

Max Series Blot Transfer Systems

User Manual



Max8

M8101



Max4

M4101



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YamayBio instruments are designed for safe, reliable, and convenient operation. However, improper use or mishandling may cause instrument damage or pose a risk to user safety.

The instrument must be used in accordance with this manual and established laboratory safety procedures. If any problems or questions arise, contact YamayBio for assistance.

Important:



The following section contains critical safety information and must be read and understood before operating the instrument.

General Safety

This instrument complies with applicable laboratory safety standards. However, the use of chemicals and biological materials presents additional hazards. Always follow Good Laboratory Practice and perform appropriate risk assessment before use.

Electrical and Environmental Safety



Do not operate the instrument near strong electromagnetic radiation sources. Avoid placing the instrument near devices that generate electrical interference. Ensure the instrument is properly grounded before use. Disconnect the instrument from the power supply before performing maintenance.

Biological Safety



Follow Good Laboratory Practice when handling biological samples. Perform a risk assessment for all sample types. Use appropriate containment and disposal procedures.



Chemical Safety

Be aware of the hazards associated with all reagents and chemicals used. Always consult Safety Data Sheets (SDS). Use appropriate personal protective equipment (PPE).



Operational Safety

Do not operate the instrument in the presence of flammable materials. Do not remove protective covers unless instructed by YamayBio or authorized service personnel. Hazardous voltages may be present inside the instrument.



General Precautions

Ensure proper grounding of the instrument.
Use only manufacturer-approved accessories.
Disconnect the instrument from the power supply before servicing.
Wear appropriate PPE when required.



Environmental and Operational Conditions

Install and operate the instrument in a clean, dry environment free from excessive moisture. Avoid spilling liquids or reagents near the instrument to prevent damage and ensure proper performance.



Inspection and Maintenance

After each use, clean and inspect the instrument and all accessories for signs of damage or wear. If damage is detected, discontinue use and contact YamayBio Technical Support.



Thermal Warning

Under normal operating conditions, components of the instrument may become warm. Avoid touching internal components immediately after use.

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Chapter 1 Introduction

This manual provides information on the system structure, installation, operation, maintenance, and technical support for the Max Series Blot Transfer Systems.

This chapter provides an overview of the system, including its components and specifications.

1.1 Operating Principle

Protein transfer is a critical step in the Western blot workflow. After proteins are separated by electrophoresis in a polyacrylamide gel, the gel is placed in contact with a transfer membrane such as a PVDF or nitrocellulose membrane. The gel-membrane assembly is immersed in transfer buffer and subjected to an electric field.

Under the electric field:

- Proteins migrate toward the positive electrode
- Proteins are transferred from the gel onto the membrane

For proper transfer:

- The membrane must be positioned on the positive electrode side
- The gel must be positioned on the negative electrode side

The purpose of this step is to transfer proteins from the gel onto a membrane for subsequent antibody detection.

1.2 Product Overview

The Max Series Blot Transfer Systems are designed for rapid protein transfer from polyacrylamide gels during Western blot experiments. The system enables efficient wet transfer of electrophoretically separated proteins from mini- or midi-sized polyacrylamide gels onto PVDF or nitrocellulose membranes, with standard transfer times of 10–20 minutes.

The Max8 system consists of the main instrument, four transfer cassettes, and three buffer containers. The Max4 system consists of the

main instrument, two transfer cassettes, and three buffer containers. These instruments are intended for laboratory use only.

Table 1-1 Product Information

Item	Description
Name	Max Series Blot Transfer Systems
Models	Max8 and Max4
System Components	The system consists of the main unit, transfer cassettes, and buffer containers. The main unit includes a transfer module, a frame assembly, a front panel assembly, and an outer enclosure.
Intended Use	Rapid transfer of proteins from polyacrylamide gels to transfer membranes
Intended Users	Laboratory personnel performing Western blot (immunoblot) experiments
Service Life	Estimated service life: 5 years (based on operation of 32 runs per station per day, 5 days per week)

1.3 About This Manual

This manual is supplied with the instrument. Before operating the instrument, carefully read and understand this manual to ensure proper use of the system and operator safety. Retain the manual for future reference.

Due to version differences, the figures, settings, and data shown in this manual may differ slightly from those displayed on the instrument. The symbols used on the instrument and its packaging are described below.

Note: The symbols shown are for reference only. Refer to the product packaging for the applicable symbols.

Table 1-2 Instrument and Packaging Symbols

Symbol	Meaning
AC	Indicates that the instrument operates on alternating current.
I	Indicates that the instrument is connected to the power supply.
O	Indicates that the instrument is disconnected from the power supply.
USB	Indicates a USB interface.
SN	Manufacturer’s serial number.

1.4 General Precautions

This section describes important precautions that must be followed during operation to ensure safe and effective use of the instrument. Failure to follow these instructions may lead to inaccurate experimental results, instrument damage, or personal injury.

- The instrument must only be operated by properly trained personnel.
- Install the instrument only under the specified environmental conditions.
- Do not open the instrument housing while the power is on. The housing may only be opened by authorized service personnel.
- If an instrument label becomes illegible or detached, contact YamayBio for replacement.

Data Storage Notice

The system stores data on an internal storage device. If the internal database is deleted or damaged, stored data may be lost.

Electromagnetic Compatibility (EMC) Statement

- The system uses radio-frequency (RF) energy to support specific functions. RF emissions are very low and are unlikely to cause interference with nearby electronic equipment.
- Portable and mobile RF communication equipment may affect the operation of this instrument. Any equipment used near the instrument should comply with applicable EMC requirements.
- This instrument is intended for use in non-residential environments and facilities not directly connected to the public low-voltage power supply network serving residential buildings.
- The power-frequency magnetic field at the intended installation site should be evaluated to ensure it is sufficiently low. Keep the instrument away from sources of strong magnetic fields. If necessary, magnetic shielding should be installed to ensure proper operation.

1.5 System Components

This section describes the overall instrument structure and key components. The Max Series Blot Transfer Systems consist of the following components: main unit, transfer cassettes, and buffer containers.

The main unit includes a transfer module, a frame assembly, a front panel assembly, and an outer enclosure.

- **Transfer Module:** The transfer module consists of the transfer cassette chamber, interface board, transfer module control board, and tubing assembly. The transfer module provides the electrical and fluidic control required for protein transfer.
- **Frame Assembly:** The frame assembly integrates key internal components of the instrument, including the power supply, controller board, and fluidic system. It also provides structural support and mounting interfaces for the front panel assembly, transfer modules, and outer enclosure.

- **Front Panel Assembly:** The front panel assembly includes the integrated touchscreen controller, status indicator lights, speaker, and front panel structure.
- **Outer Enclosure:** The outer enclosure consists of the side panels and rear panel. Together with the front panel assembly, it forms the complete protective housing for the instrument.

The Max8 system includes four transfer cassettes, while the Max4 system includes two transfer cassettes.

- **Transfer Cassette:** The transfer cassette consists of a positive electrode section and a negative electrode section. It holds the gel, transfer membrane, and support sponges during protein transfer. Side latches secure the cassette by locking the positive and negative sections together. The transfer cassette is inserted into an instrument station and connected to the transfer module. Its function is to provide a sealed transfer chamber in which proteins are transferred under controlled electrical and fluidic conditions.

Both the Max8 and Max4 systems include three buffer containers, one for transfer buffer, one for wash buffer, and one for waste.

