

XIA LLC



UltraLo-1800 Alpha Particle Counter

Installation Guide

Version: 1.0

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1. Introduction

This document is designed to guide the new UltraLo-1800 customer through the installation of the counter. The counter and its packaging are designed to make this process as simple as possible, but it requires a small number of steps, which will be explained below.

2. Uncrate

The first step is to get the counter and its components out of the packaging. The box is held closed by two plastic straps, which can be cut with a pair of scissors or wire cutters. There are also four clips holding the front door closed which need to be released. The door can then be folded down. Lower it gently, it becomes the ramp that the counter will roll down.

The crate has 4 main chambers, each covered with foam. The top left contains the laptop and support box. The top middle contains the kit box, which holds the cables and tubing that will be used to connect the support box to the counter, as well as the packing list and calibration report. The top right contains the side fairings. The large lower chamber contains the counter body strapped to a dolly, with sample trays underneath. (All of these parts are described in the User Manual, starting on page 25.)

The first step is to carefully roll the counter and dolly down the ramp. It will take a bit of effort to get the dolly over the hump created by the hinges, but be careful to keep the dolly under control as it

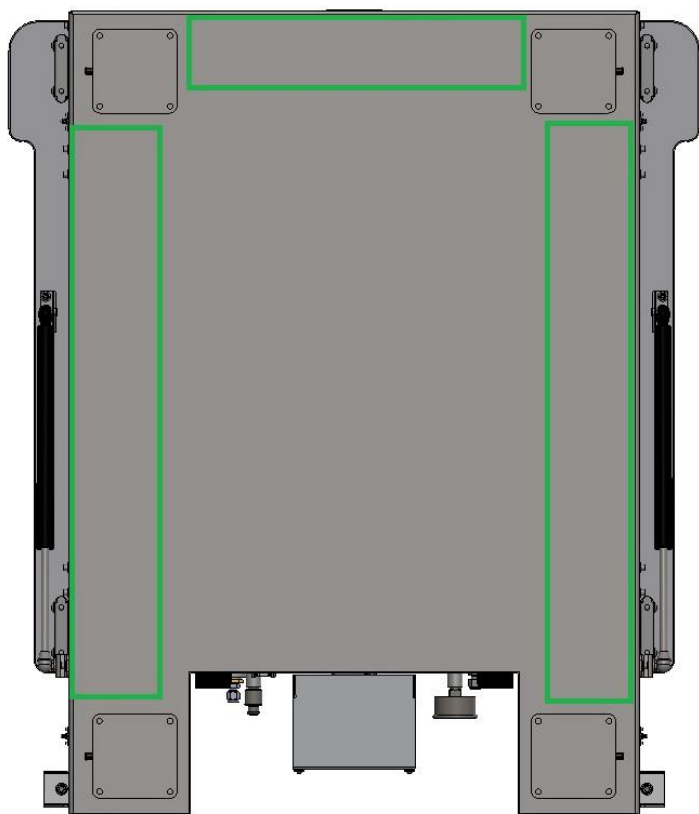


Figure 1: (Left) Bottom of counter with areas safe for holding marked in green. (Right) Example of how to lift counter.

moves down the ramp. Once down the ramp, the packaging (the straps holding the counter on the dolly, some plastic shrink wrap, and a moving blanket) can be removed and stored in the crate. The counter and the various ancillary parts should now be moved to where they will be installed. Once they're there, remove the tray from underneath the counter and set it aside.

The next step is to lift the counter onto the table or bench that will house it. Exactly how this is performed will depend on your company's safety standards, at XIA we either use four people or a specially padded forklift. Consult with your safety department about the proper procedure, keeping in mind that the main counter body weighs approximately 350 lbs. The appropriate locations for holding while lifting the counter are shown in Figure 1. While locating the counter on its table remember that you need 30" clearance in front of it for the tray, and 23" of table space behind the counter for the support box. (See Figure 2 for diagram of clearances required.) Once the counter is on the table you can attach the side fairings. Remove the blue tape and then simply press them on. If you want to bolt the counter to the table, you should do so now. You should also check the air level in the inflatable feet, which is detailed in the User Manual, page 32.

