QPix FLEX

Microbial Colony Picking System

User Guide

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MOLECULAR DEVICES

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Contents

Safety Information

The safety information section provides information on the safe use of the instrument. It includes the use of user-attention statements in this guide, a key to understanding the safety labels on the instrument, precautions to follow before operating the instrument, and precautions to follow while operating the instrument.

Read and observe all warnings, cautions, and instructions. Remember, the most important key to safety is to operate the instrument with care.

WARNING! If the instrument is used in a manner not specified by Molecular Devices, the protection provided by the equipment might be impaired.

Warnings, Cautions, Notes, and Tips

All warning symbols in the user guide are framed within a yellow triangle. An exclamation mark is used for most warnings. Other symbols can warn of other types of hazards such as biohazard, electrical, or laser safety warnings as are described in the text of the warning.

When warnings and cautions are displayed in this guide, be careful to follow the specific safety information related to them.

The following user-attention statements can be displayed in the text of Molecular Devices user documentation. Each statement implies a particular amount of observation or recommended procedure as described:

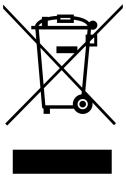
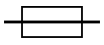
WARNING! A warning indicates a situation or operation that could cause personal injury if precautions are not followed. The warning symbol can vary depending on the warning. The definition of the symbol is included in the text of the warning.

CAUTION! A caution indicates a situation or operation that could cause damage to the instrument or loss of data if correct procedures are not followed.

Note: A note calls attention to significant information.

Tip: A tip provides useful information or a shortcut but is not essential to the completion of a procedure.

Symbols on the Instrument

Symbol	Indication
	Indicates a warning for a situation or operation that could cause personal injury if precautions are not followed. There are specific details written next to the warning symbol.
	Instrument manufacture date.
	CSA certification.
	European technology conformity.
	United Kingdom technology conformity.
	Compliance with Chinese RoHS Pollution Control Requirements.
	This symbol is required in accordance with the Waste Electrical and Electronic Equipment (WEEE) Directive of the European Union. You must not discard this electrical or electronic product or its components in domestic household waste or in the municipal waste collection system. For products under the requirement of the WEEE directive, contact your dealer or local Molecular Devices office for the procedures to facilitate the proper collection, treatment, recovery, recycling, and safe disposal of the device.
	There is an authorized representative in the European community.
	Instrument manufacturer.
	Compliance with California Proposition 65, which requires businesses to warn Californians about significant exposures to chemicals that cause cancer, birth defects or other reproductive harm.
	Indicates the location of a fuse.
	Indicates the instrument serial number.
	Indicates that you should consult the documentation for use.
	Indicates compliance with Australian radio communication requirements.
	Indicates the manufacturer catalog number.

Electrical Safety

To prevent electrically related injuries and property damage, inspect all electrical equipment before use and immediately report all electrical deficiencies. Contact Molecular Devices Technical Support to service equipment that requires the removal of covers or panels.

The instrument must be connected to a properly grounded power outlet to protect from the risk of electric shock. The main chassis of the instrument is grounded together with all related electrical components.

Do not remove the fixed covers, as there are no user-serviceable parts inside. All electrical work must be referred to Molecular Devices approved service personnel.

In the event of a liquid spillage into the main cavity of the instrument, disconnect the mains power supply before trying to clean up.

If the external covers on the instrument are removed, the power supply does not automatically stop.

WARNING! HIGH VOLTAGE Power off the instrument and disconnect the power cord before you do maintenance procedures that require removal of a panel or cover or disassembly of an interior instrument component.

Do not try to use the instrument until all covers are replaced.

To provide access for disconnecting power from the instrument, maintain a 66 cm (26 in.) minimum clearance area on the right side of the instrument.

To protect against fire hazard, replace the fuses only with the same type and rating as the original factory-installed fuses.

Ultraviolet (UV) Light Safety

The instrument door should be closed whenever you run a process. The door prevents UV light from passing through during operation.

As a safety measure, if the door is open, an electromagnetic switch prevents the instrument from running. Never tamper with this switch, as it serves two purposes:

- It prevents the motors from running to reduce the potential of physical damage.
- It disables the UV light to prevent the risk of damage from UV radiation.

Medical Device Safety

Motors and their related drives and cabling are sources of electromagnetic fields.

Persons with external or implanted medical devices must evaluate the risks related to these devices before entering an area where the instrument is in use. Keep magnetic storage devices or strips, such as hard drives and credit cards, away from the instrument.

WARNING! Due to the presence of electromagnetic fields, if you wear an external or implanted medical device, keep 305 mm (1 ft) away from the drive magnets.

Chemical and Biological Safety

Normal operation of the instrument can involve the use of materials that are toxic, flammable, or otherwise biologically harmful. When using such materials, observe the following precautions:

- Handle infectious samples based on good laboratory procedures and methods to prevent the spread of disease.
- Observe all cautionary information printed on the original containers of solutions before their use.
- Dispose of all waste solutions based on the waste disposal procedures of your facility.
- Operate the instrument in accordance with the instructions outlined in this guide, and take all the required precautions when using pathological, toxic, or radioactive materials.
- Splashing of liquids can occur. When working with potentially hazardous liquids, take applicable safety precautions, such as wearing safety glasses and protective clothing.
- Observe the applicable cautionary procedures as defined by your safety officer when using hazardous materials.
- Observe the applicable cautionary procedures as defined by your safety officer when using flammable solvents in or near a powered-up instrument.
- Observe the applicable cautionary procedures as defined by your safety officer when using toxic, pathological, or radioactive materials.

WARNING! BIOHAZARD. If a biohazard is used with the instrument, the area must be clearly marked with an applicable biohazard sign.

WARNING! Never use the instrument in an environment where potentially damaging liquids or gases are present.

Cleaning and Maintenance

Observe the cleaning procedures outlined in this guide for the instrument.

Do the following before you clean equipment that has been exposed to hazardous material:

- Contact the applicable Chemical and Biological Safety personnel.
- Review the Chemical and Biological Safety information contained in this guide. See Chemical and Biological Safety on page 10.

Avoid spilling liquids on the system. Fluid spilled into internal components creates a potential shock hazard. Wipe up all spills immediately. Do not operate the system if internal components have been exposed to spilled fluid. Unplug the instrument if there is a fluid spill in the instrument and contact Technical Support.

Perform only the maintenance tasks described in this guide. Contact a Molecular Devices service engineer to inspect and perform a preventive maintenance service on the instrument each year. See Obtaining Support on page 123.

WARNING! BIOHAZARD. It is your responsibility to decontaminate components of the instrument before you return parts to Molecular Devices for repair. Molecular Devices does not accept items that have not been decontaminated where it is applicable to do so. If parts are returned, they must be enclosed in a sealed plastic bag stating that the contents are safe to handle and are not contaminated.

For approved cleaning and maintenance procedures, see Maintenance on page 109.

Moving Parts Safety

To prevent injury due to moving parts, observe the following:

- Never try to exchange labware, reagents, or tools while the instrument is operating.
- Never try to physically restrict the moving components of the instrument.
- Keep the interior of the instrument clear to prevent obstruction of the movement.

The step motors are delicate, so be very careful with them. To prevent serious damage to the instrument or its auxiliary parts, follow the preparation instructions in this guide before every process.

The instrument door should be closed whenever you run a process. The door prevents UV light from passing through during operation.

As a safety measure, if the door is open, an electromagnetic switch prevents the instrument from running. Never tamper with this switch, as it serves two purposes:

- It prevents the motors from running to reduce the potential of physical damage.
- It disables the UV light to prevent the risk of damage from UV radiation.

In an emergency, press the Emergency Stop button on the front of the instrument to immediately stop all motion and turn off the instrument. Before you can restart the instrument, you must pull out the Emergency Stop button.

WARNING! Do not obstruct or otherwise prevent access to the Emergency Stop button.

Note: Observe all warnings and cautions listed for all external devices attached to or in use during the operation of the instrument. See the applicable user guide for the operating and safety procedures of that device.

Chapter 1: Introduction

System Functionality

The QPix FLEX™ is part of the QPix® microbial colony picking series. The QPix FLEX instrument offers a range of features to accommodate various requirements to pick microbial colonies including multiple imaging modes, disposable and sterilizable pins, agar height sensor, and specific algorithms to detect variable biological samples. Other functions include sample rearraying and color screening.

The system is useful for work with applications such as protein engineering, protein evolution, directed or enzyme evolution, protein expression, transformation, and sub-clone management.

The system is available with white light imaging by color cameras suitable for color colony screening and support to convert RGB images into gray intensity for traditional analysis methods.

A CMOS camera locates colonies, the instrument picks the colonies at high speed from source receptacles, and then inoculates the colonies into pre-filled 96-well or 384-well plates. You can rearray colonies of interest from a library into new plates.

Molecular Devices provides a range of plastic consumables for use with the instrument to optimize the systems. The destination plate bed enables versatile use of shallow, standard, and deep-well plates in various combinations. See Replacement Parts and Optional Extras on page 115.

The system allows you to log processes such as picking and re-arraying.

Picking Microbial Colonies

The system can automatically pick 260 colonies per hour by sterilizable pins or more than 350 colonies per hour by disposable pins. This is done with an integrated vision, detection, and analysis hardware and software system and a head assembly, all custom designed by Molecular Devices.

To identify potential colonies, the source plate is imaged in a single frames using a CMOS camera. These images are processed to produce a single, large image of the colonies on the source receptacle. Specific colonies are then selected for picking using feature-selection parameters, such as size, shape, and proximity.

The instrument picks from a range of source receptacles including OmniTrays and standard Petri dishes using the optional source receptacle holders. Pick colonies of an adequate size. Expect 95% pick-efficiency with colony sizes between 1 mm to 1.5 mm. See Replacement Parts and Optional Extras on page 115.

Chapter 2: Instrument Overview

2

The QPix FLEX Microbial Colony Picking System is constructed within a welded steel framework.

Before you operate the instrument or perform maintenance operations, make sure you are familiar with the safety information in this guide. See Safety Information on page 7.

The instrument door should be closed whenever you run a process. The door prevents UV light from passing through during operation.

The instrument deck contains source and destination receptacle positions.

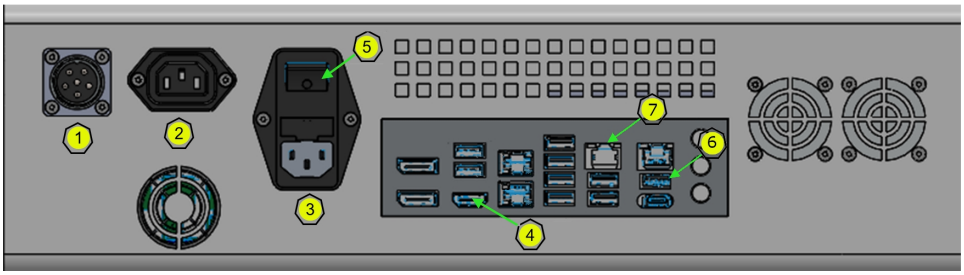
The bed also contains wash baths which clean the pins before and during a process. See Setting Up and Maintaining Wash Baths on page 22.

Microbial Colony Picking System

Item	Description
1	Optional HEPA
2	LED status light (Green = ready or running, Yellow = initializing, Red = error or warning
3	Emergency stop button
4	Start button and USB ports
5	Control box and computer (power switch is in back)

Instrument Connections

The power and data connections are on the back of the instrument.

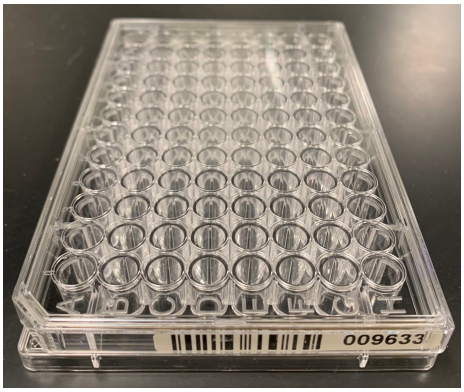


Connection Ports

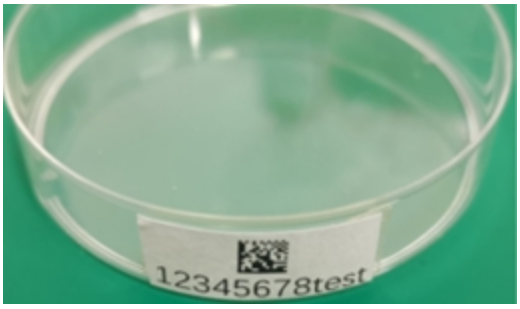
Item	Description
1	Instrument Power Output
2	Display Power Output
3	Control Box Power Input
4	Display Power Output
5	Power Button (with fuse)
6	Camera Communication Input
7	Instrument Communication Output

Using Barcode and QR Code Readers

When you use a barcode reader, use a legible barcode of the following types: 1D (linear) barcodes with code 11, 39, 93, and 128.



When you use a 2D code reader, use the 2D code type Data Matrix barcode (ISO/IEC 16022) which is a high-density, two-dimensional (2D) symbology that encodes text, numbers, files, and actual data bytes. (Tested for 5 mm and 7 mm codes.)



The following parameters are required:

- Do not use special characters, such as hyphens, in the code. Special characters can cause missed reads and other errors downstream.
- Place the code centrally on one of the short sides of the plate.

Computer Specifications

The system software requires the following computer specifications:

Minimum Computer System Requirements

Item	Description
Operating System	Windows 11
Memory	8 GB RAM
Data Connection	USB 2.0 port
Camera Connection	USB 3.0 port

CAUTION! Do not replace the computer operating the system with one of your own. Also do not replace the operating system on the provided computer. The computer supplied with your system includes hardware and driver components specifically configured to control your instrument.

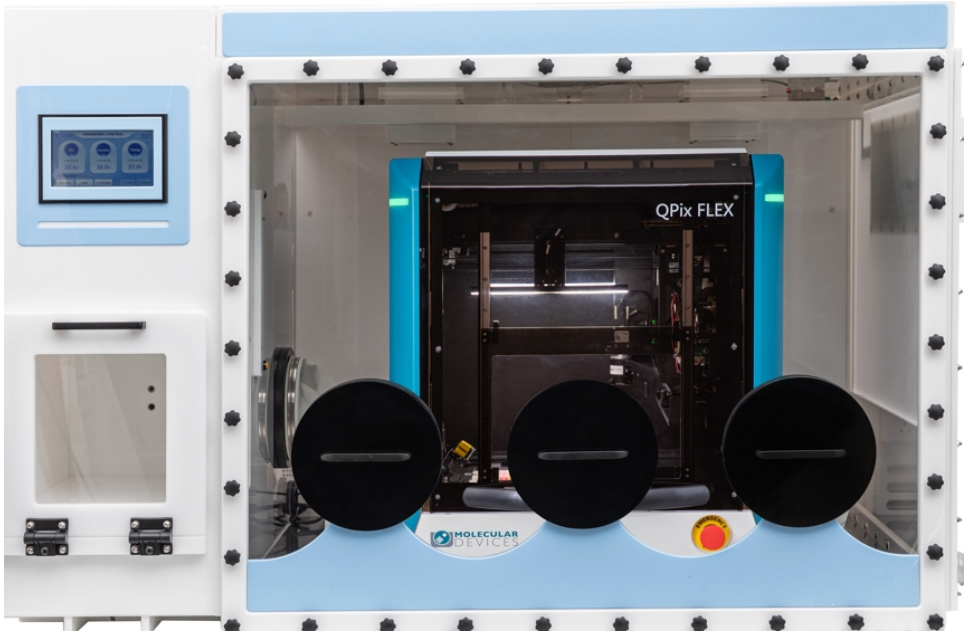
Operating System Disclaimer

Microsoft continuously updates the Windows operating system. Molecular Devices tests the compatibility of the QPix Microbial Colony Picking System Software with a selection of the current Windows operating system releases that are available when the QPix Microbial Colony Picking System Software is in development.

Please contact Molecular Devices for guidance before you select or update your Windows operating system. Although not tested, other Windows operating systems are compatible with the QPix Microbial Colony Picking System Software.

Usage Inside Hypoxic Chamber

The instrument's compact design allows it to fit into a hypoxic/anaerobic chamber. Because the instrument uses mechanical axis movement, there is no need for an air pump.

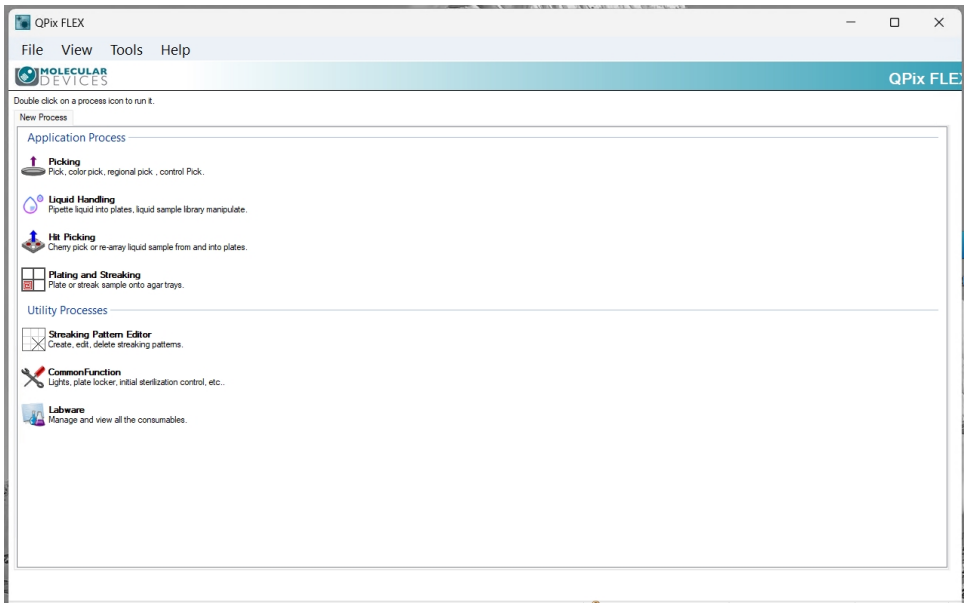


Chapter 3: Software Overview

The QPix FLEXSoftware controls the QPix FLEX instrument.

To start the software, from the computer desktop, double-click the QPix FLEX icon.

When the software starts, the Navigation page displays.



Menu Options

File:

- Select **Exit** to close the Software.

View:

- Select **Properties** to display the properties of the routine before you start the routine.
- Select **Progress** to display the progress of a running routine.

Tools:

- Select **Configuration** to display the Edit Configuration dialog.

> **Note:** Only trained personnel should configure these settings.

Help:

- Select **About** to view the software version and other software information.
- Select **Online Support** to access the Molecular Devices Service and Support website when the computer has access to the Intranet: https://www.moleculardevices.com/service-support

Navigation Page

Use the Navigation page to create and manage processes and for system maintenance.

Application Processes

 Picking

- Picking allows you to define and run processes that involve the picking of colonies from receptacles using the standard process. See Picking Process on page 39.

 Liquid Handling

- Liquid Handling allows you to define and run processes that involve the transfer of liquids during a process. See Liquid Handling on page 61.

 Hit Picking

- Hit Picking allows you to define and run hit picking processes. See Hit Picking Process on page 71.

 Plating and Streaking

- Plating and Streaking allows you to define and run processes that involve streaking samples or liquids on plates. See Plating and Streaking Process on page 83.

Utility Processes

 Streaking Pattern Editor

- Streaking Pattern Editor allows you to define patterns for the Plating and Streaking processes to use. See Streaking Pattern Editor on page 93.

 Common Functions

- Common Functions allow you to run sanitization processes, run one time washes, and to define operation chamber settings. See Common Functions on page 95.

 Labware

- Labware allows you to define the labware to use in the instrument such as plate definitions, liquid tips, picking pins, reservoirs, trays, tubes, and PCR plates. See Managing Labware on page 97.

Chapter 4: Setting Up and Maintaining the Instrument

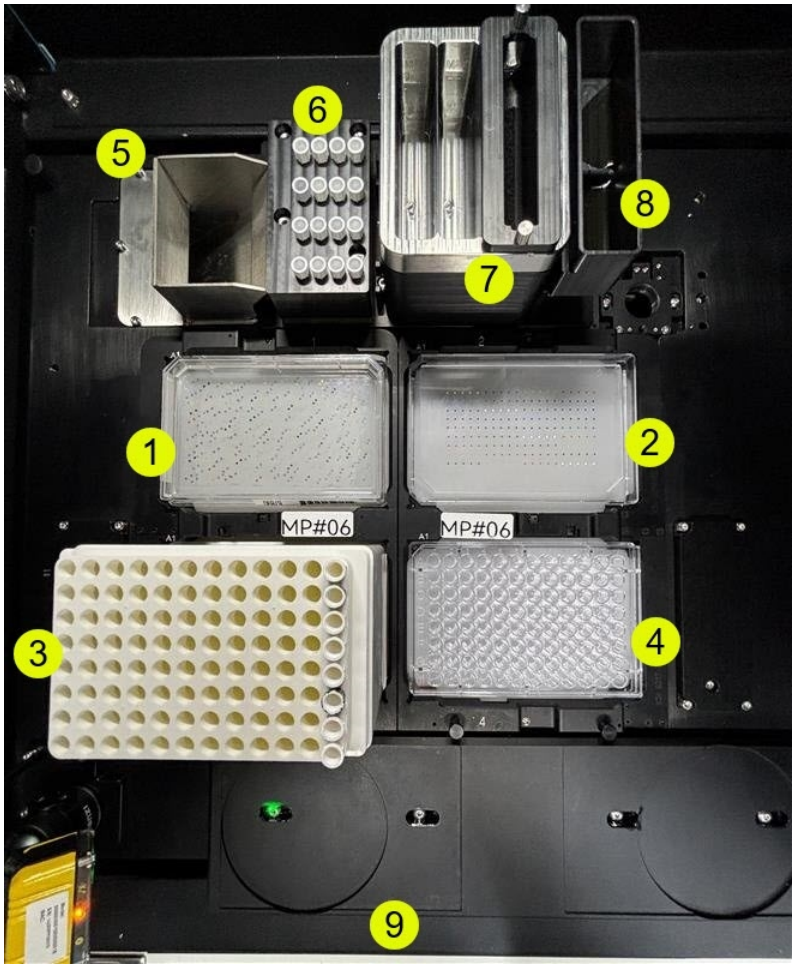
The QPix Microbial Colony Picking System is installed by approved personnel with the software pre-installed on the system computer. The instrument must be located in a well-ventilated area. See Technical Specifications on page 117.

Before you use the instrument, confirm the following:

- The Emergency Stop button on the front of the instrument is pulled out. The instrument cannot start if the button is pushed in.
- The instrument bed is clear of obstructions and loose items.
- All motor tracks are free of obstructions.
- There are no obstructions to the movement of the head.
- The door is properly closed.
- The instrument power cord is properly connected.

Setting Up and Maintaining Wash Baths

Use the wash bath for the sanitize profiles you use with most processes. The bath is next to the instrument plate deck. The liquid waste tank is attached to the wash bath.

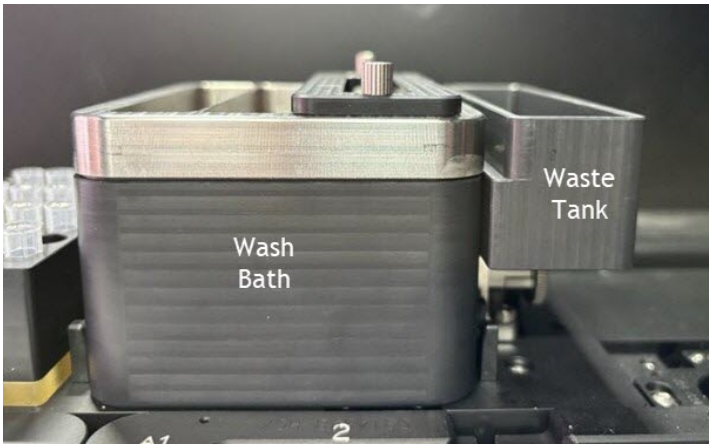


Instrument Deck Layout

Item	Description
1	Instrument plate deck position 1
2	Instrument plate deck position 2
3	Instrument plate deck position 3 with tip box
4	Instrument plate deck position 4
5	Solid waste disposal (chute setup)
6	Metal pin holder
7	Wash tank
8	Liquid waste tank
9	Front side of instrument

The instrument is set up and assembled by your Molecular Devices representative. These instructions start by disassembling what was previously set up for you.

After the instrument is used, the wash bath needs to be cleaned.

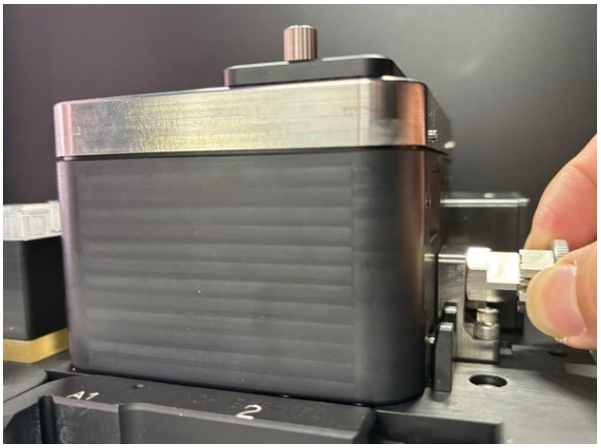


To clean the wash bath:

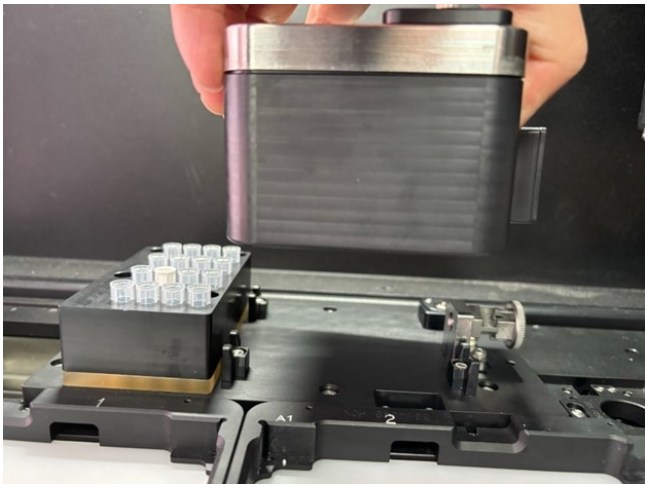
1. The liquid waste tank attaches to the right side of the wash bath with a magnet. Pull the liquid waste tank to the right to remove it from the wash bath.

2. On the wash bath, pull the lock pin out to unlock the wash bath from the instrument deck.

Note: Turn the lock pin counterclockwise to leave the wash bath unlocked from the instrument deck.



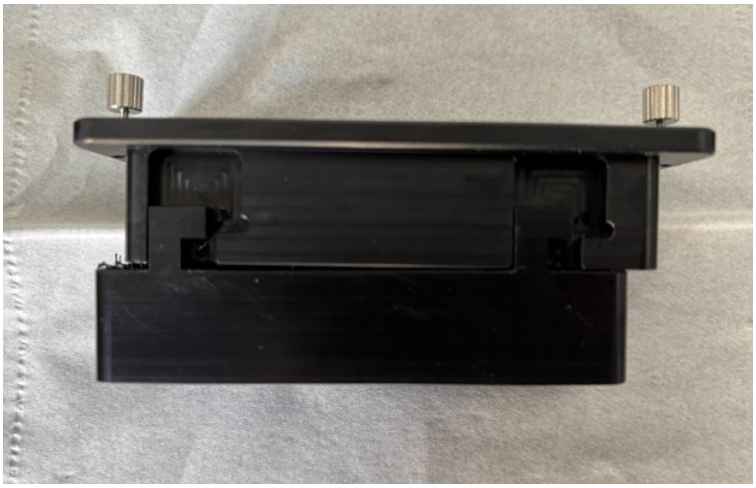
3. Lift the wash bath off of the instrument deck.



