

AmericanScreening™

# HANDHELD DOA READER



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# **1 Introduction**

## **1.1 Identification**

Name: Handheld DOA Reader

Catalogue No.: ADT 2000

## **1.2 Environment conditions**

### **Working environment**

Temperature 10~ 30°C

Relative humidity  $\leq 80\%$  RH,no condensation

Air pressure 86.0 ~ 106.0 kPa

### **Environment limitation in transport and storage process**

Temperature -20 ~ 50°C

Relative humidity  $\leq 90\%$  RH

Air pressure 86.0 ~ 106.0 kPa

### **Storage Location Selection**

The instrument must be stored in a dry environment away from the electromagnetic interference source (such as air conditioner motor). There need to set aside a certain space (about 15cm) around the analyzer.

## **1.3 Intended Use**

The Handheld DOA Reader is designed to qualitatively measure drugs of abuse with urine, saliva or whole blood sample. The system is intended for IVD use as an aid to monitor the effectiveness of drug abuse. It must be used with its corresponding drug testing strip. For forensic use.

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## **1.4 Scope of application**

Handheld DOA Reader is used to for the qualitative, presumptive detection of drugs of abuse in human urine or saliva or whole blood specimens. The instrument has advantage of built-in lithium battery, light weight, easy outdoor operation field. The Handheld DOA Reader can be used indoors and outdoors.

## **2 Principle of measurement**

The Handheld DOA Reader adopts image sensor and optics combination method for the test strip after loading and then digital image processing of the photo. Analyze the intensity of color in the test region (T) may vary depending on the concentration of analytes present in the specimen. Therefore, any shade of color in the test region (T) should be considered negative. Please note that this is a qualitative test only, and cannot determine the concentration of analytes in the specimen. The Handhold DOA Reader can test no more than 9 T of 3 strips at one time.

## **3 Package, appearance and technical specification**

### **3.1 Package**

When colloidal Handheld DOA Reader is received, open the shipping box and carefully check the package contents. If you find any part missing or if you have any questions, contact our agents in your area, or contact us directly.

Handheld DOA Reader is composed of host machine (including mainboard, capacitive touch screen, camera, light source, thermal printer), barcode scanner gun, reticle, power adapter. Software version: 1.0.3



NO.	Description	Quantity	Unit
1	DOA Reader	1	Set
2	Car charger	1	PC
3	Power adapter	1	Set
4	TF Card	1	PC
5	User manual	1	PC
6	Packing list	1	PC
7	Thermal printer paper	1	Roll
8	TF Card reader	1	Set
9	Control card	2	PC
10	Lanyard	1	PC

### 3.2 Appearance

Dimensions (L×W×H)	237mm×98mm×68mm
Weight	about 720g
Appearance	shown as Fig. 1

The Handheld DOA Reader is composed of optical unit, mechanical unit, control unit, display unit, thermal printer unit, and power key. Physical appearance of the instrument is in Fig. 1. The appearance of power adapter is in Fig. 2. The appearance of TF card reader is in Fig. 3. The appearance of car charger is in Fig. 4. The appearance of TF card is in Fig. 5. The component of handheld DOA is in Fig. 6.



