-380-1553

Fax: 1-407-380-5588

www.lia.org

Getting to Know Your TacticID-1064 ST

System Contents TacticID-1064 ST (Including optional accessories)

Name	Article #	Image
TacticID-1064 ST Main Unit with polystyrene cap	Main Unit with polystyrene cap: 19530020 Polystyrene cap alone: 607509070	
ST Smart Adapter	607509000	
Smart General Attachment	607509010	
Smart Vial Holder Attachment	607509030	
Smart Right Angle Attachment	607509050	
Smart SWD Attachment	607509020	
TacticID-1064 ST immersion probe	607509060	
LWD with 8 mm working distance	607509040	
Pouch for Attachments Advanced	607507310	
Pouch for Attachments Basic	607507300	
1064nm Laser Safety Goggles	67560050	
TacticID-1064 ST Carrying Case	602709000	
Power adaptor 15V 3.6A DC. US adaptor type.	62169010	
Type-C to Type-C USB cable for charging	62163020	
International power adaptor type INCLUDE: EU/UK/AU	62169000	

OTG Flash drive for TID21 Software and User Manuals	62169030	

Optional Libraries

- MCRL Raman spectral library of >20000 spectra containing common chemicals, narcotics, solvents, TICs and TIMs, etc. Includes NFPA 704 and GHS safety information. Compatible with TacticID-1064 ST.
- Raman Explosives library TacticID-1064 ST. Includes NFPA704 and GHS safety information. This library is classified as ECCN 1E002.g
- Raman Chemical Warfare Agent Library for TacticID-1064 ST. Includes NFPA704 and GHS safety information. This library is classified as ECCN 1E002.g

Power Supply

The TacticID-1064 ST can be run on either the external power supply or on the internal, swappable battery. A fully charged battery can last from 4 hours to a full day, depending on the usage of the device. The battery status is displayed in the top right corner of the screen when the device is powered on. The battery power can be viewed from any screen by swiping down. The battery can be swapped by opening the compartment at the bottom rear of the instrument for uninterrupted use.

The TacticID-1064 ST battery can be charged with our manufacturer-supplied 15 V 3.6A DC power adaptor. When charging with the power adaptor while the device is not powered on, the battery level, the date and the time will be displayed in the center of the screen even though the system is not powered on.

The software will give warning notifications of low battery power at 15%, 10%, and 5% power levels. The instrument will automatically shut down when the level reaches 3%.

The battery icon is green when the power percentage is higher than 25%, red when it's between 10%-25%, and empty when it's below 10%.

Users can also charge the TacticID-1064 ST device using commercially available off-the-shelf battery packs and car chargers. The minimum requirement for the battery pack is the 15V option with at least 3A output, and a USB-C to USB-C cable. Please make sure to use the USB-C port for charging, as the USB type A port does not provide the power needed to charge the device. Please also be careful when using commercial products with the TacticID-1064 ST, as Metrohm cannot guarantee the quality of third-party power adaptors.

TacticID-1064 ST Cleaning

TacticID-1064 ST requires minimal maintenance and care. To clean the TacticID-1064 ST touchscreen, wipe it with a soft cloth dampened with ethanol or isopropanol. The main body of the device may be wiped down with water, and plastic surfaces may be cleaned with soap and water. Use ethanol to clean the emission shaft. The rubber jacket may be cleaned with any of the above. A mild bleach solution may be used to wipe down the device. Do not use chlorinated cleaning products or other solvents for any part of the device.

In order to prolong the device lifetime and maintain good operating practice, please do not clean the device by immersion in bleach solutions or similar agents. In the rare cases where special decontamination protocols are necessary, please allow the device to be fully dried before turning it on.

Power Button

To turn on the device, press and hold the power button for more than 3 seconds. While powered on, pressing the power button once will shut off the screen while keeping the device running. Press and hold the power button for more than 2 seconds and choose options on the screen to turn off the device.

When the power button is pressed once, the device will go to standby mode.

In the case of an unexpected situation, the device can be turned off by long hold the Power button for more than 10 seconds.

Laser Button

The laser can be turned on only when the system is in the Scan menu, Performance Validation, or Library menu. To turn on the laser, press the **Laser** button .

In the case of an emergency, the laser can be turned off by pressing the Laser button or the Power button.

Using the SmartTip Sampling Accessories

The TacticID-1064 ST Basic package comes with four SmartTip sampling accessories which can be easily interchanged. Depending on the type and form of the materials to be measured, the appropriate sampling accessory may be selected. The sample should be placed directly against the attachment.

The user must ensure that the sampling attachment is installed properly before using the device. Before installing any accessories, the device should be at the login screen, and the laser is turned off to ensure safety. No operations shall be permitted without an attachment properly installed.

The following steps guide the user to a successful installation of the sampling accessory.

Figure 5: Shaft and O-ring

Figure 6:Top view of shaft and SmartTip connection

Figure 7: smart general attachment

Figure 8: Installed smart general attachment

Using the polystyrene validation cap

The Polystyrene cap is used to validate the performance of TacticID-1064 ST. Install the polystyrene cap by gently pushing the cap until the SmartTip connection is completed. Do not cover the pressure release pin-hole on the polystyrene cap during installation. To maintain the quality of the cap, store it in the attachment pouch when not in use and only use alcohol to clean the inside of the cap if necessary.

Figure 9: Performance Validation Attachment installed

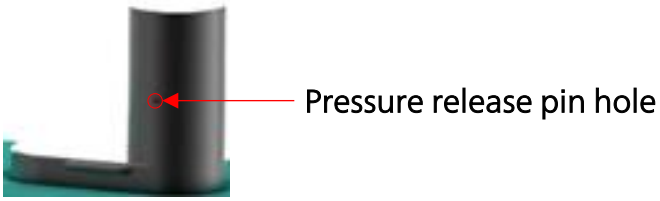


Figure 10: Polystyrene validation attachment pressure release pin hole

Using the General Attachment

The General Attachment can be used for solid and liquid samples, preferably in a transparent container such as a plastic sample bag or glass bottles. Gently push it all the way in until the attachment is locked into position. With the General Attachment in place, hold the sample so that the attachment is in close contact with the sample bag or sample surface.

Figure 11: General attachment installed

Using the SWD Attachment

The SWD Attachment can be used for primarily power and solid samples, preferably in a thin transparent container or no container situations. Gently push it all the way in until the attachment is locked into position. Hold the sample so that the attachment is in close contact with the sample bag or sample surface.

Figure 12: SWD attachment installed

Using the vial holder attachment

The vial holder can be used for liquid or gel samples. The vial holder holds a 15mm (diameter) x 45mm (height) vial. To install the vial holder attachment, insert the attachment onto the shaft. Gently push it all the way in until the attachment is locked into position. Use the cap over the vial when the sample is being measured to minimize any ambient light interference.

Figure 13: Vial holder attachment installed

Using the right angle attachment

Insert the attachment onto the shaft with the notch aligned with the set pin. Gently push it all the way in until the attachment is locked into position. Place the device on a flat surface so that the right angle attachment port is in contact with the surface of sample or the

transparent sample container. The right angle attachment should be used facing down to avoid accidental exposure of the user to laser light.

Figure 14: Right angle attachment installed

Using the LWD (Long Working Distance Attachment WD 8mm)

Insert the attachment onto the shaft with the notch aligned with the set pin. Gently push it all the way in until the attachment is locked into position. Place the device on a flat surface so that the bottle attachment outer plastic is in contact with the bottle following its curvature. The bottle attachment has a working distance around 8mm in air.

Figure 15: LWD attachment installed

Using the ST Attachment

The ST Attachment uses our patented STRam technology to sample an enlarged area with a defocused beam. It also has an optical cavity to enhance the signal from the sample in a container. It is suited for detection of powdered mixtures, pills with coatings, explosive powders as it covers a larger area and has lower power density. It can be installed the same way as all other attachments. When using it, make sure the sample tightly covers the attachment area and no ambient light is leaking into the measurement. This attachment is ideal for craft paper envelops, bags, or HDPE bottles.

Figure 16: ST attachment installed

Using the Immersion Probe (optional)

This is an optional item for TacticID-1064 ST. Insert the immersion probe onto the shaft with the notch aligned with the set pin. Gently push it all the way in until the probe is locked into position. The immersion probe has a working distance of 1.0mm. It is suitable to be used immersing in powders and liquids. The body of the immersion probe is stainless steel 316L.

Figure 17: Immersion probe attachment installed

Attachment working distance chart

Attachment Name	Working Distance
General Attachment	~ 5mm
SWD Attachment	< 2mm
Right Angle Attachment	< 2mm
Liquid Vial Holder	Inside the Vial
LWD Attachment	~ 8mm
ST Attachment	Defocused
Immersion Probe	< 1mm

Camera (13MP)

The camera is located on the back of the device. The camera function provides the capability for the user to capture the image of the packaging, label or physical appearance of the sample and then save to be included in the report. Image can be saved with each scan. The camera is also equipped with a flashlight. The camera function can be disabled if necessary.

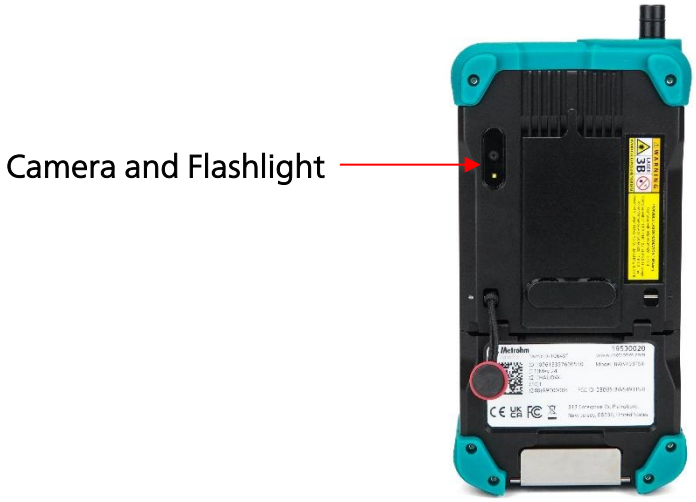


Figure 18: Camera and Flashlight on back of device

Back Cooling Fans

The cooling fans are located on the back of the device. The cooling fans allow the instrument to be continuously running in a hot environment with exceptional performance. The cooling fan can be removed for cleaning and replaced if necessary. The cooling fan will turn off when the device goes to sleep.

Figure 19: How to remove the back fan

Power On/Off

To power on the system, press and hold the **Power** button for 2-3 seconds. A screen indicating the system's initialization process will be displayed. After the initialization is completed, two warning messages will be presented, followed by the user Login screen. The device is now operational.

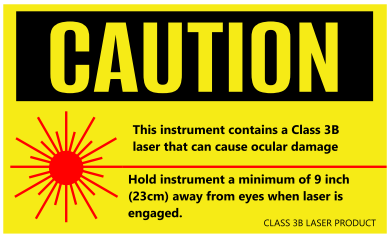


Figure 20: Laser warning when turning on device (1/2)

Figure 21: Laser warning when turning on device (2/2)

After the device is operational, pressing the Power button once will shut off the screen and the device will go into sleep mode. The battery will slowly drain during sleep mode. Typically, a brand-new fully charged device can maintain charge **under sleep mode** for more than 150 hours. To wake the device from sleep mode, press the power button once again.

There are two ways to turn the system off:

Soft power-down: press and hold the **Power On/Off** button for about 2-3 seconds. A message will appear confirming the shutdown request. Press **ACCEPT** to confirm the operation and the system will turn off. Press **CANCEL** to cancel the request and return to the previous screen. During soft power-down, a system message informing the status of the shutdown sequence will display. The message will go away shortly. Once the back fan stops, the device is shut down completely.

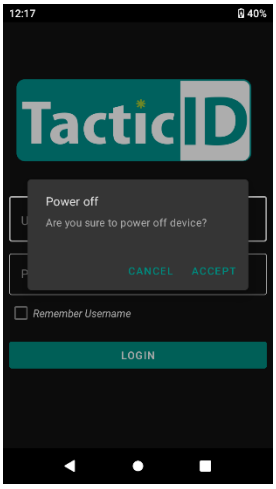


Figure 22: Soft power-down message

Hard power-down: press and hold the **Power** button for more than 10 seconds. The device will power down using only hardware, independent of software operation. Avoid using hard power-down unless necessary.

User Login

There are two levels of user accounts available, Administrator and Operator. The identity of the currently logged-in user appears at the top of the Menu accessible from the top left of the screen.

There are two pre-built accounts: ADMIN as Administrator and OPRT as Operator:

ADMIN

Administrator-level user accounts have access to all functions and options of the TOS-XM, specifically the Library and Setup options.

The default login password is 9999. After the initial login to the system, the ADMIN can set a new password for security reasons. The ADMIN also sets the account setting of what password strength is required. (see section 3.12.2) **For first time login, before doing performance validation, set the time zone and local time by going to Menu (the ☰ icon on the top left) → Settings → General → Date & Time. Once the time is set, restart the device. After that, install the polystyrene cap and do performance validation.**

OPRT

Operator-level accounts have access to selected functions: Scan, Data Transfer, Performance Validation, Diagnosis and Results Display.

The default login password is 9999. After the initial login to the system, the Operator is prompted to set a new password for security reasons. The password should follow the password requirements set for the device.

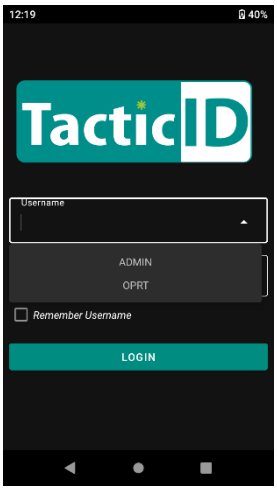


Figure 23: Login screen with two default accounts

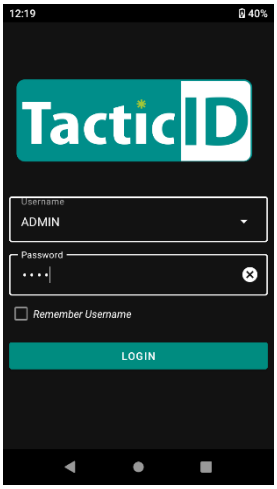


Figure 24: First time sign in with ADMIN account

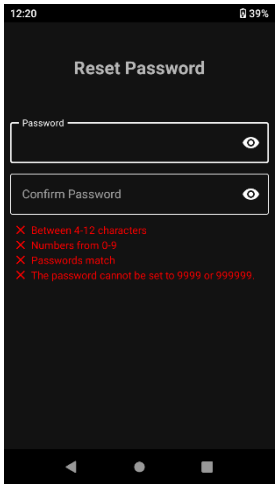


Figure 25: Reset password menu

Operating Procedure (OP)

Select Operating Procedure

Before scanning materials, an Operating Procedure must be selected. The Operating Procedure can be defined, edited, and viewed by an ADMIN-level user, and viewed only by an operator-level user.

A pre-built OP 'Standard' is selected by default. It can be viewed but cannot be edited.

The operating procedure contains the parameters used for scanning: Laser Power, Integration Time, Minimum HQI (hit quality index), Number of Hits, and Raman Shift Search Range to be used for spectral search. An ADMIN user can create a new OP and select it for scanning.

To select an Operating Procedure:

1. Press the **Menu** icon on Home screen
2. Press **Operating Procedure**
3. Press the name of the OP to view or edit the OP

Within the OP, different modes of Identification can be configured for Normal, Mixture, and ST.

To create a new preset press the plus icon at the top-right of the screen. A 'NewOP_#' procedure will be listed. To rename it, swipe to the left and choose Rename; type in new name then press **OK**. An unwanted OP can be deleted by swiping to the left and selecting Delete.