Front View

The front of the instrument includes the following components:

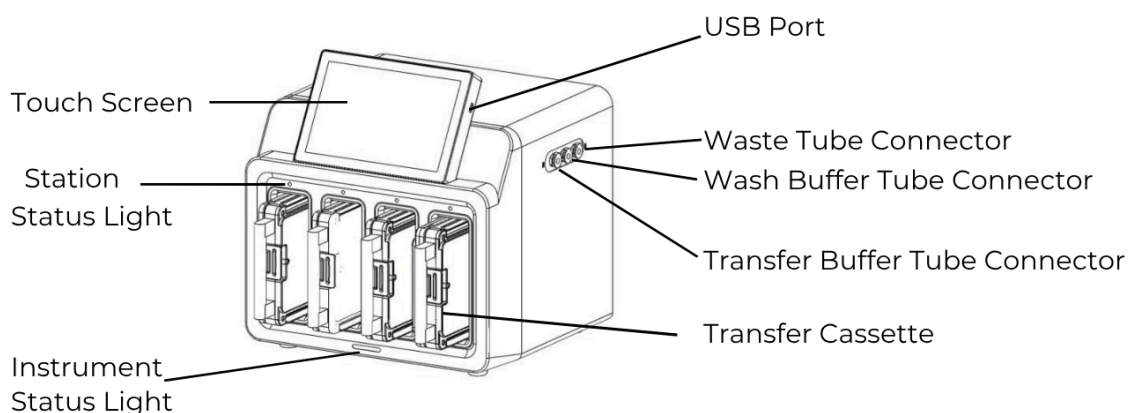


Figure 1-1 Front View of the Max8 Blot Transfer System

Rear View

The rear of the instrument includes the following components:

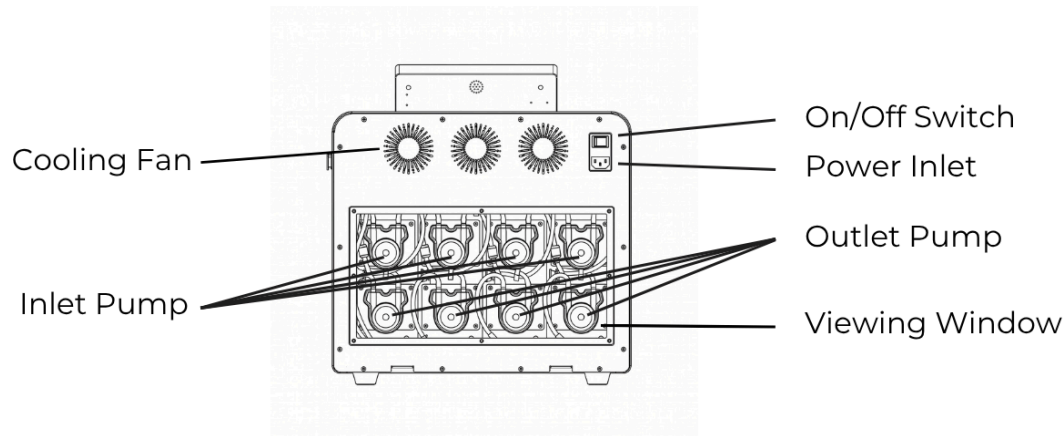


Figure 1-2 Rear View of the Max8 Blot Transfer System

Transfer Cassettes

The transfer cassettes include the following components:

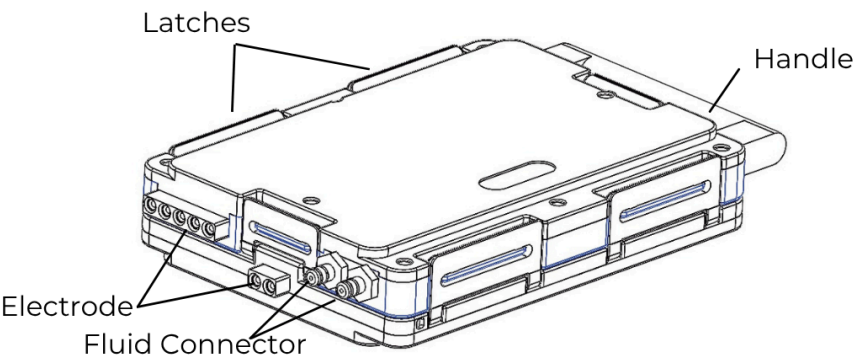


Figure 1-3 Overall View of the Transfer Cassette

1.6 Instrument Specifications

Table 1-3 Performance Specifications

Parameter	Specification
Maximum Voltage	70 V

Voltage Control Accuracy	±0.2 V
Maximum Current	3 A
Current Control Accuracy	±0.1 A
Maximum Power	150 W
Maximum Reagent Flow Rate	150 mL/min
Method Storage Capacity	≤ 1,000
Experiment Record Storage Capacity	≤ 50,000

Table 1-4 System Configuration

Feature	Max8	Max4
Application	Rapid transfer of proteins from polyacrylamide gels	
Throughput	Four stations, supporting up to 8 Mini gels or 4 Midi gels simultaneously	Two stations, supporting up to 4 Mini gels or 2 Midi gels simultaneously
Display	10-inch integrated touchscreen	7-inch integrated touchscreen
External Interface	1 × USB 2.0	
Status Indicators	Three-color system status light and station indicator lights	
Audible Alerts	Voice, Chime, Mute	
Operating System	Android 10	
Dimensions (W×D×H)	400 × 355 × 440 mm (15.7 × 14.0 × 17.3 in)	270 × 355 × 395 mm (10.6 × 14.0 × 15.6 in)
Weight	27 kg (59.5 lbs)	17 kg (37.5 lbs)

Chapter 2 Installation

This chapter describes the installation requirements and procedures for the Max Series Blot Transfer Systems, including installation conditions, handling instructions, and instrument connection. The instrument has been thoroughly tested prior to shipment. The system is carefully packaged to prevent damage during transportation. Upon receipt of the instrument, inspect the packaging carefully for any signs of physical damage. If damage is detected, immediately notify YamayBio.

Before installation, ensure that the required space, power supply, and environmental conditions described below are met.

2.1 Installation Requirements

Space Requirements

To ensure adequate space for maintenance, heat dissipation, and normal operation, the following installation conditions must be met:

- The bench surface must be level (inclination < 2%).
- Maintain a minimum clearance of 200 mm on the left, right, and rear sides of the instrument.
- Do not place the instrument where the power outlet is difficult to access.

Power Requirements

The instrument must be connected to a three-prong grounded power outlet that meets electrical safety standards. Improper grounding may result in safety hazards, instrument damage, or system malfunction.

The power supply must meet the following specifications:

Table 2-1 Power Requirements

Parameter	Specification
Input Voltage	100–240 V AC
Frequency	50/60 Hz
Input Power	1200 VA
Ground Resistance	< 100 mΩ
Fuse	F10L250V

Environmental Requirements

Install, operate, and store the Max Series Blot Transfer Systems only under the specified environmental conditions:

- For indoor use only
- Install in a dry, dust-free environment
- Avoid strong mechanical vibration and interference
- Ensure adequate ventilation
- Avoid direct sunlight
- Keep away from heat sources and strong airflow
- Do not block the fan exhaust outlet
- Keep away from equipment that emits strong electromagnetic radiation (such as radio transmitters)
- Avoid sharing a power circuit with large brush-type motors or frequently switching electrical devices to prevent voltage fluctuations
- Keep away from corrosive or flammable gases

Before operating the instrument, evaluate the electromagnetic environment of the laboratory and avoid strong electromagnetic interference.

