



Scanning & Results Interpretation Guide



Narcotics

Version 2.0 - March 2026

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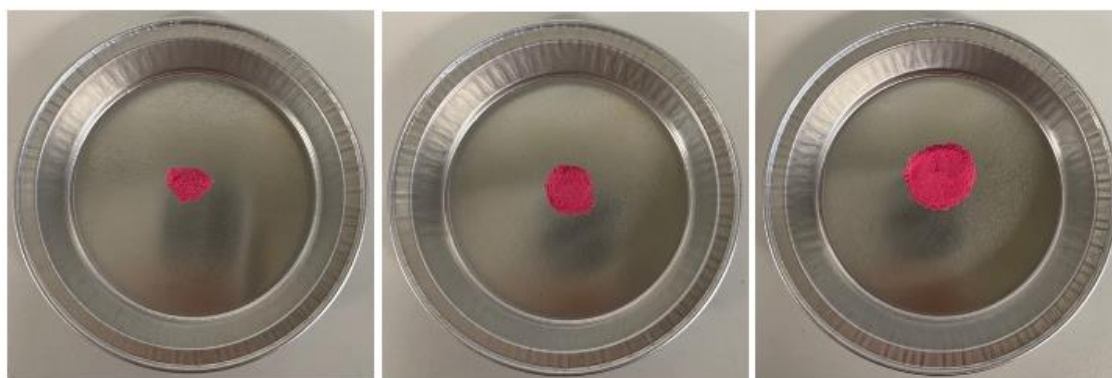
1. SCANNING RECOMMENDATIONS

1.1 Sample preparation

- Ideally place sample in an aluminium cup and ensure that you have enough sample for the analysis.

Container: The support/container significantly affects the analysis. While analysis through plastic or glass is possible, it is not recommended, especially for obtaining quantitative results. Therefore, it is recommended to use an aluminum cup to analyze samples. This material reflects all the rays emitted by the NIR, thus avoiding any influence on the obtained spectrum and minimizing interfering signals leading to more accurate results.

Quantity: Please note that the quantity of product available for the analysis also affects the results. Using small quantities poses a risk of incorrect quantification or even non-identification. For reliable results with NIR, it is recommended to analyze at least 30 mg of product whenever possible.



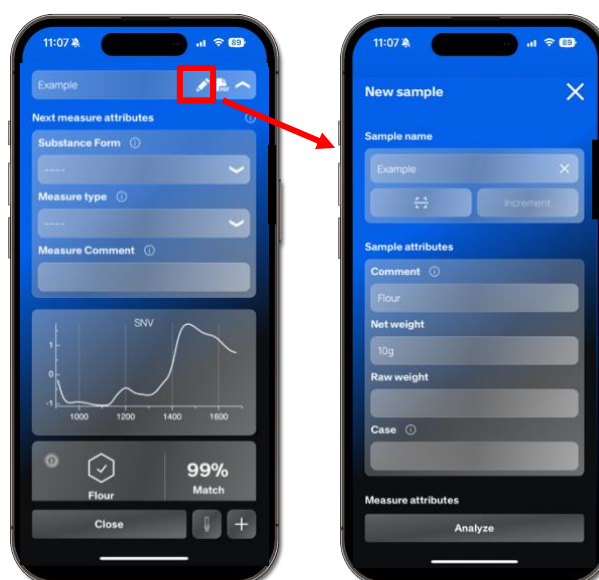
Visual aid: 15 mg, 30 mg and 60 mg of product respectively.

- Ideally use 200mg of substances.
- Decide & select the analysis mode: “Quick scan” or “Sample Scan”.

1.2 Scanning – Quick Scan

Be aware that results from a Quick Scan do not appear in the scan history in the mobile app, the results can only be recovered in the Web app.

