PICARRO AUTOSAMPLER

Installation, Training, Operation, Maintenance

User's Manual

*This manual is supplementary to the "Operation, Data Analysis, Maintenance, Troubleshooting | L2130-*i* or L2120-*i* Analyzer and its Peripherals" User's Manual and the "Installation | L2130-*i* or L2120-*i* Analyzer and its Peripherals" User's Manual

PICARRO

User's Manual

Thank you for purchasing a Picarro product. Your Picarro Autosampler is a quality product that has been designed and manufactured to provide reliable performance.

This manual is an important part of your purchase as it will help familiarize you with the Autosampler and explain the numerous features that have been designed into it. Please read this manual thoroughly before using your Picarro Autosampler.

Please contact Picarro or your authorized Picarro distributor should you have questions regarding specific applications or if you require additional information.

Contact information:

>   Website: www.picarro.com

>   Email: support@picarro.com

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Picarro, Inc. has prepared this manual for use by its customers as a guide for the proper installation, operation and/or maintenance of the Picarro Analyzer.

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See **Appendix Y** for information on getting technical support from Picarro.

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INTRODUCTION

In this section we provide details on the most relevant installation and operation of the Picarro Autosampler with the Picarro L2120-*i* or L2130-*i.* If things don't work as planned, contact us (support@picarro.com). Always purchase additional syringes if you plan to reprogram methods – damaged syringes caused by unexpected travel are the cause of most common failures.

During normal operation of the analyzer the autosampler is controlled by a coordinator software running on the computer installed in the Picarro analyzer. This software coordinates sample injections with the Picarro instrument and eliminates the need for user intervention during automated multiple sample runs. However, there are some one-time set up and once-per-run operations which will need to be performed directly with the Autosampler software, these are described in this section of the documentation.

When the autosampler is running, either during manual set up or under the control of the coordinator software, the autosampler robot will move rapidly and automatically as part of its normal operations. Keep yourself and all non-sample related items outside of the way of the autosampler robot arms at all times to prevent injury or damage to the equipment.
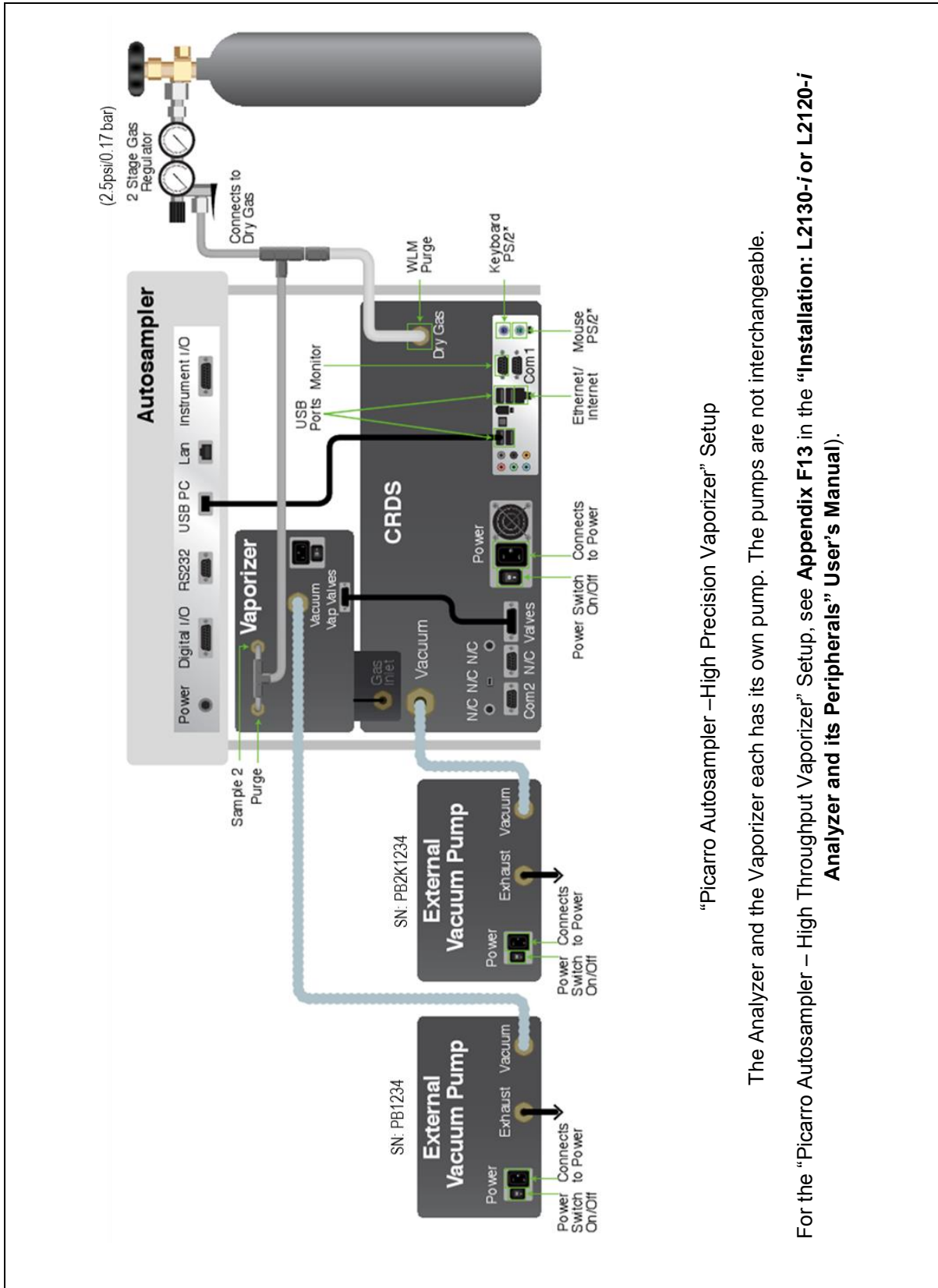
⚠️	**Alert!** Manual interference with the robotic arm during its movement can cause great damage to the Autosampler! One of the most common cases is a damaged z-lock of the arm that controls the up and down movement.

FACTORY DEFAULT

The Picarro analyzer is delivered with a single method and job. The factory default method (named 'Picarro') was used to verify instrument performance specifications and is recommended for general use.

The factory default job delivers 6 injections from vial number 1 of the tray provided with the instrument. The default job may be easily modified to deliver injections from all sample vials in the tray. Instructions can be found in this chapter under 'Autosampler Jobs'.
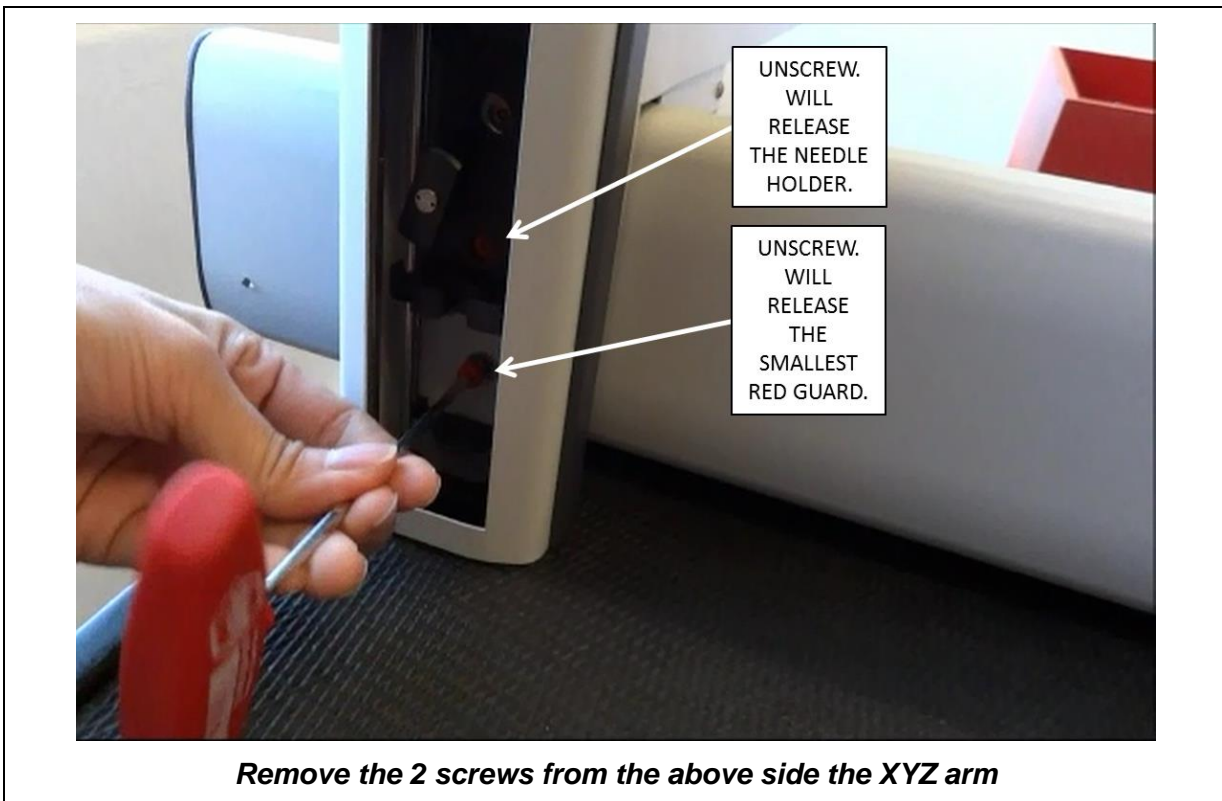
Step 1: Set up the Analyzer with its external vacuum pump (see **Appendix F2** in **"Installation: L2130-*i* or L2120-*i* Analyzer and its Peripherals" User's Manual**).

The Analyzer and the Vaporizer each has its own pump, and are not interchangeable

Step 2: Unpack the Picarro Autosampler box.
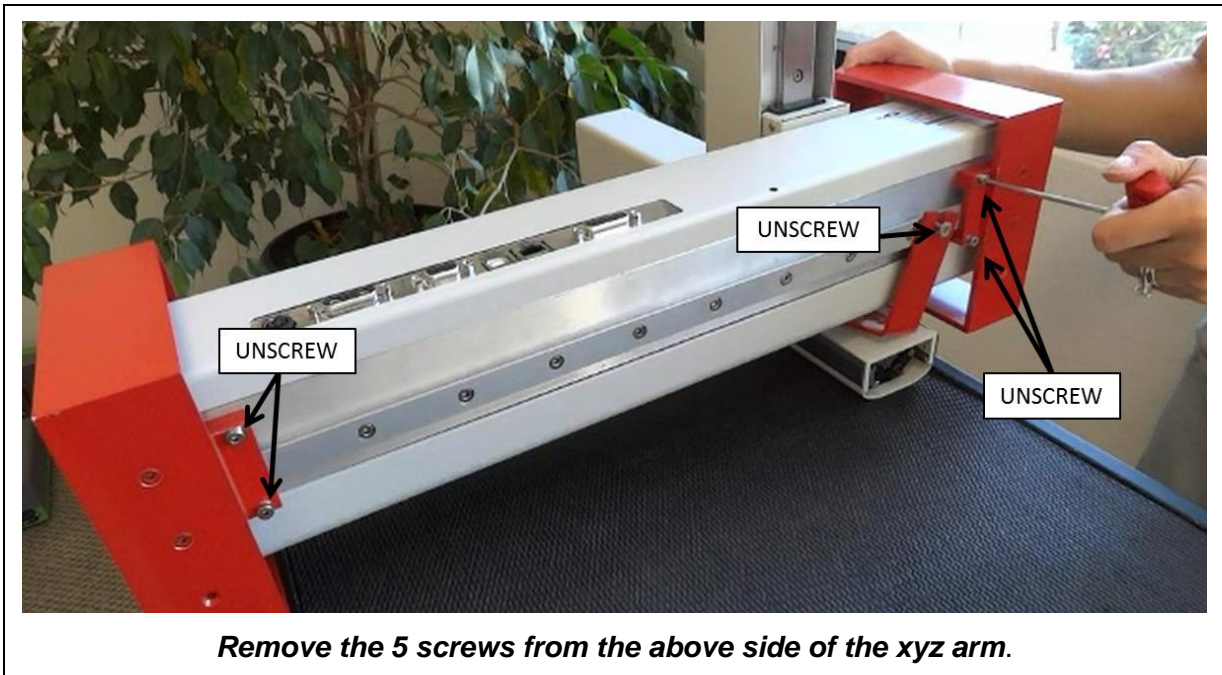

Picarro Autosampler parts and tools.

"Picarro Autosampler – High Precision Vaporizer" Setup

The Analyzer and the Vaporizer each has its own pump. The pumps are not interchangeable.

