

FLEX Manual

Original Operating Instructions

Rev. 2.1



PN: 105-00CE-DOC

Declaration of Conformity

Manufacturer: EST Analytical, Inc.
503 Commercial Drive
Fairfield, OH 45014
USA

We hereby declare under sole responsibility that the following product as originally delivered

Product Name: Flex Autosampler
Product Options: Including all options, accessories and OEM branded products based on the above model.

complies with the requirements of the following applicable European Directives and carries the CE marking accordingly:

- Low Voltage Directive 2014/35/EU
- EMC Directive 2014/30/EU
- Machinery Directive 2006/42/EC-Annex 1
- RoHS Directive 2011/65/EU

This product is designed and manufactured in accordance with the following standards:

IEC 61010-1:2014
IEC 61010-2-010:2014
IEC 61326-1:2012
CISPR 11:2009+A1:2010
EN 50581:2012

Contact established in the Community authorized to compile the technical file or relevant technical documents:

EST Holdings
Strickledeweg 44, 3044 EK
Rotterdam, The Netherlands

Signed:


Justin Murphy
President

Date:



503 Commercial Drive
Fairfield, OH 45014 USA
Ph 513.642.0100 Fx 513.642.0106
www.estanalytical.com

12-14-17

Contents

Notices	4
Warranty	5
Federal Communications Commission’s advisory	6
Safety Information	7
Electrical Hazards	8
Additional Hazards.....	9
Disposal and Recycling Information.....	12
Chapter 1: Installation	13
1.1 General Information	13
1.2 System Overview	13
1.3 System Specifications.....	14
1.4 Unpacking the FLEX	16
1.5 Mounting the FLEX onto the GC	18
1.6 Installation/Setup	18
1.6.1 Installing Sample Trays and Accessories	18
1.6.2 Connections on the Back of the FLEX.....	19
1.6.3 Setting Up User Permissions	20
1.7 Flex Configuration.....	21
1.7.1 USB Connection	21
1.7.2 Ethernet Connection.....	22
1.7.3 Rail Configuration	24
1.7.4 Syringe Configuration.....	25
Chapter 2. Instrument Operation	28
2.1 Instrument Operation Software	28
2.1.1 Logon, Connect/Disconnect or Exit Software	28
2.1.2 Instrument Status.....	28
Chapter 3. Operating Instructions.....	33
3.1 Creating Methods.....	33
3.2 Method Routines	36
3.2.1 General	36

3.2.2	Sample Prep	37
3.2.3	Wait.....	38
3.2.4	Sample Incubate Agitate	38
3.2.5	Rinse	39
3.2.6	Sample.....	40
3.2.7	Air Volume Gap.....	40
3.2.8	Sweep Needle	41
3.2.9	Standard Addition.....	41
3.2.10	Solvent Dilute.....	42
3.2.11	Single Port Injection.....	42
3.2.12	Multiple Port Injection	43
3.2.13	Injection.....	43
3.2.14	Sample Fill.....	44
3.2.15	Gas Standard Addition	44
3.2.16	Extraction	45
3.2.17	Desorbtion.....	45
3.2.18	Condition Fiber.....	46
3.2.19	Single Magnet Mixer	46
3.2.20	SPME Rinse	47
3.2.21	Vial Displacement	47
3.2.22	Sample Mix.....	48
3.2.23	Auxiliary Output Control.....	48
3.3	Sequence Planning	48
3.3.1	New Sequences	48
3.3.2	Active Sequences.....	49
Chapter 4: Parts, Service and Maintenance.....		52
4.1	Maintenance	52
4.1.1	Cleaning the FLEX.....	52
4.1.2	Maintenance/Service	52
4.2	Technical Support	53
4.3	Replacement Parts	53

4.3.1 Fuse Replacement.....	53
Appendix A: Chemstation/MassHunter Sequence Import.....	55
Appendix B: Scion Compass Integration	60

Notices

Copyright

No part of this manual may be reproduced in any form or by any means (including electronic storage and retrieval or translation into a foreign language) without prior agreement and written consent of EST Analytical.

Document Number

A05-000-UMAN Flex User Manual

Version

Rev. 2.1

Printed in USA

EST Analytical
503 Commercial Dr.
Fairfield OH, 45014 USA

Warranty

The material contained in this document is provided “as is”, and is subject to being changed without notice, in future editions. EST Analytical warrants the products it manufactures and distributes, except those specially exempted, to be free from defects for one full year from the date of shipment. This warranty is limited to the original purchaser of the product and is not transferable. This limited warranty does not extend to any products that have been damaged as a result of accident, misuse, abuse, service or modification by anyone.

Except as expressly set forth above, no other warranties are expressed or implied including, but not limited to, any implied warranties merchantability and fitness for a particular purpose, and EST expressly disclaims all warranties not stated herein. In the event the product is not free from defect as warranted above, the purchaser’s sole remedy shall be provided above. Under no circumstances will EST Analytical be liable to the purchaser or any user for any damages, including the incidental or consequential damages, expenses, lost profits, lost savings or other damages arising out of the use or inability to use the product. This warranty shall not be applicable to the extent that any provision of this warranty is prohibited by any federal, state, or municipal law that cannot be preempted.

