NIRLAB

Manual Guide

General

Version 2.0 - February 2026

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1 GETTING STARTED

We are thrilled that you've chosen NIRLAB and are eager to get started. To ensure you have the best experience, we invite you to watch our tutorial video NIRLAB Tutorial. You can also find short explanatory videos for each step on our YouTube channel.

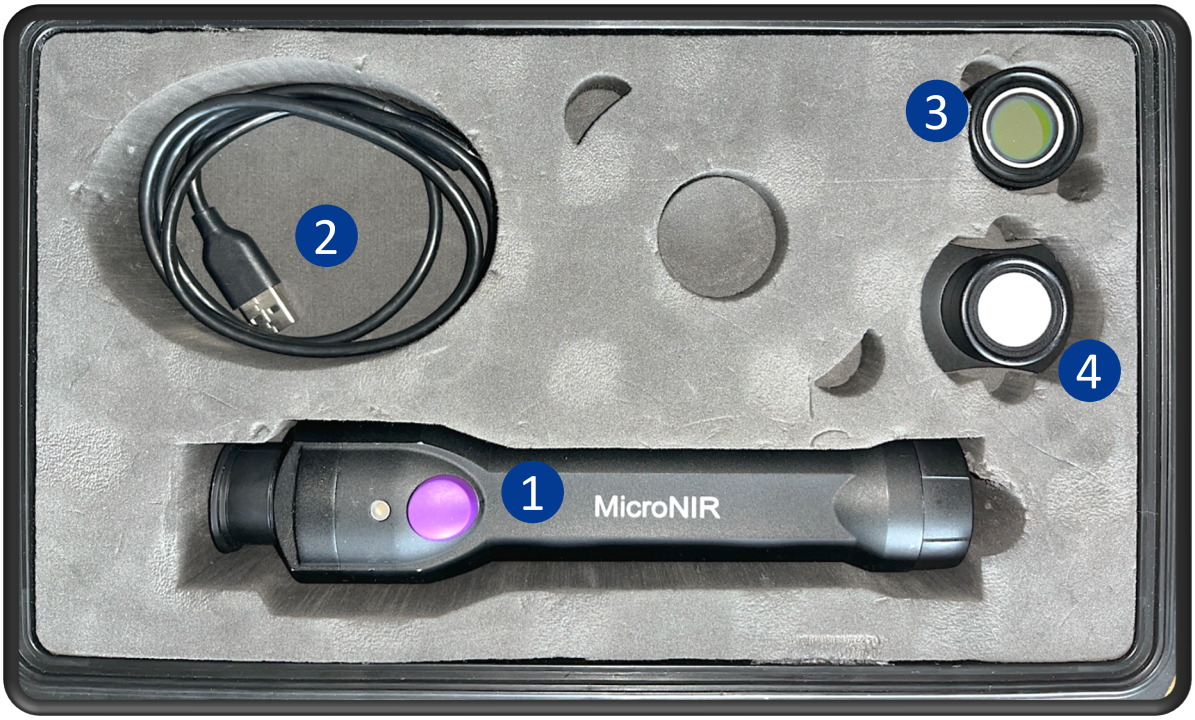
→https://www.youtube.com/@NIRLAB

It will guide you through the process and help you get acquainted with our device.

2 NIRLAB COMPONENTS

2.1 The NIRLAB Box

Provided by NIRLAB is a box that contains:



1. **NIRLIGHT**

The NIRLIGHT/ NIRLIGHT is our spectrometer, used for analysing substances. This device is water and dust resistant, lightweight, and handheld.

2. **USB charger cable**

The NIRLIGHT comes with one rugged USB cable for recharging. The instrument features a waterproof micro-B USB connector located at the rear, used for charging its internal battery.

3. **Sapphire window**

The sapphire window is screwed onto the NIRLIGHT and ensures accurate and durable measurements by allowing NIR light transmission and providing scratch-resistant protection.

4. **Calibration mirror / Reflectance reference standard**

The NIRLIGHT comes with a 99% reference standard for calibration purposes, ensuring accurate measurements. This standard is essential for calibrating the instrument and verifying the accuracy of the collected data.