For the "Picarro Autosampler – High Throughput Vaporizer" Setup, see **Appendix F13** in the "**Installation: L2130-*i* or L2120-*i* Analyzer and its Peripherals" User's Manual**).
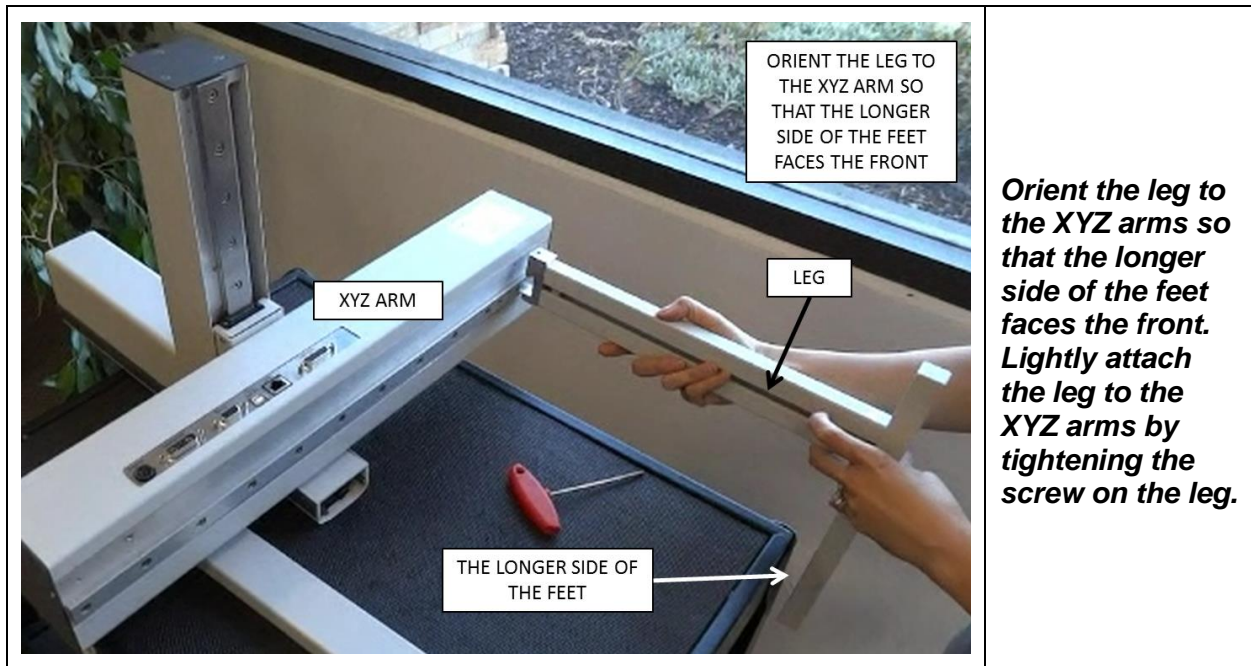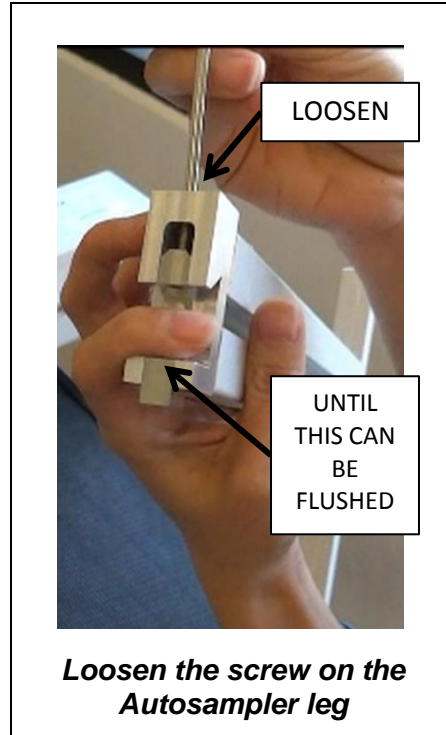
Step 3: Remove the **RED** metal guards from the XYZ arms by removing the screws.

UNSCREW

UNSCREW

UNSCREW

Remove the 5 screws from the above side of the xyz arm.

UNSCREW. WILL RELEASE THE NEEDLE HOLDER.

UNSCREW. WILL RELEASE THE SMALLEST RED GUARD.

*Remove the 2 screws from the above side the XYZ arm*

Step 4: Attach the two legs to the XYZ arms. Make sure to leave room between the legs so that the analyzer can fit in between legs. For now, keep the connection between the XYZ arms and two legs loose (the distance between the legs may need to be readjusted later).


LOOSEN

UNTIL THIS CAN BE FLUSHED

Loosen the screw on the Autosampler leg

ORIENT THE LEG TO THE XYZ ARM SO THAT THE LONGER SIDE OF THE FEET FACES THE FRONT

XYZ ARM

LEG

THE LONGER SIDE OF THE FEET

Orient the leg to the XYZ arms so that the longer side of the feet faces the front. Lightly attach the leg to the XYZ arms by tightening the screw on the leg.

Step 4: Place the Autosampler over the analyzer. The Autosampler is heavy, and may require two people to move it. Hold the YZ axis steady while moving the Autosampler.
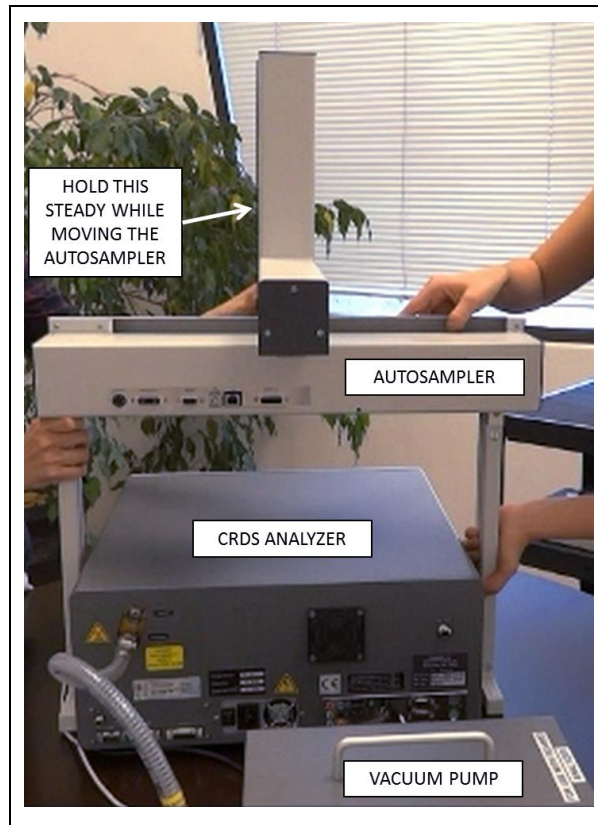

Step 5: Adjust the location of the two legs so that they hug the analyzer.
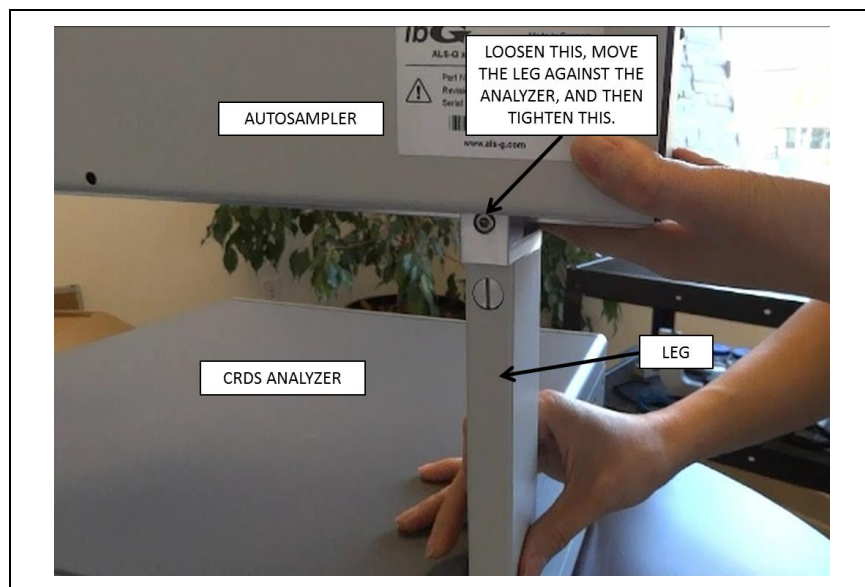
Step 6: Set up the waste port, wash stations, and the tray. First gather the station holder, waste station, two wash stations, tray, and the tray holder. Second, attach the two holders to the

Autosampler the same way you had attached the legs to the XYZ arm in the previous steps. For now, keep the connections lose. You may need to readjust their locations to fit the Vaporizer later. See the images below for more information and for relative locations of the holders.
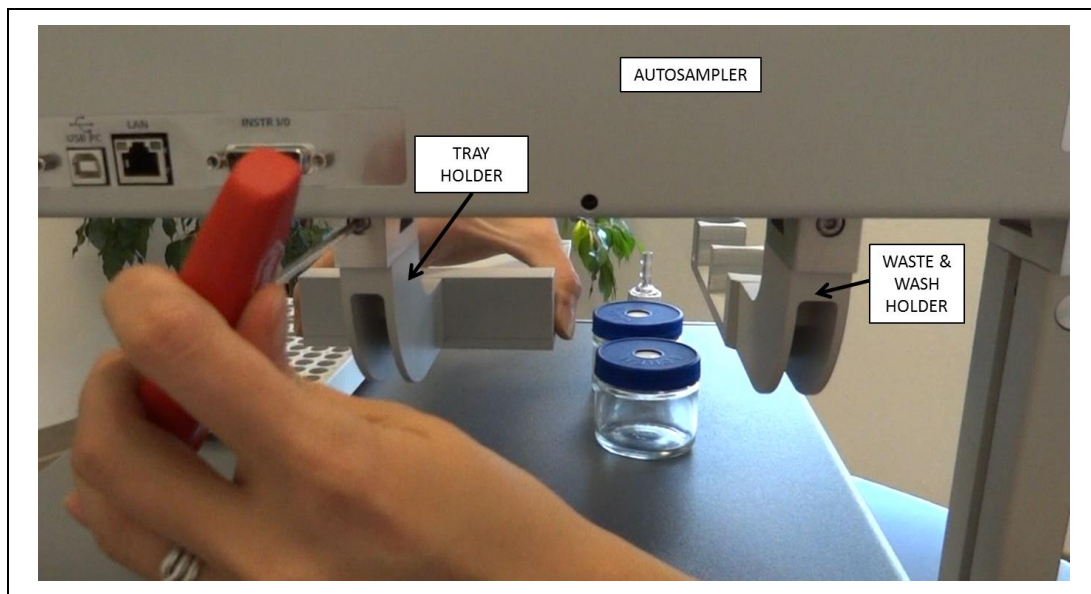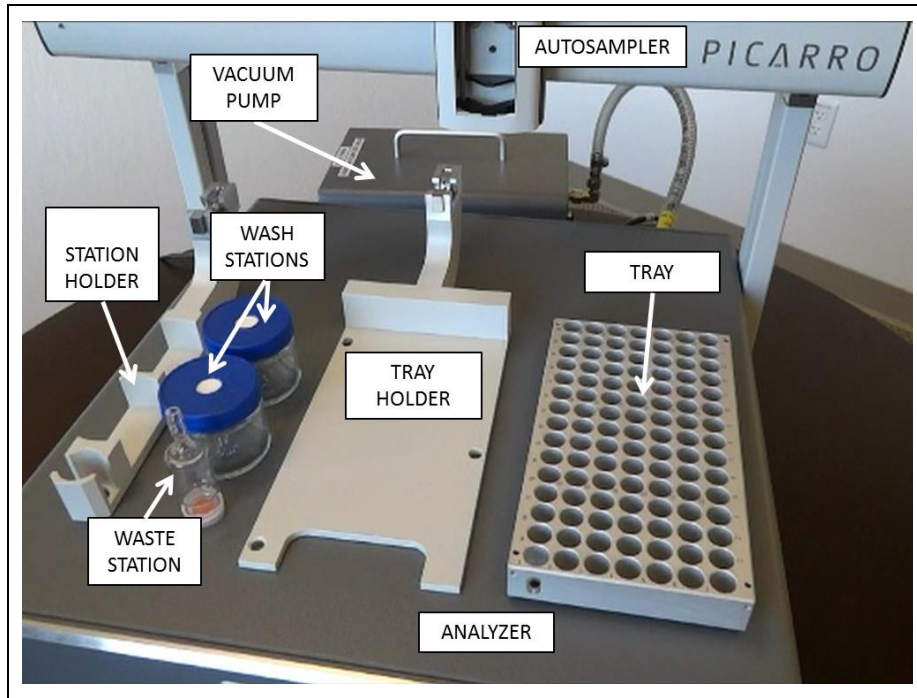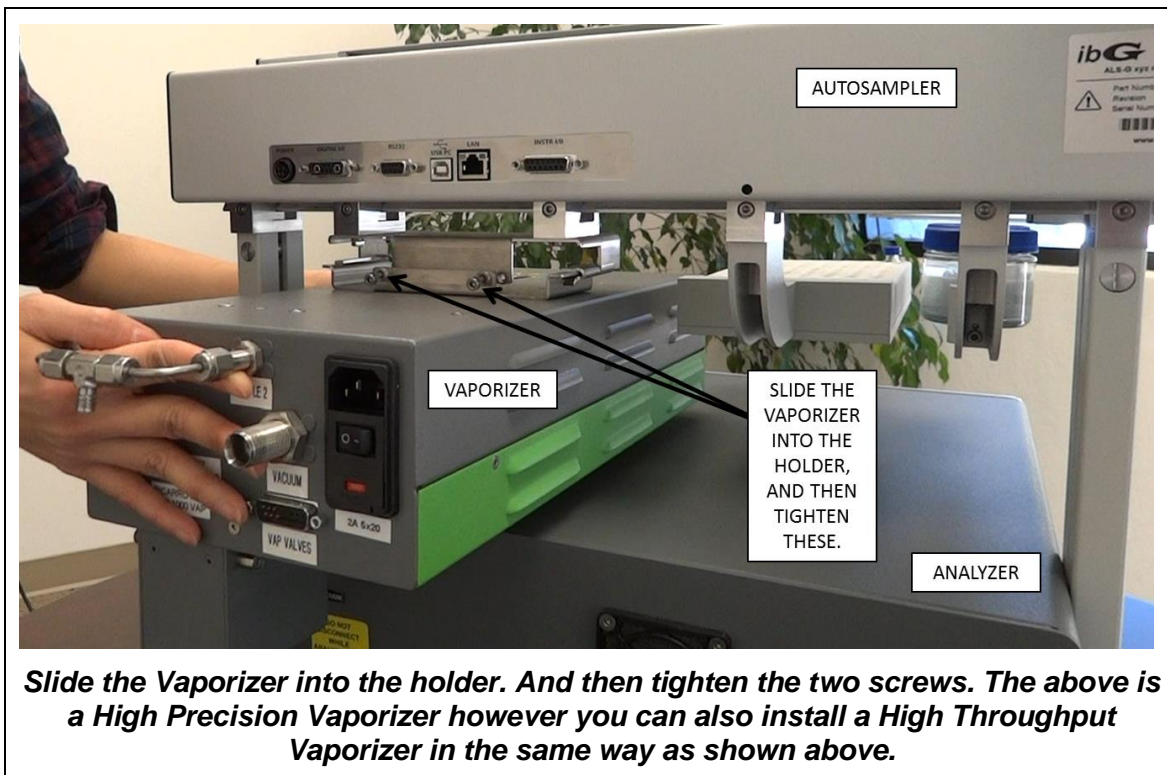

