Quick Start Guide
Extorr XTP Series RGA

This Guide contains only the basic information needed to install your Extorr RGA. For additional information on installing and operating your RGA, please refer to the User's Manual on the Extorr website https://www.extorr.com. Section 2 covers connecting to the RGA, including an RGA whose network settings have already been changed by someone else.

1. Hardware Setup

1.1 Unpack the XTP Shipment

Carefully unpack your XTP RGA. The shipment includes these components:

1. Quadrupole Probe Assembly
2. XTP Command and Control Unit (XTP CCU)
3. XTP Host (comes attached to the back of the XTP CCU)
4. 4 inch RJ11 (6P4C) Cable, the RS-232 link between the XTP Host and the XTP CCU
5. 24V Power Supply with AC Power Cord (powers the XTP CCU)
6. 5V USB-C Power Supply with AC Power Cord (powers the XTP Host)
7. USB to Ethernet Adapter and Ethernet Cable
8. Hardware Kit Containing:
   - Copper Gasket
   - Probe Mounting Bolts
   - Plastic Screw Driver
   - Allen Wrench
   - CCU Mounting Bolts
9. Spare Parts or Optional Accessories such as a Vacuum Nipple, Replacement Filaments or an Ionizer.

1.2 Mount the Quadrupole Probe on your Vacuum System and Start Pump Down.

ATTENTION!

The Quadrupole Probe is shipped in a custom box with shock absorbing, vacuum formed plastic trays. Leave the Probe in the shipping box until you are ready to install it into your Vacuum System.

Find an unused DN 40 CF (2 ¾ inch) flange on your vacuum system. Choose a location with sufficient clearance for the Quadrupole Probe inside the vacuum system and enough space for the XTP CCU on the outside.

The Quadrupole Probe requires a vacuum port with a minimum inside diameter of 1.375 inches (about 35 mm) and clearance inside the chamber to a depth of 7 inches (about 178 mm).

The location of the XTP CCU must allow you to access the Resonating Screws (located on the sides of the XTP CCU, beneath the Plastic Hole Plugs) and the cables, which all connect to the bottom of the XTP CCU and XTP Host. If possible, mount the Probe so that the XTP CCU will be in a vertical position with the cable connections toward the bottom, below the flange position. For additional mounting information see Sections 4.1 and 4.2 of the User's Manual.

Install the probe using the new Copper Gasket and Flange Mounting Bolts in the Hardware Kit. Take care in tightening the flange bolts so that the gasket is evenly compressed.

Start your pump down procedure.

1.3 Connect the XTP CCU to the Quadrupole Probe and the XTP Host.

Attach the XTP CCU to the Probe being careful to match up the flange pins to the socket on the XTP CCU. Find the two CCU Mounting Bolts in the Hardware Kit. Insert them into the holes in the XTP CCU and hand tighten the mounting bolts.

The XTP Host comes screwed to the back of the XTP CCU (see Figure 1). Connect the two with the supplied 4 inch RJ11 Cable, from the port labeled **TO CTRL** on the bottom of the XTP Host to the port labeled **CTRL** on the bottom of the XTP CCU. This is the RS-232 link between them. The XTP Host can optionally be removed and used elsewhere with a longer RJ11 cable (see C in Step 2.4).

1.4 Connect the Power Supplies.

Connect the **24V Power Supply** (barrel jack) to the XTP CCU and the **5V USB-C Power Supply** to the XTP Host, then plug both supplies into AC wall outlets. Both connect to the bottom of the units, and may be connected in any order. To confirm the XTP Host has power, look for the red or yellow light next to its USB-C power connector. Allow up to a minute after power-up before connecting to the RGA.

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2. Connecting to the RGA

To get up and running the quickest way, go straight to Step 2.1, Fast Track.

There are three ways to connect to the RGA, shown in Figure 1: **A. Wired (Ethernet)**, **B. Wi-Fi**, and **C. Standalone** (a monitor, keyboard and mouse plugged into the XTP Host). Wired and Wi-Fi each have two variations: A1 connects straight to a PC, A2 to an existing network, B1 to the RGA's own Wi-Fi network, and B2 through your facility's Wi-Fi network.

