

Automated Sample Repository System User Manual (V1.0)



Automated Sample Repository System

Product user manual

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1 Introduction

1.1 About this user manual

This user manual is for the **Automated Sample Repository System** produced by Genepoint Technologies Co., LTD. It is provided users with detailed instructions on how to operate, maintain and check the device.

1.2 About this product

This product is an automatic ultra-low temperature freezer produced by Genepoint Technologies Co., LTD. Its intended using is to automatically send biological samples into/out of the low temperature storage environment and automate the management of sample access information, specially designed for the low temperature storage of biological samples. This product can provide a stable low temperature environment for biological samples, and the door or cover will not be opened during normal use. The storage of the inventory is done by an automated mechanism. The operator realizes its automatic access by operating the touch screen or the mouse, keyboard and other tools.

This product is composed of fence structure, refrigeration system, control system, automatic access system, data recording system and related accessories.

- a). The fence structure is used for the composition and insulation of the storage space structure of the medical cryogenic storage box.
- b). The refrigeration system is used to achieve heat transfer, so that the storage space to maintain the required temperature environment.
- c). The control system (including the corresponding software and an independent power supply part and other electronic control system) is used for monitoring and power supply of temperature and other parameters.
- d). Automatic storage system (including frozen storage shelf, import and export system, access warehouse system, record inventory information and software interacting with the host computer) is used for automatic inventory access, inventory information recording, and inventory management.
- e). Accessories, including screws, gadgets, product manuals, warranty cards, etc.

1.3 Target User

This document is intended for medical care personnel, scientific research personnel, and device management and maintenance personnel who need to touch or use this product. Only trained professionals are allowed to install, operate, and maintain the installation.

1.4 Structure of this manual

This manual is divided into four parts:

Part One: Safety description and introduction of the product structure principle (Chapter 2, 3).

Part 2: Installation and Operation (Chapters 4 and 5)

Part 3: Equipment Maintenance and Troubleshooting (Chapters 6 and 7)

Part 4: After-sales Service (Chapter 8)

1.5 Conventions of this manual

This section describes the conventions and symbols.

1.5.1 Symbol Conventions

The "< >" with Angle brackets indicates the key name, button name, and information entered by the operator from the terminal;

The square brackets "[]" indicate the man-machine interface, menu bar, data table, and field name.

1.5.2 Marks

The manual uses four eye-catching signs to indicate where special attention should be paid during operation.



Caution;



Careful;



Alarm;



Danger:Remind the matters that should be

paid attention to during operation.

1.6 Remind Notes

Please refer to the product nameplate for the production date. The normal service life of this product is 10 years from the production date (excluding the life of wearing parts and purchased consumables), and it is not recommended to continue to use after the expiration.

The disposal of waste shall comply with the relevant laws and regulations of the national or local government.

1.7 Exemption Statement

This product is suitable for scientific research.

Due to the continuous update and improvement of products and technologies, the content of this information may not be completely consistent with the actual products without prior notice. For product updates, please contact your local office.

Genepoint Technologies (Shanghai) Co., LTD. (hereinafter referred to as GP) makes no representations or warranties in this manual. GP shall not be liable for any direct or indirect injury arising from the use of this manual.

1.8 Additional Information

If there is anything not mentioned in this manual, please contact the company before operation.

1.9 About this company

Genepoint Technologies headquartered is in Shanghai, it has been dedicated to provide automated and intelligent cryogenic storage solutions since its inception in 2015.

1.10 Suggestion

We attach great importance to user feedback and welcome your valuable comments and suggestions in the process of using our products. You can contact us through the sales channel or call 400-606-8780.

2 Safety Instruction

2.1 Safety Instruction

Only trained and qualified personnel are allowed to install, operate, and maintain the product.

When installing, operating, and maintaining the device, observe the local safety regulations and related operation rules. Otherwise, personal injury or device damage may occur.

The safety precautions mentioned in this manual are only intended to supplement local safety regulations. GP accepts no liability for any breach of the general safety operating requirements or the safety standards for the design, production and use of device.

2.2 Environment requirements of device using

The storage system must be used in a dry and ventilated environment.

Ambient temperature range: 10 ° C to 32 ° C

Relative humidity range: ≤83%RH

Power supply voltage: 220V±10%, frequency: 50Hz±1Hz

Avoid use in the following improper environments:

Do not use this device in or near places with strong magnetic devices, which may cause equipment failure or misoperation.

Do not use the device in places where electromagnetic interference, electrostatic discharge, or wireless frequency interference may occur. Otherwise, misoperation may cause risks.

Do not use the device in dangerous places with flammable gas, dust, gasoline, solvent, etc. (The device has no explosion-proof performance) to avoid serious accidents or fires.

Do not use the device in a place where there is water, high temperature, high humidity, and high corrosive gas. Beware of electric shock caused by damage to the device.

2.3 Cautions

This manual is a document that comes with the equipment and should be placed near the equipment for easy viewing at any time.

Before use, check whether the 220V power cable of the device is intact to prevent electric shock.

When using, please comply with the requirements of this manual and the training requirements provided by our professionals. The device must be placed smoothly to prevent tipping over. If the equipment tilts due to the damage of the caster cup, please contact our company for handling.

This equipment needs to use the supplies specified by our company. If you need to use non-specified supplies, please contact our company to confirm/debug before use.






Because the storage area of the device belongs to the low-temperature area, the door of the box is closed for a long time in normal working condition. Do not open it. If necessary or abnormal circumstances occur, please contact the professional personnel of the company for handling.














When moving the turnover drum/sample manually, you must wear low temperature protective gloves to prevent low temperature frostbite.




After use, please check that the actions required by the order, such as access box and pipe picking, have been completed, and the device has no abnormal alarm.

2.4 Instruction for security-related symbols

The warning labels shown on this product are intended to let users understand the meaning of the labels and use the product correctly to prevent harm and property damage. The expression and meaning of warning signs and legends are as follows:

Symbols	Meaning
	Important safety information, omission may cause serious injury
	General safety information, omission may cause product damage
	Express compulsion (something that must be followed)
	To forbid (something not allowed to do)
	ground protection

	<p>fragile goods</p>
	<p>Keep dry</p>
	<p>Place up</p>
	<p>No roll</p>
	<p>No stacking</p>
	<p>No card clips</p>
	<p>Indicates the lower limit of ambient temperature to which a medical device can be safely exposed</p>
	<p>Indicates the upper limit of ambient temperature to which a medical device can be safely exposed</p>
	<p>Indicates the ambient temperature limit to which a medical device can be safely exposed</p>
	<p>Indicates the ambient temperature range to which a medical device can be safely exposed</p>
	<p>Possible biohazard</p>
	<p>This indicates low temperature, do not directly contact the skin here, beware of frostbite</p>
	<p>This is connected to the power supply, please pay attention to the safety of power consumption when operating</p>

 <p>当心夹手</p>	Watch Your Hand
 <p>警告/WARNING 机器运转时 禁止开门 DO NOT OPEN DOOR DURING OPERATION</p>	Do not open the door panel when the device is running properly
 <p>警告/WARNING 非专业人员 请勿打开 NON-PROFESSIONALS DO NOT OPEN</p>	Opening by untrained professionals may cause injury

3 Learn about this product

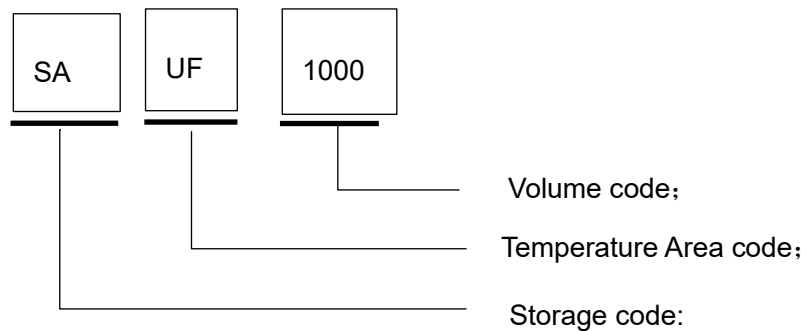
3.1 Description of product specification

3.1.1 Product model

Table 3.1 Product model

Model	Product Code	Temperature Code	Volume Code
SAUF-1000	SA	UF	1000L
SAUF-1500	SA	UF	1500L
SAUF-1500	SA	UF	2000L

3.1.2 Type naming rule



3.1.3 Storage mode code

The value consists of 0 to 2 letters, which indicates the method of storing samples. SA is the automatic access sample box. A is the automatic access sample box and sample tube. No letters for non-automatic series products.

3.1.4 Temperature area code

It is composed of 1 to 2 English letters, representing the temperature of the characteristic point, UF stands for -86°C . F is -40°C . Each temperature zone represents a product range.

3.1.5 Volume code

It consists of 3 to 4 Arabic numerals, and its value should be equal to the effective volume of the product, in L.

3.2 Product structure and principle

3.2.1 Product structure figure

As shown in figure 3.2.1, the front of the product is the inlet and outlet bin, the rear is the internal mechanism of the box, and the left is the electric control cabinet containing the control system and the cooling system.

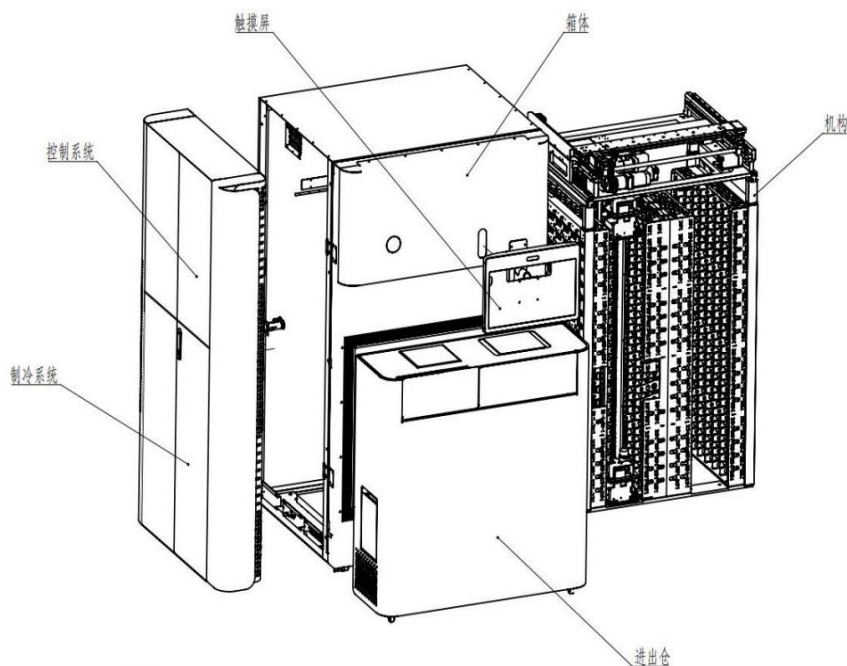


Figure 3.2.1

3.2.2 Product principle

3.2.2.1 Product cooling principle

The product realizes the transfer of heat by consuming electrical energy, thus actively creating the required low temperature environment.

Steam compression refrigeration means that the liquid refrigerant is vaporized into a gaseous refrigerant in the evaporator into the compressor, is compressed into a high temperature and high pressure gas, and then discharged to the condenser, under the action of the condenser, the gaseous refrigerant is cooled into a high pressure liquid, and then into the throttling device (common capillary and expansion valve). The pressure and temperature of the liquid refrigerant being throttled are reduced again, and after the liquid refrigerant enters the evaporator, it will vaporize and absorb heat again, and the refrigeration effect will be achieved again and again.

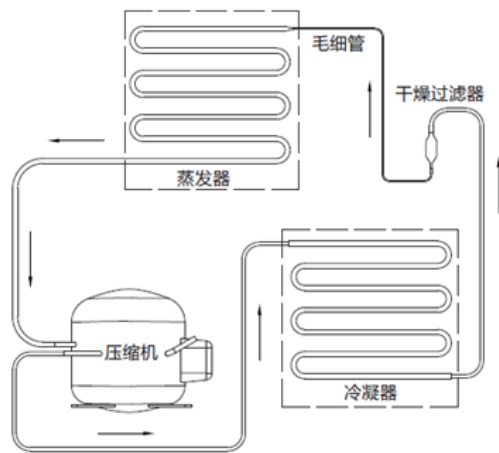


Figure 3.2 Schematic diagram of working principle

3.2.2.2 Automation principle

The mechanical structure of the product is driven by the internal motor that can work normally at low temperature. The mechanical mechanism realizes the picking and transfer of the biological sample box, and the biological sample box is placed from the outside of the box to the internal frozen storage shelf. Or remove the biological sample box from the internal freezer to the outside of the box.

The product can realize the identification of biological sample box code and tube code through the computer connected to the scanner, camera and other shooting modules that can work normally at low temperature. Then through the specially developed software on the computer, the corresponding code samples are intelligently managed.

3.3 Functions and features

The main function of the product is to preserve biological samples at low temperature, and its characteristics are automatic access and intelligent management. Compared with traditional manual refrigerators, users no longer need to open the refrigerator door to access samples, which can avoid temperature fluctuations of innocent samples and avoid large amounts of frost in the box; User access samples are recorded and confirmed by the system throughout the process, which can avoid errors caused by human management.

The product can provide users with functions such as box storage, box retrieval, order management, warehouse location management, account management, system management, alarm reminder, etc. Please see Chapter 5 for specific functions and operations.

3.4 Requirements for consumables

3.4.1 cryobox

The storage system supports two types of freezers: SBS freezers (as shown in Figure 3.4.1-1) or square freezers (as shown in Figure 3.4.1-2).

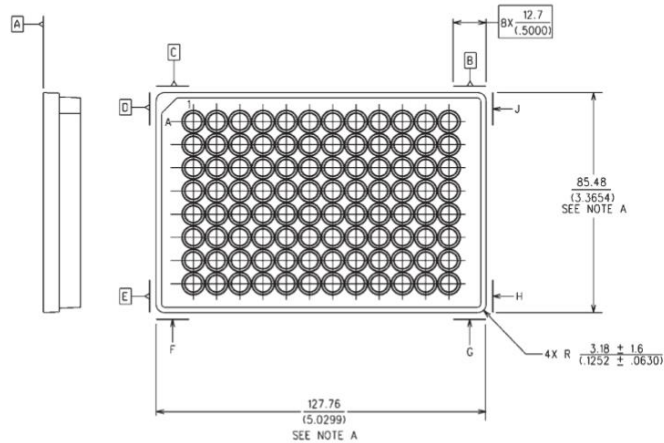


Figure 3.4.1-1 SBS cryobox (96 tubes)

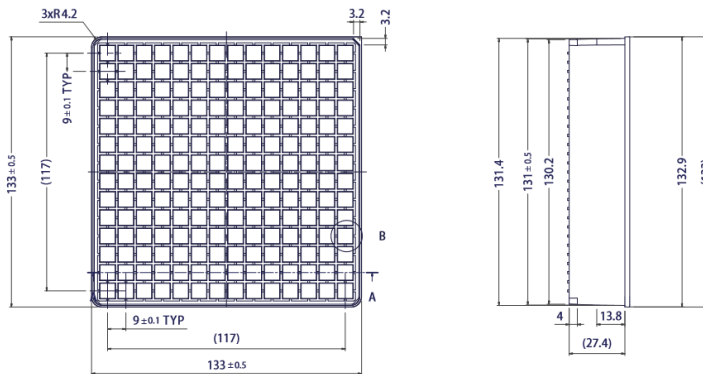


Figure 3.4.1-2 Square cryobox (196 tubes)

There should be a bar code in the middle of the side of the cryobox. The default bar code position is as shown in Figure 3.4.1-3:

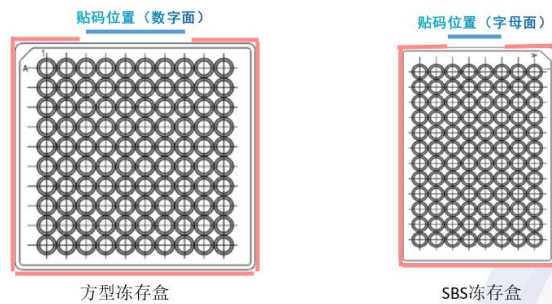


Figure 3.4.1-3 location of bar-code

Bar codes should not be loosened and cracked at low temperatures.