Table 2-2 Environmental Specifications

Condition	Temperature	Humidity	Atmospheric Pressure
Operating	4–30 °C	20–85 %	80–106 kPa
Storage	–20–55 °C	20–85 %	50–106 kPa
Transportation	–20–55 °C	20–85 %	50–106 kPa

2.2 Handling and Transportation

When transporting the instrument, observe the following precautions:

- Follow the “Fragile,” “This Side Up,” “Keep Dry,” and “Do Not Tilt” labels on the packaging.
- Always keep the instrument upright during transport.
- Handle the instrument carefully to avoid shock, vibration, or impact.

2.3 Component Checklist

Ensure that all components are present and undamaged:

- Main unit
- Transfer cassettes (two for Max4, four for Max8)
- Three buffer containers
- Three buffer tubes
- Power cord

2.4 Instrument Connection

After unpacking all components, connect the instrument according to the following steps:

1. Remove the instrument from the packaging and position it according to the space and environmental requirements described in Section 2.1.
2. Confirm that the power switch is in the OFF position.
3. Connect the instrument to a power outlet.

4. Connect the transfer buffer tube, wash buffer tube, and waste tube to their respective ports.
5. Insert the transfer cassettes into the main unit.
6. Turn on the main power switch. The display will illuminate and the system will begin the startup sequence.



Figure 2-1 Max Series System

Instrument and Station Status Lights

The Instrument Status Light is located at the bottom of the main unit and lights up with the following statuses:

- During startup, the indicator light flashes yellow and then changes to solid green once startup is complete.
- When all transfer cassettes are inserted or all are removed, the indicator light is solid green.
- If some stations have no transfer cassette inserted, or a transfer is in progress, the indicator light is solid yellow.
- If there is a device error, the indicator light is red.
- If there is a warning or other notification, the indicator light flashes yellow.

The Station Status Lights are located above each transfer station, and light up with the following statuses:

- When the transfer cassette is inserted, the light is solid green.
- When the transfer cassette is not inserted, the light is off/gray.
- When a transfer run on the current station has finished, the light flashes green.

2.5 Instrument Settings

The **Settings** interface allows users to adjust various instrument parameters. The interface contains the following areas:

- The menu bar on the left side allows users to switch between the **Operation**, **Methods**, **Records**, and **Settings** screens.
- The settings list displays all settings that may be adjusted for the instrument. Standard users can access device information, maintenance information, logs, users, and system settings. Administrators can additionally access factory settings.

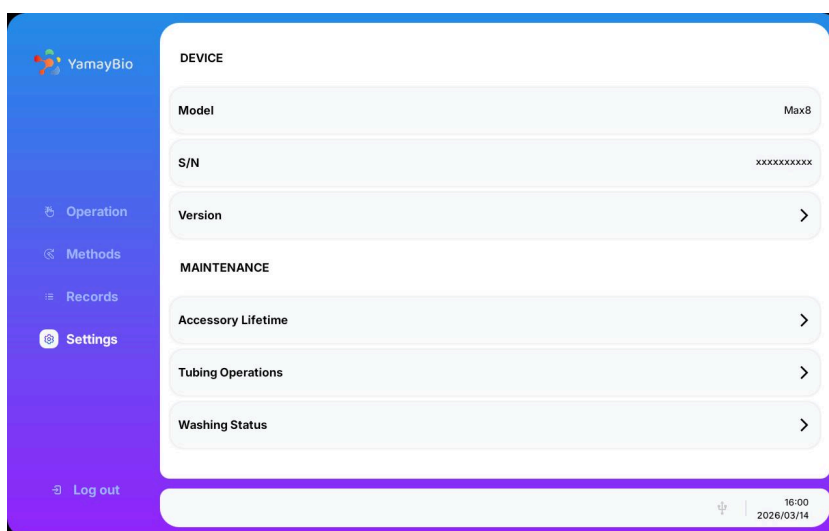


Figure 2-2 Settings Screen

Device Information

The settings interface displays the product model, serial number (SN), and version information. Version information includes the application software version, main control board version, and status board version. To upgrade the software, log in as an administrator and navigate to the Software Version page.

Maintenance

In the settings interface, the maintenance section allows standard users to view accessory lifetime, tubing operations, and washing status. Administrators can also access device settings. See Chapter 4 for more information.

Logs

The system provides two types of logs:

- Operation logs:
 - Standard user: Can view the log name and error time.
 - Administrator: Can view the log name and error time, with additional permissions to preview and export.
- Error logs: View the station ID, error code, type, and error time.

Users

The system allows different access levels depending on user type. On the user management page:

- Standard users can view the currently logged-in account name.
 - User: Can manage their own password.
 - Public: Cannot manage their password.
- Administrators can change passwords and manage users.
 - Administrators can add or delete users, reset standard user passwords, and enable or disable standard user login access.

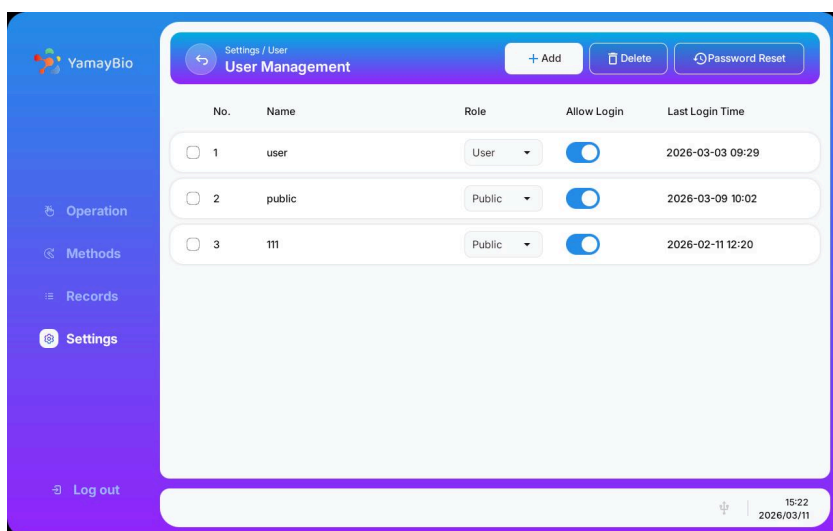


Figure 2-3 User Management

System Settings

Standard users can access the following settings:

- **Sound configuration:** Select between Voice, Chime, or Mute options.
- **System time:** Set the instrument date and time.

Administrators can additionally enable or disable the following features:

- **Navigation bar:** Controls access to the native Android navigation buttons. These buttons are disabled for standard users and are only required when accessing the Android operating system, such as during Final Quality Control (FQC) inspections.
- **Status bar:** Controls access to the native Android notification bar. The status bar is disabled for standard users and is intended for service or FQC procedures requiring access to the Android operating system.
- **Home screen:** When enabled, the instrument software launches automatically at startup and displays the login screen, preventing access to the Android desktop or other applications.