Out of the box, the RGA's Ethernet is set to Automatic (DHCP), so A1 and A2 work, and the XTP Host broadcasts its own Wi-Fi network (B1). It does not join your facility's Wi-Fi network (B2) until it has been set up to do so. If the RGA has been used before, someone may have changed these settings, and some methods may no longer work. This section covers both cases. If you are not sure how an RGA has been set up, use A1, which works no matter how the network settings have been changed.

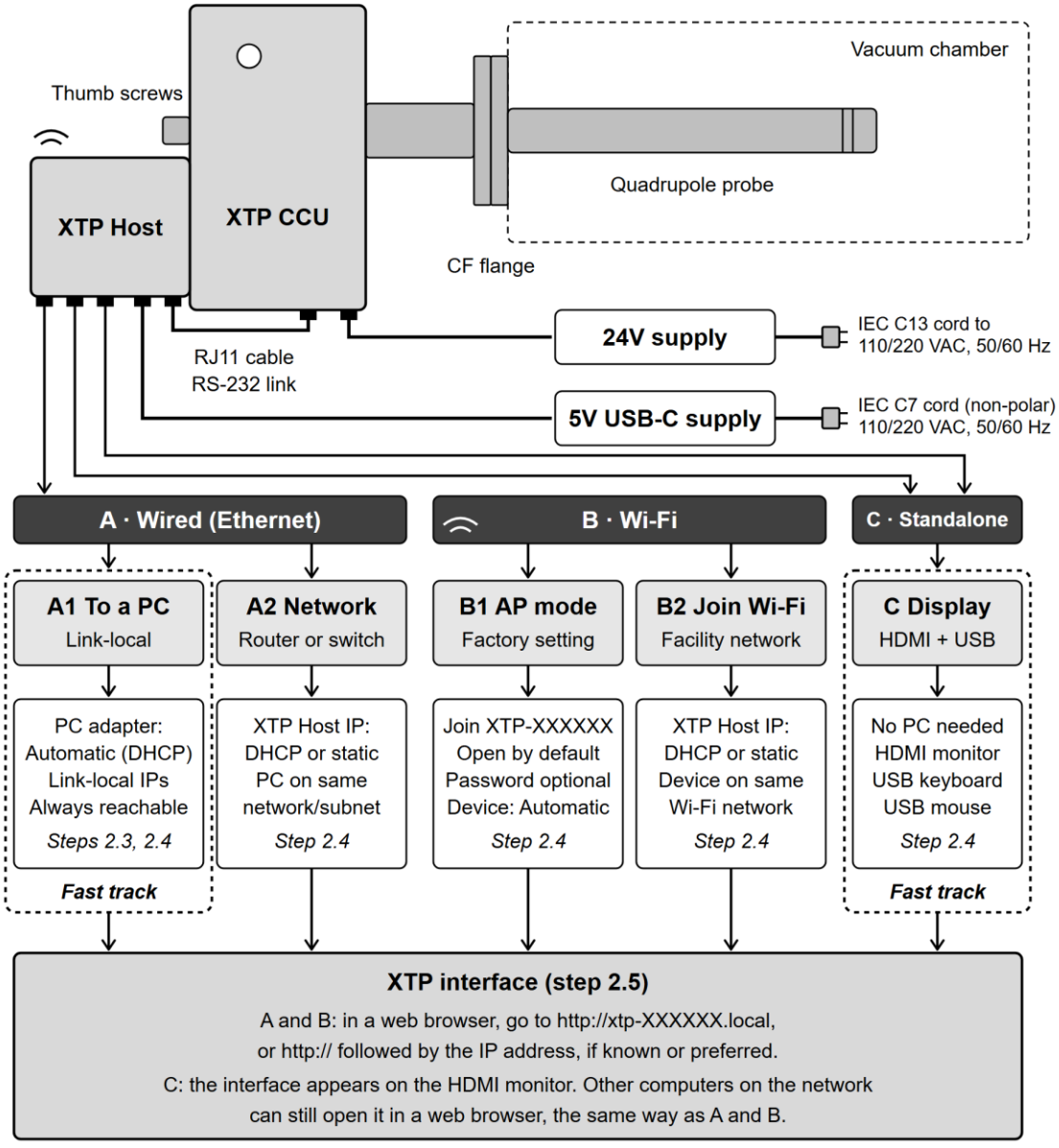


Figure 1. XTP RGA hardware and connection methods.