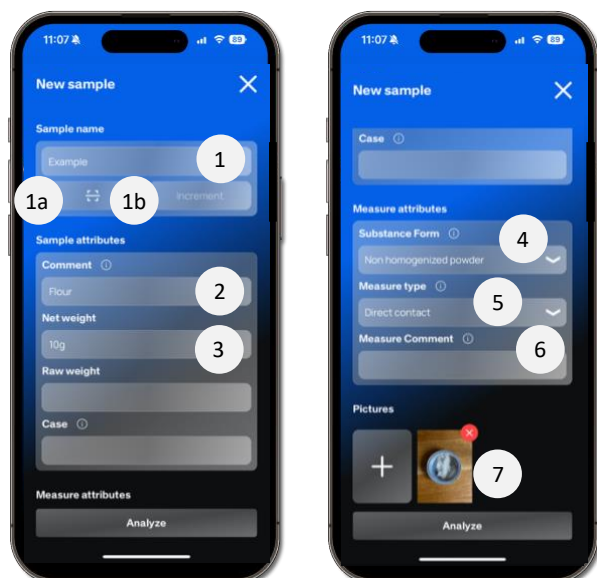
- Place the NIRLIGHT onto the sample. Remain as stable as possible.
- Press “Quick Scan” in the mobile app or click directly on the purple NIRLIGHT button.
- When the light on the NIRLIGHT turns blue again, the measurement is completed, and results are displayed in the mobile app.



- 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).

1.3 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 ⓘ.



1. Add Sample Name.
 - a. Barcode scanner to add sample name.
 - b. Increment bottom to update the number after the sample name.
2. Enter the weight of your substance in mg.
3. If needed, add comment on your sample.
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.

- 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 analyze 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 analyze 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.

Number of analyses recommended:

- Powders/crystals: Three measurements.
If enough substance is present, move the NIR slightly for each measurement but ensuring that the detector is always covered (3 measures in total).
- Pills: Two measurements on each side (4 in total)
- Cannabis buds and resin: Two measurements on each side (4 in total)

2. SCANNING TIPS AND RECOMMENDATION

- + All substances can be measured in direct contact or through thin and transparent plastic or glass. However Direct contact produces the best accuracy, especially for quantification.
- + 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 available only in small quantities should be measured in an aluminium cup which has no effect on the spectrum.
- + Point device downwards when scanning. It is NOT recommended to measure with the device pointing upwards.
- + Scan substances without altering them. Preserve original state for accuracy.
Eg. “XTC pills”: the model has been developed on pills not on the crushed pills.

You also can also check out our blogpost for accurate NIRLAB analysis [here](#).

3. RESULTS SCREENS

3.1 Substance Identified



The substance has been identified with high confidence. No warning is shown.

The operator can proceed with confidence, the result is suitable for field documentation and operational decision-making. Lab confirmation is not required by the system, though it remains available as a follow-up step.

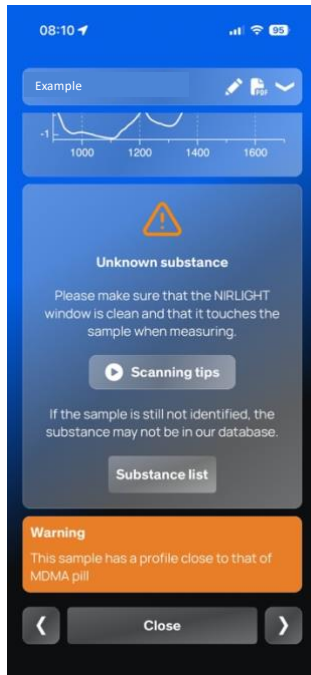
3.2 Substance Identified - with lab analysis recommended for confirmation



The substance identity is determined with good confidence, but the quantification result carries lower certainty.

This may occur when scanning through packaging, or when the mixture contains cutting agents or composition profiles not yet represented in the calibration model. The system recommends forwarding the sample for laboratory confirmation.

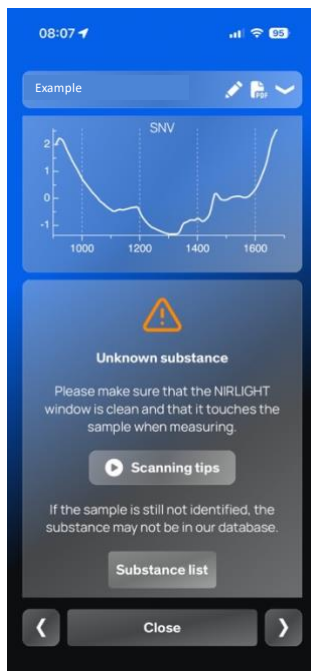
3.3 Unknown Substance - with spectral profile close to a known substance



The system cannot make a definitive identification, but the spectral profile shows partial similarity to a known substance.

