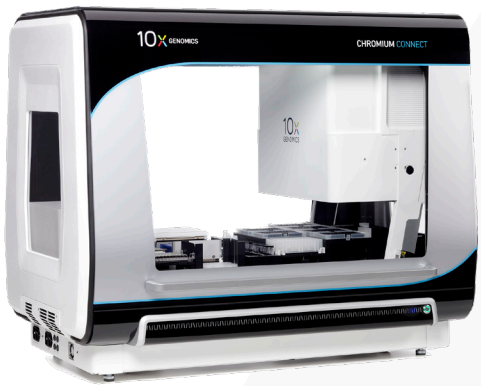
CG000180 Rev B

USER GUIDE

Chromium Connect

FOR USE WITH

Chromium Connect, PN-1000171
Chromium Connect, PN-1000180



Document Number

CG000180 • Rev B

Legal Notices

Instrument & Licensed Software Updates Warranties

Updates to existing Instruments and Licensed Software may be required to enable customers to use new or existing products. In the event of an Instrument failure resulting from an update, such failed Instrument will be replaced or repaired in accordance with the 10x Limited Warranty, Assurance Plan or service agreement, only if such Instrument is covered by any of the foregoing at the time of such failure. Instruments not covered under a current 10x Limited Warranty, Assurance Plan or service agreement will not be replaced or repaired.

Support

Email: support@10xgenomics.com

10x Genomics

6230 Stoneridge Mall Road

Pleasanton, CA 94588 USA

Document Revision Summary

Document Number	CG000180
Title	Chromium Connect Instrument User Guide
Revision	Rev A to Rev B
Revision Date	July 2020

Specific Changes:

- Updated electrical requirements on page 7 and 12.
- Hardware component safety information given more detail on pages 15-18.
- Updated the maintenance protocols on page 21 and 28.

General Changes:

- Updated for general minor consistency of language and terms throughout.

Table of Contents

Introduction

Product Identification

Product Specifications

Introduction

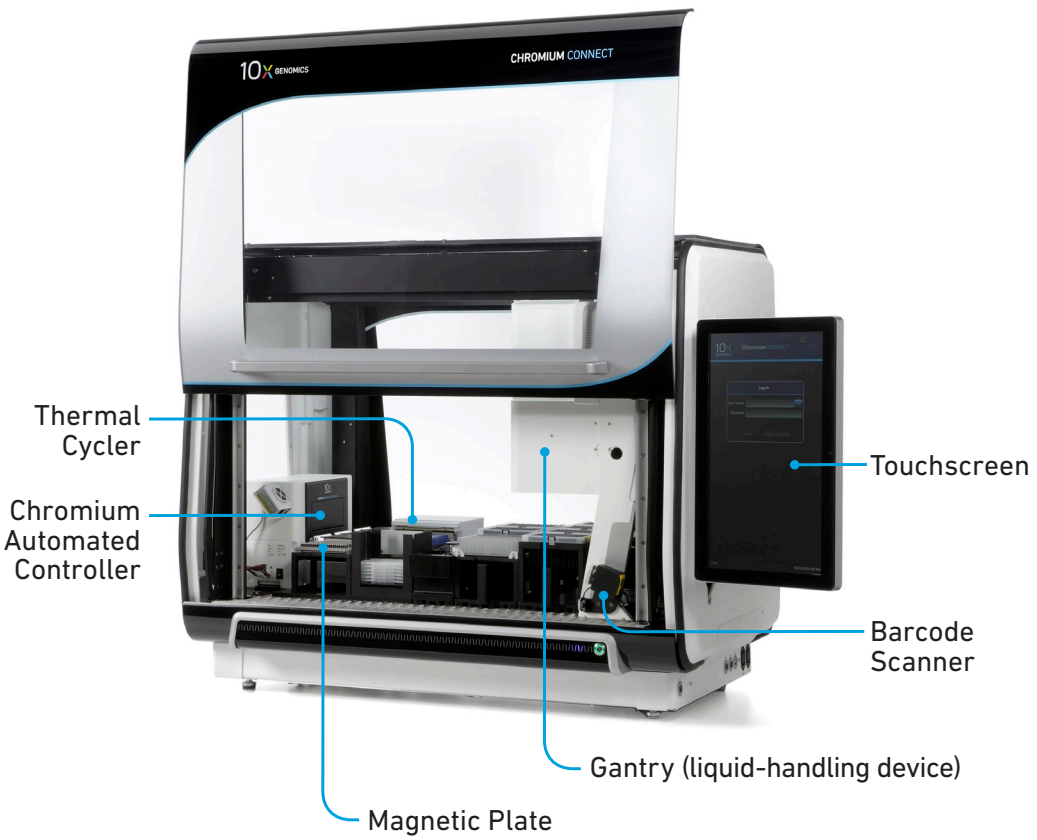
The Chromium Connect System is a fully-integrated automated system, which enables users to run the 10x Genomics library construction workflow end-to-end with minimal user interaction.

The system includes:

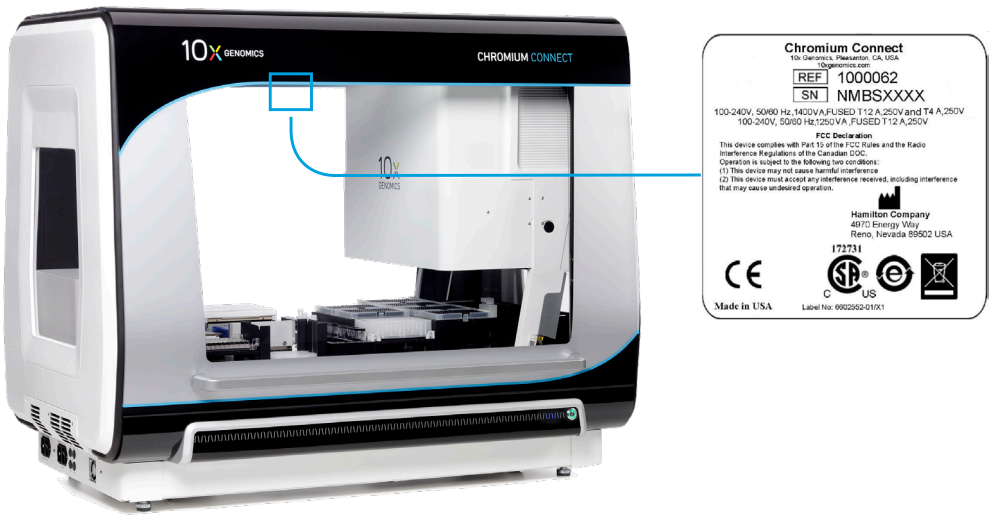
- On-board Chromium Automated Controller for generation of thousands of partitions containing barcoded samples
- Fully programmed liquid handling
- Temperature-controlled, on-deck storage for automation-specific, single-use reagent modules
- Barcode scanning for tracking reagent lots and consumables
- Thermal Cycler for multiple incubation steps

Touchscreen operations interface with the intuitive and user-friendly Chromium Connect Software. The touchscreen guides the user through each step of the experimental set up and run, ensuring that no protocol steps are missed.

With precise robotics for accurate reagent pipetting, the Chromium Connect standardizes Gel Bead-in-Emulsion (GEM) generation and library construction and minimizes variability.



