ATR6600

Handheld Raman Spectrometer

USER MANUAL

Content

1. OVERVIEW

ATR6600 is a set of 1064nm handheld Raman analyzer that is excel at fluorescence resistance suit to high fluorescence materials detection.

With compact size, lightweight (1150kg), and easy-to-held, it can be widely applied to industries of customs, public safety, lab, plant, warehouse, deck etc. It can fast detect drugs, precursor chemicals, explosives, gemstones, raw materials, and also fast identify additives, residues of pesticide & veterinary drugs.

Excellent spectral identification algorithm are embedded in Handheld Raman spectrometers to easily identify substance, and enable users to add their own spectral data. It employs Android system，simple interface，5.5" high definition screen,13-mega camera taking evidence pictures in the field, multiple modes of inbuilt WIFI, Bluetooth, GPS etc.

Optosky will provide comprehensive technical support and services, such as the establishment of spectral library, method and verification, IQ/OP/PQ certification support.

The following are the ICONS to note in this manual

⚠ ：The laser warning icon indicates the presence of a danger associated with the laser's presence

⚠ ：The ISO general warning icon indicates the security information that users must follow.This information relates to the risk of physical injury or death that may or may exist.

ℹ ：The information icon reminds the reader of the facts and conditions associated with using the device.

This user manual version 1.2, the latest revisement date: June,25th,2019.

2.Configuration List

ITEM	QTY
ATR6600	1
Power Adaptor	1
USB Cable	1
Sample Cell	1
ATR6600 User Manual	2

3.Hardware Interface

3.1 Probe

The user should aim the probe tube at the sample to be tested when measuring. For different samples, the distance between the probe tube and the object to be tested needs to be fine-tuned to ensure that the laser emitted by the probe can focus on the surface of the object to be tested, so as to keep the lens surface clean and prevent accidental damage.

CAUTION:

⚠ : When the laser indicator light is on, the surface laser light is on. At this time, the power is high. Do not put the probe tube to human eyes or skin to prevent burns.

ⓘ : During the test, the probe shall not be oriented towards the window or sunlight, etc., which may cause deviation to the experimental results.

3.2 Power button

Press power button to power on, the screen light up.

The device is configured built-in high-capacity Li-battery, and can be charged via power adaptor.

⚠️：Only the company's equipped batteries can be suitable, and a certified adapter or connector could be used to charge the instrument.

If unsuitable battery, power adaptor or connector is used could harm human body or damage instrument.

⚠️: When being charged, it is recommended to insert the charging cable first, and then insert the plug to prevent electric shock.
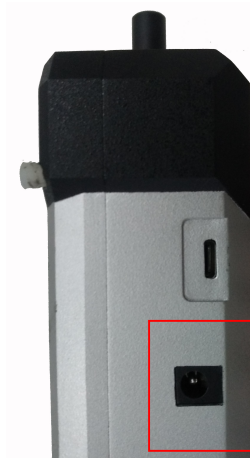
3.3 USB Port
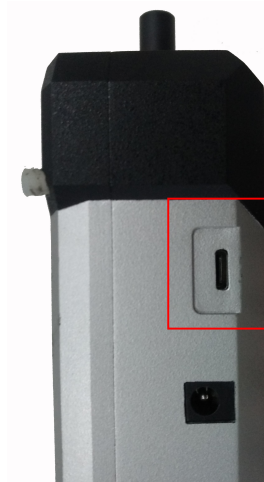
Fig 3.3.1 USB port

User can connect USB to export data or transfer document

3.4 Charge Port

Fig 3.4.1 Charge port

Users shall connect standard wire cord configured by Optosky via port marked in red rectangle.