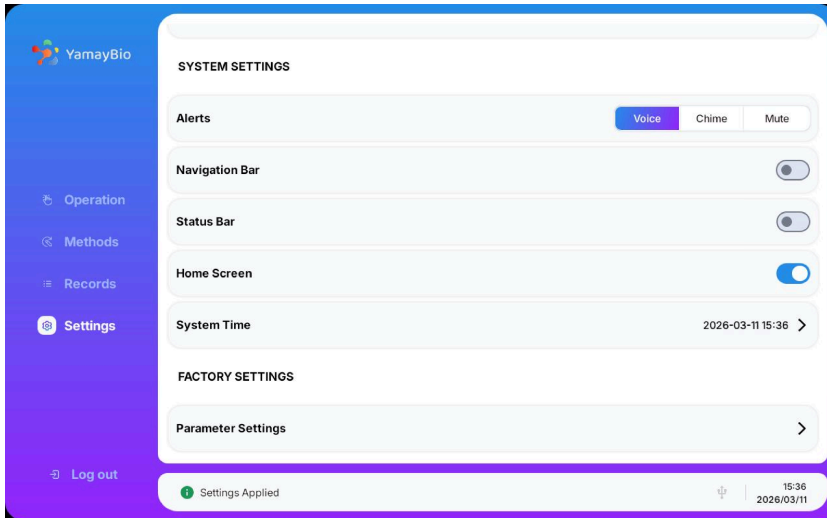


Figure 2-4 Administrator System Settings

Factory Settings

The Factory Settings page provides access to the following parameter settings:

- **Device parameters:** Administrators can disable individual stations and enable or disable the transfer cassette optical sensor detection.
- **Run parameters:** Allows modification of the operating parameters for the transfer and wash processes. These settings can be applied to all stations.
- **Pump parameters:** Provides access to pump controls, inlet and outlet pump calibration, and drain tubing settings.
- **Power parameters:** Displays real-time voltage, current, power, and temperature, along with hardware output controls.
- **Error parameters:** Configures how individual errors are recognized and processed. These settings can be applied to all stations.

Chapter 3 Daily Operation

This chapter describes the daily operating procedure of the Max Series Blot Transfer Systems, including startup, experimental operation, and system shutdown.

The standard daily workflow includes the following steps:

1. Instrument startup and user login
2. Method selection
3. Running a protein transfer experiment
4. Post-run procedure and system shutdown

3.1 Instrument Startup and Software Interface

Startup and User Login

To power on the instrument, turn on the main power switch at the rear panel. The instrument status light will illuminate and the system will begin the startup process. After startup, the system will automatically display the Home screen. Enter your username and password to log into the system.

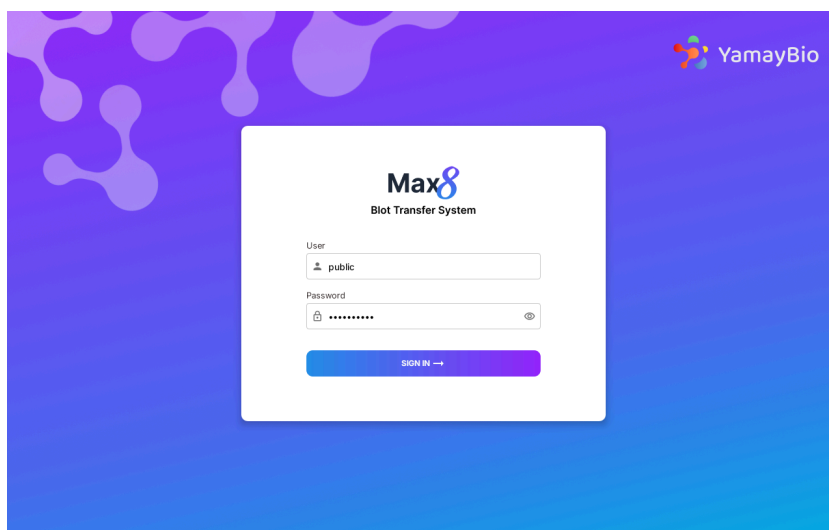


Figure 3-1 Home screen

After successful login, the main software interface is displayed. From this interface, users can run transfer experiments, access experiment methods, and view run history.

Operation Interface

From the **Operation** interface, users can start and monitor protein transfer experiments. The main sections of the interface are described below.

- The menu bar on the left side allows users to switch between the **Operation**, **Methods**, **Records**, and **Settings** screens. These can be accessed whether or not the system is running.
- Each transfer station has an independent operation panel on the screen (S1–S4 for Max8; S1–S2 for Max4). The station status in the status box at the top will display the current status of that transfer station.
 - **Not Inserted** indicates that the transfer cassette is not inserted or is not properly connected.
 - **Connected** indicates that the transfer cassette has been properly inserted and is ready for a transfer or wash cycle.
 - **Priming** indicates that the station is preparing for a transfer or wash step. The system automatically proceeds to the next step once priming is complete.
 - **Running** indicates that a transfer experiment is in progress. If necessary, tap the buttons at the bottom of the station panel to pause or stop the experiment.
 - **Washing** indicates that the station is performing a wash step.
 - **Draining** indicates that the wash step is complete, and the station is draining the tubing.
 - **Completed** indicates that the run is complete and the station has stopped.

- Each station panel displays the selected transfer method, voltage, and duration. Select a method from the drop-down menu to display the corresponding voltage and duration.
- The transfer parameters for a run will be displayed at the bottom of the operation panel during an experiment. Users can view the power, current, voltage, and temperature in real time.
- System notifications and warnings are displayed in the bottom panel of the Operation interface. The current date and time are also displayed in this panel.

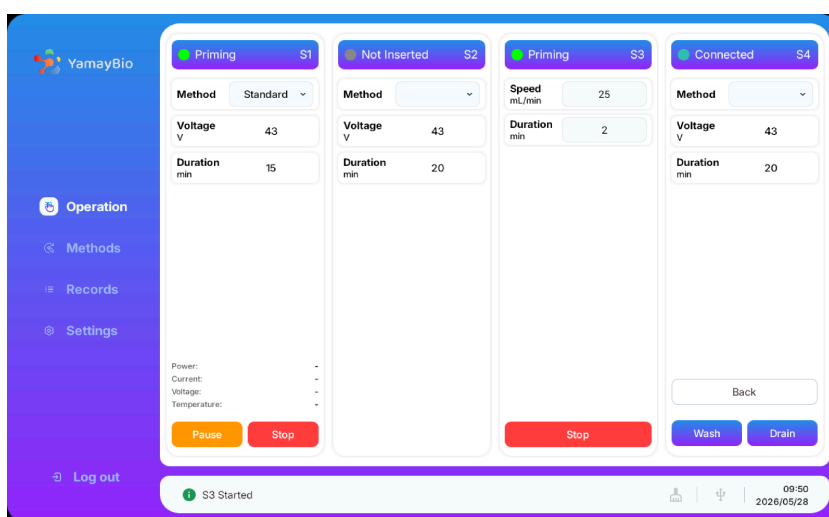


Figure 3-2 Operation Screen

3.2 Methods

The **Methods** interface allows users to view, create, edit, and delete transfer methods. The interface contains the following areas:

- The menu bar on the left side allows users to switch between the **Operation**, **Methods**, **Records**, and **Settings** screens.
- The methods list displays all available transfer methods stored in the instrument.
- The **Methods** panel at the top allows users to **add**, **edit**, or **delete** a method.

Transfer Methods List

In the method list, users can view the parameters for each protein transfer method. The three preset methods include the Fast, Standard, and Extended programs.

