REICHERT® 4SPR

4 Channel SPR System

User's Guide

Reichert® TECHNOLOGIES AMETEK®

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Warnings & Cautions

Reichert Technologies® (Reichert) is not responsible for the safety and reliability of this instrument when assembly, disassembly, repair, or modification is made by unauthorized dealers or persons. Or, when the instrument is not used in accordance with this User's Guide.

WARNING: DO NOT REMOVE OR DEFEAT THE EARTH GROUND CONNECTION ON THE INPUT CONNECTOR TO EACH COMPONENT OR THE UNIT'S POWER CORD. DAMAGE TO THE COMPONENT AND/OR INJURY TO THE OPERATOR MAY OCCUR.

WARNING: THIS INSTRUMENT SHOULD BE USED IN STRICT ACCORDANCE WITH THE INSTRUCTIONS OUTLINED IN THIS USER'S GUIDE. THE SAFETY OF THE OPERATOR AND THE PERFORMANCE OF THE INSTRUMENT CANNOT BE GUARANTEED IF USED IN A MANNER NOT SPECIFIED BY REICHERT TECHNOLOGIES.

WARNING: DO NOT REPAIR OR SERVICE THIS INSTRUMENT WITHOUT AUTHORIZATION FROM THE MANUFACTURER. ANY REPAIR OR SERVICE TO THIS INSTRUMENT MUST BE PERFORMED BY EXPERIENCED PERSONNEL OR DEALERS WHO ARE TRAINED BY REICHERT OR SERIOUS INJURY TO THE OPERATOR MAY OCCUR.

CAUTION ESDS: THE INTERNAL CIRCUITRY OF THE INSTRUMENTATION CONTAINS ELECTROSTATIC DISCHARGE SENSITIVE DEVICES (ESDS). SUCH COMPONENTS MAY BE SENSITIVE TO HIGH VOLTAGES PRODUCED BY STATIC DISCHARGES.

CAUTION: DO NOT USE STRONG SOLVENTS OR STRONG CLEANING SOLUTIONS ON ANY COMPONENT OR DAMAGE MAY OCCUR.

WARNING: RISK OF ELECTRICAL SHOCK EXISTS IF THE COVER OF THE REICHERT4SPR SYSTEM IS REMOVED. HAZARDOUS VOLTAGES WILL BE EXPOSED, WHICH CAN CAUSE INJURY OR DEATH. REFER SERVICING TO A QUALIFIED SERVICE TECHNICIAN.

WARNING: SURFACES AROUND THE PRISM MAY BE HEATED AND CAUSE INJURY.

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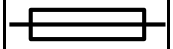
WARNING: RISK OF FIRE. THE INSTRUMENT HAS BEEN TESTED FOR USE WITH NON-FLAMMABLE LIQUIDS. DO NOT USE WITH FLAMMABLE LIQUIDS.

Symbol Information

Symbol Information

The following symbols appear on the instrument:

	Warning symbol indicating risk of electrical shock (all three modules)
	Warning symbol indicating a heated surface (SPR Module).
	CAUTION: Replace with same type and rating fuse 5x20mm, 6.3A, 250V AC Glass Fast Acting (SPR Module); 5x20mm, 1.6A, 250V Quick Acting Glass (Pump Module)
	Warning symbol indicating important operating and maintenance instructions that are included in this User's Guide
	Compliance to European Directive 2014/25/EU Low Voltage and 2014/30/EU Electromagnetic Compatibility (EMC)
	Alternating Current
	Date of Manufacture
	Authorized to mark given by Intertek ETL Semko for conformance with electrical standards
REF	Catalog Number
SN	Serial Number
	Waste of Electrical and Electronic Equipment
	Warning: Flammable Material

Introduction

Congratulations on the purchase of your new Reichert4SPR Surface Plasmon Resonance (SPR) system (Catalog Number 13309000) for the characterization of biomolecular interactions.

The Reichert4SPR system is designed for use by scientists.

This User's guide is a training and reference manual for the operation and maintenance of the SPR system. We recommend that you read it carefully prior to use and follow the instructions to ensure optimum performance of your new SPR system.

Please retain this manual for future reference and to share with other users. Additional copies can be obtained from your authorized Reichert® dealer or from the Reichert's Customer Service Department at:

Tel:+1 716-686-4500
Fax: +1 716-686-4555
Email: reichertspr.lifesciences@ametek.com

Features and Functions

The Reichert4SPR SPR system has three separate modules connected by easily addressable tubing. The modules are the Pump, the Autosampler and the SPR Instrument, respectively. The SPR Instrument Module features four channels with single (channels 1, 2 or 3), dual (channels 1 & 2 or 3 & 4) and series (channels 1, 2, 3 & 4) flow options. The Pump Module has a built-in degasser and a solvent select valve so you can easily switch between two buffer solutions or buffer and water (for flushing the system). The built-in degasser in the Pump Module allows for continuous degassing of the running buffer which helps to eliminate the possibility of air bubbles. The Autosampler Module can accommodate two sample trays. Acceptable tray types are 48-vial, 12-vial, 96-well plate and 384-well plate, which can be used in any combination. Samples in the Autosampler are stored either refrigerated at 4 ^{o}C or at ambient temperature prior to injection.

This reliable label-free system is used to characterize a broad range of molecular interactions that are important in numerous scientific disciplines. These interactions include those occurring with and between the major classes of biological macromolecules along with those involving small molecules and drugs. This SPR system is used to generate high quality data with outstanding precision for:

- Rigorous kinetics analysis (association/on and dissociation/off rates)
- Affinity measurements ranging from extremely weak (1 mM) to extremely strong (1 pM) interactions
- Precise determination of thermodynamic parameters (ΔH, ΔS)

Setup

Unpacking

1) Remove the system from packaging and check contents. If an item is missing, contact the factory for resolution.
2) Remove the User's Guide and read it carefully prior to operation of the system.

