

The logo for Revvity, featuring the word "revvity" in a white, lowercase, sans-serif font on a black background. The background of the entire page is a vibrant, abstract graphic of overlapping, translucent spheres in shades of yellow, orange, and green, resembling a molecular or cellular structure.

revvity

USER MANUAL

Prep 96 Automated Homogenizer

Version: G

Date: November 2024

Document Number: 03-2801

Data herein has been verified and validated. It is believed adequate for the intended use of the instrument. If the instrument or procedures are used for purposes over and above the capabilities specified herein, confirmation of the validity and suitability should be obtained; otherwise Revvity does not guarantee results and assumes no obligation or liability. This publication is not a license to operate under, or a recommendation to infringe upon, any process patents.

This product is warranted to be free from defects in material and workmanship for a period of ONE YEAR from the date of delivery. Revvity will repair or replace and return free of charge any part which is returned to its factory within said period, transportation prepaid by user, and which is found upon inspection to have been defective in materials or workmanship. This warranty does not include normal wear from use; it does not apply to any instrument or parts which have been altered by anyone other than an employee of Revvity nor to any instrument which has been damaged through accident, negligence, failure to follow operating instructions, the use of electric currents or circuits other than those specified on the plate affixed to the instrument, misuse, or abuse. Revvity reserves the right to change, alter, modify, or improve any of its instruments without any obligation whatever to make corresponding changes to any instrument previously sold or shipped.

THE FORGOING OBLIGATION IS IN LIEU OF ALL OBLIGATIONS AND LIABILITIES INCLUDING NEGLIGENCE AND ALL WARRANTIES OF MERCHANTABILITY OR OTHERWISE, EXPRESSED OR IMPLIED IN FACT OR BY LAW, AND STATE OUR ENTIRE AND EXCLUSIVE LIABILITY AND BUYERS EXCLUSIVE REMEDY FOR ANY CLAIM OF DAMAGES IN CONNECTION WITH THE SALE OR FURNISHING OF GOODS OR PARTS, THEIR DESIGN, SUITABILITY FOR USE, INSTALLATION, OR OPERATION. REVVITY WILL IN NO EVENT BE LIABLE FOR ANY SPECIAL OR CONSEQUENTIAL DAMAGES WHATSOEVER, AND THEIR LIABILITY UNDER NO CIRCUMSTANCES WILL EXCEED THE CONTRACT PRICE FOR THE GOODS FOR WHICH LIABILITY IS CLAIMED.

This product has been engineered for safety; however, basic safety precautions and common sense must always be demonstrated when using any electrical product.

- Use this product only for its intended purpose.
- Keep this product away from heated surfaces.
- **DO NOT** attempt to modify any part of this product.
- **DO NOT** allow the machine to be submerged in any liquid.
- **DO NOT** use in any setting other than an indoor laboratory.
- **DO NOT** use attachments not recommended by the manufacturer.
- **DO NOT** operate the product if it is damaged in any way.
- **DO NOT** operate the product with the safety ground disconnected.
- **DO NOT** modify the plug or cord that is provided.

WARNING: Reduce the risk of unintentional starting; make sure the machine is OFF before plugging into a power supply.

WARNING: Damaged or worn power cords should be repaired or replaced immediately by a qualified electrician.

WARNING: Improper connection of the equipment can result in a risk of electric shock.

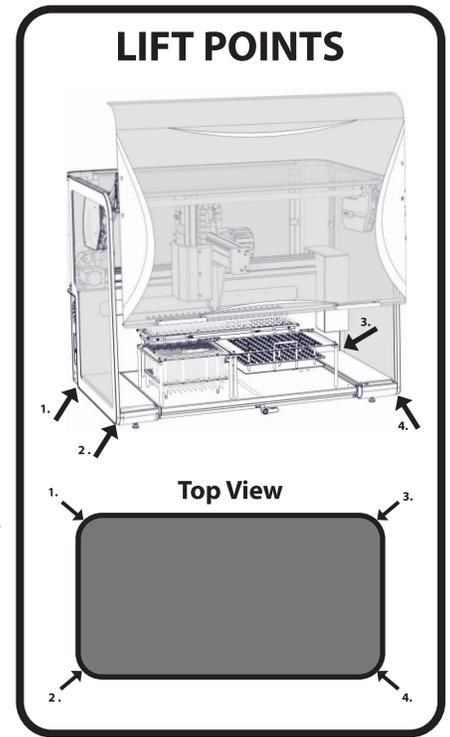
WARNING: Improper handling of the unit can result in injury! Always perform a Team Lift, when raising, lowering, or transporting the unit. Team members working together to move the unit should follow the Lifting and Lowering guidelines provided.

When Lifting from the Ground-Level:

- Position your body as close to the unit as possible.
- Bend your knees and squat down while keeping your torso upright.
- Using both hands, grab and support the unit from underneath and use your legs to slowly lift the unit up, while keeping your back straight.

When Lowering to the Ground-Level:

- Position your body as close to the unit as possible.
- Using both hands, grab and support the unit from underneath.
- While keeping your back straight, carefully lift the unit up and clear it away from the resting surface.
- Bend your knees and squat down with the unit while keeping your torso upright.
- Slowly position the unit onto the ground, while being careful not to pinch your fingers underneath.



Copyright

This manual is published by Revvity 935 Cobb Place Blvd, Kennesaw, GA 30144 USA. Copyright Revvity, Inc. All rights reserved, including but not limited to those rights to reproduce this publication or parts thereof.

Reproduction of this publication or parts thereof, or the products it describes, by any means or in any form is expressly prohibited without the written permission of Revvity.

Trademarks

Revvity is a registered trademark of Revvity. All other trademarks are the property of their respective owners.

Proper Equipment Operation

To reduce the risk of electric shock, do not remove the cover. No user serviceable parts are inside. Refer to qualified service personnel if help is required.

Use this product only in the manner described in this manual. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Preventative Maintenance

Normal use: 12 month interval.

Heavy use may require a 6 month interval.

Operating Environment

5°C to 40°C / 41°F to 104°F, Humidity: 5% to 85% RH. Internal use only

Electrical Supply

100-230V, 50/60 Hz

FCC

This device complies with part 15 of the FCC (United States Federal Communications Commission) Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

CE/UKCA

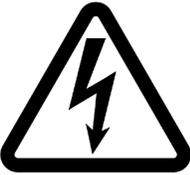
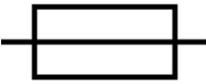
This device complies with all CE and UKCA rules and requirements.

Changes or modifications to this equipment not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Table of Contents

Table of Symbols.....	5
Safety Information	6
Intended Use	7
Specifications.....	8
Installation	9
System Overview	10
Homogenizer Module and Rotor Stator Homogenizer Probes	11
Turning on the Prep 96.....	13
Logging in/Out.....	14
Creating and Editing Deck Layouts (Editor User Group Only)	16
Calibrating Deck Layouts (Editor User Group Only).....	18
Active Deck Selection (All Users).....	26
Creating and Editing Methods (Editor User Group Only)	27
Running Methods (All User Groups)	31
Troubleshooting.....	35
Clearing Jams	36
Jog Controls.....	36
Attempt Auto Recovery	37
Error Codes.....	38
Frequently Asked Questions	41
Cleaning and Maintenance	42
Appendix 1 - Accessories.....	43
Appendix 2 - Probe Disposal - Disposal Chute	44
Appendix 3 - Probe Disposal - Cleaning Station	45
Appendix 4 - Example Deck Layouts.....	46
Appendix 5 - Method Substep Parameters	48
Appendix 6 - Method Substep Parameters for Cleaning Station	49
Appendix 7 - Working Examples of Sample Racks with Sample Selected	51
Appendix 8 - Settings (Editor User Group Only).....	53
Appendix 9 - Logs (Editor User Group Only).....	54
Appendix 10 - Transport and Storage	54
Equipment Disposal.....	54

Table of Symbols

Symbol	Description	Symbol	Description
	Caution. Refer to the User documentation (ISO 7000-0434B)		On (power). (IEC 60417-5007)
	Hazardous voltage; risk of electric shock. (IEC 60417-6042)		Off (power). (IEC 60417-5008)
	Fuse. (IEC 60417-5016)		Warning; Hand Crush
	Alternating current. (IEC 60417-5032)		Consult Instructions for Use. (ISO 7000-1641)
	WEEE symbol (EN50419:2005)		CE Compliance Mark
	RoHS 2002/95/EC, 2011/65/EU, 2015/863 Compliant		FCC Compliance
	UKCA Certification Mark		China RoHS 2 Compliance Mark
			RCM Certification Mark

Safety Information

Before using the instrument, make sure to read and understand this manual thoroughly. Keep the manual close to the instrument, easily accessible to all the users. Improper operation can cause injury to persons or damage to the equipment

Claims for damages in any form whatsoever, for injury to persons or damage to the instrument, caused through non-observance of the following safety instructions, are excluded.

Use according to the intended purpose

Do not make any alterations to the instrument and use only approved spare parts and accessories. Otherwise the Declaration of Conformity will lose its validity and this will also lead to the loss of any guarantee claims.

Transport

Do not knock or shake the Prep 96 during transport. Otherwise the electronic and mechanical components may be damaged.

Packing material

Please keep the packing material for the duration of the warranty period. In case of a complaint and return of the instrument in unsuitable packing material, your warranty claim will be lost.

Temperature variations

If the Prep 96 is subjected to rapid high temperature variations electronic components may be damaged.

Ambient temperature

If the temperature drops below -13°F (-25°C) or exceeds 140°F (60°C), electronic and mechanical components can be damaged. Performance can be changed to an unknown extent.

Atmospheric humidity

If the operating humidity exceeds 85% non-condensing, electronic and mechanical components can be damaged. Performance can be changed to an unknown extent.

Materials

Observe the relevant regulations and directives for handling chemicals and hazardous materials.

Repair

For your own safety, repairs must be carried out only by authorized service technicians approved by Revvity or its representatives,



Electrical connection

If the values for the mains power supply on the name plate are not observed, the electrical and mechanical components may be damaged.

Moving Axis

TBC

Intended Use

The Prep 96 is a fully automated sample homogenizing workstation. The Prep 96 can homogenize up to four samples simultaneously and process up to 96 samples in a batch. The potential for cross-contamination of samples can be virtually eliminated using Tip™ Plastic Disposable Homogenizer probes.

The Prep 96 fully automates the time-consuming manual homogenization of samples. Load the sample tubes into the sample rack, and the Prep 96 will quickly and efficiently homogenize the samples following the selected method.

Specifications

Part Number	51-02A-1
Power Supply	100-230 VAC, 50/60 Hz. Connect only to a properly grounded outlet
Sample Capacity	Up to 96 in any single batch
Programming/Operation	Touchscreen tablet supplied with Prep 96 control
Homogenization Motors	8 x 100-watt DC brushless
Speed Control	500 to 28,000 rpm depending on probe size
Processing Volumes	Sample size varies from 250 µL to 40 mL per tube depending on tube size.
Compatible Tube Sizes	2, 5, 14/15, 30, and 50 mL Sample Tubes.
Probe Compatibility	Disposable Tip™ Plastic Probes (7 and 12 mm Variants) Tip™ Hybrid Probes (7 and 12 mm Variants) Stainless Steel Generator Probes (5, 7 and 10 mm Variants)
Maximum dimensions during operation (W x D x H)	37.5" (95.2 cm), 25.5" (64.8 cm), 28.7" (72.9 cm) with lid open H: 42.5" (107.9 cm)
Weight	125 lbs. (57 kg)
Site Requirements	The unit must be placed on a solid work surface. The work surface also requires a 15 amp circuit; only two units can be placed on this circuit simultaneously.
Ambient Air	The system must be located in an area with clean ambient air. No emission of solid particles or smoke in the air by adjacent equipment is allowed. The level of dust should be comparable to that of normal laboratory spaces.
External Fire Protection	External fire protection should be installed according to local regulations for equipment operating unattended.
Input Current	8 Amp Maximum
Power Connector	IEC 60320 C13
Circuit breaker	8 Amp
Fan	92 x 92 mm 24Vdc 220 mA - Two fans
Overvoltage Category	II
Pollution Degree	2
Operating Environment	39°F to 104°F (4°C to 40°C)
Relative Humidity	5% to 85% non-condensing
Altitude	Up to 2000 m
Warranty	1-year extended warranty/service agreements are available.
Certification	TUV, NRTL, CE, UKCA, RCM, FCC Part 15 Approved
For Indoor Use Only	

Installation

Unpacking

The system's total weight is 125 lbs. (57 kg). Use suitable lifting equipment when moving the package. The system is supplied on a pallet, and the dimensions (W x D x H) of the package, including the pallet, are: 44" (106.7 cm) x 38.5" (97.8 cm) x 34" (86.4 cm). The fume hood or bench must be able to support the system's total weight.

Before the installation, carefully examine the delivery for possible damage or missing parts. Check that the instrument has not been visibly damaged during the transport.

Please keep the packing material for the duration of the guarantee period. In case of a complaint and return of the instrument in unsuitable packing material, your guarantee claim will be lost. Check that the mains cord is compatible with the local standard. If any kind of damage occurred during transport, immediately make a complaint to the carrier. Any incorrect delivery or missing parts should be reported to the distributor.

Installation Location

When selecting the right place for the instrument, please consider the following:

- Put the device on a smooth, horizontal and stable place.
- Leave enough space beyond the device for normal air circulation, min. 10 cm.
- Leave enough space around the device, so you can easily access all sides for maintenance.
- Don't use the device in surroundings, where there are rapid temperature and humidity changes. Also avoid places exposed to direct sunlight and places nearby heating devices.

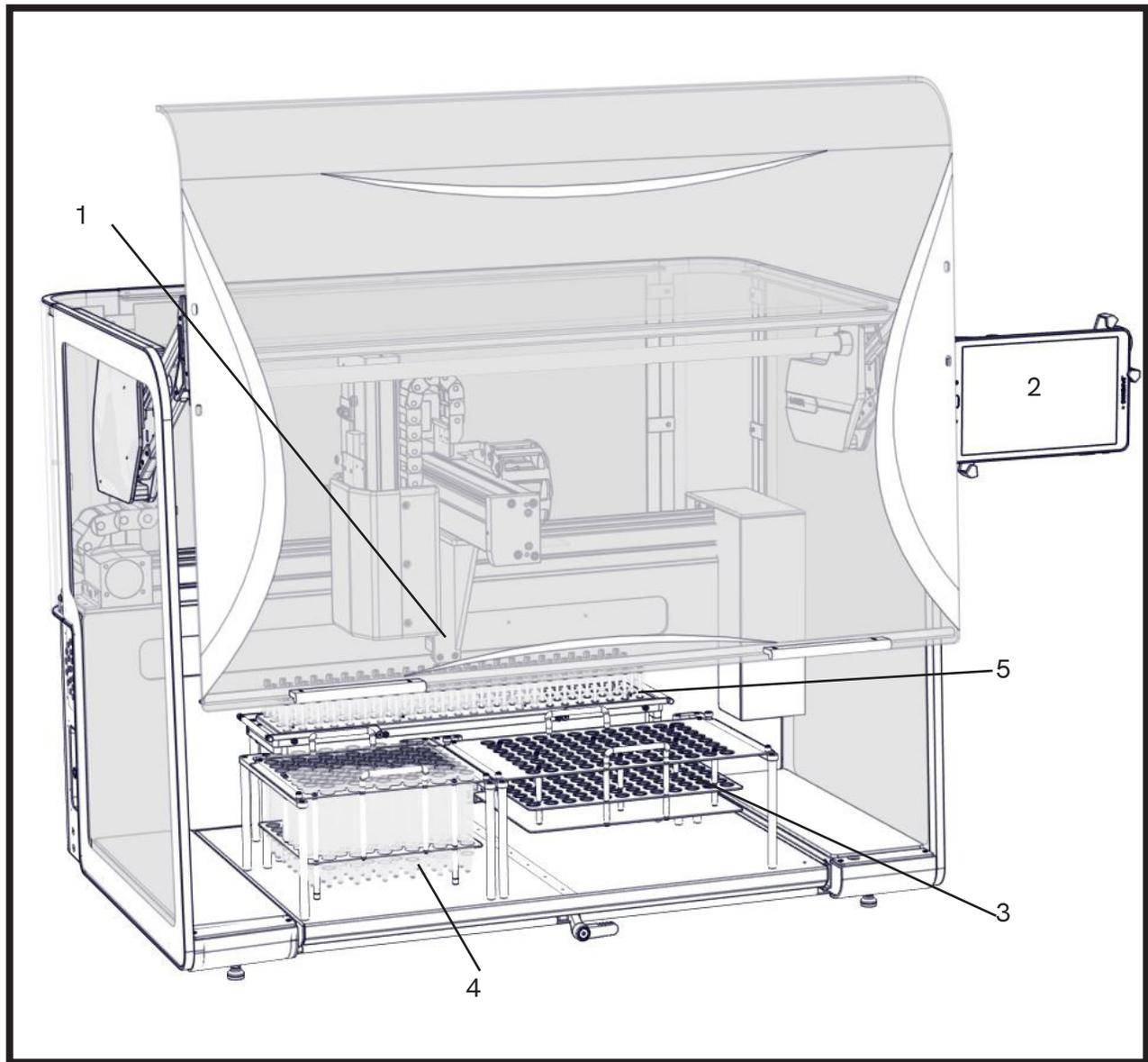
Connecting the Power Cord

Fit one end of the power cord, included in the delivery, into the main socket on the instrument. Connect the other end of the cord to a grounded wall socket.