Caution:

If the bottom of the cryobox is not empty, the freezer tube data cannot be verified by scanning the code.

Do not store any other model or specification cryobox that has not been verified on the storage system.

If the bar code position of the cryobox is inconsistent with the default position, please communicate with GP to confirm compatibility.

3.4.2 Freezer tubes

The storage system supports the following freezer tubes, which are downward compatible based on the maximum height:

	Cryobox dimension	Scope of compatibility (e.g.)	Height Max.
Square cryobox	132.5-134mm	0.5mL tube, 196 type or shorter	37.8mm
	132.5-134mm	Standard 2 inch square cryobox 2ml tube	53mm
	132.5-134mm	5-10ml tubes; blood-collecting tube; 15mL/50mL centrifuge tube	127mm
SBS cryobox	127.8*85.5(±1mm)	PCR plate/ elisa plate /0.3mL 2D tube/0.7mL 2D tube	23.8mm
	127.8*85.5(±1mm)	0.5mL 2D tube	37.8mm
	127.8*85.5(±1mm)	1.0mL 2D tube	58.6mm
	127.8*85.5(±1mm)	2.0mL 2D tube	49.4mm
	127.8*85.5(±1mm)	4-8mL 2D tube	95.5mm

4 Installation

4.1 Preparation before installation

4.1.1 Power supply

Socket specifications: Meet GB/T 1002 standard, AC 220V, 50HZ 16A (three holes).



Caution:

Each device is equipped with a 3-meter long power cable. Three-hole power sockets should be properly allocated on site.

4.1.2 Network requirement

Layout one independent local area network (LAN) for the automation system, standard RJ45 network ports, and network cables over Category 5. Each device is equipped with two network ports on the rear wall. The other end of the network port is located according to the site planning diagram. In addition, it is equipped with two client LAN network ports assigned with fixed IP addresses, which are used to connect to the sample information management system. The specific layout is determined according to the project plan.

If remote monitoring is required, the reservoir area needs to be equipped with 4G, GPRS or external network signals to select suitable remote temperature monitoring alarms.

4.1.3 Transportation channel

Before transferring equipment, check whether the channels meet the following requirements:

The width is greater than 100cm

The height is greater than 200cm

The ground is flat without depression

You need to prepare a floor protection solution at the installation location in advance (if the floor is required to carry a large load per unit area during installation and transportation, or if you have requirements on floor cleanliness).

When the transfer channel obstructs the step, it is necessary to prepare the slope block in advance. The Angle of the slope block should be less than 3°, and the length of the block should not be less than 120cm.

4.1.4 Installation area

Reserve at least 100cm space on the front of each device;

Reserve at least 20cm on the back and top for heat dissipation;

Reserve at least 20cm on the left and right sides for heat dissipation; You are advised to reserve 50cm for maintenance.

The heat dissipation of each device is 5460BTU/h (1000L series) or 8000BTU/h (1500L and above series); It is recommended that air conditioners have sufficient redundancy.



Caution

An oxygen concentration sensor is recommended for use with liquid nitrogen backup systems.

4.2 Installation

The equipment is installed and commissioned by GP engineers or engineers authorized by GP.

4.2.1 Unpacking

The device is packed in a wooden pallet. You need to unpack the wooden pallet and move the device from the wooden pallet to the flat floor.

4.2.2 Assembly

The components of the device are assembled by engineers.

4.2.3 Power on

After the device is powered on, engineers will debug it to confirm that each module works normally. After the equipment is cooled for 24 hours, the engineer will carry out low temperature calibration work.

4.3 Installation qualification

After the installation is complete, engineers need to confirm the following:

Check whether the device installation environment meets requirements.

whether the units listed in the equipment list are complete;

whether the equipment is obviously damaged;

whether the equipment can be assembled normally;

whether the equipment can work normally after power-on;

whether the equipment can be cooled normally;

whether the equipment can be operated automatically at low temperatures.

When everything is confirmed, the device can be handed over to the customer.

5 Operation

5.1 Main interface introduction



Figure 5.1-1

The main interface provides navigation bar, status bar, data statistics, storage and sampling operation and other contents or functions:

The navigation bar on the left is [Home], [Order Management], [Library Management], [Favorites Management], [Account Management] and [System Management].

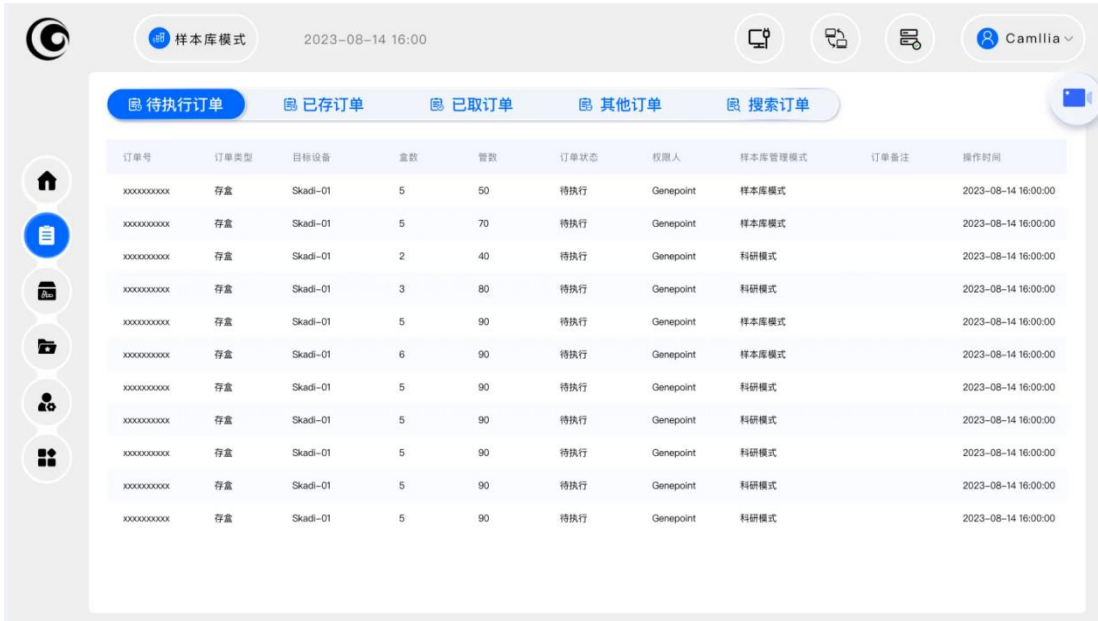
The status bars at the top are respectively [logo], [Sample Management Mode], [Real-Time time], [Warning reminder], [alarm reminder], [Network status], [Online status], [Device status], and [Login function/Login account name].

In the statistical data area, the rendering diagram of the refrigerator shows the real-time temperature of the storage area, and the card on the right displays the real-time temperature of incoming warehouse, real-time usage data of storage bit, real-time quantity of orders to be stored and real-time quantity of orders to be retrieved successively. Click the card to enter the corresponding management page.

[Box Storage], [Box Retrieval], [Tube Store], and [Tube Retrieval] order creation portals are provided at the lower right side for full box access or single tube access.

5.2 Sub-page introduction

5.2.1 Order management page



订单号	订单类型	目标设备	盒数	管数	订单状态	权限人	样本库管理模式	订单备注	操作时间
xxxxxxxxxx	存盒	Skadi-01	5	50	待执行	Genepoint	样本库模式		2023-08-14 16:00:00
xxxxxxxxxx	存盒	Skadi-01	5	70	待执行	Genepoint	样本库模式		2023-08-14 16:00:00
xxxxxxxxxx	存盒	Skadi-01	2	40	待执行	Genepoint	科研模式		2023-08-14 16:00:00
xxxxxxxxxx	存盒	Skadi-01	3	80	待执行	Genepoint	科研模式		2023-08-14 16:00:00
xxxxxxxxxx	存盒	Skadi-01	5	90	待执行	Genepoint	样本库模式		2023-08-14 16:00:00
xxxxxxxxxx	存盒	Skadi-01	6	90	待执行	Genepoint	样本库模式		2023-08-14 16:00:00
xxxxxxxxxx	存盒	Skadi-01	5	90	待执行	Genepoint	科研模式		2023-08-14 16:00:00
xxxxxxxxxx	存盒	Skadi-01	5	90	待执行	Genepoint	科研模式		2023-08-14 16:00:00
xxxxxxxxxx	存盒	Skadi-01	5	90	待执行	Genepoint	科研模式		2023-08-14 16:00:00
xxxxxxxxxx	存盒	Skadi-01	5	90	待执行	Genepoint	科研模式		2023-08-14 16:00:00
xxxxxxxxxx	存盒	Skadi-01	5	90	待执行	Genepoint	科研模式		2023-08-14 16:00:00
xxxxxxxxxx	存盒	Skadi-01	5	90	待执行	Genepoint	科研模式		2023-08-14 16:00:00

Figure 5.2.1-1

The order management page provides function modules such as [Pending Order], [stored order], [Taken order], [Other order] and [Search Order]. Click to enter each module.

Pending orders: Displays all uncompleted orders on the device within the permission of the current user.

Stored orders: Displays all completed storage/storage order data on this device within the permission of the current logged-in person.

Taken orders: Displays all completed box/tube order data on this device within the permission of the current logon personnel.

Other orders: Displays all completed auxiliary fragmentation, box transfer, and inventory order data on this device within the permission of the current logon personnel.

Order search: Provides a system-wide order data search function to search orders across devices.

On the order details page, depending on the order type and completion, different order operable functions are provided, such as [save box], [Add box], [remove box], [cancel], etc.

5.2.2 Library location management page

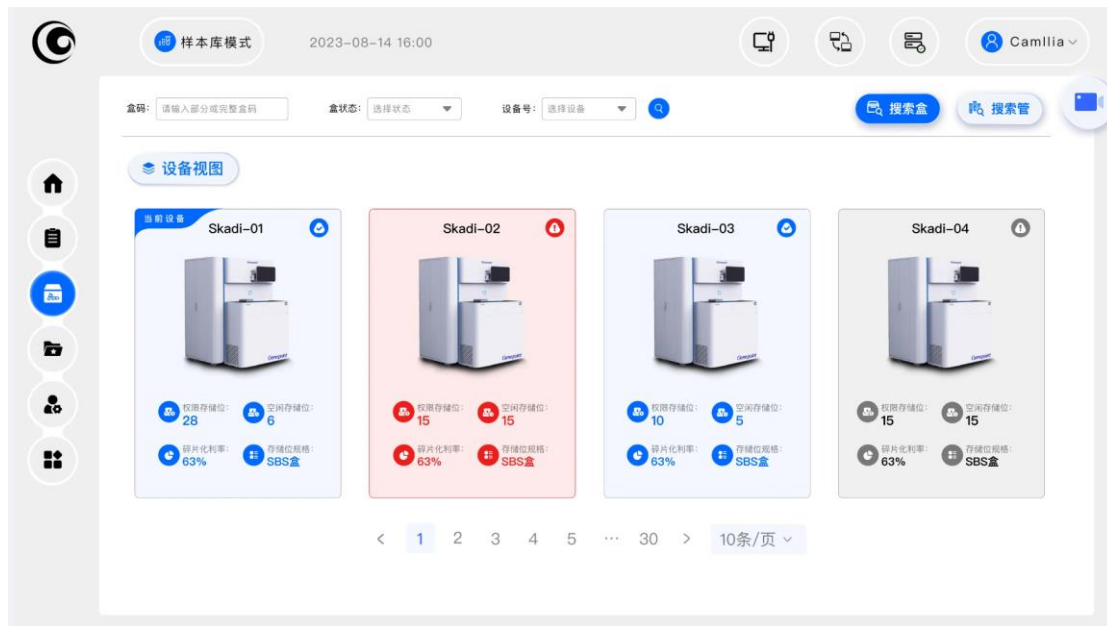


Figure 5.2.2-1

The storage location management page provides the search function of cryobox/frozen storage tube, and the visual view management function. Through the search function, you can search all the frozen box/frozen tube data in the system, and provide different operations, such as storage, retrieval, collection and other functions. Visual view management provides cross-device storage bit data view and various types of order creation, such as box order, tube order, auxiliary fragmentation order, etc.

Please refer to 5.5 for details.

5.2.3 Favorites management page

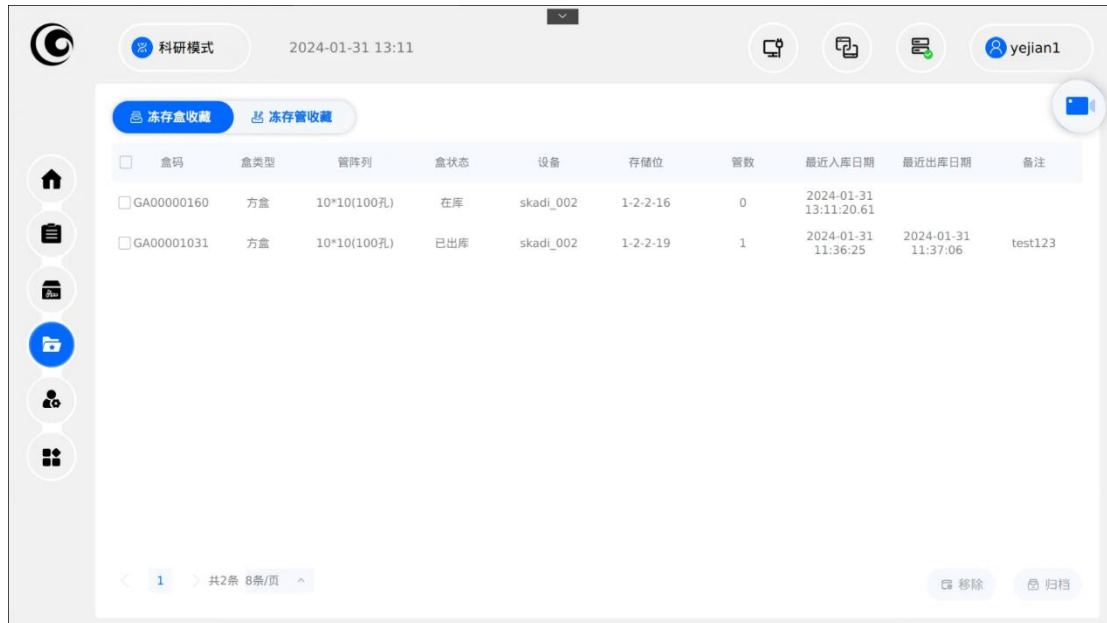


Figure 5.2.3-1

The favorites management page displays the collection data of the cryobox and the collection data of the frozen storage tube respectively, both of which provide functions such as [remove], [archive], [store box (tube)], [take box (tube)] and so on.

