Part No.: H-020-000233-00

Automated Nucleic Acid Extractor

MGISP-NE32RS

User Manual

Version: 4.0

Address: Building 24, Stage 3.1, BioLake Accelerator, No.388, 2nd Gaoxin Road, East Lake High-Tech Development Zone, 430075, Wuhan, P.R.China

E-mail: MGI-service@mgi-tech.com

Website: www.mgi-tech.com

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Wuhan MGI Tech Co., Ltd.

About the user manual

This user manual is applicable to MGISP-NE32RS Automated Nucleic Acid Extractor. The manual version is 4.0 and the software version is V1.

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Figures in this manual are all illustrations. The contents might be slightly different from the device, please refer to the device purchased.

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Revision history

	Date	Version
Revision	January 13, 2023	4.0
	March 5, 2021	3.0
	November 2, 2020	2.0
Initial release	June 20, 2020	1.0

Contents

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Important notes

During the operation or maintenance of the machine, the following safety measures should be taken. Otherwise, the guard provided by the machine is likely to be damaged, the rated safety level to be reduced, and the rated operation conditions to be affected.

Conventions

The following table describes conventions that are used in the manual:

Item	Description
Warning	Indicates that the operator should operate the device by following the instructions. Otherwise, it might result in personal injury.
Caution	Indicates that the operator should operate the device by following the instructions. Otherwise, it might result in device malfunction, damage or inaccurate experiment result.
NOTE	Indicates that the operator should pay special attention to the note information, and operate the device by following the instructions.
	Indicates biological risk. The operator should operate the device by following the instructions.
Boldface	Indicates the printings and on-screen characters on the device.

Safety

Warning

- Ensure that the device is operated under the conditions specified in this manual. Otherwise, it might result in device damages, incorrect experiment results, or even cause personal injury.
- Only the technical support authorized by the manufacturer or the qualified and trained personnel can unpack, install, and maintain the device. Incorrect operation might cause inaccurate experiment results or damage to the device.
- Only the peripheral devices and consumables specified by the manufacturer can be used.
- Only the power cord of the manufacturer can be used.
- Grounding considerations

A.C. power's grounding should be reliable for fear of an electric shock. The 3-pin plug with the machine's power cable is a safety device that should be matched with a grounded socket. Never let the third ground pin floating. If the 3-pin plug cannot be inserted, it is recommended to ask an electrician to install an appropriate power socket.

- Keep away from electric circuits

  The operator is not allowed to open the machine. Changing components or adjusting certain parameters inside the device must only be accomplished by the certificated professional maintenance personnel. Do not change elements while the power is still on.

- A.C. power considerations

  Before turning on the power, always check and insure that the mains voltage is within the required 100-240V A.C. and ensure that the current rating load of the power socket meet the required specification.

- A.C. power cable considerations

  As an accessory of the machine, the A.C. power cable should be a default one. If it is damaged, the A.C. power cable can not be repaired, but must be replaced with a new one. The power cable should be free of heavy objects during the machine's operation. Keep the power cable away from the place where people ambulate frequently.

- Connect the A.C. power cable

  While connecting or disconnecting the power cable, you should hold the 3-pin plug with your hand. Insert the plug thoroughly into the socket to ensure good contact between the plug and socket. Pull the plug, not the line, when you need to disconnect the mains supply.

- Design environments

  The machine should be placed in a low-humidity, dust-free, and good-ventilation room without caustic gas or powerful magnetic interference. In addition, the machine should be kept away from water sources, such as pools and water pipes.

  Never cover or obstruct the openings of the machine, which are designed for ventilation and to prevent the device's interior from being too hot. When a single device is running, the shortest distance between its openings and the nearest object is 25 cm; otherwise, when two devices or above are running at the same time, the shortest distance is 40 cm. Do not place the device on a soft surface, because that will result in adverse ventilation near the device's bottom openings.

  Too high temperature will lead to degraded performance or failure of the machine. Therefore, the device should be protected against any kind of heat sources like sunlight, ovens, or central heating equipment. If overtemperature occurs and results in abnormal experiment results, contact the technical support.

If the machine is set aside for a long time, it is recommended to disconnect the power cable from the mains supply and cover the device with a piece of soft cloth or plastic to prevent dust from entering.

Once one of the following events occurs, you are suggested to disconnect the power cable from the mains, and contact the distributor or ask a certificated maintenance personnel for help.

- Liquid into the device;
- The device sprinkled or drenched;
- The device malfunctioning, giving off abnormal sound or odor;
- The device falling onto the floor or its shell damaged;
- Significant changes in the device's performance.

Components safety

- If the fuse blew, replace the fuse with the specified type. For details, contact the technical support.
- Ensure that the peripheral devices meet the IEC/EN 60950-1 standards.

Biological safety

- Chemicals in reagents and waste might cause personal injury through contact with the skin, eyes, and mucosa. Follow the safety standards of your laboratory and wear protective equipment (such as laboratory coat, protective glasses, mask and gloves) when performing an experiment.
- If you accidentally splash the reagent on the skin or into eyes, immediately flush the affected area with large amounts of water and get medical aid immediately.
- Use and store the reagents according to the reagent kit user manual. Failure to do so might negate the reagent effects and cause inaccurate results.
- Check the expiration date of all reagents before use. Do not use expired reagents.
- When disposing of the expired reagents, waste liquids, waste DNBs, and consumables, comply with local regulations.

