

User Guide | CG000396 | Rev C

# Chromium X Series (X/iX)

with Readiness Test

For use with:

**Chromium X** & Accessory Kit, 12-Month Warranty, PN-1000331

*Chromium iX Accessory Kit, PN-1000323 | Chromium X Upgrade Kit, PN-1000327*

**Chromium X** & Accessory Kit, 24-Month Warranty, PN-1000332

*Chromium iX Accessory Kit, PN-1000323 | Chromium X Upgrade Kit, PN-1000327*

**Chromium iX** & Accessory Kit, 12-Month Warranty, PN-1000328

*Chromium iX Accessory Kit, PN-1000323*

**Chromium iX** Accessory Kit, 24-Month Warranty, PN-1000329

*Chromium iX Accessory Kit, PN-1000323*



# Notices

## Document Number

CG000396 | Rev C

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### 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

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# Document Revision Summary

## Document Number

CG000396 | Rev C

## Title

Chromium X Series (X/iX) User Guide with Readiness Test

## Revision

Rev B to Rev C

## Revision Date

September 2021

## Specific Changes

Network connectivity recommendations updated on pages 17, 26, and 27.

## General Changes

N/A

# Table of Contents

<b>Introduction</b>	<b>5</b>
Introduction	6
Product Identification Label	7
Product Specifications	7
<b>Safety &amp; Compliance Information</b>	<b>8</b>
Safety	9
Regulatory	10
<b>System Components</b>	<b>11</b>
System Components	12
Accessory Kits	13
<b>System Operation</b>	<b>14</b>
Step 1: Installation	15
Step 2: First-Time Use	17
Step 3: Readiness Test	18
Step 4: Main One-Touch Operation	19
<b>Tips &amp; Best Practices</b>	<b>21</b>
Icons	22
Chromium Next GEM Chip	22
Chip Placement on Chromium X Tray	24
10x Genomics Cloud	24
<b>Menu Options</b>	<b>25</b>
Menu Options	26
Firmware Update Procedure	28
<b>Maintenance</b>	<b>29</b>
System Maintenance	30
Moving & Shipping the Instrument	31
<b>Troubleshooting</b>	<b>32</b>
Error Screens	33

# Introduction

- 6** Introduction
- 7** Product Identification
- 7** Product Specifications

## Introduction

The Chromium X Series is the next generation of instrumentation, purposefully designed to enable high-throughput experiments. Compared to the Chromium Controller, the Chromium X Series has:

- Additional sensors, more accurate pressure, and tray temperature control.
- A highly interactive user interface with familiar one-button operation.
- Seamless firmware upgrades, network connectivity and syncing to the 10x Genomics Cloud, to log run information and experimental setups.
- Similar performance as assessed by multiplet rates, library complexity, read mapping rates, and cell clustering.
- Ability to run an assay with low throughput (LT) or high throughput (HT).
  - Low throughput: 100–1,000 cells per channel
  - High throughput: 2,000–20,000 cells per channel  
2,000–60,000 cells per channel with CellPlex
  - Standard assay: 500–10,000 cells per channel  
500–30,000 cells per channel with CellPlex

The Chromium X Series is one instrument, available in two firmware options (Chromium X and Chromium iX).

Both the standard Next GEM chip and holder (silver color) and the HT Next GEM chip and holder (black color) are compatible with the instrument.

### Comparison of Controller, X, and iX capabilities

Assay	Controller	iX	X
Single Cell 3' Gene Expression LT	✓	✓	✓
Single Cell 3' Gene Expression (Dual Index)	✓	✓	✓
Single Cell 3' Gene Expression HT	No	Upgrade required	✓
Single Cell Immune Profiling (Dual Index)	✓	✓	✓
Single Cell Immune Profiling HT	No	Upgrade required	✓
Single Cell ATAC	✓	✓	✓
Single Cell Multiome ATAC + Gene Expression	✓	✓	✓
Single Cell 3' Gene Expression (Single Index)	✓	Unsupported	Unsupported
Single Cell Immune Profiling (Single Index)	✓	Unsupported	Unsupported

## Product Identification Label



FCC ID: N6C-SDPAC IC: 4908A-SDPAC

**Chromium X/iX**

PN 1000326  
Model 00013-03  
Serial # CXVG10001

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.

**CAUTION** RISK OF ELECTRIC SHOCK DO NOT OPEN

Risk of Electric Shock, do not remove cover. Refer servicing to qualified service personnel.  
Risque d'électrocution, ne pas retirer le couvercle. En cas de défaut, ne pas utiliser l'appareil et faire appel à un technicien qualifié

100-240V ~ 50-60Hz 250W MAX  
FUSE: T3.15AH, 250V SLOW BLOW  
10X GENOMICS Pleasanton, CA USA

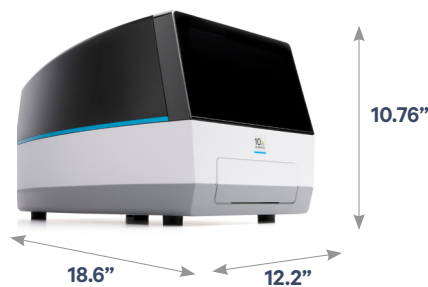
CE, TÜV, and other certification logos are present.