Step 7: Set up the vaporizer (**If installing the High Throughput Vaporizer, skip the following Step 7 – Step 12**). First, remove the holder that comes attached to the Vaporizer, and then attach the holder to the Autosampler the same way you had attached the legs to the XYZ arms in the previous steps.

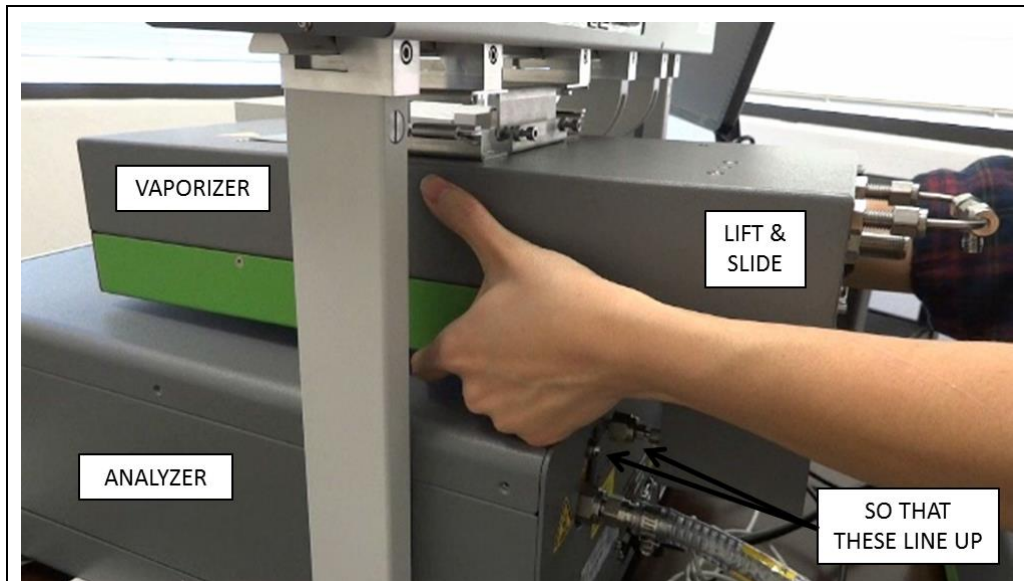*Remove the holder from the vaporizer*

Attach the holder to the Autosampler
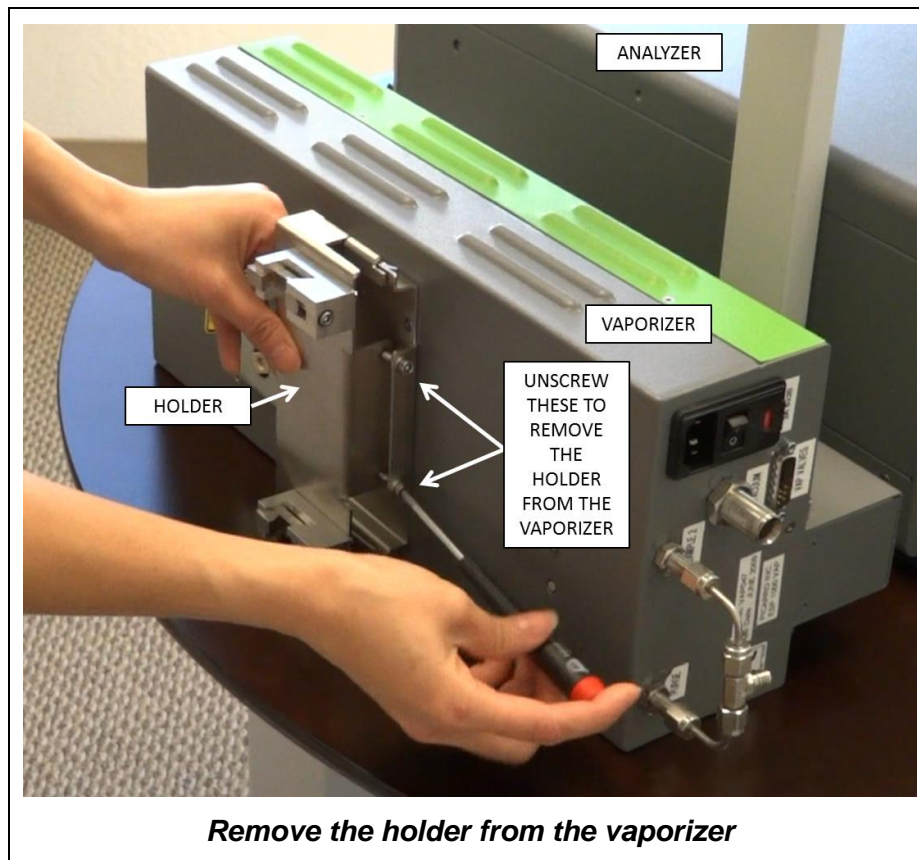
Continuation of Step 7: Second, slide the vaporizer into the holder, and then tighten the screws as shown below.

Slide the Vaporizer into the holder. And then tighten the two screws. The above is a High Precision Vaporizer however you can also install a High Throughput Vaporizer in the same way as shown above.

Continuation of Step 7: Align the gas delivery line of the vaporizer to the analyzer's gas inlet port by adjusting the location of the vaporizer along the Autosampler. You may need to move the tray and the station holders to make room for the vaporizer. When satisfied with the location of the analyzer and the holders, tighten the screws that connect them to the Autosampler. See images below for more information.
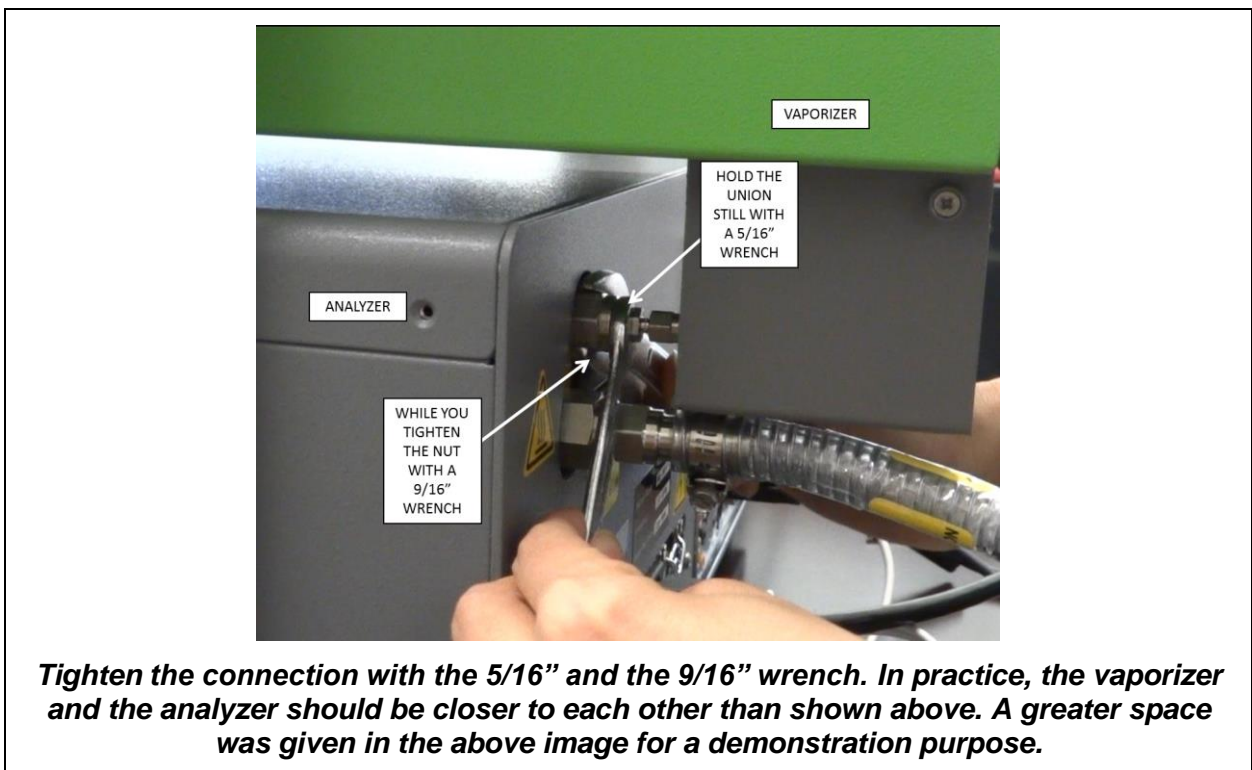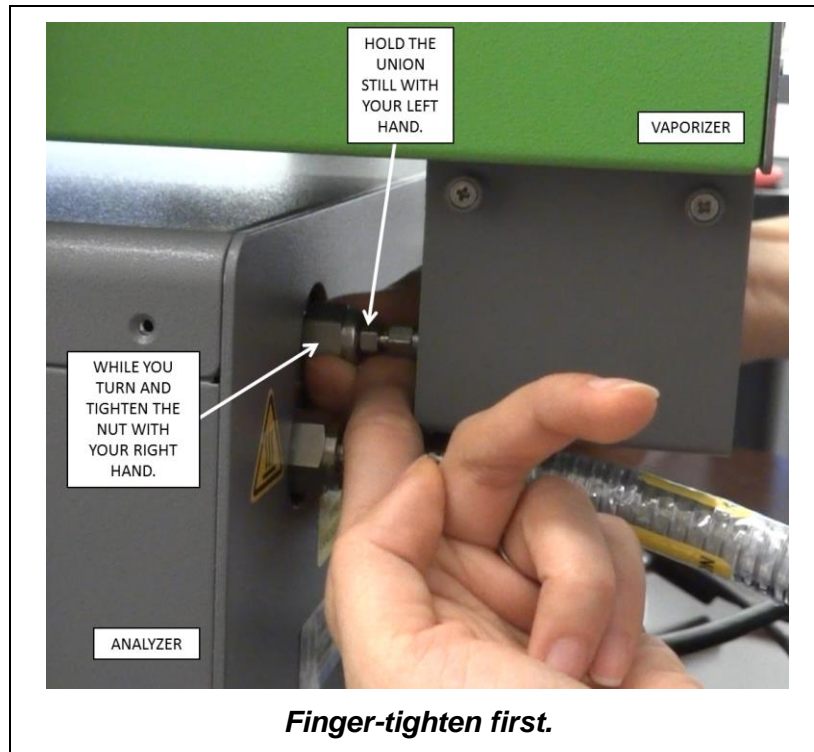
Make sure the screws that attach the holder to the Autosampler are loose while adjusting the location of the vaporizer. To move the vaporizer, lift and slide.
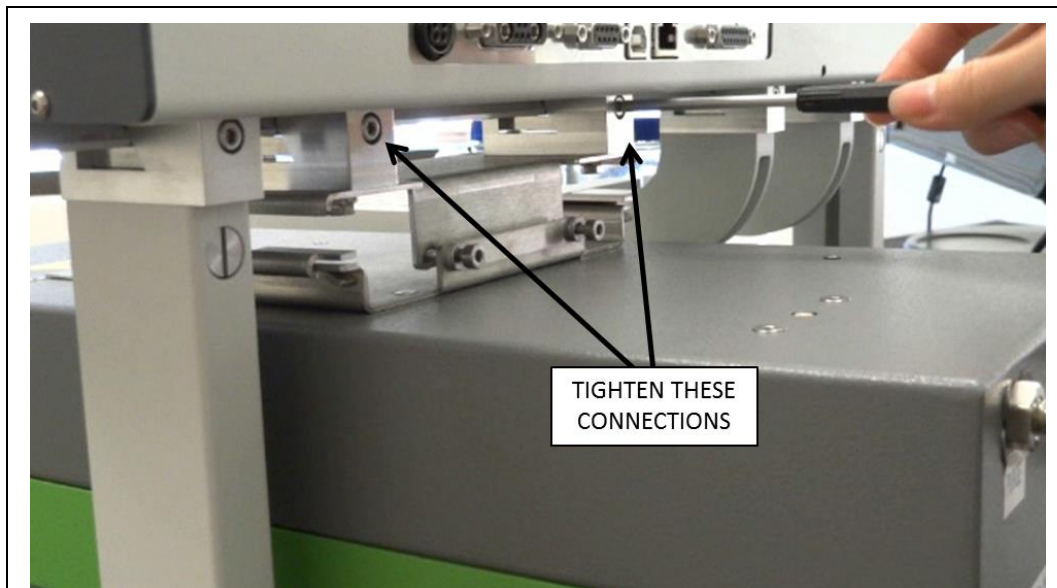
Tighten the connections between the holder and the Autosampler.

