

# **Raman Spectrometer**

## **MR-5S**

### **Guide to Use**

# Contents

- Welcome .....1**
- Warning.....1**
- Opening the box.....2**
  - List of parts..... 2
  - External view of device..... 3
  - Accessories ..... 4
  - Internal view of carrying case..... 4
  - Attaching detection probes..... 4
  - Charging the device ..... 5
- Understanding the device .....5**
  - Screen and display.....5
- Using the laser .....6**
  - Operating distance ..... 6
  - Connecting to a network..... 7
  - Environmental requirements ..... 8
  - Starting detection ..... 13
  - Exporting records ..... 18
  - Hazardous substance alerts..... 18

|                                                                      |           |
|----------------------------------------------------------------------|-----------|
| <b>Database.....</b>                                                 | <b>19</b> |
| Logging in to a database account .....                               | 19        |
| Changing your login(cloud database detection service) password ..... | 19        |
| Downloading databases.....                                           | 19        |
| Syncing databases.....                                               | 20        |
| Browsing databases.....                                              | 21        |
| Searching databases .....                                            | 21        |
| Updating offline detection databases.....                            | 21        |
| Resetting the offline detection database.....                        | 22        |
| Adding new substances .....                                          | 22        |
| <b>Detection settings .....</b>                                      | <b>23</b> |
| Account and password settings .....                                  | 23        |
| Setting the laser power .....                                        | 23        |
| Calibrating the device .....                                         | 24        |
| Updating the software .....                                          | 24        |
| Setting up offline detection.....                                    | 24        |
| Spectral databases .....                                             | 24        |
| Enabling sound and vibration alerts.....                             | 25        |
| <b>Managing cloud databases.....</b>                                 | <b>25</b> |
| <b>Device specifications .....</b>                                   | <b>26</b> |
| <b>Care and maintenance .....</b>                                    | <b>27</b> |

|                                 |           |
|---------------------------------|-----------|
| Routine calibration.....        | 27        |
| Safe use .....                  | 27        |
| Medical device safety .....     | 27        |
| Cleaning the device .....       | 27        |
| Driving safety.....             | 28        |
| Battery care .....              | 28        |
| Avoid condensation .....        | 28        |
| <b>Further assistance .....</b> | <b>29</b> |

# Welcome

Thank you for choosing CloudMinds's AI Raman spectrometer Lingxi MR-5S. This handbook will help you understand the initial settings and basic functionality of the Lingxi MR-5S as well as necessary safety information.

Before reading the contents of this manual, please note:



The functions described in this manual are those featured on your device as it is now. If the descriptions do not match your device's actual functions due to software or hardware changes, then please use the functions as they actually are on your device.

## Warning

Before opening the box, check that the external packaging is intact.



**Do not use the laser functions of this device if you have not received formal training.**



The laser diode of this device is a component of the Raman spectrometer. It can produce lasers with a power between 100 to 500mW and a 785nm long wavelength. The laser uses its own lens to focus on a spot 10mm away.



**This device uses a Class 3B laser.**



Exposing human eyes or skin to the laser emitter window can cause injury. The safety distance for this laser is no less than 50cm from the laser emitter window.



Within the 50cm safety zone, use a management controller, work controller and/or laser safety goggles to protect the operator's eyes.



Do not disassemble this device by yourself, including but not limited to its protective case and battery. If disassembly is required, contact an

authorized service center.



**Do not use controllers, modulators or software applications that are not compatible with this device to control this device.**



**Comply with your organization's safety protocols and rules when using this device's Raman laser to detect unknown substances. Using the smallest possible samples and lowest laser power can help avoid potential hazards.**



**Do not detect heat-sensitive materials in closed containers. Doing so can increase pressure inside the container and lead to the container exploding.**



**The Lingxi MR-5S is not an intrinsically safe device. Users must take the necessary safety precautions when using this device.**

## Opening the box

### List of parts

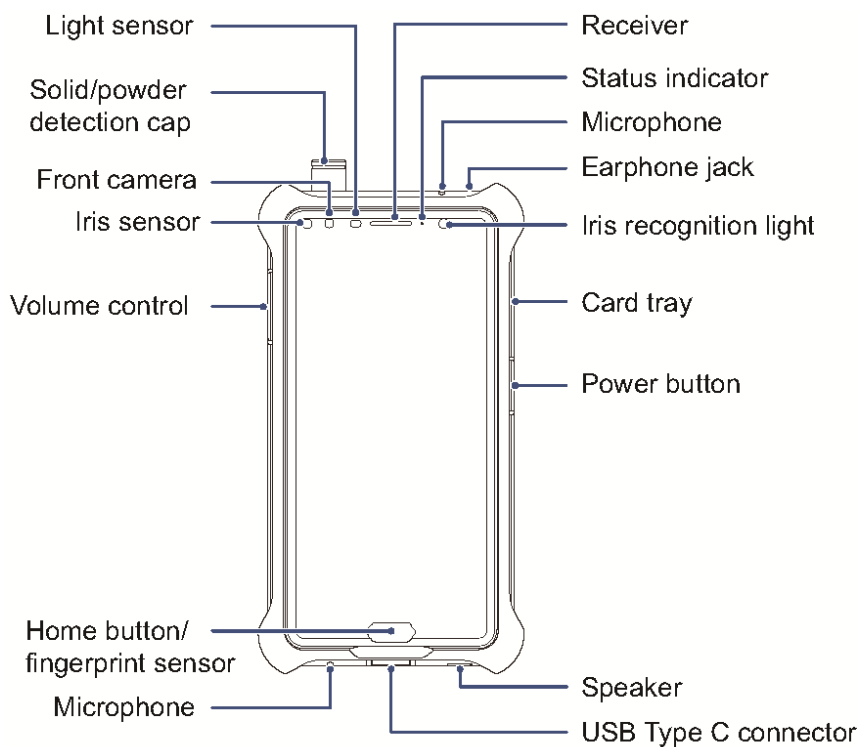
The box contains the following items:

