GenoSep™
Biofragment Analyzer



Model: CE1016

Accuris Instruments

Foreword

Thank you for selecting the GenoSep Capillary Electrophoresis System. This instruction manual has been developed to provide users with the information necessary for the proper installation, operation, maintenance, and safe use of the instrument.

The GenoSep Capillary Electrophoresis System is designed to deliver reliable and efficient nucleic acid fragment analysis through advanced capillary electrophoresis technology combined with an intuitive user interface and compact system design. Adherence to the procedures and recommendations outlined in this manual will help ensure optimal instrument performance, data quality, and long-term operational reliability.

This manual contains important information regarding system setup, routine operation, maintenance procedures, troubleshooting guidance, and safety precautions. All users should read this manual carefully prior to operating the instrument and follow all instructions provided.

Proper operation and preventative maintenance are essential for maintaining system accuracy, minimizing downtime, and extending instrument lifespan. Service procedures beyond those described in this manual should be performed only by qualified personnel or authorized service representatives.

We are committed to providing high-quality instrumentation and technical support to assist users in achieving consistent and dependable analytical results with the GenoSep System.

Edited by:	Ross Shamby
Version:	1.0
Date:	5.25.2026

Accuris Instruments

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Important Information

Users must fully understand how the instrument operates before using it safely. Read this manual carefully before operating the instrument.



Operation of the instrument is prohibited unless this manual has been read and fully understood.



This instrument is intended for scientific research purposes only and is not suitable for clinical or diagnostic testing.



Instruments should not be discarded at will. When discarded, the product must be sent to appropriate facilities for recycling and reuse.



The following basic safety precautions must be observed during the operation, maintenance, and servicing of this instrument. Failure to comply with these precautions or with other warnings contained in this manual may impair the protection provided by the instrument and compromise its intended use.

This instrument is classified as general laboratory equipment in accordance with the GB 4793.1 standard. The instrument is intended for indoor use only.



Except for the components specifically identified in this manual as user-accessible, users are strictly prohibited from disassembling the instrument. Unauthorized disassembly will void the warranty and may result in electrical shock or other safety hazards. If repair or servicing is required, it must be performed by authorized service personnel designated by our company.



Note: Risk of Injury
When the Capillary Electrophoresis System is in operation, do not place your hands or any part of your body within 15 cm of the instrument. Doing so may result in personal injury and/or damage to the instrument.



Warning:
Read this manual carefully before operating the instrument. Failure to follow the instructions may result in personal injury. This instrument must only be operated by qualified personnel who have been trained in the installation and operation of electrical equipment.



- Before connecting the power supply, ensure that the supply voltage matches the voltage requirements of the instrument. Also ensure that the rated load capacity of the power outlet meets or exceeds the instrument's requirements.
- If the power cord is damaged, it must be replaced with a power cord of the same type and specification. Do not cover the power cord during operation, and do not place it in areas where people may walk over or trip on it.
- The instrument should be positioned so that the power cord can be easily plugged in and unplugged, allowing quick disconnection in the event of a power failure or emergency.
  Always hold the plug when connecting or disconnecting the power cord. Ensure that the plug is fully inserted into the socket, and never pull forcefully on the cord itself when unplugging.



- The Bio-Fragment Analysis System is a high-voltage electrophoresis instrument. For operator safety, the instrument compartment door must remain closed during operation. Interruption or disconnection of protective conductors (grounding wires), either inside or outside the instrument, may create electrical hazards.
- When the device is connected to a power supply, internal components may remain electrically charged. Opening the device or removing parts may expose the operator to hazardous voltages. Do not operate the instrument with any covers or parts removed. If liquid is spilled into the instrument, immediately turn off the power, disconnect the instrument from the power outlet, and contact our technical support team for assistance.



- **Important:**
  During use, the gel cartridge must not remain outside the "Park" position of the solution tank for more than 10 minutes. Prolonged exposure may cause the capillary pipette to dry out, which can prevent the cartridge from functioning properly.

Caution:
The capillary suction head is made of glass and must be handled carefully. Avoid impacts and do not strike the suction head against hard surfaces, as this may damage the component and affect the normal operation of the cartridge.

Biological Contamination

Important Notice:



- Some chemicals used with the instrument may be toxic or may become hazardous after use. Operators must always wear appropriate personal protective equipment (PPE), including safety goggles, gloves, and protective clothing.
- Laboratory supervisors are responsible for implementing appropriate safety measures to maintain a safe working environment.
- Operators must not perform experiments in environments where they may be exposed to toxic or hazardous conditions.

Biohazard warning:



- All test samples, quality control materials, and standard materials must be treated as potentially infectious. Personnel handling these materials must be properly trained and qualified to do so.
- Appropriate protective gloves must be worn whenever handling these reagents or materials. In addition, any instrument components or surfaces that have come into contact with test samples must also be considered potentially infectious, and gloves must be worn when handling them.

Waste Disposal Notice:



- Used consumables and laboratory waste generated during operation may be biologically hazardous and must be disposed of in accordance with applicable local laws, regulations, and institutional laboratory safety procedures.

Sample Handling Recommendation:



- Precious or easily degradable samples are recommended to be prepared and tested separately to minimize the risk of sample loss or degradation.

Other considerations

Environmental and installation requirements



- The instrument should be installed in a clean, low-humidity environment with minimal dust exposure, away from water sources, direct sunlight, and strong light.
- The installation area should be well ventilated and free from corrosive gases and strong electromagnetic or magnetic field interference. Keep the instrument away from heaters, stoves, and other heat sources.
- Do not install or operate the instrument in humid or dusty environments.
- The openings on the instrument are designed for ventilation. To prevent overheating, do not block or cover the ventilation openings.
- When multiple instruments are operated simultaneously, maintain a minimum distance of 10 cm between each instrument to ensure proper ventilation and performance.

Shutdown and storage instructions



- When operation is complete, turn off the power and close the instrument compartment door to protect the detection components from exposure to strong light.
- If the instrument will not be used for an extended period, unplug the power cord from the outlet. After the instrument has cooled to room temperature, cover it with a soft cloth or plastic cover to prevent dust accumulation inside the instrument.

Shutdown and storage instructions



- Liquid has been spilled into the instrument.
- The instrument has been exposed to rain or water.
- The instrument is not functioning properly, especially if there are any abnormal sounds or odors.
- The instrument has been dropped or the housing has been damaged.
- The performance or function of the instrument has changed significantly.

Preparing instrument for transportation

- Clean the instrument thoroughly before transportation.
- Ensure the instrument is properly protected using suitable protective packaging prior to shipment. The instrument must be transported using the transport base and protective packaging provided by the manufacturer.
- The instrument must be transported in an upright (vertical) position. Avoid violent impact or excessive vibration during handling and transport.
- Appropriate waterproofing measures should be taken to protect the instrument from moisture during transportation.

Storage environmental conditions:

- Ambient temperature range: -10°C to 45°C
- Relative humidity: ≤ 80%
- Environment: Indoor, well-ventilated area free of corrosive gases

Chapter 1: Introduction

Introduction

The GenoSep™ is a compact automated capillary electrophoresis platform engineered for high-resolution nucleic acid fragment analysis and quality control applications. The system integrates microfluidic capillary electrophoresis technology with fluorescence-based detection to enable accurate sizing, quantification, and integrity assessment of DNA and RNA samples across a broad dynamic range.

GenoSep provides reproducible analysis of PCR amplicons, next-generation sequencing (NGS) libraries, total RNA, cell-free DNA (cfDNA), and other low-concentration nucleic acid samples. The platform delivers high analytical sensitivity and resolution while requiring minimal sample input and reduced reagent consumption compared with conventional gel electrophoresis methods.

The automated workflow streamlines sample processing, electrophoretic separation, signal detection, and data analysis within a single integrated platform. Advanced software algorithm enables automated peak identification, fragment size determination, concentration analysis, and electrophoresis generation, supporting consistent and standardized data interpretation.

Due to its compact design, robust analytical performance, and user-oriented interface, GenoSep serves as an efficient capillary electrophoresis solution for nucleic acid quality assessment in research, biotechnology, translational genomics, and molecular diagnostic laboratories.

Features

- Fully automated workflow
- 10-inch high-resolution LCD touchscreen
- Features ready-to-use gel cartridges
- Each cartridge processes up to 240 samples, depending on the type of cartridge
- Supports analysis of 1-16 samples per run
- Detection sensitivity as low as 1 pg/µL under optimized conditions
- Analytical resolution of up to 1-4 bp
- Requires a minimum sample volume of only 10 µL using standard 0.2 mL PCR tubes
- Electropherogram peak charts and virtual gel image outputs
- Suitable for PCR fragment analysis, NGS library quality control, RNA analysis, and cfDNA assessment

Chapter 2: Specifications

2.1 Required installation environment

Environmental temperature: 18 ºC - 30 ºC
Relative humidity: 20% - 85%, with no condensation
Input voltage: AC 100-240 V, 50-60 Hz, 2A
Altitude: up to 2000 meters

Note: Do not operate the instrument in environments containing corrosive gases, liquids, or vapors.

2.2 Specifications

Name	GenoSep™
Technology	Capillary electrophoresis-based system for biomolecule fragment analysis
Light source	LED
Detection mode	Fluorescence
Display mode	10 in. high resolution tablet
Resolution	1-4 bp
Sample processing time	3-5 minutes per sample
Sample input requirement	≤ 0.2 μL
Fragment size CV	≤ 2%
Quantification CV	≤ 4%
Quantification accuracy	± 10%
Sample volume	≥ 10 μL (in 0.2 mL PCR tube)
Sensitivity	1 pg/μL (under optimized conditions)
External Dimensions (W x D x H)	23.7 x 29.0 x 46.8 cm / 9.3 x 11.4 x 18.4 in
Weight	9.2 kg / 20.3 lbs

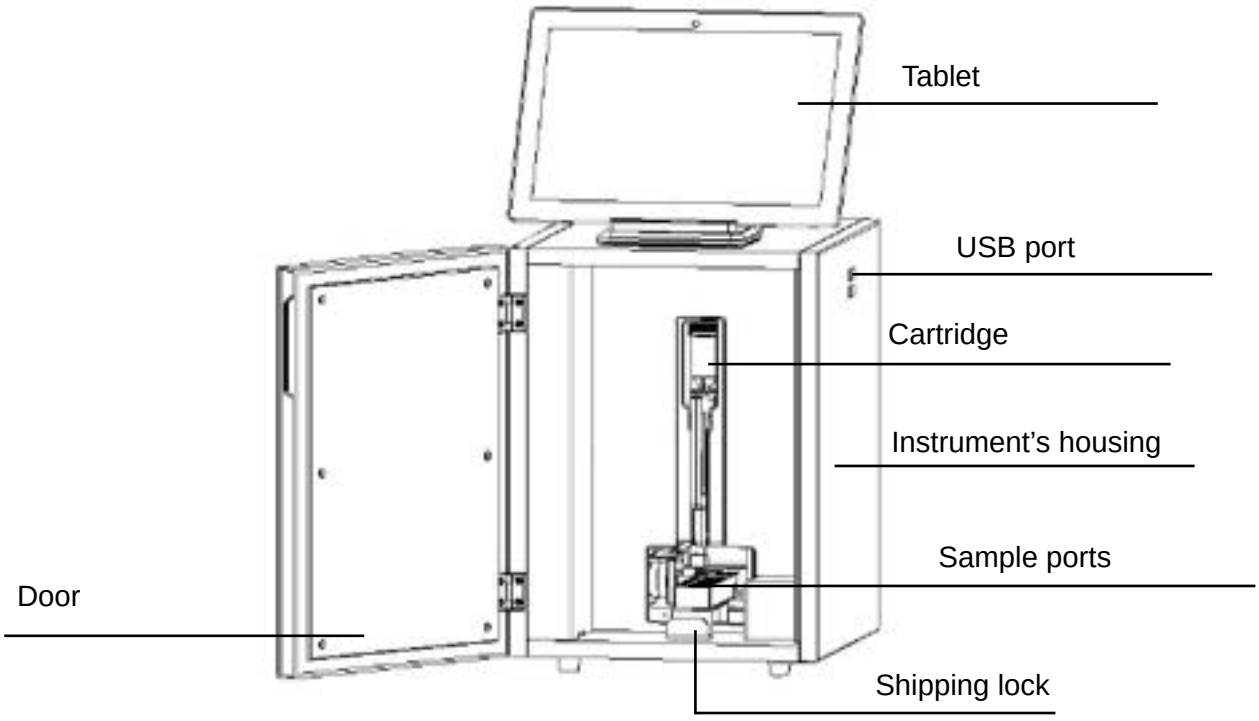
Note:
Width (W), including the door handle and hinge: 237 mm
Depth (D), including the rear protrusion: 290 mm
Height (H) with tablet installed: 468 mm; tablet bracket height: 380 mm
Dimensional tolerance: ±3 mm
Specifications are typical values obtained using a standard SC2 cartridge under specified test conditions.

Chapter 3: Instrument Overview

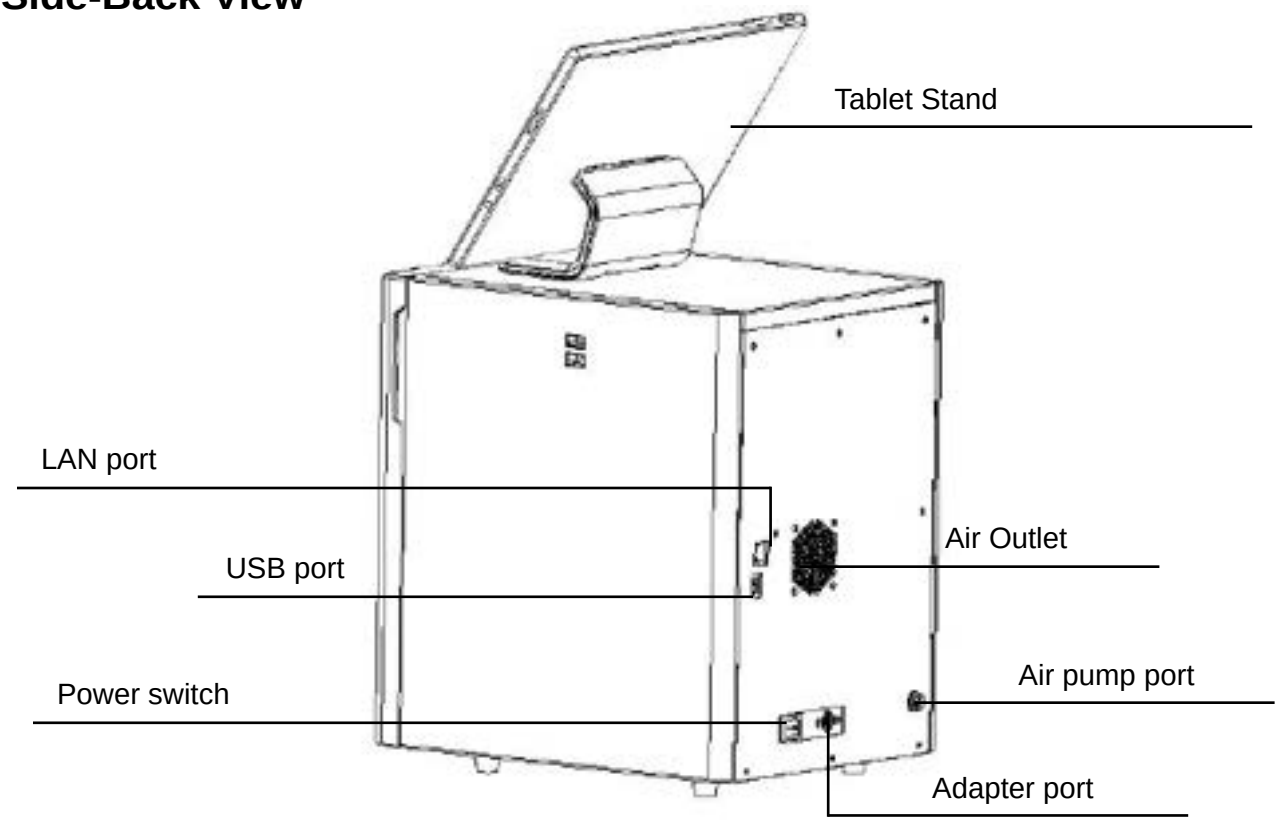
3.1 Instrument structure

This chapter describes the structural components and configuration of the instrument. Prior to initial operation, users should review this chapter thoroughly to become familiar with the instrument layout and key assemblies.