Symbols

Device

The following table describes symbols on the device:

Symbol	Name	Description
	"ON" (power)	Indicates connection to the mains supply.
	"OFF" (power)	Indicates disconnection from the mains supply.
	General warning sign	Signifies a general warning.
	Warning; biological hazard	Warns of a hazard from a biological hazard.
	Caution; hot surface	Indicates that the marked item can be hot and should not be touched without taking care.
	Warning; dangerous voltage	Indicates hazards arising from dangerous voltages.
	Protective earth	Indicates the terminal of a protective earth (ground) electrode.
	Warning; crushing of hands	Taking care to avoid injury to hands when in the vicinity of equipment with closing mechanical parts.
	Warning; ultraviolet radiation	Taking care to avoid injury to eyes and skin when in the vicinity of ultraviolet radiation.
T6AL250V	Fuse specification	Indicates the fuse specification.
	USB 2.0 port	USB connection.

Label

The following table describes symbols on the label:

Symbol	Name	Description
Research Use Only	/	Indicates a device that is for research use only, and cannot be used for clinical diagnosis
	Manufacturer	Indicates the medical device manufacturer.
	Date of manufacture	Indicates the date when the medical device was manufactured.
EC REP	Authorized representative in the European Community	Indicates the Authorized representative in the European Community.
	RoHS mark	Indicates that this device meets the requirements of Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment.
	CE mark of conformity	Indicates that this device conforms with the specified Council Directive.
	NRTL Listing and Certification Mark	Used to designate conformance to nationally recognized product safety standards. The Mark bears the name and/or logo of the testing laboratory, product category, safety standard to which conformity is assessed and a control number.
	UKCA (UK Conformity Assessed)	Indicates that this device complies with UK regulations.

Symbol	Name	Description
	WEEE symbol	Indicates that waste electrical and electronic equipment must not be disposed of as unsorted municipal waste and must be collected separately. Please contact an authorized representative of the manufacturer for information concerning the decommissioning of your equipment.
	Serial number	Indicates the manufacturer's serial number so that a specific medical device can be identified.
	Consult instructions for use	Indicates the need for the user to consult the instructions for use.

Packaging

The following table describes symbols on the packaging or on the label of the packaging:

Symbol	Name	Description
	This way up	Indicates the correct upright position of the distribution package for transport and/ or storage.
	Fragile, handle with care	Indicates a medical device that can be broken or damaged if not handled carefully.
	Keep dry	Indicates a medical device that needs to be protected from moisture.
	Stacking limit by number	Maximum number of identical transport packages/items which may be stacked on the bottom package.

Symbol	Name	Description
	Temperature limit	Indicates the temperature limits to which the medical device can be safely exposed.
	Humidity limitation	Indicates the range of humidity to which the medical device can be safely exposed.
	Atmospheric pressure limitation	Indicates the range of atmospheric pressure to which the medical device can be safely exposed.

Introduction

This chapter mainly introduces the features, intended use, and structure composition of the instrument.

Instrument features

This product adopts a magnetic bead extraction technology to extract and purify nucleic acid through precision transmission and controlling step motor by single chip microcomputer. It has features as follows: small volume, light weight, low noise, full-closed workaround; Embedded real-time operating system; Transparent working chamber facilitating the observation of working conditions; Large LCD panel, easy to operate. It has powerful functions such like door open protection, ultra-limit position protection and alarm. It is safer and more reliable for use. It can be used to extract DNA, RNA from whole blood, cells, and tissues and so on, so as to save time and labor.

Intended use

The device is intended for nucleic acids extraction and purification for samples.

This device is intended only for scientific research and should not be used for clinical diagnosis.

Structural composition

The device mainly consists of the mechanical part and electrical part. Used with reagent kit, the device can perform separation and extraction of nucleic acids in the sample.

Features

This chapter mainly introduces the usage, transportation and storage conditions of the instrument, as well as its basic parameters, performance and functions.

Normal working conditions

- Atmospheric pressure: 80 kPa to 106 kPa
- Altitude: up to 2000 m (6561.68 ft)
- Ambient temperature: 10 ℃ to 30 ℃ (50 ℉ to 86 ℉)
- Relative humidity: 20% to 70%, non-condensing
- Power supply: 100 V to 240 V~, 50/60 Hz
- Voltage fluctuation: ±10%
- Pollution degree: 2
- Indoor use


Caution Before powering on, please confirm whether the working conditions meet the above requirements. Ensure that the power cable is reliably grounded.