2.2 The NIRLAB Mobile App

Provided with NIRLAB subscription is an account to access the Mobile app. If you use the narcotics or cannabis substances library, search for NIRLAB and download the mobile app or scan the QR code below:

NIRLAB (iOS)

NIRLAB (Android)

For all other applications. search for the NIRSTORE app or scan the QR code below:

2.3 The NIRLAB Web App

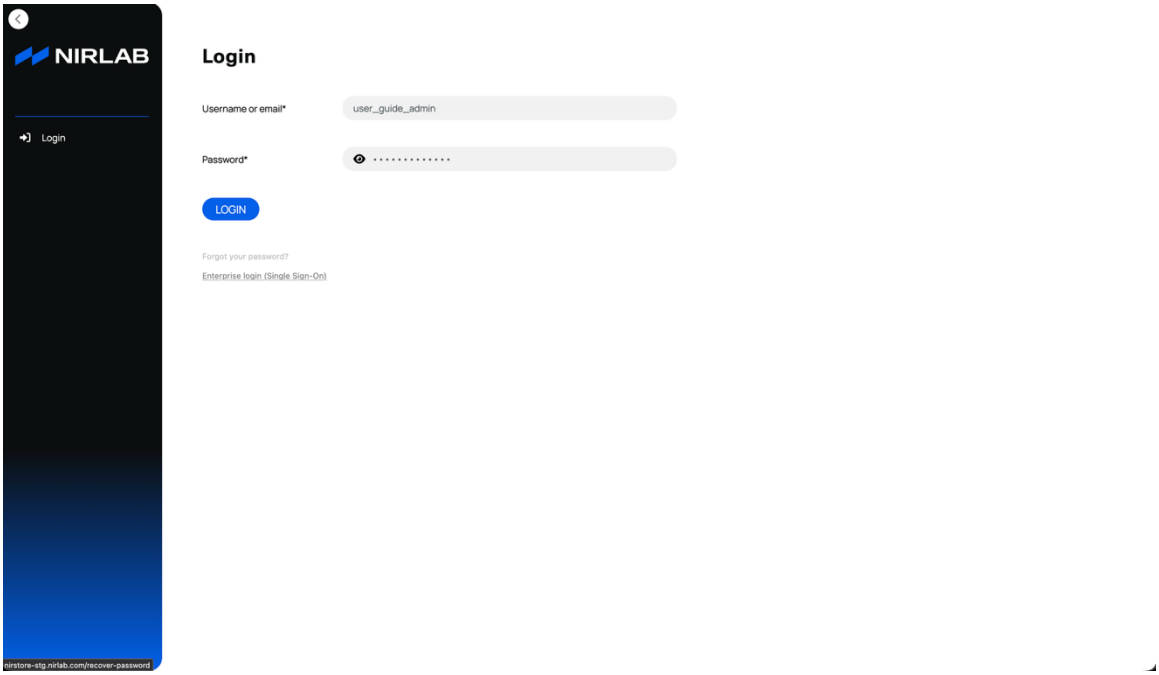
The final component is the web app you can access the web app with the same credential as the one used in the mobile app.

- For narcotics & cannabis solution

NIRLAB: https://app.nirlab.com

- For other solutions:

NIRSTORE: https://nirstore.nirlab.ch



Enter your login details to access to your sample history, the dashboards, and more options to manage your measures and your organization.

2.4 Lab material recommendation (not provided by NIRLAB)

NIRLAB recommends purchasing the following items to complete the NIRLAB kit and ensure the best analysis results.

1. **Aluminium cups**

Aluminum reflects IR light, creating a neutral effect on the NIR spectra and ensuring optimal analysis results. Using an aluminum cup is particularly important for small samples that do not fully cover the detector area, as it helps eliminate background interference.

2. **Paper wipes and alcohol for cleaning the NIRLIGHT**

Cleaning the sapphire glass between each analysis is essential for accurate results and better maintenance.

3. **Small lab material**

Although little handling is necessary, NIRLAB users may want to use gloves and a spatula to put the samples inside the aluminium cups. Minigrip bags can be useful to store the samples.

2.5 Possible Accessories

2.5.1 Tablet probe

The tablet probe is designed specifically for pills and is particularly useful for detecting counterfeit medicine. It is an adapter piece that needs to be screwed onto the device, it comes along with a specific calibrator.

During calibration, select "tablet probe" in the calibration menu.

2.5.2 Droplet sampler

The droplet sampler is designed specifically for analyzing liquids. It is an adapter piece that needs to be screwed onto the device. The specific calibrator is integrated in Droplet sampler cap.