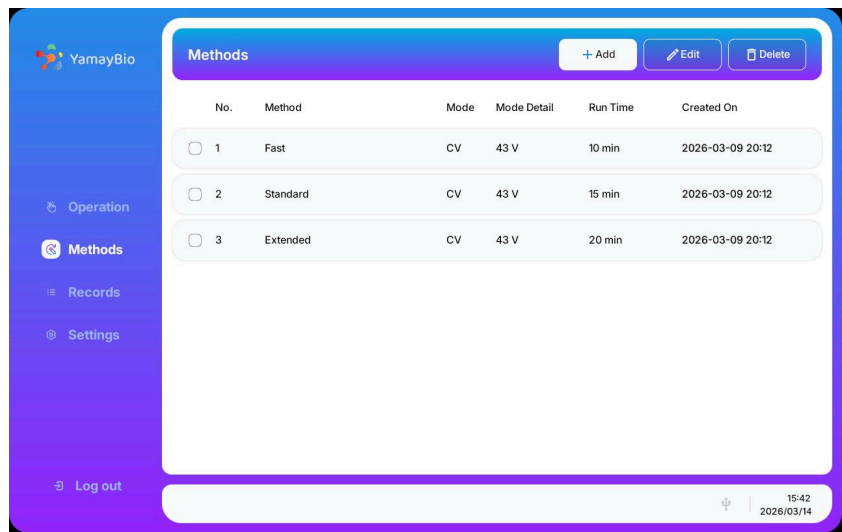


Figure 3-3 Methods List

The supplementary table below provides more detailed guidance on selecting the appropriate transfer method for different gel and protein types.

Table 3-1 Transfer Method Selection

Program	Run Time	Recommended Protein Size	Recommended Gel Type
Fast	10 minutes	Small (<20 kDa)	Tris-Tricine
Standard	15 minutes	Broad range (~10-250 kDa)	Bis-Tris, Tris-Glycine
Extended	20 minutes	Large (>250 kDa)	Tris-Acetate

Creating a New Transfer Method

Users can create custom transfer methods based on experimental requirements.

Procedure:

1. On the Methods interface, tap **Add** to create a new method.
2. Enter a method name and the transfer duration.
3. Select whether to enable **Enhance** mode. Enabling this feature adds an extra cycle with increased voltage. This is recommended for experiments that require a more complete transfer, such as for larger proteins or for 1.5 mm gels.
4. Select whether to enable **Post-Run Cooling**. When enabled, the instrument automatically cools the transfer cassette after the run is complete.
5. Tap **Save** to store the method.

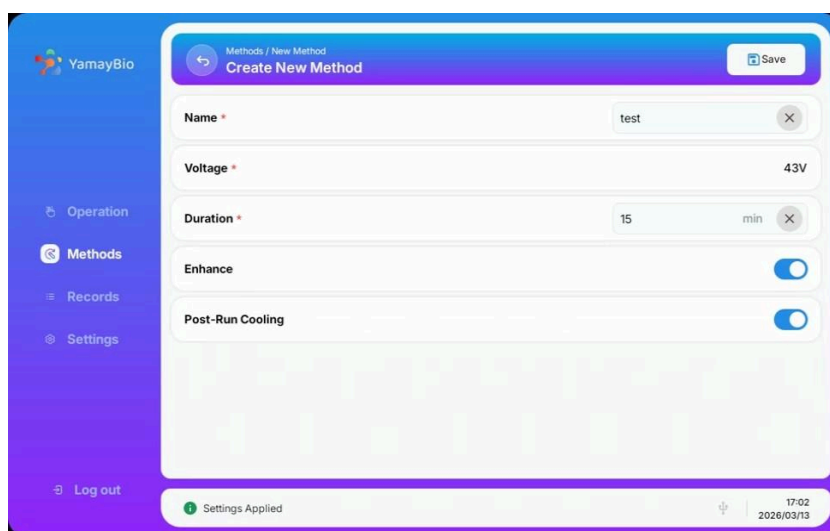


Figure 3-4 Create New Method

Editing/Deleting a Transfer Method

Existing transfer methods can be modified or deleted, with the exception of preset methods. Method names must be unique.

Edit a method:

1. Select the target method from the method list.
2. Tap **Edit**.
3. Modify the parameters as needed.
4. **Save** the changes.

The editing interface is the same as the method creation interface.

Delete a method:

1. Select the target method.
2. Tap **Delete**.
3. A confirmation dialog will appear.
4. Tap **Confirm** to delete the method.

If **Cancel** is selected, the method will not be deleted.

3.3 Running a Protein Transfer Experiment

Reagent Preparation and Method Selection

Before starting a transfer experiment, prepare sufficient reagents and select the appropriate transfer method.

Prepare Reagents

- Add DI water to the wash buffer container so that it has sufficient reagent for the experiment.
 - If using the Fast or Standard method, add 500 mL DI water per station.
 - If using the Extended method, add 600 mL DI water per station.
- Prepare transfer buffer using your normal protocol.
 - If using the Fast or Standard method, prepare 700 mL of 1× Transfer Buffer per station.
 - If using the Extended method, prepare 900 mL of 1× Transfer Buffer per station.
 - Pour 500 mL (Fast & Standard method) or 700 mL (Extended method) into the transfer buffer container.

- Use the remaining 200 mL to equilibrate the gel, membrane, and sponge pads.
- Make sure the waste container is empty.

Check Methods

1. Tap **Methods** on the menu bar to open the methods list.
2. Confirm that the desired protein transfer method is available.
3. If the desired method is not available, please refer to the section above, "Creating a New Transfer Method."

Preparing and Loading the Transfer Cassette

Prepare the Sponge Pads:

- Each transfer cassette requires two sponge pads.
- Submerge the sponge pads in an incubation box containing 1× transfer buffer so that they are completely saturated.

Prepare the Membrane:

- Membrane preparation varies depending on whether a PVDF or nitrocellulose membrane is used.
 - For PVDF membranes, activate for 15-30 seconds in alcohol (methanol, ethanol, or isopropanol), rinse briefly with DI water, and equilibrate in 1× transfer buffer for 2 minutes.
 - For nitrocellulose membranes, equilibrate directly in 1× transfer buffer for 3 minutes.

Prepare the Gel:

1. After electrophoresis, rinse the gel cassette with water to remove residual running buffer.
2. Remove the gel from the cassette and trim the stacking gel.
3. Equilibrate the gel in 1× transfer buffer for up to 3 minutes.

Open the Transfer Cassette:

1. Place the transfer cassette flat on the laboratory bench.
2. Release the six locking clips by pulling them outward.
3. Lift the latch upward to open the cassette.

Note:

- The positive electrode side is marked with a black handle.

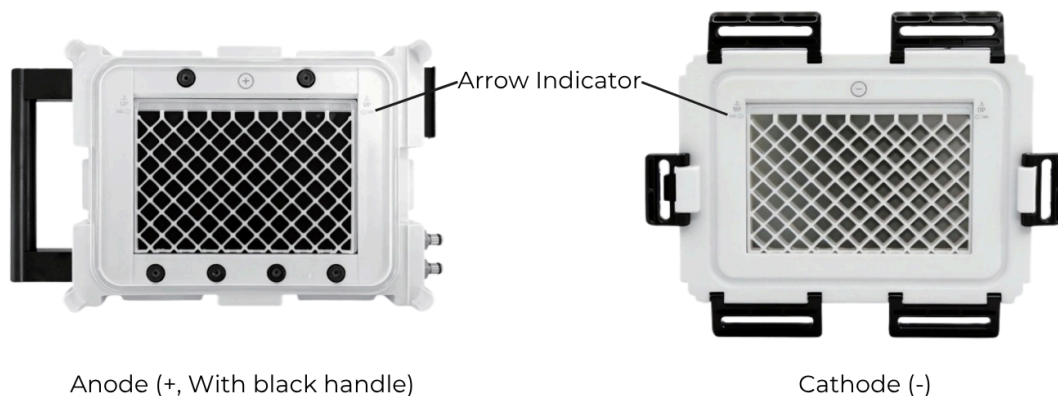


Figure 3-5 Transfer Cassette

Assemble the Transfer Sandwich:

1. On the anode side of the transfer cassette, assemble the transfer sandwich in the following order:
 - a. Anode (+) Cassette (with black handle)
 - b. Pre-wetted sponge pad
 - c. Equilibrated transfer membrane (PVDF or nitrocellulose)
 - d. Equilibrated polyacrylamide gel
 - e. Pre-wetted sponge pad
 - f. Cathode (-) Cassette
2. Ensure that the sponges are positioned below the arrow indicator.
3. Ensure that the gel is completely aligned within the membrane area during sandwich assembly. When transferring two mini gels in one cassette, ensure the gels do not overlap or touch.
4. Use a roller soaked with transfer buffer to gently roll across the gel surface to remove air bubbles between the gel and membrane.
5. Do not allow the membrane to dry during assembly of the transfer sandwich.
6. Close the cassette and secure the locking clips.