- Lingxi MR-5S
- Protective case (already attached to device)
- Charger
- USB Type-C data cable
- Card ejector pin
- Standard detection probe (already attached to device)
- Solid/powder detection cap (already attached to device)
- Self-verifying calibration cap
- Extended detection probe
- Reagent bottle holder

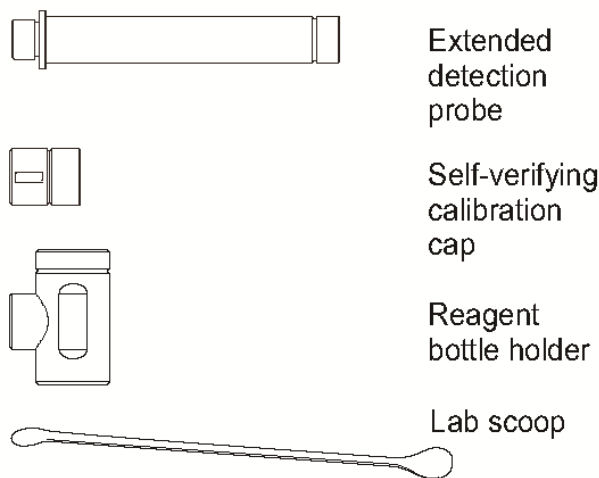
- Quartz reagent bottles (2)
- Lab scoop
- Sample bags (50)
- Instructions
- Warranty card

If any of the above items are missing when you open the box, please contact your place of purchase.

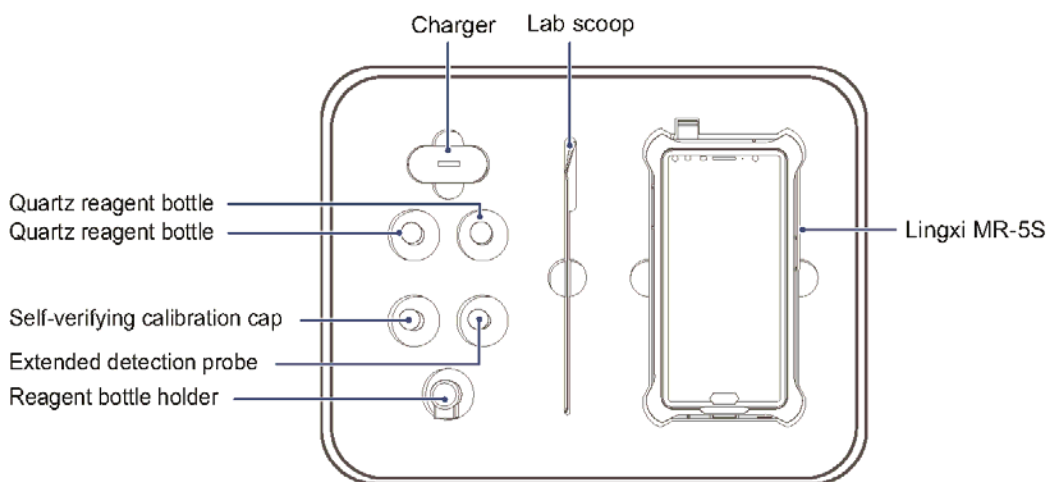
## External view of device



# Accessories



## Internal view of carrying case



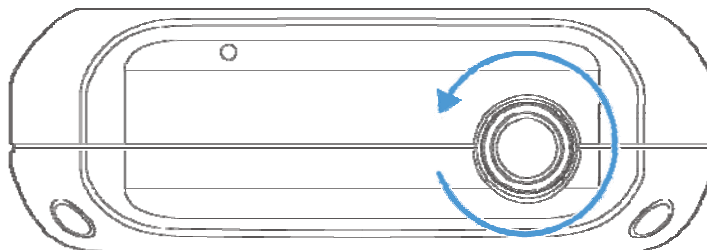
## Attaching detection probes



Your device is equipped with two detection probes. Attach and remove the device's detection probes in a clean, dry environment. Prevent dust, pollutants, water or other liquids from entering the device, which can cause electrical faults or influence the results of the laser detection.

If the solid/power detector cap, reagent bottle holder or self-verifying calibration cap is attached to the top of the device, remove it first.

1. As shown in the figure below, turn the standard detection probe on top of the device in a counterclockwise direction to expose the laser emitter. Be careful not to touch or contaminate the glass lens on the top of the detection probe to avoid influencing the results of the laser detection.



2. Insert the threaded end of the extended detection probe into the laser emitter opening and screw in the probe until it is tight.



Do not expose the internal parts of the laser emitter for an extended period when changing the detector probe as it can allow dust to enter the device, which can influence the results of the laser detection.

## Charging the device

Charge the Lingxi MR-5S before use. The device requires 3.5 hours to fully charge.

1. Connect the data cable to the charger.
2. Plug the data cable into the USB Type C port at the bottom of the device. The device screen will automatically light up to show that it is charging.



- The charger is not waterproof. Keep it in a dry environment.
- When the device is charging, the charger may become hot. This is normal.
- If the room temperature is below -10°C or above 50°C, do not use the charger to charge the device.
- Use the original charger and data cable that came with the device.