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2.1 Fast Track.

If you just want to get the RGA up and running, try one of these two methods first. Either can be used as a permanent setup. For other setups, such as connecting through an existing network or Wi-Fi, see Steps 2.2 to 2.6.

A1. Ethernet to a PC. Plug the supplied USB to Ethernet Adapter into your computer, and connect it to the bottom of the XTP Host with the supplied Ethernet Cable. Find the 6-digit Serial Number (S/N) on the label on the XTP Host. Open a web browser and go to http://xtp- followed by the Serial Number and .local.
For example, for S/N 123456, go to **http://xtp-123456.local**.
It can take up to a minute after the cable is connected for the connection to be set up, so if the page does not load straight away, wait and try again. If A1 does not connect, continue with Step 2.2.

C. Monitor, Keyboard and Mouse. Plug an HDMI monitor, a USB keyboard and a USB mouse into the bottom of the XTP Host. The XTP interface appears on the monitor once the XTP Host has started. Nothing else needs to be set up. If you would rather use the RGA from a desk away from the vacuum system, remove the two Phillips screws holding the XTP Host to the back of the XTP CCU, move the XTP Host, and connect it to the XTP CCU with a longer RJ11 (6P4C) cable.

2.2 Find your RGA's Hostname and Network Settings.

Each RGA has its own network name (hostname) in the form **xtp-XXXXXX**, where XXXXXX is the 6-digit Serial Number (S/N) of your RGA. The Serial Number is on the label on the XTP Host. The hostname cannot be changed, and you will use it to reach the RGA in the steps below.

All of the RGA's network settings are in the XTP interface under **System → Settings**, on the **Network** tab. From the factory they are:

Ethernet: Automatic (DHCP). The XTP Host gets an address from your network when it is plugged into one. The Ethernet port can instead be set to a static IP address. Either way, the XTP Host always keeps a link-local address (169.254.x.x) on its Ethernet port as well, which is what makes A1 work.

Wi-Fi: AP (access point) mode (B1). The XTP Host acts as an access point, broadcasting its own Wi-Fi network named XTP-XXXXXX, with no password. It can instead be set to join an existing Wi-Fi network (B2), with an automatic (DHCP) or static IP address, or turned off.

2.3 Check your Computer's Network Adapter Settings.

Every network connection on your computer is a separate network adapter with its own settings. This includes the built-in Ethernet port, a USB to Ethernet Adapter and Wi-Fi. Each adapter is set either to **Automatic (DHCP)**, which is the normal setting, or to a manual (static) IP address. The adapter you use to connect to the RGA should be set to Automatic (DHCP). Most computers are already set this way unless someone has changed them, but it is worth checking, since a wrong adapter setting is the most common reason a connection fails.

This matters most for A1. With no network present, an adapter set to Automatic (DHCP) gives itself a link-local address, which is how it finds the RGA. An adapter set to a static address does not. It will only reach the RGA if its static address happens to be on the same subnet as the RGA, and otherwise will not connect at all. Computers that have been used with other lab instruments often have an Ethernet port set to a static address. Before changing an adapter, write down its current settings so you can put them back later.

The supplied USB to Ethernet Adapter is set to Automatic (DHCP) the first time it is plugged into a computer, unless it has been changed on that computer before. This makes it an easy way around a built-in Ethernet port that has been set to a static address.

Windows 11: Open Settings, select "Network & internet", then select the adapter (for example "Ethernet"). "IP assignment" should show "Automatic (DHCP)". If it shows "Manual", click "Edit" and choose "Automatic (DHCP)".

Windows 10: Open Settings, select "Network & Internet", select the adapter (for example "Ethernet"), then click the connection. Under "IP settings", "IP assignment" should show "Automatic (DHCP)". If it shows "Manual", click "Edit" and choose "Automatic (DHCP)".