Remove: Check the box (tube), click [Remove] button, you can remove the selected box (tube) from the collection list. Note: It is only removed from the favorites list and does not affect other data.

Archive: After the cryoboxes (tubes) with the status of "released" are checked, the "Archive" button can be used. After clicking, you can set the selected cryobox (tube) to used, that is, change the status of the selected cryobox (tube) and the frozen storage tube in the box to used, and clear the retained location data to release the occupied storage space. But it won't be removed from the favorites list.

Storage box (tube) : After checking the cryobox (tube) whose status is "out of storage", the "storage box (tube)" button can be used. After clicking, a storage box (tube) order will be created automatically, and the selected box (tube) and the frozen storage tube in the box will be automatically added to the order. If the selected cryobox (tube) is not automatically filled with location data, it is still necessary to manually select the storage location of the box (tube).

Taken box (tube) : After the cryobox (tube) with the status of "in the library" is checked, the "Taken box (tube)" button can be used. After clicking, a pickup order (tube) is automatically created and the selected box (tube) is automatically added to the order.

5.2.4 ID management page

The account management page provides personal information page, account list page, custom property field page, custom consumables page, etc.

5.2.4.1 Personal Information

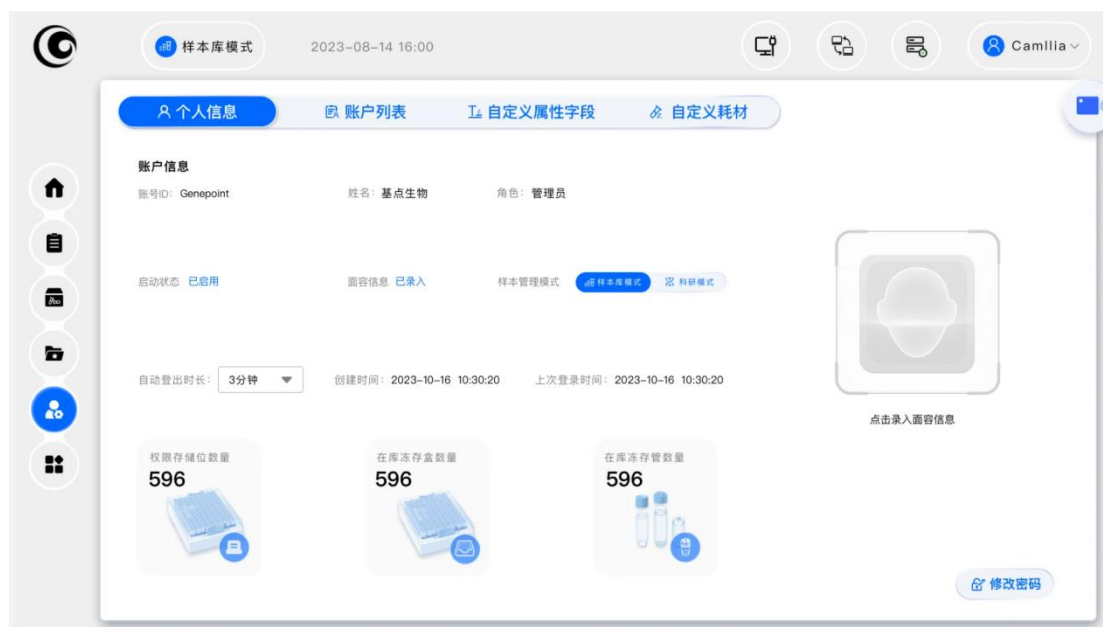


Figure 5.2.4.1-1

Basic information display: display account ID, name, role, face information input, sample management mode, automatic logout duration, account creation time, account last login time, number of storage bits within the account permission, number of freezer boxes within the account permission, number of freezer tubes within the account permission, etc.

Name modification: Click on the name to modify the name information.

Sample management mode switch: Click "Sample library mode" or "Research mode" to switch the sample management mode of the current account (valid only for the current account). There are restrictions on the sample management mode switching, that is, when the administrator sets the management mode to "Member free setting", the sample management mode can be switched. If the management mode is set to Sample Library Mode (Applicable to all employees), the sample management mode cannot be changed and is set to sample library mode.

Automatic logout duration: You can change the automatic logout duration of the account (valid for this account only), that is, the account will be automatically logged out if no operation is performed within the set period.

Face information input: Provides the face information input function, which can be used for quick login of accounts. The face data can also be updated by re-entry.

Change Password: Allows you to change a password. You must verify the current password. The new password cannot be the same as the current password. After the password is successfully changed, the account is automatically logged out. You need to use the new password to log in again.

5.2.4.2 Account List



Figure 5.2.4.2-1

Account list Displays all account information in the system, and provides account search and other account related operation functions. The operation functions related to accounts are available only to administrator accounts.

Account data display: Displays all account data based on the account creation time, including disabled account data.

Account Search: Use the fields provided to search for the specified account;

Reset Password: This feature is only available to administrator accounts. The password of the account can be reset to the initial system password, but the password of the current login account cannot be reset;

Storage bit device: This function is only available to administrator accounts. An actionable storage bit can be assigned to a specified account. There are two allocation methods. One is to copy the storage bit permission of an account in the system to the current selected account, that is, the

"Follow others account" function. One is allocated storage bits for manual selection through the view. After allocating storage bits with other accounts, you can adjust the storage bits in the second manual allocation mode.

Role Change: This feature is only available for administrator accounts. The role of an account can be changed between [Administrator] and [Operator], and the role of the currently logged in account cannot be changed.

Disable account: This function is only available to administrator accounts. You can disable the account. After the account is disabled, you cannot log in to the system. You cannot disable a currently logged in account.

Permission transfer: This function is only available to administrator accounts. Permission for an account's outstanding orders, as well as for storage bits, can be transferred to a specified account. You cannot transfer permissions from the currently logged in account to another account.

Enable Account: This function is only available to administrator accounts. For disabled accounts, the functions of [Reset Password], [Storage Bit Settings], [Role Change], and [Disable Account] are disabled, and only the functions of [Enable Account] and [Permission Transfer] are provided. You can enable a disabled account. After the account is enabled, the initial password is used.

Validator list: This feature is only available to administrator accounts. Displays the list of people who can be selected as order secondary validators and can change the accounts in the secondary validators list.

Add an account: This function is only available to administrator accounts. You can add a new account. The password of the new account is the initial system password

Full Settings: This function is only available to administrator accounts. You can set the mandatory password change cycle, sample management mode, whether to enable strong password verification and other functions; You can change the initial password of the system. After the initial password is changed, the passwords of all accounts that still use the initial password are updated to the new initial password. The preceding Settings are valid for all accounts in the system.

5.2.4.3 Custom property fields

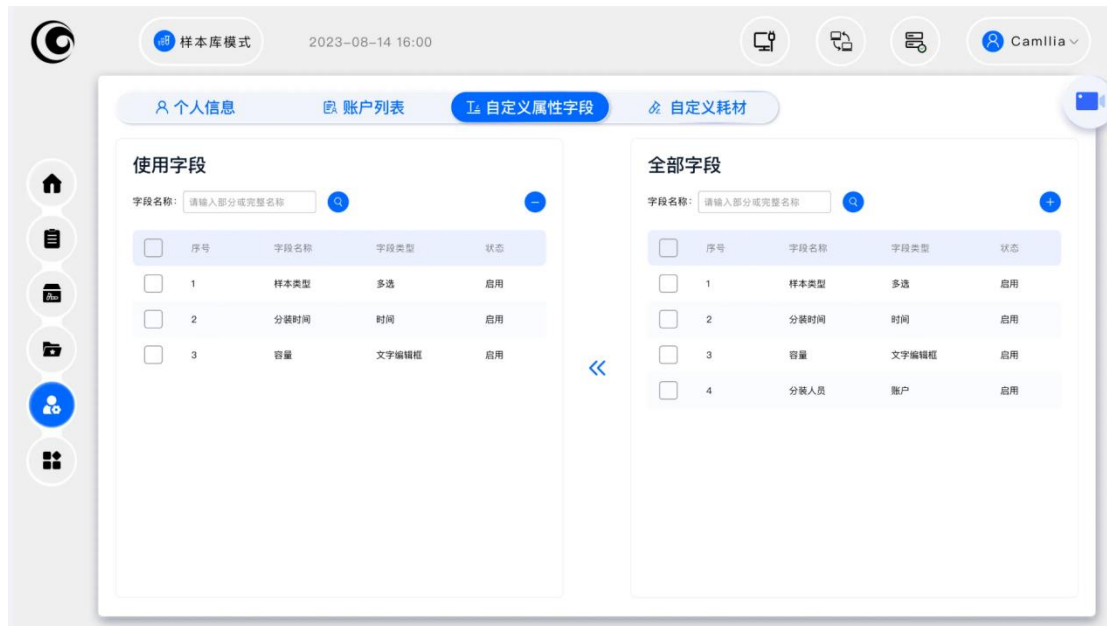


Figure 5.2.4.3-1

Custom property field, you can customize the sample information field.

Custom field display: The field is divided into two parts. The left side shows the field that can be used by individuals, that is, "Use field", which is only open to personal accounts. All fields added to the system are displayed on the right, that is, All Fields, which are open to all accounts in the system.

New fields: The function of adding fields to the right of all fields is available. You can add fields to the system. The types of fields that can be added are [Date], [Time], [Text edit Box], [Text edit area], [single selection], [multiple selection], [integer], [decimal], and [Account]. Account indicates the multiple selection type. The optional value of this option is all enabled accounts in the system.

Field addition and removal from Personal Use list: Select the field that needs to be used from all the fields on the right and click the Transfer button in the middle to add the selected field to the personal use list. To the right of a field, you can remove a field that can be used by an individual from the list. After the field is removed, the data that has been recorded using the field in the sample is not affected, and it can be added to the personal use list again. Add and remove only for the current account.

How to use the field: After adding the field to the personal usage list, select the field you want to record in the Custom Properties area and enter the field value when filling in the sample information. The data is recorded in the current sample data.

5.2.4.4 Custom consumables

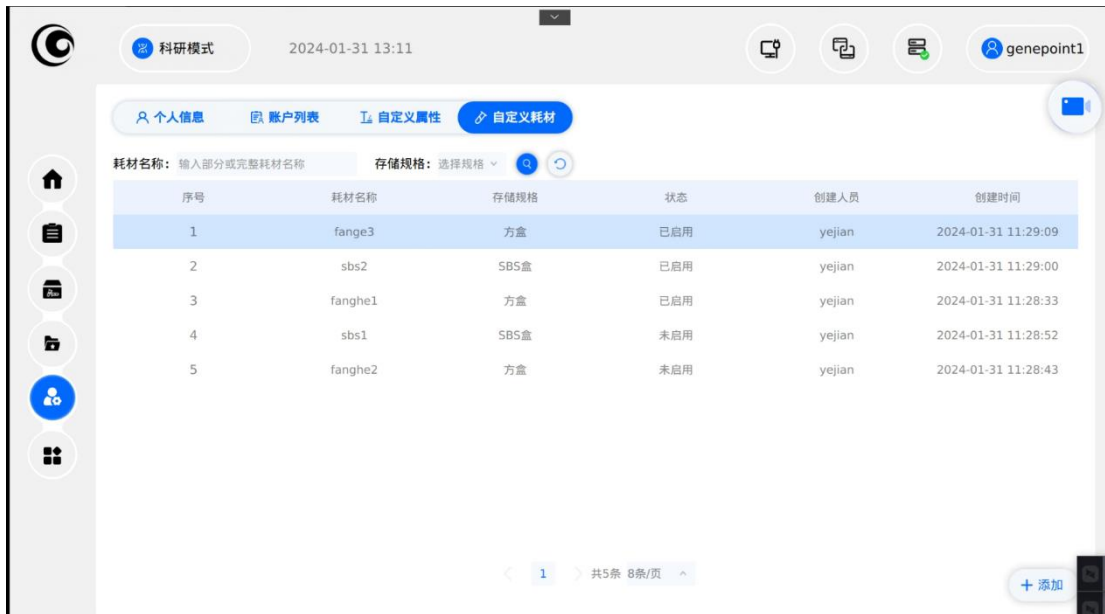


Figure 5.2.4.4-1

You can add storage consumables that are not preset in the system, such as enzyme label boards.

Consumables added: Storage consumables can be added according to the storage specifications of the device. The storage specifications of the device are divided into two types: [SBS] and [square].

Use of custom consumables: When creating a storage order, you can select the tube array as custom consumables. Custom consumables do not support bottom code scanning and sample information entry.

5.2.5 System management page

The system management page includes device monitoring page, log record page, data statistics page, system configuration page, maintenance and debugging page, and device information page

5.2.5.1 Device monitoring

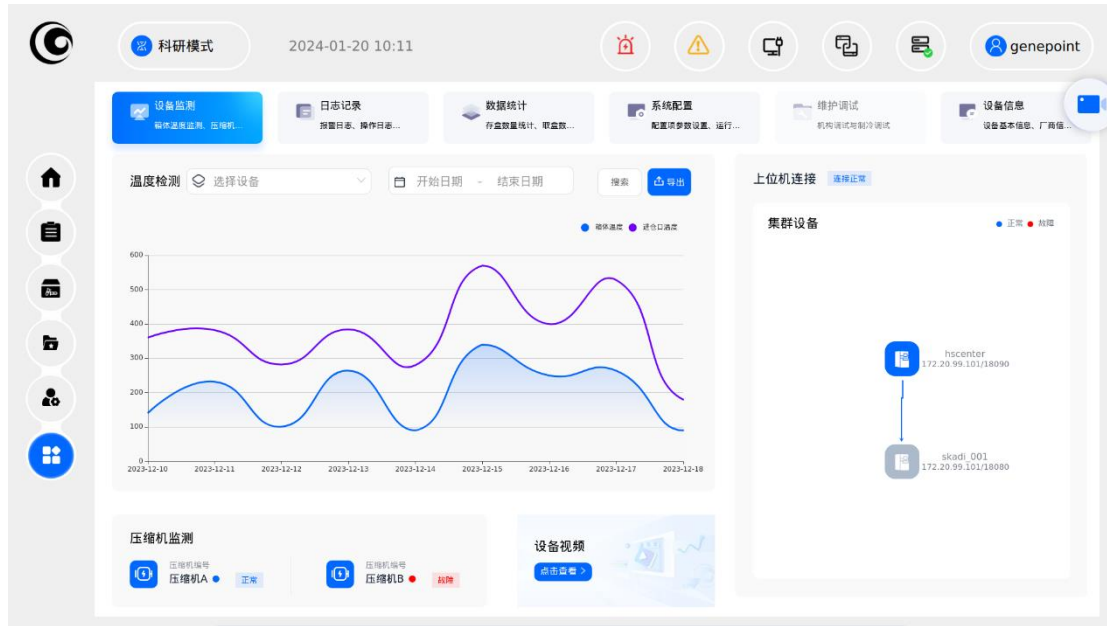


Figure 5.2.5.1-1

The device monitoring page displays real-time temperature curves, compressor status, and online status in the storage area/inlet area.

