

Using Your Nicolet iS10 Spectrometer

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Welcome

The Thermo Scientific Nicolet™ iS™10 spectrometer has integrated validation features, a powerful software suite, and many other features that make it easy for you to collect data. It was designed to allow you to install optional hardware and perform several service and maintenance procedures yourself, and this help system, or printed documentation, contains detailed information about performing such procedures.

If you are using the electronic help version of this document, you can access information by double-clicking the book in the Contents tab that interests you, and then double-clicking the topic you want to read. There is also an Index tab where you can search for topics by phrase or keyword, and there is a Find tab that allows you to search for specific words.

Questions and concerns

In case of emergency, follow the procedures established by your facility. If you have questions or concerns about safety or need assistance with operation, repairs or replacement parts, you can contact our sales or service representative in your area or visit our web site at www.thermo.com/spectroscopy.

Conventions used in this help system

This help system includes safety precautions and other important information presented in the following format:

Note: Notes contain helpful supplementary information.

Notice: Follow instructions labeled "Notice" to avoid damaging the system hardware or losing data.

⚠ Caution: Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

⚠ Warning: Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

⚠ Danger: Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

Warranty information

Thermo Fisher Scientific warrants that each product we sell you is free from defects in labor and materials and shall conform to its product specifications as defined in the product user documentation. If the product does not function as warranted during the warranty period, we will repair or replace it without charge. If in our judgment we are unable to do so, you may return it to us and we will refund your money.

This warranty replaces all other warranties, expressed or implied, including the implied warranties of merchantability and fitness for a particular purpose and any other obligations or liabilities on the part of Thermo Fisher Scientific whether in contract, warranty, negligence or otherwise. Thermo Fisher Scientific shall not be liable for and disclaims all consequential, incidental and contingent damages.

Warranty period

The system warranty period is 12 months in the U.S.A. and Canada. The warranty period begins on the date of installation or 30 days from the date of invoice, whichever is sooner.

The system warranty period for products sold outside the U.S.A. and Canada is 12 months from the date of installation or 14 months from the date of shipment, whichever is sooner.

Limit of warranty

Misuse, accident, modification, unsuitable physical or operating environment, improper maintenance, or damage caused by a product for which we are not responsible will void the warranty. Certain components may have separate warranty periods as stated in the product user documentation. Consumables are not covered under warranty.

Items not covered by warranty

We do not warrant uninterrupted or error-free operation of a product. We provide certain non-Thermo Fisher Scientific products on an "as is" basis. Non-Thermo Fisher Scientific manufacturers or suppliers may provide their own warranties to you. A separate software warranty is provided with the software user documentation.

Purge/desiccation requirement

We recommend that you maintain seal and desiccation and/or purge your instrument at all times. Equipment damage due to failure to maintain seal and desiccation and/or purge is not covered under the warranty. If you have questions about this requirement, please contact us.

Finding PDF documents

PDF files of your instrument documentation are installed on the hard drive of the system computer when the software is installed. To access these PDFs:

1. Click the Start button on the Windows® taskbar.
2. Click All Programs.
3. Click the Thermo Scientific OMNIC™ folder.
4. Click the Documentation folder.
5. Choose the PDF file you want to open.

Ordering parts

To order parts, contact us.

Safety

Safety precautions

The United States Department of Health and Human Services warns against improper laser use, as follows:

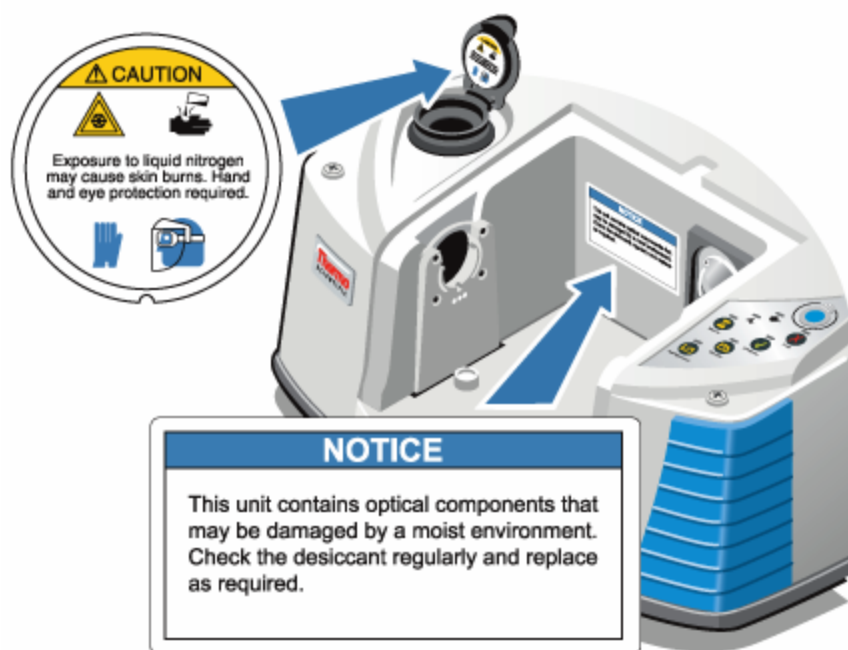
⚠ Warning: Use of controls or adjustments or performance of procedures other than those specified in your printed and electronic documentation may result in hazardous radiation exposure. Do not alter or attempt to remove the laser head from its protective housing or attempt to remove the shields that surround the laser head. Exposure to laser energy and high voltage may result.

⚠ Warning: Never stare directly into the laser beam or at its bright reflection. Avoid skin contact with the laser beam or its bright reflection. Never tamper with the laser head. Exposure to laser light or high voltage may result.

⚠ Warning: When operating your instrument, use only equipment (such as power supplies and lasers) supplied by us. Use of equipment (such as power supplies and lasers) not supplied by us can result in permanent damage to the instrument and may create a safety hazard.






Safety labels







The safety labels on your instrument are shown below. To order new labels, contact us.