Continuation of Step 7: Tighten the gas connection between the Vaporizer and the Analyzer. Hand-tighten first, and then use the 5/16" and the 9/16" wrenches.

HOLD THE UNION STILL WITH YOUR LEFT HAND.

VAPORIZER

WHILE YOU TURN AND TIGHTEN THE NUT WITH YOUR RIGHT HAND.

ANALYZER

Finger-tighten first.

VAPORIZER

HOLD THE UNION STILL WITH A 5/16" WRENCH

ANALYZER

WHILE YOU TIGHTEN THE NUT WITH A 9/16" WRENCH

Tighten the connection with the 5/16" and the 9/16" wrench. In practice, the vaporizer and the analyzer should be closer to each other than shown above. A greater space was given in the above image for a demonstration purpose.
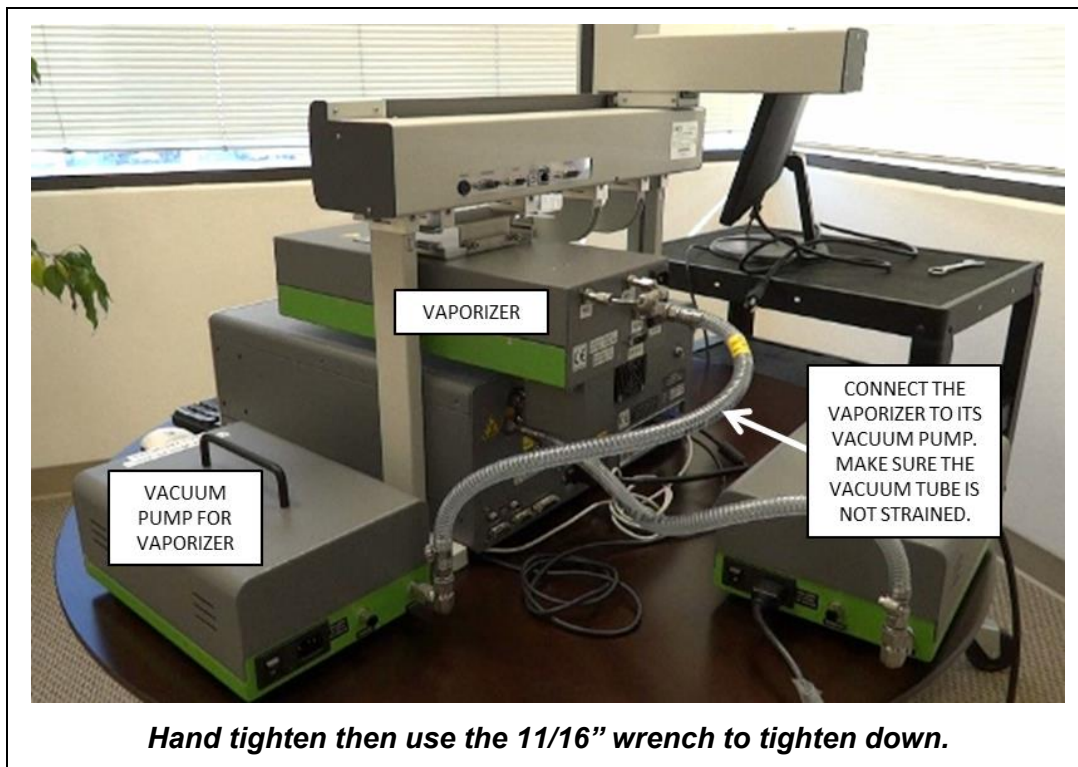
Step 8: Connect the 1/8" Swagelok connection port to a source of dry gas (See **Appendix F4 in the "Installation| L2130-i or L2120-i Analyzer and its Peripherals" user's manual.**
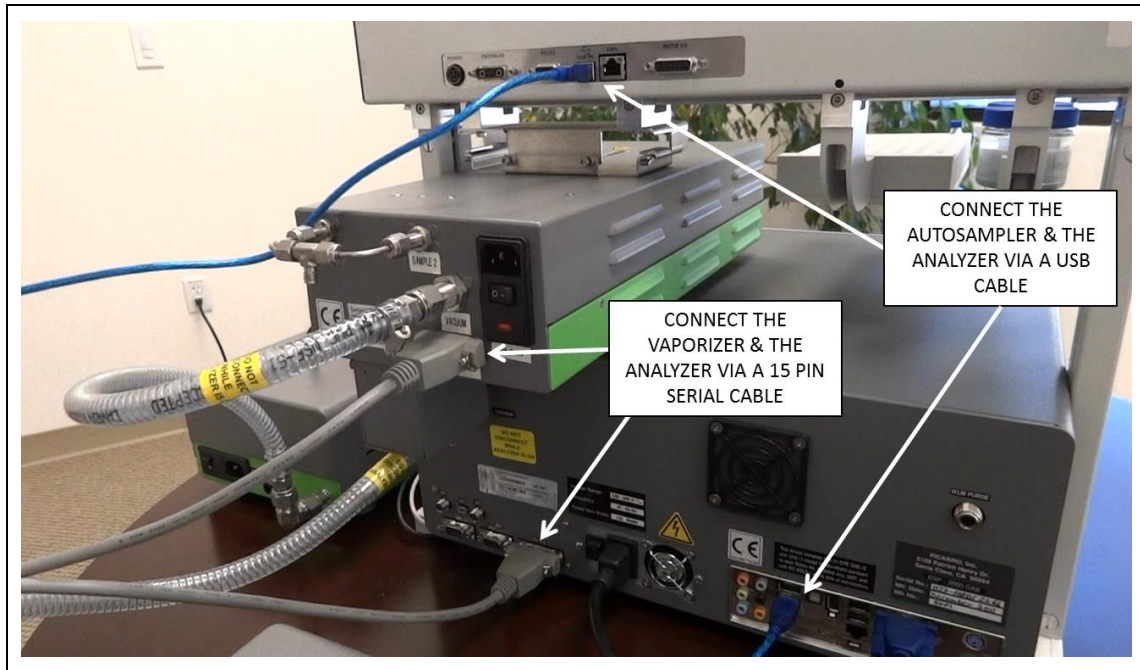
CONNECT THIS 1/8" SWAGELOCK CONNECTION PORT TO A SOURCE OF DRY GAS (APPENDIX V).

Step 9: Connect the Vaporizer to its Vacuum Pump (The Analyzer has its own Pump.).

VAPORIZER

VACUUM PUMP FOR VAPORIZER

CONNECT THE VAPORIZER TO ITS VACUUM PUMP. MAKE SURE THE VACUUM TUBE IS NOT STRAINED.
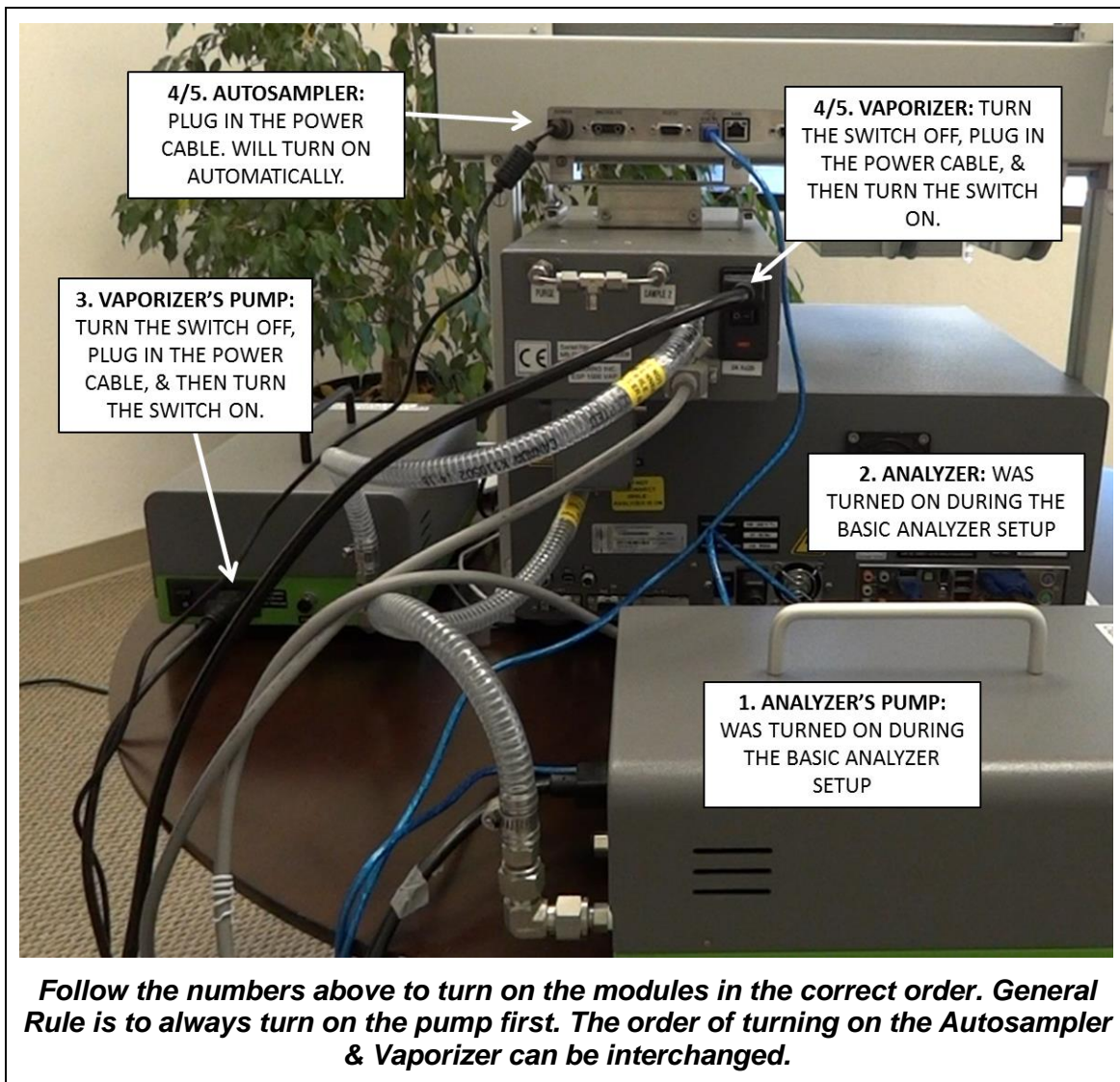
Hand tighten then use the 11/16" wrench to tighten down.

Step 10: Make the cable connections between the Vaporizer and the Autosampler.

Step 11: Turn on the modules in the correct order!

Follow the numbers above to turn on the modules in the correct order. General Rule is to always turn on the pump first. The order of turning on the Autosampler & Vaporizer can be interchanged.

Step 12: Wait until the vaporizer's temperature get stabilized before running samples.