Real-time temperature curve: Displays the temperature change curve of the storage area and inlet area during the last week. You can select the temperature data of other devices in the cluster or display the temperature in a time range. Provides the data export function, you can export the current temperature curve data, the exported file format is Excel, the exported data is [collection time point], [temperature].

Compressor status monitoring: Displays real-time status of the primary compressor and backup compressor.

Connection status: Displays the connection status to the host and devices in the cluster.

Device video: Provides the playback function of the surveillance video of the device. Click, as shown in Figure 5.2.5.1-2. Equipment video is divided into normal operation video and equipment fault video, in which the normal video rolling overwrite storage, the maximum 7 days of video return visit; The fault video is stored permanently.

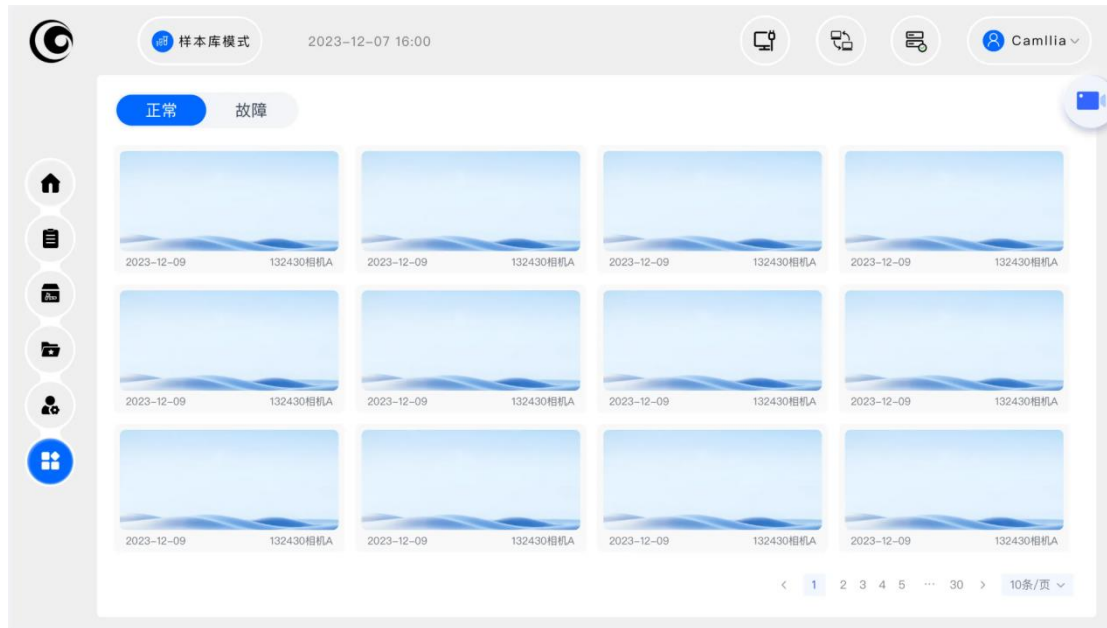


Figure 5.2.5.1-2

5.2.5.2 log record

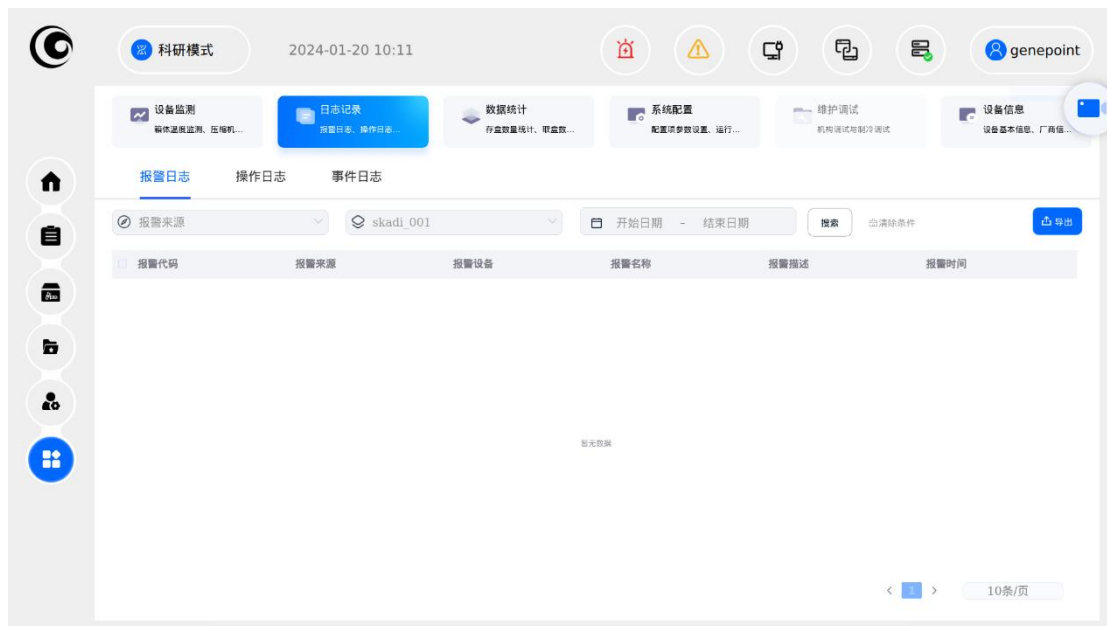


Figure 5.2.5.2-1

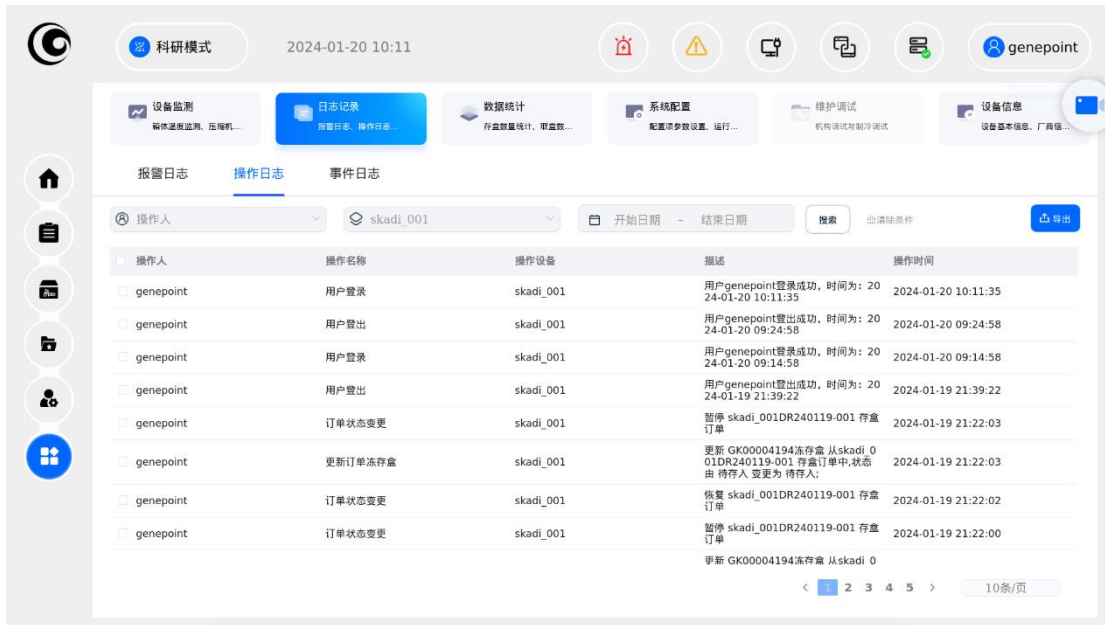


Figure 5.2.5.2-2

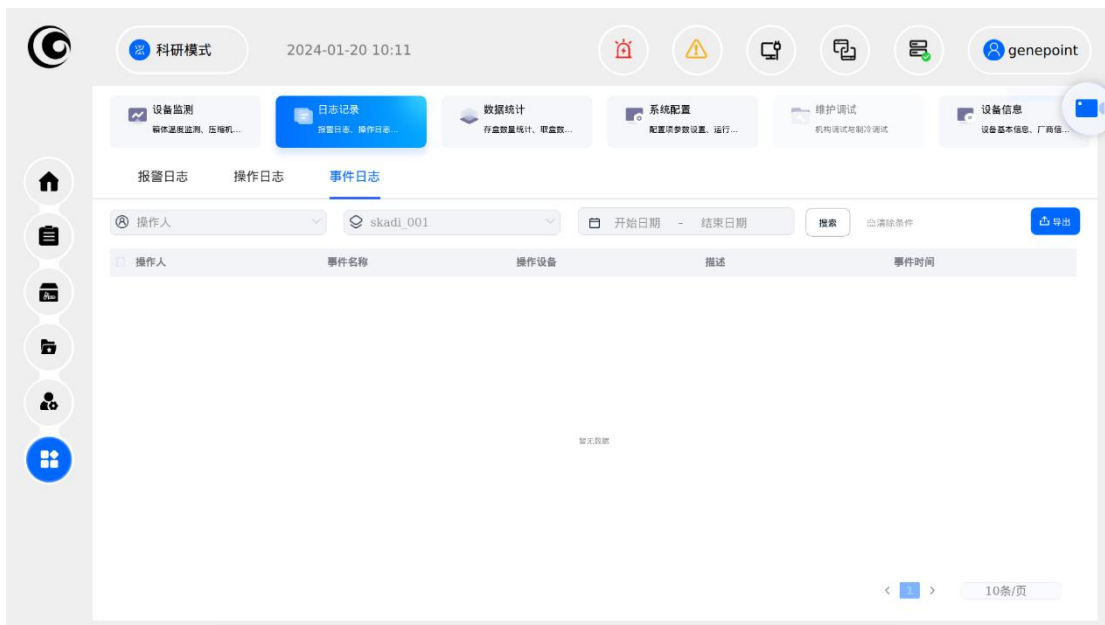


Figure 5.2.5.2-3

The log page displays alarm logs, operation logs, and event logs.

Alarm log: Displays all alarms and warning information of the device by default, as shown in Figure 5.2.5.2-1. You can search for the specified alarm information or alarm information of other devices. Click Export to export the alarm information currently displayed.

Operation log: By default, all operations on this device are displayed, as shown in Figure 5.2.5.2-2. Click Export to export the operation log.

Event log: Displays all events of the device by default, as shown in Figure 5.2.5.2-3. Event logs record the status changes of each component in the device. Click Export to export the displayed information.

5.2.5.3 data statistics

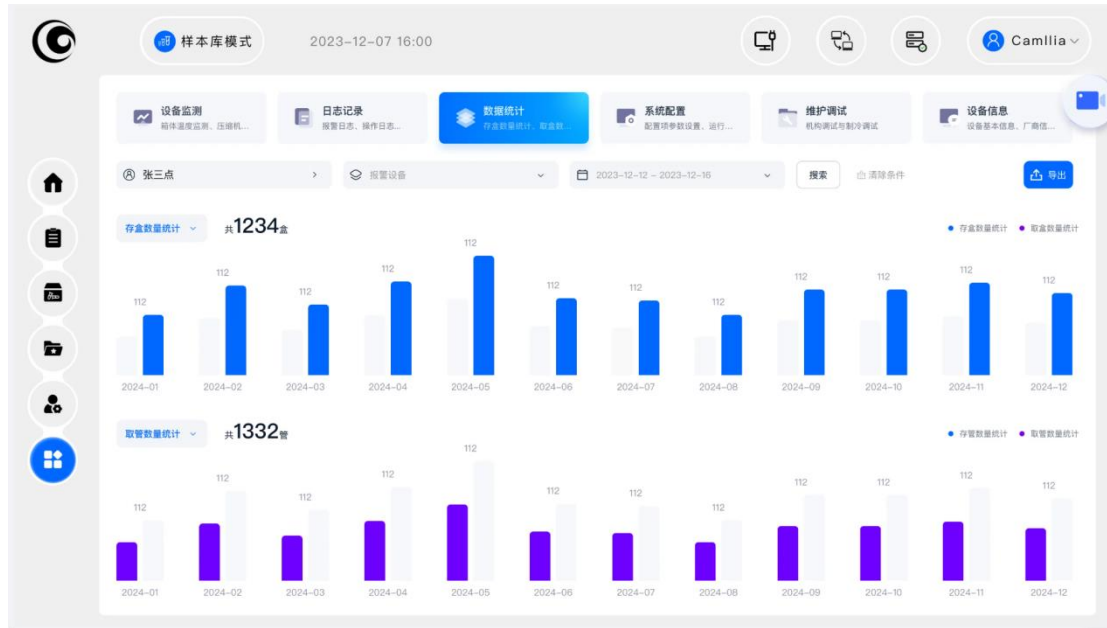


Figure 2.2.5.3-1

The data statistics page shows the statistical charts of the number of boxes stored, the number of boxes taken, the number of stored, and the number of tubes taken.

Statistics switching: You can switch statistics objects and update data in the statistics chart by selecting a title in the upper left corner of the statistics chart.

Export: Export the currently displayed statistics chart.