## Understanding the device

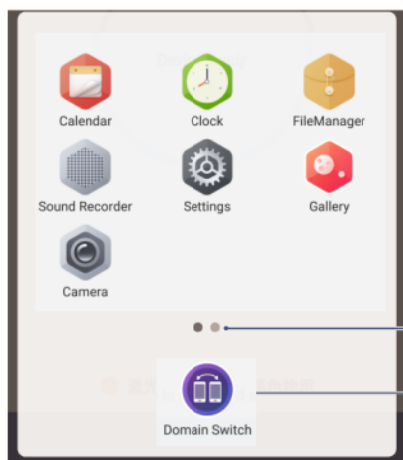
### Switching between domains

In the personal domain, tap  shortcut on the main screen to switch to the detection domain.

In the detection domain, swipe up from the bottom of the screen to bring up the

shortcut view and then tap  to switch to the personal domain.

- When you are in the personal domain,  is displayed in the top left corner.
- When you are in the detection domain,  is displayed in the top left corner.



Current screen location

Tap to switch to personal domain

## Using the laser



Before you use the Lingxi MR-5S laser, you must undergo training to understand the operating principles, performance parameters and safety specifications for the device.

### Operating distance

This device's laser must be used from the correct operating distance to obtain the best results. Detection accuracy is impacted if the substance is too near or too far.



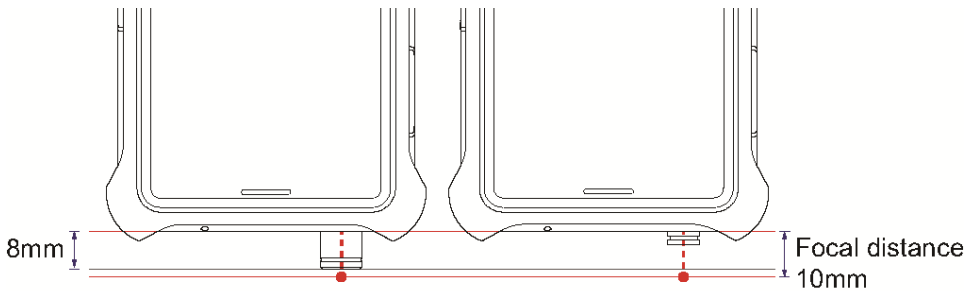
The use of the solid/powder detection cap or reagent bottle holder does not change the laser focal distance. Positioning the solid/powder detection cap flush against the outside of the detection sample places the sample at exactly the right focal point to produce the best results.



Remove the solid/powder detection cap to use the laser to detect substances in transparent or semi-transparent containers such as quartz reagent bottles.



The distance between the center of the laser lens and the laser focal spot is approximately 10mm.



## Connecting to a network

This device can conduct online detection via mobile networks and wireless local area networks. It can also be used offline.

### Connecting to a mobile network

If you have inserted a SIM card into the device, you may choose to use a mobile network to connect to the cloud detection service.

### Connecting to a wireless local area network

1. Swipe down from the top of the screen to open the notification panel. Tap and hold **WLAN** to go to the wireless local area network settings page.
2. Select the network you would like to join from the WLAN list.
3. Depending on the network:
  - If the network is not password protected, the device will connect automatically.
  - If the network is password protected, enter the password and tap .

### Disconnecting from a network

Your device will disconnect from the network in the follow situations:

- When there is no available network.
- When the flight mode is enabled: Swipe down from the top of the screen to open the notification panel, and then tap Airplane mode.

When offline, the device will automatically use the offline detection mode to detect samples and use the local database for comparison.



In the detection domain, tap  >Offline analysis to use the offline detection mode. See **Offline detection** on page 16 for more details.

In the detection domain settings, enable the offline detection mode to carry out offline detection. The offline detection mode is the same as detection when there is no network connection.

## Environmental requirements

Due to the limited penetrability of the laser, different detection accessories need to be used depending on the type of container that holds the sample.

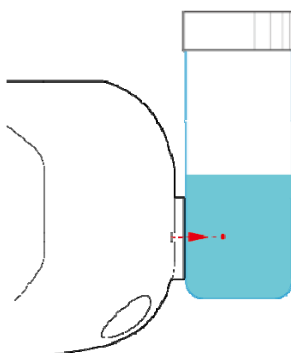


If the sample in the container is suspected to have heat sensitive or corrosive properties, do not insert the extended detection probe into the container. Doing so can result in fire or explosion, or corrode the device. Remove a small amount of the substance to be identified and place it in a quartz reagent bottle. When the bottle is open, use the delayed detection method. See **Starting detection** on page 13 for more information about delaying detection.

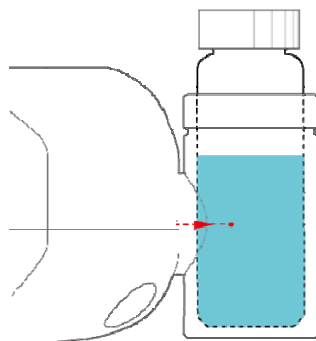
## Thin-walled containers

If the sample container is 5mm thick or less and transparent or semi-transparent glass or plastic, you may:

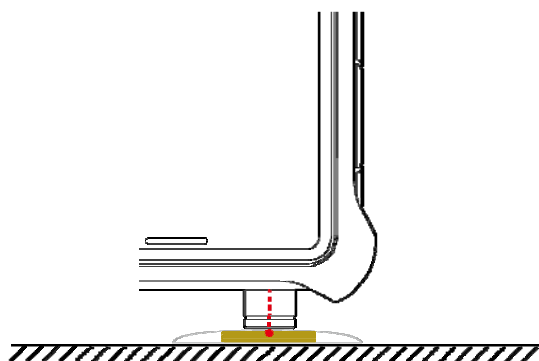
- Remove the solid/powder detection cap, and press the laser emitter window against the outside of the container. This way, the laser focal spot will be on the inside of the container.



- Remove the solid/powder detection cap, attach the reagent bottle holder, and place the container inside the bottle to carry out detection.