Safety and electrical symbols

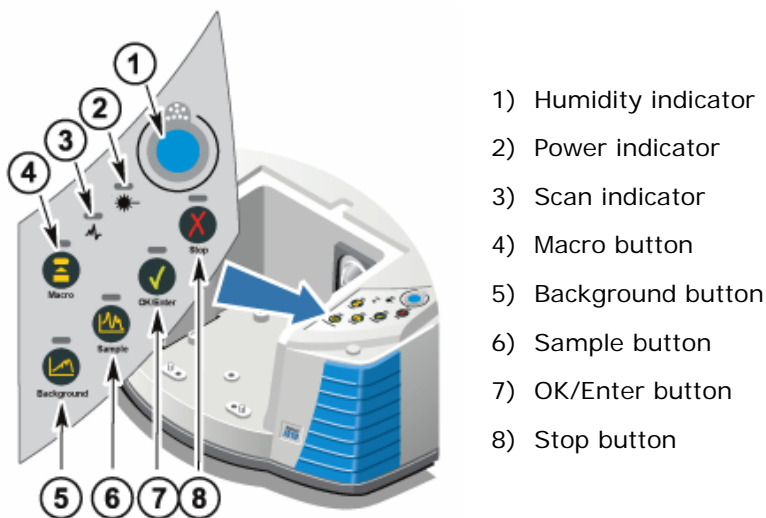
The following safety and electrical symbols may be used on this product:

Symbol	Description	Indication
	Black graphical symbol inside a yellow triangle with a black triangular band	This is a warning symbol. The graphic in this symbol is used to alert the user to potential hazards.
	Black graphical symbol inside a red circular band with a red diagonal bar	This is a prohibition symbol. The graphic in this symbol is used to alert the user to actions that shall not be taken or shall be stopped.
	White graphical symbol inside a blue circle	This is a mandatory action symbol. It is used to indicate that an action shall be taken to avoid a hazard.
	Black graphical symbol inside a yellow triangle with a black triangular band	This is the general warning sign. Failure to heed the safety precautions could result in personal injury.
	White graphical symbol inside a blue circle	This is the general data loss or property damage symbol and is not related to personal injury. Failure to heed these precautions can result in irreparable damage to property or permanent data loss.

Symbol	Indication
	Alternating current
	Earth terminal or ground
	Protective conductor terminal
	Fuse
	Power on
	Power off

Indicators and buttons

The status indicators for the instrument are located on the operations panel, which is on the main cover of the instrument. This panel also has buttons that allow you to operate the instrument.



Dangerous contaminants

Biohazards or radioactive materials and infectious agents:

Instruments, accessories, components or other associated materials may not be returned to us or other accessory manufacturers if they are contaminated with biohazard or radioactive materials, infectious agents, or any other materials and/or conditions that could constitute a health or injury hazard to employees. Contact us if you have questions about decontamination requirements.

Using liquid nitrogen

Some detectors must be cooled with liquid nitrogen before use. The following symbols remind you to wear protective clothing when using liquid nitrogen.



⚠ Warning: Liquid nitrogen is extremely cold and therefore potentially hazardous. When filling the detector dewar, be careful not to contact the liquid nitrogen with your skin. Wear protective gloves and splash-proof goggles and follow standard laboratory safety practices.

⚠ Warning: To avoid hazardous equipment damage or contact with liquid nitrogen, make sure any dewar or container you use to hold liquid nitrogen can do so safely without breaking.

Using corrosives and solvents

Caustic or corrosive agents:

Instrument components may be degraded by exposure to caustic or corrosive agents or their vapors. Materials such as hydrochloric acid and hydrofluoric acid are particularly corrosive and may accelerate the degradation of the metallic components in your instrument. Damage can also occur if the concentration level of corrosive gasses in the air is excessively high due to improper sampling techniques.

To maintain the instrument in safe working condition, do not use caustic agents, such as acetone or chlorinated solvents, when cleaning or operating your instrument. Damage to the instrument caused by the use of caustic agents is not covered by the warranty.

Volatile solvents:

You can use your instrument to analyze samples dissolved in solvents, but you must follow the guidelines listed below. These measures will help prolong the life of your instrument and will eliminate the possibility of spectral interference caused by volatile solvent vapors.

- Use sealed sample holders.
- Do not leave exposed solvent in the sample compartment for longer than necessary.
- Do not leave the solvents near the instrument.
- Be sure that your work space is properly ventilated.

Solvents containing halogenated hydrocarbons:

The pyrolysis of chlorinated solvents, perfluorochlorinated solvents, and other solvents by an infrared source or by excessive heating caused by laser absorption may produce hydrochloric acid (HCl), hydrofluoric acid (HF), phosgene (COCl₂), or other hazardous compounds.

⚠ Warning: Materials such as hydrochloric acid, hydrofluoric acid and phosgene are highly toxic. If you regularly use solvents containing halogenated hydrocarbons, your work area must be properly ventilated, and your system must be purged while the solvents are in use. Damage to your system due to pyrolysis of halogenated hydrocarbons and/or exposure to other corrosive or caustic agents is not covered by the warranty.

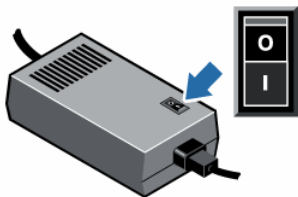
Checking the power supply

⚠ Danger: Your instrument is powered by an external power supply that accepts a variety of AC power sources and adjusts automatically to maintain a consistent VDC output. To avoid injury, only a qualified person using the appropriate measuring device should check the line voltage, current and frequency.

Operation

Turning the power on and off

To turn the system power on or off, press the power switch on the power supply.



Installing a Smart Accessory

To install a Smart Accessory™ in the sample compartment, lower the accessory into the sample compartment and press gently downward until the accessory locks in place. Then rotate the stabilizer arm (located on the top of the instrument at the back edge of the sample compartment) so that it holds down the accessory.

Note: If you want to remove a Smart Accessory, simply reverse the steps in this procedure. When you are not using an accessory, store it in a dust-free environment like a cabinet or box.

Note: For information about installing other kinds of accessories, see "Installing other accessories".

Collecting data with the instrument

For information about collecting data with your instrument, please see the getting started manual that came with the instrument.

Collecting data with the module

You must use OMNIC to collect data. OMNIC can be started by using the OMNIC shortcut on your system desktop. For additional information, please see the OMNIC help (available through the Help menu in OMNIC) or the printed documentation that came with the system microscope or spectrometer.

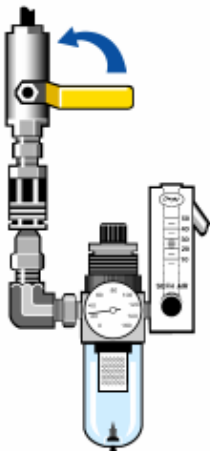
Setting the purge gas controls

You must connect a source of purge gas (dry air or nitrogen) to purge your instrument of moisture and other environmental contaminants. For best results the purge gas should be dried to a dew point of -70 degrees C (-94 degrees F) or below. Use the following instructions to set the purge gas controls.

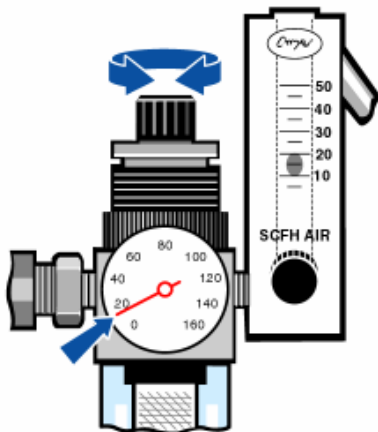
Notice: We recommend that you maintain seal and desiccation and/or purge your instrument at all times. Equipment damage due to failure to maintain seal and desiccation and/or purge is not covered under the warranty. If you have questions about this requirement, please contact us.

