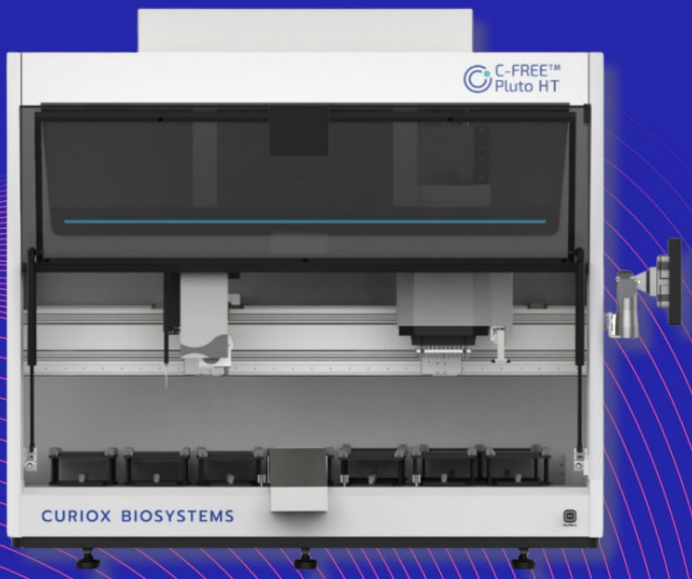
CURIOX
BIOLOGY AT ITS BEST

C-FREE™ Pluto HT Workstation
User Manual

Part No.	CF-PLU-LH08HT-01
Document No.	IN-PT-PM-UD-3
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IMPORTANT NOTICE

Adherence to all instructions in this User Manual is crucial. Using the instrument in ways not specified by the manufacturer in this manual may damage the protection provided by the system. Non-compliance may lead to the invalidation of your service contract.

While the information in this manual is considered accurate, Curiox Biosystems Pte. Ltd. disclaims all liability for errors and reserves the right to modify specifications without notice.

C-FREE™ Pluto HT Workstation – Product Specifications

Part No.	Description	Details
CF-PLU-LH08HT-01	C-FREE™ Pluto HT Workstation	C-FREE™, Pluto HT System, Standard 96-well automated liquid handling head

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Customer Service and Technical Support

If you have any questions or feedback about the workflow wizard, please contact your sales representative or reach out to us using one of the methods below.

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Contact Us	curiox.com/contact
Email Sales	sales@curiox.com

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Chapter 1 | General Information

1.1 General Information

This user manual provides technical guidance, installation instructions, operational procedures, and trouble-shooting information for operators of the Pluto HT Workstation. It covers the following areas:

- Setup and operation
- Operating principles and functional modes
- Safety features and operational precautions
- Troubleshooting and maintenance procedures

1.2 Introduction to the Pluto HT System

Welcome to the Curiox C-FREE™ Pluto HT System (Pluto HT system), a state-of-the-art automated liquid handling platform designed to revolutionize sample preparation in flow cytometry and cell analysis workflows. Developed with a focus on enhancing laboratory efficiency and biosafety, the Pluto HT system significantly reduces hands-on time and inter-operator variability. This introduction will guide you through the system's capabilities, design, and how it can streamline your laboratory processes, ensuring high-quality results with less manual intervention.

Distinctive Features of the Pluto HT System:

The Pluto HT system is distinguished by several key features that set it apart in the field of automated sample preparation:

Curiox C-FREE™ Wash Technology: Integrating the latest advancements in cell washing, the Pluto HT system employs Curiox C-FREE™ Wash technology, which provides gentler handling of cells compared to traditional methods. This technology ensures higher stain indexes for cleaner resolution of cell populations, crucial for precise analytical outcomes.

Compact Footprint: Designed to be accommodated in almost any lab environment, the Pluto HT system boasts a compact footprint. This design consideration allows for optimal use of laboratory space without sacrificing functionality.

Standard 96-Well Plate Format: The system utilizes Curiox Validated Plates that have a standard 96-well plate format, facilitating integration into existing workflows with minimal adaptation required. This feature ensures compatibility and ease of use, particularly for labs already using this format.

End-to-End Automation: From liquid handling to cell washing, the Pluto HT system provides complete automation of the sample preparation process. This end-to-end automation minimizes the potential for human error and increases throughput, making it ideal for high-demand environments.

Enhanced Reporting and Audit Trail: Tailored to meet the needs of both clinical and research markets, the Pluto HT system features advanced reporting capabilities and a robust audit trail. These features ensure compliance with regulatory standards and provide comprehensive documentation for review and analysis.

The Pluto HT system is your partner in delivering efficient, reliable, and reproducible results, making it an indispensable tool for modern laboratories focused on cell analysis.

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1.3 Technical Specifications

Description	Specification
Physical (Common items)	
Dimensions (D x W x H)	740 mm x 1090 mm x 1168 mm; 29.1 in. x 42.9 in. x 46 in.
Weight	240 kg / 529.1 lbs. (must be supported by a countertop rated for at least 1000 kg / 2,204 lbs to account for the instrument along with all consumables, accessories, and dynamic loads during operation)
Electrical	
Power Requirements	100-240VAC, 50/60Hz, 10A
Fuse	250VAC, 10A (AC250V, T10AL, 5x20mm)
Environmental	
Place of use	Indoor use
Operating Temperature Range	19°C - 25 °C
Operating Humidity	20% ~ 80%, without condensation
Altitude	2000 m below
Barometric Pressure	80 kPa - 106 kPa
Transportation and storage conditions	Temperature: -20°C - 50 °C Humidity: 20% ~ 80% without condensation
Mains supply voltage fluctuations	(100-240) VAC ± 10%
Device Type	Fixed benchtop device
Pollution Degree	Degree 2
Operation	
Plate Type	Curiox 300 µL 96 well U-bottom plate Curiox 2.2 mL 96 well U-bottom deep well plate Curiox Liquid reservoir
Deck Capacity	28 SBS plate position
User Interface	
Display	12-inch touchscreen
Input control	Touchscreen interface
External Interface (Administrator-only port)	
RJ45 port	Used for communication with third party device

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Description	Specification
USB port	Top: DC 5V, USB flash disk port, used for file transfer Bottom: OTG port, only used for internal debug
Labware	
Pipette tips	50 µL non-filter, non-sterilized 50 µL non-filter, sterilized 250 µL non-filter, non-sterilized 250 µL non-filter, sterilized 1000 µL non-filter, sterilized 1000 µL non-filter, non-sterilized
Plates	Curiox 96 well, U-bottom, standard microplate, SBS format Curiox 96 well, U-bottom, deep well, SBS format Curiox Buffer Reservoir, 70ml, 4-slot,
Tubes	5mL round bottom polystyrene tube 3mL blood collection tube Tube rack

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1.4 Chemical Compatibility

The components of the Pluto HT Workstation that come into possible contact with fluids and reagents are made from materials chosen for their resistance to common chemicals. However, certain disinfectants should not be used for decontamination. Below Table details the material composition of these components and identifies compatible reagents. Note that some reagents are incompatible with these materials and their prolonged contact should be avoided to prevent corrosion and damage. Do not use undocumented reagents without consulting Curiox Technical Support.

Table: Chemical compatibility between the component materials and accessories in the Pluto HT system, including common reagents and disinfectants. (Adapted from: CP LabSafety www.calpaclab.com, US Plastic www.usplastic.com/catalog/files/charts/Tygon%20CC.pdf accessed Jan 2023.)

Component	Material	Approved Chemicals	Incompatible Chemicals
Deck Plate / Liquid suction tube / Waste liquid tank conduit /Tip Waste Chute	Stainless Steel (304)	Ethanol, Benzene, Chloroform, Acetaldehyde, Propylene Glycol, Isopropanol, Formaldehyde, Phenol, Grease, Potassium Permanganate, Hydrogen Peroxide	Hypochlorite bleach, sulfuric acid
Waste liquid tank	Polyethylene (PE)	PBS, DPBS, Water (DI/distilled), Cell culture media (DMEM, RPMI), Saline, Tris buffer, HEPES buffer, EDTA solution, Ethanol (≤70%), Isopropanol (≤70%), Methanol (≤50%), Formaldehyde (≤10%), Hydrogen Peroxide (≤30%), Sodium Azide solution, BSA solution, FBS, Glycerol, DMSO (≤10%)	Chloroform, Toluene, Xylene, Acetone (concentrated), Concentrated H_2SO_4, Concentrated HNO_3, Acetonitrile (concentrated), High-concentration DMSO (>50%), Phenol-Chloroform mixture
Sealing ring / Drive Pipe Waste Tube	Silicon	Ethanol, isopropyl alcohol, detergents, ethylene glycol, propylene glycol, formaldehyde, formamide, sodium hypochlorite, hydrogen peroxide, sulfuric acid (<3M), ozone	Chloroform
Temperature Control Module housing	HIPS	Ethanol, Dilute acids (e.g., acetic acid), Dilute alkalis (e.g., sodium hydroxide solution), Some detergents	Strong acids (e.g., sulfuric acid), strong alkalis (e.g., concentrated sodium hydroxide), organic solvents (e.g., toluene, xylene), acetone
Liquid suction tube connector	PEEK	Ethanol, Isopropanol, Acetone, Benzene, Acetic acid, Hydrogen peroxide	Concentrated sulfuric acid, concentrated nitric acid, Halogenated solvents (e.g., chloroform, methylene chloride)
Tip Waste Box / Waste liquid storage box	ABS	Ethanol, Dilute acids (e.g., acetic acid), Dilute alkalis (e.g., sodium hydroxide solution), Some detergents	Acetone, Benzene, Toluene, Methylene chloride, Strong acids (e.g., sulfuric acid), Strong alkalis (e.g., concentrated sodium hydroxide)
Pipette tip ejector	PC+ABS	Ethanol, Isopropanol, Dilute acids, Dilute	Acetone, Benzene, Toluene, Chlorinated

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		alkalis, Some detergents	solvents, Strong acids, Strong alkalis
Carriers	6061-T6 Aluminum / Anodizing	Ethanol, Benzene, Propylene Glycol, Isopropanol, Formaldehyde, Ozone, Grease, Phenol, Hydrogen Peroxide	Hypochlorite bleach, soap solutions, sulfuric acid, potassium permanganate, phosphoric acid
Sample Pipe support	PMMA(Acrylic)	Ethanol, Isopropanol, Dilute acids, Dilute alkalis	Acetone, Benzene, Toluene, Chloroform, Methylene chloride

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1.5 Safety

User Attention Notifications

This manual uses several user attention phrases, each designed to draw a specific level of attention:

NOTE	Provides useful information.

IMPORTANT	Highlights information essential for proper operation of the instrument.

CAUTION!	Alerts users to potential hazards that could cause injury or damage to the instrument if ignored.

WARNING!	Indicates a serious risk of physical injury if precautions are not followed.

Chemical Hazards

WARNING!	CHEMICAL HAZARD: Handle with care. Exposure to chemicals used in this process can cause serious injury or illness.

Chemical Waste Hazards

Chemicals used with the Pluto HT system may be hazardous. Warning labels are affixed to all chemical containers to identify potential risks.

Material Safety Data Sheets (MSDS) offer essential safety information for the storage, handling, transportation, and disposal of chemicals.

For MSDS for Curiox reagents, please contact us at 650-226-8420 (US) or +65 6908 4201 (international). Alternatively, you can contact the chemical manufacturer directly or visit their website for more information. It is advisable to periodically update your laboratory's MSDS records.

Review Safety Data: Ensure you read and comprehend the MSDS from the chemical manufacturers before storing, handling, or disposing of chemical waste.

Minimize Exposure: Avoid direct contact with and inhalation of chemicals. Minimize contact with chemical waste. Always wear appropriate personal protective equipment such as safety glasses, gloves, and protective clothing. Refer to the MSDS for more safety guidelines.

Seal Containers: Ensure all chemical containers remain tightly closed when not in use.

Monitor for Leaks: Regularly check for chemical leaks or spills and promptly follow the manufacturer's recommended cleanup procedures listed on the MSDS if an incident occurs.

Cautious Handling: Exercise caution when emptying waste bottles.

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Follow Legal Requirements: Adhere to all applicable local, state, provincial, or national regulations concerning the storage, handling, and disposal of chemicals. Operate only in a laboratory environment meeting biosafety standards as defined by local regulations.

Instrument Safety Labels

A safety label with a safety alert symbol is affixed to the Pluto HT system to warn users of potential safety hazards. This symbol is universally recognized and prompts users to exercise caution when operating the equipment.

Symbol	Description
	Warning. Risk of personal injury to the operator or a safety hazard to the instrument or surrounding area.
	Warning. Hot surface. Burn hazard.
	Warning. Pinch point hazard.
	Danger. Hazardous voltage. Risk of electrical shock.
	Biohazard. Biological risk present; use appropriate PPE and handle waste safely.

Important Safety Instructions

Modification Warning

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

Radio Interference

This equipment has been designed and tested to CISPR 11 Class A. It may cause radio interference; in which case you may need to take measures to mitigate the interference. Do not use this device in proximity to sources of strong electromagnetic radiation (e.g., unshielded intentional RF sources), as these may interfere with proper operation.