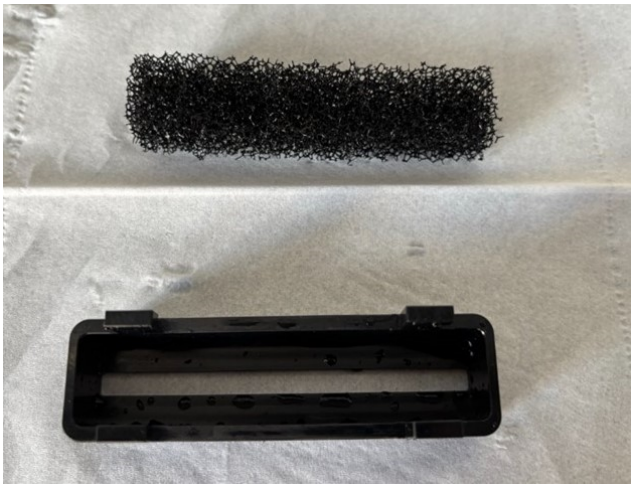
4. On top of the wash bath, unscrew the hand screws that keep the sponge holder in the wash bath.

5. Remove the sponge holder from the wash bath.

6. Slide the lower part of the sponge holder to the left to separate the two halves of the sponge holder.



7. Remove the sponge from the bottom half of the sponge holder.



Reverse these steps to reassemble and install the wash bath.

To run a protocol, fill the wash bath with fluid until the sponge is covered.

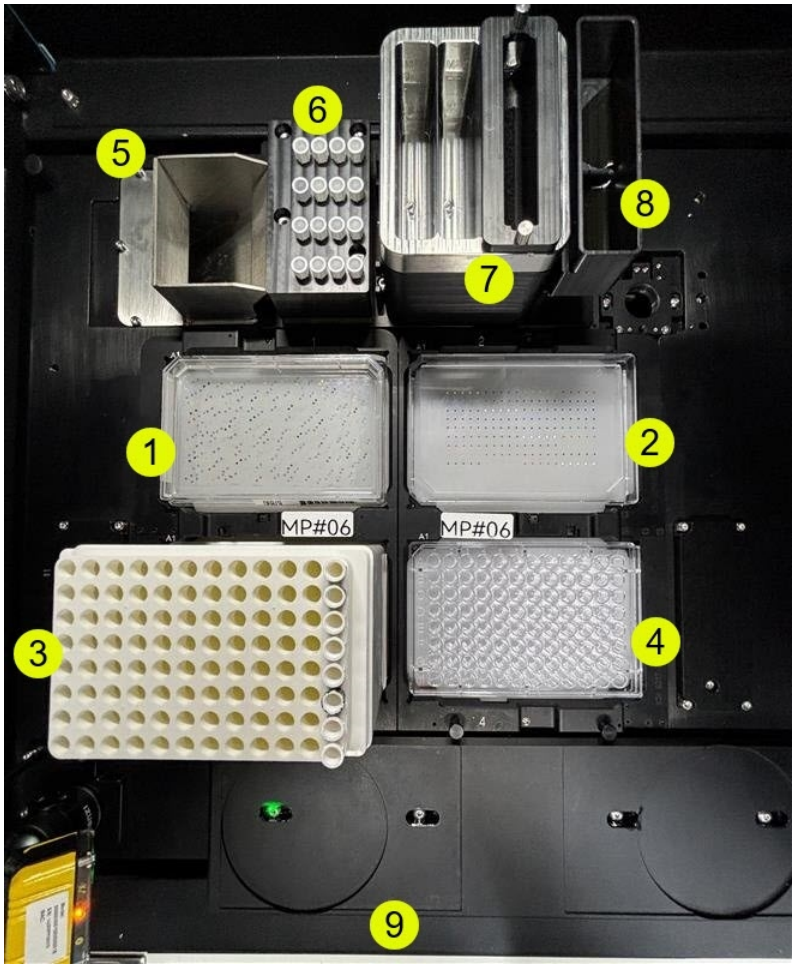
For a typical picking process, put the following solutions in the indicated wash baths:

- Wash Bath #1: 0.1% bleach
- Wash Bath #2: water
- Wash Bath #3: 70% ethanol

CAUTION! Bleach can cause corrosion if left in the instrument for too long. Remove the bleach from the instrument immediately after its use. In general, use bleach only for difficult-to-sterilize organisms.

Setting Up and Maintaining Waste Collection Receptacles

Solid waste is collected either in a drawer or via a chute for disposal and liquid waste is collected in a liquid waste tank for disposal.



Instrument Deck Layout

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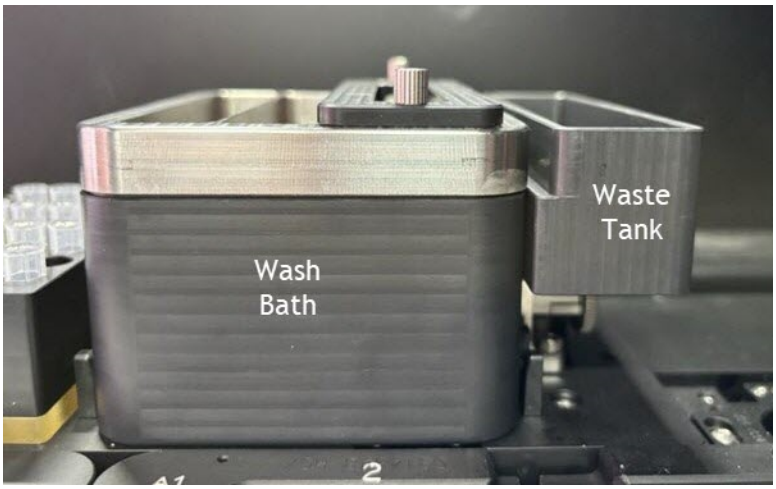
7	Wash tank
8	Liquid waste tank
9	Front side of instrument

Liquid Waste Collection

The liquid waste tank uses a magnet to attach to the wash bath that is located next to the instrument plate deck.



Pull the liquid waste tank to the right to remove it from the wash bath.

To reattach the liquid waste tank to the wash bath, hold the liquid waste tank to the right side of the wash bath and the magnet will guide the liquid waste tank to the proper position.

Solid Waste Collection

There are two configurations to collect solid waste.

- **Drawer:** Solid waste is collected inside the instrument in a drawer.
- **Slide:** Solid waste is discharged from the instrument via a slide to be collected externally. See Solid Waste Collection - Slide Setup on page 31.

Solid Waste Collection - Drawer Setup

The solid waste drawer is suitable for the disposal of pins and tips contaminated by microbial samples. When you use the solid waste drawer setup, the drawer opens on the left side of the instrument.

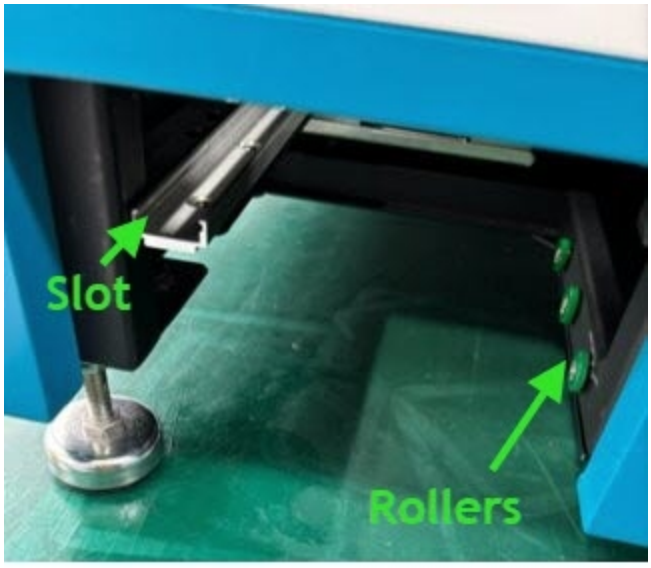
The drawer is a closed box that does not have a filled sensor. Look inside the instrument to see the tips and pins that have been discarded.

When the drawer fills, pull the drawer out to clear it.

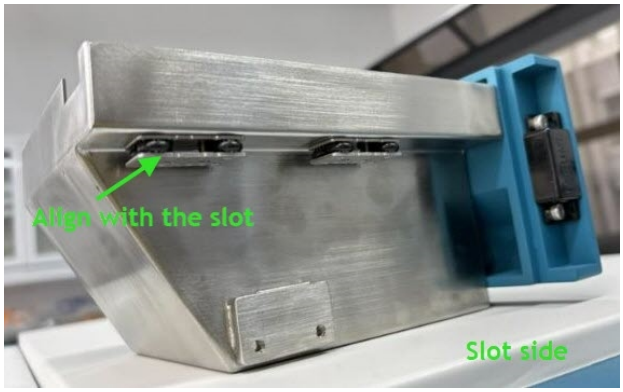
The drawer has interlock sensors that shut off the instrument when the drawer is pulled out.

To reinsert the drawer:

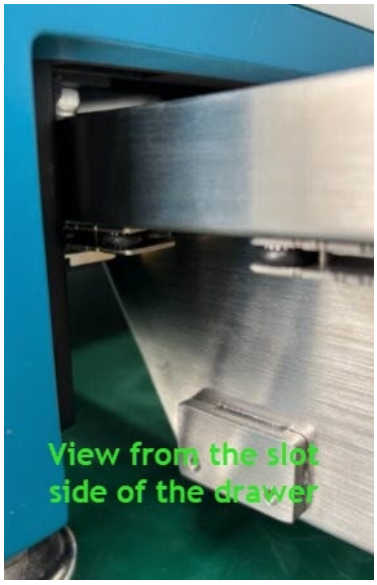
The drawer opening has a slot on the left and rollers on the right.



Align the drawer cover with the slot and roller rails inside the instrument.

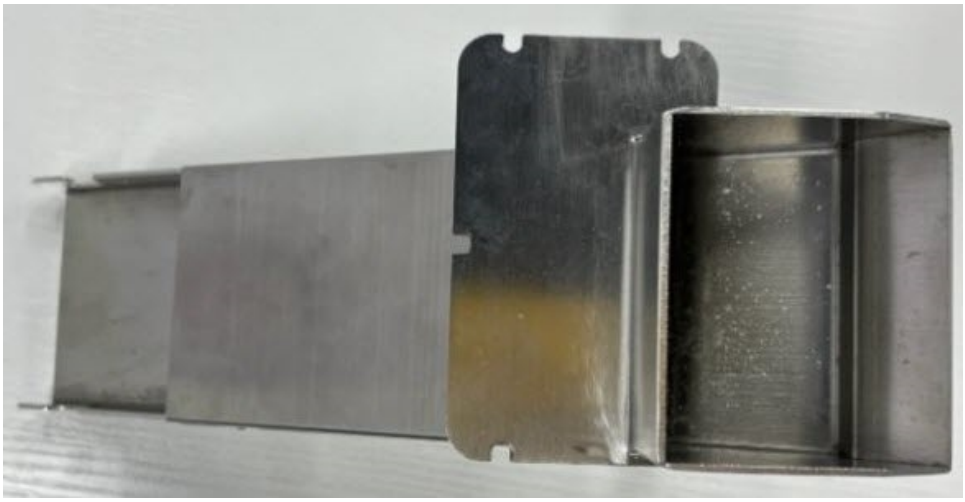


Push the drawer into the instrument.



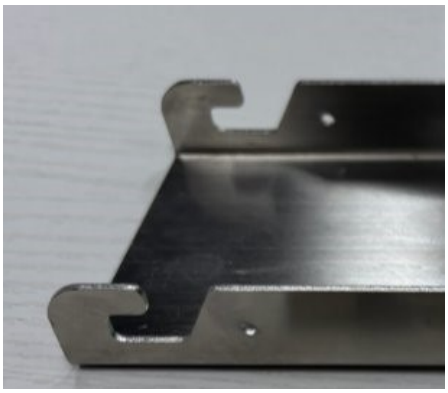
Solid Waste Collection - Slide Setup

When use plating tips which has the rubber head or pipette tips with high viscosity liquid remaining, pay attention that the consumables may block in the slide. We recommend using the waste drawer.



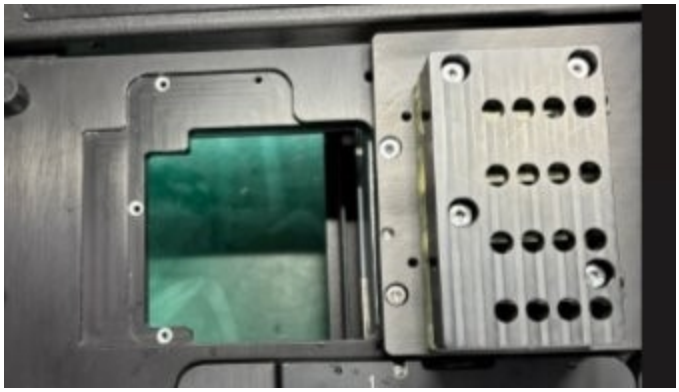
When you use the solid waste slide setup, the slide exits on the left side of the instrument.

The end has notches to which to attach a waste bag.

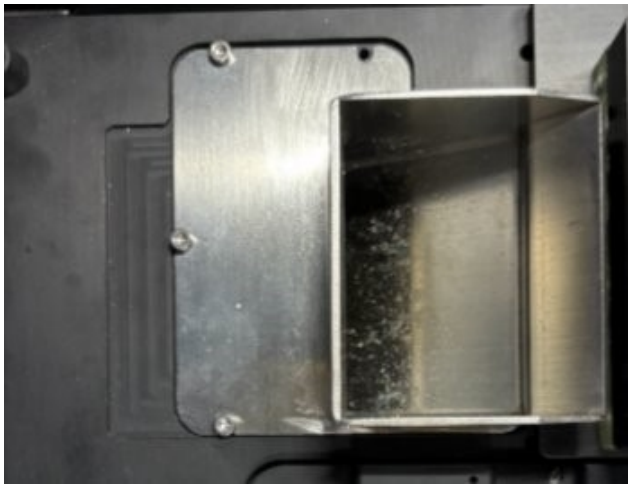


To install the slide:

From above the instrument deck, insert the slide down through this opening.

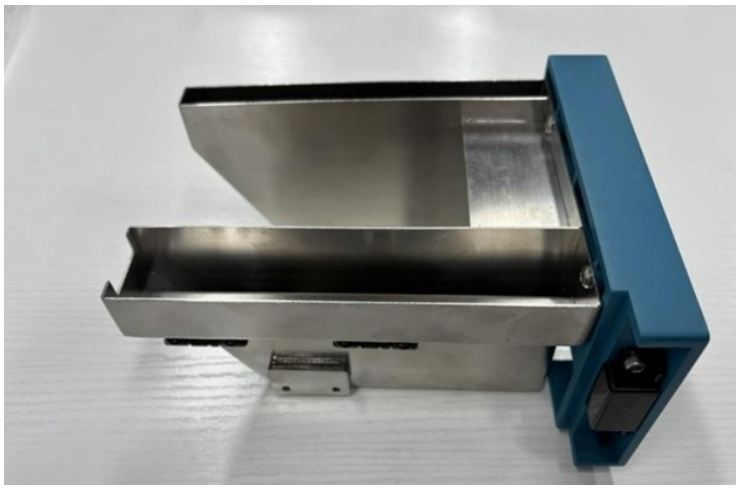


Use the screws to hold the slide in place.

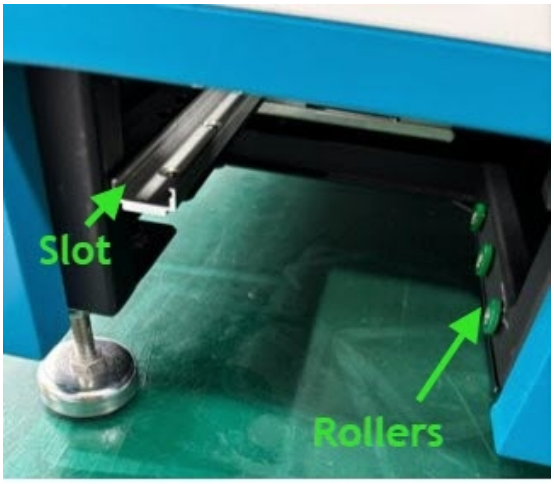


Looking inside the instrument, you can see the top of the slide to confirm that it is clear of obstructions.

Install the slide door cover.

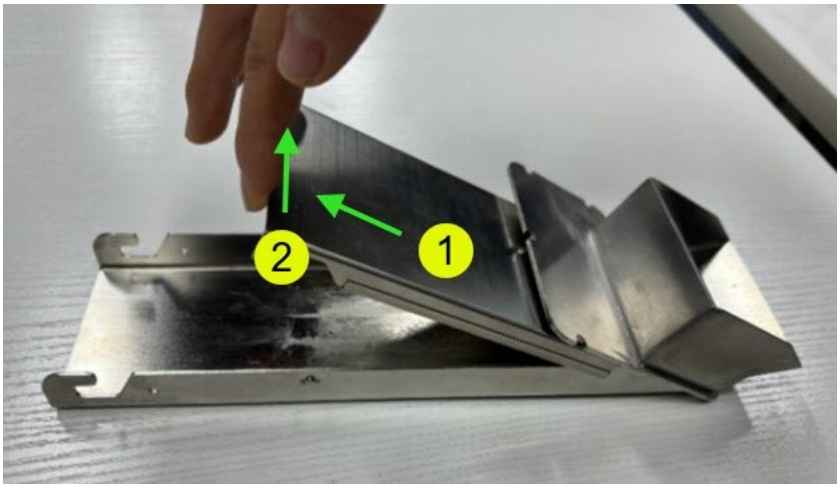


Align the slide opening cover with the slot and rollers and push it into place.



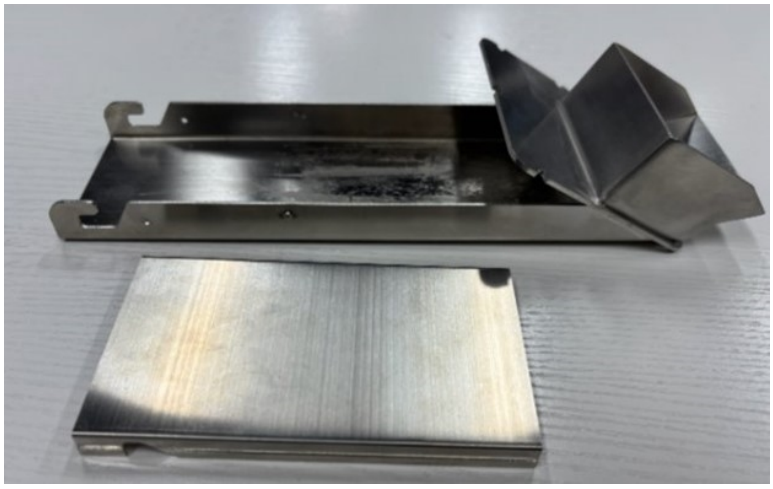
To clean the slide:

The slide has a removable cover that lifts so that you can clean the inner channel.

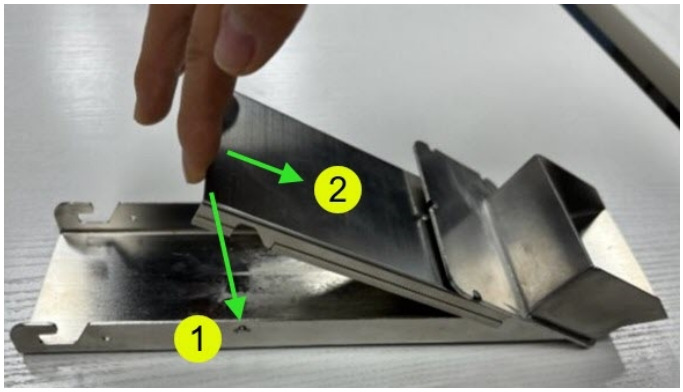


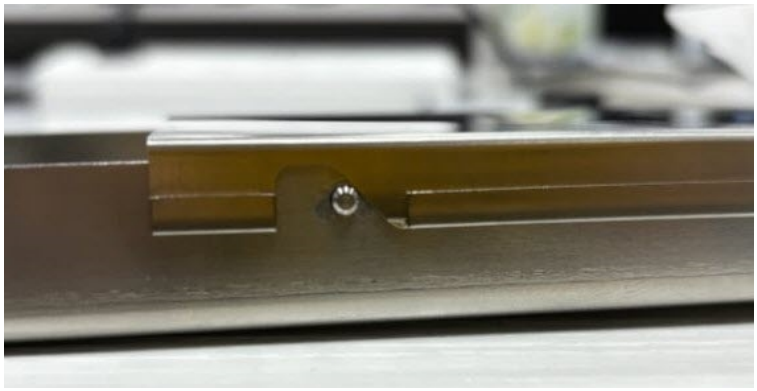
Slide the cover left to unhook it and then lift up.

Clean the inner channel.



Push the cover down and slide it backward so that the notch on the side snaps into place.





Setting Up and Maintaining HEPA Filters

The filter is an optional addition to the base instrument setup. HEPA (High Efficiency Particulate Air) is the technology also used by biological safety cabinet to ensure the inside space of the machine has top to bottom pure air flow. QPix FLEX HEPA filter can achieve H14 filtration, which is capable of capturing 99.99% of 0.3-micrometer air particles, resulting in a penetration rate of 0.01%.

The guaranteed lifetime for the HEPA filter is 2000 hours. Ask Molecular Devices for support to replace a new HEPA filter when the use time reaches 2000 hours.

When the filter reaches the recommended lifetime, the buzzer sounds an alarm to prompt you to replace the filter. Press the mute button on the panel to turn off the buzzer.

Dimensions: 60 cm (23.6 in.) L x 47 cm (18.5 in.) W x 27 cm (10.6 in.) H
Weight: 29.5 kg (65 lbs.)

HEPA Control Panel

	Item	Description
	Time Accumulation	Amount of time the filter has been used. (Replace after 2000 hours)
	Buzzer	Sound the buzzer
	Mute	Mute the buzzer
	Run	Turn the fan on or off
	Power	Power the filter on or off

Chapter 5: Starting the System

The QPix Microbial Colony Picking System is installed by approved personnel with the software pre-installed on the system computer. The instrument must be located in a well-ventilated area. See Technical Specifications on page 117.

Before you use the instrument, confirm the following:

- The Emergency Stop button on the front of the instrument is pulled out. The instrument cannot start if the button is pushed in.
- The instrument bed is clear of obstructions and loose items.
- All motor tracks are free of obstructions.
- There are no obstructions to the movement of the head.
- The door is properly closed.
- The instrument power cord is properly connected.

Powering On the System

Every time you use the instrument, the three axes sequentially run through the Initialize drives routine. This enables the drives to find the respective home positions. The system must complete this routine without interference to ensure that there is no damage to the instrument or the auxiliary equipment.

To power on the system:

1. Confirm all the tasks listed in Pre-Power-Up Check List.
2. Press the power on button on the backside of control box.
   The instrument cycles through the various startup processes.
3. Switch the computer on and wait for it to initialize the operating system and to discover the local network that connects the instrument to the computer.

   Note: If you start the software before the network is discovered, a message displays that the software cannot find the instrument.

4. After the computer finishes initialization, double-click the **QPix** icon to start the software.

Shutting Down the System

To shut down the system:

1. In the QPix Microbial Colony Picking System Software, on the Navigation page, click **File > Exit**.
2. Turn the computer off.
3. Press the button on the back side of control box, from '1' to 'O'.
4. Disconnect the power cord to the instrument.

Emergency Stop

In an emergency, press the Emergency Stop button on the front of the instrument to immediately stop all motion and turn off the instrument. The location of the Emergency Stop button is shown in front panel controls.

Before you restart the instrument, you must pull out the Emergency Stop button and then press the Start button.

Tip: To indicate if the Emergency Stop is engaged, check for a yellow ring visible around the base of the red button. If the yellow ring is visible, the Emergency Stop is disengaged, and the instrument can start.

Preparing to Run Processes

You should thoroughly clean and maintain the instrument to ensure that it continues to function correctly. See Maintenance on page 109.

Before you run a process, do the following:

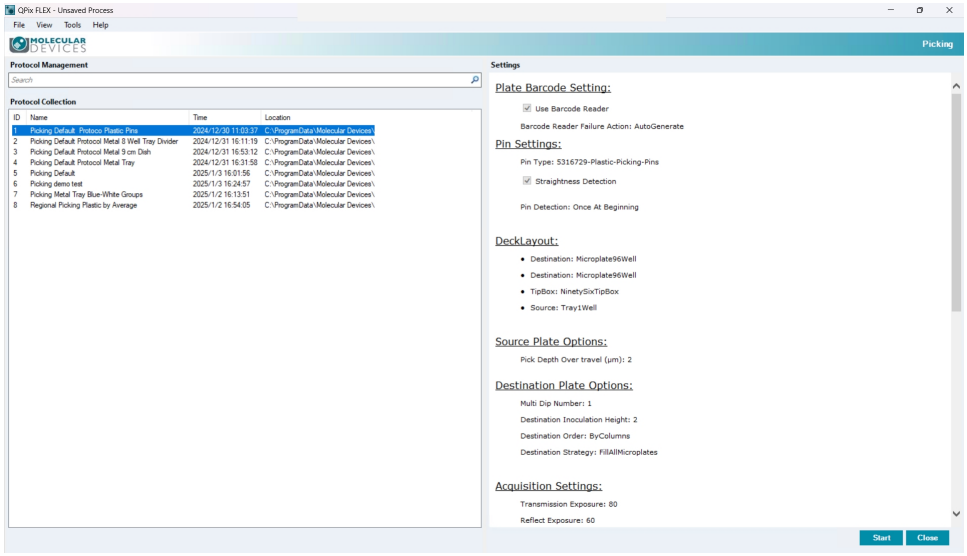
1. Manually clean the instrument interior. See Cleaning the Instrument on page 109.
2. Install and fill the wash baths with a suitable quantity of the defined solutions.

   Note: Before you run a process that uses the wash baths, verify the locations and solutions of the wash baths and also the wash cycles that are required for use. Always top off the wash baths with their defined cleaning fluids and then wipe down the surfaces of the instrument interior.

3. Start the instrument and the software.
4. Prepare plates, OmniTrays, or Petri dishes for the application.
5. Select and run the process.

Chapter 6: Picking Process

The Picking process allows you to pick colonies from receptacles using standard picking.