Any version of Windows: Open Control Panel, select "Network and Sharing Center", then "Change adapter settings". This lists every network adapter on the computer. (A shortcut to the same list is to press the Windows key + R, type ncpa.cpl and press Enter.) Double-click the adapter you will use to open its Status window, click "Properties", then double-click "Internet Protocol Version 4 (TCP/IPv4)". "Obtain an IP address automatically" should be selected (Figure 2).

Finding the right adapter: if you are using a USB to Ethernet Adapter, unplug it and plug it back in while watching the list of adapters. The one that disappears and comes back is the one to check. This does not work for a built-in Ethernet port.

macOS: Open System Settings, select Network, select the adapter, then click Details and TCP/IP. "Configure IPv4" should be set to "Using DHCP".

Linux: the steps depend on the distribution. For A2, B1 and B2, set the adapter's IPv4 method to Automatic (DHCP). For A1, note that some Linux systems do not fall back to a link-local address on their own; if A1 does not connect, set the adapter's IPv4 method to "Link-Local Only".

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Changing adapter settings needs administrator rights. On a company-managed computer you may need your IT department to make the change, or you can use a different computer.

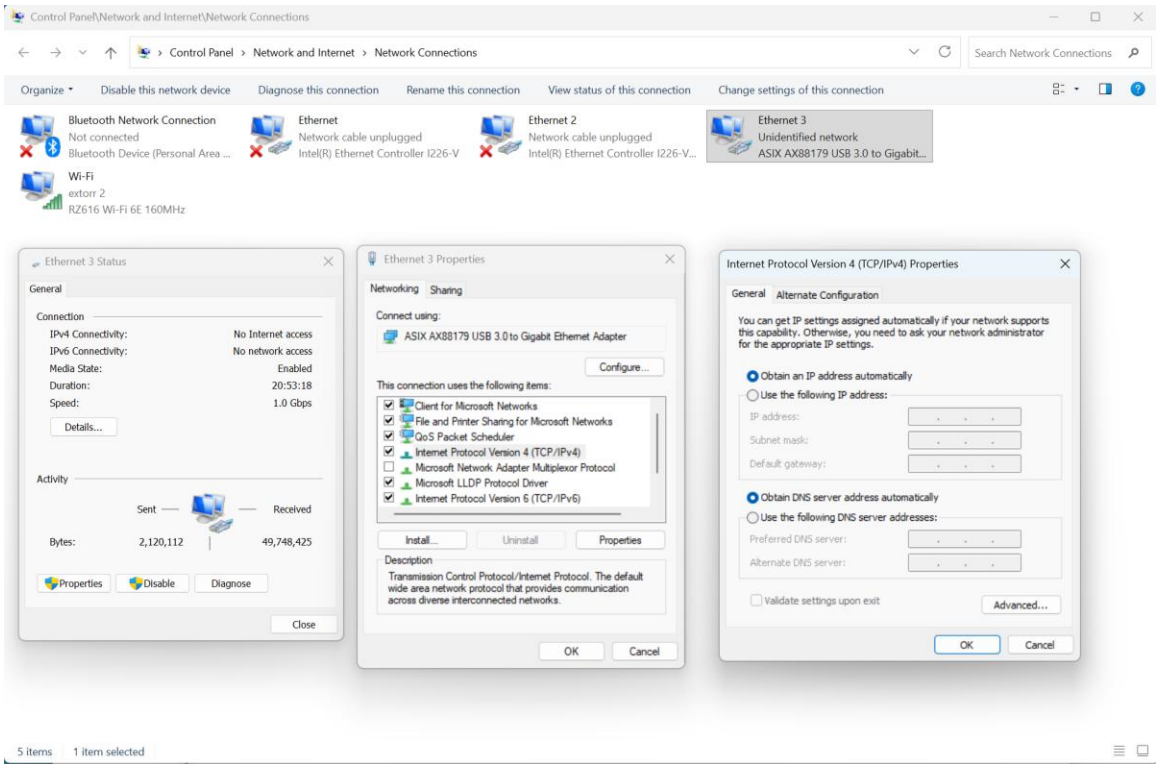


Figure 2. Windows adapter settings: the adapter (here a USB to Ethernet Adapter), its Status and Properties windows, and IPv4 set to obtain an IP address automatically.