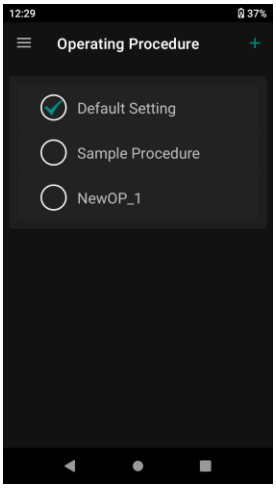


Figure 26: Operating Procedure menu

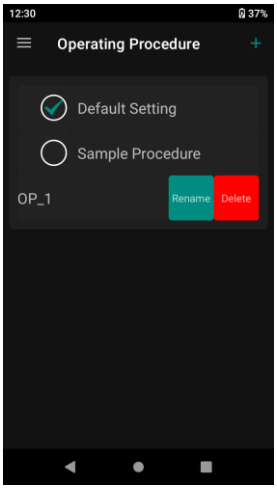


Figure 27: Rename an operating procedure

Click on an OP's name to open and view or edit. Please note that the Default Setting procedure can be viewed only but not edited, and this default OP itself cannot be overwritten by other user settings. To add a mode for identification, press Add Mode, then select which mode(s) should be added to the OP. If no scan mode for identification is selected, the OP will not save. Mixture mode cannot be added without also adding Normal mode.

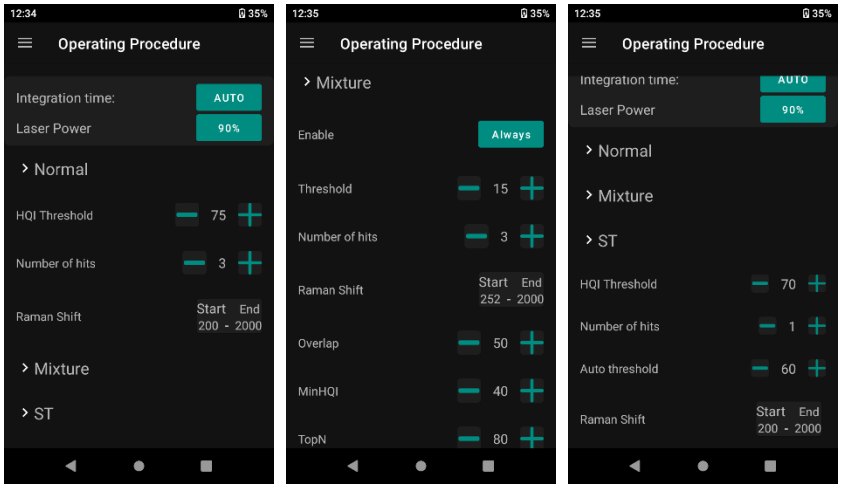


Figure 28: Operating procedure Normal, Mixture, and ST scan mode settings

Laser Power

Tap on the laser power to set the desired laser power as a percentage of the full laser power. The default setting uses 10% increments. For laser power measured in mW, it is adjustable by 10mW as default interval and the maximum laser power is 495mW.

Integration time

By default, the scan integration time is automatically determined to give an optimal sample. The integration time can be set to be Manual (Figure 29: Manual integration time setting in OP).

If the user chooses Manual integration time in the operation preset, and activates the Operating Procedure, then manual integration time option will appear on the scan screen. The user can click the timer icon on the top right on the scan screen to configure the integration time settings.

The user can toggle on and off the manual integration time function. When the function is toggled on, users can choose any integration time from 0.1s to 60s. When the function is toggled off, automatic integration time is applied.

Check “Apply for all following scans” box to apply the configured manual integration time to all subsequent scans. (Figure 30: Manual integration time setting in scan screen)

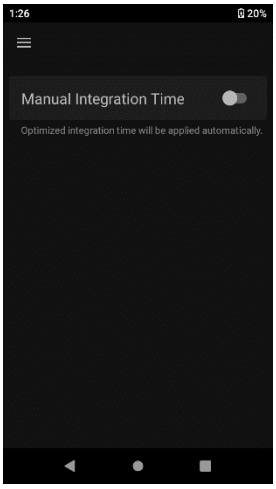


Figure 29: Manual integration time setting in OP

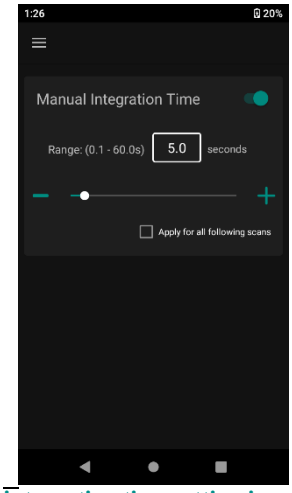


Figure 30: Manual integration time setting in scan screen

Raman Shift

The user can set the Raman Shift range of the Raman spectrum used for matching. The default range is 200-2000 cm^{-1}. Set the range to any desired value, keeping in mind that a narrower range means that only that defined range will be searched to match a library signature. Changes are automatically saved.

HQI Threshold

The criterion for Match/No Match can be set via a minimum HQI (Hit Quality Index) value. HQI is a measure of the correlation of the sample signature against a library signature by use of a predetermined cross-correlation algorithm. HQI=100 indicates a 100% correlation score between the sample and the library signature,

indicating that the signatures are identical. HQI=0 indicates a 0% correlation, and no similarity between the sample scan and the library signature.

From the Operation Preset screen, press **HQI Threshold**. Change minimum HQI value by pressing +/-. The default setting for minimum HQI is 60, which means measurements with HQI ≥ 60 will result in "Match" while measurements with HQI<60 will be "No Match".

Number of Hits

The number of hits sets the number of matches **displayed** in the results if there is more than one library signature that meets the HQI Threshold. Change the number of hits by pressing +/-. The default setting is 3, which means that the top three materials with HQI above the threshold will be displayed on the results screen in descending order.

Mixture Analysis

Mixture analysis can be done on collected data to identify if there are multiple materials that contribute to the overall sample signature. Users can choose to have the mixture analysis function enabled "Always", "AutoForNoMatch", "ManualForNoMatch", "ManualForAll", or "Disabled". When Auto mixture analysis is selected, the system will automatically perform mixture analysis after each scan if the HQI match is < 93. In Manual mode, the user may initiate a mixture analysis after reviewing the collected data, or from the scan history. When it is disabled, mixture cannot be performed for a sample scan. (It can be enabled post-scan, and mixture run from the Scan history). The detailed parameters for mixture analysis include:

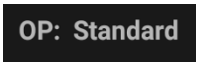
- *Mixture Library sets the libraries used in mixture matching. To improve the mixture results, the user can choose to only select the library that has a small number of signatures. For example, for narcotic detection, it is recommended that only the Illicit library is selected so that the search is focused on narcotics and its related cutting agents. Larger libraries such as TPJ should be selected when the user wants to expand the search to include more materials. Note that larger libraries take longer to search and may have too large a scope to give optimal results.*
- *Threshold **sets** the threshold value for a matched mixture component result to be displayed. The ratio value is the % contribution of a mixture component to the collected signature. The default value is 10%, and therefore all the hits up to the selected number with ⩾10% contribution to the collected signature, will be presented as part of the mixture result.*

- *Mixture Hit sets the maximum number of compounds that can be displayed in the mixture results. The default value is 3, and maximum is 9.*

Scan Operation

The home screen after login is the main interface for operation and allows the user to scan a sample and get a match result.

Current Operation Procedure

The Top of the scan screen 

indicates the currently selected operation procedure.

Container Wheel

Figure 31: Container wheel settings

The container wheel indicates the container type that the sample is stored in. The container wheel is available when the **ST mode** is added to the currently selected operation procedure.

There are several container choices that the user can quickly scroll through before taking a measurement:

1. **Auto:** The system will automatically decide whether a known container is detected and remove the best-matched container spectra from the identification process. Auto is selected by default.
2. **Transparent/None**: The system will not remove any container spectra from the identification process.
3. **New container**: The system allows the user to scan a new container that is not included in the selected container list first, then take a normal scan. The spectra contribution from the new container will be removed from the identification process.
4. **Specific container**: The user can also select specific container types before taking a measurement. In this case, the system will only remove the specific container's spectra contribution. The user can choose from any container spectra in the selected container library.

Scan Delay

Figure 32: Scan delay setting (bottom left of home screen)

The user can change the scan delay time by pressing the + or – icon at the bottom left corner of the scan screen. If a scan delay is more than 0 seconds, the system will start a countdown timer before scanning. User can hold the + or – icon to increase/decrease the speed of the scan delay change. The maximum scan delay time is 60 minutes.

The scan delay will be applied to all subsequent scans until it is changed by the user.

Laser Power

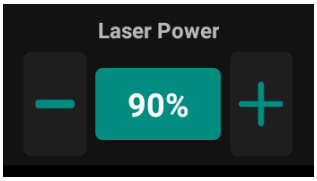


Figure 33: Laser power shortcut (bottom right of home screen)

The user can change the laser power before starting the scan. The user can change the Laser Power by pressing the + or – icon at the bottom right corner of the scan screen. The available power levels include: Operation Preset laser level set in the selected Operating Procedure, and 10% to 100% in 10% increments. Press the Laser button to start the scan.

Performance Validation Alert

The scale icon on the top right of the screen indicates the performance validation status of the instrument. If the instrument is validated, the color is green (meaning it passed the last performance validation that was run). If the instrument validation has expired, or the instrument failed the last performance validation, the symbol is changed to .

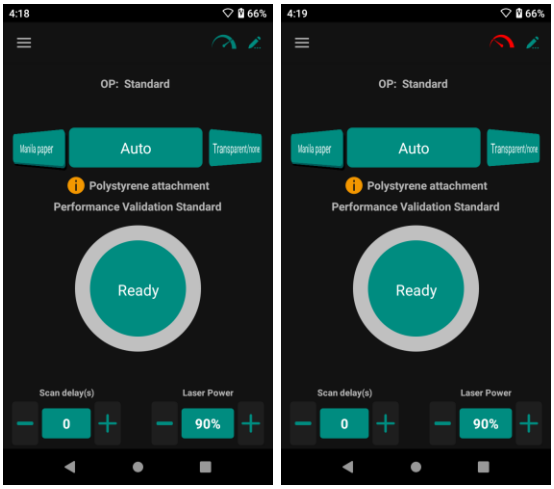


Figure 34: Performance validation shortcut (Valid and Expired)

Clicking the icon will guide users to the performance validation screen, and the user can perform the validation after installing the polystyrene cap.

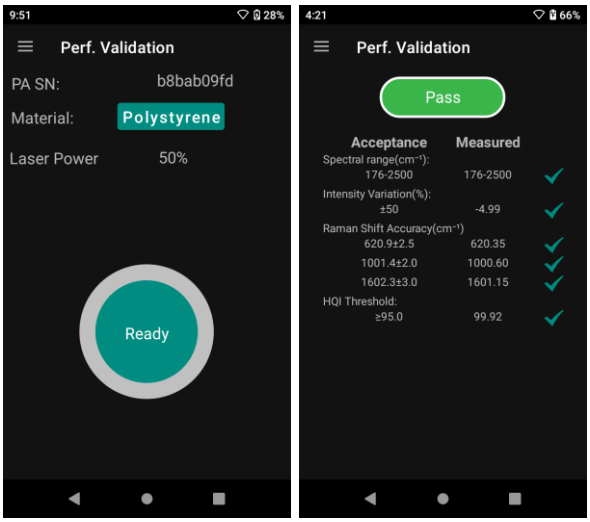


Figure 35: Performance validation screen

Notes and User Defined Fields (UDFs)

Before and after each scan, the user can add notes by clicking the Notes button. This information will be automatically included in the scan report. Notes can also be added immediately after the scan or at the scan history screen. Once the scan is saved, each entry will be associated with a timestamp. Original notes entered before the scan process cannot be changed in scan history, while additional notes can be added as a supplement.

Users can configure dedicated user-defined fields titles by going to the side menu → Settings → Advanced → User Defined Fields and enter traceability categories such as case number, sample number, badge number, etc. These UDFs will show up when user clicks  at the scan screen. Users can then enter the crucial tracking information as needed. Once saved, UDF information cannot be changed.

UDFs are not configured by default therefore will be empty if user does not input any UDFs. If the first UDF field is configured as "Barcode" in the User Defined Fields settings, then a barcode scanning icon will appear in the Inputs screen. Click on the scanning icon  and point the camera at the barcode to scan.

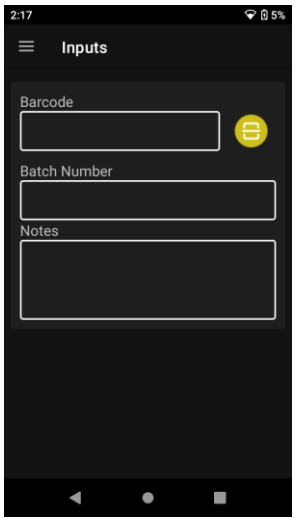


Figure 36: Example of Notes and UDF inputs before scan.

Initiating the scan

The scan is initiated by pressing the physical  button or the Ready circle in the center of the scan screen. This turns the laser on, and scans the sample, which is then analyzed, and a result returned.

Once the scan starts, the progress ring provides the user with a visual reference for the progress of the scan. The system sets a default initial integration time for the first scan. The integration time will then be automatically optimized. A dark scan will follow the sample scan.

While the dark scan is being collected, the sample needs to remain in the same position until the dark scan is completed.

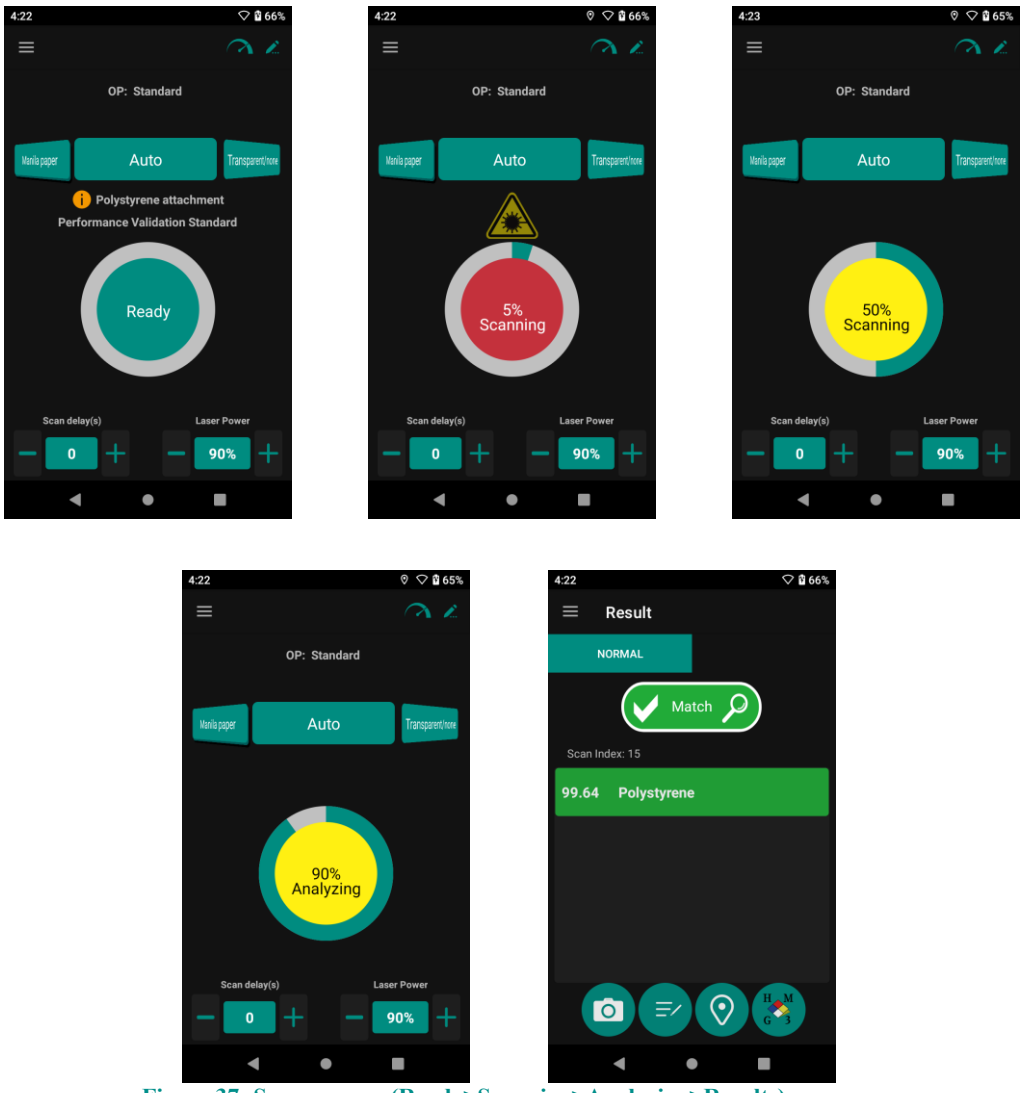


Figure 37: Scan process (Ready>Scanning>Analyzing>Results)

Abort Scan

During the scan process, the user can press the Laser button or the center screen to terminate the laser and abort the scan. The dial will retract counter-clockwise to indicate the scan is aborting. When data collection has stopped (Analyzing) and the scan is being analyzed, this current scan cannot be terminated.