Fig. 1 The physical appearance of the instrument



Fig. 2 The appearance of power adapter



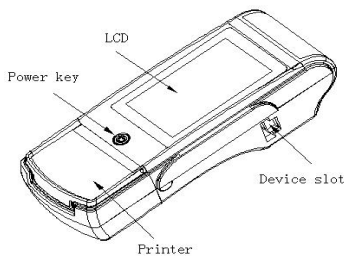
Fig. 3 The appearance of TF card reader



Fig. 4 The appearance of car charger



Fig. 5 The appearance of TF card



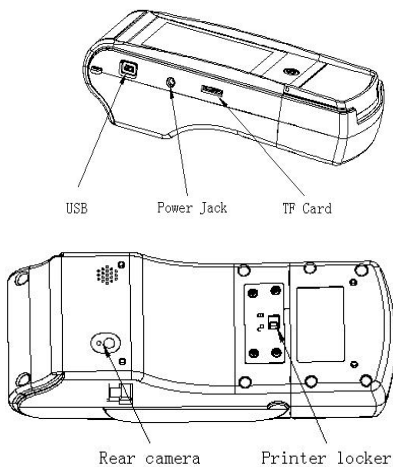


Fig. 6 The component of DOA reader

### 3.3 Technical specification

<b>Description</b>	<b>Function</b>
CPU	Qualcomm SDM450
Memory	16GB eMMC + 2GB LPDDR3
Operation system	Android 8.1
Capacitive touch screen	4.3',480*800,show the operating status and results
Thermal printer	Print test results
Testing Slot	Location to insert or remove the device
WIFI	Connect the WLAN network, support 2.4GHz and 5GHz
USB port	For manufacturer's use only No charging and data transfer function.
Power switch key	Power on/off
Power outlet	Power supply
CMOS Image Sensor	Take a strip photo
GPS	Position the longitude & latitude, support GPS/GLONASS/BeiDou
Control card	Quality control
Used	Indoor or outdoor
RTC	8M pixel, real time clock
Charging indicator	Charging animation indication when power off
Rear camera	5M pixel, take a testee's photo, scanning QR code, etc.

<b>Description</b>	<b>Specification</b>
Light source	LED
External memory	TF Card
Printer	Built-in thermal printer
Printing paper	57.5±0.5mm
Data storage	10000 records
Power voltage	Li Ion Battery 7.2 V 2900mAh
Rated power	<36VA
Cassette Size	(60~150)mm×(18~20)mm×(5~6.5)mm
On-line operation	WIFI
Adaptor	Model: GST36U12
	Input: 100-240VAC,50/60Hz,0.8A
	Output: 12V-3A, 36VA (max)
Car charger	Model: 324
	Input: 12V-24V DC ,5A max
	Output: 2*USB
	Normal output: 5V/2.4A(max) Quick charge: 18W(max)
COM interface	Male and female link thermal printer
Ingress Protection	IP01

## 4 Performance characteristics

Linear:  $r \geq 0.990$

Repeatability: Relative standard deviation (CV)  $\leq 3\%$

Stability: Relative deviation (a)  $\leq 3\%$

Accuracy: Relative deviation (B)  $\leq \pm 15\%$

A complete measurement time < 5s













## **5 Function**

Handheld DOA Reader has below functions:

- 1) Scan and store item analyzing files
- 2) Calculate the result according to the relevant analysis method
- 3) Store sample test results and test image
- 4) Built-in thermal printer, printing results directly
- 5) Position longitude & latitude of test
- 6) Link to WIFI WLAN
- 7) Upload test results via WIFI to cloud server
- 8) Real-time display the inner Li battery power
- 9) Built-in Lithium battery for filed operation
- 10) Built-in RTC
- 11) Rear camera scan QR code

## **6 Symbols and Abbreviations**

The following symbols are found on the Handheld DOA Reader and in the manual and label. Study the meanings of the symbols and always use the equipment in a safe manner.

	Catalog number		Temperature limitation
	Consult instructions for use		Serial Number
	In vitro diagnostic medical device		Use by
	Manufacturer		Contains sufficient for <n> tests
	Humidity limitation		Atmospheric pressure limitation
	Electrical and electronic items should not be disposed of in your dustbin or wheelie bin, but should be recycled.		
	Biological risks		

## 7 Precautions

1. To check the appearance and Testing Entry of analyzer are in good condition before use.
2. This product is only used by specially trained operators according to manual.
3. When dealing with potentially infectious reagents, please follow standard laboratory specifications to ensure safety.
4. The reader must be charged full of power.
5. Please place the analyzer in a wide position when charging.
6. Avoid liquid entering into the analyzer.
7. The accuracy of pipe-removing device will influence the accuracy of results. Please use maintained and calibrated pipettes.



