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AUTOMIMO 1200

Automated Sample Preparation System

Operating Manual

DISCLAIMER

Autobio is not responsible for any damage to the instrument arising from incorrect operation, usage of wrong documents and failure to observe the manual, etc. No matter whether these damages are foreseeable or already existed, no matter whether the direct or indirect damages, such as data loss, anticipated profit loss are caused by reasons besides contract clauses, torts (including negligence), unfulfilling the warranty, etc. In any case, the compensation amount paid by Autobio can not exceed the amount received from user. The user will take full responsibility of operating the instrument as well as using the related documents.

Failure to observe the operating manual will result in harms to the user or the third party, and damages to the instrument or adversely affect assay result. Autobio will not bear any responsibility arising from the aforementioned harms and damages.

This document can not be considered as substitute of official training of Autobio. AutoMimo 1200 shall only be operated by personnel who has been authorized and trained by Autobio.

CONTACT

If you have any questions related to AutoMimo 1200, please send us by email with a short description of your question to the address below. Any suggestions for improvements to our products and services are gladly acceptable.

	Autobio Labtec Instruments Co., LTD. No.199,15th Ave, National Eco & Tech Zone, Zhengzhou 450016, China
Tel	[86]-371-6798-5313
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EC Representative

EC REP

OBELIS S.A
Bd.Général Wahis, 53
1030 Brussels,
Belgium

In Vitro Diagnostic Medical Device

This product is used for In Vitro Diagnostic purpose.

Waste Electrical and Electronic Equipment (WEEE)

In accordance with European Directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE), the presence of the left symbol on the product or on its packaging indicates that this item must not be disposed of in the way that normal unsorted municipal waste stream is mixed with other normal household-type waste. Instead, the responsibility should be taken by users to dispose of this element by returning it back to a collection area dedicated for recycling the waste of electrical and electronic equipment. The waste, which may be harmful to physical and potentially mental health or makes it impossible to keep a favorable environment, must be collected separately, observing the relevant legal regulations effective, which makes for recycling and minimizing the bad effect on human physical health and the environment. In order to acquire more information with respect to the correct disposal of this product, please contact your local authority or the dealer who supplied this product.

Table of Contents

Preface

The manual is mainly used for giving instructions to users for instrument related operation and general maintenance, which includes the following: general description, safety features, description and quality control of function and operation, measures taken in case of emergency, product labelling and maintenance, etc,.

1 General Description

1.1 Safety Information

1.1.1 Safety Features

Safety labels are affixed on the instrument to remind the user of safety. Please read the label and the operating manual carefully prior to operation. If any questions, please call post- sales service.

Please accept professional training from Autobio before operation to avoid risks caused by incorrect operation of the instrument.

1.1.2 Protective Device

AutoMimo 1200 has protective device keep user from injuries. If any accident occurs during operation, please press the switch button immediately to stop the instrument running.

1.1.3 Safety Symbols and Others

Body injuries or instrument damages may be caused by incorrect operation, therefore, this manual uses the following symbols and signal words to indicate hazards or instructions. The safety instructions are always placed before an action.

Table 1.1 Safety Symbols Description

Symbol	Description
	General Warning Sign: The instrument will be damaged, including any type of damage, if the precautions are not followed. See this manual for more details.
	Caution UV Radiation: Ultraviolet rays may be present.

	Biological risks: In certain areas of instrument and related sample processing, there may be potentially infectious microorganisms. The correct laboratory procedures should be observed and local laws and regulations in the case of disposal of the substances should be complied with.
	Crushing of hands: When the user opens or closes the transparent flip of the instrument, please take care to keep your hands.
	Alternating Current.
	Protective Conductor Terminal.
	“OFF” (Power).
	“ON” (Power).
	Disposal of Electrical and Electronic Equipment: The equipment must not be processed according to the conventional waste disposal. It is the responsibility of the user to return it to the waste collection point of the electrical and electronic equipment for recycling.
IVD	In Vitro Diagnostic Medical Device.
	Consult Instructions for Use.

CAUTION:

Failure to comply with the indicator affixed to the analyzer or in the operating manual, including the symbol of warnings, precautions and prompts, will cause system damage or adverse impacts on

system functionality; or may result in physical injury or deterioration in the state of health, or damage to property.

1.1.4 General Safety

The operating manual gives important instructions for handling the system. Safety instructions must be observed at all times. Before or during the process of operation, the following steps must be observed:

Before operating AutoMimo 1200, read the following safety explanations carefully and understand the contents completely. User must be trained before operation.

CAUTION:

1) Do not perform any operations or functions which are not described in the instruction. If trouble occurs, please call post- sales service.
2) The operating manual must be accessible to the user at any time.
3) As for maintenance and service, it is forbidden to modify AutoMimo 1200 and replace the components or accessories of the instrument.
4) It is not allowed to use parts which are not provided by Autobio. It is not permitted to remove protective device.
5) Personnel without authorization of Autobio can not install or maintain AutoMimo 1200, nor make any changes during installation.

NOTE:

Improper connection between AutoMimo 1200 and the peripheral devices with mains supply, as well as usage of damaged cables may result in severe personal injury even lethal consequences and property damage (e.g.fire).

1.1.4.1 Liability

It is the users' responsibility to comply with national and local law's regulations and laboratory procedures for installation and operation of the instrument.The manufacturer has done everything possible to guarantee that the equipment functions safely, both electrically and mechanically.

Autobio is not liable for any loss or damage including consequential or special damages resulting from the misuse of the contained information or other fault of personnel and contractors.Additionally, the manufacturer assumes no liability for any damages,including those to the third parties, which is caused by improper use or handling of the system.

The instrument may only be used in accordance with its intended use.
Use the consumables and accessories described herein (e.g.disposable reaction vessels, etc,.).

1.1.5 Biological Risks

When running the instrument or handling related liquid, user may be exposed to potentially infectious materials, such as human serum, blood products, etc. Please strictly comply with Good Laboratory Practice in case of infection. Therefore, when dealing with biological hazards or repairing and maintaining the instrument, precautions must be taken to prevent operators from the infectious risks, which include but not limited to the following:

Please take appropriate protective measures, such as wearing approved disposable gloves, waterproof lab coats and safety goggles.

Adhere to national and local provisions, legislation and laboratory regulations.

All articles used in the assays must be considered potentially able to transmit infectious agents. They should therefore be decontaminated and disposed of in accordance with the prevailing regulations and guidelines of the agencies holding jurisdiction over the laboratory and the regulations of each country.

Observe the instructions in the package inserts for a correct use of the reagents.

The following articles should be disposed as potential biohazard:
a) All in vitro diagnostic instruments, pre-treated instruments, patient sample, calibrators based on serum, QC materials and medical wastes.
b) Articles that contact with the potential biohazard: Injector, test tube, waste container, storage, sampling probe, reagent probe, washing tank, incubation tray, etc,

NOTE:

Please contact the factory if the instrument needs to be scraped. The instrument can not be disposed as a regular article.

1.1.6 Electrical Hazards

The system of AutoMimo 1200 does not pose uncommon electrical hazards to operators if it is installed and operated without alteration and is connected to a power source that meets required specifications. It is essential to the safe operation of any system to have basic electrical hazard awareness. So only personnel strictly observing the related national rules and local regulations for the safe electrical operation of the system should perform electrical servicing.

Elements of electrical safety include, but are not limited to the following:
1) Do not interrupt any electrical connection or service any electrical or internal components while the power is on.
2) Keep liquids away from all connectors of electrical or communication components.
3) Do not touch any switches with wet hands.
4) Do not disconnect the grounding contacts.
5) Use cables and multiple plugs supplied or approved by Autobio.

6) Do not put connecting cables at accessible place in order to avoid squeeze or damage.

NOTE:

It is strictly prohibited to add any other device to the socket of AutoMimo 1200 (if available) without permission of Autobio.

Severe personal injury or extensive damage to machine may occur following unqualified work on the instrument or the failure to observe the precautions in this chapter. It will not trigger severe personal injury with lethal consequences and property damages unless not observing the rules and regulations for the safe electrical operation.

1.1.7 Physical Hazards

For most automated (or semi-automated) instruments, there is potential physical injury or bodily harm from moving mechanical components whenever the system is under operation. Users may have a contact with the following hazards: laser light, radiation, heavy objects, trip hazards, moving parts of the instrument and sharp units, etc.

In the event of performing or installing the instrument, it is essential to comply with the instruction for use. If a damage or personal injury occurred during the operation, user shall immediately contact service engineers. Basic safety elements are included but not limited to the following (If applicable):

1) Do not touch directly with the sharp metal edges.

2) Do not overlook or ignore a safety device.

3) Keep all protective covers and barriers in place.

4) Any part of the body is not allowed to enter the mechanical movement arrange .

5) Do not contact with any probe in that the probe tip is sharp and potentially contaminated with infectious material.

NOTE:

Do not wear clothing or accessories that could have a interference with the system.

1.1.8 Fluids Hazards

Users may be exposed to hazardous chemicals or agents when handling lysate solution and matrix or disposing the liquid waste. Observing the instructions below can minimize the risks of fluids hazard.

1) Cleaning or decontamination shall not cause a direct hazard, such as an electrical hazard or a hazard arising from corrosion or weakening of structural parts.

2) Absorb the spill with absorbent material.

3) Accompanying the documentation of reagent kits, you can access the package inserts of corresponding reagents.

4) Protect eyes and skin from touching such fluids. If inevitable contact will occur, please wear appropriate protective device, such as impervious gloves, protective goggles and clothing.

1.1.9 Electromagnetic Wave Interference

AutoMimo 1200 has met the requirements of IEC 61326 on transient emissions and interference resistance. Only cables provided by Autobio can be used to minimize electromagnetic wave interference. Please read the following content carefully and ensure the ambient environment is appropriate:

1) AutoMimo 1200 meets the requirements of IEC 61326 on transient emissions and interference resistance.
2) AutoMimo 1200 is designed and tested according to CISPR Class A. Under some circumstances, it may cause radio interference, please take protective measures.
3) It is recommended that the electromagnetic environment should be evaluated before operation.
4) Do not operate the instrument in close proximity to strong radiation sources (such as unshielded RF sources), as this may interfere with normal operation of the equipment.

NOTE:

1) Autobio is responsible for providing electromagnetic compatibility information of AutoMimo 1200.
2) User is responsible for maintaining the electromagnetic compatibility environment in which AutoMimo 1200 can work properly as intended use.

1.1.10 Radiation Protection

The UV lamp in this product will not be radiated to areas unrelated to operation. The actual irradiation area is shown below:

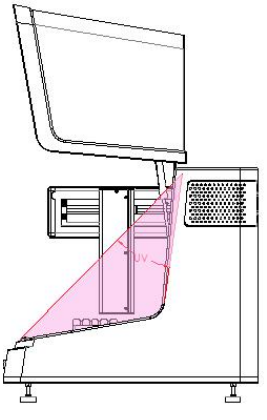


Figure 1.1 Schematic Diagram of Ultraviolet Irradiation Area

This product has the function of software and hardware protection. Under normal use conditions, if

the user opens the transparent cover during disinfection by accident, the UV lamp will turn off by itself. When using other functions, the software hinder the UV lamp on.

In order to prevent the radiation from failure under a single failure condition that self-closing function of UV lamp is invalid under the condition of software control or hardware control, which would pose a radiative effect on users, it is strictly prohibited to perform any operation during disinfection.

1.1.11 Other Residual Hazards

Notwithstanding the manufacturer has try as possible as they can to reduce the risks to an acceptable level, such as inherent safe design and protective measures, users may still at an unfavourable situation. If further clarification is required, please contact service engineer.

AutoMimo 1200 has been designed and manufactured following the applicable regulations and harmonized standards. In regards of risk management, the system has been designed and manufactured applying a risk management process, based upon the EN ISO 14971.

The materials and components of which AutoMimo 1200 is made and the reagents used on the instrument do not endanger the safety or health of users, apart from remaining biohazard and chemical risks and the interference they might cause with electrical and mechanical risks.

During the process of searching for the risk reduction methods, Autobio has applied many principles, which include but not limited to the followings :
1) Eliminate or reduce risks as far as possible (an inherently safe design and construction);
2) Take the necessary protective measures related to the risks that cannot be eliminated, which can refer to the 1.1.5-1.1.9;
3) Inform users of the residual risks due to any defects of the protective measures adopted, indicate whether any particular training is required, and specify any need to provide personal protective equipment.
4) Estimate the risks of hazardous situations, taking into account the severity of potential harm and the possibility of its occurrence by the application of an appropriate FMEA (Failure Mode Effect Analysis) methodology.

NOTE:

An emergency stop device would not lower the risk, because it would not reduce the stopping time in connection with the main switch of AutoMimo 1200. Autobio bears no responsibilities concerning the losses or damages arising from the improper operations or maintenance by unauthorized personnel. It is recommended that users have a close contact with service engineer in case emergency occurs.

1.1.12 Ergonomic

Based on the ergonomic principles, AutoMimo 1200 is designed regarding of the user habits, interface layout, information prompts and software interface operation safety etc. to reduce discomforts fatigue, physical and psychological stress. If the user needs other functions, please call

post-sales service provider.

1.2 Product and Manufacturer Information

Product Information:

Product Name: Automated Sample Preparation System
Product Model: AutoMimo 1200
Manufacturing Date: Refer to the label of the instrument
Service Life: 10 Years
Applicable Software Version: V1

NOTE:

The service life of the instrument is closely related to the operating environment and frequency of use. Regular maintenance can duly extend the service life. If there is any problem, please call post-sales service provider.

Registrant:

Name: Autobio Labtec Instruments Co., Ltd.
Legal Address: No.199, 15th Ave, National Eco & Tech Zone, Zhengzhou 450016, China
Tel: [86]-371-6798-5313

Manufacturer:

Name: Autobio Labtec Instruments Co., Ltd.
Legal Address: No.199, 15th Ave, National Eco & Tech Zone, Zhengzhou 450016, China
Tel: [86]-371-6798-5313

Post-sales Service Provider:

Name: Autobio Diagnostics Co., Ltd.
Legal Address: No.199, 15th Ave, National Eco & Tech Zone, Zhengzhou 450016, China
Tel: [86]-371-6798-5313

NOTE:

Please prepare the serial number of the instrument before calling post-sales service provider.

2 Product Description

2.1 Structure Composition

AutoMimo 1200 includes the instrument, computer (optional), and software. The instrument includes storage area of disposable pipette tips, reagent, specimen plate and waste consumables, in addition to sampling module, heating module, ultraviolet module and electronic control system inclusive.

The specimen plate, also called sample target plate, is mainly used to hold the added sample or reagent.

The key parts of the instrument are marked in Figure 2.1.

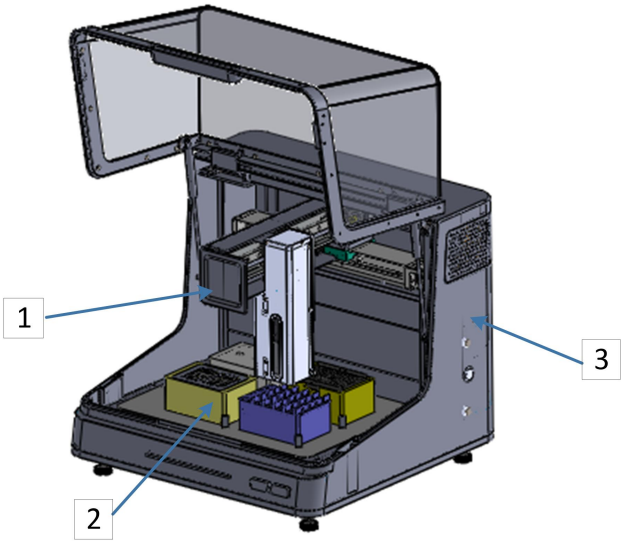


Figure 2.1 Instrument Composition of AutoMimo 1200

1	sampling module
2	Four storage areas for pipette tips, reagent, specimen plate and waste consumables respectively
3	Electronic control system

2.2 Intended Use

AutoMimo 1200 is intended for in vitro diagnostic use only. It is used for precision loading of reagents or samples detected by clinical laboratory analysis instruments.

2.3 Working Principle

Automated Sample Preparation System (Hereinafter AutoMimo 1200) includes two parts: pipetting and sampling, that is, all actions in the process of pipetting can be realized by means of movement of the mechanical arm of three-axes to different functional areas, and the sample is sucked and added by the sample pipettor module. Following the completion of samples adding, the heating module directly heats the samples in the specimen storage area to accelerate the drying process of samples, and the ultraviolet lamp can be turned on to disinfect the internal instrument.
The Automated Sample Preparation System includes function of pipetting, heating and ultraviolet disinfection.

2.4 Performance Parameter

1) Repeatability of sampling
Volume of sampling: 1~200 μl. CV ≦ 8 % when sample of 1 μl is added. CV ≦ 2% when sample of 200 μl is added.
2) Accuracy of sampling
Volume of sampling: 1~200 μl. Accuracy ≦ ± 0.4 μ l when sample of 1 μl is added, Accuracy ≦2% when sample of 200 μl is added.