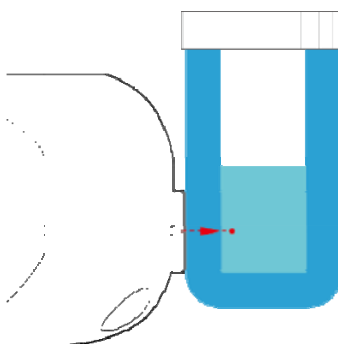
- If the sample container is a thin and transparent bag such as reagent bag, you must attach the solid/powder detection cap and position the detection cap flush against the outside of the bag. This way, the laser focal spot will be on the inside of the bag.



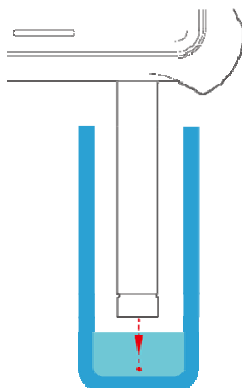
## Thick-walled containers

When the sample container is thicker than 5mm and transparent or semi-transparent glass or plastic, the container's walls are thicker than the laser focal distance. This can result in the laser focal spot being inside the container walls, which invalidates the detection. You may choose one of the following methods of detection:

- Remove the accessory attached to the laser emitter window and position the laser emitter window directly against the outside of the container to carry out detection.



- Remove the accessory attached to the laser emitter window and attach the extended detection probe. Remove the lid of the container and place the probe inside to carry out detection. If the sample has heat sensitive properties, the extended detection probe cannot be used.

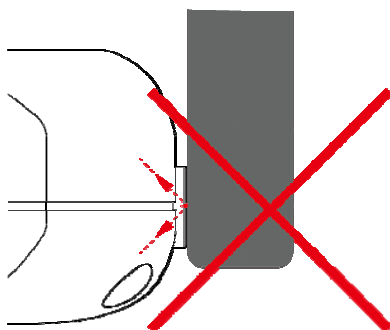


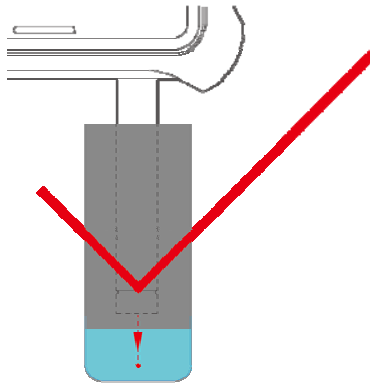
- Transfer the sample into a thin-walled container to carry out detection.

## Opaque/low transparency containers

If the sample container is an opaque or very low transparency container made of ceramic, dark color glass, frosted glass, or dark color plastic, the laser cannot penetrate the container walls. You may:

- Remove the accessory attached to the laser emitter window and attach the extended detection probe. Place the probe inside the bottle to carry out detection. If the container contains a heat sensitive sample, the extended detection probe cannot be used.
- Remove the sample from the container for detection.





## Unpackaged powder samples

If the sample to be tested is unpackaged powder, such as powder on a concrete floor, choose one of the following methods of detection:

- If conditions allow, transfer a suitable amount of the powder into a reagent bag and then proceed according to the instructions on 8 on page **Thin-walled containers**.
- Push the powder into a pile and touch the solid/powder detection cap to the top of the pile to carry out detection.



If the powder pile is not tall or thick enough, the laser beam will pass through it and the detection will fail.



If the powder sample contains differently colored or differently sized particles, move the laser focal spot relative to the powder during detection. This allows the laser to reach the maximum number of particles and increases the accuracy of the detection comparison.

## Unpackaged liquid samples

If the liquid is sufficiently safe, collect the liquid within a quartz reagent bottle, remove the accessory attached to the device's laser emitter window, and use one of the following methods of detection:

- Place the laser emitter window directly against the outside of the container.
- Attach the extended detection probe and place the probe inside the bottle to carry out detection.

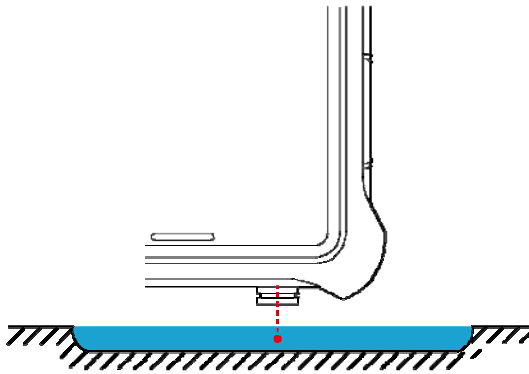
If the liquid collected does not fill the bottle enough, remove the solid/powder detection cap and position the laser emitter window at a 5mm or lower distance from the surface of the liquid, and then carry out detection.



If the liquid is suspected to have heat sensitive or corrosive properties, do not immerse the device or its accessories in the liquid. Doing so can result in hazards such as corrosion, fire, and explosion.

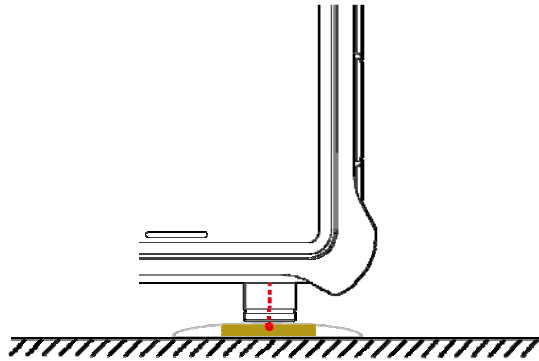


If the liquid is too shallow, the laser will identify the surface underneath the liquid.