Warning: Never use a flammable gas to purge your instrument. The purge gas must be free of moisture, oil, carbon dioxide and other reactive or infrared-absorbing materials. To prevent laser damage, use only dried air or nitrogen to purge your instrument.

1. Open the shutoff valve.

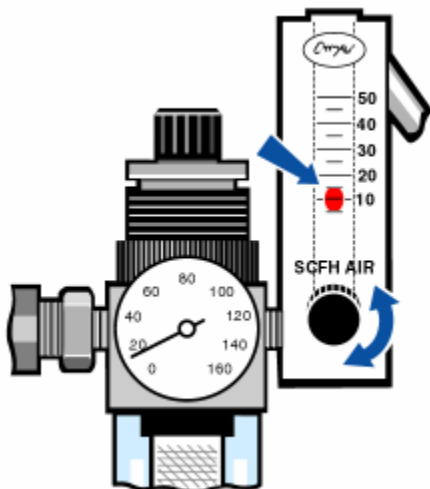


2. Adjust the pressure regulator until the gauge indicates that the pressure is between 0.7 and 1.4 bar (70 to 140 kPa, or 10 to 20 psig).



Notice: Flow rates greater than 10 scfh can cause vibration that can affect data quality. We recommend keeping the flow rate at approximately 10 scfh.

3. Set the flowmeter to 10 scfh.



Aligning your spectrometer

Your instrument can be aligned automatically using OMNIC. To align your instrument, use the Align button on the Diagnostic tab of the Experiment Setup dialog box (which is available through the Collect menu in OMNIC). For more information, refer to the electronic software help for OMNIC.

Cooling a detector

If you have an MCT detector, you must cool it with liquid nitrogen before you can collect data.

Time needed: 40 minutes or less

Tools needed: Protective clothing and eyewear

A small plastic laboratory funnel

A one-liter, metal vacuum bottle

Liquid nitrogen

Note: A detector dewar should maintain its insulating vacuum for several years. If the vacuum leaks, the insulation will lose effectiveness.

Note: Your MCT detector, when cooled according to the following procedure, should remain cool for approximately six hours.

⚠ Warning: Liquid nitrogen is extremely cold and can be hazardous. When you use liquid nitrogen, always follow standard laboratory safety practices, and make sure your dewar is made to use with liquid nitrogen. Wear protective clothing and eyewear, and avoid letting liquid nitrogen come into contact with your skin.

1. Open the detector dewar cover and remove the plastic stopper from the dewar.



⚠ Warning: Make sure you pour the liquid nitrogen *slowly* when you fill the vacuum bottle or the detector dewar. Pouring too quickly can cause liquid nitrogen spray out. Wear protective clothing and eyewear, and follow standard laboratory safety practices to prevent injury.

2. Fill the metal vacuum bottle with liquid nitrogen.

Notice: Do not spill liquid nitrogen on or near the detector window. If the window's O-ring seal is cooled very rapidly, the dewar may lose its vacuum and expose the detector element to damaging atmospheric pressure.

3. Insert the funnel into the detector dewar, and pour the liquid nitrogen *slowly* into the funnel. (A small amount of liquid nitrogen typically spills out of the funnel. This will not harm your instrument.)

Fill the funnel and then let it drain completely two or three times. Wait until the vapor plume disappears and then repeat until the dewar is filled.



4. Remove the funnel.
5. Wait until the vapor plume disappears, and then replace the plastic stopper and close the dewar cover.
6. Wait 20 minutes, and then repeat the preceding steps to make sure the dewar is completely filled.

Service

Installing or replacing hardware

Installing a purge kit

Purging your instrument protects the internal components from moisture and other environmental contaminants by maintaining an internal atmosphere of dry air or nitrogen. If your instrument is not already equipped to purge, you must install a purge kit. To install a purge kit, use the following procedure.

Notice: We recommend that you maintain seal and desiccation and/or purge your instrument at all times. Equipment damage due to failure to maintain seal and desiccation and/or purge is not covered under the warranty. If you have questions about this requirement, please contact us.

Time needed: 30 minutes or less

Tools needed: A 3/4 inch open-ended wrench

An 11/16 inch open-ended wrench

A shutoff valve (with a 1/4 inch male or 3/8 inch female fitting)

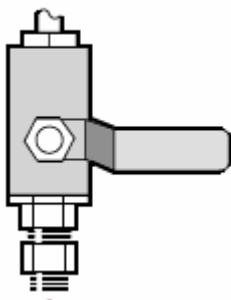
Pipe tape

Note: To order parts, contact us.

Note: For best results the purge gas should be dried to a dew point of -70 degrees C (-94 degrees F) or below.

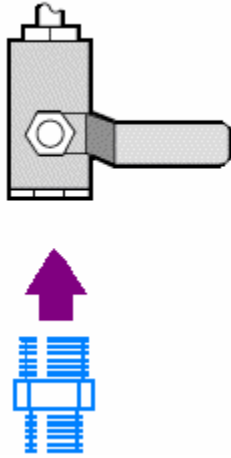
Warning: Never use a flammable gas to purge your instrument. The purge gas must be free of moisture, oil, carbon dioxide and other reactive or infrared-absorbing materials. To prevent laser damage, use only dried air or nitrogen to purge your instrument.

1. Install a shutoff valve and either a 1/4 inch male fitting or a 3/8 inch female fitting on the purge gas source. (Choose a shutoff valve and fittings that are appropriate for the purge gas source.)

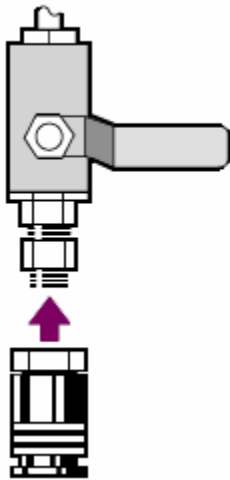


2. If you used a 1/4 inch male fitting, proceed to the next step.

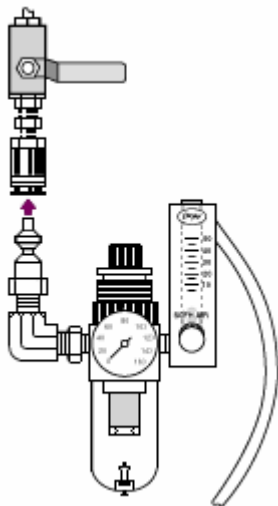
If you used a 3/8 inch female fitting on the purge gas source, install the 3/8 inch to 1/4 inch reducing nipple that was included with your purge kit. Wrap the reducing nipple with Teflon pipe tape before you install it, and use an 11/16 inch open-ended wrench to tighten the connection.