Product Identification Label



Product Specifications

Parameter	Specifications
Weight	350 lb (158.8 kg)
Instrument Dimensions with: Front Panel close Front Panel open	W D H 42.2"[107.2 cm] × 27.9"[70.9 cm] × 35.22"[89.5 cm] 42.2"[107.2 cm] × 27.9"[70.9 cm] × 49.8"[126.5 cm]]
Instrument Dimensions with Ergo Arm: Fully extended to the right Fully extended to the front	W D H 71.0"[180.3 cm] × 27.9"[70.9 cm] × 35.22"[89.5 cm] 51.2"[130.1 cm] × 48.5"[123.2 cm] × 35.22"[89.5 cm]
Electrical Requirements System power supply Thermal Cycler power supply If necessary, two independent circuits can be used	 100-240 VAC, 50/60 Hz, 1400 VA 100-240 VAC, 50/60 Hz, 1250 VA
Operating Temperature	19-25°C (66-77°F) Use in a typical indoor laboratory environment. Extreme temperature conditions will affect the sensitive reagents used with the instrument.
Humidity	30-80% R.H. non-condensing
Altitude	Altitude up to 2000 m (1.2 mile) above sea level
Power Cable Length Power cables will be in accordance with regional specifications.	9 ft Standard

Safety Compliance Information

Safety

Regulatory

Safety

Before operating this instrument please ensure that everyone involved with the operation of the instrument has:

- Received instruction in general safety practices for laboratories
- Received instruction in specific safety practices for the instrument
- Read and understood all related Safety Data Sheet (SDS) documents

Precautions are illustrated in the following way:

Symbols	Description
	The general Warning symbol indicates the possibility of damaging the instrument or compromising the results of a method.
	The Electrical Hazard symbol indicates the presence of electrical components that can be harmful to the operator if handled incorrectly.
	The Mechanical Hazard symbol indicates the presence of moving mechanical parts that can be harmful to the operator if handled incorrectly.
	The Hazardous Materials symbol indicates the presence of materials that are toxic or otherwise harmful to the operator if handled incorrectly.
	The Biohazard symbol indicates the presence of biological samples that can be harmful to the operator if handled incorrectly.
	The Magnetic Field symbol indicates the presence of a magnetic field that can be harmful to the operator if handled incorrectly.
	The Caution, Hot Surface symbol indicates the possibility of touchable surface that may exceed 105°C.

Regulatory

The Chromium Connect has been designed, tested, and certified to be in compliance with the following standards:

Certification	Standards
	Product Certification The CSA C//US mask signifies that the product is certified for both U.S. and Canadian markets, to the applicable U.S. and Canadian standards.
	IEC/EN 61010-1:2010 (3rd Edition): Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory use.
	EN 61326-1:2013: Electrical Equipment for Measurement, Control and Laboratory Use. EMC Requirements.
	EN 61326-2-6: Specifies minimum requirements for immunity and emissions regarding electromagnetic compatibility for in vitro diagnostic medical equipment, taking into account the particularities and specific aspects of this electrical equipment and their electromagnetic environment.
	EN 61000-3-2: Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤16 A per phase).
	EN 61000-3-3: Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤16 A per phase and not subject to conditional connection.
	CE Mark indicates that assembly is covered by a Declaration of Conformity, and has been declared in conformity with the provisions of all applicable directives in the European Union.
	RoHS Directive (2011/65/EU): Restriction of the use of certain hazardous substances in electrical and electronic equipment.
	WEEE Directive (2012/19/EU): Waste Electrical and Electronic Equipment.
	FCC Part 15 Class A. NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
	ICES-003 (Canada): This Class A digital apparatus complies with Canadian ICES-003. Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.
	**TUV Certification only for Chromium Automated Controller** UL 61010-1:2012 and CAN/CSA C22.2 No. 61010-1-12 with a cTUVus mark to indicate that the product has been tested and certified to Canadian and US standards by TUV Rheinland and can be legally installed in those countries.

System Components

System Components
Deck Layout
Hardware Components

System Components

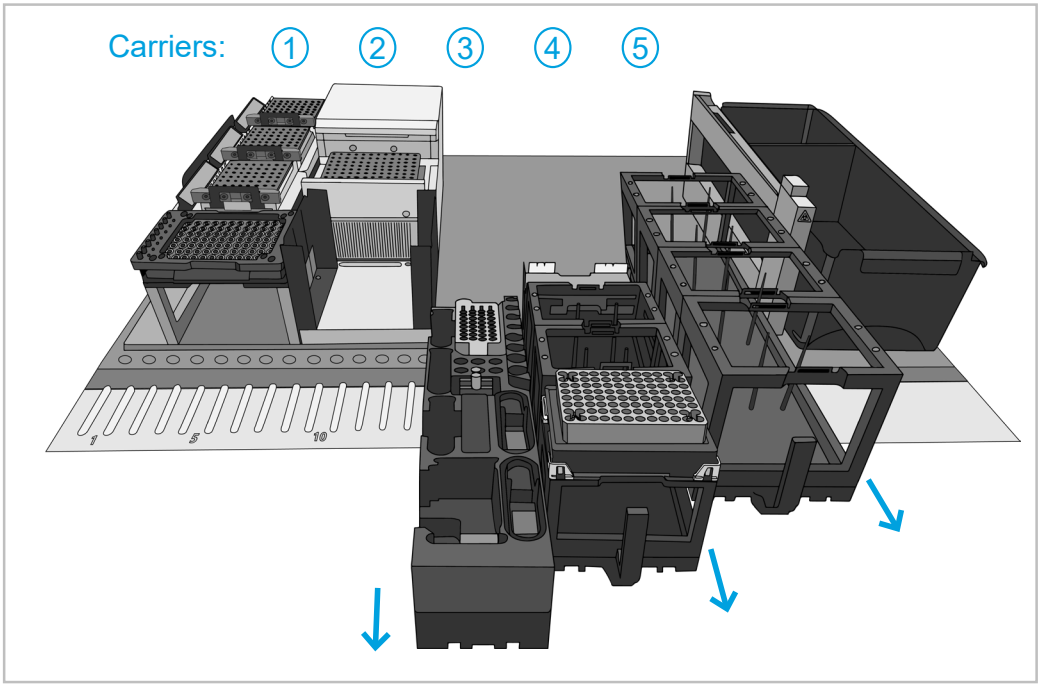
1. Front Panel
2. Left side of the power base assembly:
   - a. Thermal Cycler Power Supply
   - b. System Power Supply
     One or two independent circuits possible
   - c. Fuses/Fuse covers
     (two 12A fuses, two 4A fuses)
3. Right side of the power base assembly:
   - a. USB port: external devices
   - b. USB port: optional HEPA CAP hood
   - c. USB port: Thermal Regulator
   - d. Ethernet to customer Wired Network
   - e. Power plug: optional HEPA CAP hood
   - f. Power plug: Thermal Regulator
4. Touchscreen
   USB port on monitor: User External Drive
   (download log files/upload setup files)
5. Gantry (liquid-handling device)
6. Barcode Scanner
7. Deck Area
8. Chromium Automated Controller
9. Thermal Regulator
   (kept on/underneath benchtop)
   - a. Main power cable for Thermal Regulator
     (plugs into 3f)
   - b. USB port
   - c. ID port
   - d. External Sensor port

REMOVE POWER FROM BOTH AC INLETS PRIOR TO ANY SERVICE ON THERMAL CYCLER OR SYSTEM.

Information also available in
Chromium Connect Quick Reference Cards (CG000254)
and in the Software Menu Options.