⚠️：Disassembly/modification of instruments is strictly prohibited without the permission of the company, which may lead to instrument damage or even threaten personal safety.
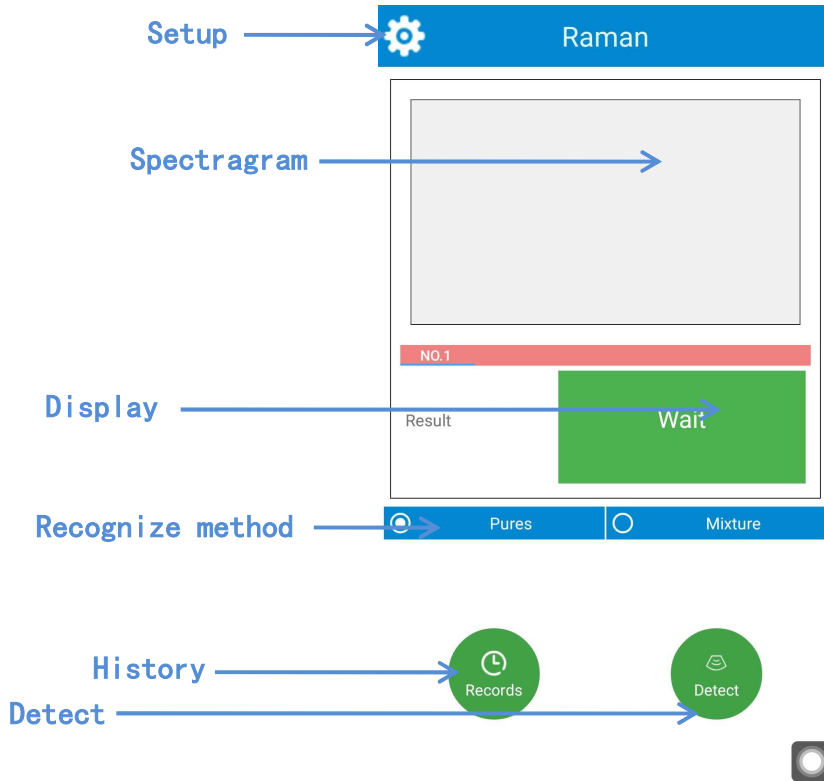
4. Operating guide

4.1 Power on & Login

Press power button to wait login screen popup as shown in Fig4.1. Input user name and password, click login to access detect screen.
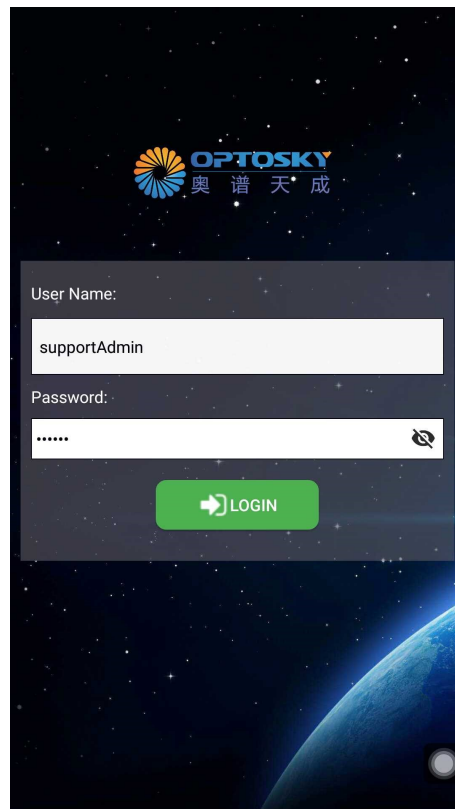
Fig 4.1.1 Software Login Screen

ℹ️：First login, user name: supportAdmin

ℹ️：First login, password: 123456 。

ℹ️：Success to first login, it's recommended to revise login password.
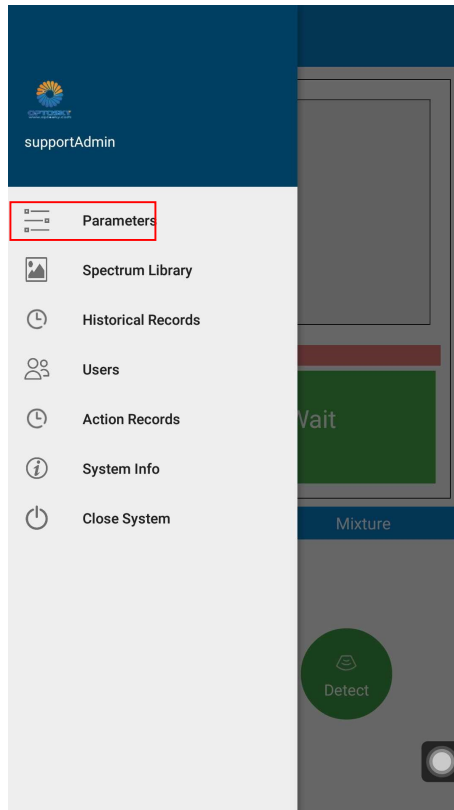
4.2 Basic detect operation