To avoid interference from noise, surges and spikes, a dedicated line is preferred. If no such line is available, avoid lines to which powerful electric motors, refrigerators and similar devices are connected.

The power can be turned on and off by the main switch, located on the inside of the left leg of the instrument.

System Overview



Position	Description
1	End Effector Homogenizer
2	Touchscreen Controller
3	Sample Rack
4	Dirty Probe Rack
5	Clean Probe Rack

Due to the modular nature of the Prep 96 system the labware accessories depicted above may not be present on your system.

Homogenizer Module and Rotor Stator Homogenizer Probes

The critical component in the Prep 96 Homogenizer is the Rotor Stator Homogenizer Probe. The rotor stator homogenizer probe spins a rotor cutting shaft at high speeds with a stationary housing to create a shearing force within the sample media. This shearing action effectively cuts, mixes, and homogenizes the sample. The homogenizer probe consists of a rotating shaft with a cutting tip (Rotor) in a stationary housing (Stator).

The Prep 96 homogenizes a sample by inserting a specific probe into the specified sample tube and operating the probe at high rotational speeds to shear and mix the sample. The Prep 96 also oscillates the probe up-and-down and side-to-side to fully process the sample, simulating the motions used in manually operated homogenizers. The Prep 96 uses dedicated probes to process up to 4 samples simultaneously and 96 samples in a single batch. As dedicated individual probes are assigned to each sample tube, the potential for cross-contamination is minimized, and using disposable probes virtually eliminates the potential for cross-contamination.

Probe Applications

Homogenizer probes are available in flat bottom, saw-tooth bottom or extended knife configurations. Flat bottom probes work best with liquids or soft tissue and for gentler applications, such as creating emulsions, basic mixing, and liquid-liquid processing. Saw-tooth and extended knife probes work best with fibrous tissue. Probes with oversized windows work best with frozen or solid samples.

Probe Sizes

Homogenizer probes are available in a variety of sizes, with the 5, 7, 10, and 12 mm probes being the most common. When working with liquids, choose a probe diameter based upon the expected volume of the sample processed. For solid samples, choose a probe that is as large or larger than the initial size of the sample being processed.

Probe Speeds

The homogenizer probes can be operated at speeds ranging from 500 to 28,000 rpm. The optimum speed is highly dependent on the type of sample and the consistency of the end product.

Tip™ Homogenizer Probes

When used as a single use consumable, the 7 and 12 mm Tip™ patented design eliminates the hassle of disassembly and maintenance of traditional stainless steel generator probes. Proprietary Tip™ Probes are available in soft tissue (disaggregation) and hard tissue (frozen) versions. Engineered from durable plastics, Tip™ probes are reusable (autoclavable) and are so economical that they can be disposed of after each use to virtually eliminate cross-contamination. The outer tube of Tip™ probes is made of Lexan 144R, a polycarbonate. The inner shafts are made of Ultem™ 1000, a polyetherimide. Tip™ probes are available in 7 and 12 mm versions.

Tip™ Specifications

Processing Range	250 µL to 40 mL
Diameter	7 or 12 mm
Length	110 mm
Outer Tube Composition	Lexan 144R (polycarbonate)
Shaft composition	Ultem 1000 (polyetherimide)
Type	Saw Tooth
Drive Connect	B-Style

Tip™ 7 and 12 mm Hybrid Probes

Tip™ 7 and 12 mm Hybrid Homogenizer Probes combine the convenience of disposable plastic probes with the durability of traditional stainless steel probes. Hybrid Homogenizer probes are made of a stainless steel outer stator tube with an inner Ultem plastic rotor shaft. The plastic shafts can be disposed of after each use or cleaned and re-used multiple times. The simple two-piece design makes these probes much easier to clean than traditional stainless steel probes. Tip™ Hybrid probes are ideal for applications where chemical compatibility issues are a factor. Hybrid Probes are compatible with most chemical compounds, including TRIzol®, chloroform, and phenol. Tip™ Hybrid Probes are available in 7 and 12-mm variants. Multiple clean Hybrid Probes may be preloaded onto the LH 96 that will be ejected between samples; or alternatively, a cleaning station may be used where the probes will then not be ejected between samples but rather re-used after the cleaning cycle completes.

Tip™ Hybrid Probe Specifications

Processing Range	250 µL to 40 mL
Diameter	7 or 12 mm
Length	110 mm
Outer Tube Composition	316 Stainless Steel
Shaft composition	Ultem 1000 (polyetherimide)
Type	Saw Tooth
Drive Connect	B-Style

Stainless Steel Generator Probes

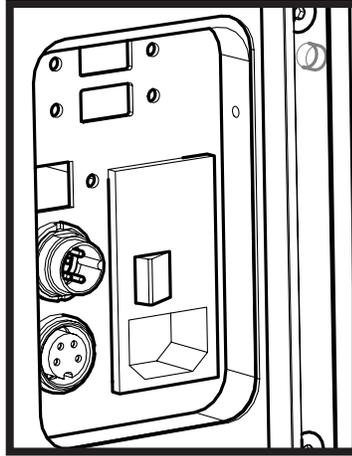
Stainless steel generator probes, available in 5, 7, and 10 mm diameters, are ideal for more challenging tissue types as well as in lab environments where reducing plastic waste is a priority. Stainless steel probes offer superior resistance to most organic solvents commonly used during homogenization. Stainless Steel probes are not picked up and ejected between samples; manual intervention is required at the start of a run to fit probes into the homogenizer head of LH 96. If Stainless Steel Probes are required on the LH 96, a Cleaning Station is required to remove sample-to-sample debris and carryover between samples.

Stainless Steel Generator Probes Specifications

Probe Diameter	5 mm	7 mm	10 mm
Processing Range	0.20 mL - 5 mL	0.25 mL - 30 mL	1.5 mL - 100 mL
Length	75 mm	115 mm	115 mm

Turning on the Prep 96

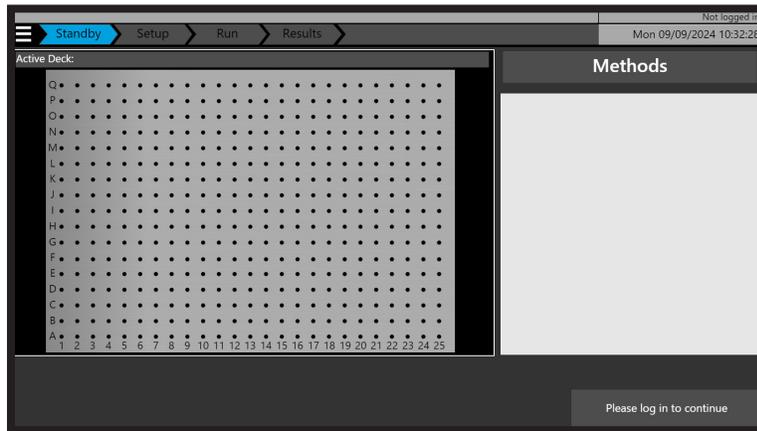
1. Check the Prep 96 unit to verify that there are no used probes or sample tubes left in the racks. Verify that the unit is clean and that no contaminants remain from previous runs.
2. Turn on the Prep 96 by pressing the On-Off switch to the ON (I) position. The On-Off switch is located on the left side of the Prep 96 toward the rear. There is an additional circular switch on the front left hand side of the unit, ensure this is also pressed.



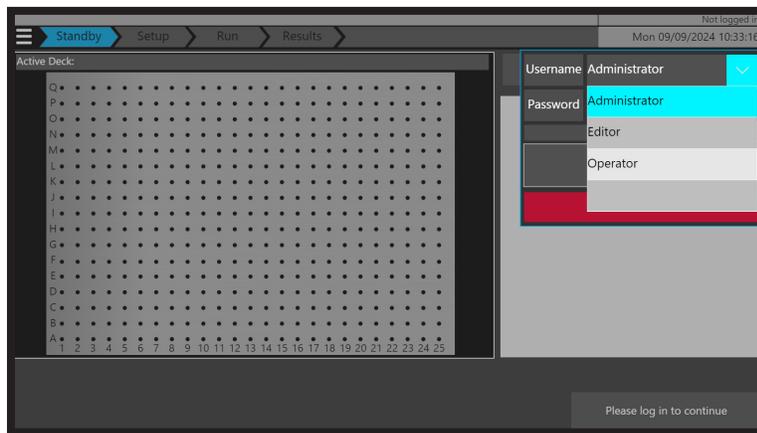
3. Ensure that the tablet is on and the Prep 96 application is running.

Logging in/Out

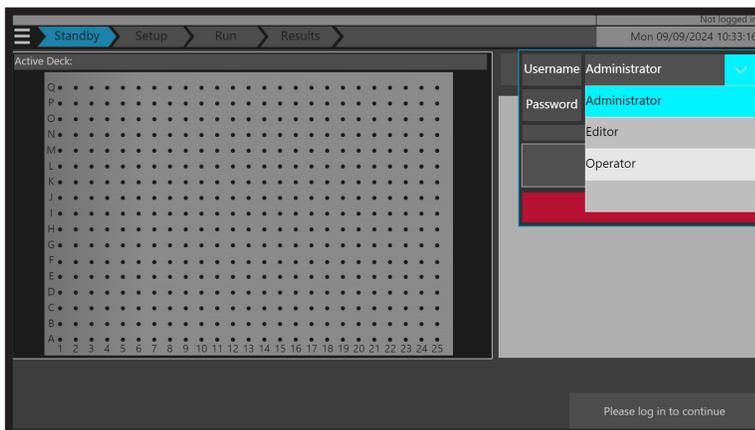
1. When the software first starts, the home screen is displayed. An operator must login to the Prep 96 to use the system. Press the "Please log in to continue button" found on the bottom right hand side of the screen or the "Menu Hamburger Icon" found on the top left of the screen.



2. Select the appropriate user by pressing on the username drop down. Users are assigned a permission group when they are initially created. There are two types of user groups (Editor and Operator). These groups allow and prohibit certain activities on the system, to protect data integrity.

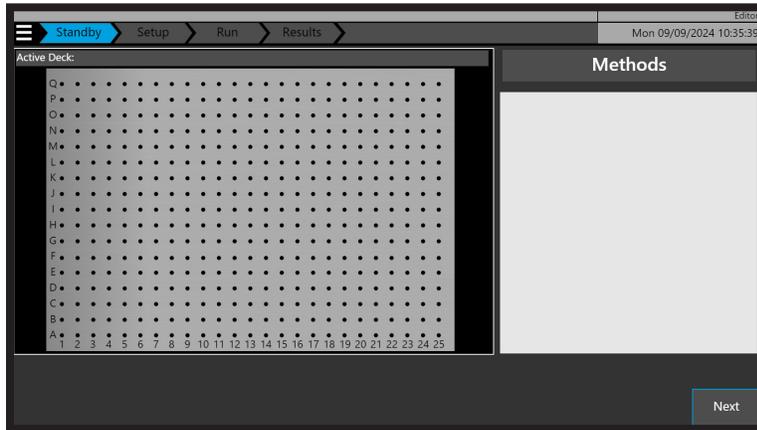


3. Press the password field and enter the corresponding password for the user logging in. Then press OK and then press Login.

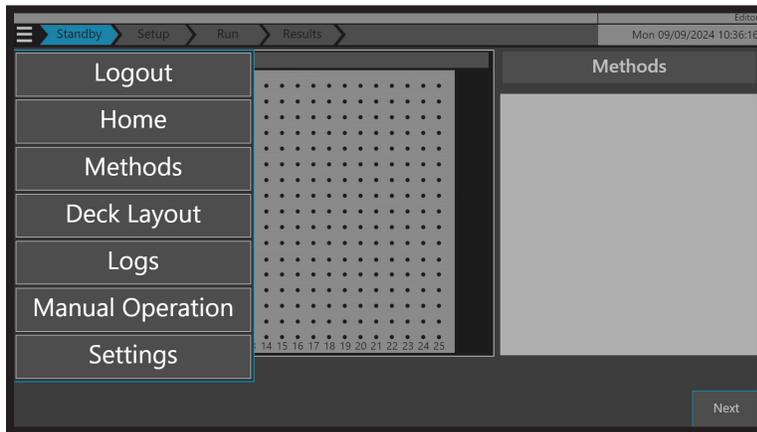


User	Password
Editor	PREP-96
Operator	omni

4. The current logged in user will be displayed on the top right of the screen.



5. To logout or change the user, press the "Menu Hamburger Icon" on the top left of the screen, which will display the navigation menu. Pressing logout will log out the current user and return to the home screen.



Creating and Editing Deck Layouts (Editor User Group Only)

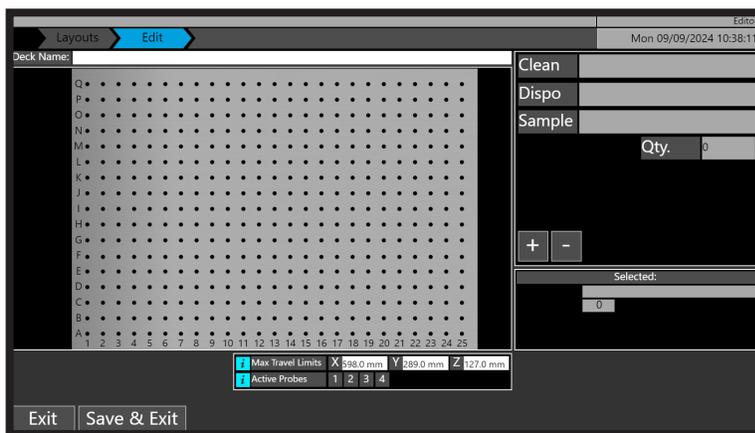
A deck layout is a combination of labware accessories (clean probe racks, sample racks, disposal racks, etc.) that are assigned to a homogenization method. When the Prep 96 software is first installed, there are no deck layouts available, only a user in the editor user group has the permissions to create them.

An Prep 96 can have multiple deck layouts saved and assigned to methods to provide ultimate flexibility in terms of the probes and sample racks used during homogenization.

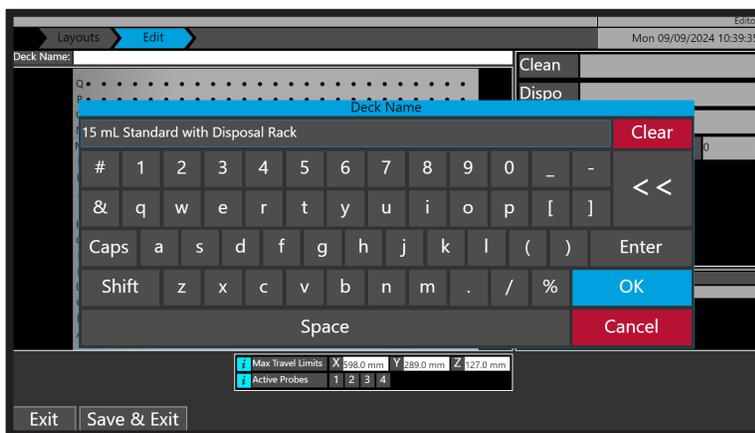
Labware accessories will have been purchased based upon your particular application requirements.

1. To access deck layout, press the **“Menu Hamburger Icon”** and then press **“Deck Layout”**. Within this view of the software, deck layouts can be created, edited, imported, exported and calibrated.

2. To create a new deck layout, press **“New”**. The deck layout editor screen will open.



3. Press in the white **“Deck Name”** field, and enter a name for the new layout. It is good practice to name the layout to indicate the labware accessories being used. Press **“OK”** once complete.



4. Press the **“+ icon”** and then scroll through the labware list to sequentially add labware accessories to create a deck layout. These labware accessories will need to correspond to the physical labware accessories you have available, and ultimately to those installed on the Prep 96 deck when a homogenization method is executed.

The complete list of available labware accessories can be found in Appendix 1.