Transportation and storage conditions

Ambient temperature: -20 ℃ to 55 ℃ (-4 ℉ to 131 ℉)
Relative humidity: ≤80%

Basic parameters

Item	Description
Sample size	32 pcs/time
Magnetic rod (fixed)	4×8 pcs
Sample range	20 μl to 1000 μl
Magnetic bead collection efficiency	>98%
Most suitable size of magnetic beads	0.2 μm to 1.0 μm
Overall dimensions	430 mm (W) × 435 mm (H) × 395 mm (D) (16.93 inches × 17.13 inches × 15.55 inches)
Net weight	32.5 kg
Maximum sound pressure level	65 dB (tested 1 m away from the device)
Degrees of protection provided by enclosures (IP Code)	IPX0

Item	Description
Accompanying accessories	Refer to the packing list
Transient over-voltage category	II

Basic performance

Program storage: 20

Software functions

- File edit, view, modify and delete functions
- File run, pause, and stop functions
- File import & export by USB drive
- Sound prompt function
- Fault protection and alarm function
- UV lamp on and timed off
- Upgrade by USB drive

NOTE The above software features are for reference only. MGI reserves the right to change the software without notice.

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Preparations

This chapter mainly describes the structure, the functions of screen and keys on the screen, as well as the preparations before the startup. Before the first operation of this instrument, please read this chapter carefully and make sure you are familiar with the contents of this chapter.

Basic components

Front view

Figure 1 Front view

No.	Name	No.	Name
1	Enclosure	2	96 deep-well plate position
3	Closing cover	4	Operating room
5	Display		

Rear view

Figure 2 Rear view

No.	Name	Description
1	USB port	Connects to the external memory.
2	Serial port	Connects to the scanner.
3	Power switch	Powers on or off the device. ● Switch to the | position to power on the device. ● Switch to the ○ position to power off the device.
4	Standard power outlet	Connects to the mains supply.
5	Sticker	/

Caution The fuse socket is fitted with two fuses for which the requirement are: T6AL250V. Fuses must be replaced with new ones that meet the requirements. Contact the technical support for fuses.

Site requirements

Caution Ensure that enough space is provided around the device for ventilation, cable connection, and power switch operation.

The following figure indicates distances that are required for optimal operation and access.

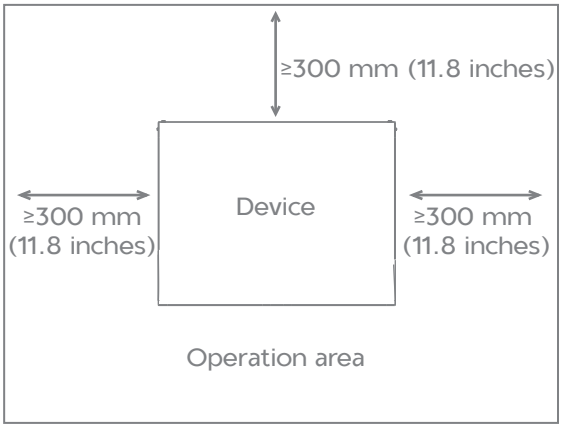

Figure 3 Space requirements

Peripheral device preparation

Prepare the following peripheral devices that can be purchased from the general laboratory supplier.

Table 1 Peripheral devices

Device	Remark
Pipette	/
Vortex	/
Mini centrifuge	PCR tube and reagent tube can be placed in the centrifuge for centrifugation.
Real-time PCR instrument	/
Ice box	/
8-strip tube centrifuge	/
Plate centrifuge	/

Check before startup

The following contents should be confirmed before powering on:

- Whether the power supply meets the required voltage of the instrument;

  Refer to *Normal working conditions on Page 12* of this manual for power requirements.

- Confirm that the power cord plug has been reliably inserted into the power socket;
- Reliable grounding of the power cord;
- Whether the 96 deep-well plate is in place.

Placement of 96 deep-well plate

There are four heating blocks placed on each plate with a limit block on each side to assist in positioning, and a spring plate on each side to help fix the 96 deep-well plate.

NOTE Ensure that the 96 deep-well plate is placed evenly before starting up.

Startup

Switch on the instrument, and the instrument will conduct self-test. Self-test takes about 10 seconds. Please wait patiently. If no problem is found in the self-test, the main menu will appear on the screen, and then you can edit, review, and delete files.

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Operation

This chapter explains in detail how to edit, review, and delete files, and how to run/stop files. It also introduces the meaning of protection interface in the process of file running.

Warning If there is any abnormal sound or display after the instrument is switched on, or there is a fault alarm during the instrument self-testing, please switch off the power immediately and contact the technical support.

Operation main interface

After the system is started, the main interface is displayed. The operation state of the instrument is displayed at the center of the interface. If the instrument is in operation state, click the status icon to check the detailed operation information. The main interface in idle and runtime status are displayed as follows.

Figure 4 Operation main interface

The bottom four function buttons are: **Run**, **New File**, **UV Lamp**, and **System**.

The middle operation status button and status information are displayed only when the equipment is in running status. Press **Running** to enter the running state interface to view the detailed information of the running state.

Run

Click **Run** in the main interface to enter the file browsing interface. You will see buttons for browsing menu selection on the left to select files, history or USB drive files, information browsing in the middle, function buttons in the bottom, and main interface icons in the upper left corner to return to the main interface. Select different browsing menu items, the bottom function buttons and browsing information will be different.