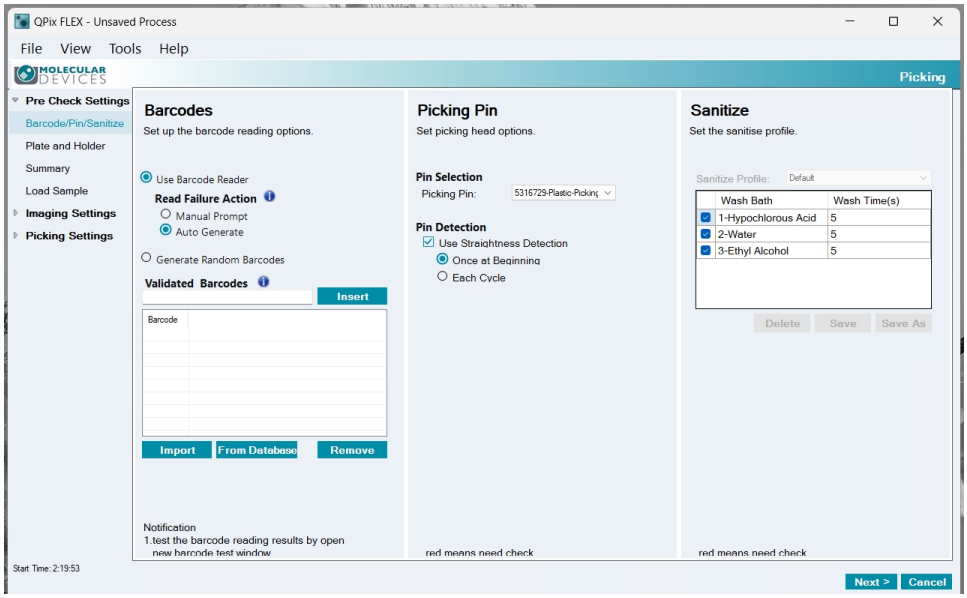


To use the Picking process:

1. On the Navigation page, double-click  **Picking** to display the Protocol Management page.
2. In the **Protocol Collection** list, select an existing protocol to run, or click in the white area to deselect the protocol and start with a default protocol.
3. Click **Start** to display the Barcode/Pin/Sanitize page.

Defining Plate Barcodes, Picking Pins, and Sanitize Settings

Use the Barcode/Pin/Sanitize page to manage the settings for barcodes, tips, and sanitize processes.



After you define the barcode settings, the picking pin settings, and the sanitize settings, click **Next** to display the Plate and Holder page. See Defining Plate and Holder Settings on page 42.

Managing Plate Barcodes

To manage barcodes:

1. Select a barcode option:
   - Select **Use Barcode Reader** to use the instrument barcode reader to read the receptacle.
   - Select **Generate Random Barcodes** to not use the instrument barcode reader. When you select this option, the following options are not available.
2. If you select the Use Barcode Reader option, select a **Read Failure Action** option:
   - Select **Manual Prompt** to have the software prompt you to enter the barcode information.
   - Select **Auto Generate** to have the software generate a virtual barcode for the receptacle.
3. The **Validated Barcodes** table lists the barcodes.
   - In the text field, enter the name of the barcode you define above the table and click **Insert** to add the barcode to the list.
   - Click **Import** to import barcode from a text file. Choose a text file with **.txt** extension and click **Import** to load the barcodes into the list.
   - Click **From Database** to add barcodes from the database in the system. Select the process and choose an existing receptacle. Click **Add Barcode** to at that barcode to the list.
   - Select a barcode in the list and click **Remove** to remove a barcode from the list.

Managing Picking Pins

You define picking pin settings from Labware on the Navigation page. See Managing Labware on page 97.

To manage picking pins:

1. Click the **Picking Pin** drop-down and select the picking pin to use.
   When you select metal pins, the Sanitize settings are available.

   Note: When you select 50 µL pipetting tips, set a minimum colony size of at least 0.5 mm. Smaller size colonies cannot be guaranteed. Since pipetting tips may have straightness variance issue, you should select the Use Straightness Detection checkbox and select the Each Cycle calibration. Do not use other type 50 µL tips since the adapter size and the calibration system use an AI camera.

2. Select the **Use Straightness Detection** checkbox to use straightness detection. If you select this checkbox, select one of the following options.
   Clear the **Use Straightness Detection** checkbox to not use straightness detection.
   - Select **Once At Beginning** to do straightness detection one time before picking.
   - Select **Each Cycle** to do straightness detection for each cycle.

Manage Sanitize Settings

When you select metal pins, the Sanitize Profile table allows you to define up to three wash baths and the number of wash times.

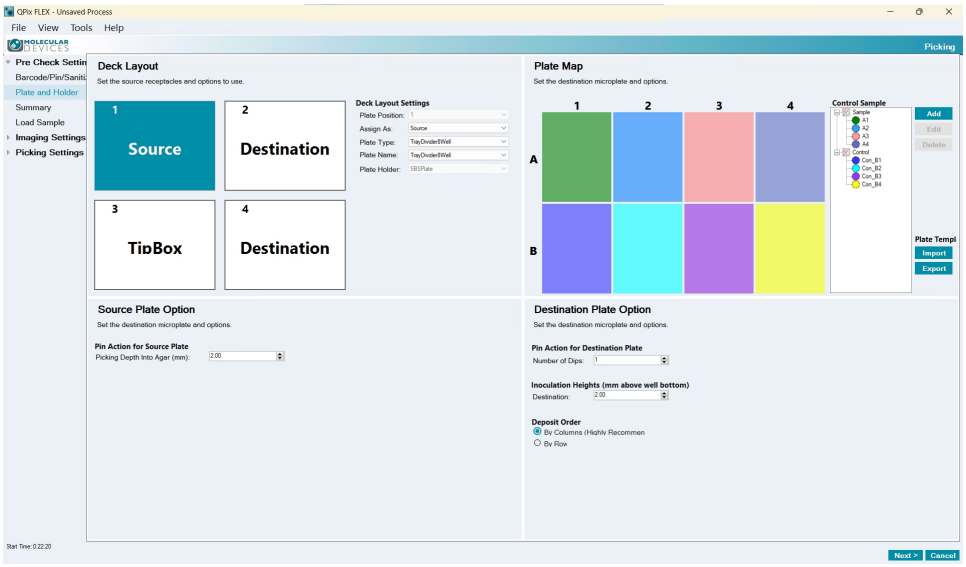
To manage sanitize profiles:

1. Click the **Sanitize Profile** drop-down and select the sanitize profile to use.
2. In the first column of the table, select the checkbox for each wash bath to use.
   Clear the checkbox for unused wash baths.
3. In the **Bath** column, you cannot change the name of the bath.
4. Double-click in a cell in the **Wash Times** column and enter the number of seconds to wash using that wash bath.

Defining Plate and Holder Settings

Use the Plate and Holder page to manage the deck layout and plate map settings.

You define plate types and tip boxes from Labware on the Navigation page. See Managing Labware on page 97.



To define deck layout and plate map settings:

1. In the Deck Layout area, select the number 1 deck layout position to define the settings for the first plate position on the instrument deck. In the Deck Layout Settings area, the **Plate Position** field displays 1.
2. Click the **Assign As** drop-down:
   - Select **None** if you do not intend to place a plate in the first deck position in the instrument. The remaining fields are not available.
   - Select **Source** if you intend to place a source plate in the first deck position. The Plate Map area displays settings to define a source plate. See Source Plate Settings on page 43.
   - Select **Destination** if you intend to place a destination plate in the first deck position. The Plate Map area displays settings to define a destination plate. See Destination Plate Settings on page 44.
   - Select **Tip Box** if you intend to place a tip box in the first deck position. The Plate Map area displays settings to define a tip box. See Tip Box Settings on page 45.
3. Repeat for plate positions 2-4.
4. After you define the source and destination plates, click **Next** to display the Summary Page.

Source Plate Settings

When you assign a deck position as a Source plate, you use the Source Plate Options area in the lower left and the Plate Map area displays options to define the source plate settings.

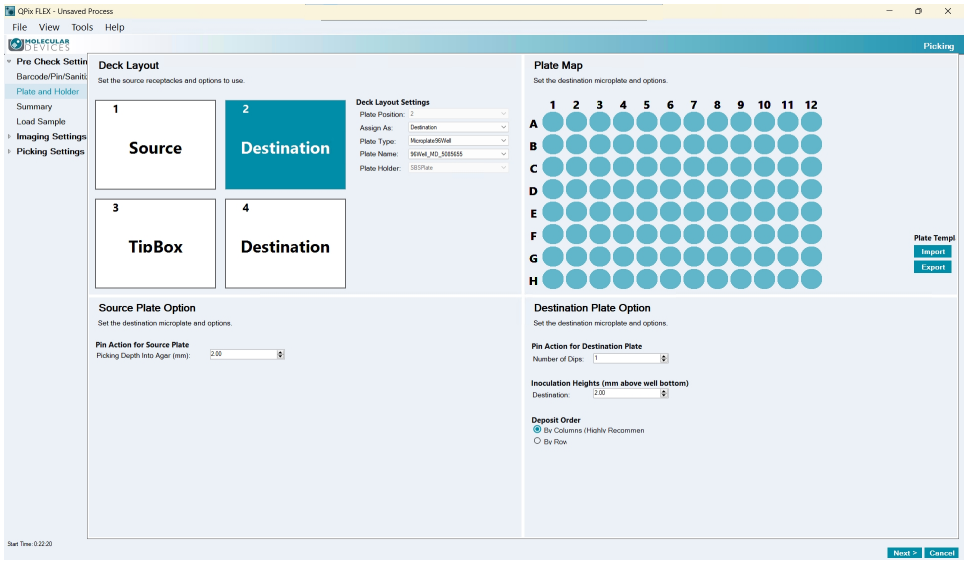
Note: The settings in the Destination Plate Options area in the lower right are not applicable for a source plate.

To define source plate settings:

1. In the Deck Layout area, click the **Plate Type** drop-down and select the type of plate you intend to place in the deck position you select.
2. Click the **Plate Name** drop-down and select the name of the plate you intend to place in the deck position you select.
3. Click the **Plate Holder** drop-down and select the type of holder to use to hold the plate on the instrument deck.
4. In the Plate Map area, click **Import** to import a plate template, if needed.
5. in the Control Sample section, click **Add** to display the Add dialog:
6. in the Control Sample hierarchy, select an item:
   - Click **Edit** to edit the item.
   - Click **Delete** to delete the item.
7. In the Plate Map area:
   a. Drag the cursor over the group of wells from which to draw an item from Control Sample list.
   b. Right-click and select the item from the Control Sample list to draw from the source plate.
   c. Repeat for each well from which to draw the source item.
8. In the Source Plate Option area, in the **Picking Depth Into Agar** field, enter the depth to insert the pins in the agar for picking.
9. Click **Export** to export a plate template.
10. Repeat for each source plate.

Destination Plate Settings

When you assign a deck position as a Destination plate, you use the Destination Plate Options area in the lower right and the Plate Map area displays options to define the destination plate settings.



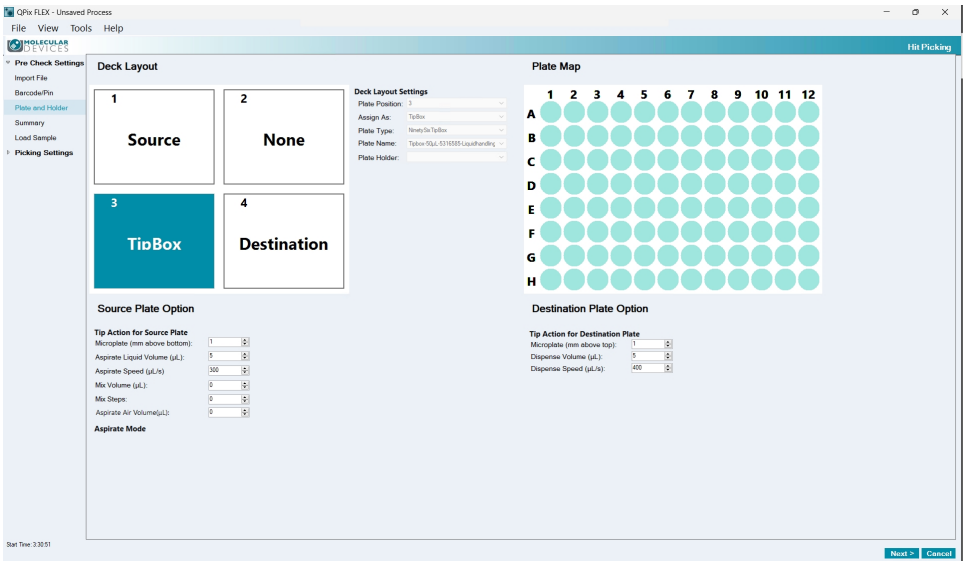
Note: The settings in the Source Plate Options area are not applicable for a destination plate.

To define destination plate settings:

1. In the Deck Layout area, click the **Plate Type** drop-down and select the type of plate you intend to place in the plate position you selected.
2. Click the **Plate Name** drop-down and select the name of the plate you intend to place in the plate position you select.
3. Click the **Plate Holder** drop-down and select the type of holder to use to hold the plate on the instrument deck.
4. In the Plate Map area:
   - Click **Import** to import a plate template.
   - Click **Export** to export the plate and holder settings as a template for future use.
5. In the Plate Map area, drag the cursor over the group of wells:
   - Right-click and select **Select** to indicate that the Control Sample item from the source plate is to be dispensed into the selected wells.
   - Right-click and select **Unselect** to indicate that the Control Sample item from the source plate is not to be dispensed into the selected wells.
6. In the Destination Plate Option area, In the **Pin Action for Destination Plate - Number of Dips** field, enter the number of times to dip the pins to dip the pins a number of times, (maximum 5 dips).
7. In the **Inoculation Heights Above Well Bottom - Destination** field, enter the height of the pin above the bottom of the plate to inoculate the destination plate.
8. Select a Deposit Order:
   - Select **By Columns** to deposit the picked colonies by column.
   - Select **By Rows** to deposit the picked colonies by row.
9. Repeat for each destination plate.

Tip Box Settings

When you assign a deck position as a Tip Box, the Plate Map area displays options to define the tip box settings.



Note: The settings in the Source Plate Options area and the Destination Plate Options area are not applicable for a tip box.

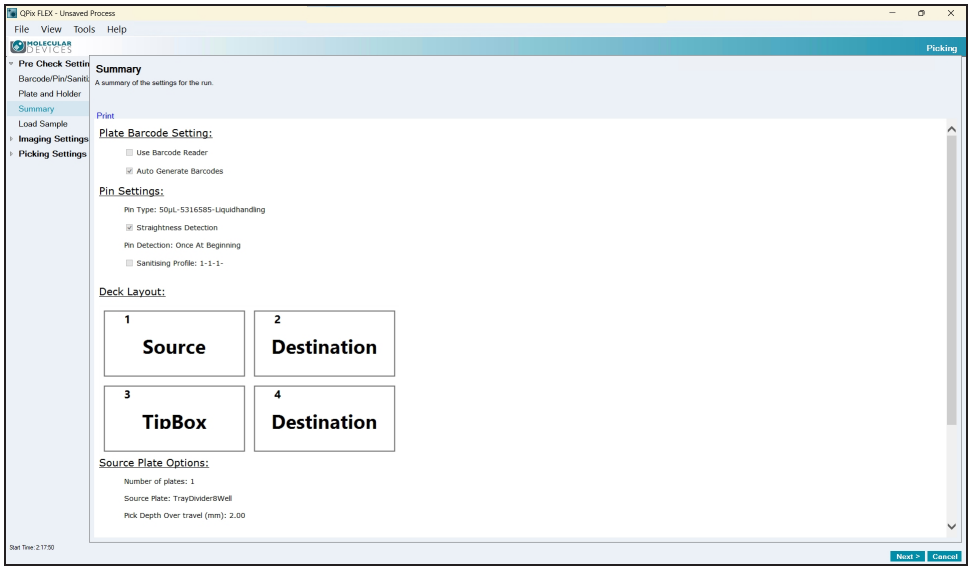
To define tip box settings:

1. In the Deck Layout area, click the **Plate Type** drop-down and select the type of tip box you intend to place in the deck position you select.
2. Click the **Plate Name** drop-down and select the name of the plate you intend to place in the plate position you select.
3. In the Plate Map area, drag the cursor over the group of wells:
   - Right-click and select **Empty** to indicate that there is no tip to be used for that well position on the destination plate.
   - Right-click and select **Filled** to indicate that you have installed a tip for that well position of the destination plate to receive a control sample item from the source plate.
4. Repeat for each tip box.

Viewing the Settings Summary

The Summary page displays a summary of the picking protocol settings. Review the summary details. To make changes, select the page on the left where the changes can be made.

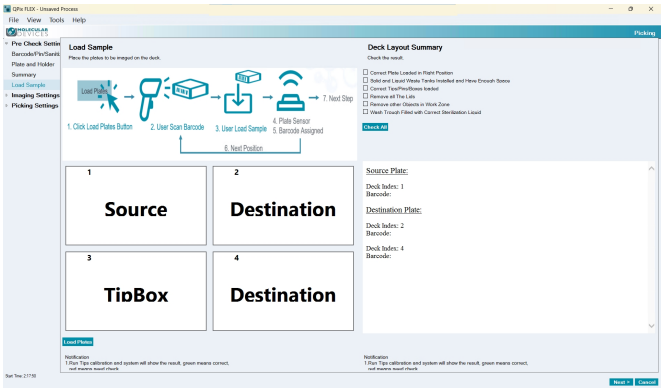
To print the summary, click **Print**.



Click **Next** to load the plates.

Loading Samples

The Load Sample page provides instructions to load the plates into the instrument.



WARNING! Ensure the correct tips/pins are used. Using incorrect tips/pins will damage the system.

To load plates:

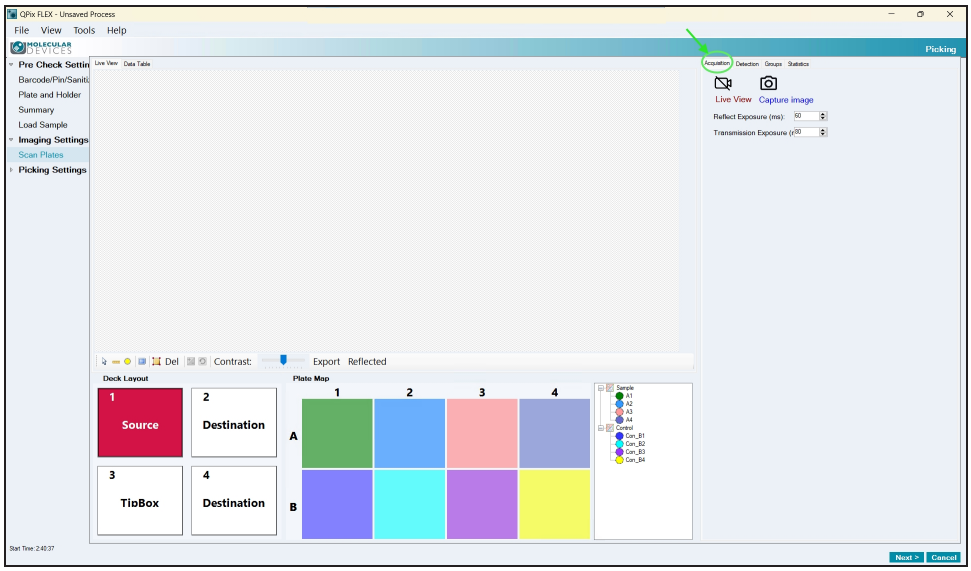
1. Using the position map as your guide, place the plates into the instrument. If prompted enter the barcode for each plate.
2. Select the checkboxes in the Deck Layout Summary area to confirm that you have:
   - The correct plate loaded in the correct position on the instrument deck layout. See Defining Plate and Holder Settings on page 42.
   - The solid and liquid waste tanks have been installed and have enough space. See Setting Up and Maintaining Waste Collection Receptacles on page 26.
   - The correct tips and pin boxes have been loaded.
   - All plate lids have been removed.
   - The work zone is clear of extraneous objects.
   - The wash trough is filled with the correct sterilization liquid. See Defining Plate Barcodes, Picking Pins, and Sanitize Settings on page 40.
3. Click **Load Plates** to have the instrument close the door and load the plates into the instrument.
4. Click **Next** to display the Imaging Settings page.

Scan Plates

Use the Scan Plates page to capture the image, detect colonies, group colonies and to view statistics.

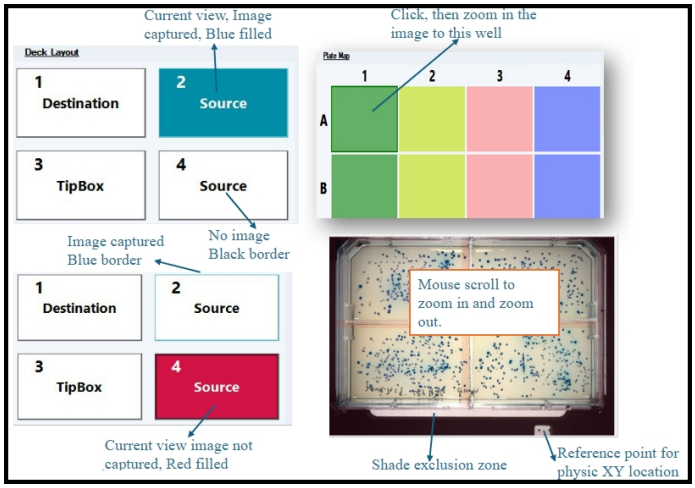
Acquisition Tab

Use the Acquisition tab on the Scan Plate page to capture the image and to define the settings for each position.



To capture an image:

1. In the **Reflect Exposure** field, enter the number of milliseconds to reflect the image.
2. In the **Transmission Exposure** field, enter the number of milliseconds to expose the transmission.
3. Click either:
   - Click **Live View** to display the live view of the image.
   - Click **Capture Image** to capture the image.
4. After the image is captured, the Deck Layout displays the following indicators:

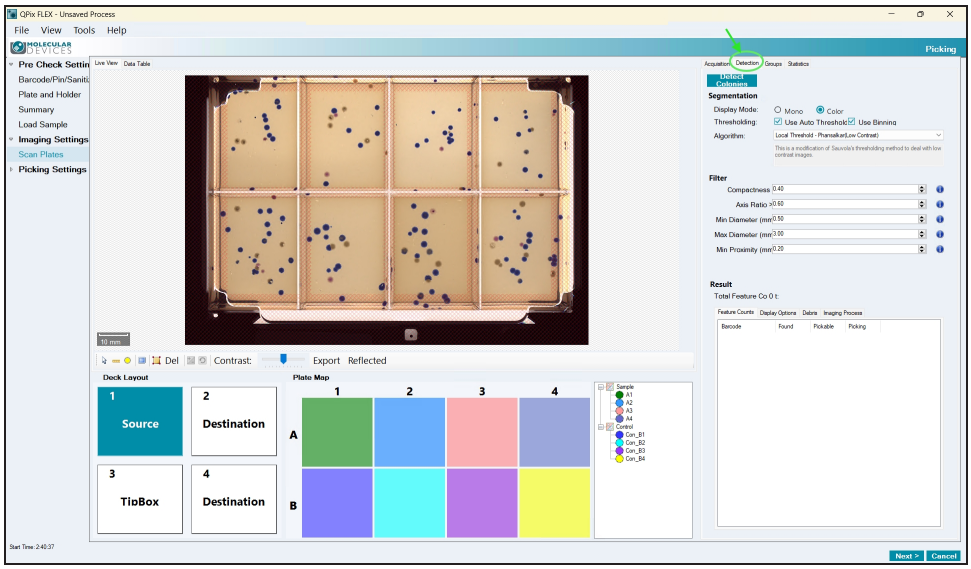


5. Use the following icons:
   - Click  to select colonies.
   - Click to use a ruler to measure colonies.
   - Click  to create an area.
   - Click  to increase the image to full screen. Press **Esc** to return to normal size.
   - Click  to draw a polygon.
   - Click  to delete a selection.
   - Click  to toggle the user selection on the Groups tab.
   - Click  to remove a user selection from the Groups tab.
   - Use the **Contrast** slider to adjust the contrast.
   - Click **Export** to export the settings.
   - Click **Transmission** to toggle the view from a Reflected view to a Transmission view and vice versa.
6. Right-click in the image:
   - Select **View** to view a colony.
   - Select **Ruler** to use a ruler to measure colonies.
   - Select **Area** to create an area.
   - Select **Intensity** to adjust the intensity.
   - Select **Copy to Clipboard** to copy the image to the computer clipboard.
   - Select **Save Image As** to save the image to the computer.
7. Select the following tabs:
   - Select the **Detection** tab to define global settings that apply to all positions. See Detection Tab on page 50.
   - Select the **Groups** tab to define settings for each position. See Groups Tab on page 52.
   - Select the **Statistics** tab to view statistics. See Statistics Tab on page 55.

After you finish everything on the Scan Plate tabs, click **Next** to display the Picking Review page.

Detection Tab

Use the Detection tab on the Scan Plates page to define global settings that apply to all positions.



To define global settings that apply to all positions:

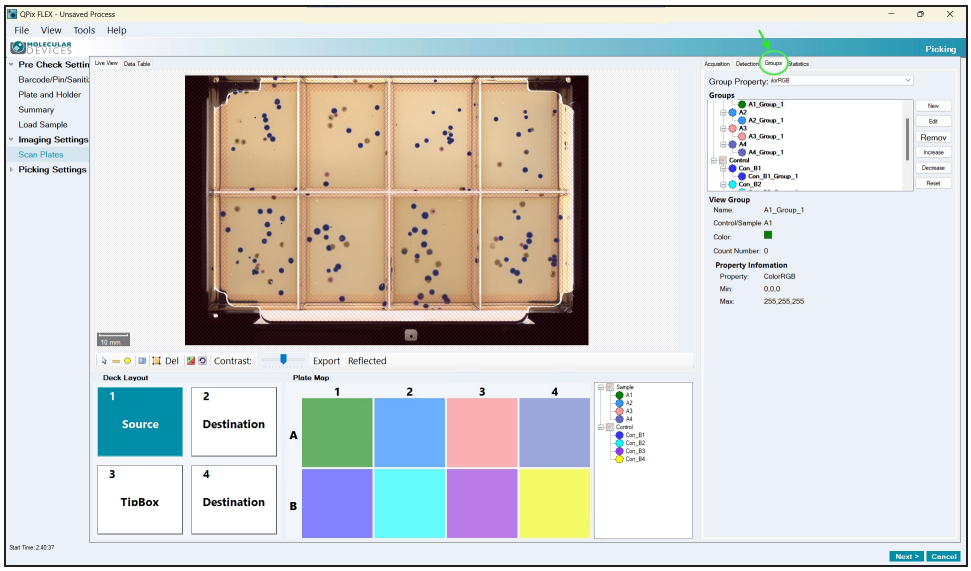
1. On the Scan Plates page, select the **Detection** tab.
2. Click **Detect Colonies** to detect colonies.
3. In the Segmentation area:
   a. Select a **Display Mode**:
      - Select **Mono** to display colonies in monochromatic black and white.
      - Select **Color** to display colonies with color enhancement.
   b. Select the **Use Auto Threshold** checkbox to use auto thresholding.
      Clear the **Use Auto Threshold** checkbox to not use auto thresholding.
   c. Select the **Use Binning** checkbox to use binning.
      Clear the **Use Binning** checkbox to not use binning.
   d. Click the **Algorithm** drop-down and select an algorithm.
4. In the Filter area:
   a. In the **Compactness** field, enter the compactness.
   b. In the **Axis Ratio** field, enter the axis ratio.
   c. In the **Min Diameter** field, enter the minimum diameter.
   d. In the **Max Diameter** field, enter the maximum diameter.
   e. In the **Min Proximity** field, enter the minimum proximity.