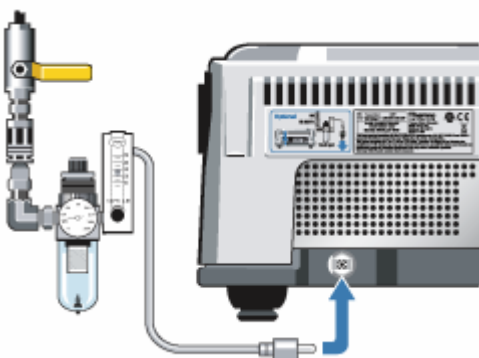
3. Wrap the reducing nipple or the 1/4 inch male fitting with Teflon pipe tape, and then install the pressure coupling. Use a 3/4 inch open-ended wrench to tighten the connection.



4. Install the purge filter, pressure regulator and flowmeter, and then snap the assembly into the pressure coupling.



5. Connect the purge kit to your instrument, set the purge gas controls, and then snap the flow coupler into the back of the instrument.



Installing a sample compartment extension kit

Time needed: 10 minutes or less

Tools needed: 4-in1 tool (included with your instrument)
A 5/32 inch hex wrench

Note: To order parts, contact us.

1. Remove any Smart Accessory, and then disconnect any cables that are connected at the back of the sample compartment.
2. Remove the stabilizer arm located on the top of the instrument at the back edge of the sample compartment.

Remove the cap on top of the stabilizer arm, and then use the 4-in1 tool with a Philips bit installed to remove the stabilizer arm screw. Lift the stabilizer arm off the instrument and save it, with its cap and screw, in a safe place in case you want to reinstall it later.

3. Place the sample compartment extension on the front of the sample compartment.

Make sure the pins in the same compartment base fit into the holes in the sample compartment extension.



4. Place the screws that came with the sample compartment extension kit into the holes in the sample compartment extension, and then use the 4-in1 tool with a Philips bit installed to tighten the screws. (The screws should be just finger-tight.)



5. Install the sample compartment cover.

You are now ready to install baseplate-mounted accessories.

Note: Please see "Installing a sample" and "Adjusting sample height" for additional information about using baseplate-mounted accessories.

Installing baseplate-mounted accessories

For information about installing accessories that are mounted on a baseplate, please refer to the procedure for installing a baseplate. For additional information about using baseplate-mounted accessories, see "Installing a sample" and "Adjusting sample height."

Installing slide-mounted accessories

The sample holder is designed to accommodate slide-mounted accessories (such as a variable angle ATR) as well as thin film samples and optical filters. To install a slide-mounted accessory:

1. Slide the accessory into one pair of slots in the standard sample holder.

2. Tighten the thumbscrew against the accessory support to hold the accessory in place.



Installing other accessories

Note: The following procedure explains how to install accessories that are not Smart accessories. This procedure applies only if a sample compartment expansion kit has been installed.

Notice: Your accessory must be mounted on one of our baseplates. If it is not, you can remove an accessory from one of our baseplates and install your accessory on that baseplate, or you can contact our sales or service representative in your area or visit our web site at www.thermo.com/spectroscopy for assistance.

1. Remove any Smart Accessory, or if a Smart Accessory is not installed, remove the baseplate. Disconnect any cables that are connected at the back of the sample compartment.
2. If the accessory is purged through the windows in the side of the sample compartment, install sidewall adapters.
3. Install the accessory.

Use the instructions that came with the accessory to make any adjustments or perform any alignment procedures that are necessary.

Note: Please see "Installing a sample" and "Adjusting sample height" for additional information about using baseplate-mounted accessories.

Replacing the power supply

Time needed: 5 minutes or less

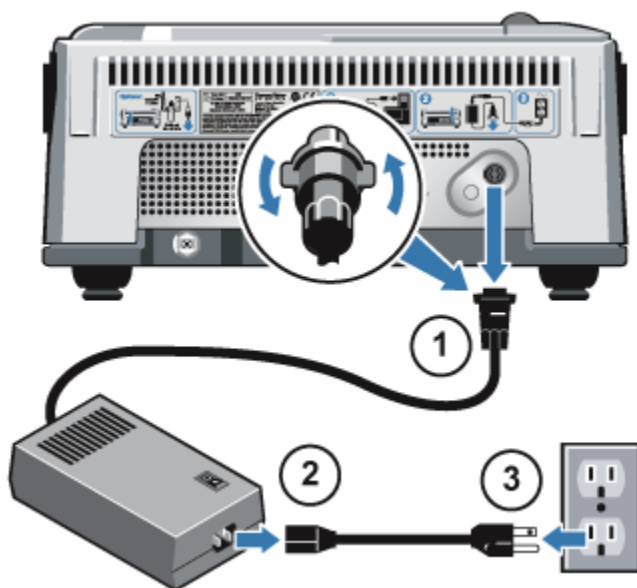
Tools needed: None

Note: To order parts, contact us.

⚠ Warning: To avoid a shock hazard, do not attempt to remove the cover of the power supply.

⚠ Warning: Before you replace the power supply, always make sure you have turned off your instrument and disconnected the power supply from the wall outlet or power strip.

1. Turn off your instrument.
2. Disconnect the old power supply.



Note: Turn the locking ring on the power supply connector until you feel it snap into place.

3. Connect the new power supply.

Simply reverse the order that you disconnected the power cords in the previous step.

4. Turn on your instrument.

The Power and Scan indicators on the main cover should light and your instrument should function normally when you turn on the power. If your instrument does not function normally, turn off the power and check the cable connections between the power supply, the instrument, and the wall outlet or power strip. If the connectors are seated properly and your instrument still does not function normally, contact us for assistance.

Replacing or changing the source

Both mid-IR and near-IR sources are available for your spectrometer. This procedure explains how to replace a source or change from one kind of source to the other.

Time needed: 25 minutes or less

Tools needed: 4-in-1 tool (included with your instrument)

Finger cots, gloves, or laboratory tissue

Note: To order parts, contact us.

Note: A spare source, or an alternate source, can be stored in a holder in the same compartment as the 4-in-1 tool (above the desiccant compartment).

Notice: Never touch a source element with your bare fingers. Skin oils or other deposits on the element will shorten its life. Always use clean finger cots, gloves, or clean laboratory tissue when handling a source.

