Seamaty®

SMT-120VP

User Manual

Multifunctional Automatic Veterinary Chemistry Analyzer

Please read this user manual carefully before using analyzer.
It's for veterinary use only.

CE

Chengdu Seamaty Technology Co., Ltd

Good to Know

Dear customers:

Thank you for your trust and using SMT-120VP multifunctional automatic veterinary chemistry analyzer. In order to let you have a comprehensive understanding of this analyzer, we provide this manual for you with contents including introduction, usage, maintenance, packing, storage, transportation, etc. To ensure the good operation of analyzer and the reliability and accuracy of test results, please pay a lot attention on the “WARNING”, “CAUTION” and “Note” in this manual.

Note: Use this manual appropriately

Scope of application:

1) User who received the operation training from Seamaty.
2) User who received the operation training from authorized distributors of Seamaty.

In order to improve the performance and reliability of the analyzer, we will make some real-time changes to the hardware or software, which may lead to the difference from this manual.

Seamaty reserves the right to revise this manual and software version without notice! No person or organization may reproduce, modify or translate the contents of the instructions without the written consent of Seamaty.

Seamaty has the final interpretation of the contents of this manual.

The illustrations used in this manual are showing as samples, which may differ from the actual.

Be sure to use the analyzer under the conditions specified in this manual. Failure to do so may result in failure of analyzer or unreliability of test results.

Symbols used in analyzer

Symbols	Meaning	Explanation
	Warning	The information should be learned on how to avoid the operator from potential harm. Please refer to any marks in this manual.
	Caution	It is the important information you should know to avoid any potential damage of analyzer.
	Warning Pinch Point	Keep hands and fingers clear during operation.
	Note	The important information shows in the screen during operation of analyzer.
	Biohazard	Consider all material from veterinary sources to be potentially infectious, and please handle them with precautions.

How to use analyzer correctly

Before operation, please do as follows at first:

1) Check that the actual configuration of the analyzer is exactly the same as the packing list. If you have any questions, please contact our salesperson or distributor.
2) Please be sure to fill in the guarantee card, and send product warranty receipt back to us as soon as possible. If you email us, please send it to sales@seamaty.com.
3) Please read all documents carefully and save them for future need.

 Warning

1) The analyzer should be protected from working in humid and corrosive atmospheres.
2) If peculiar smell or smoke generated during the operation, please cut off electricity in time and notify the manufacturer or distributor for maintaining.
3) The operator should avoid touching the inner circuit and only the certificated personnel can repair the analyzer.
4) Operator should wear protective gloves, masks, and overalls.
5) User has obligation to provide an electromagnetic compatibility conformed working

environment to ensure the analyzer working well.

6) This analyzer complies with the requirements of equipment emission and immunity in EN61010-1: 2010+A1: 2019 Class B and EN61010-2-081: 2015.
7) The design and inspection of the analyzer is according to standard of EN IEC 61326-1: 2021 and IEC61326-1.
8) Do not use this analyzer near strong radiation sources, such as unshielded RF sources, as this may interfere with the operation of the analyzer.

 Caution

1) Keep the working environment aeration; avoid strong electromagnetic interference, dust, sunshine and other strong direct light. Make sure the analyzer is placed on the worktable stably.
2) Do not damage the electrical wire, hold plug tightly when pull the plug out and do not drag the wire.
3) Do not put container with water or small metal object on top of the analyzer, to avoid water or metal object falling in inside, which may result in short-circuit and damage of the analyzer.
4) The instrument should use power wire with three cores and make sure grounding well.
5) Do not place this analyzer in a position where it is difficult to disconnect the switch.
6) The production date of the analyzer is shown on the label at the back of the analyzer.
7) The reagent discs in this manual are produced by Chengdu Polytech Biological Technology Co., Ltd which matches with SMT-120VP chemistry analyzer.

 Biohazard

In accordance with the standard laboratory practice, consider the potential biological risk of animal blood samples, and handle them based on the corresponding level of biosecurity on all samples, quality control, related containers and used reagent discs.

Guarantee

1) Considering the impact of environmental and unexpected factors, the recommended service life of SMT-120VP veterinary chemistry analyzer is 5 years on the condition of appropriate use.
2) Seamaty undertakes to provide 24 months of free warranty service (excluding consumables) for the analyzer from the date of receipt by user, except in the following cases:

- Not strictly in accordance with the instructions in the use of analyzer or not use of standard matched consumables;
- Man-made damage;
- Dismantle the analyzer without the permission of Seamaty;
- The warranty is only for the first user, resale will cause the warranty invalid.

Compliance with Safety Measures

For using analyzer safely and efficiently, please observe the following precautions:

1) Avoiding failure of analyzer
   The working environment of the analyzer should meet the requirements in this manual.
2) Preventing electric shock
   Do not open the analyzer without the authorization of Seamaty, and prevent the liquid splashing into the analyzer. In order to prevent the occurrence of electric shock and other safety incidents, if the liquid was into the analyzer inadvertently, please contact our after-sales service team in time before power on.
3) Preventing pollution
   It is a must to wear protective gloves during operation, or else there is a potential risk of biological infection. There is also a potential biosafety risk in the absence of biosafety-treated of used reagent disc. Once the skin is in direct contact, immediately wash and disinfect the contact area and consult a doctor.
4) Operating reagent disc
   Reagent beads may contain corrosive substances, please follow the instructions in accordance with the manual. The operator will not come into contact with the reagent beads sealed in the reagent disc rotor during normal use unless the rotor breaks. In case of this, try to avoid direct contact with the reagent disc and prevent the reagent beads entering into the respiratory tract.
5) Disposing reagent disc
   For further guidelines on handling and disposing of hazardous laboratory wastes, please refer to your local health and safety regulations.

Section 1 Introduction of Analyzer

1.1 Analyzer Overview

Front and side view, seeing Figure 1-1.

Figure 1-1

Back view, seeing Figure 1-2

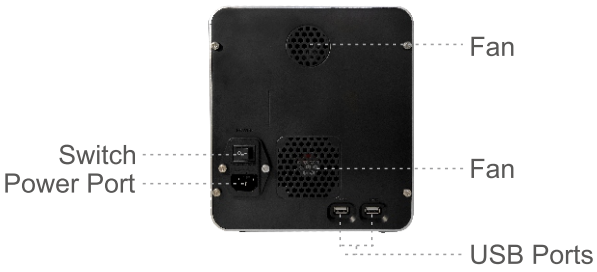


Figure 1-2

1.2 Brief Introduction

Product name: Multifunctional Automatic Veterinary Chemistry Analyzer
Model No.: SMT-120VP
Size: 193mm*226mm*224mm
Net weight: 4 KG
Accessories: power cord and pipettor.
SMT-120VP Multifunctional Automatic Veterinary Chemistry Analyzer is easy to use. The operator only needs to collect blood samples (heparin lithium anticoagulation of whole blood, plasma or serum) with 90-120 μl added into the reagent disc rotor, and then insert the rotor into analyzer to accomplish the testing automatically with immediately printing out result. In order to prepare for a second review, it is recommended that the operator collects not less than 250 μl of sample at a time. There are two USB ports of analyzer for connecting external devices, such as printer, mouse, keyboard etc. It will take 12 minutes to finish a test and the report will be printed out immediately and automatically after testing.

1.3 Principle

The SMT-120VP is a Multifunctional Automatic Veterinary Chemistry Analyzer based on an embedded system. It is recommended to be used with the matching detection reagent disc. It is used to detect the concentration of ALT, TP, UREA, CRP and other items in the liquid and the results of APTT, TT, Fib and other items. The corresponding method of the item is the end point method, the rate method, the two-point method, the maximum speed method, etc., and the eight-channel wavelength simultaneous detection.
The SMT-120VP Multifunctional Automatic Veterinary Chemistry Analyzer is based on Lambert-Beer law and adopts the detection principle of absorption spectrum colorimetry or transmission turbidimetry. The absorption spectrum colorimetry method is mainly used for biochemical reaction tests. Its working principle is: pre-install multiple sets of detection reagents in the reagent disc to form an independent “colorimetric bin”; add the collected blood sample to the reagent disc, and then add the reagents The disc is put into the analyzer, and the system is controlled by the embedded processor. The biochemical substances in the blood enter the “colorimetric chamber” and chemically react with the corresponding specific reagents and produce color changes. This change is detected by colorimetry, and Analyze and calculate through the instrument to determine the concentration of this changing substance in the blood to achieve the purpose of detection; the transmission turbidimetric method is mainly used for immunochemical tests, and its working principle is: after antigen and antibody are combined, an immune complex is formed. After a certain period of time, the complex polymerizes and appears turbidity. When light passes through the solution, it can be absorbed by immune complexes. The more immune complexes, the more light absorption happens. The amount of light absorbed is proportional to the amount of immune complexes within a certain range. The absorbance value is measured by the transmission of the light path assembly. The content of the complex is proportional to the absorbance value. Similarly, when the amount of antibody is constant, the absorbance value is also proportional to the antigen content. The instrument is analyzed and calculated to determine the concentration of the immune complex to achieve test purpose. After the analysis is completed, the results are automatically displayed and printed.

1.4 Structure and Composition

The SMT-120VP Multifunctional Automatic Veterinary Chemistry Analyzer is composed of the whole machine shell, movement components, constant temperature control components, two-dimensional code scanning collection components, printer components, optical path components, LCD capacitive display + touch panel, operating software (release version: V1. 00), power cord composition.

The analyzer has compact structure, small size, light weight and is easy to transport. The components of the analyzer have the following characteristics:

A plastic housing

- A high speed motor which drives the reagent disk to spin (movement assembly)
- A photometer to measure the concentration of substance in liquid (optical assembly)
- Two microprocessors used for analyzer control and test calculation (temperature control components, two-dimensional bar code scan components)
- A thermal printer can print out test results (print components)
- A 7 inch color capacitive multi-touch screen (display)
- Multiple selection functions of dealing with a series of tests and results (operating software), seeing Figure 1-3

Figure 1-3

1.5 Function

- 7 inch capacitive multi-touch screen, Android operating system, multiple language options.
- Independent channel test, no cross contamination.
- Advanced optical detection system, built-in 8 wavelength filters (340、405、450、505、546、600、630、850) nm.
- Test method: endpoint method, velocity method, two-point method, maximum acceleration method, maximum speed method, etc.
- Can analyze whole blood, plasma, serum, urine and other samples.
- Sample information storage capacity meets customer information storage needs.
- Intelligent real-time quality control function to ensure accurate instrument testing.
- Support external mouse and keyboard (based on USB).
- Support vehicle (15±0.5) V, it is strongly recommended to use the instrument after connecting to our company after power inverter.
- Built-in thermal printer.