5. In the Result area:
   a. Select the **Feature Counts** tab to display the feature counts.
   b. Select the **Display Options** tab to define the following display option settings:
      - Select the **Display Detected Features** checkbox to display detected features. If you select this checkbox, select the **Shade Features** checkbox to shade features. Select the **Display Proximity Indicators** checkbox to display proximity indicators. Clear the **Display Detected Features** checkbox to not display detected features.
      - Select the **Shade Exclusion Zone** checkbox to shade the exclusion zone. Clear the **Shade Exclusion Zone** checkbox to not shade the exclusion zone.
      - Select the **Display Colony ID** checkbox to display the colony ID. Clear the **Display Colony ID** checkbox to not display the colony ID.
   c. Select the **Debris** tab to define the following debris settings:
      - In the **Diameter** field, enter the diameter.
      - In the **Axis Ratio** field, enter the axis ratio.
      - In the **Diameter** field, enter the diameter.
   d. Select the **Imaging Process** tab to define the following imaging prosses settings:
      - Select the **Enhance Contrast** checkbox to enhance contrast. Clear the **Enhance Contrast** checkbox to not enhance contrast.
      - Select the **Invert Image** checkbox to invert the image. Clear the **Invert Image** checkbox to not invert the image.
      - Select the **Subtract Background** checkbox to subtract the background. Clear the **Subtract Background** checkbox to not subtract the background.
      - Select the **Merge Hole** checkbox to merge the hole. Clear the **Merge Hole** checkbox to not merge the hole.
6. Use the following icons:
   - Click  to select colonies.
   - Click to use a ruler to measure colonies.
   - Click  to create an area.
   - Click  to increase the image to full screen. Press **Esc** to return to normal size.
   - Click  to draw a polygon.
   - Click  to delete a selection.
   - Click  to toggle the user selection on the Groups tab.
   - Click  to remove a user selection from the Groups tab.
   - Use the **Contrast** slider to adjust the contrast.
   - Click **Export** to export the settings.
   - Click **Transmission** to toggle the view from a Reflected view to a Transmission view and vice versa.
7. Select the following tabs:
   - Select the **Acquisition** tab to define settings that apply to each position. See Acquisition Tab on page 48.
   - Select the **Groups** tab to define settings for each position. See Groups Tab on page 52.
   - Select the **Statistics** tab to view statistics. See Statistics Tab on page 55.

After you finish everything on the Scan Plate tabs, click **Next** to display the Picking Review page.

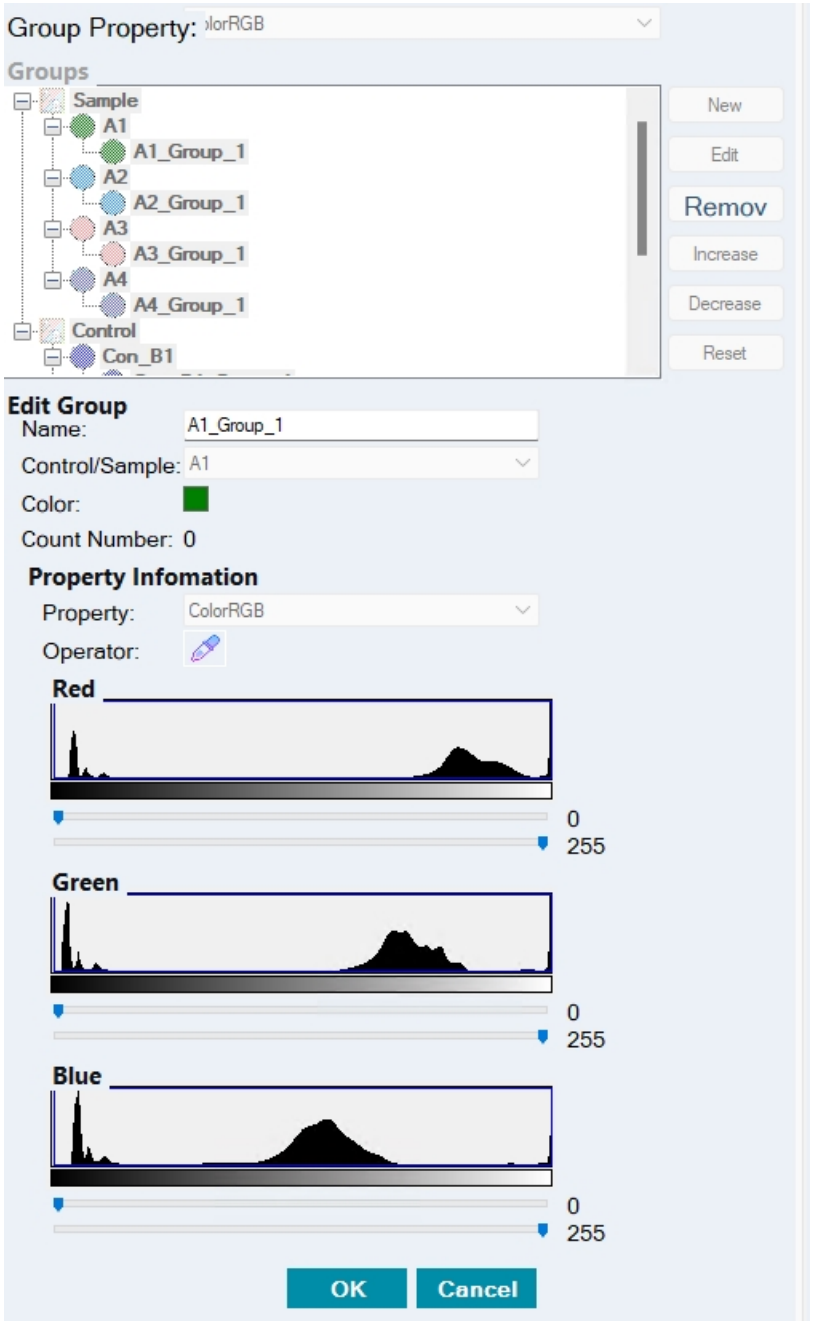
Groups Tab

Use the Groups tab on the Scan Plates page to define settings that apply to each position.



To define settings that apply to each position:

1. On the Scan Plates page, select the **Groups** tab.
2. Click the **Group Property** drop-down:
   - Select **Compactness** to group colonies by compactness.
   - Select **Axis Ratio** to group colonies by axis ratio.
   - Select **Min Diameter** to group colonies by minimum diameter.
   - Select **Max Diameter** to group colonies by maximum diameter.
   - Select **Color RGB** to group colonies by color.
3. In the Groups area:
   - Click **New** to create a new group.
   - Select a group and click **Edit** to edit the group you select.
   - Select a group and click **Remove** to remove the group you select.
   - Select a group and click **Increase** to increase the group you select.
   - Select a group and click **Decrease** to decrease the group you select.
   - Select a group and click **Reset** to reset the group you select.

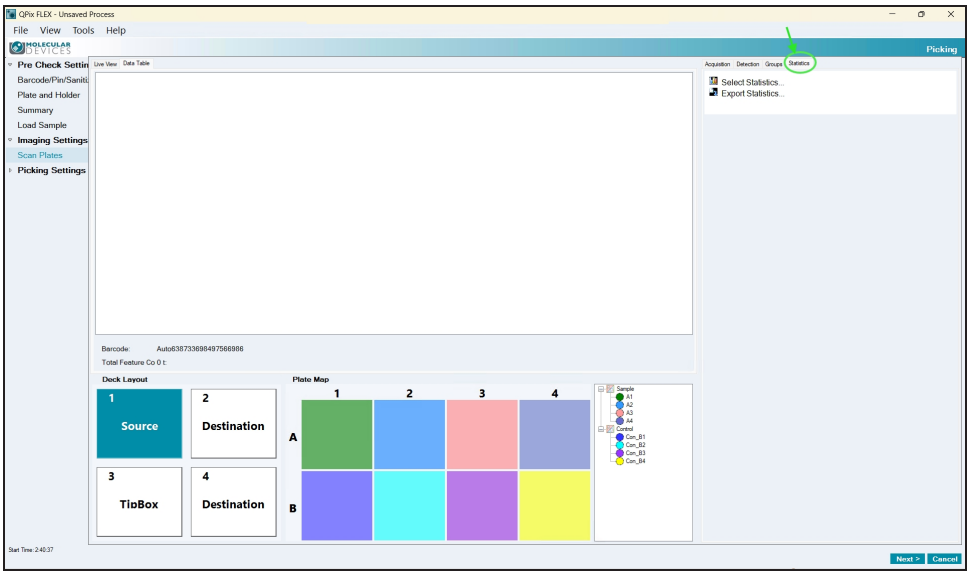
4. When you click New or Edit, the area below the Groups list allows you to enter the properties for the new group or the group to edit.
   - For all group properties except Color RGB, you define the Name, Control Sample, Color, Operator, and Minimum Value.
   - For Color RGB you use the Operator in the Property Information area to assign the range for the RGB threshold.
   - 

5. Use the following icons:
   - Click  to select colonies.
   - Click to use a ruler to measure colonies.
   - Click  to create an area.
   - Click  to increase the image to full screen. Press **Esc** to return to normal size.
   - Click  to draw a polygon.
   - Click  to delete a selection.
   - Click  to toggle the user selection on the Groups tab.
   - Click  to remove a user selection from the Groups tab.
   - Use the **Contrast** slider to adjust the contrast.
   - Click **Export** to export the settings.
   - Click **Transmission** to toggle the view from a Reflected view to a Transmission view and vice versa.
6. Select the following tabs:
   - Select the **Acquisition** tab to define settings that apply to each position. See Acquisition Tab on page 48.
   - Select the **Detection** tab to define global settings that apply to all positions. See Detection Tab on page 50.
   - Select the **Statistics** tab to view statistics. See Statistics Tab on page 55.

After you finish everything on the Scan Plate tabs, click **Next** to display the Picking Review page.

Statistics Tab

Use the Statistics tab on the Scan Plates page to view statistics.



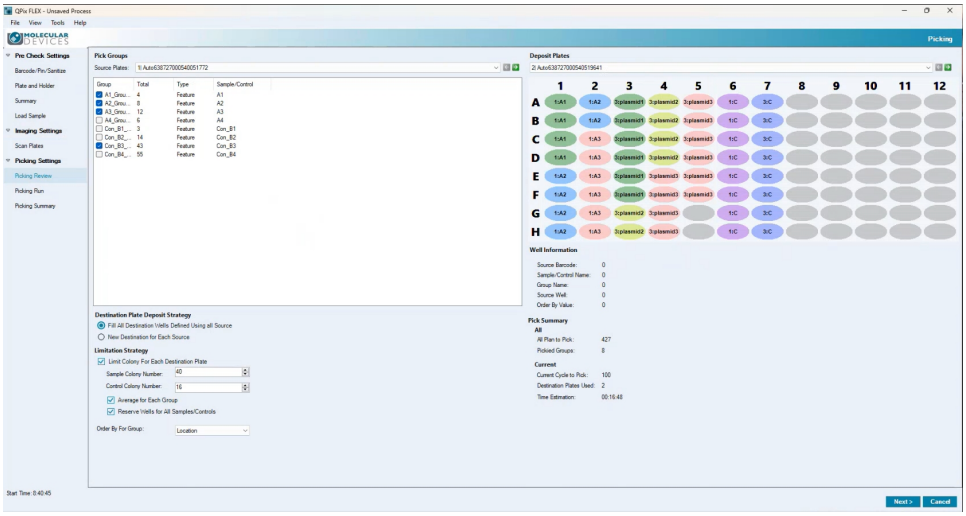
Click on each deck position to display the statistics for that specific plate.

Click the column headers to sort the information by column.

After you finish everything on the Scan Plate tabs, click **Next** to display the Picking Review page.

Picking Review

Use the Picking Review page to define the colonies to pick.



The left side displays the source plates, and the right side displays the destination plates.

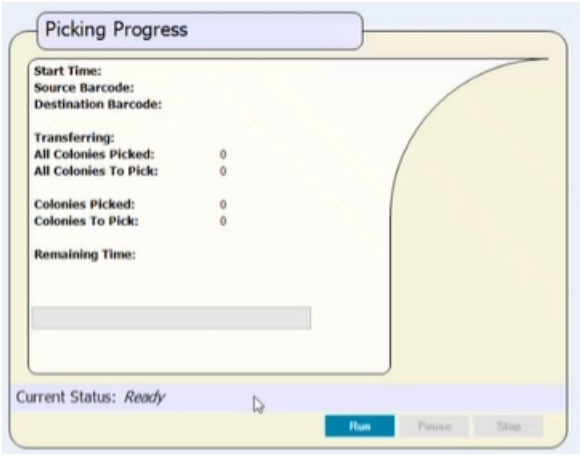
To review the picking process:

1. Below the Pick Groups caption, click the **Source Plate** drop-down and select the source plate.
2. In the Pick Groups list, select the checkbox for each group from which to pick colonies.
3. Below the Deposit Plates caption, click the drop-down and select the destination plate.
4. Below the Pick Groups area, select a Destination Plate Deposit Strategy:
   - Select **Fill All Destination Wells Defined Using All Sources** to use both source plates (deck positions 1 and 3) to fill all the wells in the first destination plate (deck position 2), if needed.
   - Select **New Destination For Each Source** to use the first source plate (deck position 1) to fill the wells in the first destination plate (deck position 2) and to use the second source plate (deck position 3) to fill the wells in the second destination plate (deck position 4).
5. Select the **Limit Colony for Each Destination Plate** checkbox to define the number of colonies to pick. If you select this checkbox, the following fields allow you to define the number of colonies.
   Clear the **Limit Colony for Each Destination Plate** checkbox to pick all applicable colonies. The following fields are not available.
   a. In the **Sample Colony Number** field, enter the number of sample colonies to pick.
   b. In the **Control Colony Number** field, enter the number of control colonies to pick.
   c. Select the **Average for Each Group** checkbox to leave blank wells if there are fewer than the average number of colonies to pick from the source plate.
   Clear the **Average for Each Group** checkbox to not leave blank wells in the destination plate.
   d. Select the **Reserve Wells For All Samples/Controls** checkbox to reserve wells in the destination plate for additional colonies.
   Clear the **Reserve Wells For All Samples/Controls** checkbox to not reserve wells in the destination plate for additional colonies.

6. Click the **Order By For Group** drop-down and select the group by which to order.
7. Click **Next** to display the Picking Run page.

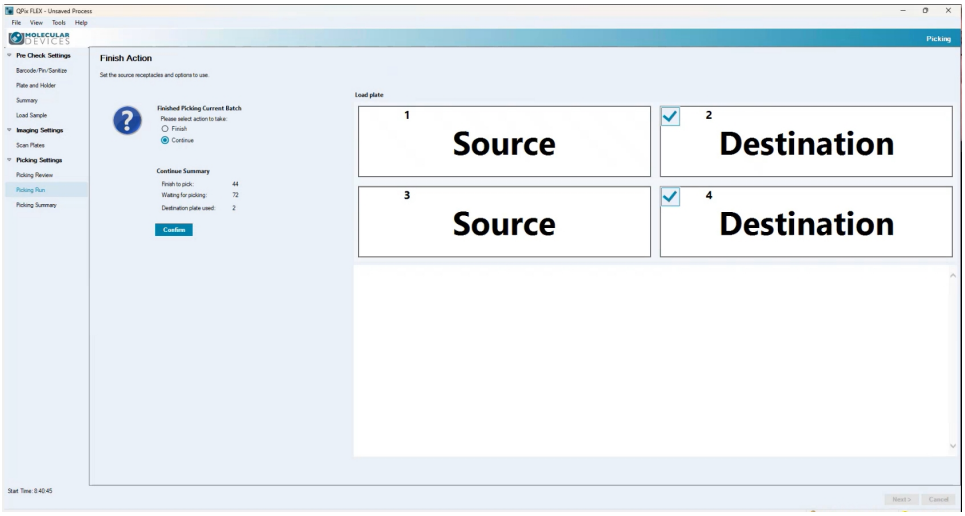
Picking Run

The Picking Run page initially displays the Picking Progress status dialog.



- Click **Run** to start the picking process.

After the process completes, the page displays the summary of the picking run.

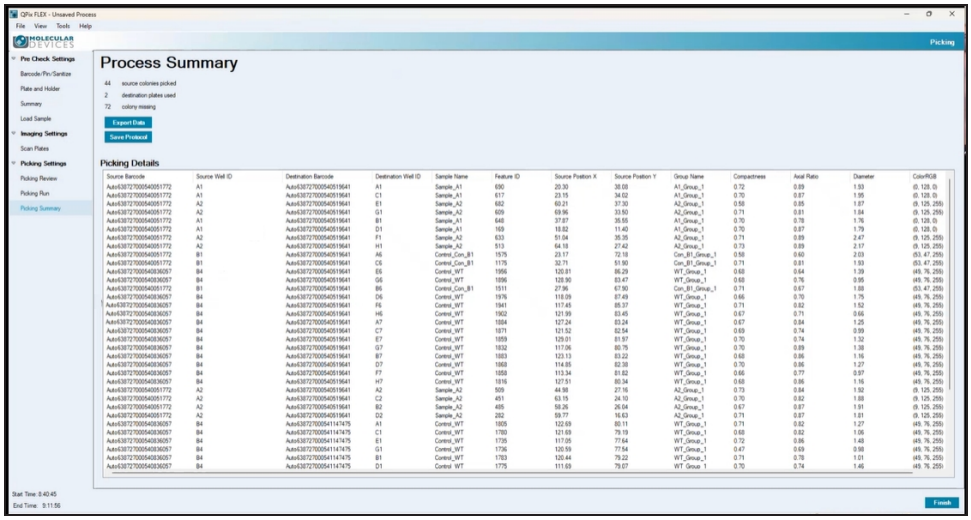


To confirm the process run:

1. Select an action to take:
   - Select **Finish** to finish the process after the run.
   - Select **Continue** to run the process an additional time after you change the tip box or a destination plate.
     You can save the settings in the protocol file when you have a multi-source run, you start a new process, or you change the settings.
2. Click **Confirm** to either run the process an additional time or to display the Finish page.

Viewing the Picking Summary

The Picking Summary page displays a summary of the process. Review the summary details.

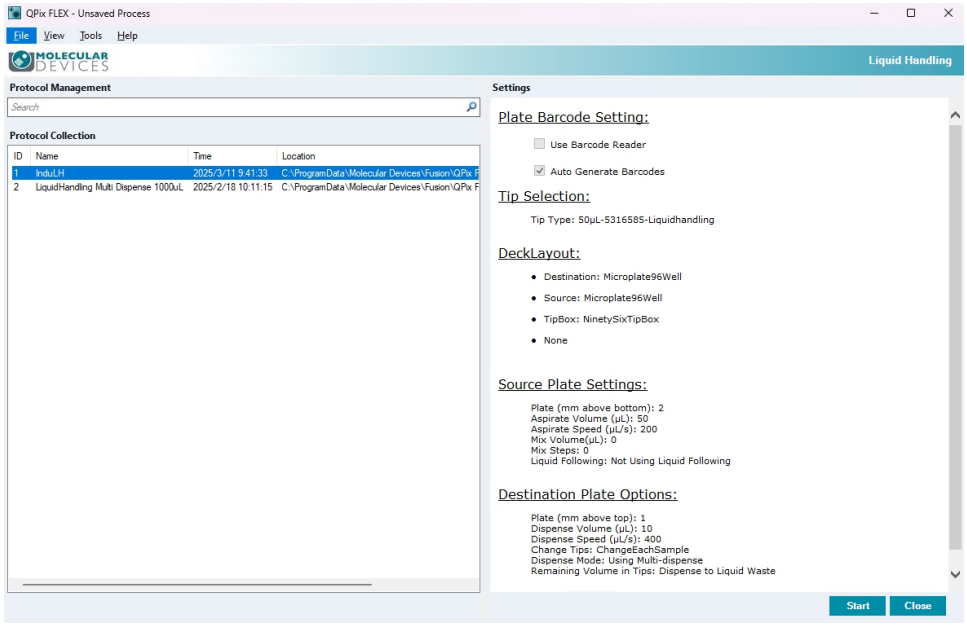


To wrap up the process:

- Click **Export Data** to export the process data.
- Click **Save Protocol** to save the protocol to the Protocol Management page for future use.
- Click **Finish** to return to the Picking process Protocol Management page.

Chapter 7: Liquid Handling

Liquid Handling allows you to define and run processes that involve the transfer of liquids during a process.

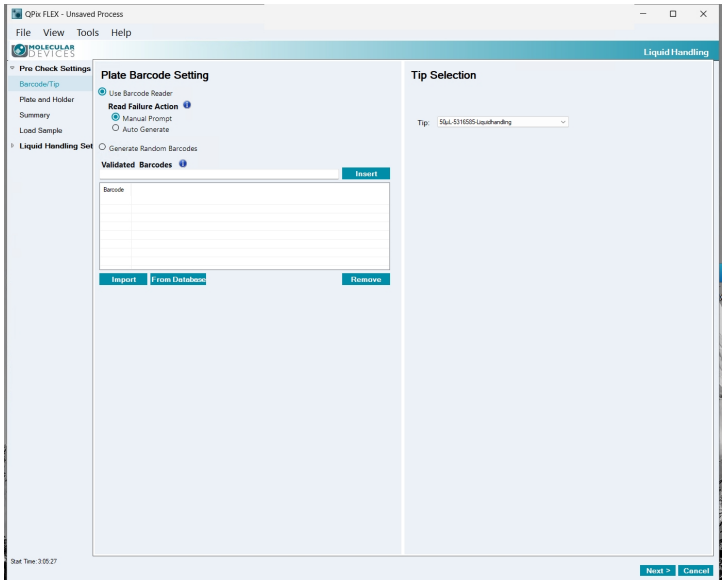


To prepare for liquid handling:

1. On the Navigation page, double-click **Liquid Handling** to display the Protocol Management page.
2. In the **Protocol Collection** list, select an existing protocol to run, or click in the white area to deselect the protocol and start with a default protocol.
3. Click **Start** to display the Barcode/Tip page.

Defining Barcode and Tip Settings

Use the Barcode/Tip page to manage barcodes and tips for Liquid Handling processes.



Managing Plate Barcodes

To manage barcodes:

1. Select a barcode option:
   - Select **Use Barcode Reader** to use the instrument barcode reader to read the receptacle.
   - Select **Generate Random Barcodes** to not use the instrument barcode reader. When you select this option, the following options are not available.
2. If you select the Use Barcode Reader option, select a **Read Failure Action** option:
   - Select **Manual Prompt** to have the software prompt you to enter the barcode information.
   - Select **Auto Generate** to have the software generate a virtual barcode for the receptacle.
3. The **Validated Barcodes** table lists the barcodes.
   - In the text field, enter the name of the barcode you define above the table and click **Insert** to add the barcode to the list.
   - Click **Import** to import barcode from a text file. Choose a text file with **.txt** extension and click **Import** to load the barcodes into the list.
   - Click **From Database** to add barcodes from the database in the system. Select the process and choose an existing receptacle. Click **Add Barcode** to at that barcode to the list.
   - Select a barcode in the list and click **Remove** to remove a barcode from the list.

Managing Tips

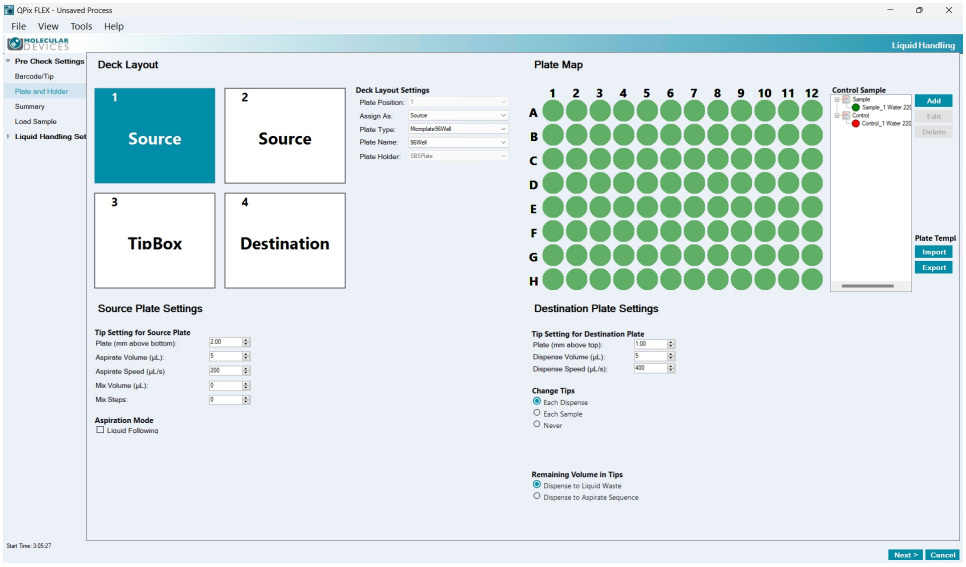
You define tip settings from Labware on the Navigation page. See Managing Labware on page 97.

To select the liquid handling tip:

1. In the Tip Selection area, click the **Tip** drop-down and select a tip.
2. Click **Next** to display the Plate and Holder page.

Defining Plate and Holder Settings

Use the Plate and Holder page to manage the deck layout and plate map settings. You define plate types and tip boxes from Labware on the Navigation page. See Managing Labware on page 97.



To define deck layout and plate map settings:

1. In the Deck Layout area, select the number 1 deck layout position to define the settings for the first position on the instrument deck. In the Deck Layout Settings area, the **Selected Plate Position** field displays 1.
2. Click the **Assign As** drop-down:
   - Select **None** if you do not intend to place a plate in the first deck position in the instrument. The remaining fields are not available.
   - Select **Source** if you intend to place a source plate in the first deck position. The Plate Map area displays settings to define a source plate. See Source Plate Settings on page 64.
   - Select **Destination** if you intend to place a destination plate in the first deck position. The Plate Map area displays settings to define a destination plate. See Destination Plate Settings on page 65.
   - Select **Tip Box** if you intend to place a tip box in the first deck position. The Plate Map area displays settings to define a tip box. See Tip Box Settings on page 66.
3. Repeat for deck positions 2-4.
4. After you define the deck layout and the corresponding plate setting described below, click **Next** to display the Summary Page.

Source Plate Settings

When you assign a deck position as a source plate, you use the Source Plate Options area in the lower left and the Plate Map area displays options to define the source plate settings.

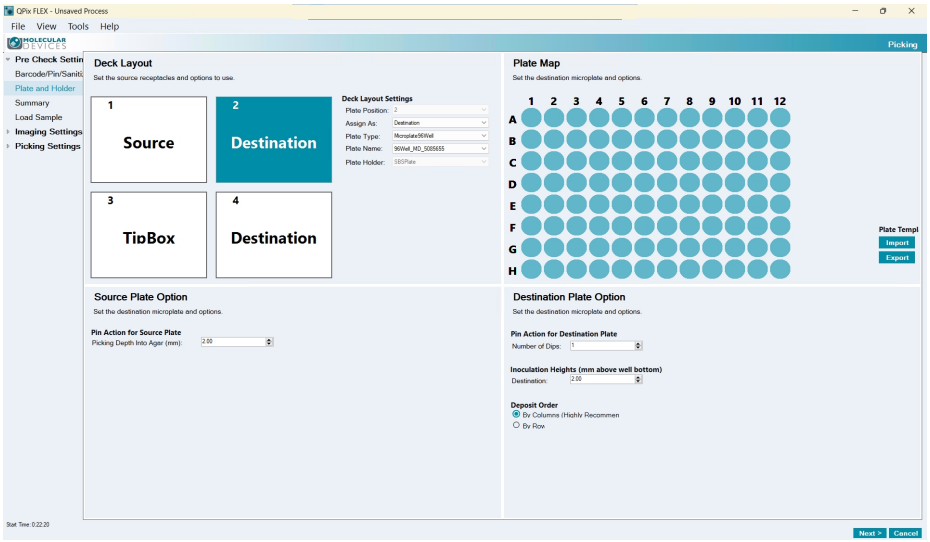
Note: The settings in the Destination Plate Options area in the lower right are not applicable for a source plate.