8. Make sure the lot number of item analysis file the same as products lot.
9. All equipment maintenance must be carried out by technical personnel appointed by manufacturer as well as repair.
10. Disassemble the instrument by itself, may cause the reader damage.
11. If the equipment is not used for a long time, the power should be cut off and the reader will be charged periodically.
12. If the reader does not work properly, please check Section 15. Please contact the supplier if problem could not be solved.
13. We do not support the product to connect with external devices, but if you are connected to an external device, the connected external device needs to be authenticated.

## **8 Warning and Handling**

- Before using the equipment, read this manual and be sure you thoroughly understand its contents.
- Please follow the instructions in this manual to assure proper operation of the equipment.
- When not in use, unplug the equipment from the electrical outlet.
- Perform regular maintenance checks on the mainframe of the instrument. Inspect all components.
- After long term storage, take extra care to be sure the equipment operates correctly.
- Avoid handling or storing liquid on or near the equipment.
- Do not open the machine at any time while it is operating or when it is

plugged into the wall outlet.

- Keep the instrument away from open flames and or smoke.
- When moving the equipment, unplug it and move it carefully and gently.
- The reader should be placed on a flat and stable surface.
- Refer to this manual for handling and/or maintenance.
- Keep the equipment (including the cable and the plug) out of reach of children.
- Do not attempt to disassemble/modify the equipment.
- Do not handle the equipment or the power cord with wet hands.
- Do not store the equipment in direct sunlight, high/low temperatures or high humidity.
- Do not throw, drop, hit or push the equipment.
- Do not touch the equipment or the plug during an active thunder and/or lightning storm.
- Do not touch the LCD panel with sharp objects.
- Do not use the equipment, if it has any damaged parts (including the power cord or the plug).
- Do not use in a manner not specified by the manufacturer, otherwise it may cause unknown risks.

## **9 Installation**

### **9.1 Unpack**

- a. If any damage is found outside the packing box, please inform our

shipping department immediately;

- b. After unpacking, check the parts and accessories of the analyzer firstly.  
If there is any shortage or damage, please contact our company sales department immediately;
- c. The reader has only one host. Accessories include the instruction manual (one), power adapter, TF card, TF card reader, thermal printing paper, car charger, packing list.

**NOTE: Please keep the packing box for maintenance.**

## **9.2 Power on**

Keep pushing the power key down until the touch screen show boot image.

### **Warning:**

If you push the power key more than 5 seconds, the touch screen does not show the boot image, please use the AC adapter charging the inner Li battery.

## **9.3 Install printing paper**

Put the printing paper into the printer, facing down to the hot sensor of the printer. Leave the rest part of the paper outside of the door and close the printer door, as Figure 7 shown.



Fig. 7 Install printing paper

## 10 Operation

### 10.1 Preparations before power on

Before power the system on, make sure the system is ready to use. Check the system as the following steps:

- Check if the power supply is ready and connected safely.
- Check if the printer is ready, including the paper and paper installation.

### 10.2 Power on

Push the power switch of the reader. The switch key will light.

The system will check its hardware automatically, as shown in Fig. 8.

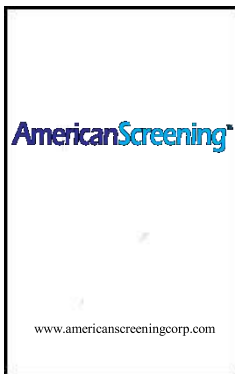


Fig. 8 Booting screen

### 10.3 The main menu

After the self-check is finished, the screen displays the main menu, as shown in Fig.9. The main menu consists four main modules: "Standard Test", "Record Manage", "System Setup", and "User Login".

At this point, the screen can be touched to operate the system by the touch of the finger.

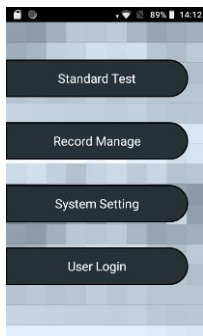


Fig. 9 The main menu

NOTE: If the main menu has not been shown after three minutes, please shut it down and restart it. If the problem cannot be solved, please contact the manufacturer.