The following figure shows the file browsing interface.

Figure 5 File browsing interface

A list of stored files is in the middle, showing up to 9 files per page and a total of 250 files. The current selected file is displayed in white. Click the current selected file to enter the file editing interface. The page information and page forward/back button is on the right; the function button is at the bottom, including **Export**, **Delete**, **New**, **Edit**, and **Run**.

Item	Description
Export	Copy the selected file to the default u-disk directory (under the *\pcrex\MGI* of u-disk directory).
Delete	Delete the selected file from the instrument.
New	After creating the default file, go to the file editing interface to edit the new file.
Edit	Go to the file editing interface to edit the current selected file.
Run	Run the selected file.

The following image shows the history browsing interface.

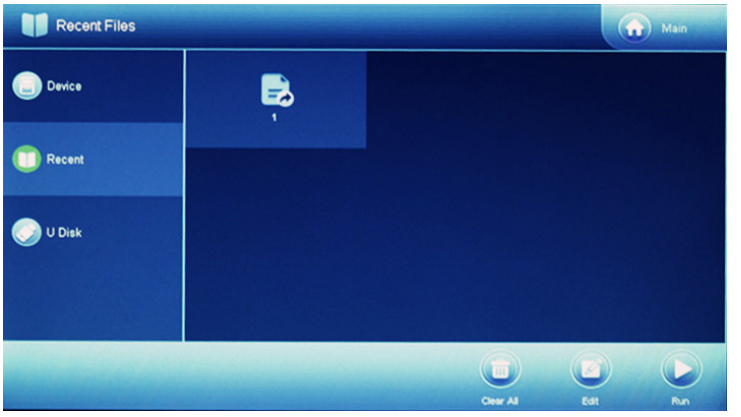

Figure 6 History browsing interface

A list of 9 files that were last edited and run is in the middle. The current selected file is displayed in white. Click the current selected file to enter the file editing interface. The function button is in the bottom, including **Clear Record**, **Edit**, and **Run**.

Item	Description
Clear	Clear history.
Edit	Go to the file edit interface to edit the selected file.
Run	Run the selected file.

The following figure shows the USB drive file browsing interface, which can only be displayed when the USB drive is inserted. If the USB drive is not inserted, it prompts failure to detect the USB drive.

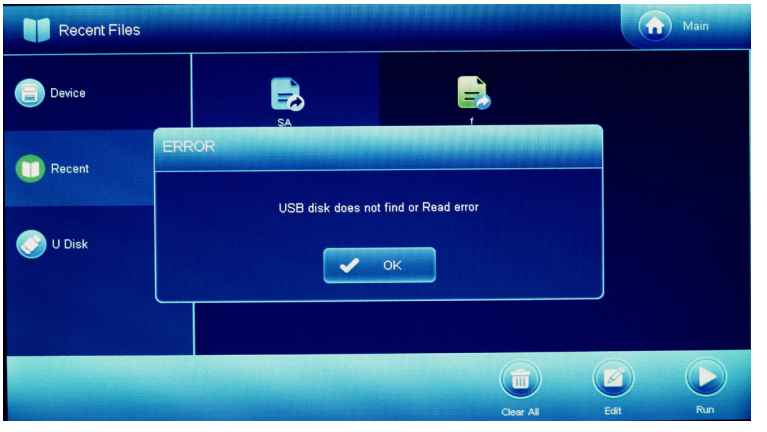

Figure 7 USB drive file browsing interface

In the center is the ".*ebr* "file list that conforms to the file name standard in the default directory of USB drive (under the *\pcrex\MGI* of u-disk directory) (a legal file name consists of an English letter, a number, and an underscore, and a filename that does not include a suffix is no longer than 12 characters). The current selected file is displayed in white. The page information and page forward/back button are in the right; the function buttons are in the bottom, including **Import**.

Import: Copy the selected file to the instrument.

New/edit file

User can create file and edit file the following ways:

- Click the new file in the main interface.
- Click currently selected file of the device file browsing interface.
- Click **New** of the device file browsing interface.
- Click **Edit** of the device file browsing interface.
- Click the currently selected file on the history browsing interface.
- Click **Edit** in the history browsing interface.

Figure 8 File editing interface

In the center of the interface, all steps of the program are displayed, including well location, step name, waiting time, mixing time, binding time, volume, mixing mode and binding mode.

Below steps interface are function buttons, including **Add**, **Delete**, **Temp**, **Page Up**, **Page Down**, **Save/Run**; Upper right **Back** and **Main** are used to return to the previous interface or main interface.

The currently selected step is displayed in a different color. Click the unselected step column to select the specified step. It can save up to 30 steps program, if there are more than 5 steps, the rest of steps are to be paged by pressing the up/down button. Add or remove steps by clicking **Add** or **Remove**.

Click **Temp** to display the temperature setting interface.

Figure 9 Temperature setting interface

Set up the lysis temperature, elution temperature, lysis heat stop, and elution heat start. After setting, click **OK** to return to the file editing interface. If the change is to be waived, click **Cancel**.

