

OPERATOR'S MANUAL

FOR

PL-AS RT/MT

AUTOSAMPLER

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VARIAN



DECLARATION OF CONFORMITY

We, Polymer Laboratories Ltd
Now a part of Varian, Inc.
Essex Road
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declare that the product:

	PL-AS RT Autosampler	Part # PL 0870-8150
OR	PL-AS MT Autosampler	Part # PL 0870-8180

conforms with the requirements of EC Directives 89/392, 91/368 & 89/336 by complying with the following Harmonised European Standards:

Safety:	EN61010 - 1	Class I Installation category II Pollution degree 2
	EN61010 - 2 - 010	Class 2
	EN61010 - 2 - 051	
	EN61010 - 2 - 081	
EMC:	EN55022	Conducted emissions: Class B Radiated emissions: Class B*
	EN50082	ESD (C), Radiated immunity (A), Fast Transient Burst (B), Surge immunity (B), Conducted immunity (A).

31st July 2009

Dr S.J. O'Donohue,
Head of Instrumentation

PL-AS RT/MT AUTOSAMPLER WARRANTY

(Extract from General Conditions of Sale)

Subject as hereinafter stated, if any goods supplied are proved to the reasonable satisfaction of the Seller to be defective in material or workmanship within a period of 12 months from the date of despatch and the Buyer notifies such defect to the Seller in writing within fourteen days of it becoming apparent the Seller shall repair or replace at its option the goods or any part thereof free of charge and any repaired (or replacement) goods will be guaranteed on these terms for the unexpired portion of the 12 month period **PROVIDED THAT** the Seller shall be under no liability in respect of any defect that has arisen because:-

of fair wear and tear; or

where the goods have not been used, maintained, stored or protected in the proper manner; or

the goods have been altered in any way whatsoever or have been subject to unauthorised repair; or

the goods have been improperly installed or connected (unless the Seller carried out such installation and connection); or

in the case of Instrument Consumables (including wetted parts, lamps etc) they prove defective as aforesaid more than 30 days after delivery notwithstanding the foregoing provisions of this condition; or

the Buyer is in breach of any other contract made with the Seller such as the Company's General Conditions of Sale.

SAVE AS PROVIDED ABOVE, THE SELLER WILL BE UNDER NO LIABILITY UNDER THE CONTRACT FOR ANY PERSONAL INJURY, DEATH, LOSS OR DAMAGE OF ANY KIND WHATSOEVER WHETHER CONSEQUENTIAL OR OTHERWISE INCLUDING BUT NOT LIMITED TO LOSS OF PROFITS AND THE SELLER HEREBY EXCLUDES ALL CONDITIONS, WARRANTIES AND STIPULATIONS EXPRESS OR IMPLIED, STATUTORY, CUSTOMARY OR OTHERWISE WHICH BUT FOR SUCH EXCLUSION WOULD OR MIGHT SUBSIST IN FAVOUR OF THE BUYER EXCEPT THAT SUCH EXCLUSION WILL NOT APPLY TO ANY IMPLIED CONDITION THAT THE SELLER HAS OR WILL HAVE THE RIGHT TO SELL THE GOODS WHEN THE PROPERTY IS TO PASS OR WHEN THE BUYER DEALS AS A CONSUMER (AS DEFINED IN SECTION 12 OF THE UNFAIR CONTRACT TERMS ACT 1977), ANY IMPLIED TERM RELATING TO THE CONFORMITY OF THE GOODS WITH THEIR DESCRIPTION OR SAMPLE OR AS TO THEIR QUALITY OR FITNESS FOR A PARTICULAR PURPOSE.

IN NO CIRCUMSTANCES WILL THE SELLER OR ITS EMPLOYEES, AGENTS, OR SUB-CONTRACTORS BE LIABLE FOR ANY LOSS OR DAMAGE OF ANY KIND WHATSOEVER WHETHER CONSEQUENTIAL OR OTHERWISE CAUSED DIRECTLY OR INDIRECTLY BY ANY NEGLIGENCE OR OTHER TORTIOUS ACT OR BREACH OF STATUTORY DUTY ON THE PART OF THE SELLER OR ON THE PART OF ANY OF ITS EMPLOYEES, AGENTS OR SUB-CONTRACTORS IN CONNECTION WITH OR ARISING OUT OF THE MANUFACTURE OR SUPPLY OF THE GOODS OR IN CONNECTION WITH ANY STATEMENT GIVEN OR MADE (OR ADVICE NOT GIVEN OR MADE) BY OR ON BEHALF OF THE SELLER.

Any statement made about the Seller's goods by the Seller or its servants or agents whether orally or in writing is intended for guidance only and the Buyer should not place any reliance thereon without specific enquiry and without ensuring that any matter of concern to him is specifically mentioned in the contract.

The Buyer is solely responsible for the suitability of the site for the installation of the goods, for obtaining all and any necessary consents and approvals under planning and building regulations and by-laws and for the preparation of the site, the constitution of foundations and the provision of services so that the site is suitable to receive the goods.

Unless expressly provided therein, the contract does not include the installation, erection or commissioning of any goods or equipment or the supervision thereof. Where installation is included in the contract it is the responsibility of the Buyer to advise the Seller of prevailing site conditions, and in particular but without prejudice to the foregoing, physical characteristics, availability of services, normal labour working hours and any local or national labour arrangement or practices which might affect the work, and any other relevant factors. Any additional costs caused by any interruption or delay not attributable to the Seller or to its employees or because the Seller cannot gain access to the site shall be charged to the Buyer together with an appropriate allowance for profit. The Buyer shall also be responsible for providing a safe and healthy working environment for the Seller's employees and the Seller's subcontractors and their employees and shall bear (or reimburse the Seller against) any loss, damage or compensation due to any person in relation to any death or personal injury or destruction or damage to property except to the extent that the same is due to the negligence of the Seller and the Buyer shall except as aforesaid keep the Seller fully indemnified in respect thereof.

HEALTH AND SAFETY

PL-AS RT/MT Autosampler

This autosampler should be used only in accordance with the instructions stated within this manual. If the autosampler is used in a manner not specified by the manufacturer, the protection provided may be impaired. Users should observe the following general safety precautions:

Ensure that the instructions within this manual are understood and carried out in the operation of the detector. All persons utilising the autosampler should have adequate training in its proper set-up, operation, and particularly its safety features.

Voltages above 110V AC are present within the autosampler; access covers should not be removed by anyone other than properly trained personnel. No attempt should be made to service the autosampler without authorisation from Varian's service department and contravention of this may result in personal hazard or damage to the autosampler and will invalidate the manufacturer's warranty.

We stress the importance of standard laboratory safe practice (e.g. COSHH regulations) for dealing with electronic laboratory equipment, solvents, etc., in preventing accidents, fires, or potentially hazardous conditions.

If in any doubt about the use of the autosampler contact your local Varian office or local distributor.

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SAFETY

The following general safety precautions must be observed during all phases of operation, service, and repair of this autosampler. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the autosampler. Polymer Laboratories assumes no liability for the customer's failure to comply with these requirements.

Safety Symbols on the PL-AS RT & MT Autosamplers

The PL-AS RT autosampler displays the following safety symbols:



This label is affixed to the back part of the autosampler to warn the user that the autosampler arm will move without warning during normal operation. Please use caution when working in and around the autosampler.

The PL-AS MT autosampler contains the following safety symbols:



This label is affixed to the back part of the autosampler to warn the user that the autosampler arm will move without warning during normal operation and that the transfer line between the autosampler and the PL-GPC instrument may reach high temperatures during operation of the system. Please use caution when working in and around the autosampler.



This label is affixed to the front of the sample vial block, which in normal operation the block may reach temperatures as high as 130 °C. Please use caution when adding or removing vials from the sample vial block.

Signs and Pictograms Used in this Manual



WARNING

WARNING:

THE “WARNING SIGN” DENOTES A HAZARD. IT CALLS ATTENTION TO A PROCEDURE, PRACTICE, WHICH IF NOT CORRECTLY DONE OR ADHERED TO, COULD RESULT IN SEVERE INJURY OR DAMAGE OR DESTRUCTION OF THE INSTRUMENT.

PLEASE DO NOT PROCEED BEYOND A WARNING SIGN UNTIL THE INDICATED CONDITIONS ARE FULLY UNDERSTOOD AND MET.



ATTENTION

ATTENTION:

The “ATTENTION sign” denotes relevant information. Read this information first before proceeding, it will be helpful or necessary to complete the task.



NOTE

NOTE:

The “NOTE sign” denotes additional information. It provides the user with advice and suggestions to facilitate the operation of the instrument.

Safety Notices

Use of this equipment in a manner not specified by Varian may result in the protection provided by the equipment being impaired.

The following safety instructions should be noted:



WARNING

Electrical

Removal of instrument panels may expose potentially dangerous voltages. Disconnect the autosampler from all power sources before removing protective panels.

Before the autosampler is switched on ensure that it is connected to protective earth via a grounded power socket. Any interruption of the protective earth grounding will cause a potential shock hazard that could result in serious personal injury. Whenever it is likely that the protection has been impaired, the instrument must be made inoperative and be secured against any unintended operation.

Replace defective fuses **only** with size and rating stipulated on the rear panel next to the fuse holder, and in the manual.

Replace faulty or frayed power cords.

Check the actual line voltage to confirm its value before connecting this autosampler to it.

Ensure the power switch and appliance coupler at the right hand side of the autosampler remain easily accessible at all times.



WARNING

Cleaning

The individual or group responsible for the use and maintenance of this equipment must ensure that appropriate decontamination is carried out if hazardous material is spilt on or inside the autosampler.

Before using any cleaning or decontamination method except those recommended by Varian, Inc., operators should check with Varian, Inc., that the proposed method will not damage the equipment or cause a hazard as a result of a reaction with parts of the equipment or with material contained in it.

See Appendix for detailed recommended procedures.



WARNING

General Precautions

This equipment is not intended for use in a hazardous atmosphere.

Do not use this equipment with hazardous substances for which it has not been designed.

Perform periodic leak checks on liquid supply lines and connections.

Do not allow flammable and/or toxic solvents to accumulate.

Use the minimum possible quantity of flammable and/or toxic solvents.

Always store flammable and/or toxic solvents in capped containers. Use only capped sample vials supplied or recommended by Varian, Inc.

Follow recommended procedures and protocols for evacuation and disposal of flammable and/or toxic solvents. Never dispose of such products through municipal waste systems.

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1 General Information

1.1 Introduction

The PL-AS RT & MT autosamplers are designed to automate the sample injection of sample solutions from the 2 mL/4 mL vials (sample vial block consists of 72 x 2 mL and 84 x 4 mL vials) to the PL-GPC system e.g. PL-GPC 50 Plus or PL-GPC 120. The PL-AS RT & MT autosamplers are controlled through the PL Instrument Control software via the connection of the Host serial port.

The PL-AS MT autosampler incorporates a heated sample vial block, which operates between 30-130 °C and a magnetic stirrer for agitation of sample solutions.

The syringe pump, oven vial block and magnetic stirrer are internally connected to the Auxiliary serial port of the autosampler and are therefore controlled through the PL Instrument Control software via the Host serial port.



Figure 1.1.1 PL-AS RT Autosampler

1.1.1 Orientation

Any references to the left or right of the autosampler in this manual are based on the reader facing the front of the PL-AS RT/MT autosampler, as shown in figure 1.1.1.1.