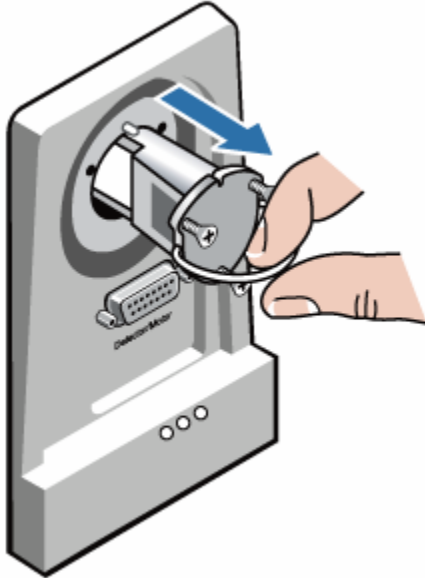
⚠ Caution: The source becomes extremely hot while you are using your instrument. Always allow the source to cool for at least 15 minutes after it is turned off before you work with it.

1. Turn off your instrument, wait 15 minutes for the source to cool, and then remove the Smart Accessory or open the sample compartment cover.
2. Use the 4-in-1 tool, with the small Philips bit installed, to loosen the screws that hold the source in place. (The screws are captive, so you only need to loosen them until they spin freely.)



Notice: Do not twist the source as you remove it, and do not touch the electrical contacts or the source element.

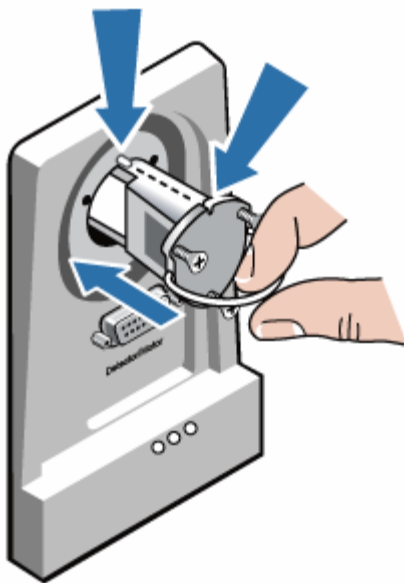
3. Remove the old source.



Notice: Do not twist the new source as you insert it. Keep the notch in the top of the source aligned with the pin in the source holder as you insert the new source.

4. Insert the new source.

Once the source is inserted, push it gently until the pin in the source holder fits into the notch in the base of the source.



5. Use the 4-in-1 tool, with the small Philips bit installed, to tighten the screws that hold the source in place. (Do not overtighten the screws.)
6. Turn on your instrument and start OMNIC.

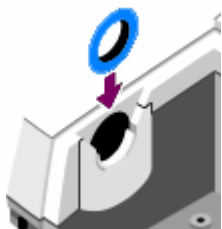
If you have installed a different type of source than you were previously using, choose Experiment Setup in the Collect menu, and then click the Bench tab in the Experiment Setup dialog box. Configure the Bench tab for the new source. (See the electronic software documentation for more information.)

Use the Advanced Diagnostics command in the Collect menu to verify that the new source is working properly. (If it does not work properly, contact us for assistance.)

7. Make sure the system has been on for at least 15 minutes (one hour for best results), and then align your instrument.

Installing sidewall adapters

Sidewall adapters are used to provide a tight purge seal for gas cells and other purged accessories. To install sidewall adapters, press the adapter ring toward the sidewall to compress the purge gasket, and then slide the adapter down into the clips on the side of the transmission sample compartment.



Note: To remove a sidewall adapter, press the adapter ring toward the sidewall to compress the purge gasket and then slide the adapter up out of the clips on the side of the sample compartment.

Maintaining your instrument

Cleaning your instrument

If the outside of your instrument needs cleaning, turn your instrument off and disconnect the power supply. When this is done, you can use a soft cloth that is damp (not wet) and a mild soap to clean the outside of your instrument.

Warning: To avoid a shock hazard, do not allow liquid to run into the power supply or the back of the instrument.

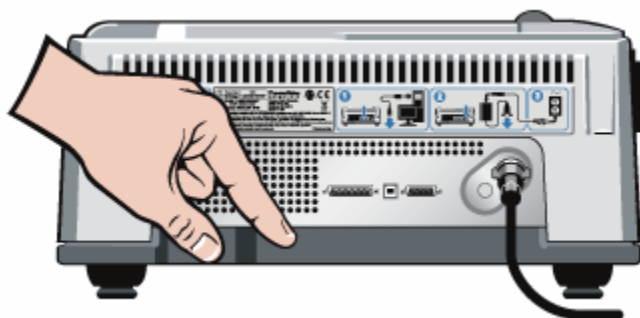
Notice: Do not use harsh detergents, solvents, chemicals or abrasives; these can damage the finish. Do not allow liquid to run contact any windows, such as those that may be in the sample compartment.

Notice: Mirror surfaces and windows can be scratched and ruined very easily. Do not touch or attempt to clean them. Dust will not affect the signal, but fingerprints can degrade the performance of your instrument and permanently damage mirrors or windows. If you wish to remove dust from a mirror or window, blow it off with a gentle stream of clean, dry air or nitrogen. *Never* allow any liquid to come into contact with a window or optical component in the instrument

Static electricity precautions

Critical components in your instrument can be permanently damaged by static electricity. To help prevent such damage, follow these recommendations:

Notice: Before you disconnect the power supply, always discharge any static electricity you may have accumulated by touching the metal base of your instrument.



Notice: Do not touch any printed circuit board in your instrument (such as the circuit board on the detector).

Notice: Do not remove replacement components from their protective packaging until you are ready to install that component in your instrument.

Maintaining detector dewars

If your instrument has a cooled detector, it will include a detector dewar. With proper care, a detector dewar should maintain its insulating vacuum for several years. If the vacuum leaks, the insulation will lose effectiveness and the following symptoms may occur:

- Liquid nitrogen boils off much faster than usual.
- The outside of the dewar stays cold more than 30 minutes after filling and may feel damp or become frosted.
- Water and atmospheric contaminants condensing on the detector window show up in spectra as unwanted peaks.

Notice: If your instrument shows any of these symptoms, the detector dewar may have a vacuum leak. Contact us immediately for assistance. Leaving internal detector elements exposed to atmospheric pressure can permanently damage them.

Note: You can restore the vacuum in a detector dewar if you have the proper equipment. The vacuum must be pumped to approximately .000001 torr. A special evacuation valve for pumping out dewars is available from us. To order a dewar evacuation valve, contact us.

Checking the humidity indicator

The optical components of your instrument are protected by two desiccant canisters that absorb moisture. As long as the humidity indicator on your instrument's main cover is blue, the desiccant canisters are not saturated and do not need to be replaced. When the desiccant canisters become saturated, the humidity indicator turns pink and then white. This means you must replace the desiccant cartridges, and you may need to replace the humidity indicator as well.

Notice: You should check the humidity indicator every time you use your instrument. If you don't use your instrument frequently, make sure you check the indicator at least once a month.