To define source plate settings:

1. In the Deck Layout area, Under Deck Layout Settings, click the **Plate Type** drop-down and select the type of plate you intend to place in the deck position you select.
2. Click the **Plate Name** drop-down and select the name of the plate you intend to place in the deck position you select.
3. Click the **Plate Holder** drop-down and select the type of holder to use to hold the plate on the instrument deck.
4. In the Plate Map area, click **Import** to import a plate template, if needed.
5. In the Control Sample section, click **Add** to display the Add dialog:
   a. In the **Name** field, enter the name of the liquid.
   b. Click the **Type** drop-down:
      - Select **Sample** to categorize the liquid as a sample.
      - Select **Control** to categorize the liquid as a control.
   c. Click the **Color** box and select a color to identify the sample or control liquid.
   d. Click the **Liquid Type** drop-down and select a liquid type.
   e. In the **Liquid Volume** field, enter the liquid volume and then click the drop-down and select the unit of measure.
6. In the Control Sample hierarchy, select an item:
   - Click **Edit** to edit the item.
   - Click **Delete** to delete the item.
7. In the Plate Map image, drag over the wells to define, right-click and select either **Sample** or **Control** and then select the sample or control from which you intend to aspirate the source liquid.
8. In the Source Plate Settings area, below Tip Settings for Source Plate, in the **Plate Above Bottom** field, enter the distance above the bottom of the plate where the tips start to aspirate the sample.
9. In the **Aspirate Volume** field, enter the liquid volume to aspirate.
10. In the **Aspirate Speed** field, enter how fast to aspirate the liquid.
11. In the **Mix Volume** field, enter the maximum volume of liquid to mix.
12. In the **Mix Steps** field, enter the number of mix steps.
13. Toggle **Liquid Following** checkbox to enable following the liquid level with the tip when aspirating.
14. Repeat for each well and each source plate.

Destination Plate Settings

When you assign a deck position as a destination plate, you use the Destination Plate Settings area in the lower right and the Plate Map area to define the destination plate settings.



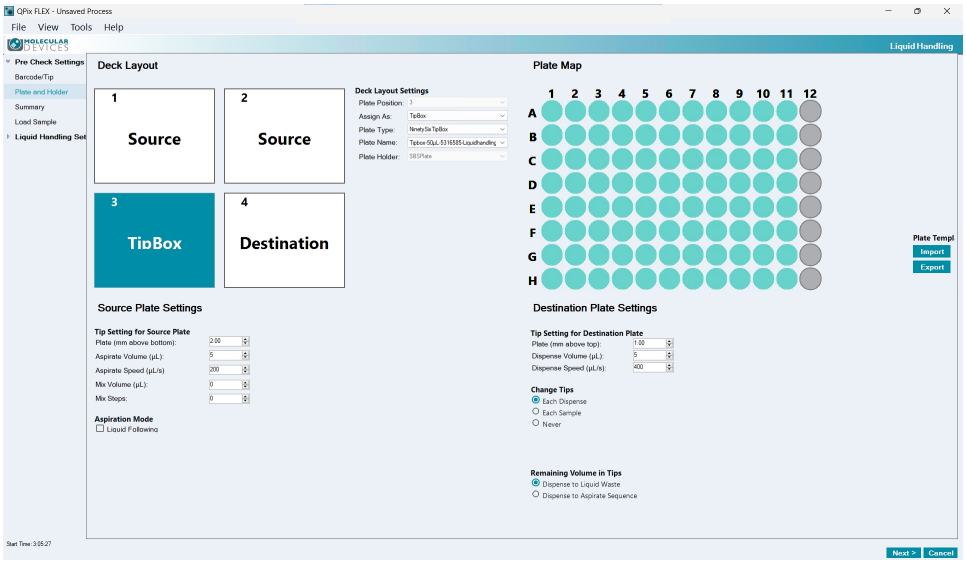
Note: The settings in the Source Plate Options area are not applicable for a destination plate.

To define destination plate settings:

1. In the Deck Layout area, click the **Plate Type** drop-down and select the type of plate you intend to place in the deck position you select.
2. Click the **Plate Name** drop-down and select the name of the plate you intend to place in the deck position you select.
3. Click the **Plate Holder** drop-down and select the type of holder to use to hold the plate on the instrument deck.
4. In the Plate Map area, click **Import** to import a plate template.
5. In the Plate Map image, drag over the wells to define, right-click and select either **Sample** or **Control** and then select the sample or control you intend to dispense into the destination wells you select.
6. In the Destination Plate Option area, In the **Plate (mm above top)** field, enter the height above the plate where the top starts to dispense the liquid.
7. In the **Dispense Volume** field, enter the total volume to dispense.
8. In the **Dispense Speed** field, enter dispense rate.
9. Select a **Change Tips** option:
   - Select **Each Dispense** to change the tips after each dispense.
   - Select **Each Sample** to change the tips after each sample.
   - Select **Never** to not change the tips.
10. Select a **Remaining Volume In Tips** option:
    - Select **Dispense to Liquid Waste** to dispense to waste.
    - Select **Dispense to Aspirate Sequence** to dispense to aspirate sequence.
11. In the Plate Map area click **Export** to export the layout you define as a plate template.
12. Repeat for each well and each destination plate.

Tip Box Settings

When you assign a deck position as a tip box, you use the Deck Layout area to define the tip box settings.



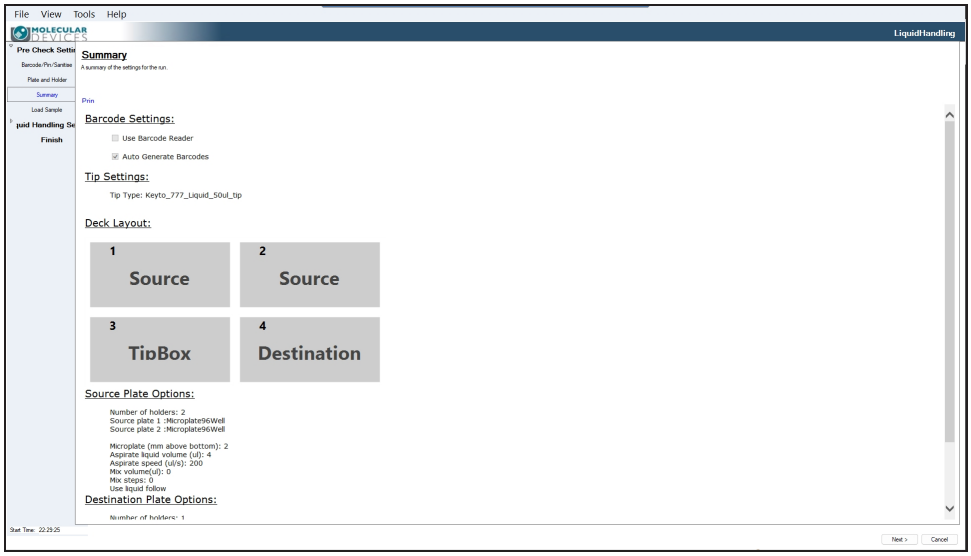
To define tip box settings:

1. Click the **Plate Type** drop-down and select the type of tip box you intend to place in the plate position you select.
2. Click the **Plate Name** drop-down and select the name of the tip box you intend to place in the plate position you select.
3. Click the **Plate Holder** drop-down and select the type of holder to use to hold the tip box on the instrument deck.
4. In the Plate Map area, select a well or group of wells, right-click:
   - Select **Empty** to not have a tip for the wells you select.
   - Select **Filled** to have a tip for the wells you select.
5. Repeat for each tip box.

Viewing the Settings Summary

The Summary page displays a summary of the liquid handling settings. Review the summary details. To make changes, click **Back** until you return to the page where the changes can be made.

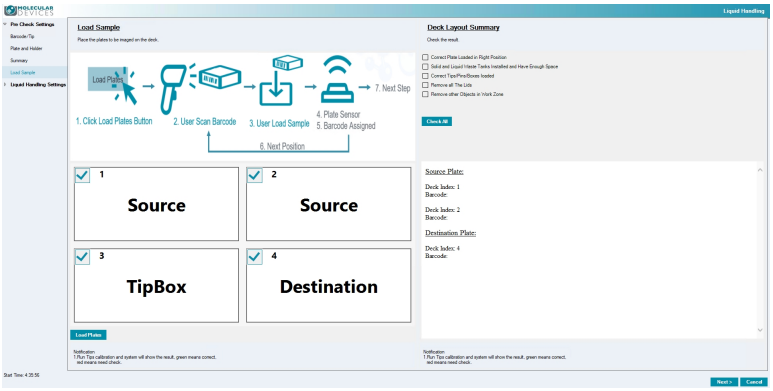
To print the summary, click **Print**.

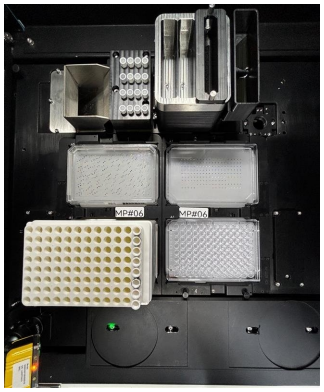


Click **Next** to load the plates.

Load Samples

The Load Samples page provides instructions to load the plates into the instrument.





WARNING! Ensure the correct tips/pins are used. Using incorrect tips/pins will damage the system.

To load plates:

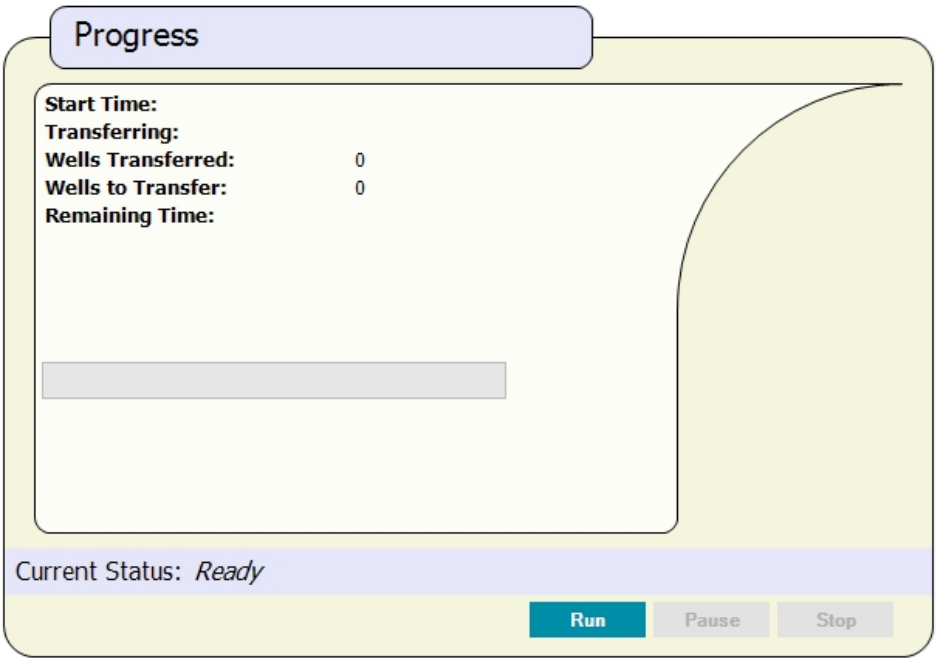
1. Use the position map as a guide to place the plates and tip boxes into the instrument. If prompted enter the barcode for each plate.
2. Click **Load**. The software confirms each position as you load the plates.
   Select the checkbox for each position as you set the plates onto the instrument deck to confirm that the barcode in the software matches the barcode on the plate.
   If the run repeats, you will select the checkbox to confirm that you have either replaced the plate in a deck space or that the plate from the first run is still the correct plate in each deck space.
3. Click **Next** to display the progress of the process.

Deck Layout Summary:

Manually perform all the actions specified in the checklist in the **Deck Layout Summary** section to ensure the assay is correctly prepared.

Liquid Handling Progress

The Progress dialog displays the progress of the process.

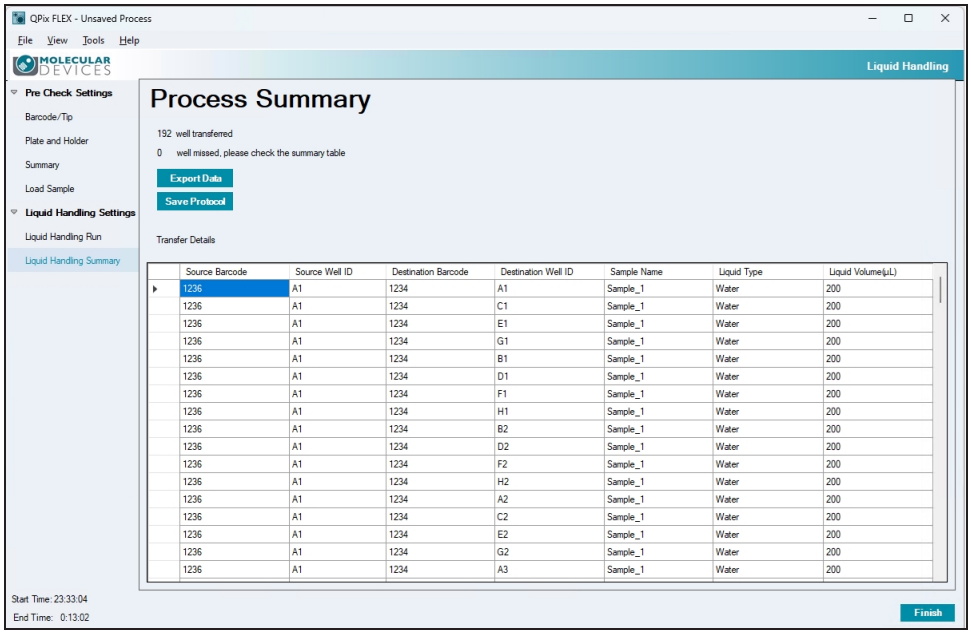


To manage the liquid handling process progress:

1. Click the following:
   - Click **Run** to run the liquid handing process. After the process runs select an action to take:
     - Select **Finish Picking** to finish picking.
     - Select **Continue Transferring** to continue transferring for a second run.
   - Click **Pause** to pause the liquid handling process. Click **Continue** to resume the process.
   - Click **Stop** to end the progress mid run.
2. When the process completes, a confirmation message displays.
   - Select **Finish** to finish the protocol. Click **OK** to display the Process Summary page.
   - Select **Continue Transferring** to return to the Plate and Holder page to define the settings for a subsequent run for the protocol. Click **OK** to display the Plate and Holder page. See Defining Plate and Holder Settings on page 74.

Viewing the Process Summary

The Process Summary page displays a summary of the process. Review the summary details.

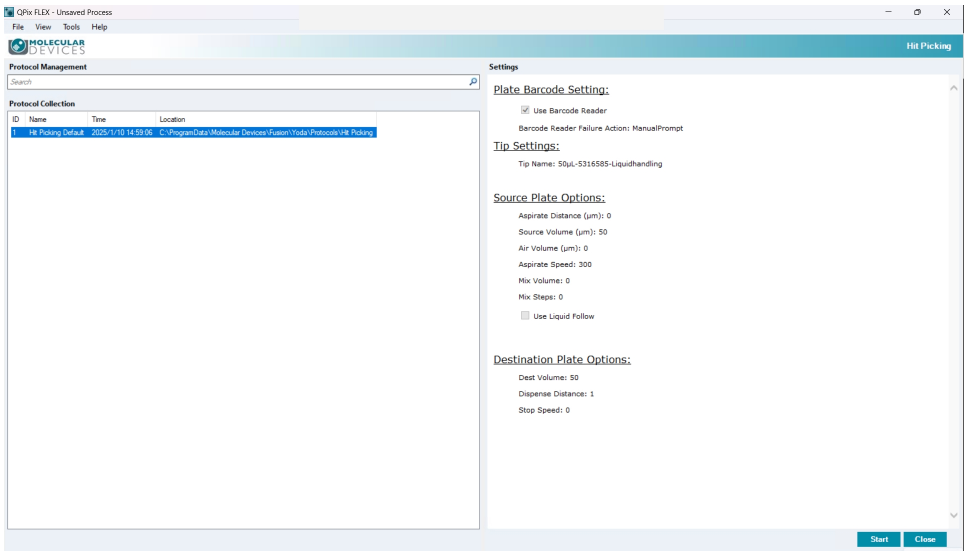


To wrap up the process:

- Click **Export Data** to export the process data.
- Click **Save Protocol** to save the protocol to the Protocol Management page for future use.
- Click **Finish** to return to the Picking process Protocol Management page.

Chapter 8: Hit Picking Process

The Hit Picking process allows you to hit pick colonies from receptacles using standard picking.

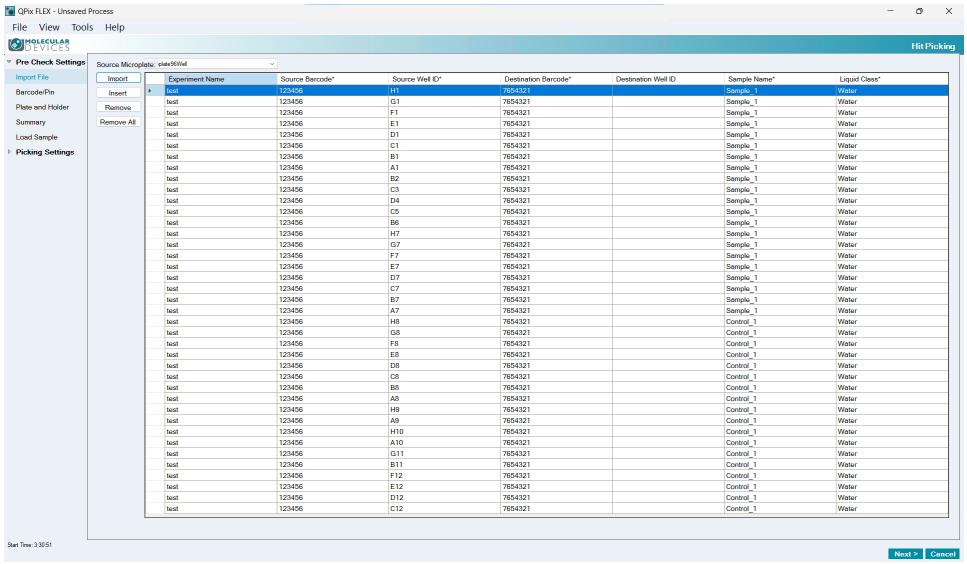


To use the Hit Picking process:

1. On the Navigation page, double-click  **Hit Picking** to display the Hit Picking page.
2. In the **Protocol Collection** list, select an existing protocol to run, or click in the white area to deselect the protocol and start with a default protocol.
3. Click **Start** to display the Import File page.

Importing Hit List Processes

Use the Import File page to import hit list process files.



To import hit picking processes:

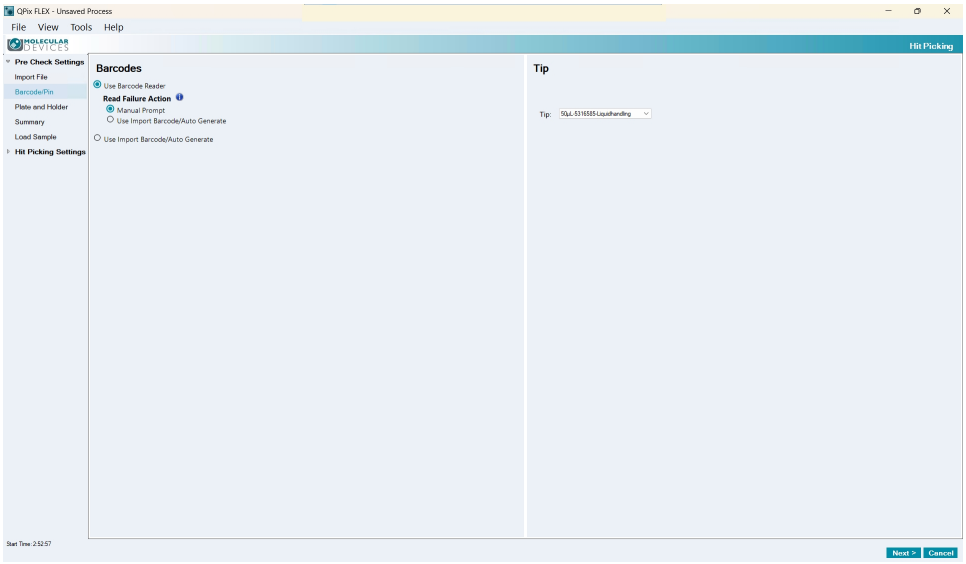
1. Click the **Source Microplate** drop-down and select the source plate.
2. Click **Import** to display the Open dialog where you select a hit pick process from the hit pick processes list.

   Note: Please use the template in the .csv file defined by Molecular Devices, the software can only read the files in designed table and fixed text strings.

3. Click the following:
   - Click **Insert** to insert a row to the hit pick process.
   - Select a row and click **Remove** to remove the row from the process.
   - Click **Remove All** to remove all rows from the process.
4. Click **Next** to display the Barcode/Pin page.

Defining Barcode and Tip Settings

Use the Barcode/Pin page to manage barcodes and tips for hit picking processes.



Managing Plate Barcodes

To manage barcodes:

1. Select a barcode option:
   - Select **Use Barcode Reader** to use the instrument barcode reader to read the receptacle.
   - Select **Generate Random Barcodes** to not use the instrument barcode reader. When you select this option, the following options are not available.
2. If you select the Use Barcode Reader option, select a **Read Failure Action** option:
   - Select **Manual Prompt** to have the software prompt you to enter the barcode information.
   - Select **Auto Generate** to have the software generate a virtual barcode for the receptacle.

Managing Tips

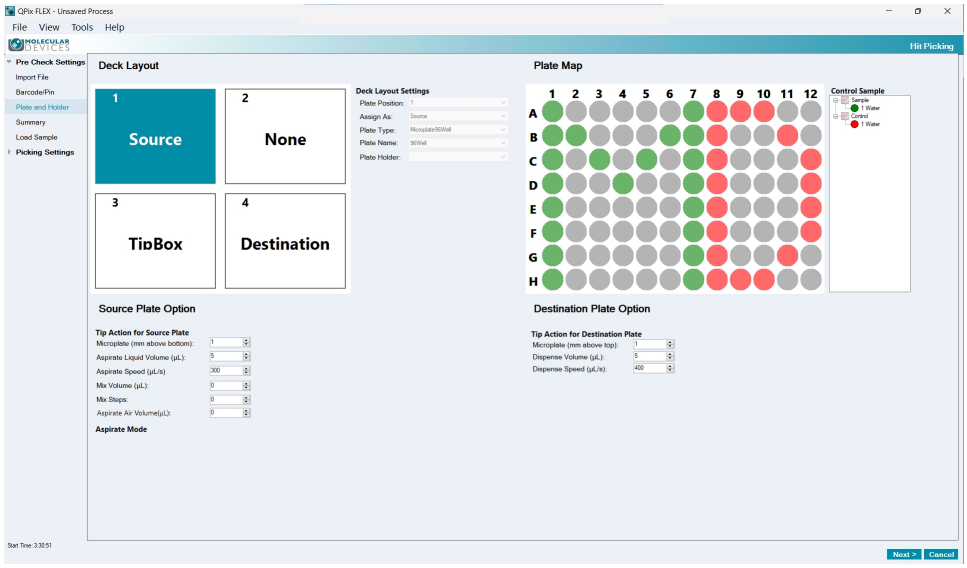
To manage tips:

1. In the Tip Selection area, click the **Tip** drop-down and select a tip. You define tips from the Labware Library. See Managing Labware on page 97.

Click **Next** to display the Plate and Holder page.

Defining Plate and Holder Settings

Use the Plate and Holder page to manage the instrument deck layout and plate map settings. You define plate types and tip boxes from the Labware Library. See Managing Labware on page 97.



Note: For Hit Picking, many of the following settings are defined within the process you imported and cannot be changed on this page.

To define deck layout and plate map settings:

1. In the Deck Layout area, select the number 1 deck position to define the settings for the first position on the instrument deck. In the Deck Layout Settings area, the **Selected Plate Position** field displays 1.
2. Click the **Assign As** drop-down:
   - Select **None** if you do not intend to place a plate in the first deck position in the instrument. The remaining fields are not available.
   - Select **Source** if you intend to place a source plate in the first deck position. The Plate Map area displays settings to define a source plate. See Source Plate Options on page 75.
   - Select **Destination** if you intend to place a destination plate in the first deck position. The Plate Map area displays settings to define a destination plate. See Destination Plate Settings on page 76.
   - Select **Tip Box** if you intend to place a tip box in the first deck position. The Plate Map area displays settings to define a tip box. See Tip Box Settings on page 77.
3. Repeat for deck positions 2-4.
4. After you define the deck layout and the corresponding plate setting described below, click **Next** to display the Summary Page.

Source Plate Options

When you assign a deck position to hold a source plate, the Plate Map area displays options to define the source plate settings.

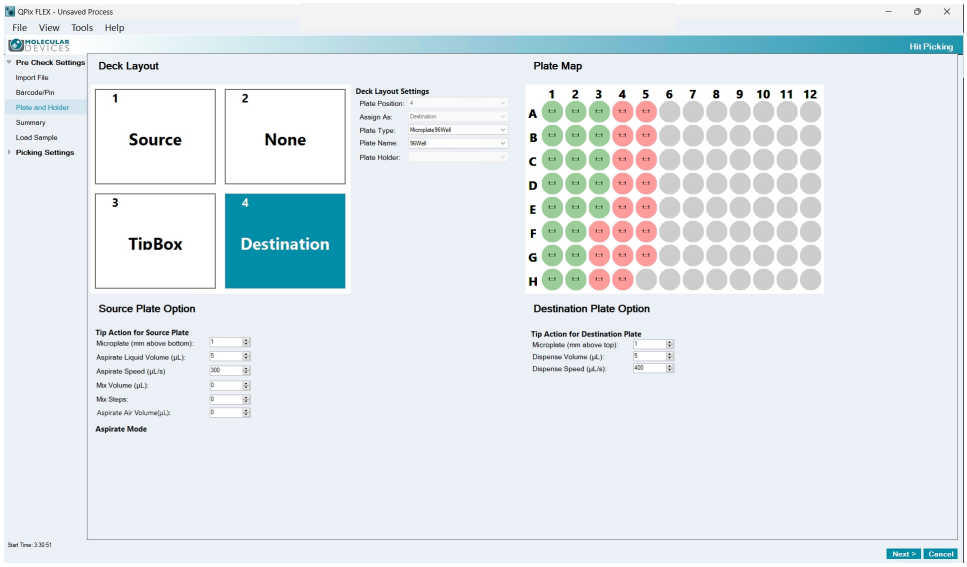
Note: The settings in the Destination Plate Options area are not applicable for a source plate.

To define source plate settings:

1. Click the **Plate Type** drop-down and select the type of plate you intend to place in the deck position you select.
2. Click the **Plate Name** drop-down and select the name of the plate you intend to place in the deck position you select.
3. Click the **Plate Holder** drop-down and select the type of holder to use to hold the plate on the instrument deck.
4. In the Plate Map area, the Control Samples are defined within the process you import.
5. In the Source Plate Option area, below Tip Action for Source Plate, in the **Microplate Above Bottom** field, enter the height of the tip above the plate bottom from which to aspirate the liquid.
6. In the **Aspirate Liquid Volume** field, enter the amount of liquid to aspirate.
7. In the **Aspirate Speed** field, enter the speed at which to aspirate the liquid.
8. In the **Mix Volume** field, enter the maximum volume of liquid to mix.
9. In the **Mix Steps** field, enter the number of mix steps.
10. In the **Aspirate Air Volume** field, enter the aspirate air volume.
11. Repeat for each source plate.

Destination Plate Settings

When you assign a deck position to hold a destination plate, the Plate Map area displays options to define the destination plate settings.