Made in Singapore

Image of label for reference only

## Product Specifications

Parameter	Specifications									
Weight	41.4 lb (18.8 kg)									
Instrument Dimensions with: Tray close Tray open	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">W</td> <td style="text-align: center;">D</td> <td style="text-align: center;">H</td> </tr> <tr> <td style="text-align: center;">12.2"[31.0 cm]</td> <td style="text-align: center;">18.6"[47.2 cm]</td> <td style="text-align: center;">10.2"[26.0 cm]</td> </tr> <tr> <td style="text-align: center;">12.2"[31.0 cm]</td> <td style="text-align: center;">22.8"[58.0 cm]</td> <td style="text-align: center;">10.2"[26.0 cm]</td> </tr> </table>	W	D	H	12.2"[31.0 cm]	18.6"[47.2 cm]	10.2"[26.0 cm]	12.2"[31.0 cm]	22.8"[58.0 cm]	10.2"[26.0 cm]
W	D	H								
12.2"[31.0 cm]	18.6"[47.2 cm]	10.2"[26.0 cm]								
12.2"[31.0 cm]	22.8"[58.0 cm]	10.2"[26.0 cm]								
Electrical Requirements Nominal <i>from a standard 3-prong wall receptacle that includes a safety ground pin</i>	100-240 VAC, 50/60 Hz, 250 W 90-264 V operational range (+/- 10% of nominal) Overvoltage Category II (standard receptacle)									
Pollution	Degree 2 (Indoor Use Only)									
Ventilation Requirement	Minimum 4" [10 cm] Around all sides									
Operating Temperature	64-82°F [18-28°C] 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 7500 ft [2286 m] above sea level									
Power Cable Length <i>Power cables will be in accordance with regional specifications</i>	6-7 ft [2 m] Standard									



# Safety & Compliance Information

**9** Safety

**10** Regulatory








## Safety

Before operation, ensure that all potential users have received:

- Instruction in general safety practices for laboratories.
- Instruction in specific safety practices for the instrument.
- 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.



**Ensure ground is reliably connected** before plugging the instrument's power cord into the power source (receptacle). *Grounding is required to prevent electric shock. If the power source is not grounded, qualified personnel must first install a reliable safety ground.*



**Warning:** The tray door is capable of moving an object that is in its opening path. If near the edge of the workspace, the object could fall and create a hazard.



**Pinch risk:** Ensure no obstructions or fingers present near closing tray.







**Warning:** Avoid using the Chromium X/iX in a manner not specified by 10x Genomics. *The Chromium X/iX has been designed to protect the user. If used improperly, the intended user protections can be impaired.*



**Heavy Load:** 41.4 lb (18.8 kg). Two-person lift required.

## Regulatory

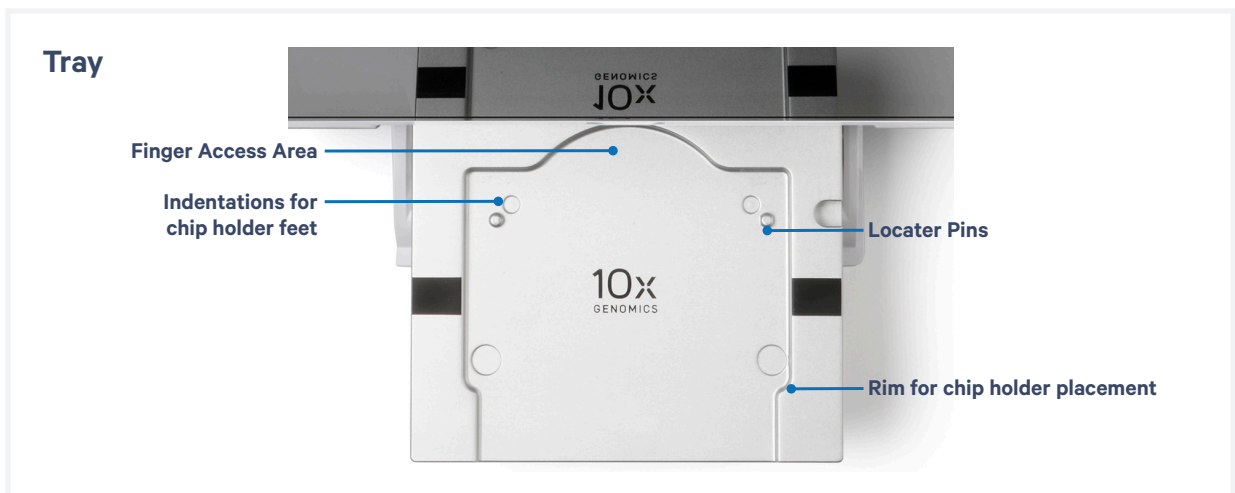
The Chromium X Series has been designed, tested, and certified to be in compliance with the following standards:

Certification	Standards
	TUV Certification only for Chromium X/iX 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 TÜV Rheinland and can be legally installed in those countries.
	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.
	The RCM mark indicates an electrical product complies with all the requirements of the electrical and EMC regulations of Australia and New Zealand in accordance with AS/NZS Standards
	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.
	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.
	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 ID: N6C-SDPAC, IC: 4908A-SDPAC 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.