Intended Use

This instrument is intended solely for automated liquid handling in flow cytometry and cell analysis sample preparation workflows in a research laboratory setting. It is not intended for diagnostic, clinical, or in vitro diagnostic use.

Power and Maintenance

Always disconnect the power to the instrument before cleaning or performing routine maintenance. Do not disassemble the unit.

Install Correct Labware on the Deck

Ensure plates, tube rack(s), and pipette tips have been securely inserted in their correct positions and orientation. Failure to do so may result in damage to the instrument.

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Use only Curiox Pluto branded and supplied plates, tube racks, and pipette tips. Do not reuse plates, tubes, and pipette tips.

Proper Use and Protection

If the equipment is used in a manner other than that specified by Curiox, the protection provided by the equipment may be impaired.

Operational Safety

Keep hands clear of the instrument platform as it moves in and out of the instrument. To avoid muscle strain or back injury, use lifting aids and proper lifting techniques when removing or replacing the instrument.

Chemical and Biohazard Safety



Equipment can be hazardous due to the use of chemical and biohazardous substances. This instrument can be used with potentially biohazardous materials. Use appropriate personal protective equipment (gloves, safety goggles, lab coat, etc.) for handling and disposing of biohazardous materials.

Instrument Door Operation

Avoid opening the door while the equipment is in operation. If the door is opened, the equipment will stop. Ensure the equipment has completely stopped before proceeding.

Disposal

Follow End-User's institutional Standard Operating Procedure (SOP) for decommissioning and disposal of laboratory instruments and accessories.

Follow End-User's institutional SOP(s) for safe disposal of used labware including pipette tips, plates and tubes.

Safety Precautions

- Always keep the area around the Power Supply dry to avoid any potential hazards.
- During operation, refrain from touching the instrument, except when interacting with the display panel.
- If an unexpected error occurs, reset the Pluto HT system by switching the power off and then back on.

General Precautions

- Only use Curiox Validated Plates with the Pluto HT system.
- Only use the power cord supplied with the unit for electrical supply.
- Avoid spilling liquids inside of the instrument.
- Conduct a cleaning cycle using the appropriate solution after each experiment.
- Retain the original packaging material for potential future shipping needs.
- Do not open or remove the instrument casing or motor parts; this can void the warranty and calibration and may cause irreversible damage.
- For any service needs, contact only qualified Curiox personnel.

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Prior to System Operation

- Ensure that all users of the Pluto HT Workstation have:
- Received training on general laboratory safety practices.
- Been instructed on specific safety protocols for operating this instrument.
- Been trained in handling biohazards if biohazardous materials are to be used with the system.
- Read and understood all relevant Material Safety Data Sheets (MSDS).

CAUTION! Avoid operating the Pluto HT system in ways not specified by Curiox. Although the system is designed to protect users, this protection can be compromised if the instrument is used improperly.

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1.6 CE Mark

Based on the testing described below and information contained herein, this instrument bears the CE mark.

Directive 2014/30/EU Electromagnetic Compatibility

This device has been type-tested by an independent, accredited testing laboratory and found to meet the requirements of EN 61326-1 for Emissions and Immunity.

Verification of compliance was conducted to the limits and methods of the following:

- EN 61326-1: 2021 Emissions
- Harmonics Current Emission (Class A)
- Voltage Fluctuation/ Flicker
- Conducted Emission (Group 1 Class A)
- Radiated Emission (Electric Field) (Group 1 Class A)
- EN 61326-1: 2013 Immunity
- Electrostatic Discharge Immunity
- RF Radiated Immunity
- Electrical Fast Transient/ Burst Immunity
- Voltage Surge Immunity
- Conducted Disturbance Immunity
- Voltage Dips & Interruptions Immunity

Directive 2014/35/EU Low –Voltage Device

This device has been verified and found to meet the requirements of Directive 2014/35/EU “electrical electronic equipment designed for use within certain voltage limits”.

Directive 2015/836/EU Restriction On the use of Hazardous Substances (ROHS 3)

This device has been verified and found to meet the requirements of Directive 2015/836/EU “restriction on the use of certain hazardous substances in electrical and electronic equipment”.

Directive 2012/19/EU Waste Electrical and Electronic Equipment (WEEE)

Dispose of the device according to Directive 2012/19/EU, on “waste electrical and electronic equipment (WEEE)” or local ordinances.

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1.7 Instrument Storage and Shipping

Before transportation, disinfect the equipment by wiping it with 70% isopropyl alcohol. For long-distance transportation, ensure that moving parts are secured and packed in shock-proof packaging. Retain the original packing material for future transportation needs.

For transportation and moving of equipment, please contact the Curiox technical support team. The instrument is quite heavy; it is recommended that at least six trained personnel carry it or use a forklift with a load capacity of at least 1000 kg.

Stow the instruments in a regulated storage environment: Temperature: 4-28°C, Humidity <80% RH, non-condensing.

The equipment must be transported in its packaged state, kept upright, and protected from tumbling and rain. Do not unpack the equipment without Curiox personnel present and handle it with care during transportation.

CAUTION!	Do not touch moving parts. Prevent serious personal injury: Do not put your hand into equipment gaps. Do not move the device without the manufacturer's consent.

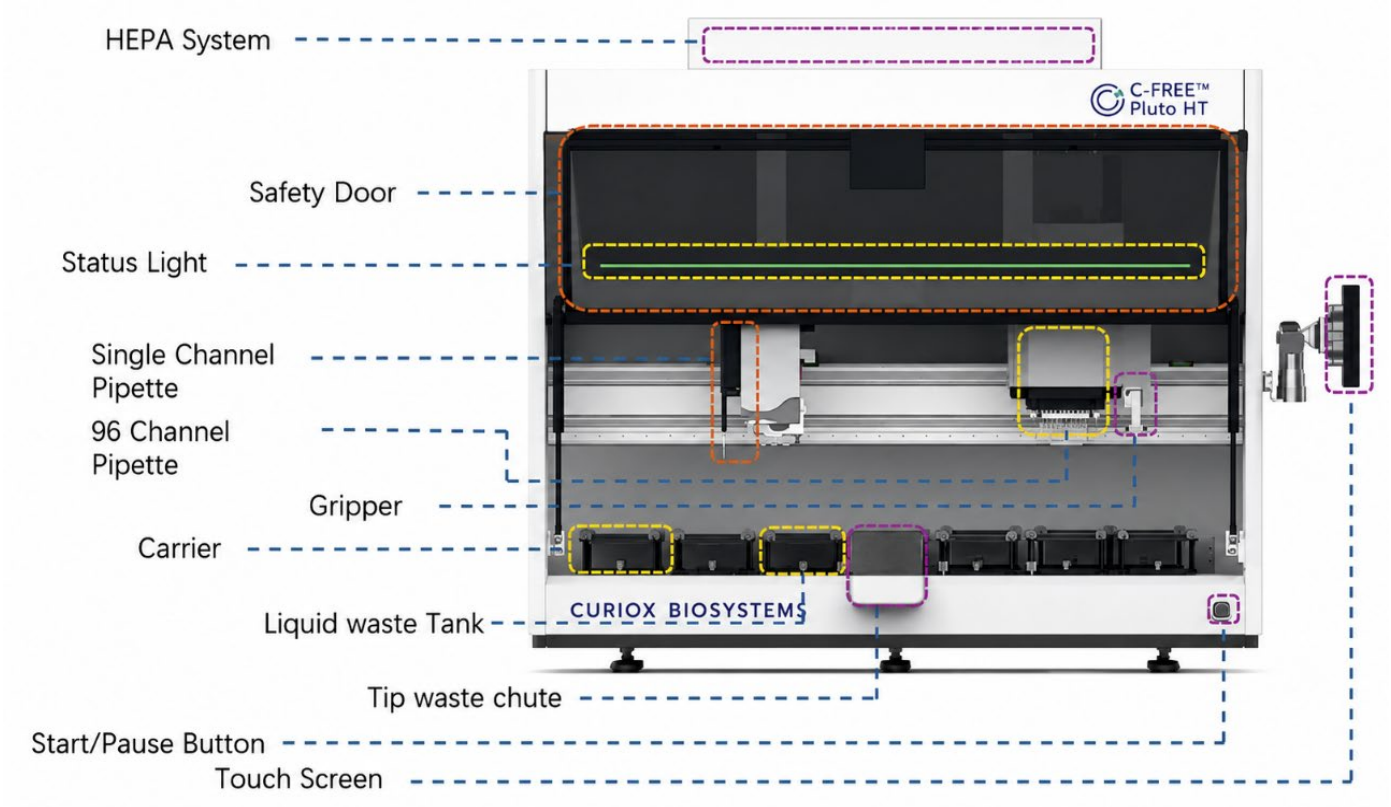
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Chapter 2 | Functional Description

This chapter provides a detailed overview of the Pluto HT Workstation components.

2.1 Main Components

The main components of the Pluto HT Workstation are shown below:



Safety Door

To ensure the safety of the operators, the Pluto HT system can sense the status of the safety door. Once the door is opened during the run, the system will automatically pause until the door is closed again.

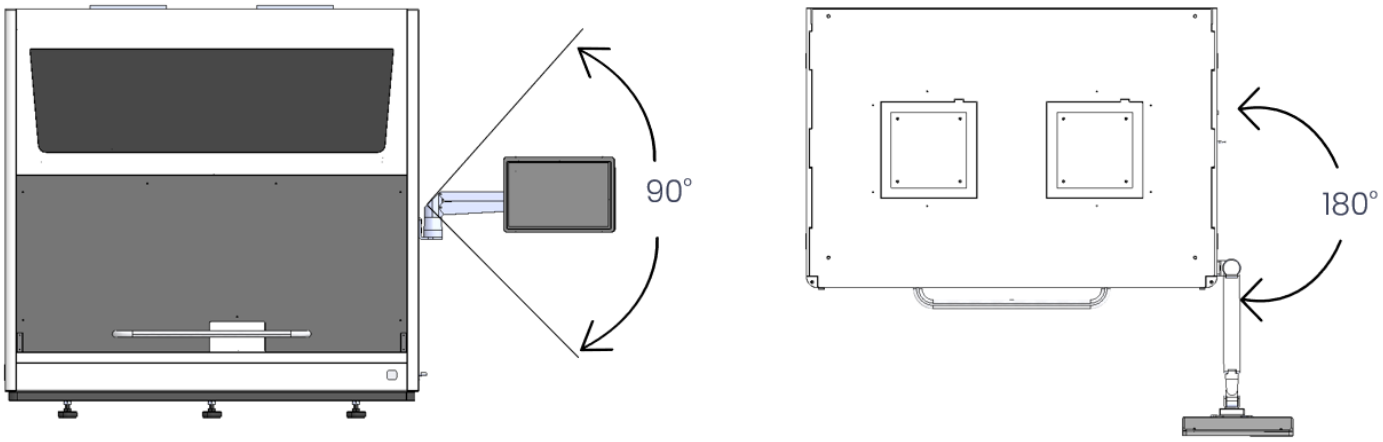
Status Light

The status light will be turned on and stay blue when powered on.

Touch Screen

The Pluto HT system is equipped with a 12-inch LED touchscreen and adjustable arm support. The arm can rotate 180 degrees forward and backward, and 90 degrees up and down.

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Tip Waste Bin and Liquid Waste Trough

The waste chute is used to collect solid waste generated during the experimental run.



Start/Pause Button

Automatic Switching

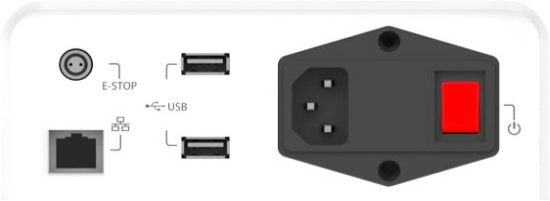
- Switches on when you start the runner application.
- Switches off when you close the application.

Status Indication

- Stays green when the application is in operation.
- Flashes when the application is on standby.