NOTE: Before the scan is completely canceled, avoid moving the device or being exposed to laser emission. Avoid other operations on the screen. The laser may still emit during scan cancellation depending on actual device operation status. Refer to the Laser Safety precaution instruction.

User can also abort the scan by holding the power button for more than 10 seconds to completely shut down the whole system.

Scan Result Screen and Operations

Scan results

After the spectral signature is acquired, the search for a matching signature starts automatically, providing a result of "Match" or "No Match" on the screen. Each recorded scan has a scan index, displayed at the top of the result screen, with the name and match value for the sample displayed below it. The result is background color-coded with red, yellow, and green as an indication of warning level.

Red color: Illicit Drugs; Explosives; Chemical warfare agents
Yellow color: Prescription drugs; Pesticides; Flammable solvents; Sedatives/Depressants; Steroids; Strong Acids;
Green color: Common chemicals; Cosmetics; Dietary Supplements; Dye/Pigments/Stain; Pharmaceutical Excipients; Over-the-counter drugs; Nutraceuticals; Plastics

NOTE: For a matching signature in the user-defined library, the background color is defined by the user.

For "Normal" results, the best matching compound above the threshold hit quality index (HQI) will be displayed. To see the overlay of the spectrum with the library, press the magnifying glass after Match. If the operating procedure is set to display more than one hit, the matching samples above the threshold HQI will be listed in descending order, up to the set number of hits.

For “Mixture” results, the best matching compound above the spectral contribution threshold will be displayed.

Note: TacticID-1064 ST will not display multiple results that have the same CAS number, because they are considered the same chemical.

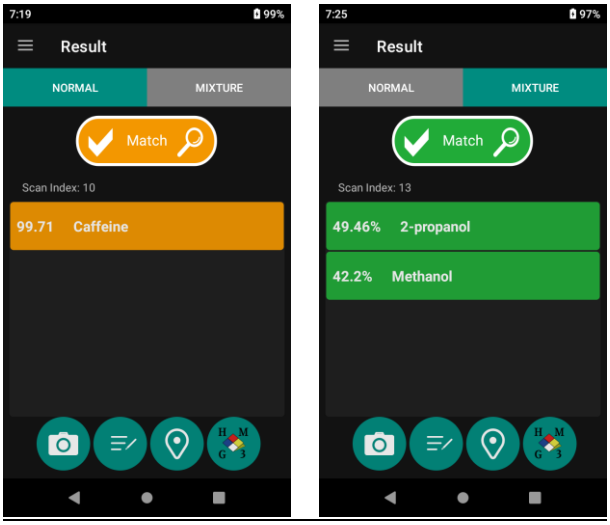


Figure 38: Results of only caffeine (Normal) and Results of a Mixture

Tagging

By default, the Illicit and General Chemicals Library contains chemicals that are labeled as narcotic cutting agents. When a narcotic cutting agent is found, the system will prompt the user to either further process the spectra to match potential narcotics or cancel the operation.

If the user selects Continue, additional processing will occur. If narcotics are found, it will be displayed with a T symbol next to the common cutting agent. If no narcotics are found, only the cutting agent will be displayed in red.

If users hit Cancel, no additional processing will be done, and normal matching results will be displayed.

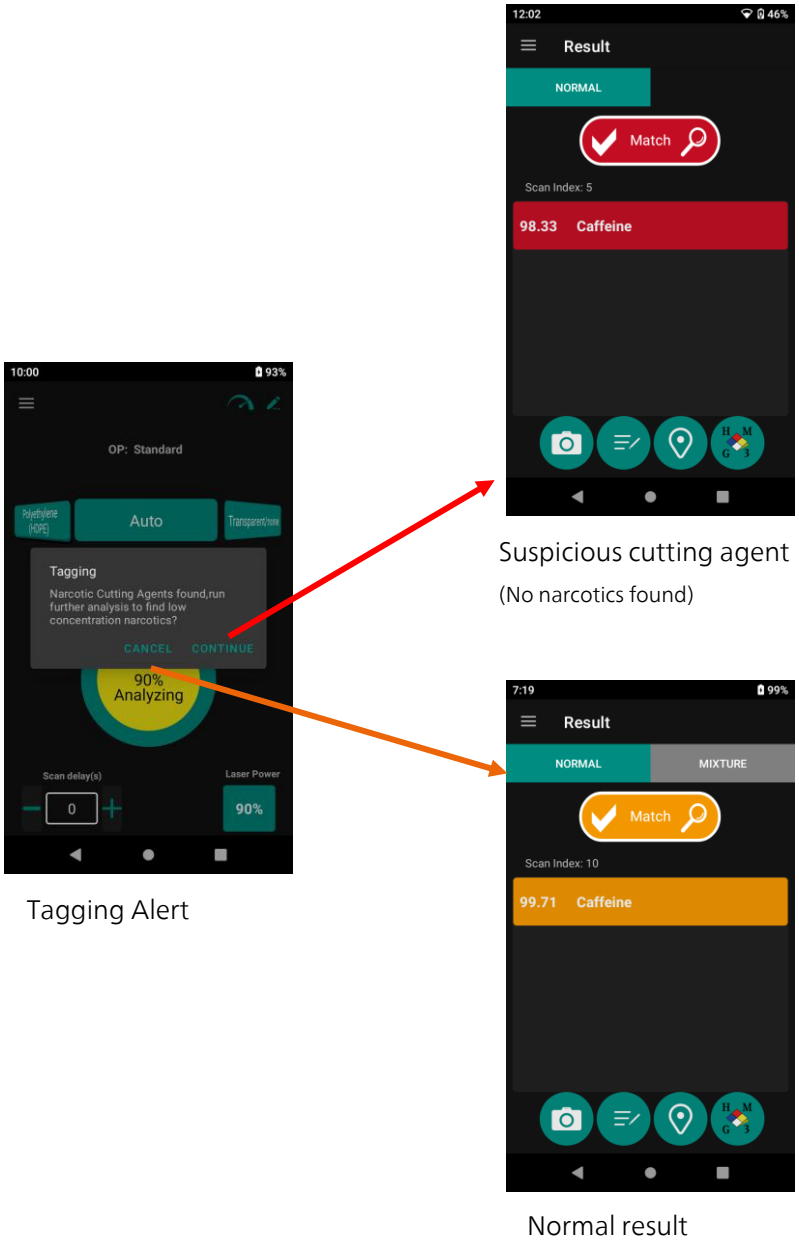


Figure 39: Results from tagging alert (Continue and Cancel results screens)

Compound Details

By tapping the compound name, the detailed result will be displayed, including name, classification, CAS#, synonyms, formula, and molecular weight. Tap on  or  to display GHS and NFPA safety information.

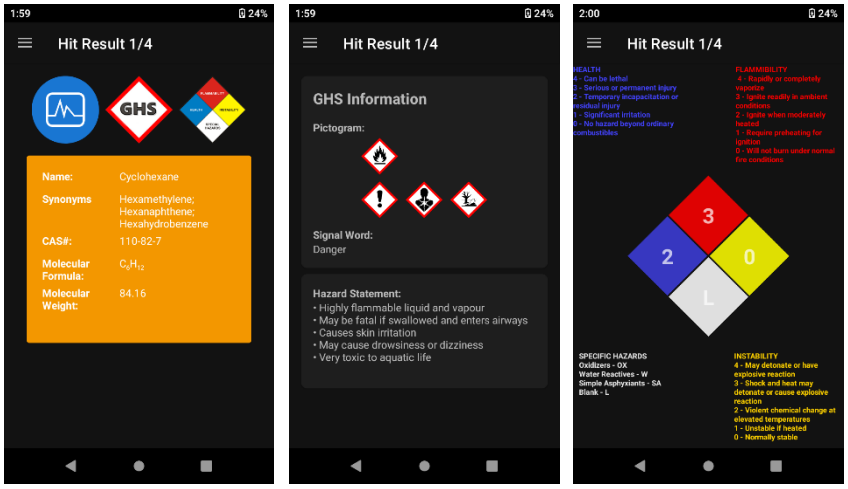


Figure 40: Compound details of match result

Press the spectrum icon, the spectral overlay of the current scan versus the library signature will be shown; the user is able to zoom-in/zoom-out by tapping the screen with two fingers and can move a cursor along the spectrum with one finger. Click the back arrow to return to the Result screen.

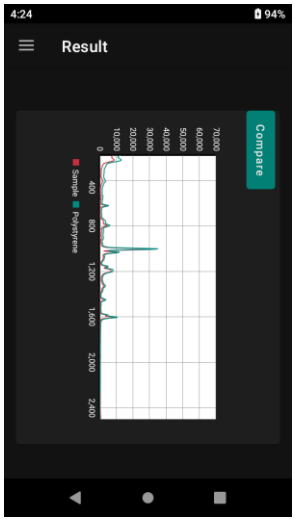


Figure 41: Raman spectrum in results screen

For "No Match" results, a message will be displayed stating that there are no samples in the library with a correlation above the threshold value. Press No Match to display the sample signature. Press the back arrow ◀ to close.

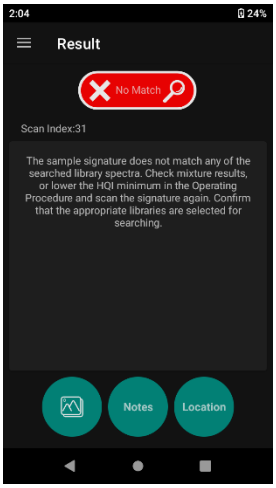


Figure 42: No match example

Mixture Analysis

The default settings will automatically calculate mixture analysis after a spectrum is acquired. Users can directly view the mixture result by tapping the mixture tab. Mixture analysis is not performed if a match with an HQI higher than 93 is found. This high of an HQI indicates the material has a high correlation with a pure compound. The typical limit to mixture analysis is about 10~20% of a material present to identify.

When the Mixture Analysis function is set for matched scans to "Manual" mode, a **Mixture** button will be shown at the scan result screen, allowing the user to perform mixture analysis manually. Users are advised to view the signature (with Match) before performing mixture analysis to ensure that it has visible peaks, indicating the scanned sample has a Raman signature. Press the Mixture button and the system will run mixture analysis on the given signature to determine the possible substances. There is no laser emission during the mixture analysis. The color of the mixture result also reflects the warning level of each individual mixture candidate.

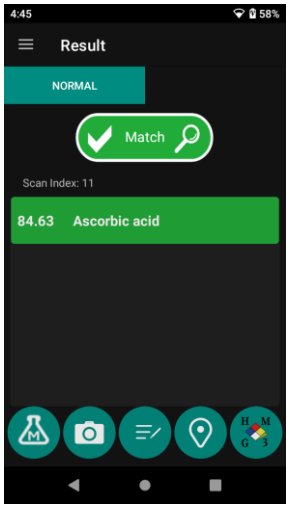


Figure 43: Results screen with manual mixture analysis set

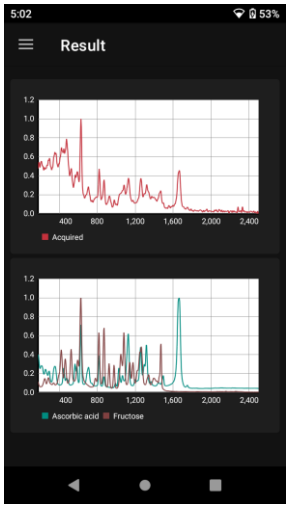


Figure 44: Results screen with acquired spectra and mixture analysis performed

When Auto Mixture analysis is enabled, after the scan is done, mixture analysis will automatically be performed and provide mixture results under the mixture tab.

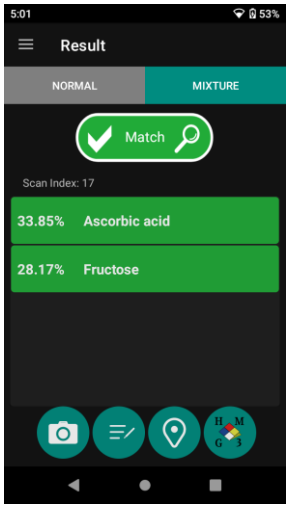
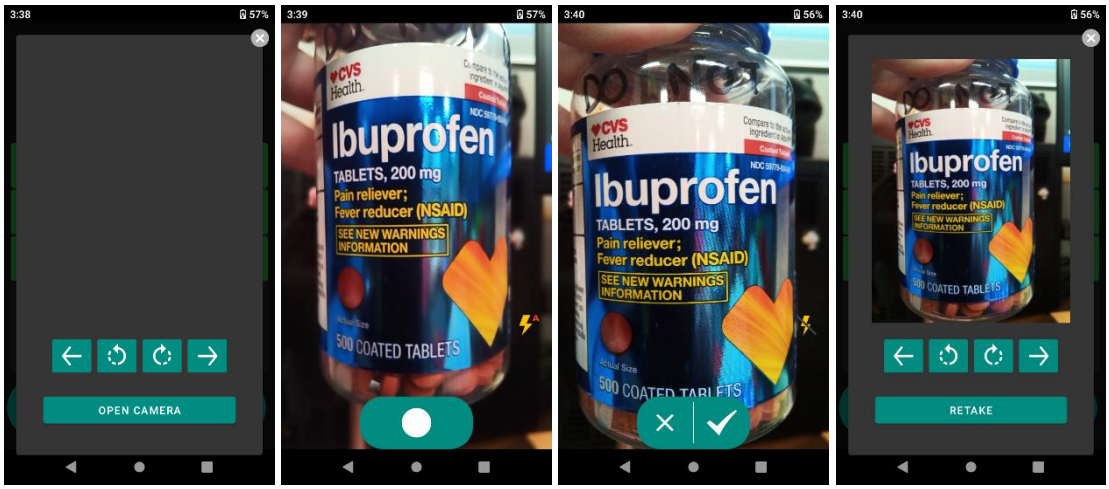


Figure 45: Auto mixture analysis under the mixture tab

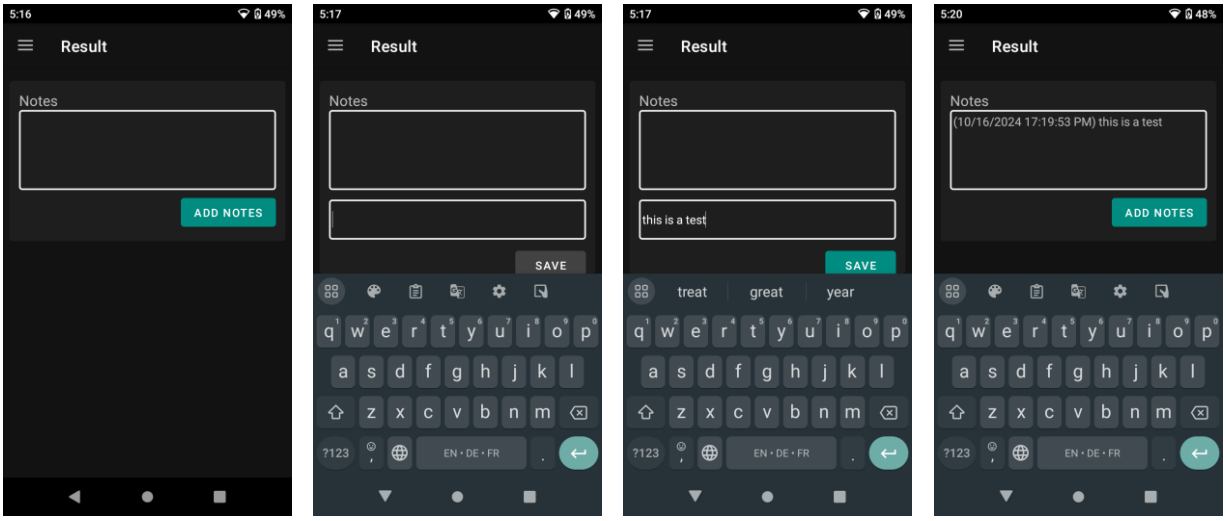
Camera

After each scan, the user may also take pictures to document the sample or other related scan information. Simply click on the camera icon, click “Open Camera”, and aim the camera at the object. Click the icon to take a picture. Users can rotate each picture by clicking the rotate buttons .