Federal Communications Commission's advisory

This equipment has not been tested or found to comply with the limits of Class A computing device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his expense.






Safety Information

English

- Warnings in the manual or on the FLEX to be observed during installation, operation, service and/or repair of the instrument. EST Analytical will assume no responsibility for customers failing to comply with the safety precautions stated.
- Use of the FLEX for something other than the intended use of the instrument is prohibited.
- The use of the FLEX is for trained personnel only.
- Personnel operating the FLEX should wear safety glasses, safety shoes and gloves where appropriate.
- The FLEX is not intended for use in a hazardous environment.
- Installation of the FLEX requires that there is nothing blocking the vents of the system.
- Installation of the FLEX requires that the instrument be placed on a non-flammable surface capable of handling the weight of the instrument.
- Sound pressure level of the FLEX is 65db (A).
- When cleaning the FLEX please refer to section 1.7 of the User Manual. No other cleaning agents may be used other than what is specified in this section.

Français

- Les avertissements dans le manuel ou sur le FLEX à observer lors de l'installation, le fonctionnement, le service et / ou la réparation de l'instrument. EST analytique n'assume aucune responsabilité pour les clients qui ne respectent pas les consignes de sécurité indiquées.
- Utilisation de le FLEX pour autre chose que l'utilisation prévue de l'instrument est interdite.
- L'utilisation de le FLEX est de personnel qualifié seulement.
- Le personnel d'exploitation le FLEX doivent porter des lunettes de protection, chaussures de sécurité et gants le cas échéant.
- Le FLEX n'est pas destiné à être utilisé dans un environnement dangereux.
- Installation de le FLEX exige que rien ne bloque les orifices de ventilation du système.
- l'installation de le FLEX exige que l' instrument est placé sur une surface non inflammable capable de supporter le poids de l'instrument.
- le niveau de le FLEX de pression acoustique est de 65 dB (A).
- Lors du nettoyage de le FLEX s'il vous plaît se référer à la section 1.7 du Manuel de l'utilisateur. Pas d'autres agents de nettoyage peuvent être utilisées autrement que ce qui est spécifié dans cette section.

Symbol	English	French
	See Accompanying Instructions for more Information	Voir les instructions d'accompagnement pour plus d'informations
	Indicates Hot Surface	Indique surface chaude
	Indicates an Electrical Hazard	Indique un danger électrique
	Indicates a Sharp Point	Indique une pointe acérée
	Indicates Bulky/Heavy Item, Use Two Person Lift	Indique objet volumineux / lourds, utilisez deux personnes ascenseur

Safety Symbols

Electrical Hazards



The power cord supplied with the FLEX system must be connected to a power outlet with a protective ground contact. If using an extension cord or a power strip, make sure that it also has a protective ground contact.



Le cordon d'alimentation fourni avec le système FLEX doit être connecté à une prise de courant avec un contact de terre. Si vous utilisez une rallonge ou une multiprise, assurez-vous qu'il dispose également d'un contact de terre.



Do not change the internal or external ground connections. Tampering with the grounding connections will result in a voided warranty and could damage the FLEX system.



Ne pas modifier les connexions de terre internes ou externes. Ingérence dans les connexions de mise à la terre se traduira par une annulation de la garantie et pourrait endommager le système FLEX.



If there is suspected electrical damage to the FLEX, contact EST Analytical in order to have a service representative evaluate the system. Do NOT try to address the problem until a service representative has looked at the FLEX.



Si on soupçonne des dégâts électriques à la FLEX, contactez EST analytique afin d'avoir un représentant du service à évaluer le système. Ne pas essayer de résoudre le problème jusqu'à ce qu'un représentant de service a examiné la FLEX.



Disconnect power cords from the FLEX before performing instrument maintenance.



Débranchez les cordons d'alimentation du FLEX avant d'effectuer l'entretien de l'instrument.



Do not disconnect any of the electrical assemblies while the power is on. Turn the power off and unplug the power cord before disconnecting any electrical assembly.



Ne débranchez pas l'un des ensembles électriques tandis que l'appareil est sous tension. Coupez l'alimentation et débranchez le cordon d'alimentation avant de déconnecter toute l'installation électrique.

Additional Hazards



Never try to repair any components of the FLEX without the aid of Technical support **(800)283-3510** (USA and Canada) or **513-642-0100** (International), email: support@estanalytical.com, the manual, or a service representative. If the FLEX is damaged during unauthorized repairs, the warranty may be voided.



Ne jamais essayer de réparer les composants pour le FLEX sans l'aide d'un soutien technique **(800) 283-3510** (États-Unis et Canada) ou **513-642-0100** (International), email: support@estanalytical.com, le manuel, ou un représentant

de service. Si le FLEX est endommagé lors de réparations non autorisées, la garantie peut être annulée.



The power switch for the FLEX is on the back of the instrument with the symbol(s) “—” meaning ON and “O” meaning OFF. The power supply for the FLEX should be located where it is possible to unplug the AC power cord from the power supply/wall outlet in case of an emergency.



L'interrupteur d'alimentation pour le FLEX est sur le dos de l'instrument avec le symbole (s) “-” signifie ON et “O” signifie OFF. L'alimentation de la FLEX devrait être situé là où il est possible de débrancher le cordon d'alimentation de la prise d'alimentation / mur en cas d'urgence.