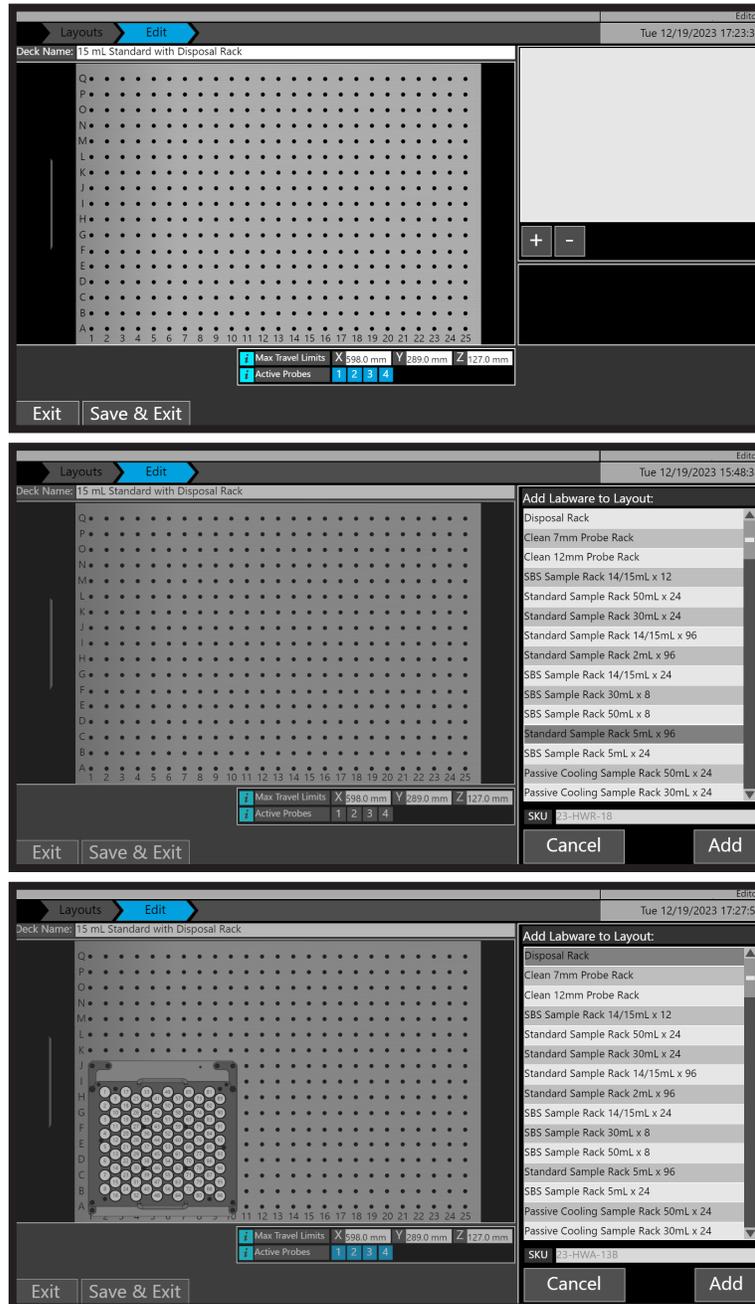
When creating deck layouts labware relationships must be taken into account.

When creating a deck layout using standard or passive cooling sample racks, disposal options can be either a disposal rack or a disposal chute. The disposal chute is activated in Settings>Advanced and is not added to the deck layout as a labware item. See Appendix 2.

If using SBS sample racks, the only disposal option is via the disposal chute.

If a cleaning station has been installed to support homogenization methods using stainless steel or hybrid probes, this accessory is activated in Settings>Advanced and is not added to the deck layout as a labware item. See Appendix 3.

Example Deck Layouts can be found in Appendix 4.

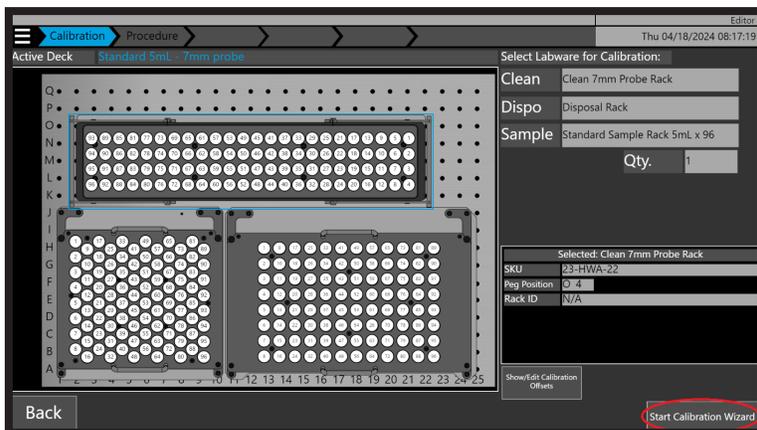


5. Once labware accessories have been added to the deck layout, press "Save & Exit".

Calibrating Deck Layouts (Editor User Group Only)

Labware within any deck layout requires calibration before use. Calibration of a deck layout begins with physically adding the labware accessories containing tubes to the Prep 96 modular deck. Once the required labware accessories are in place, change the active deck to match.

1. Press the “Calibrate Active Deck” to start the calibration process.



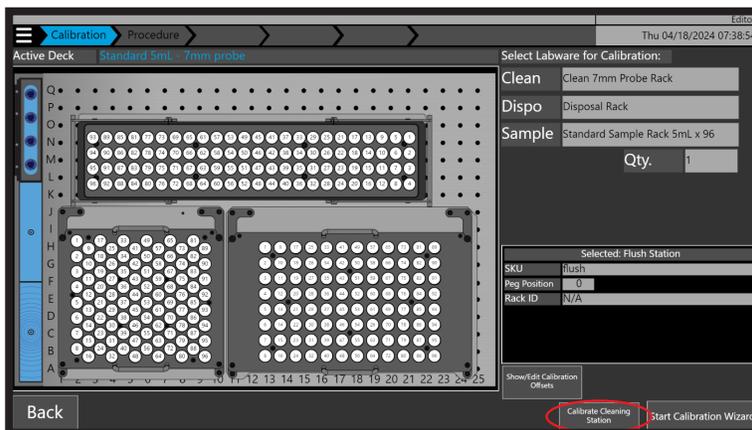
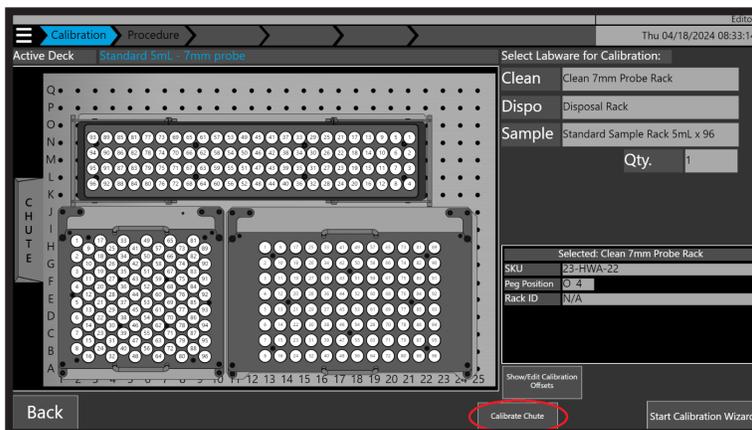
The standard practice for calibrating is shown below.

- Probe pickup
- Sample Rack
- Disposal Rack or Disposal Chute
- Cleaning Station

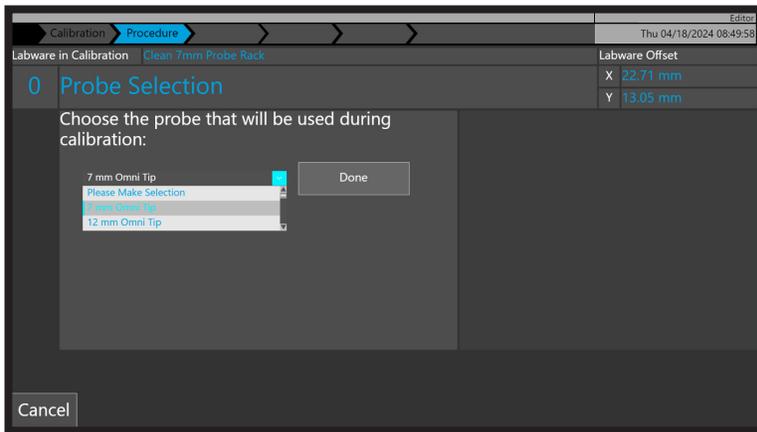
2. Select the labware accessory you want to calibrate, by pressing the labware image or the name on the right hand side. The selected labware will be highlighted with a blue rectangle. Then press “Start Calibration Wizard” to calibrate that labware accessory.

If a Disposal Chute is installed press the “Calibrate Chute” button.

If a Cleaning Station is installed press the “Calibrate Cleaning Station” button.



3. During calibration actions you will need to have a probe installed in positions #1 or 4 of the Prep 96 homogenizing head. Ensure that the installed probe matches the selection in the software. Scroll through the list to select and then press “Done”.



7 mm Tip
12 mm Tip
7 mm Hybrid Probe
12 mm Hybrid Probe
5 mm Stainless Steel Probe
7 mm Stainless Steel Probe
10 mm Stainless Steel Probe

4. You will be presented with various calibration actions depending on the labware accessory that was selected for calibration. See below.

Action	Clean Racks	Sample Racks	Disposal Rack	Disposal Chute	Cleaning Station	Purpose/Description
X/Y Alignment	✓	✓	✓	✓	✓	Calibrates the homogenizer head in the center of current position
Pickup Height	✓					Calibrates the probe pickup height in the clean probe rack
Dropoff Height			✓	✓		Calibrates the drop off height of the probe in the disposal rack
Top of Tube		✓			✓	Calibrates the homogenizing probe tip to the top of the sample tube
Bottom of Tube		✓			✓	Calibrates the homogenizing probe tip to the bottom of the sample tube
Insertion Length		✓				Calibrates a standard homogenizing probe insertion depth for a sample rack

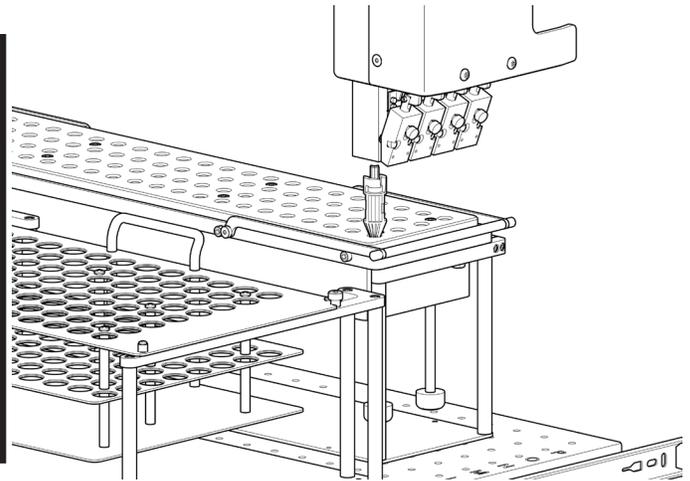
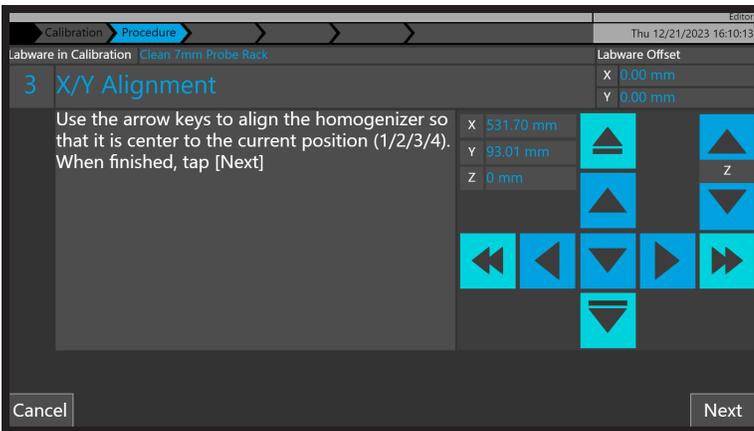
If an item of labware has been calibrated in another deck layout, it will not require calibrating, as the labware accessory calibrations are shared between deck layouts.

Clean Probe - X/Y Alignment

This calibrates the X and Y position to the first location on the clean probe rack. Items needed for calibration: Probes and clean probe rack installed on the deck.

Step to calibrate:

1. Place the appropriate probe as shown below, in **position 4** of the clean probe rack.
2. Press the "X/Y Alignment" button and the Prep 96 will move to the desired location.
3. Using the X, Y and Z arrow keys in the software, move the Prep 96 end effector so that position 4 is located centrally over the probe in position 4 of the clean probe rack.
4. When at the desired location, press "Next". The Prep 96 will save calibration data.

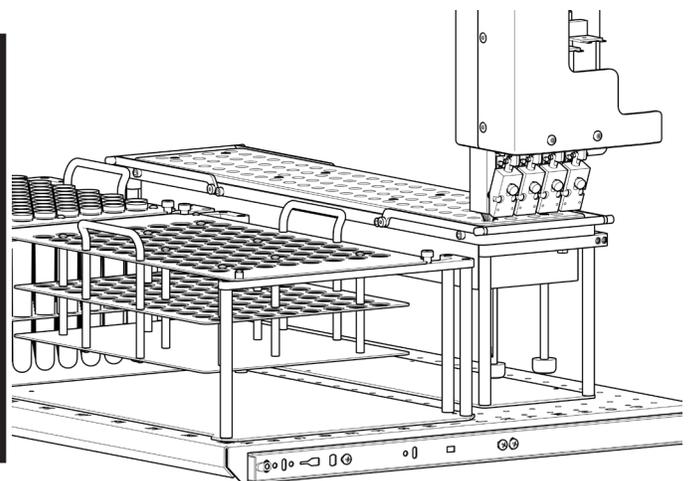
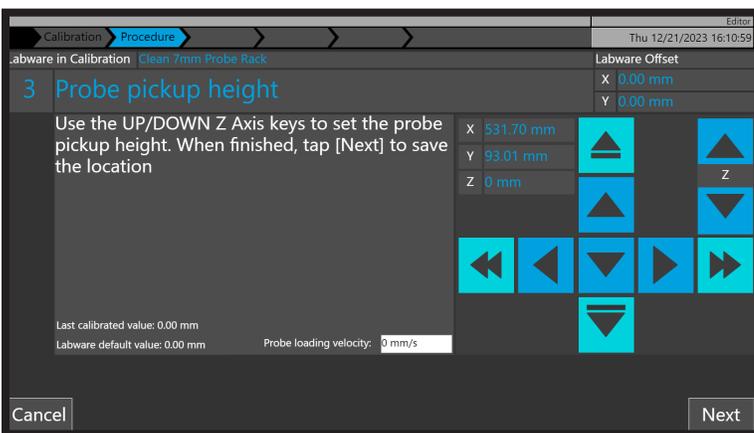


Clean Probe - Pickup Height

This action calibrates how far the Z axis moves down when picking up probes from the clean probe rack. Items needed for calibration: Probes and clean probe rack installed on the deck.

Steps to calibrate:

1. Place appropriate probes as shown below, in **positions 1-4** of the clean probe rack.
2. Press the "Pickup Height" button and the Prep 96 will move to the desired location.
3. Using the X, Y and Z arrow keys in the software, move the end effector downward until the end effector is fully bottomed out on the probes in the clean probe rack.
4. When at the desired height press "Next". The Prep 96 will save calibration data.



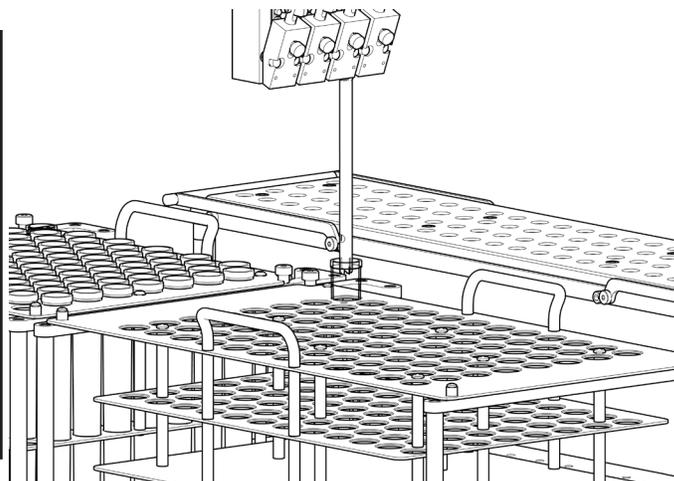
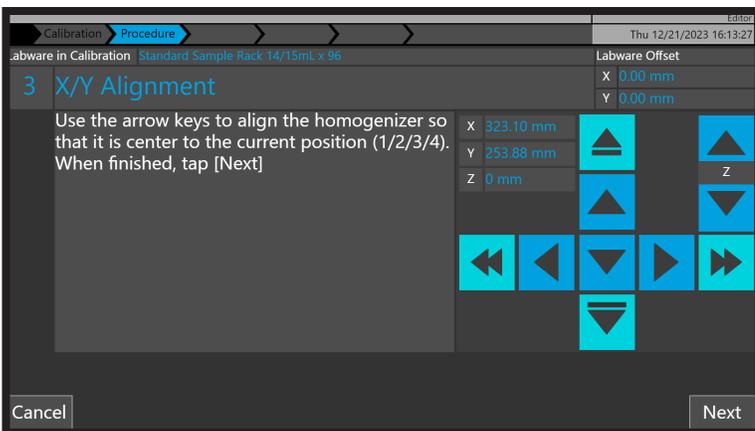
Sample Rack - X/Y Alignment

This calibrates the X and Y position to the first location on the sample rack.

Items needed for calibration: Probes and sample rack with tubes installed on the deck.

Step to calibrate:

1. Place the appropriate probe as shown below, in **position 1** of the end effector.
2. Press the "X/Y Alignment" button and the Prep 96 will move to the desired location.
3. Using the X, Y and Z arrow keys in the software, move the Prep 96 end effector so that the probe in position 1 is located centrally over the tube in position 1 of the sample rack.
4. When at the desired location, press "Next". The Prep 96 will save calibration data.