By clicking on the selected step area, you will enter the step editing interface, as shown in the following figure.

Figure 10 Step editing interface

Set up well positions (1~6), liquid volume, wait time, mixing mode, and binding mode.

Click the list box beside the name, and the name selection list will pop up.

Figure 11 Name selection list

It allows users to select the appropriate name in a pre-set list of step names to describe the action that the step performs. See *Step name management on Page 35* for how to add or remove preset step names.

Click the list box of mixing mode, and the mixing parameter setting will pop up.

Figure 12 Mixing parameter setting interface

The mixing parameter allows user to set up a mixing step for up to three periods. If the mixing step is not to be used, set the time to 00:00. The mixing speed can be selected from the option list by clicking on the mixing steps list. See the figure below.

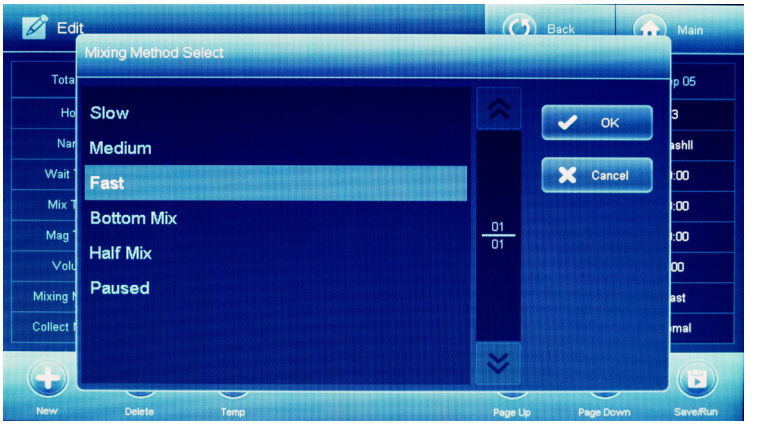

Figure 13 Mixing method selection interface

Click the list box beside the binding mode, and the binding parameter setting will pop up.

Figure 14 Binding parameter setting interface

Click **Save/Run** to display the file save interface, as shown in the figure below.

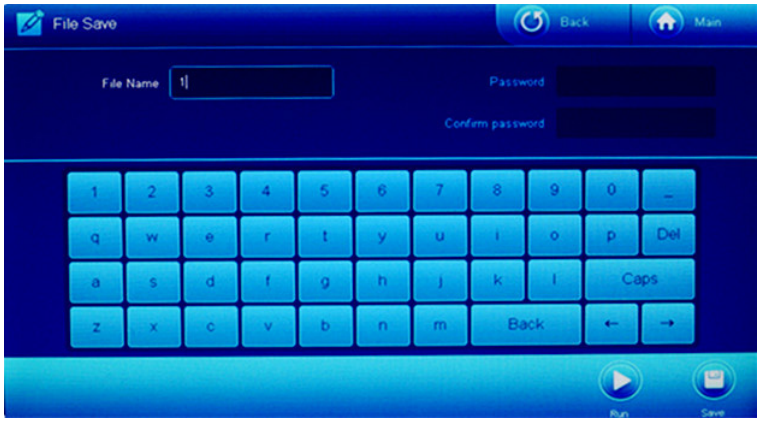

Figure 15 File save interface

You can use the on-screen keyboard to input the file name. If you do not want a file to be viewed, modified, or run, you can enter a password.

Item	Description
Run	Run the current edited file.
Save	Save the current edited file.

Running files

After editing and saving the program, you can run it in the following ways:

- Click **Run** in the file browsing interface;
- Click **Run** in the history browsing interface;

- Click **Run** in the file save interface.

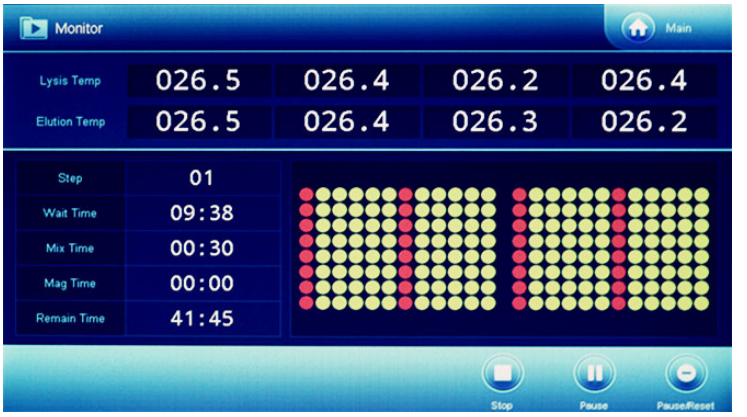

Figure 16 Running files interface

The lysis and elution temperatures are displayed on top of the running interface. The lower left side of the interface shows the steps undergoing, including waiting time, mixing time, binding time, and remaining time. The bottom right side of the interface shows the number of columns being heated. At the bottom are the function buttons, including: **Stop**, **Pause**, and **Pause/Reset**.

Item	Description
Stop	Stop the experiment.
Pause	Suspend the experiment.
Pause/Reset	Suspend the experiment and Raise the magnetic rods.