Front view

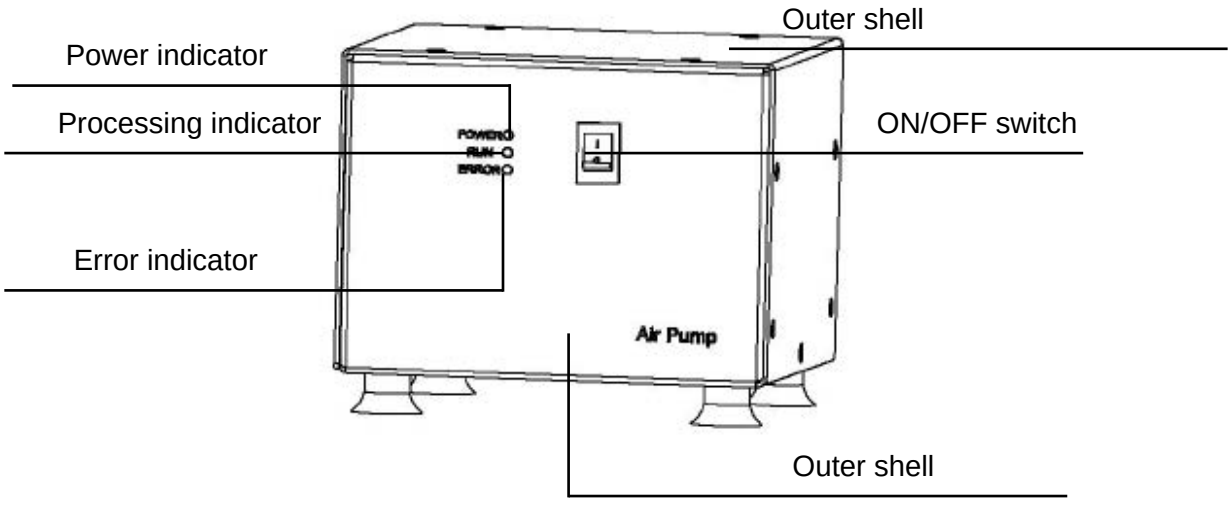


Side-Back View

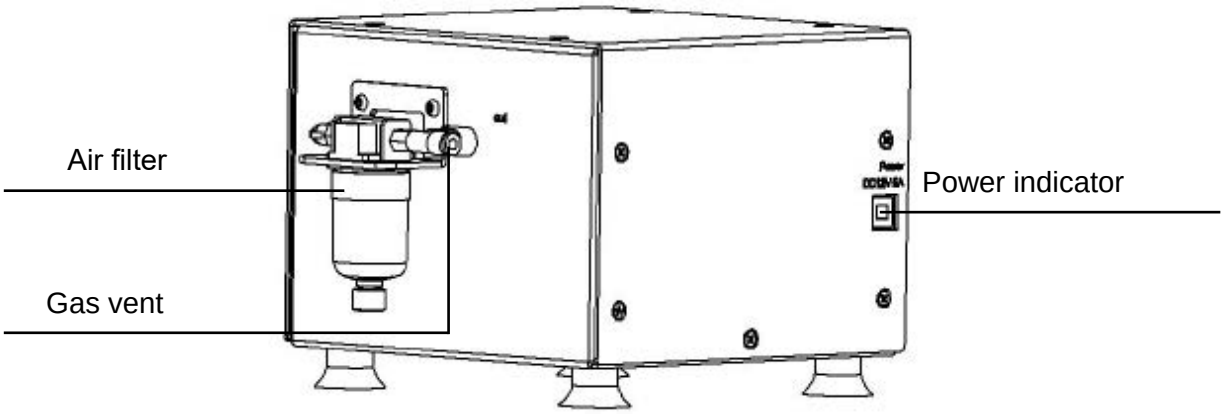


3.2 Air-pump structure

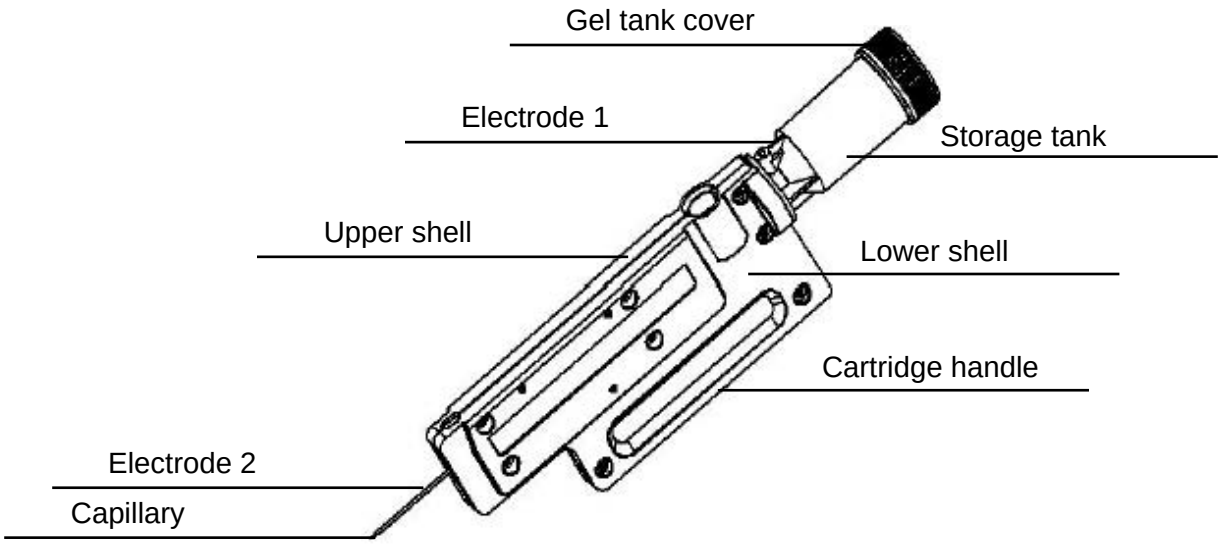
Side View



Side-Back View



3.3 Cartridge structure



Chapter 4: Instrument Setup

4.1 Removing outer packaging

The GenoSep™ biofragment analysis system is thoroughly inspected prior to packaging and shipment. Upon receipt of the instrument, inspect the shipping container carefully for any signs of damage before unpacking, including the following:

1. The outer packaging is overturned, crushed, or deformed;
2. The outer packaging shows visible signs of water exposure or moisture damage;
3. The outer packaging shows obvious impact or collision marks;
4. The outer packaging appears to have been opened or tampered with.

If any of the above conditions are observed, please contact us or notify your local distributor immediately. If the outer packaging is intact, open the shipping container and perform the unpacking inspection in the presence of the distributor representative or authorized personnel.

5. Verify that all components are present according to the packing list;
6. Carefully inspect all components for visible damage, including cracks, impact damage, or deformation.

4.2 Instrument handling and installation

1. Carefully place the shipping carton at the installation site and open it. Remove the top protective packaging and take out the tablet box. Then remove the middle protective packaging and take out the instrument and air pump. Place the instrument and air pump on a stable workbench.

2. Open the instrument access door. Using the supplied hex wrench, remove the three screws securing the transport fixture to the base plate and sample stage. Remove and retain the transport fixture for future transportation or shipment of the instrument.
Note: Unless otherwise specified in this manual, do not loosen or remove any other screws or components, as this may damage the instrument and void the warranty.

3. Place the tablet onto its designated stand. Connect the tablet power cable to the rear power port of the device, and connect the other end to the tablet. Locate the USB Type-C extension cable included with the accessories. Connect one end to the tablet and the other end to the instrument, as shown in the diagram.

4. Locate the air tubing assembly with the micro water-blocking filter included in the accessories kit. Connect the end closest to the filter to the air pump, and connect the opposite end to the instrument, as shown in the figure below.

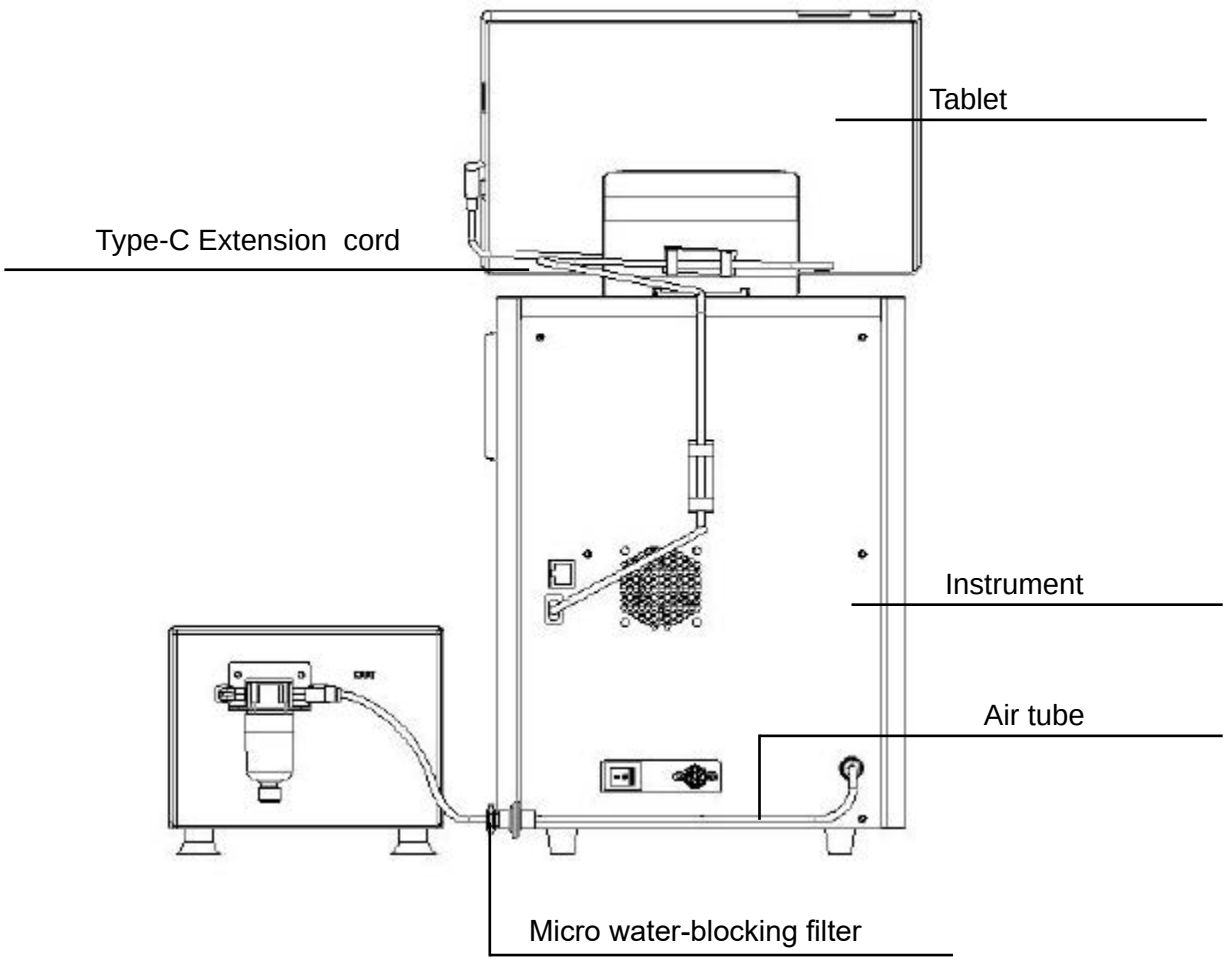
5. Ensure that the “I/O” power switch on the rear panel of the instrument and the air pump power switch are both set to the “O” (OFF) position.

Connect the power adapter (model GSM160A24-R7B) to the instrument rear power socket, then connect the power cord to an AC 100–240 V power source. Repeat the same procedure for the air pump.

6. Turn on the air pump first, then turn on the instrument power switch located on the rear panel.

Note: Ensure the arrow on the adapter plug is facing upward when connecting it to the instrument. The blue end of the micro water-blocking filter should face the air pump.

Warning: Do not operate the instrument connected to an ungrounded power outlet.



4.3 Tablet battery check

1. Please turn on the tablet and check the battery level before use. If the battery level is low, the tablet may start slowly. In this case, please connect the charger and allow sufficient time for the tablet to power on.

2. Before starting the experiment, please ensure that the tablet has sufficient battery power. Do not disconnect the charger during the experiment, as the tablet may automatically shut down if the battery becomes too low, which could interrupt the experiment.

3. After connecting the charger, please confirm that the tablet is charging properly. If the charging indicator does not appear, check whether the charging cable or adapter connection is loose.



4. If the tablet battery level falls below 20%, please charge it promptly. If the tablet cannot be turned on, the battery may be completely depleted. Please charge the tablet for at least 20 minutes before attempting to turn it on again.

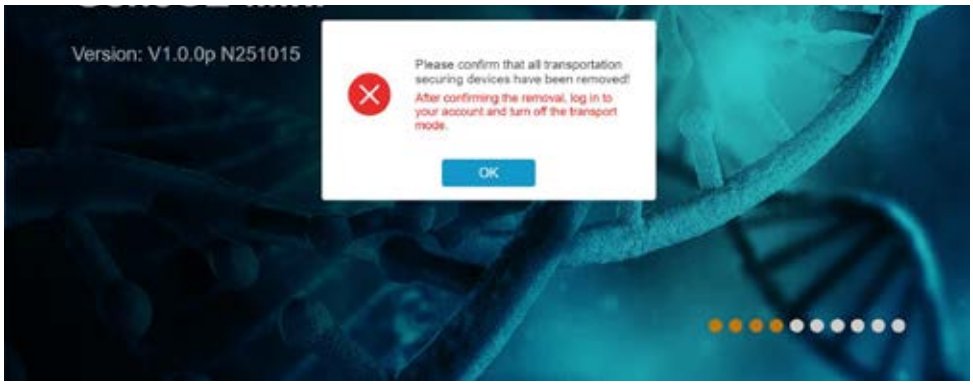
Chapter 5: Instrument Operation

5.1 Instrument start-up and”Transportation mode”

After completing the instrument installation described in Chapter 4, turn on the instrument power switch and the air pump switch. The instrument will start up and display the interface shown in Figure 5-1.

After confirming that all transportation positioning components have been removed, click the “OK” button to continue.

If a fault alarm occurs during startup, please refer to Chapter 7: Troubleshooting.

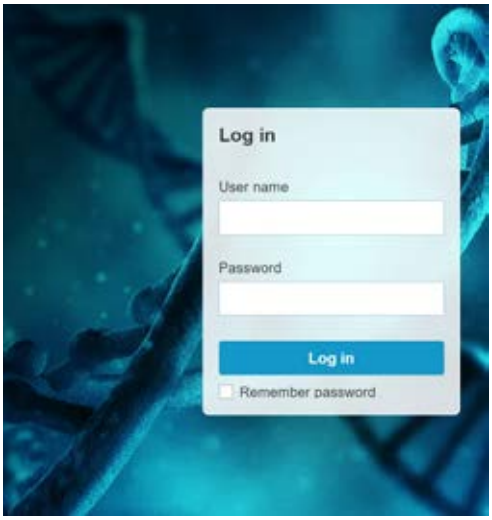


Self-initialization inter phase

After clicking “OK,” a login dialog box will appear. Users must log in with their account credentials before accessing the software.

The default login credentials are:

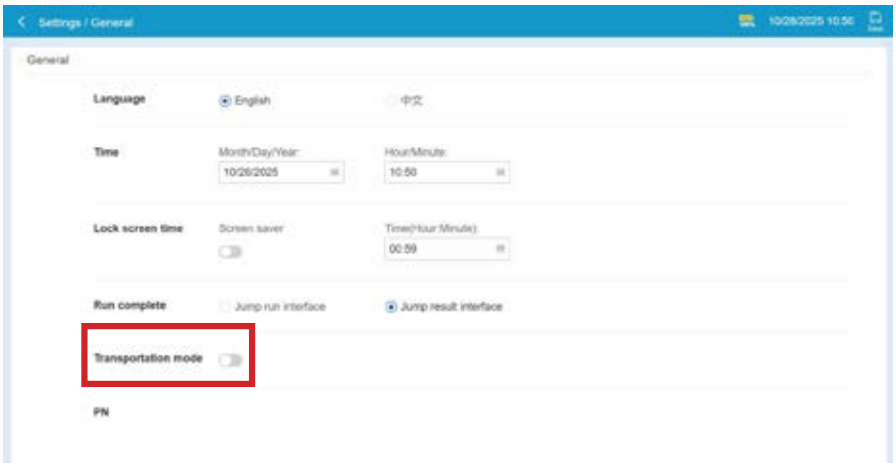
Username: Admin
Password: 0000



User login interface

Enter the user login credentials to access the “Settings/General” interface. From there, disable Transport Mode, then click the button in the upper-right corner to exit.

The system will then navigate to the instrument connection operation interface.



Disabling Transportation Mode

Transport Mode ON



Transport Mode OFF

5.2 Instrument connection

Enter the user login credentials to access the “Settings/General” interface. From there, disable Transport Mode, then click the button in the upper-right corner to exit.

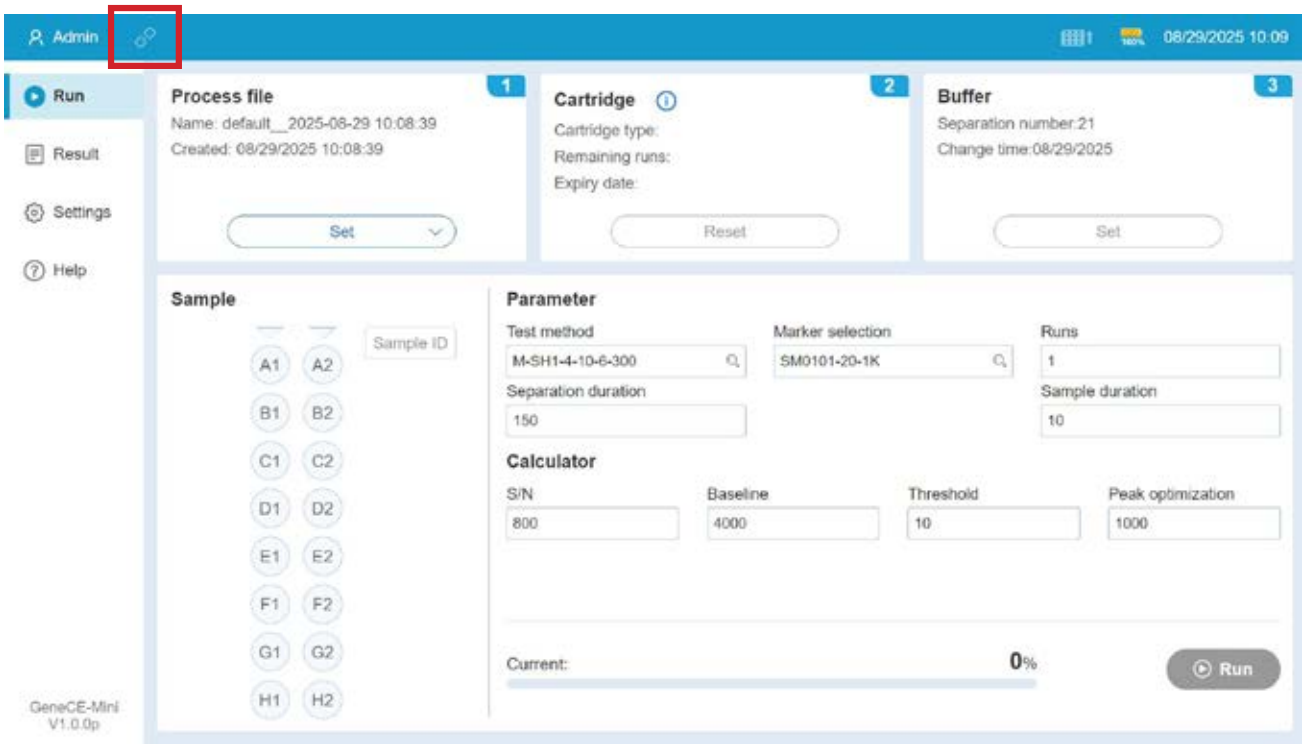
The system will then navigate to the instrument connection operation interface.



Not connected



Connected



Instrument connection

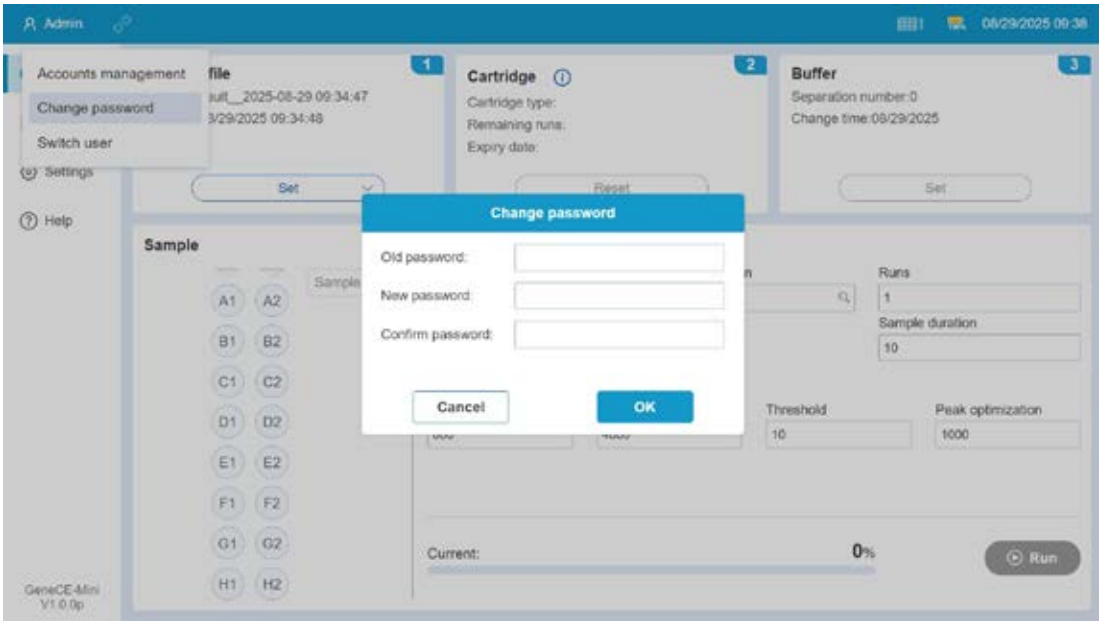
Enter the user ID and password, then click “Login” to access the software.