Notes and User Defined Fields (UDFs)

Notes can be added immediately after the scan in the results screen or after the scan has been taken by loading the scan from the history screen. Once the scan is saved, each notes entry will be associated with a timestamp. Notes cannot be edited nor deleted once added. Additional notes can be added as supplement.



Example of Notes and UDF inputs before scan.

Location

Location data of the scan are recorded (if available) immediately after each scan. This function can be turned on-off by default in the Settings -> Advanced -> Options settings.

To ensure location data is available, one of these 2 conditions must be met:

1. **The scan occurred while the instrument is connected to a Wi-Fi network that has internet access.**
2. **The scan operation happened while the instrument has a clear line of sight of the sky with no obstructions (building, window, heavy clouds).**

If the location data is available, the user can view the location data by pressing the  icon on the bottom of the result screen. The user will see longitude and latitude data at the top of the screen and a detailed map if internet access is available.

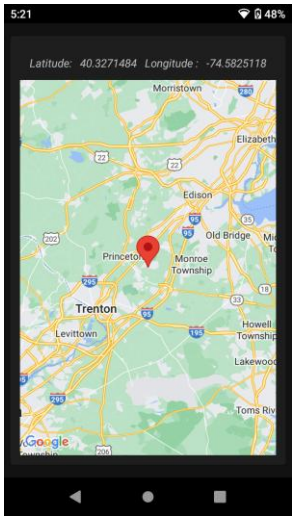
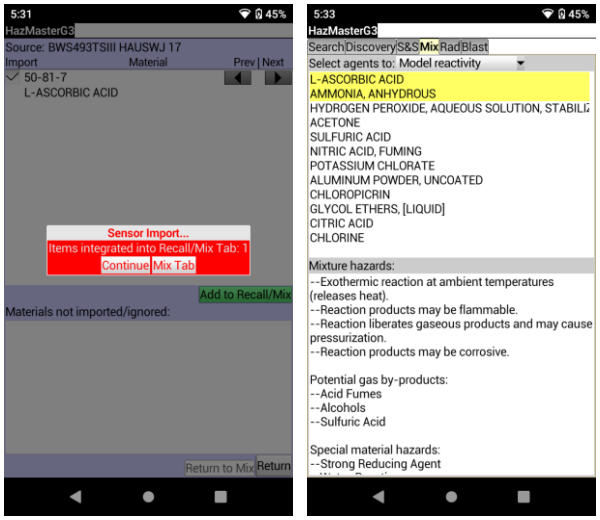


Figure 46: Location in scan results

HazmasterG3

The TacticID-1064 ST system allows users to gain tactical insights on the chemical safety nature of the identified compound by importing the hit result into HazmasterG3 app. One example function includes: At the result screen, users can click the HazmasterG3 App icon and add the identified compound into the Recall/Mix tab. This allows the user to predict what could happen if a series of potentially dangerous mix compounds are found.

For details, please visit: https://www.alluviam.com/enterprise-faq/what-hazmasterg3



View Scan History

View

Press the ▢ key at the bottom of the screen to display the scan history. All scans that have been collected since the last synchronization of data to TID21 can be viewed. Scan history lists scans by their scan index, date, and time stamp. The data can be viewed by tapping on the result area. Use the filters at the bottom of the screen to see only a selected group of results.

Scan records can be filtered by different scan type (including measurement scans), performance validation scans, Raman shift calibration scans, and performance reference file scans. The time frame filter can be set to 1 day, 7 days, 30 days, or a user-selected start and end date.

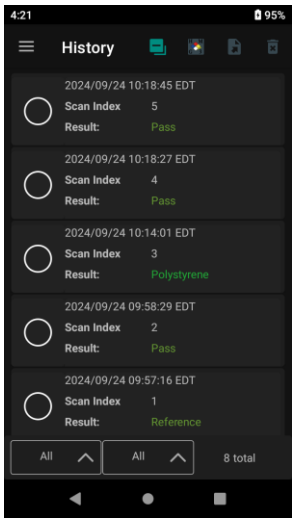


Figure 47: History screen

Delete Data Directly from TOS-XM

The scan records on the scan history page can be deleted directly from TOS-XM by any administrator account.

To delete numerous scans at once:

- Select the scans. A green checkmark will appear next to each selected record inside the circle.
- Select **the Trash can icon** 🗑 on top of the screen.

Users can swipe left on individual scans to delete the scan entry. The message “Deleted records are not retrievable. Are you sure you want to delete the selected record(s)?” will appear. Press **ACCEPT** to confirm or **CANCEL**. After it is done, a message “Successfully Deleted” will be briefly displayed.

Performance validation, Raman shift calibration, and Performance reference scans cannot be deleted.

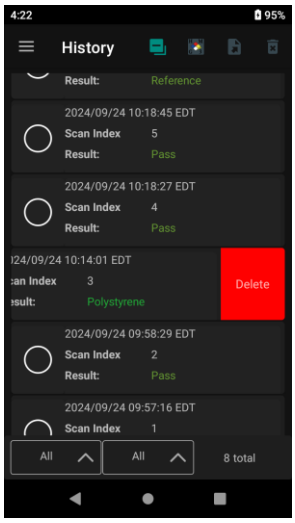


Figure 48: Delete scan in history

NOTE: Deleted data are not retrievable by users or factory. Confirm the selections before deleting. The scan history will be cleared after synchronization of remaining data to the computer via TID21 software.

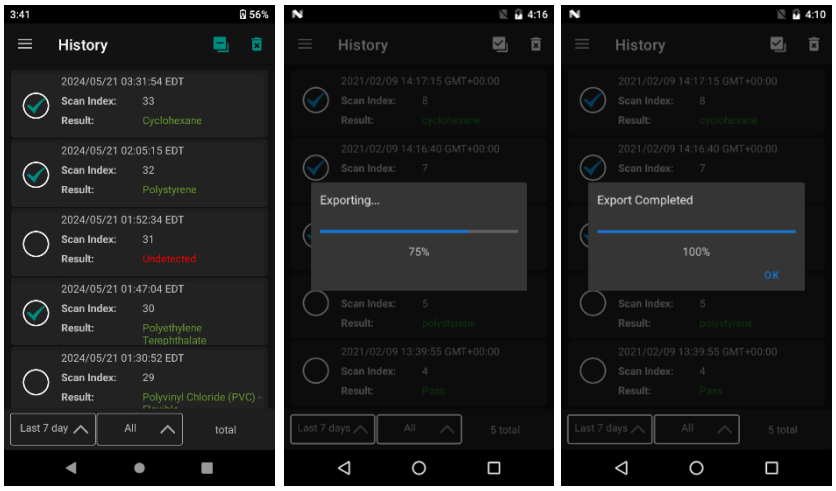
Export Scan Report (OTG and Bluetooth)

OTG

When a USB drive is connected to the device through the USB-C port, the device will allow users to export scan reports directly to the USB drive. Exported scans will export as PDF reports and CSV format data files. The PDF reports will export to a “Report” folder. The data files will export to a “Scan data” folder inside the “Report” folder. Reports will be exported as *DeviceSN_ScanIndex_Date*.pdf. Data files will be exported as *DeviceSN_ScanIndex_Date*.csv.

Select the scan(s) to be exported from the scan history list. A green checkmark will appear next to the record. Press on on top of the screen and select OTG, and the export will start.

After it is done, a message “Export Completed” will be displayed. Press **OK** to proceed. The data is stored on the USB in the folder “Report”. The data is not removed from the device automatically following the OTG export.

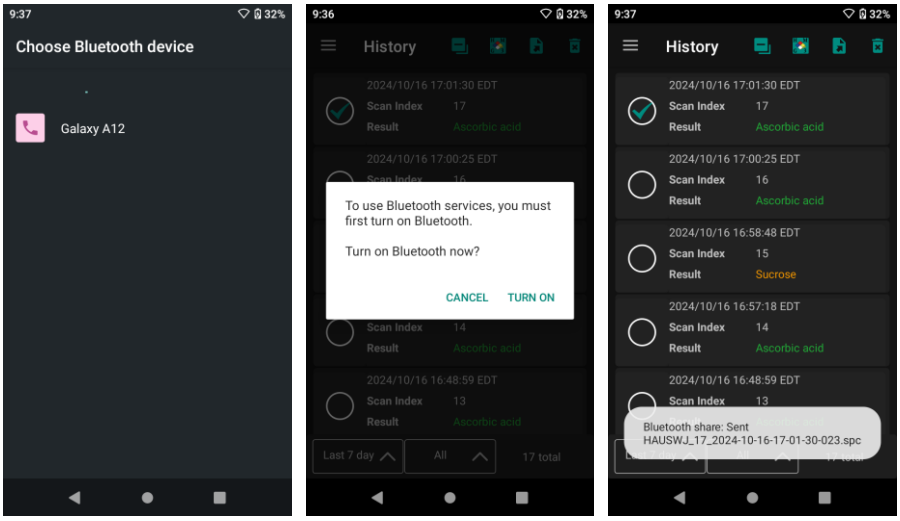


NOTE: To avoid potential USB drive quality issues during data export, please use the factory supplied USB drive or a FAT32/exFAT format USB drive with a “Report” folder under the root directory.

Bluetooth

Users can export the data directly to an Android cellphone that’s connected with the instrument through Bluetooth. In the scan result screen, click on the export button and select Bluetooth. The system will start by generating report files. If No Bluetooth devices are detected or Bluetooth is not turned on, the system will guide the user to connect to a Bluetooth device. Once a Bluetooth device is connected, the system will automatically export the scan report and spectra file. A successful message will be displayed at the bottom of the screen to indicate the export is successful.

Users can then find the report in their Android device under the Download folder.



Scan Report Output (PDF)

The PDF report for identification scans shows the Sample Info, Instrument information, Acquisition Parameters, Spectral Data, and Identification Results.

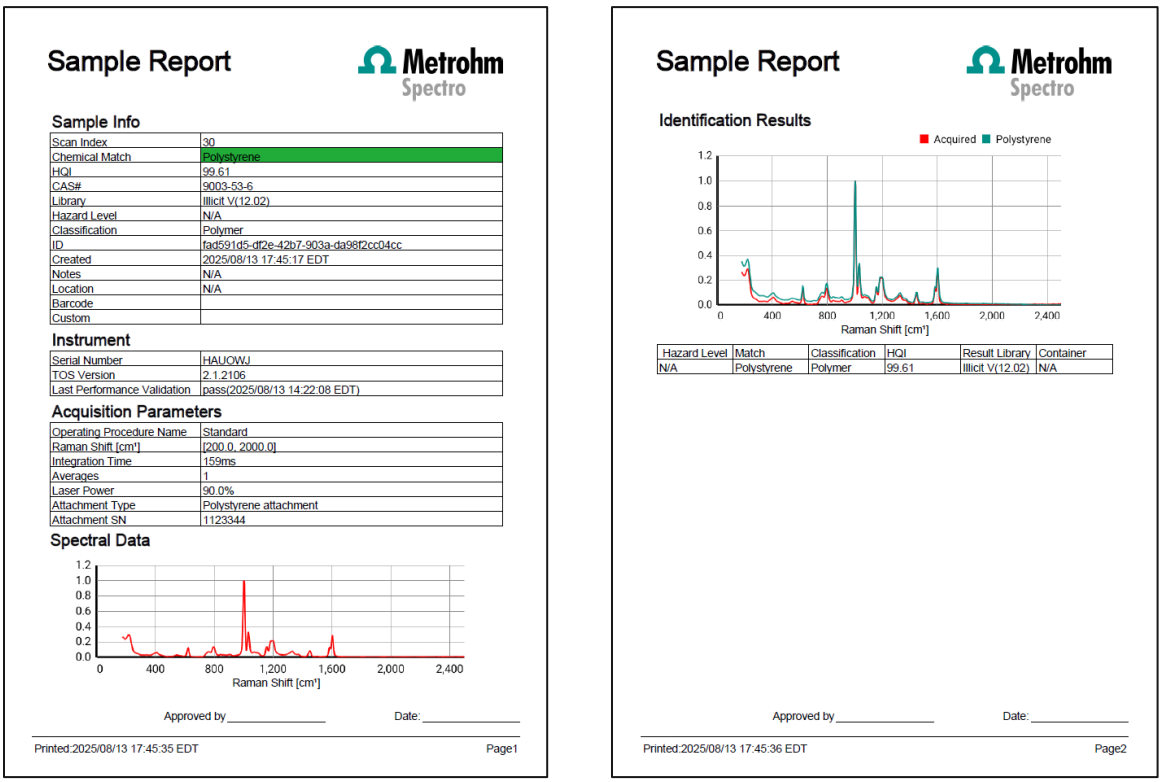
The Sample info records the Scan Index, Chemical Match, HQI, CAS#, Library, Hazard Level, Chemical Classification, Acquisition time, notes, location, UDFs (Barcode, and "custom" in example report below).

The instrument information records the Serial Number, TOS Version, and Last Performance Validation.

The Acquisition Parameters record the Operating Procedure used, Raman Shift Range, Integration time, Averages, Laser Power, Attachment Type, and Attachment SN.

The Spectral Data shows the acquired spectra from the scan.

The Identification Results shows the acquired spectral data overlayed with the matched identification result's spectra. The Hazard level, Match material, HQI, Library, and Container library (if applicable) are also stated.



Sample Report

Metrohm Spectro

Sample Info

Scan Index	30
Chemical Match	Polystyrene
HQI	99.61
CAS#	9003-53-6
Library	Illicit V(12.02)
Hazard Level	N/A
Classification	Polymer
ID	fad591d5-df2e-42b7-903a-da98f2cc04cc
Created	2025/08/13 17:45:17 EDT
Notes	N/A
Location	N/A
Barcode	
Custom	

Instrument

Serial Number	HAUOWJ
TOS Version	2.1.2106
Last Performance Validation	pass(2025/08/13 14:22:08 EDT)

Acquisition Parameters

Operating Procedure Name	Standard
Raman Shift [cm¹]	[200.0, 2000.0]
Integration Time	159ms
Averages	1
Laser Power	90.0%
Attachment Type	Polystyrene attachment
Attachment SN	1123344

Spectral Data

Approved by _____ Date: _____

Printed:2025/08/13 17:45:35 EDT Page1

Sample Report

Metrohm Spectro

Identification Results

Hazard Level	Match	Classification	HQI	Result Library	Container
N/A	Polystyrene	Polymer	99.61	Illicit V(12.02)	N/A

Approved by _____ Date: _____

Printed:2025/08/13 17:45:36 EDT Page2

Figure 49: Report from a normal scan of Polystyrene

Performance

Performance Validation

Performance validation should be done on a regular basis to confirm the accuracy of the instrument for use in terms of the Raman peak positions, peak intensities and the HQI value against a standard Raman signature of polystyrene created at the factory. It is done by using the performance validation function and the validation smart attachment with built-in polystyrene. The frequency of performing the validation test should be determined by the user and can be set by the Administrator.

To install the performance validation smart attachment, insert the attachment onto the shaft by matching the SmartTip connector then gently push it all the way in until it is installed properly into position and secured. With the validation cap in place, press the menu  icon

on the top left of the Home screen, go to Performance → Performance Validation, then press **the physical laser button or the Ready button** to start scanning.