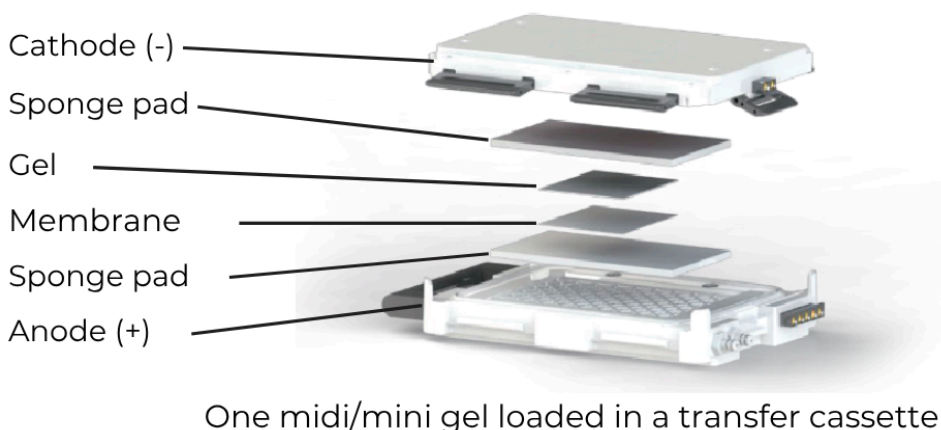
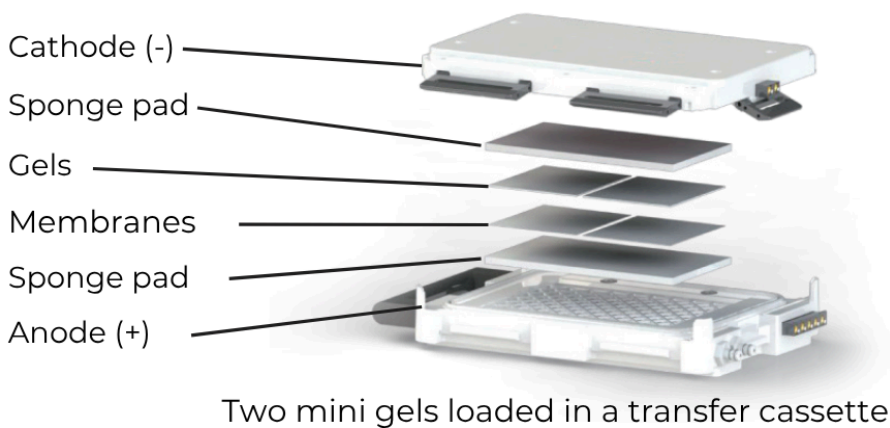


Figure 3-6 Transfer Sandwich Configuration

Insert Cassette into the Instrument

1. Insert the assembled transfer cassette into the appropriate station of the instrument.
2. Confirm that the cassette indicator light is green and the software status shows **Connected**.

Running the Transfer

Once the cassette and reagents are ready, the transfer experiment can begin. Each station can be run independently from the other stations. Use the individual operation panel for the station you intend to run.

Run Transfer:

1. On the station panel, select the desired transfer method from the method list.
2. The software will display the voltage and duration of the selected method.
3. Tap **Start**. The system will go through a priming step before the run begins. Once the transfer starts, the time remaining will be displayed on the screen.
4. If needed, tap **Pause** or **Stop** to halt the experiment during the transfer.
5. When the run is complete, the station status light will flash and the status will change to **Completed**.
6. After the run, tap **View Record** to see the parameter data for the experiment.

Note: Watch for warning notifications during operation:

- Yellow warning icon - the experiment continues but requires attention.
- Red error icon - the experiment stops.
- Tap the notification icon to view detailed error information.

3.4 Experiment Records

The **Records** interface stores the history of all completed experiments. The interface contains the following areas:

- The menu bar on the left side allows users to switch between the **Operation**, **Methods**, **Records**, and **Settings** screens.
- The records list displays all available experiment data stored in the instrument.

- The **Records** panel at the top allows users to **view** or **delete** a record.

Record List

After each run is completed, the experiment data is automatically saved to the experiment record list. Users can select a record to view or delete. Each record contains information about the experiment time, station, method, mode and status of the experiment.

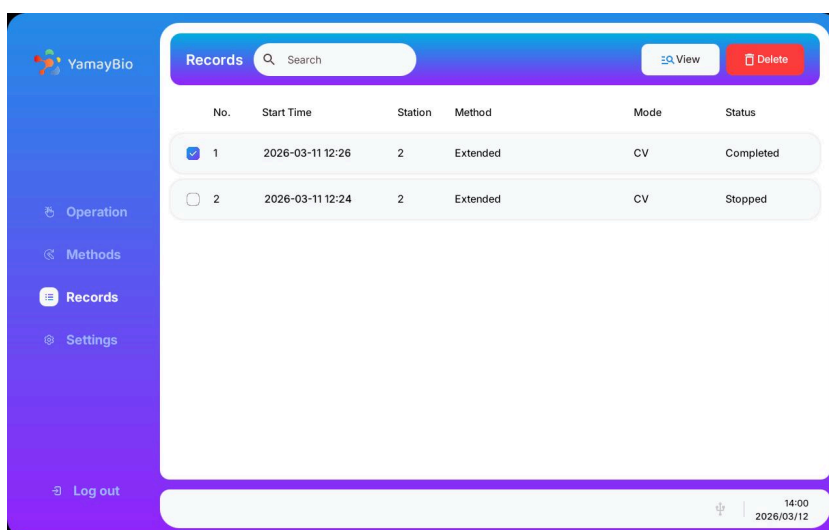


Figure 3-7 Record List

Viewing/Deleting Records

Viewing experiment details:

1. Select an experiment record.
2. Tap **View**.
3. The **Record Detail** page will display the experimental parameters on the left and data acquired during the experiment on the right.
4. At the bottom of the screen, users can select the **voltage, current, power, or temperature** to view further information. The plot on the right will display the selected parameter over the course of the run. The graph will typically show a dip between

cycles as the instrument exchanges fresh transfer buffer. If Enhance mode is selected, the last cycle will have an increased voltage.