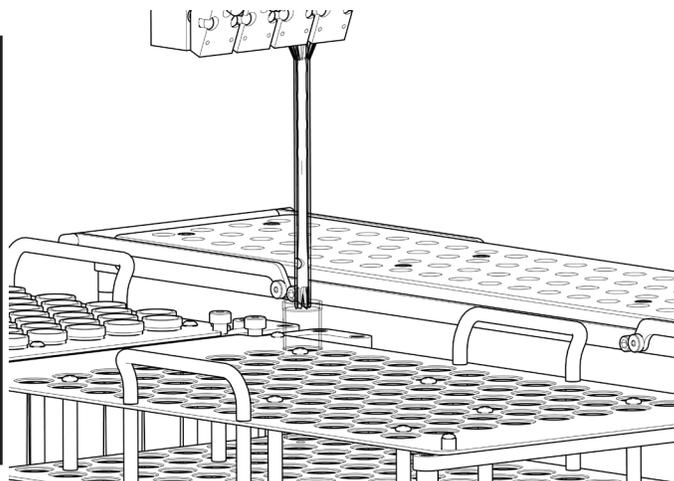
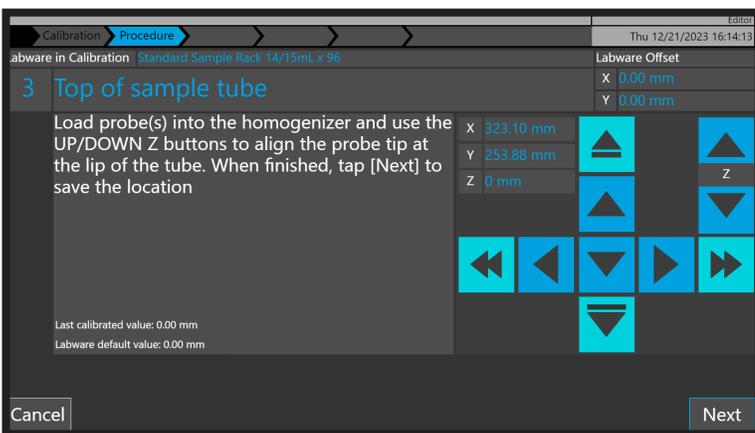
Sample Rack - Top of Tube

This calibrates the top of the tube position in the sample rack, which is used during touch off.

Items needed for calibration: Probes and sample rack with tubes installed on the deck.

Step to calibrate:

1. Place the appropriate probe as shown below, in **position 1** of the end effector.
2. Press the "Top of Tube" button and the Prep 96 will move to the desired location.
3. Using the X, Y and Z arrow keys in the software, move the Prep 96 end effector so that the probe in position 1 is located at the top of tube in position 1 of the sample rack.
4. When at the desired location, press "Next". The Prep 96 will save calibration data.

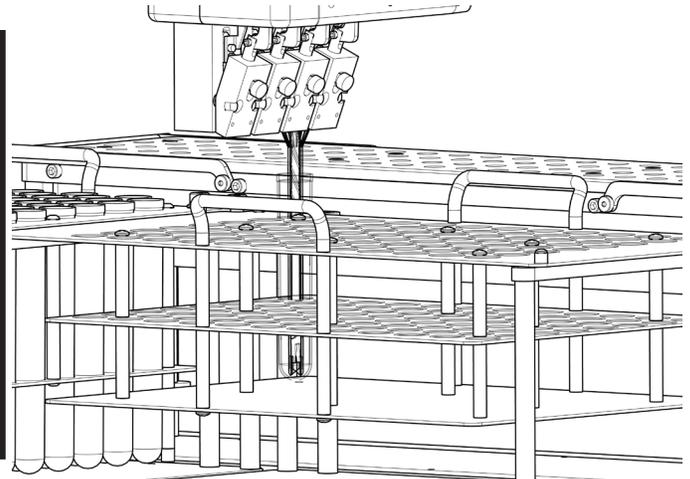
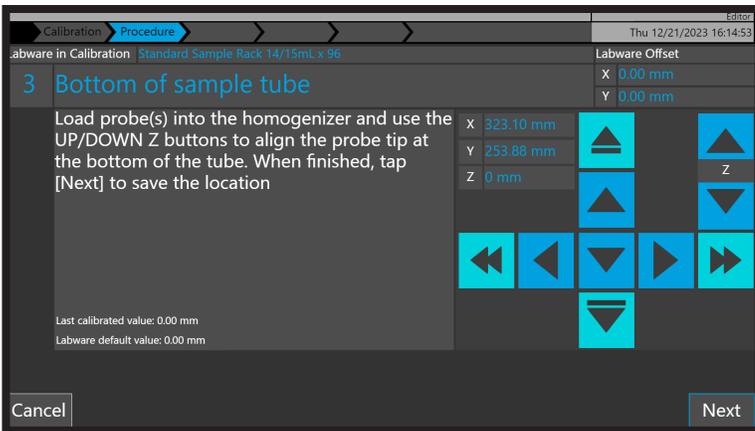


Sample Rack - Bottom of Tube

This calibrates the bottom of the tube position in the sample rack, which is used during homogenization. Items needed for calibration: Probes and sample rack with tubes installed on the deck.

Step to calibrate:

1. Place the appropriate probe as shown below, in **position 1** of the end effector.
2. Press the "Bottom of Tube" button and the Prep 96 will move to the desired location.
3. Using the X, Y and Z arrow keys in the software, move the Prep 96 end effector so that the probe in position 1 is located at the bottom of tube in position 1 of the sample rack.
4. When at the desired location, press "Next". The Prep 96 will save calibration data.

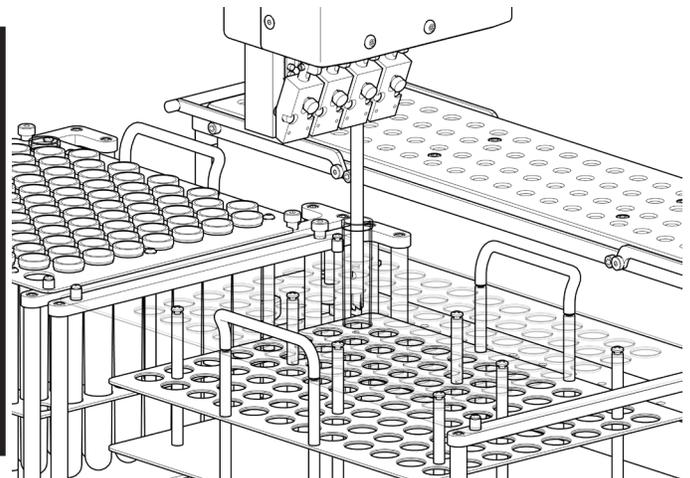
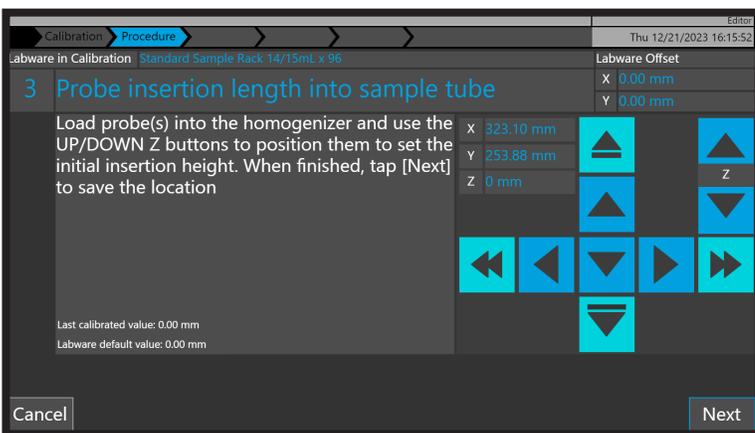


Sample Rack - Insertion Length

This calibrates the maximum insertion depth of a probe in a tube in the sample rack. Items needed for calibration: Probes and sample rack with tubes installed on the deck.

Step to calibrate:

1. Place the appropriate probe as shown below, in **position 1** of the end effector.
2. Press the "Insertion Length" button and the Prep 96 will move to the desired location.
3. Using the X, Y and Z arrow keys in the software, move the Prep 96 end effector so that the insertion depth of the probe in position 1 is maximized without bottoming out in the sample tube.
4. When at the desired location, press "Next". The Prep 96 will save calibration data.



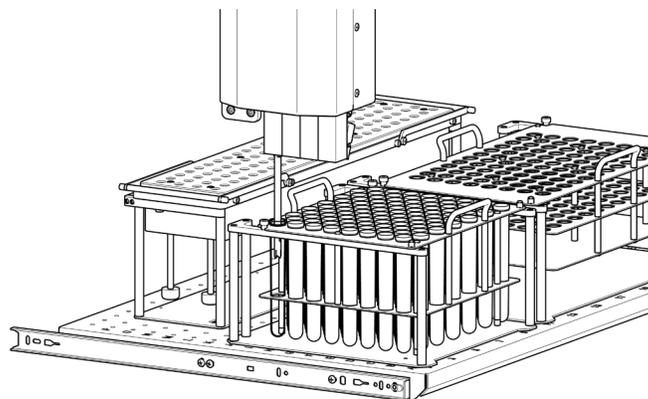
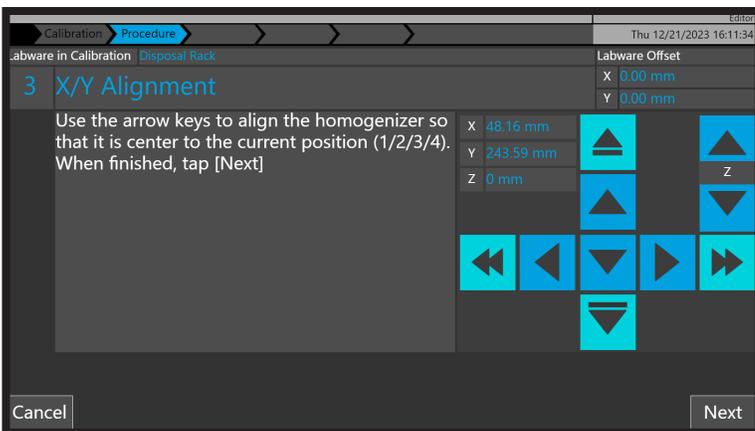
Disposal Rack - X/Y Alignment

This calibrates the X and Y position to the first location on the disposal rack.

Items needed for calibration: Probes and disposal rack with tubes installed on the deck.

Step to calibrate:

1. Place the appropriate probe as shown below, in **position 1** of the end effector.
2. Press the "X/Y Alignment" button and the Prep 96 will move to the desired location.
3. Using the X, Y and Z arrow keys in the software, move the Prep 96 end effector so that the probe in position 1 is located centrally over the tube in position 1 of the disposal rack.
4. When at the desired location, press "Next". The Prep 96 will save calibration data.



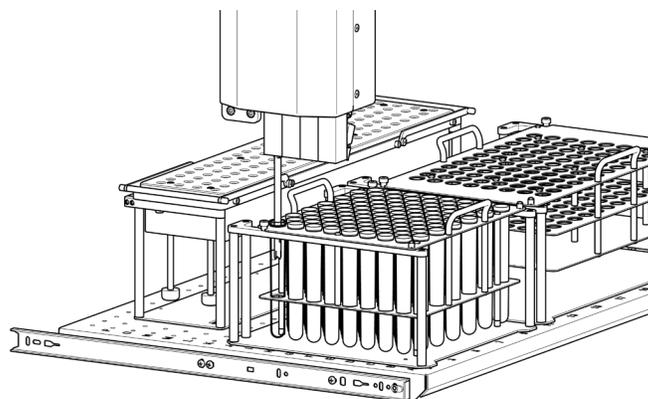
Disposal Rack - Dropoff Height

This calibrates the height at which the used probes are ejected during disposal.

Items needed for calibration: Probes and disposal rack with tubes installed on the deck.

Step to calibrate:

1. Place the appropriate probe as shown below, in **position 1** of the end effector.
2. Press the "Dropoff Height" button and the Prep 96 will move to the desired location.
3. Using the X, Y and Z arrow keys in the software, move the Prep 96 end effector so that the probe in position 1 is located just below the top of the tube in position 1 of the disposal rack.
4. When at the desired location, press "Next". The Prep 96 will save calibration data.



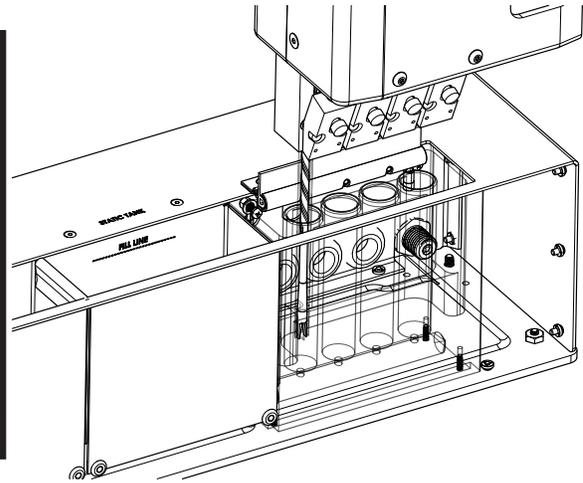
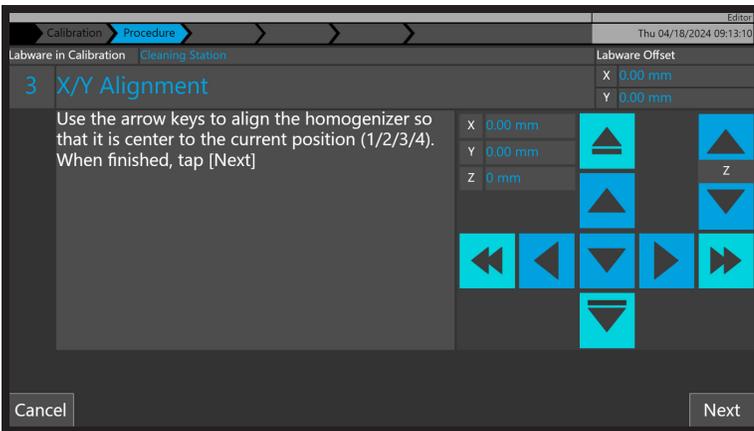
Cleaning Station - X/Y Alignment

This calibrates the X and Y positions on the cleaning station

Items needed for calibration: Probes and installed cleaning station.

Step to calibrate:

1. Place the appropriate probe as shown below, in **position 4** of the end effector.
2. Press the "X/Y Alignment" button and the Prep 96 will move to the desired location.
3. Using the X, Y and Z arrow keys in the software, move the Prep 96 end effector so that the probe in position 4 is located centrally over the cleaning station position 4.
4. When at the desired location, press "Next". The Prep 96 will save calibration data.



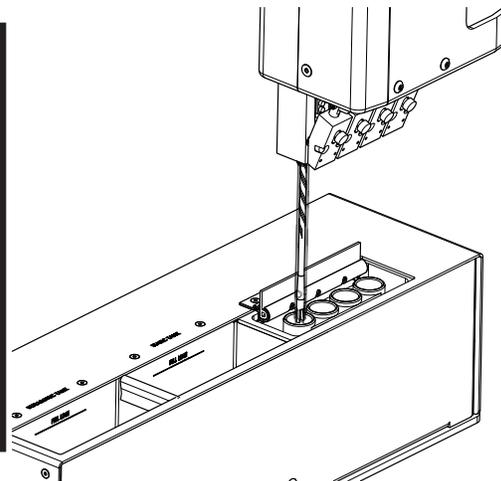
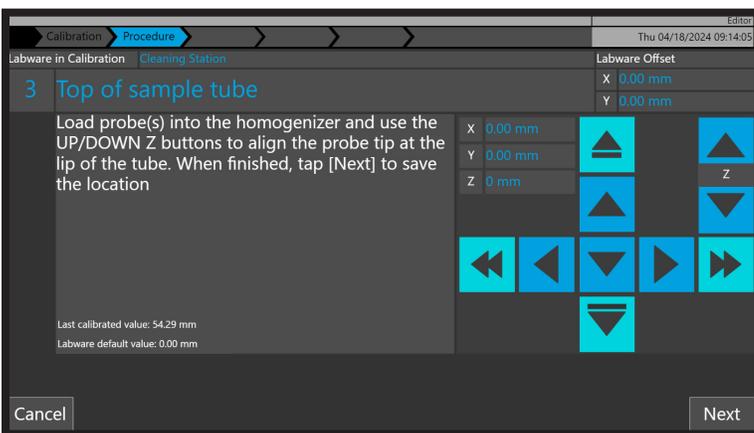
Cleaning Station - Top of Tube

This calibrates the top of the tube position in the sample rack , which is used during touch off.

Items needed for calibration: Probes and installed cleaning station .

Step to calibrate:

1. Place the appropriate probe as shown below, in **position 4** of the end effector.
2. Press the "Top of Tube" button and the Prep 96 will move to the desired location.
3. Using the X, Y and Z arrow keys in the software, move the Prep 96 end effector so that the probe in position 4 is located at the top of the cleaning station position 4.
4. When at the desired location, press "Next". The Prep 96 will save calibration data.