The default login credentials are:

Username: Admin
Password: 0000

If you need to change the password:

1. Log in to the account and enter the main software interface.
2. Click “Admin” in the upper-left corner of the main interface, then select “Change Password.”
3. Enter the current password.
4. Enter the new password.
5. Re-enter the new password to confirm.
6. Click “OK” to save the changes.



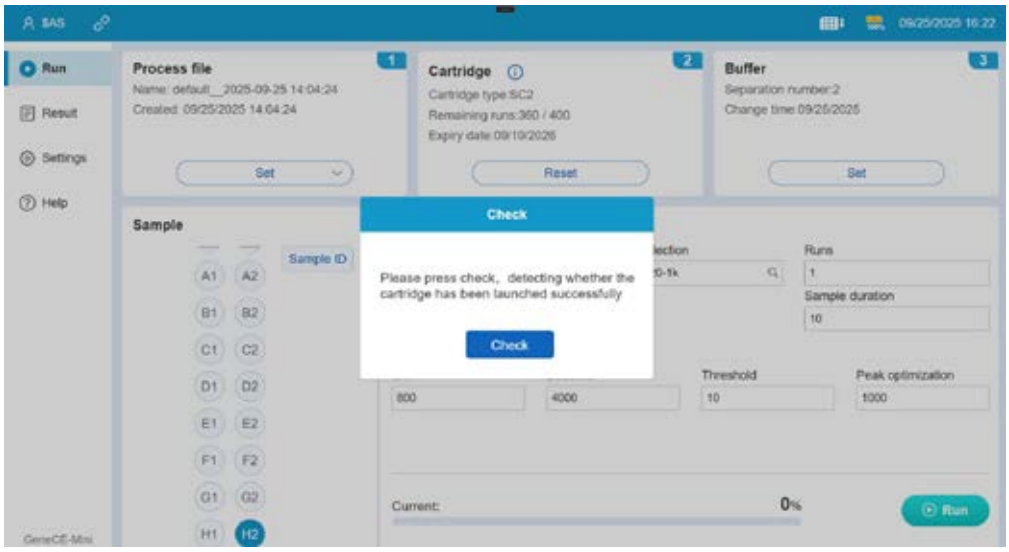
Changing Login and Password

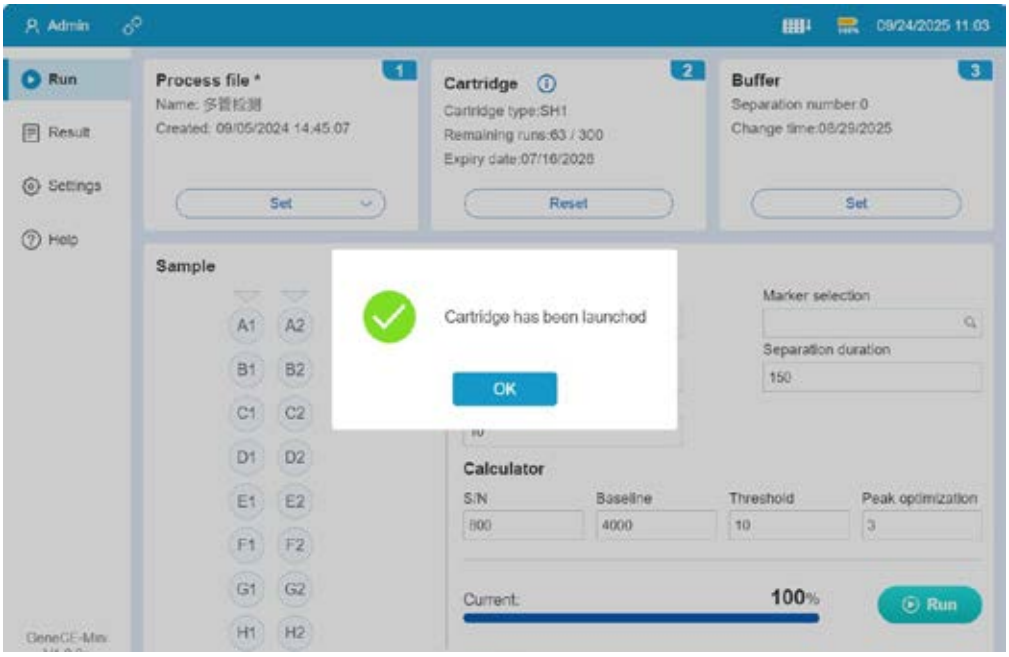
5.3 Cartridge connection

After the device has been successfully connected, insert the cartridge into the instrument. A “Check” dialog box will appear automatically.

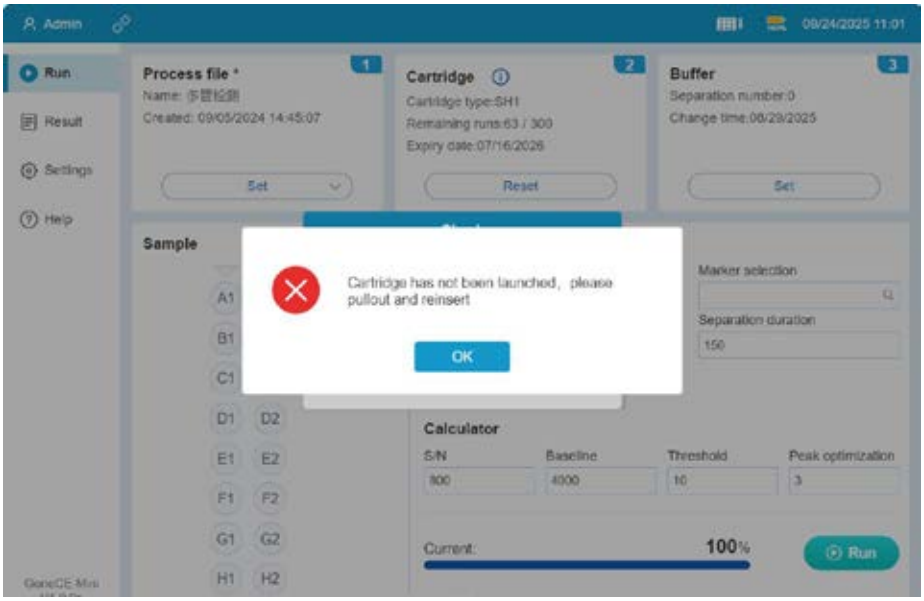
Click “Check” to verify that the cartridge is properly inserted using the air pressure detection system.
If the message “Cartridge has not been launched, please pull out and reinsert” appears, remove the cartridge and insert it again, then click “Check” once more.

Repeat this process until the system confirms that the cartridge has been successfully connected.





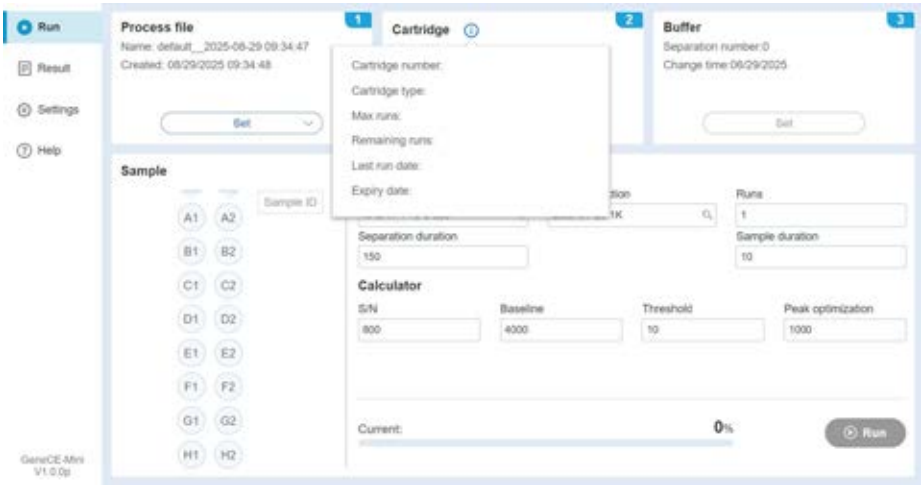
Cartridge successfully installed on the instrument



After the cartridge is successfully launched, the instrument will automatically identify the cartridge information.

Click on the cartridge to view its details, including:

1. Cartridge number
2. Cartridge type
3. Maximum runs
4. Remaining runs
5. Last run time
6. Expiry time



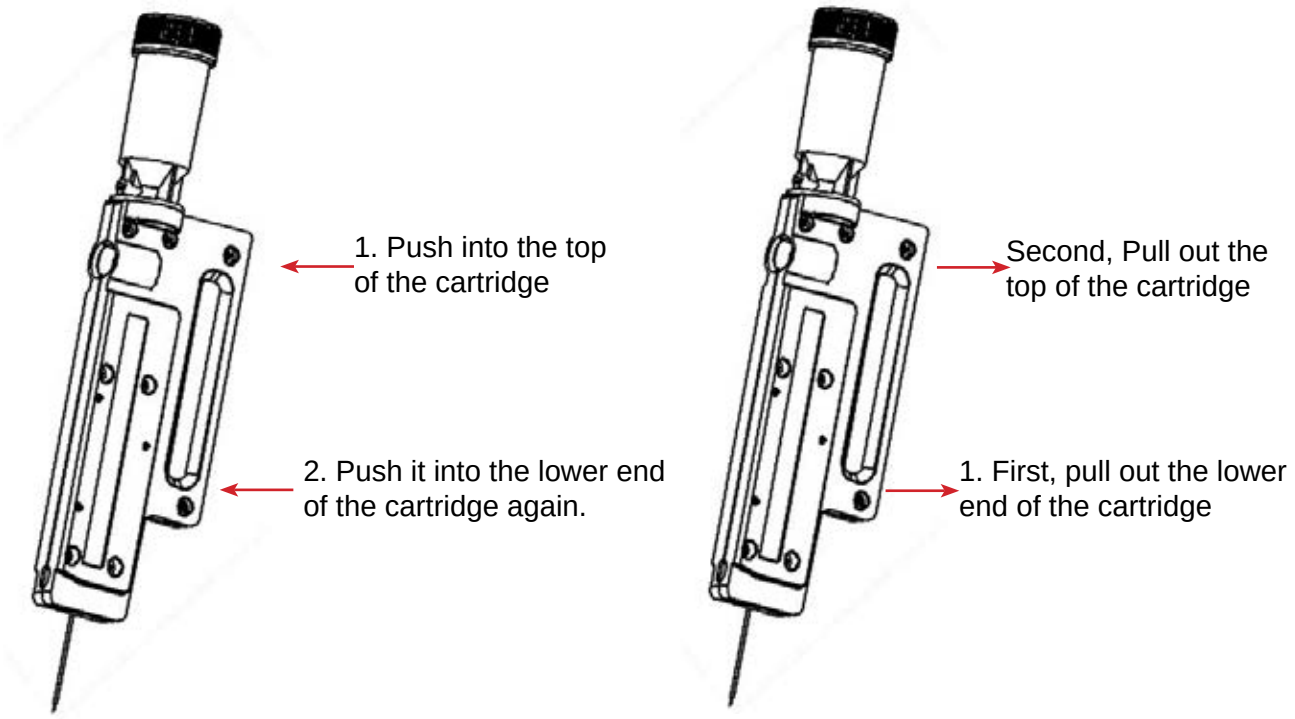
Cartridge information

If you need to replace the cartridge:

1. Click the “Replace Cartridge” button.
2. Open the instrument cabin door.
3. Hold the cartridge handle and insert the cartridge into the internal slot.

When inserting, first align and insert the upper part of the cartridge, then press down the lower part of the handle until fully seated (only the handle should remain visible).

To remove the cartridge, reverse the process: pull out the lower part first, then lift and remove the upper part to fully extract the cartridge.



Click the icon located on the right side of the cartridge. Confirm that the cartridge is properly installed and that the cartridge information displayed on the screen is accurate. Important:

IMPORTANT:

Ensure that the cartridge is properly inserted before operation. If the cartridge is not installed correctly, the system may fail to recognize the cartridge information and will be unable to operate. Improper installation may also damage the internal capillary tube.

When the remaining usage count reaches “0”, the cartridge has reached the end of its usable life and must be replaced before further testing. Using an expired or depleted cartridge may result in inaccurate test results.

Always verify that the cartridge is within its expiration date before use and replace it as necessary.

5.4 Reagents and Buffers

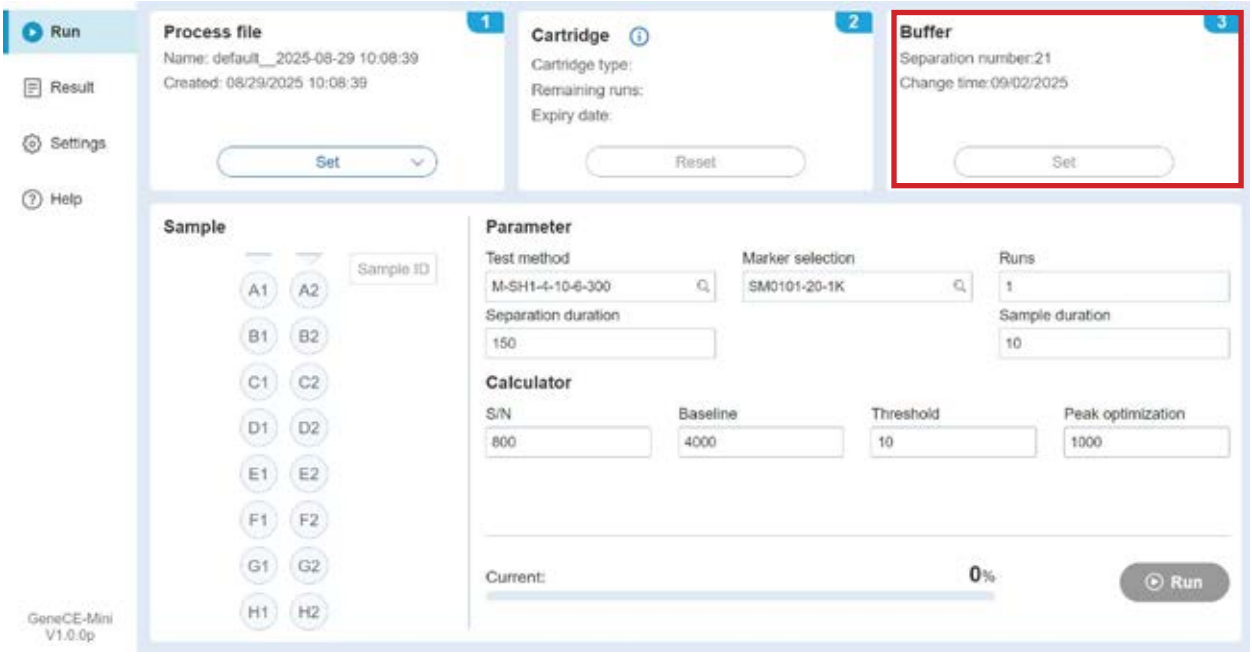
5.4.1 Buffer information

The Cartridge column displays the current number of remaining runs and the maximum number of runs allowed for the cartridge, shown in the format Remaining Runs / Maximum Runs.

The Buffer column displays:

Separation Number: the number of times the current buffer has been used.

Change Time: the date and time when the buffer was last replaced.



5.4.2 Reagent replacement

1. Click the Reagent Seat Move button in the upper-right corner of the interface.
2. Remove the reagent seat.
3. Place the required buffer and reagents into their designated positions on the reagent seat.



Move out



Reset

4. For the Separation (S) step, add approximately 700 µL of separation buffer using the tank provided in the kit.

For the Clean (C) and Park (P) steps, use 0.2 mL PCR tubes filled with deionized water:

Clean (C): 200 µL
Park (P): 50 µL

After adding the reagents, place the tubes into their designated positions on the instrument.

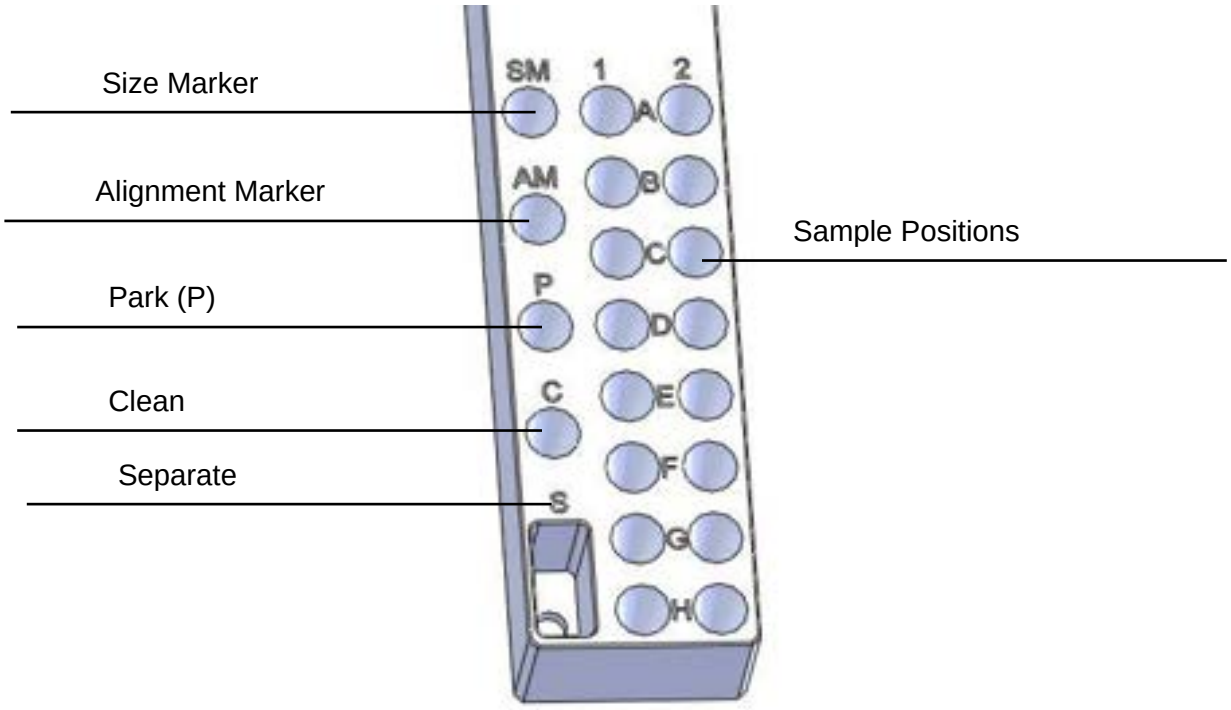
3. Place the Alignment Marker (AM) and Size Marker (SM) (if a new reference marker is required) into their specified positions.

Then load the samples into the right two columns of the 8-row rack, using 0.2 mL PCR tubes. Ensure each sample volume is at least 10 µL.

Note: When using 0.2 mL PCR tubes, the reagent volume must be at least 10 µL.