Fig 4.1.1 Detect Main Screen

[Setup]：Click icon![gear icon], or right slide screen to open setup interface can set integration time and laser power etc.
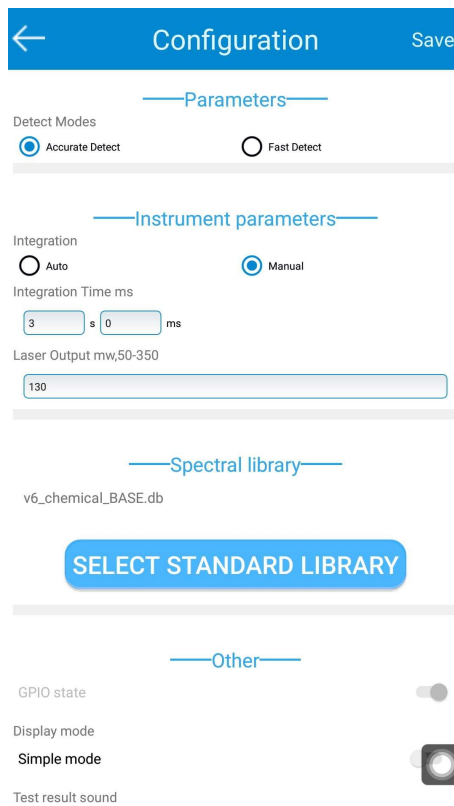
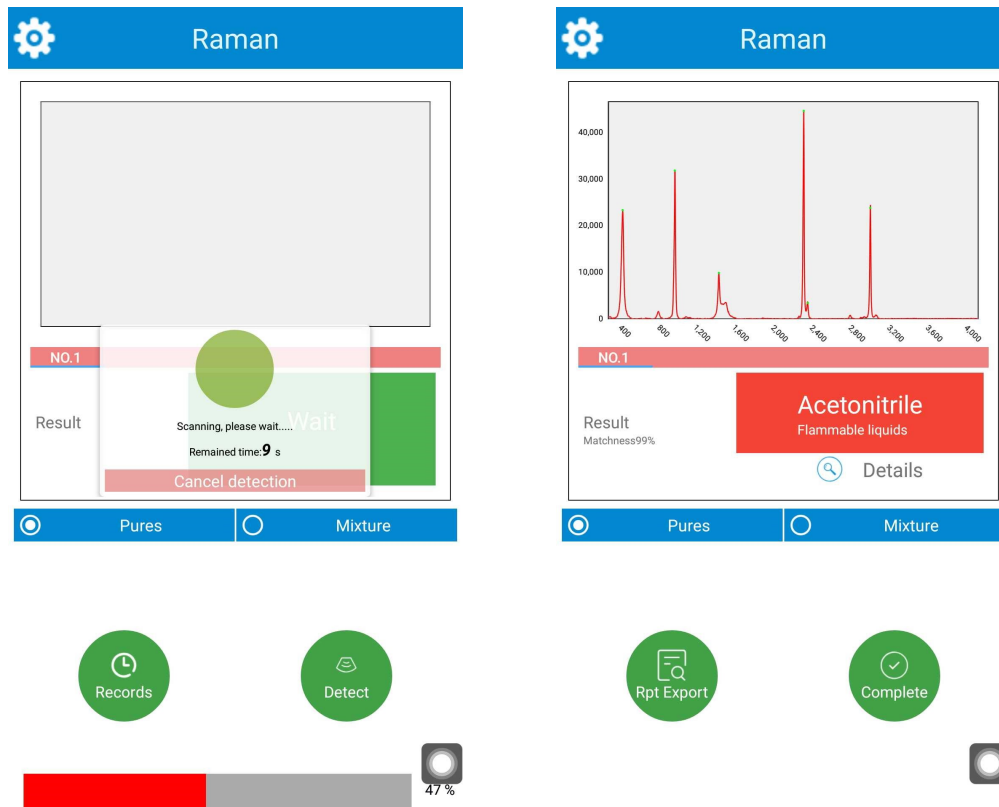[Detect]：Click icon![detect icon] or press detect button in the side of device to scan spectrum.

Fig 4.2.2 Setup Menu

Click Configuration can set scan parameters
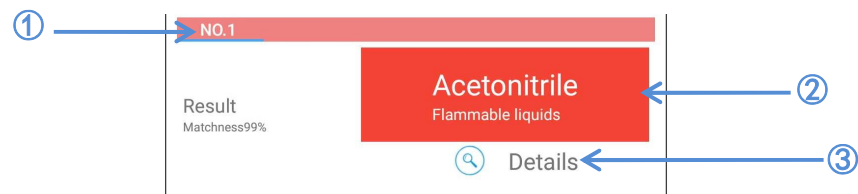