1.6 Application

It is suitable for the biochemical, coagulation and immunoassay of whole blood, plasma, serum and other samples in animal medicine. It is recommended to be used with the matching detection reagent disc.

1.7 Specifications

Sample Type	Whole blood, plasma, serum
Sample Volume	90-120 μl
Bar Code	Two-dimensional bar code
Testing Time	12 minutes/sample
Testing Principle	Absorption spectroscopy, transmission turbidimetry
Testing Method	End point method, speed method, two-point method, maximum acceleration method, maximum speed method
Temperature	37±0.3°C
Absorbance	0-3.0Abs
Resolution	0.001 Abs
Carryover	0
QC & Calibrate	Automatic and real-time
Work Environment	Temperature: 10-30°C Humidity: ≤85%
Light Source	12V/20W halogen lamp with lifespan over 2500 hours
Optic System	After the filter spectral,8 wave length synchronous detection: 340、405、450、505、546、600、630、850 (Unit:nm)
Power Supply	AC100-240V, 50/60Hz
Rated Power	100VA
Display	Android 7 inch 800*480, multi-point capacitive touch screen, multiple language options
Storage	>500,000 PCs data
Printer	Built-in thermal printer
IT Connection	2 USBs
Weight	4 KGs

Section 2 Installation of Analyzer

2.1 Unpacking

Open the package according to the instructions of the box, check the accessories and documents with the packing list, and prepare to install the machine after checking. If you have any questions, please contact our after-sales service department. At the same time, please fill in the service guarantee letter carefully and send the product warranty card receipt back to our company so that we can track the quality of the product and carry out the service in time. (Or email back to our company after scanning: E-mail:sales@seamaty.com).

Note:

Instrument work environment : Temperature:10°C~30°C;
Relative Humidity: ≤85%;

Do not place the device in following environment:

1) Humidity, corrosive gas, dust, dander, strong electromagnetic field interference;
2) Crowded, unventilated place;
3) Direct sunlight and other heat sources nearby; uneven and unstable countertops.

Instrument working power requirements:

- AC100-240V,50/60Hz;
- It is not recommended to share a power socket with high-power equipment;
- The power supply should be well grounded. It is recommended to use the special three-core power cord for the instrument, connected to the power supply, and the grounding voltage is less than 5V.

2.2 Installation Procedure

2.2.1 Set up analyzer

1) Take the instrument out of the packaging carton and place it on a flat surface;
2) Check whether the appearance of the instrument is intact;
3) Connect the power cord to the instrument;
4) After the instrument is installed, press the power switch on the back of the instrument, the prompt light logo at the bottom of the screen is on, the system starts, and the interface to be tested is entered.

Please keep the removed accessories in a safe place.

2.2.2 Set up printing paper

The specification of thermal print paper is 50*57cm, the inner structure, seeing Figure 2-1

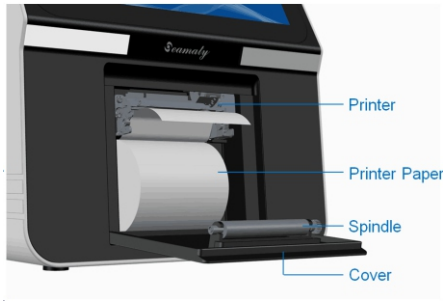


Figure 2-1

Steps：

1) Open the printer door.
2) Remove the packing of printing paper, and then load the paper roll into the printer chamber with correct direction, seeing Figure 2-2. Pay attention to the front and back of the thermal paper.

Figure 2-2

3) Hold the end of the printing paper, go around the shaft and make the printing paper protrude from the paper exit of the printer door.
4) Close the printer door and lock the lock to complete the installation.

Note: The printer paper has been installed when the instrument leaves the factory, and the user should follow this method when installing the printer paper after using it up.

2.2.3 Set up external printer

This device supports printers with standard HP PCL3GUI printer language, such as HP Deskjet2529.If you do not need to use an external printer to print the test report, please skip this section.

The installation steps are as follows：

1) Install and set up the printer according to the printer's instruction manual；
2) Place A4 size printing paper；
3) Insert the USB cable of the printer into any of the 2 USB ports on the back of the instrument；
4) Power on the printer.

Section 3 Turning the Analyzer On and Off

Turning on: Connect power cord with power adapter, and then connect with analyzer, turn on the switch in the back as the indicator light (logo beneath the display) turns bright with the screen showed as Figure 3-1.

Figure 3-1

Loading and initializing, the screen shows as Figure 3-2.

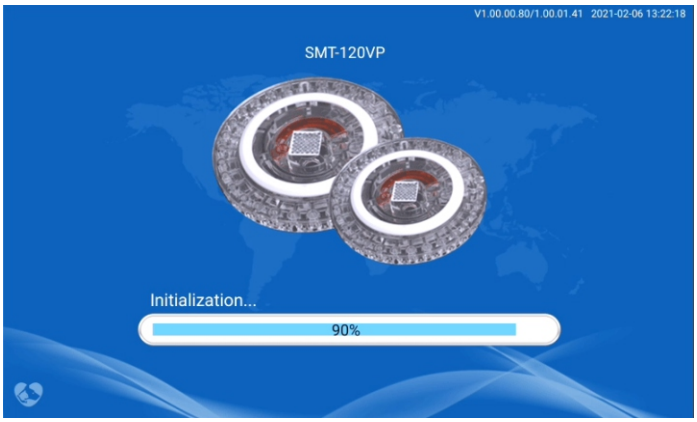


Figure 3-2

Turning off: Press down the switch button in the back of the analyzer when the drawer is closed, disconnect the plug from analyzer, the indicator light off.

Note: To extend the lifespan of the analyzer and accessories, it is required to follow the procedures of powering off, please do not frequently switch on and off.

Section 4 Operation

4.1 Boot check and frequently used buttons

After the instrument is turned on, it will automatically enter the interface shown in Figure 4-1. The user must first ensure that the date and time displayed in the upper right corner of the screen are correct, otherwise, please refer to 4.1.1 of this chapter to reset the date and time.

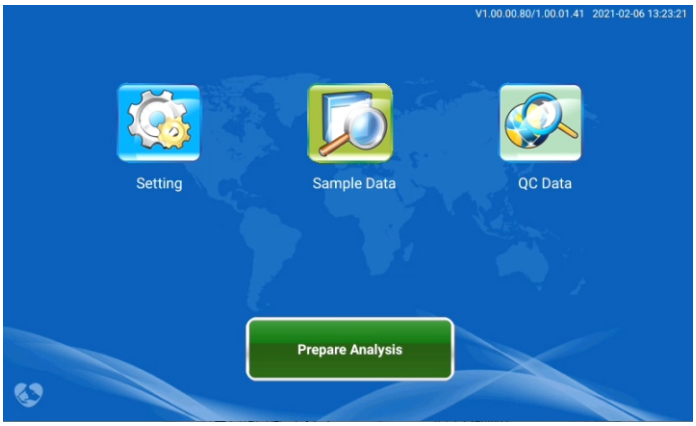


Figure 4-1

There are four buttons on the touch screen showing as Figure 4-1, the detailed function explanations are as follows:

4.1.1 Setting

This button is used to set system date, time, hospital name, printer mode, sample or quality control range etc. Click “Setting” icon in the home screen, and enter into setting menu, showed as Figure 4-2.

Figure 4-2

System Time: The date and time is factory preset to GMT+08:00 Beijing Standard Time. To change date and time, please operate like this,

1) Press “System Time” icon in the setting screen.
2) In the Date & Time Setting screen, set date, time, time zone etc. Click “Done” to save your time setting.
3) Find Drop-Down Menu in the right corner, click the icon, showing “Exit” button.
4) Press “Exit” to return back to setting screen.

Hospital Name: Use soft keyboard to input hospital name and click "Save" it.

Factory Reset: This function will clear all the test data and settings of the instrument. After clicking, a prompt box will pop up. Click OK to confirm the operation, click Cancel to cancel the operation.

Prompt abnormal samples: After the test is completed, if the test sample is abnormal, the instrument test report will prompt the abnormal content of the sample.

Print abnormal test results: When checked, if there is an abnormality in this test sample, the printed report will show the abnormality.

Printer: Set the default printer. First select the printer you want to use, and then click "Save" to take effect.

Upgrade: This system provides version upgrade function, seeing 6.2 for specific operation steps.

Print Clinical Significance: When selecting the corresponding printer to print the report, you can choose whether to print the clinical significance, and then click save to take effect.

LIS Settings: The data results measured by the instrument are transmitted to the LIS (hospital, clinic) system, which is convenient for the storage and management of the hospital. The setting interface is shown in Figure 4-3.

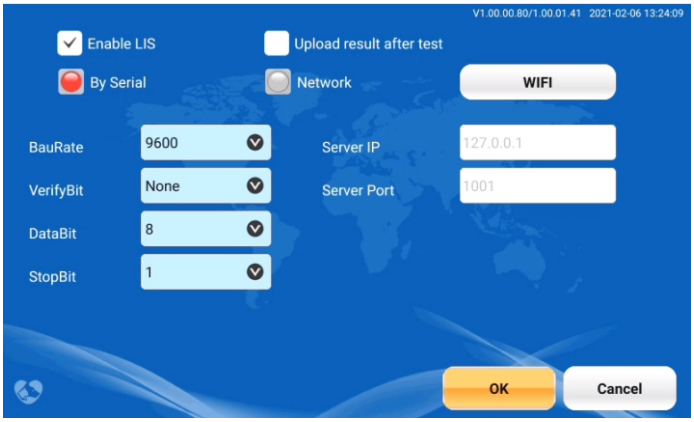


Figure 4-3

Assay Info.: When the user clicks this button, an interface as shown in Figure 4-4-1 will pop up. In this interface, the user can set the reference value of each biochemical item of different species, modify the print name of the item, and click to save as the next default value. Before

leaving the factory, part of the reference value has been set. The user can adjust the parameters according to actual needs when using it, and then save.