If samples will remain in the instrument for an extended period, add an appropriate amount of mineral oil to prevent evaporation. Recommended volumes are:

Add 8 µL mineral oil to a 10 µL sample
Add 10 µL mineral oil to a 20 µL sample

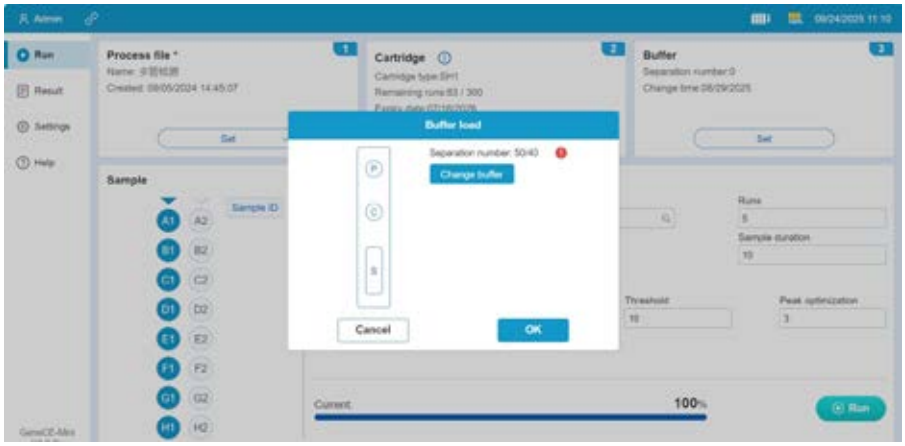


5.4.1 Reagent replacement

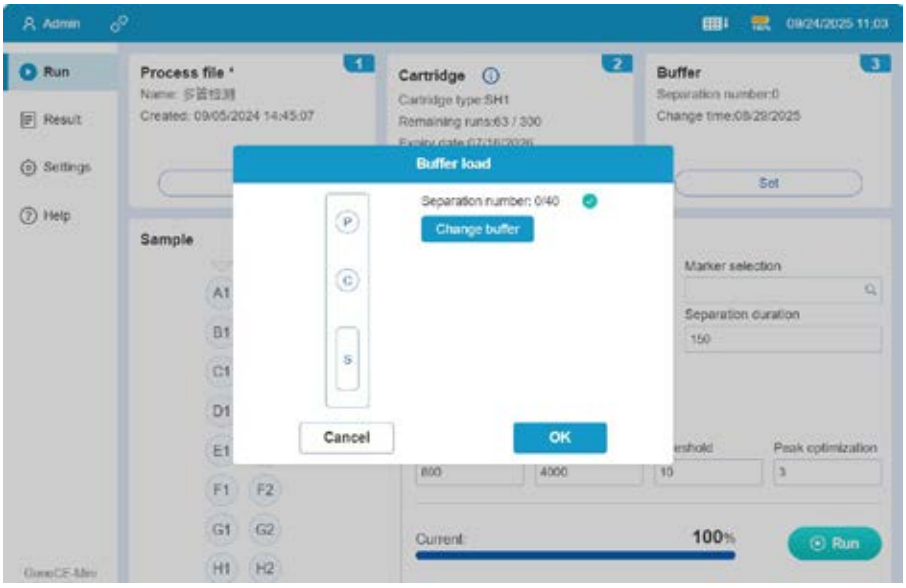
If the number of consecutive electrophoresis runs exceeds 40 cycles, the instrument will prompt the user to replace the buffer.

To do so, click the “Set” button under the Buffer section on the right side of the interface, then select “Change Buffer.” The sample tank will automatically move out for access.

Manually replace the separation buffer, then click “OK” to complete the process.



Buffer Replacement

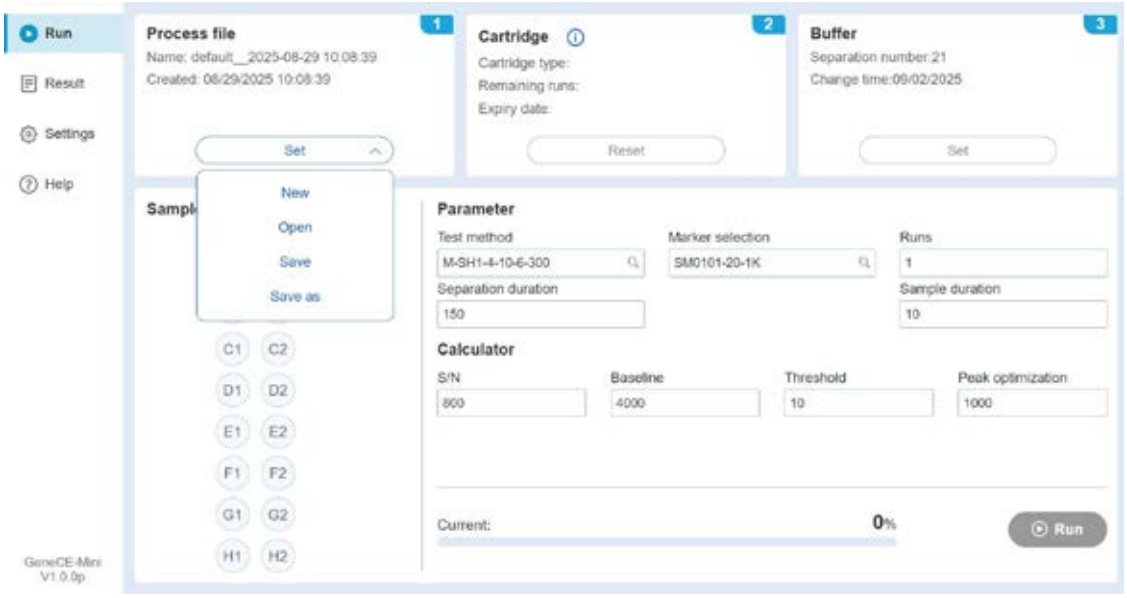


Successful Buffer Replacement

5.5 Operation and data analysis

5.5.1 File processing

Click the **Program File Settings** button to create a new program file, open an existing file, save the current file, or use Save As to save it as a new program file.



Create a program file

New: Create a new program file

Open: Open the saved program

Save: Save the current program

Save as: Save the current program under a different name

5.5.2 Running the experiment

After setting up the program file, users can create an experiment and start the run.

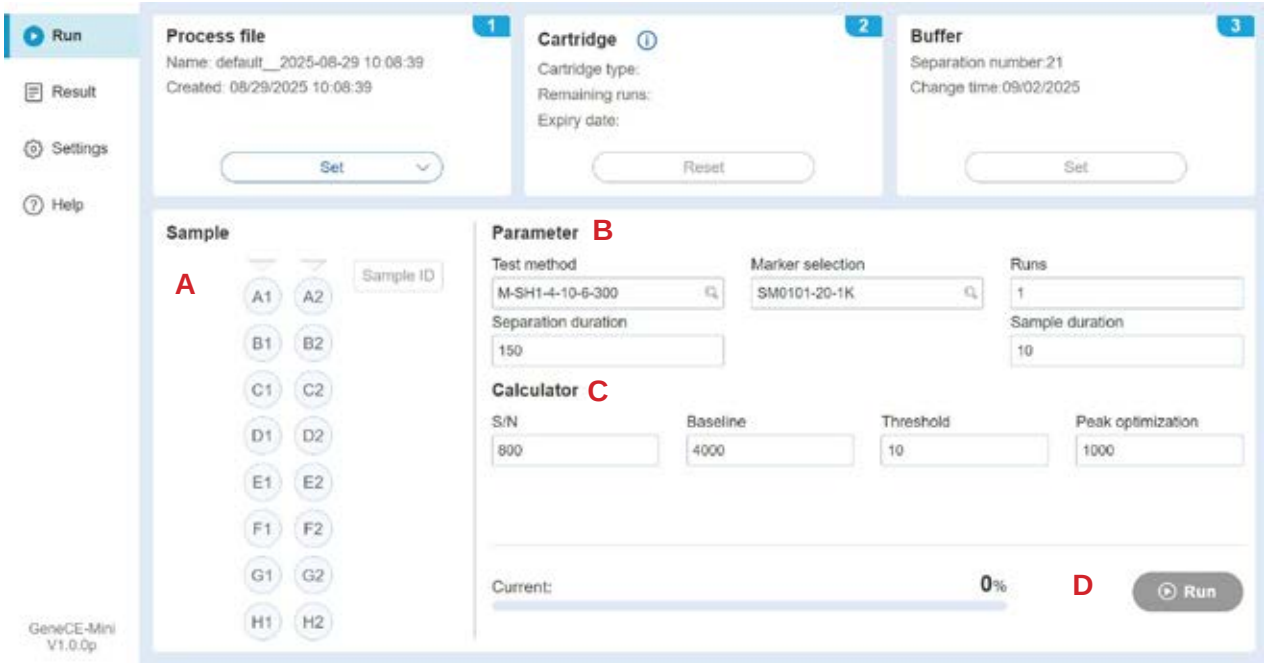
The sample run procedure is as follows:

1. Select the wells to be tested and enter the sample ID and description for each well. Alternatively, sample IDs can be imported using the “Import” function in the upper-right corner of the Sample ID interface for faster entry.

2. Select the appropriate experimental method and set the number of runs. The corresponding injection time and separation time for the selected method will be displayed below. These parameters can also be adjusted manually according to experimental requirements.

3. Select the appropriate Marker and configure the calculation parameters.

4. Click “Run” to start the experiment.



A. Well Selection

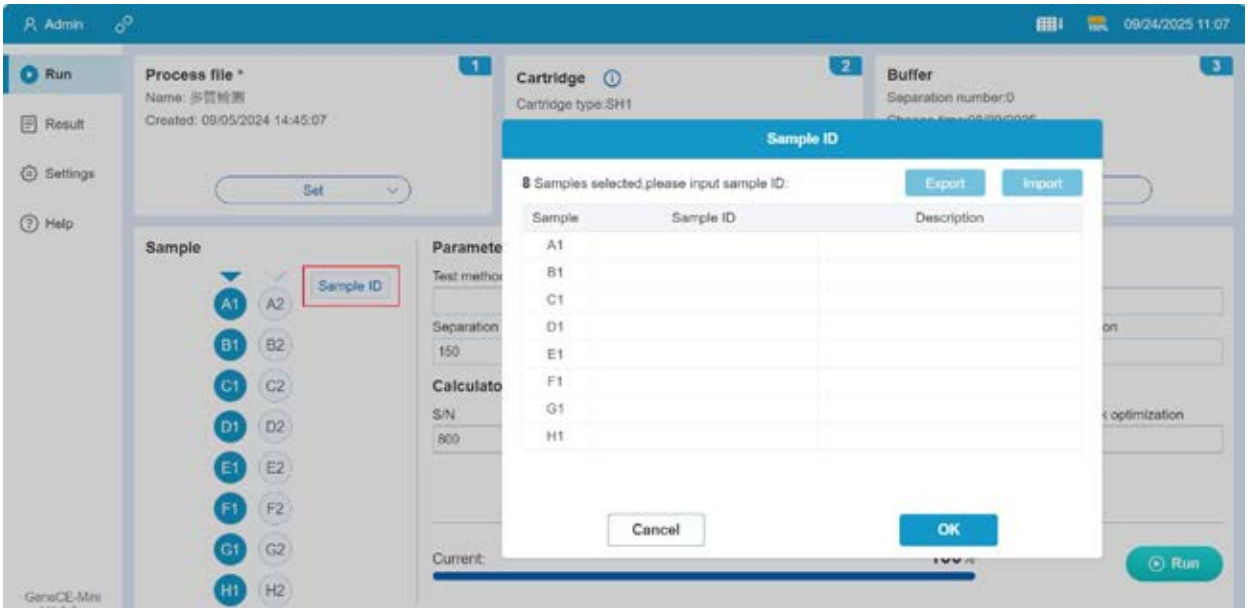
B. Parameter Settings

C. Calculation Settings

D: Start the run

Note: Each well can be run up to 10 times. Ensure that all settings are completed before starting the run.

The total number of sample runs must not exceed the remaining number of runs available on the cartridge.



Setting sample ID

5.5.3 Marker set up

Result calculation is based on the selected Marker size, peak area, and other relevant parameters.

Users may choose to create a custom reference Marker or use the built-in electronic reference Marker, depending on experimental requirements.

5.5.3.1 Alignment marker and electronic reference marker setup

1. Select the “Alignment Marker and Electronic Reference Marker” option.

2. Click the drop-down arrow and choose the electronic reference marker type that corresponds to the selected Test Method.

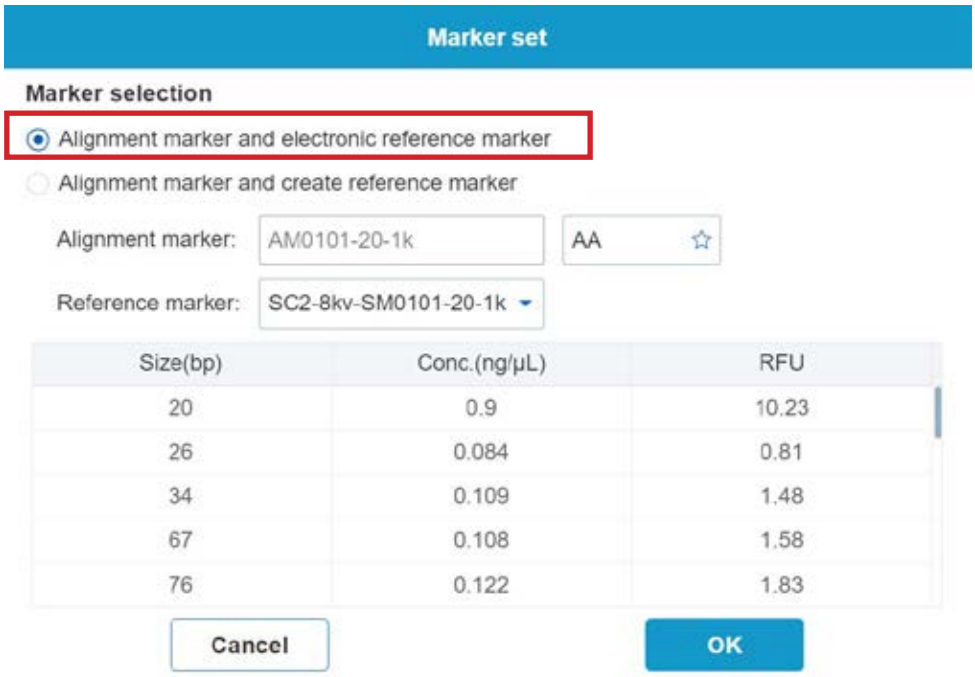
3. The software will automatically select the appropriate Alignment Marker type based on the chosen electronic reference marker.

4. Place the corresponding Alignment Marker into the well labeled “AM”.
Click “OK” to confirm the settings.

Electronic Reference Marker Description:



Description of electronic reference marker

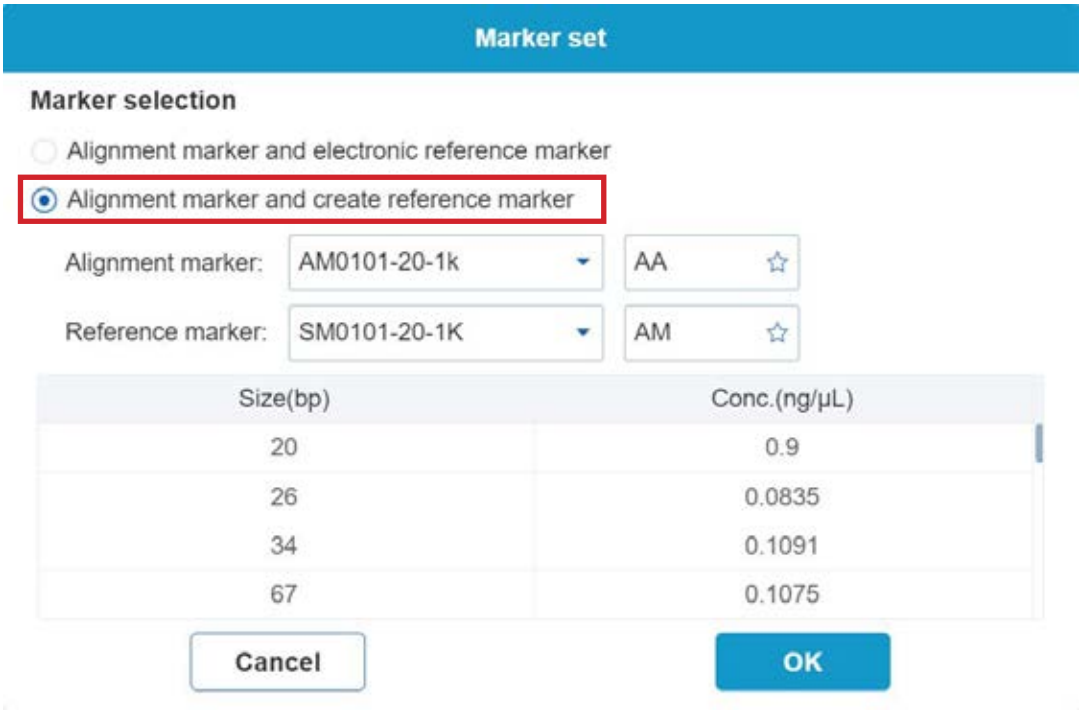


Electronic Reference marker selection

5.5.3.2 Create a reference marker

1. Select the “Alignment Marker and Create Reference Marker” option, then click the drop-down arrow to select the Alignment Marker and Reference Marker types cor responding to the selected Test Method.