## 10.4 Setting

Touch “System Setup” and “More”, screen show menu as shown in Fig. 10.

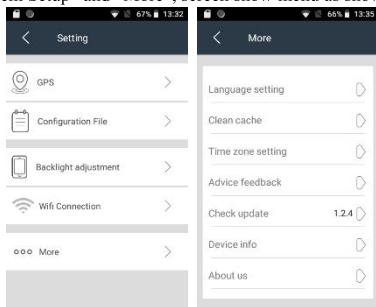


Fig. 10 The system setup menu

### 10.4.1. GPS

Touched “GPS”, screen show menu as shown in Fig. 11.



Fig. 11 The GPS sub menu

The GPS function used to get the longitude and latitude of the test position.

### 10.4.2. Configuration File

Touch “Configuration File”, screen show menu as shown in Fig. 12.

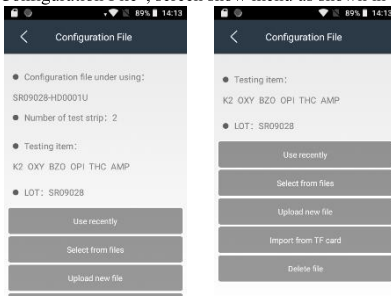


Fig. 12 The configuration file menu

From the menu, user can select, upload, delete, update configuration file according to strip or test item. Also, user can import configuration file from TF card. For example, user copy configuration file to TF card .Then, touch “Import from TF card”, user chose configuration file by long touch, LCD show menu as shown in Fig. 13.

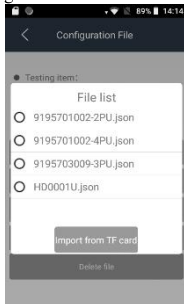


Fig. 13 The import configuration file from TF card

In figure 12, touch “Delete file”, LCD show menu as figure 14.

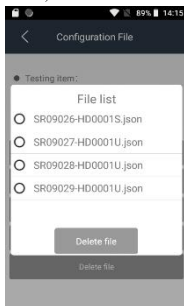


Fig. 14 Delete configuration file



User select file by long touch, then touch “Delete file”. System delete configuration file. Soft analyses the configuration file to get the strip’s positive and negative threshold, test item ,reacting time, etc. information. Touch “Upload new file”, LCD will show menu as shown in Fig. 15.This is used to scan the strip’s bar code.



Fig. 15 Scanning QR code

#### **10.4.3. Record manager**

Touch “Record management”, LCD show menu as shown in Fig. 16.



Fig. 16 The record manager menu

Record manager is a database which used to check, search, review history record. User can use keyword such as name, result, etc. to traverse the whole database.

In the figure 16, the light blue stand for negative result; and the dark blue stand for positive result.

In the figure 16, touch the testee's name, operator review see testee's name, photo, device photo and test result as shown in figure 17.

In the figure 16, operator can search by name, result as shown in figure 18.

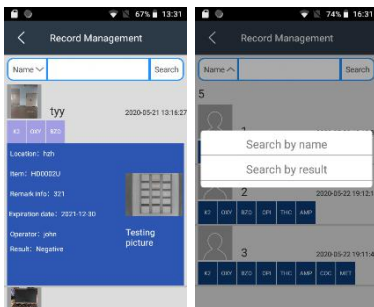


Fig. 17 The detail a test record

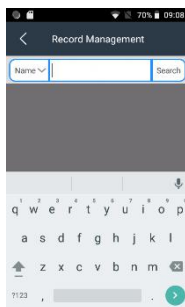


Fig. 18 Input user name to search

As shown in figure 19, user select a record by long touch, user can export, print, delete, data upload and all data export.

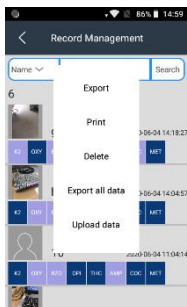


Fig. 19 Handle a record

#### 10.4.4. Device info

Touch "Device info", LCD show menu as shown in Fig. 20.