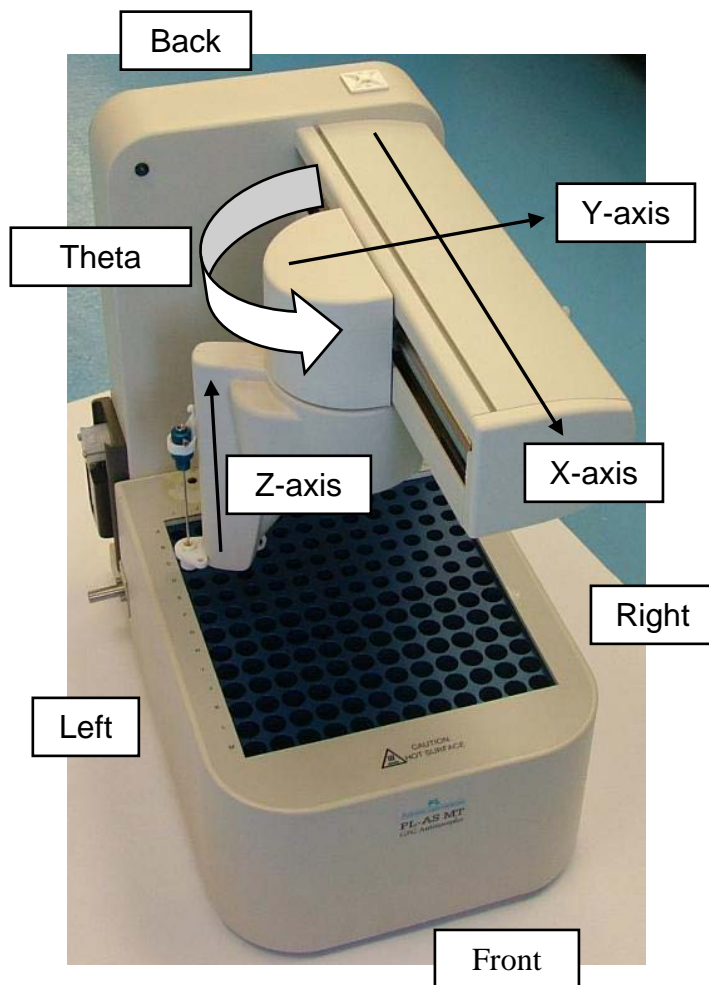


Figure 1.1.1.1 Autosampler Orientation and Axis Description

1.2 Specifications

PL-AS RT Autosampler	Position	Located to the left hand side of the PL-GPC 50 Plus but controlled directly from the PL Instrument Control software
	Sample capacity	72 x 2 mL vials and 84 x 4mL vials
	Vials dimensions:	Vial height: 35 mm (2 mL incl. cap) and 47 mm (4mL incl. cap)
	Injection methods	Full loop injections
	Injection Loop volumes	0 – 250 μ L
	Injections per vial	Up to 9
	Analysis time	Max 999 mins
	Needle wash	User programmable between injections or series
	Priority sample	Programmable
	Dispenser syringe	1000 μ L syringe
	Wash solvent	External wash solvent bottle
	Reproducibility	Flushed loop injections: RSD < 0.3%
	Dimensions: (W x D x H)	300 x 500 x 340 mm
	Valve location	Uses valve located in the column oven of the PL-GPC 50 Plus
PL-AS MT Autosampler	Same specifications as for the PL-AS RT Autosampler with the addition of:	
	Temperature range	30-130 $^{\circ}$ C
	Temperature Stability	< \pm 1 $^{\circ}$ C
	Magnetic Stirrer	User programmable

1.3 Unpacking

Care has been taken to ensure that the autosampler should be received in proper condition. The packing and protection are designed for normal hazards of road, rail or air transit. Any damage to the container or autosampler should be reported immediately to your local distributor or to Varian. It is recommended that the shipping containers be kept, if possible, for re-shipment or return to a service centre.

Examine the shipping cartons for visible signs of exterior damage. Unpack the autosampler and examine for transit damage. Check that all items on the packing list are included.

Notify Varian or your local distributor of any damage or missing items.

1.3.1 Unpacking Instructions

Unpacking

The autosampler is shipped into two specialised cardboard cartons, one for the autosampler main body and the other for the sample vial block. Unpack as follows:-

1. Remove the strapping from the cartons.
2. Remove the packaging around the autosampler and vial block.
3. Remove the autosampler accessories from the vial block carton.
4. Once the packaging and accessories are removed lift the autosampler and vial block out of the cartons and place on to a work surface. **WARNING: Care should be taken when lifting the autosampler main body and sample vial block from the cartons.**

1.3.2 Packing List

1.3.2.1 Standard Items

PL-AS RT/MT Autosampler

Operator's Manual for PL-AS RT/MT Autosampler

Mains Lead (110-120V, 60Hz or 230V, 50Hz)

RS232 serial cable

Autosampler needle assembly for 2 mL vials (Metallic)

Autosampler needle assembly for 4 mL vials (Blue)

0.040" PTFE Tube (autosampler syringe valve to solvent reservoir)

3/8" PTFE Tube (autosampler wash port to waste bottle)

Tube nut, male, 1/16" Whit

Ferrule, flangeless 1/16"

4 mL screw cap vials

12 mm screw caps (12-sc)

12 mm rubber/PTFE septa

1.3.2.2 Additional Items for the PL-AS MT Autosampler (If supplied separately)

PL Instrument Control Software

Keyspan USB 4-Port Serial Adapter

Flexible heated transfer line

0.040" PTFE Tube (autosampler syringe valve to injection valve)

Firmware upgrade for the PL-GPC 120

1.4 Site Preparation Check List

Environmental Conditions



Temperature 15 to 35 °C (59 to 86 °F)
At constant temperature
Avoid positioning in direct sunlight
Humidity 40-80%

Power

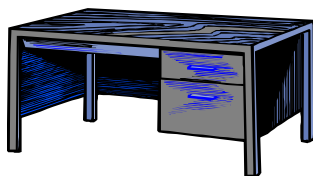


110V or 230V (AC) $\pm 10\%$ - *not switchable*
4.5A max for PL-AS MT, 1.3A max for PL-AS RT
50/60 Hz single-phase with protective earth connection
The mains supply should be fitted with an RCCB.



ENSURE THE POWER SWITCH AND APPLIANCE COUPLER REMAIN ACCESSIBLE AT ALL TIMES.

Bench Space



The autosampler will require the following bench space: Width 30 cm (11.8”), Depth 50 cm (19.7”), Height 34 cm (13.4”). The complete autosampler weighs 20kgs (44lbs.) and care should be taken when lifting/moving it. Refer to local manual handling / lifting regulations.
DO NOT MOUNT THE UNIT ON A FLAMMABLE SURFACE!

NOTE: Additional bench space will be required for the PL-GPC instrument and the computer with which to control the system.

Extraction Requirements



The autosampler is not fitted with extraction, but depending on the solvents used in the equipment it might be necessary to site the unit under an extraction hood or installed in a fume cupboard.
NOTE: housing the unit in a fume cupboard may compromise the temperature stability of the oven block for the PL-AS MT Autosampler.

Computer



Pentium 4 operating at 2 GHz
256 MB of memory
30 MB of free hard disk space
SVGA (800 x 600) resolution monitor and video adapter (Set to High Colour)
Microsoft Windows 2000 or XP Professional operating system
Microsoft compatible mouse
One USB serial communication port per instrument.

1.5 Installation Procedures – Assembly

1.5.1 Mechanical Reassembly & Wiring



THESE TASKS MUST BE CARRIED OUT ONLY BY FULLY TRAINED & QUALIFIED PERSONNEL.

The sample vial block must be fitted and secured to the main autosampler frame. In the case of the PL-AS MT some internal wiring needs to be connected and the instrument must then be tested for electrical safety before use. See Appendix 3 & 4 for details.

1.5.2 Installing the 2 mL or 4 mL Vial Autosampler Needle Assemblies



Before installing/removing a needle assembly from the autosampler arm ensure the autosampler is powered off.

The PL-AS RT and MT autosamplers are supplied with two needle assemblies, one for the 2 mL vials and the other for the 4 mL vials. The 2 mL vial assembly is metallic whereas the 4 mL vial assembly is coloured blue.

The needle assembly is installed on to the autosampler arm as follows.

1. Select the required needle assembly to be installed, i.e. if using 2 mL vials then install the 2 mL vial needle assembly or if using 4 mL vials then install the 4 mL vial needle assembly.
2. Remove the locking nut from the assembly and insert the needle through the needle holder on the autosampler arm, the locking nut and the needle guard on the autosampler arm.
3. Tighten the locking nut back on to the needle assembly.

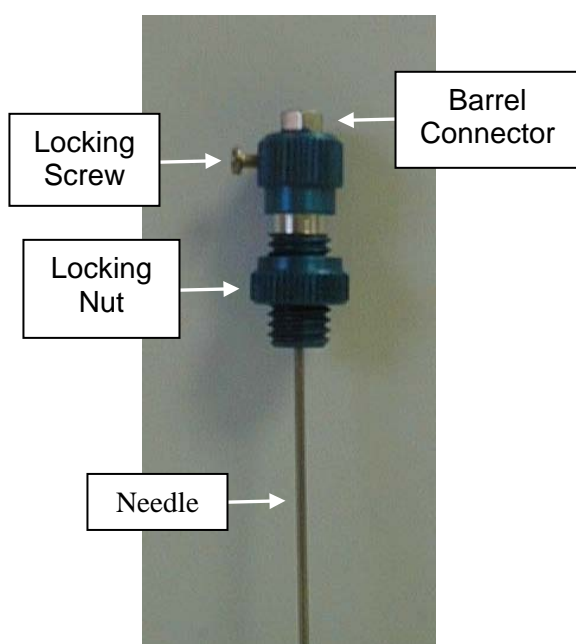


Figure 1.5.3.1

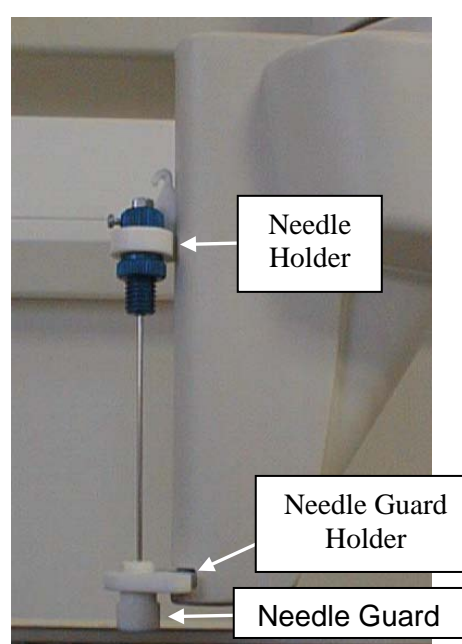


Figure 1.5.3.2

1.6 Installation Procedures - Wiring

1.6.1 Connections - Overview

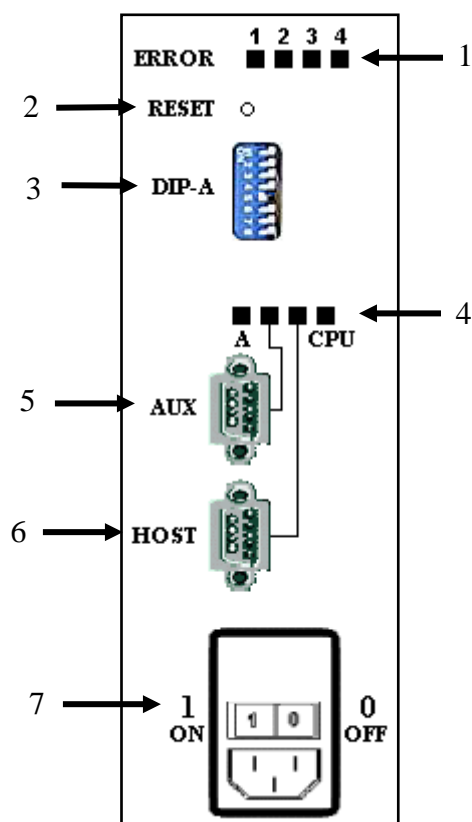


Figure 1.6.1.1 Side Panel Layout of The PL-AS RT & MT Autosamplers

1. *Error Indicators* – These indicators illuminate to show the binary error code for the fault. This is not needed as the PL Instrument Control software will display any errors associated with the autosampler.
2. *Reset Switch* – The Reset Switch is used to return the Autosampler to its initial start up sequence. A small pointed device is required to depress the recessed button.
3. *DIP Switch Settings (DIP-A)* – The default settings for the Eight DIP switches, numbered 1 to 8 from top to bottom are off except for switch 5 which is on.
4. *Status Indicators* – These indicators illuminate to indicate various conditions of the Autosampler, as shown below.