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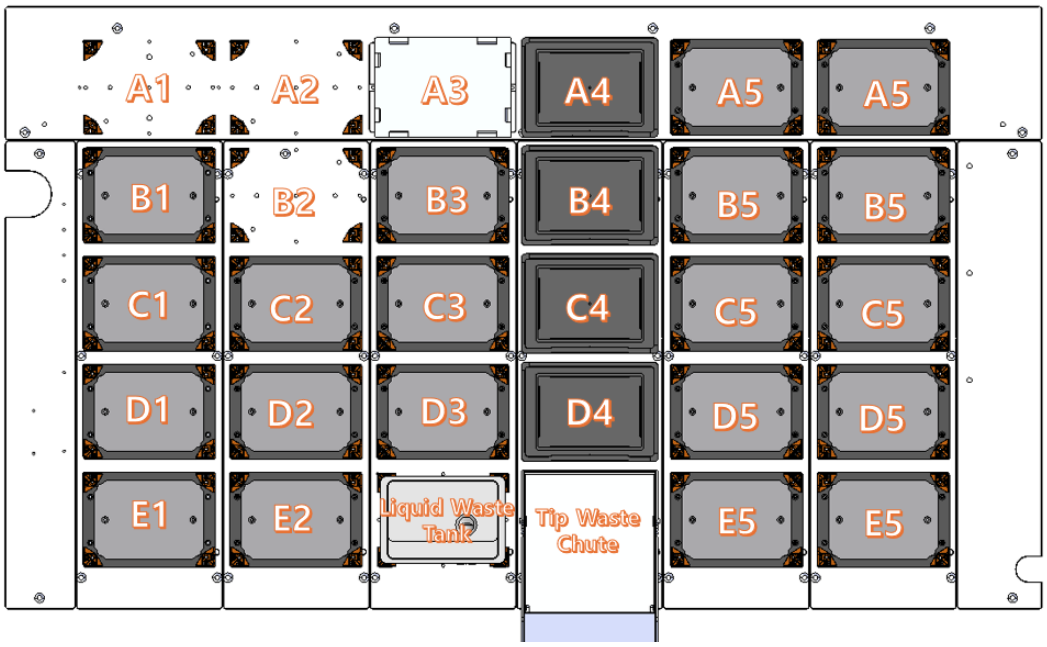
Hardware Interface



- E-STOP: E-Stop button connector
- RJ45: used for communication with third party device [an administrator-only port]
- USB port (top): DC 5V, USB flash disk port, used for file transfer
- USB (bottom): OTG port, only used for internal debug
- Power connector: Connect to power cable, AC100-250V 10A
- Fuse connector: F10AL250V (Notice: if the fuses are damaged, only replace with ones specified by Curiox)
- Power Switch: turns power on or off.

Worktable/Deck

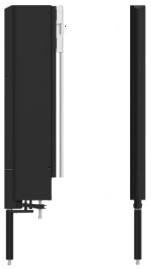
The Pluto HT system supports up to 28 SBS plate positions.



2.2 Integrated modules

	Parts name	Type
Pipette Module	96-Channel	F96M
	4 x Single-Channel	4-PM
Gripper Module	Left/Right	RGM
Temperature Control Module	On-deck Heater/Cooler	MT-120
Other	HEPA Filter	Positive pressure
		Negative pressure

Pipette modules

Specification	96-Channel Pipette	Single-Channel Pipette
		
Size/Dimension	9 mm fixed pitch	Individual Z-axis 18 mm distance flexible channel pipette module
Partial Loading Support	Yes	No
Rapid Replacement Support	Yes	
Consumables and Adapters	Compatible with all kinds of SBS/SLAS standard-pitch consumables, module adapters	
Pipetting Principle	Air displacement	
Range of Pipetting	1-1,000 µL	
Liquid Level Detection	Pressure sensing (pLLD)	
Pipetting Accuracy	≤8% @ 5 µL ≤2.5% @ 50 µL ≤1.4% @ 250 µL ≤1.5% @ 500 µL	

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	≤1% @ 1,000 µL
Positional Accuracy	± 0.1 mm X, Y, Z axes

Gripper Module



Accurate force-controlled gripper: Gripper force ranging from 1 to 16N supports the transfer of various consumables.

Configurable finger directions: Capable of accessing peripheral devices to enable a huge array of process automation possibilities.

Parameter	Specification
Force control	1-16 N
Maximum travel length Lmax	92 mm
Minimum travel length Lmin	74 mm
Z-axis travel distance	150 mm
Maximum loaded weight	≤1,000 g ≤ 2.2 lbs

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Temperature Control Module

The On-Deck HEATER/COOLER module is capable of heating, cooling liquids in a plate, and provides different temperature conditions during experimental tests for reagents on deck. Different consumables can be matched by adapters.



Parameter	Specification
Dimension (D × W × H)	98 mm x 140 mm x 81 mm 3.9 in. x 5.5 in. x 3.2 in.
Shell Material	HIPS
Input Voltage	24V DC
Wattage	120W
Temperature Control Range	0℃- 120℃
Heating Rate	$t_{4\to21℃}$, 20K/min. $t_{21\to95℃}$, 8K/min.
Cooling Rate	$t_{95\to21℃}$, 11K/min. $t_{21\to4℃}$, 6K/min.
Temperature Accuracy	±0.2℃
Temperature Uniformity	≤±1℃@4℃ ≤±0.5℃@15℃&40℃ ≤±2℃@90℃
Communication Interface	RS422/485
Adapter	For consumable fixing, see adapter list

CAUTION! Hot Surface. Avoid contacting the HEATER/COOLER after use to prevent burns.

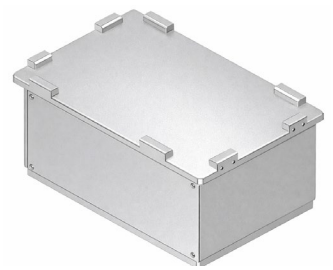
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Adapters and Carriers

Model	Image	Description
Deep Well Plate Adapter		96-well deep well U-bottom plate 2.0 mL Deep Well Plate ;
Micro Plate Adapter		96-well microplate with round and U- bottom
Carrier (57 mm /62 mm)		SBS/SLAS standard pitch consumables

Tilter Accessory

The tilter used with the Pluto HT system is an optional component designed for accelerated sample settling.





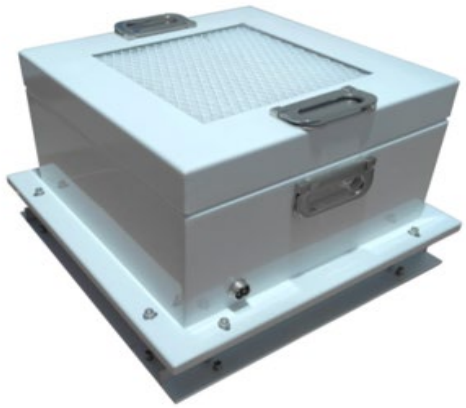
Parameter	Specification
Dimension (W×D×H)	140 mm × 98 mm × 70 mm; 5.5 in. x 3.85 in. x 2.76 in.

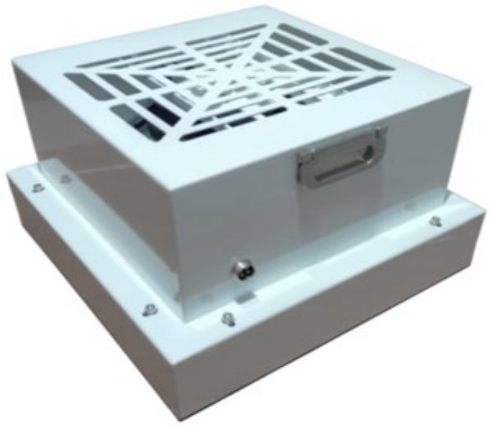
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Weight	1.3 kg / 2.86 lbs.
Input Voltage	24VDC
Wattage	60W
Angle Control Range	0~60 degrees
Load mass	Less than 350 grams
Communication Interface	CAN

HEPA Module

Positive Pressure Model: MAC-150E / P+ **Negative Pressure Model: MAC-150E / P-**





Perform air filtration to ensure air cleanliness during operation.

Model	**MAC-150E; P+ (Positive Pressure) / P- (Negative Pressure)**
Dimensions	300 × 300 × 200 mm
HEPA Filter	H13, 99.95% efficiency / Filter size: 292 × 292 × 50 mm
Maximum Airflow	360 ±10% m³/h / DC fan
Air Velocity	0.4 m/s ±20%
Fan Voltage	DC 24V
Fan Speed Control	0–10 VDC input
Noise Level	≤ 65 dB(A)
Fan Lifetime	25,000 hours at 40°C, 15–65% RH condition
HEPA Lifetime (Recommended)	8–10 months (ordinary environment) / 12 months (clean environment)

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Chapter 3 | Installation

3.1 Product Label

The product labels can be found on the exterior or interior of the product and provide basic information about the product.


Manufacturers


Production date


Validity period



Serial number


Check the instructions


General warning signs


Electronic device disposal

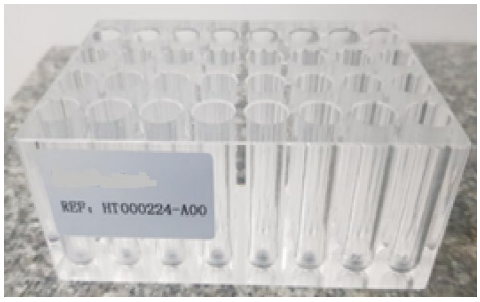
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3.2 Unboxing and Checking

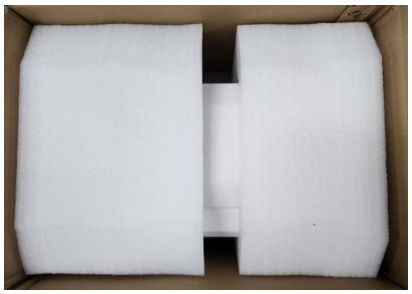
Please follow the instructions in Appendix A for unboxing the Pluto HT Workstation.

Packing list

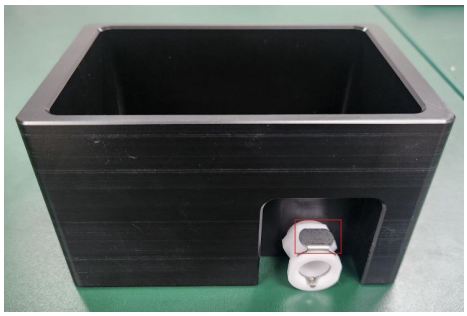
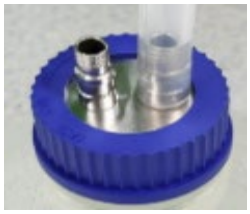
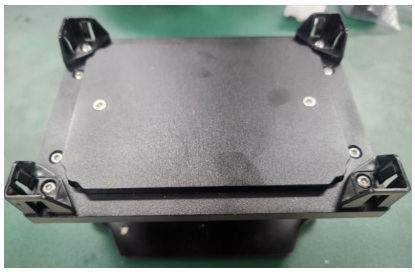
After unboxing, please check all the instruments and accessories in the list below. To prevent damage, some of the parts may be packaged individually inside of the crate. Please ensure that all the materials are matched to the packing list. If any items are damaged or missing, please contact the manufacturer or dealer, and be sure to retain the original packaging materials.

No	Part/Specification	Q'TY	Image
1	Pluto HT Instrument		
2	Sample Pipe support HT000223-A00 (32 holes)	3 EA	
3	Sample Pipe support HT000224-A00 (32 holes)	1 EA	

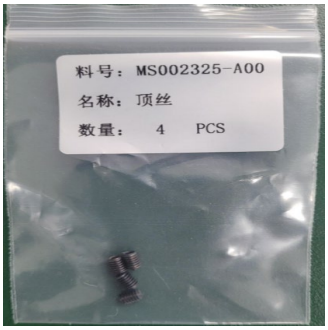
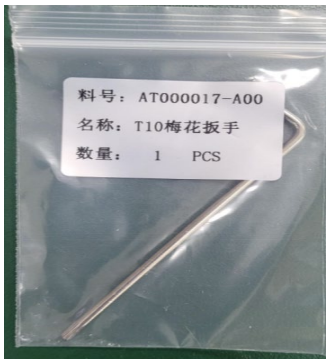
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4	Sealing ring / 2.5x1.0mm	80 EA	
5	Tip Waste Chute Revvity Part Name: Refuse Chute	1 EA	
6	Screw for Waste chute	2 EA	
7	96-Channel Head	1 EA	
8	Single channel Pipette head	4 EA	

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9	Liquid Waste Tank	1 EA	
10	Fitting-Male	1 EA	
11	Tube	1.5M	
12	Bottle Cap	1 EA	
13	Liquid Waste Bottle	1 EA	
14	Carrier with Thumbscrew – Label: A01, A07 and B07	3EA	

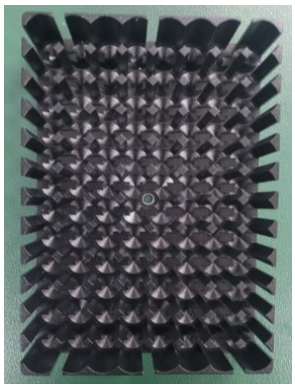
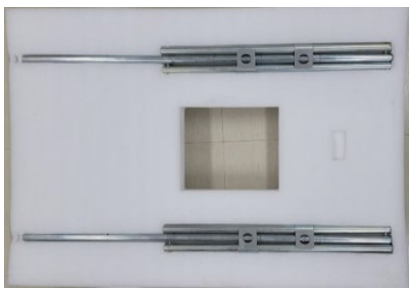
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15	Snap-fit (=Corner Bracket)	10 EA	
16	Snap-fit Screw	10 PCS	
17	Thumb screw (Set Screw for Head Installation)	4 EA	
18	Plastic Cover	4 EA	
19	Torx wrench / torx (3.0mm)	101 EA	

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20	Hex key	1 SET	
21	Expansion Quick Release	8 EA	
22	Power cord (Please check if it is the correct power cord for the nation)	1 EA	
23	Fuse	2 EA	
24	USB A-A Cable	1 EA	

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25	ON-DECK HEATER/COOLER adapter for DWP	Depends on the number of ON-DECK HEATER/COOLER installed machine	
26	Thumb Screw for Carrier	2 EA	
27	Open-end Spanner	1 EA	
28	Handling Gear	1 SET	
29	ON-DECK HEATER/COOLER adapter Screw - Revvity Part Name: 2.5x4 Screw	10 EA	

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30	ON-DECK HEATER/COOLER adapter for Pluto MTP	2 EA	
31	THUMB_DRIVE (USB Memory Stick)	1 EA	

Depending upon your system configuration, some or all of these parts may be in your container. Confirm the parts and quantities listed below.