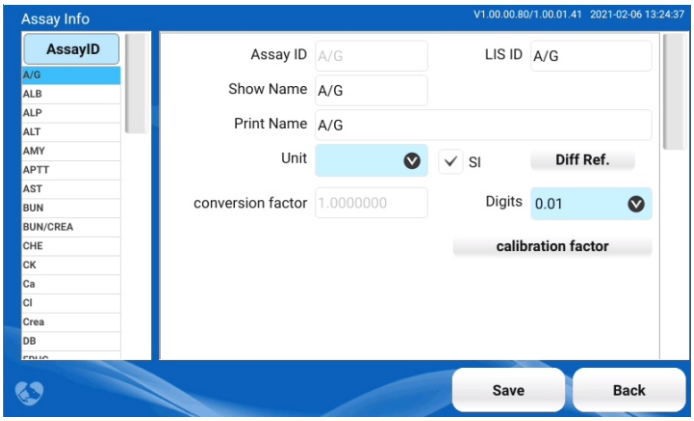


Figure 4-4-1

The project calculation and result units of this system are divided into international standard units (SI) and ordinary units. The factory default is SI. Users can choose to change the calculation unit of each item according to their needs, as shown in Figure 4-4-2.

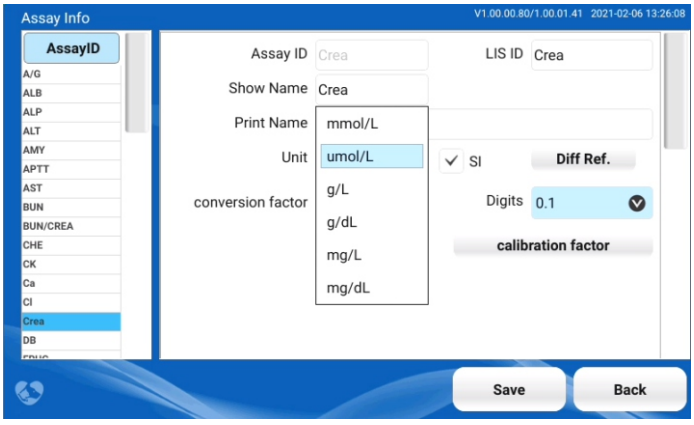


Figure 4-4-2

QC Settings: When the user clicks this button, the interface shown in Figure 4-5 will pop up. In this interface, the user can set the reference value of each item of QC 1 (low value) or QC 2 (high value), and then save, and the following QC test will automatically call this reference value.

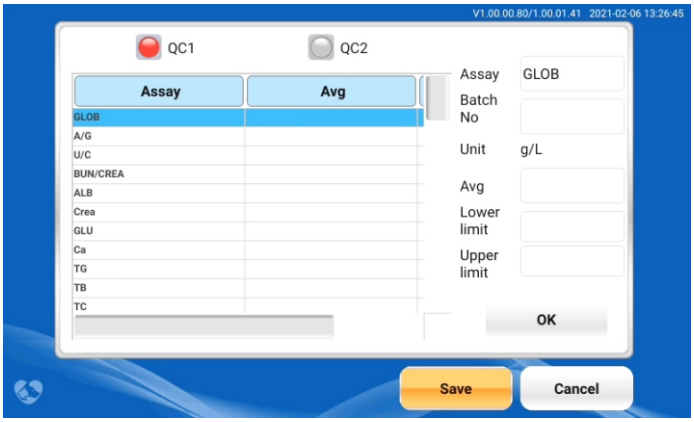


Figure 4-5

Import database: Import the database file of the test data from log export, after entering, click the file to be imported as shown in Figure 4-6, and then click "Import database".

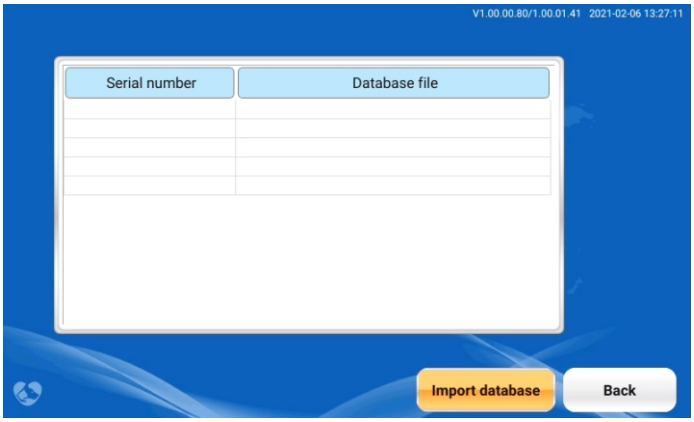


Figure 4-6

Other Settings: Click this button to enter the "Other Settings" interface as shown in Figure 4-7.
BUN/UREA: Select whether to use UREA (urea) or BUN (urea nitrogen) for the test item, click the drop-down menu, select the desired option, click OK, and the restart will take effect.
Auto Sample ID info table during analysis: Set whether to automatically pop up the sample information setting interface during testing.
Print disclaimer: Click this item to switch whether to print the report statement for the test report; When the instrument leaves the factory, this configuration defaults to “on”.
Switch to external or built-in WIFI adapter: Click this button to switch the built-in WiFi/external WiFi; When switching to external WiFi, you need to plug the external WiFi into the USB port of the instrument before restarting the instrument. Otherwise, the external wireless WiFi cannot be used.
Save abnormal test results: Click this item to set whether to save abnormal test results; The default is "Yes", save the abnormal test data.

Print manufacturer logo:Click this button to set whether to print the manufacturer's LOGO on the printed report; The default is "No".
Default species profiles:Click this button to enter the animal type setting interface, the animal type that is unchecked will not be displayed in the animal list when filling in the sample information; The default is all check.

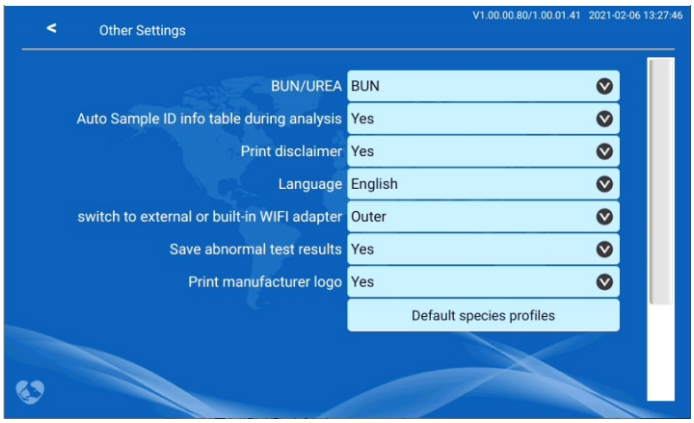


Figure 4-7

Upgrade:This function is to upgrade the instrument software remotely. See section 6.1.1 for details.

4.1.2 Sample data

This button is used to query historical sample information and test results, and can realize query, modify sample information, upload sample test results and print sample test results. As shown in Figure 4-8-1.

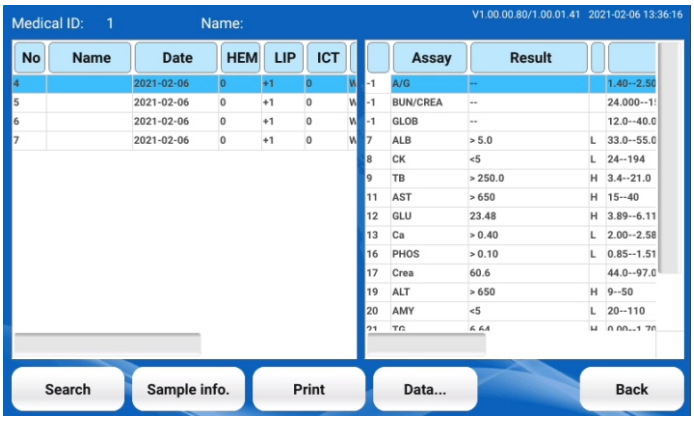


Figure 4-8-1

Press "Query" icon to show screen as Figure4-8-2. User can search history results by Sample No., Name or Date. Click "Sample info" icon to view or modify the sample information. Click "Print" icon to print out the result.

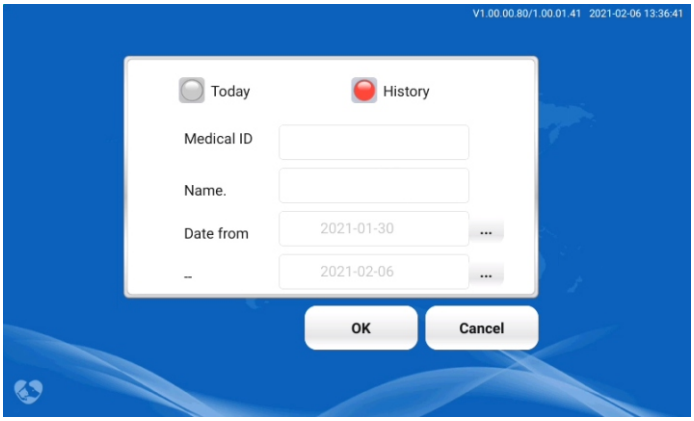


Figure 4-8-2

Click "Sample info." to check and modify the sample information.
Click "Print" to print the currently selected test result.
Click "Data..." to upload data to SDMS platform, LIS system, export electronic test report, etc.

4.1.3 QC Data

It is used to search and review the historical quality control information and test results, and can realize the functions of querying, modifying sample settings and printing sample information, seeing Figure 4-9-1.