Parts Identification

- Pump Module (P/N 13309100)
- Autosampler Module (P/N 13309200)
- SPR Instrument Module (P/N 13309000)
- MOXA RS-232 USB to Serial Adapter (UPort 1110)
- MOXA Serial Hub (UPort 207) (optional if the PC is equipped with two available USB connectors).
- Three Power Cables
- Two RS232 Cables
- One USB Cable
- Spare Parts Kit P/N (13309000-803)

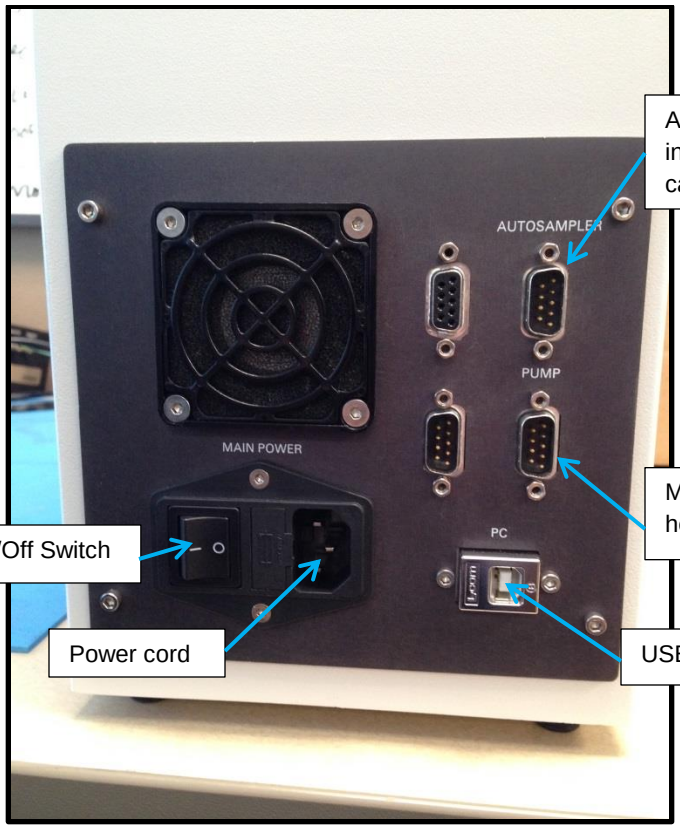
Installation

1) Plug the Pump Module, the SPR Instrument Module and the Autosampler Module each into an AC outlet in accordance with the voltage requirement.

Caution: The instrumentation should be positioned in use such that it is possible to disconnect the power cord during an emergency.

2) Connect serial connector of Syringe Pump to the MOXA RS-232 USB to Serial Adapter (UPort 1110) with an RS232 serial cable.
3) Connect the MOXA RS-232 USB to Serial Adapter (UPort 1110) USB connector to an available USB port on the PC with a USB cable.
4) Connect SPR USB to an available USB port on the PC with a USB cable.
5) Power up all hardware including the SPR.
6) Note: The use of the MOXA USB hub (UPort 207) is optional if the PC is equipped with two available USB connectors.
7) Schematics of the back of each Module are shown below:

Back of SPR Instrument Module



Autosampler Module plugs in here via RS232 COM cable

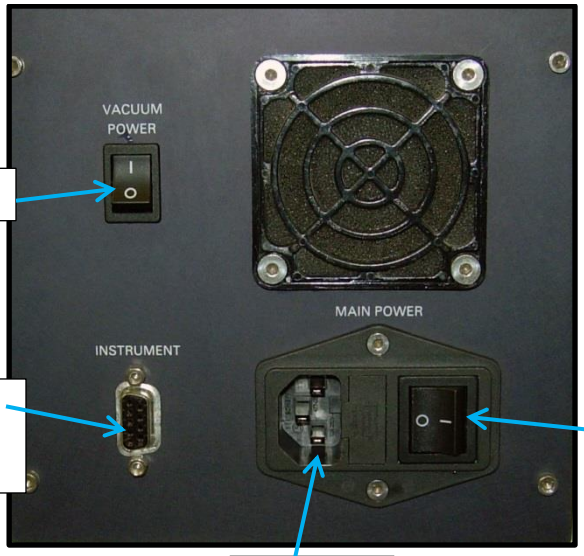
MOXA USB switch plugs in here via a RS232 COM