2.4 Connect to the RGA.

Use any of the methods below. All cables connect to the bottom of the XTP Host. The RGA uses IPv4 only.

A. Wired (Ethernet)

A1. To a PC (recommended). Plug one end of the supplied Ethernet Cable into the XTP Host and the other end into your computer's Ethernet port, or into the supplied USB to Ethernet Adapter. No router or network is needed. With your computer's adapter set to Automatic (DHCP) (Step 2.3), the XTP Host and your computer each give themselves a link-local address (169.254.x.x) and find each other by hostname. This can take up to about a minute after the cable is connected.

The XTP Host always keeps its link-local address, even if its Ethernet has been set to a static IP address or Wi-Fi has been turned off. This means A1 works no matter how the RGA has been set up. If it does not work, the cause is almost always the computer's adapter settings (Step 2.3), or less often its name lookup (Step 2.5).

A2. To a Network. Connect the XTP Host to a router, network switch or wall jack with an Ethernet cable. Your computer must be on the same local network. How the RGA is reached depends on its Ethernet setting:

Automatic (DHCP), the factory setting: the XTP Host gets an address from the network's DHCP server and is reached by hostname.

Static IP address: the XTP Host uses the address it was given and is reached by hostname or by that address. The address must suit the network it is plugged into. If it does not, the RGA cannot be reached this way. Use A1 to correct the setting.

Some company networks block the hostname lookup used in Step 2.5. If you cannot reach the RGA by name, use its IP address (your IT department can find it), or use A1.

B. Wi-Fi

Your computer, tablet or phone's Wi-Fi adapter must be set to Automatic (DHCP), which is almost always the case for Wi-Fi.

B1. AP Mode (factory setting). The XTP Host acts as a Wi-Fi access point (AP), broadcasting its own Wi-Fi network named XTP-XXXXXX. Open the Wi-Fi settings on your device and join it (Figure 3). From the factory there is no password. If someone has added one, you will need it, or use A1 or C. While connected to the RGA's Wi-Fi, your device may not have internet access.

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B2. Join a Wi-Fi Network. The XTP Host joins your facility's Wi-Fi network instead of broadcasting its own. As with Ethernet, it gets its address from that network automatically (DHCP) or uses a static IP address, and is reached by hostname or IP address from devices on that network, as in A2.

To switch between B1 and B2, add a password to the RGA's own network, or turn Wi-Fi off, go to **System → Settings**, on the **Network** tab. Wi-Fi is turned off by setting the Wi-Fi drop-down to "Off".

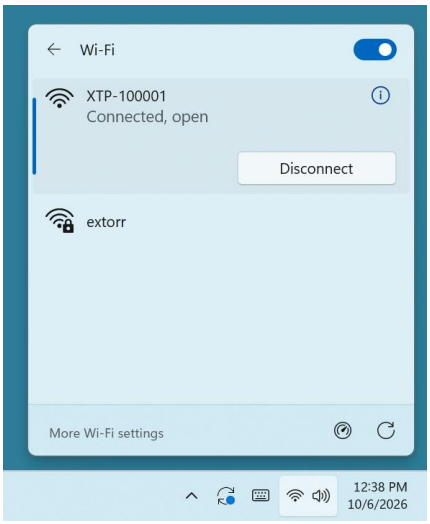


Figure 3. Windows connected to the Wi-Fi network of an RGA in AP mode (B1).

C. Standalone (Monitor, Keyboard and Mouse)

No computer is needed. Plug an HDMI monitor, a USB keyboard and a USB mouse into the XTP Host. The XTP interface appears on the monitor. This works regardless of the network settings, and other computers can still connect using A or B.

To use the RGA from a desk away from the vacuum system, the XTP Host can be moved. Remove the two Phillips screws holding the XTP Host to the back of the XTP CCU, place the XTP Host where you want it, and connect it to the XTP CCU with a longer RJ11 (6P4C) cable in place of the supplied 4 inch cable.