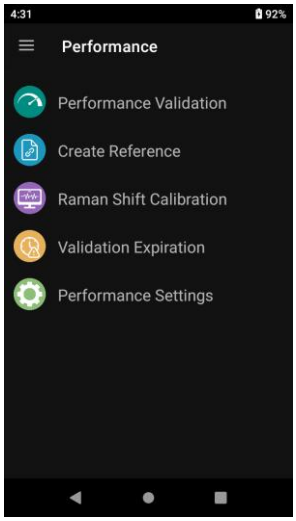


Figure 50: Performance menu

The device will give a **Pass** when the validation is successful. The "**Pass**" result is based on:

1) The HQI for the acquired signature and the calibration signature is ≥ 95.
2) The highest peak intensity ratio between the acquired and the calibration signature is within ± 50%.
3) The Raman shift variation of the acquired and calibrated signature is within the tolerance as given in the table below.

Polystyrene:

Standard position (cm^{-1})	Tolerance (cm^{-1})
620.9	±2.5
1001.4	±2.0
1602.3	±3.0

The detailed pass/fail criteria is displayed on the screen, along with the spectra overlay with the reference material.

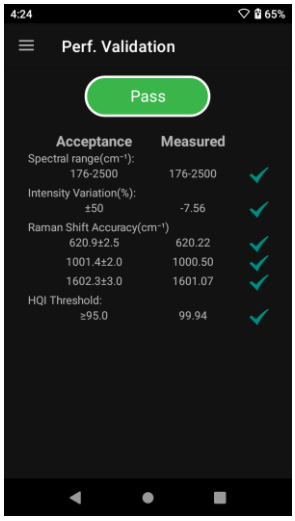


Figure 51: Performance validation results (Pass)

The Performance validation report to gives a record of instrument performance. It can be viewed and printed from device itself using OTG export from scan history or from the PC software TID21 after syncing the device to TID21.

Automatic system calibration is integrated into this instrument. If a performance validation test fails due to measuring outside of Raman shift variation tolerance, but the variation is not larger than 6 cm^{-1}, Raman shift calibration will automatically be triggered. *Note: the user will need to start this calibration with the rubber acquisition button or selecting ready on the touch screen.*

If performance validation fails due to Raman shift variation from the standard value larger than 6 cm^{-1}, peak intensity out of ±50% or HQI value less than 95, a warning message will show up to prompt the user to contact Metrohm support. If this occurs, users should first check to see if the validation cap is pushed all the way. Then, press the back button once to return to the Performance Validation screen to run the test again.

Each scan report includes the validation condition of the instrument at the time of the scan (Figure 49: Report from a normal scan of Polystyrene ,Error! Reference source not found.).

Instrument

Serial Number	19530020.25.01001
TOS Version	2.1.2107
Calibration Standard Serial Number	324d312252544ae9

Figure 52: Scan report instrument section showing the last performance validation's result and date

Create Reference

Under the circumstances where the performance validation failed due to a degraded polystyrene standard material, an administrator-level user can create a new polystyrene reference file for the performance validation. Follow the on-screen instructions to install the polystyrene validation cap. With the cap in place, press the laser button to collect the reference scan.

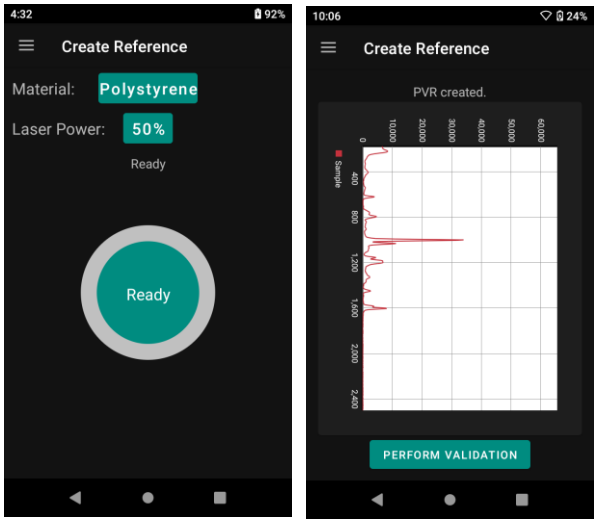


Figure 53: Create a reference

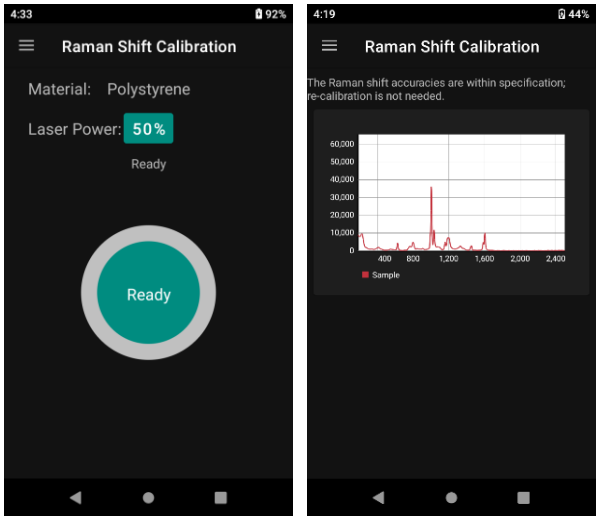
Note: Once the reference file is created, it is recommended for users to uninstall the polystyrene attachment, then reinstall it, then do a performance validation scan. If the performance validation passes, then it means the reference scan is created properly.

Raman Shift Calibration

TacticID-1064 ST has an automatic system calibration which is triggered when a performance validation test fails due to Raman shift variation being slightly out of pre-defined tolerance.

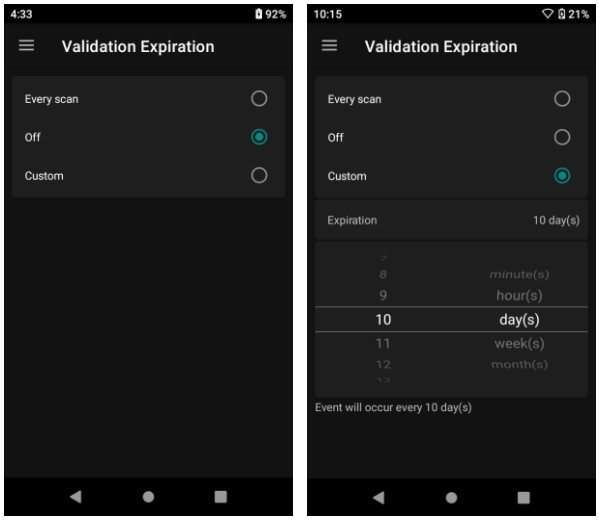
The Raman shift calibration can also be manually initiated by an Administrator-level user.

The Raman Shift calibration uses 50% laser power and the standard polystyrene reference cap. The Polystyrene reference cap must be installed before pressing the laser button. If the unit can be recalibrated, a new set of “A coefficients” will be shown after the calibration has finished. (These are the values used to adjust the Raman shift axis to the newly calibrated values.) If the unit does not need to be calibrated, no new A coefficient will be created nor shown. If the unit fails the Raman shift calibration, please contact Metrohm support for further help. After Raman shift calibration, the previous performance validation record will expire.



Validation Expiration

Regular performance validation of your TacticID-1064 ST is recommended to confirm the system’s suitability. A validation expiration time can be set by an Administrator-level user with the options including Every scan, Off, or a custom time period. When the performance validation has expired, the home screen will show in the upper right corner as the expiration status.



Performance Settings

There are 3 setting options for user to configure regarding the enforcement of the performance validation before scan:

1. **Mandatory Validation**: When this function is on, users must have a non-expired, passed performance validation status to take a scan. By default, this option is turned off.
2. **Validation at startup**: When this is on, users will receive a performance validation alert every time user starts up the instrument. This option is turned on by default.
3. **PA Match**: When this function is on, Performance Validation requires the exact the smart Polystyrene Attachment used to create the reference file. This option is turned on by default.

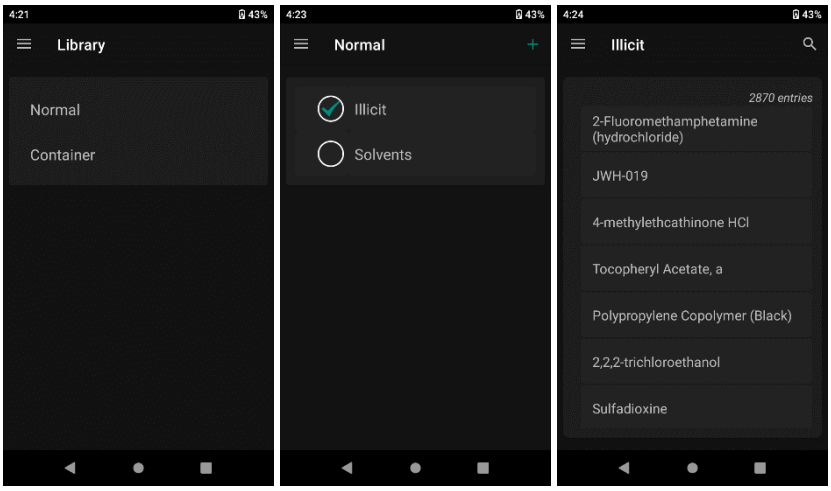
Library

Select, View, and Edit

The library section of TacticID-1064 ST provides the user with the ability to view current libraries (Administrator and Operator) and create new libraries or edit existing libraries. (Administrator Only)

Click the menu icon ☰, select library, then Normal to list all normal mode libraries on the device. Select any library to be viewed or select a user-made library to be viewed and edited.

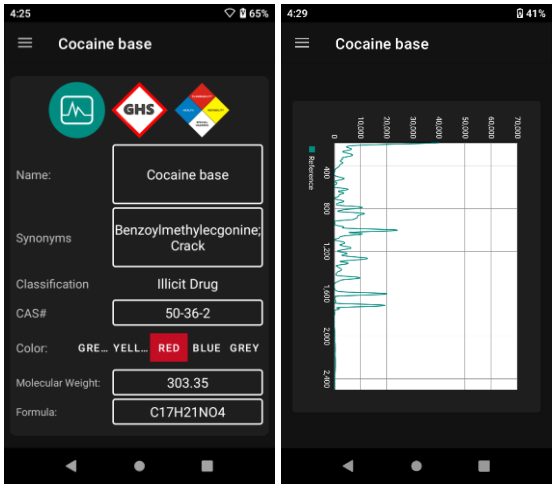
The signature compound names of this library are listed, and details can be accessed by tapping the name of the chemical.



Select any name to display chemical details. Click the graph button to show the spectral signature. Detailed safety information of each chemical can be viewed by clicking the GHS symbol or the NFPA diamond.

The active libraries used for matching can be selected. Click the menu icon , select library, then Normal. A list of the available libraries will be displayed. Select/unselect the desired library from the list by tapping on the circle next to the library's name. A selected library is marked by ✓. Multiple libraries may be selected at the same time.

TacticID-1064 ST has a default "Illicit" library, which contains over 2000 items including illicit materials, common chemicals, narcotics, solvents, plastics, etc.
The optional MCRL library is an expanded library that contains over 24000 items including common chemicals, additional narcotics and pharmaceutical drugs, and industrial chemicals
Optional libraries including but not limited to explosives, toxic industrial chemicals, chemical war fare agents, can be purchased. Libraries can also be created by users (see section 3.9.2).



Note: Details of the user-created library can be edited and saved. Details of any default or Metrohm library cannot be edited.

Users can also search within the selected library by clicking the magnifying glass button and typing in the chemical names or CAS#, as shown below:

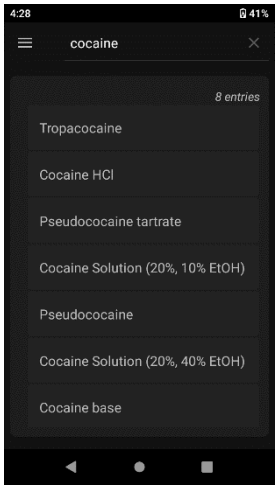


Figure 54: Search with chemical name

Generate User-Defined Library

A user-defined library can be generated on the TacticID-1064 ST by an ADMIN user.

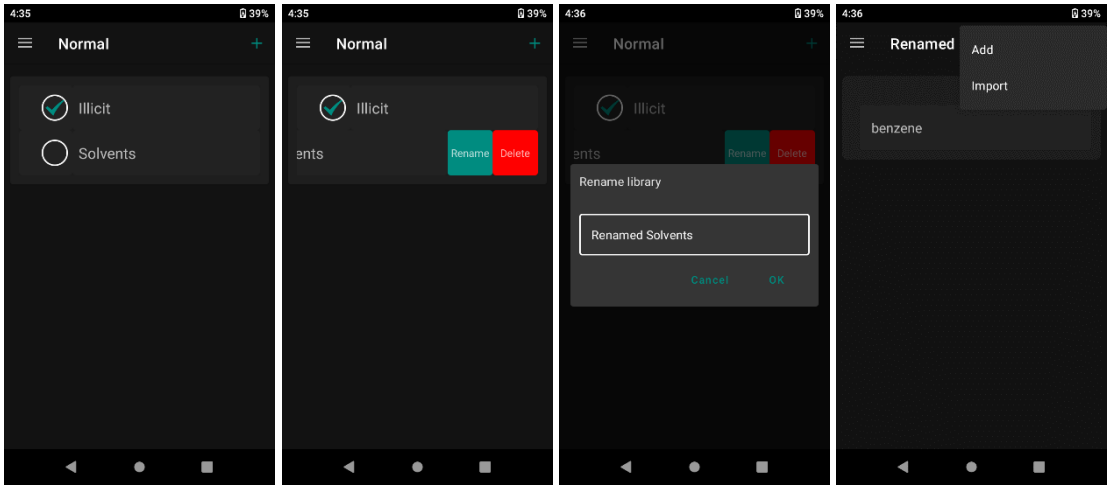
There are two steps in generating a user-defined library:

1. Create a new library

Under the library menu, click the + icon to create a new library. All newly created libraries will follow the naming convention 'NewLib#' as default. Users can then swipe the library banner to the left to Rename or Delete the library.

2. Add a sample to a specified library

Click on the library, then click the + again to add signatures into the library

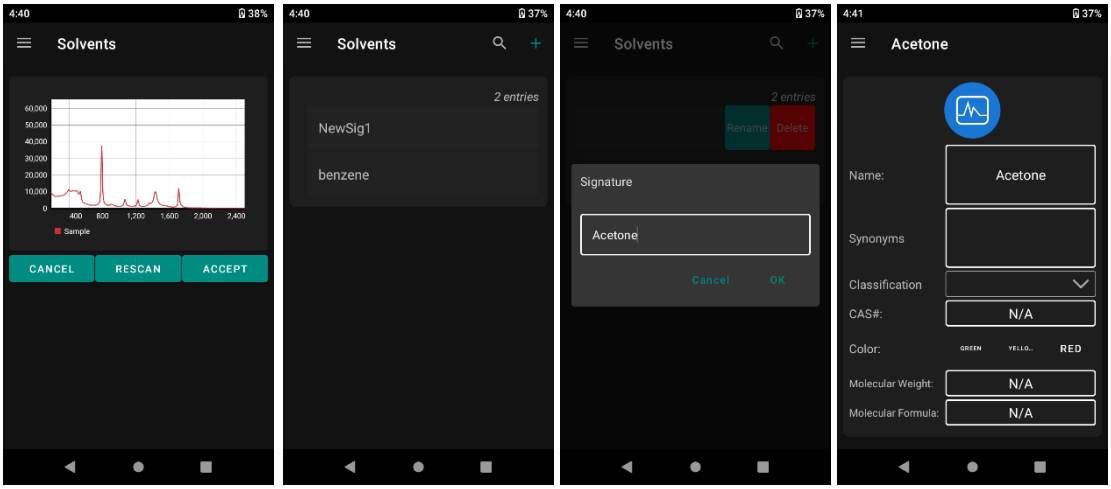


There are two ways to add spectral signatures to a user-library. The first way is to use the "Add" function to scan a sample and add that sample to the library. The second way is to import a spectrum using the OTG USB-C.