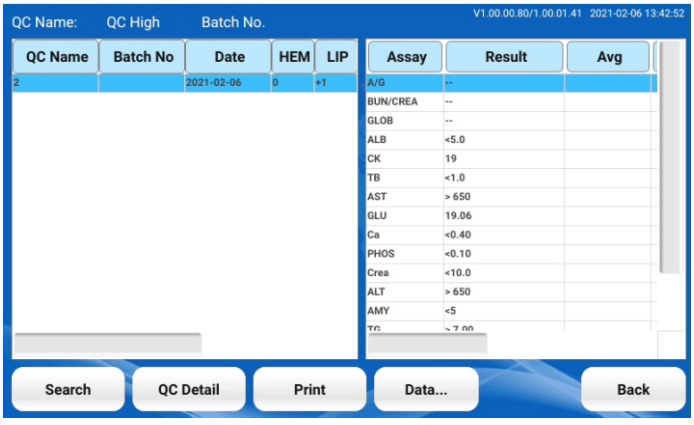


Figure 4-9-1

Press "Query" icon to show screen as Figure 4-9-2. User can search history results by Quality Control ID, Lot or Date. Click "QC Detail" icon to view or modify the sample information.

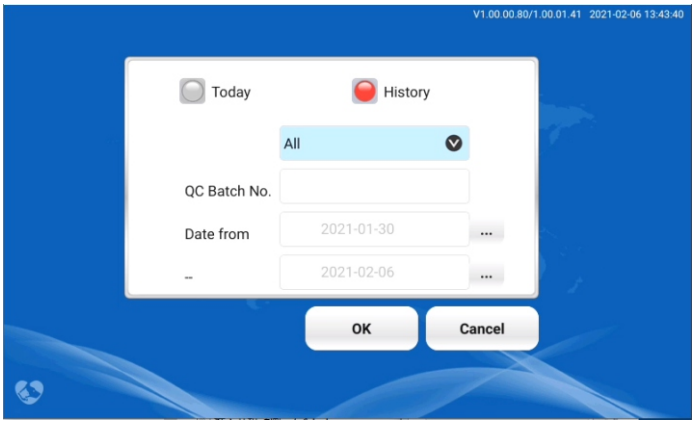


Figure 4-9-2

Click "Sample information" to check and modify the information of the quality control.
Click "Print" to print the currently selected test result.
Click "Data..." to upload data to SDMS platform, LIS system, export electronic test report, etc.

4.1.4 Prepare Analysis

Add sample or control into reagent disc and insert into drawer of analyzer, click "Prepare Analysis" icon to start testing. If there are messages showed on screen, read it carefully before operation to move next step. For the details of test process, please refer 5.3 "Sample Testing"

4.2 Soft Keyboard

The analyzer has a built-in soft keyboard. Click the space where you want to input text to activate the soft keyboard, seeing Figure 4-10.

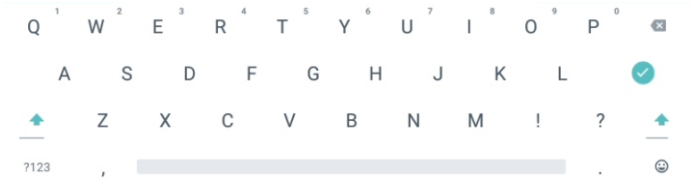


Figure 4-10

Section 5 Test and Result

5.1 Sample Requirements

Warning

Users should strictly follow the local clinical laboratory bio-safety regulations when handling blood samples and operating the analyzer.

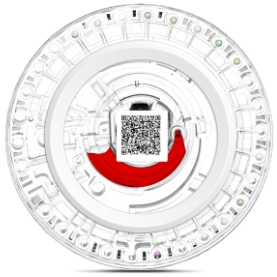
Note

- The required sample volume to add in reagent disc is 100 µl, and 90-120 µl is acceptable. It is recommended to collect no less than 250 µl blood.
- Lithium heparin is the only anticoagulant tube recommended for use with the analyzer, except for 4 Coagulation parameters test.
- Sodium citrate anticoagulant tube is the only tube recommended for 4 Coagulation parameters test.

Caution

- When collecting the sample in lithium heparin collection tubes, turn upside down 3-5 times slightly to ensure the sample and the anticoagulant mixed well.
- Whole blood must be analyzed within 30 minutes of collection, or separated into plasma or serum.
- To prevent hemolysis, do not refrigerate or shake whole blood.
- If not analyzed immediately, plasma or serum can be stored at 2-8° C for no longer than 24 hours after centrifugation; or store it at -20°C for up to 30 days with no self-defrost cycle. Under these conditions, there will be no clinically important changes in most analyte concentrations.
- In order to obtain the correct glucose test results, blood collection should only be taken at least fasting 12 hours.

5.2 Preparing the reagent disc （example of SMT-120VP matched Polytech reagent disc)



Description：

The reagent disc matched with SMT-120VP multifunctional automatic veterinary chemistry analyzer is 8CM in diameter and 2 cm thick. It contains diluent in the center and dry reagent beads in cuvettes around its edge. It is disposable and single packed.

The two-dimensional code on the disc has recorded the disc's category, production batch number, production date, expiration date, test parameters, reagent hole positions, analysis methods, factors, intercepts and other related information.

There are multiple test menus for choosing from, and customization is available.

5.2.1 Storage and Preparing

- Store all reagent discs at 2-8°C as described on their respective pouch labels. Discs should be used after 20 minutes in room temperature when take from the refrigerator. Use the reagent disc within 10 minutes of opening the foil pouch, and if it is not used in time, dispose it instead of putting back to the refrigerator and use it again.
- A disc can remain in its sealed pouch at room temperature (about 25°C) for a cumulative period of 48 hours. Longer time at room temperature can cause suppression of chemistries and disc cancellations.
- Do not expose discs - in or out of their foil pouches - to direct sunlight or to temperatures above 30°C.
- Inspect the unopened foil pouch for tears and punctures. Never use a reagent disc that has cracks or has been damaged.
- Keep reagent discs clean. Use powder-free gloves to handle the discs, and touch the discs only along their edges to eliminate the possibility of fingerprints on the cuvette optical surfaces.
- Only make marks in the gray area on the reagent disc, seeing Figure 5-1.
- After adding the sample, it should be tested immediately, and the disc after adding the sample should be avoided from excessive tilt and deliberate shaking before the test on

the machine.

- Please use the disc during 10 minutes to avoid condensation of water vapor and ensure that the test temperature meets the requirements.
- It is forbidden to put the unused disc after package has been taken apart back into the refrigerator and use them again.

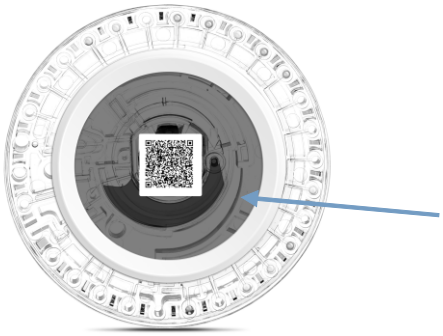


Figure 5-1

5.2.2 Sample Injection

1) Use a 100 µl volume pipette and a new tip. Place the pipette tip into the disc's sample chamber, and tilt the disc to 45° with the sample port above the fill line, so that the entire sample flows into the sample chamber, seeing Figure 5-2.

Figure 5-2

2) Take care not to overfill the sample chamber. A 90 µl sample will fill the sample chamber and form a line between the arrow molded on the disc, seeing Figure 5-3. The appropriately value is from 90 to 120 µl. More than 120 µl of sample will overfill the chamber. Less than 90 µl also will affect the test results.

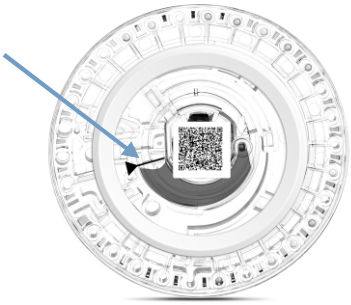


Figure 5-3

3) To avoid cross contamination, the pipette tip can not be used repeatedly to draw multiple samples.
4) Hold the disc by its edges in a flat position and insert it into analyzer.

Caution

1) Do not contaminate or damage the two-dimensional bar code on the reagent disc.
2) Do not touch the tip to avoid false elevation.
3) Immerse the tip 2-3 mm below the surface of the sample.
4) Do not remove the sample and try to reintroduce it into the disc.
5) Clean the reagent disc. Use a lint-free tissue to remove any sample spilled on the outside of the disc, taking care that the tissue does not withdraw any sample from the sample port. Dispose of the tissue in a biohazard container.
6) Discard the pipette tip into a biohazard container.

5.3 Sample Testing

1) Booting and preparing
2) Self-check and warming up

Note: The screen will show as Figure 5-4 after booting. It needs about 5 minutes to warm the disc chamber to operate temperature.

Figure 5-4

3) Click “Prepare Analysis” icon, the drawer will be open. Insert disc into drawer showing as Figure5-5.

Figure 5-5

Note: Make sure the bottom of reagent disc holding in the hole of drawer, and the home screen shows as Figure 5-6.

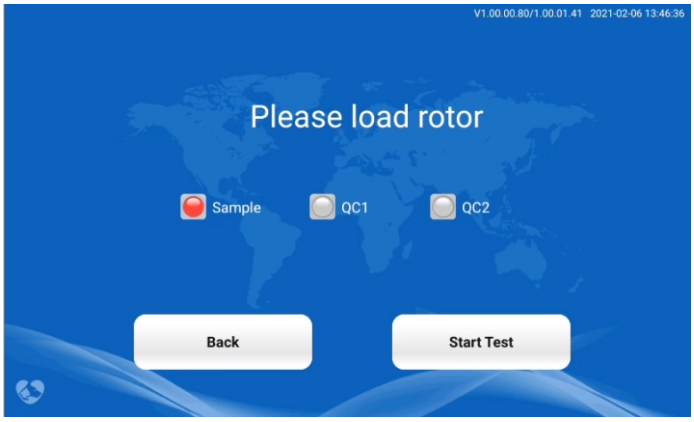


Figure 5-6

4) Press “Start Test” icon, the drawer will be closed, and the analyzer will read the two-dimensional bar code and enter into testing screen, seeing Figure 5-7.