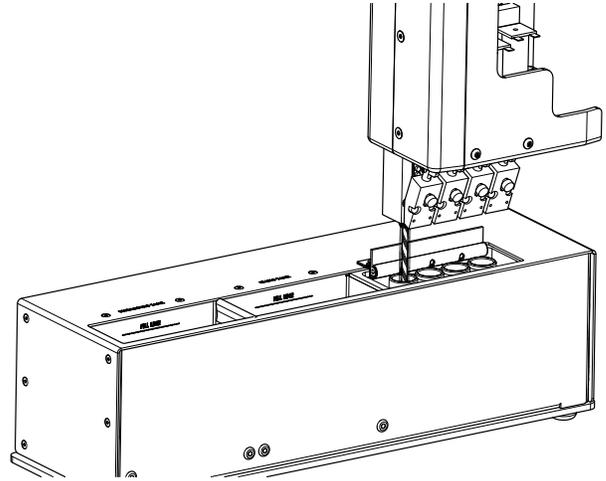
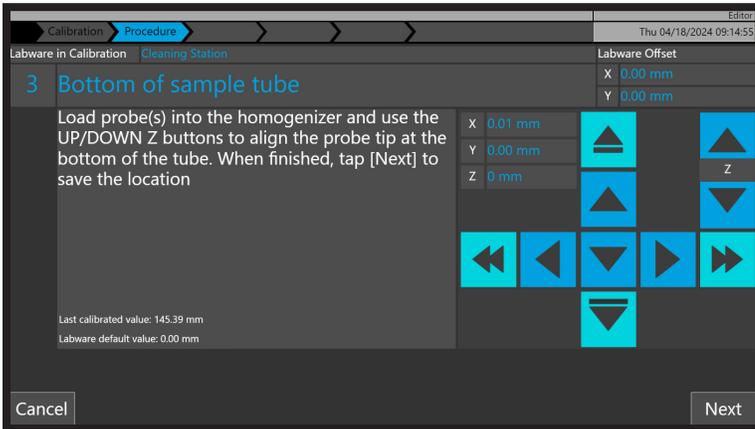


Cleaning Station- Bottom of Tube

This calibrates the bottom of the tube position in the sample rack, which is used during homogenization. Items needed for calibration: Probes and installed cleaning station.

Step to calibrate:

1. Place the appropriate probe as shown below, in **position 4** of the end effector.
2. Press the "Bottom of Tube" button and the Prep 96 will move to the desired location.
3. Using the X, Y and Z arrow keys in the software, move the Prep 96 end effector so that the probe in position 4 is located at the bottom of the cleaning station position 4, without bottoming out.
4. When at the desired location, press "Next". The Prep 96 will save calibration data.



5. Ensure each calibration action for the selected labware is completed and saved, until each action is complete

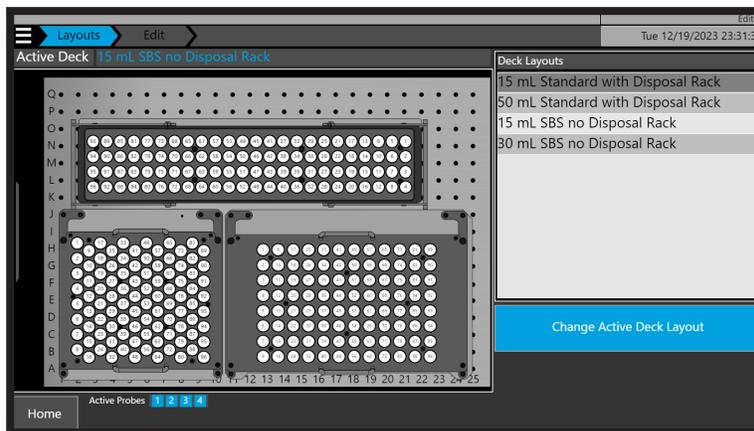
6. Calibrate the remaining labware items in the deck layout, by repeating the above process.

If an item of labware has been calibrated in another deck layout, it will not require calibrating, as the labware accessory calibrations are shared between deck layouts.

Active Deck Selection (All Users)

Once deck layouts have been created and calibrated by a user in the editor group, they are available for all users, irrespective of their user group allocation. This allows operator group users to swap between layouts but prevents unintentional changes to deck configurations.

To swap the active deck in the software, select the active deck from the list and press the **“Change Active Deck Layout”** button.



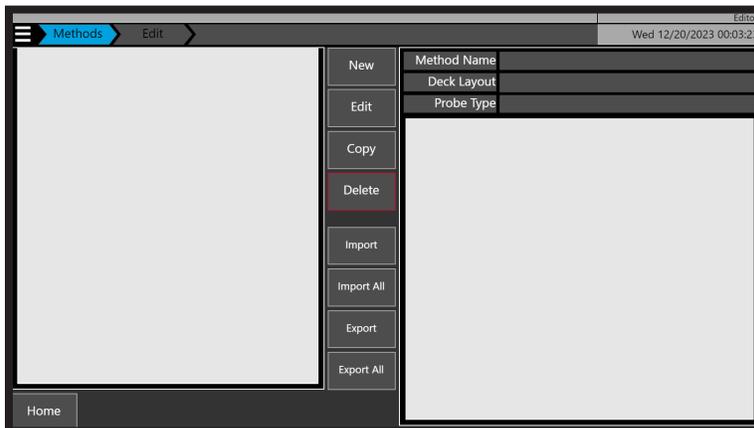
If the active deck is changed within the software, the physical labware accessories on the Prep 96 system must be exchanged and replaced in appropriate peg positions, accordingly.

The active and physical deck must correspond to the deck layout saved with the method before a method is run.

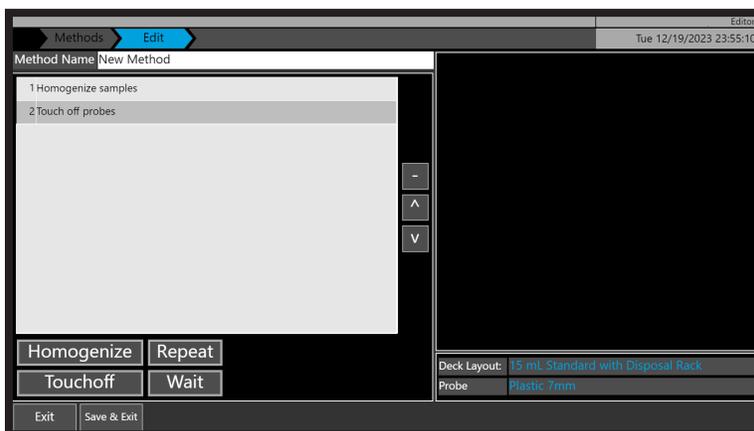
Creating and Editing Methods (Editor User Group Only)

Methods can only be created, edited, copied, deleted, imported and exported by users within the editor group. Once a method has been saved, it is available to run by any user in any user group. This prevents any accidental method changes or data loss.

1. To create a new method, press the **“Menu Hamburger Icon”** and then press **“Methods”**. The methods screen will open.



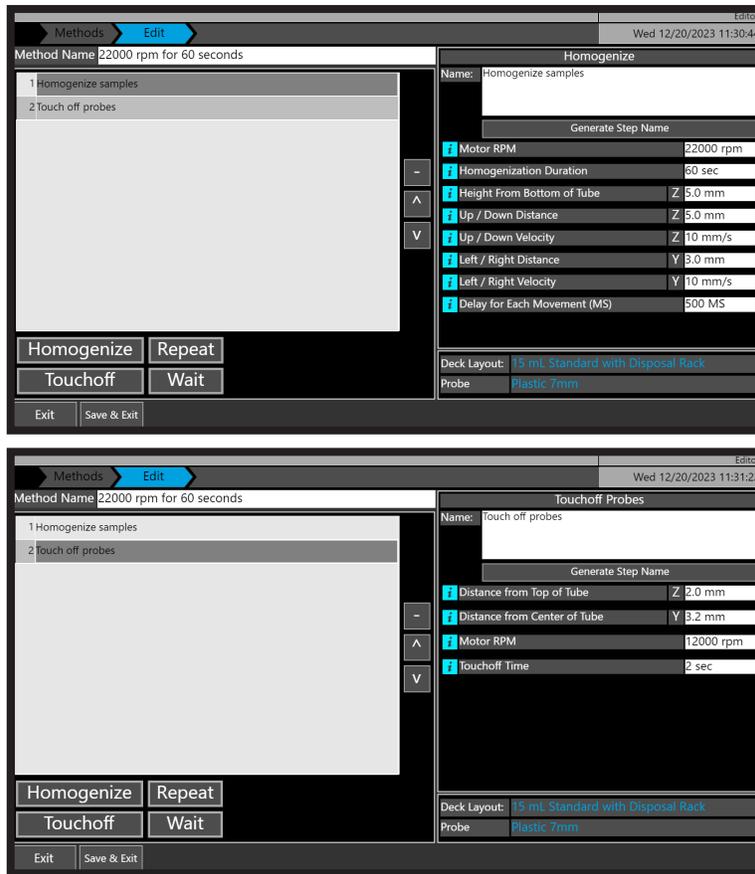
2. To create a new method, press **“New”**. The method editor screen will open.



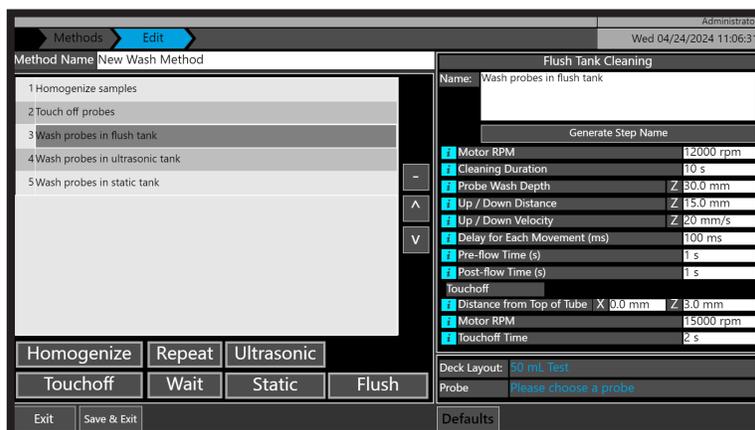
3. Press in the white **“Method Name”** field, and enter a name for the new method. It is good practice to name the method to indicate parameters being used during homogenization. Press **“OK”** once complete.

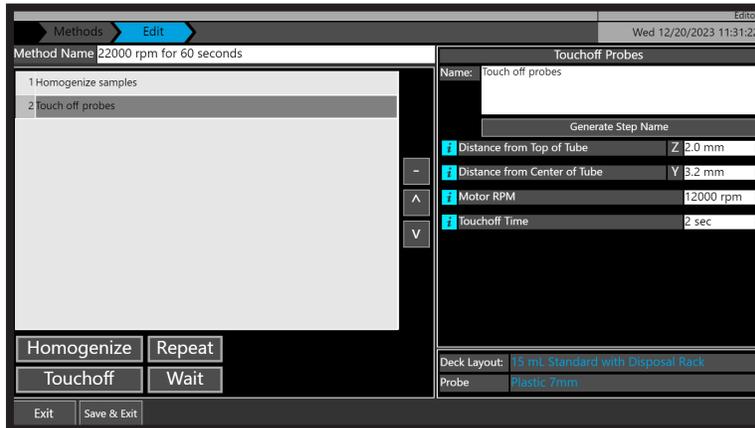
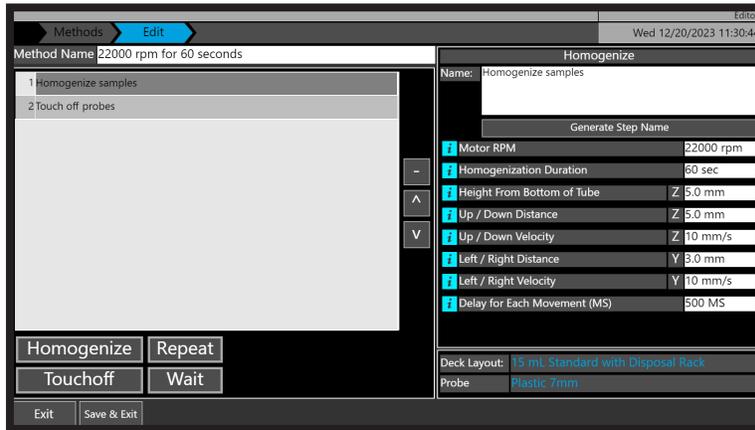


4. A method is created with basic substeps to achieve a homogenization. Pressing on each substep on the left hand side of the screen will display the relevant substep parameters on the right hand side, which can be edited. Basic homogenization parameters are “Homogenize samples” and “Touch off probes”. It is possible to add “Repeat” and “Wait” substeps in a method if required, which facilitates more complex homogenization methods. **For additional details on the standard homogenization substep parameters including default, minimum and maximum values, see Appendix 5.**



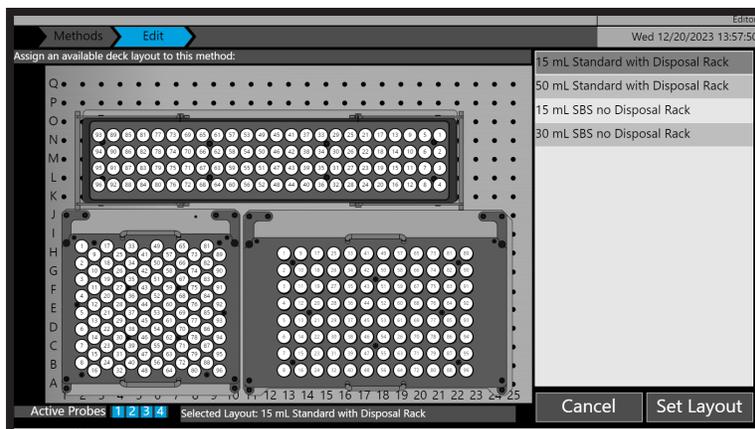
5. If the cleaning station has been installed and is toggled on in settings, then additional substeps appear as part of the default new method. “Flush”, “Ultrasonic” and “Static” are available to facilitate cleaning of stainless steel and hybrid probes. The sequence of substeps can be rearranged using the up and down arrows. **For additional details on the cleaning station substep parameters including default, minimum and maximum values, see Appendix 6.**



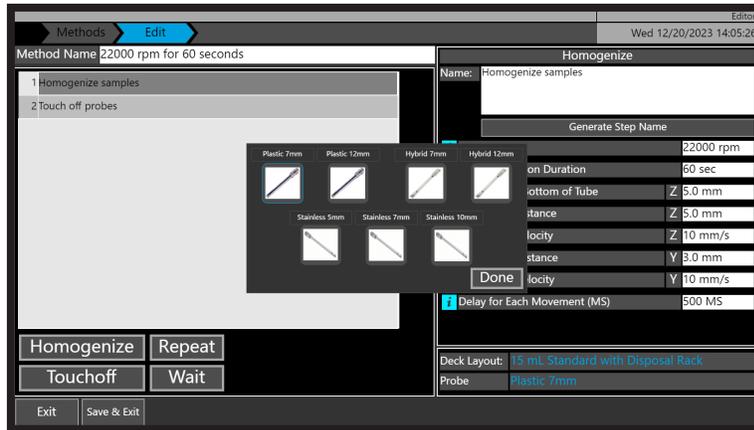


6. Adjust the value of all necessary substeps to provide an optimized homogenization.

7. Next, select the Deck Layout to be associated with the method by pressing the blue name of the deck layout on the bottom right hand side of the screen. The deck layout assignment window will display. Choose the deck layout you want to associate with the method from the list of available layouts and then press “Set Layout”.



8. Next, select the Deck Layout to be associated with the method by pressing the blue name of the deck layout on the bottom right hand side of the screen. The deck layout assignment window will display. Choose the deck layout you want to associate with the method from the list of available layouts and then press **“Set Layout”**.



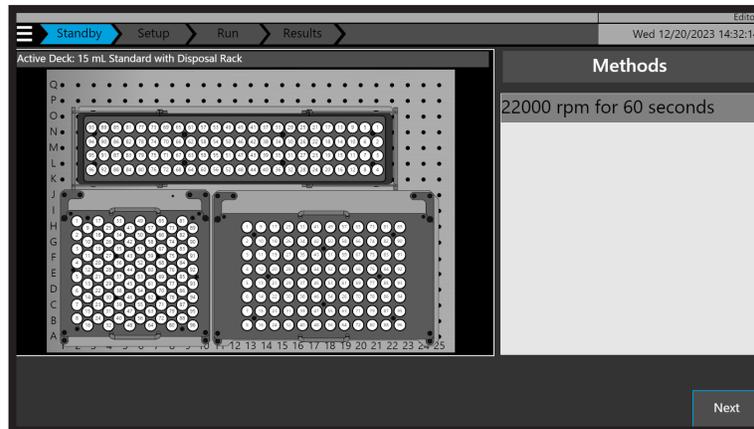
9. Select the homogenizing probe to use in the method by pressing the image, and then press **“Done”**. Probe choice will be dictated by the labware accessories physically available on the system (7 mm or 12 mm probe size of clean probe rack, disposal options selected as rack, chute, cleaning station, etc.)

10. Press **“Save & Exit”** to save the method and return to the method screen.

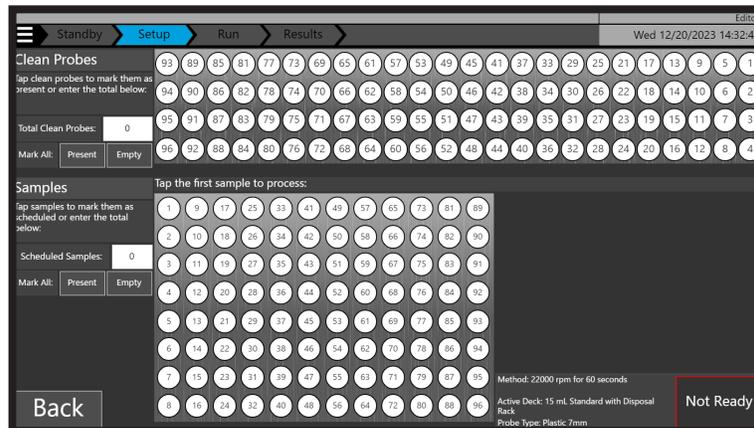
Running Methods (All User Groups)

Methods are available to run by any user in any user group.