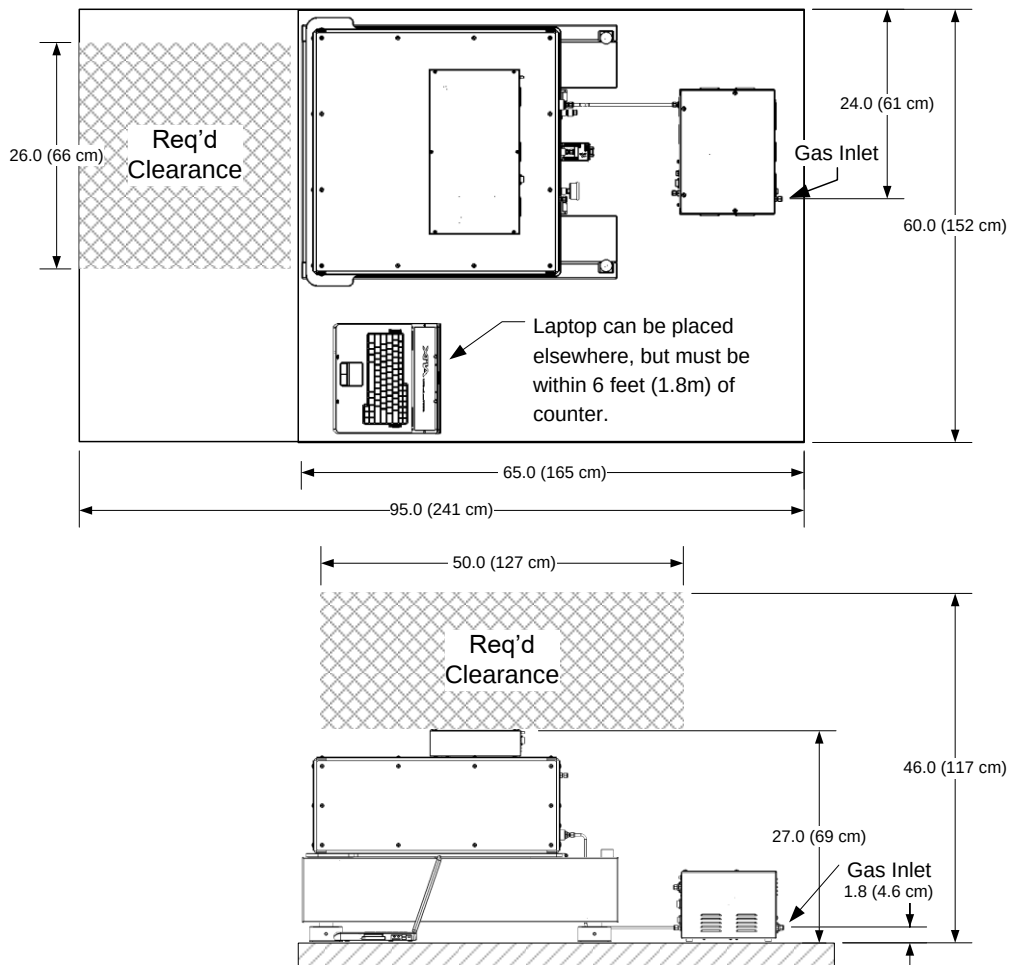
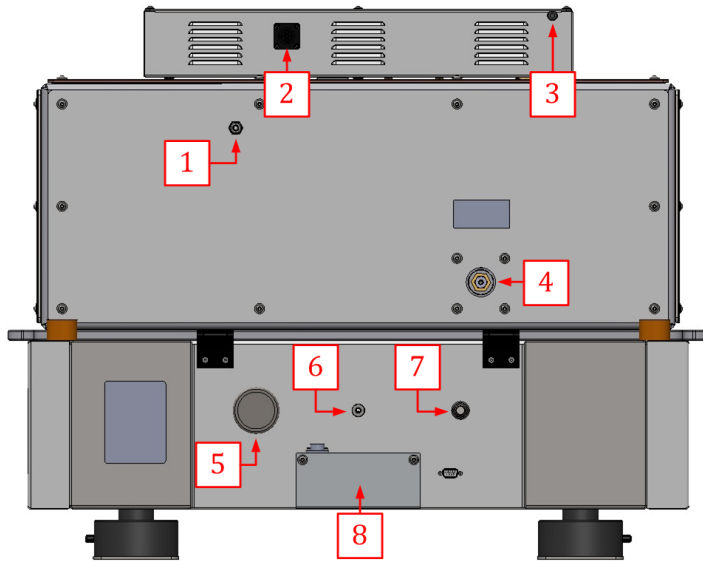
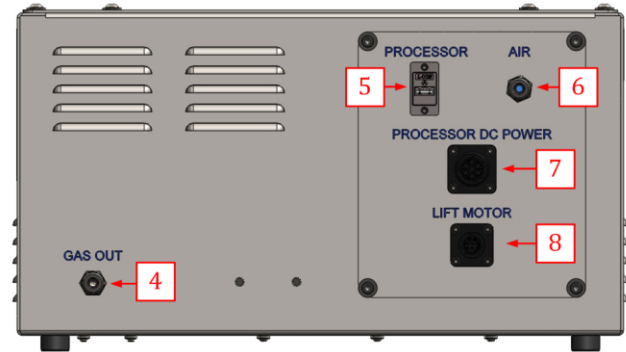