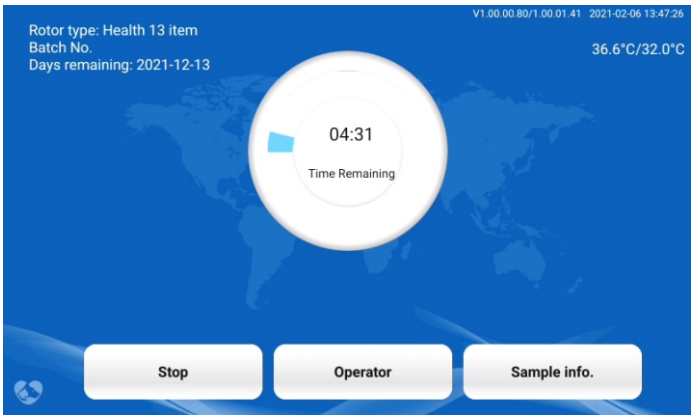


Figure 5-7

Note: If the analyzer failed to read two-dimensional bar code, the screen will show a message as Figure 5-8.

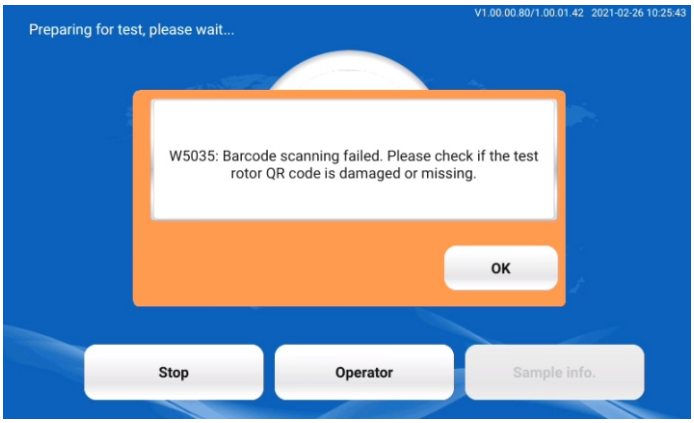


Figure 5-8

5) When it shows “W5035” error code, please click “OK” icon to open the drawer. Check the bar code on reagent disc to make sure it is intact and uncontaminated, and then place the disc into drawer again to start test. If the bar code has been damaged, please do not use it.
6) When it shows “W5043” error code, please upgrade the software version to test again.
7) During the testing process, user can input information of operator and sample. Please follow the steps: Press “Operator” icon to enter into screen as Figure 5-9.

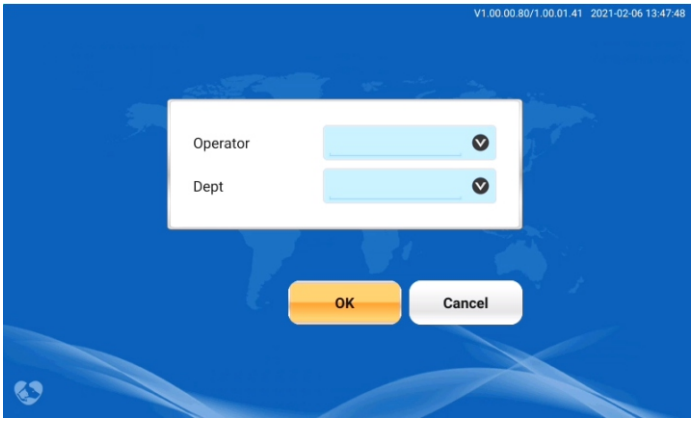


Figure 5-9

8) Click the input field, when the cursor appeared, input the information of “Operator”, “Department”, then click “OK”, seeing Figure 5-9.
9) Press “Sample Detail”, the screen will show as 5-10.

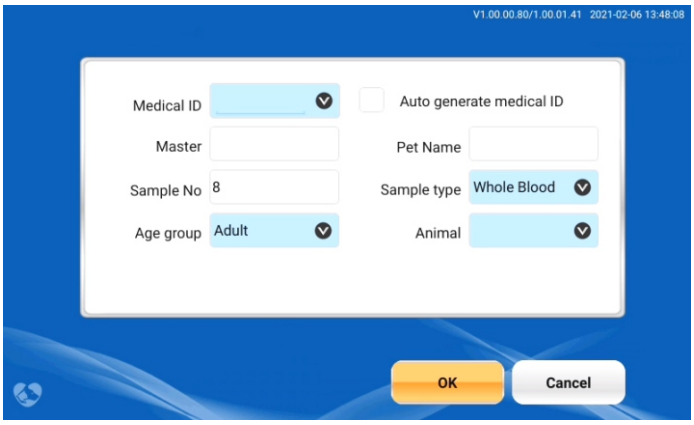


Figure 5-10

10) Do not press “Stop” icon during the testing, unless it is in emergency. Click “Stop”, it will show a dialog box as Figure 5-11.

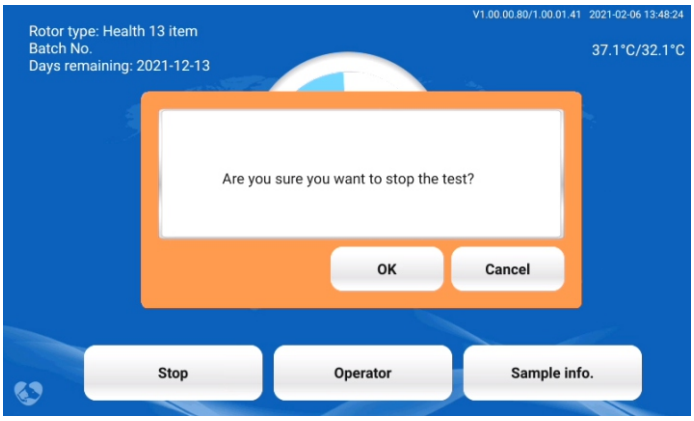


Figure 5-11

Click “OK” to stop the testing.

 Caution

If it is not a special case, please do not terminate the test to avoid wasting the reagent discs and samples.

5.4 Test Process Summary

Analyzer

- Make sure the electrical outlet utilized for the analyzer is grounded.
- Make sure the working temperature of analyzer at 10-30°C.
- Do not disconnect the power of analyzer during testing.
- Keep the analyzer drawer closed when not using.
- Disassembling the analyzer without permission will void the warranty.

Reagent Disc

- Do not use an expired disc. The expiration time is printed on the round label.
- Store all reagent discs at 2-8°C as described on pouch label. Keep discs clean. Handle them only by their edges to avoid smudges on the optical surfaces.
- After injecting the sample, hold the reagent disc flat to avoid spillage.
- Never use a dropped reagent disc.
- Use the reagent disc within 10 minutes of opening the package.
- Run the reagent disc immediately of injecting the sample.

Sample

- Whole blood must be analyzed within 30 minutes of collection.
- To prevent hemolysis, do not refrigerate or shake whole blood samples.

5.5 Calibration & Q.C.

5.5.1 Calibration

The analyzer is self-calibrating. Self-check process will run at every booting, if not passed the self-check, the analyzer will remind the user with a message for warning on screen. Each reagent bead used in the disc is calibrated to a reference method and/or reference material. The bar code on the reagent disc contains the required information to perform its calibration along with the Real-time Quality Control (RQC) system in analyzer whenever a reagent disc is run. In this way, the analyte concentrations produced by the analyzer will be accurate.

5.5.2 Quality Control

The performance of the analyzer can be inspected by running an external quality control. The standard substance for quality control is the same as the test sample. It is recommended to perform a quality control every month with RANDOX quality control products. When the laboratory conditions change or the test results is not match with clinical manifestations, it should also do quality control to verify, or comply with your local national and regional regulations. The test data of quality control and sample stored in different databases. It is easy to search and print the control results. In the home screen, click “Prepare Analysis”, dispense quality control into reagent disc and insert into analyzer. Please refer to Section 5.2.2 for detail operation. Select the quality control mode in Disc Load Screen, quality control 1 (low level) or quality control 2 (high level), as showed in Figure 5-12. Take an example of quality control 1 and the operation of quality control 2 is the same.

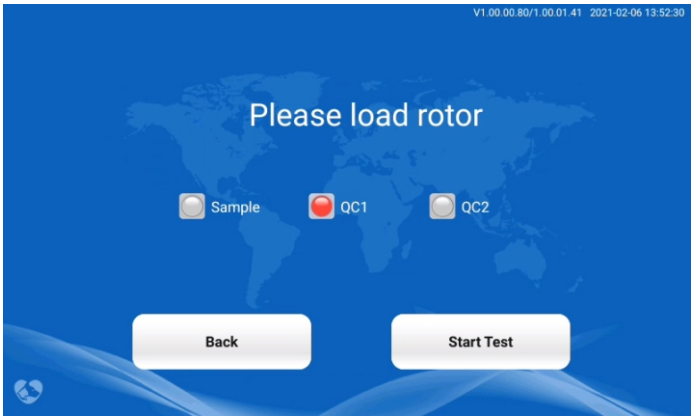


Figure 5-12

Start testing with showing the screen as Figure 5-13.

Figure 5-13

Edit “Operator” and “QC Detail” information. Please refer to Section 4.3-5.1 for “Operator”. Click “QC Detail” to enter into screen as 5-14.

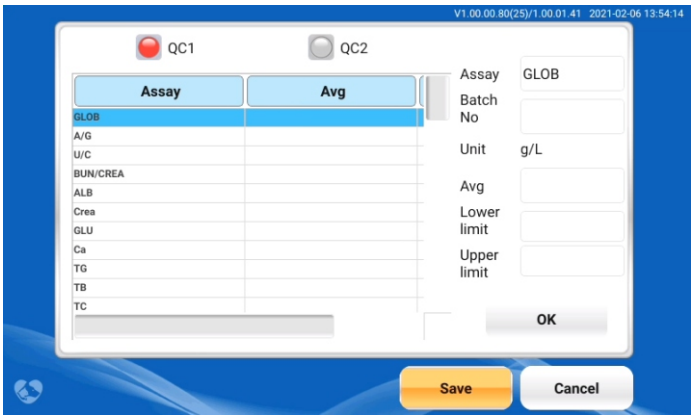


Figure 5-14

User can modify Batch Number, Analyte Name, Target Value, Ranges in the right side. Click "Save" icon after modified. When QC testing finished, it will show screen as Figure 5-15. User can check or print out the result.