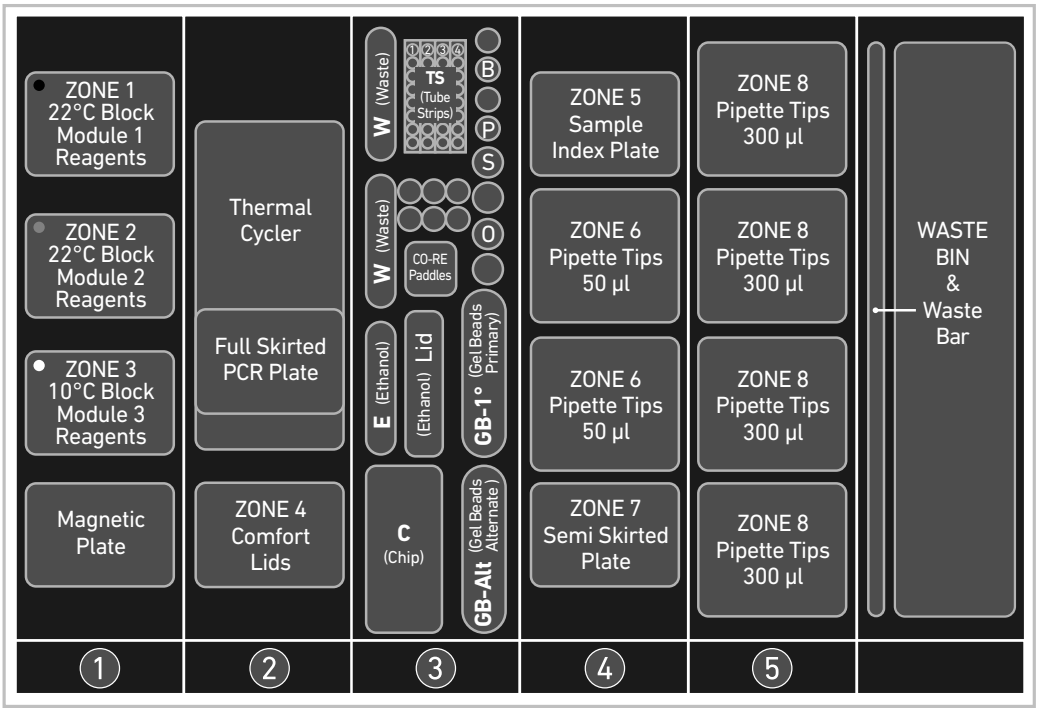
Deck Layout

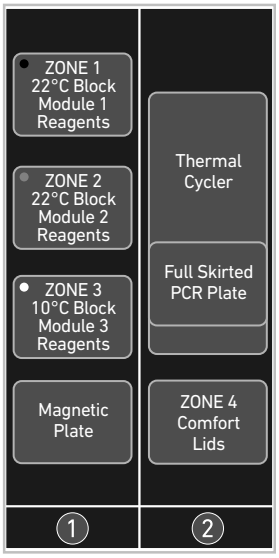
The deck includes Carriers 1-5. Carriers 1-2 are stationary, while Carriers 3-5 slide out for loading/unloading items. See the Deck Layout in the Chromium Connect Quick Reference Cards (CG000254) and in the Software Menu Options.

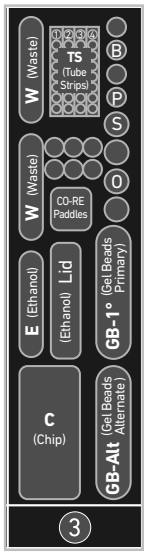


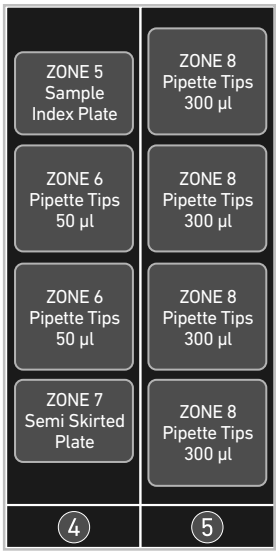
Assay-Specific Deck Layout

Chromium Next GEM Automated Single Cell 3' Gene Expression v3.1 Assay









Deck Layout Reagents/Consumables

Chromium Next GEM Automated Single Cell 3' Gene Expression v3.1 Assay

Carrier	Zone	Item
1 Stationary	Zone 1 (Black)	22°C Block, Reagent Strips, Module 1
	Zone 2 (Gray)	22°C Block, Reagent Strips, Module 2
	Zone 3 (White)	10°C Block, Reagent Strips, Module 3
	-	Magnetic Plate
2 Stationary	-	Thermal Cycler
	-	Full Skirted PCR Plate (within Thermal Cycler)
	Zone 4	Comfort Lids
3* Sliding Deck Rails: 15-18 Number of Lights: 4	Position W	Waste Reservoirs
	Position TS	Tube Strips
	Position B	Dynabeads™ MyOne™ SILANE
	Position P	Template Switch Oligo
	Position S	50% Glycerol
	Position O	Partitioning Oil
	Position CP	CO-RE Paddles
	Position E	Ethanol Reservoir
	Position Lid	Lid for Ethanol Reservoir
	Position GB-1°	Gel Beads Primary
	Position GB-Alt	Gel Beads Alternate
	Position C	Chip
4 Sliding Deck Rails: 19-24 Number of Lights: 6	Zone 5	Sample Index Plate
	Zone 6	Pipette Tips 50 µl
	Zone 7	Semi Skirted Plate
5 Sliding Deck Rails: 25-30 Number of Lights: 6	Zone 8	Pipette Tips 300 µl

*Assay choices determine items loaded in Carrier 3

Hardware Components

The system includes the following hardware components for seamless workflow execution. The Thermal Cycler and Chromium Automated Controller are powered through the instrument and controlled by the software. The software guides the user through maintenance and troubleshooting for these components.

Chromium Automated Controller

Controlled by the Chromium Connect Software and designed specifically to fit on the deck, the Chromium Automated Controller uses the same 10x Genomics Next GEM Technology as a benchtop Chromium Controller.

Compatible with Next GEM Automated Chips and gaskets only.

Ionizer

Attached to the Chromium Automated Controller, the ionizer removes electrostatic charge from the chip prior to use.

Caution: Electrical Hazard

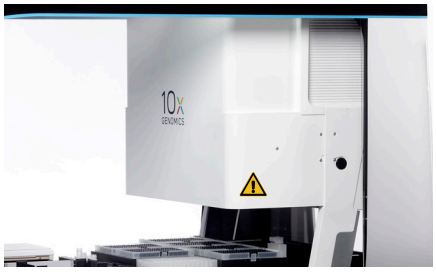
Chromium Connect Software – Touchscreen

The touchscreen displays the software's operational user interface for driving this self-guided system. Attached to the instrument via an adjustable arm, the touchscreen is double-glove compatible and includes an easily accessible USB port.

Gantry

The gantry is a liquid-handling device, controlled by the Chromium Connect Software. There are eight channels used for pipetting, pickup, and item presence verification.

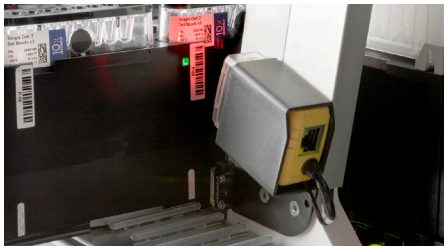
DO NOT obstruct the motion path of the gantry. DO NOT manually move the gantry. Use software controls located in the stacked menu.