Indicator Label	Description	Indication
S1	Relay A energized	ON when Relay A is energized.
AUX	Auxiliary Instrument Port activity LED	ON when a byte is sent or received on Auxiliary Instrument Port, then Off.
HOST	Host Interface Port activity LED	ON when a byte is sent or received on the Host Interface Port, then Off.
CPU	Central Processor Unit (CPU) Heartbeat LED	OFF for 10 secs then ON for 1 second.

5. *Auxiliary Communications Port (AUX)* – This port provides the PL Instrument Control software with connection and control via the Host Communications Port of the syringe pump, oven vial block and magnetic stirrer. This is an internal connection and therefore the port is not required and has been blanked off.
6. *Host Communications Port (HOST)* – This port provides the PL Instrument Control software with connection and control of the autosampler via RS-232.
7. *Power Supply Input* – The power supply input panel incorporates an on-off switch with fuses and pullout fuse compartment. The Power Indicator is a blue LED located at the front, top left hand side of the autosampler and indicates when power to the unit has been turned on.

1.6.2 Power Connections



THIS UNIT IS DOUBLE-FUSED.



RISK OF FIRE, REPLACE FUSES
AS MARKED.

Before connecting the power cable, ensure the instrument voltage rating (on the rating plate label) matches your local power supply. Use only a supply with **protective grounding**.

The correct fuses should be installed:

For PL-AS RT

230V (AC) $\pm 10\%$, use two 250V 3.15A T HBC fuses

115V (AC) $\pm 10\%$, use two 250V 3.15A T HBC fuses

For PL-AS MT

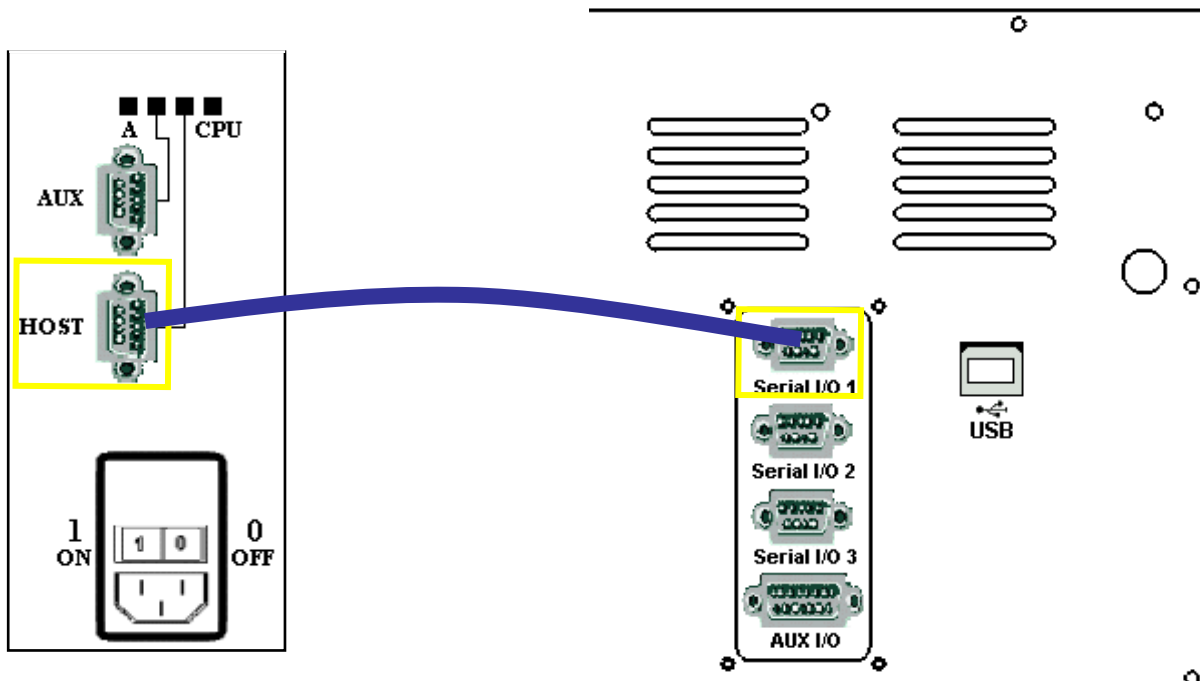
230V (AC) $\pm 10\%$, use two 250V 5A T HBC fuses

115V (AC) $\pm 10\%$, use two 250V 5A T HBC fuses

If the voltage rating and fuses are correct for your power source, plug in the power cable.

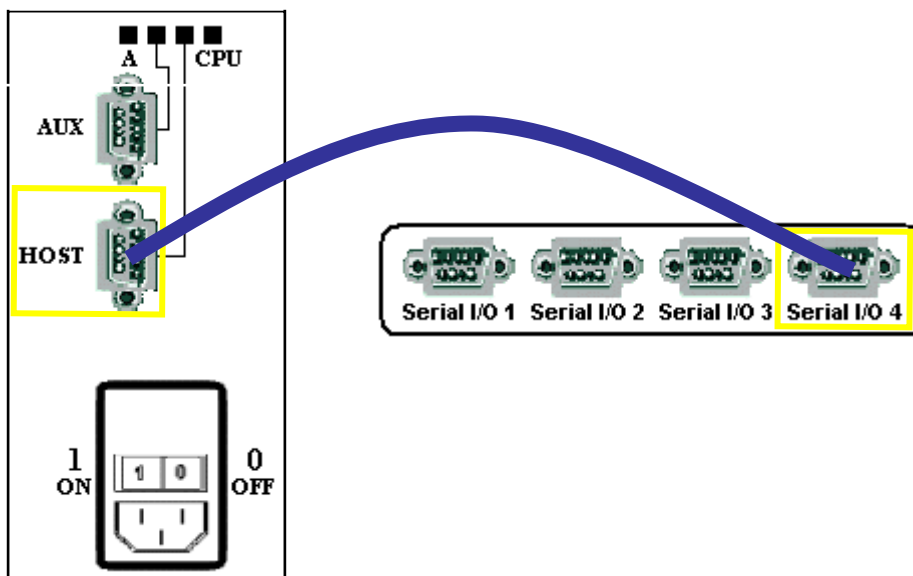
1.6.3 Connecting the PL-AS RT/MT Autosampler to the PL-GPC 50 Plus

Using the Serial Cable supplied, attach one end of the cable to the Host Port on the autosampler and the other to the port labelled "Serial I/O 1" on the rear of the PL-GPC 50 Plus. The PL-AS RT/MT autosampler is now connected to port 4 of the 1st USB hub.



1.6.4 Connecting the PL-AS MT Autosampler to the PL-GPC 120/XT

Using the Serial Cable supplied, attach one end of the cable to the Host Port on the autosampler and the other to the port labelled "Serial I/O 4" on the Keyspan USB 4-Port Serial Adapter. The PL-AS RT/MT autosampler is now connected to port 4 of the serial adapter.



1.6.5 Configuring the PL-AS RT/MT Autosampler

The PL-AS RT/MT autosampler needs to be added to the instrument configuration in order to control it from the PL Instrument Control software. To add the autosampler to the configuration open the PL Instrument Configuration Editor program and select *Add Component* from either the Configure menu or toolbar icon. From the Add Component dialog select either the PL-ASRT component for the PL-AS RT autosampler or the PL-ASMT and PL-ASMT Heated Block components for the PL-AS MT autosampler. Once the autosampler component(s) has been added assign the correct Com port.

For further information on configuring the system then please see the on-line help within the PL Configuration Editor program and either the PL-GPC 50 Plus Operator's Manual, the PL-GPC 120 Operator's Manual or the XT Operator's Manual.

Before the PL-AS RT/MT autosampler can be used the specific co-ordinates defining the Vial Positions A1, A12 and M1 and the Wash Port for the autosampler need to be stored in your instrument configuration.

The control software is installed with default values for these co-ordinates however the actual values for one or more of these may vary slightly because of build and engineering tolerances between individual autosamplers. A Test Certificate containing the actual co-ordinates for the autosampler is supplied. It is important that the instrument configuration stored on your PC is updated with the values supplied on the Autosampler Test Certificate.

To enter the supplied co-ordinates open the PL Instrument Configuration Editor program and select *Edit Substrates* from the Configure menu. The Edit Substrates dialog will open. Enter the X and Y co-ordinates for the Vial Positions and the Wash Port from the supplied Test Certificate. Once completed press the OK button and close the PL Instrument Configuration Editor program. The new co-ordinates will now be stored in the instrument configuration.

Section	Parameter	Value
Wash Port	Well X (mm)	1
	Well Y (mm)	29.5
	Well Z (mm)	72
	Tilt State	Normal
Plate	Well A1 X (mm)	51
	Well A1 Y (mm)	6.5
	Well A1 Z (mm)	50
	Well A12 X (mm)	52
	Well A12 Y (mm)	206.5
	Well A12 Z (mm)	50
	Well M1 X (mm)	267.5
	Well M1 Y (mm)	5.5
	Well M1 Z (mm)	50
	Tilt State	Normal



This will not be required again unless a different autosampler is connected to the system or the PL Instrument Control software is reinstalled.



Check that the co-ordinates are correctly entered as entering incorrect values could result in the autosampler malfunctioning and the possibility of damage.



DO NOT CHANGE THE Z CO-ORDINATES OR THE TILT STATE.

For further information on editing the PL-AS RT/MT autosampler co-ordinates then please see the on-line help within the PL Configuration Editor program.

1.7 Installation Procedures – Plumbing

For the PL-AS RT/MT autosampler the needle and syringe valve must be plumbed directly to the injection valve onboard the PL-GPC instrument. If connecting a PL-AS RT/MT autosampler to a PL-GPC 50 Plus then the connecting tubes are provided in the instrument and are colour coded with red and yellow bands. If connecting a PL-AS MT autosampler to a PL-GPC 120/XT then a heated transfer line and a connecting tube to the syringe pump are provided in the instrument.