On/Off Switch

Power cord

USB Port to computer

Back of Pump Module

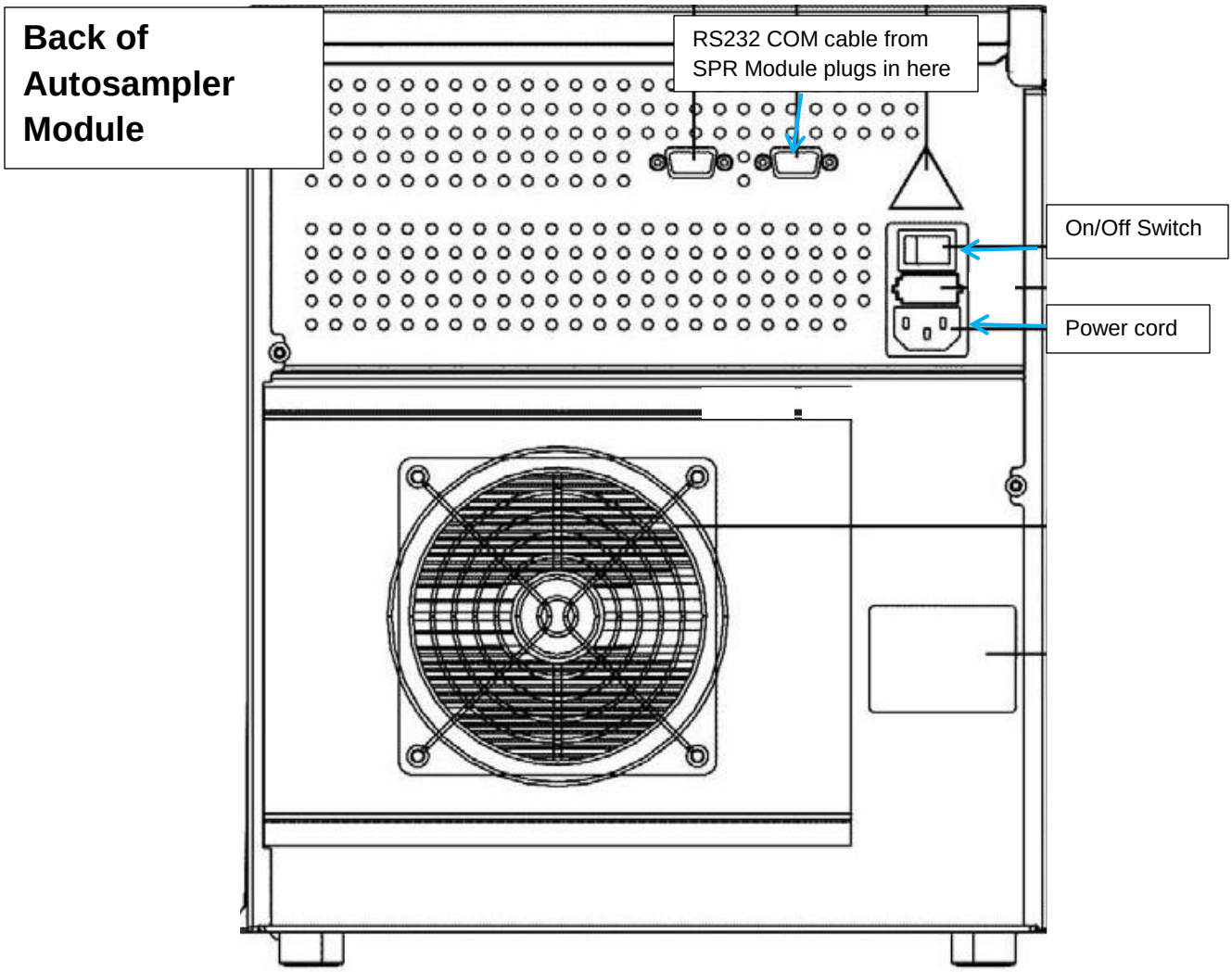


Degasser On/Off

RS232 Com cable from MOXA serial hub plugs in here

On/Off Switch

Power cord

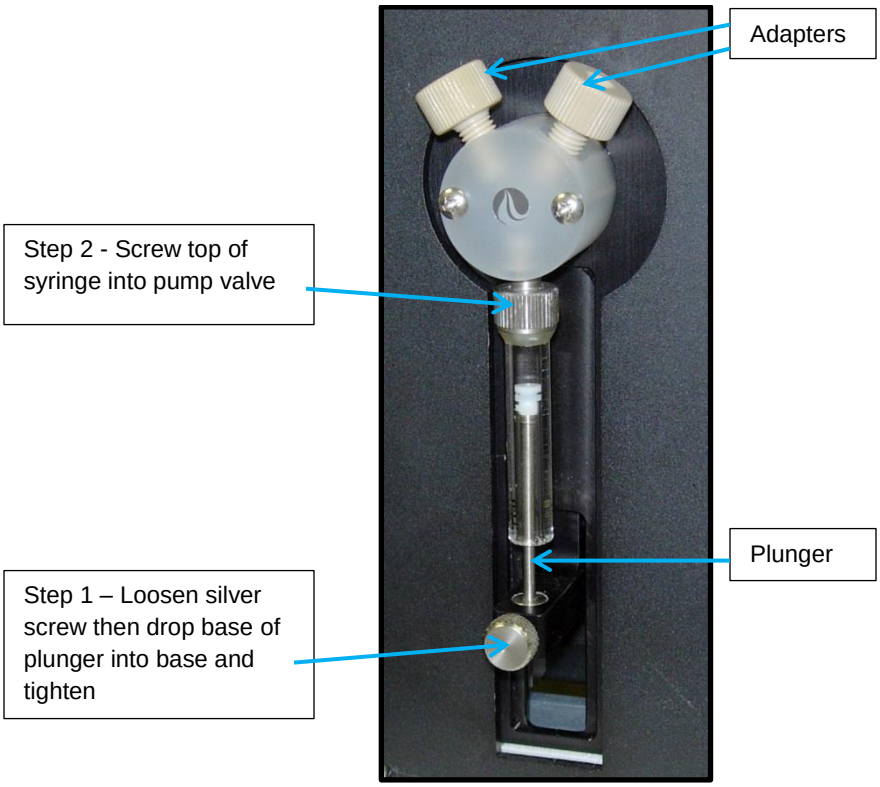


8) A fluidics kit containing all the necessary fittings and tubing should be opened and its contents checked against a packing list.
9) Two sensor chips are also included for initial use with your instrument.

Fluidics Setup – Pump Module

Installation of the Syringe into the Pump

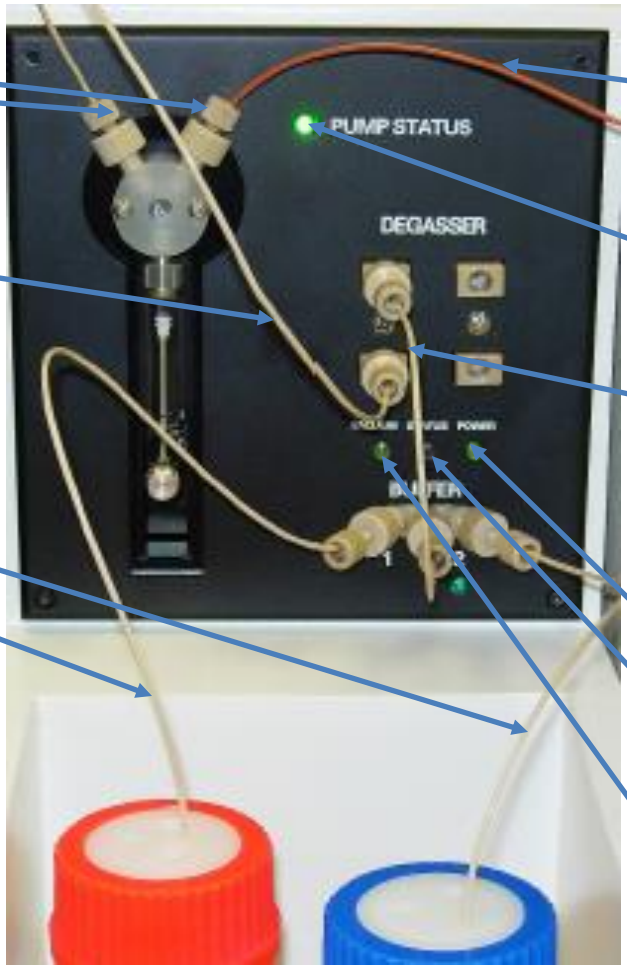
1) Loosen the set screw on the pump and drop the plunger base into the opening, and tighten the set screw securely (fingertight).
2) Pull the syringe up into the pump valve and tighten (luer connection).



Note: PEEK© tubing is used to plumb the pump (Teflon© (PTFE) is also acceptable).

3) Screw adapters into the left and right top of the pump head and use one-piece fingertight fittings to attach tubing (see pictures and description below).

Pump Module



Fingertight fittings

Use beige 0.04” ID PEEK Tubing to connect from syringe inlet to degasser

Use beige 0.04” ID tubing to connect buffer 1 (left) and buffer 2 (right) to solvent reservoirs

Inlet to Autosampler from Degasser – use orange 0.02” ID PEEK tubing

Power light for Pump Module – illuminates when turned on, blinks when pumping

Use beige 0.04” ID PEEK tubing to connect the degasser to the inlet of the buffer select valve