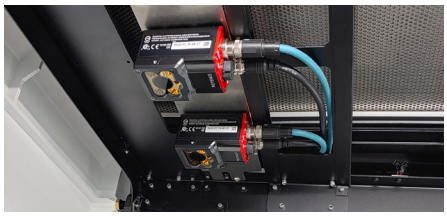


Barcode Scanners

Attached to the gantry, the barcode scanner reads the barcodes of reagent tubes and consumables loaded on the carriers. Scanning occurs as the user slowly slides the carriers back into the deck position.

A separate overhead scanner reads the barcodes of tube strips placed on the module blocks via angled mirrors.

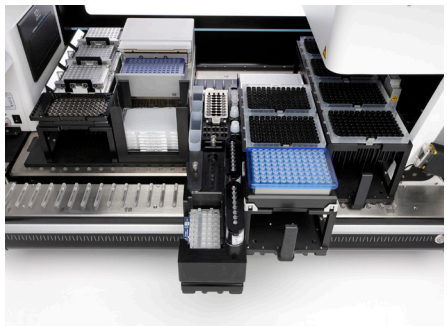




Carriers

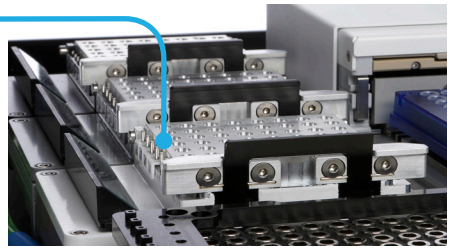
The deck includes two stationary carriers (Carriers 1 & 2) and three sliding carriers (Carriers 3, 4 & 5) for loading reagents and consumables. Refer to Deck Layout & Carrier Loading.

Unique barcodes, placed along the side of each sliding carrier, enable the software to identify the carrier during barcode scanning.



Module Blocks

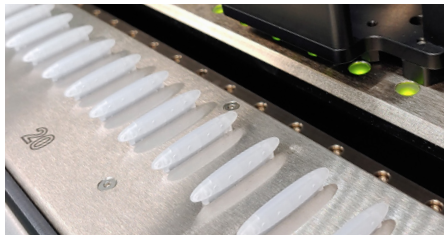
Reagents and samples placed on the white Temperature Controlled Block are always maintained at **10°C**. The gray and black blocks are maintained at **room temperature**.



Rails

Rails along the front of the deck ensure proper alignment when loading the sliding carriers.

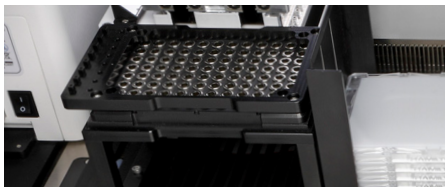
The carriers have a side groove that aligns with the rail. Green deck lights and coordinating software prompts assist in proper placement of the carriers.



Magnetic Plate

This high powered magnet is on deck for all SPRI and Dynabead cleanup steps in the automated workflow.

Caution: High Magnetic Field

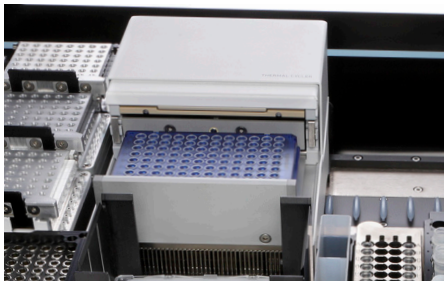


Thermal Cycler

The on-deck Thermal Cycler is used for thermal incubation and cycling of reactions during library generation in the automated workflow. There is no direct user interaction, apart from plate loading and unloading (compatible with full skirted plates).

Caution: Hot Suface and Mechancial Hazard

The lid is controlled by the software and does not need to be touched. In case of debris removal, use caution and act as prompted by the software.



Thermal Regulator

The Thermal Regulator maintains the **10°C** temperature of the Temperature Controlled Block. An LED light on the front indicates usage. The regulator is powered from an AC outlet, on the right side of the power base assembly.

Waste Bin & Waste Bar

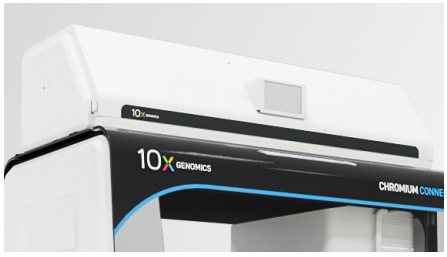
During operation, the Waste Bar helps to correctly dispose of pipette tips and disposable consumables in the Waste Bin. The touchscreen guides the user through cleanup after every run. The Waste Bar must be removed prior to removing the Waste Bin.

Caution: Biohazard
Dispose of Waste Bin contents according to institutional recommendations.

HEPA CAP Hood (optional)

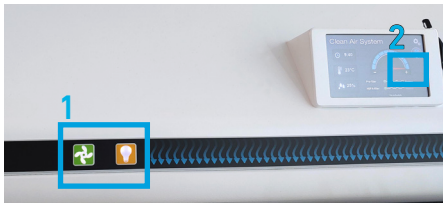
Supplier	Description	Part Number (US)
Equipment		
Hamilton	HEPA Filter HEPA Pre-Filter	92171-01 95574-01

This optional HEPA CAP (Clean Air Protection) hood filters all air entering the system. The HEPA filter is rated at 99.99% 0.3 µm system.



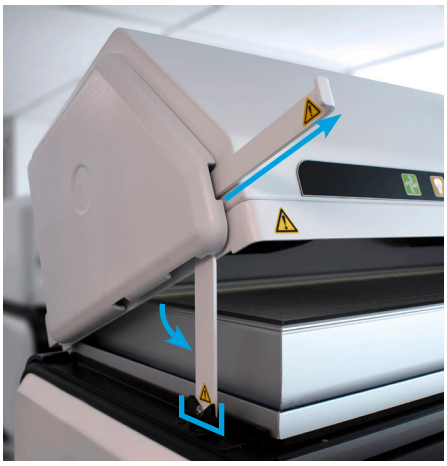
By constantly monitoring the air flow, the system maintains positive pressure (whether Front Panel is open or closed). Temperature and humidity are also monitored.

The HEPA hood, if present on the instrument, must be turned on during instrument operation in order to prevent overheating.



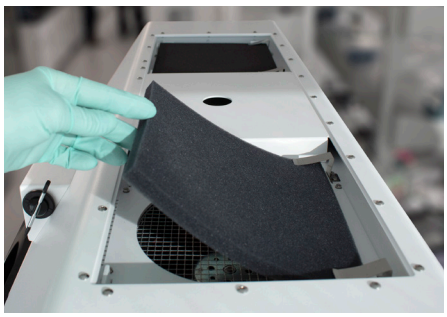
Turning the HEPA Hood On

1. Turn on fan and light by pressing the buttons on the front of the hood.
2. Turn hood fan to max using the "+" button on the touchscreen.



Changing the Filter

1. Lift up the hood with the extended handle and secure the kickstand into the grooved bracket.
2. Slide out old HEPA filter. Avoid blue gel in the lip of the filter frame.
3. Remove new HEPA filter from packaging. Do not touch the white filter material or blue gel.
4. Using side groove, slide the new HEPA filter into place.