Use safe laboratory practices when using solvents, changing syringes or operating the FLEX. See the MSDS sheets from the manufacturer for all solvents in use.



Utilisez pratiques de laboratoire lors de l'utilisation de solvants, seringues ou changer le fonctionnement du FLEX. Voir les fiches signalétiques du fabricant pour tous les solvants utilisés.



Use caution when using any polymer tubing under pressure. Always use eye protection, do not use stressed or kinked tubing and refer to the MSDS sheets in order to determine if the solvent in use would cause any issues with the tubing.



Faites preuve de prudence lorsque vous utilisez un tube de polymère sous pression. Toujours utiliser des lunettes de protection, ne pas utiliser de stress ou de tubes pliés et se référer aux fiches signalétiques afin de déterminer si le solvant utilisé causerait des problèmes avec le tube.



A lithium battery is used to buffer the electronic memory when the FLEX is not in use. Replace it only with an equivalent battery. The battery recommended is a CR1225. NOTE: Dispose of all Lithium batteries properly.



Une batterie au lithium est utilisé pour tamponner la mémoire électronique lorsque le FLEX n'est pas en cours d'utilisation. Remplacer uniquement avec une batterie équivalente. La batterie recommandée est une CR1225. REMARQUE: Eliminer toutes les batteries au lithium correctement.



If one of the printed circuit boards fails, contact EST Analytical Technical Support for a replacement board. Technical support **(800)283-3510** (USA and Canada) or **513-642-0100** (International)



Si l'une des cartes de circuits imprimés échoue, contactez le support technique EST analytique pour une carte de remplacement. Support technique **(800) 283-3510** (États-Unis et Canada) ou **513-642-0100** (International)



To avoid injury during operation of the FLEX, keep hands away from heated surfaces



Pour éviter les blessures pendant le fonctionnement du FLEX, garder les mains loin des surfaces chauffées



To avoid injury when changing a Headspace syringe, let syringe cool before changing the syringe.



Pour éviter les blessures lors de la modification d'une seringue de Headspace, laissez refroidir la seringue avant de changer la seringue.



To avoid injury during the operation of the FLEX, keep hands away from the syringe.



Pour éviter les blessures lors de l'opération de l'FLEX, éloigner les mains de la seringue.

Disposal and Recycling Information



United States:

This symbol indicates that your product must be disposed of properly according to local laws and regulations. When your product reaches its end of life, contact your local authorities to learn about recycling options.

European Union:

This symbol above means that according to local laws and regulations your product should be disposed of separately from household waste. When this product reaches its end of life, take it to a collection point designated by local authorities. Some collection points accept products for free. The separate collection and recycling of your product at the time of disposal will help conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment.

Chapter 1: Installation

1.1 General Information

The system setup and installation is intended to be as thorough as possible. If in doubt at any point during the installation, please contact EST Analytical toll free at **(800) 283-3510**, or outside the United States at **(513) 642-0100**. If installation is not directed or performed by EST Analytical personnel or an appointed representative, the operator must be thoroughly familiar with setup and installation instructions enclosed with the FLEX.

- **NOTE: Failure to follow the installation instructions as set forth could result in damage to the product and nullify the warranty.**

1.2 System Overview

- X-Axis
- Y-Axis
- Z-Axis
- 10 ml Wash Station
- 2 ml Vial Tray
- SPME Conditioner (Optional)
- Incubator Shaker Oven(Optional)
- 100 ml Wash Station (Optional)
- 20 ml Vial Tray (Optional)