2.5 Operation Environment

The AutoMimo 1200 needs to be used indoors and must meet the environmental conditions in the table below in order to operate correctly.

Table 2.1 Operation Environment Conditions

Items	Demand
Temperature	Normal operating environment temperature: 10 ℃ ~ 30℃
Relative Humidity (RH), (non-condensing)	Normal operating environment humidity: ≦70%
Atmospheric pressure	700 hPa ~ 1060 hPa
Power supply	AC 100-240 VAC; 50/60 Hz
Ambient brightness	Illuminance≥ 300
Pollution Degree	2

Electromagnetic interference	Stay away from strong electromagnetic interference sources
Other equipment interference	Keep away from high power, strong amplitude, strong optical instruments or equipment.
Attitude	No more than 2000 m

2.6 System Specifications and Features

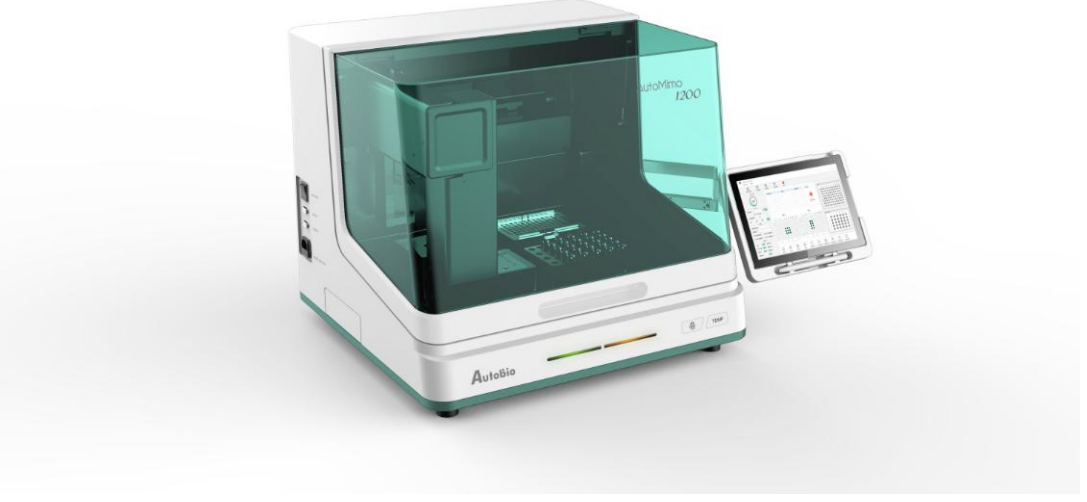


Figure 2.2 External View of AutoMimo 1200

2.6.1 Weight

Table 2.2 Weight of the Instrument of AutoMimo 1200

Item	Weight
Instrument	56 ± 2kg

2.6.2 Power Requirement

Table 2.3 Power Requirements

Component	Requirement

Instrument	Voltage: 100-240V Frequency: 50/60Hz Power Consumption: 110VA
Computer	Voltage: Refer to documents of manufacturer Frequency: Refer to documents of manufacturer Power Consumption: Refer to documents of manufacturer

2.6.3 Dimensions

Table 2.4 Size and Dimension

Instrument	Length: 588mm Height: 562mm Width: 510mm
Clearance Required to Ventilation, Safety Operation and Maintenance	Back: 340mm Top: 490mm Side: 400mm

2.6.4 Electronic Requirements

2.6.4.1 Power Supply

The power output should meet the requirements of the following table in order to avoid damaging the instrument.

Table 2.5 Electronic Requirements

Items	Requirements
Circuit Power Supply	AC 100-240 V，50/60 Hz, 110 VA，single-phase power
Line specificity	Dedicated (only for the connection of AutoMimo 1200 to the circuit)
Power cord connector	AC 250 V, 10 A
Power cord plug	AC 250 V, 10 A

Power cable	300 V-500 V, H05VV-F, 1.5 mm2
Line outlet	Not more than 2 m from the AutoMimo 1200 instrument and compatible with the instrument's plug
Voltage fluctuation	Not more than ±10 % of the nominal voltage
Maximum resistance between the safety ground wire and the laboratory safety ground.	Not more than 0.1 Ω
Transient overvoltage	II
Sound pressure level	< 85 dB

2.6.4.2 UPS for the Instrument

Table 2.6 UPS Configuration Requirements

Items	Requirements
Minimum output capacity	> 200VA
Output voltage	AC 240V
Output frequency	50 Hz
Output waveform	Sine wave
Certification	CE

2.6.4.3 Computer Configuration

Table 2.7 Computer Configuration Requirements

Items	Requirements
CPU	Desktop CPU: Intel i3 or above / Tablet CPU: Intel x5 or higher
Internal storage	> 4 G
Hard Disk	> 50 G
Display	1920 × 1080 resolution is recommended

VGA Card	Discrete Graphics
System Requirements	Windows 10 64-bit version
Safety Certificate	Compliance with CE certificate and meet current edition of IEC 60950-1 requirement
Line power	100-240 VAC, 50/60 Hz

2.7 Used in Combination with Other Products

This product is not used in combination with other medical devices, medicines or other medical technologies.

3 Installation & Commissioning

The installation and commissioning of AutoMimo 1200 must be executed by service engineer. Do not take out the instrument from the package without the engineer presenting at the site. After installation, any other device can not be plugged in the socket connected with the instrument.

3.1 General

The instrument can not be installed and used in a laboratory with potentially explosive atmosphere. It can only be operated under the working conditions (temperature, altitude, on direct sunlight exposure and humidity) specified in this manual. End-user is obliged to assess whether the above requirement has been met.

3.2 Introduction of Instrument Connection

On the left side of the AutoMimo 1200 instrument, there are two connections as shown in Figure 3.1. Connect the corresponding cable or signal cable to the corresponding port on your computer, as shown in Figure 3.2 and Figure 3.3.

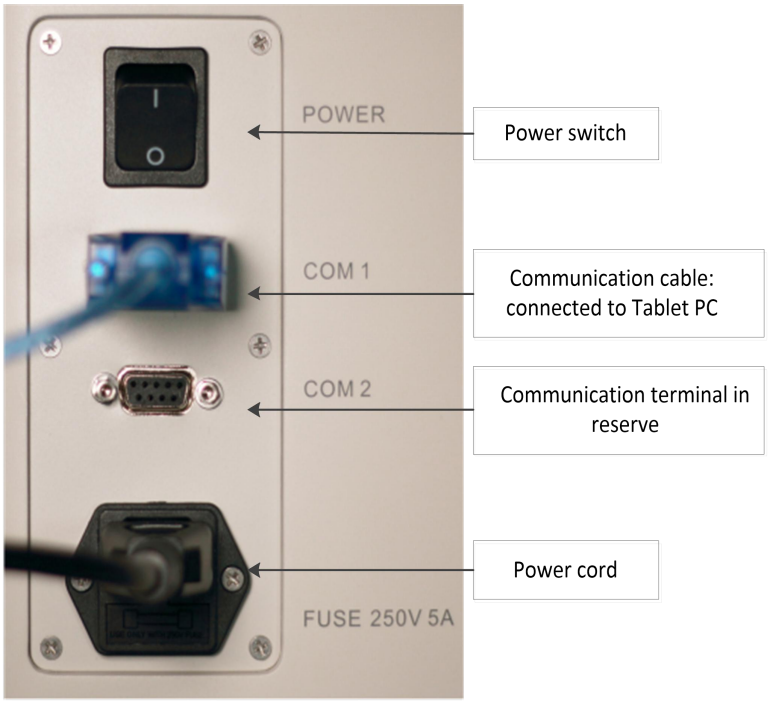


Figure 3.1 AutoMimo 1200 External Wiring Connection

Figure 3.2 Connection between AutoMimo 1200 and Desktop

When laptop is used, connect the communication cable to Micro USB, shown as figure3.3.

NOTE:

Please connect the power cable according to the following drawings:

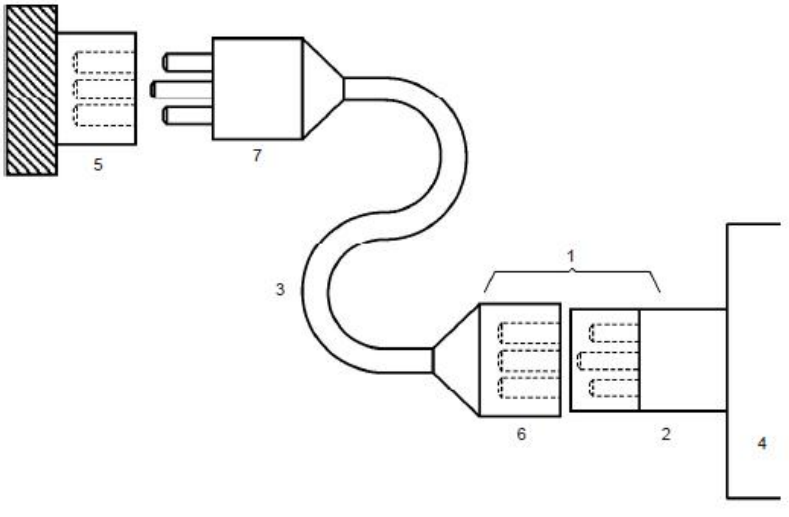


Figure 3.3 Cable Connection Diagram

Table 3.1 Description of each Module.

1 : Appliance coupler	2 : Appliance inlet
3 : Cable	4 : Equipment
5 : Fixed mains socket-outlet	6 : Mains connector
7 : Mains plug	

CAUTION:

To avoid the risk of electric shock, this equipment must only be connected to a mains supply with protective earth.

Conductor which can be touched or may cause a shock hazard should be grounding. Please connect the power cord supplied by manufacturer to mains supply with a protective earth.

Contact the professional engineer when transporting or removing the instrument;

APPLIANCE COUPLER or MAINS PLUG is used as the isolation means from the SUPPLY MAINS. Do not position the equipment where it is difficult to operate the disconnecting device ;

Please replace detachable mains supply cords with adequately rated cords.

Please insure the Tablet PC is in sufficient charge before use.

AutoMimo 1200 cable is connected to the tablet PC per default configuration. If the user needs to connect to the desktop computer, please contact our engineer from Autobio.

3.3 Installation Precautions

1) The instrument should be installed in a good ventilation environment, and there must be no obstructions near the right vent.

2) The surface of the installation position of the instrument must be hard, and the bearing capacity of the platform is not less than 230 kg.

3) The instrument must be installed in the position where it is convenient to operate the mains supply switch and emergency brake switch.

4) Please contact professional engineers before transporting or removing the instrument.

5) Ensure the housing is closed before the instrument is power on.

6) All power lines and signal lines should be disconnected when the equipment is transported. Two people lift the four retaining brackets of the instrument to move the instrument to other position, or place the instrument in the mobile cart to transport to the designated occasion, then place on the

designated work surface.

7) Conductors that are accessible or may cause a shock hazard should be grounded. Connect the mains cable to a power supply with grounding protection.

8) When installing, make sure that all fixing hardware (such as screws and fasteners) are in the proper position on the detachable protective barrier.

9) Failure to use the equipment in accordance with the manufacturer's instructions may result in damage to the equipment.

10) After the instrument is installed and commissioned by our technical engineers, the customer still needs to go through the technical training of our company before operating the instrument to avoid instrument failure.

CAUTION:

In no event shall Autobio bear any responsibilities for injuries and damages arising from persons not fully trained or authorized by Autobio.

3.4 Installation of Software

3.4.1 Installation Environment

1) Hardware environment

Dominant frequency: CPU:1.4 GHz or above; RAM: 4 G or above;

LCD: min. Size: 18inch, recommended resolution :1920 × 1080;

Available hard disk space: 50G or above.

2) Software environment

Operating system: Windows10 (64 bit) or above.

3.4.2 Installation Specification

The software is delivered on CD-rom as an accessory of the instrument, and installation of the software will be executed by the engineer from Autobio during the installation and acceptance of the instrument.

4 Use of System

Change of analysis performance: please contact service engineer when there is an error message or a change in the diagnosis.

NOTE:

Refer to chapter 1.1.5-1.1.11 for all potential safety hazards. Do not perform any operations or functions not described in the operating instructions. If trouble occurs on the diagnostic system, contact service engineer immediately. If the instrument is operated unreasonably and improperly, erroneous assay result, damage to the system and personal injury may be caused.

4.1 Start-up & Shutdown

The AutoMimo 1200 is operated through mains power supply and can be powered off after operation.

4.1.1 Start-up

Prior to start the instrument, it is suggested to check whether all the modules and constituent parts are well fixed. Then, strictly observe the orders below:

1) Turn on the computer.

2) Make sure that the mains cable of AutoMimo 1200 is connected to the main power supply correctly.

3) Press power switch of AutoMimo 1200 as shown in Figure 7, that is, press the I side and the main power supply is connected.

Figure 4.1 Start-up

4) Open the software  , the software detailed information is shown as section 5.1 of Chapter

Five.

5) After pressing "POWER" switch, and open the software, the indicator turns green, which means the instrument is powered on normally, as shown in Figure4.2.

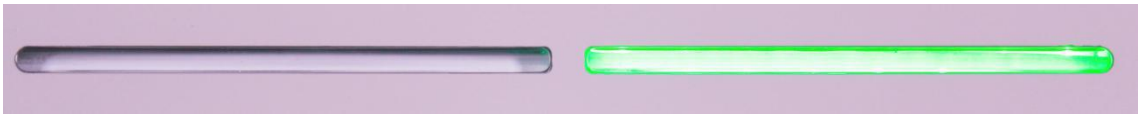


Figure 4.2 Instrument Status

4.1.2 Shutdown

1) Press "POWER" switch of the AutoMimo 1200 as shown in Figure 4.3. Press the ○ side to disconnect the main power supply.

Figure 4.3 Shutdown

2) The indicator turns off at right side of the instrument (Figure 4.4), which means the instrument is power off.

Figure 4.4 The Indicator at Right front of the Instrument (Shutdown)

4.2 Instrument Status Check

There are two switches in the front of the instrument, one of which is UV disinfection switch, and the other is incubation switch. Press the UV disinfection switch and the instrument will be disinfected for 30 minutes (default time can be set by user). The UV lamp will be automatically extinguished after 30 minutes. The switch is shown as Figure 4.5.

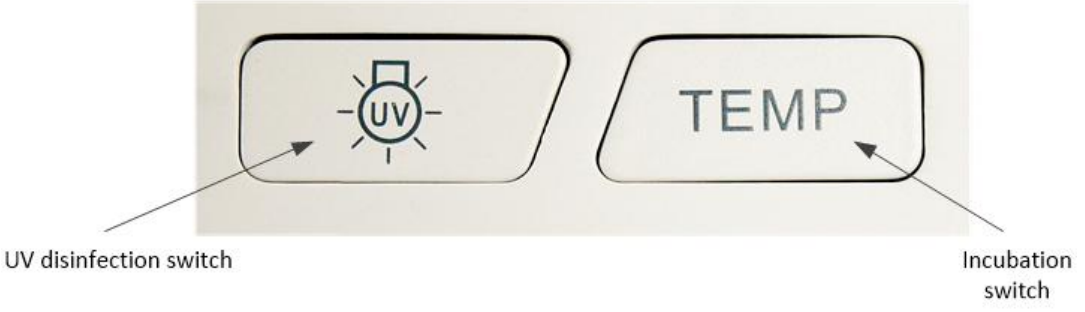


Figure 4.5 Instrument Switches

CAUTION:

The UV lamp can only be turned on when other functions of the instrument are not used. The instrument has made a strong limit to the UV lamp during the movement of the mechanical arm. In addition, the UV lamp should only be turned on when there is no any people around in case of people getting injured.

4.3 Instrument Indicator

The indicator of the instrument is shown in Figure 4.6. When the heating button is turned on, the left indicator light at the front of the instrument is always bright orange, and the left indicator light is off after the heating is completed. When the instrument is powered on normally, the front right indicator flashes in green at a frequency of 1 time/second. When the instrument has a malfunction, the indicator turns red.

Figure 4.6 Indicator at the front of the instrument

4.4 Instrument Operation Procedure

The operation procedure of the AutoMimo 1200: open the transparent lid → place the pipette tips, target reagent, specimen plate → close the lid → turn on the instrument power → start the instrument control software → check the instrument status → calibrate the instrument →compile and save sample application method → method load operation → open the cover and remove the specimen plate → air purification → ultraviolet disinfection.

Among them, instrument calibration, air purification, UV disinfection are optional steps and can be used when necessary. See Chapter 4 for detailed steps.

CAUTION:

Make sure that the coordinate is at the right position before operation. If there is any deviation, please set the coordinate in accordance with section 5.3.2 of Chapter Four.

4.5 Reagents Used during Operation

Because the parameters of different reagents are not same, such as viscosity and surface tension. The instrument can only use the dedicated reagent manufactured by Autobio, which is a default manner. If the user requires other reagent, please contact personnel of Autobio for assistance.
If any questions, please contact after-sales service of Autobio.

4.6 Consumables and Replacement

4.6.1 Ventilation System

The AutoMimo 1200 has the internal ventilation function, and the purification filter shown (Fig. 4.7) needs to be replaced after one to one and half years according to the frequency of usage. When replacing, you can open the wedging block shown (Fig. 4.8) to replace it.