Part/Specification	Quantity	Image	Check
Tilter			☐
ON-DECK HEATER/COOLER			☐

3.3 Getting Started

For a step-by-step guide to setting up the product, refer to the hardcopy Quick Start Guide document.

Placing the Instrument

The instrument is a fixed benchtop system. Ensure the work area is well-ventilated, and does not contain corrosive or flammable gases, or strong magnetic interference.

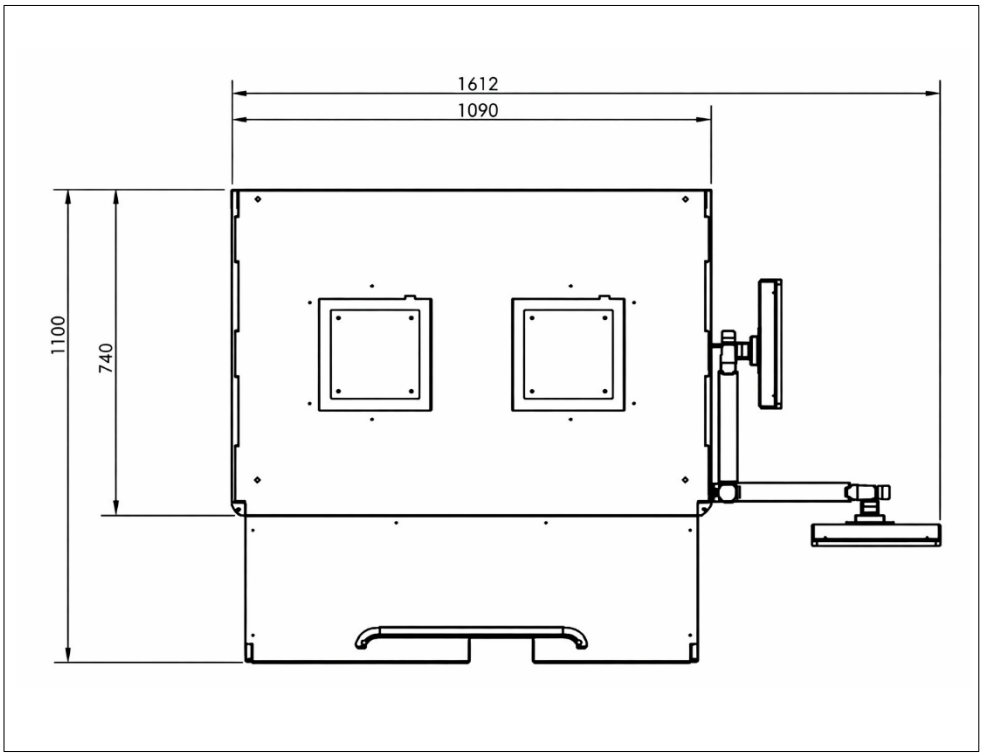
NOTE

- Do not install the instrument on a combustible surface.
- Do not place the device in a position where it is difficult to turn off.
- Do not place the instrument in a wet or dusty location.
- Do not place the instrument on a cushioned or unstable surface.
- Do not place the instrument against a wall or stack other objects around/against it.
- Please use forklift truck with load bearing 1000KG or more when moving (Contact Curiox personnel before moving the instrument).
- Ensure that the bench surface is level and that it can support weights up to 1000 kgs.

WARNING! There are moving parts inside the container. Ensure safe operating practices.

Space Requirement

The Pluto HT system space requirement is as depicted.



Remove the machine from the wooden box pallet and place it on a suitable countertop. At least six people are required to carry the instrument safely. The countertop should be able to hold (1000kg / 2,204 lbs) to account for the instrument along with all consumables, accessories, and dynamic loads during operation.

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3.4 Installation

Installation of this instrument is performed by a Curiox Field Service Engineer (FSE) who visits the customer site; end users should not attempt installation on their own.

3.5 Software Update

Please contact technical support for software updates.

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Chapter 4 | Operation

4.1 Preparation for Operation

Power On the Instrument

Connect the power cable and turn on the instrument.



NOTE	Only the power cord specified by Curiox (250V10A) can be used to connect the power supply. Make sure the power switch is in the off position before connecting the power supply.

WARNING!	Be sure that the ground wire in the power outlet is working correctly.

WARNING!	Do not pull the power cord when pulling out. Do not touch the metal part of the plug.

Module Function Check and Verification

Run Position Calibration Verification Protocol

Please contact Curiox personnel for assistance.

Run Volume Verification Protocol

Please contact Curiox personnel for assistance.

Run Gripper Verification Protocol

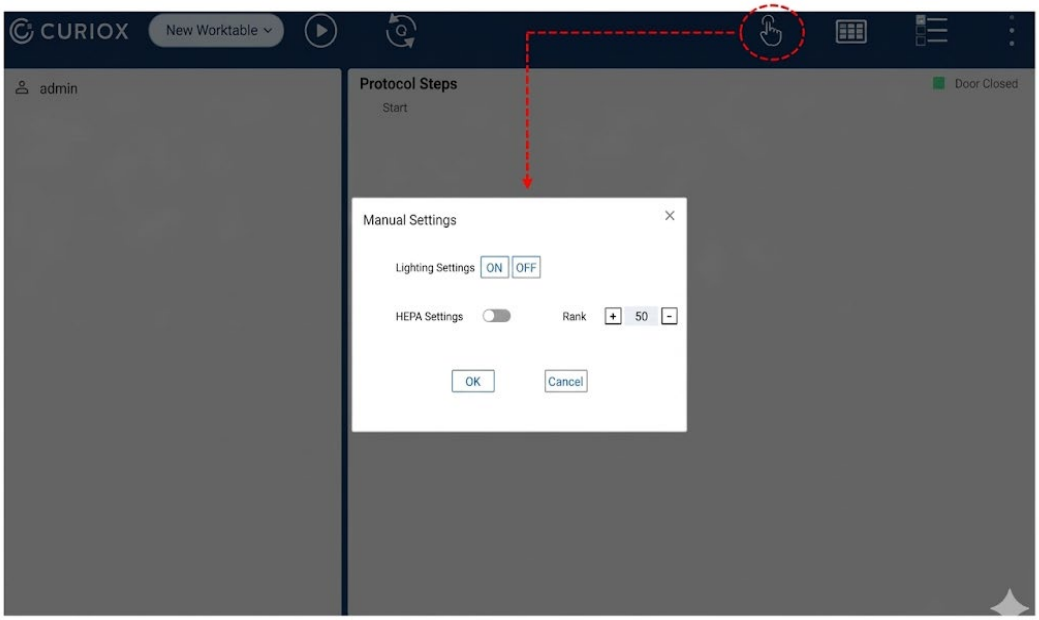
Please contact Curiox personnel for assistance.

GUI Introduction

Manual Settings

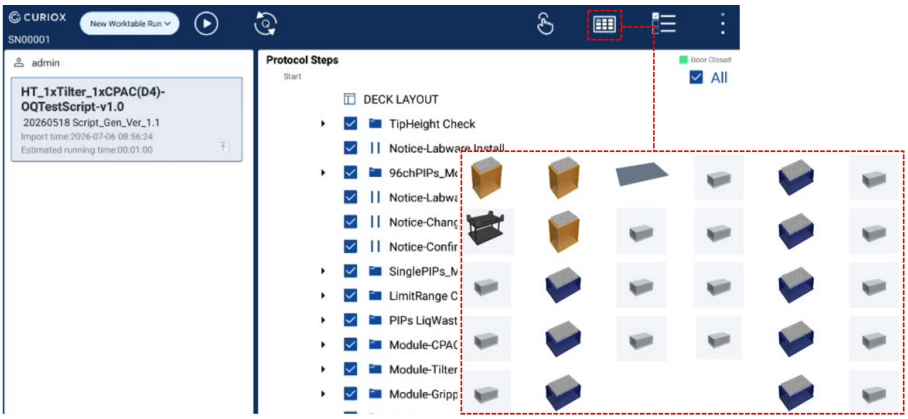
Click the button on the main window to access the manual settings screen (settings for lighting, HEPA, and rank).

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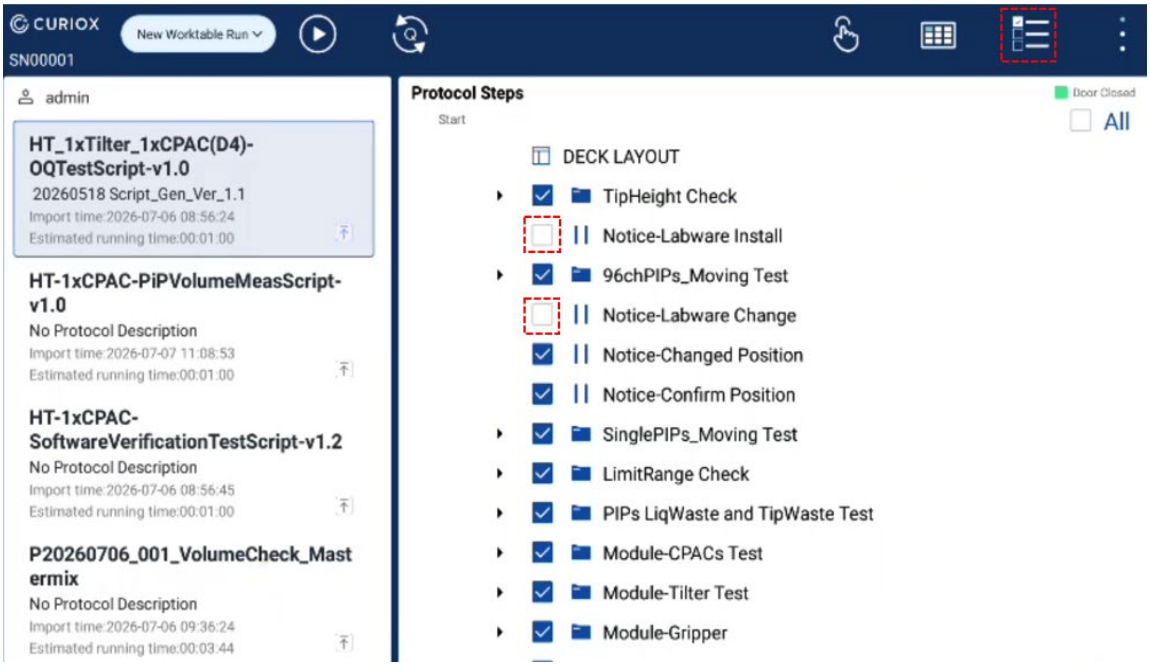
Worktable Viewer

Click  to access the worktable viewer button, which allows you to get detailed information on the consumables on the instrument deck.



Run Protocol Step by Step

Click  to access a protocol's step menu.



WARNING!

The PLUTO WORKSTATION contains functionality that allows Curiox personnel to deactivate individual steps within a method script. This functionality is intended solely for limited, controlled use by authorized Curiox representatives. Due to the complex and interdependent nature of the underlying scripting logic, deactivation of one or more method steps may cause the instrument to perform movements, tip-handling actions, or liquid-handling operations outside the intended sequence. Such actions may result in instrument collision, improper tip engagement or ejection, liquid-handling errors, invalid run results, system malfunction, and damage to critical hardware components, including, without limitation, the pipetting head, gantry system, and related assemblies.

Clients are strictly prohibited from deactivating any method step unless Curiox has provided prior written authorization expressly identifying the applicable method, the specific step or steps authorized for deactivation, and the conditions under which such deactivation may occur. Verbal instructions, informal communications, prior practice, or general troubleshooting discussions shall not constitute authorization. Clients are responsible for ensuring that all personnel who operate, supervise, or otherwise interact with the PLUTO WORKSTATION are informed of and comply with this requirement.

Any hardware damage, instrument malfunction, invalid or compromised run results, downtime, data loss, workflow interruption, or other related losses arising from or relating to the unauthorized deactivation of method steps may be excluded from coverage under the applicable Curiox warranty, service agreement, service contract, or other standard support obligations. If a client believes that deactivation of a method step is required for any workflow, troubleshooting activity, or operational purpose, the client must contact Curiox in advance for review and, where appropriate, written authorization before taking any such action.