Fig. 20 The device menu

Device info shows the manufacture, device model, software version information.

#### 10.4.5. WIFI connection

Touch “WIFI connection”, LCD show menu as shown in Fig. 21.



Fig. 21 The WIFI connection menu

The WIFI connection used connect WIFI, user can input ciphers to link wireless network. When user want to connect a new WIFI, touch a searched WIFI, such as in Figure 21 “ZHGY”, LCD show menu as shown in Fig. 22. User input correct password to connect WIFI.



Fig. 22 Input WIFI password menu

#### 10.4.6. More

Touch “More”, LCD show menu as shown in Fig. 23.

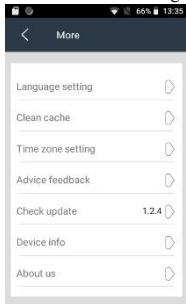


Fig. 23 The more menu

In more menu, user can select language, update software. For example, when touch “Language setting”, LCD show menu as shown Fig .24.

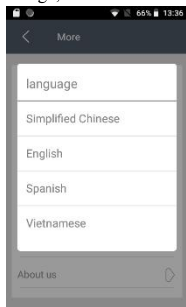


Fig. 24 Select language menu

User can select language such as Chinese, English, and Spanish etc.

## 10.5 Sample measurement

According to different configure files, test menu bar will show current test project as show in figure 25.

Note: Wear protective clothing such as laboratory coats, disposable gloves and eye protection when touch the test device.



Fig. 25 Current test project

Here is a urine test example.

First, select a correct configuration file.

Second, in main menu, touch “Urine Test”, LCD show menu as shown in Fig. 26.

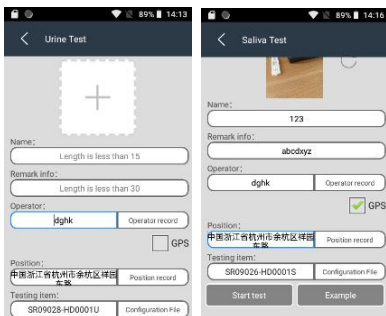


Fig. 26 Urine or saliva test menu

In figure 26, if user touch “Example”, system will animate shown as figure 27.

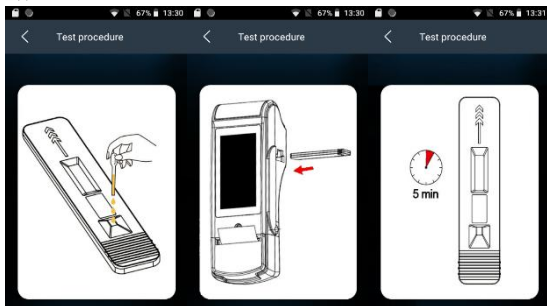


Fig. 27 Animation demonstration

Touch “person info”, take a photo of testee. Tester input testee’s name, other information, test position.

Third, get testee’s urine into strip window. Insert strip into socket.



Fourth, touch “Start test”, LCD show menu as shown in Fig. 28.

Saliva Test

Name: 123

Remark info:

Operator: dghk Operator record

GPS

Position: 中国浙江省杭州市余杭区祥园 Position record

Testing item: SR09026-HD0001S Configuration File

Start test Example

Fig.28 Test menu

The LCD show Fig.28 until test is finished. When test finished, LCD show menu as shown in Fig. 29.

Test result

Name	fjd
result	Negative
test time	2020-05-22 09:00:16

Photo of test reagent:

Test result

Report Retest

Fig. 29 Test result menu

Attention:

In figure 29, if operator touch “Retest”, the current test result will not store

in system!

In figure 29, touch “report”, LCD show menu as shown in Fig. 30.



Fig. 30 test result menu

In figure30, touch “Print”, thermal printer will print the test result. Touch “New test”, will start a new test procedure, LCD show in Fig.26.

## 10.6 Test record function

Click the "Record Management" button on the main menu page to switch to the following interface as see in Fig.31. Record management function provide record browsing and record operations.