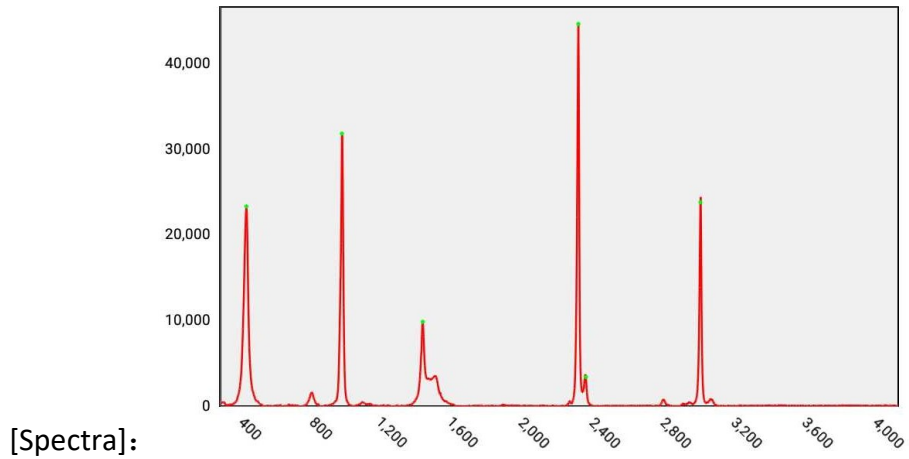**Fig 4.2.3 Configuration Screen**

Fig 4.2.4 Scan Process

Wait for scan to popup detect result

Fig 4.2.5 Detect Result
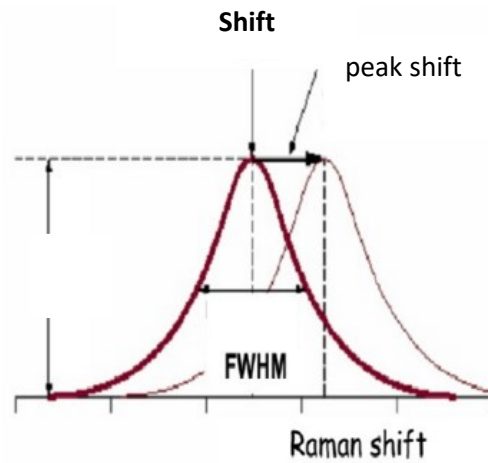
① ：Identify high-matched materials(It can display Max 3 materials, left-and-right slide can switch from one material to another.)

② ：Detect material name and category

③ ：High-matched materials detailed description

ℹ️：**How to understand spectrum？**

[Spectra]：

Fig 4.2.6 Raman Spectra

ℹ️ : How to read Raman spectra?

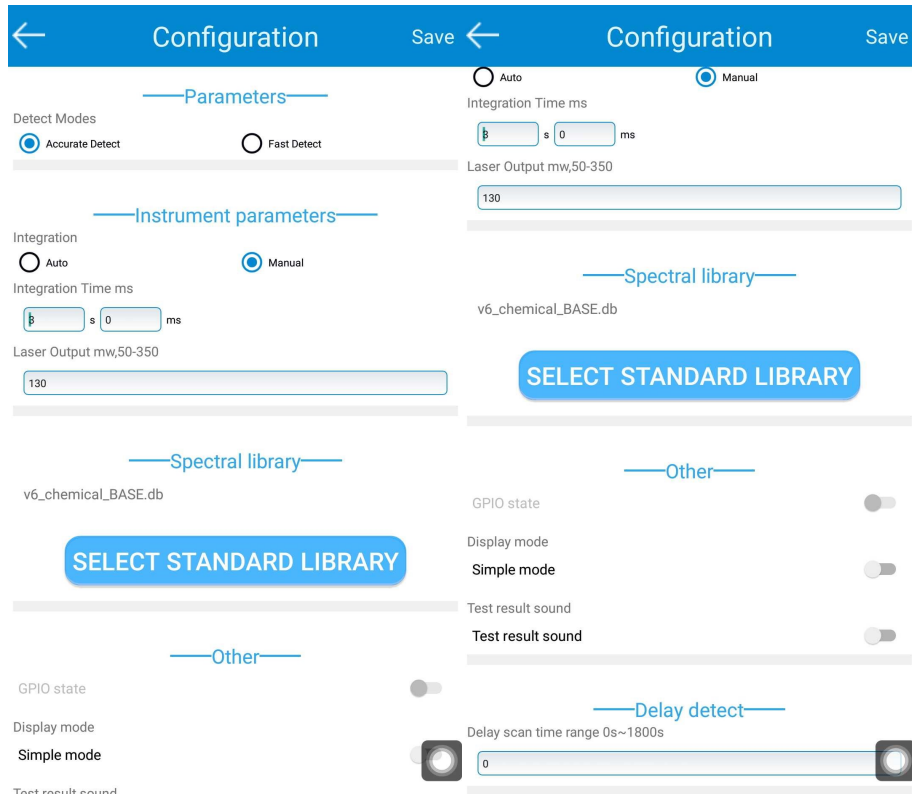Raman Frequency (wavenumber) ➡️ Confirm materials composition

Raman polarization (Raman shift) ➡️ Confirm crystal symmetry

Raman peak width(FWHM) ➡️ Confirm crystal quality

Raman peak intensity(Integration time) ➡️ Confirm total materials quantities

ℹ️ :   Which factors affect Raman signal intensity?