1. To run a method, ensure you are on the “Home” screen.
2. Press on the method name in the right hand side of the screen. The deck layout of the method is displayed in the main screen.
3. Check that the deck layout of the selected method matches with the physical labware accessories on the deck of the Prep 96. Swap out the racks on the deck of the Prep 96 as necessary to match, and then press “Next”.



4. On the deck overview screen, the sample rack and clean probe racks are displayed.



5. Select the quantity of clean probes in the clean probe rack using one or more of the following methods. Loaded tips are indicated as light blue circles.

- Pressing the “**Mark All: Present**” function, which will fill the complete clean probe rack
- Pressing on the white “**Total Clean Probes**” field and specifying the quantity of probes
- Pressing on the individual probe positions

Ensure the physically installed clean probe rack and quantity of clean probes matches the software.



6. Select the number of samples to be homogenized using one or more of the following methods. Samples to be homogenized are indicated as light blue circles.

- Pressing the “**Mark All: Present**” function, which will fill the complete sample rack
- Pressing on the white “**Scheduled Samples**” field and specifying the number of samples
- Pressing on the first and last sample positions (if the first sample is not #1, it has to be any sample in the top row. Last sample can be anywhere)

Ensure the physically installed sample rack and quantity of samples matches the software.

If the quantity of probes is not sufficient to process the numbers of samples being homogenized, the software will warn you with a red warning message.

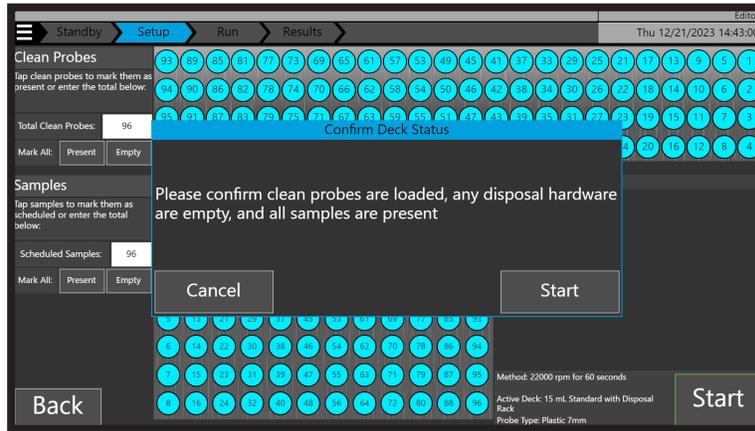


Working examples of sample racks with samples selected are shown in Appendix 7.

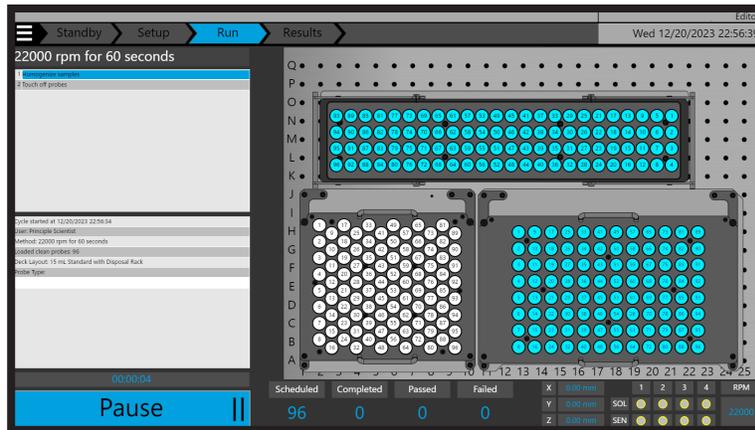


7. Perform one final check to ensure that everything matches between software and what is physically present on the Prep 96 unit. Ensure the drawer is securely fastened and the door is closed.

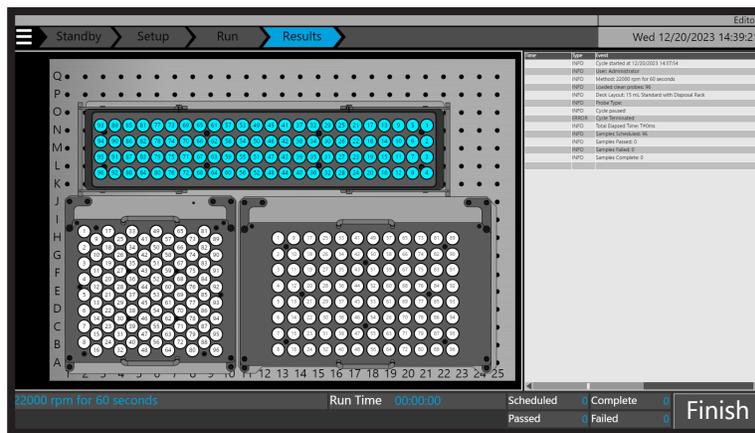
8. Press "Start".



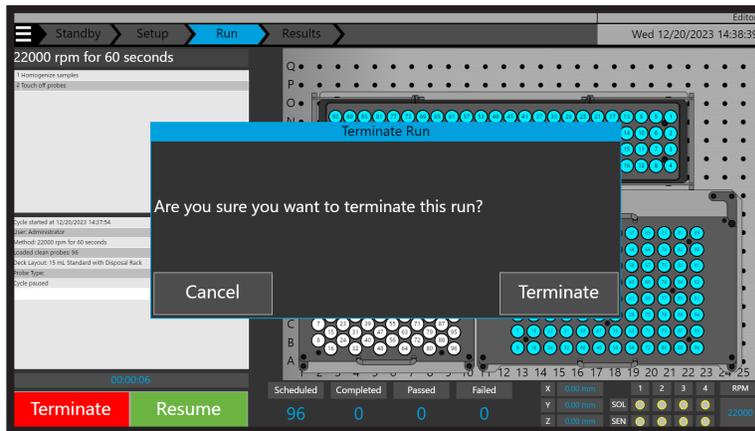
9. The current substep of the method in operation will be highlighted in blue on the left hand side of the screen. You can follow the progress of the batch of samples being homogenized on this screen.



10. At the end of the run, you will be presented with a results screen. This has useful information including number of samples run, total time elapsed and the method steps.

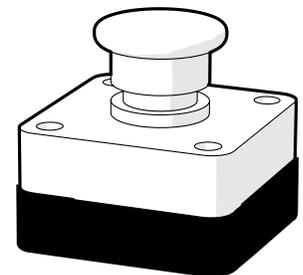
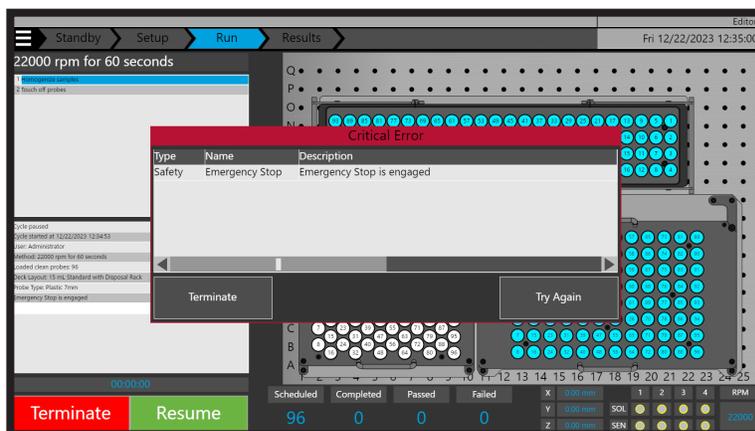


11. When **“Pause”** is pressed, you will have the option to terminate the run, or continue. Press the **“Pause”** button to pause the current operation. The unit will finish its current movement prior to pausing. Pausing allows you to stop the homogenization temporarily and then resume at the next operation step. Press on the terminate button within this prompt window to terminate the program or press the cancel option, and then the **“Resume”** button to continue homogenization.



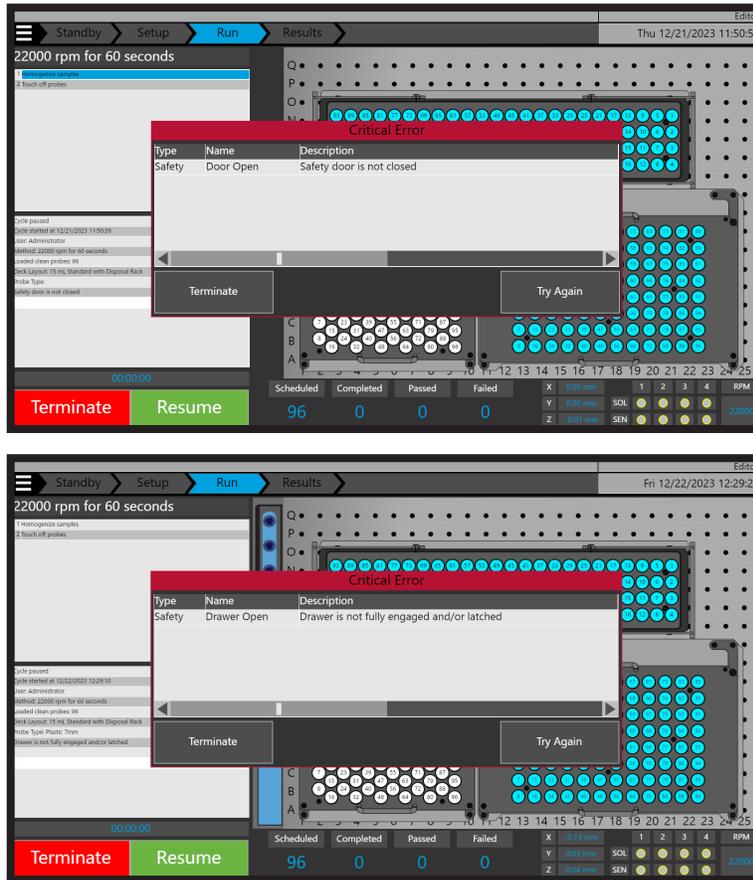
Pressing the **“Terminate”** button will present a prompt - From this prompt you can choose to resume the run, or stop processing. If you terminate and processing is stopped, the system will proceed to the results page and a new run can be started.

In the event of an emergency, press the red Emergency Stop button, attached to the base of the Prep 96 to immediately shut down the entire operation. Power will not be restored to the unit until the Emergency Stop button is rotated and pulled back out into the operational position.



Troubleshooting

There are several sensors on the system. If the door or modular deck drawer are open or ajar, you will see the following error messages.

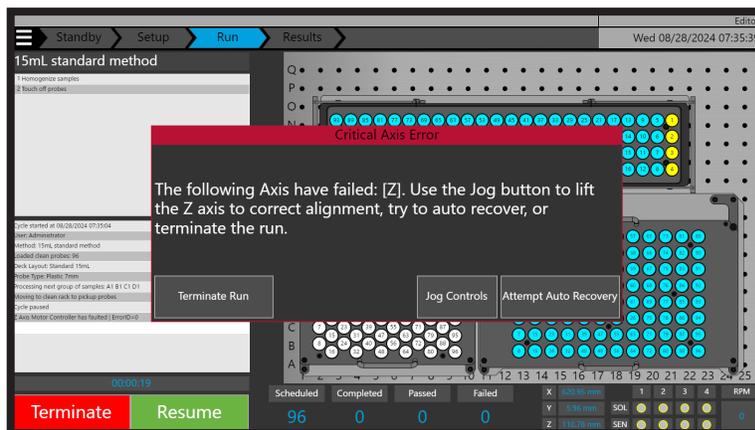


Close the door of the Prep 96 or ensure the modular deck drawer is securely latched in position, and press "Try Again".

Clearing Jams

Minor problems such as a jammed probe may be resolved as follows:

1. Clear Emergency Stop (E-Stop) if pressed.

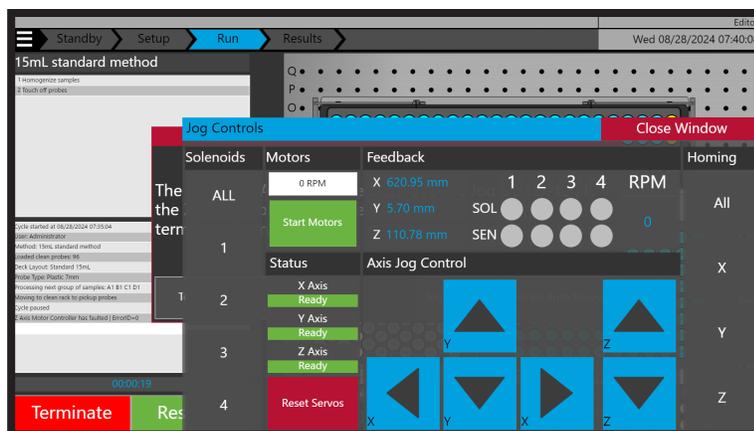


2. A user has two options to try to resolve the issue, or they can terminate the run:

- Jog Controls
- Attempt Auto Recovery

Jog Controls

Pressing “Jog Controls” will open up the window below.



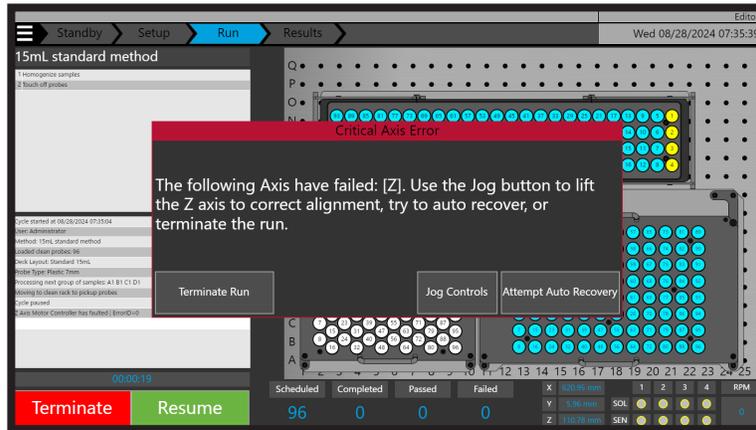
This function is available to all users. It provides manual control of all aspects of the robot including the following:

- Solenoids - Actuation of individual or all solenoids.
- Motors - Start/Stop of the motors as a user specified speed.
- Servos - Reset of all servos.
- Homing - Homing of the homogenization head on individual X, Y, Z or all Axis.
- Jog Control - Step by step movement of the homogenization head in both directions on X, Y or Z axis.

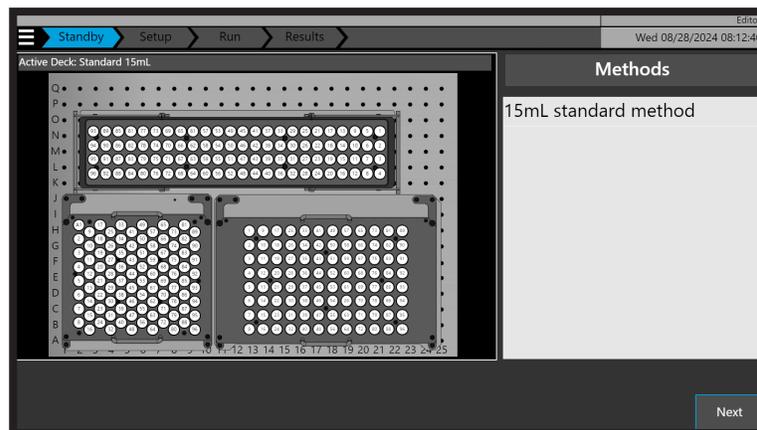
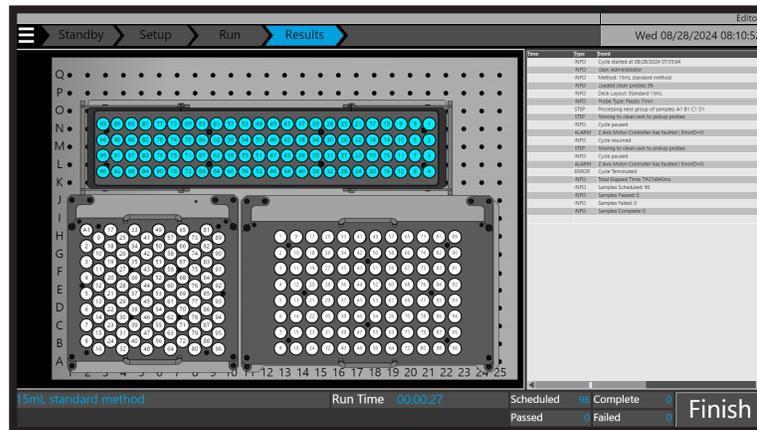
It may be necessary to use a combination or individual functions from the above list to resolve the issue/s. Once the issue that caused the error has been cleared press “Close Window” and you will be returned to the previous screen to either “Attempt Auto Recovery” or “Terminate Run”.