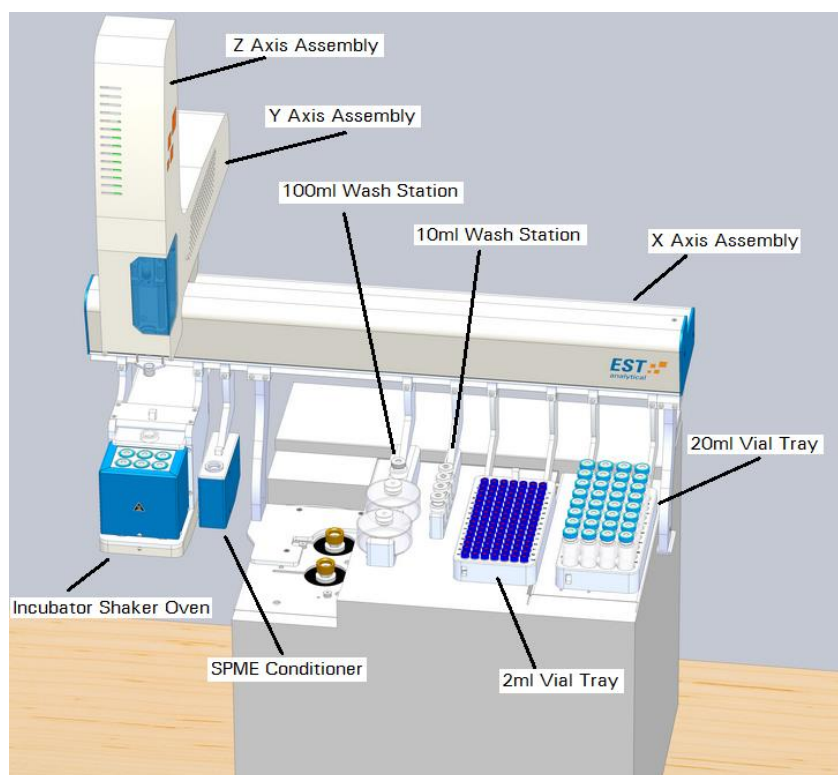


Figure 1.2a: System Overview Components

1.3 System Specifications

- Sample Capacity
 - 105 x 2ml vials per tray
 - 32 x 10ml/20ml vials per tray
 - (up to three trays can be configured)
- Liquid Injection Range
 - 0.5µl to 10µl with standard 10µl syringe
 - 50µl to 500µl with optional 500µl syringe
- Headspace Injection Range
 - 100µl to 2500µl with standard 2.5ml syringe
 - 100µl to 1000µl with optional 1.0ml syringe
 - 500µl to 5000µl with optional 5.0ml syringe
- Syringe Heater Accessory (for Headspace Option)
 - Accommodates a 1ml or a 2.5ml headspace syringe
 - Ambient to 150°C temperature range
- Incubator/Agitation Station (for Headspace Option)
 - 6 heated vial positions for 10 or 20ml vials
 - Ambient to 200°C temperature range
 - Orbital shaking speeds from 120 to 750rpm
 - Oscillation shaking frequency 190Hz
- Heated Needle/Fiber Conditioning Station (For Headspace/SPME Option)
 - 1 heated station for needle or fiber conditioning
 - Ambient to 350°C temperature range for fiber conditioning
 - Ambient to 150°C temperature range for needle conditioning
 - Sweep gas port
- Single Magnet Mixing Station (Option for SPME kit)
 - 1 heated station for sample heating
 - Ambient to 150°C
 - Mixing Speeds from 380 to 725 rpm
- SPME/Fiber Holder MFX-6 (Option for SPME kit)
 - 6 SPME fiber stations for multiple fiber exchange
- Agilent 7693 Tray Holder (Option)
 - For Agilent 50 position tray
- Replicate Injections
 - 1 to 99 injections per vial

- Precision
 - Refer to Flex Operational Quality Assurance/Quality Control Verification Document
- Power Requirements
 - 100-240 VAC
 - 50-60 Hz, 3-1A
- Dimensions/Weight (Base Unit)
 - 21.7H X 19.5D X 32.7W inches (55.1H X 49.5D X 83.1W cm)
 - 24 lbs (10.9 kg)
- Dimensions/Weight XTR (option)
 - 21.7H X 19.5D X 49W inches (55.1H X 49.5D X 124.5W cm)
 - 28 lbs (12.7 kg)
- Operating systems supported:
 - Window 10, all editions including 64-bit
 - Windows 8, all editions including 64-bit
 - Windows 7, all editions including 64-bit
- Host PC Requirements
 - 2.0 GHz processor; 2.4 GHz recommended
 - 1 GB RAM, 2 GB RAM recommended
 - Display resolution 1024 x 768 pixels or higher
 - Disk space requirements:
 - 250 MB of disk space
 - Additional software: 250 MB for Microsoft .NET 4.0 Runtime
- Connectivity:
 - USB 2.0 port for peer to peer
 - LAN Connectivity
- Indoor Use
 - Recommended operating altitude up to 2000m altitude. Maximum altitude 4600m.
 - Recommended operating temperature 10°C to 25°C. Maximum operating temperature 40°C
 - 5°C to 85°C storage temperature
 - 10 to 90% relative humidity
- FLEX Syringe Speeds

Syringe Speeds Summary			
Syringe Size (µl)	Application	Min. Injection Speed (µl/sec)-- 1%	Max. Injection Speed (µl/sec)-- 100%

1.2	liquid	0.0010	6.0
5	liquid	0.0041	25.4
10	liquid	0.0082	50.8
25	liquid	0.0204	127.0
100	liquid	0.0817	508.0
500	liquid	0.4085	2400.0
1000	headspace	4.4934	1270.0
2500	headspace	11.2336	3175.0
5000	headspace	22.4670	6350.0


Table 1.3a: Syringe Speeds

1.4 Unpacking the FLEX

- The FLEX is packaged in one carton containing all components necessary for instrument installation and operation.



Figure 1.4a: Shipping Container

- Before unpacking the FLEX, visually inspect the shipping carton for any damage. If visual damage is present, call EST Analytical at **(800) 283-3510** or **(513) 642-0100**  immediately.
- Cut the strapping and lift the top box cover off of the box and put aside. Lift the outer box shell off the FLEX and put aside. Remove the excess foam packing material from the box and put aside.
- Remove the box inside the main FLEX body. This box contains the installation kits. There are separate installation kits for each option on the FLEX. Each FLEX system contains the FLEX software, Mounting Kit, and Power Supply. The Liquid Injection, Headspace and SPME kits are included when those options are purchased.