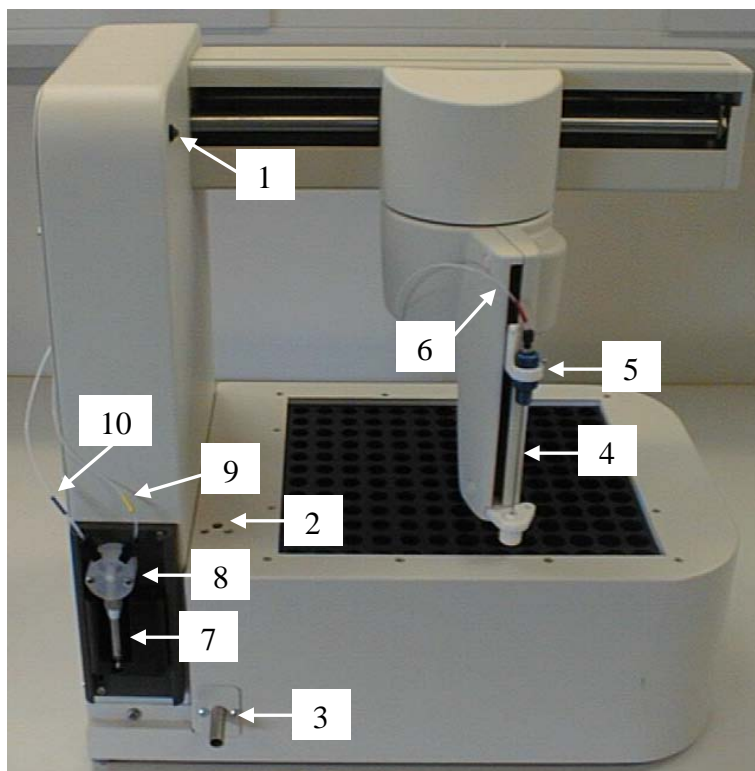


Figure 1.7.1 Side View of PL-AS RT Autosampler Showing Plumbing Connections

- | | |
|-------------------------------------|--|
| 1. Power LED
Instrument | 6. Connecting Tube to a PL-GPC |
| 2. Wash Port | 7. Autosampler Syringe |
| 3. Wash Port Outlet | 8. Autosampler Syringe Valve |
| 4. Autosampler Needle
Instrument | 9. Connecting Tube to a PL-GPC |
| 5. Needle Holder | 10. Connecting Tube to Solvent Reservoir |



NOTE

The heated transfer line is controlled by the column oven and can be heated up to 120 °C.

1.7.1 Connecting the PL-AS RT/MT Autosampler to the PL-GPC 50 Plus

The PTFE tubes for connecting the PL-AS RT/MT autosampler to the PL-GPC 50 Plus are located behind the small removal panel on the left hand side near the front top corner of the PL-GPC 50 Plus. Removal of this small panel will reveal the two tubes and a grommet. The grommet should be inserted into the blanked off access hole and the tubes passed through the grommet. The panel should then be fixed back to the PL-GPC 50 Plus.

The ends of the tubes located in the column oven of the PL-GPC 50 Plus should be connected to the injection valve as follows.

1. The tube labelled with the red band should be connected to PORT 1 of the injection valve. This tube is 1m long with a 0.010" ID thus having an internal volume of 50 μL .
2. The tube labelled with a yellow band should be connected to PORT 6 of the injection valve. This tube is 1m long with a 0.040" ID thus having an internal volume of 810 μL .

The PTFE tubes should then be connected to the autosampler as follows.

3. The tube labelled with the red band should be connected directly to the injection needle, routed in such a way that the tube is not strained or tangled when the autosampler is operated. From the PL-GPC 50 Plus run the tube through the cable clip to the cable tie beneath the autosampler arm and then directly to the needle, as shown in figures 1.7.1.1 and 1.7.1.2. Connect the tube to the barrel connector of the needle assembly by gently tightening the finger nut.

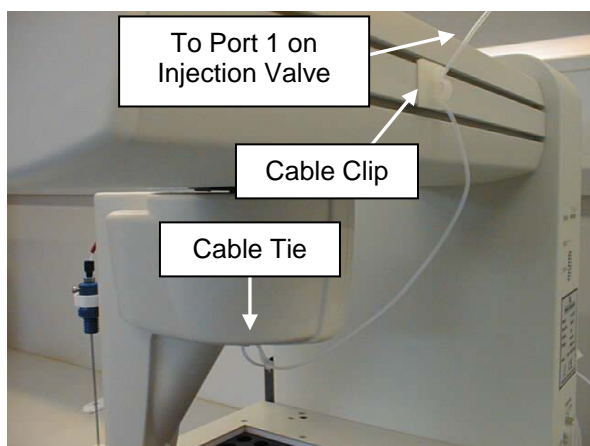


Figure 1.7.1.1

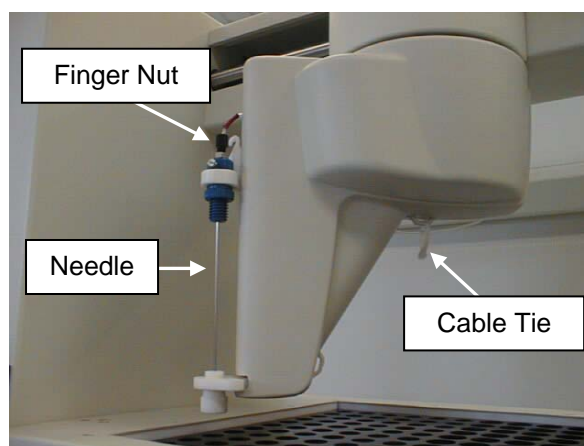


Figure 1.7.1.2

4. The tube labelled with the yellow band should be connected to the right hand port of the autosampler syringe valve. From the PL-GPC 50 Plus run the tube around the back of the autosampler to the syringe valve passing through the cable tie on the rear of the autosampler, as shown in figures 1.7.1.3 and 1.7.1.4. Connect the tube to the valve by gently tightening the finger nut.

The remaining PTFE tubes should then be connected as follows.

- The PTFE tube labelled with the blue band, connected to the left hand port of the autosampler syringe valve, should be routed behind the autosampler through the cable tie on the rear to the solvent reservoir located onboard the PL-GPC 50 Plus, as shown in figures 1.7.1.3 and 1.7.1.4.
- Connect the supplied PTFE tube to the autosampler wash port outlet. Place the other end into a waste bottle situated below the autosampler.

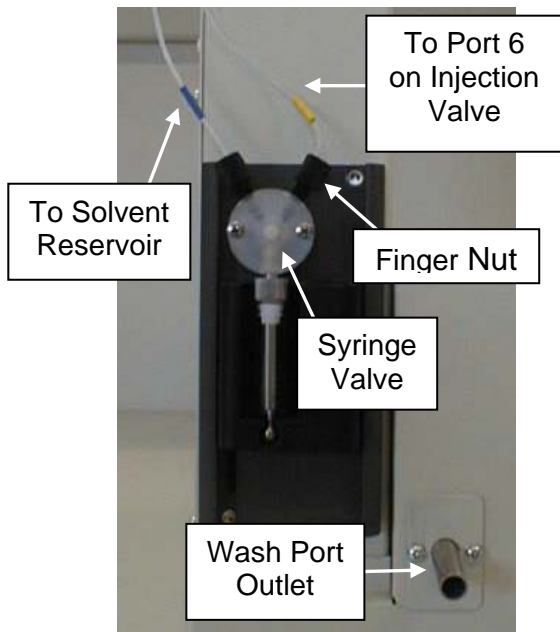


Figure 1.7.1.3

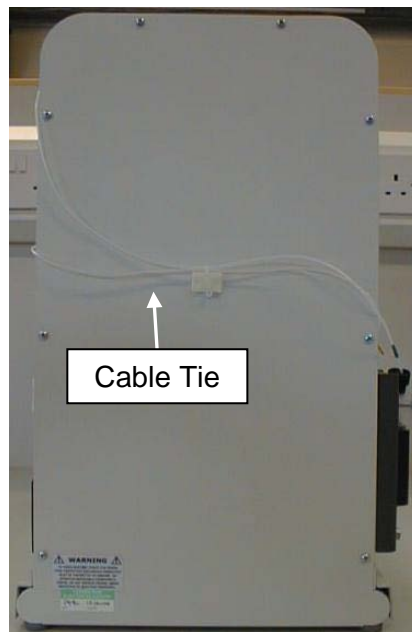


Figure 1.7.1.4

1.7.2 Connecting the PL-AS MT Autosampler to the PL-GPC 120/XT

The heated transfer line and PTFE tube for connecting the PL-AS MT autosampler to the PL-GPC 120/XT are located behind the removable panel at the left hand side of the PL-GPC 120/XT. Removal of this side panel will reveal the heated transfer line and PTFE tube. The transfer line and tube should be passed through the hole on the side panel and the side panel put back.

The ends of the tubes located in the column oven of the PL-GPC 120/XT should be connected to the injection valve as follows.

- One of the tubes within the heated transfer line should be connected to PORT 1 of the injection valve. This tube is 1m long with a 0.010" ID thus having an internal volume of 50 μ L.
- The PTFE tube should be connected to PORT 6 of the injection valve. This tube is 1m long with a 0.040" ID thus having an internal volume of 810 μ L.

The transfer line and PTFE tube should then be connected to the autosampler as follows.

- The tube in the transfer line which has been connected to the injection valve should be connected directly to the injection needle, routed in such a way that the transfer line is not strained or tangled when the autosampler is operated. From the PL-GPC 120/XT Plus run the transfer line through cable clip to the cable tie beneath the autosampler arm and then directly to the needle, as shown in figures 1.7.2.1 and 1.7.2.2. Gently connect the correct PTFE tube to

the needle, a wrench can be fitted to the bottom nut if necessary to stop the barrel fitting turning while tightening the connection

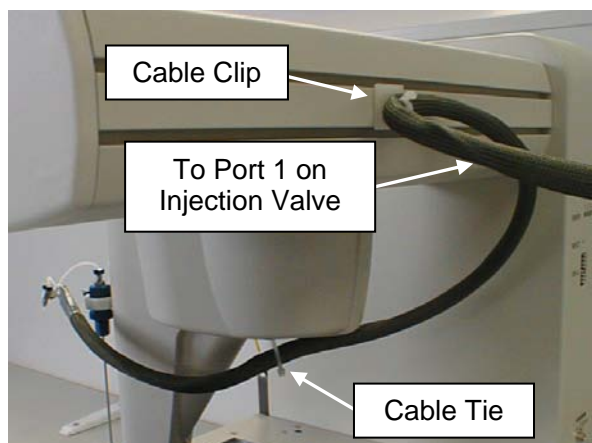


Figure 1.7.2.1

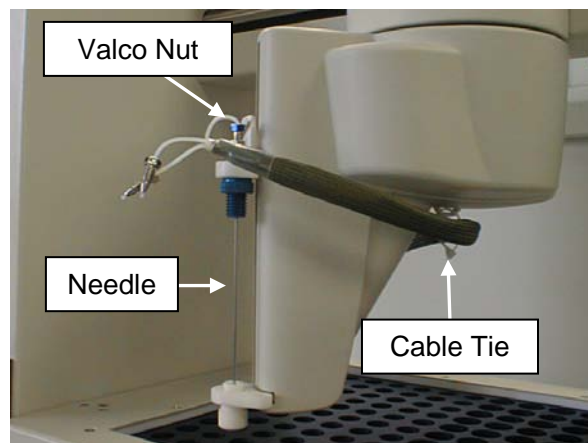


Figure 1.7.2.2

- The PTFE tube should be connected to the right hand port of the autosampler syringe valve. From the PL-GPC 120/XT run the tube around the back of the autosampler to the syringe valve passing through the cable tie on the rear of the autosampler, as shown in figures 1.7.2.3 and 1.7.2.4.

The remaining PTFE tubes should then be connected as follows.

- The PTFE tube labelled with the blue band, connected to the left hand port of the autosampler syringe valve, should be routed behind the autosampler through the cable tie on the rear to the solvent reservoir, as shown in figures 1.7.2.3 and 1.7.2.4.
- Connect the supplied PTFE tube to the autosampler wash port outlet. Place the other end into a waste bottle situated below the autosampler.