2. Place the Size Marker in the well labeled “SM” and the Alignment Marker in the well labeled “AM.”

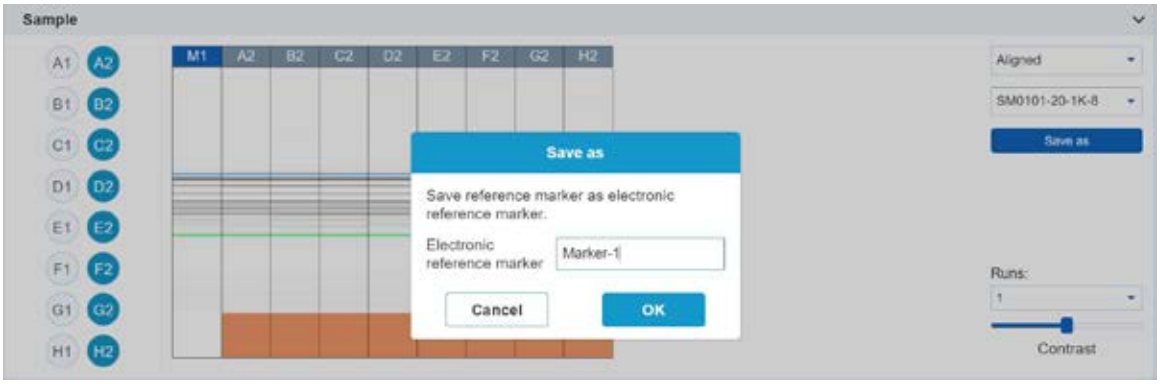


5.5.3.3 Saving electronic reference marker for future use

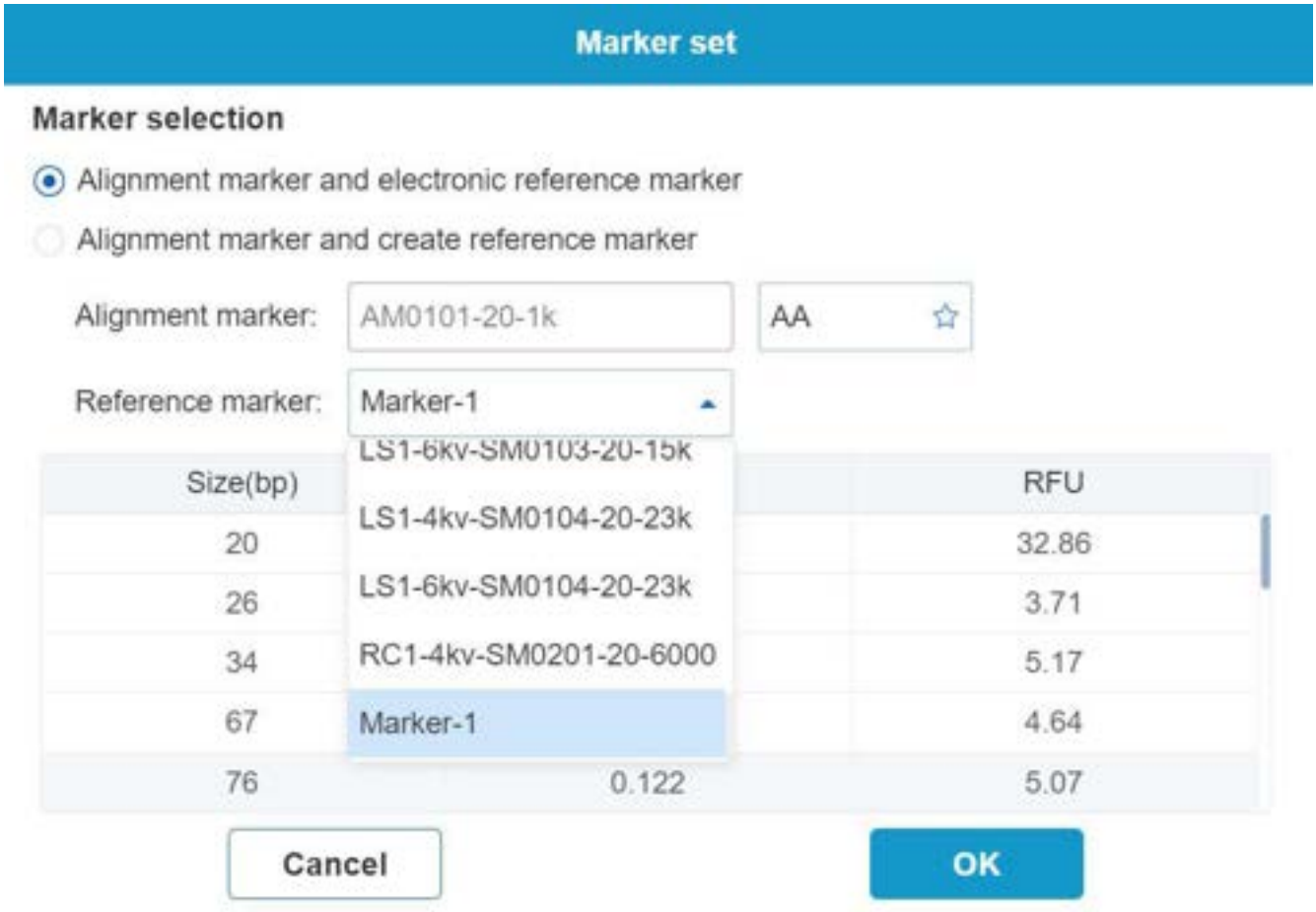
You can save a newly created reference marker as an electronic reference marker for future use. The procedure is as follows:

1. Click “OK” to confirm the reference marker settings.
2. Click the “Save As” button on the right side of the interface.
3. Enter a name for the electronic reference marker.
4. Click “OK” to save the marker.
5. To use the saved marker, follow the same procedure described in Section 5.5.3.1, “Select Electronic Marker.” Select the saved electronic reference marker from the Electronic Marker drop-down menu.

Note: For the LS1 cartridge, saved electronic reference markers are assigned the default prefix “SM0104-”.



Save as an electronic reference Marker

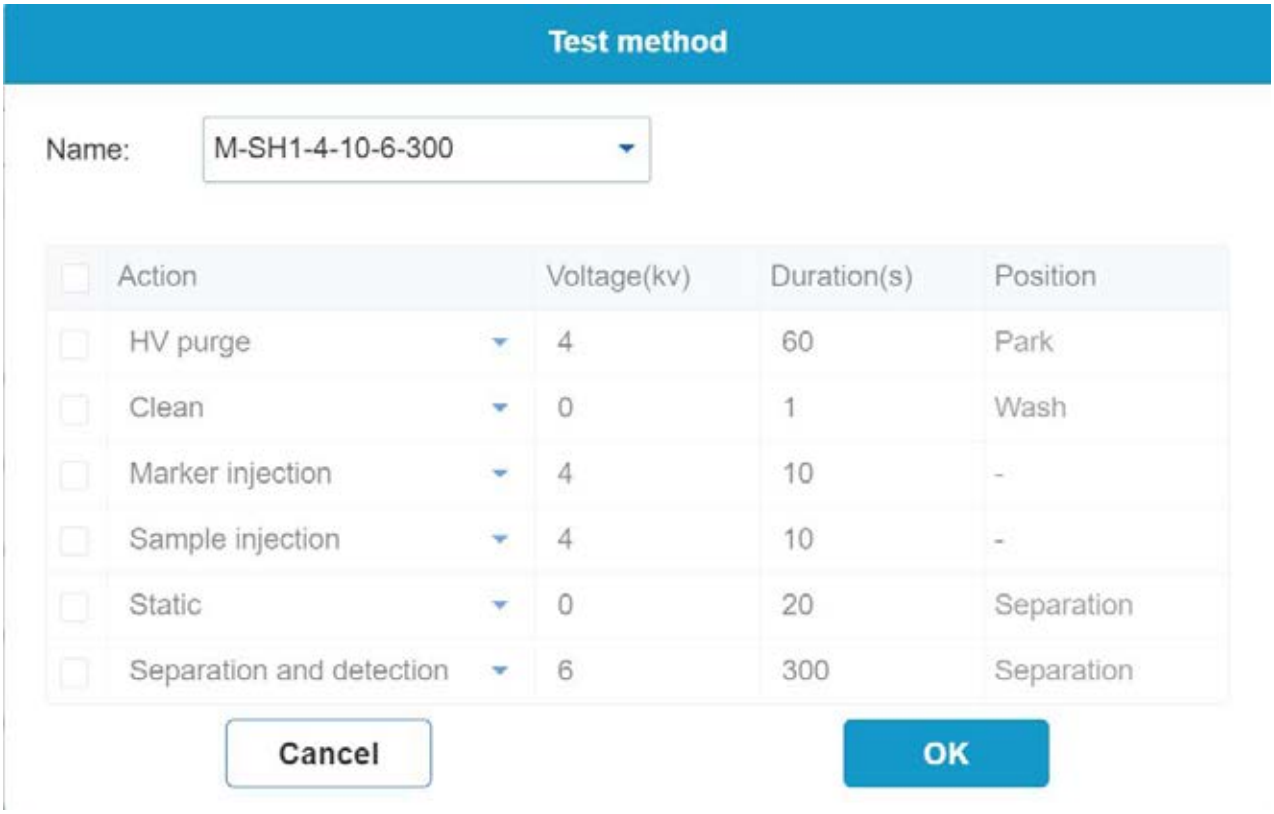


Loading saved electronic reference Marker

5.5.4 Method Setup

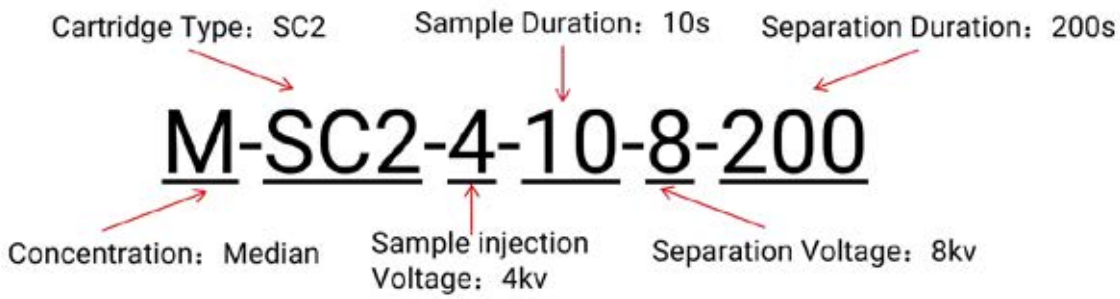
Users can select the appropriate test method according to the size and concentration of the sample.

Details of the selected method are displayed below the Test Method section, including the sequence of actions, voltage settings, duration of each step, and position set tings used throughout the experiment.



Operation workflow

Description of the method:



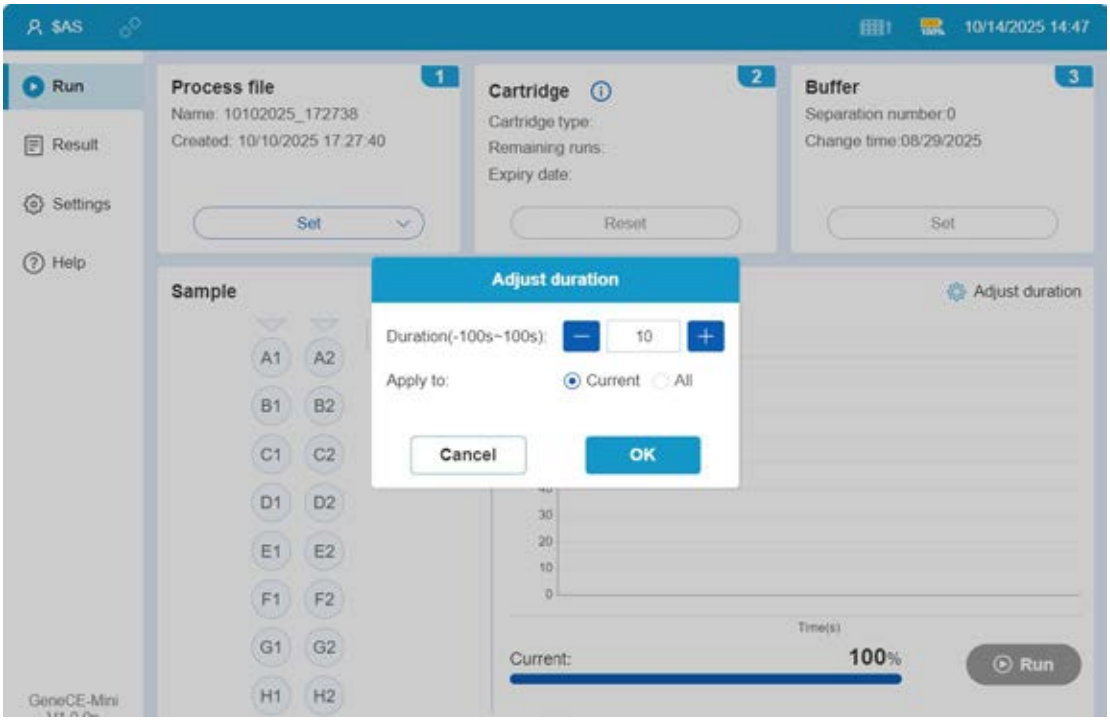
Test Method Description

Users can select the appropriate **Low, Medium, or High** concentration method based on the concentration of their samples, as shown in the table below.

Sample Concentration Range (ng/μL)	<0.1	0.1 - 10	>10
Detection Concentration	(Low) L-	(Medium) M-	(High) H-
Corresponding Injection Voltage (kv)	8	4	2

5.5.5 Experiment duration setup

Users can adjust the separation time while the experiment is running. Click the “Adjust Duration” icon in the upper-right corner of the interface to increase or decrease the sample separation time, providing greater flexibility in optimizing the experiment.



Adjusting separation time

5.5.6 Data Analysis

Users can adjust the separation time while the experiment is running. Click the “Adjust Duration” icon in the upper-right corner of the interface to increase or decrease the sample separation time, providing greater flexibility in optimizing the experiment.

The software provides several views for displaying and analyzing raw sample data, including:

Gel Chart View – displays sample results in a gel-like format.

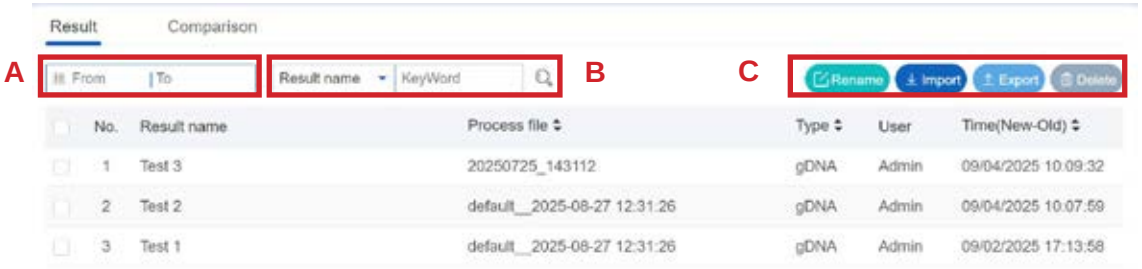
Single Electropherogram View – displays the electropherogram of an individual sample.

Electropherogram Overlay View – allows multiple electropherograms to be overlaid for comparison and analysis.

5.5.6.1 Loading result files

After the software completes the run, it automatically redirects to the Result Analysis interface of the program file. Alternatively, users can click the “Results” button on the left side of the screen and select the corresponding result files for data analysis.

When multiple result files are available, users can filter them by time or name to locate specific files. The system also supports importing result files from other instruments for analysis. In addition, users can rename, export, or delete files within the results list.



A: Filter by time

B: Filter by result name

C: Result editing (Rename, Import, Export, Delete)

5.5.6.2 Viewing sample data

Users can select specific wells from the left-side list and choose the desired number of runs using the “**Runs**” drop-down menu on the right.

Selected wells are highlighted in different colors to distinguish between inspected and unexamined wells. In addition, users can change the reference marker selection by clicking the drop-down arrow next to the marker name on the right side.



A: Well selection

B: Replace the reference marker

C: Runs

5.5.6.3 Viewing the gel

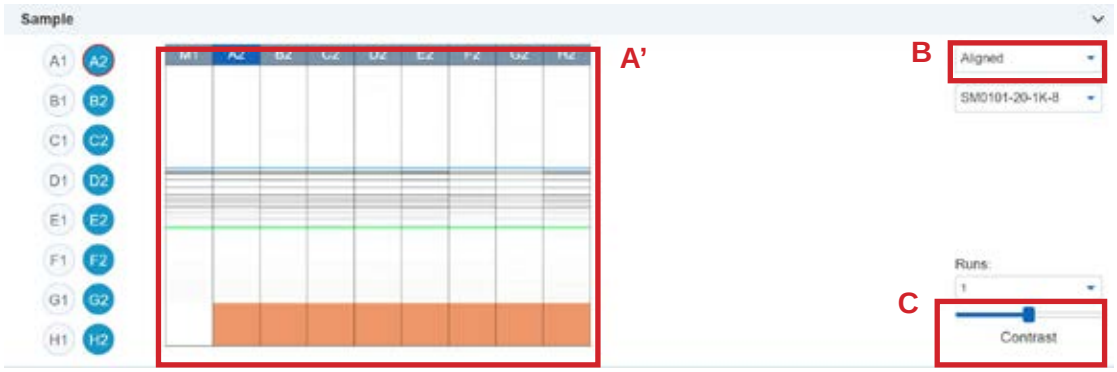
The Gel Chart View displays the sample’s gel pattern. Users can adjust the brightness and contrast of the bands by dragging the slider to improve visibility.

The alignment options at the top allow users to choose whether to align with the sample or not. When aligned, bands appear with enhanced contrast.

For datasets with multiple results, users can swipe left in the Gel View interface to view additional data.



Unaligned gel diagram



Aligned gel diagram

A/A': Gel aligned / unaligned

B: Alignment toggle option (aligned / unaligned)

C: Contrast adjustment

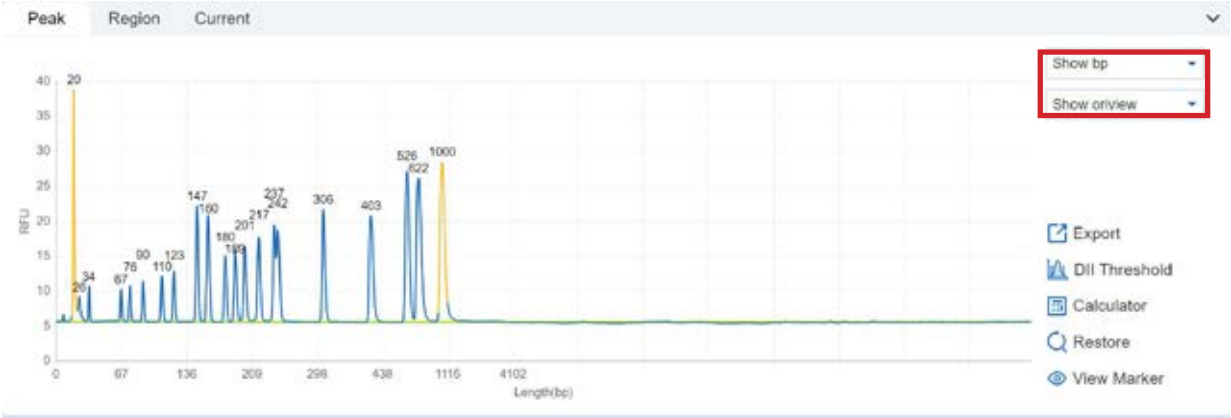
5.5.6.4 Viewing the peak diagram

In this view mode, the software automatically displays the fragment sizes of recognized peaks.

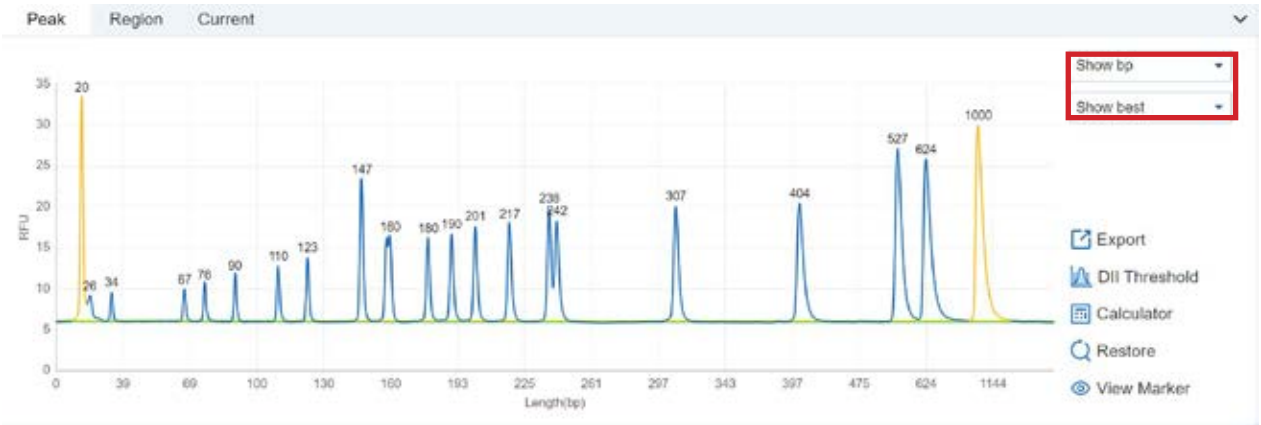
Users can set the horizontal axis unit to time/bp and choose to display the peak profile in either Oriview or Best mode.