# System Components

- 12** System Components
- 13** Chromium X/iX Accessory Kits

## System Components



## Accessory Kits

### Chromium iX Accessory Kit PN-1000323

Product	#	Part Number (Item)
10x Vortex Adapter	3	330002
10x Strip Vortexer	2	230002
10x Magnetic Separator	1	230003
Chromium Next GEM Secondary Holder	2	3000332
Chromium Next GEM Chip Gaskets, 2 Pack	1	3000072
Chip Gasket, HT, 2 pack	1	3000656
Universal Power Cord, 10 Amp-250 V (IEC 60320 C-14, with C-13 Detachable Adapters)	1	3000603
USB, 8 GB*	1	3000664

### Chromium X Upgrade Kit PN-1000327

Product	#	Part Number (Item)
Chromium X Chip Holder	2	3000598
Chip Gasket, HT, 5 Pack	1	3000614
10x Magnetic Separator HT	1	2000431
USB, 8 GB*	1	3000664

\*The Chromium X Series instrument is compatible with VFAT and exFAT formatted USBs.

### Additional Items

Product	#	Part Number (Item)
Shipping/Readiness Test Block	1	3000652
Chip Gasket, HT	1	3000613

The shipping/readiness test block and gasket assembly is located on the tray within the instrument during shipping.

# System Operation

- 15** Installation
- 17** First-Time Use
- 18** Readiness Test
- 19** Main One-Touch Operation

## Step 1: Installation

### Bench Space

Follow these instructions for installation to operate the Chromium X/iX properly and obtain maximum performance of the system. Before unboxing the instrument choose a location that:

- Is not situated in direct sunlight.  
*Direct sunlight leads to inadequate cooling conditions or rapid evaporation of reagents.*
- Provides maximum bench space (front to back).  
*Avoid areas that have obstruction in the rear such as power strips or house lines (spigets for vacuum or air).*
- Allows access to the plug at the wall receptacle (to safely disconnect power).
- Allows access to the detachable power cord at the rear of the instrument



**Ensure ground is reliably connected** before plugging the instrument's power cord into the power source (receptacle). *Grounding is required to prevent electric shock. If the power source is not grounded, qualified personnel must first install a reliable safety ground.*

- Includes a level sturdy laboratory bench that is not subject to movement or vibration.
- Provides a minimum of 4" (10 cm) clearance around unit to allow free air circulation.
- Provides a minimum of 6" (15 cm) directly in front of the instrument for unobstructed movement of the tray door.



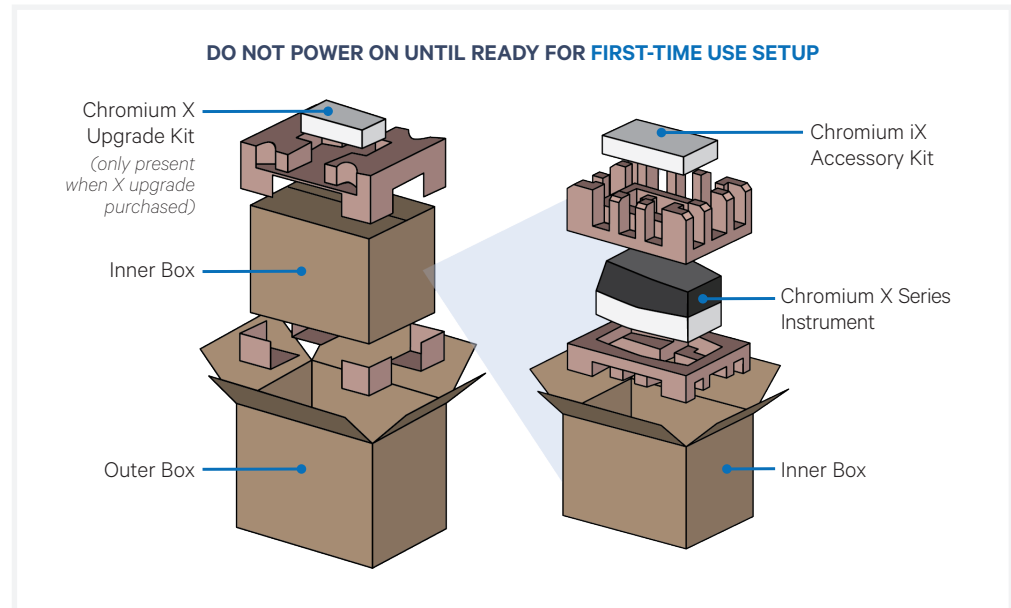
**Warning:** The tray door is capable of moving an object that is in its opening path. If the object is near the edge of the workspace, it could fall and create a hazard.



**Warning:** Avoid using the Chromium X/iX in a manner not specified by 10x Genomics. *The Chromium X/iX has been designed to protect the user. If used improperly, the intended user protections can be impaired.*

## Step 1: Installation *contd.*

### Unbox



**Heavy Load:** 41.4 lb (18.8 kg). Two-person lift required.

- a. Open box according to box label “this side up.”
- b. Remove the Upgrade Kit box (present only if Chromium X upgrade was purchased) and packaging material. Carefully lift inner box out and open inner box according to box label “this side up.”
- c. Remove the Chromium iX Accessory Kit box and packaging material.
- d. Carefully lift the Chromium X/iX instrument out of the box and place on bench top. Remove all transportation packaging materials and tape.
- e. Within the Accessory Kit box, locate the universal power cord and plug adaptors. Attach the correct country adaptor to the universal adaptor.
- f. Plug the Chromium X/iX into a properly grounded outlet of proper voltage.