Notice: We recommend that you maintain seal and desiccation and/or purge your instrument at all times. Equipment damage due to failure to maintain seal and desiccation and/or purge is not covered under the warranty. If you have questions about this requirement, please contact us.



Replacing the humidity indicator

The humidity indicator must be replaced when it turns white or does not return to blue after the desiccant has been replaced.

Time needed: Less than 1 minute

Tools needed: Gloves, finger cots, or laboratory tissue

Note: To order parts, contact us.

1. Remove the old humidity indicator.

Save the old indicator for reference when you install the new indicator.



Notice: Always wear lab gloves or finger cots, or use laboratory tissue, when handling the humidity indicator. Oil or moisture from skin can discolor the indicator.

Notice: Make sure that the indicator is centered in the holder and that there are no gaps.

2. Peel the backing off of the indicator holder, and then, as shown below, press the round, blue indicator onto the adhesive on the holder.

Place the new indicator and holder over the indicator opening, and press down gently to make sure it is sealed.



Replacing the desiccant

The optical components of your instrument are protected by two desiccant canisters that absorb moisture. As long as the humidity indicator on your instrument's main cover is blue, the desiccant canisters are not saturated and do not need to be replaced. When the desiccant canisters become saturated, the humidity indicator turns pink or white. This means you must replace the desiccant cartridges.

Notice: We recommend that you maintain seal and desiccation and/or purge your instrument at all times. Equipment damage due to failure to maintain seal and desiccation and/or purge is not covered under the warranty. If you have questions about this requirement, please contact us.

Time needed: 3 minutes or less

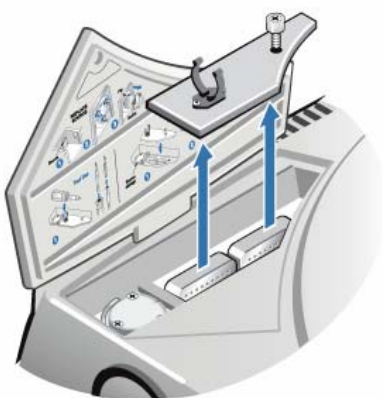
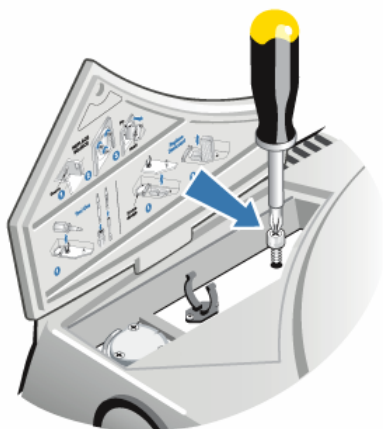
Tools needed: 4-in-1 tool (included with your instrument)

Note: To order parts, contact us.

Notice: Make sure nothing falls into the instrument while the desiccant cover is removed.

1. Open the tool compartment, and use the 4-in-1 tool, with the large Philips bit installed, to loosen the captive screw in the desiccant cover.

Lift off the desiccant compartment cover and put it in a safe place.



⚠ Caution: The contents of the desiccant canisters could be harmful if ingested. If you discard the saturated desiccant canisters, make sure they are properly disposed of.

2. Lift the saturated desiccant canisters out of your instrument and install the new desiccant canisters.



3. Use the 4-in-1 tool to install the desiccant cover, and then replace the 4-in-1 tool in its compartment and close the tool compartment door.

Notice: If the humidity indicator has turned white or does not return to blue after the desiccant has been replaced, you must replace the humidity indicator.

Regenerating the desiccant

When the desiccant canisters must be replaced, you can contact us to order new desiccant canisters, or you can dry and reuse the saturated canisters according to the following instructions.

Time needed: 3 hours

Tools needed: Vented oven

Insulated cloth or hot pad

Notice: If you need to replace the humidity indicator, you must order new desiccant canisters. A new humidity indicator is included with the new desiccant canisters.

Notice: If you are going to dry and reuse saturated desiccant canisters, make sure you have fresh desiccant canisters you can place in your instrument while the saturated canisters dry.

Notice: Do not leave canisters in the oven for more than three hours and do not exceed a temperature of 150 °C (about 300 °F).

Notice: Make sure the insulated cloth or hot pad you use to handle the regenerated desiccant canisters is not contaminated with substances that could be absorbed by the desiccant and subsequently released into your instrument.

1. Place the saturated desiccant canisters in a vented oven at 150 °C (about 300 °F) for three hours.

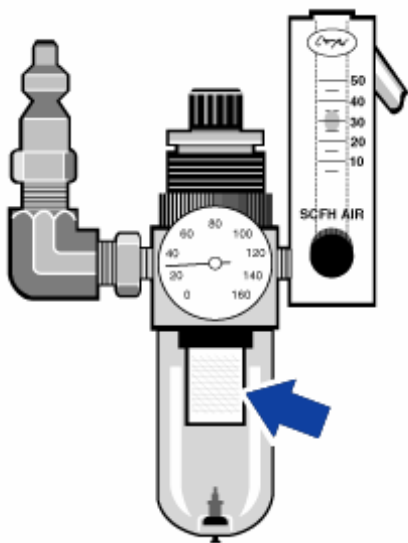
⚠ Caution: To avoid a burn hazard, use an insulated cloth or hot pad to handle the heated desiccant canisters, and always wait until the canisters have cooled to room temperature before you reinstall them in your instrument.

2. Use an insulated cloth or hot pad to remove the desiccant canisters from the oven.

Allow the canisters to cool on the hot pad or cloth, and do not attempt to handle or install them until they have cooled to room temperature. As soon as the canisters reach room temperature, however, you must either install them in your instrument or seal them in an airtight container or bag. Otherwise, they will absorb moisture from the air in the room and quickly become saturated again.

Checking and changing the purge gas filter

You should check the purge filter occasionally to make sure it is clean and dry. (The drawing below shows where the purge filter is located.)



If the filter is green, it does not need to be replaced. If it is yellow, or otherwise discolored, replace it according to the following procedure.

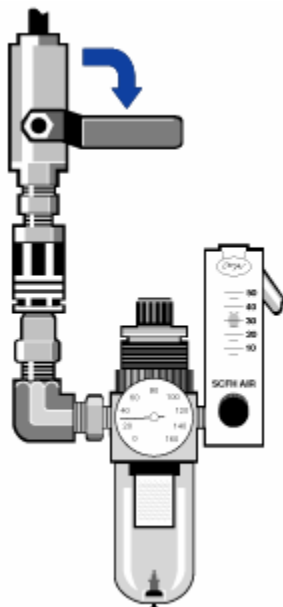
Notice: We recommend that you maintain seal and desiccation and/or purge your instrument at all times. Equipment damage due to failure to maintain seal and desiccation and/or purge is not covered under the warranty. If you have questions about this requirement, please contact us.