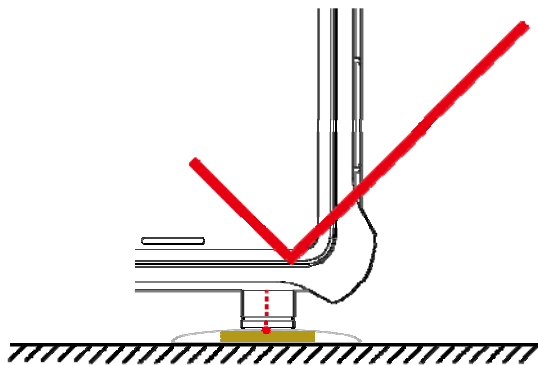
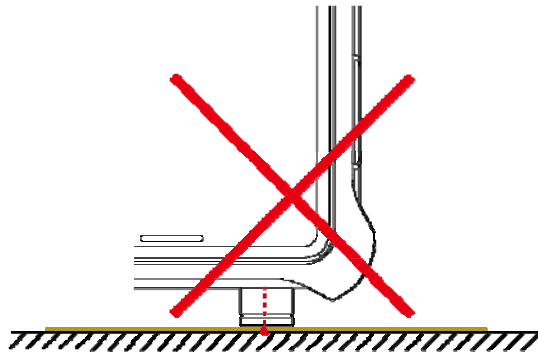
## Scanning large, solid samples

If the solid sample to be scanned has a relatively large area (such as a tablet), position the solid/powder detection cap against the sample surface and then begin detection.



## Scanning thin or loose solid samples

If the solid sample to be scanned is fibrous or thinly spread (such as cotton, plastic netting, or paste), collect more of the sample, press it into a tight ball and place inside a reagent bag, then enable the solid/powder detection cap to touch the reagent bag to carry out detection.



## Starting detection



**Do not test combustible or flammable substances or substances with unknown heat sensitivity without protection, to avoid hazards such as fire or explosion.**



**Do not shine the laser onto eyes or skin.**



**Do not test black, brown or dark-colored substances. When these substances absorb the energy of the laser, they can become hot or start to burn, resulting in fire.**



**Do not place the substance to be identified on paper for testing. The paper may absorb the energy of the laser and become too hot or even start to burn, resulting in fire.**



**If the substance to be identified is light in color, any dark spots in the substance absorb the energy of the laser more easily and quickly heat up.**

If you have not determined if the substance to be identified has heat sensitive properties, prepare in the following way:

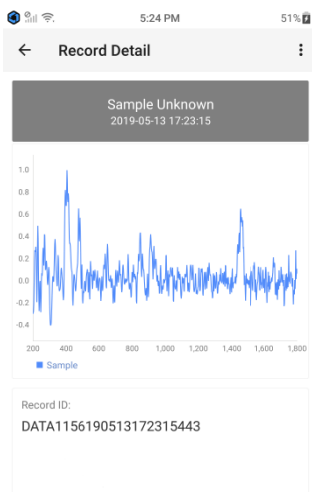
- Place a small amount of the substance to be identified (<300µl or 5 drops for liquids, <300mg for solids) into a reagent bottle or bag.
- Do not seal the container.
- Do not place the substance to be identified on paper or other cellulose materials for testing.
- Set a detection countdown.
- Reduce the laser power to a low level.
- The safe use zone for this device is 50cm.
- Keep the laser emitter window at least an arm's length from people's eyes.

## **Online detection**

If the device is logged in to a cloud detection service account, online detection can be carried out while connected to a network. When carrying out online detection, the device calls the cloud database to compare substances and return results.

1. In the detection domain, tap Analysis.
2. If the sample to be identified could be a flammable or explosive substance, when setting the detection countdown, the length of the countdown should depend on the time it takes people to move a suitable distance away. When a countdown is not necessary or a countdown has been set, line the laser emitter window up with the substance to be identified or its container, and then tap Analysis.
3. After the required time (the detection time depends on the nature of the sample), the device shows one of the following types of results.

- **Detection successful, identification successful:** The device shows information on the identified sample substance, the spectrogram of the sample, and the calibration spectrogram. Tap detail to view information on various constituent substances in the sample.
- **Detection successful, identification unsuccessful:** The device shows the spectrogram for the sample, but is unable to find a match in the spectral database.

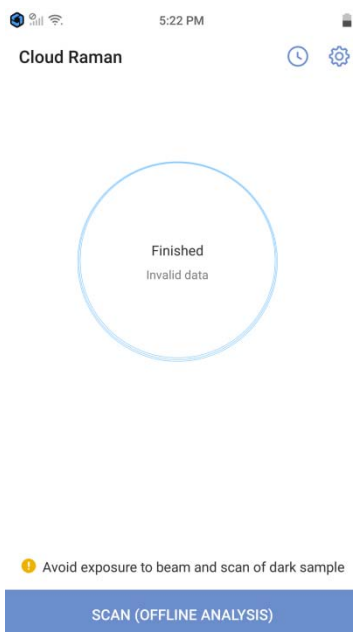


•



You can name the unknown substance and add it to your personal database. You can also add it to the expansion database, if you have permission. See **Adding new substances** on page 22 for how to add the substance.

- **Detection unsuccessful:** The device has not obtained a spectrogram of the sample. There is no valid information. Check that the laser focal spot is on the substance to be identified and not in the air. Otherwise, this sample may not produce a Raman signal or the signal may be too weak to measure.



Check that the laser focal spot is on the substance to be identified and not in the air. Otherwise, this sample may not produce a Raman signal or the signal may be too weak to measure.

## Offline detection

Your device may only use offline detection in the following circumstances:

- The device is logged in to an account, and you have manually chosen offline detection.
- The device is logged in to an account, but the network connection has been lost.
- The device is not logged in to an account.

Offline detection uses the spectral database on your device to compare detection results. The results will be temporarily saved to the device only. To upload the results to the cloud, re-connect the device to the network.