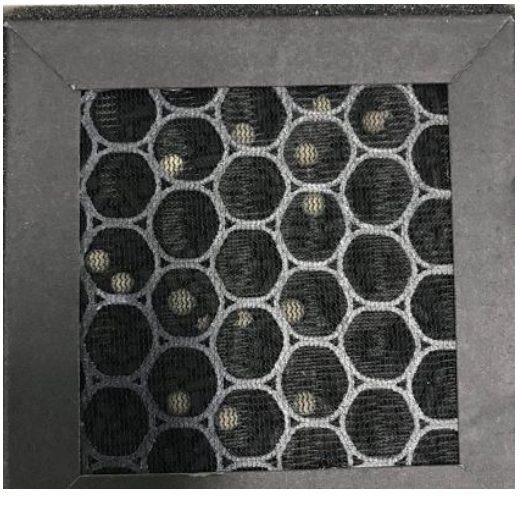


Figure 4.7 Purification Filter

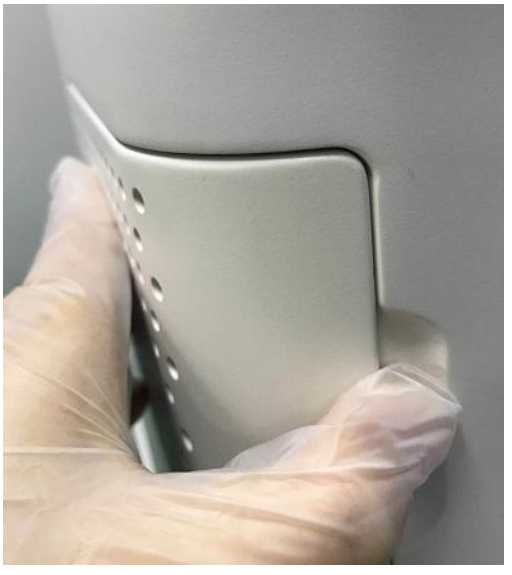


Figure 4.8 Wedging Block

4.6.2 Pipettor Tips

The pipette tip used in the AutoMimo 1200 is disposable, and Autobio has the matching tip kits in package, which shall be replaced together with the tips baffle after use.

4.6.3 Specimen Plate

The specimen plate is also called sample target plate, and sample target plate used with AutoMimo 1200 is a 96-well or 48-well specimen plate.

4.6.4 Pipettor Tips Rack

The pipette tips storage area can be disassembled or replaced according to requirements, and the pipette tips rack can be taken out directly during disassembling.

4.6.5 Regent Rack

The reagent storage area can be disassembled or replaced according to the requirements, and the reagent rack can be taken out directly during disassembling.

4.7 Operation Cautions

For the purpose of assuring body safety of user and instrument ' s quality, and preventing unnecessary loss due to improper operation, please read this manual carefully and observe the following guidelines.

1) Please read all contents of this manual before using the instrument.

2) Wear appropriately protective clothing, masks, goggles (when the UV lamp is turned on) and

gloves when using the equipment.

3)The solvent used by the instrument should be handled according to the national safety regulations and the manufacturer's suggestion.

4) The instrument interior can be disinfected with a soft cloth dipped with 75% ethanol. The user can wipe it according to the frequency of use of the device after each use. The housing including the transparent lid can be directly wiped with a dry soft cloth. Do not use strong acid, strong alkali and other unsuitable solutions to clean. Please make sure the power supply has been turned off before cleaning.

5) The instrument is large and the oscillation may affect the performance parameters of the instrument, therefore, it is not recommended that the user remove the instrument without Autobio ' s permission, which may damage the instrument.

6) Care should be taken when placing the sample reagent, sample pipette tips, and sample target plate to prevent liquid from spilling.

7) Make sure that all fixed parts are installed in place on the detachable protective barrier during normal operation of the instrument. If not, contact the manufacturer or customer service and can not operate the instrument.

8) It is strictly forbidden for the user to disassemble the instrument shell.

9) The pipette tip is disposable. It is strictly forbidden to reuse. Please properly handle according to the experimental requirements.

10) This product is used for the clinical laboratory, and the operator is the professional laboratory physician or laboratory technician trained in instrument-related knowledge.

5 AutoMimo Operator

5.1 Software Start

The software will be launched after double click on the icon  , then login interface of AutoMimo Operator will pop out, as shown in the figure 5.1.

Figure 5.1Login Interface of AutoMimo Operator

After inputting correct user name and password and clicking “Login”, the main operational interface will pop out.

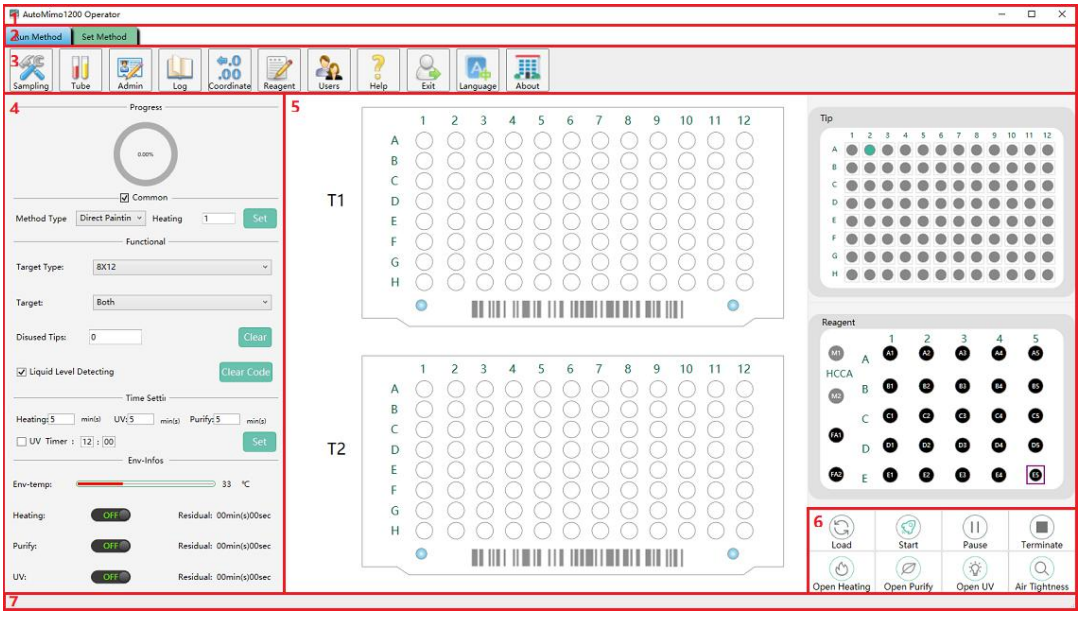


Figure 5.2 Main Interface of AutoMimo Operator

Table 5.1Structure Description of Main Interface of AutoMimo Operator.

Table5.1 Structure Description of Main Interface

NO	Description
1	Title bar
2	Tab bar
3	Menu bar
4	Environment parameter area
5	Method compiling running area
6	Button area
7	Information bar

5.2 Interface Structure

5.2.1 Title Bar

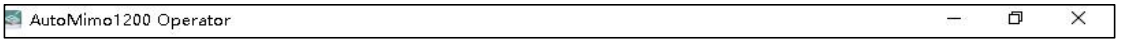


Figure 5.3 Title Bar

The interface can be adjusted by clicking minimization and maximization button.

5.2.2 Tab Bar

Figure 5.4 Tab Bar

There are two tab bars in AutoMimo Operator, one of which is “Run Method Set”, and the other is “Compile Method Set”. User can realize quick compiling and running method in “Run Method Set”, refer to 5.5 chapter in detail.

Users can compile more complex methods according to requirements and save them in the “Compile Method Set”, and complete the sampling by clicking "Load" button under the “Run Method Set” to select the method set compiled by user, refer to 5.4 chapter in detail.

The user can switch to the corresponding functional interface by clicking the corresponding tab.

5.2.3 Menu Bar

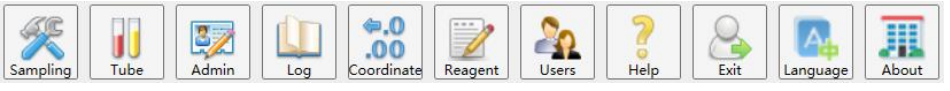


Figure 5.5 Menu Bar

By clicking the menu button in the menu bar to activate the settings or query dialog box, setting the corresponding parameters or entering the query dialog box to access the relevant information. Click the “Help” button to go to the corresponding page. This software interface can be closed by clicking “Exit” button. Clicking “Exit” button when the method set is running, and warning dialog box will pop out to remind the user in case of sampling failure due to software closure by mistake.

5.2.4 Main Area

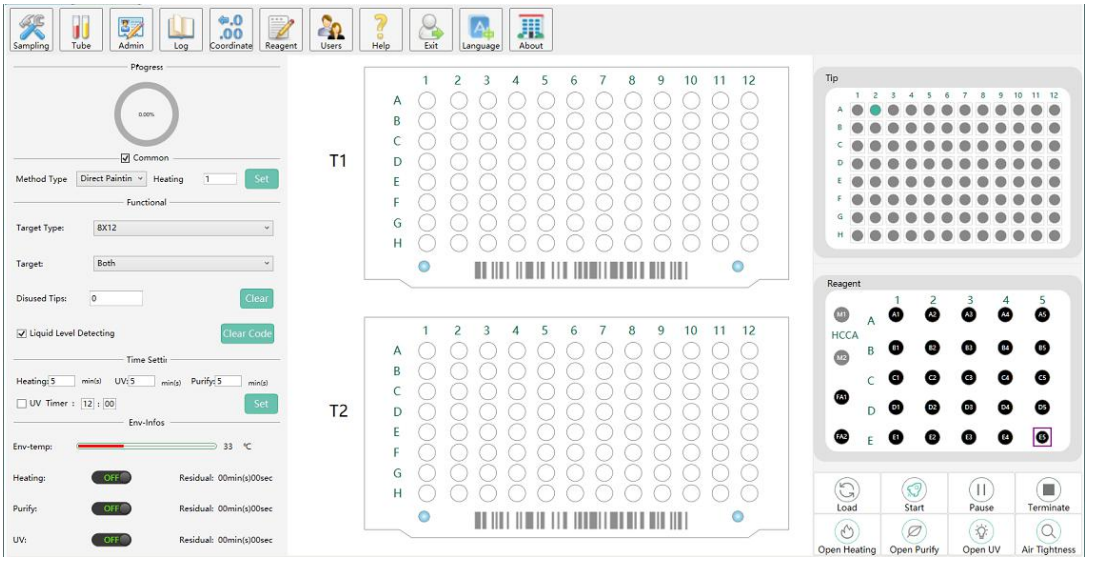


Figure 5.6 Main Area

Main area is composed of environment parameter area, method set compiling area and operation function area. Most of the operation of the user shall be executed on the Main Area.

5.2.5 Infobar

Figure 5.7 Infobar

The infobar interface: **Fault code 001, Operating platform fault** , which is located below the real-time log bar and is mainly used to display the prompt message when running is abnormal and also show the residual liquid volume for current sample.

5.3 Parameter Setting

Generally speaking, parameter setting has been completed after the AutoMimo Operator is launched. However, if there is any fine adjustment, the user can set up the parameter or query related information in the poped-out dialog box appeared after clicking button in the menu bar.

5.3.1 Sampling Scheme Setting

The dialog box can be opened by clicking the button , the default loading displays the top schemes sorted by name among all sampling schemes. The interface is shown as Figure 5.8 below:

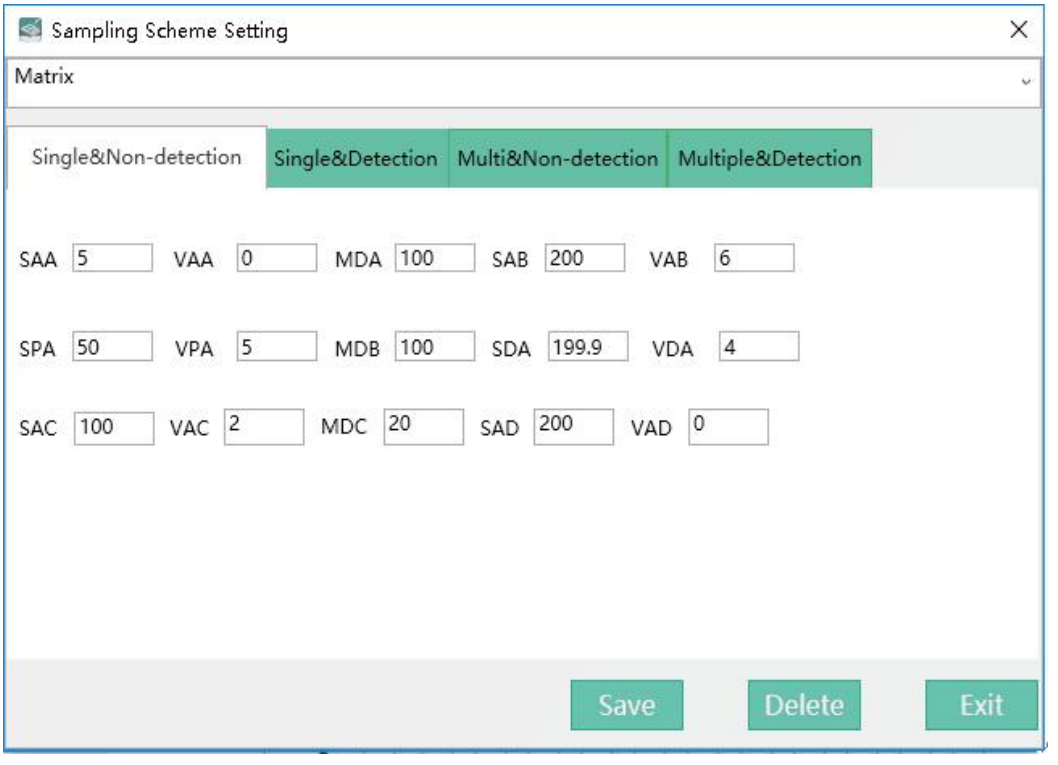


Figure 5.8 sampling Setting

There are three default sampling methods: matrix, formic acid, bacteria suspension, which can be added according to the requirements of user. As the results of sampling, sampling and liquid detecting can be directly affected by the parameter of sampling scheme, the user are not allowed to set up the parameter without permission. If there is demand, please contact our engineers.

CAUTION:

The formic acid mentioned in this manual refers to the lysate 1 in the reagent kits dedicated by Autobio, namely 60% formic acid. Matrix mentioned refers to the matrix powder in the kit, lysate 2, and matrix solution formulated by buffer, and it also refers to the matrix solution in the matrix kit.

5.3.2 Coordinate Setting

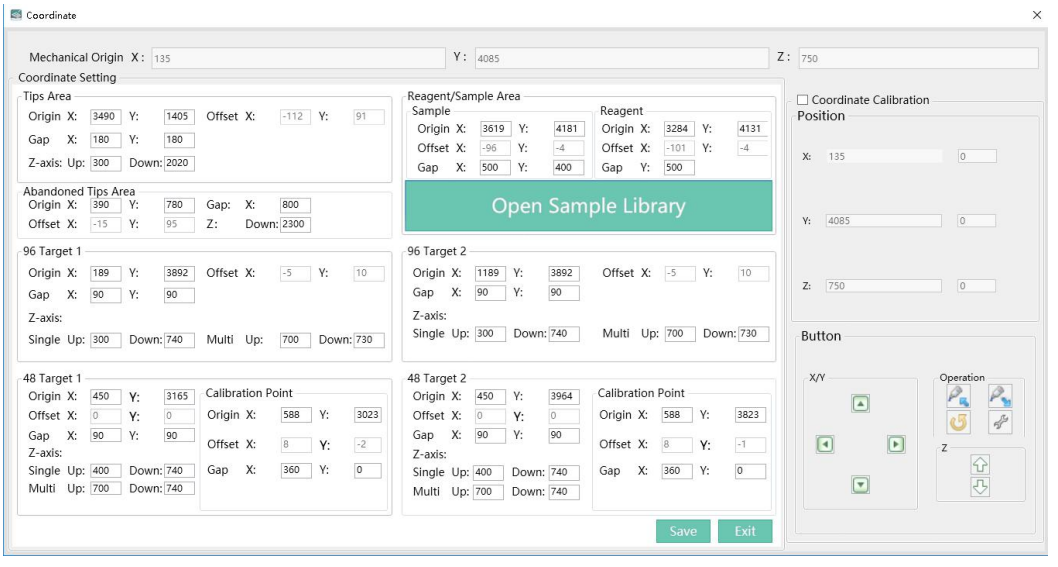


Figure 5.9 Coordinate Setting

It is required that coordinate should be set under the guidance of the engineer of Autobio after entering into the coordinate setting interface by clicking the button . Users can make a calibration setting to the mechanical origin coordinate and set z-axis coordinate of each zone through coordinate calibration. The position of mechanical arm can be influenced by the coordinate parameter, therefore, please set the parameter with care. All the parameter editing boxes have upper and lower limitation. If the setting exceeds the limitation, only the data close to the limitation will be taken when the configuration is saved. After “Save” button is clicked, setup will become effective immediately. The coordinate setting interface will be exited after “Exit” button is clicked. The following description is specially added to explain coordinate calibration.