Figure 2: Required clearances for UltraLo-1800.

Counter



Support Box



Connection	Number on Counter	Number on Support Box	Cable Name	Part Number
Argon to Counter	4	4	Rigid Steel Tube	30001350
Processor Power	2	7	PRCS DC	64000507
Motor	8	8	MOTOR	64000520
USB	3	5	Optical USB	60052219
Air	1	6	Polytube Air	NA
Normal Gas Exhaust	6	-	By customer	-
Exhaust Check Valve	7	-	-	-

Table 1: How to connect the counter to the support box.

3. Connect

Now we'll be connecting the support box to the counter. There are five counter-to-support-box connections, two for gas and three for electronics. See Table 1 for a summary of how to connect them.

The rigid steel tube should be connected first, as it is completely rigid and determines the position of the support box. The easiest way to get the positioning right is to loosely connect the tube to the counter (4), allowing it to move somewhat freely. Then position the support box so that the other end of the tube can easily slide into the Swagelok connection labeled "GAS OUT" (4). Then tighten the nut with your fingers. Move the support box until both nuts (on the support box and on the counter) go in easily. Afterward, connect using the standard method ([see page 10 of this document](#)), which will require two 9/16" box wrenches and one 5/8" box wrench.

Next you will finish the connections between the support box and the counter. The cable marked "PRCS DC" connects between the connector on the support box marked "PROCESSOR DC POWER" (7) and the electronics box on the counter (2). The cable marked "MOTOR" connects between the

connector on the support box marked “MOTOR” (8) and the motor enclosure (8). The USB cable connects between the USB type B port on the electronics box (3) and the USB type A port on the support box, marked “PROCESSOR” (7). The final connection is for purge air, simply connect the blue flexible tubing between the support box outlet marked “AIR” (6) and the input on the rear panel of the counter (1).

The next step is to connect your external gas supply to the counter. The only requirement is that the connection uses ¼” metal tube (it can be either copper or stainless, depending on your preference). Now that the support box is positioned, you simply need to adjust the path of the connection tube so that you can connect it to the counter using the fitting included on the Swagelok connector marked “GAS IN”. This will be done via the standard method, and using one 9/16” box wrench and one 5/8” box wrench.