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Settings

Import

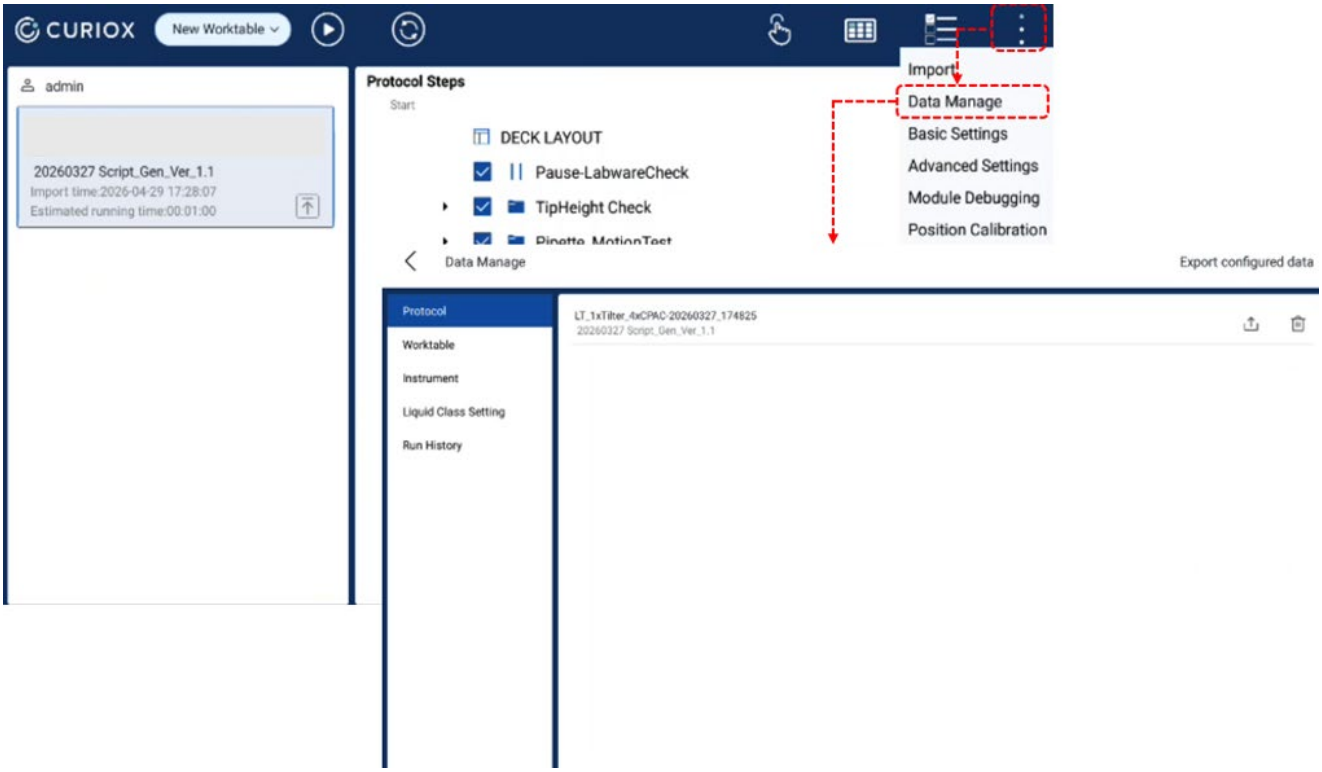
Automatic import of experimental data (protocol, instrument parameters, worktable, modules, adapters, consumables, etc.)

Export

The device execution log is stored in the database. You can export this database to a USB flash drive for analysis and backup.

Data Manage

Used to export or delete protocols, worktables, instrument parameters and to edit liquid class information.



21 CFR Part 11

Please refer to the **21 CFR Part 11 User Guide** for information on user management and information on audit trail.

Position Calibration

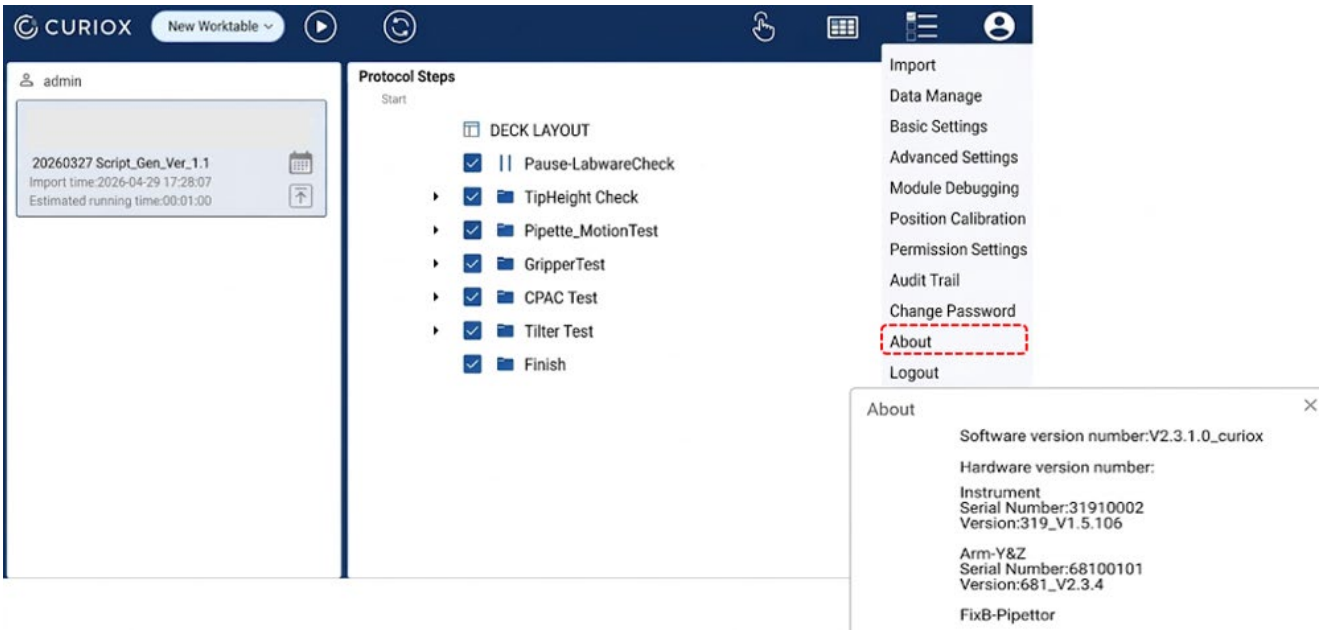
Instruments are finely calibrated for position accuracy before shipping. Recalibration may be necessary during installation due to shipping and transportation movement.

If a position-related problem occurs during operation, please contact the Curiox Service Team for assistance.

About

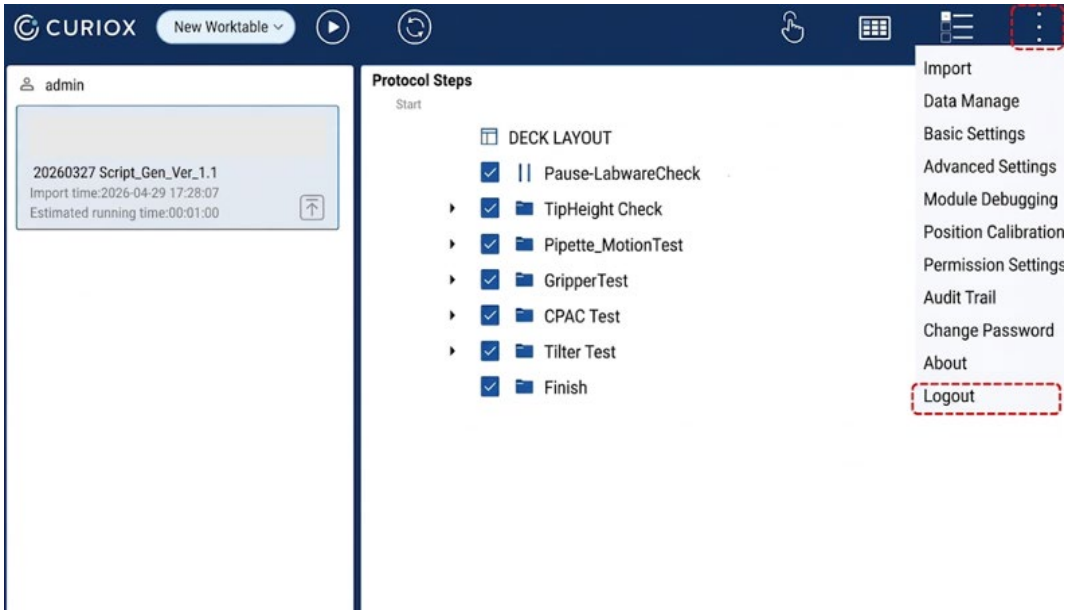
Displays software information.

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Log Out

Allow users to log out of the current account.



4.2 Operation

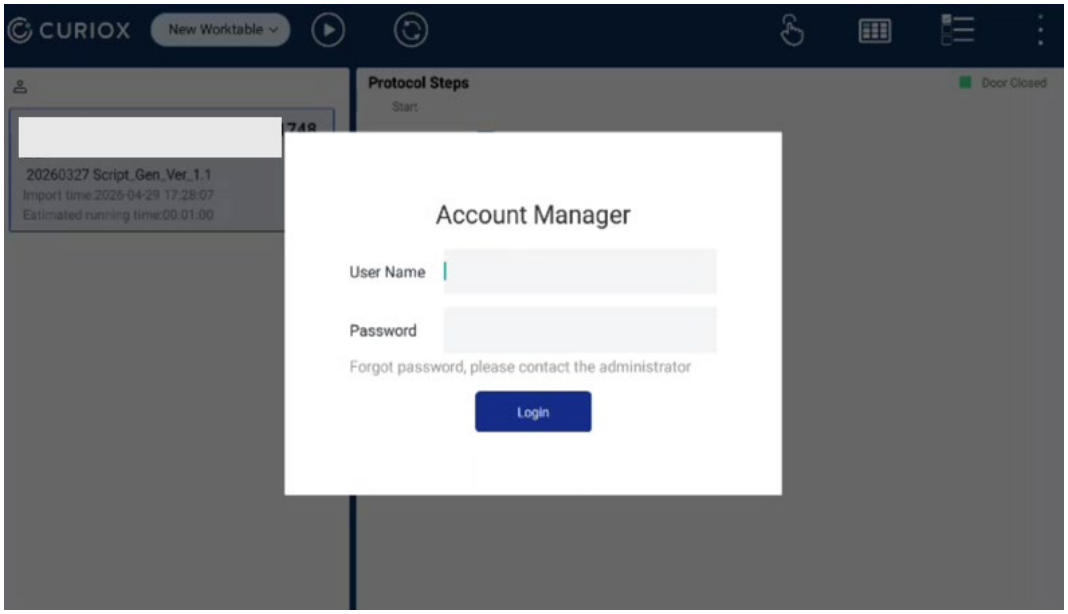
Please follow the instructions below to run your protocols.

User Login

If START UP is enabled in the Basic Settings during installation, the system will automatically proceed to the Login screen without requiring the application to be launched manually. Log in by entering your username and password. The default account is Admin, with a default password of 123456.

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ID: admin Password: 123456



Once Logged in, the main window will display the protocol list of the current user on the left side. On the right side, detailed information of each protocol is shown.

IMPORTANT	For security purposes, it is strongly recommended to change the default Admin password upon first login, particularly if the instrument will be connected to a network.

Only Admin accounts can add new accounts with different roles. This can be done by going to **Permission Settings**, then **User Config**.



For non-admin accounts, please contact your admin for the password to your account.

Instrument Initialization

The device needs to be initialized every time the power is turned on, the control software is restarted, or a fault is resolved.

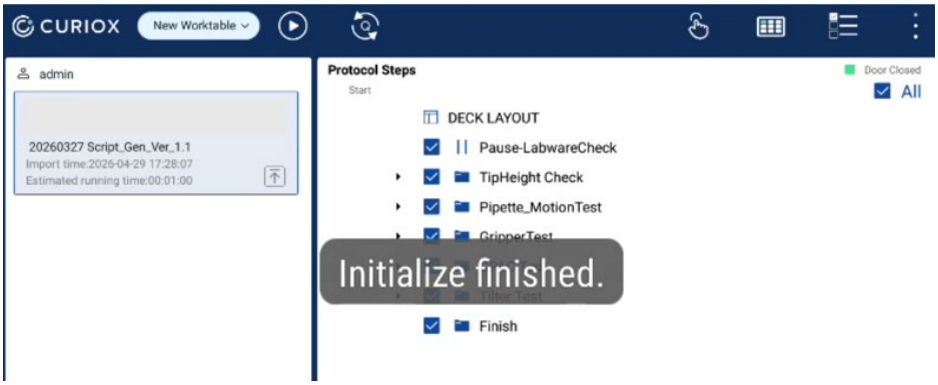
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Please follow the guide, click to initialize the device.

After the device has been initialized, the 'initialize finished' message Initialize finished. will show in the center of the screen, and the user can then move to the next operation.

The icon of the initialize button will be changed to , which can be used to initialize the device quickly.

WARNING! When there is movement occurring in the device, do not touch any internal parts!



The pipettor modules will return to their home position when the initialization is finished.

Prepare the deck

Plates and Tips

The Pluto HT system uses three types of microplates to maximize performance during experiment runs.



The Pluto HT system uses three types of pipette tips: 50µL, 250µL, and 1,000µL tips. Please fully load the tip box before placing it onto the deck. This will prevent running issues.