This represents a lower confidence scenario. The named substance should be treated as an investigative lead only, not a confirmed result. The operator should re-scan following best practice guidelines and, if the result persists, submit the sample for laboratory analysis.

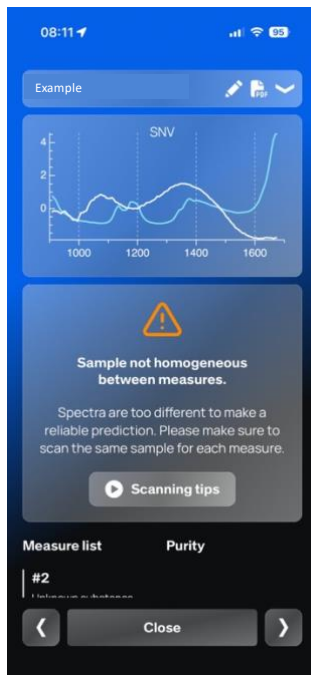
3.4 Unknown Substance - with no match in database



The substance does not match any entry in the NIRLAB database, and no similar profile is available.

The operator should verify that the NIRLIGHT window is clean and in full contact with the sample. If the result persists after re-scanning, the substance is likely not covered by the current models. The operator should submit the sample for laboratory identification.

3.5 Sample not homogeneous between measures



This result appears only when using Sample Scan Mode with multiple measurements in a single scan session.

It indicates that the individual spectra collected during the session are too dissimilar to produce a reliable aggregate prediction.

The operator should also ensure that all measurements in a sample scan session are taken on the same sample and re-initiate the scan for a new sample.

Alternatively, this may be caused by an inhomogeneous sample, in which case the sample should be homogenized and the analysis repeated.






4. RESULT INTERPRETATION




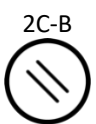
4.1 Commonly encounter narcotics

This is an overview of commonly expected results and their meaning. Please note that these results are based on Swiss market experience and may not represent the narcotics market of your region.

Additionally, just because a result is not close to what is commonly detected, this does not necessarily mean that it is an analysis error. In such cases, however, it is advisable to take the result with care and undertake confirmatory laboratory analysis if deemed necessary.

Major classes

Substance	Substances form	What can be Identified & quantified	LOD*	Commonly encountered results
Cannabis 	Dry, whole flowers Dry, ground flowers Resins & Hash	Total THC \pm 2% (absolute) Total CBD \pm 2% (absolute)	0.1%	<ul style="list-style-type: none"> • Cannabis (THC bud) → THC 15-30% and CBD 0-3% • Cannabis (CBD bud) → THC 0-3% and CBD 15-20% • Cannabis (Resin) → THC 20-45% and CBD 5-10%
Cocaine 	Mixed powders	Cocaine HCl \pm 15% (relative) Cocaine Base \pm 15% (relative) Predominant cutting agents: <ul style="list-style-type: none"> - Phenacetin - Lactose - Sucrose - Mannitol - Creatine - Levamisol 	10%	<ul style="list-style-type: none"> • Uncut Cocaine → 80- 100% salt form • Cut cocaine → 40-60% salt form and cutting agents
Heroine 	Mixed powders	Heroine Base \pm 15% (relative) Predominant cutting agents: <ul style="list-style-type: none"> - Caffeine - Paracetamol 	5%	<ul style="list-style-type: none"> • Heroin → 5-30% base form with caffeine and paracetamol
MDMA 	Powders/ Crystals Pills	MDMA HCl \pm 15% (relative)	10%	<ul style="list-style-type: none"> • MDMA (Crystals) → 80- 100% salt form • MDMA (pills) → 30-45% salt form
Ketamine 	Powders/Crystals Pills	Ket. HCl \pm 15% (relative)	20%	<ul style="list-style-type: none"> • Ketamine → 85-100% salt form