The offline detection results will be handled in different ways depending on the situation:

- The device is logged in to an account, and you have chosen offline detection: The results will be saved to the device. When you switch to online detection, the offline detection results will be automatically uploaded to the cloud.
- The device is logged in to an account, but you lost your network connection and were automatically switched to the offline detection mode: When the network connection is restored, the detection results will be automatically uploaded to the cloud.

- The device is not logged in to an account: The detection results will be saved to the device only and will not be uploaded to the cloud.



Tap  >Offline Analysis and then enable Offline Analysis to use the offline detection mode while connected to the a network.

## Starting offline detection

1. In the detection domain, tap Offline Analysis.
2. If the detection sample could be a flammable or explosive substance, set a detection countdown and vacate the area. When a countdown is not necessary or a countdown has been set, line the laser emitter window up with the substance to be identified or its container, and tap Offline Analysis.
3. After the required time (the detection time depends on the nature of the sample), the device shows one of the following types of results (the same display as for online detection).
  - **Detection successful, identification successful:** The device shows information on the sample substance, the spectrogram of the sample, and the calibration spectrogram. Tap **detail** to view information on various constituent substances in the sample.
  - **Detection successful, identification unsuccessful:** The device shows the spectrogram for the sample, but is unable to find a match in the spectral database. Tap detail and then Save Spectra Data to name the substance.
  - **Detection unsuccessful:** The device failed to obtain a spectrogram. There was no valid information.

## Uploading offline detection records



Not all offline detection results can be uploaded to the cloud database.

The way the device saves the offline detection results depends on the offline mode and account login status.

In the following situations, the device can upload the offline detection results to the cloud:

- The device is logged in to an account, and you have manually chosen offline detection.
- The device is logged in to an account, but the network connection has been lost.



If you close the account before the network connection is restored, the device

will warn you that any results that have not yet been uploaded will be deleted. If you need to upload the results, wait until the network connection is restored before deactivating the account.



Offline detection results will not be uploaded to the cloud if the device is not logged in to an account. These results will be saved to the device only.

## Exporting records

Your device can export detection records in PDF and TXT format and save them to a local folder on the device so that they can be easily transferred to a computer or used elsewhere.

1. Tap .
2. Tap the detection record you wish to export.
3. Tap  >Export.
4. Select the file format.
5. Tap Export.



You can also select multiple records and tap Export to export as a package.

## Hazardous substance alerts

When the device detects safe substances, the name of the substance will be displayed in green. When the device detects a hazardous substance, such as a flammable or explosive substance, an alarm will sound, and different colors will be used to indicate the hazard level.

- Red: high hazard substance
- Orange: medium hazard substance
- Green: low hazard substance



Companies may customize the names and classifications of hazardous and safe goods using the Raman detection management system.



Please follow your company's rules and regulations regarding the handling of hazardous samples. Do not arbitrarily dump, discard, ignite, compress or knock the sample.



If the device is in the silent mode, the alert will not sound. Please ensure you

disable the silent mode before starting detection. Alternatively, take other supporting safety precautions to avoid potential hazards.

## Database

Your device can query cloud or local databases, compare detection results to those in the databases, and save new detection records to a database.

### Logging in to a database account

By logging the device in to a cloud detection service account, you can sync and upload detection results to the cloud, browse the cloud database, and edit your personal database, etc. Obtain a cloud detection service account and password from a seller or your company administrator.

1. In the detection domain, tap  >Sign in.
2. Enter the account name and password.
3. Tap Sign in.



When turning the device on for the first time, it will force the user to log in to an account via the detection domain, connect to a network, and download the calibration files and the spectral database to the device. This process may incur data charges. You are advised to first connect to a wireless local area network and then log in.



The expansion database and personal database downloaded to the device will be kept synchronized with the expansion database and personal database in the cloud.

### Changing your login (cloud database detection service) password

You may change the password for the account the device is currently logged in to via the detection domain.

1. Tap  >Change Password.
2. Follow the instructions on the screen to change the password.
3. Tap Change Password.

### Downloading databases

The device automatically syncs the basic database, expansion database (if any) and

personal database (if any) when it is connected to the network and logged in to the cloud detection service account.



Downloading requires the use of mobile data. To save data, connect to a wireless local area network before logging in to the account.

## Syncing databases

The device syncs the databases in the following ways:

- When the device is logged in to an account, it automatically connects to a network and updates.
- When offline detection is disabled, the device automatically connects to a network and updates.
- An administrator can force the database to sync to the device using the console.

## Browsing databases

You can browse information on all the substances you are able to detect in your current mode. The information is split across the basic local database, expansion database, personal database, and logged-out self-created database.

1. Tap  >Spectra Database.
2. You may:
  - Swipe up and down the database list to browse the data in the database. Each entry contains the name of the database to which the data belongs.
  - Tap a database name to bring up a database list. Then tap any database name in the list to browse that database.



When the device is connected to a network and logged in to an account, you can browse either cloud or local databases. If you are not logged in, or are in the offline detection mode, you can only browse local databases.

## Searching databases

Use keywords to quickly search the large volume of information in the databases for a substance spectrum.

1. Tap  >Spectra Database.
2. Tap  .
3. Tap  then select the database you want to search.
4. Enter the name of the substance you wish to find and tap the search button in the keypad.

The substances found will be displayed in a list.

## Updating offline detection databases

Databases used in offline detection can be updated when connected to a network.

1. Tap  >Offline Analysis.
2. Tap to update the offline detection database.

## Resetting the offline detection database

Reset the offline detection database on the device to clear newly-added data from the database. After resetting, the device will resynchronize the offline detection database from the cloud.