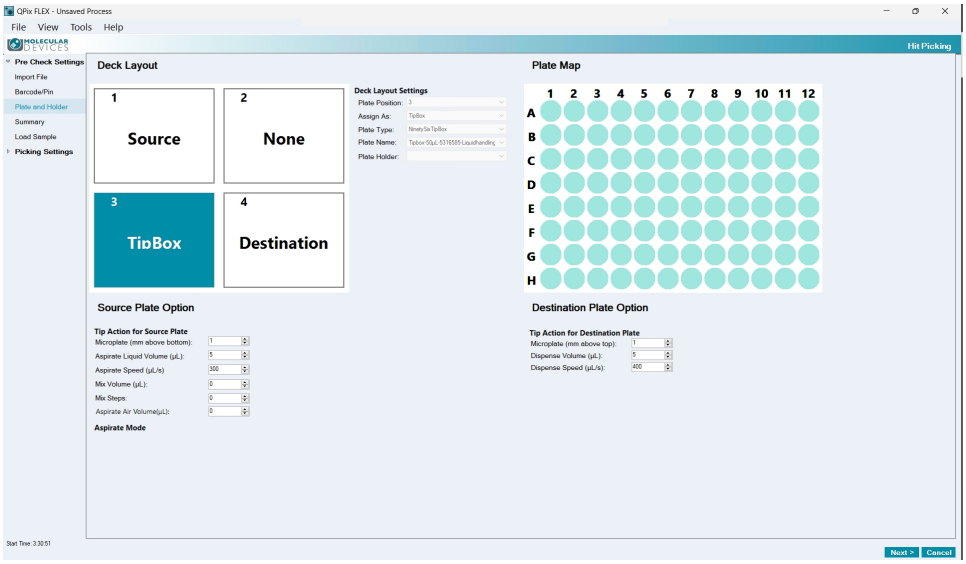


Note: The settings in the Source Plate Options area are not applicable for a destination plate.

To define destination plate settings:

1. Click the **Plate Type** drop-down and select the type of plate you intend to place in the deck position you select.
2. Click the **Plate Name** drop-down and select the name of the plate you intend to place in the deck position you select.
3. Click the **Plate Holder** drop-down and select the type of holder to use to hold the plate on the instrument deck.
4. The Plate Map area settings are defined in the process you import.
5. In the Destination Plate Option area, below Tip action for Destination Plate, in the **Microplate Above Top** field, enter the height of the tip above the plate at which to dispense the liquid.
6. In the **Dispense Volume** field, enter the volume of liquid to dispense.
7. In the **Dispense Speed** field, enter the speed at which to dispense the liquid.
8. Repeat for each destination plate.

Tip Box Settings



Note: The settings in the Source Plate Options area and the Destination Plate Options area are not applicable for a tip box.

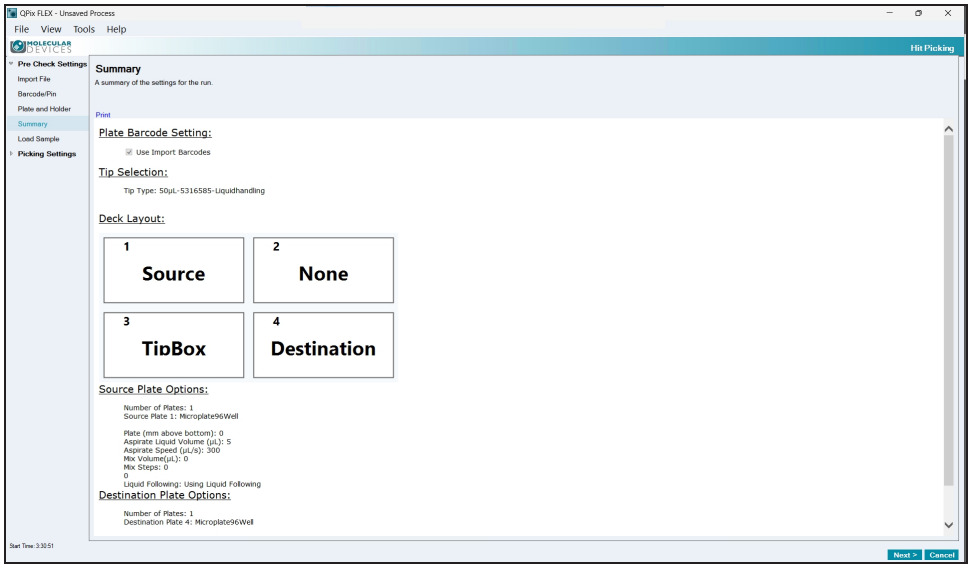
To define tip box settings:

1. In the Deck Layout area, click the **Plate Type** drop-down and select the type of tip box you intend to place in the deck position you select.
2. Click the **Plate Name** drop-down and select the name of the plate you intend to place in the plate position you select.
3. In the Plate Map area, drag the cursor over the group of wells:
   - Right-click and select **Empty** to indicate that there is no tip to be used for that well position on the destination plate.
   - Right-click and select **Filled** to indicate that you have installed a tip for that well position of the destination plate to receive a control sample item from the source plate.
4. Repeat for each tip box.

Viewing the Settings Summary

The Summary page displays a summary of the picking routine settings. Review the summary details. To make changes, click on the page link on the left where the changes should be made.

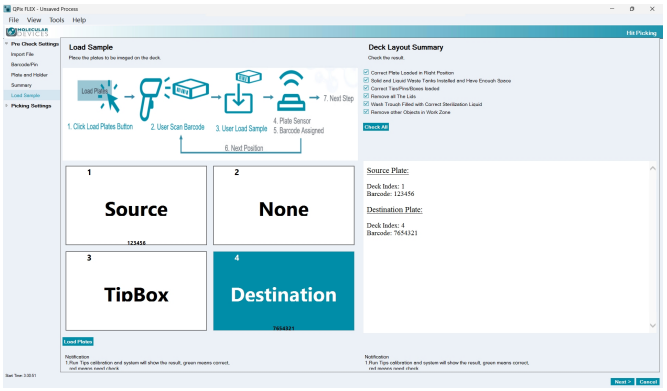
To print the summary, click **Print**.

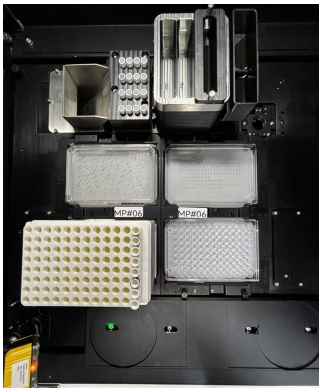


Click **Next** to load the plates.

Loading Samples

The Load Sample page provides instructions to load the plates into the instrument.





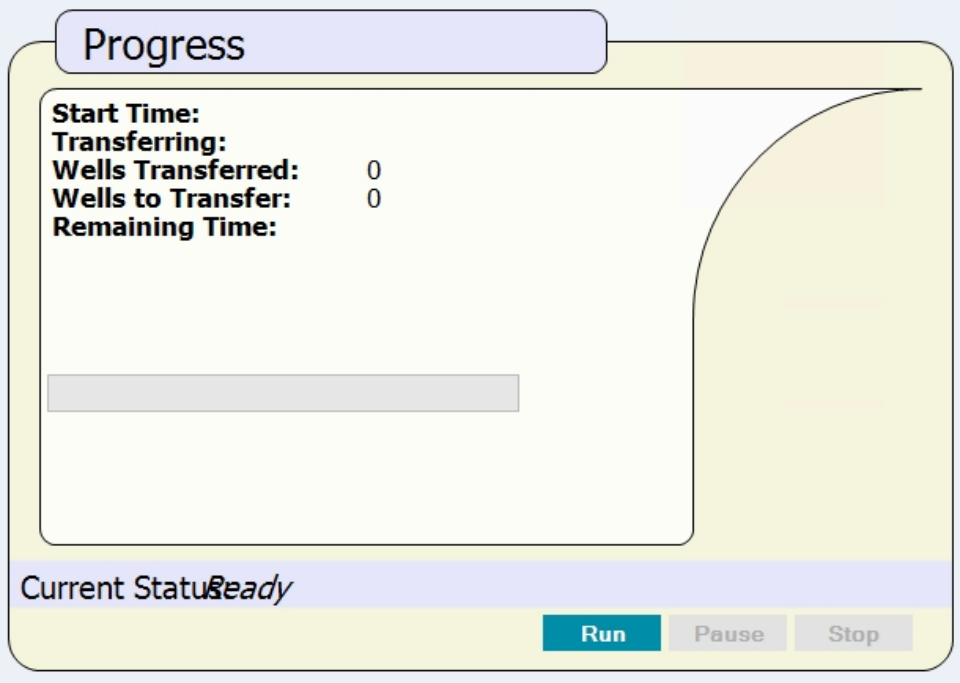
WARNING! Ensure the correct tips/pins are used. Using incorrect tips/pins will damage the system.

To load plates:

1. Using the Load Sample position map as your guide, place the plates into the instrument.
2. Select the checkboxes in the Deck Layout Summary area to confirm that you have:
   - The correct plate loaded in the correct position on the instrument deck layout. See Defining Plate and Holder Settings on page 42.
   - The solid and liquid waste tanks have been installed and have enough space. See Setting Up and Maintaining Waste Collection Receptacles on page 26.
   - The correct tips and pin boxes have been loaded.
   - All plate lids have been removed.
   - The work zone is clear of extraneous objects.
   - The wash trough is filled with the correct sterilization liquid. See Defining Plate Barcodes, Picking Pins, and Sanitize Settings on page 40.
3. Click **Load Plates** to have the instrument close the door and load the plates into the instrument. If prompted enter the barcode for each plate.
4. Click **Next** to display the Picking Run - Progress page.

Hit Picking Progress

The Progress dialog on the Picking Run page displays the progress of the process.

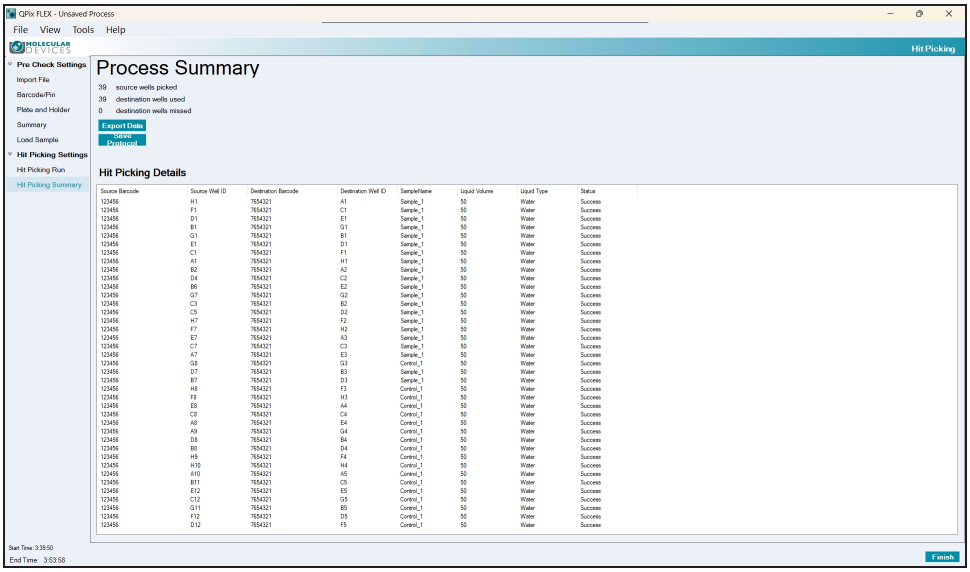


To manage the hit picking process progress:

1. Click the following:
   - Click **Run** to run the liquid handing process. After the process runs select an action to take:
     - Select **Finish** to finish the process.
     - Select **Continue Transferring** to continue transferring for a second run.
   - Click **Pause** to pause the process.
   - Click **Stop** to end the progress mid run.
2. When the process completes, a confirmation message displays.
   - Select **Finish** to finish the protocol. Click **OK** to display the Process Summary page.
   - Select **Continue Transferring** to return to the Plate and Holder page to define the settings for a subsequent run for the process. Click **OK** to display the Plate and Holder page. See Defining Plate and Holder Settings on page 74.

Viewing the Picking Summary

The Picking Summary page displays a summary of the pick. Review the summary details.

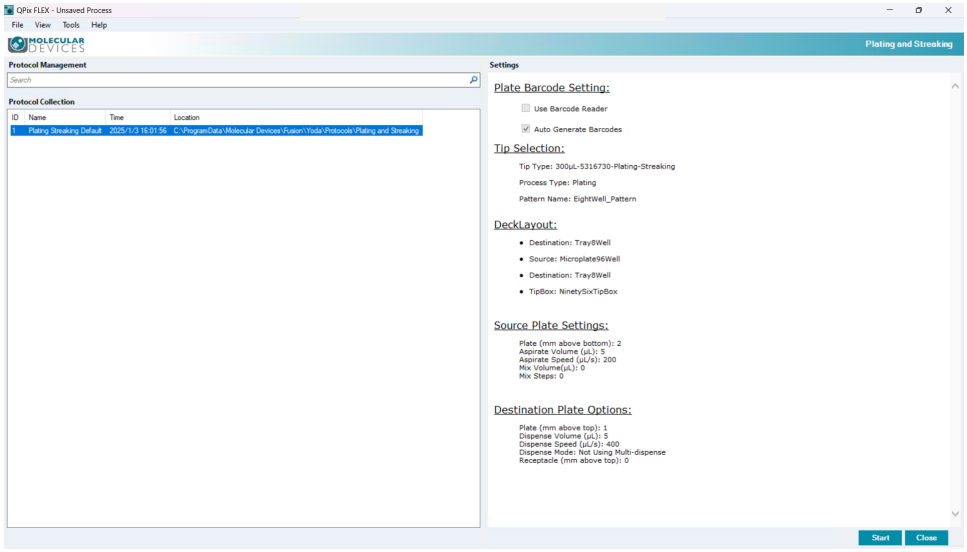


To wrap up the process:

- Click **Export Data** to export the process data.
- Click **Save Protocol** to save the protocol to the Protocol Management page for future use.
- Click **Finish** to return to the Picking process Protocol Management page.

Chapter 9: Plating and Streaking Process

Use the Plating and Streaking process to plate and streak.



To plate and streak:

1. On the Navigation page, double-click **Plating and Streaking** to display the Plating and Streaking page.
2. In the **Protocol Collection** list, select an existing protocol to run, or click in the white area to deselect the protocol and start with a default protocol.
3. Click **Start** to display the Pre Check Settings page.

Defining Plate Barcode and Tip Settings

Use the Plate Barcode Setting and Tip Selection page to plate manage barcodes and tips for plating and streaking processes.

Managing Plate Barcodes

To manage barcodes:

1. Select a barcode option:
   - Select **Use Barcode Reader** to use the instrument barcode reader to read the receptacle.
   - Select **Generate Random Barcodes** to not use the instrument barcode reader. When you select this option, the following options are not available.
2. If you select the Use Barcode Reader option, select a **Read Failure Action** option:
   - Select **Manual Prompt** to have the software prompt you to enter the barcode information.
   - Select **Auto Generate** to have the software generate a virtual barcode for the receptacle.

3. The **Validated Barcodes** table lists the barcodes.
   - In the text field, enter the name of the barcode you define above the table and click **Insert** to add the barcode to the list.
   - Click **Import** to import barcode from a text file. Choose a text file with **.txt** extension and click **Import** to load the barcodes into the list.
   - Click **From Database** to add barcodes from the database in the system. Select the process and choose an existing receptacle. Click **Add Barcode** to at that barcode to the list.
   - Select a barcode in the list and click **Remove** to remove a barcode from the list.

Managing Tips

To manage tips:

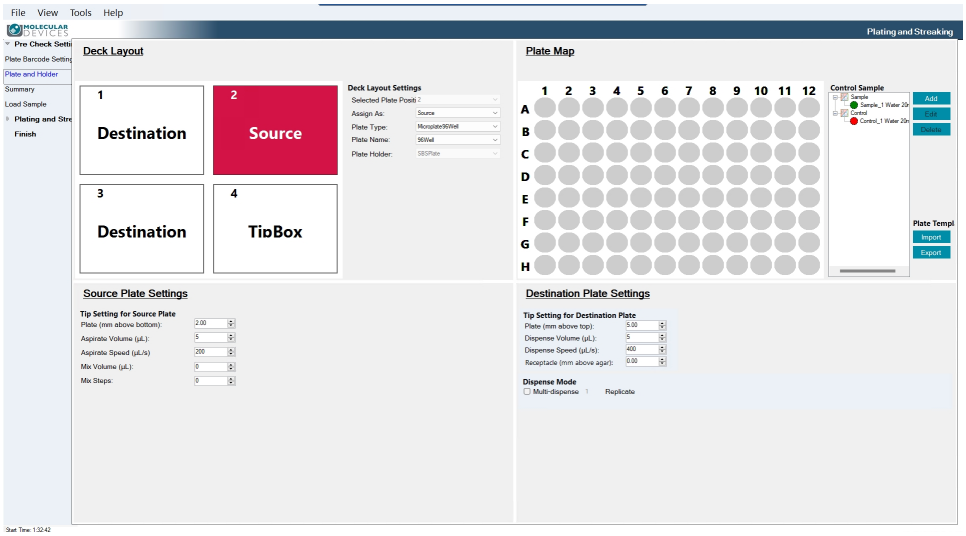
1. In the Tip area, click the **Tip** drop-down and select a tip.
2. Select an option:
   - Select **Plating** to define a plating pattern.
   - Select **Streaking** to define a streaking pattern.
3. Click the **Pattern** drop-down and select a pattern. You define patterns from the Streaking and Pattern Editor. See Streaking Pattern Editor on page 93.

Click **Next** to display the Plate and Holder page.

Defining Plate and Holder Settings

Use the Plate and Holder page to manage the deck layout and plate map settings.

You define plate types and tip boxes from Labware on the Navigation page. See Managing Labware on page 97.



To define deck layout and plate map settings:

1. In the Deck Layout area, select the number 1 deck layout position to define the settings for the first position on the instrument deck. In the Deck Layout Settings area, the **Selected Plate Position** field displays 1.

2. Click the **Assign As** drop-down:
   - Select **None** if you do not intend to place a plate in the first deck position in the instrument. The remaining fields are not available.
   - Select **Source** if you intend to place a source plate in the first deck position. The Plate Map area displays settings to define a source plate. See Source Plate Settings on page 86.
   - Select **Destination** if you intend to place a destination plate in the first deck position. The Plate Map area displays settings to define a destination plate. See Destination Plate Settings on page 87.
   - Select **Tip Box** if you intend to place a tip box in the first deck position. The Plate Map area displays settings to define a tip box. See Tip Box Settings on page 88.
3. Repeat for deck positions 2-4.
4. After you define the deck layout, click **Next** to display the Summary Page.

Source Plate Settings

When you assign a deck position as a source plate, you use the Source Plate Options area in the lower left and the Plate Map area displays options to define the source plate settings.

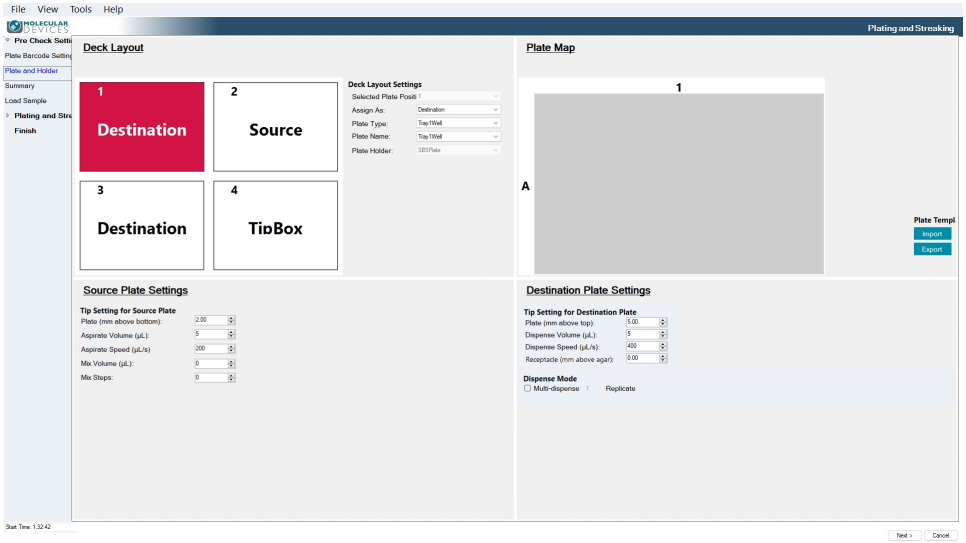
Note: The settings in the Destination Plate Options area in the lower right are not applicable for a source plate.

To define source plate settings:

1. In the Deck Layout area, click the **Select Plate Type** drop-down and select the type of plate you intend to place in the deck position you select.
2. Click the **Select Plate Name** drop-down and select the name of the plate you intend to place in the deck position you select.
3. Click the **Plate Holder** drop-down and select the type of holder to use to hold the plate on the instrument deck.
4. In the Plate Map area, click **Import** to import a plate template, if needed.
5. In the Control Sample section, click **Add** to display the Add dialog:
   a. In the **Name** field, enter the name of the liquid.
   b. Click the **Type** drop-down:
      - Select **Sample** to categorize the liquid as a sample
      - Select **Control** to categorize the liquid as a control.
   c. Click the **Color** box and select a color to identify the sample or control liquid.
   d. Click the **Liquid Class** drop-down and select a liquid class.
   e. In the **Liquid Volume** field, enter the liquid volume and then click the drop-down and select the unit of measure.
6. In the Control Sample hierarchy, select an item:
   - Click **Edit** to edit the item.
   - Click **Delete** to delete the item.
7. In the Plate Map image, drag over the wells to define, right-click and select either **Sample** or **Control** and then select the sample or control you intend to use to fill in the source wells you select.
8. In the Source Plate Option area, in the **Microplate Above Bottom** field, enter the distance above the bottom of the plate where the pins start to aspirate the sample.
9. In the **Aspirate Liquid Volume** field, enter the liquid volume to aspirate.
10. In the **Aspirate Speed** field, enter how fast to aspirate the liquid.
11. In the **Mix Volume** field, enter the maximum volume of liquid to mix.
12. In the **Mix Steps** field, enter the number of mix steps.
13. Select the **Liquid Follow** checkbox to have liquid follow.
    Clear the **Liquid Follow** checkbox to not have liquid follow.
14. In the **Before Aspirate Air Volume** field, enter volume of air to aspirate before aspirating the liquid.
15. In the **Aspirate Buffer Volume** field, enter the volume of buffer to aspirate.
16. In the **Dispense Cut Off Speed** field, enter how fast to stop the aspiration.
17. In the **Dispense Buffer Volume** field, enter the volume of buffer to dispense.
18. Click **Export** to export the plate definition to a plate template for future re-use.
19. Repeat for each well and each source plate.

Destination Plate Settings

When you assign a deck position as a destination plate, you use the Destination Plate area in the lower right and the Plate Map area displays options to define the destination plate settings.



Note: The settings in the Source Plate Options area are not applicable for a destination plate.

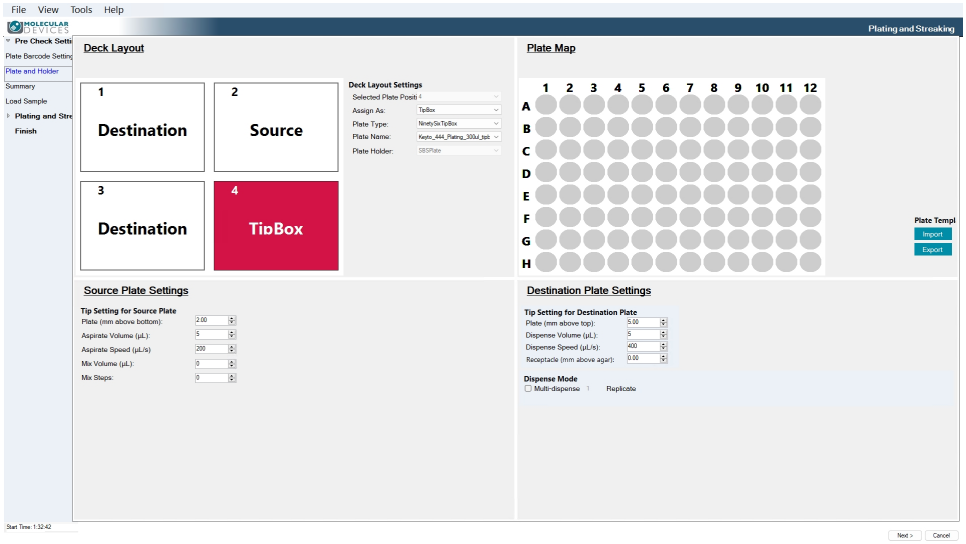
To define destination plate settings:

1. In the Deck Layout area, click the **Select Plate Type** drop-down and select the type of plate you intend to place in the deck position you select.
2. Click the **Select Plate Name** drop-down and select the name of the plate you intend to place in the deck position you select.
3. Click the **Holder** drop-down and select the type of holder to use to hold the plate on the instrument deck.
4. In the Plate Map area, click **Import** to import a plate template.
5. In the Plate Map image, drag over the wells to define, right-click and select either **Sample** or **Control** and then select the sample or control you intend to dispense into the destination wells you select.
6. In the Destination Plate Option area, In the **Microplate Above Top** field, enter the height above the plate where the tip starts to dispense the liquid.
7. In the **Blowout Volume** field, enter the volume to blowout.
8. In the **Blowout Speed** field, enter how fast to blowout.
9. Select a **Deposit Order** option:
   - Select **By Columns** to deposit the picked colonies by column.
   - Select **By Rows** to deposit the picked colonies by row.
10. Select a **Change Tips** option:
    - Select **Each Dispense** to change the tips after each dispense.
    - Select **Each Sample** to change the tips after each sample.
    - Select **Never** to not change the tips.
11. Select a **Rest Volume In Tips** option:
    - Select **Dispense to Waste** to dispense to waste.
    - Select **Dispense to Aspirate Sequence** to dispense to aspirate sequence.

12. In the Plate Map area click **Export** to export the layout you define as a plate template.
13. Repeat for each well and each destination plate.

Tip Box Settings

When you assign a deck position as a tip box, you use the Deck Layout area to define the tip box settings.



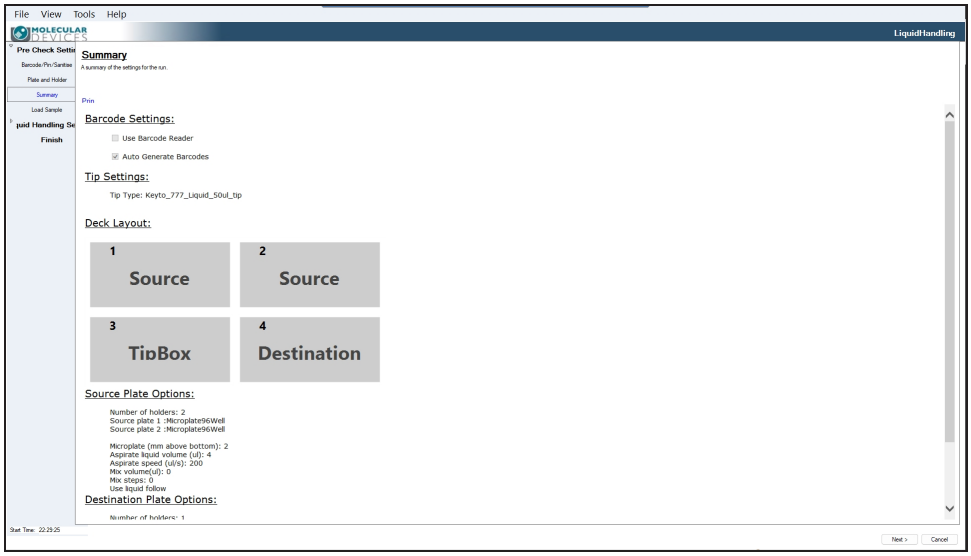
To define tip box settings:

1. Click the **Select Plate Type** drop-down and select the type of tip box you intend to place in the plate position you select.
2. Click the **Select Plate Name** drop-down and select the name of the tip box you intend to place in the plate position you select.
3. Click the **Holder** drop-down and select the type of holder to use to hold the tip box on the instrument deck.
4. In the Plate Map area, select a well or group of wells, right-click:
   - Select **Empty** to not have a tip for the wells you select.
   - Select **Filled** to have a tip for the wells you select.
5. Repeat for each tip box.

