

Chromium X Series: Network Connectivity Guidelines

Introduction

The Chromium X Series offers a highly optimized approach to single cell studies and enables both low and high throughput experiments. All 10x Genomics Chromium Next GEM Single Cell assays are supported on Chromium X Series instruments. This Technical Note provides network connectivity guidelines for Chromium X Series instrument to enable automated updates and 10x Genomics Cloud connection to reduce unplanned instrument downtime, minimize run failures and sample loss, and help troubleshoot any connectivity issues.

The Chromium X Series (X/iX) is the next generation of 10x Genomics instrumentation, designed to enable high-throughput single cell experiments. The instrument has a highly interactive user interface along with multiple connectivity options (Ethernet/Wi-Fi*/USB) for seamless firmware upgrades and for syncing to the 10x Genomics Cloud. The firmware may be installed with or without network connectivity. However, Ethernet connection (via an Ethernet port at the back of the instrument) is recommended for optimal performance.

Refer to the Chromium X Series user guide (CG000396) for details regarding various instrument components, user interface navigation, firmware upgrade options (with or without Internet connectivity), and all additional features.



Figure 1. Chromium X Series instrument (1A) has a user-friendly interface (1B). The back of the instrument includes various connection ports, including a port of Ethernet connectivity (1C).

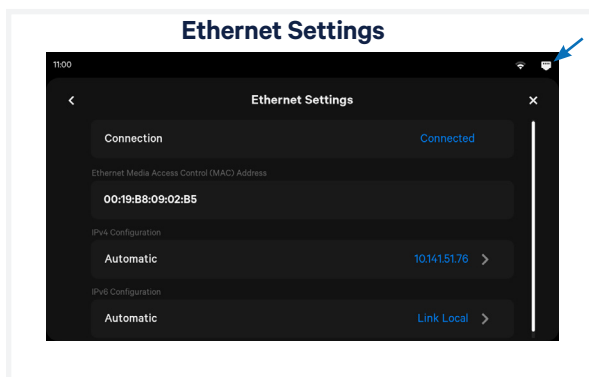
* Note that Wi-Fi configuration may not be available in all regions.

Verifying Physical Ethernet Connection

The Ethernet connectivity is designed to be the simplest approach for connecting to a network with Dynamic Host Configuration Protocol (DHCP) enabled. DHCP is available on the Chromium X Series instruments. To confirm that the DHCP is working properly, connect the instrument to the network via Ethernet or Wi-Fi and confirm that an IP address is generated. If the instrument detects a valid Ethernet connection, it connects automatically and an IP address will be visible on the instrument user interface.

To verify that the instrument has a valid Ethernet connection:

1. Confirm the presence of a white Ethernet icon on the top right corner of the instrument user interface. The presence of the icon indicates that the instrument has a functional Ethernet port.



2. Navigate through the main menu to the Connectivity page → select “Ethernet”. Check the IP address under the IPv4 or IPv6 Configuration fields.
3. If the Ethernet connection button indicates that the instrument is connected but there is no IP address, wait ~1 min for IP address assignment.

Manual IP Address Setup

If the network does not have DHCP enabled, use the Manual setup option for network connectivity. Navigate to the connections page from the main menu → select “Ethernet” and select IPv4 Configuration. From the 3 buttons (Automatic, Manual, Link-Local), select “Manual” → enter the necessary information such as IP, Netmask, DNS, and gateway addresses provided by your institution's IT department/network administrator.

After an IP address has been assigned, either automatically on a DHCP enabled network or manually using the steps above, the Chromium X Series Ethernet-based network connection should be active.

If the instrument is connected to an Ethernet port but there is no active Internet connection, check with the network administrator/support team to:

- Allow the instrument to access the Internet.
- Ensure that the Ethernet port for Chromium X Series is allowed to connect to the Internet.

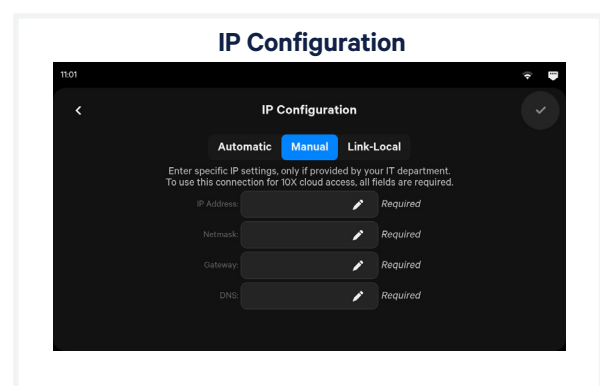
Currently, the Chromium X Series does not support manual IPv6 assignment. If IPv6 is available on a LAN, the instrument should self-assign an IPv6 address.

Static IP Address Setup

To add a static IP address, contact the institution's IT department/network administrator for the device's IP, netmask, default gateway, and DNS servers.

After a valid IP address setup:

1. Navigate to the Connectivity page on the user interface.
2. Select either Ethernet or Wi-Fi.
3. Select on the IP configuration, which is set to automatic by default.
4. When presented with the option of Automatic or Manual, select Manual.
5. Input the manual IP, Netmask, Gateway, and DNS values.



Identifying Instrument Hostname

For instruments running firmware version 1.1.0, the instrument's hostname is now set to its serial number. The serial number can be found in the back of the instrument as well as in the "About" section of the Systems menu on the screen.

Network & Security

Allow outbound TCP port 443 for 10x Genomics Cloud access. As an additional (optional) level of security, the instrument can be put on its own network VLAN with Internet-only access.

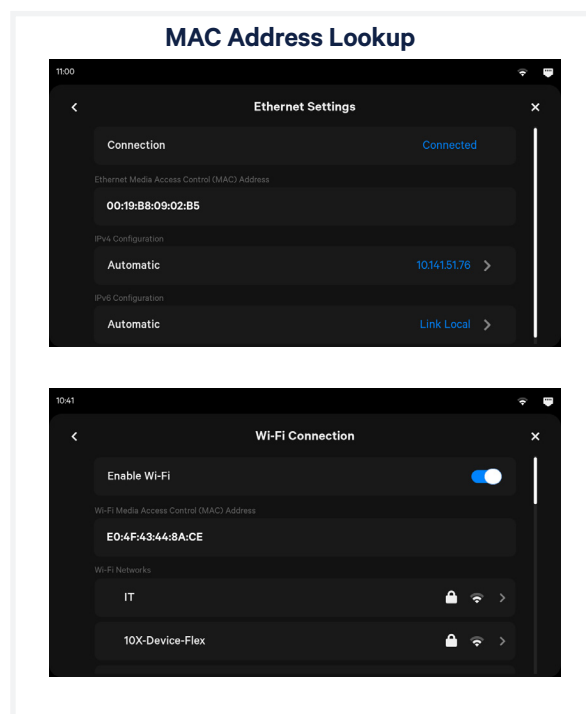
Supported Wi-Fi Authentication Schemes

The Chromium X Series supports the following Wi-Fi authentication schemes:

- Open
- WPA1
- WPA2 personal
- WEP
- EAP-PEAP

MAC Address Lookup

The Ethernet and Wi-Fi adaptors each have their individual MAC address, however, the MAC address for Wi-Fi will only appear if the instrument is connected to a Wi-Fi access point. The address can be found by navigating to the Connectivity menu and selecting either Ethernet or Wi-Fi. The MAC address will be listed right below the connection status bar, and listed as either "Wi-Fi Media Access Control address" or "Ethernet Media Access Control address". The MAC address is only visible on instruments running firmware version 1.1.0 and beyond. Instruments running older firmware versions will not see the MAC address.



Document Revision Summary

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