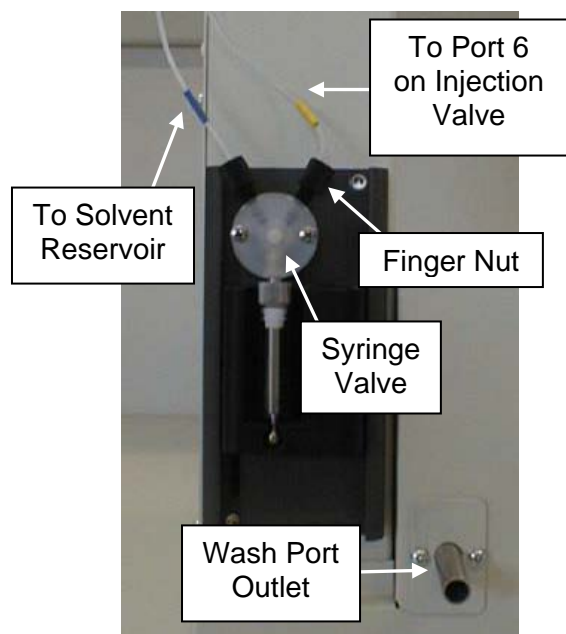


Figure 1.7.2.3

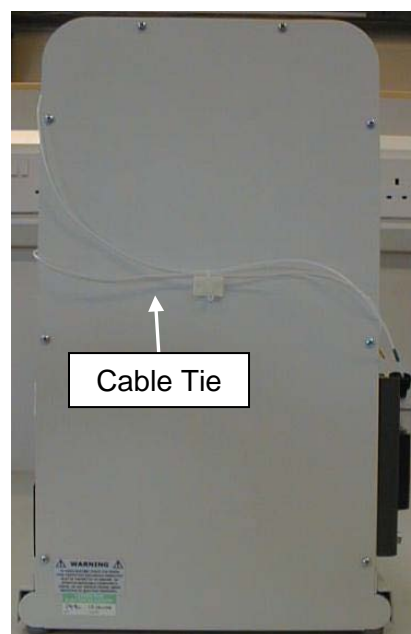


Figure 1.7.2.4


2 The Graphical User Interface

A Windows based Graphical User Interface (GUI) providing total instrument control is used to operate the PL-AS RT & MT autosamplers as well as the PL-GPC instruments. This intuitive interface provides simplistic control as well as a comprehensive monitoring system. The instrument status can be rapidly assessed for each of the instruments modules.



NOTE

For further information on the PL Instrument Control software please see the on-line help within the program.

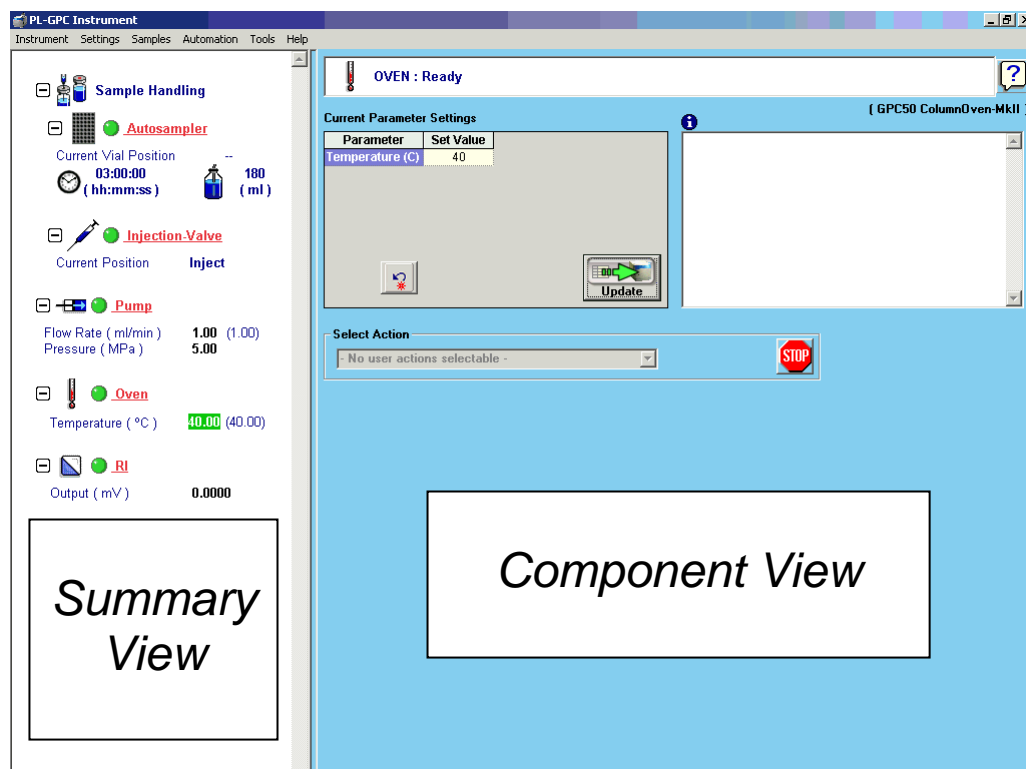
To start the control software select the PL Instrument Control item  in the PL Instrument Control program group of the Programs option in the Start menu.



WARNING

THE PL-AS RT/MT AUTOSAMPLER WILL INITIALIZE ON START-UP OF THE CONTROL SOFTWARE.

2.1 Overview



The Control screen is effectively divided into **two** main Views, these are:

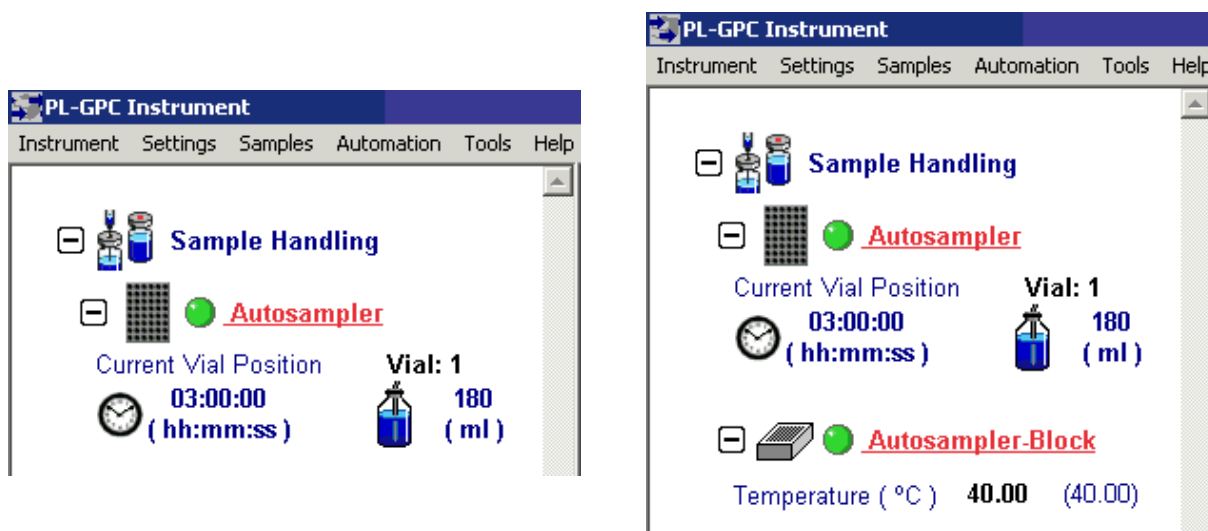
1. The **Summary View**
2. The **Component View**

2.2 Summary View

The summary view displays all the components of your PL-GPC system as a "Tree" providing you with status for each of the modules and a quick way of access to the various components, parameters and options available within the PL Instrument Control software.

For the PL-AS RT & MT autosamplers the status information within the *Summary View* reports the current vial position, approximate total time of analysis and approximate volume of solvent that will be used during the analysis. The total time of analysis and solvent volume will update during an injection sequence, thus indicating the approximate remaining analysis time and solvent volume.

Also for the PL-AS MT autosampler is the Autosampler-Block component where the status information within the Summary View reports the actual and set sample vial block temperatures.



Clicking on the component names displayed in red in the *Summary View* of the screen changes the control display shown in the *Component View*.

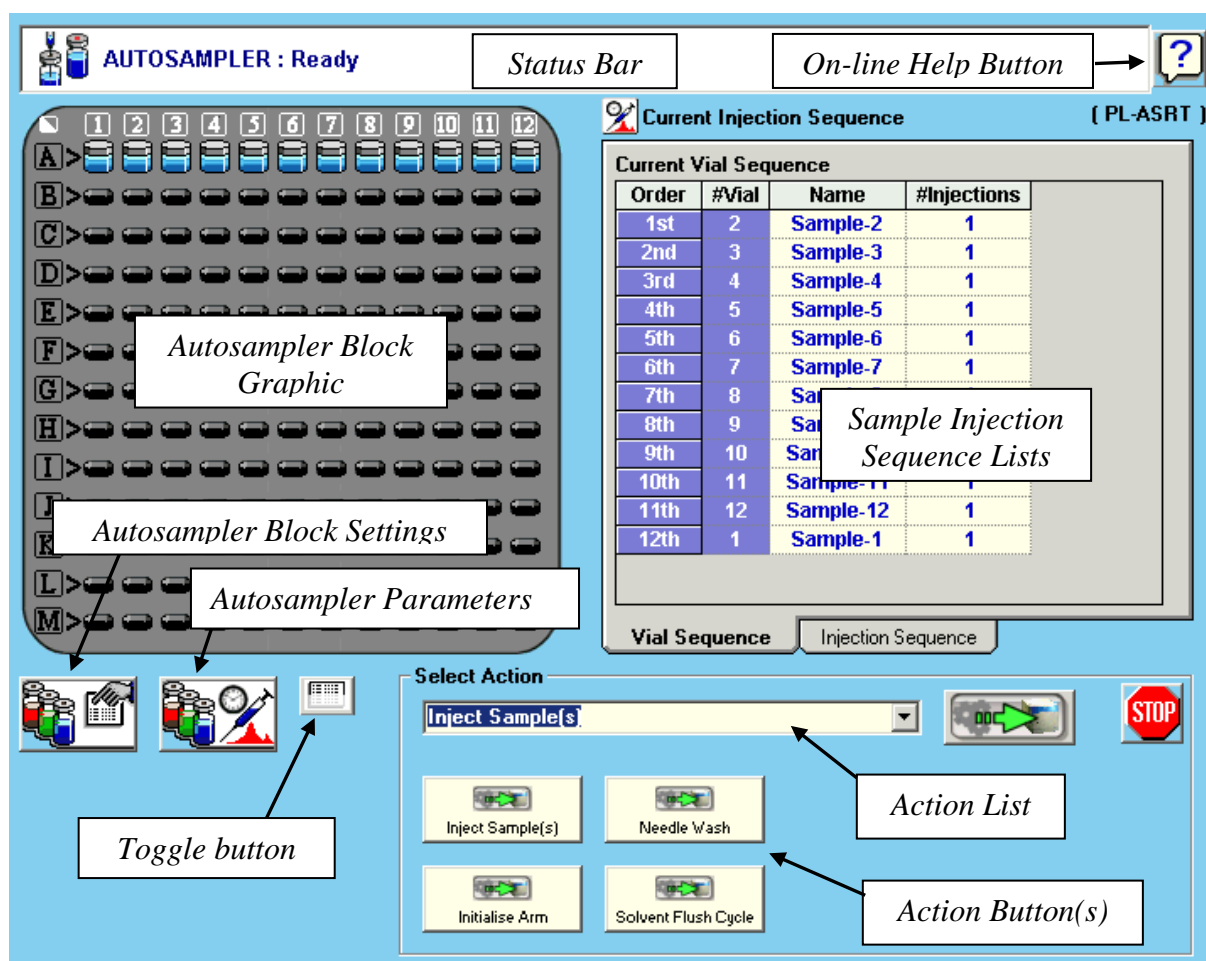
A green LED next to the autosampler and block (if using a PL-AS MT autosampler) component indicates the module is being controlled and running whereas a red LED would indicate the module is either not running or not controlled.