Viewing the Settings Summary

The Summary page displays a summary of the liquid handling settings. Review the summary details. To make changes, click **Back** until you return to the page where the changes can be made.

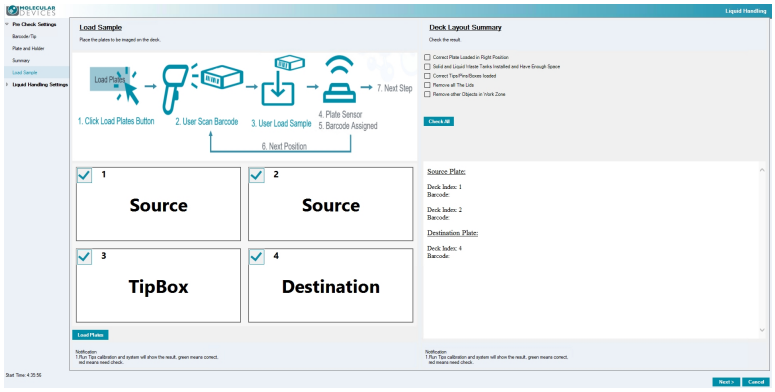
To print the summary, click **Print**.

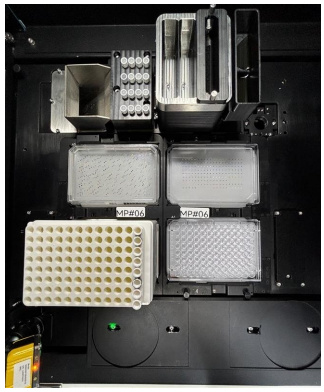


Click **Next** to load the plates.

Loading Samples

The Load Sample page provides instructions to load the plates into the instrument.





WARNING! Ensure the correct tips/pins are used. Using incorrect tips/pins will damage the system.

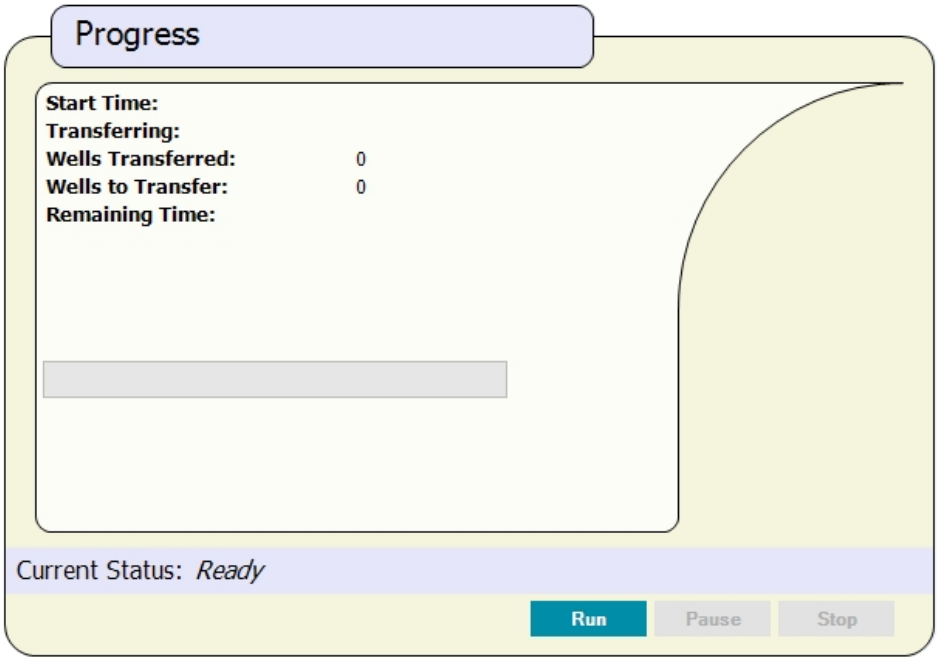
To load plates:

1. Use the position map as a guide to place the plates and tip boxes into the instrument. If prompted enter the barcode for each plate.

2. Click **Load**. The software confirms each position as you load the plates.
   Select the checkbox for each position as you set the plates onto the instrument deck to confirm that the barcode in the software matches the barcode on the plate.
   If the run repeats, you will select the checkbox to confirm that you have either replaced the plate in a deck space or that the plate from the first run is still the correct plate in each deck space.
3. Click **Next** to display the progress of the process.

Plating and Streaking Progress

The Progress dialog displays the progress of the process.



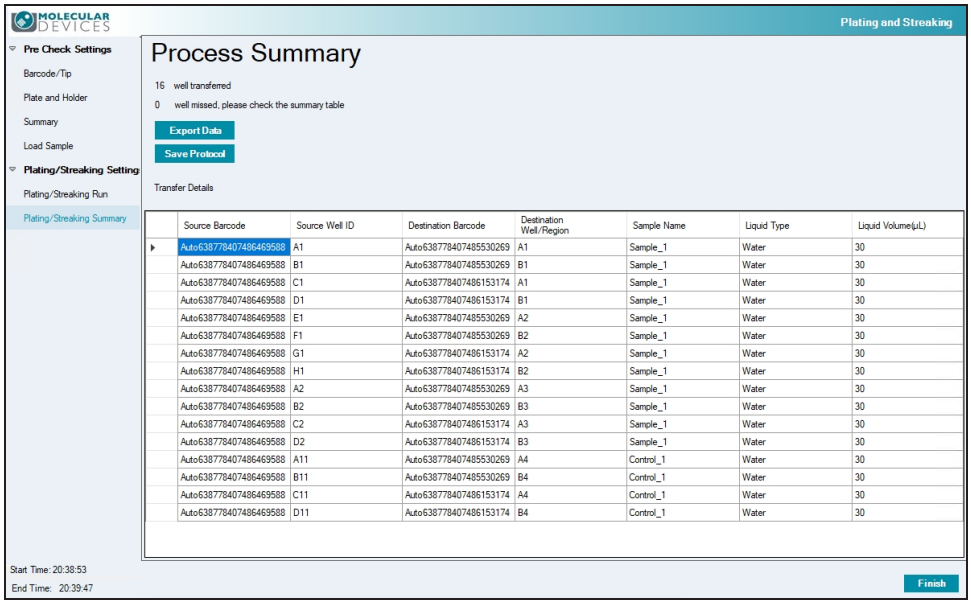
To manage the liquid handling process progress:

1. Click the following:
   - Click **Light Table** to turn the light in the instrument on and off.
   - Click **Run** to run the liquid handing process. After the process runs select an action to take:
     - Select **Finish Picking** to finish picking.
     - Select **Continue Transferring** to continue transferring for a second run.
   - Click **Pause** to pause the liquid handling process.
   - Click **Terminal** to end the progress mid run.
2. When the process completes, a confirmation message displays.
   - Select **Finish** to finish the protocol. Click **OK** to display the Process Summary page.
   - Select **Continue Transferring** to return to the Plate and Holder page to define the settings for a subsequent run for the protocol. Click **OK** to display the Plate and Holder page. See Defining Plate and Holder Settings on page 84.

Viewing the Process Summary

The Process Summary page displays a summary of the process. Review the summary details.

To export the process summary, click **Export**.

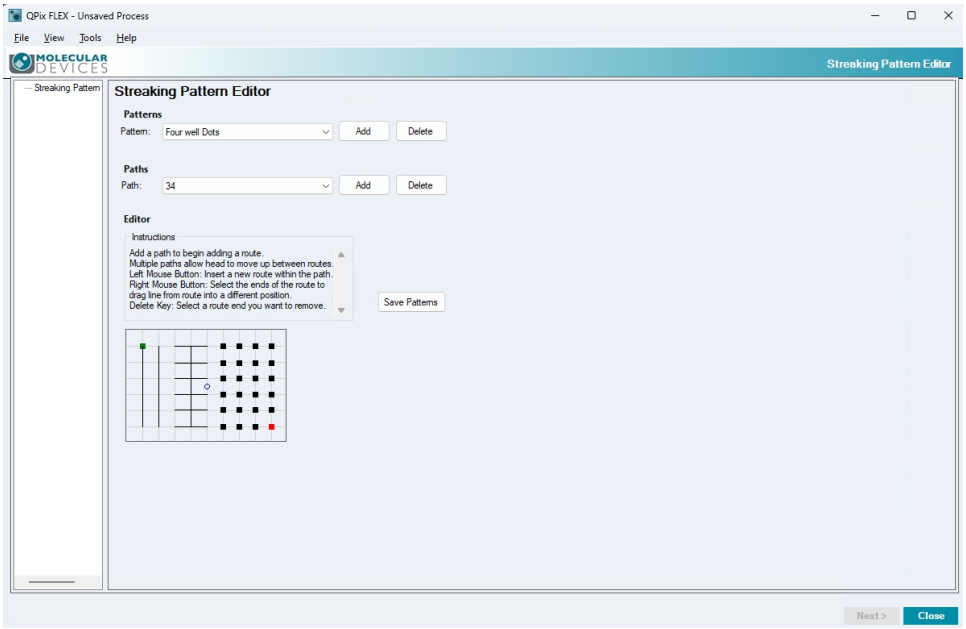


To wrap up the process:

- Click **Export Data** to export the process data.
- Click **Save Protocol** to save the protocol to the Protocol Management page for future use.
- Click **Finish** to return to the Plating and Streaking process Protocol Management page.

Chapter 10: Streaking Pattern Editor

Use the Streaking and Pattern Editor to manage the patterns you use for the Plating and Streaking process. See Plating and Streaking Process on page 83.



To manage streaking patterns:

1. On the Navigation page, double-click  **Streaking Pattern Editor** to display the Streaking Pattern Editor page.

Streaking Pattern Editor

Use the Streaking and Pattern Editor page to manage streaking patterns.

To manage streaking patterns:

1. In the **Patterns** area:
   - Click **Add** to display the Add dialog where you enter the name and select the plate type for a new pattern.
   - Click the **Pattern** drop-down and select a pattern to edit or delete.

     Note: A pattern refers to the actual XY stage. The plate type you select determines the grids area. The basic grid size is 6 x 6 mm and the space between streaking lines is 2 mm.

   - Click **Delete** to remove the pattern definition from the system.
2. In the Paths area:
   - Click **Add** to increment the number in the drop-down list indicating an additional path for the pattern.
   - Click the **Path** drop-down and select a path to edit or delete.
   - Click **Delete** to remove the path definition from the system.

3. In the **Editor** area text field, enter the instructions for the pattern and path, then click **Save** to save the instructions.
4. Use the grid area to define the streak pattern.
   a. After you select the path from the drop-down, click in the grid where you want to start the path. A red dot displays.
   b. Click in the grid where you want the path to end or turn. A red line displays from the dot to the place you click. To continue the path on a new trajectory, click in the grid again to display an additional red line for the path.

      Note: The path can contain only straight lines and 90° turns.

   c. Click the **Path** drop-down and select the next path to define and repeat steps a and b to define the path for the subsequent path.
   d. Repeat for all paths in the pattern.
5. Click **Save** to save the pattern.
6. Click **Close** to return to the Navigation page.

Chapter 11: Common Functions

11

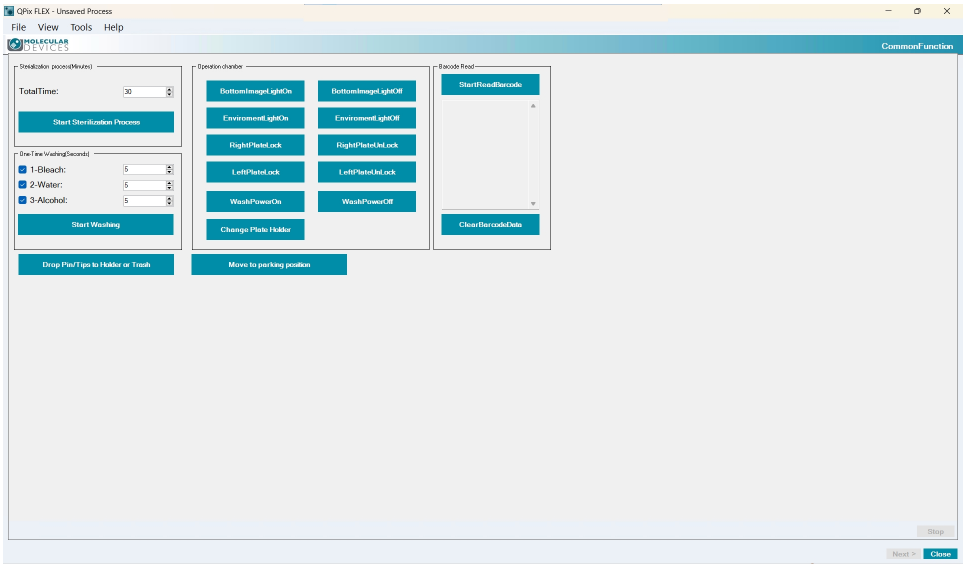
Use the Common Functions page to define and run common functions.

To define and run common functions:

- On the Navigation page, double-click **Common Functions** to display the Common Functions page.

Use the Common Functions page to define the following common functions:

- Define and run sterilization processes
- Define and run one time washes
- Define operation chamber settings



Running a Sterilization Process

Run a sterilization process for the inner space. The sterilization process turns on the LED UV light. There are 2 arrays of UV light in the opposite angle of the system, to guarantee the efficiency. During sterilization, the head moves to a new position every five minutes so that every corner inside the machine is exposed for enough time to be sterilized.

To run a sterilization process:

1. In the **Total Time** field, enter the length of time to run the sterilization process, (recommended 30 minutes minimum).
2. Click **Start Sterilization Process**.
3. When the sterilization finishes, click **OK**.
4. Click **Close** to return to the Navigation page.

Running a One-Time Wash

Scenarios where you would run a one-time wash include:

- When you have four sets of metal pins loaded on the holder for a long time, you should run a one-time wash before you start a picking process, although the standard picking process will still run sterilization for metal pin cleaning.

- If something goes wrong when you do a run or you press the emergency stop button, the head may stop with metal pins still loaded. You should run a one-time wash after you reboot the system as an initial step to reset the system.

To run a one-time wash:

1. Select the checkbox for each wash liquid to use for the one time wash.
   - If you select the **1-Bleach** checkbox, enter the number of seconds to use bleach in the wash.
   - If you select the **2-Water** checkbox, enter the number of seconds to use water in the wash.
   - If you select the **3-Alcohol** checkbox, enter the number of seconds to use alcohol in the wash.
2. Place the wash basins in the corresponding positions inside the instrument.
3. Click **Start Washing**.
4. When the wash finishes, click **OK**.
5. Click **Close** to return to the Navigation page.

Define Operation Chamber Settings

To define the operation chamber settings:

- Click **Bottom Image Light On** to turn the bottom image light on.
- Click **Bottom Image Light Off** to turn the bottom image light off.
- Click **Environment Light On** to turn the environment light on.
- Click **Environment Light Off** to turn the environment light off.
- Click **Right Plate Lock** to lock the plates in the right two spaces on the instrument deck after you place the plates on the instrument deck.
- Click **Right Plate Unlock** to unlock the right two spaces on the instrument deck so that you can remove the plates from the instrument deck.
- Click **Left Plate Lock** to lock the left two spaces on the instrument deck after you place the plates on the instrument deck.
- Click **Left Plate Unlock** to unlock the left two spaces on the instrument deck so that you can remove the plates from the instrument deck.
- Click **Wash Power On** to turn the ultrasonic wash power on.
- Click **Wash Power Off** to turn the ultrasonic wash power off.
- Click **Change Plate Holder** to change the plate holder.

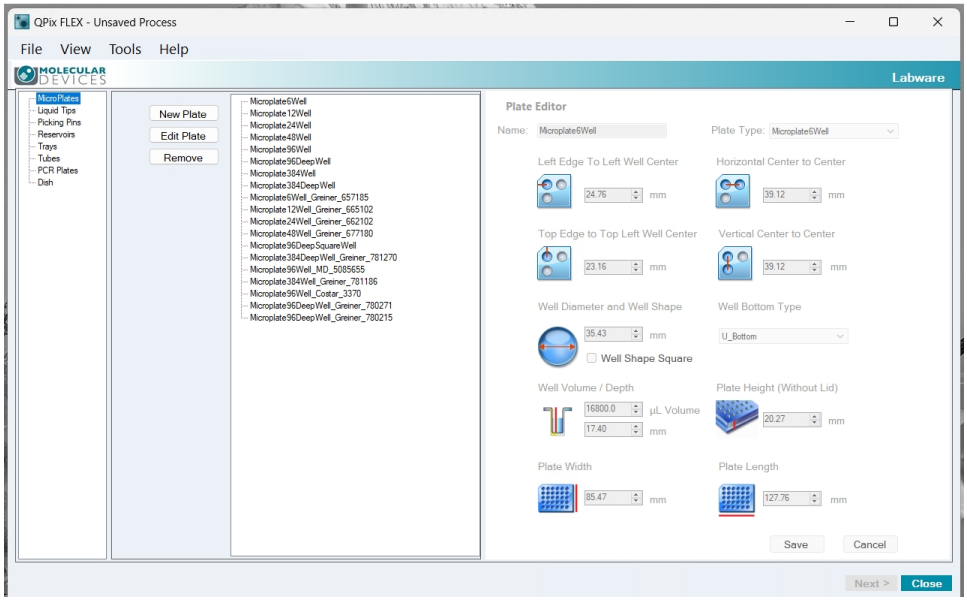
Other Common Functions

Click the following buttons on the Common Function page:

- Click **Drop Pin/Tips to Holder or Trash** to drop the pins or tips into the solid waste holder or to the trash.
- Click **Move to Parking Position** to move all moving parts to their parked position.
- Click **Close** to return to the Navigation page.

Chapter 12: Managing Labware

Use the Labware page to manage labware.

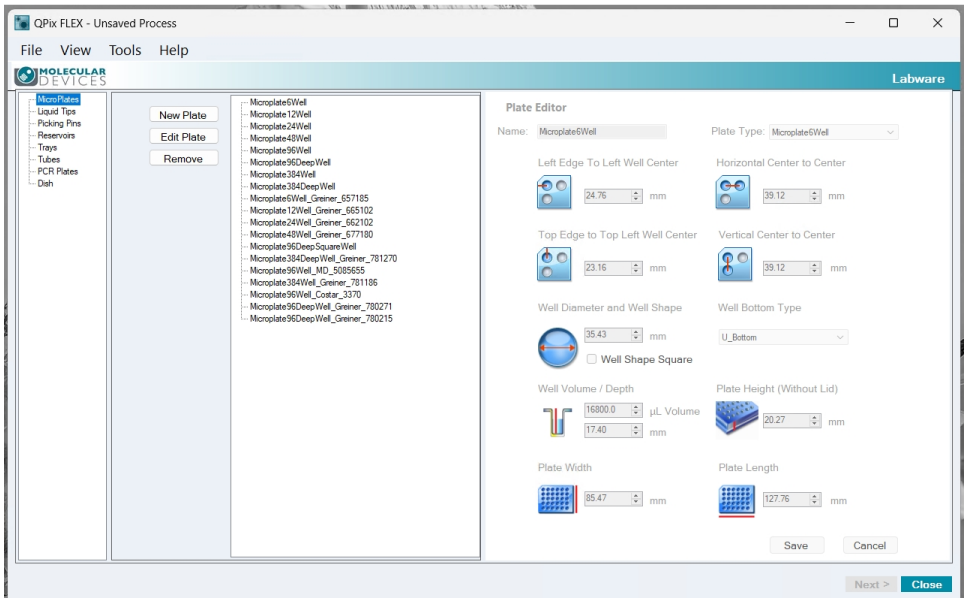


To manage labware:

1. On the Navigation page, double-click  **Labware** to display the Labware page.

Managing Plates

On the left side of the Labware Library page, select **Microplates**.



To manage plates:

- Click **New Plate** to add a new plate to the list.
- Select a plate to edit and click **Edit** to edit an existing plate.
- Select a plate to delete and click **Delete** to delete the plate.

Plate Editor Settings (all measurements in millimeters)

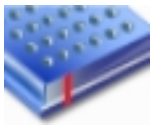
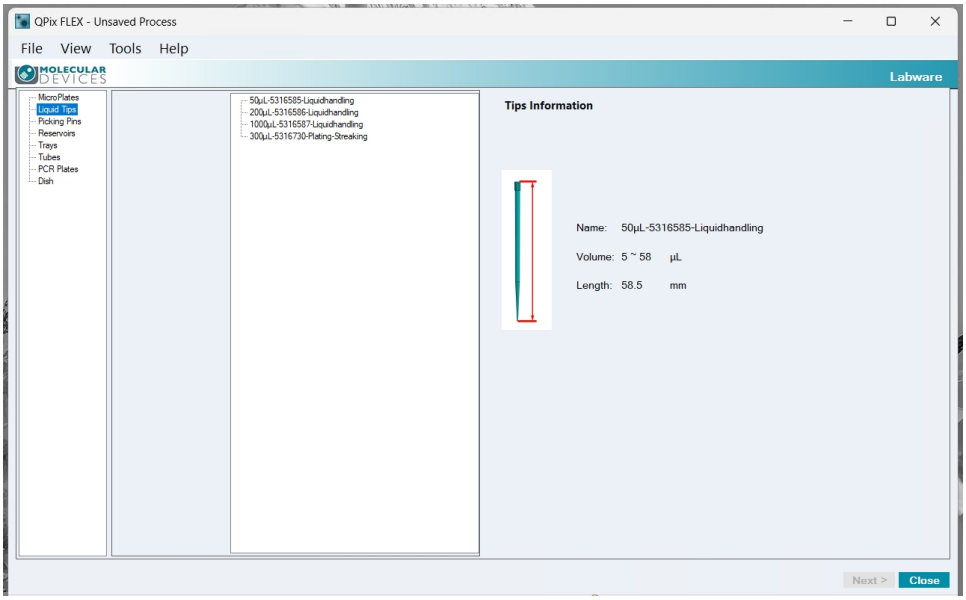
Field Name	Image	Description
Name		Enter the name of the plate.
Plate Type		Click the drop-down and select the plate type.
Left Edge to Left Well Center		Enter the distance from the left edge of the plate to the center of well A1.
Horizontal Center to Center		Enter the horizontal distance between well centers.
Top Edge to Top Left Well Center		Enter the distance from the top edge of the plate to the center of well A1.
Vertical Center to Center		Enter the vertical distance between well centers.
Well Diameter and Well Shape		Enter the diameter of a round well or the width of a square well. Select the **Well Shape Square** checkbox for square wells. Clear the **Well Shape Square** checkbox for round wells.
Well Bottom Type / Thickness		Click the drop-down and select the well bottom type.
Well Volume / Depth		Enter the depth of the well or enter the working volume of the well for the plate in microliters. This determines the maximum allowable dispense volume.
Plate Height		Enter the height of the plate without a lid.
Plate Width		Enter the width of the plate.

Plate Editor Settings (all measurements in millimeters) (continued)

Field Name	Image	Description
Plate Length		Enter the length of the plate.

Managing Liquid Tips

On the left side of the Labware Library page, select **Liquid Tips**.

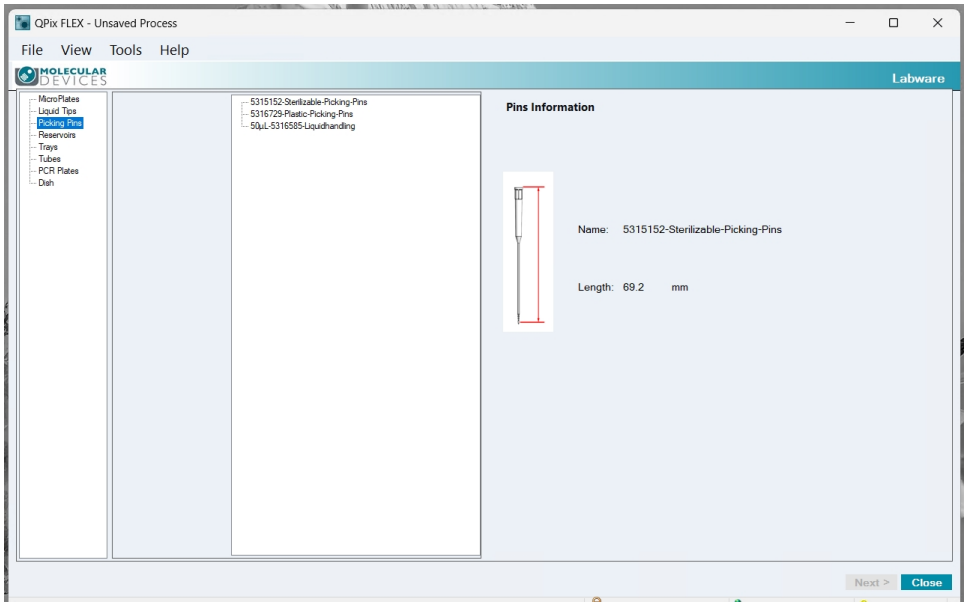


To manage liquid tips:

1. Select a tip type in the list.
2. View the tip information.

Managing Picking Pins

On the left side of the Labware Library page, select **Picking Pins**.

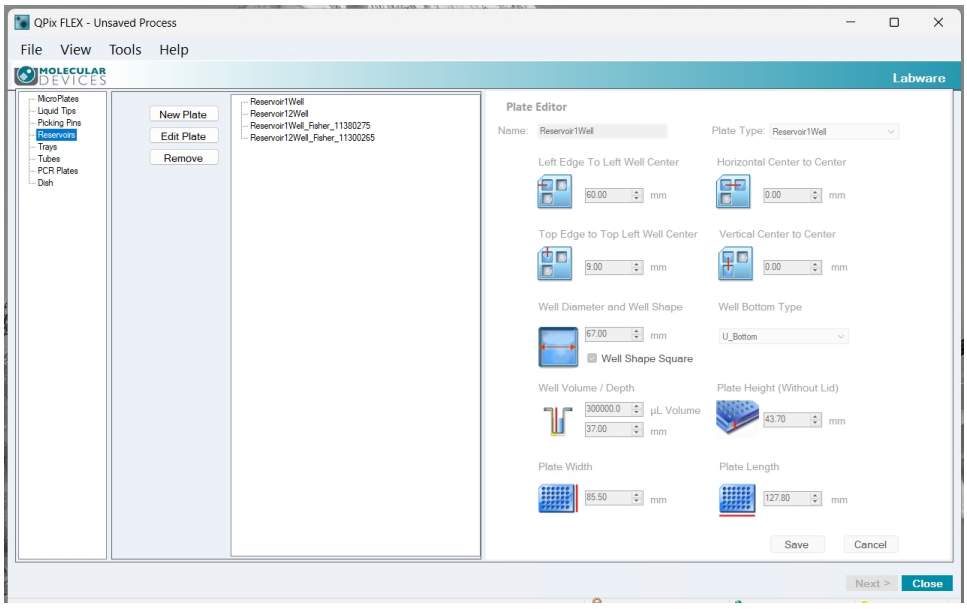


To manage picking pins:

1. Select a pin type in the list.
2. View the pin information.

Managing Reservoirs

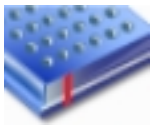
On the left side of the Labware Library page, select **Reservoirs**.