2.5 Open the XTP Interface.

With C, the interface is already on the monitor. With A or B, open a web browser (Chrome, Edge, Firefox or Safari) and type **http://xtp-XXXXXX.local** into the address bar, replacing XXXXXX with your RGA's Serial Number. If you know the RGA's IP address, or prefer to use it, type http:// followed by the address instead. Be sure to include "http://", otherwise some browsers will run a web search instead of opening the RGA. The XTP interface opens in the browser (Figure 4).

Windows 10 and 11, macOS, iOS and most Linux systems find ".local" names automatically. On older versions of Windows, try **http://xtp-XXXXXX** without the ".local". Windows 7 or newer with an up-to-date web browser is required. Finding the RGA by name relies on mDNS, which modern operating systems include by default. If the RGA can be reached by its IP address but not by name, name lookup on the computer is the likely cause.

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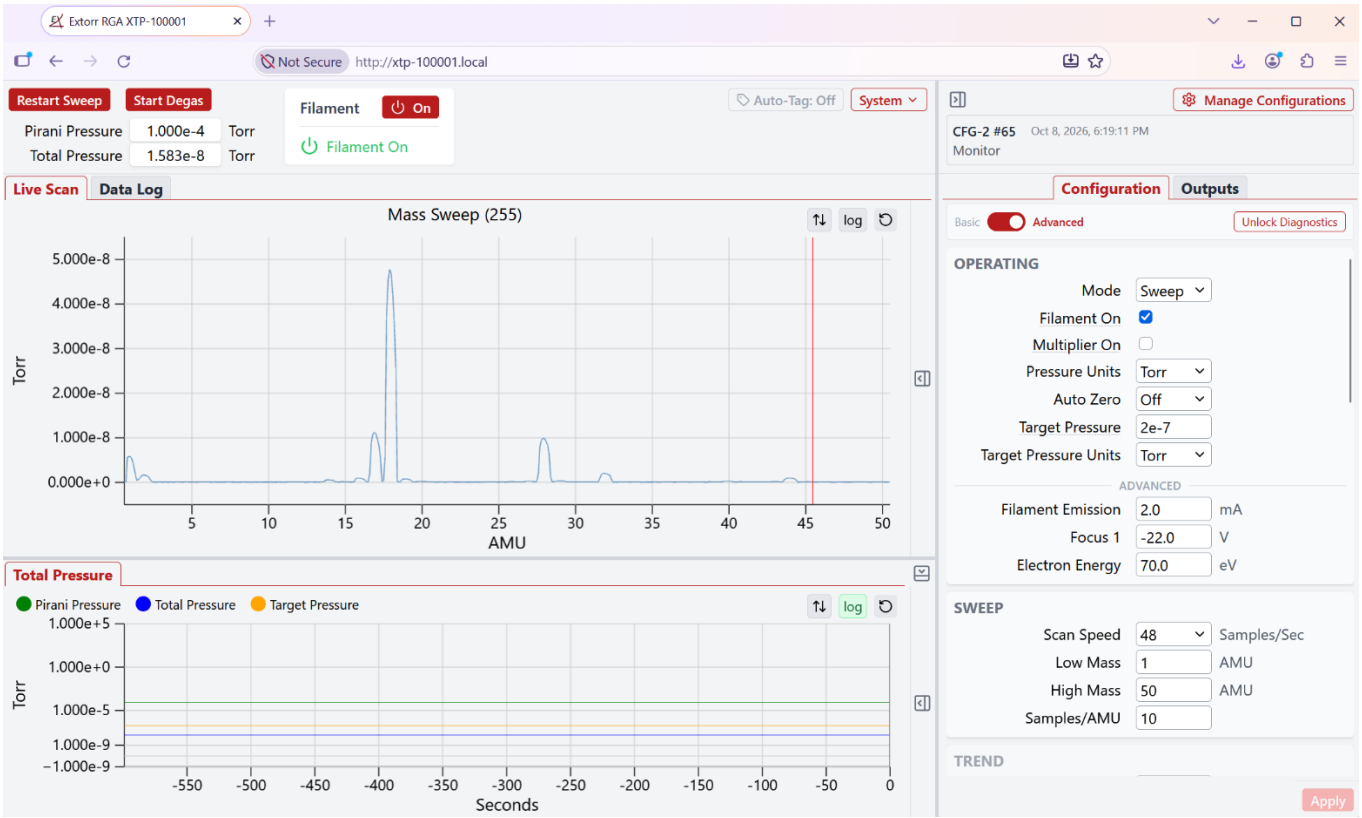