**DO NOT power on yet.**

- g. If using an Ethernet cable (not provided) to connect to the network, connect cable directly to the instrument.



## Step 2: First-Time Use

The instrument will walk through a first-time setup protocol to ensure a proper setup and up-to-date firmware.

Setup requires the following:

- **10x Genomics Account**

*Onscreen instruction will guide account setup. Alternatively, visit [cloud.10xgenomics.com](https://cloud.10xgenomics.com) to create an account beforehand.*

*First-time setup (listed below) describes onscreen steps to register your instrument and receive firmware updates.*

*See [Tips & Best Practices](#) for more information on 10x Genomics Cloud.*

- **Instrument serial number and instrument ID**

- **Network server settings**

- **Networked device (computer or phone)**

- **Internet connection (optional)**

*Ethernet connection is recommended for optimal performance.*

### Turning on the system

**a.** Power on the instrument using the power switch at the back of the unit.

**b.** The touchscreen will display an initialization progress bar, followed by a welcome screen.

**c.** Walk through the Internet Connectivity Setup (optional) and the Date and Time Setup.

**d.** On a networked device, login to your 10x Genomics account at [activate.10xgenomics.com](https://activate.10xgenomics.com) and register the instrument. Enter the serial number + instrument ID. Read and accept the legal agreement.

**e.** Update the firmware.

- *Network connection:*

*After registration, the instrument will automatically search for the latest firmware update. Confirm data transmission settings for automatic upload/download.*

- *No network connection:*

*Download the latest firmware update from your 10x Genomics account to the USB provided in the Accessory Kit. Insert USB into the back of the instrument. See [Firmware Update Procedure](#) section for more details.*

**f.** A confirmation screen will display the instrument name and the current firmware version number. Click Reboot to complete installation.

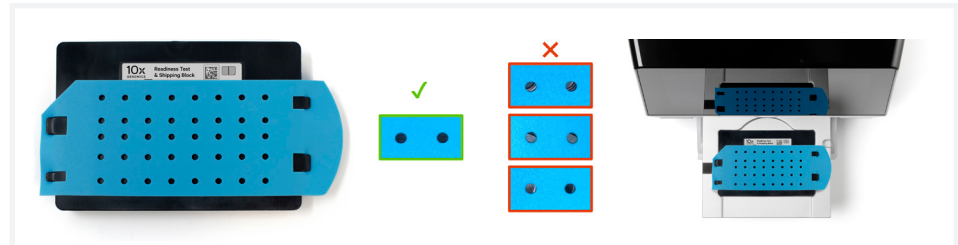


*See [Troubleshooting](#) section if an error occurs during the first-time setup protocol.*

### Step 3: Readiness Test

The readiness test verifies that all systems are working optimally. The first-time setup protocol will prompt the initial readiness test:

- a. Follow screen instruction to launch the readiness test.
- b. Verify that the shipping/readiness test block is properly placed on the tray:
  - Press the eject button.
  - Ensure that the gasket is properly attached (see [10x Gasket Attachment](#)).
  - Replace the assembled block on the tray.
  - Place the eject button again to close the tray.



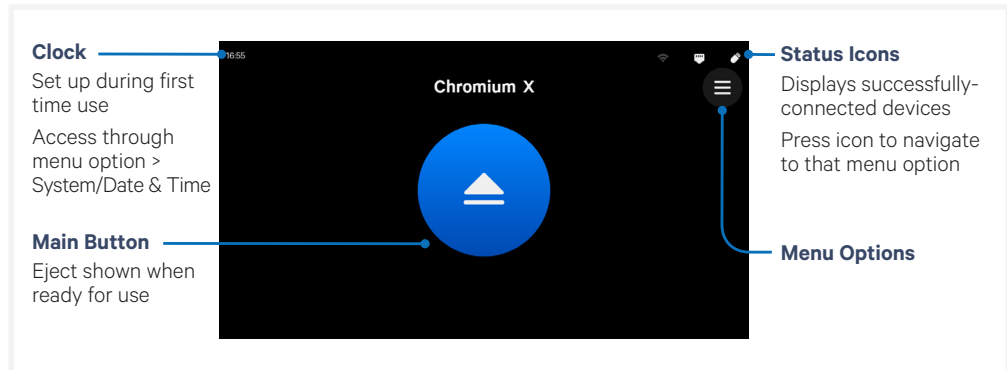
- c. After the test is complete, follow screen instruction to remove the block with gasket from the tray.
- d. Store the assembled block and gasket in a plastic bag, away from sunlight and extreme temperature. Retain for future use.
- e. A successful readiness test marks the end of setup. The instrument is now ready for use.

Initiate subsequent readiness tests through the home screen by loading the shipping/readiness test block with gasket into the instrument. For optimal performance, tests are recommended at the following times:

- During first-time use (the shipping/readiness test block will already be present in the instrument)
- After any update
- After moving the instrument
- At regular intervals (daily/weekly/monthly, at user's discretion)

## Step 4: Main One-Touch Operation

The home screen indicates the instrument is ready for use. This is the most common state of the instrument. There are several key functions that provide valuable information.