Do not start running your samples until the red number becomes the same as the temperature you have set.
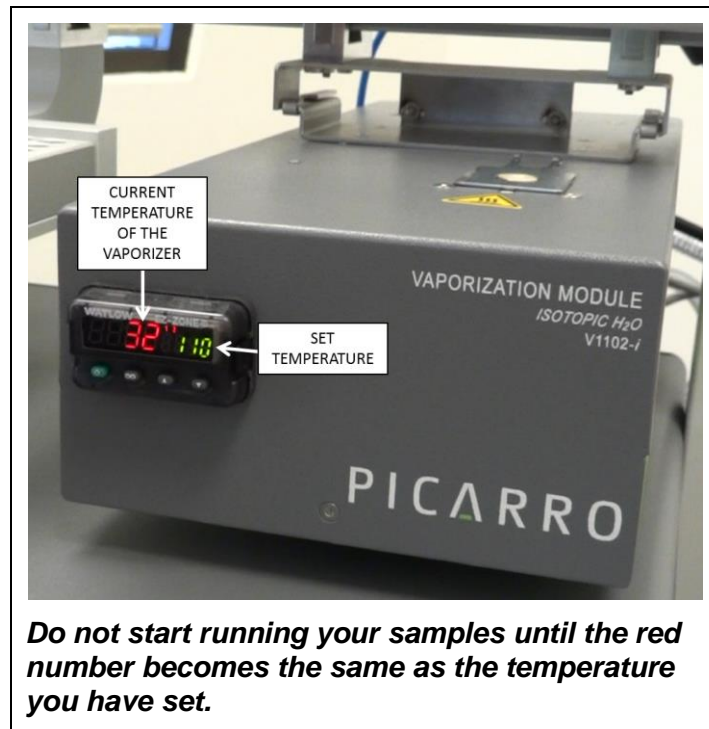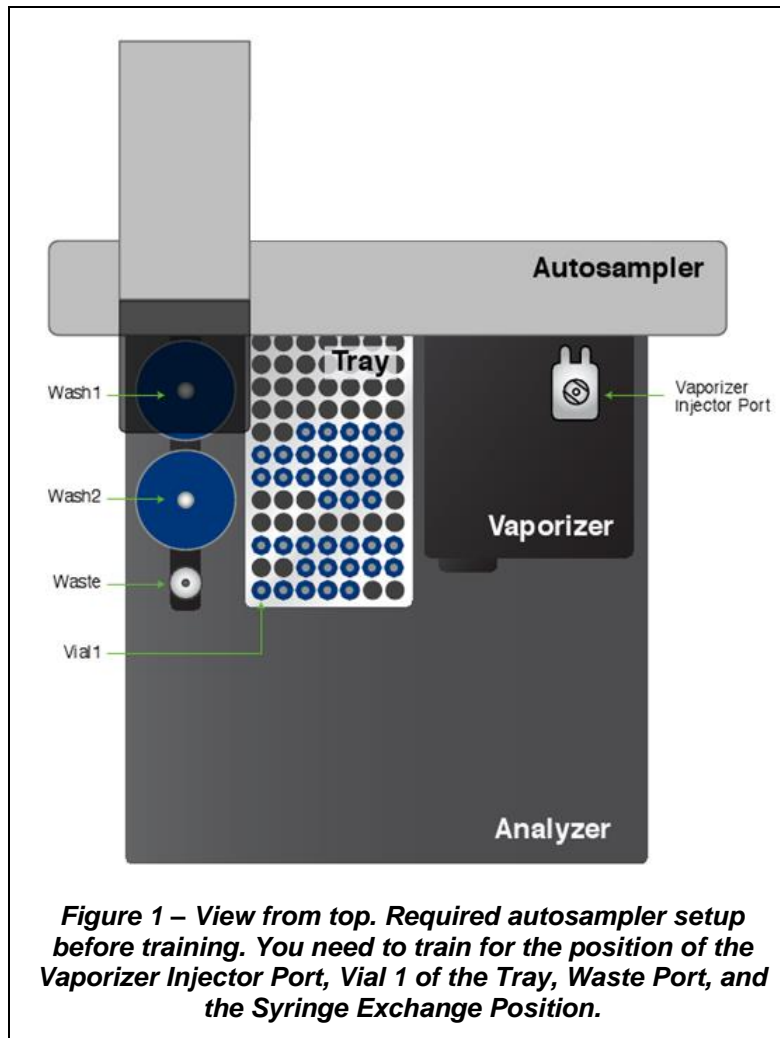
Step 13: The next step is to install the Autosampler needle. See the **"Syringe"** section in the "**Autosampler Maintenance**" Chapter.

AUTOSAMPLER TRAINING

With each installation and at periodic time intervals the autosampler will need to be recalibrated to ensure the needle goes to the correct positions.

Training is done using the "Picarro Autosampler Training Utility Version xyz" software (icon in the analyzer desktop); the Picarro analyzer does not need to be operational. This procedure will need to be performed again if the autosampler starts to go out of alignment. Check the positioning about once per week, or more often if the analyzer is in an environment that is more prone to movement. If the analyzer and autosampler combination is going to be used on a ship or on a vehicle a special stand may be needed that locks the autosampler legs and analyzer together. Substantially moving platforms may only be able to accommodate manual injections!

Required autosampler setup before training is shown in Figure 1, below.

Figure 1 – View from top. Required autosampler setup before training. You need to train for the position of the Vaporizer Injector Port, Vial 1 of the Tray, Waste Port, and the Syringe Exchange Position.

Before training the Autosampler, you will need to complete the following.

1. Setup and turn on the Autosampler - Analyzer setup

2. Install caps and septa on the washes, waste and vaporizer injector port.

3. Place the tray and vials in tray holder.

4. **Optional:** Install the syringe. See the **"Syringe"** section in the "Autosampler Maintenance" chapter for directions on how to install the syringe as well as the note below.

This chapter holds the following subchapters in the following order.

- **Injection Point** training
- **Syringe Exchange Position** training
- **Tray Adjust** training
- **Sample Depth** Training
- **Waste Port Station** training

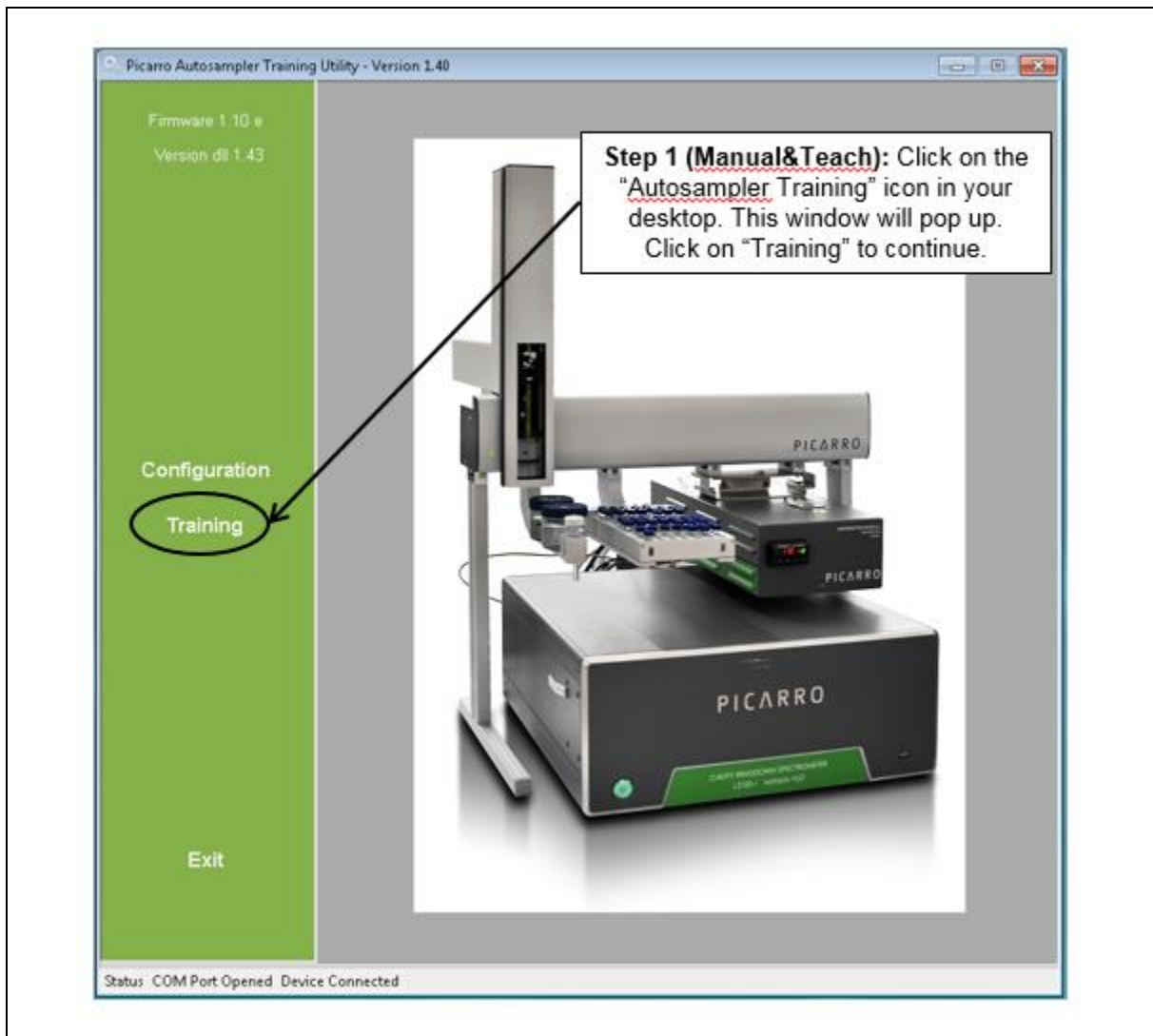|	
	IMPORTANT NOTE!!! Installing the syringe before training can help you aim the needle to your target accurately. However, this increases the likelihood for needle damage during training, and requires you to be extra careful while lowering the needle holder to your target. If worried, you can train without the needle.

	IMPORTANT NOTE!!! After applying the new training setting, the Autosampler will automatically run a sample run with the new setting. Make sure there's nothing in the way of the Autosampler injection head before applying the new setting, as it might damage the needle and the injection head.

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INJECTION PORT TRAINING

You can train the Autosampler manually or digitally. **Manual training is recommended** by Picarro for its ease of use. However, digital training can be useful when dealing with small movements (e.g. needle depth).

Choose one of the methods then follow the steps below to train the Autosampler for the location of the Vaporizer Injection Port.

Step 4(Manual): Manually move the Autosampler injection head over to the Vaporizer injection port. Gently pull down the black needle holder and lower it onto top of the port.

Close-up

VAPORIZER

Step 5(Manual) Step 4(Teach): Lift this black piece up to make sure the needle is pointing into the small entrance of the injection port.
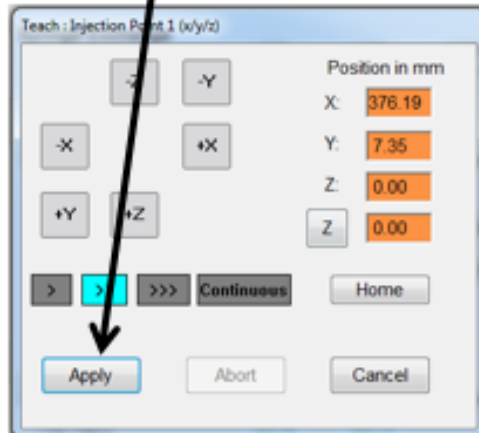
Step 6(Manual): Click "Apply" to apply your new setting.

Step 5(Teach): Click "Apply" to apply your new setting.

Manual : Injection Point 1 (x/y/z)

Determining Positions

x/y/z axes are now without power

x/y/z axes can now be set manually

Apply   Abort   Cancel

Teach : Injection Point 1 (x/y/z)

Position in mm
X: 376.19
Y: 7.35
Z: 0.00
Z: 0.00

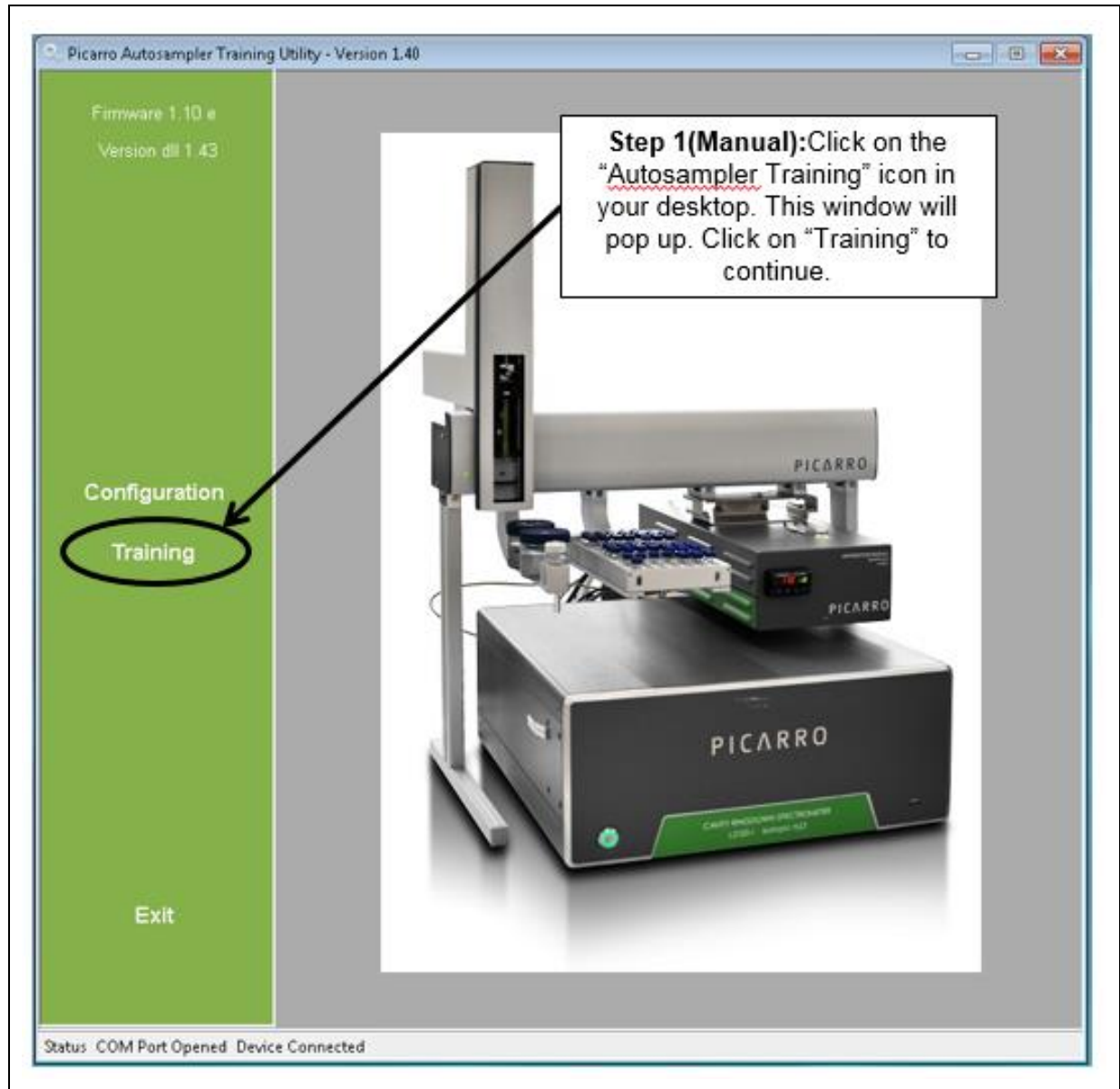> | > | >>> | Continuous   Home

Apply   Abort   Cancel

The Autosampler will always do a test run after "Apply" is clicked.