For further information on the *Summary View* please see the on-line help within the PL Instrument Control software.

2.3 Component View

The component view displays the component view of the selected component providing you access to parameters and/or direct commands for that specific component. In general each component view contains a number of common items and options. The actual items available in a view are dependent on the component selected.

The component view for the PL-AS RT autosampler is shown below. The only difference between this view and the view for the PL-AS MT autosampler is the addition of the Inject Heated Sample(s) action in the *Action List* and *Action buttons*.



Status Bar – This displays information about the autosampler component and its current status.

On-line Help Button – This is a direct link to the on-line help for the autosampler component view.

Autosampler Block Graphic – This displays the autosampler vial block graphically and can be used to select the sample vial positions for the injection sequence. To select/deselect a position double click on the relevant vial position within the graphic. To select/deselect entire rows or columns double click on the relevant letter or number. To select/deselect the entire sample vial block double click on the icon at the top left hand corner of the graphic.

The order in which the sample vial positions are selected defines the injection sequence. This can be viewed in the *Injection Sequence Lists*. Vial positions can also be selected using the *Sample Grid*.

Sample Injection Sequence Lists – The *Vial Sequence List* displays the order in which the sample vials will be injected. The sample name and number of injections can be defined for each sample. The order can be re-prioritized by simply highlighting the relevant vial(s) in the list and using standard Windows drag and drop actions. Sample vial(s) can also be removed from the injection sequence list by simply highlighting the relevant vial(s) and pressing the delete key on the keyboard.

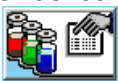



NOTE

The injection order of the pending vials can be changed after the injection sequence has started.


The *Injection Sequence List* displays the actual injection sequence. This is calculated from the order the vials are to be injected and the number of injections per vial. This grid is read only.

Autosampler Block Settings – This allows a new sequence of samples based on a set of default parameters (which will be applied to all the samples) to be set. The details for individual samples can then be changed as required. Also the current injection sequence can be reset within this option. To open the autosampler block


settings press .

Autosampler Parameters – This allows the autosampler parameters for sample injection to be set. To open the autosampler parameter settings press .

Action List – This is a drop down list of the actions that are available for the autosampler. To run an action, select the required one from the *Action List* and

press the Submit Action button, .

Action Button(s) – The actions available for the autosampler are displayed as *Action Buttons*, as well as being found in the *Action List*. To run an action, press the required Action button.

Press the Stop button,  to stop all the procedures currently running on the autosampler.

Toggle Button – This toggles between the *Action Buttons* and the *Sample Grid*.

Sample Grid – This displays the sample details and can be used to select the sample vial positions for the injection sequence. The grid also shows the vial positions that have been injected (in black), the current vial position being injected (in red) and vial positions to be injected (in blue). To select/deselect a sample vial left click in the active box for the relevant vial position. Sample details can be added to the selected vial positions.



NOTE

Sample vials can be added and pending vials can be removed after the injection sequence has started.

Sample Vial Data and Status

#Vial	Active	Name	#Injections	Conc. (mg/ml)	Method	Sample Type	K	Alpha
1	<input checked="" type="checkbox"/>	Sample-1	1	0.000	None	Unknown	14.100	0.700
2	<input checked="" type="checkbox"/>	Sample-2	1	0.000	None	Unknown	14.100	0.700
3	<input checked="" type="checkbox"/>	Sample-3	1	0.000	None	Unknown	14.100	0.700
4	<input checked="" type="checkbox"/>	Sample-4	1	0.000	None	Unknown	14.100	0.700
5	<input checked="" type="checkbox"/>	Sample-5	1	0.000	None	Unknown	14.100	0.700
6	<input checked="" type="checkbox"/>	Sample-6	1	0.000	None	Unknown	14.100	0.700
7	<input checked="" type="checkbox"/>	Sample-7	1	0.000	None	Unknown	14.100	0.700
8	<input checked="" type="checkbox"/>	Sample-8	1	0.000	None	Unknown	14.100	0.700
9	<input checked="" type="checkbox"/>	Sample-9	1	0.000	None	Unknown	14.100	0.700
10	<input checked="" type="checkbox"/>	Sample-10	1	0.000	None	Unknown	14.100	0.700
11	<input checked="" type="checkbox"/>	Sample-11	1	0.000	None	Unknown	14.100	0.700
12	<input checked="" type="checkbox"/>	Sample-12	1	0.000	None	Unknown	14.100	0.700
13	<input type="checkbox"/>	Sample-13	1	0.000	None	Unknown	14.100	0.700
14	<input type="checkbox"/>	Sample-14	1	0.000	None	Unknown	14.100	0.700

The order in which the sample vial positions are selected defines the injection sequence. This can be viewed in the *Injection Sequence Lists*. Vial positions can also be selected using the *Autosampler Block Graphic*.

The component view for the PL-AS MT autosampler block is shown below.


The screenshot displays the AUTOSAMPLER-BLOCK interface. At the top, it shows the status 'Ready' and an 'On-line Help Button'. Below this is the 'Current Parameter Settings' section, which includes a 'Parameter Grid' with 'Temperature (C)' set to 40 and an 'Update' button. To the right is a 'Help Output Window' titled 'Switch stirrer on'. At the bottom, the 'Select Action' section features a dropdown menu currently set to 'Stirrer On', with 'Stirrer Off' also visible. An 'Action List' label points to the dropdown, and 'Action Button(s)' labels point to the 'Stirrer On' and 'Stirrer Off' buttons. A 'STOP' button is also present in this section.

Status Bar – This displays information about the autosampler block component and its current status.

On-line Help Button – This is a direct link to the on-line help for the autosampler block component view.

Parameter Grid – This displays the current set temperature for the autosampler block. To set and update the temperature enter the required value in the *Set Value*



column and press the Update button, . This will automatically set and run the autosampler block to the new temperature.

To undo the new set value prior to pressing the Update button, press the Undo

button, .

To reset the temperature back to the default value, press the Factory Reset button,




Help Output Window – This displays a simple summary help for the temperature parameter and autosampler block actions. To view this information, select the parameter or action. The information displayed in the *Help Window* will be a short description about the action or parameter, the Factory Default Value and the Minimum and Maximum Values for the autosampler block temperature.

Action List – This is a drop down list of the actions that are available for the autosampler block. To run an action, select the required one from the *Action List* and

press the Submit Action button, .

Action Button(s) – The actions available for the autosampler block are displayed as *Action Buttons*, as well as being found in the *Action List*. To run an action, press the required Action button.

Press the Stop button,  to stop all the procedures currently running on the autosampler block.

For further information on the autosampler component views please see the on-line help within the PL Instrument Control software.

For information on the Toolbar menus please see the on-line help within the PL Instrument Control software.

3 Operation

3.1 Safety Information



ENSURE THE SET TEMPERATURE DOES NOT EXCEED 10° BELOW THE SAMPLE BOILING POINT



USE ONLY CAPPED VIALS FOR TOXIC OR FLAMMABLE LIQUID SAMPLES.

To avoid possible hazards from toxic or injurious vapours, always place the autosampler in a fume cupboard or otherwise ensure adequate ventilation if using toxic or flammable samples. The following safety instructions should also be observed:

3.2 Powering the PL-AS RT/MT Autosampler On/Off




THE PL-AS RT/MT AUTOSAMPLER ARM WILL INITIALIZE ON POWERING THE AUTOSAMPLER.

The PL-AS RT/MT autosampler is powered on and off using the main power rocker switch at the right hand side of the unit. Switching this on provides power to all the components integrated in the autosampler, i.e. the syringe pump, the sample vial block heater and magnetic stirrer as well as the autosampler arm. Confirmation of power on is provided when the blue LED on the top of the autosampler is illuminated.

3.3 Controlling the PL-AS RT/MT Autosampler



THE PL-AS RT/MT AUTOSAMPLER WILL INITIALIZE ON START-UP OF THE CONTROL SOFTWARE.

The PL-AS RT/MT autosampler is controlled using the PL Instrument Control software. To start the control software select the PL Instrument Control item  in the PL Instrument Control program group of the Programs option in the Start menu.

On start-up the software will automatically connect to and report the status of the autosampler. If using the PL-AS MT autosampler the actual sample vial block temperature will be displayed.


A green LED next to the autosampler component indicates the autosampler is being controlled and running whereas a red LED would indicate the autosampler is either not running or not controlled.


For further information on controlling the PL-AS RT/MT autosampler please see the on-line help within the PL Instrument Control software.

3.3.1 Flushing the PL-AS RT/MT Autosampler

Before using the autosampler the PTFE tubes connecting the autosampler to the injection valve in the PL-GPC instrument and the PTFE tube connecting the autosampler to the solvent reservoir need to be flushed through with solvent.

To flush the PTFE tubes run the Solvent Flush Cycle action, from the autosampler

component view, by either pressing the  button or selecting the action

from the action drop down list and pressing the Submit Action button, .

The autosampler needle will automatically move to the wash port and the autosampler syringe will draw up 1 mL of solvent and flush this through the injection valve connecting tubes and needle and into the wash port. This will be repeated four more times. If required repeat the action.


If changing solvents then again use the Solvent Flush Cycle action to flush the autosampler tubes and needle into the new solvent. Again if required repeat the action.

3.3.2 Running the PL-AS RT/MT Autosampler


Once the PL-AS RT/MT autosampler has been flushed through with the required eluent the autosampler is then ready to run sample injections.


To set-up the autosampler for sample injections prepare the sample solutions and place the 2 mL/4 mL vials into the appropriate vial positions on the sample vial block. From the autosampler component view of the PL Instrument Control software create or load in the injection sequence and set-up the required autosampler injection parameters.

If using a PL-AS MT autosampler and a sample vial block temperature is required then from the autosampler-block component view, set the temperature value and

press the Update button, . The block temperature should be stable within an hour. Also from this view the magnetic stirrer can be turned on and off by using the action buttons or the action drop down list.

To start the injection sequence run the Inject Sample(s) action by either pressing the

 button or selecting the action from the action drop down list and

pressing the Submit Action button, . The autosampler will then automatically run the injection sequence.

If using a PL-AS MT autosampler with a heated sample vial block then use the Inject Heated Sample(s) action to start the injection sequence. As this action provides conditioning of the needle, that is small aspirations of sample to heat the needle before filling the injection loop and also flushes the sample back to the vial after injection to prevent any precipitation in the wash port.



Ensure the PL-GPC system is stable (Detector(s) baseline(s) and oven temperature) and ready for sample injections before starting the injection sequence.

4 Troubleshooting

4.1 Errors

Any error(s) that occur with communications or operations (running actions, updating parameters etc.) with the autosampler, the *Diagnostic Output Window* will automatically open with the error(s) displayed in the *Component Error Status Tab* of the *Diagnostic Output Window* as shown below.

Each error is uniquely identified with a number that can be referenced back to the control code.