### Main Operation

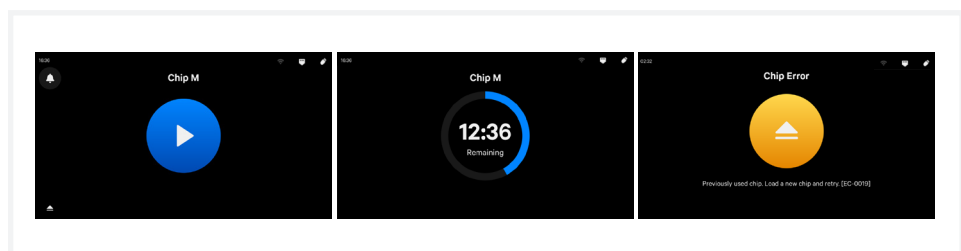
- f. Press eject button on the touchscreen to eject the tray. A chime will sound.
- TIPS** g. Load an assembled chip and holder (see [Tips & Best Practices](#) as well as the appropriate assay kit user guide).
- h. Press the eject button again to close the tray.
  - If the eject button is not touched within 1 min, it will automatically close on its own.
  - System requires a few seconds before the tray can be reopened again.



**Pinch risk:** Ensure no obstructions or fingers present near closing tray.

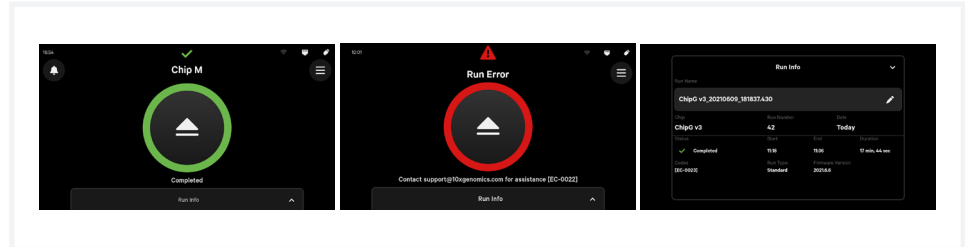
The home screen will now display a play symbol and the name of the chip type. (Use Eject button in lower left corner of the screen to abort).

- i. Press the play button to start the run.
  - Midrun progress bar will show the time remaining in the run.
  - Yellow indicates a user-recoverable error after loading chip (see [Troubleshooting](#)).



- j. At the end of a run, the button will display an eject symbol and a “Run Info” tab at the bottom of the screen.

- Green indicates a successful completed run.
- Red indicates a failed run/error (see [Troubleshooting](#)).



# Tips & Best Practices

- 22** Chromium Next GEM Chip
- 24** Chip Placement on Chromium X Tray
- 24** 10x Genomics Cloud



## Icons



Tips & Best Practices section includes additional guidance



Signifies critical step requiring accurate execution



Troubleshooting section includes additional guidance



HT specific protocol step updates

## Chromium Next GEM Chip

For instructions on the standard assay Next GEM chip, refer to the appropriate assay kit user guide.

### Chromium Next GEM Chip Handling

- Minimize exposure of reagents, chips, and gaskets to sources of particles and fibers, laboratory wipes, frequently opened flip-cap tubes, clothing that sheds fibers, and dusty surfaces.
- After removing the chip from the sealed bag, use in  $\leq 24$  h.
- Execute steps without pause or delay, unless indicated. When using multiple chips, load, run, and collect the content from one chip before loading the next.
- Only even number of reactions can be run on the chip. Refer to the “Load Chromium Next GEM Chip” section of the appropriate assay kit user guide for specific instructions.
- Fill all unused paired input wells on a chip with an appropriate volume of 50% glycerol solution before loading the used wells.
- Avoid contacting the bottom surface of the chip with gloved hands and other surfaces. Frictional charging can lead to inadequate priming of the channels, potentially leading to either clogs or wetting failures.
- Minimize the distance that a loaded chip is moved to reach the Chromium instrument.
- Keep the chip horizontal to prevent wetting the gasket with oil, which depletes the input volume and may adversely affect the quality of the resulting emulsion.



### Chromium X Chip Holders

- Chromium X Chip Holders encase Chromium Next GEM Chips used for the HT (high throughput assay).
- The holder lid flips over to become a stand, holding the chip at 45 degrees for optimal recovery well content removal.
- Squeeze the sliders on the back side of the holder together to unlock the lid and return the holder to a flat position.



## Chromium Next GEM Chip

*contd.*



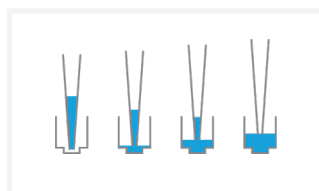
### Chip & Holder Assembly



- Close the holder lid. Attach the gasket by holding the tongue (curved end, to the right) and hook the gasket on the left-hand tabs of the holder. Gently pull the gasket toward the right and hook it on the two right-hand tabs.
- DO NOT touch the smooth side of the gasket.
- Open the chip holder.
- Align notch on the chip (upper left corner) and the open holder with the gasket attached.
- Slide the chip to the left until the guide on the holder is inserted into the chip. Depress the right hand side of the chip until the spring-loaded clip engages.
- Keep the assembled unit with the attached gasket until ready for dispensing reagents into the wells.