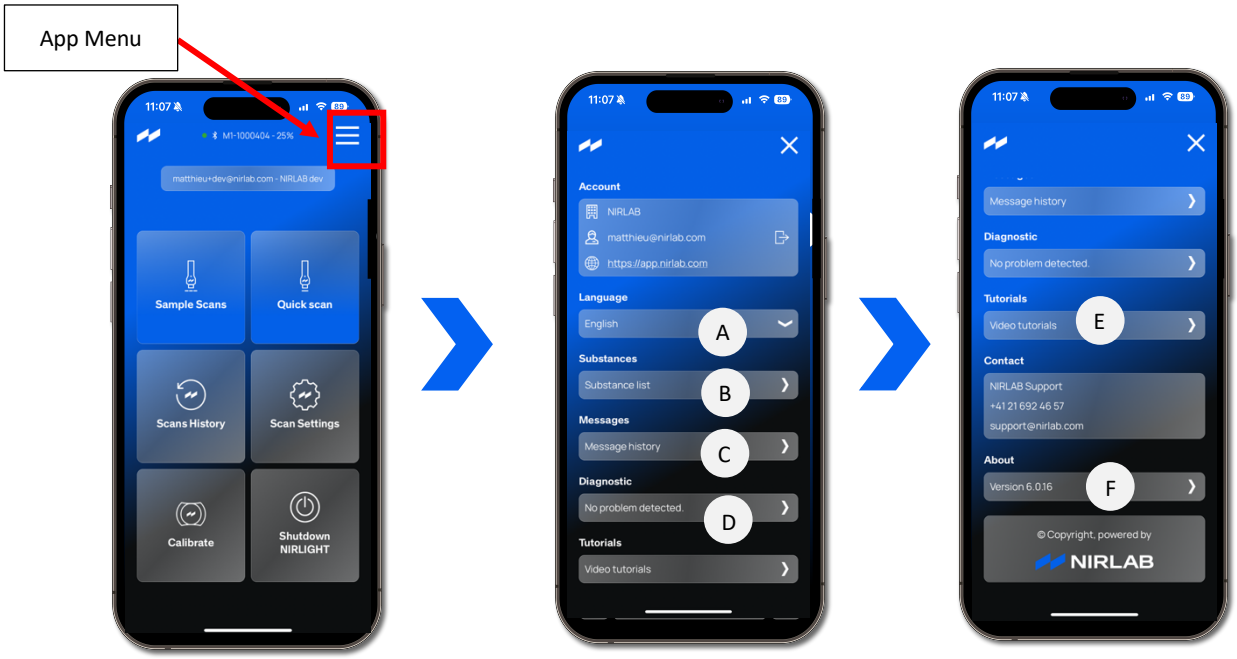
During calibration, select "droplet sampler" in the calibration menu.

3 NIR ANALYSIS

Within this guideline:
→ Press will refer to the buttons in the mobile app.
→ Click will refer to the physical purple button on the NIRLIGHT

3.1 App Menu

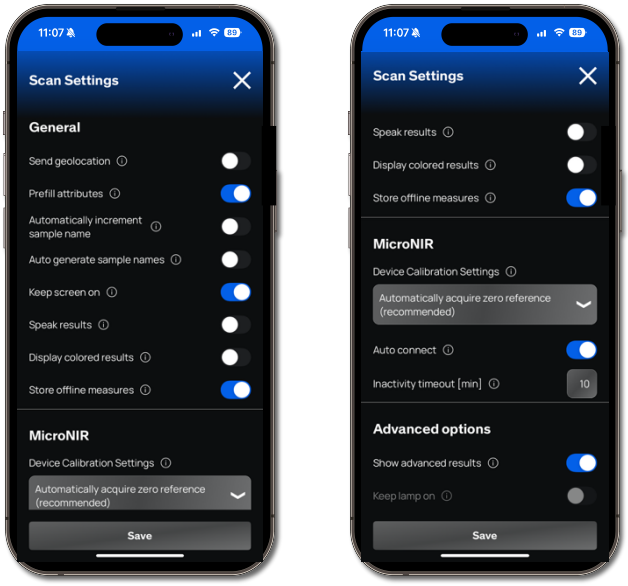
In the app menu, you can access your user account, select your preferred language, and view major updates.



A. **Language setting**: choose your language
B. **Substances**: Substances in your library
C. **Messages:** Latest updates on your substance library
D. **Diagnostic**: Latest calibration values
E. **Tutorials:** Tutorials videos to help you at each step of the analysis
F. **About:** Major software updates

3.2 Scan Settings

Before starting your initial analysis, ensure the app is set up according to your preferences. Activate geolocation if needed, along with any other relevant options displayed. Be sure to enable the offline measurement option to save measures even when an internet connection is unavailable.