1）The mechanical arm will automatically take the first sampling tip in the upper left of the sampling tips area by clicking the button.

2）Please fill the X,Y and Z coordinates of the mechanical origin into the coordinate calibration edit box. Press any button in the X/Y and Z regions, and the mechanical arm with sampling tip will move to the mechanical origin. Please observe whether it is consistent with the origin. If there is deviation, you can fill in the deviation value in the second edit box of the line of X, Y, Z in the location area. Click the corresponding button in each area for fine tuning.

3）After aligning with the mechanical origin, click the “Set” button to override values of X,Y and Z into the editing box of the mechanical origin, and click the “Save” button to complete coordinate correction and save.

CAUTION:

As improper operation of coordinate calibration may cause machine damage, the user is requested to operate under the guidance of our engineers.

It is prohibited to execute sampling and coordinate settings when the method set is running or the cover is open.

5.3.3 User Management

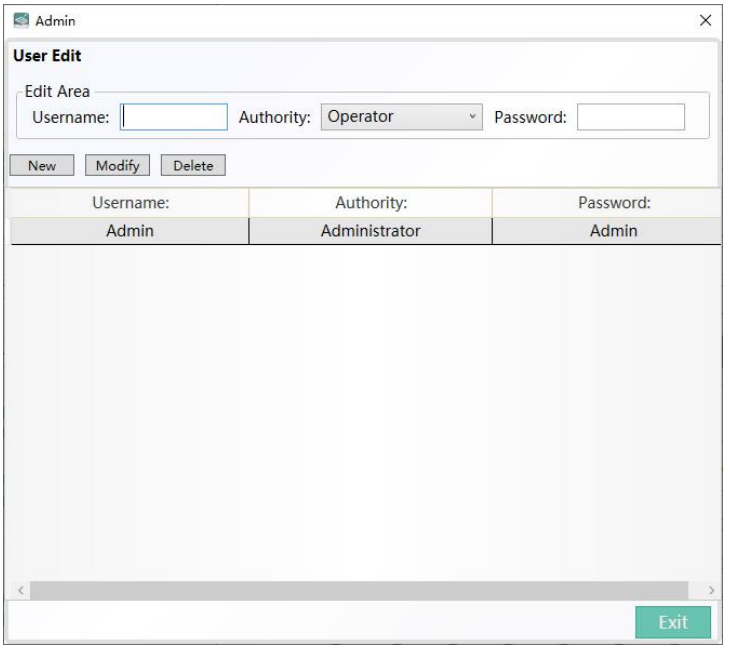


Figure 5.10 User Management

If you have administrator authority, you can enter this interface by clicking the button in the menu bar.

1）**Create**

A new user information can be created by clicking the button after inputting user name and password in editing area and the permission. Note: If the user name is already existed, “Error” dialog will pop out due to failure of “Create”.

2）**Modify**

The user information will appear in the edit area after a row of user information being chosen in the table. The user information can be modified in the edit area. The modified user information will be saved and updated in the table by clicking “Modify” button.

3）**Delete**

One row of user information can be deleted after the information is selected and “Delete” button is clicked.

5.3.4 Reagent Description Setting

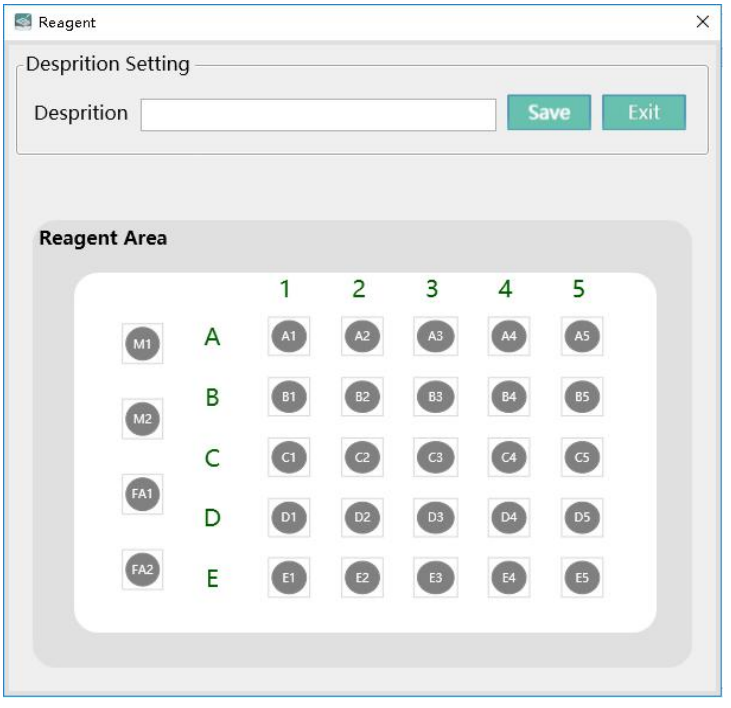


Figure 5.11 Reagent Description Setting

The user can enter the reagent description setting function by clicking the button on the menu bar. In the “Reagent Description Setting” area, description of each sampling spot in the reagent area can be set. If a spot is set as the name of the reagent it contains, the top two points of the four points on the far left are fixed as the sample spot of the matrix, and the lower two points are fixed as formic acid points, please try not to change its description. The specific operation is in the following: when clicking a spot in the lower part (sampling/sampling area), the current description of the spot will be displayed in the upper editing box, and the edit box description will be modified, then the modified description of the point will be saved by clicking “Save” button.

5.3.5 Log Management

Log

Search

Username: All users Start Date: 05-14-2020 00:00:00 End Date: 05-14-2020 16:20:59 Search

User	Log	Data time
Admin	Enter Sampling Adding Settings	05-14-2020 16:13:45
Admin	Enter Sampling Adding Settings	05-14-2020 16:13:09
Admin	Insert one submethod	05-14-2020 15:57:53
Admin	Delete one submethod	05-14-2020 15:53:16
Admin	Insert one submethod	05-14-2020 15:49:05
Admin	Discard the edit	05-14-2020 15:49:01
Admin	Insert one submethod	05-14-2020 15:36:10
Admin	Discard the edit	05-14-2020 15:36:01
Admin	Insert one submethod	05-14-2020 15:35:47
Admin	Delete one submethod	05-14-2020 15:35:34
Admin	Insert one submethod	05-14-2020 15:34:22
Admin	Delete one submethod	05-14-2020 15:34:13
Admin	Insert one submethod	05-14-2020 15:33:53
Admin	Discard the edit	05-14-2020 15:33:07
Admin	Insert one submethod	05-14-2020 15:31:41
Admin	Discard the edit	05-14-2020 15:28:29
Admin	Insert one submethod	05-14-2020 15:25:08
Admin	Discard the edit	05-14-2020 15:22:47
Admin	Insert one submethod	05-14-2020 15:18:58
Admin	Discard the edit	05-14-2020 15:18:46
Admin	Insert one submethod	05-14-2020 14:54:03

Figure 5.12 Log Management

User can enter "Log Management" interface by clicking the button  . All operation details of certain period will be displayed by clicking "Query" after inputting user name and selecting start and end date. If the edit box of user name is empty, all users' operation information can be displayed in following table.

5.3.6 Sample Tube Library

Tube

Sample Tube Type Add Delete

Select	Sample Tube Type	Z-axis up	Z-axis down	Z-axis down c	Bottle mouth height	Z-axis down	Z-axis limit
○	T-Tube	300	1340	10	500	1200	1250
○	Matrix Tube	300	1610	40	500	1630	1550
○	Centrifuge Tube	300	1665	5	500	1660	1550
○	Formic Acid Tube	300	1280	20	500	1280	1180
○	Calibrator Tube	300	1240	5	500	1230	1230
○	Pretreated Matrix Tube	330	1180	50	500	1230	1130

Save Exit

Figure 5.13 Sample Tube Library

1）Create

Fill in the sample tube type in the edit box. Click the "Add" button, then a sample tube information

will be added to the table, the other columns are default 0 except the column of “Type of Sample Tube”.

2）**Modify**

Only “Z-axis" parameter can be modified in the table. If other parameters need to be modified, please contact our service engineer for modification. By double-clicking the corresponding parameter in the table, the parameter can be edited.

3）**Delete**

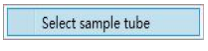
The sample tube information will be deleted by clicking “Delete” button after one single line in the “Select” list is selected from the table.(It is not available to users. If you want to delete it, please contact our engineering .)

4）**Save**

All sample tube information will be saved by clicking “Save” button.

After the user completes the operation, click the "exit" button to exit the functional interface.

5）**Function**

The sample tube information is used for reagent/sample spot at main area and method set compiling area. The default matrix spot corresponds to matrix tube, formic acid spot to T tube, and sample spot to centrifuge tube. If the setup needs to be changed, right click the spot and the icon 

will pop out, then left click it, the following dialog box will be displayed, indicating it has been bound to the reagent/sample point.

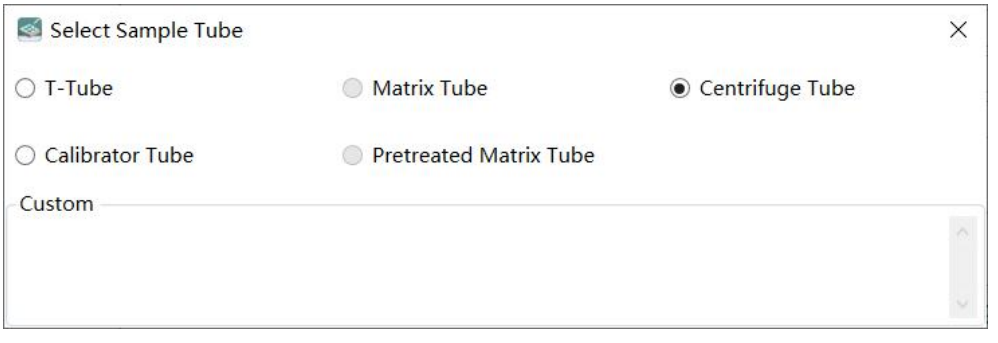


Figure 5.14 Sample Tube Checkbox

5.3.7 Select Language

The software is provided in Chinese and English. If it is required to switch languages, please click the menu bar icon, the software will automatically pop up and users can choose the corresponding language.

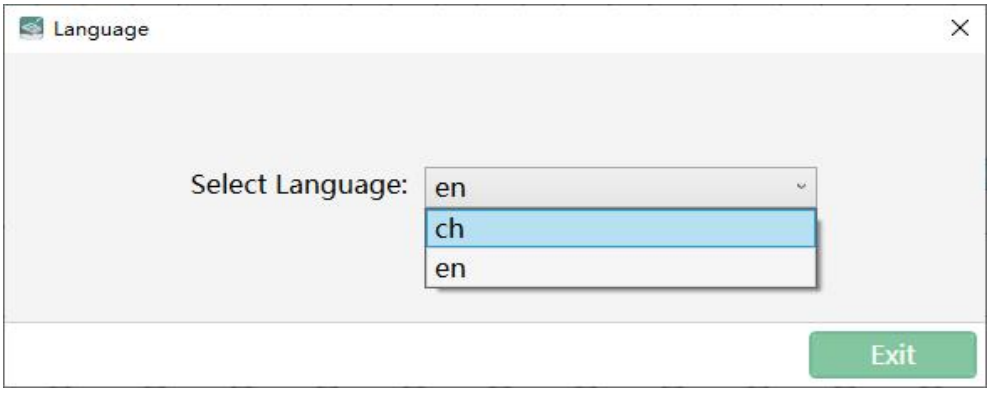


Figure 5.15 Language Selection Box

5.3.8 About

The following information window will pop up by clicking the "About" icon  .

Figure 5.16 About Dialog Box

5.4 Method Set Compiling

When clicking the button 

icon on the tab bar, the user can edit method on the interface and integrate all methods to one set as method set file permanent at the disposal of main operating interface.

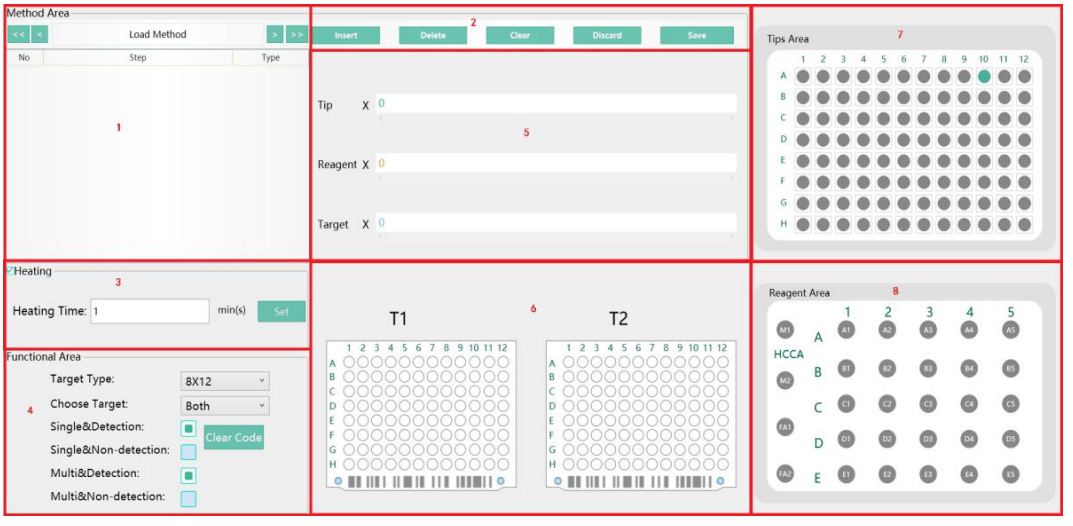


Figure 5.17 Set Method Interface

Table 5.2 Description Set Method

NO	Description
1	Method check, current method setup
2	Method edit area
3	Heating setup
4	Function area: Target plate type, single sample application, constant sample application, scanner
5	Display the compiling method description of pipette tips, reagent and target plate
6	Target plate storage area, select target point of sample application
7	Pipette tips storage area: display the initial spot of pipette tips
8	Reagent storage area, select the reagent which will be applied

5.4.1 Single Sampling Method

There are two methods for single sampling:

1） Click or select one spot at the reagent area and select multiple spots at the target plate area. After clicking “Insert” button, a dialog box will be popped out showed as figure 5.18.

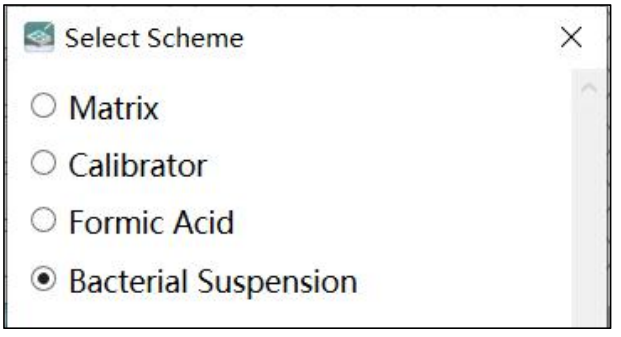


Figure 5.18 New Acquisition Method

2）After choosing sampling scheme, a dialog box will be popped out, showed as figure 5.19.

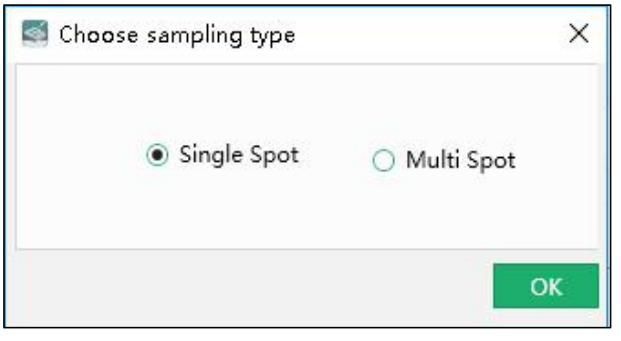


Figure 5.19 Sampling Type Checkbox

3）After clicking “Single Spot” button, the inserted method is single sampling mode under which the pipette tip will return to sampling spot to add the sample again after one target spot is added with sample. After six target spots are added with sample, the pipette tip will be changed and the operation of target sampling is completed.