Used to check, print and export test results as shown in Figure 19. To print test record of a specimen number, long touch it, LCD show menu as shown Figure 19, select “Print”. To print a record of a sample number, just click "Print". If you need to print all records under all samples number, click "Print all". To export a test record to TF card, select "Export" or "All data export". Enter the specific sample number, click “Search” to find the test record wanted or click Advanced Search to input more search criteria.

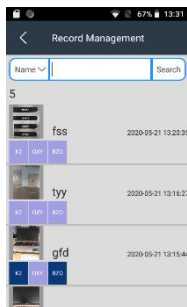


Fig. 31 Record management menu

## 10.7 Tune time zone and time

In figure 23, touch “Time zone setting”, LCD show menu as shown in Fig.32.

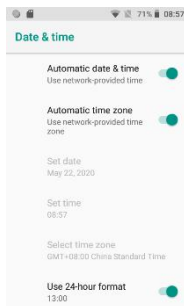


Fig. 32 Tune time zone menu

In figure 32, close “Automatic time zone”, user can select correct time zone

and time.

## 10.8 About...



Fig. 33 About menu

In figure 33, touch “About us”, LCD show menu as shown in Fig.33.

## 10.9 Shut down action

The power switch can be used to shut off the machine directly at any interface.

## 10.10 Removable printer

The Handheld Reader has designed a removable thermal printer. User can remove or install printer manually. The printer locker in the back of reader, as shown Fig .34.



Fig. 34 Printer locker

### 10.11 Inner battery

The Handheld Reader has a built-in Lithium battery. The reader will show battery power in real-time. Battery power is shown as Fig. 35.



Fig. 35 Battery icon

When battery low, please charge battery until it's full.

### 10.12 Charging battery

When system is running, linked the DOA and adapter, status bar will show in animation indicating charging state and current charge.

When power off, linked the DOA and adapter, LCD show as Fig. 36.

When charged done, LCD show as Fig. 37.

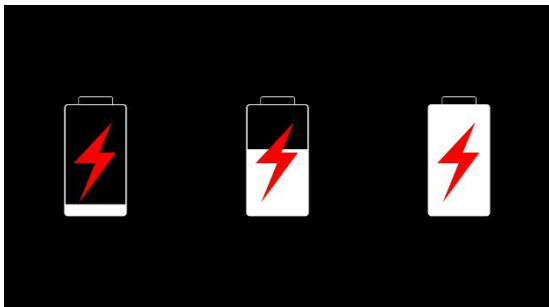


Fig. 36 Charging animation

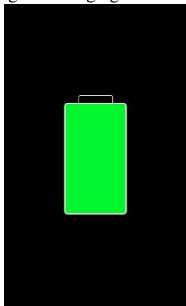


Fig. 37 Charge done

### 10.13 User login

Touch “User Login”, LCD show menu as shown in Fig. 38.



Fig. 38 Login menu

In figure 38, user can register a new user or login system. User must login system, test data will upload to cloud server when where there is a WIFI and linked.

#### 10.14 Browsing cloud record

Authorized user can manage record by a browser, such as IE, google Chrome, etc. User input <http://www.wecare.me:8090/#/usermgt> in browser, browser will show Fig.39. Input user name and password, then login, browser will show as Fig.40. In figure 40, user can retrieve, delete, browsing history records.