UV lamp setting

In the operation main interface, click **UV Lamp** to enter the ultraviolet lamp setting interface. After setting ultraviolet lamp turn-on time, click **OK** to turn to the ultraviolet lamp turn-on time set state interface or click **Cancel** to return to the main interface.

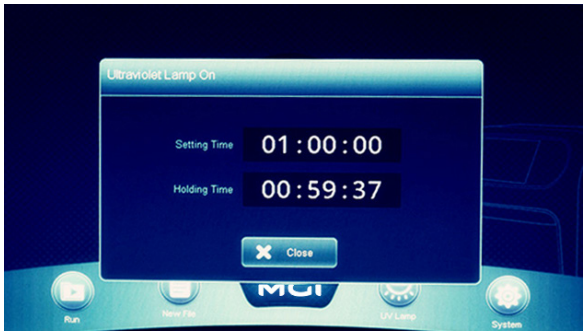

Figure 17 UV lamp setting interface

System setting

Click **System** in the operation main interface to enter the system setting interface .

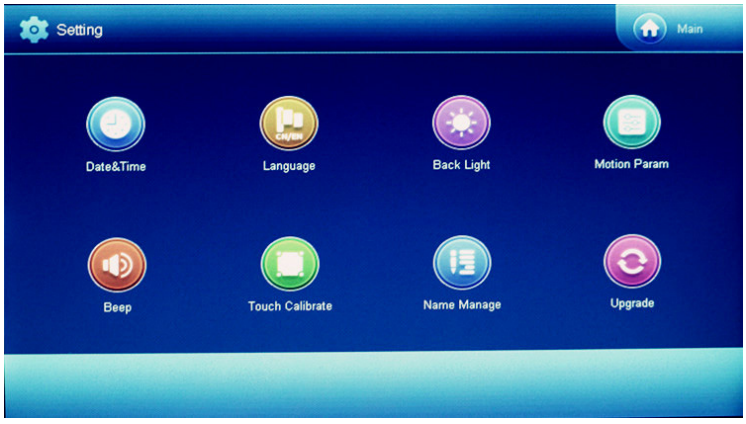

Figure 18 System setting interface

Eight setting entries are provided. Click **Main** in the upper right corner to return to the main interface.

Date and time setting

Click **Date&Time** in the system setting interface, enter the Date & Time setting interface, and click **OK** or **Cancel** after setting time or date to return to the system setting interface.

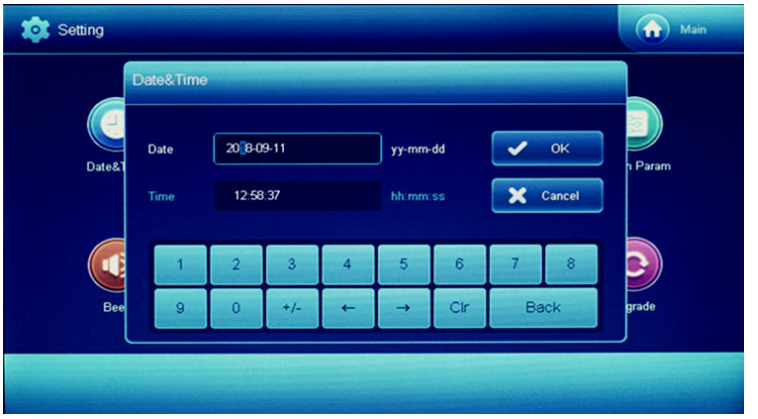

Figure 19 Date and time setting interface

Language selection

In the system settings interface, click **Language** to enter the language settings interface, select **Chinese** or **English**, click **OK** or **Cancel** to return to the system setting interface.

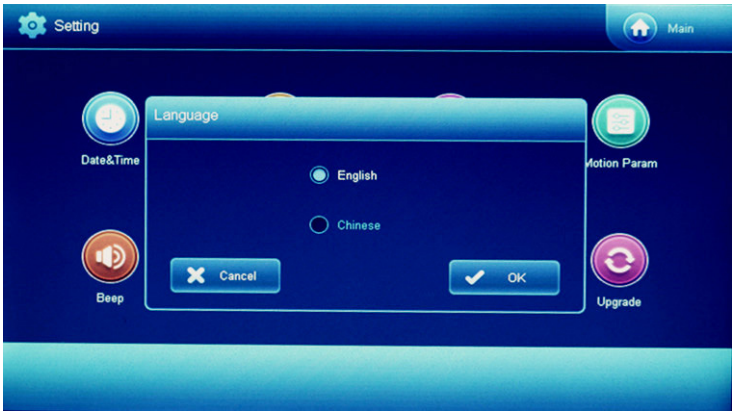

Figure 20 Language selection interface

Backlight adjustment

Click **Back Light** in the system setting interface to enter the backlight adjustment interface. Turn up/down screen brightness by clicking and dragging the scroll bar, or by clicking certain spot in the scroll bar to modify the position of the indicator sign, and then click **OK** or **Cancel** to return to the system setting interface.