Attempt Auto Recovery

Pressing “**Attempt Auto Recovery**” will repeat the last prescribed actions of the Prep 96. If an issue still persists that has not been resolved, the Prep 96 will continue to display the screen below until the issue is resolved using “**Jog Controls**” or the “**Terminate Run**” button is pressed.



Pressing “**Terminate Run**” will stop the method and the screen below will be displayed. Press “**Finish**” to return to the home screen.



Error Codes

Operating the Prep 96 is straightforward; however, if you see an error code or informational window on the screen, the following table may be useful in determining the source of the problem.

Error Code	Title/Description	Details/Resolution
0001	VERIFY_RUN_TERMINATION	Confirm a requested termination of the current run. If user selects to terminate, all sample processing stops and cannot be restarted without initiating an entire new run. If user selects not to terminate, control will be returned to the previous window.
0002	MOTION_ERROR_TERMINATION	Window appears if one of the motor's motion was interrupted or if a motor is knocked out of position.
0003	?? Axis Motor had motion error. Code = ??	Reports the motor that had a motion error.
0004	SELECT_A_SAMPLE_TO_TERMINATE	Window appears if user presses the terminate sample button on the main screen while system is paused. Provides options for terminating samples.
0005	The sample number entered is not an active or valid sample.	Alerts user to invalid selection in sample termination window (E200).
0006	VERIFY_SAMPLE_TERMINATION	C single sample. Only the selected sample will terminate. If termination is confirmed, all subsequent processing steps will not be performed on the sample. NOTE: that once sample is terminated, it cannot be restarted.
0007	Profile Setup Error	Alert for person that is programming a profile that the selected graphic is not correct or the maximum specified number of samples in the rack is not correct.
0008	Run Setup Window	Appears at the beginning of a run to allow user input of number of samples. Also provides options for changing certain run parameters.
0009	First Sample to run needs to be equal to or less than Last Sample to run.	Warning appears if user inputs an inappropriate starting sample for a run.
0010	Last Sample to run needs to be equal to or less than ?? for the rack selected	Warning appears if the user inputs an inappropriate final sample, for example, if the user selects to run 55 samples in a 24 position rack. The ?? value is usually 24, 48, or 96 depending on the sample rack.
0011	VERIFY_PROPER_LOADING_FOR_RUNNING_Omni_TIPS	Appears when running tips to allow user to confirm proper loading of tips before run starts.

Error Code	Title/Description	Details/Resolution
0012	There should not be any tips in Probe Holders on Robot Arm. However, probe(s) is (are) detected in position(s): ??	Displays if tips are improperly loaded in Probe Holders at the start of the run.
0013	VERIFY_PROPER_LOADING_FOR_RUNNING_FIXED_PROBES_AND_CLEANING_TANKS	Appears when running fixed homogenization probes (i.e., Stainless Steel or Hybrid Probes) to allow user to confirm proper loading.
0014	Probes should be loaded in any probe holder position where there is a ...	Appears if system detects an improper loading of fixed homogenization probes.
0015	Cannot run Sample Rack that has a wide spacing with fixed probes in probe holder positions 2,4,6 and 8.	Appears if probes are in positions 2,4,6 or 8 when running 24 position rack.
0016	CHANGE_STEP_PARAMETERS	Appears if user selects to change step parameters while starting a run.
0017	Run complete	Appears after a run is finished.
0018	Run complete. "\n" However, samples in the following rack positions had processor errors	Appears if run completes with specific samples having errors or warnings. The error or warning will highlight in the screen graphics and appear in the sample data file.
0019	Homing sequence has been terminated. Need to clear all obstructions and then restart.	Appears if system detects a motor error while homing system at the start of a profile. Since proper homing is critical, the startup sequence must be restarted if this error occurs.
0020	Cannot cycle to more than 50 mm from bottom of tube. The processing parameters need to be changed. This run will be terminated.	Appears if the person who programmed the profile specifies a cycle height of more than 50 mm. A cycle height of over 50 mm is greater than the allowed travel distance of the homogenizer probe axis.
0021	Edit Homogenizing parameters for Step No. ??	Appears if user selects to override the default profile parameters for homogenizing.
0022	DID_NOT_FULLY_LOAD_Omni_TIPS	Appears if the system was not able to properly load the four tips. Follow the on-screen prompts that instruct the operator on how to recover and proceed.
0023	RIFY_Omni_TIP_PROPERLY_LOADED_AFTER_MISLOAD	Appears after an tips loading error window. It allows the user to confirm system has properly loaded probes before proceeding.
0024	IMPROPER_PROBE_LOADING	The system has sensors that detect the position in which homogenizer probes are loaded. Appears If there are probes in locations that should be empty or there are empty positions that should have a probe. After the user takes action to correct the problem, this window reappears until the loading is correct.

Error Code	Title/Description	Details/Resolution
0025	SENSOR_DETECTED_ STUCK_PROBE	Appears if the system sensors detect a probe is stuck in the holder after it should have been ejected. The user is prompted to make sure all probes are fully ejected.
0026	DETECTED_STUCK_PROBE_ DURING_ MOVE	The system makes a slow move after ejecting homogenizer probes. If this move is obstructed, a probe may not have been fully ejected. The user is prompted to make sure all probes are fully ejected.

Frequently Asked Questions

How do I turn on my Prep 96?

The Prep 96 must be connected to a power supply via an appropriate power cable. Additionally, the control tablet must be connected via USB-C. To turn on the Prep 96, switch the power on. The Prep 96 status lights will indicate the system has power. Once the system is powered up, use the control tablet to launch the Prep 96 software.

How do I select a Method in the Prep 96 Software?

Methods can be selected from the Prep 96 software's "Home" window. All methods are listed in the methods table on the right hand side of the screen.

How do I initiate a sample run on the Prep 96?

A sample run can be initiated by pressing the "Next" button after selecting the desired method on the "Home" screen.

What is the touch off step for?

The touch off step is designed to spin debris caught in the probe out of the probe and back into the tube.

How does the Prep 96 know it has picked up the probes it needs to process?

The Prep 96 is equipped with sensors to detect if probes have been successfully picked up.

How do I terminate a sample run?

Press the pause button on the Prep 96. The system will pause and ask the user to either resume or terminate. If terminate is selected, the user will be prompted again. If yes is selected on this occasion, the system will terminate all processes. Sample processing will have to be resumed from the beginning.

What is the Emergency Stop button for?

The Emergency Stop button or "E-Stop" button is used to immediately stop the Prep 96 system from running. Ideally, the "Emergency Stop" is only used if the system becomes hazardous to the user or other individuals.

How can I move the axis of the system without running a program?

To move an axis, open the menu on the Prep 96 start window. Once the menu is open, select "Select Manual Controls". From here, the robot can be 'jogged' in any direction.

NOTE: Always home Z-Axis first, when cleaning jams.

NOTE: The system under manual control has the ability to crash into racks or other system structures. Use caution when manually moving the system. To extract, support the probe and lift the probe latch pin on the motor module probe coupling. The probe should fall free from the coupling.

Cleaning and Maintenance

Turn the power off to the Prep 96 unit prior to cleaning. This minimizes the potential for electrical shock and prevents damage to sensitive components on the unit.

Recommended: After each use and at the end of the work day (after all processing is complete), remove all racks (sample, disposal, clean probe) from the unit, and clean separately with a mild detergent.

Wipe the interior of the unit with a moist cloth to clean any spills. You may also use a mild detergent if necessary; however, be careful not to spill water on any sensitive electronics or electrical connections. Wipe surfaces dry prior to replacing racks. Sterilize Prep 96 using mild bleach solution (i.e. Bleach-Rite®), followed by an immediate isopropyl alcohol wipe down to prevent metal corrosion.

For stainless and metal components only. Use soap and water to clean plastics

Extended bleach exposure on metal parts may cause pitting and/or corrosion.

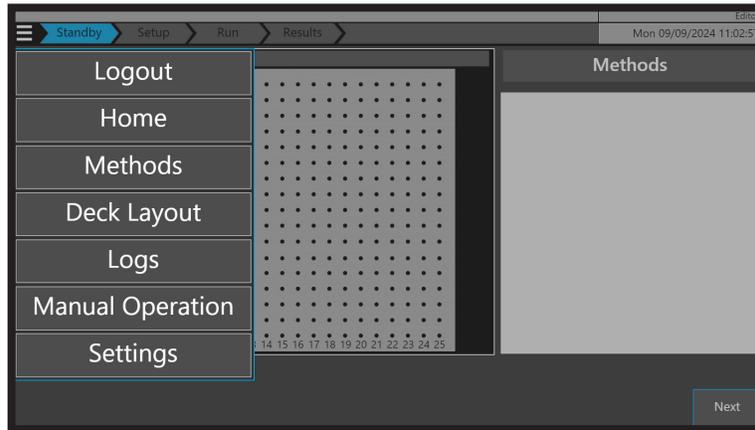
The robotic arm must not be moved manually while the power is on. If necessary, you may manually move the robot arm to access covered areas when the unit is powered off.. Move the robotic arm slowly. Fast movements may induce stray currents in the stepper motor that can damage the stepper motor or other sensitive electrical components. Manually moving the control arm with the power on may result in damage to the stepper motors.

Appendix 1 - Accessories

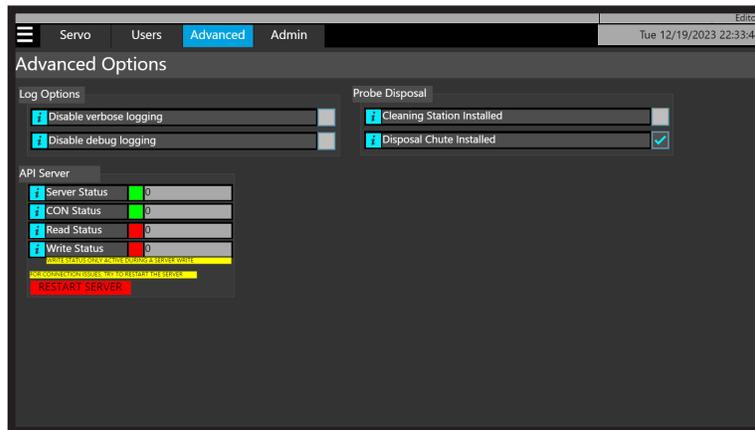
Part Number	Description
51-02A-1	Prep 96 Automated Homogenizer
23-HWA-22	Clean 7 mm Probe Rack
23-HWA-23	Clean 12 mm Probe Rack
23-HWR-15	Standard Sample Rack 2 mL x 96
23-HWR-18	Standard Sample Rack 5 mL x 96
23-HWR-14	Standard Sample Rack 14/15 mL x 96
23-HWR-13	Standard Sample Rack 30 mL x 24
23-HWR-12	Standard Sample Rack 50 mL x 24
23-HWR-18SBS	SBS Rack 5 mL x 24
23-HWR-11SBS	SBS Rack 14/15 mL x 12
23-HWR-15SBS	SBS Rack 14/15 mL x 24
23-HWR-16SBS	SBS Rack 30 mL x 8
23-HWR-17SBS	SBS Rack 50 mL x 8
23-HWR-25	Passive Cooling Sample Rack 2 mL x 96
23-HWR-28	Passive Cooling Sample Rack 5 mL x 96
23-HWR-24	Passive Cooling Sample Rack 14/15 mL x 96
23-HWR-23	Passive Cooling Sample Rack 30 mL x 24
23-HWR-22	Passive Cooling Sample Rack 50 mL x 24
23-HWA-13B	Disposal Rack
23-HWA-16JA	Disposal Chute
51-BRA-1095/1096	Cleaning Station 110/220V

Appendix 2 - Probe Disposal - Disposal Chute

The disposal chute (if purchased) will have been physically installed by the service engineer who installed and commissioned the Prep 96. Toggling the disposal chutes availability as a disposal option can only be achieved in the Settings>Advanced menu. **Access and change functionality is only available to users in the editor user group.**

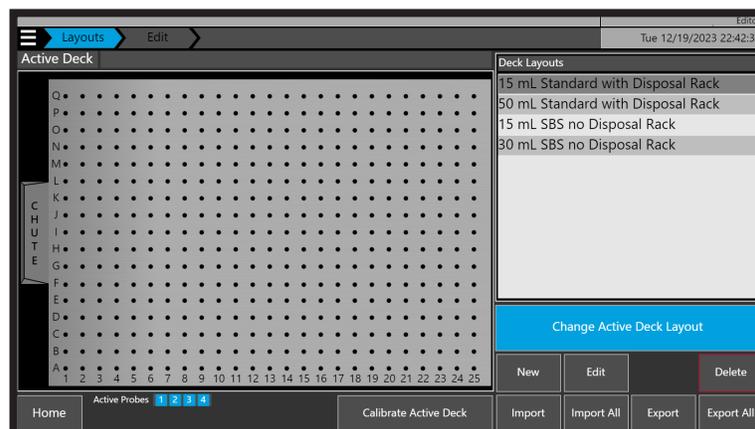


Press the **“Hamburger Menu Icon”**, then **“Settings”**, and then press **“Advanced”** on the top menu. Toggle the disposal chute installation on or off using the check box.



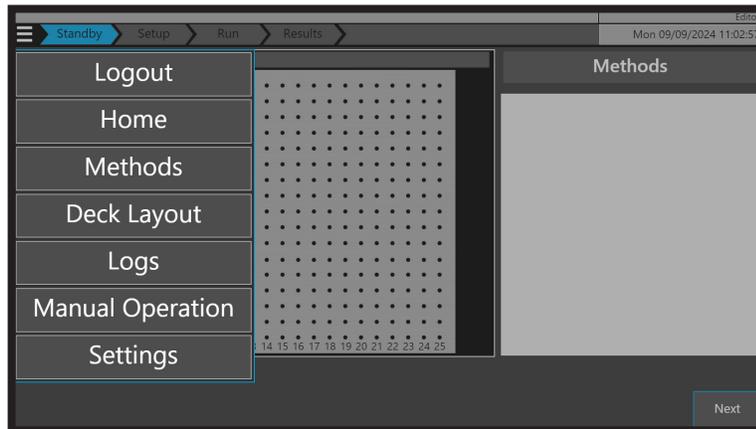
If the cleaning station installation tick box is checked, it will not be possible to toggle on the disposal chute.

To save the selection, press the **“Hamburger Menu Icon”** and then press **“home”**. If the check box is ticked, the disposal chute will be shown in the deck layout and home views.

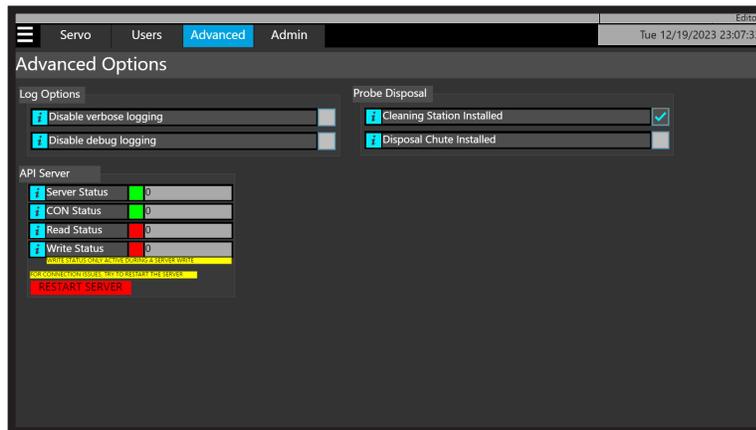


Appendix 3 - Probe Disposal - Cleaning Station

The cleaning station (if purchased) will have been physically installed by the service engineer who installed and commissioned the Prep 96. Toggling the cleaning stations availability can only be achieved in the Settings>Advanced menu. **Access and change functionality is only available to users in the editor user group.**

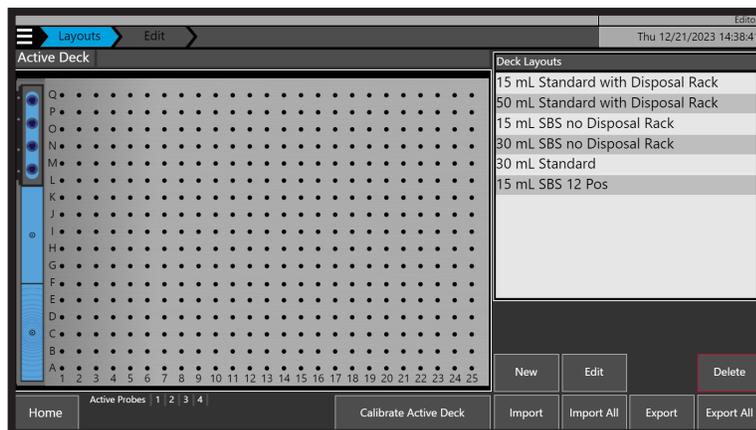


Press the **“Hamburger Menu Icon”**, then **“Settings”**, and then press **“Advanced”** on the top menu. Toggle the cleaning station installation on or off using the check box. To save the selection, press the menu icon and then press home.