The gas from the counter will exhaust out the back, both out of the normal gas exhaust (6) and an overpressure check valve (7). Because the flow rate is so low this exhaust poses a very low danger to personnel in the room, but many customers choose to vent it to the outside out of an abundance of caution. To do this connect to the normal exhaust using ¼” stock of your preferred tubing type, and vent it per your standards. The venting solution should not draw too forcefully on the counter, otherwise it will be under negative pressure and draw room air into the counting volume. Similarly if there’s significant positive pressure to overcome, the counter may build up internal pressure. The pressure gauge on the rear of the counter will be helpful in determining if there are issues with the venting solution. It should be low during normal use, around or above 1” water while purging, and pressure should rise quickly if the normal exhaust port is closed.

Before finishing the connections, you need to pick a location for the laptop. Its location is constrained by the length of the included USB cable, which is about 72” long. It can go anywhere in that range except on top of the counter. At XIA we typically put the laptop on top of or next to the support box, but the geometry of your setup will likely determine the optimal location.

4. Use

Once the laptop is set up and the USB cable plugged in, plug the standard computer power cable into the support box and into an electrical outlet and power up the counter via the switch on the rear of the support box. Then power up the laptop via its power button. (As an aside, we highly recommend connecting the laptop to the internet. Updates to CounterMeasure, the UltraLo-1800’s software and firmware, will be delivered through our website, and we will issue new updates periodically.) Once the laptop has booted up, log onto the “UltraLo” user, which normally ships with no password (but may occasionally ship with the password “ultralo”) . You can create a password if you wish, but you should use this user to run CounterMeasure as important files are stored on a per-user basis and will not be found if you try to run CounterMeasure from a new user. If you wish to create a new user, people contact us at support@xia.com.

Once logged onto the UltraLo account, double-click the CounterMeasure icon on the desktop to launch CounterMeasure. If CounterMeasure has trouble connecting to the counter, check the User Manual, page 59, for troubleshooting tips. If difficulty persists please contact us at support@xia.com.

Once CounterMeasure is running, hit the eject button to eject the tray. Remove the 8 metal blocks from their bag and install them with the side marked “1.440” up. Then remove the perforated support tray from its wrapping and place it on the blocks. Finally, remove the sample tray from its packaging and place it on top of the support tray. See Figure 3 for a diagram. Both trays should fit flatly and snugly into the drawer and lie below its upper edge. Then place the silicon wafer “source” on the center of the tray, push the drawer back firmly, and use CounterMeasure to retract the tray.

The next step is to check the noise. Open the Diagnostics panel via Ctrl+D or *Tools->Diagnostics*. Click the play button to take a trace. (For more on the Diagnostics Panel see page 40 in the User Manual.) Take several traces on both the anode and guard, the trace should look like a sine wave with an amplitude of 10-20 ADC. Once that looks good, close the Diagnostics Panel and hit the play button on the Main Panel to start a run. Enter 10 minutes for the run time and hit “Start Run”. It will purge for 45 minutes. After the purge finishes, open the Analysis Panel via Ctrl+Z or *Tools->Analysis*. (For more on the Analysis Panel see page 38 in the User Manual.) Because there is a source in the counter, after a few minutes a clear cluster of events should appear. In all likelihood, after shipping the counter risetimes will be low, resulting in yellow “Mid-Air” classifications instead of red “Alpha” classifications. The counter will dry out in a few days (unless the shipping process was unusually long, in which case it could take as long as a few weeks). In the meantime keep doing short source runs (10 minutes to 1 hour), and when the events are regularly all classified as alphas the counter is ready for use with your samples. If this process takes more than a few days, contact XIA at support@xia.com for advice.

And that’s it! Your UltraLo-1800 is now ready to use. Happy counting!