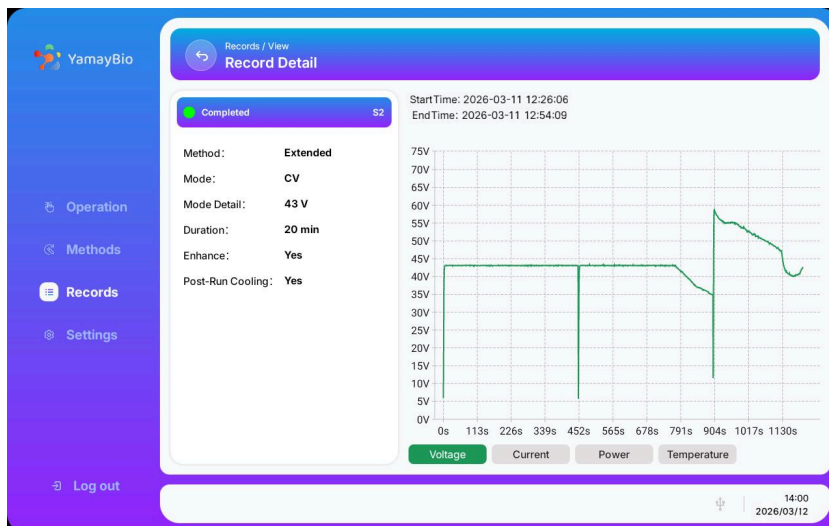


Figure 3-8 View Record Details

Deleting an experiment record:

1. Select the record.
2. Tap **Delete**.
3. Confirm the deletion in the pop-up dialog.
4. The selected record will be permanently removed.

3.5 Post-Run Procedure and System Shutdown

Post-Run Procedure

After the experiment is completed, perform the following steps:

1. Remove the transfer cassette from the instrument.
2. Place the cassette on the bench and open it.
3. Remove the transfer membrane, gel, and sponges.
4. Replace the cassette in the instrument station.

Shutdown Procedure

1. Place the transfer buffer tube into the wash buffer container.
2. Tap **Wash** to start the wash cycle for any cassettes that were recently used.
3. Once the wash cycle is complete, remove the tubing from the wash buffer container and tap **Drain** to drain the tubing.
4. Turn off the instrument.
5. Remove the cassettes and leave them open on a bench to air dry.
6. Empty the waste container.
7. Wipe the instrument exterior with a lint-free cloth.

Waste Handling and Laboratory Safety

- Wear appropriate PPE (gloves, safety glasses) when handling hazardous reagents.
- Dispose of experimental waste according to local laboratory safety regulations.
- Decontaminate spills immediately using appropriate disinfectants.

Chapter 4 Maintenance and Service

This chapter describes maintenance procedures and guidelines for the Max Series Blot Transfer Systems. To ensure proper operation, perform the following maintenance procedures regularly.

In the **Settings** interface, the maintenance section allows standard users to view accessory lifetime, tubing operations, and washing status. Administrators can also access device settings.

4.1 Routine Maintenance

After each day of operation, clean the tubing by running a wash step.

Washing status

The Washing Status interface allows users to set the wash reminder interval and to view the last wash time for each station.

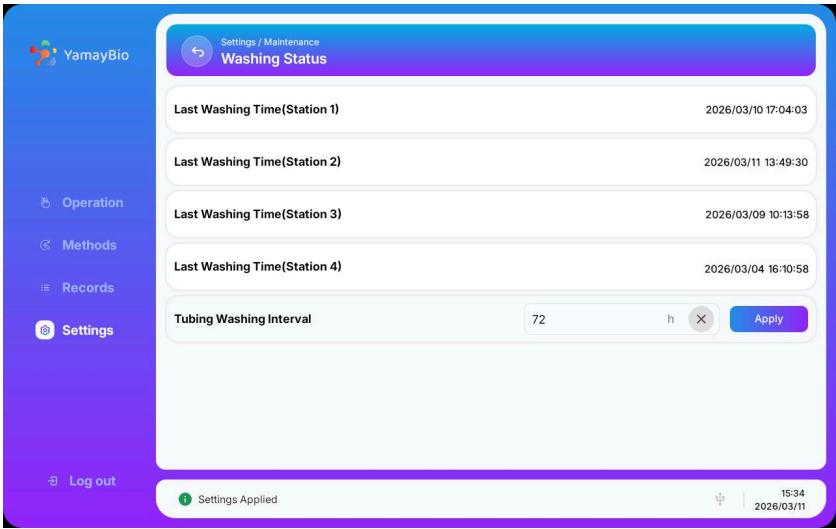


Figure 4-1 Washing Status

Avoid leaving the transfer buffer or wash buffer in the tubing system or buffer containers for extended periods. The tubing system and buffer containers should be cleaned weekly to prevent reagent buildup.

Tubing Operations

The Tubing Operations interface allows users to perform manual fluid operations for each station. Available functions include:

- Tube prime: Used to prime the system tubing with transfer buffer or wash buffer.
- Tube drain: Used to remove transfer buffer or wash buffer from the tubing.
- Tube wash: Used to flush the tubing system for the selected station.

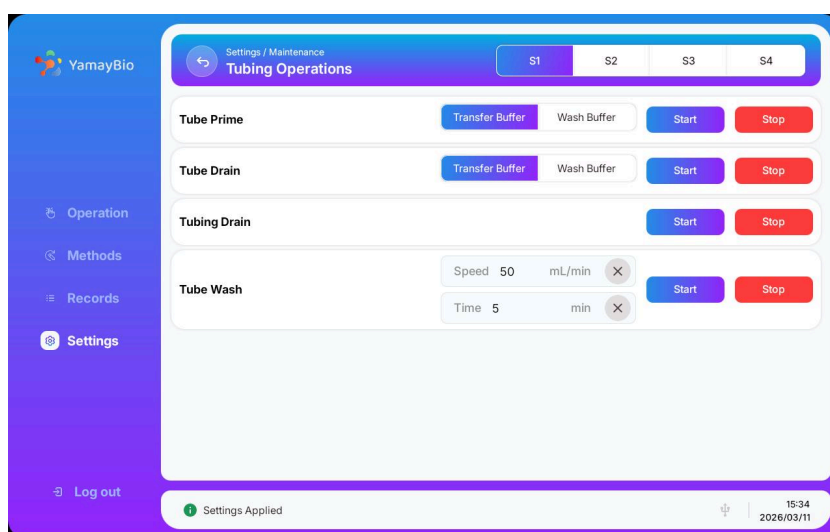


Figure 4-2 Tubing Operations

Device Settings

Administrators can access settings for voice notification, status light, solenoid valve, tubing operations, and experiment operation.

Storage

If the instrument will not be used for an extended period:

1. Insert the transfer cassettes and tap **Wash** for each station to rinse all stations.

2. Once the wash cycles are complete, remove the tubing from the wash buffer container. Tap **Drain** for each station to empty the tubing.
3. Wipe the instrument exterior with a lint-free cloth.
4. Empty all containers and rinse them with DI water.
5. Remove the transfer cassettes and allow them to air dry.
6. Turn off the main power switch.
7. Disconnect the power cable.

Store the instrument in a clean and dry laboratory environment.

4.2 Calibration

Calibration is only required for the transfer buffer pump. For optimal accuracy, we recommend performing this calibration every six months.

1. Ensure all cassettes are inserted into the main unit.
2. Log in as an administrator.
3. From the **Settings** interface, navigate to **Factory Settings**.
4. Select **Parameter Settings** followed by **Pump Parameters**.
5. Fill a beaker with approximately 200 mL of DI water.
6. Place the beaker on a balance and tare it.
7. Place the transfer buffer tube into the beaker, and insert the waste tube into the waste container.
8. Select a station and tap **Start** to prime the tubing.
9. Once the pump has stopped completely, reweigh the beaker.
The difference in weight is the actual dispensed volume.
10. Enter the measured value into both the **Inlet Pump** and **Outlet Pump** fields, then tap **Apply** for each.
11. Repeat this procedure for the remaining stations until all are fully calibrated.
12. Once calibration is complete, remove the tube from the beaker and tap **Start** to drain the tubing.