Set integration time, laser power

Distance and angle between probe and samples

Laser wavelength

Materials

4.3 Configuration

Fig 4.3.1　System Configuration Setup

1. Detect Modes：

(1).Accurate Detect - select accurate mode to scan spectrum, it will scan dark background every time, then start laser to scan, scan result can deduct dark background.

(2) .Fast Detect – Firstly, it can scan dark background in fast mode setting, click detect to scan sample do not repeat dark background scan, scan result can deduct dark background spectra scan in advance.；
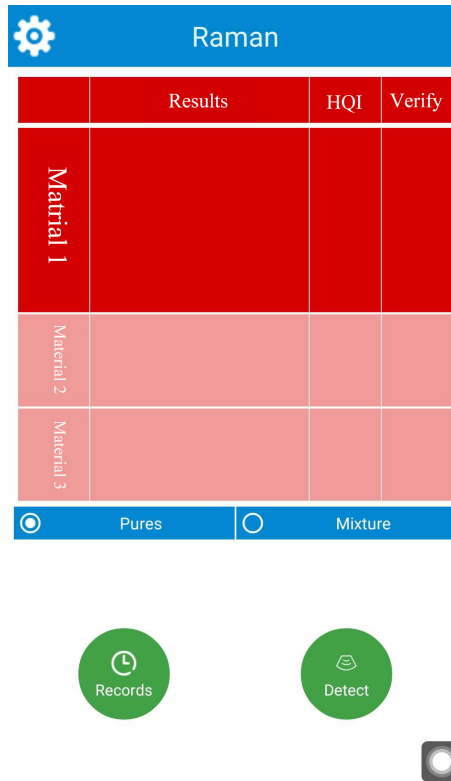
2. Integration Time ：

(1).Auto mode- the optimized integration time can be automatically set by the system.

(2).Manual mode- the integration time can be set manually by users.

3 . Integration time means time accumulated for CCD to scan spectra；

4 . Laser power : Driving power during laser scan.
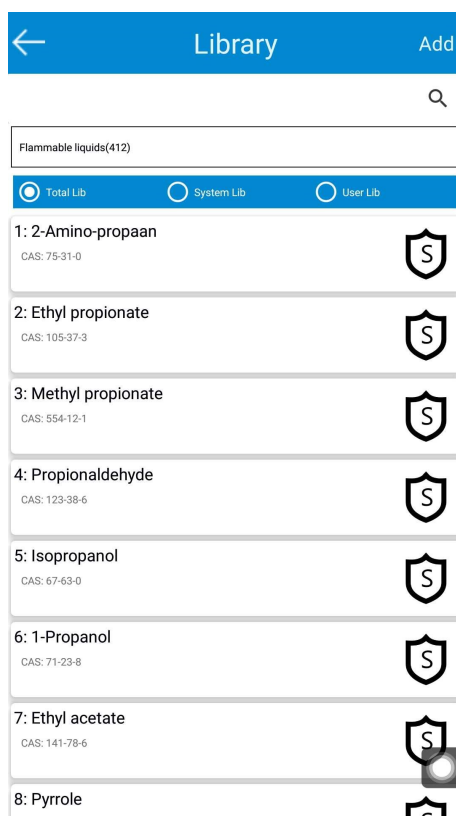
5. Simple mode: detect interface in the simple mode as shown below:

Fig 4.3.2 Detect interface in the simple mode

6. Delay scan time: how long can wait for starting scan?

7. Detect result sound: Finish detect will produce a humming sound when click it.

8. Spectral library management: Click standard library, users add library, or total library.

4.4 Library Management

Fig 4.4.1 Spectral library interface

Access to Library Management interface can display current spectral data lists of the selected library. Click search can proceed key words search, click add data can self-built spectral library. Or click current material can review detailed description.