5.2.5.4 System setting

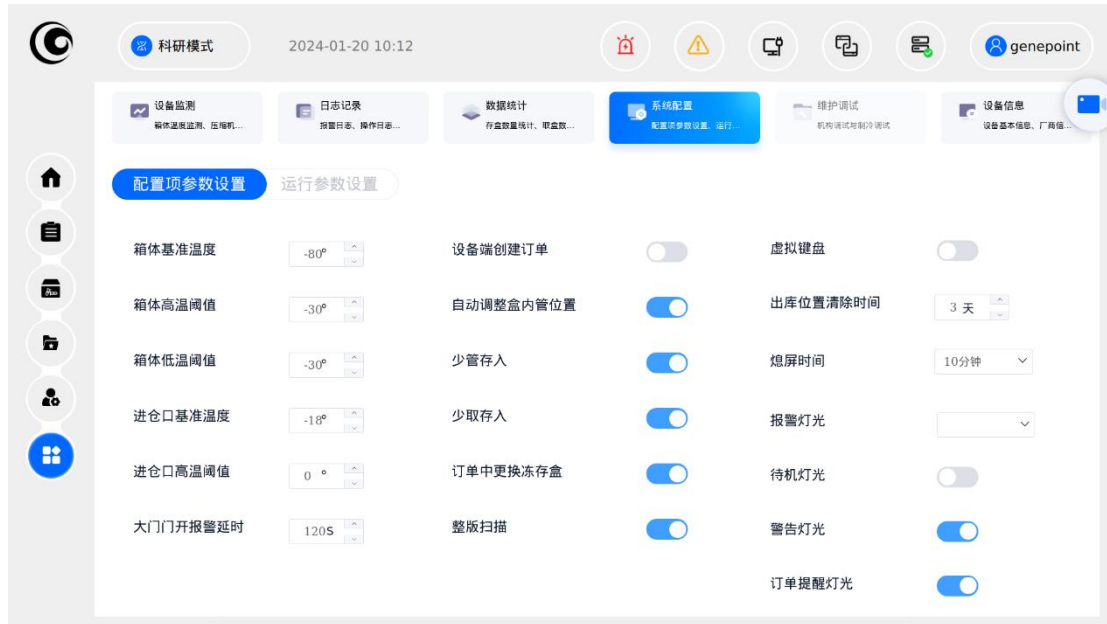


Figure 5.2.5.4-1

The system settings page provides configuration item parameter Settings and running parameter Settings. The configuration item parameter Settings are available only to the administrator account and the running parameter Settings are available only to the maintenance account.

Effective parameter configuration of the device: temperature in the box, alarm value of high temperature in the box, alarm value of low temperature in the box, inlet temperature, inlet high temperature alarm value, door opening alarm delay, virtual keyboard, screen off time, alarm light, standby light, warning light, order reminder light.

The parameters that take effect in the cluster on the network are as follows: create an order on the device side, automatically adjust the position of pipes in the box, store with fewer pipes, store with less fetch, replace the frozen storage box in the order, scan the whole page, and clear time at the outbound location.

Some of the parameters are explained as follows:

door opening alarm delay: that is, the time interval between the device door opening and the alarm starting to remind.

Exit location Clearing time: The storage bit in the device will be retained after the cryobox and tube are discharged from the storage. Other cryoboxes/ tubes cannot be stored until the location data of the cryobox/ tube has been cleared.

Alarm light: The alarm light prompt cannot be turned off, you can choose other colors specified by the system to remind.

Standby light, warning light, order reminder light: light reminder can be turned off.

Creating an order on the device: When the device is not connected to the sample information management system, the order creation function cannot be disabled. After connecting to the sample information management system, you can choose whether to allow the creation of storage/sampling orders on the device. If you choose to disable this function, the storage and sampling orders can only be initiated by the connected sample information management system.

Automatically adjust the position of the tube in the box: after this function is enabled, if the position of the frozen tube is found inconsistent with the position recorded in the order by scanning the bottom code of the frozen tube during sample storage, the function of updating the position of the frozen tube is provided; If you choose to update the frozen storage tube position, the recorded frozen storage tube position is updated to the actual scanned position.

minor tube access: after this function is enabled, in the sample storage, if the frozen tube is found to be missing by scanning the bottom code of the frozen tube, it provides the function of continuing to save; If you choose to continue, mark the unstored frozen tube and remove it from the frozen box data.

less take and deposit: after sampling, when returning the sample, it is found by scanning the bottom code of the frozen storage tube that the frozen storage tube should be taken out is not taken out, it can provide the function of continuing to deposit; If continue storage is selected, the unretrieved frozen storage tube data is updated as unretrieved and the device continues to be stored.

replacement of cryobox in the order: when storing samples or sampling, it is found that the data of the tube has not changed through scanning the bottom code of the tube and scanning the side code of the cryobox. However, if the cryobox is replaced, the function of continuing storage will be provided; If you choose to continue to save, update the old cryobox data to the new cryobox data and continue to save to the device.

full-page scan: In the sample library mode, this function is automatically turned on and cannot be turned off; In research mode, you can choose whether to use the full-page scan function. The full-page scanning function refers to whether the data is reviewed by scanning the bottom code of the tube when storing samples. If you choose to turn on this function in scientific research mode, you can provide full-page scanning function when storing samples.

5.2.5.5 Maintenance debugging

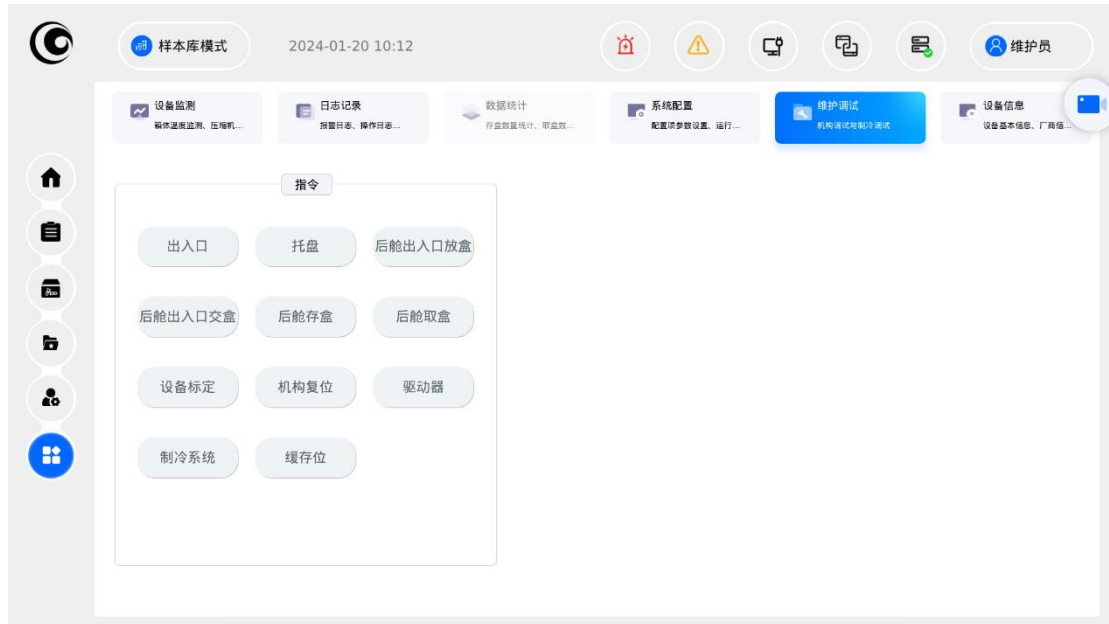


Figure 5.2.5.5-1

The maintenance and debugging page provides the calibration, commissioning and maintenance functions of the device. Due to the professional knowledge involved and the avoidance of crash risks, this page is only open to the account of the maintenance role.

5.2.5.6 Device Informaiton

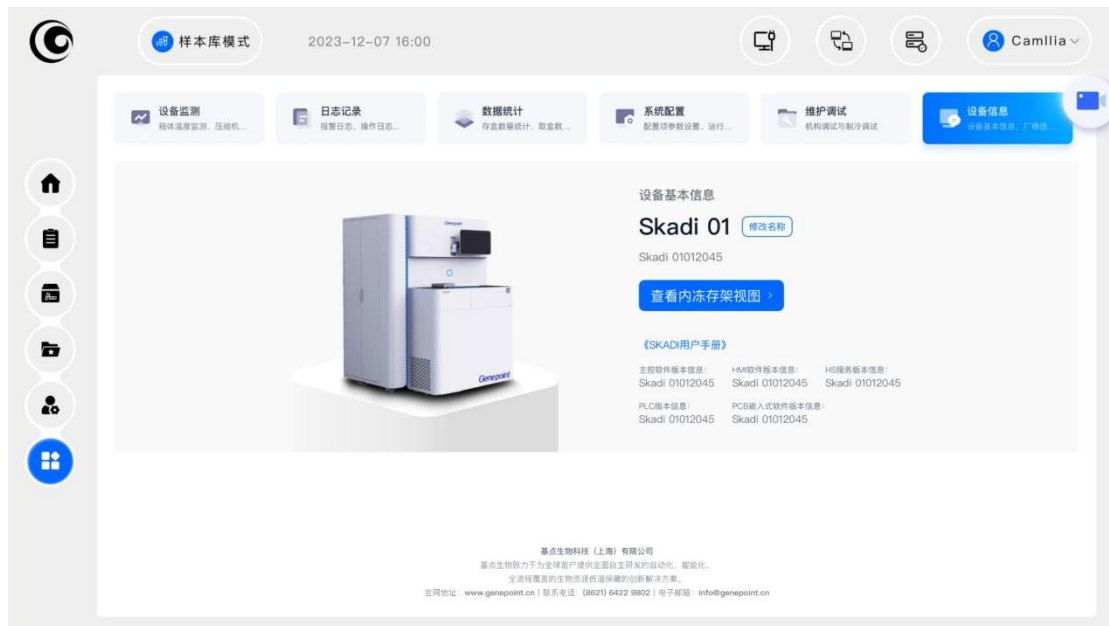


Figure 5.2.5.6-1

The Device information page displays the basic information of the device, and provides the modification function of the device name and frozen shelf name. See the link in User Manual.

Basic Device information: Displays the device name, device specifications, and version information of the main control software, HMI software, HS service software, and PLC software.

Name Change: You can click [Change name] next to the device name to change the device name. The modified device name will be synchronized to the home page and the visual device management page. To modify the name of the frozen shelf, click [View View of the frozen shelf] to open the view page of the frozen shelf, and modify the name on this page. The modified name will be synchronized to the visual management page of the device.

User Manual View: Click the User Manual link to view the user manual of the device.

5.3 Sub-page introduction

The sample storage operation is realized by the way of box storage order and storage order. The storage operation is as follows:

Create an empty storage order by clicking the “Store Box” button on the home page or device view page, as shown in Figure 5.3-1.



The screenshot shows a web-based form for creating a storage order. At the top, there are fields for '订单号' (Order No.) with value 'skadi_102DR240120-001', '订单类型' (Order Type) set to '存盒' (Store Box), and '样本管理模式' (Sample Management Mode) set to '科研模式' (Research Mode). Below these are dropdown menus for '协作人' (Collaborator) and '辅助验证人' (Auxiliary Verifier), and a text field for '订单备注' (Order Remarks) with a 200-character limit. The main section contains several required fields: '*盒 码' (Box Code) with a note '由英文字母和数字组成' (composed of English letters and numbers), '*盒 类型' (Box Type) with radio buttons for 'SBS盒' (selected) and '方盒' (Square Box), '*管 阵列' (Tube Array) with a dropdown menu, and '*存 储 位' (Storage Position) with a search input. There is also a field for '已占用孔位' (Occupied Holes) with the value '0'. A large text area for '盒 备注' (Box Remarks) contains the text '冻存盒备注' (Freezing box remarks) and has a 200-character limit. A central graphic shows a blue rectangular box representing the storage container. At the bottom right, there is a '保存' (Save) button.

Figure 5.3-1

On the order creation page, you can select an order collaborator, auxiliary verifier, or enter order remarks.

Fill in the necessary data of the cryobox, such as box code, box type, tube array, storage bit, etc. Click the icon in the input box to open the page for selecting the storage bit view, as shown in figure 5.3-2.

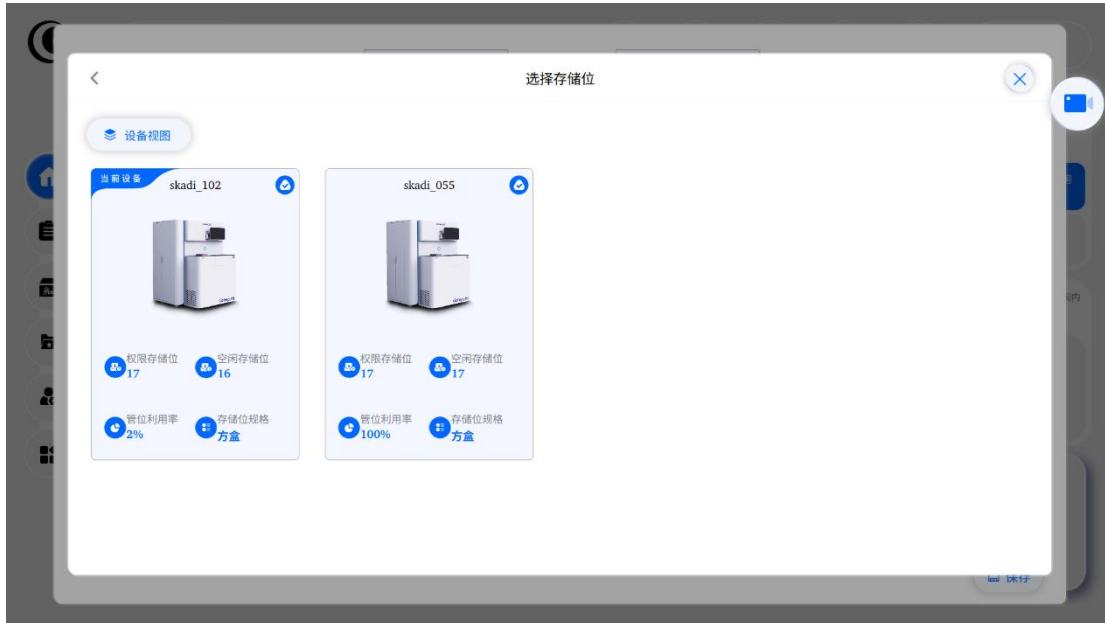


figure 5.3-2

After entering the cryobox information, you can click a hole in the view to enter the sample data, as shown in figure 5.3.




figure 5.3-3


Tube code data are generally recorded in the prefabricated code at the bottom of the tubes and must be filled in. In User-defined properties, select the sample property field to be recorded and add the sample information

The functions of [Save] and [Save & Confirm] are provided after the input of the cryobox/ tube information is completed. Among them, "Save" can save the current input data; [Save & Confirm] Provided only when the selected storage bit is the device currently operating, the entered data can be saved and the "save operation" can start.


The tube data entered in the cryobox can be displayed in four ways, namely [model drawing], [top photo], [bottom photo] and [tube list], which can be switched by clicking the icon



To add a new cryobox data entry page, click the icon  below the cryobox data.

You can switch the cryobox data in the order between view and list by using the icon  provided in the upper right corner of the page.

You can cancel your order by using the icon  provided in the top right corner of the page.

You can use the icon  in the upper right corner of the page to create a storage order, save the entered data, split the cryobox into different suborders according to the storage device, and deliver the suborders to the storage device.

After the order is created, you can search for the order in [To Be Performed List] in order management and start storing the cryobox.

After the front compartment tray is extended, place the cryobox to be stored in the order into the tray, and point the side with the box code at the refrigerator.

Click [Close the door] on the screen, and the device will store the cryobox in the specified position after code scanning and other verification.

During the cryobox storage process, you can edit the custom property data that is currently being stored in the tube again.

After the cryobox is stored, click [Store box] to open the outer door again and store the box.

The operation of the storage tube is similar to that of the storage box, but the differences are as follows:

After storage begins, the system will first remove the cryobox that needs to be stored in the tube from the device.