Add Spectra to User-Defined Library by Taking a Scan

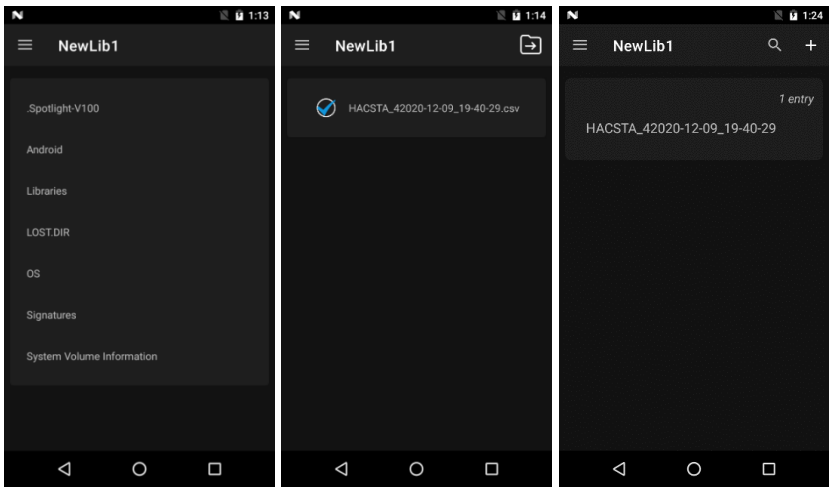
1. Press +.
2. Press "Add".
3. Make sure the appropriate sampling attachment is installed, and the sample is properly placed.
4. Press the scan button.
5. After the scan finishes, click "Accept".
6. Swipe from right to left on the 'NewSig#'.
7. Select Rename.
8. Enter sample name then press "OK".

9. Select the newly renamed collected scan to enter detailed chemical information accordingly.
10. Click "Save" to save the sample.



Import Spectra to User-Defined Library

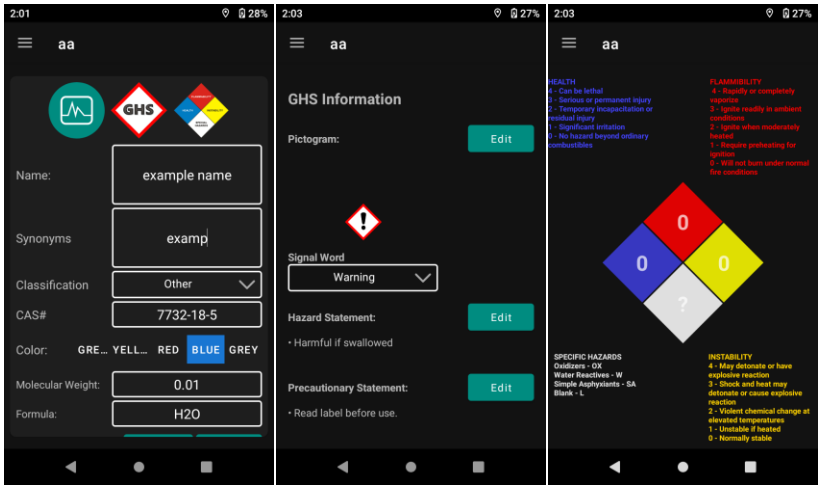
The Import function allows the user to import spectral data through the OTG function from an USB device. Only spectral files with pre-defined CSV format and SPC format are supported. Users can follow the CSV and SPC format exported from the device to create the predefined spectrum. Users can then load the spectrum to the USB drive\DATA folder, connect the USB drive to TacticID-1064 ST, select the spectrum from the drop-down menu, then click Import. Data that has been collected on another TacticID-1064 ST can be imported, after being exported via OTG.



User-Defined Library detailed chemical information

User-Defined Libraries can enter the following information for spectra:

Section	Information allowed
Name	Type name of spectra.
Synonyms	Type name of synonyms.
Classification	Illicit Drug, Pharmaceutical, Packaging, Common Material, Pesticide, Dye/Pigment/Stain, Organic Chemical, Inorganic/Organometallic Chemical, Explosive, Chemical Warfare Agent, Polymer, Personal Care Product, Mineral, Biochemical, Boron/Phosphorus/Sulfur Chemical, Calibration Standard, Other.
CAS#	Type CAS#.
Background Color	Green, Yellow, Red, Blue, Grey.
Molecular Weight	Type molecular weight
Formula	Type chemical formula
GHS information	Pictogram, Signal Word, Hazard Statement, Precautionary Statement.
NFPA 704 information	Health, Flammability, Specific Hazards, Instability.



Multiple Language Support for User-Defined Libraries

User-Defined Libraries support language specific names for spectra.

When a device is set to another language, the user-defined libraries will keep their names. If the signatures are renamed while the device is in another language, the name of the signature will only change for that new language.

Example:

1. The device is set to English. "NewSig1" is added to a user library. "NewSig1" is renamed to "sucrose".
2. The device is set to German. The signature will appear as "sucrose". "sucrose" is renamed to "saccharose".
3. The device is then set to Spanish; the signature's name will appear as "sucrose". The signature is renamed to "sacarosa".
4. The device is set to German again. The signature will appear as "saccharose".
5. The device is set to Spanish. The signature will appear as "sacarosa".

Data Transfer

TacticID-1064 ST allows data export without connecting to a PC. This function was illustrated previously in the Scan History section. It is possible to export this data with OTG technology or Bluetooth.

TacticID-1064 ST is supported by the PC program TID21. TID21 can handle data reporting and management in a secure database. TID21 must be installed on a PC or server where the secure database will be kept and data managed. The user must connect to a PC where TID21 is installed and synchronize the data from the TacticID-1064 ST to TID21 database on the PC. The TacticID-1064 ST device can be connected to the PC using Wi-Fi or USB.

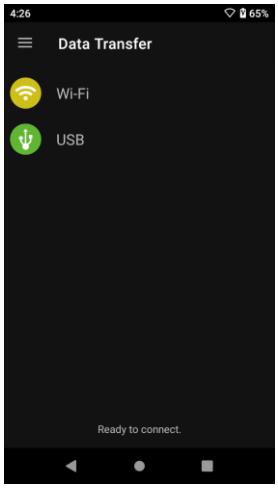


Figure 55: Data transfer screen

To establish a connection between the TacticID-1064 ST device and PC:

- Open the Data Transfer screen on the TacticID-1064 ST using: **Menu** ☰ → **Data Transfer.**
- Connect the instrument by the desired connection to the PC
    - Select the **USB** option to connect by USB
    - Select the **Wi-Fi** option to connect by Wi-Fi.
        - See the Wi-Fi connection details below.
- Open TID21 on PC.
- Login to the TID21 software to access the stored data
    - Make sure to use the account login credentials from the last successful synchronization.
- Select your TacticID-1064 ST device as displayed in the Device Group in TID21
    - The device's serial number will be present
- Login to the device through TID21 using the same login credentials as the device.

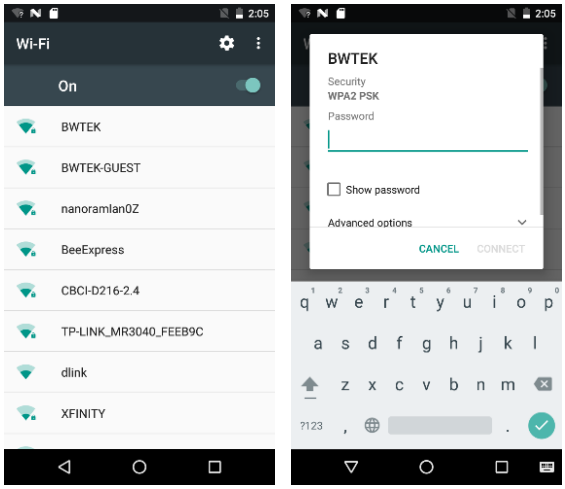
NOTE: For information on TID21 installation, driver installation, and device connection, refer to the document "290020461 TID21 Installation Guide and User Manual". You must consult with your IT department before installation to ensure the TID21 software installs correctly and all features are available.

Wi-Fi Connection

TacticID-1064 ST supports Wi-Fi 4 protocol of IEEE 802.11 a/b/g/n, with WPA/WPA2 encryption protocol. Turn on the Wi-Fi on the device and a list of available wireless (WLAN) networks will be displayed. Press Refresh to update the available wireless networks if needed. Scroll down the list and select the appropriate wireless network SSID. Enter the password and tap Connect to the network. Wait until the network

shows it's connected, then click the back key to return to the data transfer screen. The device is now ready to be connected to the TID21 software.

The TID-1064 ST system clock automatically updates to the correct time when connected to Wi-Fi. For the most accurate and reliable timekeeping, we recommend connecting the device to Wi-Fi, as this ensures the clock is synchronized with network time



USB Connection

TacticID-1064 ST is integrated with USB2.0 port for data communication. Use the factory supplied USB-C to USB-A cable to connect the device to the PC.

When in the Data Transfer screen on the TacticID-1064 ST you can turn on the USB connection by tapping on "USB". A blue dot will appear to the right of the selected data transfer method indicating the device is ready to be connected to the TID21 software.

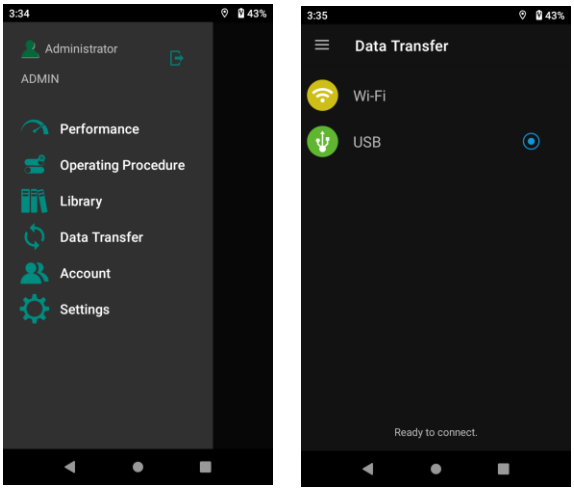


Figure 56: Data Transfer screen > USB connected > USB selected on TacticID-1064 ST Data Transfer screen

Once the device is ready to be connected, a TacticID-1064 ST icon should show up at the TID21 Device Group. Click on the icon to select the device, then log in TID21 using the currently-logged-in account in the device. In other words, if the device is logged in with the ADMIN account, and password 1111, type in the same account and password (ADMIN, 1111) to establish the connection between TOS-XM and TID21.

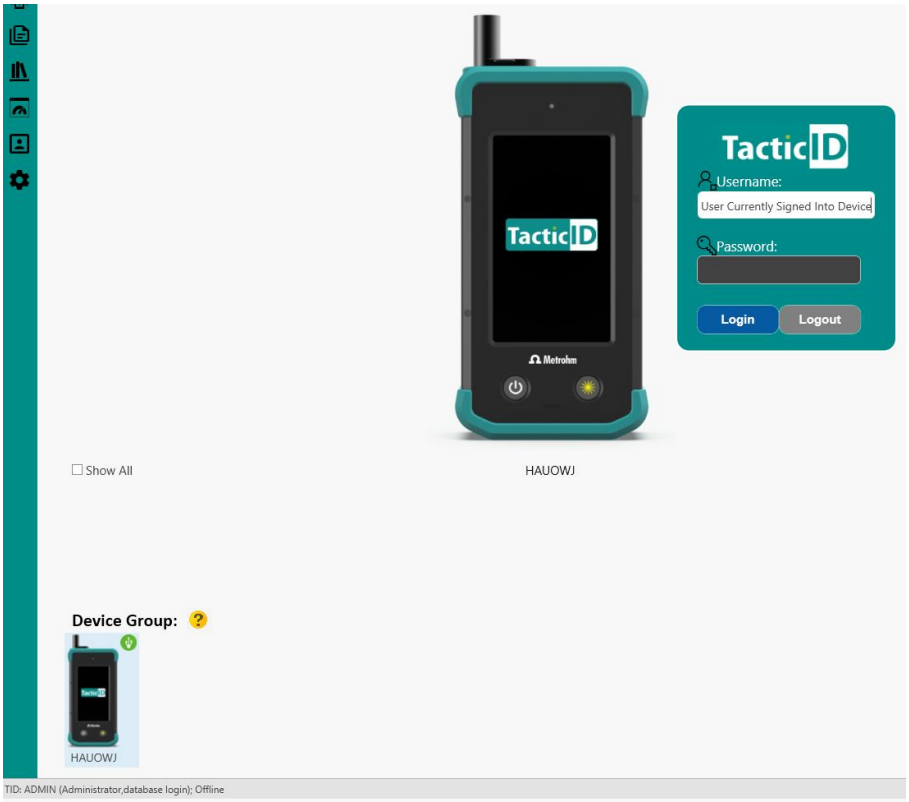


Figure 57: Selecting device in TID21 > Second login screen to establish connection

Account

Login as ADMIN and press the menu icon, followed by pressing **Account**; a list of existing accounts will be displayed.

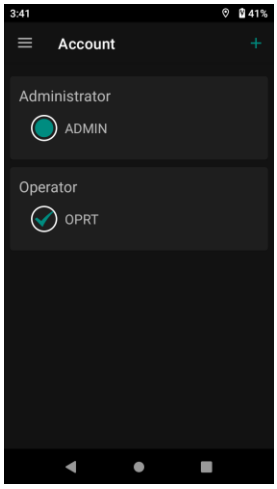
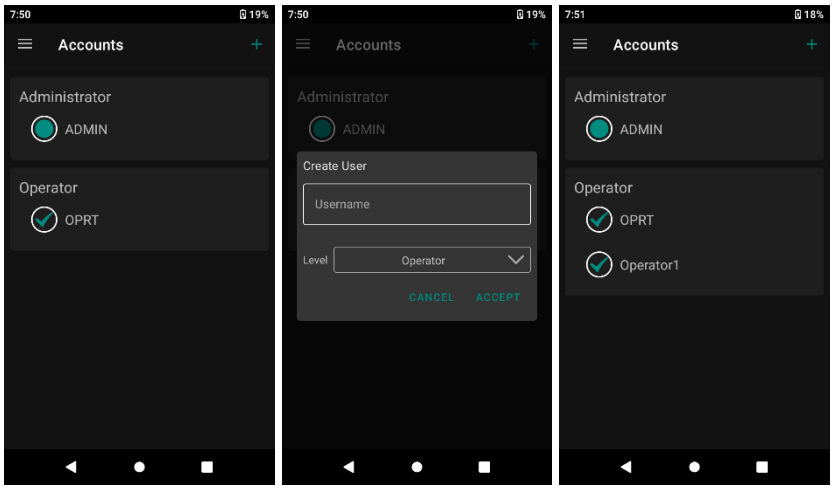


Figure 58: List of accounts on device

Creating an account

Multiple Administrator-level and Operator-level accounts can be created by ADMIN. To create a new account, press the ✚ icon. A screen will prompt the user to set the username and then click Create. No special character will be accepted in the username. New accounts can be logged in with default password 9999 followed by a screen for the user to reset the password.



Editing an account

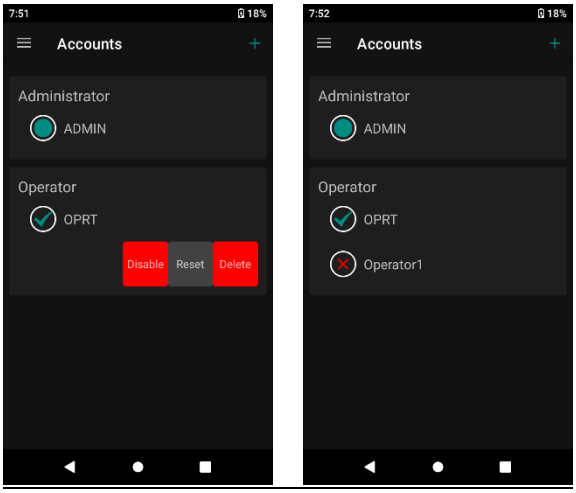


Figure 59: ADMIN account management functions

ADMIN can access additional functions for other user accounts by swiping the username to the left (Figure 59: ADMIN account management functions). The three functions are:

Disable/Enable

The ADMIN user can disable an account except ADMIN. The disabled account is then suspended but can be enabled any time afterward. When an account is disabled, the user will not be able to log in and a warning message will be displayed after any login attempt. Administrator-level user can click the "Enable" button to enable a currently disabled account. The blue circle in front of the account shows the currently logged-in account. The blue/red checkmark indicates whether this account is enabled or disabled.