1. Mounting Kit

- GC Mounting Instructions
 - 2. Power Supply
 - 3. Liquid Injection Kit
 - 2ml vial tray
 - 10µl syringe
 - 10ml rinse station
 - Allen wrench set
 - Phillips head screwdriver
 - USB cable
 - Tray support hardware
 - Liquid syringe insets
 - 2ml vials and caps
 - Syringe cover
 - 10ml headspace rinse vials
 - 4. Headspace Injection Kit
 - 20ml headspace vial tray
 - 2.5ml syringe
 - 5.0ml syringe (Option)
 - Sleeve for 1ml syringe
 - Heated syringe sleeve
 - Incubator (without SPME latching mechanism)
 - Tray support hardware
 - 10ml incubator inserts
 - 6ft copper tubing (183 cm)
 - Headspace cables
 - 5. SPME Kit
 - SPME fiber conditioning station with hardware
 - SPME latching mechanism for incubator
 - EST SPME fiber holder
 - SPME holder inserts
 - 2ft Tygon tubing (61 cm)
 - SPME cable
 - SPME fiber cover
 - Single Magnet Mixer (Option)
- With the help of another person, tilt the FLEX gently on one side and remove the foam inserts. The FLEX is now ready to be installed on the GC.
 - **NOTE: Please retain all shipping material.**

1.5 Mounting the FLEX onto the GC ⚠

Follow the specific GC installation instructions enclosed in the FLEX Mounting Kit, in order to mount the FLEX onto the GC.

With the help of another person tilt the FLEX gently on one side and remove the foam inserts. The FLEX is now ready to be placed on the FLEX mount that has been installed onto the GC. With one person on each side of the FLEX transfer the FLEX onto the GC.



- **NOTE:** The FLEX needs to be lifted from the base of the instrument.
WARNING: The FLEX needs enough space on all sides of the instrument to ensure proper cooling of instrument components AND to ensure that the power cord can be easily disconnected.
- **AVERTISSEMENT:** Le FLEX a besoin de suffisamment d'espace sur tous les côtés de l'appareil pour assurer le bon refroidissement des composants de l'instrument et de veiller à ce que le cordon d'alimentation peut être facilement déconnecté.

1.6 Installation/Setup

1.6.1 Installing Sample Trays and Accessories

1. Loosen the front clamp(s) on the leg bracket(s) in order to clear the mounting rail on the FLEX by loosening the M4 X 10mm screw(s).
2. Place the leg bracket(s) on the mounting rail where needed.
3. Tighten the leg bracket(s) onto the mounting rail by tightening the M4 X 10mm screw(s).
4. Repeat steps one through three for all of the other FLEX accessories.
 - **NOTE:** See Figure 3 below for leg bracket, clamp and screw mounting.

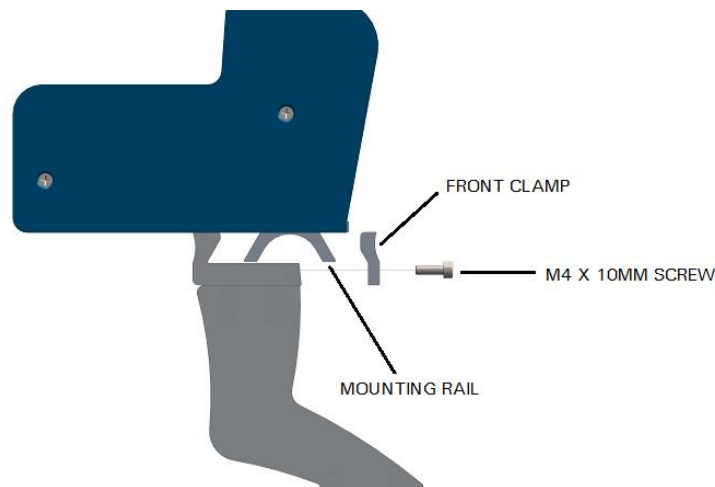



Figure 1.6.1a: FLEX Mounting Rail, Front Clamp and M4 X 10mm Screw

5. For installation of the sample tray(s), position the sample tray straight down onto the mounting legs.
6. After all the FLEX and all of the accessories and trays have been mounted. Remove the tie down and orange instrument lockouts from the syringe head of the FLEX.

1.6.2 Connections on the Back of the FLEX

1. Plug the power supply cord from the power supply into the main power supply port.
2. Plug the USB cable into the micro USB port.
3. Connect the GC-I/O Connect cable from the GC into the GC-I/O Connect port.
4. Plug the Incubator (option) power cable from the Incubator into the Incubator power output.
5. Connect the SPME (option) Heater and Thermocouple (T.C.) cable from the SPME Conditioning station into the SPME Heater and T.C. ports.
6. Connect the SPME (option) Gas Supply onto the SPME gas supply port using Tygon tubing.
 - **NOTE: There is a toggle switch on the back of the SPME Fiber conditioner to turn the gas supply on and off.**
7. Connect compressed gas into the Gas Input connection (if needed). Gas supply pressure should be between 60 and 80 psi.
 -  **Do NOT exceed 80psi or 550kPa.**
 - **NOTE: See Figure 1.6.2a below for the locations of the connections on the back of the FLEX**