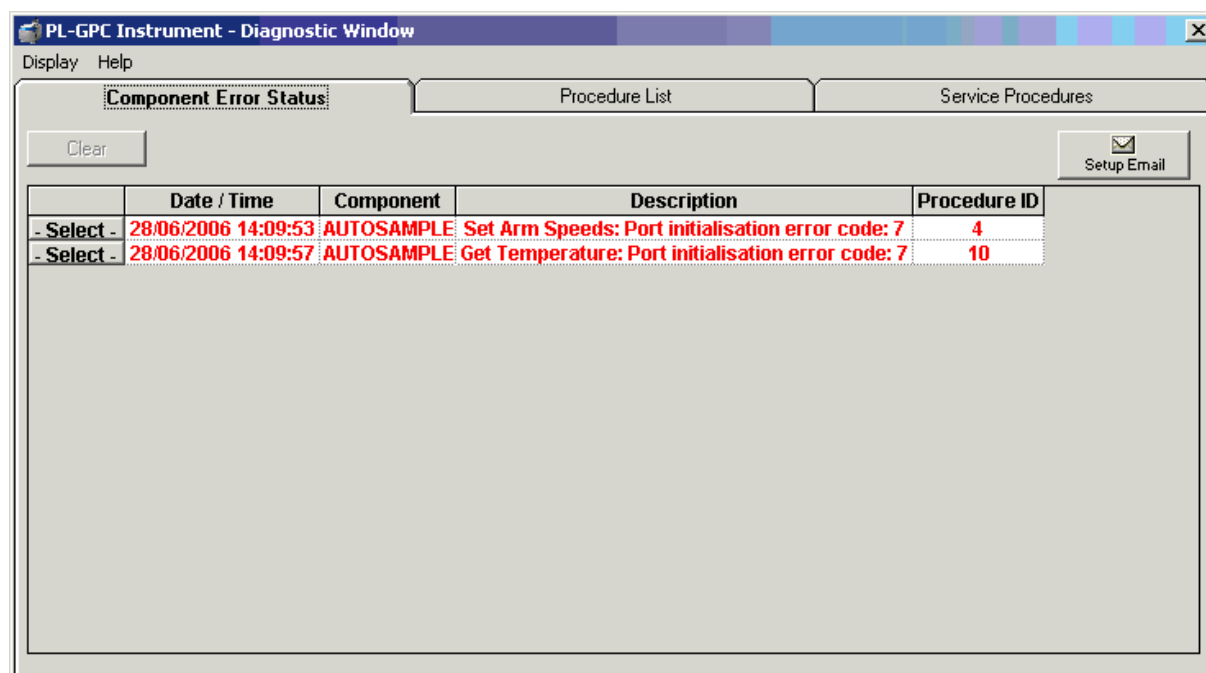


Figure 4.1.1 Diagnostic Output Window

Note: The information displayed in last two Tabs is primarily for service diagnostics and the window does not need to be open for normal operation of the instrument.

If an error is displayed it needs to be cleared in order for the diagnostic window to be closed, allowing access back to the PL Instrument Control software. To clear an error press the Select button to highlight the row and press the Clear button. Multiple errors can be selected at a time. Once all errors have been cleared the diagnostic window can be closed.

Clearing an error will stop all procedures that are running and attempting to communicate with the autosampler. To re-establish communications with the autosampler either select the *Reconnect option* from the *Instrument menu* or return to the autosampler view and resend the parameters or repeat the required action.

The errors that can be displayed from the software for the autosampler are listed on the following pages.

4.1.1 Errors for the PL-AS RT and PL-AS MT Autosamplers

General

Error	Cause(s)	Action
Could not initialize specified comms port	Incorrect Com port assigned to the Autosampler or the PL-GPC 50 Plus is not powered on.	Ensure the correct Com port has been assigned within the PL Instrument Configuration Editor program. Ensure the PL-GPC 50 Plus is powered on.
No response from device	Incorrect Com port assigned to the Autosampler or communications lost with the component, e.g. power failure.	Ensure the correct Com port has been assigned within the PL Instrument Configuration Editor program. Ensure the Autosampler is powered on. If assigned Com port is correct and the Autosampler is powered on then contact Varian or your local agent.
An incomplete response was received from the device		Turn the Autosampler off and then on again and then reinitialize the Autosampler. Ensure the initialization is completed successfully. If this error persists then contact Varian or your local agent.
An unknown response was received from the device		
The device responded with an error	The Autosampler failed to complete an action.	Reinitialize the Autosampler from the PL Instrument Control software and ensure the initialization is completed successfully. If unsuccessful and no obvious cause for the error then contact Varian or your local agent.
No response from the auxiliary device	Oven Block component selected for system configuration but not present or loss of communications with the Syringe Pump and/or Oven Block.	Remove the Oven Block component from the system configuration within the PL Instrument Configuration Editor program. For the loss of communications then contact Varian or your local agent.
An unknown response was received from the auxiliary device		Turn the Autosampler off and then on again and then reinitialize the Autosampler. If this error persists then contact Varian or your local agent.

Autosampler Arm

Error	Cause(s)	Action
X-Axis position error - On move but did not reach the desired number of steps	The Autosampler arm was unable to reach the selected position due to either the arm hitting an obstacle, the arm reaching a position outside the defined limits of the intended position or excessive friction in the mechanical movement.	Reinitialize the Autosampler from the PL Instrument Control software and ensure the initialization is completed successfully. If unsuccessful and no obvious cause for the jam then contact Varian or your local agent.
T-Axis position error - On move but did not reach the desired number of steps		
Z-Axis position error - On move but did not reach the desired number of steps		
X-axis movement error - Movement was detected on the X-axis without being commanded to move	The Autosampler arm has been moved without being actively driven by the Autosampler.	Reinitialize the Autosampler from the PL Instrument Control software.
T-axis movement error - Movement was detected on the T-axis without being commanded to move		
Z-axis movement error - Movement was detected on the Z-axis without being commanded to move		
Dallas ID Chip communications error		Contact Varian or your local agent.
Program memory checksum error		Contact Varian or your local agent.
Configuration memory checksum error		Contact Varian or your local agent.

Error	Cause(s)	Action
RAM Test error		Contact Varian or your local agent.
Axis initialization error		Contact Varian or your local agent.
Invalid command		Contact Varian or your local agent.
Invalid number of parameters - the command had too many or too few parameters		Contact Varian or your local agent.
Parameter out of range - one of the parameters supplied by the command is out of range		Contact Varian or your local agent.
Invalid configuration variable		Contact Varian or your local agent.
Specified configuration value out of range		Contact Varian or your local agent.
Envelope error - the probe was commanded to move to a position outside of its operating envelope		Contact Varian or your local agent.
EEPROM read error		Contact Varian or your local agent.
EEPROM write error		Contact Varian or your local agent.
Timed move error - the probe did not perform the move in the required time		Contact Varian or your local agent.
Profile length error - the Vf, Vi, A and J parameters result in a profile that is too large to fit in the fixed buffer		Contact Varian or your local agent.

Syringe Pump

Error	Cause(s)	Action
Initialization error	The syringe pump was unable to initialize.	Check for blockages and loose connections before attempting to reinitialize. The syringe pump will not accept commands until it has been successfully initialized. This error can only be cleared by successfully initializing the syringe pump. Use the Initialize Arm action for the Autosampler to initialize the syringe pump. If this error persists then contact Varian or your local agent.
Device not initialized	The syringe pump has not been initialized or has lost its positional information, i.e., a stall has occurred, but a move command has been issued.	Reinitialize the syringe pump. Use the Initialize Arm action for the Autosampler to initialize the syringe pump.
Plunger overload	The syringe plunger on movement is blocked by excessive back pressure.	Check the connecting tubing, syringe valve and syringe for blockages. The syringe pump must be reinitialized before normal operation can resume. This error can only be cleared by reinitializing the pump. Use the Initialize Arm action for the Autosampler to initialize the syringe pump. If this error persists then contact Varian or your local agent.
Valve overload	The syringe valve drive has lost steps.	Reinitialize the syringe pump by using the Initialize Arm action for the Autosampler. If this error persists then contact Varian or your local agent.
Plunger move not allowed	The syringe valve is in the bypass or throughput position.	Reinitialize the syringe pump by using the Initialize Arm action for the Autosampler. If this error persists then contact Varian or your local agent.
Invalid command		Contact Varian or your local agent.
Invalid operand		Contact Varian or your local agent.
Invalid command sequence		Contact Varian or your local agent.
Command overflow		Contact Varian or your local agent.

Oven Block (PL-AS MT Autosampler)

Error	Cause(s)	Action
Oven temperature has become unstable	The block heater is unable to maintain a stable temperature.	Ensure the Autosampler is located in a stable environment. If the environmental conditions are fine then contact Varian or your local agent.
Temperature sensor is not responding correctly	The temperature sensor is no longer functioning.	Contact Varian or your local agent.

Appendix 1 - Spare Parts List

Part #	Description
PL 0870-8154	4 mL screw cap vials, caps and Rubber/PTFE septa (pk 500)
PL 0870-8152	2 mL screw cap vials, caps and Rubber/PTFE septa (pk 1000)
PL 0870-8130	4 mL needle assembly
PL 0870-8140	2 mL needle assembly
PL 0870-8110	Syringe pump
PL 0870-8120	Syringe (1 mL) for syringe pump
PL 0870-8280	3 way valve
PL 0870-8290	End cap for robotic arm

Appendix 2 - Cleaning & Decontamination Procedures



SWITCH OFF AND DISCONNECT POWER CORD FROM INSTRUMENT BEFORE CLEANING OR DECONTAMINATION. ALLOW ANY HOT PARTS TO COOL BEFORE PROCEEDING.

Cleaning

The exterior of the instrument should be cleaned by wiping down with a soft cloth moistened with dilute detergent solution, followed by wiping down with a cloth moistened with deionised water. Do not attempt to clean any of the connectors on the rear panel; water may gain ingress and accessible pins may become bent. Ensure that no moisture enters the instrument. Allow instrument to dry off completely before reconnecting power.

Decontamination

THIS PROCEDURE TO BE CARRIED OUT BY TRAINED SERVICE PERSONNEL ONLY

The operator should wear appropriate personal protective equipment for this operation (gloves, safety glasses, lab coat and respirator if level of hazard has been risk-assessed to be sufficiently high).

Disconnect the instrument completely and remove it to a fume cupboard if necessary. Open the rear panel of the instrument to see if any solvent has contaminated the interior.

Excess quantities of liquid spilt on or inside the instrument should be mopped up using absorbent cloths, followed by repeated wiping down with soft cloths moistened with Acetone or deionised water (as appropriate to the spilt solvent) until the last traces of the hazardous liquid have been removed.

Identify and if possible correct the source of the leak. Inspect cabling, parts and surfaces to determine whether any damage has occurred. If in doubt, contact Varian Service Dept for assistance.

Allow the interior and exterior of the instrument to dry out completely before closing the rear panel and reconnecting power.

Dispose of contaminated waste appropriately.