[Standard Spectral Library] data is unavailable for being revised; user can only review them. Self-built data is available for review and revise.
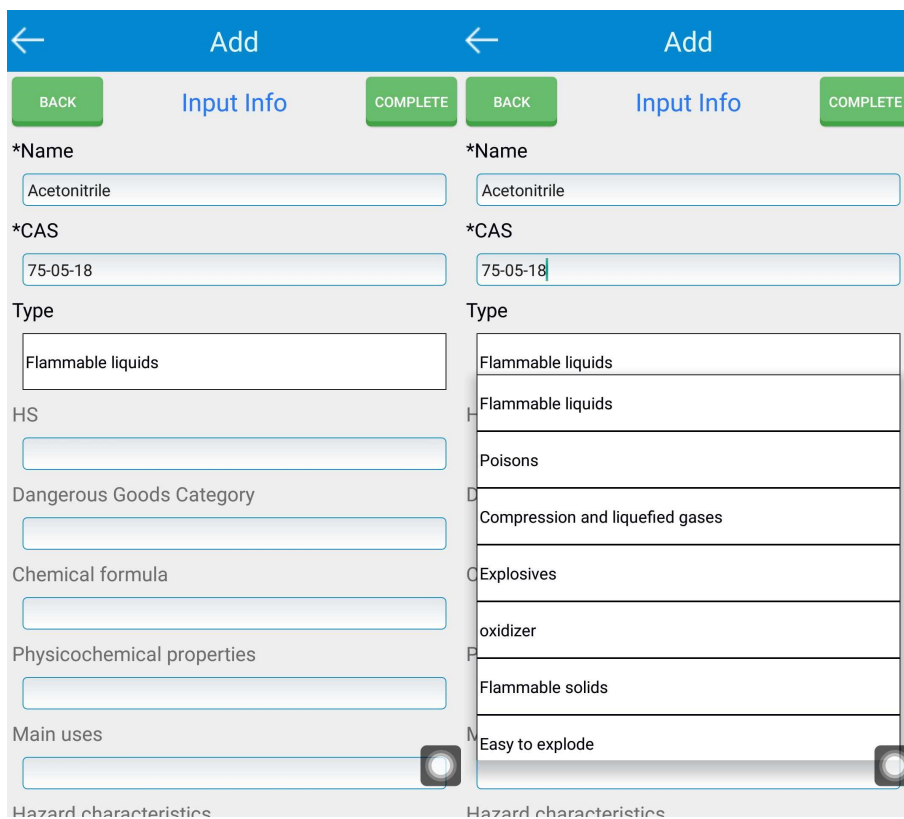
4.5 Add self-built library

In the interface of Library Management, click Add in the upper right corner to access to the interface of Add Material.
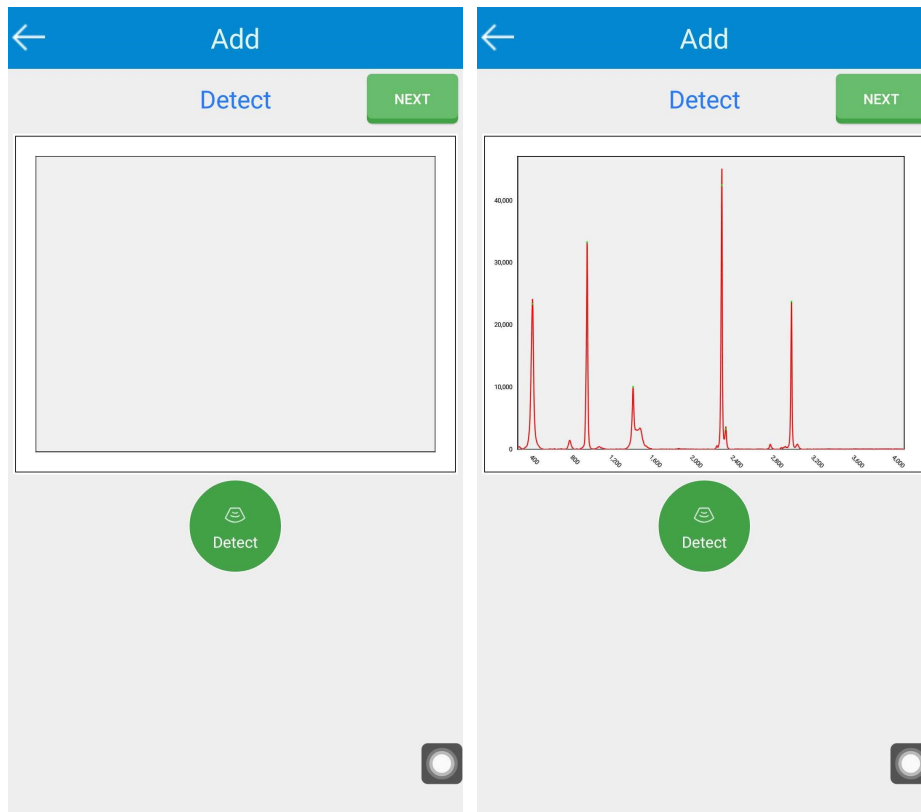
Fig 4.5.1 Add Material-Scan Interface

Firstly Detect spectra, input spectra info into the system, finish Detect click Next.