Installing the Pre-Filters

1. Access the top of the hood, using a ladder.
2. Place pre-filter under clips and press edges down into position.

System Operation

Chromium Connect Software
Operation Overview

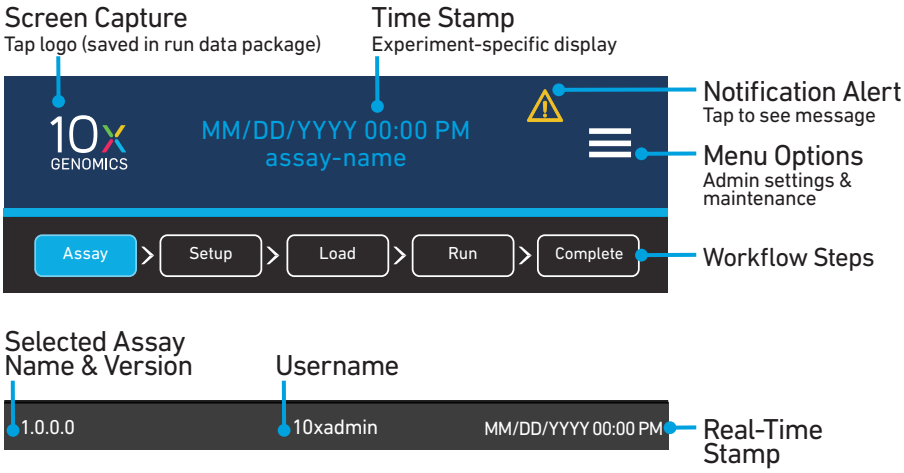
Chromium Connect Software

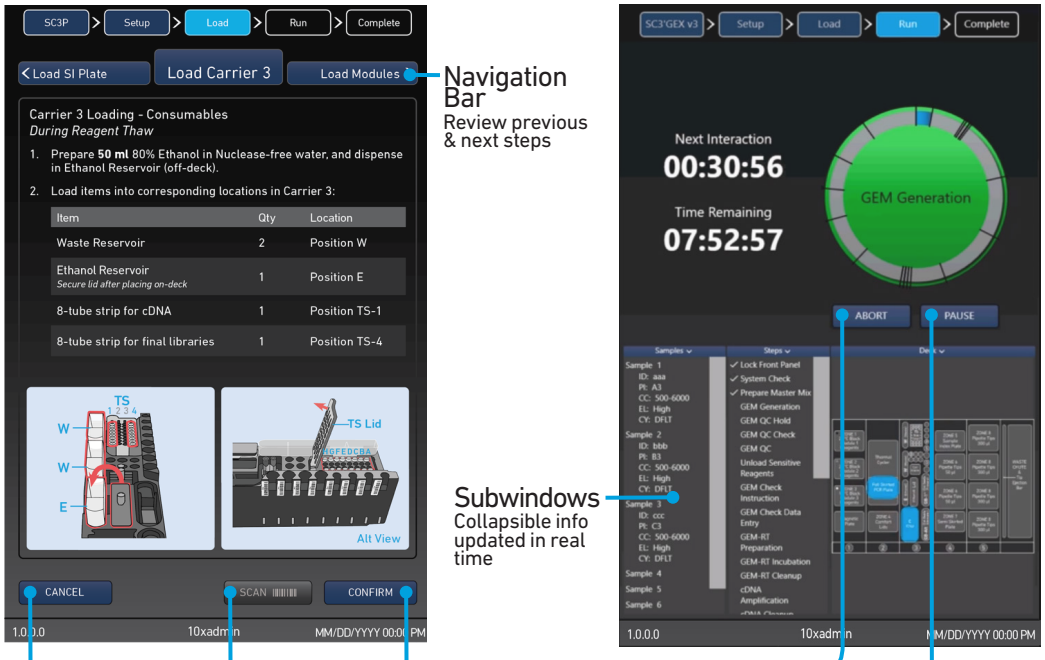
Chromium Connect operation is controlled by the touchscreen, which guides the user through all the steps to set up the system for an experiment. The software also allows the user to define system settings, manage assays/users, create usage reports, and perform instrument maintenance.

Data for the assay run are collected in a run package, saved to the hard drive, and exported to USB. With an approximate 10,000 run maximum capacity, there is enough memory to run for several years without purging.

AIO System Specs: RAM: 8 GB DRAM, DISK 512 GB SSD

Navigation Buttons





Operation Overview

Chromium Connect Workflow		Timing
1 › 2 › 3 › 4 › 5		1 h
Assay Setup	Select Input Info	
Load	Consumables, Reagents & Samples	
1 › 2 › 3 › 4 › 5		8.5 h
Run	Single Cell Partitioning, Barcoding & Reverse Transcription GEM QC *(optional)* cDNA Amplification & Cleanup cDNA QC *(optional)* Library Construction, Cleanup & Sample Indexing	
1 › 2 › 3 › 4 › 5		1 h
Complete Unload	Final Library QC & Quantification Reagents & Consumables	
Optional Assays		**1.5 h**
	qPCR Setup Pooling	

Daily and weekly maintenance required. Schedule preventative maintenance with a Support Automation Scientist ~every 6 months. Refer to Maintenance for automated protocols.

Setup

Choose from three navigational modes to run the deck loading procedure. Standard mode enables all features to allow a successful run for beginning users, whereas Advanced and Expert modes facilitate a faster run.

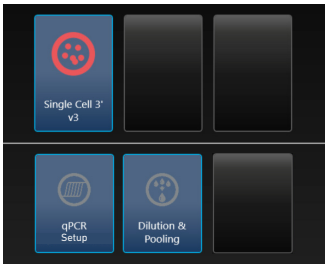
Expert navigation mode disables the deck check. User must ensure correct reagents and consumables, proper carrier loading, and tube cap removal to avoid critical failure.

Navigational Modes	Standard	Advanced	Expert
Deck and instrument orientation	✓		
Complete loading instruction; user must "confirm" each step	✓		
Scanning and reagent selection	✓	✓	✓
Navigation bar enabled (to review previous and next steps)		✓	✓
Deck check	✓	✓	

Assay Options

1 › 2 › 3 › 4 › 5

Select an assay and any optional/additional workflows. The assay workflow alone includes five sequential steps, navigated using the touchscreen.

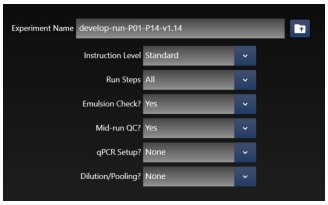


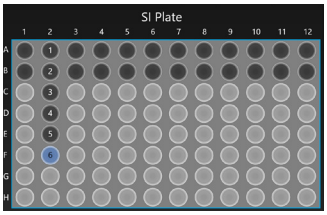
Setup Experiment & Sample Information

1 › 2 › 3 › 4 › 5

Enter specified experiment information or upload from a CSV file (via USB Port or through network access). Templates can be found on the 10x Genomics website. Choose cycing parameters and select additional assay options such as Emulsion Check or Midrun QC Check. Selections are automatically incorporated into the assay run.

Tap wells on screen to select desired sample indices from the Sample Index Plate. Once selected, the well is grayed out and numbered. Wells that are not physically accessible by remaining gantry channels are automatically grayed out.

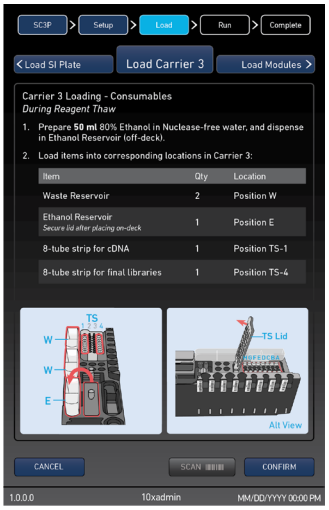




Deck Loading

1 › 2 › 3 › 4 › 5

Load all reagents and consumables on the deck, following the touchscreen prompts. Select "Confirm" after completing each screen in order to advance. Refer to Best Practices for Deck Loading or Quick Reference Cards (Document CG000256) for useful information during loading.