### Chip Loading

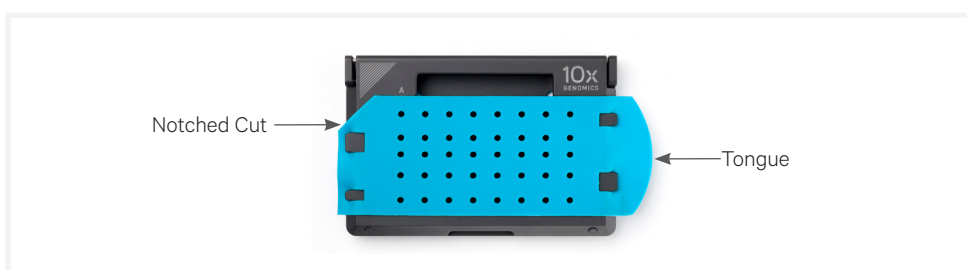
- Place the assembled chip and holder flat (gasket attached) on the bench with the lid open.
- Dispense at the bottom of the wells without introducing bubbles.
- When dispensing Gel Beads into the chip, wait for the remainder to drain into the bottom of the pipette tips and dispense again to ensure complete transfer.
- Refer to the “Load Chromium Next GEM Chip” section of the appropriate assay kit user guide for specific instructions.



## Chromium Next GEM Chip *contd.*

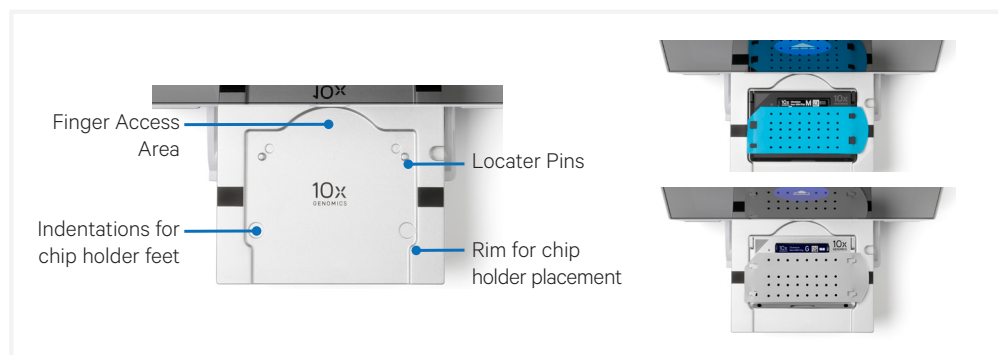
### 10x Gasket Attachment

- **Before reagents are loaded**, attach the gasket by holding the tongue (curved end, to the right) and hook the gasket on the left-hand tabs of the holder. Gently pull the gasket toward the right and hook it on the two right-hand tabs.
- DO NOT touch the smooth side of the gasket.
- Keep the assembled unit with the gasket attached until ready for dispensing reagents into the wells.
- After loading reagents, DO NOT press down on the top of the gasket. Keep the assembly horizontal to avoid wetting the gasket with Partitioning Oil.



## Chip Placement on Chromium X Tray

Indentations and locator pins assist in proper placement of the assembled chip and holder on the instrument tray.



## 10x Genomics Cloud

The 10x Genomics Cloud, at [cloud.10xgenomics.com](https://cloud.10xgenomics.com), is a universal user account for all of the web services offered by 10x Genomics, including instrument management. Access instrument information, download firmware updates, and monitor runs.

All users of each Chromium X/iX instrument are encouraged to register their instrument. Users may register multiple instruments to their accounts. The Chromium X/iX instrument can transfer serviceability data directly to the cloud, enabling streamlined customer service options.



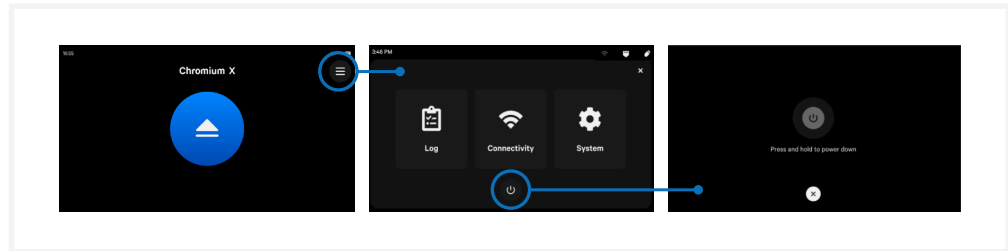
# Menu Options

**26** Menu Options

**28** Firmware Update Procedure

## Menu Options

Main mode of access to Logs, Connectivity, and System information.



Power off the instrument by tapping the power icon at the bottom of the menu options screen. The system will go into a soft power down (screen is dimmed and displays time and name of instrument).