Time needed: 5 minutes or less

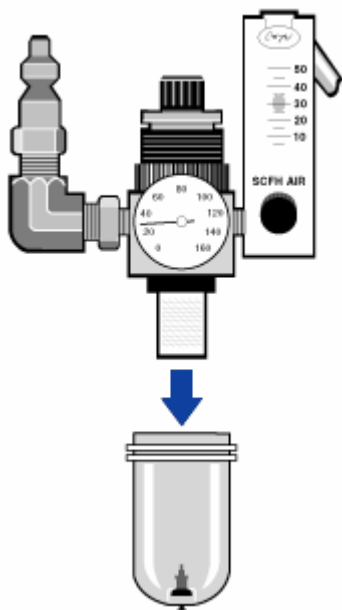
Tools needed: None

Note: To order parts, contact us.

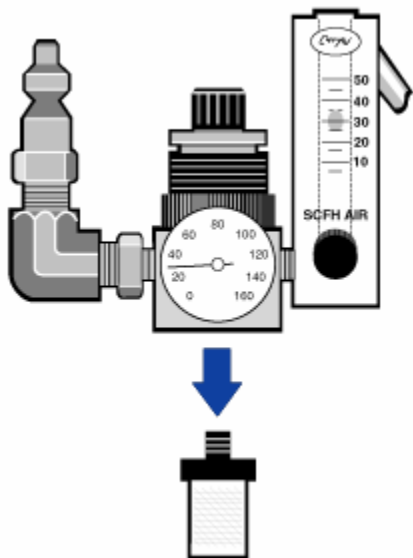
1. Turn off the purge gas at the main valve. Do not turn down the flowmeter or the pressure regulator.



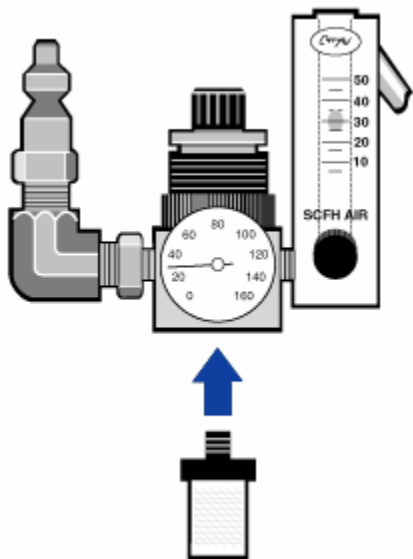
2. Remove the plastic bowl that houses the filter. (You can unscrew the bowl by hand.)



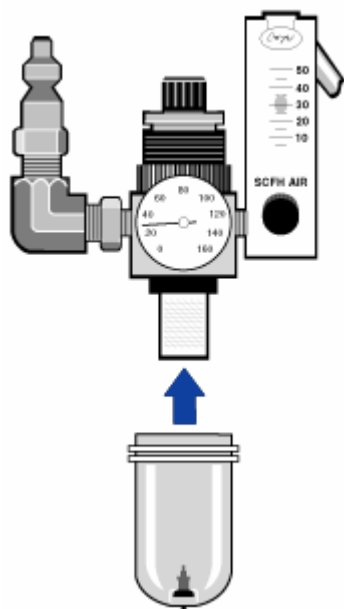
3. Remove the filter. (You can unscrew the filter by hand.)



4. Install the new filter.



5. Reinstall the plastic bowl.



6. Turn on the purge flow to your instrument.

Note: You may notice increased levels of water and carbon dioxide in spectra collected immediately after you have had the purge gas turned off. If this interferes with your data, wait 15 to 60 minutes until purge is completely re-established.

Troubleshooting

Using the troubleshooting topics

The "Troubleshooting your instrument" book has a variety of topics about troubleshooting and solving problems with your instrument. These topics are divided into the following two books:

- "Hardware problems" contains topics that address specific hardware problems you may encounter. Each topic lists steps you can take to try to resolve the problem.
- "Error messages" contains topics that deal with error messages you may see. Each topic lists steps you can take if you see such error messages.

Note: If you're having a problem with applications or software, refer to the electronic or printed software documentation that came with your system.

⚠ Warning: When performing any of the procedures in the troubleshooting topics, always follow the safety precautions included in this help system and in any of the other documentation that came with your instrument.

Hardware problems

The status indicators do not light when you turn on your instrument

1. Turn your instrument off and check the connections between the instrument and the power supply. Make sure the locking ring is tightened finger-tight. (The locking ring should "snap" into the locked position.)
2. Make sure the power cord is securely connected to the power supply and a working outlet or power strip.
3. Check the power cord descriptions and part numbers to make sure the power cord is appropriate for your local AC power source. Order a new power cord if necessary.
4. Check the ground prong on the power cord. If the ground prong has been removed or is defective, replace the power cord.
5. Contact us for assistance.

The Scan indicator flashes intermittently

1. Check the sample compartment windows. If they are fogged, contact us to have the windows replaced
2. Check the source indicator on the Diagnostic tab of the Experiment Setup dialog box to see if the source is functioning properly. Replace the source if needed.
3. Check the laser signal by clicking the laser indicator on the Diagnostic tab of the Experiment Setup dialog box. If there is a problem, contact us for assistance.
4. Open the Diagnostic tab of the Experiment Setup dialog box in OMNIC, and click Reset Bench.
5. Make sure the system has been on for at least 15 minutes (one hour for best results), and then align your instrument.
6. Make sure any accessories are installed according to the instructions that came with them.
7. Contact us for assistance.

The Scan indicator does not flash (the instrument is not scanning)

Note: After 1 hour without data collection activity, the interferometer automatically stops scanning and the Scan light stays on. This is normal. Any data collection activity will cause the interferometer to begin scanning again.

1. Turn your instrument on (if it is not already turned on).
2. Start OMNIC (or other instrument software you are using).
3. Make sure the system has been on for at least 15 minutes (one hour for best results), and then align your instrument. If your instrument does not resume scanning, proceed to the next step.
4. Turn off the power to the computer and the instrument. Leave the power off for 15 seconds. Turn your instrument on and wait until the start-up diagnostics finish. Then turn on the computer and restart OMNIC.
5. Open the Diagnostic tab of the Experiment Setup dialog box and change the Detector selection to Reference Detector.

If the instrument scans normally (look for a flashing Scan indicator and an interferogram), the problem is probably related to the sample or the detector. Make sure that the sample compartment beam is not blocked, and check the Diagnostic tab of the Experiment Setup dialog box to make sure the detector is recognized. If it is not, contact us for assistance.