Deck Check

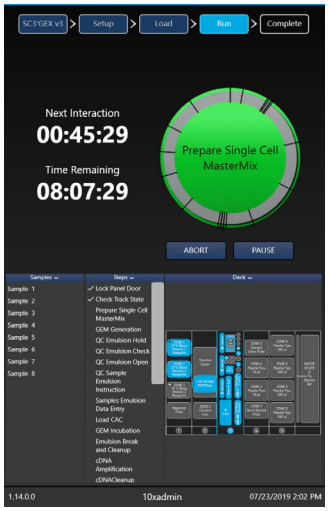
At the end of deck loading (read Instrument Busy), the instrument performs a series of automated checks:

- Full Skirted Plate present on Thermal Cycler
- Caps removed from tubes
- CO-RE Paddles present
- Liquid levels in tubes detected
- Magnetic Plate unoccupied
- Six Comfort Lids in stack
- Semi Skirted plate present
- Waste Bar present
- Ethanol Reservoir Lid present

Run Assay

1 › 2 › 3 › 4 › 5

The run screen features a simple informative view that allows users to see information quickly. Refer to Navigation for details.

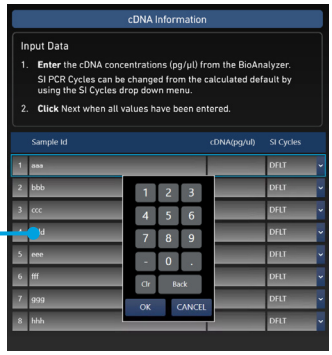


Expand/minimize subwindows:

- Samples: Displays ID information for each sample, entered during setup.
- Steps: Indicates approximate assay step-completion in real time (in sync with countdown and run clock).
- Deck Layout: Indicates the process location on deck in real time.

Optional QC Checks

The touchscreen prompts the user (twice during an assay run and once at library completion) to confirm and enter QC data. All quantifications are performed off deck.



- GEM QC Check: Visual verification that emulsions are present.
- Midrun QC Check: Quantification of samples, with concentrations entered on screen and optional setting of Sample Index PCR cycles if default values are not used.

Completion & Cleanup

1 › 2 › 3 › 4 › 5

At the end of a successful run, enter comments (required) and final library concentrations (appended to run data package). User must then confirm or opt out of optional QC checks.

During Cleanup, the user unloads finished libraries, reagents, and consumables from the deck by following software prompts (includes proper storage of reusable reagents and cleaning procedures).

After cleanup, the software will prepare the final run report for export.

Best Practices for Deck Loading

Stationary Carriers 1 & 2

Sliding Carriers 3, 4 & 5

Carrier Loading

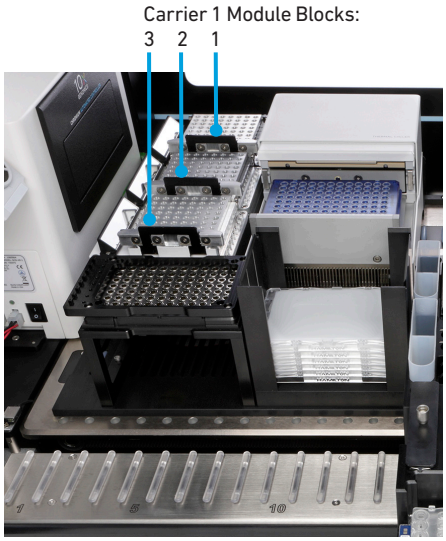
Important considerations when loading the carriers are listed below. For complete step-by-step instructions, follow the prompts on the touchscreen.

- Ensure correct barcode orientation (on tubes & racks) as prompted by touchscreen.
- The deck orients A1 positions to the back left corner of the instrument.
- Carrier loading continues during reagent thaw, which begins at specified points on touchscreen.

Stationary Carriers 1 & 2

The stationary carriers include the Module Blocks, Magnetic Plate, Thermal Cycler, and Comfort Lid rack—all of which are affixed to the deck area. Cables connect and power the Temperature Controlled Block (Module 3) and Thermal Cycler.

Library Modules



- Ensure that no air gaps or precipitate remain at the bottoms of Module tube strips.
- Module loading: Use black handles to lift lids. Load from row 1 (back to front), inserting barcode end onto pin.
- **Press black handles while closing lids.** DO NOT allow lids to forcefully snap shut.
- DO NOT touch the Module Mirrors. Smudges can prevent barcode scanning. Wipe clean with laboratory wipes when necessary.

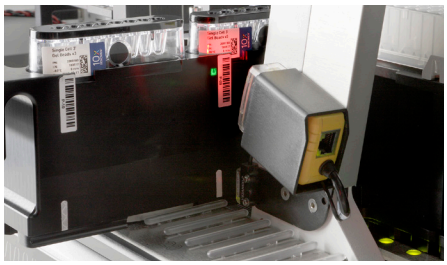
Carrier 2 Consumables

- The Thermal Cycler requires no direct user interaction, apart from plate loading. The software controls closing and opening the lid.
- Comfort Lids are the only consumable that are stacked on deck.

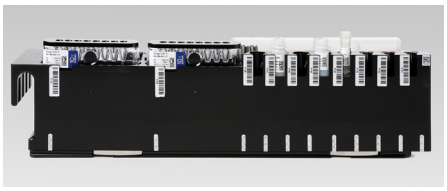
Sliding Carriers 3, 4 & 5

Establish a clean space near the instrument for placing sliding carriers during loading. While loading, place the carrier on the benchtop with the barcodes facing the user.

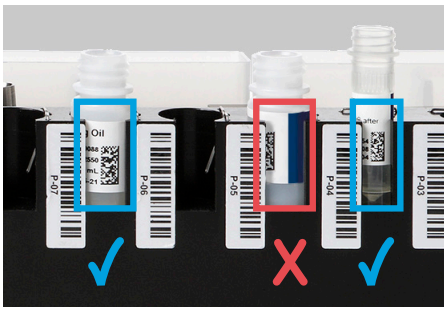
Scanning/Returning to Deck



- The Barcode Scanner reads barcodes on carrier/reagent/tip racks, as the carrier is slid back in the deck position.
- To facilitate barcode scanning, slide carriers in SLOWLY and follow touchscreen prompts (chime and flashing green lights).
- Practice sliding the carriers completely off the deck and replacing them using rails.

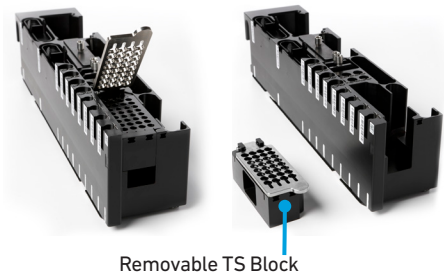


Handling Reagents



- Follow touchscreen prompts for assay-specific handling.
- Ensure that no air gaps or precipitate remain at the bottoms of tubes.
- Remove caps when prompted by the touchscreen, to avoid evaporation.
- Label tube strips for cDNA and libraries for orientation.
- Keep chip and gasket in sealed package until prompted to load. DO NOT use chips or gaskets specific to other 10x Genomics protocols.
- Prepare and dispense 80% ethanol off-deck to avoid spilling on consumables (i.e. chip).