Features descriptions can be found directly in the app when pressing the Information Icon ⓘ or here in this guideline.

Do not forget to Press “Save”!

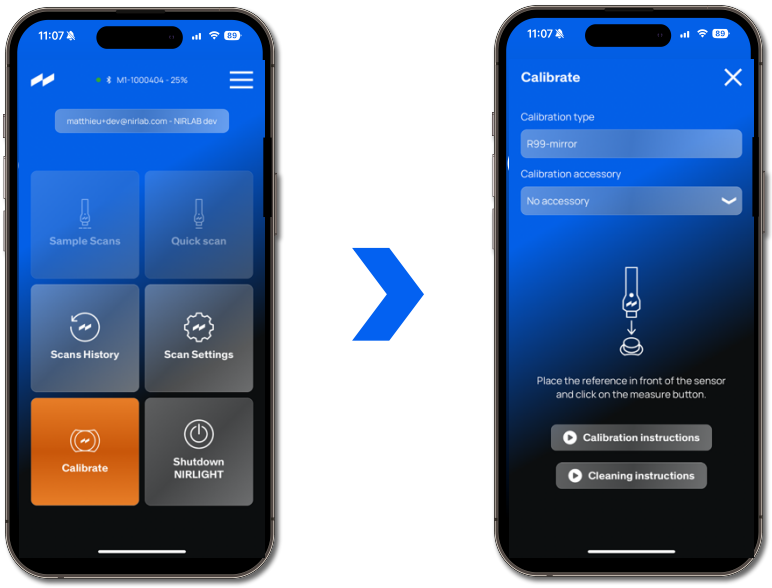
3.3 Scan Settings

- Activate Bluetooth and WIFI on your phone.
- Open NIRLAB app and connect to your account with username and password.
- Click the NIRLIGHT button once (Light on the NIRLIGHT turns on)
- Wait for the connection to be made with the NIRLIGHT, you will automatically be connected to the main page. On top of the main page you will see the connected NIRLIGHT device serial number and its batterie status.

3.4 Calibration

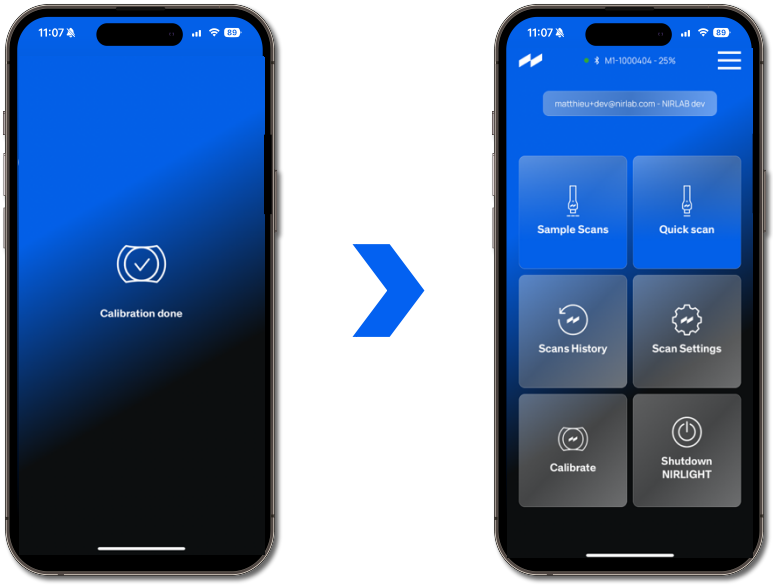
Calibration is an important step for the device to work properly. Since our algorithm works by comparing the acquired sample with our database, we would also say it is essential to acquire good results. Once the device has been connected to your phone through the app you will see the Calibration button mark in Orange. The Orange colour indicates the need for a calibration.

- Press “Calibrate”



- Place the NIRLIGHT on top of the calibration mirror and click on the purple NIRLIGHT button.

- Wait until the calibration is complete. You will be automatically redirected to the main page. The orange colour will no longer be visible. Whenever the NIRLIGHT needs recalibration, the calibration button will appear orange.