The operation is shown as figure 5.20:

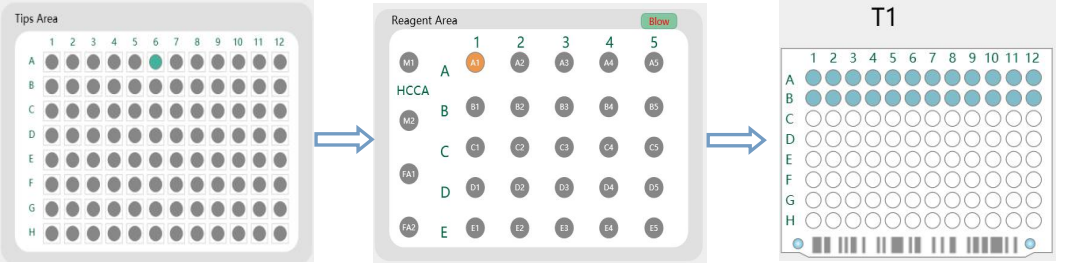


Figure 5.20 Operation Process

Result will be created as figure 5.21:

No	Step	Type
1	Heating	Heating1min(s)
2	Acquire the tip	A6
	Absorb liquid	A1
	Point Target	A1-1
	Absorb liquid	A1
	Point Target	A1-2
	Absorb liquid	A1
	Point Target	A1-3
	Absorb liquid	A1
	Point Target	A1-4
	Absorb liquid	A1
	Point Target	A1-5
	Absorb liquid	A1
	Point Target	A1-6
3	Acquire the tip	A7

Figure 5.21 Sampling Method

4) When the number of selected spot in the reagent area is same as that in the target area, the default is single sampling mode. At this time, click the “Insert" button and the dialog box as shown in Figure 5.22 will pop out.

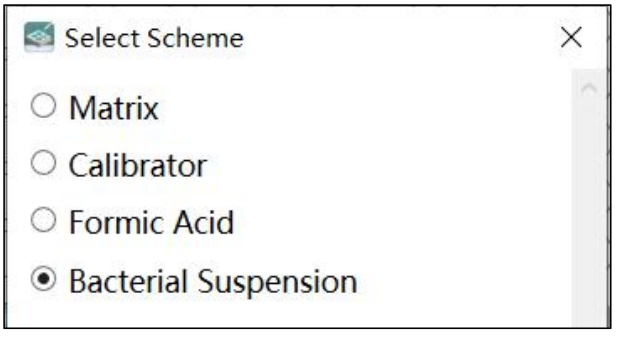


Figure 5.22 sampling Plan Checkbox

The operation is shown as following figure:

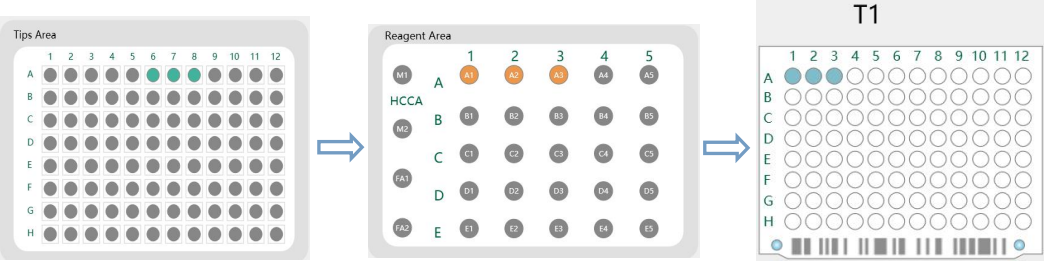


Figure 5.23 Operation Process

Result will be created as following figure:

No	Step	Type
1	Heating	Heating1min(s)
2	Acquire the tip	A6
	Absorb liquid	A1
	Point Target	A1-1
3	Acquire the tip	A7
	Absorb liquid	A2
	Point Target	A1-2
4	Acquire the tip	A8
	Absorb liquid	A3
	Point Target	A1-3

Figure 5.24 Sampling Method

5.4.2 Multiple Sampling Method

1) Left click or select one spot at the reagent area and select multiple spots at the target plate area. After clicking "Insert" button, a dialog box will be popped up shown as figure 5.23.

After clicking "Multiple" button, the inserted method is multiple sampling mode under which the pipette tips will transfer the sample constantly at the target plate. If the target spot is more than 12, the pipette tips will be changed after twelve target spots are added with sample. The sampling operation will be continued until all target spots are added with samples.

Operation process is shown as below:

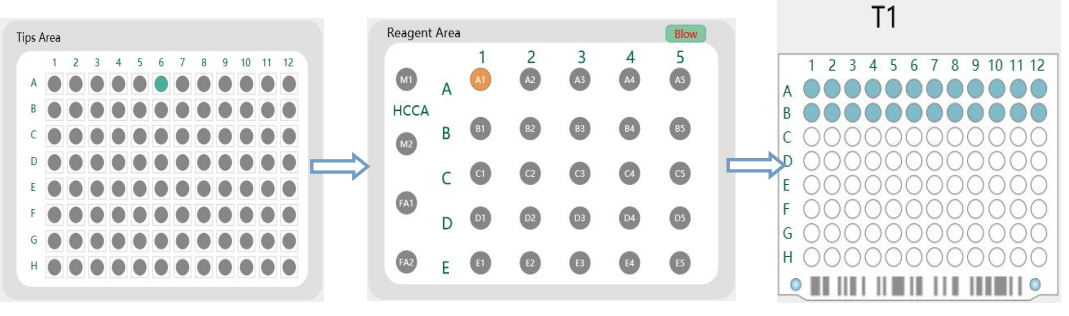


Figure 5.25 Operation Process

Result will be created as following figure:

No	Step	Type
1	Heating	Heating1min(s)
2	Acquire the tip	A6
	Absorb liquid	A1
	Point Target	A1-1
	Point Target	A1-2
	Point Target	A1-3
	Point Target	A1-4
	Point Target	A1-5
	Point Target	A1-6
3	Acquire the tip	A7
	Absorb liquid	A1
	Point Target	A1-7

Figure 5.26 Method Created

2）When the number of selected spots in the target plate is the multiple of that in the reagent area, the default mode is multiple sampling method. At this time, figure 5.27 is shown as below:

Select the sampling plan. After twelve target spots are added with sample, the pipette tip will be changed automatically.

The operation process is shown below:

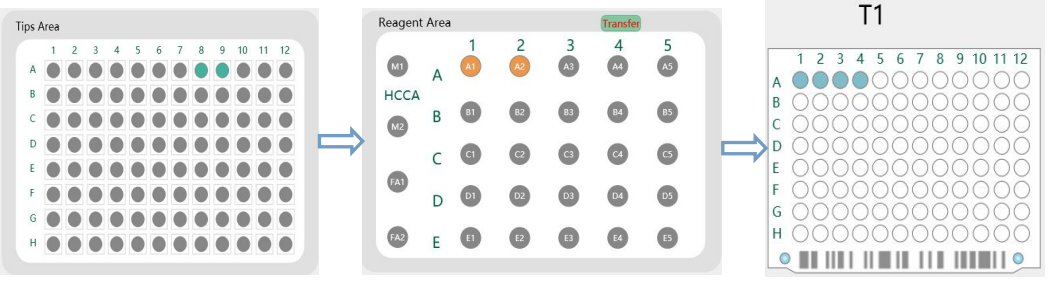


Figure 5.27 Operation Process

Result will be created as following figure:

No	Step	Type
1	Heating	Heating1min(s)
2	Acquire the tip	A8
	Absorb liquid	A1
	Point Target	A1-1
	Point Target	A1-2
3	Acquire the tip	A9
	Absorb liquid	A2
	Point Target	A1-3
	Point Target	A1-4

Figure 5.28 sampling Plan

5.4.3 Pipette Method

If selecting two sampling points on reagent area, pipette button will be displayed. Left click "Pop up" dialog box to set up sampling spot and aspirating quantity. Pipette method will be created by clicking "Insert" at the top of dialog box. One thing needs to be emphasized that pipette tip will not be changed for repeatedly pipette at two same sampling spot.

The operation is shown as figure below:

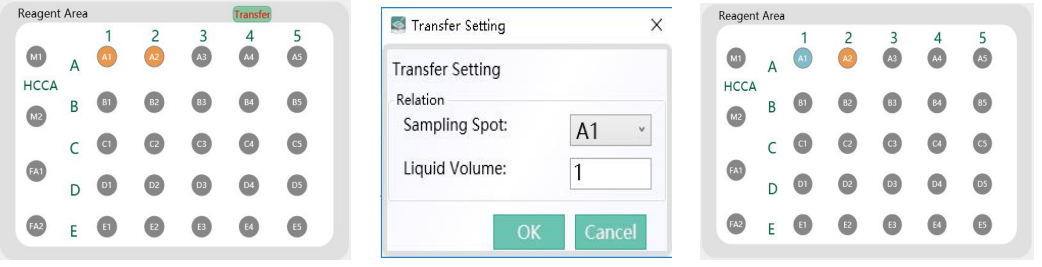


Figure 5.29 Operation Process

Result will be created as following figure:

No	Step	Type
1	Acquire the tip	A1
	Absorb liquid	A2
	Spit Liquid	A1

Figure 5.30 sampling Method

5.4.4 Blending

If one sampling spot is selected, "Blending" button will be displayed. Click "Pop up" dialog box to set up "Repeat times" and "Blending Quantity" and click "Yes", then dispensing operation will be created. Blending method will be created after clicking "Insert" button.

The operation is shown as figure below:

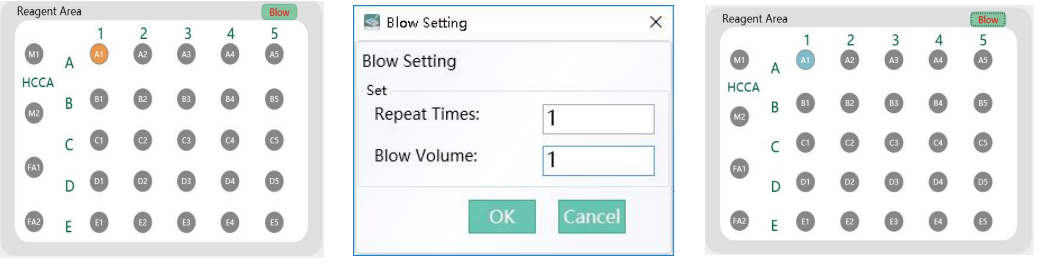


Figure 5.31 Operation Process

Result will be created as following figure:

No	Step	Type
1	Acquire the tip	A1
	Blow	A1

Figure 5.32 Blending Method

5.4.5 Heating Setting

Figure 5.33 Method Created

The function area determines whether the method written by the user is set to heat and the heating time. When the heating time is input in the edit box, click "Set" to confirm the heating time and save it permanently. The user can select or cancel the "Heating" to determine whether the method written by user is enabled to heat.

5.4.6 Barcode Scanner Binding

Select at least one bio-target at target plate area, and the barcode scanner binding button will be displayed in functional area, and dialog box will pop out after clicking the button, shown as figure 5.32. Under such circumstance, if the barcode scanner is connected, it can be used for scanning QR code, then the selected bio-target is bound to the QR code by clicking the "Confirmation"

button. When running the method set , LIS interface document can be generated to connect with LIS system. The above mentioned operation can be repealed by clicking the “Cancel” button.

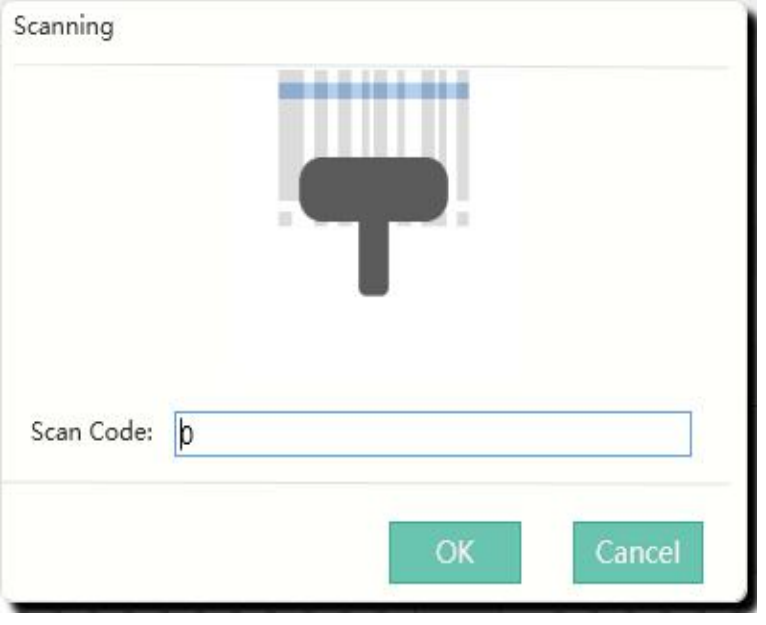


Figure 5.34 Barcode Scanner

At this time, if the scanner is connected, the QR code can be scanned and the selected target is bound to the QR code by clicking the “OK” button. When running this method set, LIS interface file can be generated to interface with LIS system. Scanning will be canceled by clicking “Cancel”.

5.4.7 Current Method Setup

Click << button to shift the current method to the first line of set method. Click < button to shift the current method to previous line. If the current method is the first one, then it will be shifted to the last line. Click > button to shift current method to next line, if the current method is the last one, then it will be shifted to the first line. Click >> button to shift the current method to the last line. The background color of current method is gray, and foreground color is green, shown as figure 5.35.

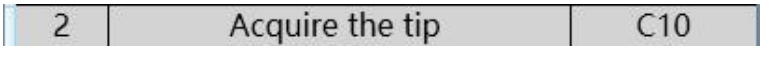


Figure 5.35 Selected Method

5.4.8 Method View

When the user needs to select a compiled method for query or modification, click the Load Method button, and dialog box of file opening will pop out. Select a method file and it will be displayed in the table.

5.4.9 Method Compiling

Method set can be compiled by clicking buttons of “Insert”, “Clear”, “Quit” and “Save”.

1) Insert: Insert the current method to method set by clicking “Insert”.attention should be paid before non-pipetting, blending and heating methods are inserted, a configuration scheme of pneumatic pump checkbox is popped out. If it needs to choose the sampling scheme, please see the figure 5.36.

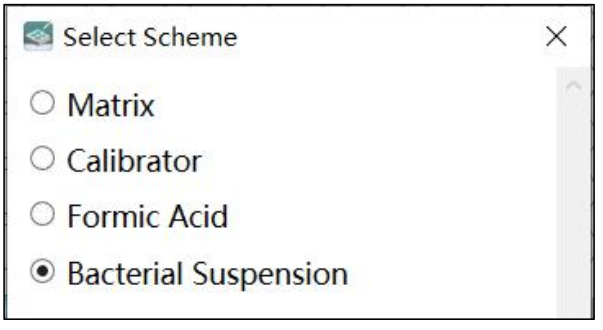


Figure 5.36 sampling Plan Checkbox

2) Delete: The selected method in the table will be deleted from method set by clicking “Delete”.

3) Clear: The compiling method will be cleared by clicking “Clear”.

4) “Quit”: The method which is not saved in method set will be cleared by clicking “Quit”.

5) “Save”: The compiling method set will be saved by clicking “Save”.

5.4.10 Function Area

1) Target plate type can be selected in drop down box of function area.