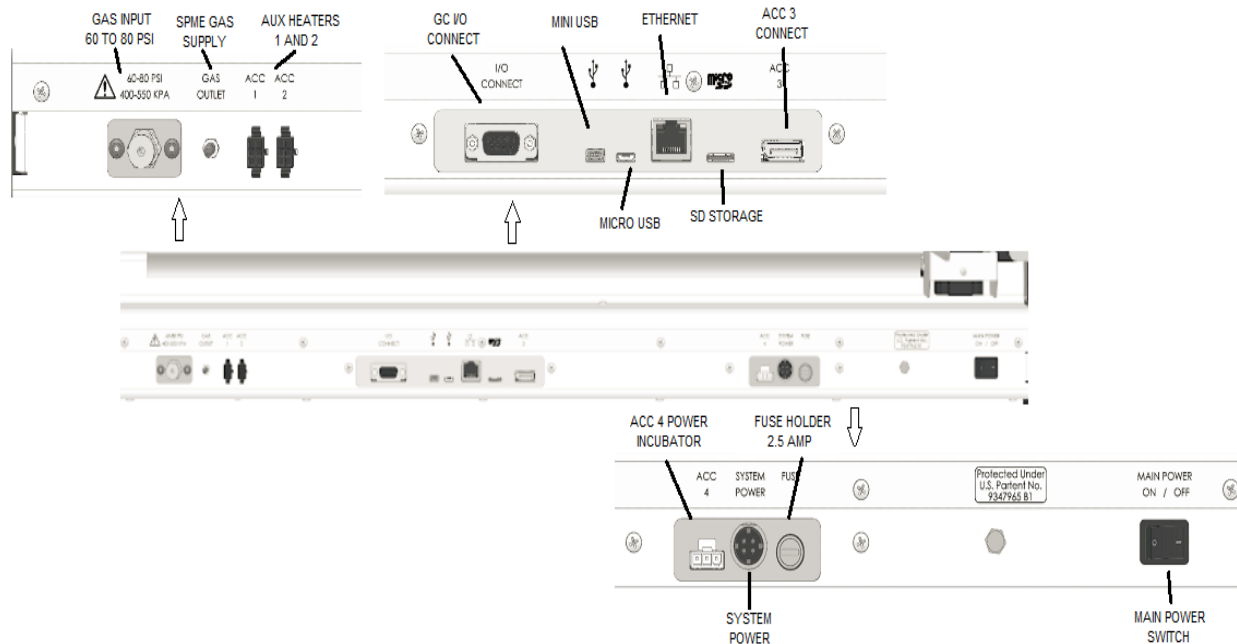


Figure 1.6.2a: Connections on the Back of the FLEX

1.6.3 Setting Up User Permissions

1. In FlexOS, <click> Options→User Management

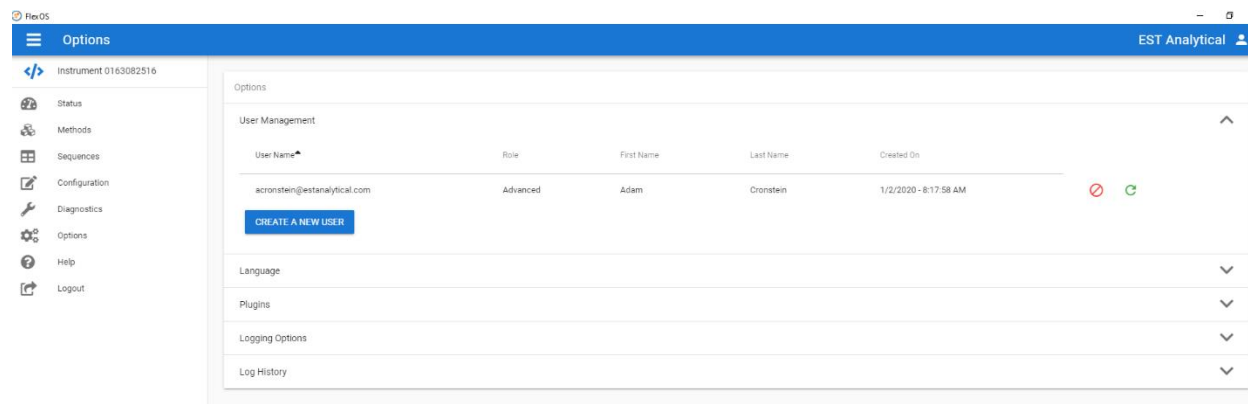


Figure 1.6.3a: User Library

2. <click> Create a New User or <click> on the user from the list to edit.

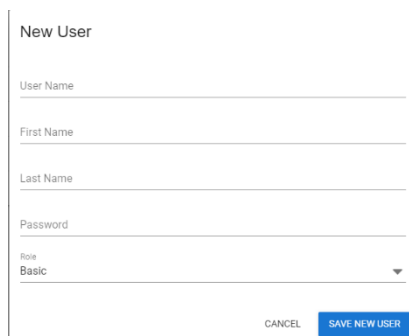
A screenshot of a 'New User' form. The form has a title 'New User' at the top. Below the title are four text input fields: 'User Name', 'First Name', 'Last Name', and 'Password'. Below these fields is a dropdown menu labeled 'Role' with 'Basic' selected. At the bottom right of the form are two buttons: 'CANCEL' and 'SAVE NEW USER'.