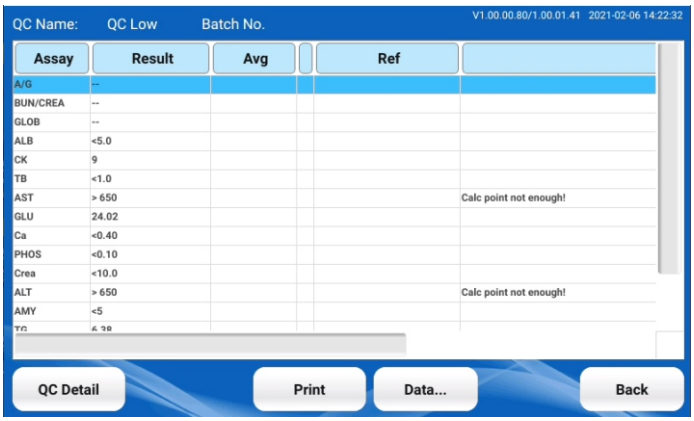


Figure 5-15

5.6 Printing Out

5.6.1 Build-in Printer

5.6.1.1 Sample Test Report

The Figure 5-16 at the below shows the contents of a typical results printout.

1) The heading of the results printout includes information such as hospital name, owner name, animal name, medical ID number, sample ID number, age, animal type, blood type, operator ID number, lab, disc lot number, disc and analyzer ID number, version and test time.
2) The test results section of the card is printed in four columns: assay name, analyte concentration, reference range, and specified units, as shown at right.
3) The deviation between the test value and the reference range will be followed by "H" or "L" standing for higher than or lower than reference range.

4) Real-time quality control level WAT means “empty” cuvettes fills with diluent only, as a control on the system cuvettes; EMP means “hollow” cuvette for self-check of analyzer and reagent disc; CHE means cuvette for absorbance monitoring. There are three degrees: “0” means good; “1” means acceptable; “2” means non-acceptable; when there is number of “2”, please contact our after-sales service team.

HospitalName

RESULTS

OWNER NAME:

ANIMAL NAME:

Medical ID:

SAMPLE ID: 9

AGEGroup: Adult

Animal: Canine

SAMPLE TYPE: Whole Blood

OPERATOR ID:

LAB.:

REAGENT BATCH NO.:

PLATE ID:

MACHINE ID: · 201601109

Ver: V1.00.00.80/1.00.01.41

TEST TIME: 2021-02-06 14:31

Assay	Result	Ref	Unit
Na^+	175.8 H	136.0--156.0	mmol/L
Cl^-	> 185.0 H	105.0--122.0	mmol/L

Cl^-> detection limit. Please dilute sample and re-test

* Abnormal sample: HEM? ICT? LIP?

WAT:0 EMP:0 CHE:0

Figure 5-16

5.6.1.2 QC Test Report

The results of the quality control test will be automatically stored, the user can choose to print, or prepare for search.

The Figure 5-17 shows the contents of a typical results printout.

1) The heading of the results printout includes information such as hospital name, test time, QC name, QC batch number, operator ID number, lab and disc lot number.
2) The test results section of the card is printed in four columns: assay name, analyte concentration, reference range, and specified units.
3) The explanation of QC sample indices included at the bottom refers to Section 5.6.1.

HospitalName

CONTROL REPORT

TEST TIME: 2021-02-06 14:55

CONTROL: QC LOW

QC BATCH NO.:

OPERATOR ID:

LAB.:

REAGENT BATCH NO.:

Ver: V1.00.00.80/1.00.01.41

Assay	Result	Ref	Unit
Na^+	172.4		mmol/L
Cl^-	> 185.0		mmol/L

Cl^-> detection limit. Please dilute sample and re-test

* Abnormal sample: HEM? ICT? LIP?

WAT:0 EMP:0 CHE:0

Figure 5-17

5.6.2 External Printer

5.6.2.1 Sample Test Report

The Figure 5-18 shows the contents of a typical results printout by an external printer. It is recommended to use HP brand external printer, such as HP Desk jet 1010.

HospitalName

RESULTS

ANIMAL NAME:	OWNER NAME:
Animal:Canine	Medical ID:
SAMPLE ID:1	AGEGroup:Adult
SAMPLE TYPE:Whole Blood	REAGENT BATCH NO.:
PLATE ID:	OPERATOR ID:
LAB.:	TEST TIME:2021-02-06 15:06
MACHINE ID:201601109	PRINT TIME:2021-02-06 15:08
Ver:V1.00.00.80/1.00.01.16	

Assay	Result		Ref	Low	Normal	High
ALB	7.6g/L	L	23.0--40.0			
TP	22.5g/L	L	52.0--82.0			
GLOB	14.9g/L	L	23.0--45.0			
A/G	0.51	L	0.80--2.00			
ALT	5U/L		5--125			
ALP	> 1300U/L	H	23--212			
Crea	<10.0umol/L	L	44.0--159.0			
BUN	0.51mmol/L	L	2.50--9.60			
BUN/CREA	--		16.000--218.000			
GLU	> 30.00mmol/L	H	4.11--7.94			
Ca	> 5.00mmol/L	H	1.98--3.00			
PHOS	0.50mmol/L	L	0.81--2.19			

-- means it can't be calculated.

ALP、GLU、Ca> detection limit. Please dilute sample and re-test

print notes

1.This instrument is a screening analyzer, disease diagnosis is complex and individual, the result is a reference, and should not be a basis for specific disease diagnosis.

2.If there is H behind result value, it indicates the test parameter is beyond the upper limit of the normal range. If there is L behind result value, it indicates the test parameter is lower than the lower limit of the normal range.

3.If there is > behind result value, it indicates the test parameter result is beyond the upper measuring range limit of the instrument. If there is < behind result value, it indicates the test parameter result is lower than the lower measuring range limit of the instrument.

* The test result is only a refence and screening and not intended for specific diagnosis.

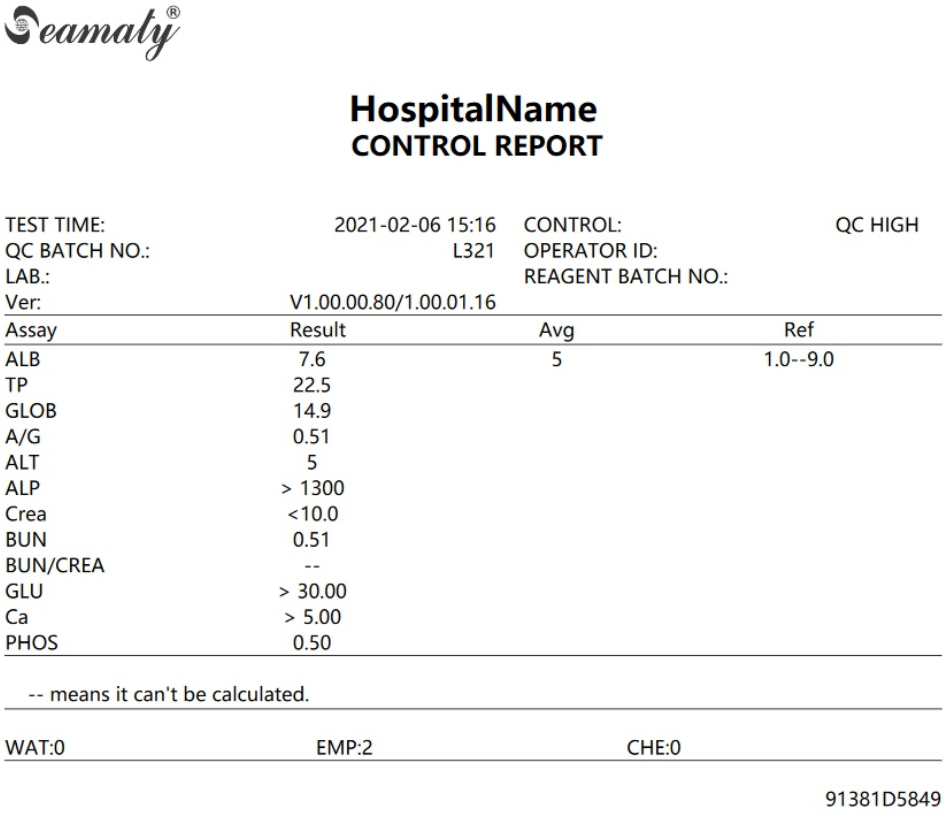
WAT:0	EMP:2	CHE:0

73721D5308

Figure 5-18

5.6.2.2 QC Test Report

QC Test Report, seeing Figure 5-19.



HospitalName
CONTROL REPORT

TEST TIME:	2021-02-06 15:16	CONTROL:	QC HIGH
QC BATCH NO.:	L321	OPERATOR ID:	
LAB.:		REAGENT BATCH NO.:	
Ver:	V1.00.00.80/1.00.01.16		

Assay	Result	Avg	Ref
ALB	7.6	5	1.0--9.0
TP	22.5		
GLOB	14.9		
A/G	0.51		
ALT	5		
ALP	> 1300		
Crea	<10.0		
BUN	0.51		
BUN/CREA	--		
GLU	> 30.00		
Ca	> 5.00		
PHOS	0.50		

-- means it can't be calculated.

WAT:0 EMP:2 CHE:0

91381D5849

Figure 5-19

Section 6 Maintenance & Service

SMT-120VP requires minimal maintenance, and regular maintenance of the analyzer will make the analyzer in good working condition.

6.1 Cleaning the Analyzer

6.1.1 Cleaning the exterior case

Clean the exterior case of the analyzer weekly with mild detergent and a soft, damp cloth. Don not spray or pour any detergents, solutions or other liquids directly onto the analyzer. Dampen a soft cloth or disposable paper towel with the detergent, then apply to the analyzer.

6.1.2 Cleaning the screen

Clean the analyzer's screen periodically using a soft, lint-free cloth dampened with a glass-cleaning fluid or window cleaner.

6.1.3 Cleaning the inside of drawer

Note: Seamaty recommends only the cleaning methods described in this section. If for some reason another method is needed, contact Seamaty for Technical Support to verify that the proposed method will not damage the analyzer. Seamaty is not responsible for damage caused by non-recommended cleaning methods.

1. Preparing the following cleaning tools

1) Cleanroom Swabs (length at 23 cm)
2) 75% isopropyl alcohol solution
3) Clean white paper (size at 70*110 mm)

2. Opening the drawer

1) Switch on to the home screen
2) Press “Prepare Analysis” icon, the drawer will be opened.