After the first cryobox is taken out, you can choose to take off one cryobox directly after removing the cryobox from the tray; Or the tube is stored in the box, and the removed cryobox is returned to the device first, and then the box is removed.

Take out a maximum of two cryoboxes in a row. After taking out two cryoboxes in a row, you must return at least one of the cryoboxes before you can remove another cryobox.

5.4 Take out sample

The sampling operation is carried out by taking box orders and taking tube orders. The operation of taking the box is as follows:

Create a carton take order by clicking the “Take Box” button on the home page or device view page, as shown in Figure 5.4-1



<input type="checkbox"/>	盒码	盒类型	管阵列	盒状态	所在设备	所在存储位	管数	备注
暂未添加冻存盒								

Figure 5.4-1

On the order creation page, you can select an order collaborator, auxiliary verifier, or enter order remarks.

Click [Add Box] to add the box you want to take out. You can add the box in three ways: conditional search, view pick and Recent Box order pick.

Figure 5.4-2 shows the page for adding a box by searching for a box. You can search for a box to be removed.



Figure 5.4-2

View the page for selecting and adding cryoboxes is shown in Figure 5.4-3. You can directly select the cryobox to be taken out from the device view and add it to the order.

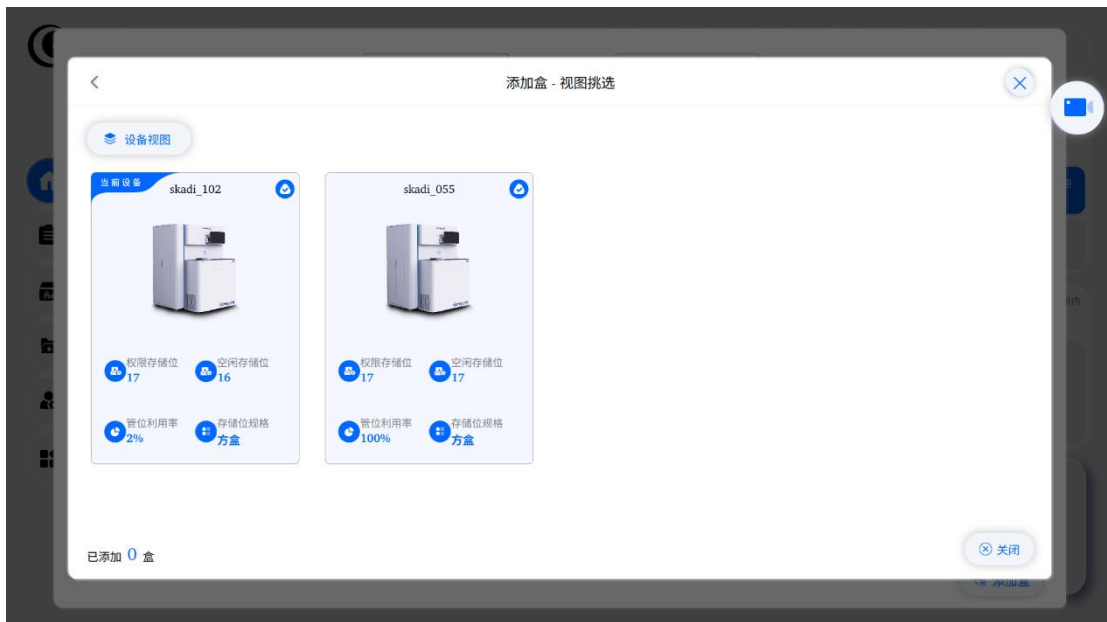


Figure 5.4-3

After the cryobox is added, you can select [Take out box] or [Remove box], as shown in figure 5.4-4. [Take out box] function is only provided when the added cryobox is stored on the device

currently in operation. After clicking, an order is created first, and then the cryobox is taken out. [Remove box] The currently displayed cryobox can be removed from the order.

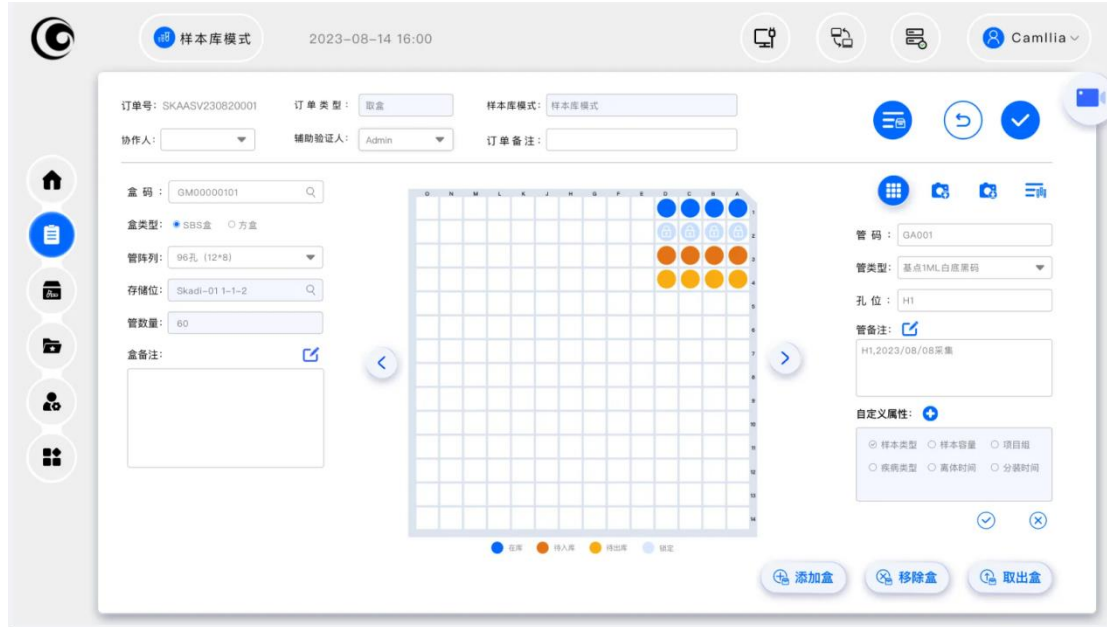



Figure 5.4-4

You can create a storage order by using the icon  in the upper right corner of the page, and split the storage order into different sub-orders according to the storage device of the storage box to be taken out, and then deliver the sub-orders to each device.

On the [To be performed list] of Order Management, you can view the created “pick up order” and start picking up the box.

Click [Take out box], the system will take out the cryobox in the order one by one. After the freezer box is removed, remove it from the tray, and then click [close the door], the system will perform the operation of removing a box.

The tube-removal operation is similar to the box removal operation, with the differences as follows:

Take out cryobox, after the required tube is removed from the box, the cryobox needs to be returned to the device.

After the first cryobox is taken out, you can choose to take off one cryobox directly after removing the cryobox from the tray; Or remove the required tube from the box, and then return the removed cryobox to the device before removing the box

Take out a maximum of two cryoboxes in a row. After taking out two cryoboxes in a row, you must return at least one of the cryobox before you can remove another cryobox.

5.5 Storage management

The storage management page provides the search function of cryobox/ tube, and the visual view management function.

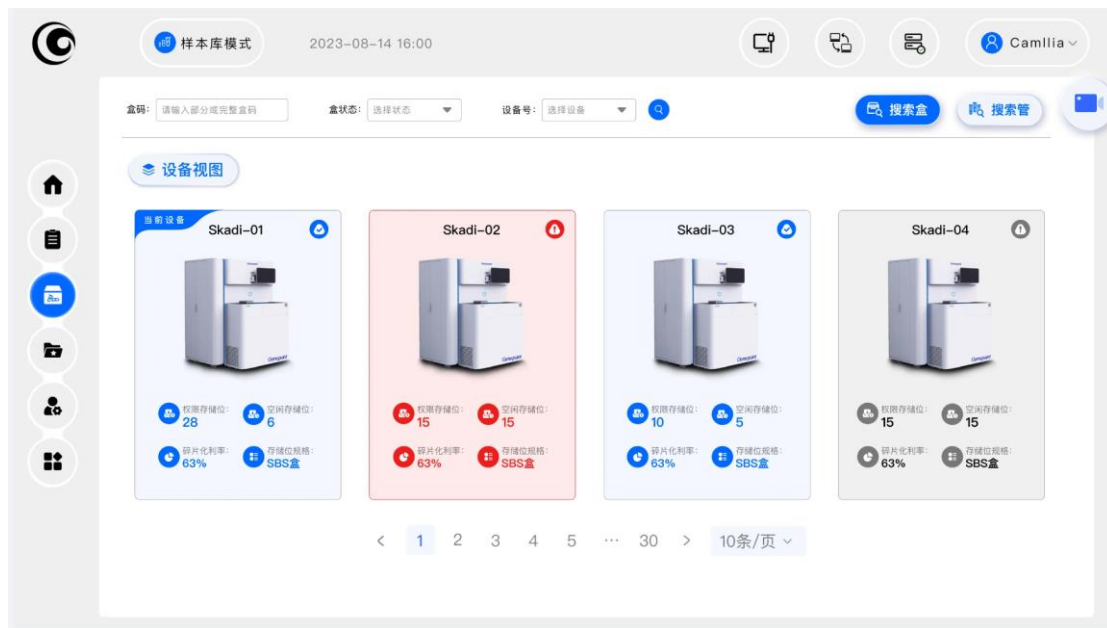


Figure 5.5-1

5.5.1 Cryobox data search

Click anywhere on the upper part of the middle horizontal line in Figure 5.5-1, and the drop-down page displays the search page for the cryobox, as shown in Figure 5.5.1.

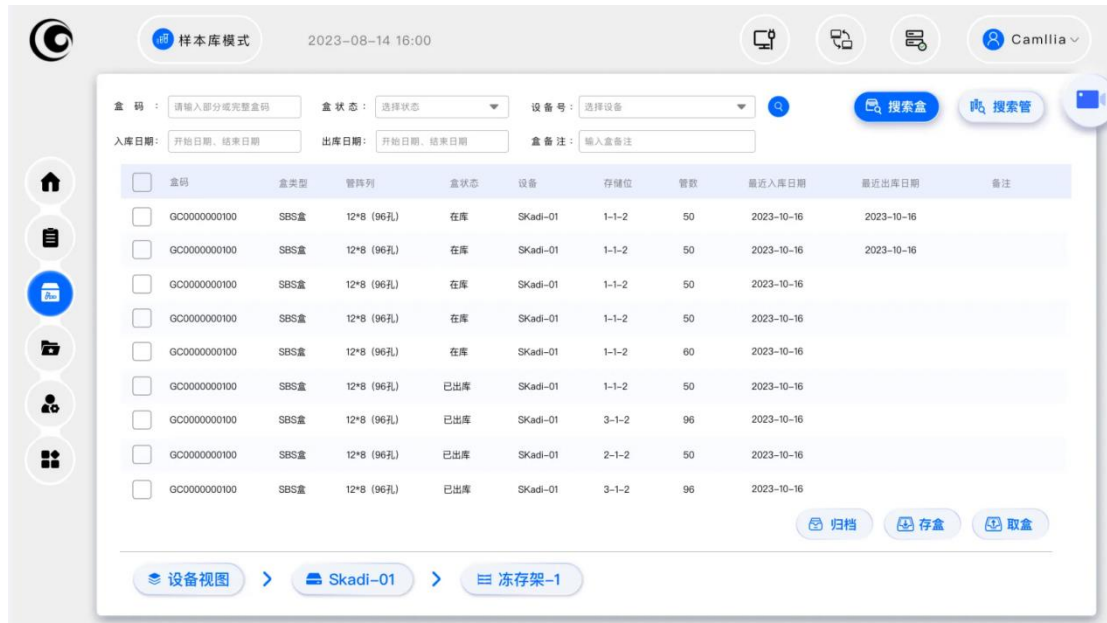


Figure 5.5.1-1

In the cryobox search page, search the cryobox data through the provided searchable fields, and provide functions such as [re-sorting], [Favorites], [export], [archive], [storage], [Take out box], etc.

Re-Sorting: For searched cryobox data, sort again by clicking on the field name. Click for the first time and sort according to the ascending order of the clicked field value. Click again and sort according to the descending order of the field value.

Favorites: Check the cryobox in the search result data and click the [Favorites] button provided at the bottom of the right to add the selected freezer box to the favorites list;

Export: Select the frozen box in the search result data and click the [Export] button provided at the bottom of the right to export the data of the selected frozen box. The exported fields are consistent with those displayed in the search result. The exported data format is Excel.

archive: In the search result data, the [Archive] button at the bottom of the right side of the page can be used when you check the cryoboxes whose status is [out of storage]. After clicking, the selected cryobox and the tube recorded in the box can be archived, that is, the status of the cryobox/tube is changed to [used], and the retained location data is cleared to release the occupied storage space.

Store box: In the search result data, when you check the cryobox whose status is [out of storage], the [store] button at the bottom of the right side of the page can be used. After clicking, a box storage order will be created automatically, and the selected box and the tube inside the box will

be automatically added to the order. If the selected cryobox is not automatically filled with location data, it is still necessary to manually select the storage location of the cryobox.

Take out box: In the search result data, when the status of the boxes is [in the library] cryoboxes, the [Take out box] button at the bottom of the right side of the page can be used. After clicking, a pickup order will be created automatically, and the selected box and the tube in the box will be automatically added to the order.

The display and function of the tube search page are similar to the cryobox.

5.5.2 Device visual management

Figure 5.5-1 shows the device visual management page.

Device view (Figure 5.5-1)

Displays the view of all devices in a cluster, including the device name, device status, number of storage bits, and tube bit usage. The device marked in blue is a device that has permission to operate and is running properly, the device marked in red is a faulty device, and the device marked in gray is a device that has no permission to operate. (The administrator account has permission to operate all devices except for storing and sampling samples.)

The inside view of a properly operated device is displayed, as shown in Figure 5.5.2-1.