The table below lists all peak fragments in the profile, including Size (bp), Peak start/end (s), Concentration (ng/μL), Peak molarity (nmol/L), % of total, Area, Time (s), RFU, and FWHM.

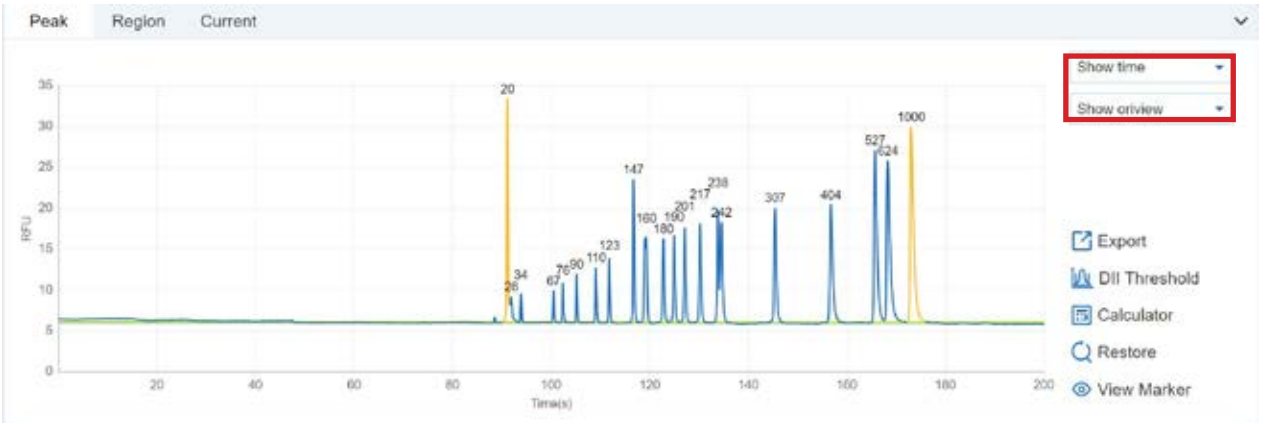
Users can delete selected peaks by checking the corresponding boxes in the left panel and clicking "Delete Peaks." Individual or multiple peaks can be removed, and the corresponding fragment sizes in the profile will be updated accordingly.



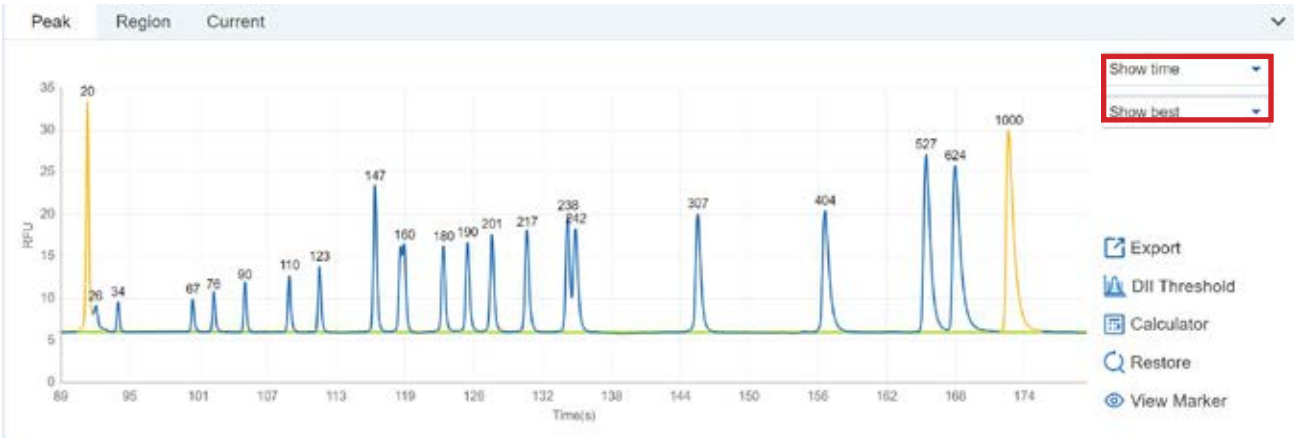
Original peak display in “Display bp” mode



Optimized peak display in “Display bp” mode



Original display spectrum in “Display Time” mode



Optimized spectrum display in “Display Time” mode

Sample table | Peak table | Region table

Merge peak | Delete peak

No.	Size(bp)	Peak from (s)	Peak to (s)	Conc. (ng/μL)	Peak molarity (nmol/L)	% of total	Area	Time(s)	RFU	FWHM
1	20	90.32	91.68	NA	NA	6.47%	217612	91.16	27.392	0.28
2	26	91.68	92.12	0.069	4.021	0.91%	30644	91.92	3.200	0.44
3	34	93.64	94.16	0.112	4.980	0.71%	23736	93.88	3.584	0.28
4	67	100.32	100.88	0.111	2.515	0.84%	28216	100.52	3.944	0.32
5	76	102.16	102.84	0.126	2.516	1.06%	35751	102.40	4.876	0.32
6	90	104.96	105.52	0.151	2.544	1.26%	42204	105.20	5.996	0.28
7	110	108.84	109.52	0.179	2.466	1.59%	53584	109.12	6.776	0.32
8	123	111.52	112.24	0.200	2.462	1.89%	63509	111.80	7.870	0.32
9	147	116.40	117.20	0.480	4.947	4.73%	159044	116.72	17.552	0.36

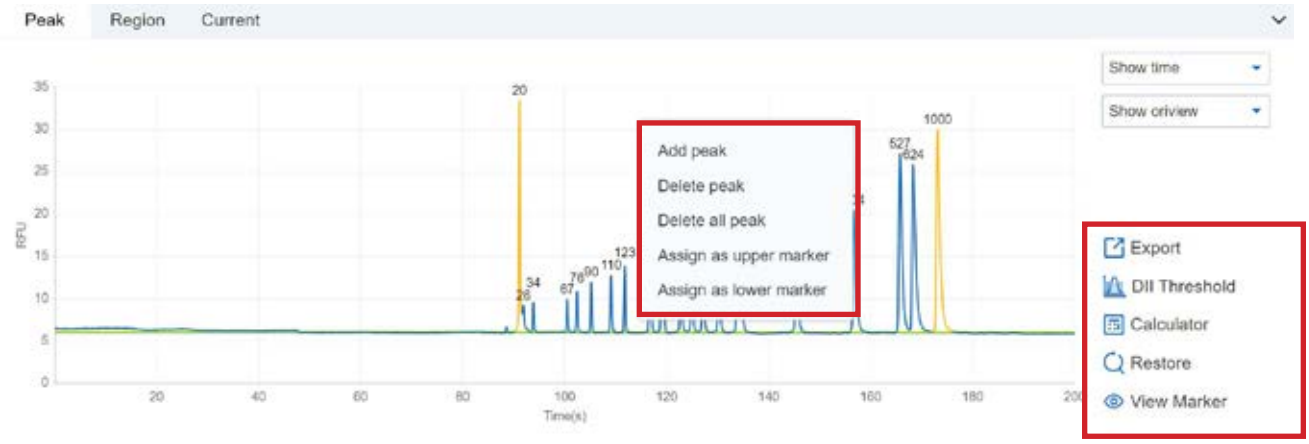
Peak table list

5.5.6.5 Navigating the peak chart

Users can zoom in or out of the peak chart by moving outward or inward, and can restore the original peak view with a single click.

Long-pressing a peak for approximately 0.5 seconds enables additional functions, including Add Peak, Delete Peak, Delete All Peaks, and Assign as Upper/Lower Marker.

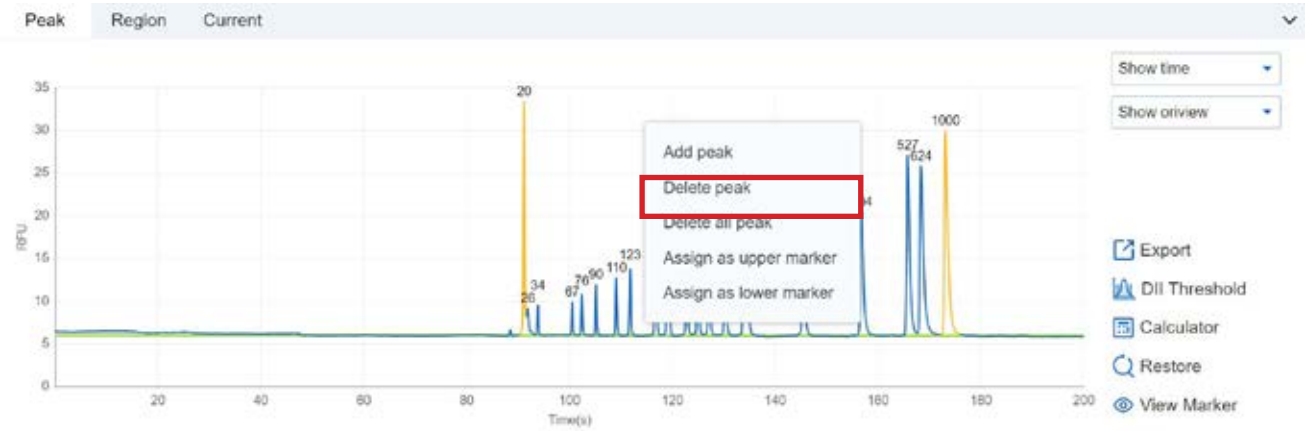
The right-side panel provides additional tools, including Restore, Calculator, Marker view, and DII Threshold.



Peak Diagram Function

Deleting and merging peaks

If a peak is pressed and held for approximately 0.5 seconds, select “Delete Peak” to remove it. The corresponding entry in the table below the peak chart will also be deleted.



Deleting the peak

Users can also select peaks for deletion or merging directly from the table below the chart, as shown in Figure below.
To delete or merge multiple peaks, select the first and last target peaks; all peaks between them will be automatically selected.

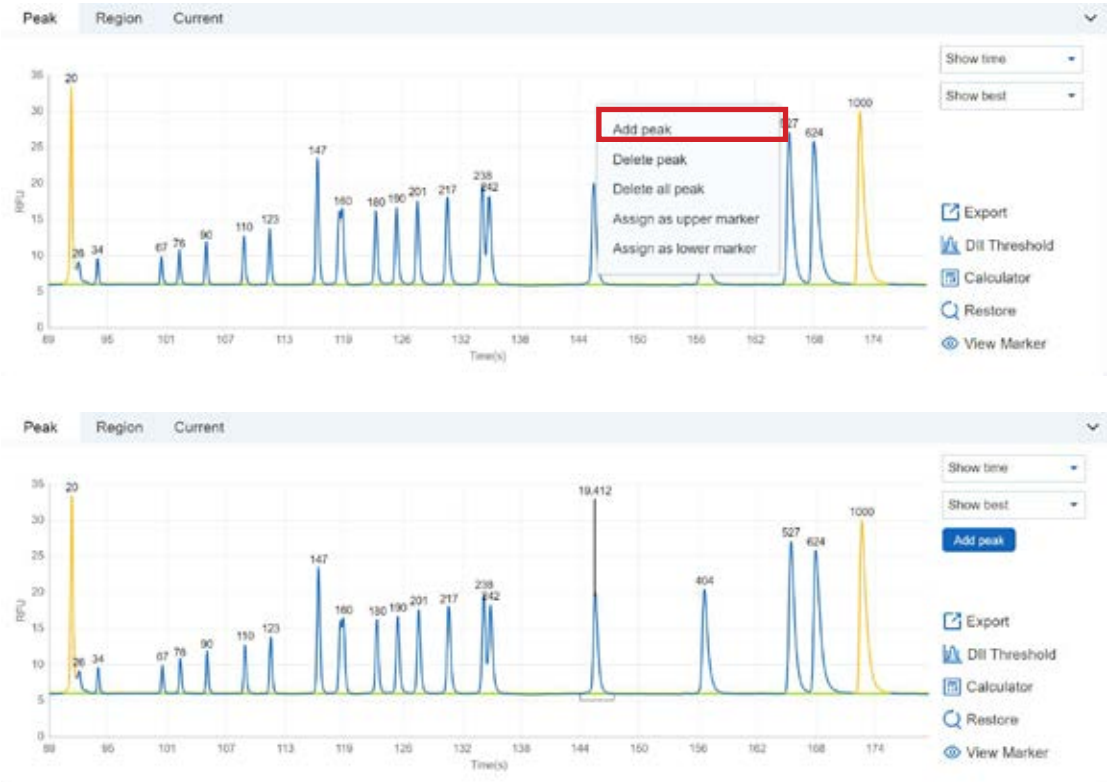


No.	Size(bp)	Peak from (s)	Peak to (s)	Conc. (ng/μL)	Peak molarity (nmol/L)	% of total	Area	Time(s)	RFU	FWHM
5	76	102.16	102.84	0.126	2.516	1.06%	35751	102.40	4.876	0.32
6	90	104.96	105.52	0.151	2.544	1.26%	42204	105.20	5.996	0.28
7	110	108.84	109.52	0.179	2.466	1.59%	53584	109.12	6.776	0.32
8	123	111.52	112.24	0.200	2.462	1.89%	63509	111.80	7.870	0.32
9	147	116.40	117.20	0.480	4.947	4.73%	159044	116.72	17.552	0.36
10	160	118.40	119.96	0.522	4.941	5.28%	177477	119.32	10.584	0.72
11	180	122.48	123.28	0.290	2.441	2.93%	98364	122.80	10.312	0.40
12	190	124.60	125.48	0.311	2.481	3.19%	107352	124.96	10.728	0.40
13	201	126.80	127.64	0.327	2.465	3.54%	119060	127.16	11.676	0.44

Deleting and merging peaks within a table

Adding peaks

Press and hold the peak that requires modification for approximately 0.5 seconds, then select “Add Peak.” Next, choose the appropriate start point and end point. Click “Add Peak” at the top of the screen to complete the process. The table below the corresponding peak chromatogram will automatically display the information for the newly added peak.



Adding Peaks

Deleting peaks

Press and hold any position on the peak chart for 0.5 seconds and select “Delete All Peaks.” This action will delete all peaks except the Alignment Marker. The corresponding data in the table below the peak chart will also be deleted.



Deleting all peaks

Assigning the marker to data

To assign a marker:

1. Select the desired peak and set it as the Upper Marker or Lower Marker.
2. Verify that both markers are positioned correctly before analysis.
3. Proper marker placement is essential for accurate calculations of fragment size, concentration, and other related results.

Calculator

After changing the calculation parameters, the software will automatically generate the baseline and identify peaks according to the data. If the results are not satisfactory, further adjust the parameters to optimize peak detection and obtain more accurate results.



Setting calculation parameters

S/N (Signal-to-Noise Ratio):
Affects peak identification. A higher parameter value results in fewer identified peaks and reduces the detection of invalid impurity peaks. A lower parameter value increases the number of identified peaks but may also increase the detection of invalid impurity peaks.

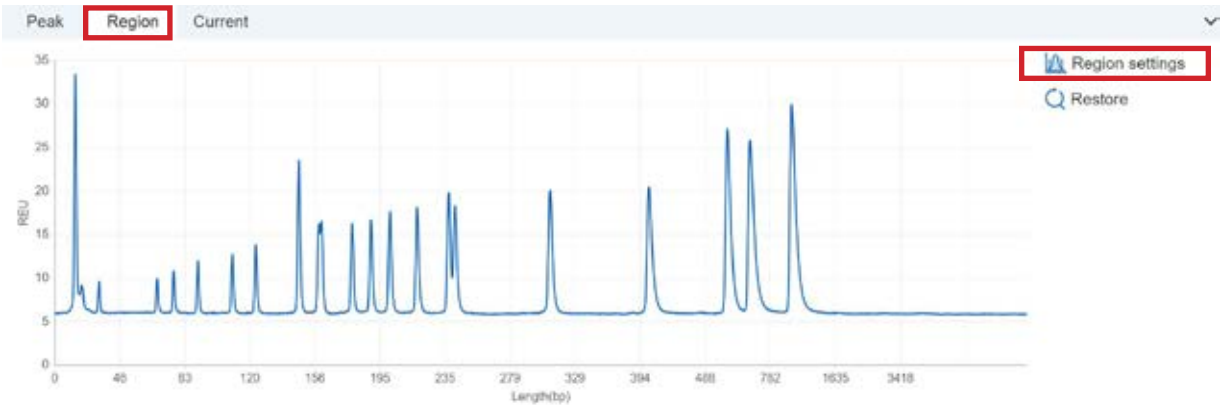
Baseline:
Affects the smoothness of the baseline. A higher parameter value produces a smoother baseline, while a lower value results in a more detailed but less smooth baseline.

Threshold:
Affects peak discrimination. A higher parameter value increases the minimum peak height required for a peak to be identified as valid. A lower parameter value decreases the minimum peak height requirement, allowing smaller peaks to be detected.

Peak Optimization:
Affects the number of peaks displayed. A higher parameter value reduces the number of displayed peaks by merging or filtering minor peaks. A lower parameter value increases the number of displayed peaks, resulting in a denser peak profile.

5.5.6.5 Navigating the peak chart

In this mode, you can define a region of interest (ROI) in which the software automatically calculates the average fragment size, concentration, molar concentration, percentage, and peak area for all fragments within the selected region. The user can assign a custom description or label to the selected region for identification and reporting purposes.



Region Setting

Region Settings:

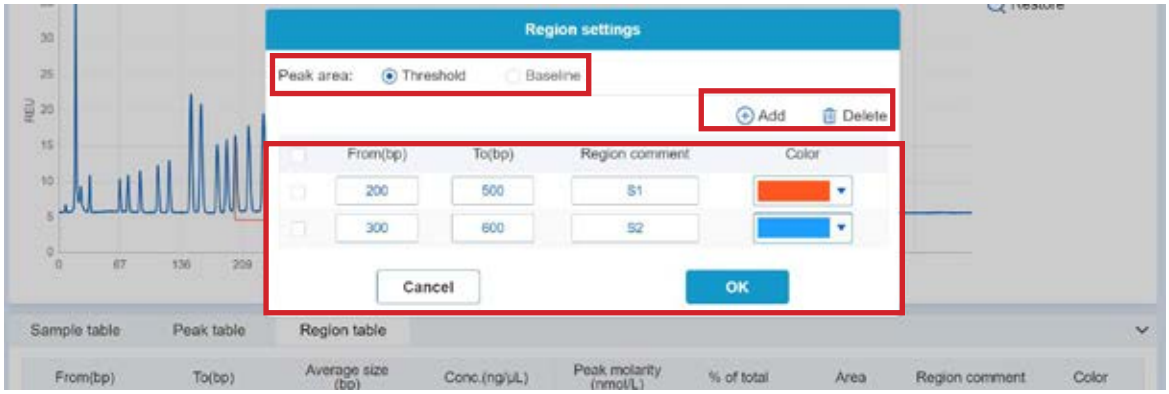
1. Click “Region Settings”.
2. Select the desired area calculation method: Baseline or Threshold.
3. Click “Add”, then:

    - Enter the desired region range and region description
    - Select a color for the region.
    - Click “OK” to add the region.