Lights on Degasser

Right – Power Light

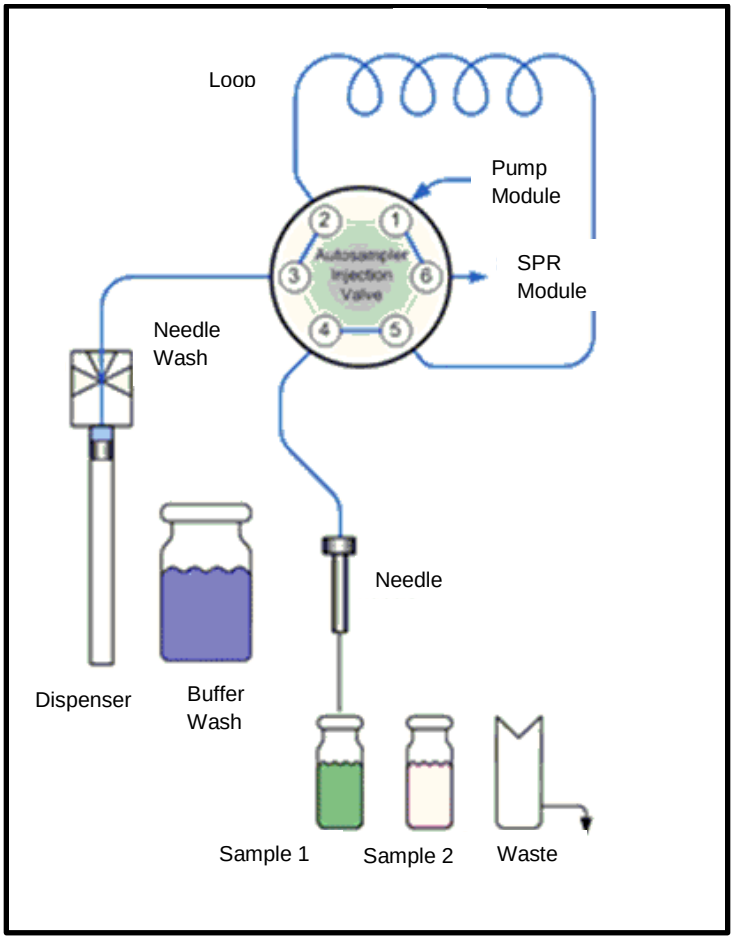
Middle – Status – comes on only at start up for about 1 minute. Flashing indicates a problem with degasser

Left – Vacuum light comes on and stays on once degasser is ready for use

4) The inlet (left side) of the pump attaches to the left (lower) degasser inlet using 9” of beige (0.04” ID) PEEK tubing. The outlet (right side) of the pump attaches to the autosampler inlet using 18” of orange (0.02” ID) tubing and fingertight fittings. The top port of the Degasser is attached to the solvent select valve inlet (center port under Buffer) using 6” of beige (0.04” ID) tubing.
5) The left and right Buffer lines (18” beige 0.04” ID PEEK tubing) are attached to the Pump Module via fingertight fittings and the left line is placed into the Running Buffer and the right line is placed into a bottle containing Water. A 3-hole cap is used to accommodate the tubing to the buffer (or water) bottles and to hold them firmly in place.

Setup - Autosampler

1) The Port Layout for the tubing connections for the Reichert Autosampler is shown in the schematic below. The needle wash tubing and the tubing to the needle (Ports 3 and 4) are already plumbed for use.
2) Several sample loops are supplied with the instrument and can be exchanged depending on what volume is best for your experiment (sample loop is connected at ports 2 and 5).
3) The outlet tubing from the Degasser on the Pump Module connects to Port 1 and Port 6 is where the connection is made to the SPR flow cell:

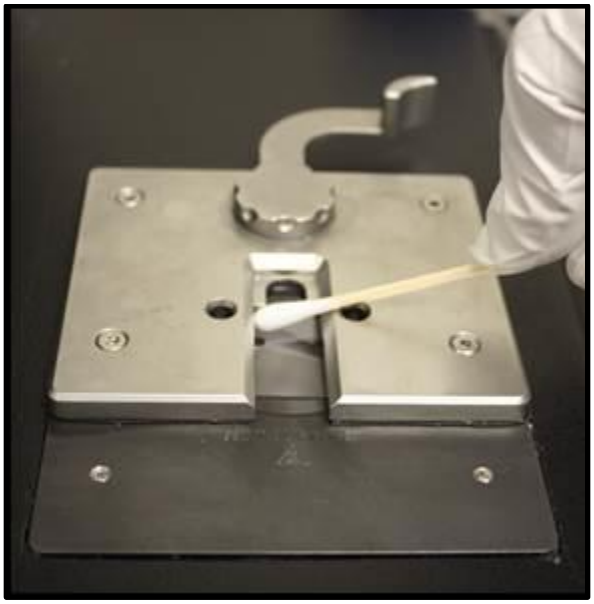


4) The tubing from the degasser on the Pump Module to the Autosampler is 16” of orange (0.02” ID PEEK tubing). The tubing from the Autosampler to the SPR Module is 12” of red (0.005” ID PEEK tubing).

Installation of Sensor Chip and Flow Cell

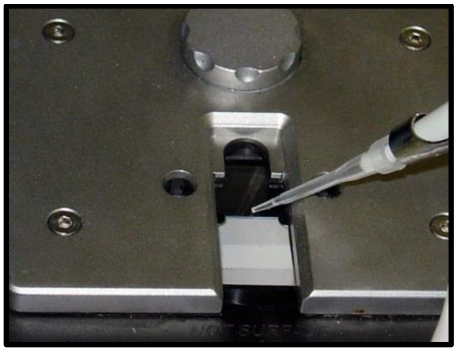
Overview: The SPR sensor chip is optically coupled to the prism surface using refractive index matching oil. The flow cell mounts on the top of the sensor chip and is locked into place via a clamp mechanism.

1) Clean the prism surface by wiping with a lint free wipe. If the surface still looks dirty or streaky, a cotton swab wetted with ethanol can help remove any index matching fluid from the corners. Dry with a lint free wipe or a stream of nitrogen.



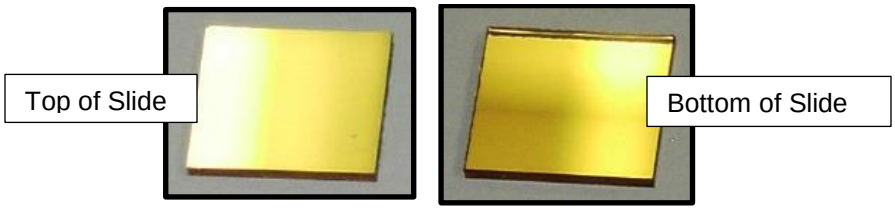
Note: The prism surface is sapphire and is highly resistant to scratches. This surface should be clean with no visible streaks or haze prior to mounting a new sensor slide. A stream of compressed air or nitrogen will help remove dust from the prism surface.

2) Place 0.8 μL of 1.515 refractive index matching fluid (provided in the Fluidics Kit) on the center of the prism surface. The center can be located by choosing the midpoint between the two holes on either side of the prism.