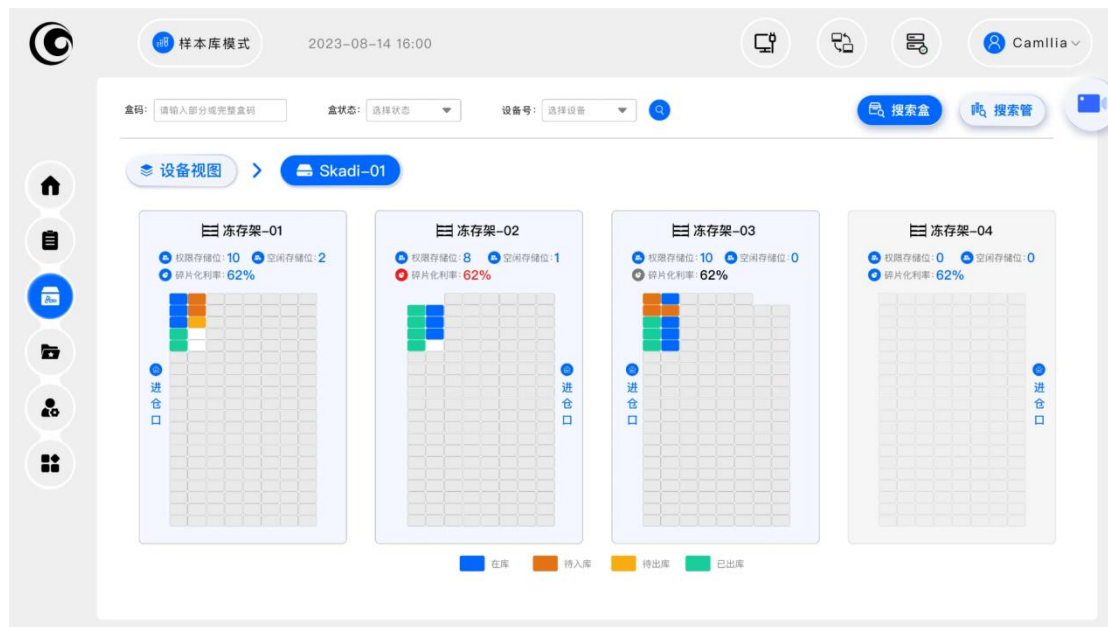


Figure 5.5.2-1

Device internal view (Figure 5.5.2-1)

Provides view navigation prompts to identify the currently operated equipment, freezer rack, or freezer box. Click the corresponding navigation name, and the view will jump to the corresponding management page.

Internal view Displays the names, storage bit data, and pipe bit utilization data of all frozen shelves in the device. At the same time, thumbnail images of storage bits in the freezer shelf are displayed, and different colors are used to identify different storage bits or the status of the freezer box on the storage bit. The gray identifier is the freezer shelf or storage bit without operation permission. Identifies the storage bit on the freezer shelf near the inlet.

When you click a freezer that has the permission to operate, the freezer view is displayed, as shown in Figure 5.5.2-2.

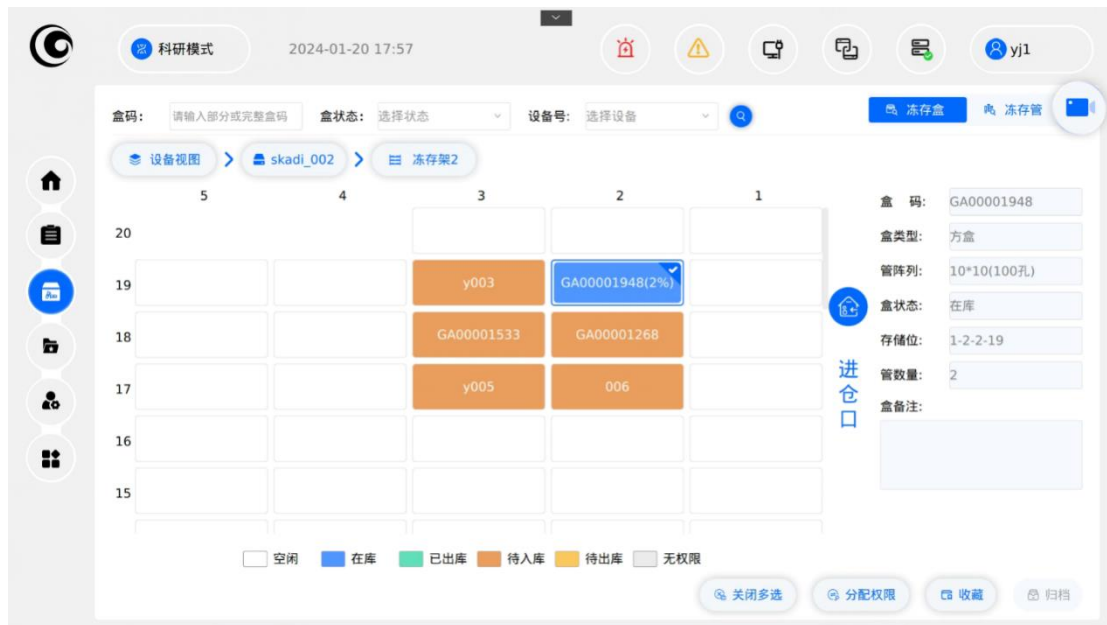


Figure 5.5.2-2

Frozen shelf view (Figure 5.5.2-2)

Display contents: Frozen shelf displays different states of storage bits or cryoboxes on storage bits, marked with different colors.

Multiple selection: Provides the multiple selection function. When the multiple selection function is enabled, tap a storage bit to select the storage bit. If a freezer box exists on the storage bit, select the freezer box and display the freezer box information on the right.

Assign rights: This function is only available to administrator accounts. After multiple storage bits are selected, the Assign Permissions function can be used. Click to select the assigned account;

After selecting an account, the selected storage bit is added to the operation rights of the selected account.

Favorites: The [favorites] function can be used when there is a freezer box on the selected storage bits. Click to add the selected freezer box to your personal freezer box Favorites list.

archive: The [archive] function can be used when the selected storage bits have cryoboxes and the status of the cryoboxes is [out of storage]. After clicking, set the selected cryobox and the tube inside the box to the [used] state, and clear the location data of the cryobox and the tube inside the box.

Cryobox transfer: The cryobox transfer function can be used when the selected storage bits have cryoboxes and the status of cryoboxes is in the library. When clicked, a cryobox transfer order is created and the selected cryobox is added to the order, but you still need to manually select the location data for each cryobox to be transferred.

Inventory: After multiple storage bits are selected, the [inventory] function can be used. When clicked, an inventory order is automatically created and the selected storage bits are added to the order.

Auxiliary defragmenting: The auxiliary defragmenting function can be used when the selected storage bits have cryoboxes and the cryoboxes are in the "in" state. After clicking, an auxiliary fragmentation order will be created automatically, and the selected cryobox will be added to the order, and the sorting plan will be provided according to the auxiliary fragmentation rules.

Store box: When there is no cryobox on any of the selected storage bits, but all the selected storage bits are locked and all the recorded cryoboxes are in the "out of storage" state, the "store box" function can be used. It is suitable for returning the repository. After clicking, a storage order is automatically created, and the selected cryobox and the tube in the box are automatically added to the order.

Take out box: The [Take out box] function can be used when the cryobox is in the [in library] state on all the selected storage bits. After clicking, a pickup order will be created automatically, and the selected cryobox and the tube inside the box will be automatically added to the order.

Display in-box view: After the multiple selection function is disabled, tap a storage bit with a cryobox to display the in-box view of the cryobox, as shown in Figure 5.5.2-3.

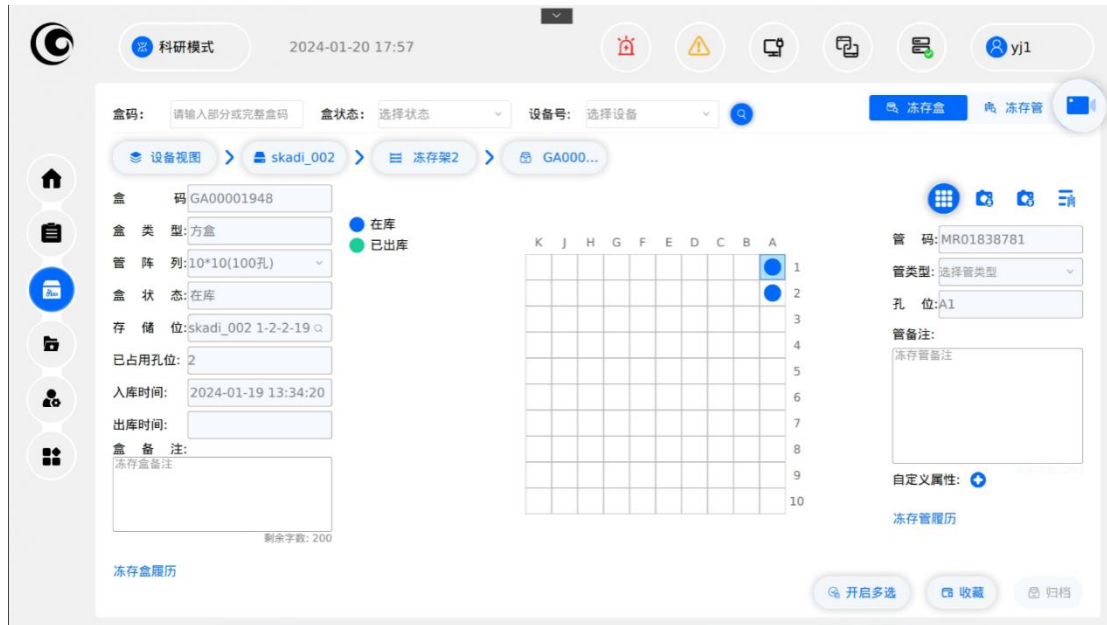


Figure 5.5.2-3

Cryobox internal view (figure 5.5.2-3)

Display content: The data of the cryobox is displayed on the left, and the remarks data of the cryobox can be updated; Middle display box inside view; The tube information of the selected tube is displayed on the right side, and the remarks data and custom attribute data of the tube can be updated;

View switching function: The cryobox view switching function is provided above the tube data on the right side of the page. You can switch the inside box view in the middle between [model drawing], [top photo] and [bottom photo], or you can switch the view in the middle and the tube data on the right to [tube list] data view.

History data: Click [History of cryobox] or [History of tube] to display the corresponding historical data and provide the export function.

Multiple selection: After the multiple selection function is enabled, tap a hole to select the hole. If a tube is displayed on the hole, select the tube at the same time.

Favorites: The favorites function is same as the cryobox.

Archive: The archiving function is same as the cryobox.

Store tube: the store function is same as the cryobox.

Take out tube: the take out function is same as the cryobox.

5.6 Alarm information

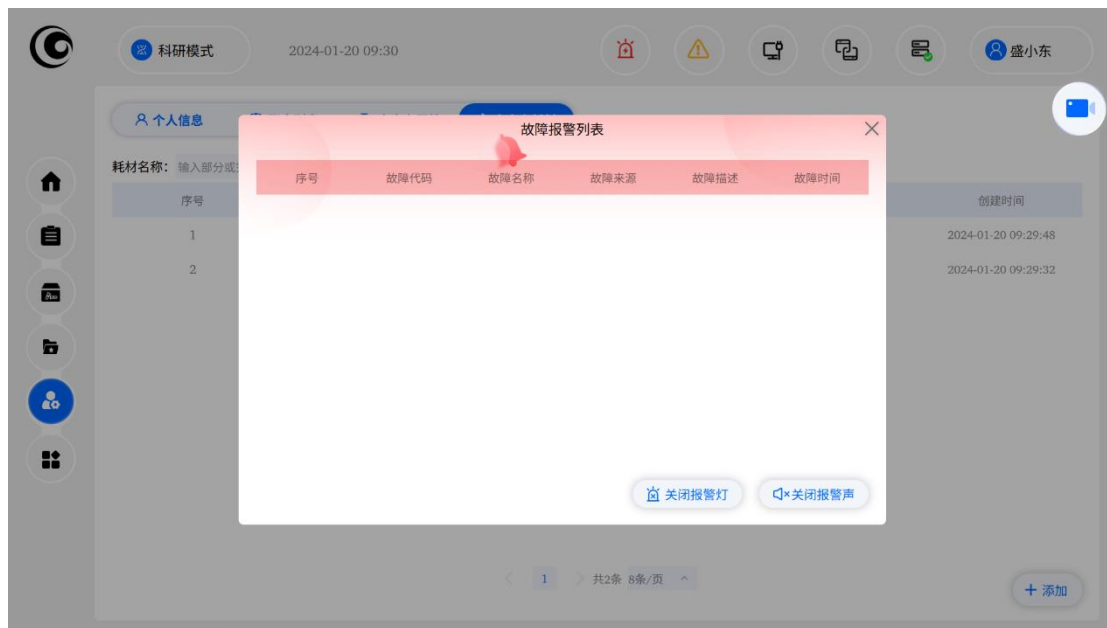


Figure 5.6-1

When the device has a fault alarm, it will be reminded by the way of light, buzzer and pop-up window, and the alarm icon will be displayed in the status bar at the top of the page. You can click the alarm icon to view the information about all faults that have not lifted the alarm, as shown in Figure 5.6-1.

On the alarm list page, provide the functions of "turn off alarm light" and "turn off alarm sound". After clicking, the light or sound triggered by the alarm can be turned off. After the alarm light or alarm sound is turned off, if a new fault triggers the alarm, it will still be reminded by the alarm light or alarm sound; At the same time, within 30 minutes of turning off the alarm sound or alarm light, if the fault is still not fully removed from the alarm state, the alarm light will also be triggered and the alarm light will ring to remind you again.

6 Device repair and maintenance

6.1 Temperature calibration

The storage system is equipped with a temperature sensor, which automatically records the temperature, saves the temperature data, and supports historical data query. An external temperature probe inlet is also available for placing a third party temperature probe.

6.1.1 Temperature calibration period

It is recommended that the temperature sensor be calibrated once a year.

6.1.2 Calibration method

Temperature sensor calibration is generally self-calibration. The calibration method is a 2-point calibration method, that is, the temperature of the ice-water mixture and liquid nitrogen is used to calibrate the sensor.

The temperature of the ice-water mixture refers to the temperature of the ice and water at a standard atmospheric pressure, when pure ice and water are mixed, and there is no heat exchange (that is, heat equilibrium) with the outside world, the temperature of the ice and water is equal to 0 ° C.

Engineers or trained personnel need to open the lower cover of the electric control cabinet and take out the sensor. According to the [Calibration interface] prompt, place it in the ice water mixture or liquid nitrogen, and click the screen to confirm after 5 minutes. When calibration is complete, relocate the sensor.

6.2 Regular Check

Perform preventive maintenance of the system according to the maintenance schedule, including checking system status, daily cleaning of equipment, system backup, and technical communication with customer engineers. The maintenance personnel of the device should receive basic training, conduct regular inspection, and update the checklist.

Check points: The purpose of regular check is to discover and prevent possible hardware and system problems in time, so as to ensure the continuous and stable operation of the system to the maximum extent. Inspection mainly includes:

The operating status of the host system, and check the system alarm and self-check status;

connector inspection, inspection of connection plugs, cables, power sockets, etc.;

Environment check, including power supply voltage, room temperature, humidity, etc.

Clean and maintain, remove dust and foreign matter in the chassis and filter;

Temperature sensor calibration.