Figure 4. The XTP interface in a web browser at http://xtp-100001.local. (S/N 100001)

A note on Wi-Fi: from the factory, the RGA's Wi-Fi network has no password, so anyone nearby can join it and use the RGA. Once you are up and running, add a Wi-Fi password, or turn Wi-Fi off if you do not use it. Either takes a minute under System → Settings, on the Network tab.

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2.6 If You Cannot Connect.

First check the basics. Make sure the Ethernet cable is connected at both ends and the XTP Host is powered, then wait a minute and try again. If your computer is connected to a VPN, disconnect it. When using A1, temporarily turn off your computer's Wi-Fi so that it does not look for the RGA on the wrong network.

If someone else has set up the RGA and you do not know its settings, use this table:

If the RGA is set to…	Connect using…
Factory settings (new RGA)	Any method: A1, A2, B1 or C.
Ethernet: Automatic (DHCP)	A1, or A2 on a network with a DHCP server.
Ethernet: static IP address	A1, or A2 from a computer on the same subnet (by hostname or IP address).
Wi-Fi: AP mode with a password	B1 with the password. If you do not know it, use A1 or C and change it.
Wi-Fi: joined to a network	B2 from a device on that Wi-Fi network, or A1 or C.
Wi-Fi: off	A1, A2 or C.
Unknown	**A1, with your computer's adapter set to Automatic (DHCP) (Step 2.3), or C.**

Once connected, you can view and change all of the RGA's network settings under System → Settings, on the Network tab.

Restoring the Network Settings to Factory Defaults. This should rarely be needed, since A1 works whatever the network settings are. To reset them, plug a USB keyboard into the XTP Host, power on the XTP Host and wait 20 seconds. Then press and hold **Left Ctrl + Left Shift + Left Alt + G + U + L** together. The light next to the XTP Host's power connector normally changes from yellow to red, and the XTP Host restarts on its own. This returns the network and time settings to their factory defaults. It does not affect the RGA configuration or saved mass spectra.

3. Operation

3.1 Obtain your First Mass Spectrum.

The factory configuration for your RGA is stored in the RGA. The RGA starts scanning automatically in the Mass Sweep Mode from 1 amu to the highest rated mass of the system. The Pirani Pressure reading is updated during the mass sweep. If the chamber pressure is below $3x10^{-2}$ torr, the ion gauge will turn on. When the chamber Total Pressure (Ion Gauge) reading is below $5x10^{-3}$ torr, the quadrupole will start to operate.

A Mass Spectrum should be displayed in the Mass Sweep Graph after several complete scans.

The RGA will initially keep the filaments on for up to 120 seconds (2 minutes) so that the Ion Gauge can measure the vacuum chamber pressure. If the measured Total Pressure is greater than the "Target Pressure" setting, the RGA will turn the filaments off (put them to Sleep) to preserve the life of the Filaments and Ionizer. The Filaments will immediately go to sleep if the vacuum chamber pressure is above about $5x10^{-3}$ torr. While the filaments are asleep, a "Filament Asleep" indicator is shown at the top of the screen along with a counter showing how long they have been asleep.

If a Mass Spectrum is not shown, the most likely cause is that the Vacuum pressure is not low enough for the RGA to operate. This may be the result of an Air Leak or the system may just need additional time to pump down.

Check that the Pirani Pressure reading is below $3x10^{-2}$ torr and the Total Pressure (Ion Gauge) reading is below $5x10^{-3}$ torr. If the pressure readings are correct, check that the Filament switch on the top panel is set to "On". The filaments can also be controlled from the Configuration panel on the right side of the screen, which holds all of the other operating parameters. Electrical shorts on the Quadrupole Probe may also keep you from getting a Mass Spectrum. Refer to the User's Manual for additional information.

All spectra and configuration changes are saved automatically in the RGA.

For additional information on Operating your RGA see Sections 5 and 6 of the User's Manual.

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