3.5 Sample preparation

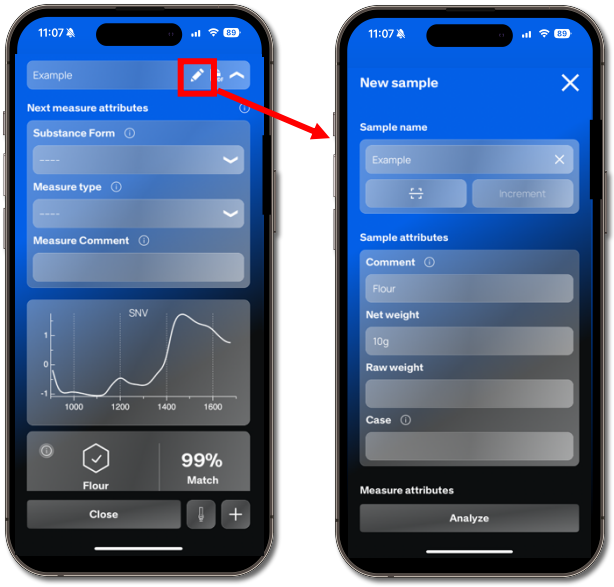
One of the key advantages of NIR analysis is that it typically requires minimal sample preparation. However, specific requirements may vary depending on your use case.
If your application requires the sample to be ground or its form altered, ensure this is done prior to analysis. Additionally, always ensure you have a sufficient quantity of the sample to cover the detector area completely, as insufficient sample amounts may affect the accuracy of the results.

- Decide & select the analysis mode: “Quick scan” or “Sample Scan”.

3.6 Scanning – Quick Scan

By default, results from a Quick Scan do not appear in the scan history of the mobile app. To enable this option, please visit your user account on the web app and adjust the settings accordingly.

- Place the NIRLIGHT onto the sample. Remain as stable as possible.
- Press “Quick Scan” in the mobile app or click directly on the purple NIRLIGHT button.
- When the light on the NIRLIGHT turns blue again, the measurement is completed, and results are displayed in the mobile app.



- After the quick scan analysis, it is possible to Edit information by pressing the Pencil if needed (adds same information than the ones you would add for Sample Scan.

3.7 Scanning – Sample Scan

- Press "Sample Scan"
- Fill in the information (Sample name, Measure type, Photo, etc). Features descriptions can be found directly in the app when pressing the Information Icon ⓘ.

Here an example of what you can find:

1. Add Sample Name.
   a. Barcode scanner to add sample name.
   b. Increment bottom to update the number after the sample name.
2. If needed, add comment on your sample.
3. Enter the weight of your substance in mg.
4. Substance form: Choose from the menu.
5. Measure type: Choose from the menu.
6. If needed, add comment on your measure.
7. Add a picture(s) of your sample.

⚠ Important: Each sample must have a unique name. If a name is reused, the analysis will be added to the existing sample, and the following warning will appear:
"This sample name already exists. The sample properties will be updated, and a new measurement will be added to that sample."

- Place the NIRLIGHT onto the sample. Remain as stable as possible.
- Press “Analyze” and wait for the results to be displayed on the mobile app.

1. Spectra.
2. NIRLAB Result.
3. The different measures performed.

- To do another analyse on the same sample press the Lamp icon or directly click on the purple NIRLIGHT button.
- All the analysis will be displayed within the same sample and the average percentage calculated based on all the analysis performed.
- If you want to analyse a new sample press the "+" icon and redo the previous steps by filling in the sample information.
  If deemed appropriate, think about using the "increment" button, to quickly change sample number.
- It is recommended to clean the sapphire glass between each sample.
- It is recommended to perform 3 analysis per sample.

3.8 Turn off the device

- Press 3s on Shutdown NIRLIGHT in the mobile app or click and hold for 5s the purple button on the NIRLIGHT
- NIRLIGHT is now turned off and you can exit the app.

4 RECOMMENDATIONS

+ The sapphire glass should be cleaned before each scan. This can easily be done by a disposable isopropyl alcohol wipe.

+ To better assess homogeneity, Sample Scans mode is recommended for powders and high quantity samples.

+ Samples that are available only in small quantities or that do not completely cover the detector area should be measured in an aluminium cup. The cup has a neutral effect on the spectrum and helps avoid background signals that could lead to signal interference.

+ Point device downwards when scanning. It is NOT recommended to measure with the device pointing upwards.

You also can also check out our blogpost for accurate NIRLAB analysis here.