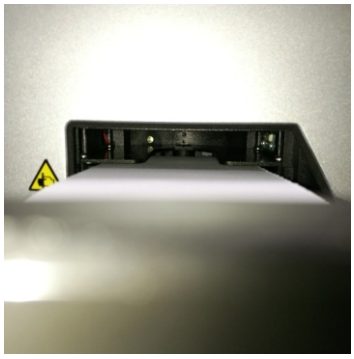
3. Turning off analyzer

Turning off:

Power off and disconnect with analyzer and plug, the picture showing as below:

CAUTION: Only to do maintenance after powering off

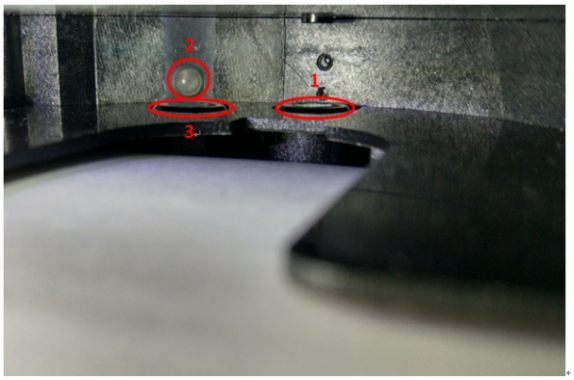
4. Insert the clean white paper

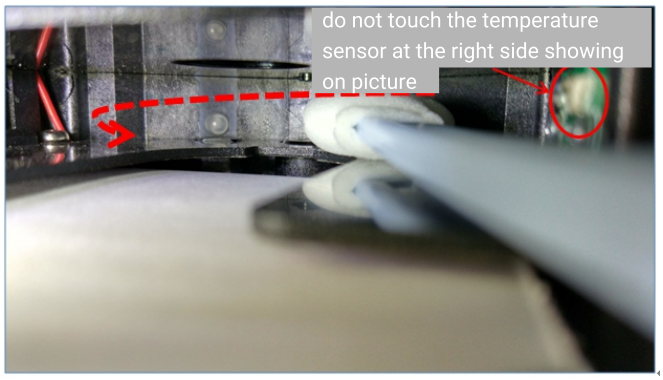


Insert the clean white paper with the size 70*110mm into the inside of drawer along the surface of the drawer plate until the paper can not move forward, the picture showing as below:

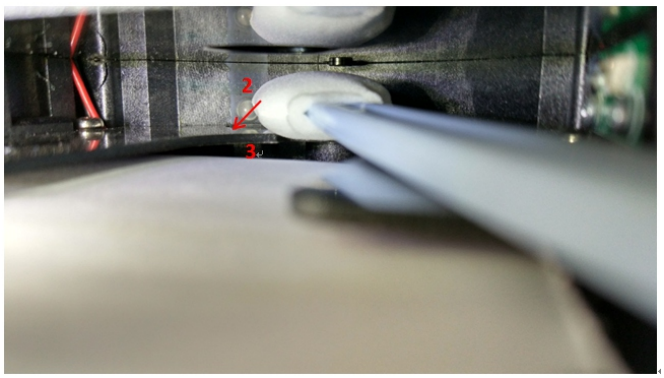
5. Cleaning the inside of drawer chamber

It is crucial to clean the location 3 well showing in the picture.





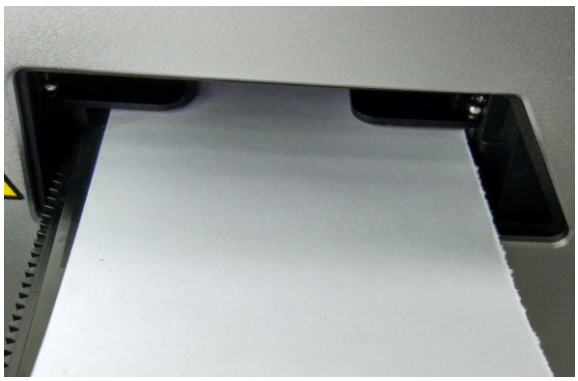
Step 1: Clean the inner wall of drawer chamber
Use the cleanroom swabs dampened with 75% isopropyl alcohol, and then put swabs into the chamber. Clean the inner wall from right to left with swabs, repeated gently until the inner wall has no obvious dirt or the head of swabs is clean.
(*Caution: When cleaning, do not touch the temperature sensor at the right side showing on picture)
Step 2: Clean the key position 1
Use the cleanroom swabs dampened with 75% isopropyl alcohol, and then put swabs to the cleaning position 1, according to the direction of arrow showed in picture to gently wipe back and forth until the inner wall has no obvious dirt or the head of swabs is clean.



Step 3: Clean the key position 2 and 3
Use the cleanroom swabs dampened with 75% isopropyl alcohol, and then put swabs into the chamber to clean position 2 and 3, according to the direction of arrow showed in picture to gently wipe back and forth until the inner wall has no obvious dirt or the head of swabs is clean.

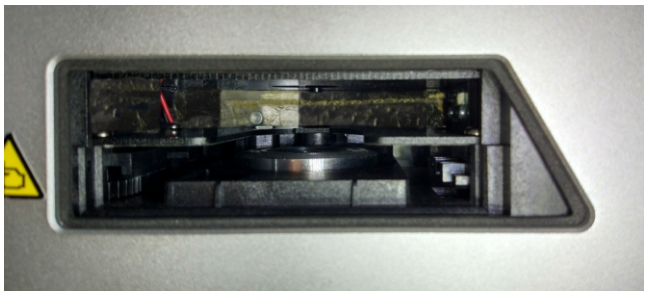
6. Take out white paper

After cleaning, take out the white paper carefully to avoid the dirt on the paper falling into the chamber.

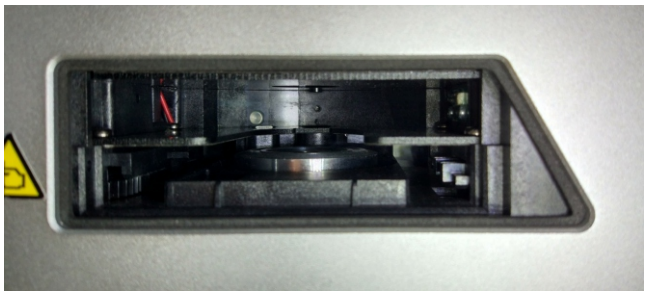


6.1.4 Comparison of before and after cleaning

Note: Cleaning the analyzer periodically is an effective measure to ensure a good running condition, to maintain accuracy, and to extend the service life of the analyzer. The recommended period is weekly for a basic cleaning and monthly for a deeper cleaning. It needs an immediately cleaning when there is foreign matter or dirt in the chamber caused by accident.



Picture of before cleaning



Picture of after cleaning

6.2 Software Updating

Update the analyzer software in the below occasions:

1) Notice of software upgrade issued by manufacturer
2) After-sales service require to upgrade the software of the analyzer during after-sales maintenance.

3) USB or WIFI are available for software updating.

Caution: Updating has risks. Please read the update steps or tips carefully and confirm the right software update package and version before upgrading, avoiding the update error which may cause the damage of analyzer.

6.2.1 Updating by USB flash drive

1) Prepare a FAT32 format USB drive. If the format is not correct or cannot be confirmed, please format it on the computer. Remember to backup data before formatting.
   Steps for formatting USB drive: Connect USB flash drive to computer - select USB flash drive - right click on the mouse - format - select “FAT32” file system - start - confirm - message of formatting successfully - ok.
2) To obtain software update package from our website or after-sales service team. Please refer to Section 8 for the detail contact information.
3) Create a “SMT120” folder in the root directory of USB flash drive, copy “.zip” and “.md5” format files into this folder showing as Figure 6-1.

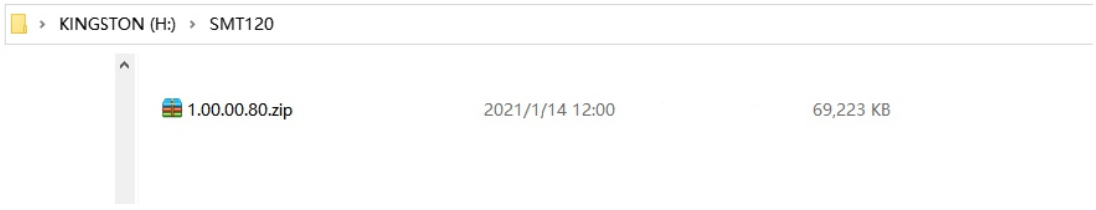


Figure 6-1

CAUTION: Make sure the upgrade package under the “SMT120” folder

Also it is better to check the below files has been included in the “SMT120” folder:

File: 1.00.00.80.zip.

4) Remove the USB flash drive from computer and connect it with the USB port at the back of analyzer.
5) Power on or restart the analyzer.
6) When the analyzer starts, it will show upgrade information. Check the version number of the upgrade software is the same as the software compression package, select “Yes” to start upgrade.
7) Software update needs to restart the analyzer, please turn off and then restart analyzer.
8) The analyzer will automatically initialize the software when the update is complete.

CAUTION: If the software update fails, please restart the analyzer. If fails again, please contact our after-sales service team, the detail contact information, seeing Section 8.

6.2.2 Updating by WIFI

1) In the standby interface, click “Settings”, showing as Figure 6-2.

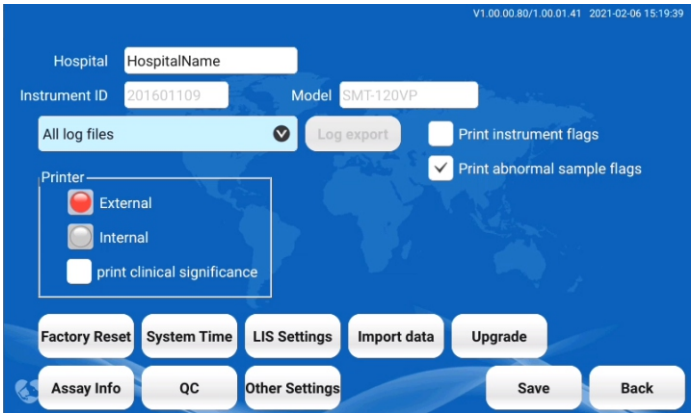


Figure 6-2

Click “Upgrade” icon to show screen as Figure 6-3.