2) If target plate 8×12 is selected, Target Type: 8X12, the target plate will be changed into 8×12 plate, shown as figure 5.37:

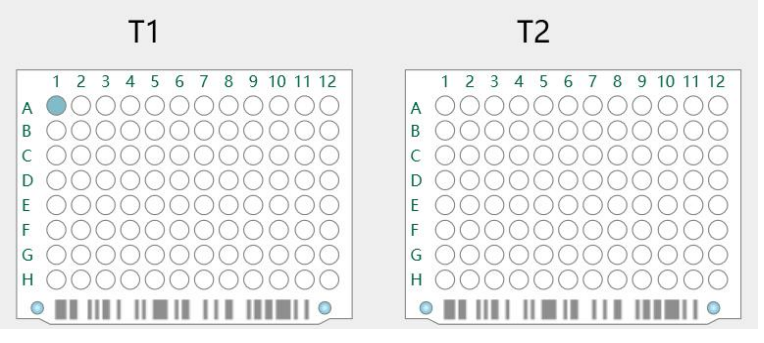


Figure 5.37 8×12 Target Plate

3) Target plate 4 × 12 is selected, Target Type: 4X12 , the target plate will be changed into 4 × 12 plate, shown as figure 5.38:

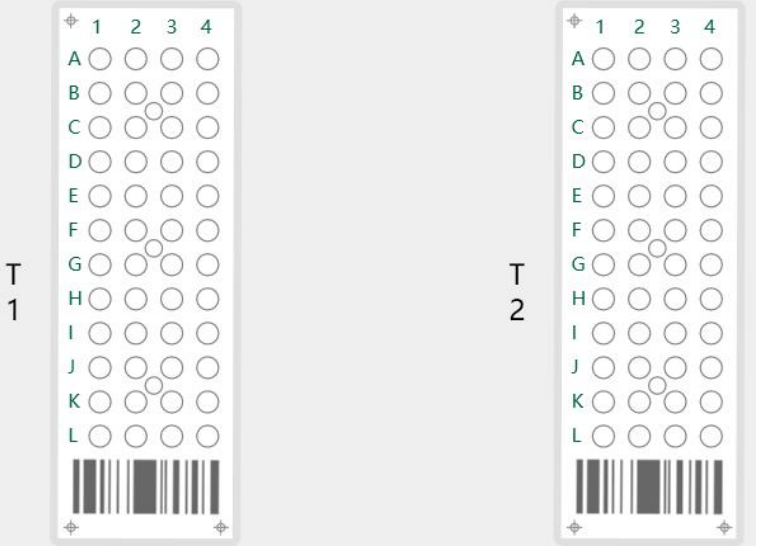


Figure 5.38 4 × 12 Target Plate

4) All or one target plate of some target plate type can be selected in drop down box of function area. When two target plates are all selected by clicking Target: Both , the two target plate can be used, as the figure 5.39:

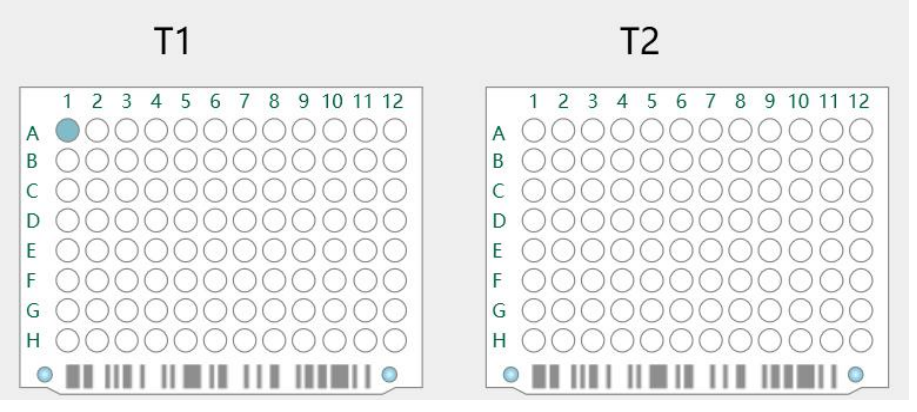


Figure 5.39 8 × 12 Target Plate

When target plate 1 is selected, Choose Target: 1 , target plate 1 in function area at left side can be used, as the figure 5.40:

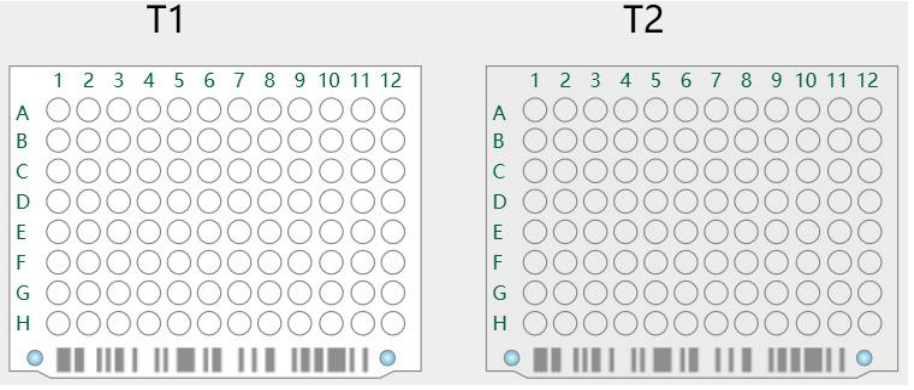


Figure 5.40 8×12 Target Plate(Target Plate 1)

When target plate 2 is selected, Choose Target: 2, target plate 2 in function area at right side can be used, as the figure 5.41:

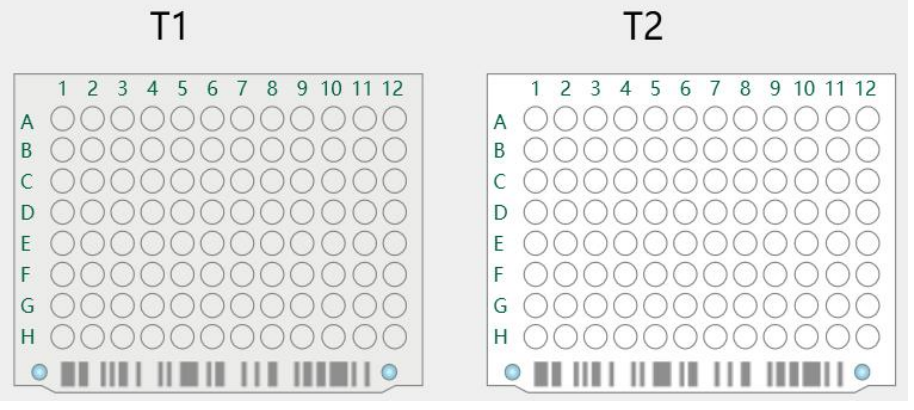


Figure 5.41 8×12 Target Plate(Target Plate 2)

5）Through the selection of checkbox of sampling mode configuration, you can choose whether the sampling mode is single or multiple, and whether liquid level detection is required.

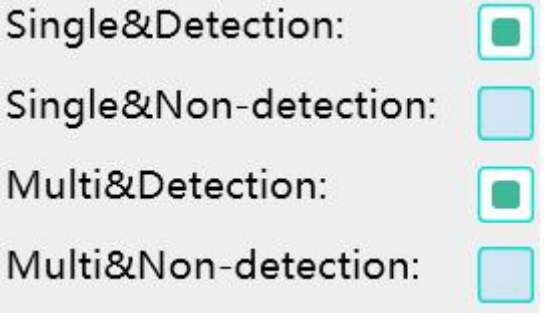


Figure 5.42 Selection of sampling Mode

5.5 Run Method Set

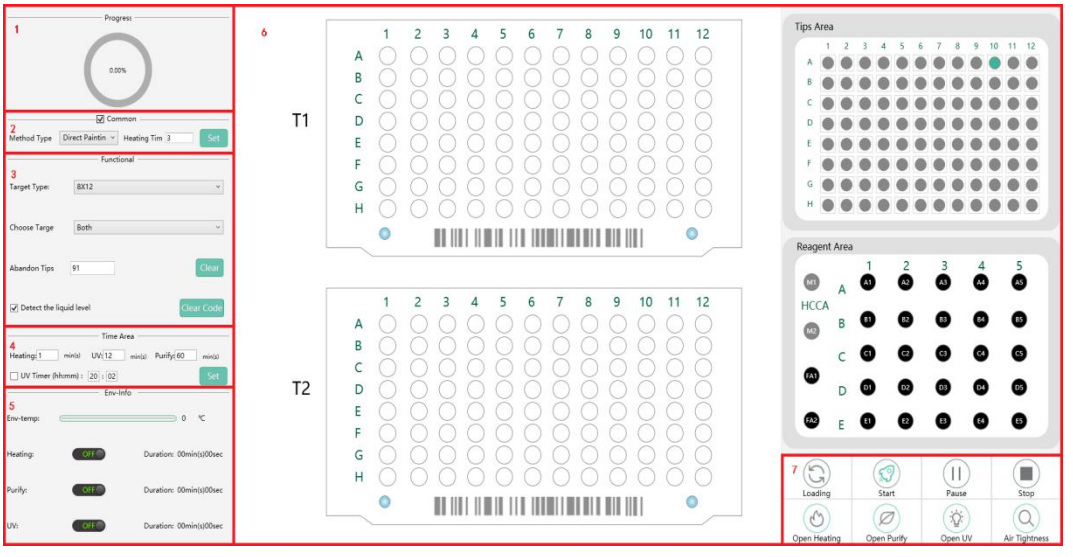
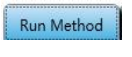


Figure 5.43 Run Method Set

Table5.3 Description of Running Method Set

NO	Description
1	Method running process
2	Common method set selection setup
3	Target selection and waste tips reset; whether liquid level is detected (common method set);scan code binding (common method set)
4	Heating, air purification core, UV lamp time setup
5	Heating, air purification core, UV lamp and environment information display
6	Indication area of pipette tips, reagent and target plate state while the method set is running
7	Buttons area of method set loading, running, pause and termination, heating, air purification core and UV lamp switch

It can be switched to the interface of method set running by clicking the tab 

when method set is compiled.

5.5.1 Common Method Set Compiling

This software default state is common method set 

, and the user can check or cancel to determine whether to use the common method set compiling. When the user choose the

common method set compiling, the loading button 

is under failure state.

There are three types of common method set (direct smearing method, extension method, extraction method).

1)Direct smearing method: put the matrix to target plate.

First, select the spot on the target plate. The default spot is the topmost matrix spot at reagent area, which is optional, and also can select the matrix spot below. See the figure below:

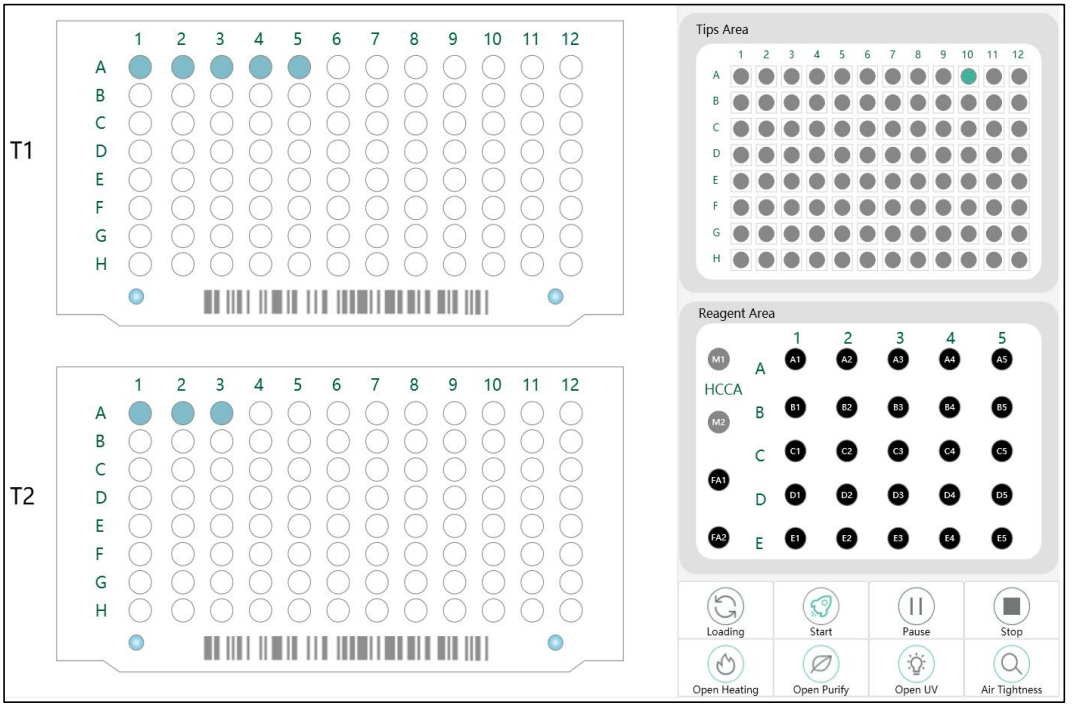


Figure 5.44 Default Topmost Matrix Spot Selected

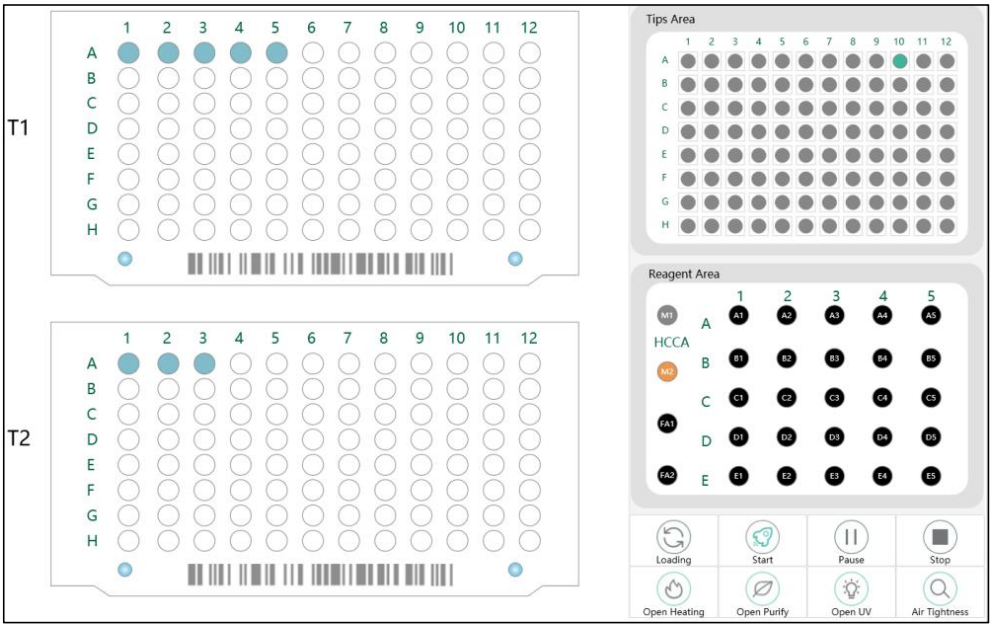


Figure 5.45 Default Downmost Matrix Selected

2)Extension method: put the formic acid on target plate for heating, then add matrix to cover it. The compiling method is similar to that of direct smearing method. The difference is the default spot is formic acid at reagent area:

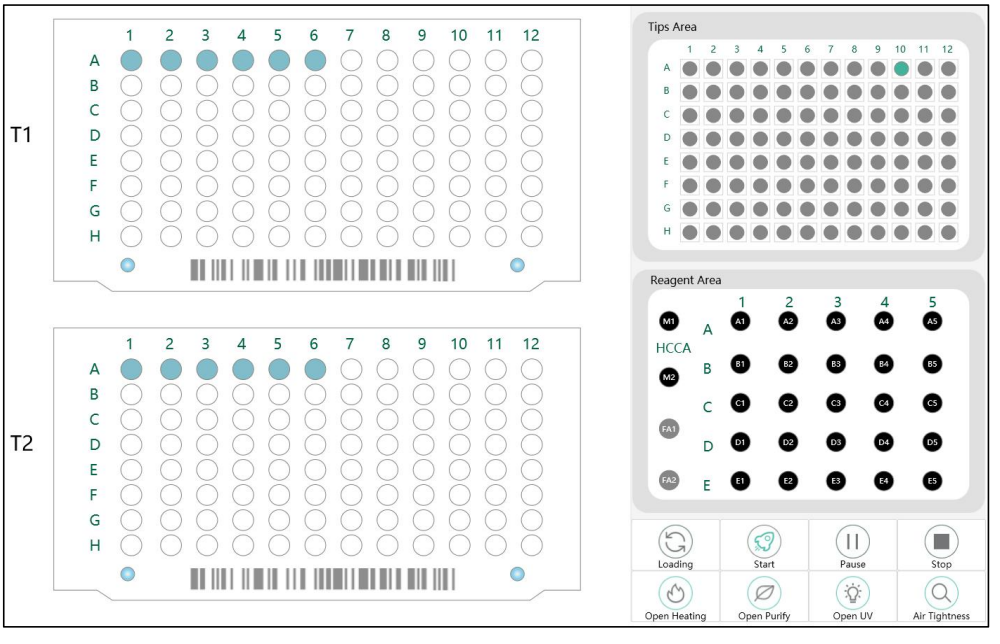


Figure 5.46 Default Topmost Formic Acid Selected

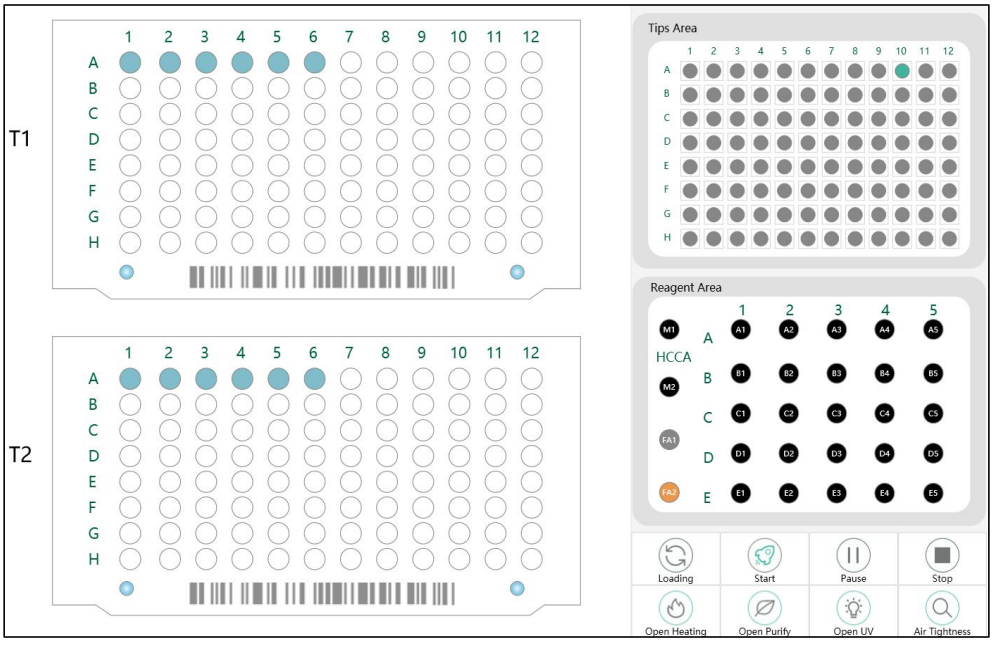


Figure 5.47 Default Downmost Formic Acid Selected

3) Extraction method: put the bacterial solution on the target plate, then add matrix.