4.3 Pump Tubing Replacement

Accessory Lifetime

The Accessory lifetime page displays usage statistics for critical components, including:

- Tubing usage time
- Tubing connector usage time
- Electrode usage count
- Pump usage time

When a component exceeds its recommended service interval, the software will generate a replacement reminder.

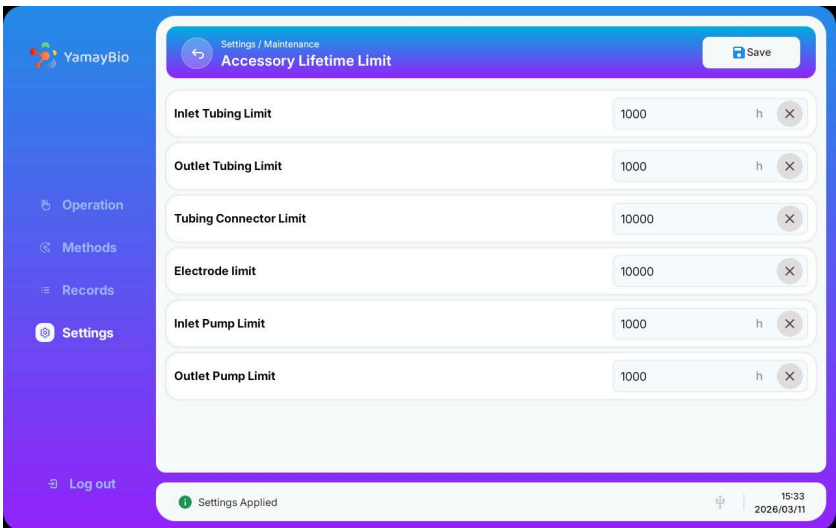


Figure 4-3 Accessory Lifetime Limit

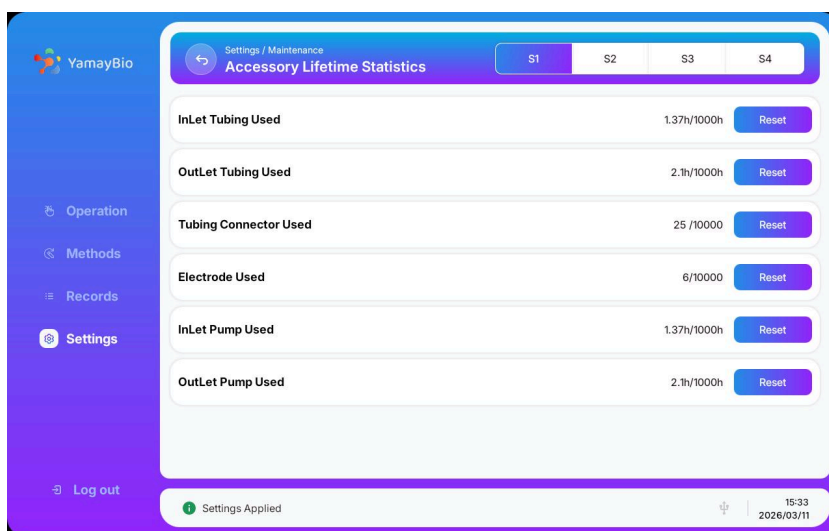


Figure 4-4 Accessory Lifetime Statistics

For optimal performance, replace the tubing after every 1000 hours of operation. Before replacement, ensure all tubing is empty and the power is disconnected.

Replace tubing:

1. Remove the eight screws on the rear panel and detach the blue acrylic backplate.
2. Gently remove the transparent cover over the pump.
3. Remove the entire tubing assembly, including both side connectors.
4. Firmly insert both ends of the new tubing into the ports.
5. Ensure it fully covers the connectors for a leak-free seal.
6. Carefully reinstall the tubing into the pump.
7. Manually rotate the rotor to verify the tubing is properly installed, then snap the cover back on.
8. Repeat this process for the remaining pumps.
9. Once all tubing is replaced, reinstall the blue acrylic backplate and tighten the eight screws.

Always use manufacturer-approved replacement parts.

4.4 Instrument Troubleshooting

If the instrument does not operate normally, refer to the troubleshooting table below.

Table 4-1 Instrument Troubleshooting Guide

Problem	Possible Cause	Solution
Cassette not recognized	Cassette improperly installed	Reinstall the transfer cassette
	Cassette contacts dirty	Clean cassette contacts
Transfer run does not start	Station status not "Connected"	Verify cassette installation
	Transfer method not selected	Select a valid transfer method
Fluid flow abnormal	Tubing blocked	Perform tubing cleaning
	Reagent container empty	Refill reagents

4.5 Warning and Error Messages

The instrument software provides visual notifications for warnings and errors.

Warning Notifications

A yellow warning icon indicates a non-critical issue.

Examples include:

1. Low reagent level
2. Maintenance reminder
3. Minor system notification

The experiment may continue running, but user attention is recommended.

Error Notifications

A red error icon indicates a critical system issue.

Examples include:

1. Communication failure
2. Hardware malfunction
3. Safety protection activated

When an error occurs, the experiment will automatically stop, and an error message will appear on the screen.

Users can view detailed information by navigating to **System Settings** followed by **Error Log**.

4.6 Technical Support

If a problem cannot be resolved using the troubleshooting guide:

1. Record the instrument serial number (SN).
2. Note the software version.
3. Record the error message displayed on the screen.

Contact the manufacturer for technical support. Providing detailed information will help technical support diagnose the problem more quickly.

Important Notes

- Do not attempt to disassemble the instrument housing.
- Use only manufacturer-approved replacement parts.
- Follow laboratory safety guidelines when handling chemicals.

Ordering Information:

Max Series Blot Transfer System and Accessories

Catalog No.	Description
M8101	Max8 Blot Transfer System
M4101	Max4 Blot Transfer System
M8101A1	Tubing Set (For Max Series)
M8101A2	Transfer Cassette (For Max Series)
M8101A3	Mesh Plate Set for Transfer Cassette, 2 Pieces
M8101A4	Reagent Container, 5 L
EICM0473	Transfer Cassette Tray
EICM0070	Incubation Box (S)
EICM0135	Incubation Box (M)

Consumables and Reagents

Catalog No.	Description
M8013	Sponge Pad, 40 Pieces (For Max Series)
PVDFMR022	PVDF Membrane, 0.22 μ m, 26.5 cm x 3.7 m, 1 Roll
BPM8022	PVDF Membrane, 0.22 μ m, Precut, 6 x 9 cm, 40 Pieces (For Max Series)
MIDIBPO22	PVDF Membrane, 0.22 μ m, Precut, 8.5 x 13.5 cm, 10 Pieces
NCMR022	Nitrocellulose Membrane, 0.22 μ m, 30 cm x 3.0 m, 1 Roll
BNM8022	Nitrocellulose Membrane, 0.22 μ m, Precut, 6 x 9 cm, 40 Pieces (For Max Series)
MIDIBNO22	Nitrocellulose Membrane, 0.22 μ m, Precut, 8.5 x 13.5 cm, 10 Pieces
MS8134	Transfer Buffer Instant Granules



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Video Guide