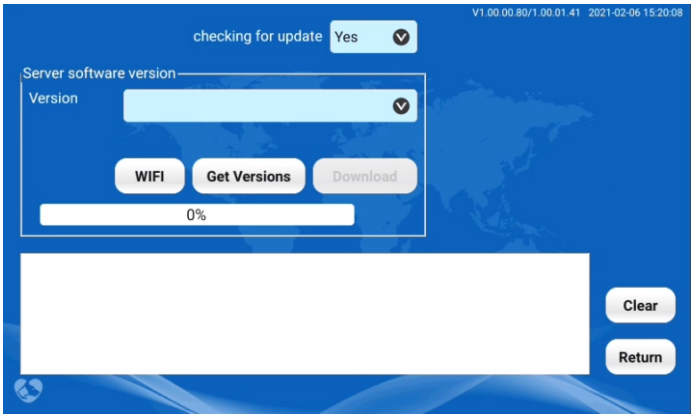


Figure 6-3

Note: when the check update status is on, the system will automatically download the latest software upgrade package.

Click "WIFI", as Figure 6-4.

Figure 6-4

2) Connecting network

Select a WIFI to connect, input account name and password, seeing Figure 6-5.

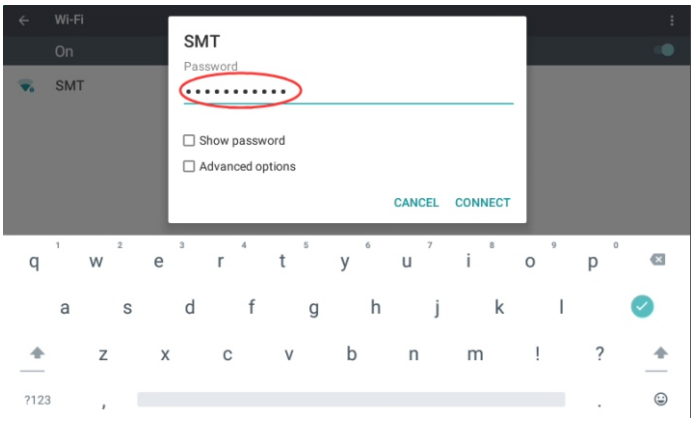


Figure 6-5

Click “connect”. When it is succeed, it will show as Figure 6-6.

(If the connection failed, please check the account name and password matched or not.)

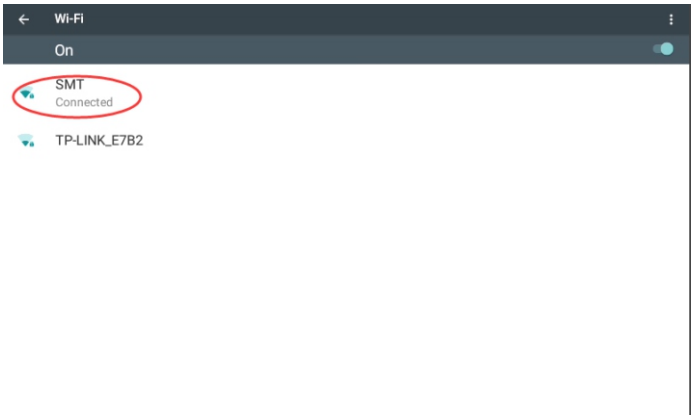


Figure 6-6

Note: Ensure the WIFI is connected to internet and the signal is strong.

3) Download the latest software

Click “Get Versions” icon to obtain the software version on the server, seeing Figure 6-7.

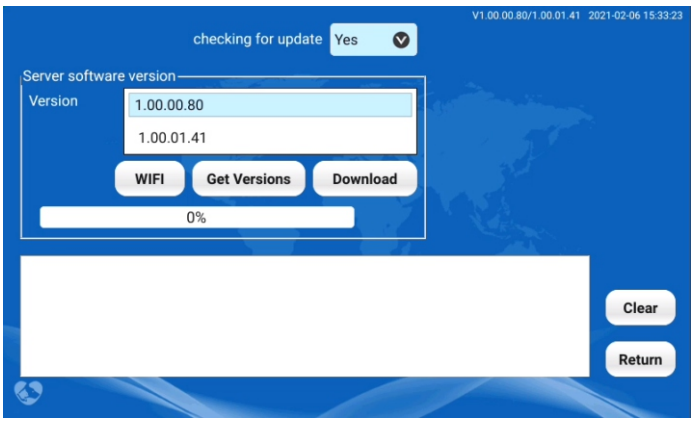


Figure 6-7

4) Click “Get Versions” icon to obtain the software version on the server, seeing Figure 6-8.

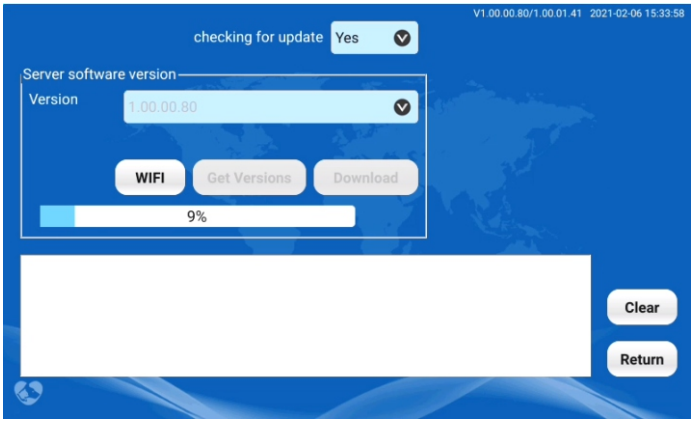


Figure 6-8

5) Installation

Restart the analyzer to start installation after downloaded successfully. It needs restarting in the process, please restart.

Figure 6-9

6.3 Troubleshooting

Symptoms	Solutions
Analyzer cannot turn on	Check whether the instrument is powered on. Check whether the power plug is loose. Check the access voltage.
Failure of loading home screen	Restart the Analyzer
Abnormal testing results	Check whether the reagent disc is out of date (refer to the instruction of reagent disc). Check the parameter setting of test items.
The touch screen is not working properly	Connect USB mouse as an alternative.
The mouse can't move	Reconnecting the USB mouse to computer. Check if the USB mouse damaged. Restart the analyzer.
The built-in thermal printer cannot work	Check if the “Build-in Printer” mode has been selected in Setting screen; Check if the thermal printing paper is loaded in the right direction.
The external printer cannot work	Check if the “External Printer” mode has been selected in Setting screen; Verify if the USB cables are connected firmly between printer and analyzer; Make sure the external printer matching the analyzer.
The soft keyboard cannot work	Try to use the soft keyboard in another screen. Restart the analyzer.
QR code not recognized	Recheck whether the reagent disc is in place. Is the QR code contaminated or damaged.
Prompt “this round of test is abnormal, need to change disk to retest	Contact the distributor or Seamaty.

Note: if the above problems cannot be solved, please contact after-sales service.

6.4 Consumables Replacement

Name	Type	Instruction
Printing Paper	Consumable	The specification of thermal printing paper used in build-in printer is 50 * 57mm.

Caution

Internal parts require professionals for replacement such as stepping motors, fans, etc. Clean the inside drawer periodically according to the situation.

Section 7 Packing, Storage and Transportation

7.1 The instrument is packed with rigid cardboard boxes, with high-quality pearl cotton foam, strong and shockproof.

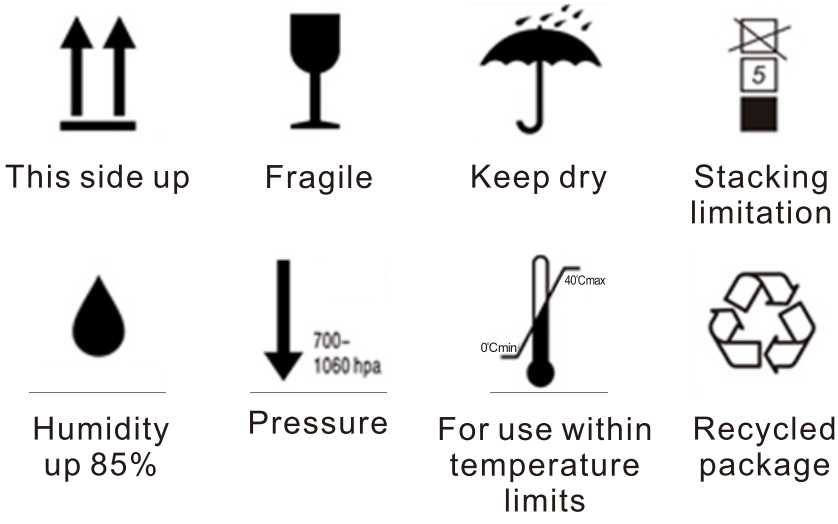
7.2 Simple shockproof facilities are set in the packing box of the instrument, which is suitable for air, railway, highway and ship transportation, but rain and snow splashing, inversion and collision should be avoided.

7.3 When the storage period of the instrument exceeds 3 months, the instrument shall be taken out of the packing box, powered on for 4 hours, and then put into the box and placed in the warehouse according to the direction shown on the packing box after checking the operation status.

7.4 Please do not stack the instruments, and do not place them close to the floor, walls and roof.

7.5 Transportation environment temperature: - 20°C ~ + 55°C; storage environment temperature: 0°C ~ + 40°C; relative humidity: ≤85%.

7.5.1 Signs on outer carton



Section 8 Contact Information

Manufacturer info

Manufacturer: Chengdu Seamaty Technology Co., Ltd
Registered name: Chengdu Seamaty Technology Co., Ltd
Registered Add: No.1 Floor 1 Building1,No.1 Floor 1 Building2, No.333 Hezuo Road, Hi-Tech Zone of Chengdu, Sichuan, China
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Tel: (028) 69760308
Fax: (028) 69760308
Post code: 611731
Web site: www.seamaty.com

After-sales Service

Company name: Chengdu Seamaty Technology Co., Ltd
Company Add: No.1 Floor 1 Building1,No.1 Floor 1 Building2, No.333 Hezuo Road, Hi-Tech Zone of Chengdu, Sichuan, China
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NOTE

Please read this manual carefully before using analyzer.