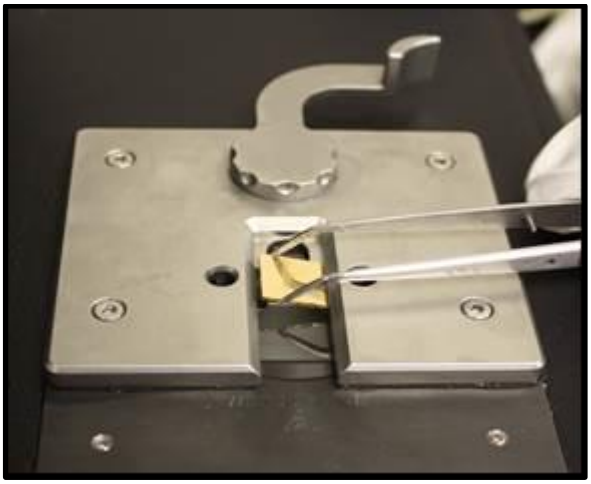


3) To determine which side of the sensor chip should be up, look at the surface of the slide. If it looks smooth with no visible difference in brightness along the edges, that is the gold (up)

side. If it appears to have shiny gold edges, that is the glass (bottom) of the chip (acts as a mirror) and should be set onto the prism surface.



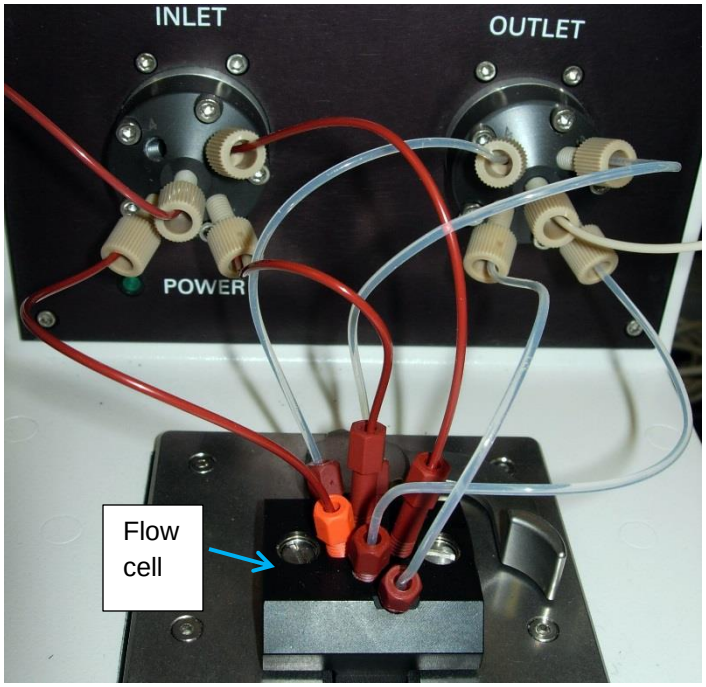
4) Slowly lower the sensor chip and place it onto the prism surface near the back of the prism and on top of the oil droplet. Make sure the sensor chip is flush against the back of the prism slot. Do not touch the faces of the sensor chip. Handle only by edges with forceps.



5) To mount the flow cell, place it over the sensor chip so that the two metal pins on the underside insert into the two openings on the metal base plate surrounding the prism. Be sure to put the flow cell on with the notched side to the back of the prism slot on the SPR Instrument. To dock the flow cell, hold the flow cell down with your left hand and pull the clamp lever toward yourself until it locks with your right hand.

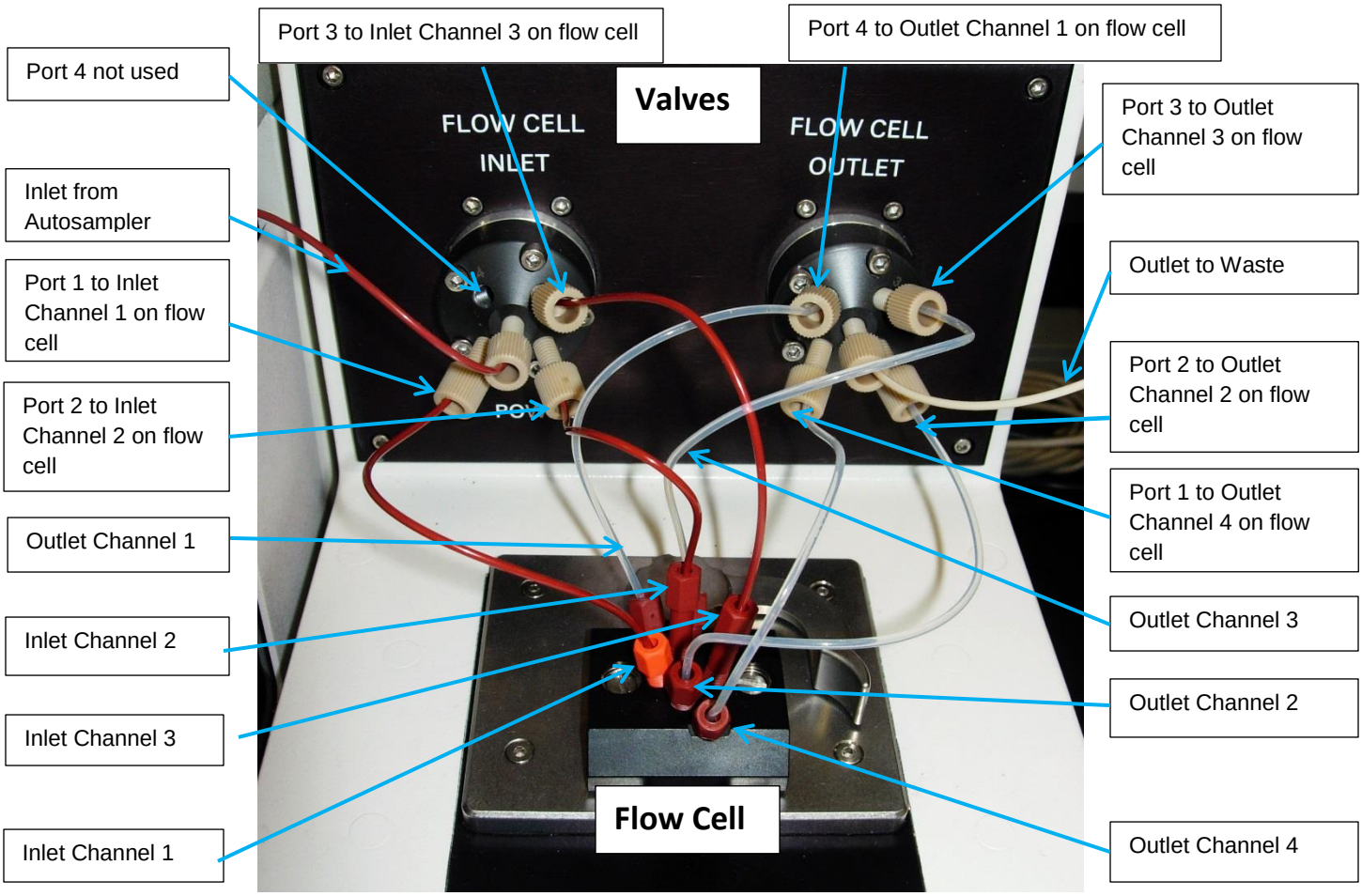
Note: that the clamp lever should pull easily if the flow cell and Sensor Chip are in the correct positions.