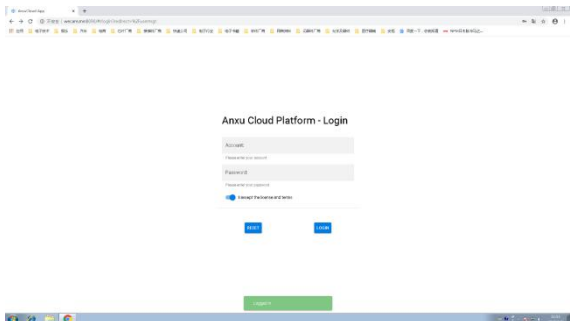


Fig. 39

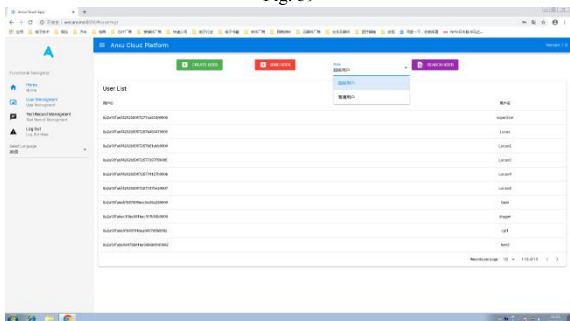


Fig. 40

## 10.15 Change LCD backlight

In figure 10, touch “Backlight adjustment”, LCD will show as Fig.41.



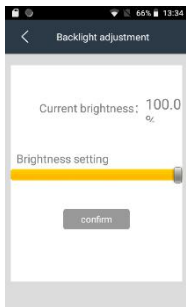


Fig. 41 Adjust LCD backlight

User can slide bar to change LCD backlight. Touch “confirm”, LCD is shown as Fig.42. When user choose “yes”, system reboot.

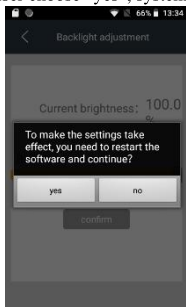


Fig. 42 Confirm or cancel

## 11 Software Update

The software version number for this manual is 1.2.4. To upgrade the

software, the company will send the new version of the software to Yun server. When receive the new version of the software, please install new version. Enter "System Setup" Function as Figure 9, chose “More”, touch "Check update" button as Figure 10. If Handheld DOA Reader has been connected to the WIFI, touch “Check update”, if have a new version software LCD show menu as shown in Fig.43.

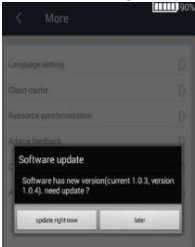


Fig. 43 Software update menu

Touch “update right now”, LCD show menu as shown in Fig.44. System begin downloading the package data, LCD show menu as shown in Fig. 44.

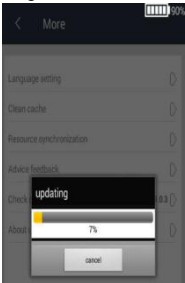


Fig. 44 Download menu

When download finished, LCD show menu as shown in Fig. 45.

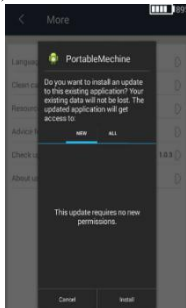


Fig. 45 Download finished menu

In figure 45, touch “Install” to install new version software.

## **12 Disposal information**

Dispose discarded specimens in accordance with national and local regulations. The disposable products such as standard product, reagent bar, pipette tip should be put into the special biological garbage bag and handled by the professional waste disposal company.

## **13 Control procedure**

Every 3 months recalibration the reader.

The expiration date of control cards is 6 months.

The control cards are provided by the manufacturer.

## **14 Limitations of use**

Please do not use handheld when battery low, or else will damage reader.

Please do not test strip which not authorized by manufacture.

## **15 Maintenance**

### **15.1 Reader maintenance**

To assure reliable and accurate test results, please check the following:

- Observe the external appearance and screen of Handheld DOA Reader every time you use the device.
- Please operate the analyzer following the requirements of the user manual.
- Calibrate the analyzer periodically by ID card to make sure the results accurate.
- Analyzer should be put in stable temperature, dry place.
- Do not try to disassemble the reader. Operation by laypeople may damage the analyzer.
- If there are any problems found in the results after the checkup, stop using the device immediately and contact the supplier's customer support.
- The maintenance is carried out by members of the professional equipment maintenance team. After equipment maintenance, random inspections and tests will be carried out. Only those that meet the technical requirements will be released.