Make sure there's nothing in the way of the Autosampler injection head for this test run.

SYRINGE EXCHANGE TRAINING

You can train the Autosampler for the Syringe Exchange location in manual mode. Follow the steps below to train the Autosampler for the location of the Syringe Exchange location.

Step 2(Manual): Click on this to do the Syringe Exchange Location training.

Step 3(Manual): The following window will pop up.

Step 5(Manual): Click "Apply" to apply your new setting.

Step 4(Manual): Manually move the Autosampler injection head to an open location where you will be able to exchange your syringe easily.

The Autosampler will always do a test run after "Apply" is clicked.

Make sure there's nothing in the way of the Autosampler injection head for this test run.
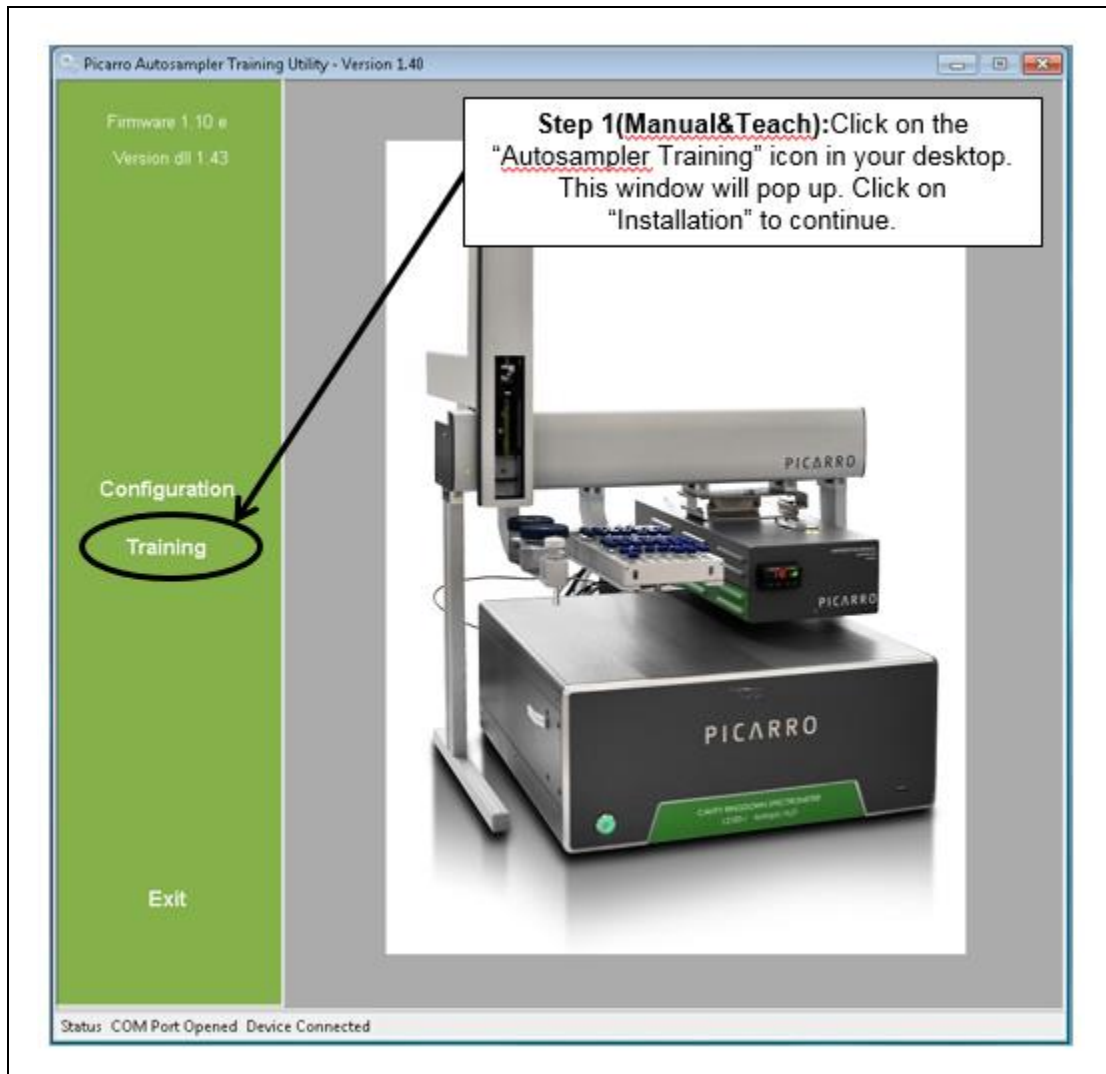
TRAY HOLDER TRAINING

You can train the Autosampler manually or digitally. Manual training is recommended by Picarro for its ease of use. However, digital training can be useful when dealing with small movements (e.g. needle depth). Choose one of the methods and then follow the steps below to train the Autosampler for the tray (sample vial) location.

When doing the tray training, train the Autosampler to the location of **vial 1.** The position of other vials will be automatically calculated based on the set position of vial 1 from the training.

Step 4(Manual): Manually move the Autosampler injection head so that the needle points to the **Vial 1** of the tray.

Step 5(Manual) Step 4(Teach): Lift this black piece up to make sure the needle is pointing to the correct place.

Step 6(Manual): Click "Apply" to apply your new setting.

Step 5(Teach): Click "Apply" to apply your new setting.

The Autosampler will always do a test run after "Apply" is clicked.

Make sure there's nothing in the way of the Autosampler injection head for this test run.

SAMPLE DEPTH TRAINING

You can train the Autosampler for sample depth in "Teach" Mode.

You can see where the needle is relative to the sample through this window.

Train the Autosampler so that the needle touches the sample surface. You will be able to see where the needle is relative to the sample surface through the window on the sample tray. See image above.

 To not damage the needle while training for sample depth, teach in slow mode while looking through the sample tray window.

WASTE PORT TRAINING

You can train the Autosampler manually or digitally. Manual training is recommended by Picarro for its ease of use. However, digital training can be useful when dealing with small movements (e.g. needle depth). Choose one of the methods then follow the steps below to train the Autosampler for the location of the Waste port and the Wash Stations.

You only need to train the Autosampler to the location of the waste port. Picarro's software will automatically calculate the location of the wash stations based on the set location of the waste port from the training.
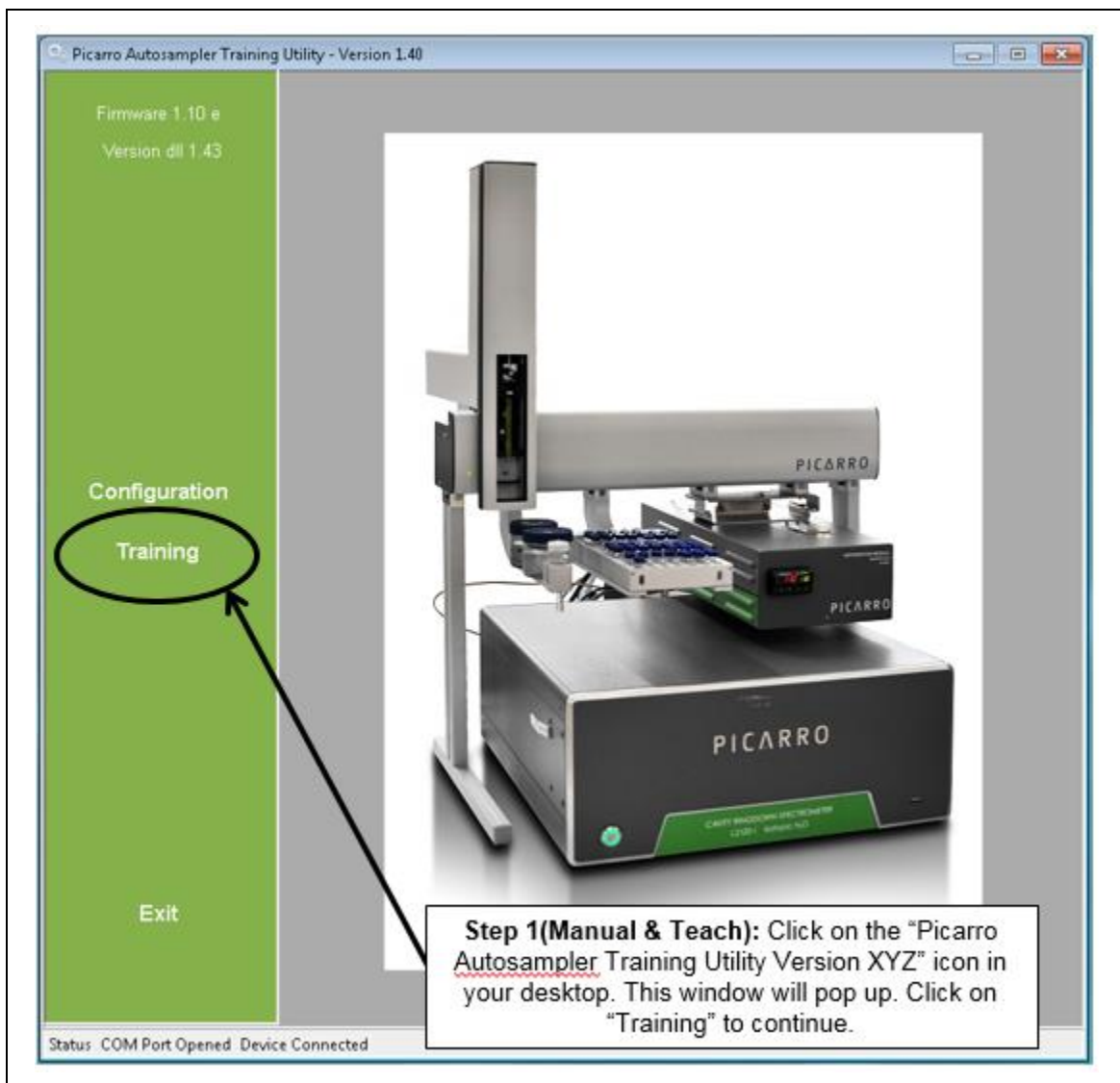
Step 2(Manual): Click on this to train the Autosampler for the position of the wash stations and the waste port manually. You will manually move the Autosampler injection head to the waste port. Picarro Autosampler will automatically calculate out the relative locations of the wash stations based on the location of the waste port.

Step 2(Teach): Click on this to do the wash stations and the waste port training digitally. You will be led to a window which will allow you to modify the XYZ locations of the Autosampler injection head digitally.

You can change the depth of the needle into the solvents and waste from here.

Step 3(Manual): The following window will pop up.

Step 3(Teach): The following window will pop up. Set the XYZ values of the injection head so that the Autosampler needle points to the waste port.

You can alter the speed of the injection head with these buttons.

Make sure there's nothing in the way of the Autosampler injection head for this test run.

AUTOSAMPLER METHODS AND JOBS

Please familiarize yourself with the following terms.

Term	Definition
Method	Describes how each injection is handled.
Job	Method + Specifies which samples will be handled.
Job Queue	A collection of jobs.

AUTOSAMPLER METHODS

Occasionally direct interaction with the autosampler may be needed to create, edit or delete methods.

Autosampler methods are used to define the syringe used, how much/how fast/where to inject, syringe cleaning routine and related parameters. Only one cycle and syringe can be used per method and cannot be changed once the method is saved.

Jobs are based on a particular method and the job will include tray used, vial to be sampled, number of injections and choice of method. You cannot edit methods from the job—so be sure to set up the method first!

FACTORY SUPPLIED METHODS

The Picarro is supplied with 1 method which can be used with the system in its delivered configuration or modified to create a new method. The factory supplied method was used in the instrument performance testing and should be used to verify instrument performance.