To manage reservoirs:

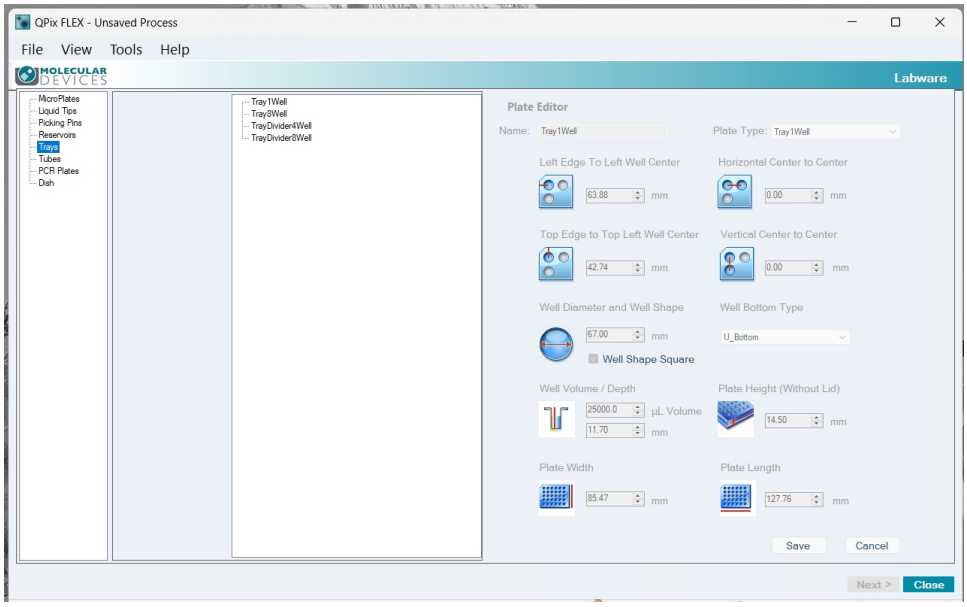
- Click **New Plate** to add a new reservoir to the list.
- Select a reservoir to edit and click **Edit** to edit an existing reservoir.
- Select a reservoir to delete and click **Delete** to delete the reservoir.

Reservoir Editor Settings (all measurements in millimeters)

Field Name	Image	Description
Name		Enter the name of the reservoir.
Plate Type		Click the drop-down and select the reservoir type.
Left Edge to Left Well Center		Enter the distance from the left edge of the reservoir to the center of well A1.
Horizontal Center to Center		Enter the horizontal distance between well centers.
Top Edge to Top Left Well Center		Enter the distance from the top edge of the reservoir to the center of well A1.
Vertical Center to Center		Enter the vertical distance between well centers.
Well Diameter and Well Shape		Enter the diameter of a round well or the width of a square well. Select the **Well Shape Square** checkbox for square wells. Clear the **Well Shape Square** checkbox for round wells.
Well Bottom Type / Thickness		Click the drop-down and select the well bottom type.
Well Volume / Depth		Enter the depth of the well or enter the working volume of the well for the reservoir in microliters. This determines the maximum allowable dispense volume.
Plate Height		Enter the height of the reservoir without a lid.
Plate Width		Enter the width of the reservoir.
Plate Length		Enter the length of the reservoir.

Managing Trays

On the left side of the Labware Library page, select **Trays**.



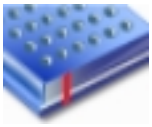
To manage trays:

1. Select a tray type in the list.
2. View the tray information.

Tray Editor Settings (all measurements in millimeters)

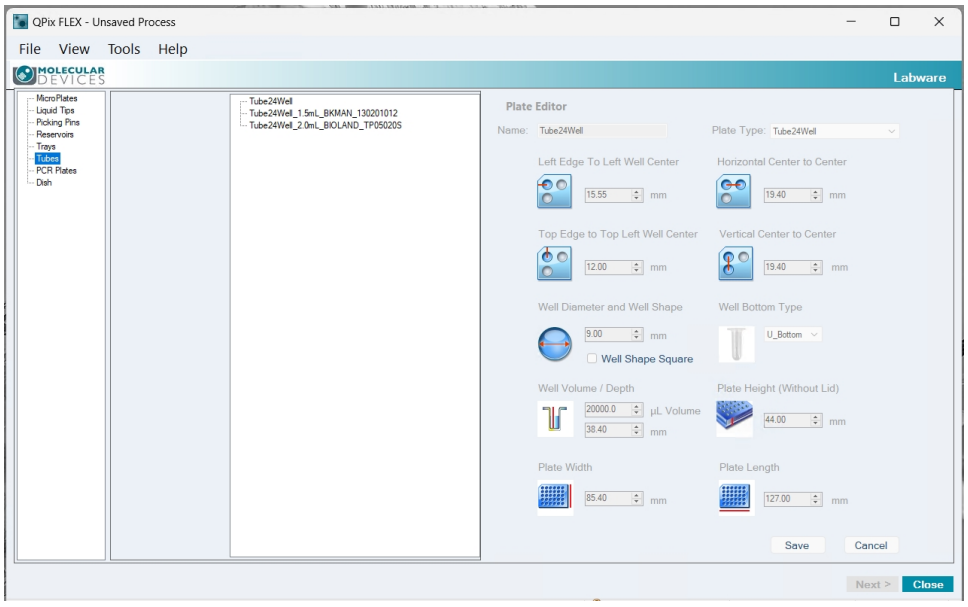
Field Name	Image	Description
Name		Enter the name of the tray.
Plate Format		Click the drop-down and select the tray format.
Left Edge to Left Well Center		Enter the distance from the left edge of the tray to the center of well A1.
Horizontal Center to Center		Enter the horizontal distance between well centers.
Top Edge to Top Left Well Center		Enter the distance from the top edge of the tray to the center of well A1.
Vertical Center to Center		Enter the vertical distance between well centers.

Tray Editor Settings (all measurements in millimeters) (continued)

Field Name	Image	Description
Well Diameter and Well Shape		Enter the diameter of a round well or the width of a square well. Select the **Well Shape Square** checkbox for square wells. Clear the **Well Shape Square** checkbox for round wells.
Well Bottom Type / Thickness		Click the drop-down and select the well bottom type.
Well Volume / Depth		Enter the depth of the well or enter the working volume of the well for the tray in microliters. This determines the maximum allowable dispense volume.
Plate Height		Enter the height of the tray without a lid.
Plate Width		Enter the width of the tray.
Plate Length		Enter the length of the tray.

Managing Tubes

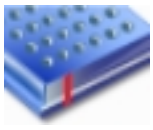
On the left side of the Labware Library page, select **Tubes**.



To manage tubes:

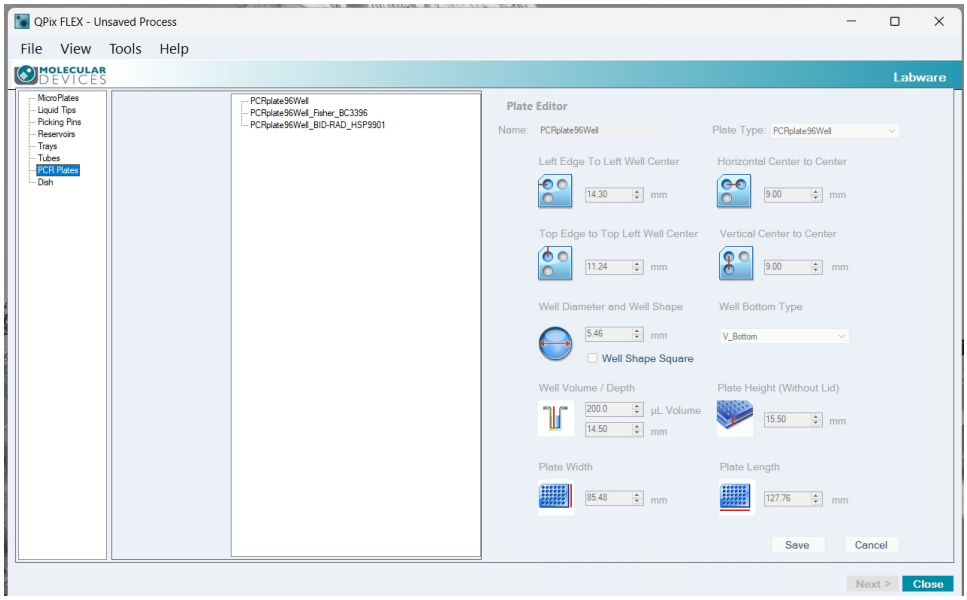
1. Select a tube type in the list.
2. View the tube information.

Tube Editor Settings (all measurements in millimeters)

Field Name	Image	Description
Name		Enter the name of the tube.
Plate Format		Click the drop-down and select the tube format.
Left Edge to Left Well Center		Enter the distance from the left edge of the tube to the center of well A1.
Horizontal Center to Center		Enter the horizontal distance between well centers.
Top Edge to Top Left Well Center		Enter the distance from the top edge of the tube to the center of well A1.
Vertical Center to Center		Enter the vertical distance between well centers.
Well Diameter and Well Shape		Enter the diameter of a round well or the width of a square well. Select the **Well Shape Square** checkbox for square wells. Clear the **Well Shape Square** checkbox for round wells.
Well Bottom Type / Thickness		Click the drop-down and select the well bottom type.
Well Volume / Depth		Enter the depth of the well or enter the working volume of the well for the tube in microliters. This determines the maximum allowable dispense volume.
Plate Height		Enter the height of the tube without a lid.
Plate Width		Enter the width of the tube.
Plate Length		Enter the length of the tube.

Managing PCR Plates

On the left side of the Labware Library page, select **PCR Plates**.



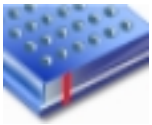
To manage PCR plates:

1. Select a PCR plate type in the list.
2. View the PCR plate information.

PCR Plate Editor Settings (all measurements in millimeters)

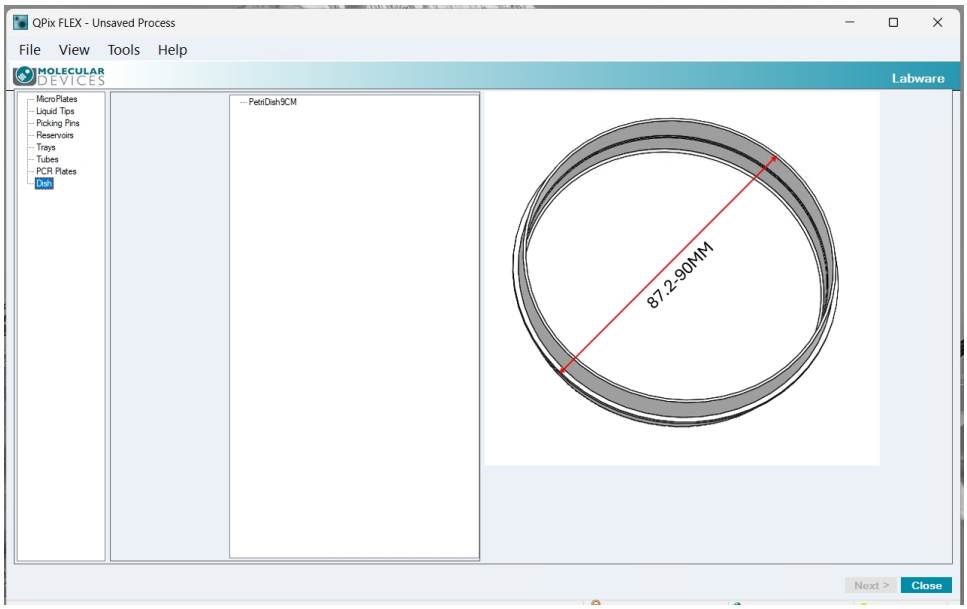
Field Name	Image	Description
Name		Enter the name of the PCR plate.
Plate Format		Click the drop-down and select the PCR plate format.
Left Edge to Left Well Center		Enter the distance from the left edge of the PCR plate to the center of well A1.
Horizontal Center to Center		Enter the horizontal distance between well centers.
Top Edge to Top Left Well Center		Enter the distance from the top edge of the PCR plate to the center of well A1.
Vertical Center to Center		Enter the vertical distance between well centers.

PCR Plate Editor Settings (all measurements in millimeters) (continued)

Field Name	Image	Description
Well Diameter and Well Shape		Enter the diameter of a round well or the width of a square well. Select the **Well Shape Square** checkbox for square wells. Clear the **Well Shape Square** checkbox for round wells.
Well Bottom Type / Thickness		Click the drop-down and select the well bottom type.
Well Volume / Depth		Enter the depth of the well or enter the working volume of the well for the PCR plate in microliters. This determines the maximum allowable dispense volume.
Plate Height		Enter the height of the PCR plate without a lid.
Plate Width		Enter the width of the PCR plate.
Plate Length		Enter the length of the PCR plate.

Managing Dishes

On the left side of the Labware Library page, select **Dish**.



To manage dishes:

1. Select a dish type in the list.
2. View the dish information.

Chapter 13: Maintenance

13

Perform only the maintenance tasks described in this guide. Contact a Molecular Devices service engineer to inspect and perform a preventive maintenance service on the instrument each year. See Obtaining Support on page 123.

Before you operate the instrument or perform maintenance operations, make sure you are familiar with the safety information in this guide. See Safety Information on page 7.

Maintenance and troubleshooting procedures that can be done by users to ensure optimal operation of the instrument are described as follows.

CAUTION! Maintenance procedures other than those specified in this guide must be performed by Molecular Devices. When service is required, contact Molecular Devices technical support.

Doing Preventive Maintenance

You are responsible for doing daily and weekly maintenance. Also, Molecular Devices strongly recommends that a complete instrument maintenance be done every six (6) months by an approved service engineer.

Daily Maintenance

- Ensure that the interior of the instrument is free from dirt and dust. Check the surface of the x-drive drag-chain support bracket. Dust and debris collected here can be swept onto the instrument bed during operation. See Cleaning the Instrument on page 109.
- Remove, clean, and sanitize the wash bath and brushes.

Weekly Maintenance

- Check the operation of the **Emergency Stop** button. See Emergency Stop on page 37.
- If the instrument door shows signs of damage, request a replacement door from Molecular Devices. See Obtaining Support on page 123.

Semi-Annual Maintenance

- A complete instrument maintenance should be done every six months by an approved service engineer. To obtain a maintenance contract or schedule a service visit, contact your representative or technical support. See Obtaining Support on page 123.

Cleaning the Instrument

For efficient decontamination of pathogenic micro-organisms, wipe all non-removable parts within the instrument with a cloth using 75% ethanol.

CAUTION! Molecular Devices recommends that you spray ethanol on a cloth for cleaning the instrument. Autoclaving is not compatible with anodized parts. Do not use the ethanol on acrylic parts. Use water and then turn on the UV lamp. Do not use abrasive cleaners, as they can damage the surface of the bed.

Clean the plate holder glass and front door with a 75% ethanol.

To clean of the tray holder (adapter): Please remove the adapter from the instrument and wipe the surface with 75% ethanol.

The instrument can be left in a laboratory during formaldehyde vapor fumigation at a safe concentration. However, excessive formaldehyde treatment can damage sensitive electrical and optical components.

You can clean all components that come into close contact with biological materials.

The stainless steel picking pin holder consists of two parts: the upper plastic holder and the lower cushion pad. Use a cotton swab dipped in disinfectant alcohol to wipe and disinfect the surface and the holes of the holder. If further disinfection is needed, Remove the four positioning screws with an Allen wrench, then take out the plastic holder and the cushion pad. Cleaned and disinfect these two parts separately. Use 75% ethanol as the cleaning agent.

You should sonicate the pins weekly. See Sterilizing Metal Pins on page 110.

CAUTION! Do not clean the imaging glass and front door with ethanol because it degrades the surfaces.

Sterilizing Metal Pins

The reusable metal pins are sterilized when you run a process that includes a Sanitize profile. They are cleaned before the first pick, between each cycle of picking (if selected), and at the end of the run. You cannot sterilize themetal pins in a pressure oven.

The instrument has three wash bins for ultrasonic washing of metal pins.

Note: You should replace the reagent before each new experiment and also replace the reagent according to your experiment.

To wash metal pins: See Setting Up and Maintaining Wash Baths on page 22.

CAUTION! You can spray ethanol on a cloth to clean the instrument. Autoclaving is not compatible with anodized parts. Do not use the ethanol on acrylic parts. Use water and then turn on the UV lamp.

Replacing Fuses

Fuses burn out sometimes and must be replaced.

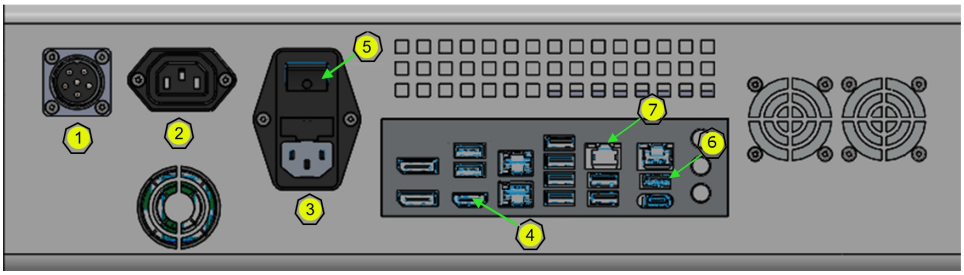
If the instrument does not seem to be getting power after switching it on, check to see whether the supplied power cord is securely plugged into a functioning power outlet and to the power port on the rear of the instrument.

If the power failed while the instrument was on, check that the power cord is not loose or disconnected and that power to the power outlet is functioning properly.

If these checks fail to remedy the loss of power, replace the fuses. You can obtain replacement fuses from Molecular Devices. Fuses must be replaced with the correct type and rating as specified in Technical Specifications on page 117.

CAUTION! Do not touch or loosen screws or parts other than those specifically designated in the instructions. Doing so could cause misalignment and possibly void the warranty.

The fuses are located in the fuse carriers on the back of control box.



Connection Ports and Fuses

Item	Description
1	Instrument Power Output
2	Display Power Output
3	Control Box Power Input
4	Display Power Output
5	Power Button (with fuse)
6	Camera Communication Input
7	Instrument Communication Output

The mains power inlet and the computer and monitor power outlets are separately fused.

To replace a fuse:

WARNING! HIGH VOLTAGE Power off the instrument and disconnect the power cord before you do maintenance procedures that require removal of a panel or cover or disassembly of an interior instrument component.

1. Switch the power switch on the front of the instrument to the off position.
2. Unplug the power cord from the power port.
3. Use a small slot-head screwdriver to turn the fuse carrier counterclockwise and then pull the fuse carrier out to expose the fuse.
4. Use the screwdriver to gently lift the old fuse from the carrier.
5. Gently place a new fuse into the carrier by hand.
6. Slide the fuse carrier back into the instrument.
7. Use the screwdriver to turn the carrier clockwise until it is snug, but do not over tighten it.
8. Plug the power cord into the power port.
9. Turn on the power to the instrument.

Note: If the instrument still does not power on after changing the fuse, contact technical support.

Moving the Instrument

The instrument should not be moved after installation. If relocation is necessary, standard lifting gear is sufficient but must be used only with supervision by an approved engineer.

Move the instrument into position using applicable handling equipment such as forklift trucks or dolly trucks. Make sure that the instrument is properly balanced on the forks before lifting.

CAUTION! Do not use part of the exterior body of the instrument to lift it, as this can cause irreparable damage.

Appendix A: Replacement Parts and Optional Extras

For an up-to-date list of replacement parts and optional extras, see the following web pages:

- www.moleculardevices.com/products/accessories-consumables

QPix FLEX System Microbial Colony Picking System Replacement Parts

Part Number	Description
5317121	HEPA filter. Guaranteed lifetime 2000 hours.

QPix FLEX Consumables

CAUTION! All items listed here are not suitable for autoclaving; the working temperature must be below 80°C. All liquid handling tips listed below cannot be replaced by any other brand, as doing so will not only impact performance and risks severe damage to the instrument.

Part Number	Product Description
4 WELLDIV-30	DIVIDER, 4 WELLS, PACK OF 30
4 WELLDIV-90	DIVIDER, 4 WELLS, PACK OF 90
8 WELLDIV-90	DIVIDER, 8 WELLS, PACK OF 90
96-1000-10PK	TIPBOX WITH 96 1000 UL TIPS; 10 TIPBOXES IN ONE BOX PACKAGE
96-1000-50PK	TIPBOX WITH 96 1000 UL TIPS; 50 TIPBOXES IN ONE BOX PACKAGE
96-200-10PK	TIPBOX WITH 96 200 UL TIPS; 10 TIPBOXES IN ONE BOX PACKAGE
96-200-50PK	TIPBOX WITH 96 200 UL TIPS; 50 TIPBOXES IN ONE BOX PACKAGE
96-50-10PK	TIPBOX WITH 96 50 UL TIPS; 10 TIPBOXES IN ONE BOX PACKAGE
96-50-50PK	TIPBOX WITH 96 50 UL TIPS; 50 TIPBOXES IN ONE BOX PACKAGE
96-PICK-10PK	TIPBOX WITH 96 PICKING TIPS; 10 TIPBOXES IN ONE BOX PACKAGE
96-PICK-50PK	TIPBOX WITH 96 PICKING TIPS; 50 TIPBOXES IN ONE BOX PACKAGE
5315152	KIT, 4 STERILIZABLE PICKING PINS
5316012	SPONGE H20
96-200-PLT-10PK	TIPBOX WITH 96 -200 UL PLATING TIPS; 10 TIPBOXES IN ONE BOX PACKAGE
96-200-PLT-50PK	TIPBOX WITH 96 -200 UL PLATING TIPS; 50 TIPBOXES IN ONE BOX PACKAGE

Appendix B: Technical Specifications

The following tables list the technical specifications of the QPix FLEX Microbial Colony Picking System.

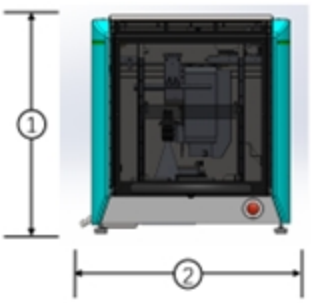
Technical Specifications Instrument

Item	Description
Environment	Indoor use only
Voltage	100-240V~, 50/60Hz, 900W maximum
Dimensions	Instrument: 64 cm (25.2 in.) W x 55 cm (21.7 in.) D x 70 cm (27.6 in.) H Control Box: 44 cm (17.3 in.) W x 32.5 cm (12.8 in.) D x 14.5 cm (5.7 in.) H
Weight	Instrument: 80 kg (176.4 lb) Control Box: 12 kg (25.5 lb)
Power disconnect minimum clearance	To provide access for disconnecting power from the instrument, maintain a 66 cm (26 in.) minimum clearance area on the right side of the instrument.
Ambient operating temperature	15°C to 40°C (59°F to 104°F)
Ambient storage and transport temperature	-5°C to 40°C (23°F to 104°F) continuous -20°C to 50°C (-4°F to 122°F) transient up to 10 hours
Humidity restrictions	30% to 75% (non-condensing)
Altitude restrictions	Up to 2,000 m (6,561 ft)
Sound pressure level	Maximum sound pressure at one meter: 70 dBA
Installation category (Overvoltage category)	II
Pollution degree	2
Fuses	Input F1: T10 A, 250 V
Power connections	IEC Input: Instrument
Mains power cord length	2 m (6.6 ft) maximum Ensure that all power connections for the instrument meet the specified power requirements for the country of use.
Data connection	USB 2.0

Technical Specifications Optional HEPA

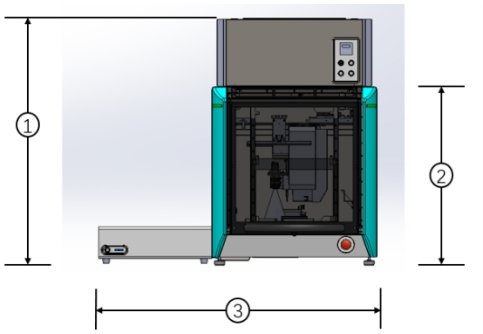
Item	Description
Dimensions	HEPA: 600 mm (23.6 in) W x 480 mm (18.9 in.) D x 270 mm (10.6 in.) H
Weight	HEPA: 25 kg (55 lb)

Appendix C: System Diagrams and Dimensions



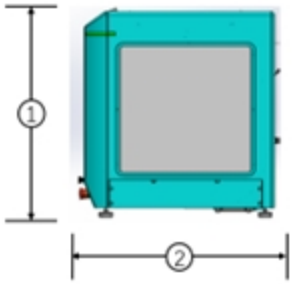
Front View Dimensions

Item	Description
1	Height of instrument: 70 cm (27.6 in.)
2	Width of instrument: 64 cm (25.2 in.)



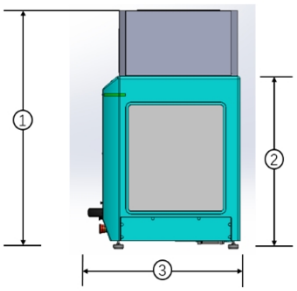
Front View Dimensions with Control Box

Item	Description
1	Height of instrument with HEPA: 96 cm (37.8 in.)
2	Height of instrument without HEPA: 70 cm (27.6 in.)
3	Width of instrument with control box: 108 cm (42.5 in.)



Side View Dimensions without HEPA

Item	Description
1	Height of instrument: 80 cm (32 in.)
2	Depth of instrument: 55 cm (21.7 in.)



Side View Dimensions with HEPA

Item	Description
1	Height of instrument with HEPA: 96 cm (37.8 in.)
2	Height of instrument without HEPA: 70 cm (27.6 in.)
3	Depth of instrument: 55 cm (21.7 in.)

Optional HEPA Dimensions

Item	Description
1	Width of HEPA: 60 cm (23.7 in.)
2	Depth of HEPA: 47 cm (18.5 in.)
3	Height of HEPA: 27 cm (10.6 in.)

Electromagnetic Compatibility

Regulatory for Canada (ICES/NMB-001:2020)

This ISM device complies with Canadian ICES-001.

Cet appareil ISM est confomre à la norme NMB-001 du Canada.

ISM Equipment Classification (Group 1, Class A)

This equipment is designated as scientific equipment for laboratory use that intentionally generate and/or use conductively coupled radio-frequency energy for internal functioning, and are suitable for use in all establishments, other than domestic and those directly connected to a low voltage power supply network which supply buildings used for domestic purposes.

Information to the User (FCC Notice)

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 18 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense. Changes or modifications made to this equipment not expressly approved by the party responsible for compliance may void the FCC authorization to operate this equipment.

Obtaining Support

Molecular Devices is a leading worldwide manufacturer and distributor of analytical instrumentation, software, and reagents. We are committed to the quality of our products and to fully supporting our customers with the highest level of technical service.

Our Support website—support.moleculardevices.com/—describes the support options offered by Molecular Devices, including service plans and professional services. It also has a link to the Molecular Devices Knowledge Base, which contains documentation, technical notes, software upgrades, safety data sheets, and other resources. If you still need assistance, you can submit a request to Molecular Devices Technical Support.

For more information about QPix instruments and accessories, go to www.moleculardevices.com/qpix-sw2.0.

Contact Us

Phone: +1-800-635-5577
Web: moleculardevices.com
Email: info@moldev.com

Visit our website for a current listing of worldwide distributors.

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