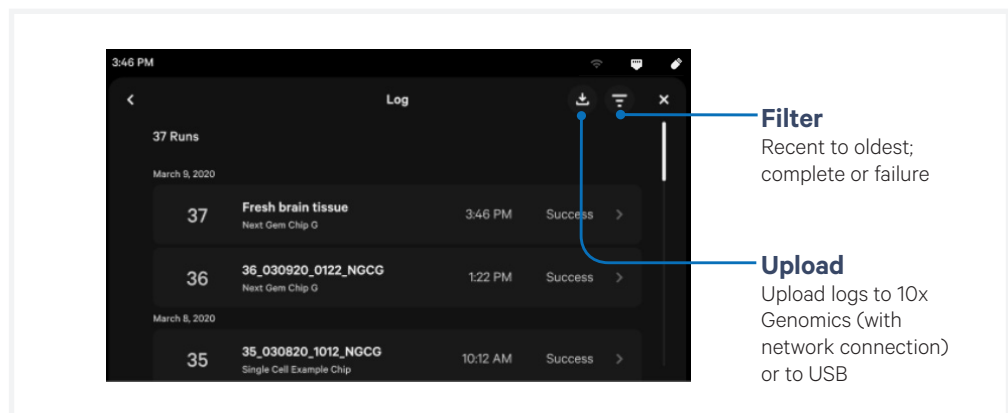
While instrument is active, it will engage a screensaver and dim the display after a few minutes of no screen interaction.

To shutdown the instrument completely, flip the power switch at the back (no preliminary steps needed before a complete shutdown). See [Moving & Shipping the Instrument](#) section

## Logs

Access and upload past run information. When filtering, only those logs that appear in the filter will be uploaded to 10x Cloud/downloaded to USB.

File capacity is 650 runs. Oldest files are deleted first. Log export ranges in size from 10s to 100s of MB, depending on how many runs are selected.



To review run logs with 10x Genomics Technical Support:

- Email [Support@10xgenomics.com](mailto:Support@10xgenomics.com) with any applicable error codes.
- Upload pertinent logs via USB (no network connection) or directly to 10x Cloud if you are connected to the Internet.  
*Support personnel will guide the user through these steps.*

## Menu Options

*contd.*

### Connectivity

Wi-Fi, Ethernet, and USB options display relevant information and configurable parameters. Note that Wi-Fi configuration may not be available in your region. Ethernet is recommended for optimal performance.

Click Automatic Uploads to enable automatic upload of log files to 10x Genomics Cloud.

Internet connectivity is not required, but is highly recommended so that the instrument may receive security/firmware updates and automatically upload system log files to the 10x Genomics Cloud. 10x Genomics has no remote access to the instrument.

Users may separately configure connectivity settings related to firmware updates and log upload behavior.

### Network & Security

- Allow the following outbound ports for 10x Cloud access:
  - UDP ports: 53, 123
  - TCP port: 443
- As an additional (optional) level of security, put the instrument on its own network VLAN with Internet-only access.

### System

The system runs on a Linux platform. The instrument's hardware and software have been securely implemented to prevent modification and to only execute trusted 10x code. There is no end-user configuration or access to the internal hardware, OS, or applications.

**Locate information** about this instrument such as serial number, instrument ID, and firmware version.

**Change the date and time** by country or time zone. Time can be set automatically via network connection. Toggle between 12-hour or 24-hour time.

**Launch Shipping Mode** (for safe instrument transportation) through the Alternate Modes menu option. The shipping/readiness test block and a gasket are required for transporting the Chromium X in shipping mode. See the Maintenance section, [Moving & Shipping the Instrument](#), for specific instructions for shipping mode.

**Firmware update notifications** will appear on the home screen when the instrument is connected to a network. Alternatively, navigate to [cloud.10xgenomics.com](https://cloud.10xgenomics.com) to view firmware updates and download via USB.

Review the firmware update procedure below:

## Firmware Update Procedure

### Step 1: Download and install the update

*Procedure with a network connection, auto-download enabled:*

- a.** A pop-up on the home screen will alert the user of available updates.
- b.** Open pop-up and click to install.

*Procedure with a network connection, auto-download disabled:*

- a.** A pop-up on the home screen will alert the user of available updates.
- b.** Open pop-up and click to download.
- c.** Click to install.

*Procedure with no network connection:*

- a.** Visit [cloud.10xgenomics.com](https://cloud.10xgenomics.com) to view firmware updates.
- b.** Download the desired updates onto a USB.  
*See [Accessory Kit](#) section for a list of compatible USB formats, or use the one provided in the accessory kit.*
- c.** Insert USB into the back of the instrument.
- d.** Onscreen, navigate through the menu to System > Firmware Update > Update via USB.
- e.** Click on “Firmware update available.”
- f.** Click to download the update to the instrument.
- g.** Click to install.
- h.** After installation is complete, remove USB from instrument.

### Step 2: Reinitialize the instrument

*After installing an update, run a readiness test.*

- a.** Retrieve the shipping/readiness test block with attached gasket. See [Readiness Test section](#) for more information on the block.
- b.** Initiate a readiness test through the home screen by loading the block into the instrument.
- c.** After the test is complete, follow screen instruction to remove the block from the tray.
- d.** Store the assembled block and gasket in a plastic bag, away from sunlight and extreme temperature. Retain for future use.

# Maintenance

- 30** System Maintenance
- 30** Moving & Shipping the Instrument

## System Maintenance

### Interior

The Chromium X Series tray and door areas have been designed to catch and contain drips and a small volume of liquid spills. Occasionally, use a soft lab towel to clean these areas with a mixture of mild detergent and distilled water. For deeper, more thorough cleaning, it is acceptable to use a 5-10% Bleach solution followed by a 70% ethanol wash.



**Do not use acetone or other harsh solvents**, as these may remove the colored markings in the tray. Apply all standard safety practices when using cleaners, and dispose of any generated waste in a responsible manner.