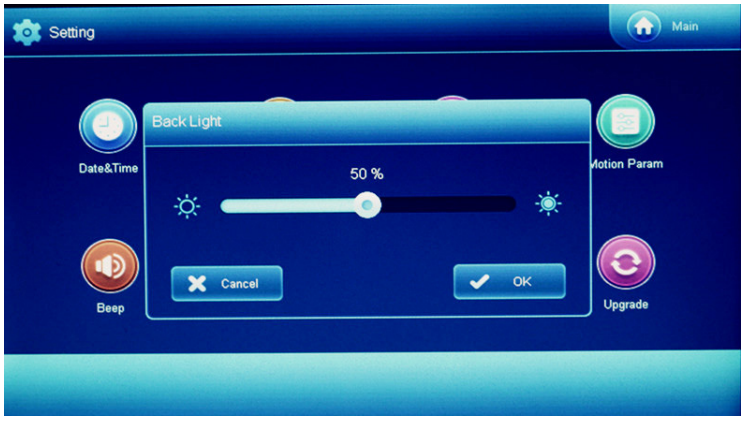

Figure 21 Backlight adjustment interface

Motion parameters

The parameters in this interface are only used by authorized or trained engineers. Please do not modify the parameters without authorization.

Prompt tone setting

Click **Beep** in the main interface to enter the prompt tone setting interface. After setting the alarm prompt, the keyboard prompt, and the closing prompt, click **OK** or **Cancel** to return to the system setting interface.

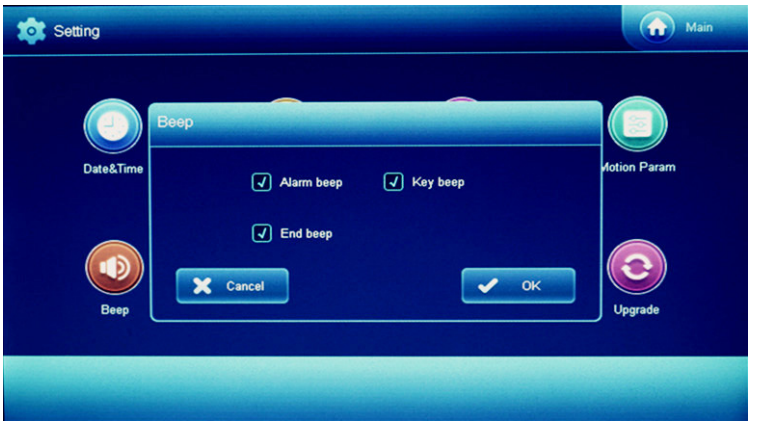

Figure 22 Prompt tone setting interface

Screen calibration

In the operation main interface, click **Touch Calibrate** to enter the screen calibration interface, and click the center of the cross icon in the upper left corner and lower right corner, then return to the system setting interface.

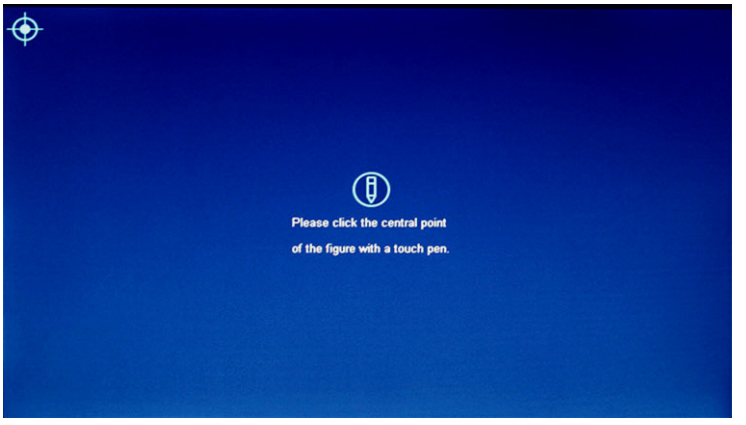

Figure 23 Screen calibration interface

Step name management

Click **Name Manage** in the system setting interface to enter the step name management interface. The interface displays all the steps currently, and you can create, delete and clear the customed step name tags. Click **Exit** to return to the system setting interface.

Figure 24 Step name management interface

Item	Description
New	Add a new step name tag. The name tag should be English letters, numbers, and underscores only and be within 12 characters, preferably no more than 8 characters.
Delete	Delete the selected custom name label. The default name is not removable
Clear	Remove all custom name tags, leaving only the default name tags.

System update

After inserting the upgrade USB drive into the device, click **Upgrade** to enter the system update interface. If the upgrade USB drive is not inserted or there is no upgrade file in the USB drive, you will be prompted that the upgrade file is not detected.

After selecting the program that needs to be upgraded (according to the upgrade file in the USB drive, automatically list the items available for upgrade), click **Upgrade** to start the firmware upgrade process, and click **Cancel** to return to the main interface.