Reset

ADMIN user can reset the password for any existing account including itself by clicking Reset. A warning message for resetting the account password will be displayed. When clicking Yes, the password of this selected account is reset to default. Users then must log in to reset the password.

NOTE: It is the user's responsibility to make sure that the new password is kept safe. Access to the password shall be controlled by the user's policies through external measures.

Delete

ADMIN can delete or disable any non-default (not ADMIN or OPRT) account when it is no longer needed. Please note that this operation cannot be recovered. A warning message will alert the user before any account is deleted.

User account privilege

TacticID-1064 ST adopts two levels of user accounts to grant different privilege access to certain functions. For detailed privilege information, please refer to the table below:

Function	Administrator	Operator
Scan	Yes	Yes
Data transfer	Yes	Yes
Library: Select libraries used for analysis	Yes	Yes
Library: View sample chemical details	Yes	Yes
Library: Edit and Save sample chemical details	Yes	No
Library: Create new user library	Yes	No
Library: Add new samples to an existing user library	Yes	No
About	Yes	Yes
Setting: System Clock	Yes	No
Setting: Language and Keyboard	Yes	Yes
Setting: Sound	Yes	Yes
Setting: Display	Yes	No
Operation Procedures: New/Save/Save As	Yes	No
Operation Procedures: Select/View	Yes	Yes
Performance: Performance Validation	Yes	Yes
Performance: Create Reference	Yes	No
Performance: Val. Expiration	Yes	No

Performance: Raman Shift Calibration	Yes	No
Performance: Performance Settings	Yes	No
Account: Create new accounts	Yes	No
Account: Enable/Disable operator account	Yes	No
Account: Reset password for other accounts	Yes	No
Account password reset or change for itself	Yes	Yes
Delete Scan Data	Yes	No
Manual Integration Time Setting	Yes	No
Scan Delay	Yes	Yes
Settings/Advanced	Yes	No
Status	Yes	Yes
Export reports via OTG	Yes	Yes
TID21: Sync	Yes	Yes
TID21: TOS/Library update	Yes	No
TID21: Export and Report for all functions	Yes	Yes
TID21: Backup and Restore	ITADMIN account only	No
TID21: TID server configuration	ITADMIN account only	No

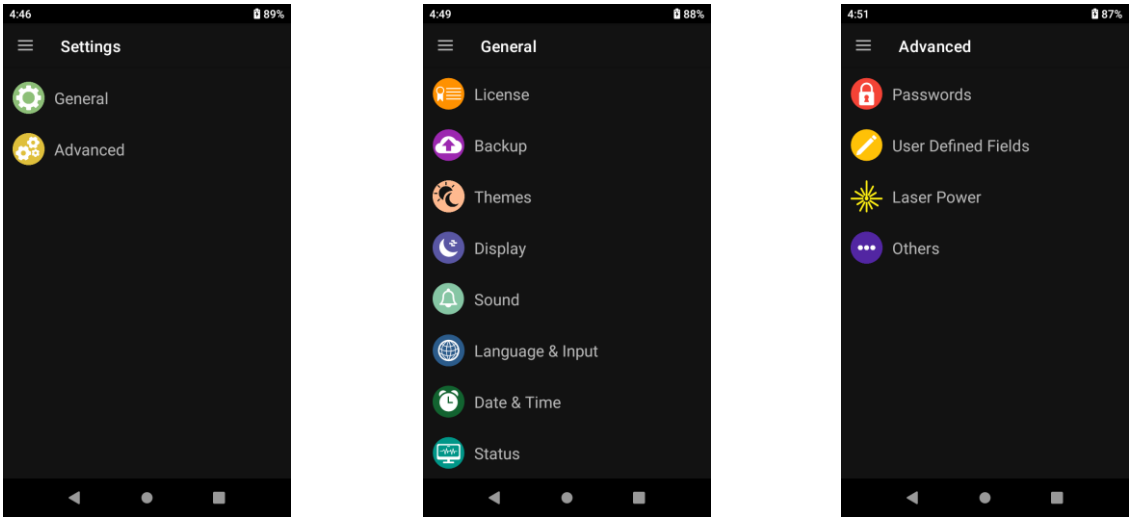


Figure 60: General and Advanced settings

Users can access the device setting menus and make changes to the device time, language, sound, and display. The setting section has both General and Advanced settings.

General

About

The About screen shows the basic information of this device such as the TOS (TacticID Operating System) Version, Device Type, the Device Serial Number (SN), BSP Version and the Library Version. This information will be helpful to users who might want to submit a service request.

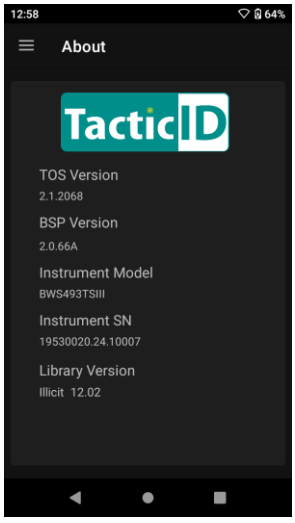


Figure 61: About screen

Update

Note: Please consult with your IT department before performing system upgrades.

TOS software and libraries can be updated directly when a pre-configured USB drive is connected to the TacticID-1064 ST unit. Users can prepare a USB drive with FAT32 format or use the factory supplied USB drive, create folders with name OS or Library on the root directory (folder name is case sensitive), then put the updated OS system file or Library file in the corresponding folders.

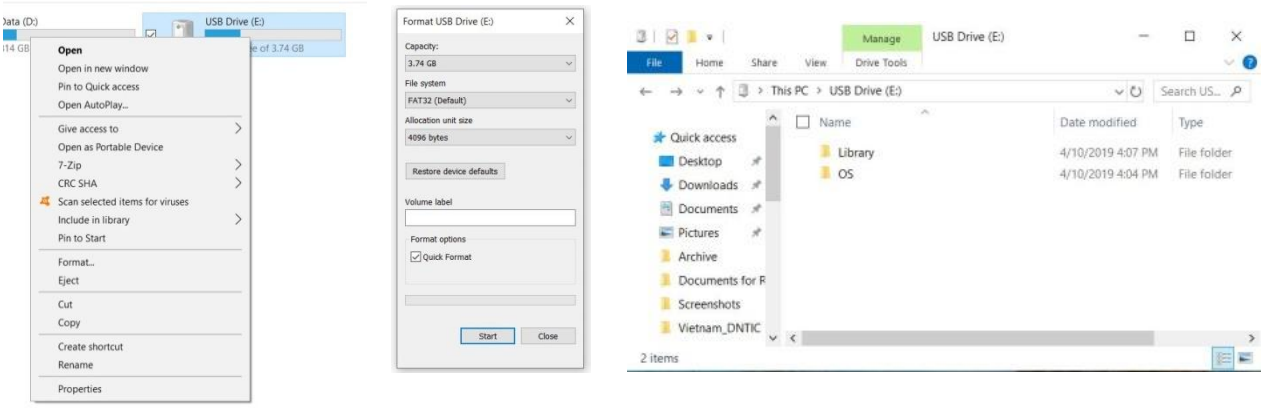
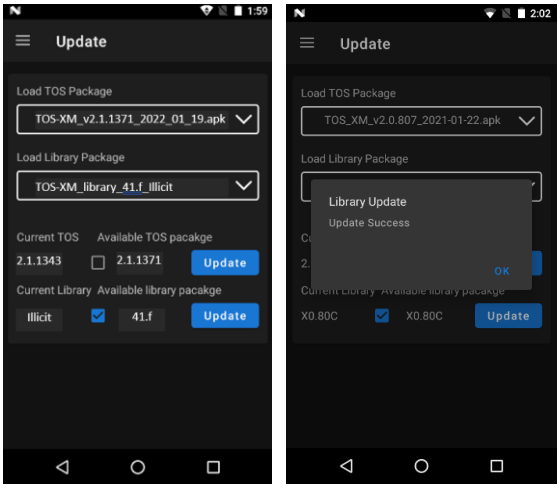


Figure 62: Configure USB drive for use with TacticID-1064 ST

Users can then connect the OTG USB drive to TacticID-1064 ST, press **Update**, and select the files under Load TOS Package or Load Library Package, enable the checkmark to select the available packages then click “Update”.



In general, the TOS update will take around 10 seconds, and the library update will take 1 to 10 minutes depending on the library size. After the update is completed, the user will be prompted to reboot the TacticID-1064 ST device. Disconnect all cables from the TacticID-1064 ST, turn off the device, then turn on the TacticID-1064 ST on. The system may initialize for a few minutes. Verify that the upgrade is successful by viewing the TOS Version under **About** (Figure 61: About screen).

License

The license function allows the user to import a license from the manufacturer. The license grants access to Metrohm libraries. The license and manufacturer libraries have the capability to be updated. Unlicensed or expired libraries cannot be updated. **The license status of the software or the library does not affect the normal-usage of the currently installed library and enabled functionalities** and only affects the capability to update to newer versions.

To import a license, users will receive an XML file from the manufacturer or a local service center. Place the license file in the "License" folder in the USB-C drive. Connect your USB drive to the device, verify the license file was auto select, and choose "Import". The license on the device will then be updated.

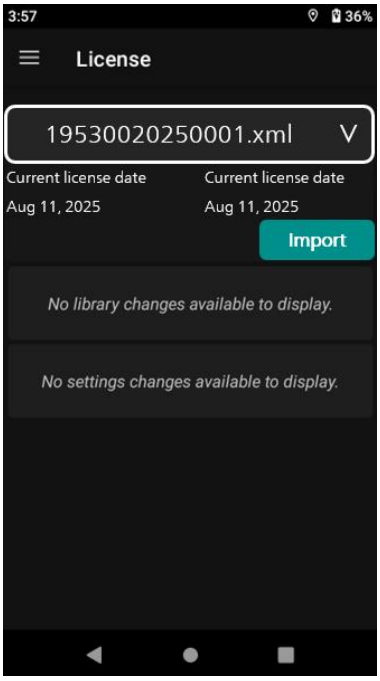


Figure 63: Import License

Backup & Restore

The Backup & Restore section allows Administrator-level users to configure the backup schedule for the data in the software and restore from previous backups. The backup will copy all the libraries, operation files and data to the units internal SD card.

- Users can configure the scheduled backup time as 30 days, 60 days, 90 days, 120 days, or a customized number of days.
- Users can also perform a manual backup by clicking Backup Now.

The Backup function will back up all the essential files and data that's currently stored on the device to the SD card.

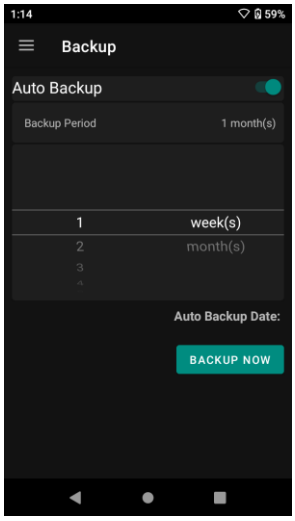


Figure 64: Backup menu with Auto Backup selected

After clicking restore, the user will be able to select which of their backups they would like to restore.

Themes

The theme of the user interface can be switched between Dark (left) and Light mode (right). Dark theme is best for reducing eye strain for users in indoor and dim environments. Light theme makes the screen easier to see when used in very bright environments and sunlight. After switching

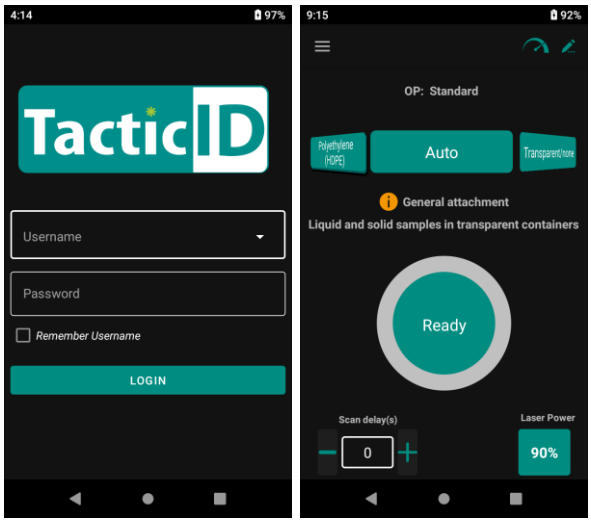


Figure 65: Dark mode

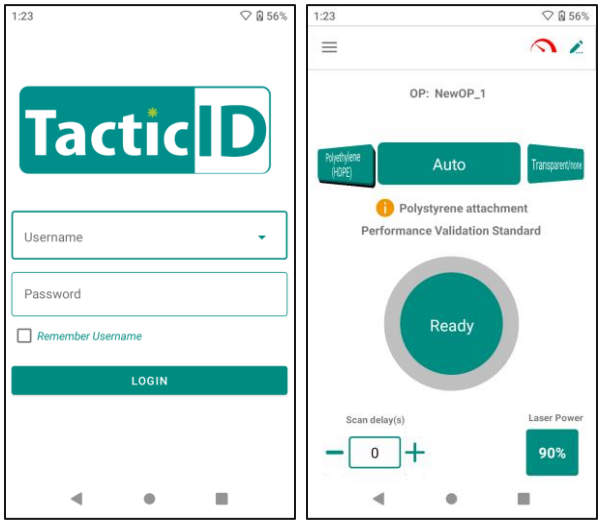


Figure 66: Light mode

Display

Adjust the brightness of the screen, and the sleep mode under the Display section. The screen timeout function will turn off the display of the screen and the back fan based on the idle time set by the user.

Users can also adjust the display brightness by using the drop-down menu at any screen. Swipe down from the top of the screen and adjust the display using the scale.

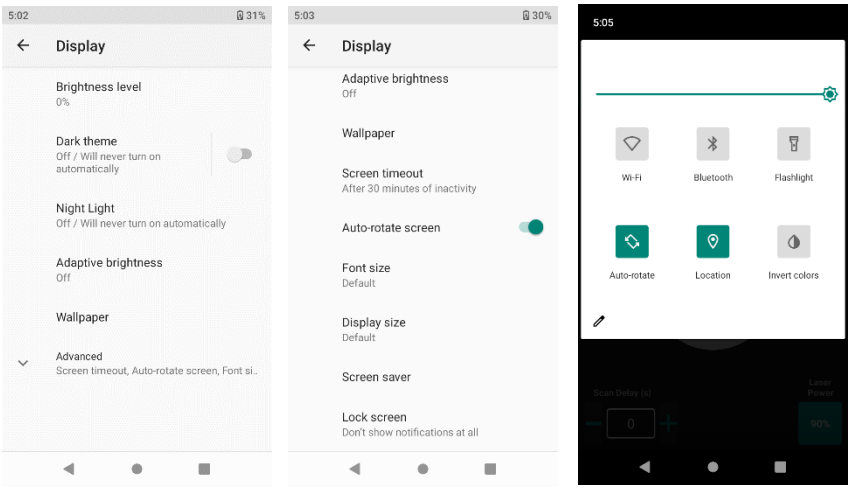


Figure 67: Display settings

Sound

In this section the user can adjust the volume of the sound of the instrument. The “Other sounds” and “Sound enhancement” section are reserved functions. Please contact your local support before using these reserved functions.

Language and input

Users can also add and select the display languages and keyboard for TOS-XM.