Loading Reagents



- Two Gel Bead locations on Carrier 3 allow use of one full tube strip or two partially used strips (a maximum of 8 tubes will be used). Use GB-Primary position first.
- The Gel Bead holders "click" into place in position GB-Primary and GB-Alternate, with barcodes facing toward user.
- Lift lid on TS block before placing tube strips.
- Optional removal of the TS block from Carrier 3 may facilitate loading tube strips.

Maintenance

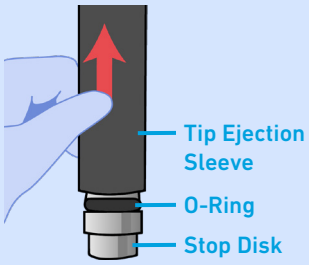
Maintenance

The maintenance protocols on the touchscreen guide the user through manual instruction, then run autonomous tests for calibration and communication.

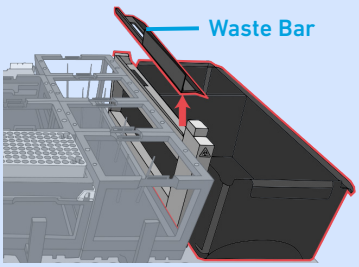
Running Maintenance via Software	Daily *15 min*	Weekly *40 min*
Inspect for Condensation, Dust & Smudges	✓	✓
Empty Waste Bin & Liquid Waste	✓	✓
Channel Tests Pipette Channel Tightness Test Liquid Detection Test	✓	✓
Clean Deck, Rails, Carriers, Mirrors & Walls Wipe down with laboratory wipes to minimize sources of particles and fibers Metal: 70% isopropanol or microcide/polycarbonate-compatible disinfectant Nonmetal: Deionized water or microcide/polycarbonate-compatible disinfectant		✓
Clean Gantry Channels Lens-cleaning tissue and nuclease-free water		✓
Calibration		✓

Preventative Maintenance is handled by a Support Automation Scientist ~every 6 months.

Access Gantry pipette channels for cleaning by lifting up on tip ejection sleeve



Remove Waste Bar prior to maintenance and replace when prompted by UI



Menu Overview

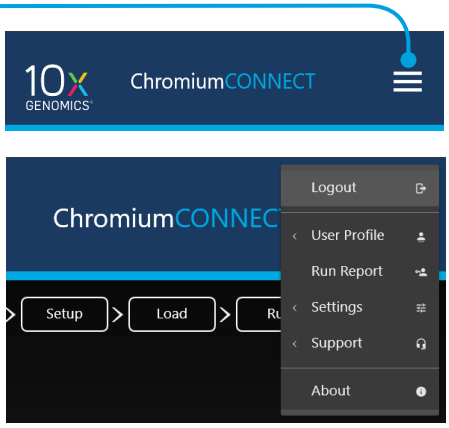
Menu Options
Admin Settings
Support/Maintenance

Menu Options

Access menu options using the bars in the top right corner. Refer to option-specific sections for details.

Logout **User Profile** **Run Report**
Settings **Support** **About**

Grayed out functions in the menu options indicate no access for the user. Many functions are accessible only by the administrator, as specified in the sections below.



Logout & System Shutdown

Logout functionality is active only during assay selection, and disabled during a run.

Shutdown on the touchscreen only powers off the computer and monitor.

To shut power off completely, press the lighted green power button on the front of the instrument. Use inlet switches on left side of power base to shut down the Thermal Cycler and system.

User Profile

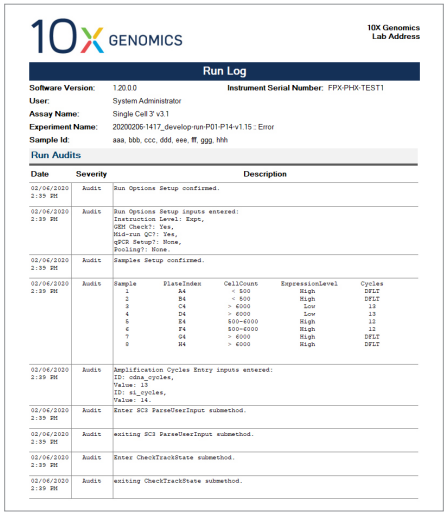
The User Profile menu option modifies settings for email and password (alphanumeric, 8 characters, case sensitive). Only one email address can be linked to a user profile, in order to receive notifications. Examples of notifications include:

- Timer alert for next screen interaction
- Run completion
- Errors

Run Report

Access a log of all experimental runs through this menu option. It includes:

- General instrument and assay information
- A list of all steps (with time stamp) and pass/fail/confirmation
- A record of user selections and inputs (sample IDs, plate index, cell count, cycles, qc check inputs)
- Run completion


10x GENOMICS

10X Genomics
Lab Address

Run Log

Software Version: 1.20.0.0 Instrument Serial Number: FPX-PHX-TEST1
User: System Administrator
Assay Name: Single Cell 3' v3.1
Experiment Name: 20200206-1417_develop-run-P01-P14-v1.15 : Error
Sample Id: aaa, bbb, ccc, ddd, eee, fff, ggg, hhh

Run Audits

Date	Severity	Description
02/06/2020 2:39 PM	Audit	Run Options Setup confirmed.
02/06/2020 2:39 PM	Audit	Run Options Setup inputs entered: Instruction Level: Expt, GEM Check?: Yes, Mid-run QC?: Yes, qPCR Setup?: None, Pooling?: None.
02/06/2020 2:39 PM	Audit	Samples Setup confirmed.
02/06/2020 2:39 PM	Audit	Sample PlateIndex CellCount ExpressionLevel Cycles 1 A4 < 500 High DFLT 2 B4 < 500 High DFLT 3 C4 > 6000 Low 13 4 D4 > 6000 Low 13 5 E4 500-6000 High 12 6 F4 500-6000 High 12 7 G4 > 6000 High DFLT 8 H4 > 6000 High DFLT
02/06/2020 2:39 PM	Audit	Amplification Cycles Entry inputs entered: ID: cdna_cycles, Value: 13 ID: si_cycles, Value: 14.
02/06/2020 2:39 PM	Audit	Enter SC3 ParseUserInput submethod.
02/06/2020 2:39 PM	Audit	exiting SC3 ParseUserInput submethod.
02/06/2020 2:39 PM	Audit	Enter CheckTrackState submethod.
02/06/2020 2:39 PM	Audit	exiting CheckTrackState submethod.

Admin Settings

ADMIN

General

The administrator can input:

- Lab Name
- Lab Address
- Email
- Date Format
- Time Format
- Export/Report Location

Send run status notifications and exported files to a specified email address via wireless/ethernet connection. If entering multiple email addresses, use a comma. Inputs will be the default for LIMS (*.csv) and experiment log files (*.pdf).

Volume controls the touchsreen prompts (i.e., during scanning and errors).

User Security

The administrator can set their own security information, or use the default settings:

- Password Expiry: 60 days
- Password Expiry Notice: 1 (notification)
- Max Login Attempts: 3
- Lockout Period: 5 days

If a user gets locked out of their account: login, update their user profile, and gain access to their account before the lockout period has ended. (Refer to Manage Users below).

Manage Users

The administrator can add and view all user profiles with the listed information:

- Username
- First Name
- Last Name
- Role
- Email
- Active

All Active Users (checked box) will appear during login. Select to edit a user's profile or reset their password. Users may be activated/deactivated, but cannot be deleted.

 “Save Settings” and "Load Settings" allows the administrator to transfer user accounts to another instrument (to avoid manually and individually entering user accounts).

Manage Assays

The administrator can view all assays loaded onto the system.

Select to activate or deactivate an assay. Only active assays appear on the Assay Selection home screen. Deactivated assays have an unchecked box in the Manage Assay table until reactivated.