Figure 1.6.3b: User Permissions List

3. Add user name, password and user access level. <click> Save User. User permissions can be set up individually.

- **NOTE:**
 - **Basic: Able to set up sequences, load methods and change syringes.**
 - **Advanced: Able to build methods, edit methods, and adjust calibrations.**
 - **Expert: Has no limitations to user capabilities.**

1.7 Flex Configuration

Turn on instrument using the on/off switch on the back left hand side of the instrument.

- **NOTE: When the instrument is ON, LEDs will be lit behind the syringe assembly.**

1.7.1 USB Connection

1. Double <click> on the EST Analytical FlexOS icon in order to open the FlexOS software.
2. Log in and the software will automatically detect any connected Flex rail systems. This will be indicated in the upper left-hand corner by the display of the Flex ID. For example:

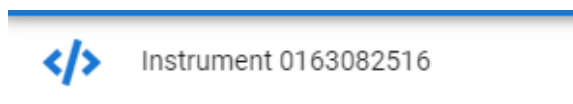


Figure 1.7.1a: Connected Flex ID

3. To check the connection status or toggle between configured systems <click> on the instrument ID and the instrument information will be displayed along with other configurable instruments. See Figure 1.7.2b.
 - **NOTE: When an instrument is connected and powered on, the software will automatically connect to that instrument. To use any of the pre-installed virtual instruments, the physical instrument must be disconnected or powered off.**

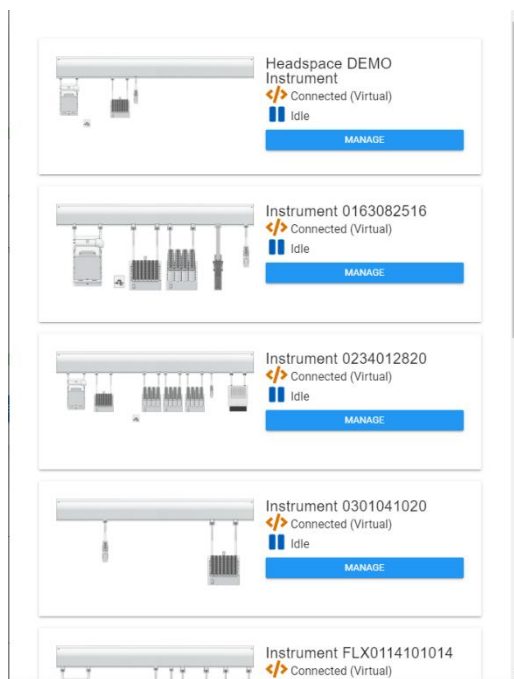


Figure 1.7.1b: Instrument Information

1.7.2 Ethernet Connection

If enabled, packets which don't get a response will be resent.

Resend NAK packets

If enabled, packets which returned negative-acknowledgement will be resent.

Maximum retries
25

Hold Current

Left-Right Hold Current
1100

Up-Down Hold Current
900

Front-Rear Hold Current
900

Syringe Hold Current
900

Incubator Hold Current
900

1. Alternatively, if a user wanted to connect to their Flex rail via Ethernet that is possible also.
 - **NOTE: In order to connect via Ethernet, the main firmware must be version 3.0.6 or newer and FlexOS must be version 1.3.5 or newer**
2. To connect via Ethernet a user must first connect via USB so that an IP address can be assigned to the instrument manually. **A fixed IP address should be obtained from a local Network Administrator.**
3. To assign an IP address to Flex rail while connected via USB, select ETHERNET SETTINGS in the configuration screen and enter an IP address, netmask and gateway. **DHCP is not currently recommended.** Click SAVE in the Ethernet Settings pop up, and then press SAVE on the configuration screen. The Flex will reset after pressing SAVE.
4. To establish the Ethernet connection, the user will need to then close FlexOS, turn off power to the instrument, disconnect the USB cable, connect the Ethernet cable, turn power back on the instrument, and finally restart FlexOS.

1.7.3 Rail Configuration

- **NOTE:** After installation, the rail is empty and needs to be configured and calibrated.