CREATING A NEW METHOD

Follow the steps below to create a new method.

STEP1. Click on the Autosampler Control icon in your desktop. Click on the "Method" tab. From this tab, characterize your desired method. See below for explanation of the method tab. Bolded are new features offered by the Picarro Autosampler.

Choices	Explanation
# Pre Rinse 1	# of rinses from Rinse Station 1 before an injection (or between vials)

# Pre Sample Rinse	# of rinses using sample before an injection (or between vials). Dispenses to the waste station.
# Post Rinse 1	# of rinses from Rinse Station 1 after an injection (or between vials).
Fill Speed Rinse	# of times to fill with the sample & dispense back into the sample before drawing the sample to be injected.
Sample Volume µL	Amount of sample to draw for injection into the Vaporizer.
Inject Speed µL/sec	Speed in µL/sec the syringe will dispense sample into the vaporizer.
Pre Inj Dly secs	Delay in sec after inserting the syringe into the vaporizer before dispensing will commence.
Rinse Post Fill Dly	Delay in sec after filling the syringe from either rinse station to allow the vacuum gap to relax.
Rinse Vol µL	Amount of solvent in µL to draw from either rinse station when performing any rinse step.
Injection Depth	**Sets how far needle penetrates into the vaporizer. For High Throughput Vaporizer: ~26mm. For High Precision Vaporizer: ≤42mm ≥30mm.**
# Pre Rinse 2	# of rinses from Rinse Station 2 before an injection (or between vials).
Sample Wash Vol µL	Amount of sample to use when performing sample rinses.
# Post Rinse 2	# of rinses from the Rinse station 2 after an injection (or in between vials)
Fill Strokes	# of times to fill with the sample & dispense back into the sample before drawing the sample to be injected.
Fill Speed µL/sec	Speed in µL/sec to use when filling from the sample.
Post Fill Dly secs	Delay (seconds) after filling the syringe from the sample to allow the vacuum gap to relax.
Post Inj Dly secs	Delay in sec after dispensing is complete before the syringe will be removed from the vaporizer.
Waste Eject µL/sec	Speed in µL/sec which will be used to dispense from the syringe into the waste port.

Rinse only between vials	Check this and the AS will ONLY perform rinses between vials, not between individual injections.

Step 2: Once finished, save your method by following the steps below.

You can also delete a method following the steps below.
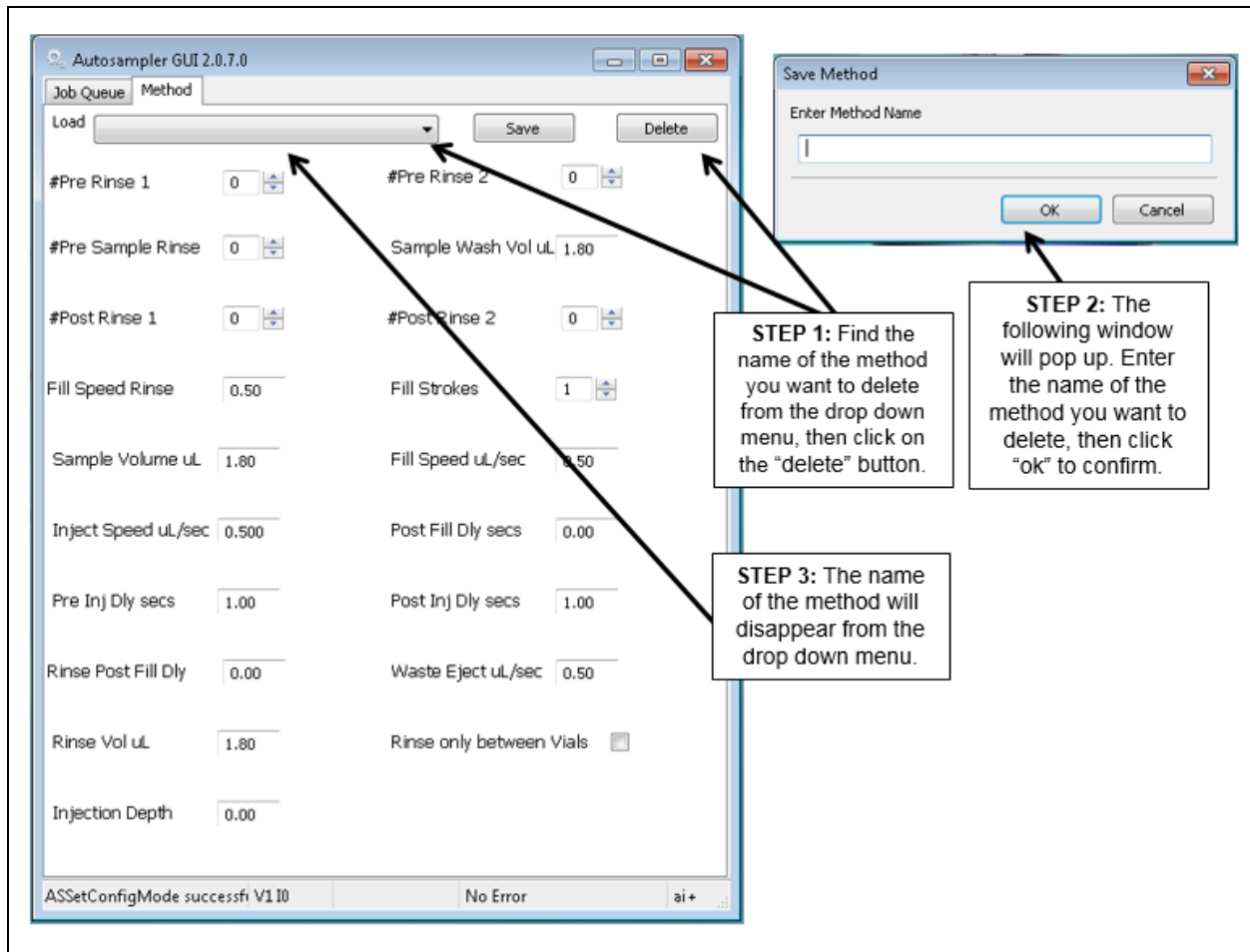
EDITING A METHOD:
You can edit a method while the job is still running. Simply click on the Method tab, choose the method you want to edit from the drop-down menu, and then edit your method appropriately. Don't forget to save when finished. You will be prompted with a window asking whether you are okay with overwriting the current Method. Click Ok to continue.

AUTOSAMPLER JOBS:

Direct interaction with the autosampler is needed to create, edit, start or delete jobs, change syringes, and for editing methods.

Jobs are based on a particular method and the job will include tray used, vial to be sampled, number of injections and choice of method. You cannot edit methods from the job—so be sure to set up the method first!

FACTORY SUPPLIED JOBS:

The Picarro L2120-*i* (or L2130-*i*) is supplied with one job which can be used with the system in its delivered configuration or modified to create a new job.

CREATING A NEW JOB:

Step 1: Click on the "Autosampler Control" icon in the desktop.

Step 2: A new window will pop up. In the "Job Queue" tab, follow the steps below.

Keyboard Command	Description
Control +	You will be able to promote the method of your choice to be run earlier.

APPROPRIATE SAMPLES AND SAMPLE PREPARATION

Maximum reliability of the autosampler/vaporizer/analyzer combination is ensured by removing particulates, suspended solids or other material from the same. This can be achieved by passed water samples thru a particulate filter (2-10 microns) prior to filling the sample vials or manual injection. Particulates will generally first clog the syringe needle. Although they can build up in the vaporizer, the volume of the vaporizer cell actually allows a significant number of dirty samples to be injected before cleaning is required. However, if you are injecting samples that repeatedly cause the syringe to require cleaning, the vaporizer should be visually checked (remove the septa and look for buildup on the inside). The vaporizer can be cleaned by rinsing with water, contact Picarro for the vaporizer cleaning procedure and software.

Samples containing dissolved ionic solids (aka salts) can generally be injected into the vaporizer. A rinse step after each injection is recommended to prevent syringe needle clogging—in the case of high salt concentration (>5%) the use of a larger syringe (10 microliter) will significantly extend syringe lifetime. Salts will build up in the vaporizer, these can be washed out using the vaporizer cleaning procedure if they do not decompose in the vaporizer and they are sufficiently water soluble at room temperature.

	Caution must be used when analyzing water samples containing organic compounds. Depending upon the nature of the organic it may build up a permanent layer inside the vaporizer which cannot be removed. Samples contain particulates, such as fruit juice, should be filtered (an in line polypropylene Luer lock filter disk can be attached to a large syringe and used to fill the autosampler vials). Certain compounds (generally the lower molecular weight compounds) interfere with the spectroscopic measurement and affect the measured isotopic ratios. The ChemCorrect software package detects and flags these situations. See **Appendix E** for operational details. Many organic compounds can be removed by sample pre-treatment, however some types of pre-treatment cause isotopic fractionation thus control experiments with the specific method chosen should be performed. Due to the broad range of organics and types of interactions Picarro cannot assume responsibility for measurements made using or damage caused by organic compounds.

STARTING THE AUTOSAMPLER

For each run, a job will need to be started from the Autosampler software. This is described in this section.

OVERVIEW: To run the Autosampler, a job must be queued, which is a collection of predefined methods. The loaded sample tray must be placed in the tray holder. Wash solvent(s) and a syringe should also be in place.

This procedure assumes the factory default job and method or a verified user created method and job have been used and the Autosampler has been properly installed and connected to the Picarro analyzer.

PREPARING THE AUTOSAMPLER

1   Place the loaded sample tray into the tray holder. The sample vials hold 2mL of sample, fill with a minimum of 200μL (more is recommended to minimize isotopic fractionation due to vapor equilibrium). Ensure caps are screwed on properly (see Autosampler Maintenance for example).

2   Verify the syringe is installed. See the **"Syringe"** section of the manual for more information.

3   Fill Wash 1 with wash solvent (factory recommendation is 1-methyl-2-pyrrolidinone (NMP) which helps prolong syringe life)

4   Place fresh glass wool or new septa in the waste port. These should be replaced every 300 injections (at same time as injector port septa). See Autosampler Maintenance for instructions on this procedure and for a discussion of the pros/cons of using glass wool or septa.

5   Place a new septum in the vaporizer injector port. The septa should be replaced every 200-300 injections. See Autosampler Maintenance for instructions on this procedure.

STARTING A JOB

1   Verify the Picarro GUI shows the instrument is taking measurements, and the Autosampler Control Window is open. **Also make sure the Autosampler Training window is closed.**

| | The instrument will not run samples while the Autosampler Training Window is open at the same time as the Autosampler Control Window. |

2   Start the Coordinator Launcher by double clicking on the desktop icon.   Select the desired coordinator from the drop down menu.

3   Click on the Autosampler Control Icon in the desktop.

4   The window below will pop up. Follow the steps described in the next page.

5   The Autosampler will now wait for a start command from the Picarro coordinator software. As soon as it gets a command, it will start its methods.

⊘	Do not start the 'Coordinator' before the instrument starts showing measurements on the GUI.
📝	**Before running the coordinator, it is important to have the Autosampler Control Window Open.**
📝	After the job queue is finished, the Autosampler will stop, and the analyzer will continue to wait for a new sample injection. At this point, the user can start a new job on the Autosampler and click on 'New output file' button on the CRDS Coordinator window. The user can append more data to the same output file by simply starting a new job queue without pressing the "New output file" button.

STEP 3: Click "run" to run the selected methods. Don't forget: you also need to start the coordinator software (click on the icon in the desktop) for the Autosampler to start running.

STEP 4: While the Autosampler is operating, the majority of the window will become disabled.

PAUSE: Pause or resume a job. For example, if any problem occurs with the syringe while the Autosampler is running, you can always click "Pause" and change the syringe.

END: Halt the current operation. The Autosampler will dump the content of the needle to waste.

STEP 1: Choose the method(s) you want from the drop down menu(s) or load a queue.

STEP 2: Check the jobs you want to run.

You can see the status of your Autosampler from here.

AUTOSAMPLER MAINTENANCE

The Autosampler requires daily maintenance for reliable operation. The various procedures are described in the 'Autosampler Maintenance' section.

OVERVIEW

The Autosampler requires daily maintenance to ensure proper operation. Many of the consumable parts need to be replaced on a daily basis if full sample trays are run. To ensure uninterrupted operation a minimum of a week's supply of consumables should be kept on reserve.

The consumables and how to replace them is described in the following subsections.

CHANGING THE VAPORIZER INJECTION PORT SEPTA

The injector port septa should be replaced every 200-300 injections. The more closely grouped needle piercing on the septa, the earlier the septa will need to be replaced. If the septum is not changed, it will be difficult to maintain the vacuum inside the vaporizer which will degrade the quality of the data.

1   To change the vaporizer injection port septum when an autosampler job is running (i.e. actively injecting samples), press the "change injector septum" button on the coordinator software. The analyzer will fill the vaporizer with dry gas. If the autosampler is not running a job then proceed directly to step 3. If no job is running and the "change injector septum" button is pressed the coordinator software will wait indefinitely (to resolve this either start a job on the autosampler or manually end the coordinator software).

2   Wait for the software indication to change the septum.

3   Remove the protective metal cover around the injection port (ensure that the insulation foam stays attached to the cover).