5 RESULT INTERPRETATION

5.1 Substance not Homogeneous

The varying spectra indicate high variability between measurements. This may be caused by an inhomogeneous sample, in which case the sample should be homogenized and the analysis repeated. Alternatively, the variation can occur if different physical samples are analyzed under the same sample name. In Sample Scan mode, each sample name must correspond to one physical sample only. Different physical samples must be analyzed under separate sample names, as measurements from different samples cannot be averaged

5.2 "Close to"

In some cases, the algorithm may not produce a satisfactory match with a specific substance. In such instances, the app will indicate that the spectrum has not found any match in the database but is closely aligned with the spectrum of a particular substance. This type of result could be due to several factors:

5.2.1 Analysis through plastic layer or container:

If the analysis has been conducted through a plastic layer or container, it is advisable to repeat the analysis with direct contact.

5.2.2 Substances below Limit of Detection (LOD) or not primary compound:

Alternatively, it is possible that the quantity of substance of interest is below the limit of detection (LOD) or that the substance is not the primary compound in the mixture.

5.2.3 Uncommon composition or mixture:

Another possibility is that the spectrum indicates an uncommon composition or mixture.

5.2.4 Error

Another possibility is that the substance is unknown, but the algorithm determines that the profile obtained is still similar to the spectra of one of the substances in the database.

→ If feasible, we recommend analysing the substances at the laboratory for more accurate and detailed results.

5.3 Unknown substance

The reasons for this issue can be multiple, and we will try to guide you through them to find out what your case is.

5.3.1 Analysis through Plastic Layer or Container:

If the analysis has been conducted through a plastic layer or container, it is advisable to repeat the analysis with direct contact.

5.3.2 Insufficient material:

In cases where there is a small amount of sample, it is possible that the detector may not be completely covered, thus influencing the spectrum. If possible, try to add more sample and redo the analysis.

5.3.3 Substance /Mixture not in the database

You may have the “unknown” results displayed if you encounter a substance for which we do not have a reference. This means that the substance is not referenced in our database. It is also possible that the substance to be analysed is a mixture, perhaps a combination of substances we have not yet identified.

5.3.4 Data acquisition

You may see "unknown" results if you are in the data collection phase and the substance library has not yet been developed, updated, or deployed.

These are some of the limitations. Nevertheless, the cloud-based solution allows for rapid updates. In both cases, we recommend determining if you believe this substance or mixture is going to be a recurrent issue for you. If yes, please contact us so we can work together to rapidly improve the substance library.

Contact of NIRLAB:
Email: contact@nirlab.com

6 TROUBLESHOOTING & FAQ

6.1 Can I see all my scan directly in the mobile app?

Yes, you have access to your scan history directly on your mobile phone. Just press Scan history on the main menu to access your past analysis.

6.2 I want to add a new substance to the database, Is it possible?

Yes, we can add new substances to the library. We basically just need the scan of the substance in question with our NIRLIGHT device and the corresponding lab results of a bench top and our scientific team can then update the library and models accordingly and make it available to all users instantly. That is the big advantage of our solution compared to existing solutions. We are constantly updating our substance library and improving our models thanks to our cloud-based solutions."

6.3 Can I use the device as standalone unit without a smartphone?

The narcotic solution includes NIRLIGHT hardware and software with Android and iOS applications, along with a computer dashboard for data analysis. The user-friendly mobile apps enable real-time monitoring, while the computer dashboard facilitates in-depth analysis. Additionally, users can easily export data and integrate with other systems when needed. The device does not have a display; hence the results are shown on the mobile app and web application.

6.4 Is it possible to analyse substances without an internet connection?

The apps require an internet connection to deliver results, but not necessarily for the collecting process itself. To enable this feature, you need to activate the Store offline measures option within the scan settings window. However, if you do not have an internet connection, the results won't be displayed immediately. Instead, the analysis will be saved, and when your device is connected to the internet, the spectra will be transferred and compared against our database, and the results will then be displayed. If internet issues can be a recurrent problem, we recommend using Starlink.

6.5 I need to personalize the app. How to proceed?

Feel free to contact us so we can assess together the tailored adaptation we can make for you. We aim to ensure ease of use and provide solutions tailored to your needs.

7 APPENDIX

7.1 Version History

Version	Date	Major changes
Version 2.0	04.02.2026	Rebranding
Version 1.1	10.12.2024	Improved version with reviewed structure and addition of content
1.0.0	07.06.2024	Initial version