Substance	Substances form	What can be Identified & quantified	LOD*	Commonly encountered results
Methamphetamine HCl 	Powders/Crystals Pills	Meth. HCl \pm 15% (relative) Predominant cutting agents: - Caffeine	5%	<ul style="list-style-type: none"> • Methamphetamine → Sometimes cut with: -Pseudoephedrine -Dipentylone
Amphetamine sulphate 	Powders/Crystals Pills	Amphet. HCl \pm 15% (relative) Predominant cutting agents: Caffeine	5%	<ul style="list-style-type: none"> • Amphetamine → 5-15% salt form and caffeine • Amphetamine (rarely) → 30-50% salt form and caffeine
Tusi 	Powders	Tusi \pm 5%	In evaluation	<ul style="list-style-type: none"> • Tusi → 40-80% Ketamine → 5-20% MDMA
2C-B 	Powders/Crystals Pills	2-CB. HCl \pm 5%	In evaluation	<ul style="list-style-type: none"> • 2C-B pills → 3-8% salt form • 2C-B crystals → 85-100% salt form

* Limit of Detection

These values are indicative of the status at the current date: 01 January 2026. Value may change over time with improvement of the models.

New Psychoactive substances (NPS) - Pure form

Synthetic cannabinoids	Synthetic cathinone	Phenethylamines	Synthetic opioids
<ul style="list-style-type: none"> • XLR-11 • JWH-250 • JWH-200 • JWH-081 • JWH-073 • JWH-019 • JWH-018 • RCS-4 • 5F-PB-22 • MAM-2201 • AKB-48 • AB-PINACA • AB-FUBINACA • AB-CHMINACA • 5F-AB-PINACA • UR-144 • PB-22 • MDMB-CHMICA • AM-2201 • 5F-APINACA • JWH-122 • MDMB-4en-PINACA 	<ul style="list-style-type: none"> • 4-MEC • 3-MMC • 4-MMC • 3-CMC4-CMC • 2-CMC • 2-MMC • Alpha-PhP • Alpha-PVP (with quantification estimation) • Pentedrone 	<ul style="list-style-type: none"> • 2C-C • 2C-D • 2C-E • 2C-H • 4-Fluoroamphetamine (4-FA) 	<ul style="list-style-type: none"> • Fentanyl • Metonitazene • N-Desethylisotonitazene • Protodesnitazene • Protonitazene • N-Desethyletonitazene

Other relevant substances

Cocaine adulterants	Cocaine excipients	Heroin excipients	Generic excipients	Medicines (Genuine)	Precursors
<ul style="list-style-type: none"> • Ascorbic acid • Benzocaine • Caffeine • Citric acid • Hydroxyzine • Lidocaine • Procaine • Tetracaine 	<ul style="list-style-type: none"> • Baking soda • Boric acid • Fructose • Glucose • Glutamine • Inositol • Lactose • Levamisole • Mannitol • Phenacetin • Sucrose 	<ul style="list-style-type: none"> • Caffeine • Griseofulvin • Paracetamol 	<ul style="list-style-type: none"> • Dimethyl-sulfone • Palmitic acid • Stearic acid 	<ul style="list-style-type: none"> • Aspirin • Ibuprofen • Diazepam • Dormicum • Oxycodone • Pseudoephedrine • Xanax • Viagra 	<ul style="list-style-type: none"> • PMK-Glycidate • Ephedrine

These lists are indicative of the status at the current date: February 04,2026. The list of detected substances is constantly evolving, and new substances are continuously added to the database and are immediately available to all users.

If you need to identify a substance that is not on the list, feel free to [contact NIRLAB team](#) and we will add it if possible.

4.2 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

4.3 “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:

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.

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.

Uncommon composition or mixture:

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

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.

4.4 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.

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.

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.