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P/N: 303F0005
Part name : Unfiltered, Non-Dnase/Rnase free, Non-Sterile Tips, 1 Racks, 50uL (96 tips)

P/N : 303F0006
Part name : Filtered, Dnase/Rnase free, Sterile Tips, 1 Racks, 50uL (96 tips)

P/N: 303F0001
Part name : Unfiltered, Non-Dnase/Rnase free, Non-Sterile Tips, 1 Racks, 250uL (96 tips)

P/N: 303F0002
Part name : Filtered, Dnase/Rnase free, Sterile Tips, 1 Racks, 250uL (96 tips)

P/N: 303F0003
Part name : Unfiltered, Non-Dnase/Rnase free, Non-Sterile Tips, 1 Racks, 1000uL (96 tips)

P/N : 303F0004
Part name : Filtered, Dnase/Rnase free, Sterile Tips, 1 Racks, 1000uL (96 tips)

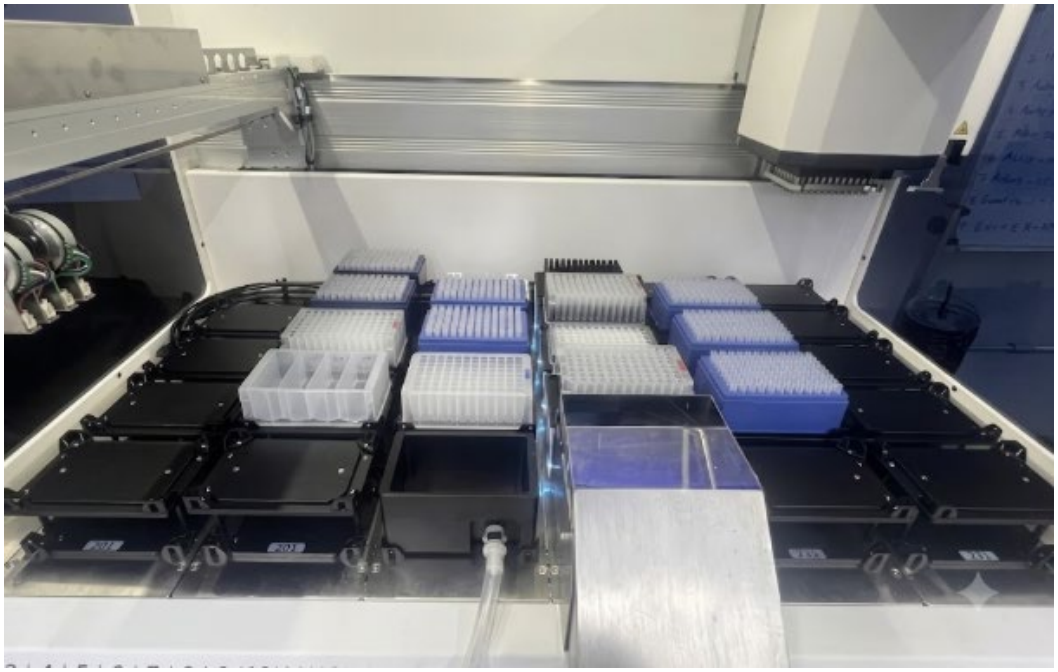
WARNING! The 50µL Tip is available in two colors: blue and teal. As it may be confused with the 250µL Tip, please ensure they are used correctly by distinguishing between them.

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Deck Layout

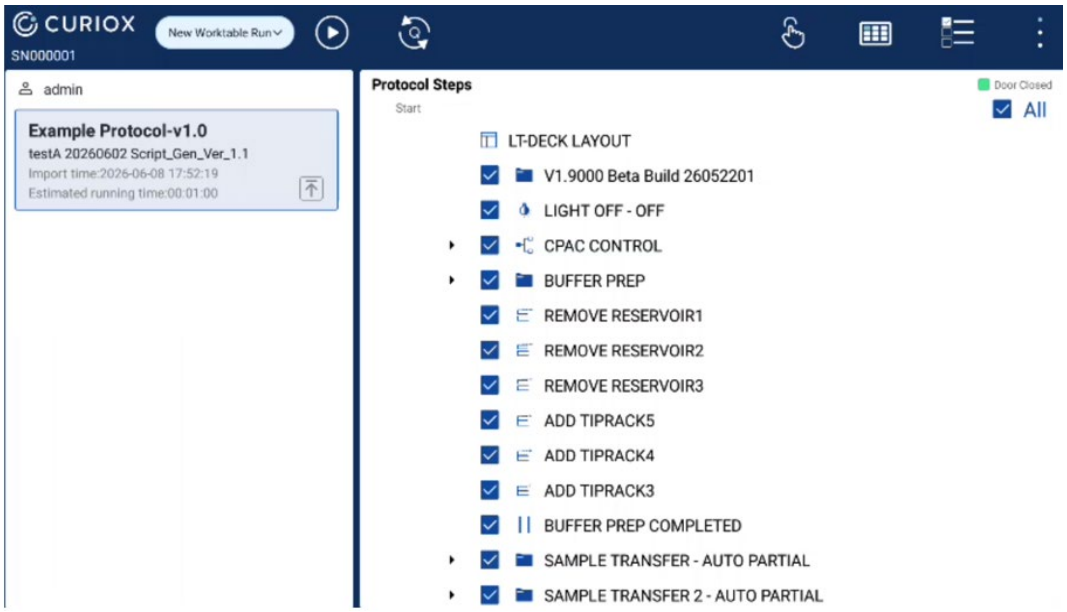
Each of the protocols listed in the Runner software are designed based on the system's specific deck layout. Check the deck layout and prepare the deck before each run.

Labware Setting



Run the Protocol

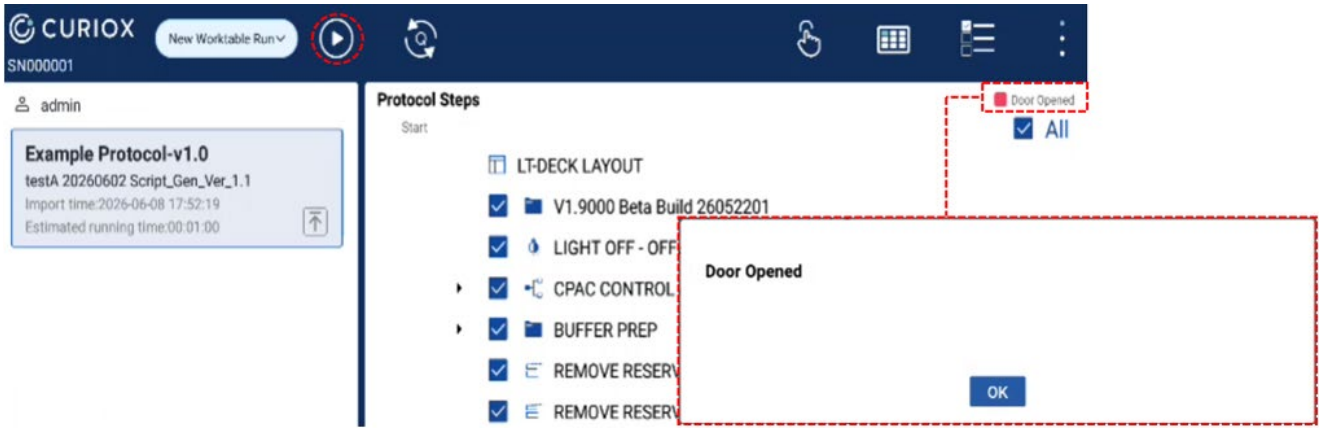
Select the desired protocol. The main steps of this protocol will be shown on the right side of the display, allowing you to review the protocol and make changes as needed.



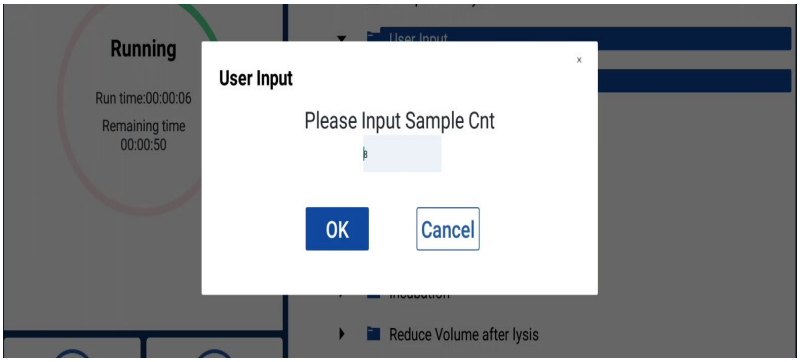
Close the safety door. Then click the start button to run the experiment.

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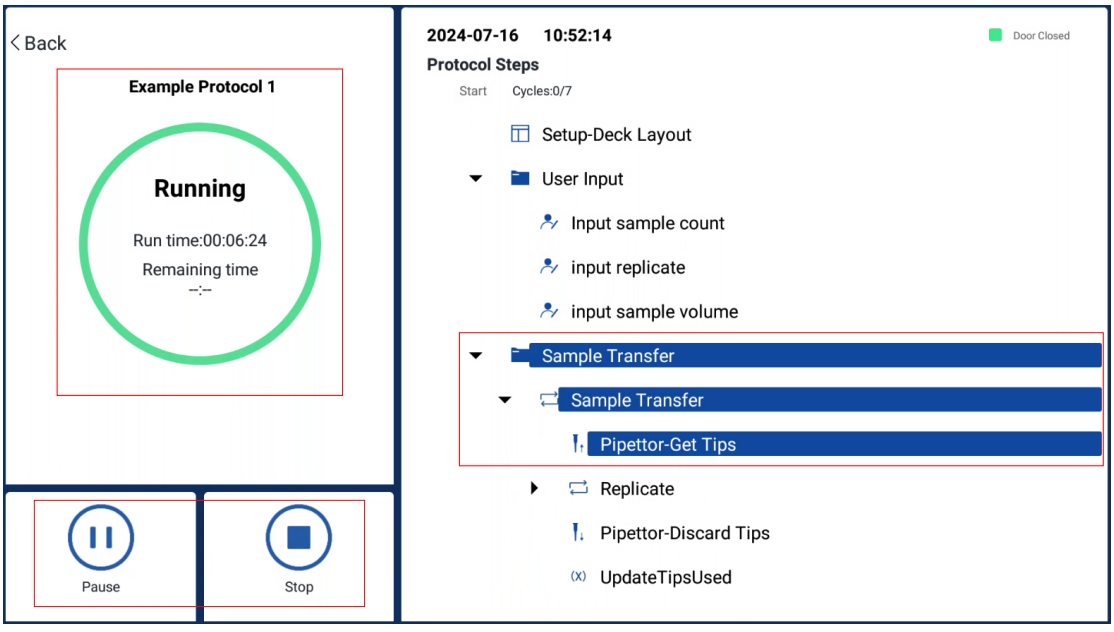
NOTE	Close the door gently to avoid sensor error. If the safety door remains open, users cannot start the run. A warning message will appear.



Some of the protocols may require key parameters of the experiment to be added (i.e., Sample Number, Replicate Number, Sample Volume, etc.)

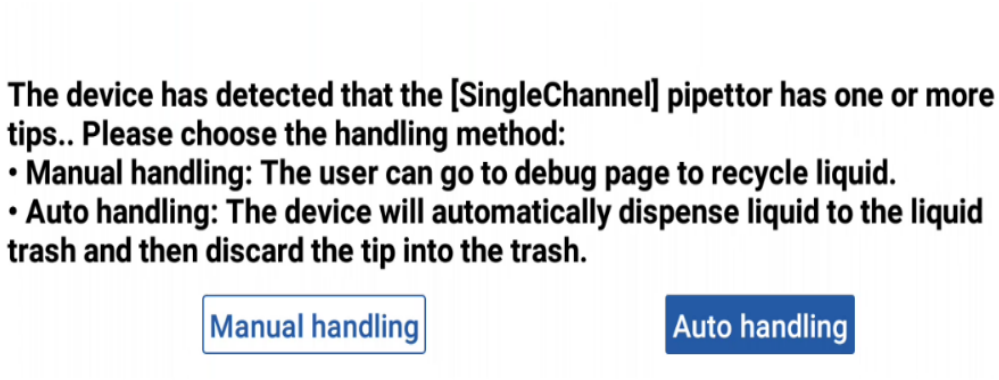


During the run, the current steps (on right) and the status info (on left) will be shown. Users can press the Pause or Stop buttons (on bottom left corner of screen) if they need to pause or abort the run.