Fig 4.5.2 Add Material-Material Info Interface

4.6 Review Historical Records
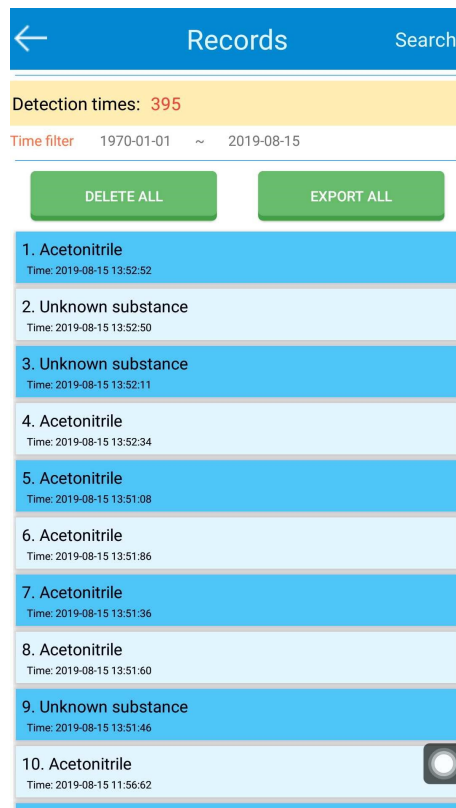
Fig 4.6.1 Historical Records Interface

How to review historical records?

Click the item can review the detailed detect records.

Time Filter: Screen detect records in any time of period through time filter.

Look up：Fast search any records detected through fast look up.

图 **4.6.2 Historical Records- Material Interface**

Click export report can export pdf file.
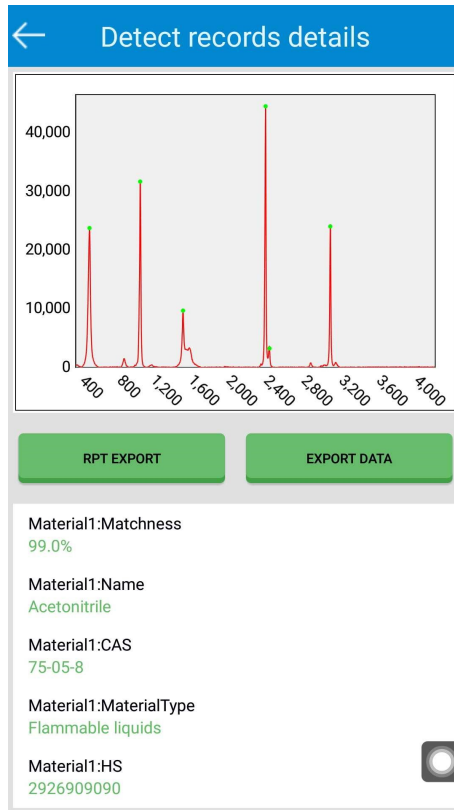
Export report path：storage/HandheldRaman/pdf

Fig 4.6.3 Detect Report

Click export data can export peak info file.

Export data path：storage/HandheldRaman/txt
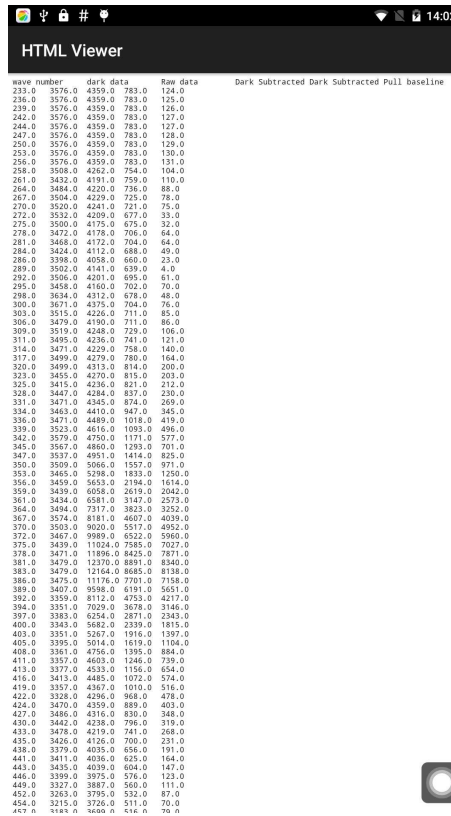
Fig 4.6.4 Data interface