1. Tap  >Offline Analysis.
2. Tap Reset Offline Database.
3. Tap OK.

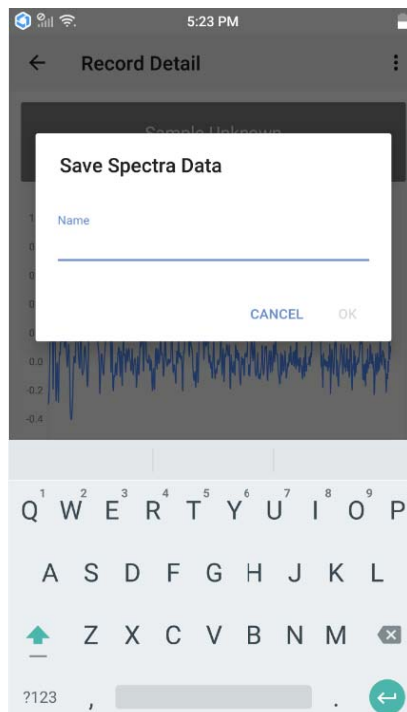
## Adding new substances

You can use the device to add unknown substances to a database.

### Adding new substances to your personal database

You can add new substances that have been identified to your personal database for future reference.

1. Tap .
2. Tap the detection record you wish to add to the database.
3. Tap Save Spectra Data.



4. Enter the substance name, then tap OK.

Tap  >Spectra Database >Location database **to view the newly added substance information.**



When there is a network connection, the data in the local personal database can be synced to the cloud personal database.

## Moving data to the extension database

Data in the local personal database can be moved to the local expansion database and then synced to the cloud expansion database. This allows data to be shared within the company.

1. Tap  >Spectra Database.
2. Tap the drop-down database list, and select Location database.
3. Tap the name of the entry you want to move.
4. Enter the access code provided by your administrator, and then tap ok.



When there is a network connection, the data in the local expansion database will be synced to the cloud expansion database.

# Detection settings

## Account and password settings

When using the device, you can log in or out of a database account and change the account password. For more details, see **Logging in to a database account** on page 19 and **Changing your login (cloud database detection service) password** on page 19.

## Setting the laser power

You can manually adjust the power of the Raman laser to meet different detection needs.

1. Tap  > Advanced Setting.
2. Tap Laser Power( mW ).
3. Enter the laser power value. Valid values are any integer between 100 and 500.
4. Tap OK .



The default laser power is 350mW.

## Calibrating the device

When the detection results deviate from reality, or a known substance is not identified, the device may need recalibrating. Before calibrating the device, attach the calibration accessory (that came with the device) to the laser emitter window.

1. Tap  >Recalibrate Device.
2. Tap Recalibrate Device to automatically recalibrate the device.



If the device warns that the calibration accessory was not used correctly, check that it has been correctly attached to the device.

## Updating the software

CloudMinds periodically updates the device's software system. You can manually check if there is an updated software system available for download and installation.



Before checking for new versions, make sure the device is connected to a network.

1. Tap  .
2. Tap Check update.

If there is a new version available, download and install it. If the current version of the software is the latest version, “Download” will be displayed under software update.

## Setting up offline detection

You can manually enable the offline detection mode to use the local databases to analyze the sample.

For more details on offline detection, see **Offline detection** on page 16.

## Spectral databases

Tap  , then tap Spectra database to view a preset local spectral database and the cloud spectral database. For more details, see

**Browsing databases** on page 21 and **Searching databases** on page 21.

## Enabling sound and vibration alerts

Tap  and slide the Sound or Vibrate toggle to make the device sound an alert or vibrate once detection of a sample is complete.



If the device is in the silent mode, the alert will not sound. Please ensure you disable the silent mode before starting detection. Alternatively, take other supporting safety precautions to avoid potential hazards.

## Managing cloud databases

The cloud databases can be viewed on a website accessed using a computer Internet browser.

Your account permissions depend on the cloud database you’re using. See the table below for details. For details, contact your system administrator.

| Service type                   | Company self-created cloud <sup>1</sup> | CloudMinds shared cloud <sup>2</sup> |
|--------------------------------|-----------------------------------------|--------------------------------------|
| Updating personal information  | Supported                               | Supported                            |
| Browsing cloud databases       | Supported                               | Supported                            |
| Editing the basic database     | Supported                               | Not supported                        |
| Editing the expansion database | Supported (administrator only)          | No extension database                |
| Editing your personal database | Supported                               | Supported                            |

1. The cloud databases created by your company are the basic database, expansion database and personal database.

2: The public cloud databases created by CloudMinds contain the basic database and personal database.



If you use a cloud detection platform created by your company, contact your system administrator to obtain an account and password. If you use the cloud

detection platform provided by CloudMinds, contact CloudMinds to obtain a account and password.

## Device specifications

|                         |                                                                                                                                                                                                                                                                                                                        |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Size</b>             | <b>159mm x 78.9mm x 27mm</b>                                                                                                                                                                                                                                                                                           |
| <b>Weight</b>           | 410g                                                                                                                                                                                                                                                                                                                   |
| <b>Battery capacity</b> | 3080mAh,2660mAh                                                                                                                                                                                                                                                                                                        |
| <b>Laser power</b>      | 100-500mW, adjustable                                                                                                                                                                                                                                                                                                  |
| <b>Laser wavelength</b> | 785nm                                                                                                                                                                                                                                                                                                                  |
| <b>Detection range</b>  | 200-1,800cm <sup>-1</sup>                                                                                                                                                                                                                                                                                              |
| <b>Resolution</b>       | 8-11cm <sup>-1</sup>                                                                                                                                                                                                                                                                                                   |
| <b>Detection time</b>   | < 3s (ethanol)                                                                                                                                                                                                                                                                                                         |
| <b>Databases</b>        | <p>Cloud: Basic cloud database, expansion database, personal database</p> <p>Device: Basic local database, expansion database, personal database, logged-out self-created databases</p> <p>Both cloud and local expansion and personal databases are synced in real-time when logged in and connected to a network</p> |
| <b>Camera</b>           | 8MP+16MP                                                                                                                                                                                                                                                                                                               |
| <b>Networks</b>         | 4G LTE/WLAN/Bluetooth                                                                                                                                                                                                                                                                                                  |
| <b>Location</b>         | GPS                                                                                                                                                                                                                                                                                                                    |

# Care and maintenance

## Routine calibration

Calibrate the device at least once a day to ensure that it remains in good working order. See **Calibrating the device** on page 24 for the calibration method.