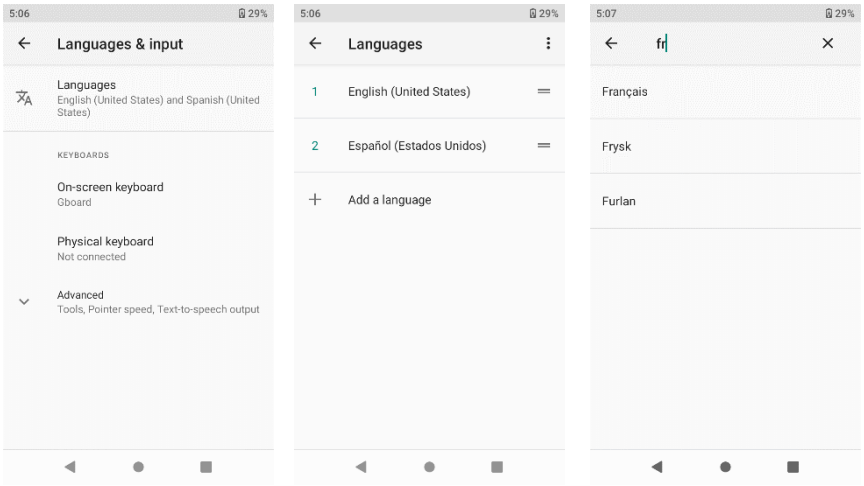


Figure 68: Language settings

Click “Languages” → “Add a language” → Click the magnifying glass to search for the language. Please choose the language and your region and add it to the list. These are the languages that we currently support for TOS-XM operation system:

1. English (United States)
2. English (United Kingdom)
3. English (Australia)
4. Simplified Chinese
5. Traditional Chinese
6. Japanese
7. Spanish
8. Korean
9. German

10. French
11. Turkish
12. Polish
13. Italian
14. Portuguese
15. Vietnamese
16. Hungarian (Magyar)
17. Arabic
18. Croatian (Hrvatski)
19. Dutch
20. Romanian
21. Portuguese (Portugal)
22. Ukrainian

After adding language to the list, simply press and hold the = icon, and drag the language to the top of the list to make it the displayed language.

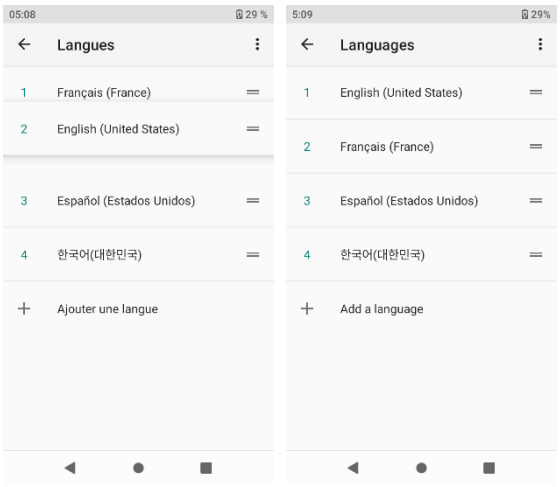


Figure 69: Set the active language

When new languages are added to the list, a new keyboard is usually available as well. Press and hold the space key to select the keyboard you want to use. TOS-XM support UTF-8 characters. Gifs or pictures are not supported.

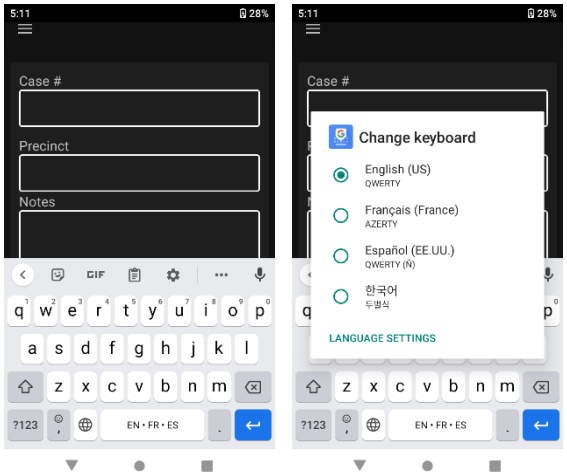


Figure 70: Change keyboard

Date and time

Press Date and Time under the Setting function to adjust the time based on the location of your area. When selecting the time zone, user can click the “three dot” button on the top right to arrange the time zone alphabetically for easier search.

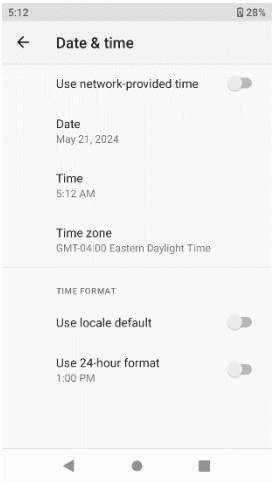


Figure 71: Date and time settings

User can also turn on the “Use network provided time” function. When this function is turned on, the system will synchronize the time with the internet when an internet available Wi-Fi connection is established.

Status

The status section shows the device status including laser status, spectrometer status, laser temperature, detector temperature, chamber temperature, available storage, etc.

Note: The system contains 64GB of internal storage and a 64GB external SD card, a combined total 128GB storage space. Due to unit counting conversions and internal system files, the Total Space in both categories will always read less than 61035MB.

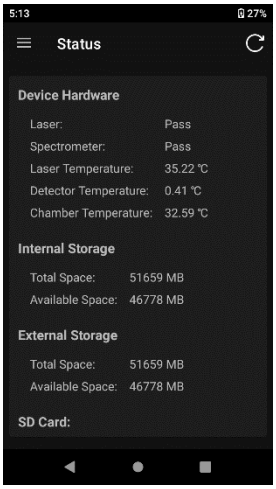


Figure 72: Status screen

Advanced

In the Advanced sections, users can adjust advanced settings related to password, user defined fields, laser power display preferences, data export options, mixture analysis display options and more.

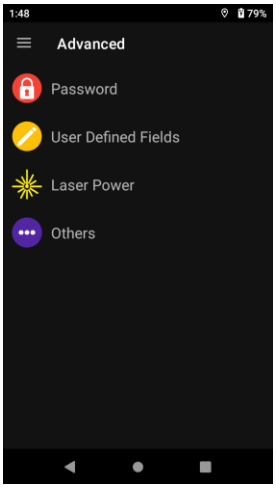


Figure 73: Advanced settings menu

Passwords

The Administrator-level user can change the password visibility, password strength and password expiration time. When the password strength is enabled, newly created users will be forced to create a password that includes 4-12 characters with at least one lower case letter, one upper case letter, one digit from 0-9 and one symbol. When the password strength is disabled, the password will only accept 4-12 characters, with no restrictions on the types of characters that must be included.

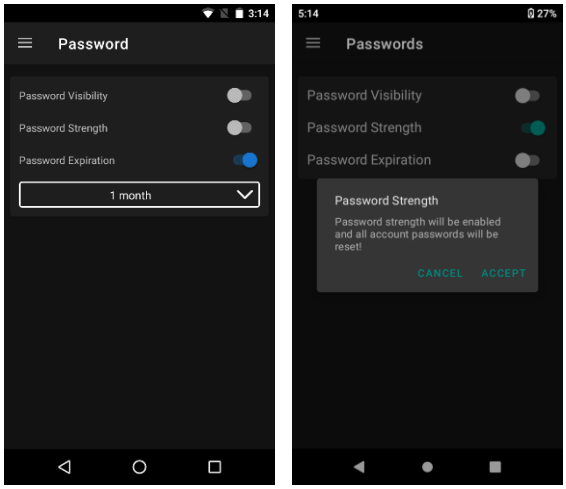


Figure 74: Password settings

When a user is creating the password, the criteria will show up as red first, then turn green when they are fulfilled.

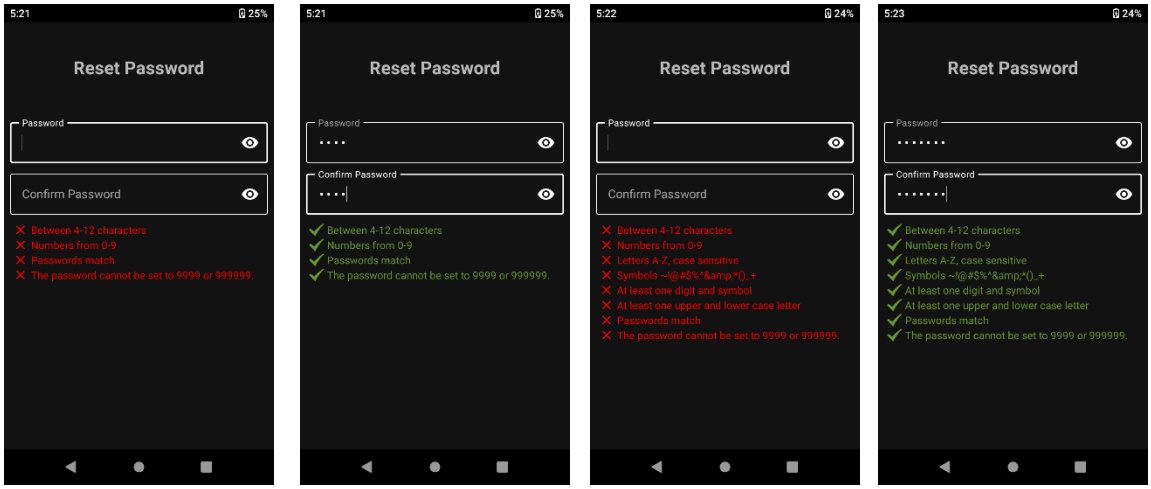


Figure 75: Comparing password strength requirements

Important Note: When the password strength is changed, all users' passwords will be reset to default (9999) and users need to re-enter their password after login.

User Defined Fields

The user can configure up to three UDFs (user-defined fields) titles for sample information input which will be incorporated in the report. These UDF titles can serve as the traceability field for each scan, including details such as case number, precinct, sample number, etc.

After these UDF titles are configured in the setting, users can click the button in the scan screen to access these fields and enter information accordingly. This information will be automatically included in the results report.

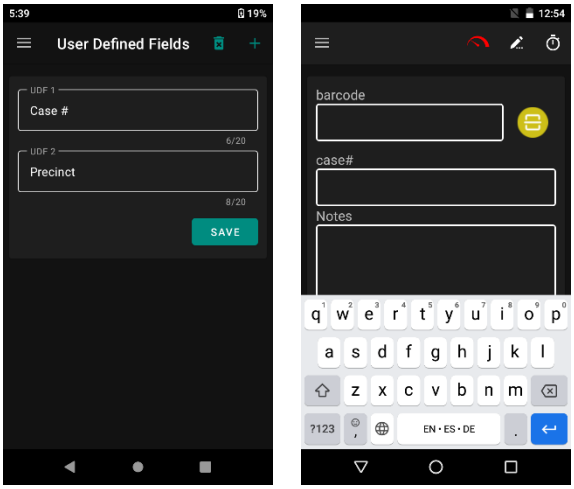


Figure 76: Setting User Defined Fields and the fields themselves

If user entered “barcode” in the first UDF title, click the icon to bring up the camera, and scan barcodes directly.

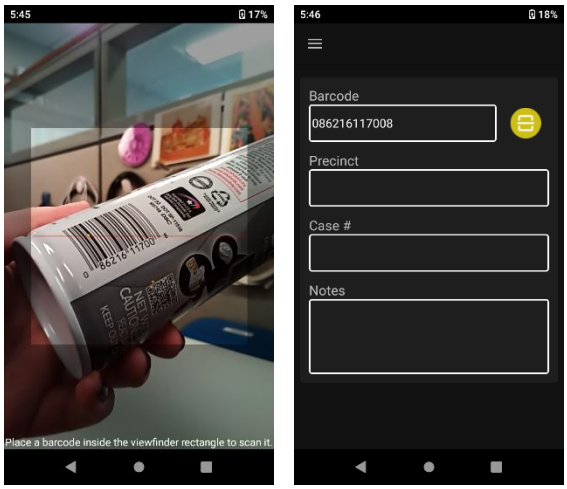
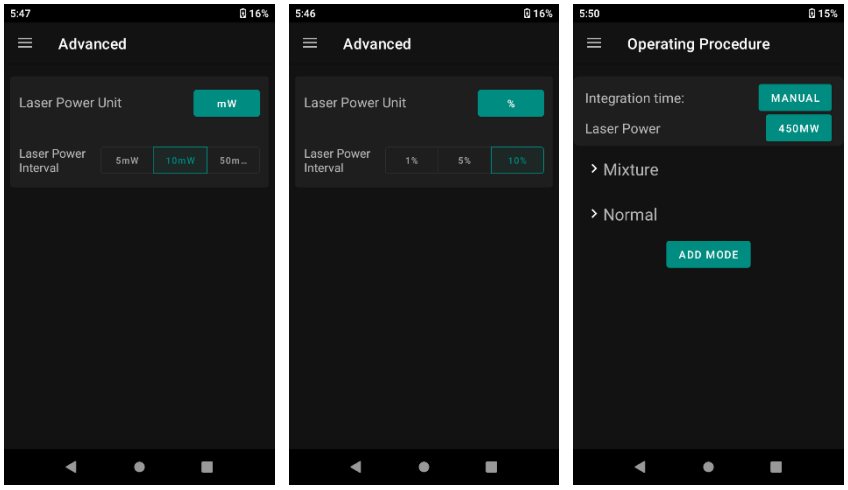


Figure 77: Barcode scanning in UDF

Laser Power

In this menu, Administrator user can adjust the default laser power increments in percentage 1%, 5% and 10% or in mW. Once changed, it allows Administrator users to configure operation preset in the new laser percentage increments. Users will also see the display of the quick toggle at the home screen changes accordingly.



Others

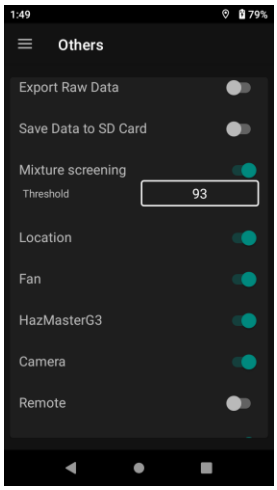


Figure 78: Others menu (can scroll for more settings)

Save Raw Data and Save Data to SD Card

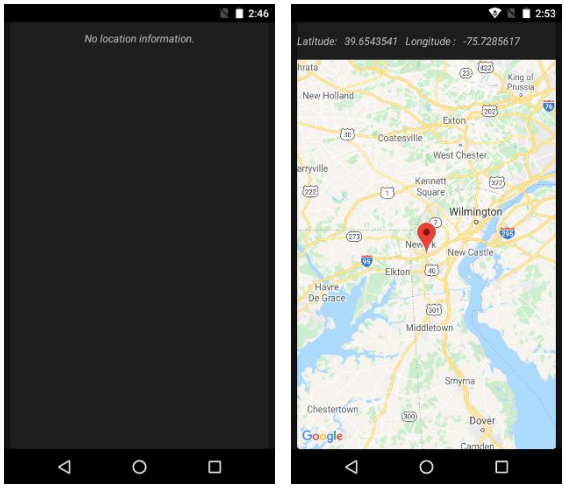
Users can choose to turn on the advanced save data functions under the instruction of our service personnel. For normal users, these functions should be turned off.

Mixture Screening

Under Option, users can also turn on/off the automatic mixture screening mode configuration tab. If turned on, users can choose to set the threshold to trigger mixture analysis after a scan to their desired value. The default settings will enable mixture screening with a threshold of HQI = 93. Once the mixture screening is turned on, the screening will overwrite auto, and manual mixture analysis and mixture analysis will not show any result when a match is found with an HQI higher than the mixture-screening threshold.

Location

Users can choose to turn on/off location finding for each scan result. When the location is turned on, the device will try to locate GPS coordinates after each scan. It is recommended that GPS is only turned on when a user is outdoors (where the GPS signal is strong) or the instrument is connected to Wi-Fi with internet services. If the GPS signals are too low, it might require a long time to locate the coordinates. If neither option is available, location data will show not available.



Location data will be automatically included in the scan history viewing and the scan report. Users can use their local map services on PC to type-in the coordinates and find out the location.

Other non-GPS location services are available. Please contact Metrohm factory for details.

Fan

Users can choose to turn the fan off permanently for special situational requirements. It is recommended that the fan is turned on to achieve the best performance, especially when using the device for long periods of time.

HazMasterG3

Users can choose to toggle on/off the HazMasterG3 button availability in the scan result screen.

Camera

Users can choose to disable the camera function after scanning, in accordance with the local regulations.

Remote

A remote operating function is available when this is turned on. Please contact your local distributor or Metrohm Factory for details.