4.7 User Management
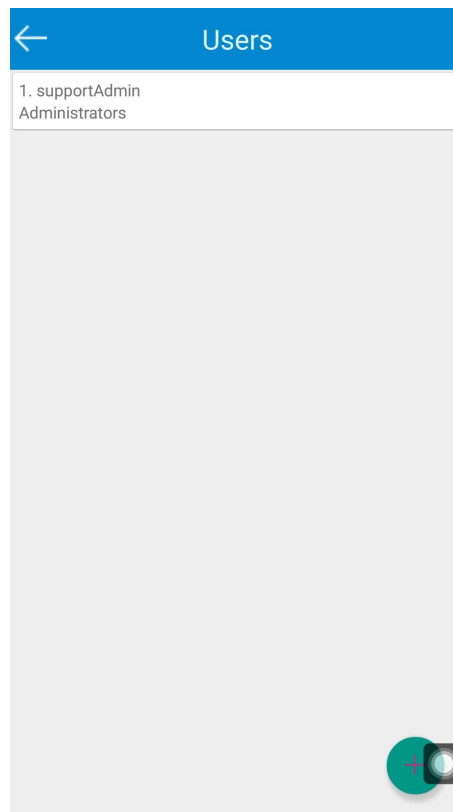
Fig 4.7.1 User Management Interface

User information can be added, deleted and revised.

User permission classes:

Super administrator	Supervisor	Operator
User Management	Revise configuration in the setup	Detect
Choose Standard Library	Revise self-built spectral library	Save detect records
	Add self-built spectral data	Review historical records

4.8 Suggest parameters and detect distance

4.8.1Suggest parameters

ITEM	Suggestion
Detect mode	Accurate detect
Integration time	Auto（Users have no idea integration time can set auto mode）

Laser power	130-200mW, or if Raman signal is weak increase to 300-349mW
Delay detect	When detect explosive and inflammable materials, delay detect can be used and set laser power as low as possible.

4.8.2 Suggest detect distance

（1）Usually package is transparent or semitransparent, and packing thickness shall no exceed 1mm.

Material Type	Packing Type	Suggest Distance（from probe to external package）
Solid/Power	Transparent plastic Transparent glass vial Semi-transparent plastic bags Semi-transparent glass vial	Add solid or powder attachment and contact external package to detect
Liquid	Any package	Probe contact external package to detect

（2）If the thickness of external package of solid/powder exceed 1mm, it suggests user to transfer materials to glass vial with a diameter of 1cm, or put into solid/liquid sample cell to detect, or expose materials in a distance of 2-3mm away from probe.

4.8.3 How to use solid & liquid probe?

（1）Liquid: Methods used to detect various samples' package refer to 4.8.2(suggest distance detect is not applicable). When use double-purchase probe to detect, rotate probe screw with care to outer line, that is probe lens protrude most, probe contact package to detect.

（2）Solid or Powder: Methods used to detect various samples' package refer to 4.8.2(suggest distance detect is not applicable). When use double-purchase probe to detect, rotate probe screw with care to inside line, that is probe lens protrude nearer, probe contact package to detect.

5. Technical Parameters

ATR6500 System			
Operative System	Android		
Excitation Wavelength	1064 ± 0.5nm		
Wavenumber Range	200-2800 cm-1		
Resolution	12-16 cm-1		
Touch Screen	5.5", 1920×1080, c		
Size	22.5"×11"×5"		
Weight	<1.2Kg		
Interface	WIFI, USB Type-C, Bluetooth, GSM		
Library	Item	Spectral Library	Application
	ATR6600	Self-built Spectral Library	Scientific Research
	ATR6600DH	Pharmaceutical drugs：Heroin, Cocaine, Metamfetamine, Ketamin… Precursor：(-)-ephedrine, Chloroform, Diethyl ether… Explosives：TNT,RDX,TATP, Ammonium nitrate… Hazardous chemicals：Sulfate, Gasoline, Nitric acid, Toluene… Food Safety：Illegal food additives, residues of pesticide, veterinary drugs…	Police Customs Metro Court Prison Public Safety
	ATR6600PH	APIs, excipients…	Pharmaceutical Factory
	ATR6600GM	Gemstones：Diamond, Agate, Emerald…	Gemstones
Export Report	Export report including detect result, spectral info, evident pictures		
Battery	4-6 hour continuous operation		
Charging Type	USB Type-C		
Operating Temperature	-20 – 50 ℃		