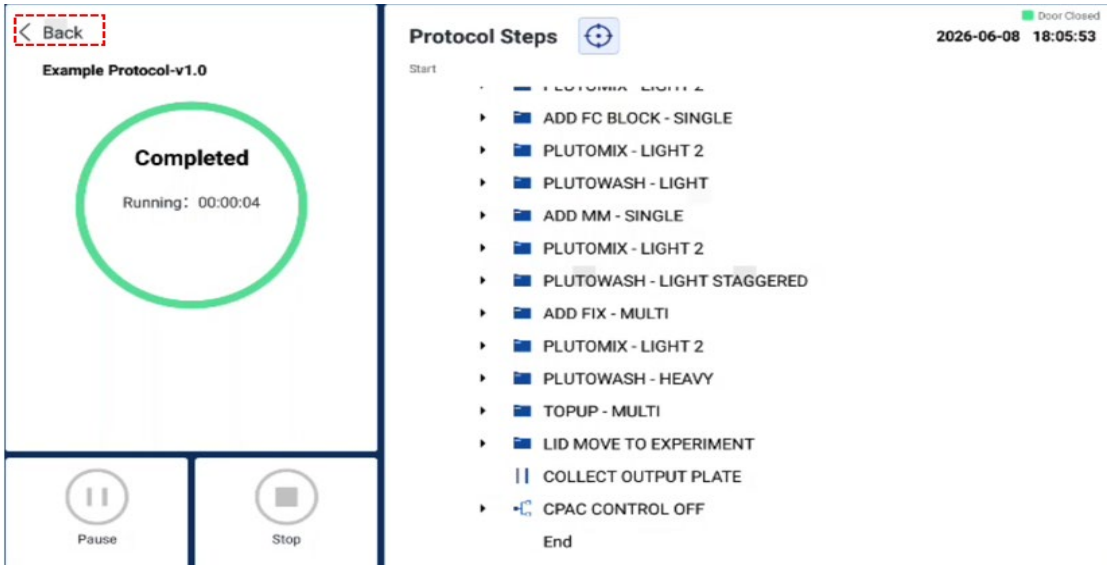
NOTE	Although it is possible to pause and continue the run by directly opening/closing the safety door, Curiox does not recommend this action. Doing this may affect the experiment results.

If the run is aborted by hitting the Stop button when a tip is on the pipettor, a message will show on the screen. You can choose to eject the tip via the manual handling or the auto handling method.



WARNING!	Pausing when the pipettor is dispensing/aspirating liquid will severely affect the ACCURACY of your experiment and DATA QUALITY. Use this button with caution.

When the run is completed, you can click the back button on the top left corner of the screen and go back to the main window of the Runner app.

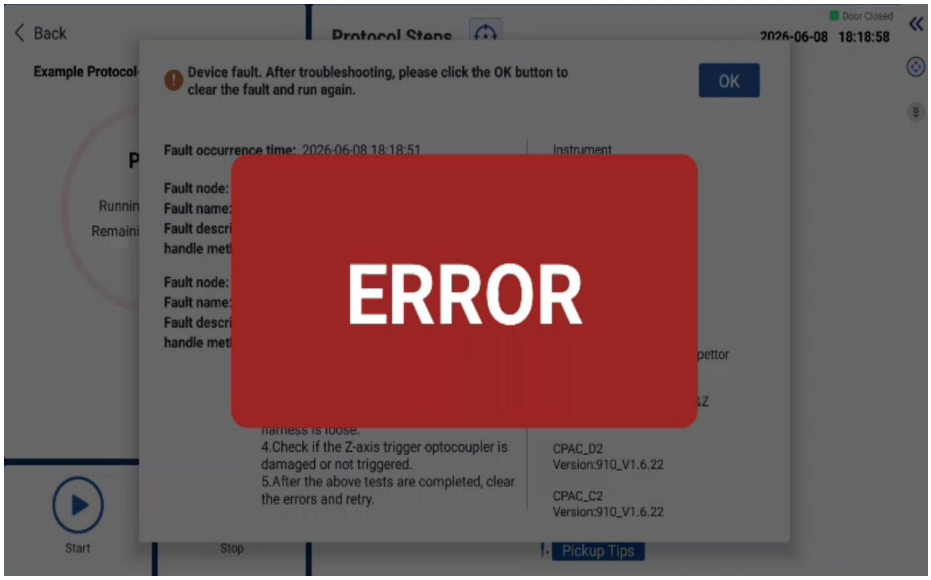


4.3 Visual Alert

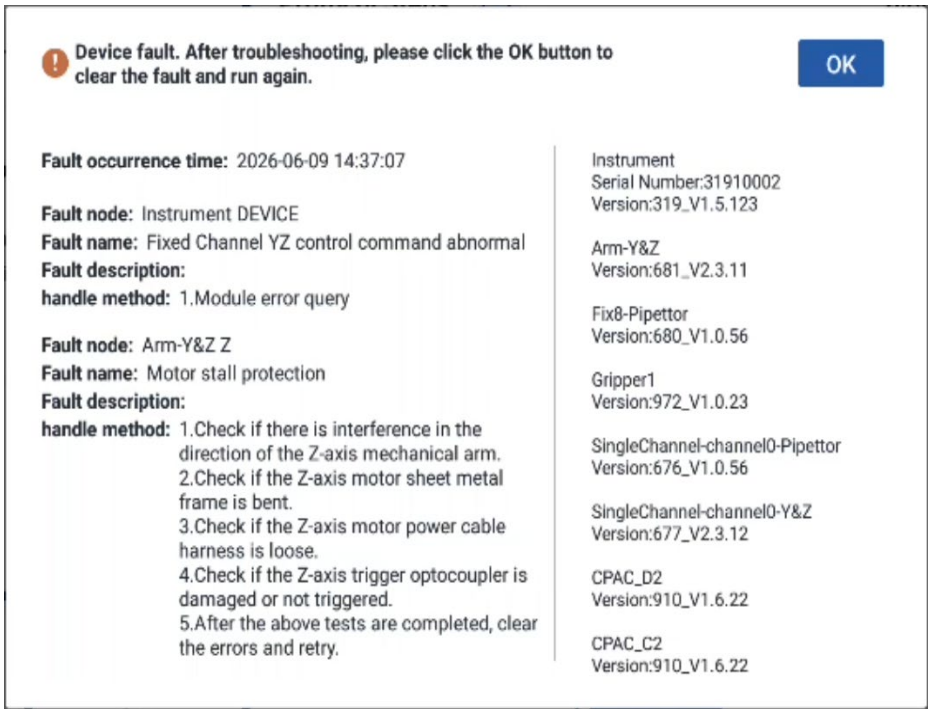
Error Visual Alert

When an error occurs during protocol operation, an error message will flash on the tablet screen, displaying a visual alert. The user can dismiss the error alert by touching the screen.

1. If an error occurs during protocol operation, an Error Alert will be triggered as shown below. The alert window will repeat regular intervals and will continue until the screen is touched.



2. Once the Visual Alert is dismissed by touching the screen, a window will appear describing the nature of the error that has occurred. Pressing the OK button in the window will proceed to the next state.



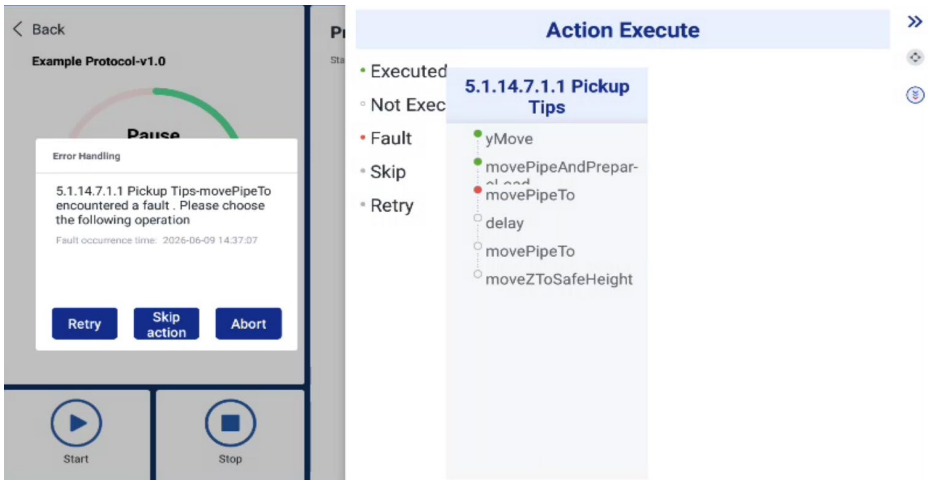
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3. The next state window provides three options for Error Handling.

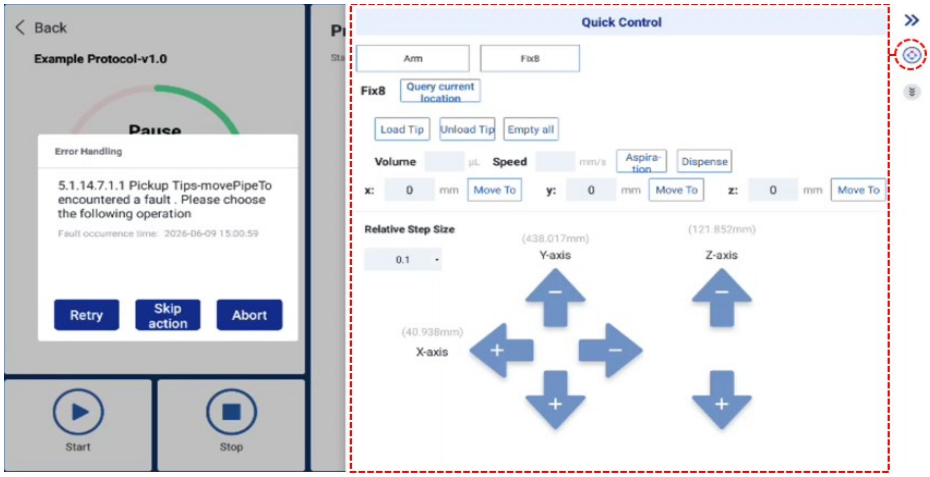
- Retry: Retries the step in which the error occurred.

- Skip action: Skips the current step and proceed to the next step

- Abort: Terminates the protocol.



4. If recovery from the error is required, click the icon located at the far-right panel to open the Quick Control window. Use the functions available in this window to recover from the error state, then manually adjust as needed and execute Retry.



Complete Visual Alert

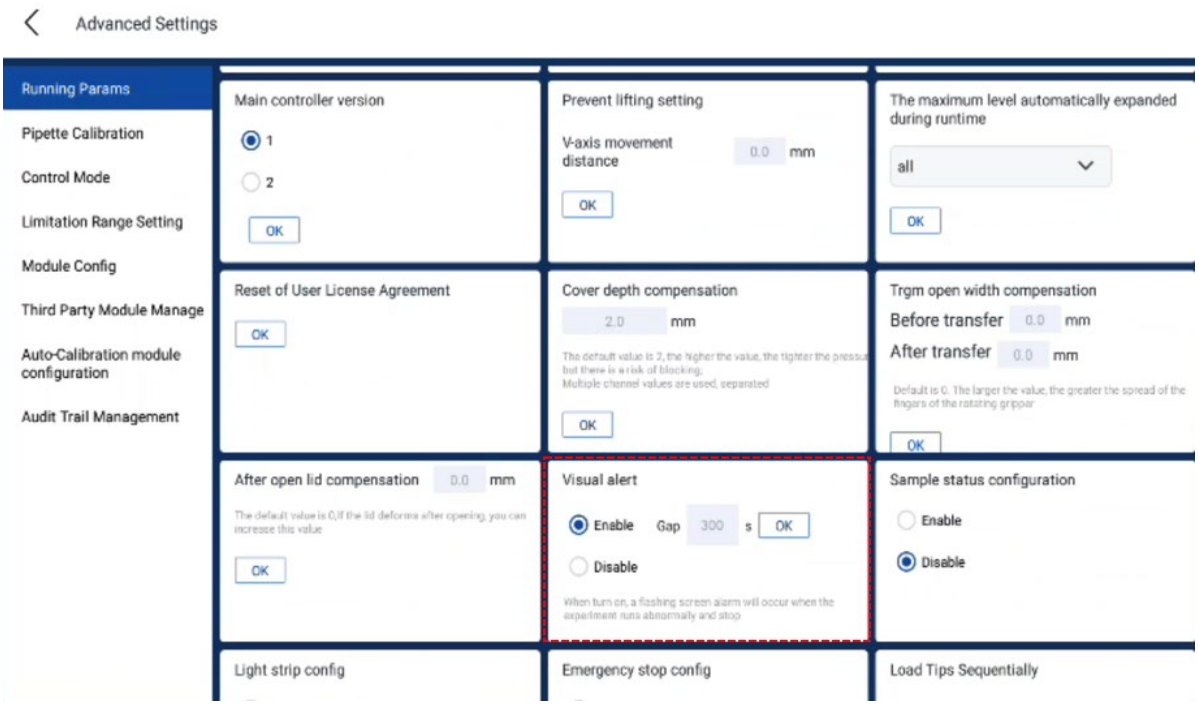
1. When the protocol is completed, a Complete Visual Alert will be triggered. The alert will be dismissed once the user touches the screen.



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Disable Visual Alert

Visual Alert can be disabled from the Running Params menu under Advanced Settings. Advanced Settings is accessible only with an admin account. It is recommended not to modify any options other than the afore-mentioned option, as the remaining options are related to the operation of the equipment.



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Chapter 5 | Maintenance & Troubleshooting

5.1 Device Maintenance

Clean After Experiment Run

After each run, following these steps will ensure that the instrument is properly maintained and ready for the next run.

Power Off and Access

Turn off the power switch and open the front door.