6. Check all of the indicators on the Diagnostic tab of the Experiment Setup dialog box. Click any indicator that has a red slash through it to view diagnostic information about the component.

If the laser frequency is outside the specified range, contact us to have the electronics module and/or laser replaced.

If the temperature is not in the acceptable range, make sure the cooling vents on the back of the instrument are not blocked and nothing is stacked on top of the instrument. Maintain at least 30 cm (12 in) of clearance behind the instrument and 64 cm (25 in) of clearance above the table. Make sure the ambient temperature is between 16 and 27 °C (60 and 80 °F), and make sure that the power supply vents are not blocked.

8. Contact us for assistance.

The system scans normally but the signal intensity is very low

1. Align your instrument.
2. Set Optical Velocity on the Bench tab of the Experiment Setup dialog box to a lower velocity.
3. If the Source status indicator is off, click the source indicator on the Diagnostic tab of the Experiment Setup dialog box to check the source current and voltage. If the Source indicator is on, check the interferogram on the Bench tab of the Experiment Setup dialog box; if the interferogram is not present, check the beam path and detector.
4. Check the Aperture parameter on the Bench tab of the Experiment Setup dialog box. For an MCT-A detector, set Aperture to High Resolution. For a DTGS detector, set Aperture to Medium Resolution.
5. Make sure any accessories you are using are installed and aligned correctly. (For more information, see the instructions that came with the accessory.)
6. Contact us for assistance.

The baseline is not stable

1. Lower the purge flow rate to minimize the acoustic noise inside the instrument until the baseline is stable.
2. Align your instrument.
3. Use the Bench Diagnostics software to check the laser levels for proper balance. If the levels are out of tolerance, contact us for assistance.
4. Make sure the environmental conditions meet the requirements given in the site preparation manual that came with your instrument.
5. Check the humidity indicator and replace the desiccant and indicator if needed.

Notice: If you are using purge and the instrument cover was recently opened, allow the instrument to purge for 3 to 5 minutes after the cover is closed.

6. If the power to your instrument was recently turned on, allow 1 hour for the temperature to stabilize.
7. If the instrument has a cooled detector and the detector dewar was recently filled, allow the detector to cool.
8. Contact us for assistance.

The alignment fails

1. Check the sample compartment windows. Contact us for assistance if they are not clear or appear to be damaged.
2. Check all of the indicators on the Diagnostic tab of the Experiment Setup dialog box.
3. Open the Diagnostic tab of the Experiment Setup dialog box in OMNIC, and click Reset Bench.
4. Make sure the system has been on for at least 15 minutes (one hour for best results), and then align your instrument.
5. Make sure any accessories are installed according to the instructions that came with them.
6. Contact us for assistance.

There is a problem selecting an external detector in a microscope

1. Check the accessory connector on the rear of the instrument or on the back wall of the sample compartment. Check the detector cable connection. If it is loose, tighten it.
2. Contact us for assistance.

Data cannot be collected (or other software problems)

1. Close OMNIC, and then turn off the instrument power. Wait for a few seconds, and then turn on the instrument power. Allow the start-up diagnostics finish, and then restart OMNIC.
2. Shut down the computer and turn your instrument off. Check the data cable. If it is damaged, replace it. If the cable is loose or disconnected, reconnect it. Turn your instrument on, and wait until the start-up diagnostics finish. Then turn on the computer and restart OMNIC.
3. Contact us for assistance.

Error messages

The computer cannot communicate with the instrument

1. Close OMNIC, and then turn off the instrument power. Wait for a few seconds, and then turn on the instrument power. Allow the start-up diagnostics finish, and then restart OMNIC.
2. If the indicators on the main cover do not turn on, make sure the power supply is connected to the instrument and a wall outlet or power strip.
3. Shut down the computer and turn your instrument off. Check the USB data cable. If the cable is damaged, replace it. If the cable is loose or disconnected, reconnect it.
4. Turn your instrument on. Wait until the power-up diagnostics finish, and then turn on the computer and restart OMNIC.
5. Remove any USB computer accessories that may be interfering with communications with the spectrometer.
6. Close any applications that might interfere with OMNIC.
7. Contact us for assistance.

The instrument temperature is out of specification

1. Make sure nothing is placed on top of your instrument and that air can flow freely around your instrument.
2. The ambient temperature in your lab may be too high. The ambient temperature should be between 20 and 22 °C (68 and 72 °F).
3. Make sure the power supply vents are not blocked.
4. Contact us for assistance.

OMNIC cannot communicate with the detector

If OMNIC cannot communicate with the spectrometer, contact us for assistance.

The instrument is not scanning

Note: After 1 hour without data collection activity, the interferometer automatically stops scanning and the Scan light stays on. This is normal. Any data collection activity will cause the interferometer to begin scanning again.

1. Turn your instrument on (if it is not already turned on).
2. Start OMNIC (or other instrument software you are using).
3. Make sure the system has been on for at least 15 minutes (one hour for best results), and then align your instrument. If your instrument does not resume scanning, proceed to the next step.
4. Turn off the power to the computer and the instrument. Leave the power off for 15 seconds. Turn your instrument on and wait until the start-up diagnostics finish. Then turn on the computer and restart OMNIC.
5. Open the Diagnostic tab of the Experiment Setup dialog box and change the Detector selection to Reference Detector.

If the instrument scans normally (look for a flashing Scan indicator and an interferogram), the problem is probably related to the sample or the detector. Make sure that the sample compartment beam is not blocked, and check the Diagnostic tab of the Experiment Setup dialog box to make sure the detector is recognized. If it is not, contact us for assistance.

6. Check all of the indicators on the Diagnostic tab of the Experiment Setup dialog box. Click any indicator that has a red slash through it to view diagnostic information about the component.

If the laser frequency is outside the specified range, contact us to have the electronics module replaced. If the laser voltage or current is outside the specified range, contact us for assistance.

If the temperature is not in the acceptable range, make sure the cooling vents on the back of the instrument are not blocked and nothing is stacked on top of the instrument. Maintain at least 30 cm (12 in) of clearance behind the instrument and 64 cm (25 in) of clearance above the table. Make sure the ambient temperature is between 16° and 27°C (60° and 80°F), and make sure that the power supply vents are not blocked.

8. Contact us for assistance.

The MCT detector is warm

1. Cool the detector.
2. Check the detector dewar for signs of leaks. If necessary, contact us to restore the dewar vacuum.
3. Contact us for assistance.

The laser voltage is out of specification

1. Remove any accessories or samples from the sample compartment, and then align your instrument.
2. Replace the laser.
3. Contact us for assistance.

The source voltage is out of specification

1. Check to see if the source is properly seated in its holder.
2. Replace the source.
3. Contact us for assistance.

The power supply voltages are out of tolerance

1. Replace the power supply.
2. Contact us for assistance.

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