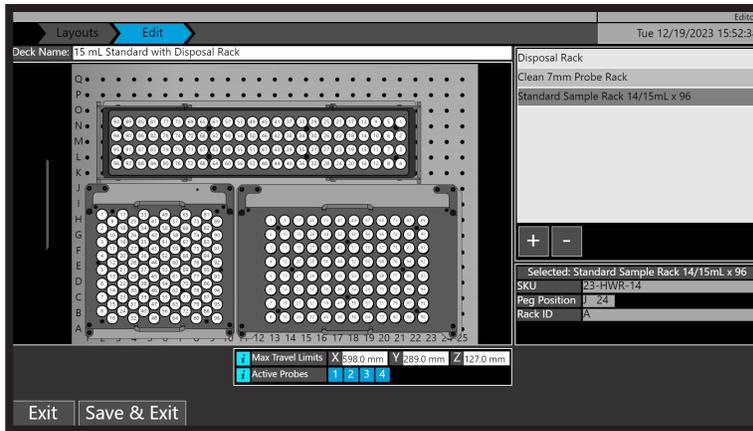


If the disposal chute installation tick box is checked, it will not be possible to toggle on the cleaning station.

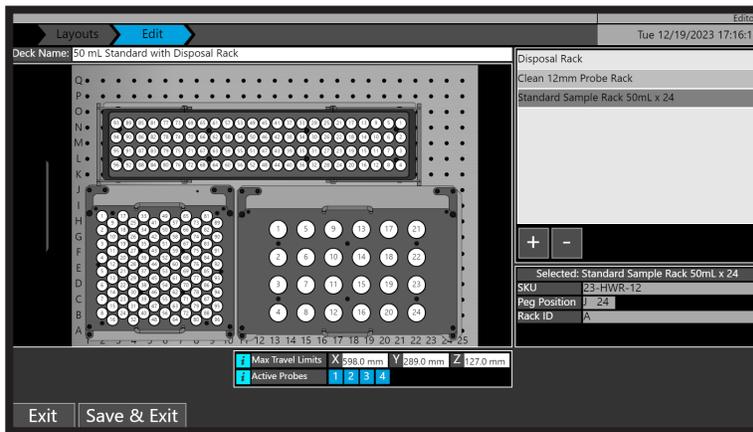
To save the selection, press the **“Hamburger Menu Icon”** and then press **“Home”**. If the check box is ticked, the cleaning station will be shown in the deck layout and home views.



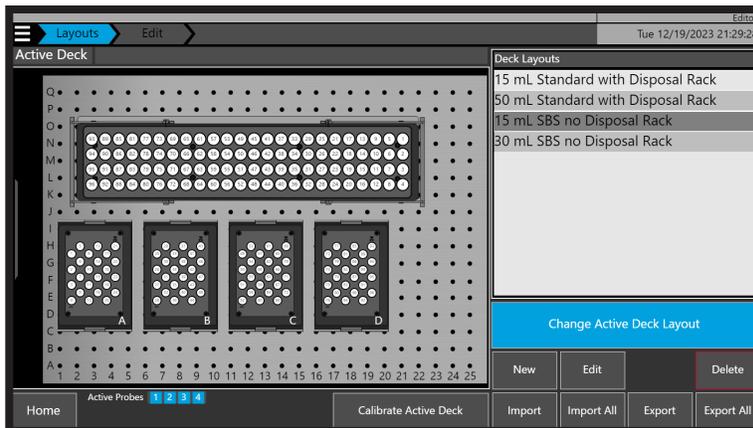
Appendix 4 - Example Deck Layouts



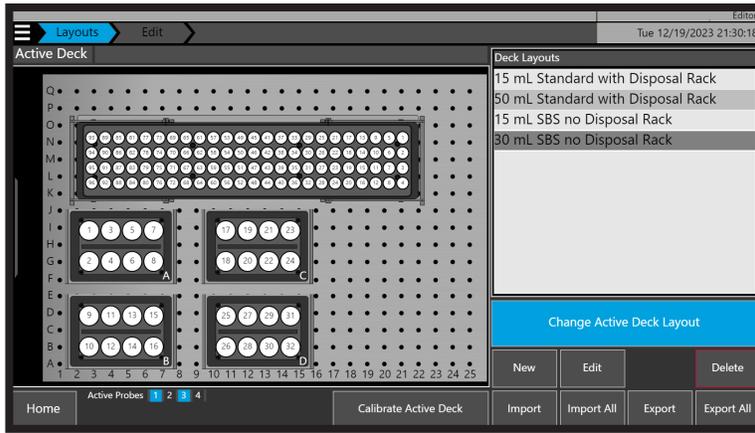
Clean 7 mm Probe Rack - Standard Sample Rack 14/15 mL x 96 - Disposal Rack



Clean 12 mm Probe Rack - Standard Sample Rack 50 mL x 24 - Disposal Rack



Clean 7 mm Probe Rack - (SBS Sample Rack 14/15 mL x 24) x 4



Clean 7 mm Probe Rack - Standard Sample Rack 14/15 mL x 96 - Disposal Rack

Appendix 5 - Method Substep Parameters

Substep	Parameter	Description	Default	Min	Max
Homogenize	Motor RPM	Speed of probe during the sample homogenization	10,000	0	28,000
	Homogenization Duration (sec)	Time in seconds of the homogenization	15	0	7,200
	Height From Bottom of Tube (Z) (mm)	Height of the homogenization probe from the bottom of sample tube	5	0	50
	Up / Down Distance (Z) (mm)	Up and down distance of the probe during homogenization	5	0	50
	Up / Down Velocity (Z) (mm/s)	Up and down speed of the probe during homogenization	10	0	50
	Left / Right Distance (Y) (mm)	Left and right distance of the probe during homogenization	3	0	50
	Left / Right Velocity (Y) (mm/s)	Left and right speed of the probe during homogenization	10	0	50
	Delay for Each Movement (ms)	Pause time between each of the above movements	500	0	30,000
Touch off Probes	Distance from Top of Tube (Z) (mm)	Distance from tube top during droplet removal (touch-off) post homogenization	2	0	25
	Distance from Center of Tube	Distance from tube center during droplet removal (touch-off) post homogenization	3.2	0	25
	Motor RPM	Speed of probe during droplet removal (touch-off) post homogenization	12,000	0	28,000
	Touchoff Time	Time for during droplet removal (touch-off) post homogenization	2	0	1,000
Repeat*	Step Number	Substep Number	0	0	5
	Number of Times to Repeat	Repeat the specified substep this number of times	0	0	100
Wait*	Wait Time (sec)	Pause time whilst the system waits between substeps	0	0	>99999

Appendix 6 - Method Substep Parameters for Cleaning Station

Substep	Parameter	Description	Default	Min	Max
Flush	Motor RPM	Speed of probe during the cleaning step	12,000	0	28,000
	Cleaning Duration (sec)	Time in seconds of the cleaning step	10	0	7,200
	Probe Wash Depth	Height of the homogenization probe from the bottom of cleaning station	30	0	50
	Up / Down Distance (Z) (mm)	Up and down distance of the probe during cleaning step	15	0	50
	Up / Down Velocity (Z) (mm/s)	Up and down speed of the probe during cleaning step	20	0	50
	Delay for Each Movement (ms)	Pause time between each of the above movements	100	0	200
	Pre-flow Time (sec)	Time in seconds that the cleaning station will flush lines and bath before probe cleaning step	1	0	10
	Post-flow Time (sec)	Time in seconds that the cleaning station will flush lines and bath after probe cleaning step	1	0	10
	Touchoff - Distance from Top of Tube X (mm)	Distance to the side of cleaning station during droplet removal (touch-off) post cleaning step	0	0	25
	Touchoff - Distance from Top of Tube Z (mm)	Distance from top of cleaning station during droplet removal (touch-off) post cleaning step	3	0	25
	Touchoff - Motor RPM	Speed of probe during droplet removal (touch-off) post cleaning step	15,000	0	28,000
	Touchoff Time	Time for droplet removal (touch-off) post cleaning step	2	0	1,000
Ultrasonic	Motor RPM	Speed of probe during the cleaning step	12,000	0	28,000
	Cleaning Duration (sec)	Time in seconds of the cleaning step	10	0	7,200
	Probe Wash Depth	Height of the homogenization probe from the bottom of cleaning station	30	0	50
	Up / Down Distance (Z) (mm)	Up and down distance of the probe during cleaning step	15	0	50
	Up / Down Velocity (Z) (mm/s)	Up and down speed of the probe during cleaning step	20	0	50
	Delay for Each Movement (ms)	Pause time between each of the above movements	100	0	200

Substep	Parameter	Description	Default	Min	Max
Ultrasonic	Pre-flow Time (sec)	Time in seconds that the cleaning station will flush lines and bath before probe cleaning step	1	0	10
	Post-flow Time (sec)	Time in seconds that the cleaning station will flush lines and bath after probe cleaning step	1	0	10
Static	Motor RPM	Speed of probe during the cleaning step	12,000	0	28,000
	Cleaning Duration (sec)	Time in seconds of the cleaning step	10	0	7,200
	Probe Wash Depth	Height of the homogenization probe from the bottom of cleaning station	30	0	50
	Up / Down Distance (Z) (mm)	Up and down distance of the probe during cleaning step	15	0	50
	Up / Down Velocity (Z) (mm/s)	Up and down speed of the probe during cleaning step	20	0	50
	Delay for Each Movement (ms)	Pause time between each of the above movements	100	0	200
	Post-flow Time (sec)	Time in seconds that the cleaning station will flush lines and bath after probe cleaning step	1	0	10

Appendix 7 - Working Examples of Sample Racks with Sample Selected

Standby Setup Run Results Editor Wed 12/20/2023 22:16:26

Clean Probes
Tap clean probes to mark them as present or enter the total below:
Total Clean Probes: 96
Mark All: Present Empty

Samples
Samples have been marked as scheduled. To start over, tap anywhere on the sample rack:
Tap samples to mark them as scheduled or enter the total below:
Scheduled Samples: 7
Mark All: Present Empty

Method: 22000 rpm for 60 seconds
Active Deck: 15 mL Standard with Disposal Rack
Probe Type: Plastic 7mm

Back Start

Standby Setup Run Results Editor Wed 12/20/2023 14:33:48

Clean Probes
Tap clean probes to mark them as present or enter the total below:
Total Clean Probes: 96
Mark All: Present Empty

Samples
Tap the first sample to process:
Tap samples to mark them as scheduled or enter the total below:
Scheduled Samples: 16
Mark All: Present Empty

Method: 22000 rpm for 60 seconds
Active Deck: 15 mL Standard with Disposal Rack
Probe Type: Plastic 7mm

Back Start

Standby Setup Run Results Editor Wed 12/20/2023 14:34:44

Clean Probes
Tap clean probes to mark them as present or enter the total below:
Total Clean Probes: 96
Mark All: Present Empty

Samples
Samples have been marked as scheduled. To start over, tap anywhere on the sample rack:
Tap samples to mark them as scheduled or enter the total below:
Scheduled Samples: 8
Mark All: Present Empty

Method: 22000 rpm for 60 seconds
Active Deck: 15 mL Standard with Disposal Rack
Probe Type: Plastic 7mm

Back Start

Standby Setup Run Results Editor Wed 12/20/2023 14:35:26

Clean Probes
Tap clean probes to mark them as present or enter the total below:
Total Clean Probes: 96
Mark All: Present Empty

Samples
Samples have been marked as scheduled. To start over, tap anywhere on the sample rack:
Tap samples to mark them as scheduled or enter the total below:
Scheduled Samples: 96
Mark All: Present Empty

Method: 22000 rpm for 60 seconds
Active Deck: 15 mL Standard with Disposal Rack
Probe Type: Plastic 7mm

Back Start

Standby **Setup** Run Results Editor

Wed 12/20/2023 22:21:13

Clean Probes

tap clean probes to mark them as present or enter the total below.

Total Clean Probes:

Mark All:

Samples

Tap the first sample to process:

tap samples to mark them as scheduled or enter the total below.

Scheduled Samples:

Mark All:

Method: 18000 rpm for 90 secs
Active Deck: 30 ml_Standard
Probe Type: Plastic_12mm

Standby **Setup** Run Results Editor

Wed 12/20/2023 22:25:15

Clean Probes

tap clean probes to mark them as present or enter the total below.

Total Clean Probes:

Mark All:

Samples

Samples have been marked as scheduled. To start over, tap anywhere on the sample rack:

tap samples to mark them as scheduled or enter the total below.

Scheduled Samples:

Mark All:

Method: 22000 rpm for 60 seconds
Active Deck: 15 ml_SBS no Disposal Rack
Probe Type: Plastic_7mm

Standby **Setup** Run Results Editor

Wed 12/20/2023 22:30:26

Clean Probes

tap clean probes to mark them as present or enter the total below.

Total Clean Probes:

Mark All:

Samples

Samples have been marked as scheduled. To start over, tap anywhere on the sample rack:

tap samples to mark them as scheduled or enter the total below.

Scheduled Samples:

Mark All:

Method: 18000 rpm for 90 secs
Active Deck: 15 ml_SBS 12 Pos
Probe Type: Plastic_7mm

Appendix 8 - Settings (Editor User Group Only)

Servo Options

Defaults

Velocity	X 500 mm/s	Y 500 mm/s	Z 140 mm/s
Acceleration	X 1100 mm/s ²	Y 1100 mm/s ²	Z 100 mm/s ²
Deceleration	X 1100 mm/s ²	Y 1100 mm/s ²	Z 100 mm/s ²
Jerk	X 500 mm/s ³	Y 500 mm/s ³	Z 200 mm/s ³

Users

Username	Full Name	Group
Administrator	Administrator	Admin
Editor	Editor	Editor
Operator	Operator	Operator
Lab Tech	Lab Tech	Operator
Lab Manager	Lab Manager	Editor

New User

Delete User

Selected User Information

Username: Lab Manager

Password: [tap to change]

Full Name: Lab Manager

Group: Editor

Changes are automatically saved upon exit

Advanced Options

Log Options

Disable verbose logging

Disable debug logging

Probe Disposal

Cleaning Station Installed

Disposal Chute Installed

API Server

Server Status 0

CON Status 0

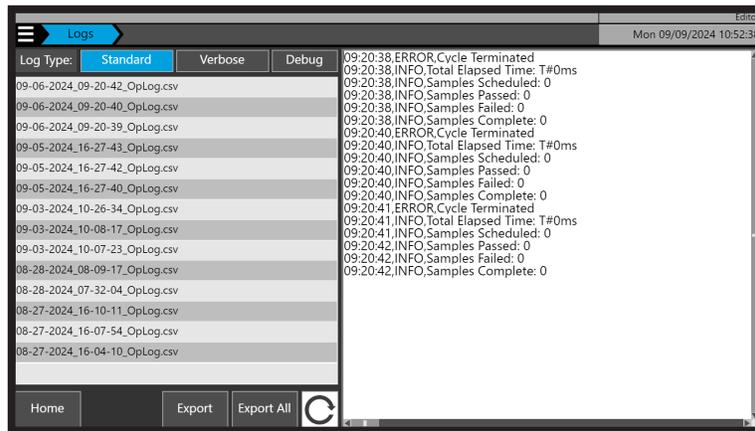
Read Status 0

Write Status 0

RESTART SERVER

Appendix 9 - Logs (Editor User Group Only)

Logs are only accessible by users in the editor user group. They are used for instrument troubleshooting by service personnel and can be exported via USB.



Appendix 10 - Transport and Storage

Transport and storage are only allowed in the original packaging. Remove racks, probes and other accessories from the machine before transport and storage. The machine is heavy. To prevent possible injuries, be careful when lifting and carrying the machine. Use a transport aid for transferring the machine.

Permissible environmental conditions for transport and storage of the equipment:

- Temperature from -13 °F to 140 °F (-25 °C to 60 °C)
- Relative humidity 5 % to 95 %

Equipment Disposal

This equipment is marked with the crossed-out wheeled bin symbol, to indicate that this equipment may not be disposed of as unsorted municipal waste.

It's your responsibility to correctly dispose of your equipment at life-cycle end, by handing it over to an authorized facility for separate collection and recycling of waste equipment. It's also your responsibility to decontaminate your equipment in case of biological, chemical or radiological contamination, and so protect the persons involved in the disposal and recycling of the equipment from health hazards.

For more information about where you can dispose of your waste equipment, please contact your local dealer, from whom you purchased the equipment.

By doing so, you will help to preserve natural and environmental resources and you will ensure that your equipment is recycled in a manner that protects human health.





The information provided in this document is for reference purposes only and may not be all-inclusive. Revvity, Inc., its subsidiaries, and/or affiliates (collectively, "Revvity") do not assume liability for the accuracy or completeness of the information contained herein. Users should exercise caution when handling materials as they may present unknown hazards. Revvity shall not be liable for any damages or losses resulting from handling or contact with the product, as Revvity cannot control actual methods, volumes, or conditions of use. Users are responsible for ensuring the product's suitability for their specific application. REVVITY EXPRESSLY DISCLAIMS ALL WARRANTIES, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, REGARDLESS OF WHETHER ORAL OR WRITTEN, EXPRESS OR IMPLIED, ALLEGEDLY ARISING FROM ANY USAGE OF ANY TRADE OR ANY COURSE OF DEALING IN CONNECTION WITH THE USE OF INFORMATION CONTAINED HEREIN OR THE PRODUCT ITSELF.

www.revvity.com

revvity

For research use only. Not for use in diagnostic procedures.

Revvity, Inc.
940 Winter Street
Waltham, MA 02451
USA
www.revvity.com

For a complete listing of our global offices, visit www.revvity.com
Copyright ©2024, Revvity, Inc. All rights reserved.