4. To delete a region:

    - Select the checkbox next to the desired region.
    - Click “Delete”.
    - Click “OK” to confirm the deletion.

Note: Once a region is defined, the software can automatically calculate the average fragment size, concentration, molar concentration, percentage, and area for all peaks within that region.



Region Settings



Example of regional setting result

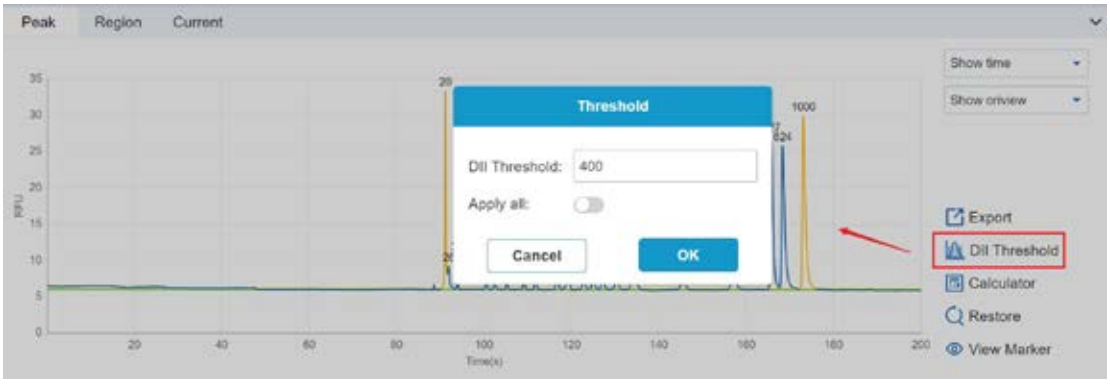
5.5.6.6 DII Threshold

The DII (DNA Integrity Indicator) is used to evaluate the quality of DNA samples. Users can define a fragment size threshold, either individually for each sample or uniformly for all samples within a results file. The software automatically calculates the proportion of DNA fragments that exceed the specified threshold.

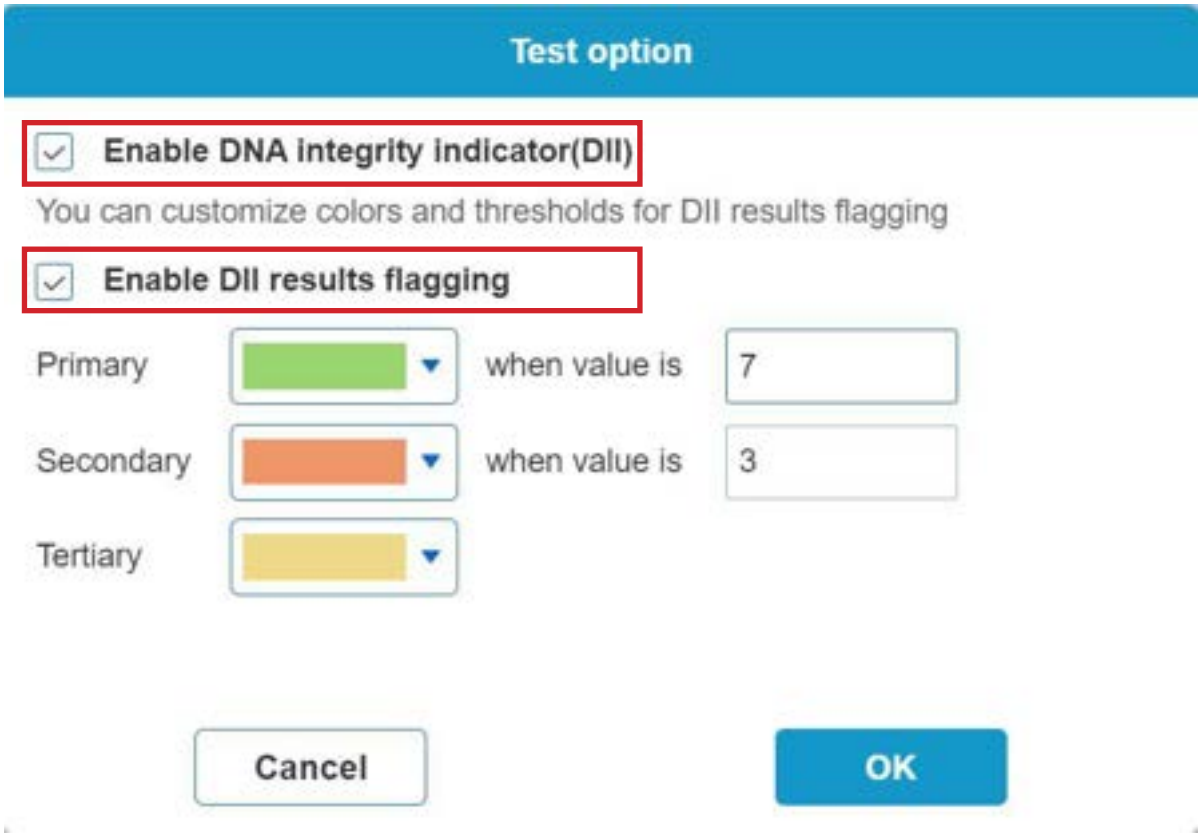
The DII value ranges from 0 to 10, with higher values indicating better DNA sample quality and integrity.

DII Threshold Setting

1. Click "DII Threshold" in Peak Mode.
2. Set the required fragment size threshold for each sample, and choose whether to apply the same threshold to all samples.



In the upper-right corner of the results interface, you can choose whether to display the DII value and configure the label colors for different DII value ranges.

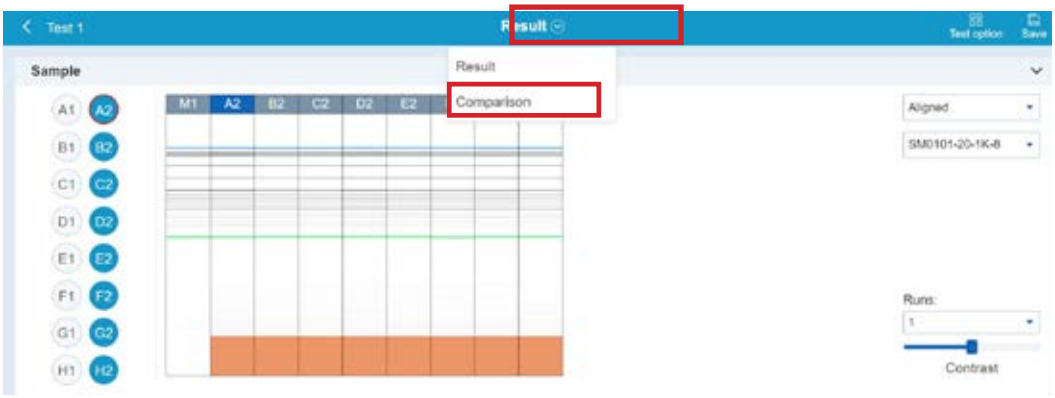


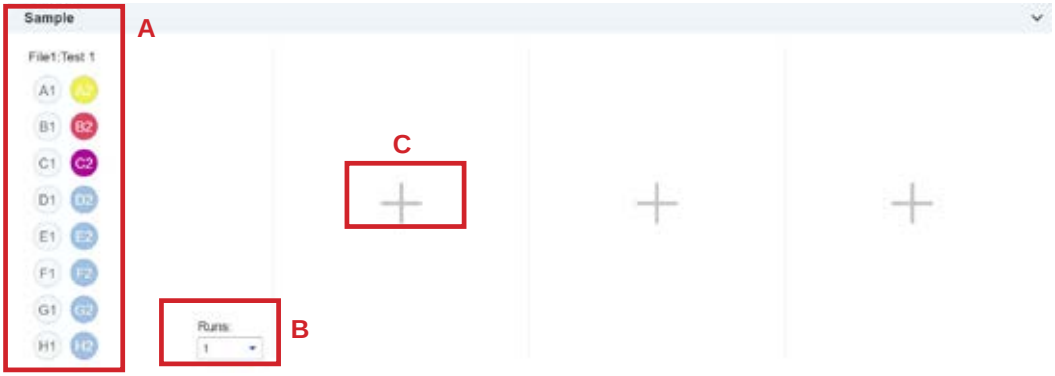
5.5.7 Comparison function

Users can use the comparison function to compare different well positions within the same file, different runs of the same file, or results between different files. This allows visual comparison of gel images or peak graphs.

Add Comparison File

1. Click the drop-down arrow next to “Result” at the top of the result file, then select “Comparison” to enter the comparison interface.
2. If additional files are required for comparison, click “+” to add them.
3. Select the desired experiments and samples, including the relevant run data for com comparison.





Comparison selection

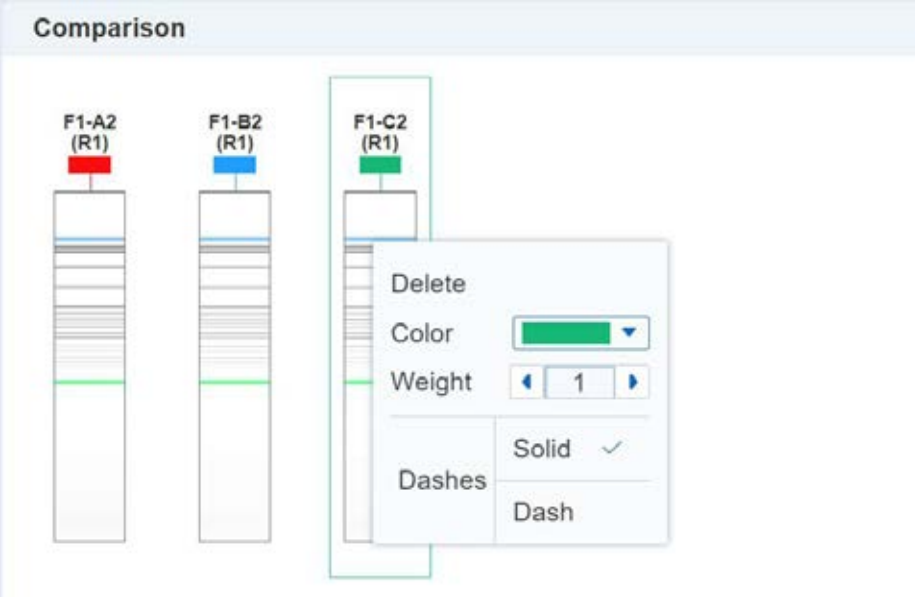
A. Well Selection Comparison
   Compare samples from different wells within the same run.
B. Run-to-Run Comparison
   Compare samples from different runs.
C. File Comparison
   Import and compare samples from different result files.

After the desired samples have been added, the corresponding gel image and electropherogram (peak plot) will be displayed in the lower section of the screen.

Users can select a sample in the gel image and perform the following actions:

1. Modify the peak plot color
2. Adjust line weight (thickness)
3. Change line style (solid or dashed)
4. Delete the selected sample from the comparison

These functions allow for easy visualization and comparison of sample results.



Sample comparison output

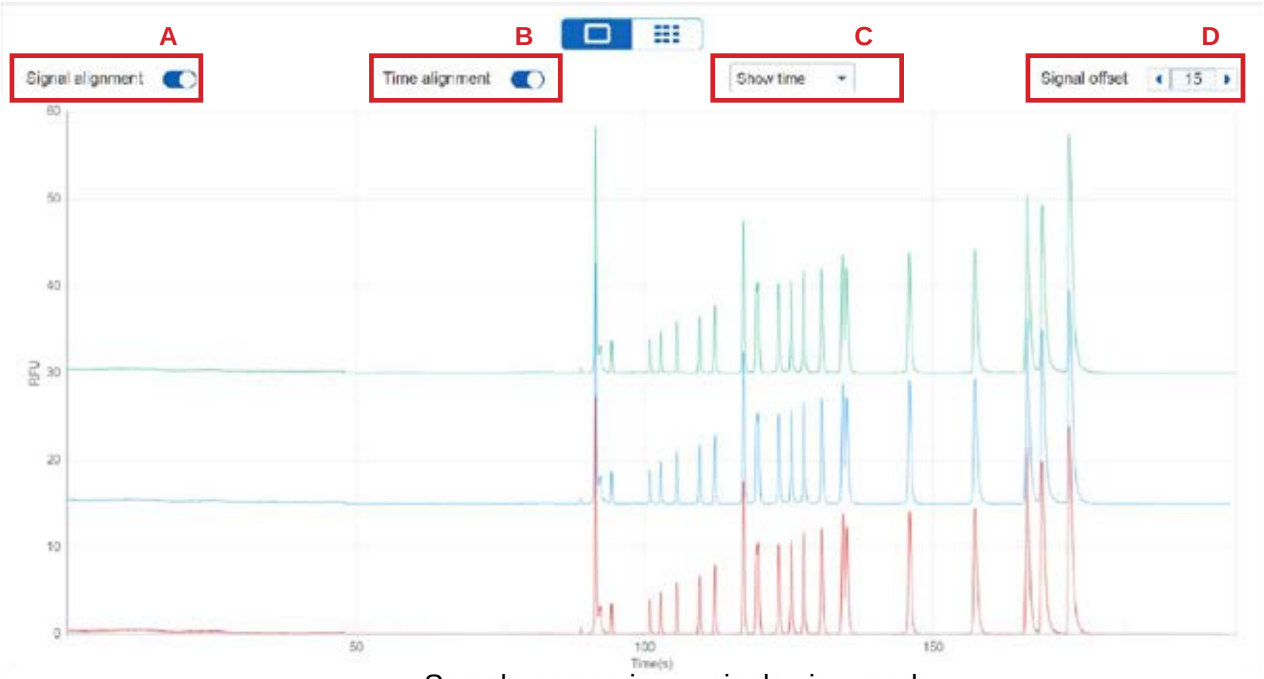
Single-View Mode

In Single-View Mode, clicking a peak trace in the peak diagram panel displays the corresponding electropherogram.

The following functions are available:

1. Switch the x-axis display unit between Time and Base Pairs (bp).
2. Align peak diagrams by signal intensity or migration time for easier comparison.
3. Offset individual peak diagrams vertically to separate overlapping traces and improve visualization.
4. View and analyze the corresponding peaks associated with the selected sample.

These tools allow users to compare and evaluate sample results more effectively.



Sample comparison - single view mode

A. Signal Alignment
Aligns the signal intensity of all selected samples to the same baseline level for easier comparison.

B. Time Alignment
Aligns sample electropherograms based on the selected alignment marker, allowing direct comparison of peak positions.

C. X-Axis Unit Selection
Switches the x-axis display between Time and Base Pairs (bp).

D. Signal Offset
Applies a vertical offset between samples to separate overlapping peak traces and improve visualization.

Multi-View Mode

In Multi-View Mode, the peak diagram for each sample is displayed individually. Users can review each electropherogram independently and change the x-axis display unit between Time and Base Pairs (bp) as needed.



Multi-view mode

5.5.8 File export

Users can export data in one of the following formats:

Original Data
The raw data acquired directly from the instrument and received by the software.

Report
A report containing the processed data, analysis results, and calculations generated by the software.

Result
A result file that can be imported into compatible instruments or software for further analysis.

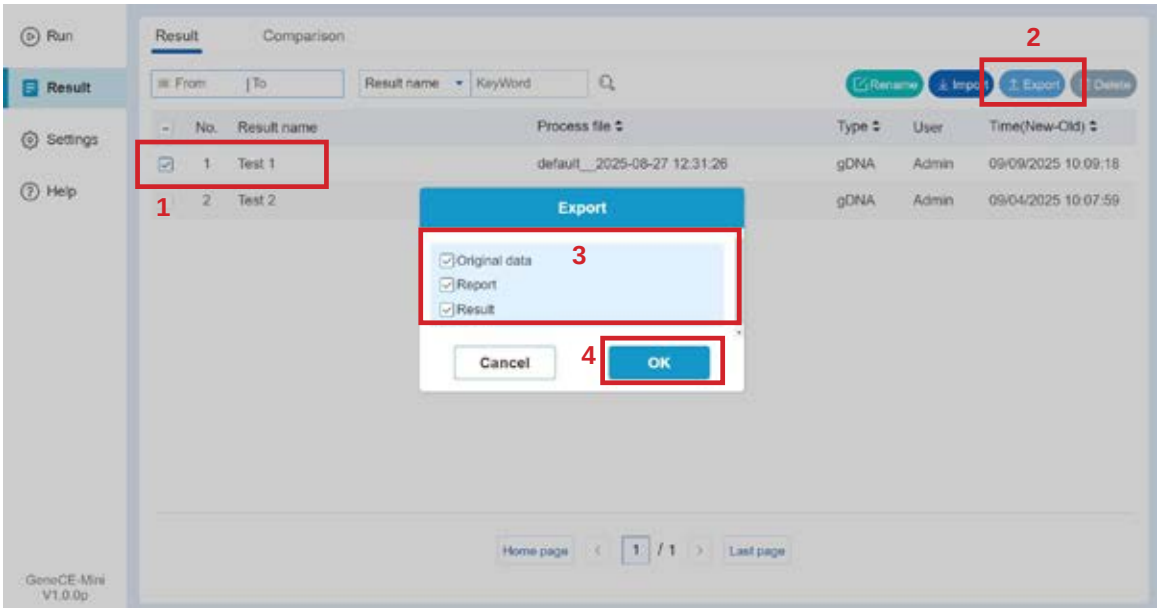
Export File Location

When exporting files with a USB storage device connected, the software automatically creates a folder named “GenoSep” on the USB drive and saves all exported files in that folder.

If no USB storage device is connected, the software automatically creates a “GenoSep” folder on the computer desktop and saves the exported files there.

Exporting result files:

1. Select the result file to be exported.
2. Click Export.
3. Select the desired file type.
4. Click OK to save the file.



Exporting files

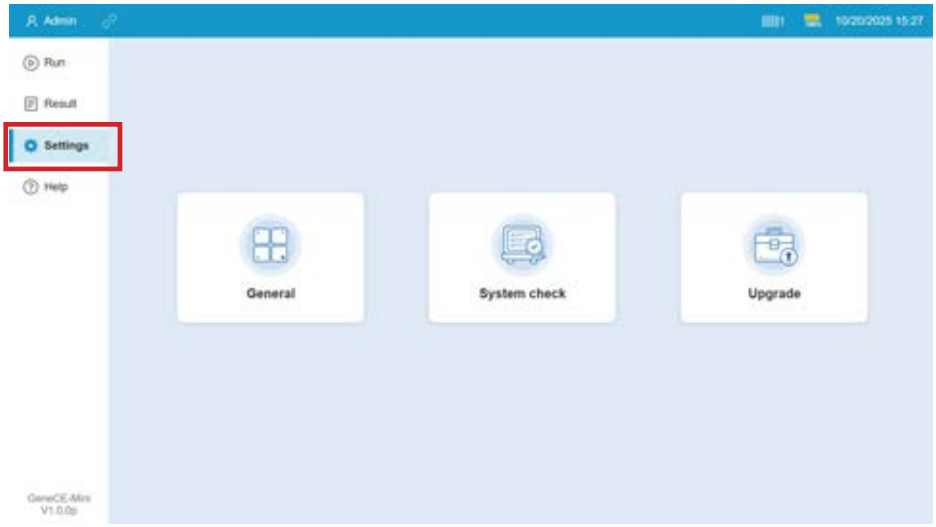
5.5.9 Settings

The Instrument Setup menu includes the following functions:

General – Configure basic instrument and software settings.