### **15.2 Cleaning and storage**

- Do not clean the reader with strong or caustic cleansing agents, chemicals or cleansing tissues impregnated with chemicals.
- The analyzer only requires external cleaning. Please do not clean any internal parts or inner surfaces.
- The power switch should be turned off before the analyzer is cleaned,

to avoid short circuit and electric shock hazard.

- If you want to store for a lengthy period, keep Fluorescence Immunoassay Analyzer covered in a dry place. Do not expose the equipment to direct sunlight.
- Recommended storage conditions are as follows: Temperature (10~40°C), Humidity (20% ~ 90%), Air pressure (86.0 ~ 106.0 kPa).
- Do not place the equipment near chemicals and/or corrosive substances.
- Keep the equipment, cable and other accessories well-organized.
- Keep the equipment clean for the next use.
- To move the equipment, carefully pick it up and put it down gently to avoid impact.
- Do not place heavy materials on top of the equipment.

## 16 Troubleshooting

1. When the button in the interface does not respond, or a phenomenon of crash occurs, please follow the following steps to restart the instrument:

- a) Long pressed the power switch to power off;
- b) Release the power key, then wait for a while;
- c) Long pressed the power switch to power on.

2. If the thermal printer is jammed:

- a) Pull up the top of the printer, check whether paper is fold;
- b) Restart the reader;

3. If the data can not be printed, please check if the printer is out of paper, or if the paper is installed correctly, if there is paper but the above problems occur, please contact manufacturer for repair.

**Common error description:**

- a) Error occurs on the user interface. This may cause the reader fails to execute the "detection" function. The data backup and transmission functions are not affected. In this case, you can upload the backed up records to the host computer software and return the reader to the factory for repair.
- b) Error of logic of the application itself. The occurrence rate of this error is very low. When it happens, the latest test data is lost, but the historical data backed up in the reader will not be lost. At this time, the reader should be powered off and restarted and can be used continuously.
- c) When the system or network resources can not be used, the reader's own detection function and data backup function may continue to be used, which may affect the record upload to the host computer software. When the system or network resources become stable, the function will be automatically restored.

## **17 Warranty**

Please complete the warranty card included in the packaging. Mail it to your local distributor to register your purchase within one year of purchase. For your records, write the purchase date of your starter kit here:

### **NOTE:**

This warranty applies only to the analyzer in the original purchase. It does not apply to the other materials included with the analyzer.

American Screening LLC warrants to the original purchaser that this analyzer will be free from defects in materials and workmanship for a period of one year (12 months). The one year starts from the later of the date of original purchase or installation (except as noted below). During the

stated one year period, American Screening LLC shall replace the unit under warranty with a reconditioned unit or, at its option, repair at no charge a unit that is found to be defective. American Screening LLC shall not be responsible for shipping charges incurred in the repair of such a analyzer.

This Warranty is subject to the following exceptions and limitations:

This warranty is limited to repair or replacement due to defects in parts or workmanship. Parts required which were not defective shall be replaced at additional cost. American Screening LLC shall not be required to make any repairs or replace any parts that are necessitated by abuse, accidents, alteration, misuse, neglect, failure to operate the analyzer in accordance with the operations manual, or maintenance by anyone other than American Screening LLC. Furthermore, American Screening LLC assumes no liability from malfunction or damage to analyzers caused by the use of strips other than strips manufactured by American Screening LLC. American Screening LLC reserves the right to make changes in the design of this analyzer without obligation to incorporate such changes into previously manufactured analyzers.

### **Disclaimer of Warranties**

This warranty is expressly made in lieu of any and all other warranties express or implied (either in fact or by operation of law) including the warranties of merchantability and fitness for use, which are expressly excluded, and is the only warranty given by American Screening LLC.

### **Limitations of Liability**

In no event shall American Screening LLC be liable for indirect, special or

consequential damages, even if American Screening LLC has been advised of the possibility of such damages.

For warranty service, please contact your local distributor.

Manufactured for:

American Screening LLC  
9742 St. Vincent Ave., Suite 100  
Shreveport, LA 71106

1-318-798-3306 or 866-526-2873 Toll Free

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