First select the sample spot at reagent area when compiling method, then select one spot on the target plate, after which the spot on the target will be bound with the sample spot. If cancellation is required, please select the bound spot on the target again. Multiple sample spots can be bond with corresponding target spot by repeating the above operation.

See the figure 5.48:

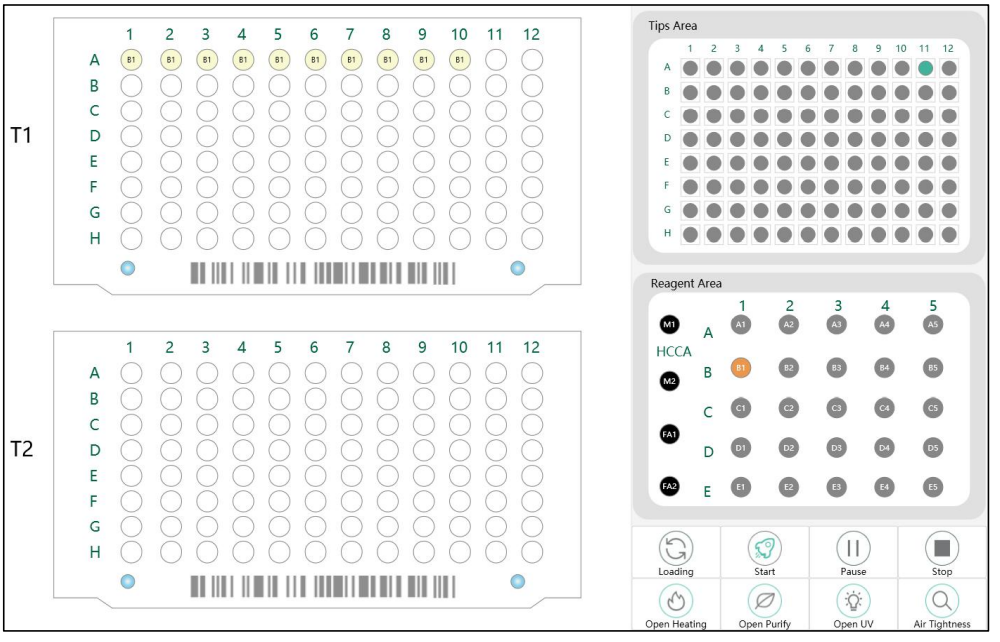


Figure 5.48 Multiple Sample Spots Bond with the Target Spot

After preparing the extraction method, click "Running" button at the bottom right to quick run the method.

The above three methods can set the calibration point method, the specific steps are as follows:

Direct coating method / Extension method calibration spot setting: first switch the method type to extraction method, select the reagent spot placed in the calibration spot in the reagent area, right mouse button, select calibration spot setting, the software automatically sets the current sample point as the calibrator The sample tube type is the calibrator tube. At this time, the sample spot is surrounded by a purple square frame. After setting the calibrator spot, switch the method to the direct coating method or the expansion method. Select the calibration spot setting, then compile and run the direct coating method or extended method method set

2) Extraction method calibration spot setting: first switch the method type to extraction method, select the reagent spot placed in the calibration spot in the reagent area, right mouse button, a selection box pops up, select the calibrator setting, the software automatically sets the current sample spot as the calibrator, The sample tube type is a calibrator tube. At this time, the sample spot is surrounded by a purple square frame. After setting the calibrator spot, directly select the target point to be calibrated to complete the calibrator

The three methods above can be chosen in the drop-down box Method Type Direct Paintin . The corresponding heating time (minutes) will be shown in editing box after one method is selected. The user can change the heating time by left clicking the right setup button Set , and the heating time will be set and saved. When the user select extension method and abstraction method, the matrix

spot drop-down box will be displayed below 

. The user can select matrix sampling spot and the default spot is matrix 1.

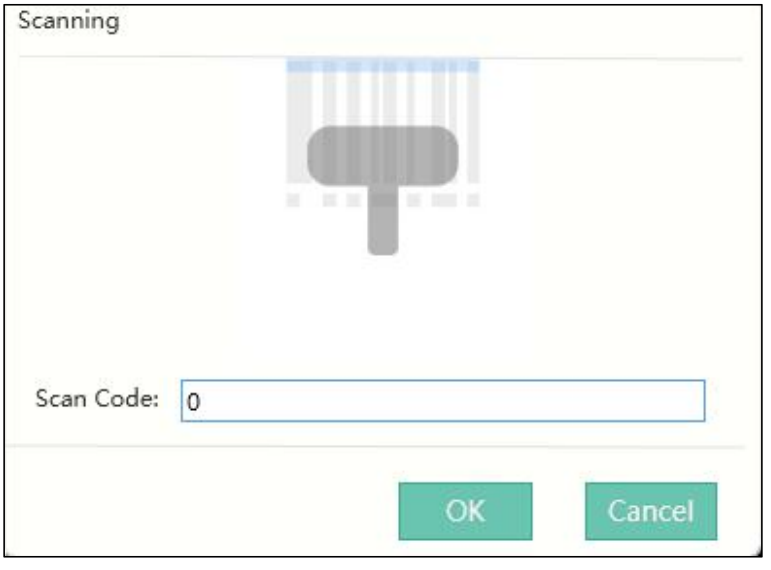
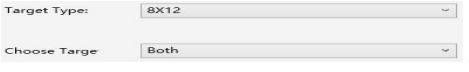
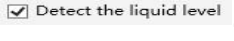


Figure 5.49 Barcode Binding Box

The barcode can be created by manual input or scanner to bind with target spot. The corresponding documents will be created to interface with LIS system of the hospital when the method set is running.

If the user wants to change the types of target plate or limit the number of target plate, selecting from the drop-down box 

. If liquid level detection is not required during aspirating liquid, please cancel the check from the checkbox of ‘Level Detection’ 

.

If 8×12 target plate is selected, then the target plate will be displayed as figure 5.50:

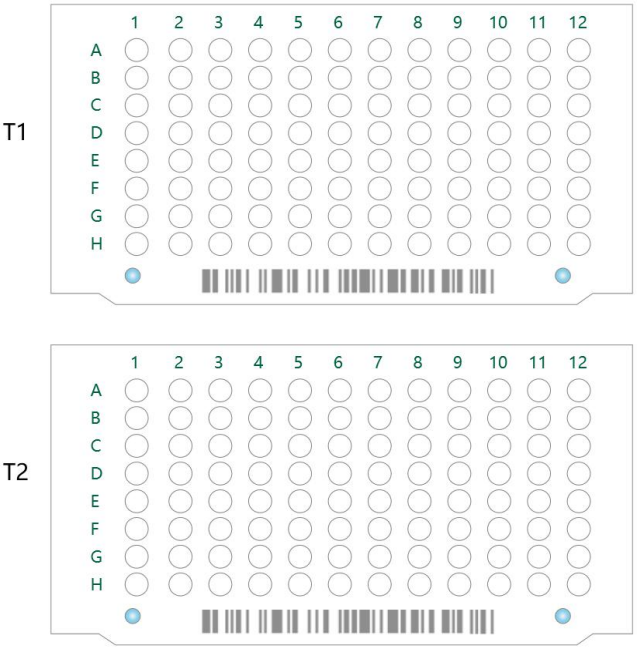


Figure 5.50 8×12 Target Plate

If 4×12 target plate is selected, then the target plate will be displayed as figure 5.51:

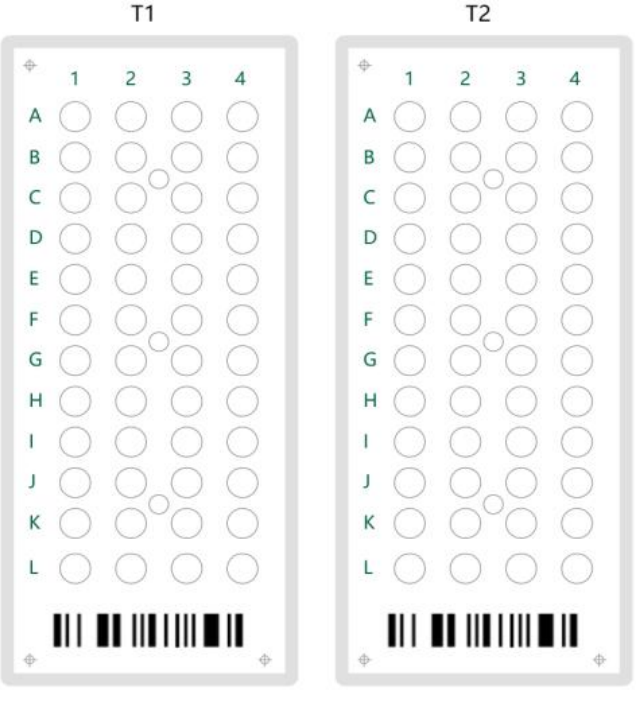


Figure 5.51 4×12 Target Plate

After the above parameter confirmed is correct, corresponding aspirating spot and target spot should be selected. The method set shall be running by clicking “Running” button.

5.5.2 Loading Method Set

When canceling the checkbox Common, and left lick button of method set load Loading a dialog box will pop up, shown as figure 5.52, then select a method and open the method file by left click, then initialize the button of running method set.

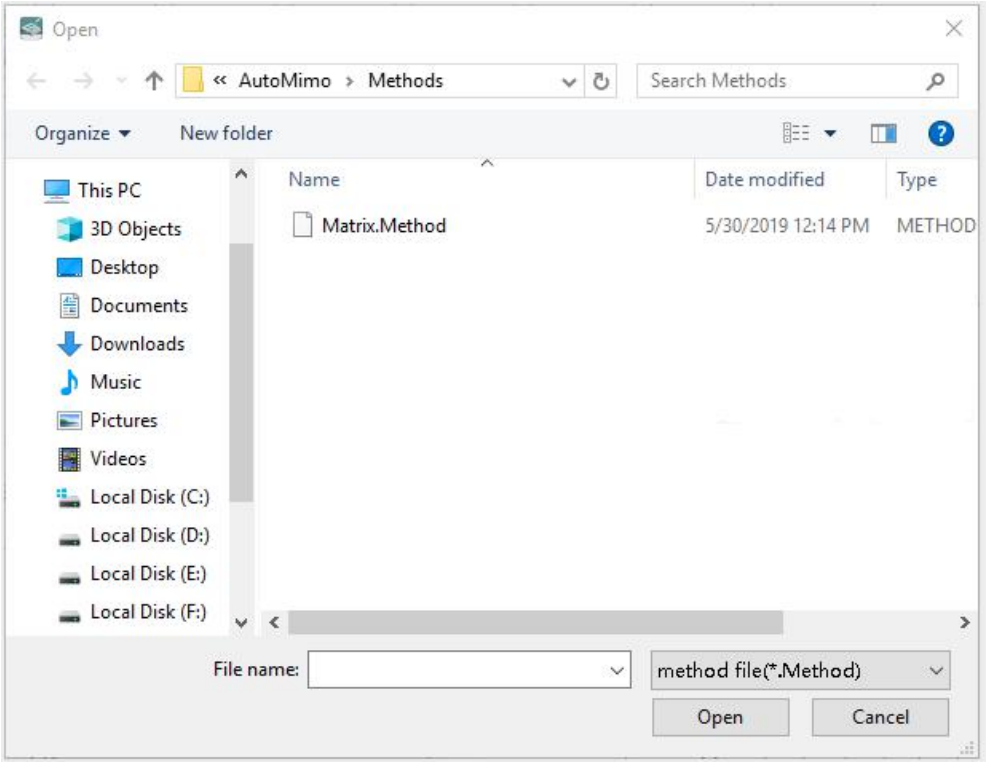


Figure 5.52 4×12 Target Plate

5.5.3 Running Method Set

When the common method set or loading method set are compiled, Automated Sample Preparation System can be operated and controlled according to the loaded method by clicking the button Start. The following situation may occur during method set running:

1）A dialog box will be displayed as figure 5.53 to remind user of adding tips to tips area when the tips are used up. The operation of method set running can be continued after clicking “OK” by the user.

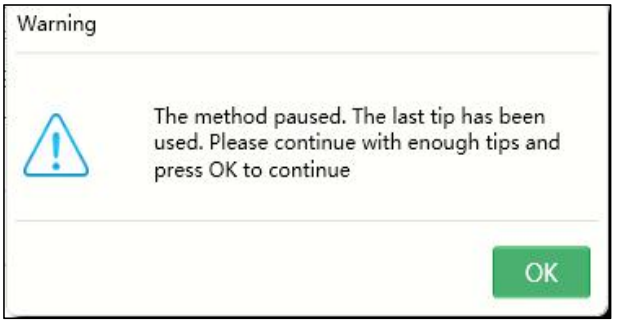


Figure 5.53 Dialog Box of Tips Shortage

2) The software can calculate the number of waste tips. When the discarded tips accumulate up to 150 pieces in container, a dialog box will be displayed as figure 65 to remind the user of clearing the used tips. After the user clicks "Yes" button, method set running will be continued.

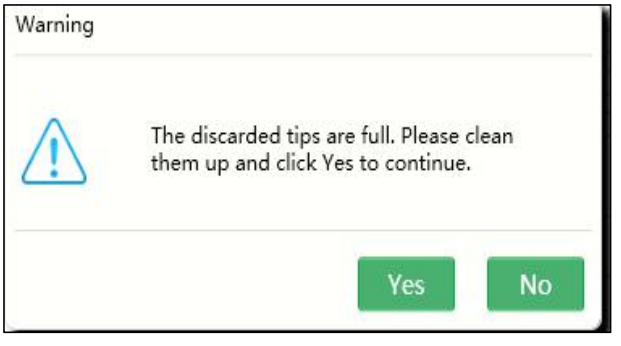


Figure 5.54 Dialog Box of Discarded Tips Container Full

3) When the liquid level is insufficient, following operation will be executed.

A dialog box and voice prompt will be displayed as figure 5.55 if the matrix and formic acid are taken. Error Fault code 107: Liquid is not enough. on the state bar will be appeared. After reagent is added and "Yes" button is clicked by the user, the mechanical arm will move to the aspiration position to detect the liquid level until the test is passed. The method set running can be terminated by clicking "Terminate" button or by clicking "No".

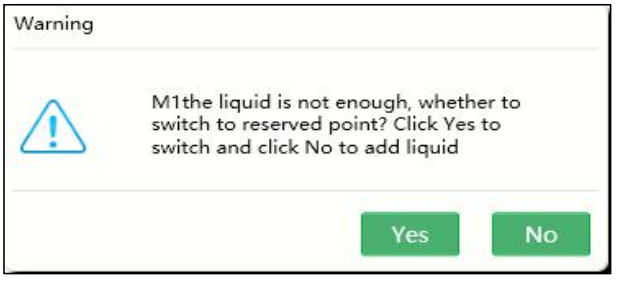


Figure 5.55 Dialog Box of liquid level is insufficient

A dialog box and voice prompt will be displayed as figure 5.56 if it is the liquid in the sampling area. Error Fault code 107: Liquid is not enough. on the state bar will be appeared. After liquid is added and "Yes" button is clicked by the user, the mechanical arm will move to the aspiration position to detect the liquid level until the test is passed. The method set running can be terminated by clicking "Terminate" button or by clicking "No".

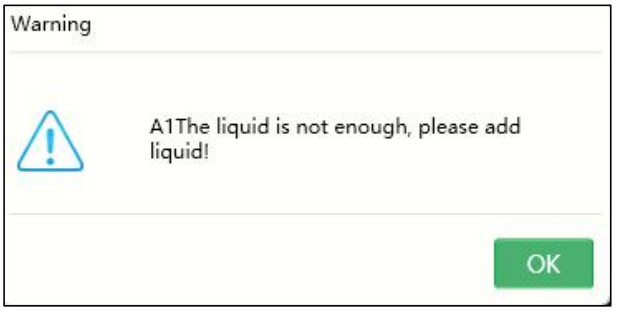


Figure 5.56 Dialog Box of the sampling area liquid level is insufficient

When the method set is running with the extraction method: the dialog box as shown in figure 5.57 will pop up. Left click to select the sampling plan, and click "OK" to confirm.

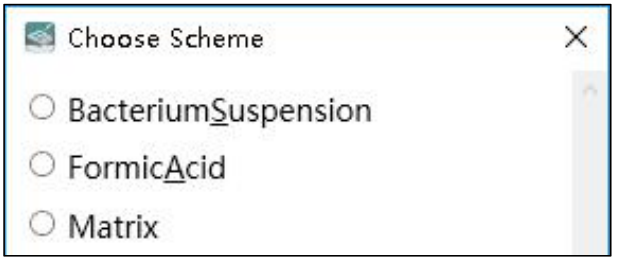


Figure 5.57 Dialog Box of the extraction method

5.5.4 Pause

The system running will be suspended after user clicks "Pause" button during process of method set running. By this time "Continue" button will be displayed and the current method running will be continued by clicking it.(Note: The heating and purification function will be automatically turned on during the method operation. Click "Pause" during the operation, the software will automatically turn off the heating and purification function, and turn on thefunction again after clicking "Continue")

5.5.5 Terminate

Motions after running steps of the current method can be ignored by clicking "Terminate" button during the process of the method set running. Running of the method set will be ended after the two motions of "Tips off" and "Recovery".