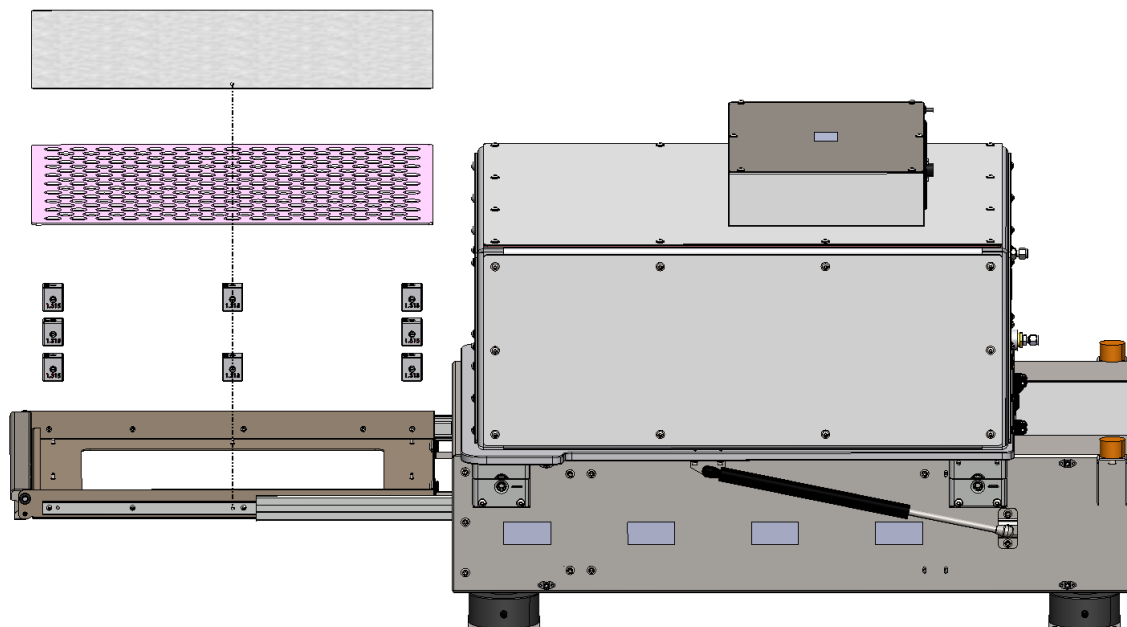


Figure 3: Tray Explode Diagram

Checklist

Use the checklist below to ensure that you have made all installed the UltraLo-1800 counting system correctly. If you have any questions regarding the items in the checklist, please contact XIA at support@xia.com.

Date verified	Requirements
Pre-Installation	
	All checklists from UltraLo-1800 “Site Requirements & Planning” document have been completed and signed.
Table Mounting	
	Air level in (4) vibration isolation feet is appropriate, per User Manual (p. 32)
Laptop Location	
	<i>Laptop is not located atop UltraLo-1800 counter module.</i> Laptop is located appropriately such that USB cable is connected to rear of Support Box and laptop power is connected to outlet.
Electrical Connections	
	3 electrical cables (PNs: 64000507, 64000520, 60052219) are securely connected between Counter Module and Support Box, per Table 1.
	Support Box power cable (PN: 60051005) is plugged into rear of Support Box, and into appropriate outlet.
Gas Connections	
	Rigid Steel Tube (PN: 30001350) is installed between Counter Module and Support Box, per Table 1, and is gas tight.
	Air polytube is installed between Counter Module and Support Box, per Table 1.
	Included Swagelok connector is installed onto your external gas supply tube, and connected to the ‘GAS IN’ connector at rear of Support Box. This connection is gas tight, and the external gas supply is turned on.
Tray Installation	
	Laptop is powered on, UltraLo-1800 is powered on, CounterMeasure is started and connected to hardware.
	Tray is ejected, 8 cubes (PN: 30001324) installed on mounting pegs with 1.440” marking facing up. Perforated tray support and tray installed, and lie below upper edge of drawer.