Remove Labware

Remove all labware after the run. Leaving labware with any chemical reagents may result in damage to the system.

Empty the Waste Bin

Empty the waste bin(s) after each run and wash with DI water and 70% isopropyl alcohol.

Ethanol Disinfection

If necessary, use 75% ethanol to wipe the surface of the instrument and function modules 2-3 times. For laboratories operating under elevated biosafety levels, supplementary decontamination measures such as NaOCl should be applied in accordance with the institution's biosafety guidelines.

Nucleic Acid Removal

If needed, use a nucleic acid scavenger to moisten a clean paper towel and wipe the surface of the instrument and function modules 2-3 times.

Water Cleaning

If necessary, use DI water to moisten a dust-free paper towel and wipe the surface of the instrument and function modules 2-3 times.

Drying

After wiping, allow the instrument to air-dry naturally.

Once the instrument is dry, close the front door.

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HEPA Maintenance

The HEPA system is equipped with two filters: a Primary filter and a HEPA filter. Each filter has a different replacement interval. The Primary filter has a maximum service life of 720 hours. Therefore, the replacement cycle can vary depending on the daily equipment operating hours.

Refer to the equipment operating hours table below to determine the appropriate replacement interval.

Daily Operating Hours	Required Operating Days (720h ÷ daily hours)	Equivalent Weeks (based on 5 days/week)	Approximate Calendar -Based Replacement Cycle
5 hours/day	144 days	28.8 weeks	6.6 months
6 hours/day	120 days	24 weeks	5.5 months
8 hours/day	90 days	18 weeks	4.5 months

The HEPA filter has a validity period of 12 months, with a recommended replacement interval of 12 months. The filters should only be replaced by Curiox authorized technical support personnel.

Other Conditions

Prior to disposal, use 70% isopropyl alcohol to clean and disinfect the equipment.

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5.2 Troubleshooting

Common faults and possible solutions are listed in this section. If you encounter any issues not mentioned in this manual, please contact Curiox technical support.

An Error Occurs During Initialization

- Turn the power off and on again, then reinitialize.
- If the ejector lever is out of position and thus causing an initialization error, manually adjust the tip ejector lead screw to return the lever to its normal position, and then attempt reinitialization once more.
- If an error related to HEATER/COOLER or Tilter occurs, contact the Curiox service team for assistance.

The Equipment Does Not Power On

- Confirm that the power cord is properly connected.
- Check the fuse condition as unstable AC power may cause the fuse to blow, preventing the equipment from powering on.

Unusual Noise Occurs During Tip Loading

- Check if the O-ring is worn out.
- Contact Curiox personnel for position recalibration of the single/multi-channel.

Liquid Leaks After the Aspiration Operation

- Check if the O-ring is worn out.
- Try to replace the tip(s) and attempt again.

Labware Is Not Secured Properly

- Check if the corner bracket is damaged or not. If it is damaged, replacement is necessary.

An Error Occurs In HEATER/COOLER

- If condensation has caused water to accumulate on the HEATER/COOLER surface, remove the water and dry thoroughly before running it again.

An Error Occurs During Protocol Operation

- Take a photo of the error code, export logs and then send them to the Curiox service team. We will provide feedback as soon as possible.

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Appendix A | Unboxing the System

Curiox ships your Pluto HT Workstation in a sturdy plywood crate. The shipping crate uses hooks and latch clamps to secure the top, side, and bottom panels together. Using latches, instead of nails or screws, means you won't need a crowbar (or a lot of force) to disassemble the crate, and you can reassemble it later if needed.

To release the latches, flip the latch tab up and turn it to the left (counterclockwise). This action moves the clamp arm out of its corresponding retaining bracket. You can then flip the latch arm away from the crate.

CAUTION! Crate edges can get roughed up during shipping. Wear work gloves to protect your hands from wood splinters.

Unlock the 32 latches securing all sides.





After releasing the latches, remove the top panel. Then, remove the four side panels.



Remove the handle rod on top of the machine and set it aside. This is the handle used to lift the machine.

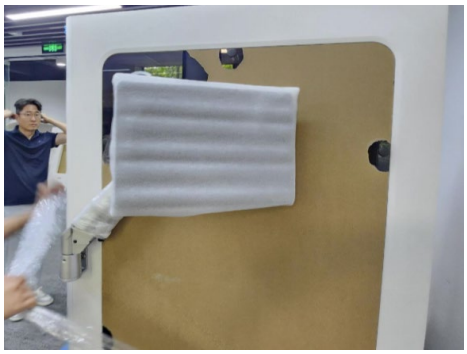


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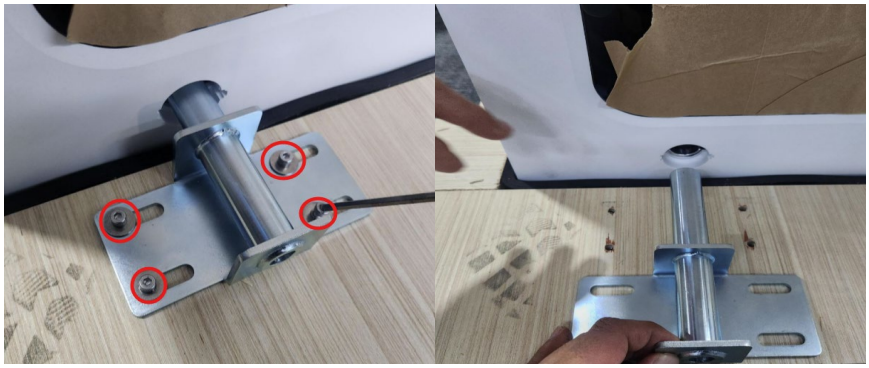
Cut the clear film and remove the accessory boxes, setting them aside.



Remove the foam from the screen bracket.

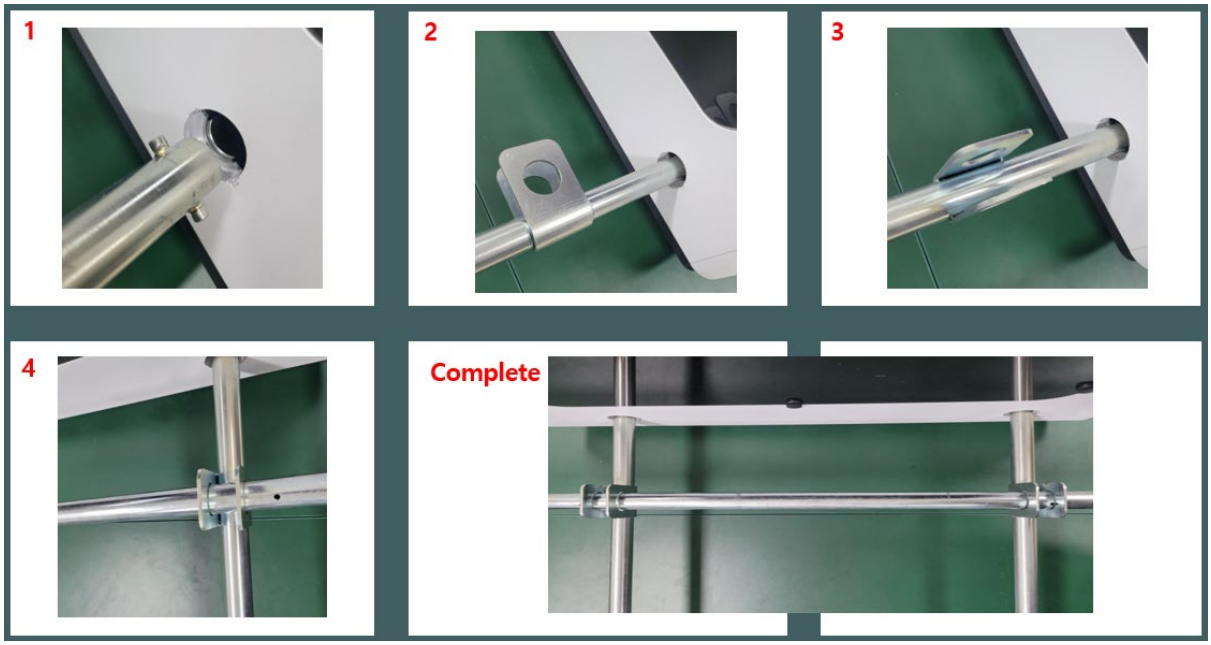


Remove the screw to detach the bracket attached to the bottom wood crate. A total of four brackets need to be removed. When removing the bracket, remove the metal rod along with the machine and take them out together.



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Insert the handle rod into the four holes on both sides of the machine.



With the assistance of at least six people, carefully move the entire machine out of the wooden pallet and place it on a suitable countertop. It is recommended to leave some space behind the machine.



After placing the machine on the table, remove the handle rods and cover the holes with the hole cover in the accessory box.

 - Hole Cover



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Appendix B | Acknowledgement of Decontamination

Acknowledgment of Decontamination Form

Decontamination is required prior to the Pluto HT Workstation being returned to Curiox Biosystems (i.e., for servicing, maintenance, etc.). You are required to fill out this form to acknowledge that decontamination has been conducted on the instrument. Failure to do so may result in the return of the instrument to your address for decontamination.

PRODUCT SERIAL NO.

CONTACT INFORMATION	
Dr./Mr./Mrs./Ms. (Please circle accordingly)	JOB TITLE
NAME	EMAIL ADDRESS
COMPANY	PHONE NUMBER
DECONTAMINATION INFORMATION	
DECONTAMINATION METHOD	
DECONTAMINATION DATE	
ACKNOWLEDGEMENT	

I hereby acknowledge that this piece of equipment has been decontaminated and sealed in accordance to the procedure recommended in this manual prior to shipment to Curiox Biosystems. To the best of my knowledge, the equipment is safe to handle by the receiving personnel.

Name

Signature and Date

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Appendix C | Purchase Information and Feedback

Purchase Information and Feedback Form

PURCHASE INFORMATION

PRODUCT SERIAL NO.	
PURCHASED BY	PURCHASED FROM
COMPANY	DISTRIBUTOR
ADDRESS	DATE OF PURCHASE
PHONE	DATE OF DELIVERY
FAX	
CONTACT INFORMATION	
Dr./Mr./Mrs./Ms. (Please circle accordingly)	JOB TITLE
NAME	EMAIL ADDRESS

FEEDBACK (PLEASE CHECK/COMMENT ACCORDINGLY)

	Excellent	Good	Average	Poor	Comments
User Guide					
Ease of Use					
Reliability					
Operating Costs					
Overall Experience					

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Revision History

Rev No	Date	Change Description	Author(s)
0.1	July 23, 2025	First Release	Mia Liu
0.2	Oct 15, 2025	Update	Koh Jing Xuan
1.0	Mar 17, 2026	Updated v1.0	Koh Jing Xuan
1.1	Apr 17, 2026	Volume accuracy specs updated. Field feedback incorporated: Corrected specs (pipette count, bench weight) Clarified functionality (gripper usage, calibration requirements) Updated maintenance procedures (HEPA intervals, tip-loading) Revised hardware terminology (SD card → USB flash drive)	Koh Jing Xuan
1.2	May 29, 2026	Corrected duplicate trademark symbol on cover page Replaced discriminatory language with "six trained personnel" for instrument lifting; standardised personnel count to six throughout Added intended use statement Added clarifying note that PlutoLTStartUp V2 is the correct software for the Pluto HT Workstation Added warning to change default Admin password upon first login Added clarifying footnote on bench weight requirement (1000 kg accounts for instrument, consumables, accessories, and dynamic loads) Standardised product name usage throughout Removed Appendix on Position Calibration	Koh Jing Xuan
1.3	June 11, 2026	Added the selection/deactivation language under the 'Run Protocol Step By Step' to align with the LT/MT user manuals covered in EC-369.	Mark Doucette
2.0	13/Jun/2026	Corrected incorrect content in Chemical Compatibility. Add Visual Alert feature GUI image update HEPA Filter replacement interval update Remove Head installation step and Module debugging section.	Sunguk Jang
2.1	12/Aug/2026	Updated to reflect Curiox branding styling and trademarks, changed all instances of CPAC to "On-deck Heater/Cooler). Added '28' to 'SBS plate position' under Technical Specifications section. Removed duplicated module specifications from Chapter 1; retained in Chapter 2. Removed duplicated environmental specifications from	Mallory Griffin Kyunghwan Park Koh Jing Xuan

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	Chapter 3; retained in Chapter 1. Consolidated MSDS content into Chemical Waste Hazards. Corrected Singapore number for Chemical Waste Hazards Singapore to align with the Customer Service and Curiox Biosystems Locations sections. Renamed MSCH Module to On-deck Heater/Cooler in the Integrated Modules table. Removed reference to Appendix C for Packing List. Updated Position Calibration message of GUI Introduction section. Updated troubleshooting instructions for 'An Error Occurs During Initialization' section.		

Author	Designation	Signature	Date
Kyunghwan Park			12 Aug 2026
Koh Jing Xuan			12 Aug 2026

Review & Approval

Name	Designation	Signature	Date
Mallory Griffin	Global Marketing Manager		
Chyan Ying	Snr Director of BA and CX		

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