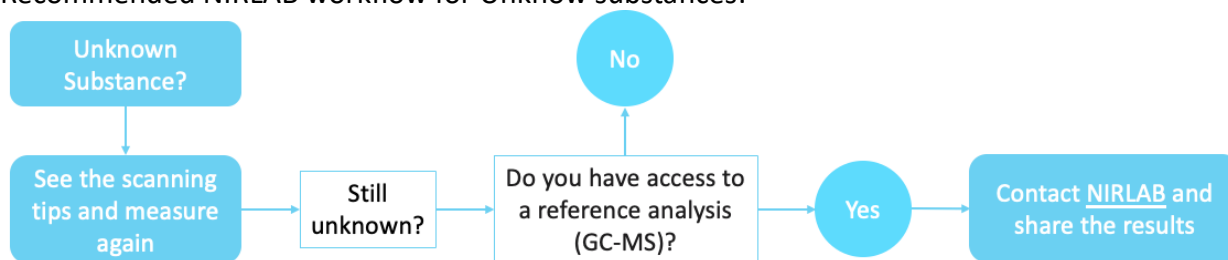
Substance /Mixture not in the database

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 analyzed is a mixture, perhaps a combination of substances we have not yet identified.

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 database.

→ If feasible, we recommend analysing the substances at the laboratory for more accurate and detailed results and share this result with NIRLAB so that we can improve the library.

Recommended NIRLAB workflow for Unknow substances:



Contact of NIRLAB:

Email: support@nirlab.com

5. TROUBLESHOOTING & FAQ

5.1 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.

5.2 What about the security of the data?

Our system ensures the security of data transfer and stored information through careful measures. The data is kept in a secure data center on the university campus of the university of Lausanne and developed by IT experts from the Swiss Federal Institute of Technology in Lausanne, Switzerland. Communication between the mobile app and server is encrypted, giving control over shared information. Setting such as geolocation are customizable and sensitive data, like sample names, is coded for confidentiality.

5.3 How often are the models updated?

Our database and the associated models are updated constantly, as we are collecting samples on the daily base as well as the models. Since this is in the cloud, user do not have to update their app. However, for major updates we send a push notification to the user, when they open the app.

5.4 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.”

5.5 Can I analyse substances through a thin plastic bag or glass to avoid direct contact?

Yes, the device is capable of scanning through glass and plastic bags, eliminating the need for to come into direct contact with illicit substances. In these cases, quantification may lose a bit in accuracy.

5.6 Is it possible to have a downloaded data base?

Unfortunately, at the moment, downloading the database is not an option. NIRLAB operates as a cloud-based solution, and we exclusively utilize our cloud infrastructure for communication. Offering database downloads would contradict our cloud-based approach

and impede continuous updates. We prioritize the highest security standards for data transfer to ensure the utmost protection.

5.7 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.

5.8 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.

5.9 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.

6. ANNEX

6.1 Glossary

Match %:

Indicates how closely the scanned sample corresponds to the pure substances' spectra in the database, based on spectral comparison or the probability of belonging to a particular class when not pure. This measure compares the sample's spectra to reference spectra and calculates a value representing how closely they match.

Confidence Level:

The confidence level is calculated by combining predictions from both the classification model (identification) and the regression model (quantification), resulting in a single value that reflects the likelihood of an accurate result. Unlike the match percentage, the confidence level is more suitable for substances that are **not in pure form**. It is based on a similarity calculation using multiple spectra in the database along with reference analyses, providing an estimate of how closely the scanned sample aligns with known compounds.

6.2 Narcotics synonyms

List of alternatives name for several narcotic substances:

Narcotic	Synonyms
Cannabis	Marijuana, weed, pot, ganja, grass Hashish (cannabis resin) Spice (Synthetic cannabinoids)
Cocaine	Coke, snow, blow, white horse Crack (cocaine in base form)
Heroin	Smack, junk, brown sugar, dope
MDMA	Ecstasy, Molly, X, XTC
Ketamine	Special K, K
Methamphetamine	Crystal, meth, ice
Amphetamine	Speed,
LSD	Acid, Lucy, trips, blotter
Fentanyl	China white, synthetic heroin
Cathinone	Bath salts, Meow Meow (4-MMC)
Others:	Do not hesitate to extend the list with your relevant narcotics:

These are just a few examples, but there are many more narcotics and their synonyms out there.

6.3 Version History

Version	Date	Major changes
Version 2.0	10.03.2026	Addition of Result screens
Version 1.0	05.02.2026	First version