6) Once the flow cell is securely docked, the SPR Module setup will look as follows:



Fluidics Setup - Valves and Flow Cell

1) As shown in the figure above, external tubing is attached to the valves via PTFE (Teflon©) or PEEK© tubing.
2) For the inlet tubing at each port, use 6 inches of red (0.005" ID) tubing and for the outlet tubing at each port, use 6 inches of Clear Teflon© (0.010" ID) tubing.
3) A more detailed description of how to plumb the tubing from the flow cell to the ports is included here:


Port 3 to Inlet Channel 3 on flow cell
Port 4 to Outlet Channel 1 on flow cell
Port 4 not used
Valves
FLOW CELL INLET
FLOW CELL OUTLET
Port 3 to Outlet Channel 3 on flow cell
Inlet from Autosampler
Outlet to Waste
Port 1 to Inlet Channel 1 on flow cell
Port 2 to Outlet Channel 2 on flow cell
Port 2 to Inlet Channel 2 on flow cell
Port 1 to Outlet Channel 4 on flow cell
Outlet Channel 1
Outlet Channel 3
Inlet Channel 2
Outlet Channel 2
Inlet Channel 3
Flow Cell
Inlet Channel 1
Outlet Channel 4

Programs

Installation

See the Quick Start Guide “Reichert4SPR 4Ch Version 2_0_1 Quick Start Guide.docx” for information on how to configure and install the MOXA hardware and drivers.

For details on installing the data acquisition and analysis software, see the Reichert4SPR software manual.

Instructions for Use

STARTUP

1) Turn on all three Modules If possible, it is suggested the SPR instrument warm-up for at least 1.5 hours to achieve the most stable baseline. While the prism temperature will stabilize very quickly, the internal components must come to an equilibrium temperature to ensure the most stable baseline.
2) Prepare the running buffer (HEPES or PBS with 0.005% Tween-20 are the most common). Filter and degas the buffer under vacuum for at least 15 minutes. Put approximately 100 mL of the freshly prepared buffer in the Autosampler Wash Bottle and the remaining should be in a reservoir bottle and placed in the buffer tray in the front of the Pump Module. Use a 3-hole cap on the top of the running buffer bottle and insert the beige tubing from the port 1 (left side) of buffer selector valve into the bottle (make sure tubing is fully submerged in the buffer).
3) Open the Reichert4SPR software. Follow details for startup listed in the Reichert4SPR software manual.

Standard Amine Coupling Experiment

EXAMPLE EXPERIMENT:

Bovine Serum Albumin (BSA) is immobilized onto either a planar or hydrogel (dextran) sensor chip that has available carboxyl groups. The carboxyl groups on the surface of the sensor chip are modified with a linker by challenging the surface to a mixture of EDC and NHS to form an NHS ester. A covalent amide bond is then formed to BSA via free primary amines within the protein. Injection of ethanolamine removes any loosely bound ligand and deactivates any remaining NHS ester groups.

Anti-Bovine Serum Albumin (Anti-BSA) is injected over the surface at a range of concentrations and the data is analyzed to determine the binding kinetics and affinity of this antibody-antigen interaction.

CHEMICALS:

EDC (Sigma Aldrich Cat No. 03449-5G)

NHS (Pierce Cat No. 24500)

10 mM Sodium acetate pH 5.2 (need pH about 1 unit below pI of ligand to be coupled)

1 M ethanolamine pH 8.5 (Sigma >98% Cat No. EO135 – you dilute to 1M and pH to 8.5 with HCl)

PBST (Sigma Cat No. P 3563) or whatever buffer is needed

BSA

Anti-BSA

20 mM HCl

INSTRUMENT CONDITIONS:

Sensor Chip: Reichert carboxymethyl dextran P/N 13206066 or planar P/N 13206061

Running Buffer: PBS, PBST, HBS or HBST

Flowrate: 25 μL/min

SPR prism temperature: 25 °C

1) Open the Reichert4SPR software and refer to the Reichert4SPR software manual as a reference as well as the Help section on each page.
2) On the home page, run Prime using your Running Buffer as Buffer 1.
3) Create a new Project called “Standard BSA Experiment” and a New Experiment in that project called “BSA/Anti-BSA binding test”. On the bottom of the page, choose Couple for the experiment type and select the appropriate sensor chip type from the drop down menu (dextran or planar) and change the buffer name as needed.
4) Once Prime is complete, go to the Immobilize page. In the Targets section, fill in the name BSA and a concentration of 20 μg/mL to inject over Channel 1 (CH1). Enter in the same information for Channel 2 (CH2). Channels 3 and 4 will serve as a reference. Enter an Assoc time of 2 minutes and a Dissoc time of 1 minute for both Channels 1 and 2. Under Sample Trays, select 48 vials (2mL) for Sample Tray 1.
5) Place 1 mL of 1 M Ethanolamine HCl, pH 8.5 in a 2 mL HPLC vial, cap and place in the position indicated in Sample Tray 1 (3A).

6) Prepare a 1 mg/mL solution of BSA in water, dilute 20 μL of this BSA stock solution to 1 mL with 10 mM sodium acetate pH 5.2 into a 2 mL HPLC vial, cap and place in the position indicated in Sample Tray 1 (2A).
7) As a last step before starting, prepare an EDC/NHS mixture by dissolving 40 mg EDC and 10 mg of NHS in 1 mL of water. Place the vial containing the diluted EDC/NHS mixture in the position indicated in Sample Tray 1 (1A) and Select Run. Note: once EDC and NHS are diluted and mixed together they must be injected quickly to prevent outgassing which leads to air in the injection.
8) As the run is executing, you can see the data plot in the upper right corner of the screen. The total run time and the time for each step will count down on the screen.
9) To expand the view of the plot, click on the double arrows next to the plot. The plot will look similar to the following on channels 1 and 2 where BSA is being immobilized (only one channel is shown here).