### Exterior

The exterior of the Chromium X Series instrument should always be kept clean and free of dust and debris that may affect its function and/or cooling efficiency. Generally, the exterior finish can be wiped down using a mixture of mild detergent and distilled water applied to a slightly dampened lab towel. As an added precaution it is recommended that the instrument be unplugged from the power source before beginning any cleaning process.

### Service



**Electrical shock hazard.** Do not open the Chromium X/iX. There are no user-serviceable parts inside. Refer all servicing to qualified 10x Genomics service personnel.

Servicing is required when the Chromium X/iX has been damaged in any way (e.g., a power entry module or plug is damaged, liquid was spilled into, or objects fell into the instrument, the instrument does not operate properly, or has been dropped).

Use only the power cord supplied with the Chromium X/iX. Do not replace it with a non-approved power cord as it may be inadequately rated to handle the electrical loads.

If replacing the externally accessible fuses in the power entry module becomes necessary, use only certified (EN60127 Sheet 5) 5 x 20 mm sized fuses rated T3.15AH, 250V Slow-Blow or equivalent.

When returning a Chromium X/iX for repair, take steps to ensure that the instrument has been decontaminated so as not to pose a hazard for 10x Genomics service personnel.

## System Maintenance

*contd.*

### Environmental Requirements

It is the design intent of the Chromium X/iX that it be used in a typical indoor laboratory environment. The instrument's operating temperature is 18–28°C (64–82°F), Humidity 80% Max (Non-Condensing) Altitude 0–7500 ft (0–2286 m) (see [Product Specifications](#)).

## Moving & Shipping the Instrument

If the Chromium X/iX will be transported in a vehicle or shipped, it should be repackaged according to the instructions below. The Readiness Test should be re-run (see [Readiness Test](#) section) after relocating the instrument.

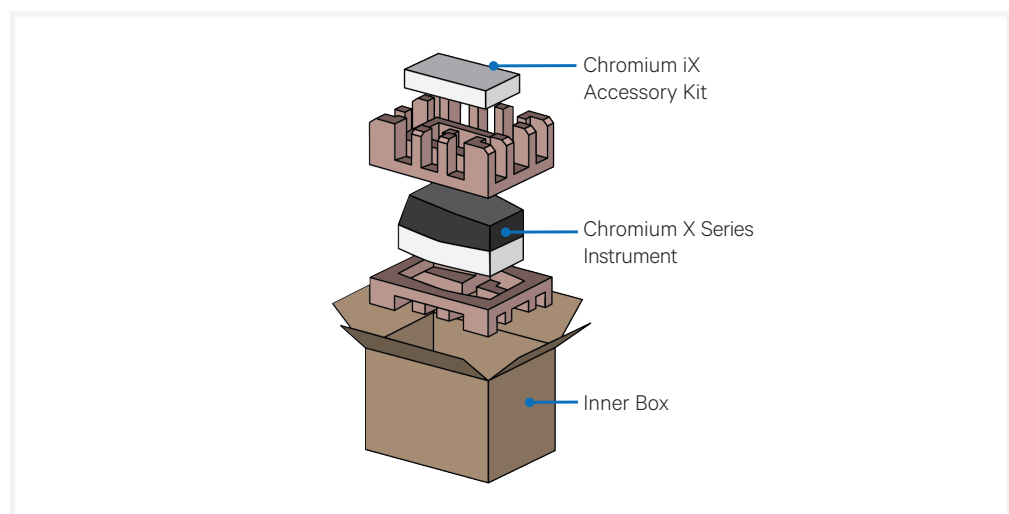
### Step 1: Shipping Mode

- a. Retrieve the shipping/readiness test block and a gasket.
- b. Launch Shipping Mode (for safe instrument transportation).  
*Menu Options > System > Alternate Modes > Shipping Mode*
- c. Follow the screen prompts for loading the shipping/readiness test block, which will instruct a soft power down.
- d. Turn off the instrument completely using the power switch on the back of the instrument.
- e. Remove the power cord.



DO NOT turn on the Chromium X/iX again after inserting the shipping/readiness test block. It will raise the manifold into a position unsafe for shipping.

### Step 2: Packaging Diagram



# Troubleshooting

## 33 Error Screens





## Error Screens

The touchscreen will guide the user through recoverable errors. If the error continues, or if the instrument has seen critical or intermediate errors, email [Support@10xgenomics.com](mailto:Support@10xgenomics.com) with the error code displayed.

Support will request log files for troubleshooting. Upload pertinent logs to 10x Genomics by navigating to the Logs menu option on screen. (See [Logs](#) section).

There are two types of errors:

**Critical Errors** – When the instrument has seen a critical error, the run will immediately abort. Do not proceed with any further runs. Contact [support@10xgenomics.com](mailto:support@10xgenomics.com) with the error code.

- System Error
- Pressure Error
- Chip Error
- Run Error
- Temperature Error
- Firmware Error

**User Recoverable Errors** – Follow error handling instructions through the touchscreen and continue the run.

- Gasket Error
- Tray Error
- Chip Error
- Unsupported Chip Error
- Network Error
- Update Error

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## Pressure Release Valve

This factory button aids qualified 10x Genomics service personnel in manually ejecting the instrument tray in the event that the instrument is unresponsive.



DO NOT open the Chromium X/iX. There are no user-serviceable parts inside. Refer all servicing to qualified 10x Genomics service personnel.