5.5.6 Heating, Purifying and UV Open

Figure 5.58 Heating, Air Purification and UV Lamp Irradiation

1) Open UV

It is used for disinfection of the Automated Sample Preparation System.

2) Open Purifying

It is used for eliminating the harmful gas from the Automated Sample Preparation System.

3) Open Heating

It is used for heating the area of target plate.

By clicking the corresponding button in the environment operation, automatic turning on and off within limit time can be set. The corresponding operation can be closed by clicking the button "Close". The UV lamp can be turned on at the set time point and turned off automatically after the set time limit. The above operation can only be executed when the method set is not running.The opening time can be filled in the setting edit box in the information area, and time of turning on can be set by clicking the "Enter" key on the keyboard or the "Set" button (as shown in figure 5.59) in the edit box, and the message dialog box (as shown in figure 5.60) will pop up to indicate the setting is successful.

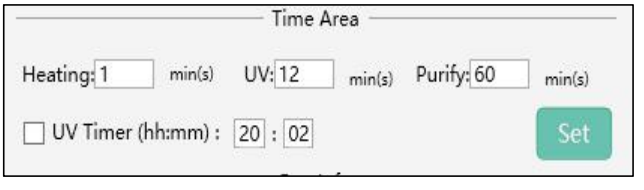


Figure 5.59 Time Setting Area

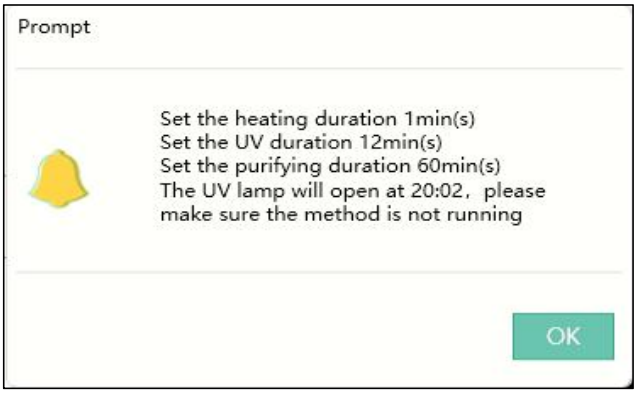


Figure 5.60 Prompt Box for Duration Setting

5.5.7 Emergency Stop

When user opens protection cover of the Automated Sample Preparation System, the system running will immediately stop, the instrument will be disconnected with power. and dynamic interface shown as figure 5.61 will pop out, then running interface can not be operated by user. UV lamp heating and air purification will be closed in order to protect the operator. When protection cover of the instrument is closed, the instrument continues to run and the running interface will return back to the operation state.(Note: do not move the mechanical pump, otherwise the instrument will move abnormally)

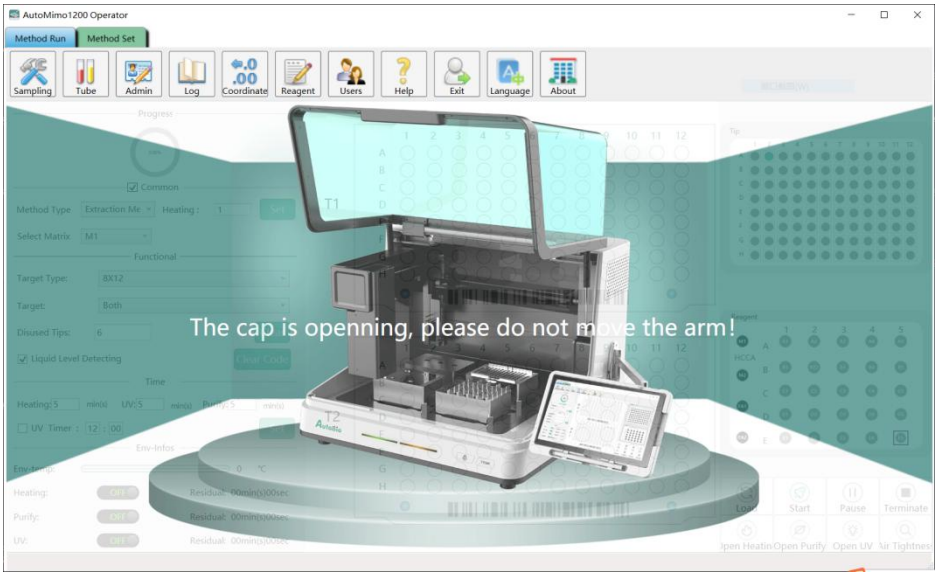


Figure 5.61 Open Dynamic Interface

5.5.8 Waste Tips Clearing

The waste tips number will be displayed in edit box in function area Abandon Tips 3. Before or after running method set, if the discarded tips have been cleaned, the waste tips number will be cleared by clicking the Clear icon.

5.5.9 Air Tightness Test

After selecting one reagent spot and left clicking the button “Air Tightness Test” Air Tightness, the mechanical arm will take one tip to aspirate the liquid from the selected spot and overhang for 5 minutes. If there is no liquid leakage, the air tightness is qualified. The test will be terminated by clicking the button again.

6 Troubleshooting

The simple malfunction information and processing methods are shown in table 6.1. If there is any problem or other malfunction, please contact our engineer immediately.

Table 6.1 Troubleshooting and Solutions

Fault code	Description	Reasons	Solutions
101	COM1 serial port can not be identified.	1. Serial port is plugged off. 2. Serial port cable is loosen.	1. Reconnect the serial port. 2. Replace the serial port.
102	COM1 serial port communicates abnormally	1. When the software is open, the slave computer is power off. 2. When the software is open, the slave computer is not powered on. 3. The serial port is not connected or plugged well. 4. Serial port is damaged.	1. Check the slave computer and reconnect with the power again. 2. Reconnect the serial port. 3. Replace the serial port.
103	Movement platform is abnormal	The slave computer moves abnormally or mechanical pump is stuck.	Check the slave computer position
104	Transparent cover is open	Transparent cover is opened	Close the transparent cover
105	Pneumatic pump feedback abnormal	Communication of the pump is abnormal	Run the method again; Check the pump.
106		Order of the pump is invalid	The input order is over limit, or

			unreasonable. Check the pump configuration.
107		The liquid is short	Add the reagent.
108		Press sensor failure	The pressure sensor is damaged, replace the pneumatic pump
109		The operation quantity is wrong	The aspirating quantity is too much. Confirm the configuration is reasonable or not.
110		The pump is overload	The pump is damaged. Change the pump.
111		The pump is stuck	Change the pipettor tip and operate again
112		The initialization of pump is failed	1. Confirm the power and communication cable is connected normally. 2. The pump is damaged, replace it.
113		Liquid taking is abnormal	The pump fails, replace it.
114	Temperature sensor is abnormal	1.The connection cable of temperature sensor is loose. 2.The temperature sensor is damaged.	1.Check the connecting cable is loose or not. 2. Change environment temperature module.
115	Heating module is abnormal	The slave computer is failed to start heating	1.Check the connecting cable is loose or not. 2. Change heating module.

116	Purified system is abnormal	The slave computer is failed to start air exhausting	1.Check the connecting cable is loose or not. 2. Change purification module.
/	The UV lamp does not work after opening disinfection.	1.Driving wire of UV lamp is loose. 2.UV lamp tube is loose. 3.UV lamp tube is damaged.	1. Reconnect the driving wire. 2. Re-install the UV lamp. 3. Change the UV lamp tube.
/	The mechanical arm moves slowly in one direction.	1.Encoder connector is loose. 2. Pinboard wire is loose. 3. Encoder is damaged.	1. Reconnect the encoder connector. 2. Reconnect the wire of pinboard. 3. Change the encode.
/	The mechanical arm can not stop when executing restoration	1. Limit switch connector is loose. 2. Limit switch is damaged.	1. Reconnect the limit switch. 2. Replace the limit switch.
/	Status indicator lamp malfunction.	1. Status indicator lamp connector is loose. 2. Status indicator lamp is damaged.	Reconnect status indicator lamp connector . Replace lamp plate.
/	Failure of the UV heating button	1. Button connector is loose. 2. Button is damaged.	1. Reconnect the button connector. 2. Change the button.
/	Mechanical shaft is stuck	1. The guideway screw is loose. 2. The coupling screw is loose.	Use thread glue and give regular inspection.

/	Mechanical shaft deflection	1. Accumulated error. 2. Switch is vibrating and the pipette tip is shaking.	1. Take regular calibration. 2. Adjust the coordinate of Z axis and pipette tip.

CAUTION:

Any person can cut off the power supply when the instrument breaks down, such as sampling arm is stuck. If permitting, click the "Pause" button or open the transparent lid firstly, then contact the manufacturer to describe relevant problems and phenomena, and operate the instrument according to the instructions. Do not attempt to perform any other operation before contacting with the manufacturer, who can be only responsible for the instrument under the circumstance of checking and adjusting the instrument by qualified staff approved by the manufacturer.

Cut off the power supply before opening the housing of the instrument case.

Please contact our professional engineer and pack the instrument well if the instrument needs to be returned back to the factory.

7 CYBERSECURITY

7.1 Operating Environment

7.1.1 Hardware Configuration

Part Name	Configuration (At least)
Computer	Desktop CPU：above Intel i3/Laptop CPU：above Intel x5 Memory: 4 G
Firewall	Windows system with built-in firewall

7.1.2 Software Environment

Operating environment: Window 10.

7.1.3 Network Condition

XML data exchange mode is adopted for external software.

7.2 Security Software

Windows Defender, Internal firewall of Windows operating system.

7.3 Data and Equipment (system interface)

The computer software communicates with the instrument through a serial port.

7.4 User Access Mechanism

Access control: the software can be accessed by user name and password.

Authority control: The administrator mode can manage users of operations, using all functions except the function of debugging status. Operator mode can use all functions except user management and debugging functions. Engineer mode can use all the functions of the software except for managing the operating users.

7.5 Software Environment

Operating system: Window 10.

7.6 Security Software Update

Security software update can be completed by updating operating system.

8 MAINTENANCE AND WARRANTY

8.1 Maintenance

The instrument itself does not require special maintenance for operator. However, the operator should do some routine cleaning after use. There are some cleaning tips for operator:

1)Please wear protective gloves and protective clothing before cleaning and make sure the power supply is disconnected. Strong acid, strong alkali and other inappropriate solutions are not allowed to be used for cleaning.

2)Check whether the cord plug is dusted. If dusted, please clean to use cloth soaked with 75% alcohol. Clean the surface of the instrument with soft dry cloth.

3)The black bottom plate, tips frame, reagent frame, waste tips collection frame and drawer inside the instrument should be cleaned with soft dipped with 75% ethanol after each experiment.

4) Purification core should be changed for one year or one and half year according to the usage frequency.

5) Metal parts of the instrument may be rusty due to humidity or contacting with corrosive liquid. If rust is found, please contact the our engineer of Autobio in time.

6) Service life of the instrument can be prolonged through regular checking of electrical performance by authorized institution of the manufacturer (once a year).

Table 8.1 For service personnel before maintenance

No	Risk	Protect measures	Safe verification
1	Maintenance of instrument under the condition of power supply may lead to electric shock.	Disconnect the power supply before the instrument maintenance.	Make sure the neutral line and the live line are connected correctly and all the ground wires of the instrument are connected. Make sure all the ground lead and screws are tight.
2	There is UV radiation within the instrument , and your eyes may be	Disconnect the power supply before the instrument maintenance.	Make sure all switches are turned off.

	hurt in case of directly looking into the UV lamp .	Forbid looking directly into the lamp beam when maintaining.	

Vulnerable Parts:

Name	Model	Change Frequency	Remarks
Fuse	T5AH 250 VAC ;Rated breaking capacity :1500 A	/	Change it after the fuse is damaged.

CAUTION:

Please replace detachable mains supply cords with adequately rated cords.

8.2 Remove from use

If the instrument should be removed from users for repair or disposal, users should contact the manufacturer, and it cannot be handled as a regular item.

8.3 Warranty

Warranty will be supplied to customers for repairing the AutoMimo 1200 by Autobio according to purchasing contract.

Warrant period is 12 months. Free fee on site maintenance for the instrument will be supplied by Autobio within warrant period.

Customer should be responsible for daily maintenance and daily cleaning. If the customer can not implement the relevant maintenance and cleaning procedure within specified period, which may result in damages to the instrument, then Autobio will not be obligated to repair the instrument for free. The customer shall pay for the charges of maintenance and spare parts, including the following situation:

1) Loss or damage of warranty label on the instrument.

2) Serial number of the instrument is not the one provided by our company or has been altered.

3) The end-users, involved in the process of installation, power supply and operation of instrument & accessories, fails to comply with this manual and its appendix.

4) Damage is caused in transportation.

5) Damage is caused by spattering of reagent or contacting with corrosive substance or air.

6) Instrument is disassembled or spare parts are changed by any unauthorized personnel.

7) Damage is caused by unclear internal voltage.

8) Damage is caused by natural disasters or force majeure.

9) Malfunction or damage of software and hardware is caused by improper operation and computer viruses, etc,.

Free maintenance shall be supplied by Autobio if there is any malfunction during the warranty period. Autobio shall have the right to decide which spare parts should be changed, and the warranty period of spare parts should be same with that of the instrument.

Warranty service is non-transferable. Any defects caused by misuse, changes, improper delivery or maintenance by unauthorized personnel can not be guaranteed.

CAUTION:

Spare parts can not be changed by any person without permission of Autobio except the consumables such as pipette tips and purification core. The Instrument is designed according to related standards, and substantially conforms to EN 61010-1-2010 Safety Standards.

It is safe to operate the instrument according to this operating manual. Do not try to make any changes to the instrument, otherwise, the following results may occur:

• No more quality guarantee supplied by the manufacturer.

• Not complying with the requirements of EN 61010-1-2010 Safety Standards.

• Potential safety hazards.

Autobio will not be responsible for any damages caused by using the instrument for any purpose other than the intended purpose, or being repaired by the engineer who is not from Autobio .

The service life of the instrument is related to the operating environment of the instrument, the frequency of use, etc,. Regular maintenance can extend the service life.

If any questions, please contact the after-sales service provider.

9 TRANSPORTATION AND STORAGE

9.1 Transportation Requirements

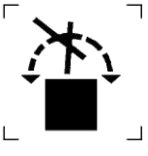
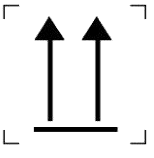
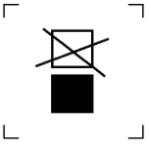
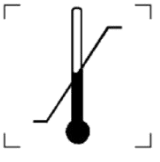
The instrument should be handled with care and placed in this way up under moisture-proof and waterproof condition for transportation. Severe vibration and pressure is prevented and stacking is prohibited. Transportation environment requirements: temperature: - 40 ℃ ~ 55 ℃, relative humidity: 5 % ~ 70 %. The person who carry out the operation should be professional or supervised by professional engineers from Autobio when handling, loading and unloading.

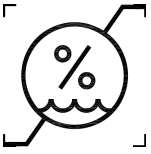
9.2 Storage Requirements

The instrument should be stored in the room where no chemical drugs and corrosive air can not be found, and condition of ventilation and sanitation is favorable ,and temperature should be kept between -40 ℃ ~ 55 ℃ and relevant humidity between 5 % ~70 %.

9.3 Graphical Symbols Used for Packages

The following symbols and characters should be printed obviously on distribution packages.

	Contents of the distribution packages are fragile, therefore it shall be handled with care.		Distribution package shall be kept away from rain and kept in dry condition.
	Distribution packages shall not be rolled or turned over.		This is the correct upright position of the distribution packages for transportation and/or storage.
	Stacking of the distribution packages is not allowed and no load shall be placed on the distribution packages.		Distribution packages shall be stored, transported and handled within temperature limits indicated.

	Distribution packages shall be stored, transported and handled within humidity limits indicated.	/	/

10 PARTS LIST

Parts list of AutoMimo 1200 is described as table 10.1.

Table 10.1 Parts List of AutoMimo 1200

SN	Name	Quantity
1	AutoMimo 1200 host	One
2	1.5 m international power cable	One
3	1.5 m serial port cable	One
4	AutoMimo 1200 operating manual	One
5	AutoMimo 1200 disk	One
6	Computer supporting rack (Optional)	One
7	Computer (Optional)	One

Consumables list of AutoMimo 1200 is described as table 10.2.

Table 10.2 Consumables list

Name	CHANGE DESCRIPTION
Purification core	Refer to 3.6.1

11 COMMITMENT TO CUSTOMERS

Timely: Supply twenty four hours hotline without holidays. Feedback within one hour and confirm solutions within 24 hours. The engineer will arrive at site at the first time and supply technical service to the customer.

Professional: There are more than ten engineers who are committed to specific support to customers with their integrated techniques and powerful abilities of solving problems.

Considerate: Technology seminar will be organized through one to one guidance and training to meet the requirements of customer at different level for flexible services. Pre-sales and after sales service will be supplied to customers.

Care line: Technical service: [86]-371-6798-5313

Order service: [86]-371-6798-5313