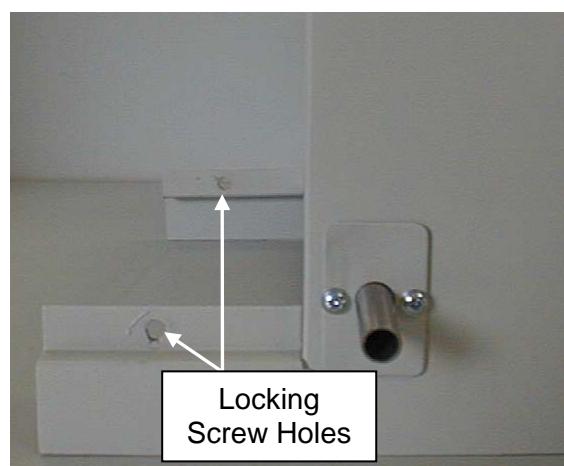
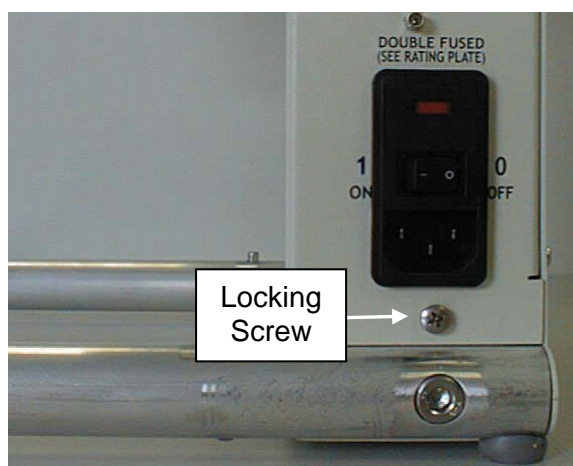
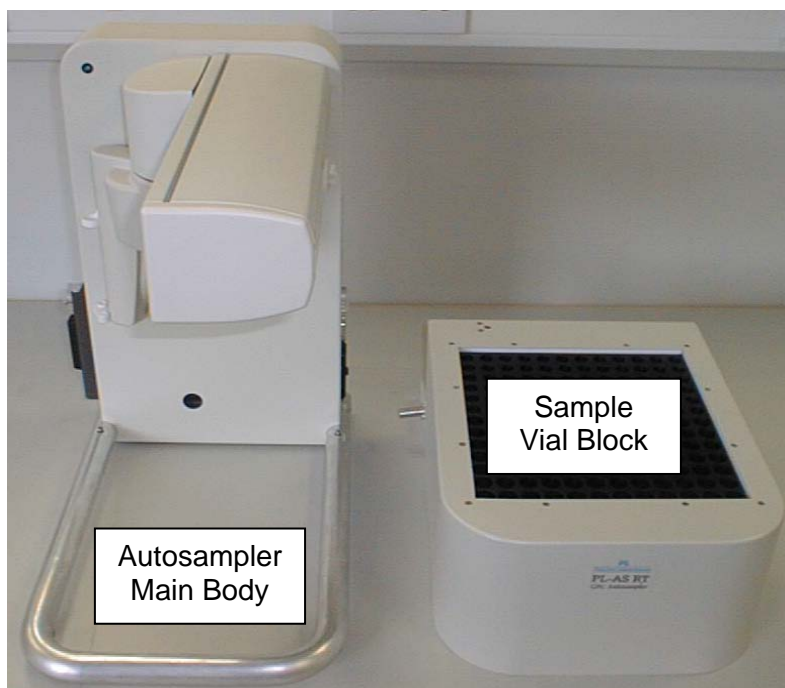
Appendix 3 – Assembly of PL-AS RT



**THIS PROCEDURE MUST ONLY BE CARRIED OUT BY
FULLY TRAINED AND QUALIFIED PERSONNEL**

After the autosampler main body and sample vial block have been unpacked, assemble the PL-AS RT autosampler as follows.

1. Remove the two locking screws on the autosampler main body. These are located on the left and right hand side, one under the autosampler syringe and the other under the main power rocker switch.
2. Place the sample vial block on to the autosampler main body. Slightly tilt the vial block towards the back of the main body, i.e. lowering the block from back to front.
3. Tighten the locking screws back into the locking screw holes.



Appendix 4 – Assembly of PL-AS MT

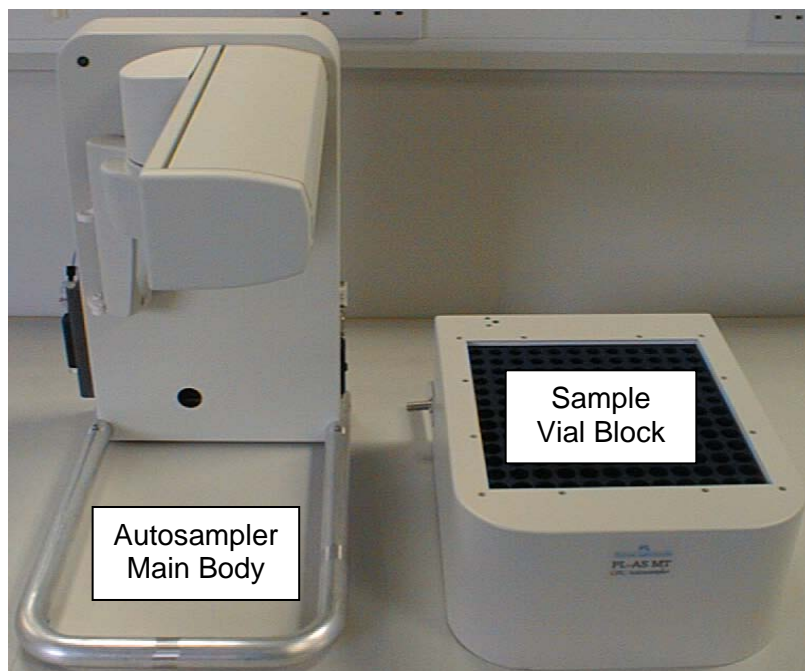


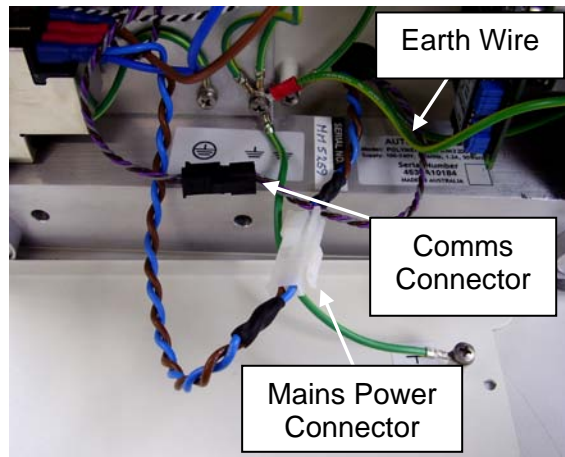
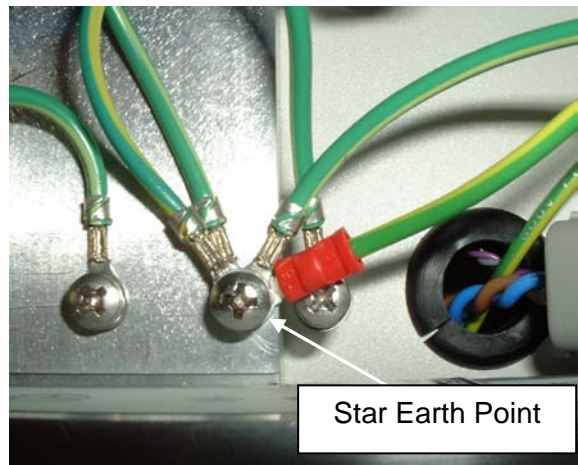
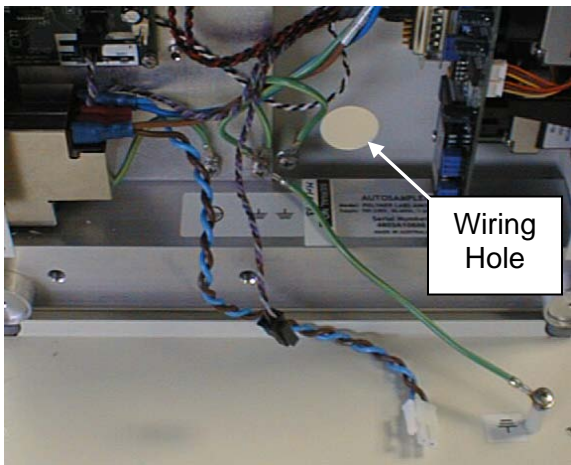
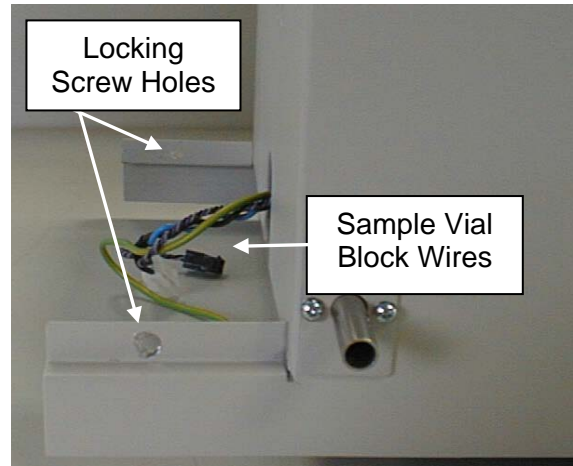
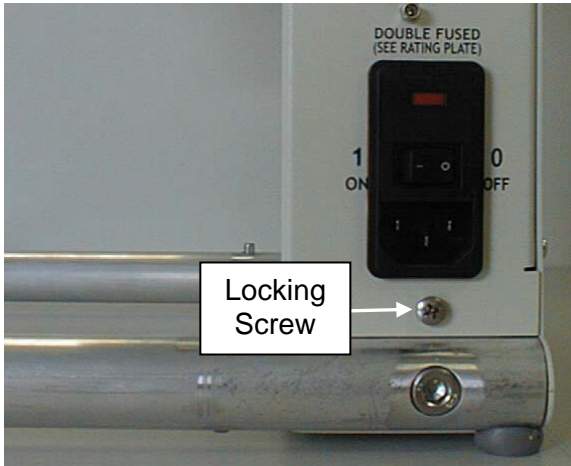
**THIS PROCEDURE MUST ONLY BE CARRIED OUT BY
FULLY TRAINED AND QUALIFIED PERSONNEL**

After the autosampler main body and sample vial block have been unpacked, assemble the PL-AS MT autosampler as follows.

1. Remove the two locking screws on the autosampler main body. These are located on the left and right hand side, one under the autosampler syringe and the other under the main power rocker switch.
2. Remove the back panel of the autosampler main body.
3. Place the sample vial block on to the autosampler main body. Slightly tilt the vial block towards the back of the main body, i.e. lowering the block from back to front.
4. Thread the sample vial block wires through the wiring hole in the main body.
5. Connect the earth wire, (yellow and green) to the star earth point shown.
6. Connect the mains power wires; white connector, blue and brown wires.
7. Connect the communication wires; black connector, mauve, grey and brown wires.
8. Fit ferrite around the mains and comms wires as shown.
9. Fasten the back panel on to the autosampler main body.
10. Tighten the locking screws back into the locking screw holes.

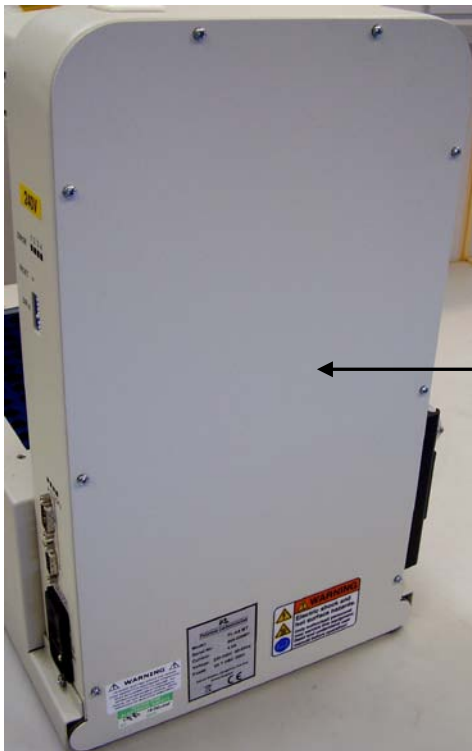
11. THE AUTOSAMPLER MUST BE PAT TESTED FOR ELECTRICAL SAFETY PRIOR TO USE







Clamp Ferrite around
Mains & Comms Wires



Replace Rear Panel