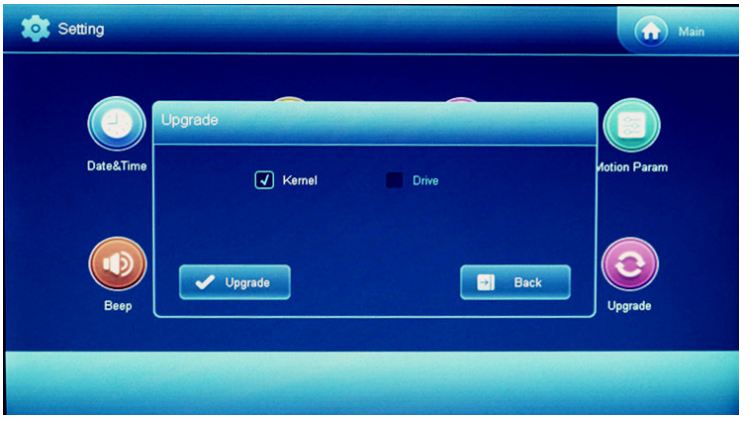

Figure 25 System upgrade interface

After the upgrade is completed, follow the screen prompt to shutdown the device, remove the upgrade USB drive, and restart the device.

Caution Please restart the device according to the screen prompt message, and it is forbidden to shut down the device during the upgrade process.

- Kernel program: program stored in folder BYQ5T59.
- Drive program: program stored in folder BYQ561021.

Maintaining the device

This chapter mainly introduces the possible fault phenomenon, causes analysis and solutions of this instrument.

Cleaning the device

Warning
- We do not recommend that you use other disinfectants or wash solutions except for those that are mentioned in this manual. Because other solutions are not verified for use and their effects to the device are unknown.
- If you have questions about the compatibility of wash solutions, contact the technical support.

Pre-clean and post-clean

The device is equipped with a UV lamp. You should perform pre-clean and post-clean before and after each experiment. The UV lamp turns on automatically, to ensure that the interior of the device is clean and to avoid cross contamination.

Post-experiment cleaning

After each sample preparation, perform the following steps:

1. Turn off the device and open the door.
2. Wipe the surface of the device and heating module with a dust-free wipe moistened with Milli-Q water or pure water.
3. Wipe the surface of the device and heating module twice with a dust-free wipe moistened with 75% alcohol.

NOTE Ensure that the dust-free wipe is wet but leaves no droplets.

4. Let the device air-dry.
5. Close the door.

Monthly cleaning

Perform the following steps:

1. Turn off the device and open the door.
2. Wipe the door handle and the surface and inner walls of the device with a dust-free wipe moistened with 75% alcohol.
3. Wipe the door handle and the surface and inner walls of the device with a dust-free wipe moistened with Milli-Q water or pure water.
4. Let the device air-dry.
5. Close the door.

Fault analysis and troubleshooting

If malfunction occurs during operation, the device beeps or a message appears on the screen. Follow the on-screen prompt to troubleshoot and solve the problem. The following table lists some of the problems and possible solutions. If problems that are not mentioned in this manual arise, or if you need additional assistance, contact the technical support.

Table 2 Troubleshooting

Fault phenomenon	Cause	Solution
Display screen is not on when the power switch is turned on.	The device is not connected to the mains supply.	Connect the device to the mains supply and switch on.
	The fuse blew.	Replace the fuse.
	The switch is damaged.	Replace switch.
	Others.	Contact the technical support.
When power switch turned on, buzzing alarm sounds and system error is displayed.	Error occurs during self-test.	Contact the technical support.
Abnormal screen display	Screen wires are disconnected.	Contact the technical support.
	The screen control chip is damaged.	
Screen buttons don't work	The touch screen is damaged.	Contact the technical support.

Users are not allowed to open the housing of the instrument for inspection by himself during the warranty period. If any failures that require opening of the housing for inspection, contact the technical support.

Disposal of the device

The service life of this device is five years, which is determined by the simulated service life evaluation method. For the date of manufacture, refer to the label on the device. Perform the maintenance according to the requirements mentioned in this manual. Dispose of the end of life device according to local regulations.

Compliance information

The device complies with following standards:

Item	Standard
Electromagnetic compatibility	• IEC 61326-1:2012 Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 1: General requirements
Safety requirements	• IEC 61010-1:2010, AMD1:2016 Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements • IEC 61010-2-081:2019 Safety requirements for electrical equipment for measurement, control and laboratory use - Part 2-081: Particular requirements for automatic and semiautomatic laboratory equipment for analysis and other purposes • IEC 61010-2-010:2019 Safety requirements for electrical equipment for measurement, control and laboratory use - Part 2-010: Particular requirements for laboratory equipment for the heating of materials

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Manufacturer information

Manufacturer	Wuhan MGI Tech Co., Ltd.
Address	Building 24, Stage 3.1, BioLake Accelerator, No.388, 2nd Gaoxin Road, East Lake High-Tech Development Zone, 430075, Wuhan, P.R.China
Technical support	Wuhan MGI Tech Co., Ltd.
Technical support E-mail	MGI-service@mgi-tech.com

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European representative information

Name	Latvia MGI Tech SIA
Address	Mārupes nov., Mārupes pag., ”Lidostas parks”, LV-2167, Latvia

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