Immobilization of BSA

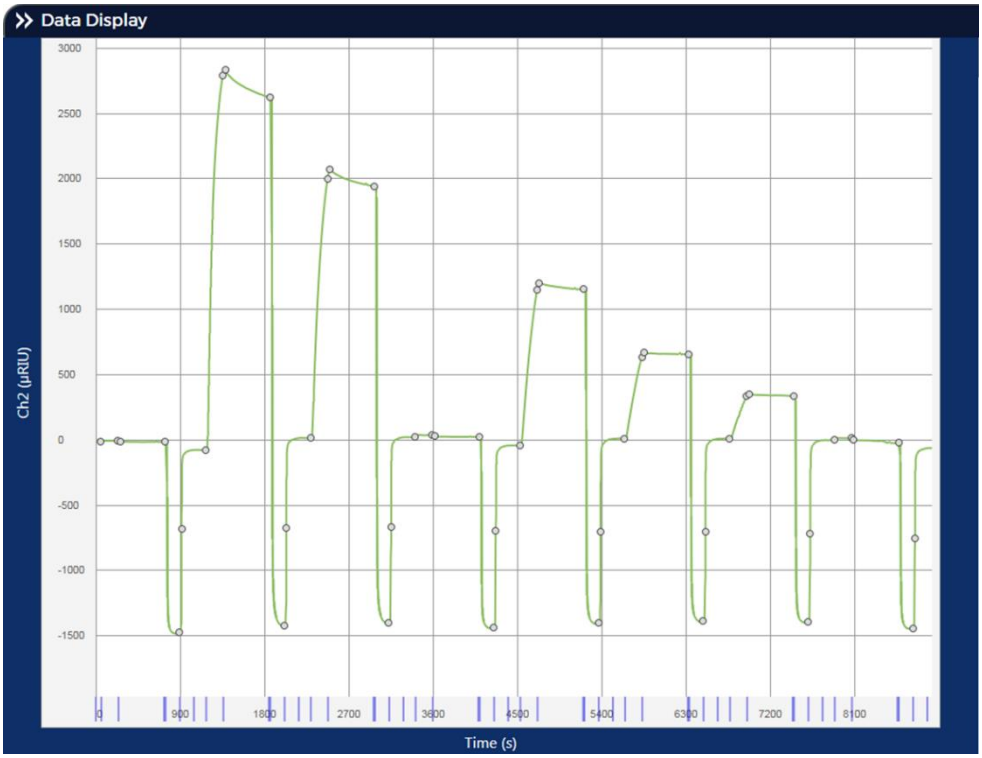
10) To remove loosely bound BSA, on the Method Development page, leave the default flow rate as 25 μL/min and check boxes to Enable Analyte and 1st Regen only. Leave the Analyte ID as BLANK and type in an Assoc Time of 30 seconds and a Dissoc Time of 30 seconds. Type in the Regen name as 20 mM HCl with a Regen Time of 3 minutes and a Wait Time of 5 minutes. Fill a 2 mL vial with about 1.5 mL of running buffer and second 2 mL vial with about 1.5 mL of 20 mM HCl. Open Sample Trays and for Tray 1 choose 48 vials (2mL).
11) When Immobilize is complete, press Run to remove loosely bound BSA.
12) Start preparation of the Anti-BSA solutions.

13) Make a 1 mg/mL stock of Anti-BSA in running buffer. Dilute 288 μL of the 1 mg/mL Anti-BSA stock with 1512 μL of PBST in a 2 mL HPLC vial to prepare the highest concentration solution of Anti-BSA, 32 nM.
14) Serially dilute in half (pipet 900 μL of buffer in four separate 2 mL HPLC vials and add 900 μL of Anti-BSA from each higher concentration in prior vial) to make an additional four concentrations, 16, 8, 4 and 2 nM.
15) Fill a 2 mL HPLC vial with approximately 1.5 mL of 20 mM HCl.
16) Fill a 2 mL HPLC vial with approximately 1.5 mL of PBST.
17) On the Scale Up page, leave the default flow rate as 25 μL/min, type in 5 for the Number of Concentrations field and Dilution factor 2. Leave the DMSO calibration and sample cooling boxes unchecked. Choose Beginning/Middle/End for Blank placement. Check the Enable box next to Analyte ID, and under Analyte ID type Anti-BSA. For Max Conc type in 32 and choose nM from the drop down list of units. Input an Assoc time of 3 minutes and a Dissoc time of 6 minutes. Check only the 1st Regen box, type in 20 mM HCl for Regen ID and fill in a Regen Time of 3 minutes and a Wait Time of 5 minutes.
18) Open Sample Trays, and for Tray 1 choose 48 vials (2mL). Place the vials in Tray 1 as indicated in the Sample Trays picture.

    32 nM Anti-BSA position 1A
    16 nM Anti-BSA position 2A
    8 nM Anti-BSA position 3A
    4 nM Anti-BSA position 4A
    2 nM Anti-BSA position 5A
    20 mM HCl 6A
    PBST position 7A

19) Once Method Develop is done, click on Run.
20) Responses will look similar to the following on channels 1 and 2 where BSA has been immobilized (only one channel is shown here).

Anti-BSA and Blank Injections



21) At the end of the experiment, you can go directly to Data Analysis or Export to either Tracedrawer or Scrubber for later analysis. Refer to the Reichert4SPR software manual for further details on how to use Tracedrawer for analysis or to the Scrubber manual for how to use Scrubber software.
22) When the experiment is complete, the flow rate will be set to 5 µL/min and data collection will stop.
23) You can either leave a continuous, slow flow of buffer in the lines at all times or rinse with water and then shut down (if you are going to Shut Down, you must run Prime using water as either buffer 1 or buffer 2 to ensure that all the lines are flushed sufficiently).
24) For information on other Applications and SPR technology, refer to www.reichertspr.com.

Cleaning & Maintenance

Cleaning

The Reichert4SPR is a precision optical instrument and should be cleaned regularly to maintain optimal performance.

External Cleaning

The outer cases of all the instrument components can be cleaned with a mild soap solution or ethanol whenever needed.

Prism Cleaning

The prism surface can be cleaned with a Kimwipe or with ethanol if all the oil does not wipe off. The prism should be cleaned each time after an old sensor chip is taken off and prior to addition of oil for coupling a new sensor chip.

Flow Cell Cleaning

The flow cell can be cleaned by soaking and sonicating it in a solution of dilute TritonX-100 (one drop in 50-100 mL water). The flow cell should be cleaned as needed.

Decontamination

Additional cleaning can be carried out by injecting ethanol (pure ethanol is flammable) or 5% bleach. Contact Reichert if you want to use a different cleanup procedure.

Maintenance

Short Term Storage

Never leave buffer in your lines with no flow for more than a few minutes. To conserve on buffer when a run table is complete, reduce the flow rate to 5 μL/min. Once experiments are complete, rinse all the lines with distilled, deionized water and shut down.

Long Term Storage

Pump 20% pure ethanol (pure ethanol is flammable) in water through all your lines to help prevent bacteria from growing in the tubing.

Troubleshooting

The following chart presents some possible errors and the steps that you can take to correct the issue. If a problem persists, please contact Reichert (see Introduction section of this manual for contact information).