As new assays become available, users will be notified. Schedule 10x Genomics Technical Support to load them onsite and provide necessary training.

Email Server

The administrator can set up email notifcations and a back up path to the Email Server.

Obtain the Server Address and Server Port from the institution's network administrator. Specify a username and password for the Email Server. The Display Name will appear in the "From" field of emails sent from the instrument. Select a secure connection and press "Test" to send a test email to the server. If successful, the Status window will read "Connected."

Support

The Support submenu contains the following options:

Admin Only	**All Access**
Maintenance	**System Events**
Database	**Usage Report**
Network	**Troubleshooting**
Apply Upgrade	**Control Panel**
	Screen Connect

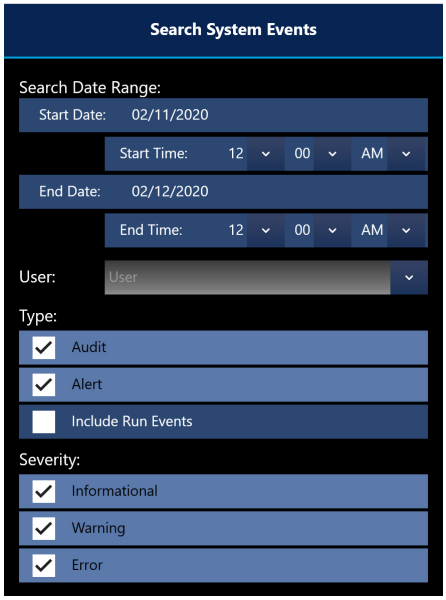
Maintenance

The maintenance protocols on the touchscreen guide the user through manual instruction, then run autonomous tests for calibration and communication. Refer to Maintenance section for automated protocols.

System Events

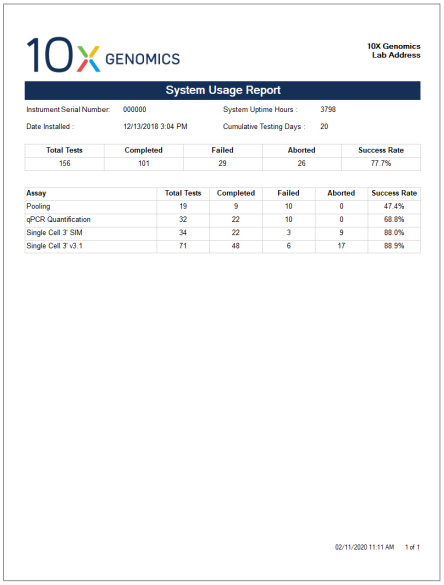
Access the back-end instrument system log activity. It displays events for the current day, with a search tool for previous date ranges. Selected events can be packaged into an exportable report. View the report by clicking "Report" or immediately "Export" to the drive. Examples of events include:

- Maintenance
- Login/Logoff
- Changed password or settings
- System upgrades/notifications
- Run initiation/abort/cancel
- Run events (data entry and each comlpeted assay step)



Usage Report

Generate an exportable usage report that summarizes tests and their outcomes (complete, failed, aborted), as well as a calculated success rate percentage.



ADMIN

Database

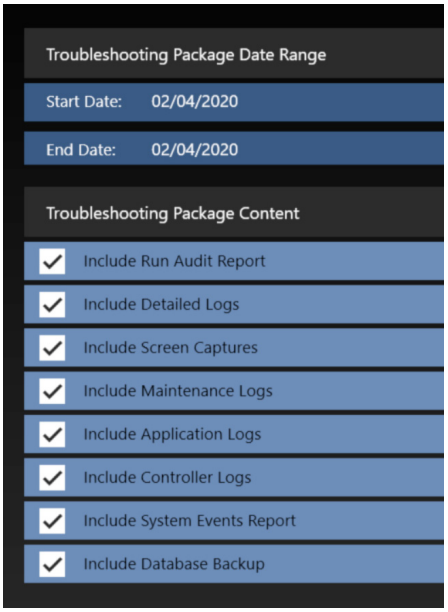
The administrator can perform a full system database back up to the default export path, which includes:

- Master Experiment Information
- Base Memory (configured)
- Settings Storage
- Backup Archive
- User Information

Purge is not recommended. However, if the system hard drive becomes full or if the administrator must remove run information from the hard drive, always backup the database before purging.

The date of the Last Purge is automatically entered when"Purge" is clicked. Purge Cutoff Days indicates that it will keep the last [30] days, but purge run information before that range.

The administrator can also "Restore" the database from the Email Server or USB



Troubleshooting

During troubleshooting, 10x Genomics Technical Support will need specific information. This menu option allows users to package logs, reports, and screen captures for a specified date range. "Generate" sends the zip-file to the default export path.

Refer to Troubleshooting section for details.

Control Panel

The control panel allows 10x Genomics Technical Support to handle deck components individually for troubleshooting purposes.

DO NOT access control panel without guidance from 10x Genomics Technical Support, to avoid instrument damage.

ADMIN

Network

Requires a Support Automation Scientist and IT coordination for set up.

1. Connect to the network via wireless or ethernet by clicking "Add." Obtain the username/password or correct ethernet cables from the institution's network administrator. If the network's crendentials change, "Reconnect" through this menu option.
2. Connect to the shared drive by clicking "Add." Obtain the device ID path and credentials from the institution's network administrator (syntax must be entered correctly to verify proper connections). The software will designate a drive letter.

Connect to any number of shared drives in order to save data to different locations. In order to send email notifications, ensure a connection to an Email Server. Refer to Email Server in Settings for details.

Screen Connect

With a network connection, remote support from 10x Genomics Technical Support may be available. This feature allows the user to share the screen when checkmarked.

During remote support, a screen banner notifies the user that the screen is currently shared and remotely controlled.

ADMIN

Apply Upgrade

With a network connection, some upgrades may be downloadable and require a restart. Alternatively, an onsite Support Automation Scientist can install upgrades manually.

Troubleshooting

Troubleshooting

The touchscreen will guide the user through recoverable failures. If the error continues, or if the instrument has seen critical or intermediate failures, contact 10x Genomics Technical Support.

Take a screen capture of the error message by tapping the 10x Genomics logo in the top left corner of the touchscreen.

Support will request a troubleshooting package. Support may also request Screen Connect to remotely service the instrument. Refer to Troubleshooting and Screen Connect in Menu Overview for details.

There are three types of failures:

- **Critical Failures** – When the instrument has seen a critical error, the run will immediately abort. Do not proceed with any further runs. Contact support@10xgenomics.com with the error code.
- **Intermediate Failures** – When the instrument has an unrecoverable error, the run will immediately abort. Perform the specified test to verify system integrity.
- **User Recoverable Failures** – Follow error handling instructions through the touchscreen and continue the run.

    i. Tip Failures
    Pick up, Drop

    ii. Plate Pickup Failures
    Ethanol Lid, Chip, Comfort Lid count

    iii. Detection Failures
    Semi Skirted Plate, Full Skirted Plate, Ethanol Lid, Waste Bar, CO-RE Paddles

    iv. Reagent Failures
    Caps detected, Tube not detected

    v. Door Lock Failure

    vi. Carrier Failures
    Carrier already loaded, Debris on magnet

    vii. Thermal Cycler Failures
    Communication, Lid closure

    viii. Chilling Block Communication Failure

    ix. Chromium Automated Controller Failures
    Communication, Chip check

See the 10x Genomics Support website for more information

Contact support@10xgenomics.com for further assistance.