6.3 Maintenance plan

Genepoint Technologies recommended maintenance plan is below:

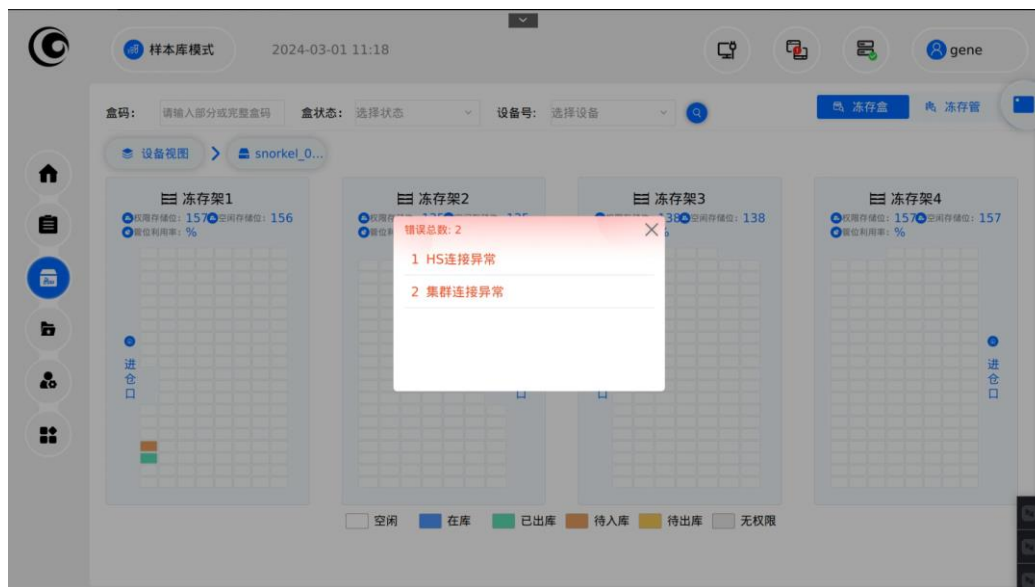
Project	Period	Content	Remark
Daily check	Daily	Device running status, device connection, device environment, etc	By user
Clean and maintain	Quarterly	Clean the body surface, clean the electric control cabinet screen	By user
Temperature sensor calibration	Yearly	Calibrate temperature sensor	By user or paid manufacturer
Minor maintain	Two years per time	Check the refrigeration unit, part of the mechanism, apply lubricating oil, comprehensive cleaning	Paid manufacturer
Major maintain	Five years per time	Check the refrigeration unit, all the mechanism, apply lubricating oil, replace wear components, comprehensive cleaning, low temperature calibration	Paid manufacturer

7 Troubleshooting

7.1 Common fault tips and solutions

7.1.1 The HS connection or cluster connection is abnormal

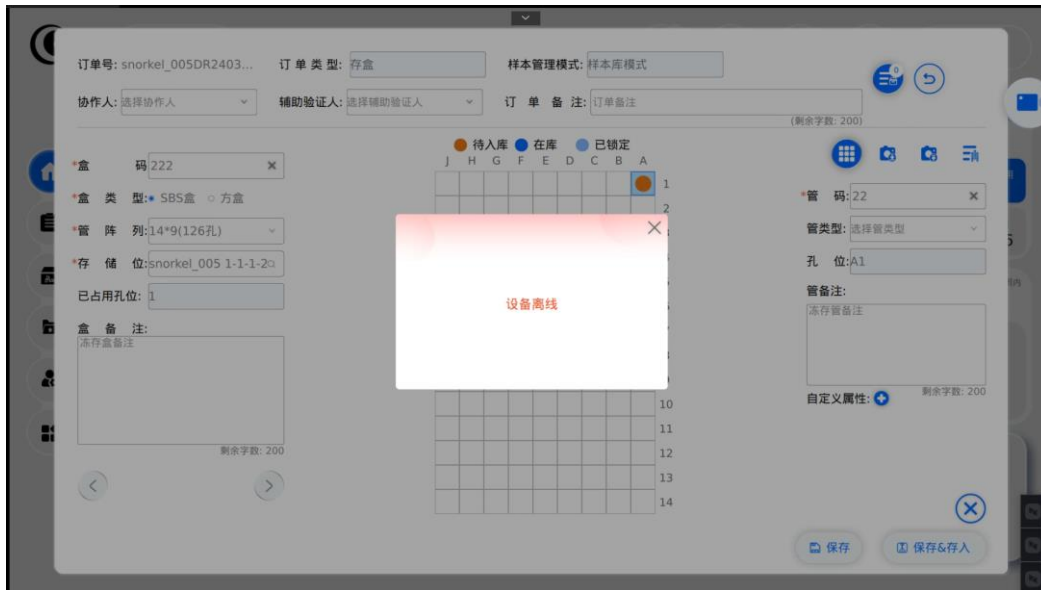
Prompt: HMI pop-up prompt, light (yellow light) prompt.



Solution: Contact the vendor maintenance personnel to debug the cluster network configuration or parameter settings.

7.1.2 The Device is Offline

Prompt mode: HMI pop-up prompt, light (red light) prompt, buzzer prompt.



Solution: Contact the maintenance personnel of the manufacturer to check the device.

7.1.3 Mechanical fault

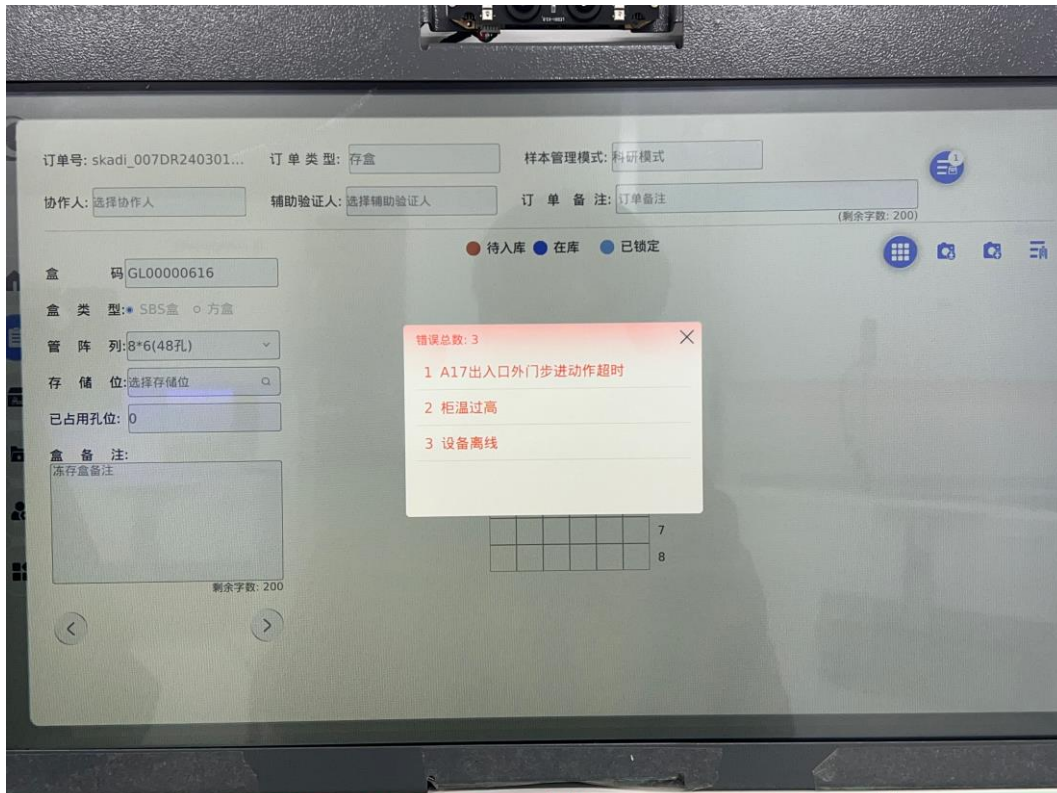
Prompt mode: HMI pop-up prompt, light (red light) prompt, buzzer prompt.



Solution: Contact the maintenance personnel of the manufacturer to check the device.

7.1.4 Temperature alarm

Prompt mode: HMI pop-up prompt, light (red light) prompt, buzzer prompt.



Solution: Check whether the compressor is running properly on the device status page. If the compressor is faulty, contact the maintenance personnel of the manufacturer to check the device. If the compressor is running properly, wait for a period of time to check whether the alarm is still generated. If yes, contact the manufacturer's maintenance personnel to check the device.

7.1.5 General tips

Prompt: HMI prompt, light prompt. Both fault and alarm information can be viewed in the fault alarm list.



7.2 Deal with emergency fault

When a fault occurs that endangers the safety of the sample, you need to contact the manufacturer for technical support immediately.

7.2.1 Emergency sampling in and out of warehouse

When the sample accidentally falls into the warehouse and cannot be removed

- 1) The user first snaps the emergency stop button (the emergency stop button is located at the back of the screen) to ensure that the mechanism is in a static state;
- 2) Then wear gloves, manually open the emergency sampling door on the left side of the warehouse;
- 3) Reach into the grope and pick up the frozen storage tube;
- 4) After completion, lock the emergency sampling door;
- 5) Click Restore on the screen



Caution

Before performing this operation, take a figure of the emergency stop to avoid injuries caused by mechanism movement

After completing the emergency sampling, ensure that the emergency sampling door is completely locked to avoid cold leakage in and out of the warehouse.

7.2.2 Emergency sampling in storage bin

When the internal mechanism fails and the freezer box cannot be removed/deposited to the designated location, the base point company should be contacted immediately. The engineers authorized by BBP will solve the problem on site.



Alarm

storage bin temperature to fully ensure the safety of samples, do not panic, do not open the door without the manufacturer's permission.

7.2.3 Cooling stop

When the refrigeration system stops working due to equipment failure or power failure, the UPS of the equipment can ensure that the current action is completed, the sample enters the low-temperature safe space, and ensure that all automatic doors are closed. Then, the user needs to

- 1) Confirm whether the refrigeration system is stopped because of power failure, if so, confirm the call time or standby power supply at the starting place (if any);
 - 2) If the call time is more than 4 hours, or due to equipment failure, please contact BPS for technical support immediately;
 - 3) Before the arrival of professional personnel, it is necessary to use the liquid nitrogen backup system to maintain the low temperature of the equipment, launch the liquid nitrogen tank prepared by the site or contact the liquid nitrogen supplier for emergency delivery;
 - 4) Under the remote guidance of professional personnel, pull out the silicone plug of the liquid nitrogen interface on the back of the box, and connect the liquid nitrogen tank pipeline;
 - 5) Open the valve of the liquid nitrogen tank, and complete the control of the valve size under the remote guidance of professionals
 - 6) Wait for a call or professional to arrive
-



Danger

See appendix for safe use of liquid nitrogen.

8 Customer service

This chapter is mainly about the after-sales service commitment of Automated Sample Repository System, and provides training and technical consultation.

8.1 Warranty

Warranty period is 1 year from product delivery date.

Over 1 year, will be charged based on case.

8.2 Training

We will provide users with technical training and technical exchange services. Includes:

On-site training: mainly carried out during inspection and project implementation. Our engineers will explain in detail the installation, commissioning, use, and maintenance of the storage system based on actual conditions, so that related personnel can use and maintain the storage system independently.

Professional and technical training: Through training, relevant personnel can effectively manage the server, monitoring, daily operation and maintenance.

8.3 Technical consultation

Manufacturer and distributors provide free technical consultation.

Technical Hotline: +86 021-64229802 (Shanghai)

Reception time: Monday to Friday 9:00-12:00 13:30-17:00 (except holidays)

Customer service hotline: 400-606-8780

8.4 Warranty service card

Warranty service card

Dear Customer:

Thank you very much for choosing the -Cardinal Automatic Medical Cryopreservation box. Our company in accordance with the relevant laws and regulations, to provide you with the following services:

1, warranty principle: warranty period, normal use and maintenance of the case of failure, the company provides free maintenance services.

2. Equipment failure caused by the following reasons does not belong to the scope of free warranty:

- ◆ Failure to operate as required or wrong operation leads to damage;
- ◆ Caused by force majeure factors such as accidents, fires, earthquakes and natural disasters;
- ◆ Caused by disassembly and assembly without the consent of the company.

Device Information

Name	Automated Sample Repository System		
Model		SN	
Delivery Date			
Warranty Date			

Customer service hotline:400-606-8780

Genepoint Technologies (Suzhou) Co.,Ltd

Annex A Security information for liquid nitrogen using

Summary

This chapter describes the matters needing attention during the use of liquid nitrogen in the liquid nitrogen backup system to enhance customers' understanding and use of liquid nitrogen.

A.1 Liquid Nitrogen Characteristics

Liquid nitrogen, or liquid nitrogen, is referred to as LN2. It is an inert, colorless, odorless, non-toxic, non-corrosive, non-combustible, extremely low temperature gas. Nitrogen makes up the majority of the atmosphere (78.03% by volume, 75.5% by weight). Specific features are as follows:

ultra-low temperature: the boiling point of liquid nitrogen is -195.8°C , at this low temperature, the life activities in the organic body basically stop, so biological samples can be preserved in liquid nitrogen for a long time. When liquid nitrogen is vaporized, each kilogram of liquid nitrogen can absorb 48 kcal of heat.

Liquid nitrogen is very weakly permeable. When the skin is exposed to liquid nitrogen for more than 2 seconds, frostbite can occur due to the extremely low temperature.

Expansibility: liquid nitrogen is made of air compression and cooling, and is restored to nitrogen when gasification, and the volume expands 696 times instantaneously. Therefore, the liquid nitrogen container cannot be closed, otherwise there is a risk of explosion.

asphyxiation: Nitrogen itself does not cause suffocation, but in a certain space, if too much nitrogen and isolated oxygen, the operator will also cause asphyxiation. According to the measurement, 10 kilograms of liquid nitrogen in 10 cubic meters of indoor instant evaporation, can make the space oxygen suddenly reduced to 13%, resulting in space hypoxia, can cause people to suffocate and even death.

A.2 Safety protection

Operators should take the following safety precautions during the operation and use of the equipment:

Wear antifreeze gloves as required before handling or using liquid nitrogen. Do not touch a substance cooled by liquid nitrogen with any unprotected part of your body.

Store and use liquid nitrogen only in a well-ventilated area with an oxygen concentration alarm.

Do not dispose of liquid nitrogen in enclosed areas or Spaces where others may have access.

A.3 Emergency Handling

A.3.1 Emergency rescue

In case of dizziness, loss of consciousness or exposure to liquid gas or cold gas while handling liquid nitrogen, call the hospital emergency number immediately and give the following emergency care:

It should be moved immediately to a well-ventilated area, kept warm and rested. If you have stopped breathing, artificial respiration should be performed; Oxygen should be administered if breathing is difficult.

Restore body tissue to normal body temperature (37 ° C) as soon as possible and prevent further injury and infection of the injured body tissue.

Remove or loosen clothing that may restrict blood circulation to the frozen area. Using water with a temperature of 42 ° C can quickly heat up the affected part.

Under no circumstances shall hot water be used at a temperature higher than 44 ° C, nor shall the frozen part be wiped before or after the temperature has been restored.

Patients must not smoke or drink alcohol.

A.3.2 Leak Handling

When leakage occurs during operation and use, it should:

Cut off the leak source as much as possible, do not contact the leak directly.

Evacuate the contaminated spill area quickly, move personnel to the upper wind, set up isolation areas, and strictly restrict access.

Notify the relevant authorities immediately to avoid leaking liquids into basements or other enclosed manned workspaces.

Use a mist spray to accelerate liquid evaporation, but do not spray the water gun into the liquid.

To prevent the accumulation of gas in the low concave, use the exhaust fan to send the leaking gas to the open area.

Do not stay in low-lying or downwind areas.