Chart of Common Errors

Issue	Probable Cause	Possible Solution
I am seeing a flat (-1) response on one or more channels.	1. Air in the flow cell on one or more channels. To confirm, go to Maintenance and then select Detector Scan Data and check whether you have SPR minimums of about the same depth in each channel. 2. If this happens when an injection is done, the likely cause is insufficient solution in the autosampler vial or well plate.	1. If you were not injecting or the baseline does not come back, increase the flow rate to 250 μL/min through the line with the air in it to try to push it out. Repeat taking a Detector Scan until minimums on all four channels are the same depth, 2. If a sample is being injected, return to Load and add additional solution to the vial or well plate.
The Status light is flashing on the degasser.	An error has occurred.	Be sure to never use a flow rate above 500 μL/minute or the Degasser could be over-pressurized and would require Factory Service.

Specifications

Catalog Number 13309000

Physical Dimensions

SPR Instrument Module

Size
- Height: 14.2” (36 cm)
- Width: 6.75” (17.15 cm)
- Depth: 22.6“ (57.5 cm)

Weight, unpacked: 20 lbs (9 kg)
Weight, packed: 22 lbs (10 kg)

Autosampler

Size
- Height: 14.2” (36 cm)
- Width: 11.8” (30 cm)
- Depth: 22.6“ (57.5 cm)

Weight, unpacked: 46.2 lbs (21 kg)
Weight, packed: 50 lbs (22.7 kg)

Pump Module

Size
- Height: 14.2” (36 cm)
- Width: 6.75” (17.15 cm)
- Depth: 22.6“ (57.5 cm)

Weight, unpacked: 15 lbs (7 kg)
Weight, packed: 17 lbs (8 kg)

Electrical

Input: **SPR Module** 100-240 V~ 50/60 Hz 105 W
Input: **Pump Unit** 100-240 V~ 50/60 Hz 25 W

Autosampler: Review Autosampler documentation

Fuses: 5x20 mm, 250 V, Glass Fast Acting (SPR Module 6.3A, Pump Module 1.6A)

Operation Performance

- 780nm LED arrays
- Refractive Index Range: 1.33 to 1.40 (@ 780nm)
- Refractive Index Resolution: < 0.01 μRIU
- Prism Assembly: Synthetic sapphire sealed to stainless steel well with solvent resistant epoxy
- Sample area surfaces: stainless steel with protective coating

Environmental Conditions

Operating:

Indoor Use Only

Temperature 10° C (50° F) to 40° C (104° F)

Maximum Relative Humidity: < 70%

Transportation & Storage:

Temperature and Relative Humidity: Not Specified

Keep Dry

Device Classification

Electrical Protection: Class I

Operating Mode: Continuous

Disposal

This product does not generate any environmentally hazardous residues. At the end of its product life, follow your local laws and ordinances regarding the proper disposal of this equipment, or contact Reichert.

Software Revision

You will be given the latest version available on your date of purchase. Your software version is found on the upper right of the screen when the software is open.

CATALOG INFORMATION

Reichert4SPR System

Catalog Number	Description
13309000	**Reichert4SPR System**
13309000	Reichert4SPR SPR Instrument Module
13309100	Reichert4SPR Pump Module
13309200	Reichert4SPR Autosampler

Accessories

• 13309100-403	Pump Valve
• 13309100-404	Pump Syringe
• 13309000-333	Flow Cell
• 13207120-003	Autosampler Needle

Optional Accessories

• 13207120-022	Autosampler 12-vial Tray
• 13207120-025	Autosampler vials for 12-vial Tray
• 13207120-026	Autosampler vial caps for 12-vial Tray
• 13207120-017	Autosampler Preventative Maintenance Kit
• 13309000-803	SR4 Parts Kit
• 13309000-804	SR4 Preventative Maintenance Kit
• 13309000-805	SR4 Tubing Kit

Additional components with a complete system include 1 planar and 1 dextran Sensor Chip and all necessary tubing, fluidics, connections, check valves, starting PBST buffer packs, buffer filter, forceps, cables and software.

Please note that accessories and options will change and you should contact the factory or refer to www.reichertspr.com for the latest versions available

Warranty

This product is warranted by Reichert Technologies against defective material and workmanship under normal use for a period of one year from the date of invoice to the original purchaser. (An authorized dealer shall not be considered an original purchaser.) Under this warranty, Reichert's sole obligation is to repair or replace the defective part or product at Reichert's discretion.

This warranty applies to new products and does not apply to a product that has been tampered with, altered in any way, misused, damaged by accident or negligence, or which has had the serial number removed, altered or effaced. Nor shall this warranty be extended to a product installed or operated in a manner not in accordance with the applicable Reichert instruction manual, nor to a product which has been sold, serviced, installed or repaired other than by a Reichert factory, Technical Service Center, or authorized Reichert Dealer.

Consumable items such as pump valves, fittings, etc. are not covered by this warranty.

All claims under this warranty must be in writing and directed to the Reichert factory, Technical Service Center, or authorized instrument dealer making the original sale and must be accompanied by a copy of the purchaser's invoice.

This warranty is in lieu of all other warranties implied or expressed. All implied warranties of merchantability or fitness for a particular use are hereby disclaimed. No representative or other person is authorized to make any other obligations for Reichert. Reichert shall not be liable for any special, incidental, or consequent damages for any negligence, breach of warranty, strict liability or any other damages resulting from or relating to design, manufacture, sale, use or handling of the product.

PATENT WARRANTY

If notified promptly in writing of any action brought against the purchaser based on a claim that the instrument infringes a U.S. Patent, Reichert will defend such action at its expense and will pay costs and damages awarded in any such action, provided that Reichert shall have sole control of the defense of any such action with information and assistance (at Reichert's expense) for such defense, and of all negotiation for the settlement and compromise thereof.

PRODUCT CHANGES

Reichert reserves the right to make changes in design or to make additions to or improvements in its products without obligation to add such to products previously manufactured.

CLAIMS FOR SHORTAGES

We use extreme care in selection, checking, rechecking and packing to eliminate the possibility of error. If any shipping errors are discovered:

1. Carefully go through the packing materials to be sure nothing was inadvertently overlooked when the unit was unpacked.

2. Call either Reichert directly (for direct purchases) or the dealer you purchased the product from and report the shortage. The materials are packed at the factory and none should be missing if the box has never been opened.
3. Claims must be filed within 30 days of purchase.

CLAIMS FOR DAMAGES IN TRANSIT

Our shipping responsibility ceases with the safe delivery in good condition to the transportation company. Claims for loss or damage in transit should be made promptly and directly to the transportation company.

If, upon delivery, the outside of the packing case shows evidence of rough handling or damage, the transportation company's agent should be requested to make a "Received in Bad Order" notation on the delivery receipt. If within 48 hours of delivery, concealed damage is noted upon unpacking the shipment and no exterior evidence of rough handling is apparent, the transportation company should be requested to make out a "Bad Order" report. This procedure is necessary in order for the dealer to maintain the right of recovery from the carrier.

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ISO-13485 Certified

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