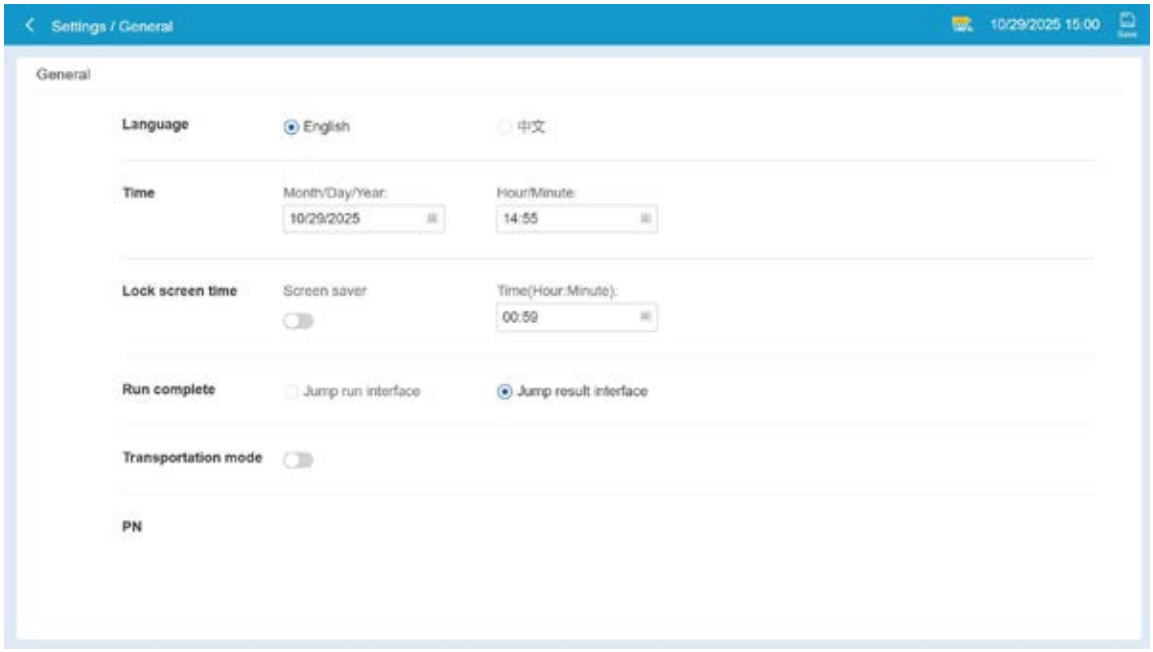
System Check – Perform diagnostic checks to verify instrument status and proper operation.

Upgrade – Update the instrument software or firmware to the latest version.



Instrument Settings

5.5.9.1 General Settings



Instrument Settings

Language
Select the software display language. Available options are English and Chinese.

Time
If the system time is incorrect, such as when the computer is not connected to the Internet, the date and time can be adjusted manually.

Lock Screen Time
Select the desired lock screen timeout period. When the screen locks, the software interface is hidden and the computer may enter sleep mode. If an instrument run is in progress, the operation will continue uninterrupted and communication between the software and instrument will be maintained until the run is complete.

Transportation Mode
After installation, confirm that all shipping restraints and positioning components have been removed, then disable Transportation Mode. Before transporting the instrument, reinstall the positioning components and enable Transportation Mode to protect the instrument during shipment.

PN (Product Number)
The PN is the unique identification code assigned to the instrument. This value is factory-set and cannot be modified by the user.

5.5.9.2 System Check

The System Check menu provides diagnostic tools to verify proper instrument operation. The available tests include:

HV Function Test – Verifies stable operation of the high-voltage system.
Capillary Clog Test – Checks for blockages or restrictions in the capillary.
Air Pressure Test – Verifies proper operation of the pneumatic system.
Movement Function Test – Confirms correct movement of the instrument's mechanical components.
HV Power Supply Verification – Validates the performance of the high-voltage power supply.

HV function

When a new cartridge is installed, an HV (High Voltage) Function Test should be performed to verify that the cartridge operates stably under high-voltage conditions. The instrument will automatically evaluate the test results and indicate whether the test has passed or failed. If the test fails, repeat the test. If the test fails three consecutive times, the instrument will perform an Air Pressure Test to determine whether the air circuit system is functioning properly.

Test Procedure:

1. Ensure the cartridge is properly installed and latched.
2. Verify that the park tank is filled with the appropriate buffer solution.
3. Close the instrument door.
4. Click **Check** to start the Test.

Wait for the system to complete the test and display the result.



High voltage testing

Capillary Clog Test

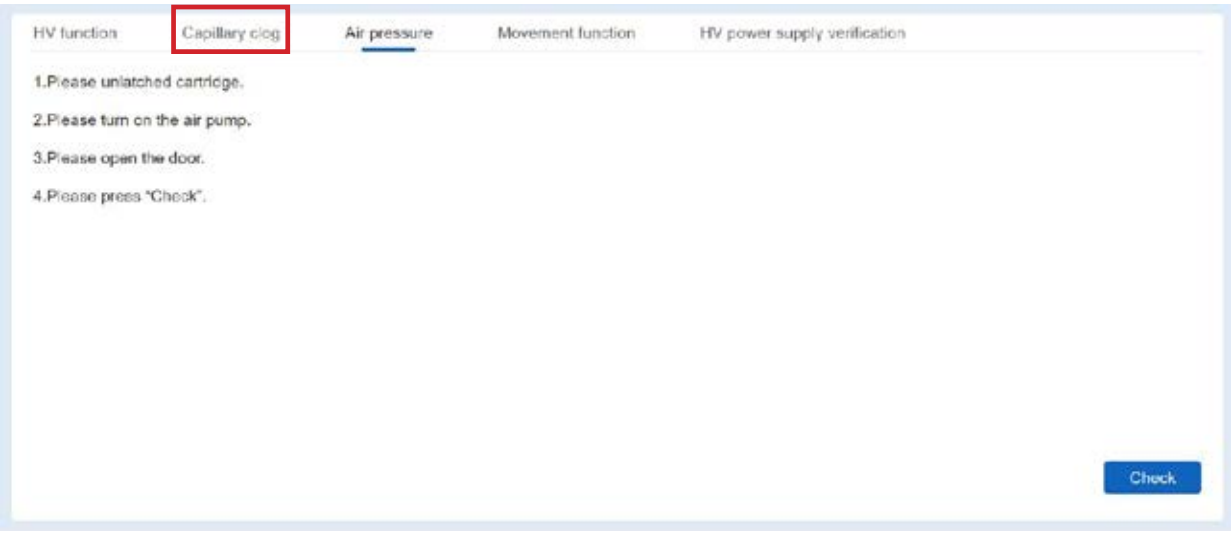
The Capillary Clog Test applies air pressure to the cartridge without applying high voltage. This pressure forces electrophoresis gel through the capillary, allowing the user to verify that the capillary is unobstructed.

During the test, observe the outlet end of the capillary. The appearance of a gel droplet indicates that the capillary is open and functioning properly.

If the electrophoresis current is unstable during operation, this test can be used to determine whether the capillary is partially or completely blocked.

Test Procedure

1. Ensure the cartridge is properly installed and latched.
2. Turn on the air pump power.
3. Open the instrument door.
4. Click Check to start the Capillary Clog Test.
5. Observe the capillary outlet for the presence of a gel droplet.



Capillary clog test

Air pressure test

The Air Pressure Test verifies the proper operation of the instrument's pneumatic system.

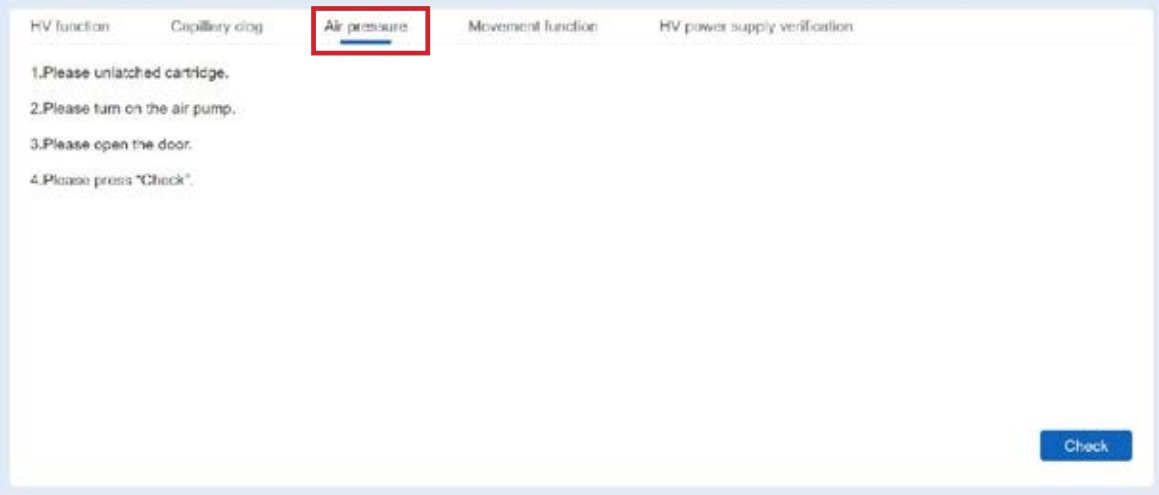
During the test, air is passed through the pneumatic circuit. A noticeable "hissing" or airflow sound indicates that the system is functioning normally. If no airflow sound is heard, the pneumatic circuit may be blocked or one of the pneumatic components may be malfunctioning.

If no airflow is detected, repeat the test 2–3 times to clear any trapped air within the system. If airflow is still not present after multiple test cycles, contact an authorized service technician for further inspection and repair.

Test Procedure

1. Ensure the cartridge is unlatched.
2. Turn on the air pump power.
3. Open the instrument door.
4. Click Check to start the Air Pressure Test.

Listen for the airflow sound and verify proper pneumatic operation.



Air pressure test

Movement Function Test

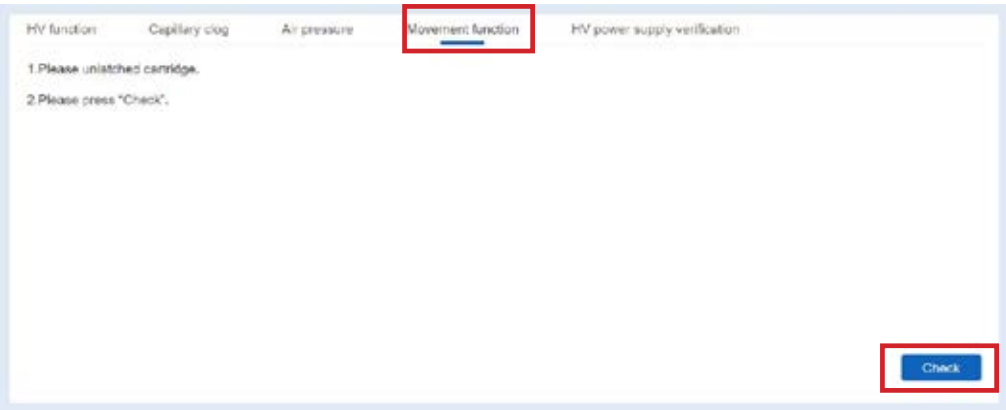
The Movement Function Test is used to verify that all mechanical moving components of the instrument are operating correctly.

Before performing the test, ensure that the cartridge is disconnected to prevent interference or damage.

If the test result indicates an abnormal condition, discontinue use and contact an authorized service engineer for further inspection.

Test Procedure

1. Ensure the cartridge is unlatched and removed.
2. Close the instrument door.
3. Click Check to start the Movement Function Test.



Movement function test

HV Power Supply Verification

The High-Voltage Power Supply Verification function is used to assess the stability and accuracy of the instrument's high-voltage output.

Before testing, ensure that the verification device is correctly inserted into the card slot alignment mechanism and properly connected to the high-voltage resistance meter.

If any abnormal conditions are detected during the test, discontinue use immediately and contact an authorized after-sales service engineer.

Test Procedure
Insert the HV power supply verification device into the designated slot.
Click Run to start the test.
To verify additional voltage levels, click Stop, then repeat steps 1 and 2 as required.

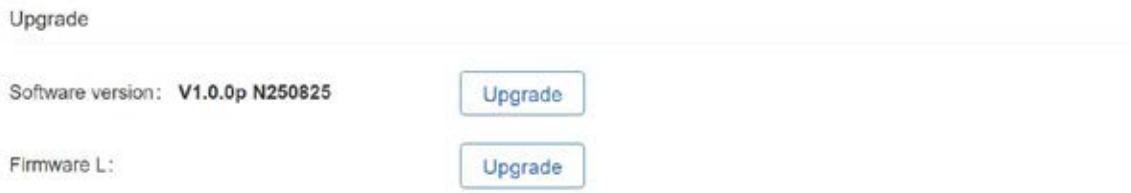


HV power supply verification

5.5.9.3 Upgrade

Software and Firmware Upgrade

Insert the USB drive containing the upgrade file into the instrument, then click the Upgrade button. The system will automatically begin the software and firmware upgrade process.

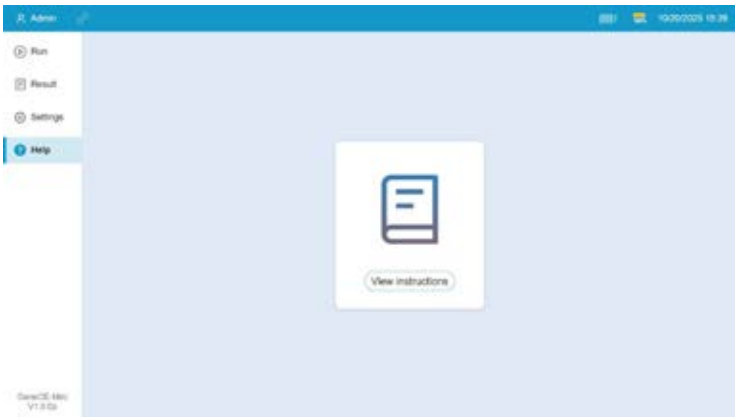


Instrument Settings

5.5.9.4 Help

Click “View Instructions” to access the relevant operation guidance and troubleshooting information for resolving related issues.

If the problem persists after following the instructions, please contact our after-sales service personnel for further assistance.



Chapter 6: Preventative maintenance

6.1 Precautions for Storage and Operation

- The instrument should be stored in a dry environment to prevent moisture and corrosion, and kept away from strong electromagnetic interference sources.
- The instrument is precisely calibrated before leaving the factory. Users must not disassemble or adjust the instrument. If any abnormal operation or malfunction occurs, contact the manufacturer or authorized service personnel immediately.
- Avoid frequently switching the power supply on and off in a short period of time.
- Ensure the power supply voltage is within the specified rated range before operation.

Content	Daily	Weekly	Annually	As required
Ensure that the instrument is properly closed				✓
Keep the instrument free of dust.	✓			
Immediately wipe off any salt solution, solvents, acids, or alkaline solutions spilled on the instrument surface to prevent damage. Clean the affected area using deionized or distilled water.	✓			
If any surface has been contaminated by a biological hazard, disinfect it using a mild disinfectant.	✓			
Clean the instrument housing regularly.		✓		
Clean the shelf if necessary.		✓		
Disinfect the instrument before relocation or when sending it for repair.			✓	
Preventative maintenance				✓

6.2 Air pump filter drainage

Condensation may accumulate inside the portable air pump during operation. Perform regular weekly maintenance checks to ensure that the air tubing assembly is free of moisture before each use.

For continuous operation, inspect the air pump and related air line components every 12 hours to prevent potential damage caused by condensation buildup.



Note

1. Unscrew the drain valve clockwise to release accumulated water vapor.
2. Apply pressure to the air filter during drainage; without applied pressure, proper drainage will not occur.
3. After drainage is complete, rotate the valve counterclockwise to close it securely.

Chapter 7: Troubleshooting

7.1 Instrument troubleshooting

1. Instrument cannot be powered on:
   Check that the power cable is properly connected.

2. Instrument cannot connect to software:
   Restart both the instrument and the software. If the issue persists, contact a service engineer.

3. Software cannot start:
   Use Task Manager to end the application or restart the computer, then relaunch the software. If the problem continues, contact a service engineer.

4. Frequent air pump noise during high-voltage injection (>2 times/min):
   Check whether the cartridge is properly inserted and reinstall if necessary.
   Verify that the air circuit is correctly connected and confirm the air pump indicator is functioning normally. If the issue persists, contact a service engineer.

5. Electrophoretic gel microleakage:
   Click “Replace Cartridge” to enable safe cartridge removal. Disconnect power to the instrument. Wear double-layer gloves (PE gloves + rubber gloves), remove the cartridge, and wipe any leakage using clean tissue. Dispose of used materials and gloves in a sealed waste bag. Ensure proper laboratory ventilation before resuming operation. In emergency situations, immediately disconnect the instrument form power.

7.2 Cartridge troubleshooting

1. Expired cartridge with remaining usage cycles:
   The cartridge may still be used; however, results may be affected. It is recommended to use the cartridge within its valid period.

2. Cartridge not detected:
   Reinsert the cartridge. If it is still not recognized, contact a service engineer.

3. Improper or overused separation buffer:
   Using an incorrect buffer, excessive buffer usage cycles, or prolonged buffer use may cause unstable ent and inaccurate results.

4. Capillary blockage:
   Refer to Section 5.5.9.2 and run the Capillary Test program. If blockage persists, immerse electrode 2 of the cartridge in hot water for 30 minutes, then repeat the Capillary Test until a droplet appears at the capillary outlet.

7.3 Software troubleshooting

Current Instability and Peak Identification Issues

1. Unstable injection current:
   Check whether the capillary is blocked. If the issue persists, contact a service engineer.
2. Unstable Marker and sample injection current:
   Ensure the reagent volume is sufficient (≥20 μL). Confirm that Marker and sample are placed in the correct positions. Verify that samples are diluted using the correct buffer.
3. Unstable separation current:
   Check for capillary blockage. Confirm correct buffer usage for sample dilution. Run the high-pressure injection program 3–5 times. If the issue remains unresolved, contact a service engineer.
4. Marker peak not identified or incorrectly identified:
   Ensure an adequate volume of alignment marker is loaded in the correct position. Manually adjust the upper and lower limits of the alignment marker according to Section 5.5.6.5.

Chapter 7: Abbreviations

8.1 Abbreviations

The following abbreviations are provided for reference only and may appear throughout the instruction manual.

A	Ampere
AC	Alternating Current
V	Volt
Hz	Hertz
W	Watt (tile)
USB	Universal Serial Bus
Kg	Kilogram
mm	Millimeter
µL	Microleter
ºC	Degree Celsius

8.2 Warning icons

The following warning icons appear on the instrument

	Warning label
	High Voltage
	Biological contamination