## Safe use

- Keep the device and accessories out of the reach of children.
- Keep the device dry.
- Do not expose the device or its battery to high temperature areas or place near heat-generating devices such as flames, direct sunlight, heaters, microwaves and ovens.
- When charging the device, plug the charger into an outlet that is within easy reach of the device.
- Do not dispose of this device or its accessories in household waste streams.
- Do not use non-officially certified chargers, mobile power banks or batteries. Doing so can lead to fire, explosion and other hazards.
- Only use officially certified accessories. The use of other accessories can invalidate the warranty, violate national or local regulations, and result in safety incidents. Contact an authorized service center to obtain officially certified accessories.

## Medical device safety

- Please comply with the rules and regulations of the facility when using this device in a medical environment such as a hospital or rehabilitation facility.
- Keep the device at least 15cm away from implanted medical devices such as pacemakers and cochlear implants during use.
- The radio waves generated by the device may interfere with the operation of implanted medical devices or other medical equipment. If you use one of these devices, contact your device manufacturer to inquire about restrictions on your use of the device.

## Cleaning the device

- Do not use the device for extended periods in dusty environments such as workshops, factories and deserts to prevent minute particles entering the device and causing a drop in performance or other faults.
- Do not allow liquid or powdered substances to stick to the surface of the device or accessories. This prevents the laser lens from becoming rusty or getting scratched. If there is liquid or powder on the laser lens, use a soft, dry cotton or silk cloth to lightly wipe clean.

- Do not wipe the device case with a damp cloth to avoid causing moisture and faults of the device.
- Do not use chemical products, detergents or water to clean the device.
- Do not store the device in very high or low temperature to avoid damaging the device. The device should be used in temperatures between -10°C and 50°C.
- If the device falls into water, immediately retrieve it and take it to an authorized service center.
- Do not disassemble this device by yourself.
- Do not allow the device to be compressed, knocked or dropped to prevent damage to the device or fire, explosion or other hazards.

## **Driving safety**

- Do not use this device to make calls while driving.
- If necessary, use external equipment to receive calls while driving.

## **Battery care**

- This device contains a battery. Do not disassemble this device or remove the battery by yourself. Doing so can cause the device to become faulty or result in hazards such as fire, burning, or explosion.
- Keep the device away from heat sources. Do not immerse the device in liquid.
- Only use the specified charger and data cable.
- Store the battery of this device in temperatures between -15°C and 55°C.

## **Avoid condensation**

When moving the device from a low-temperature environment to a high-temperature environment, the moisture in the air may condense into water droplets on the outside or inside of the device. This phenomenon is called condensation. If you continue to use the device when condensation has occurred, it can result in faults.

Do not use the device immediately in the following situations. Wait a while to allow the device to gradually adjust to the new environment.

- When going from cold exterior environment to a warm interior environment.
- When a cold interior environment quickly heats up.
- In humid interior environments.
- When going from a cool interior environment to a warm, humid external environment.

If condensation occurs, wait at least one hour before using the device.

## Further assistance

If you need more help or ask for human support, please contact us using the following methods:

Customer services telephone: 400-6633-888

Customer services email: [support@cloudminds.com](mailto:support@cloudminds.com)

### **FCC STATEMENT:**

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

Warning: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and receiver.

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected. Consult the dealer or an experienced radio/TV technician for help.

**RF Exposure Information (SAR) :**

This device meets the government's requirements for exposure to radio waves. This device is designed and manufactured not to exceed the emission limits for exposure to radio frequency (RF) energy set by the Federal Communications Commission of the U.S. Government.

The exposure standard for wireless devices employs a unit of measurement known as the Specific Absorption Rate, or SAR. The SAR limit set by the FCC is 1.6 W/kg. \*Tests for SAR are conducted using standard operating positions accepted by the FCC with the device transmitting at its highest certified power level in all tested frequency bands.

Although the SAR is determined at the highest certified power level, the actual SAR level of the device while operating can be well below the maximum value. This is because the device is designed to operate at multiple power levels so as to use only the power required to reach the network. In general, the closer you are to a wireless base station antenna, the lower the power output.

The highest SAR value for the device as reported to the FCC when tested for use at the ear is 0.86W/kg and when worn on the body, as described in this user guide, is 1.20W/kg (Body-worn measurements differ among devices, depending upon available enhancements and FCC requirements.) While there may be differences between the SAR levels of various devices and at various positions, they all meet the government requirement. The FCC has granted an Equipment Authorization for this device with all reported SAR levels evaluated as in compliance with the FCC RF exposure guidelines. SAR information on this device is on file with the FCC and can be found under the Display Grant section of <http://www.fcc.gov/oet/fccid> after searching on FCC ID: 2ASQT-MR-5S

For body worn operation, this device has been tested and meets the FCC RF exposure guidelines for use with an accessory that contains no metal and the positions the handset a minimum of 1.0 cm from the body . Use of other enhancements may not ensure compliance with FCC RF exposure guidelines. If you do not use a body-worn accessory and are not holding the phone at the ear, position the handset a minimum of 1.0 cm from your body when the device is switched on at its highest certified power level in all tested frequency bands.