4   Unscrew the cap of the port.

⚠	**Warning:** the bottom of the cap is very hot!
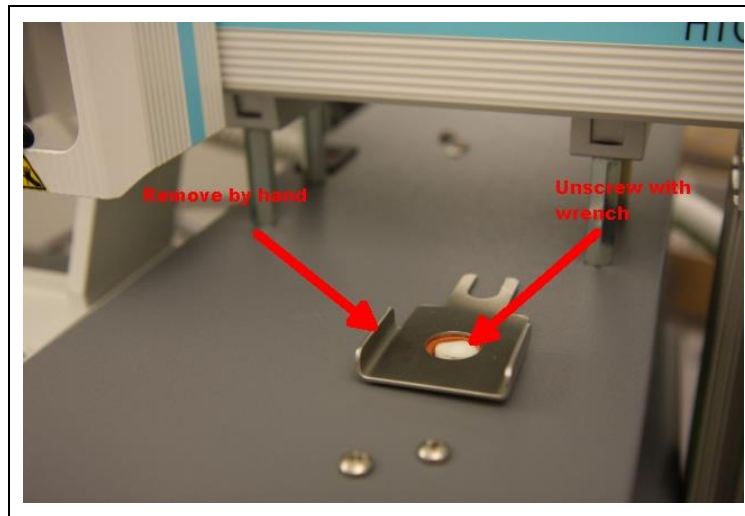
5 The old septum will usually stick to the port, but if it is in the cap, remove it using tweezers (again the port and cap are really hot!).

6 Insert a new septum into the cap and screw the cap onto the port by hand until it comes to a hard stop. It should be finger tight only.

🚫	**Caution:** do not overtighten or use a wrench, the injector port will be damaged. Replace the metal cover around the injector port.

7 Press "continue" on the user interface; the analyzer will restart the vaporizer purge cycle and then wait for the next sample injection.

📝	A septum can be replaced at any time. If a job queue is in progress, the analyzer will wait until the current sample measurement is complete (potentially as long as the cycle time) before preparing to change the septum.

Additional injector port septa can be purchased by ordering the part number "C0324" which is a single package contains 100 units of 9.5 mm septa.

WASTE PORT SEPTA AND GLASS WOOL

The waste port can have one of two configurations.

Configuration 1

Waste port is sealed with a septum and attached to a vacuum pump (not included). This configuration requires additional hardware and there have been reports of septa material clogging the syringe needle.

The waste port septa should be replaced every 200-300 injections, at the same time as changing the injector port. The following procedure assumes this is done at the same time as the injector port septa.

1   Pull up on cap by hand to remove from waste port. Press up from the bottom if the cap does move easily.

2   Use tweezers to remove the old septa.

3   Place the new septa into the cap and replace the cap

Additional waste port septa can be purchased by ordering the part number "C0323" which is a single package contains 20 units of red PTFE septa.

Configuration 2

Waste port is filled with glass wool and a small positive pressure pump (such as an aquarium air pump attached). The pump helps evaporate the water and the large mass of the glass wool serves as a reservoir. This configuration requires minimal hardware and is what is used at Picarro. No septa is used in this configuration, the top of the waste port is left open to speed evaporation.

The waste port glass wool should be replaced every 200-300 injections, at the same time as changing the injector port. The following procedure assumes this is done at the same time as the injector port septa.

1   Pull up on cap by hand to remove from waste port. Press up from the bottom if the cap does not move easily.

2   Use tweezers to remove the old glass wool.

3   Place the new glass wool into the waste port and replace the cap. Do not use a septum.

SAMPLE VIALS

Improper sealing of the sample vial is the most common cause of accidental isotopic fractionation! The caps of the vials can easily be threaded incorrectly. Check the cap is screwed on level to the vial:

Proper capping of vial shown on left, improper capping of vial on right
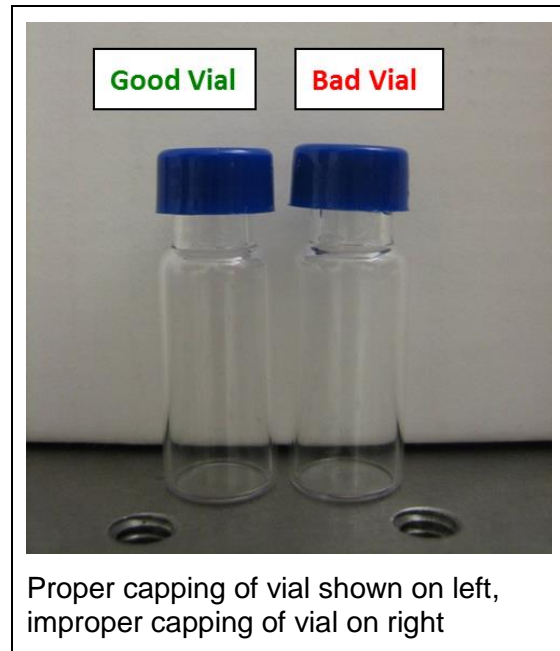
Additional sample vials can be purchased by ordering the part number "C0322" which is a single package contains 100 units of clear glass, 2mL, 12 x 32mm screw-top vials with a 9mm thread finish.

Additional caps and septa can be purchased by ordering the part number "C0321" which is a single package contains 100 units of 9-mm thread PTFE/Silicone septa to fit 2 ml vial.

SYRINGE

CLEANING THE SYRINGE

The syringe should be removed and cleaned by hand daily. Multiple rinses with DI water should be sufficient. If needed, diluted solvent can be used but it is important to flush the syringe with a lot of water afterwards. If the plunger does not move smoothly in either direction, replace the syringe. The best way to store syringe is to soak it in DI water.

REMOVING THE SYRINGE:

Follow the following directions until Step 3.

INSTALLING THE SYRINGE:

The syringe should only be replaced when the coordinator software is not running, and no job is running on the Autosampler. Error during sample analysis is often caused by damaged/clogged needles. You can always pause your analysis by following the steps below and install a new syringe.
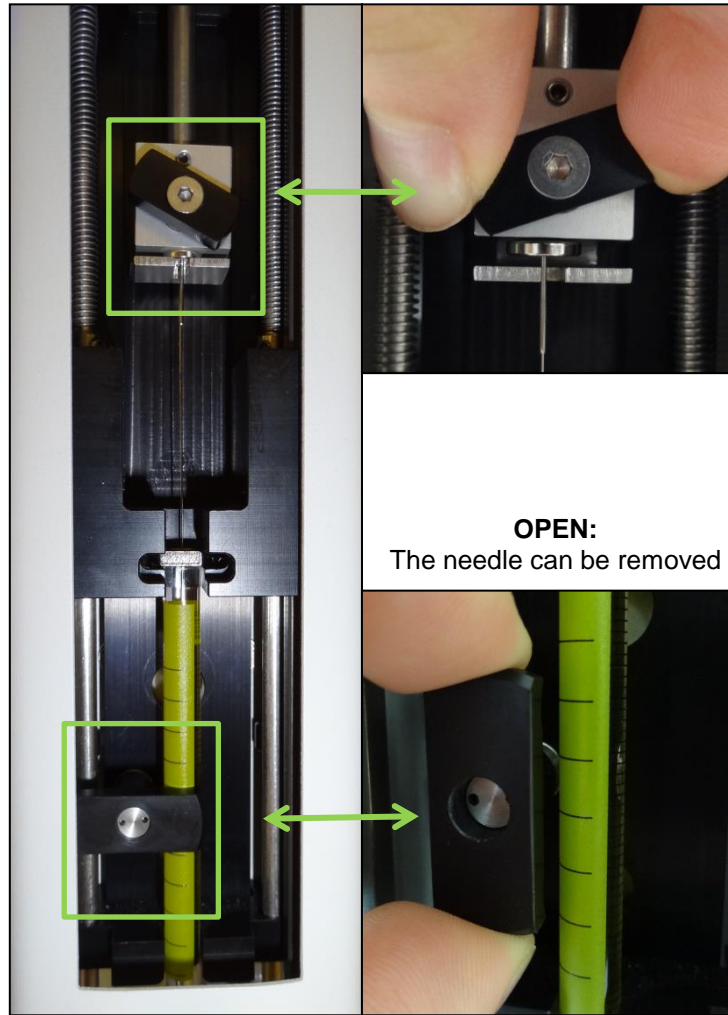
STEP 3 Carefully remove the syringe from the injection unit by unlocking the needle and then pulling it out by the body.

CLOSED:
The needle is locked in

OPEN:
The needle can be removed

OPEN:
The needle can be removed

STEP 6: Unlock, then push the plunger head into the slot

STEP 5: Push this metal piece into the slot.

STEP 7: Lock the body of the needle (lift then turn the black piece clockwise) then push down the plunger holder.

The needle hole

STEP 4: Gather these, and then carefully insert the needle tip into the needle hole.

Syringe Exchange

Syringe Exchange Procedure

Please exchange the Syringe and press 'Next'

STEP 8: Once the new syringe has been installed, click "Next."

Next   Apply   Abort   Cancel

STEP 9: Adjust dead volume by gently pushing down the plunger head while holding the lower part of the needle holder. See note below and then click "Apply."

NOTE: Don't Keep your finger here while clicking "APPLY." The black needle tip holding piece will zip up very quickly once the button is clicked, which may pinch your finger.

	Caution: Be careful to not to damage and/or contaminate the needle tip while installing the needle.
	Caution: failure to check the needle penetration can cause permanent damage to the syringe.

Additional syringes can be purchased from various manufacturers. The list below specifies the syringes that are approved to use with the Picarro Autosampler.

Fixed Syringe Size	Manufacturer	Part Number	Description
5µl	SGE	001982	5F-C/T-5/0.47C
5µl	SGE	001700	5F-CTC-5/0.47C
5µl	SGE	001981	5F-C/T-5/0.63C
5µl	ILS	2106302	5µlN/F/0,47(26s)/c/51/CTC
5µl	ILS	2106335	5µlN/F/0,63(23s)/c/51/CTC
5µl	Hamilton	204051	75 N Cem NDL, 26s ga, 50, AS
10µl	SGE	002700	10F-CTC-5/0.47C
10µl	SGE	002980	10F-CTC-5/0.47C
10µl	SGE	002981	10F-C/T-5/0.63C
10µl	SGE	002977	10F-C/T-GT-5/0.47C
10µl	SGE	002987	10F-C/T-GT-5/0.63C
10µl	ILS	2106416	10µl SYR N FN 0,47(G26s)c51 CTC
10µl	ILS	2106403	10µl SYR N FN 0,64(G23s)c51 CTC
10µl	ILS	2606407	10µl SYR H FN 0,47(G26s)c51 CTC
10µl	ILS	2606403	10µl SYR H FN 0,64(G23s)c51 CTC
10µl	Hamilton	204052	701 N Cem NDL, 26s ga, 50,AS

10µl	SGE	002982	10R-C/T-5/0.47C
10µl	SGE	002984	10R-C/T-5/0.63C
10µl	SGE	002985	10R-C/T-GT-5/0.47C
10µl	ILS	2120407	10µl SYR N RN 0,47(G26s)c51
10µl	ILS	2106408	10µl SYR N RN 0,64(G23s)a51
10µl	ILS	2606405	10µl SYR H RN 0,47(G26s)a51
25µl	SGE	003980	25F-C/T-5/0.47C
25µl	SGE	003700	25F-CTC-GT-5/0.47C
25µl	SGE	003987	25F-C/T-GT-5/0.63C
25µl	ILS	2620506	25µlSYRHo6,5 FN 0,47(G26s)c51 CTC
25µl	ILS	2620503	25µlSYRHo6,5 FN 0,64(G23s)c51 CTC
25µl	ILS	2620513	25µl syringe H ø6,5 RN 0,47(G26)d51 PTFE-seal
25µl	ILS	2620514	25µl syringe H ø6,5 RN 0,72(G22s)d51 PTFE-seal
100µl	SGE	005700	100F-CTC-GT-5/0.47C
100µl	SGE	005335	100F-C/T-GT-0.63C
100µl	ILS	2620719	100µl SYR H ø6,5 FN 0,47(G26s)c51 flat button
100µl	ILS	2620721	100µl SYR H ø6,5 FN 0,64(G23s)c51 flat button
100µl	SGE	005333	005333 100R-C/T-GT-0.47C
100µl	ILS	2620736	100µl syringe H ø 6,5 8mm button FN0,72(G22)d51

APPENDIX Y – NEED HELP FROM PICARRO?

We are committed to helping our customers! Following the steps below will help us get to your problem faster!

STEP 1: Visit our popular Community forum! It offers a wealth of information with answers to thousands of questions from our customers as well as useful links and updates to operate your analyzer optimally.   www.picarro.com/community

If this is your first time visiting this forum, you will be asked to login using your username and password, which can be created easily with a special email invitation from Picarro. These invitations are automatically emailed to current customers upon purchase and to interested individuals. Please contact us to request an invitation to community (support@picarro.com).

STEP 2: If you can't find the answer your question in the Community, **please download Team Viewer software before emailing us.** This program allows our technical engineers to get access to your analyzer's desktop remotely, allowing us to find and solve your problem quickly. This access can be turned off easily by the user.

STEP 3: Email us! (support@picarro.com) Please feel free to attach data and/or screen shots to your email that you feel might help us diagnose your problem. They always do! We will get back to you right away!