1. To populate a rail with the assembled accessories <click> to access the configuration screen

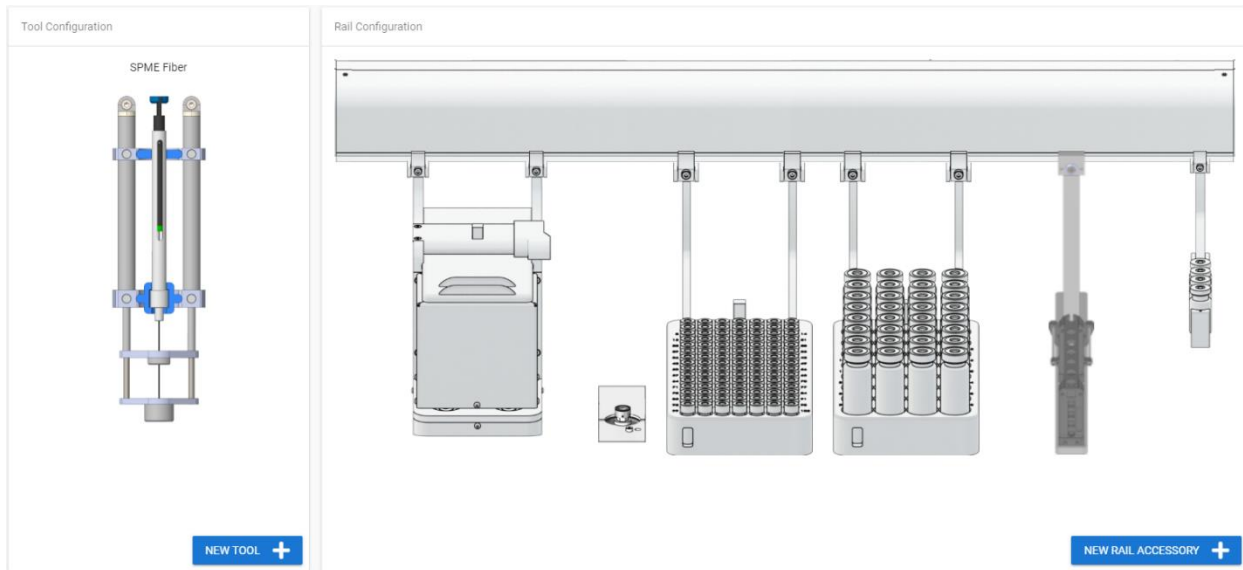
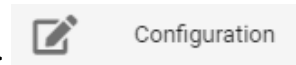


Figure 1.7.3a: Flex Rail Configuration

2. <click> **New Rail Accessory** to open list of available accessories that can be configured to the Flex.

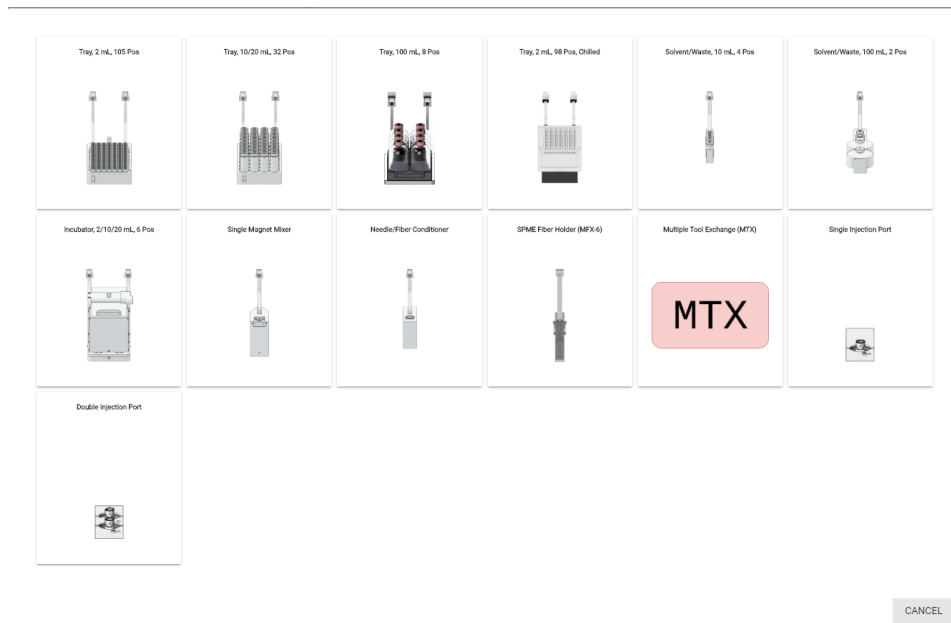


Figure 1.7.3b: Flex Rail Accessories

3. Select the appropriately attached accessories and calibrate them by following the on-screen calibration wizard

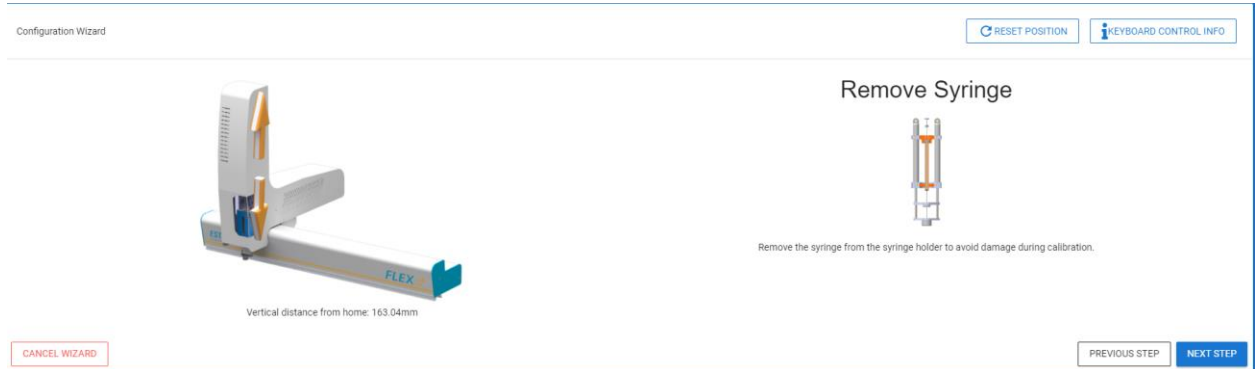


Figure 1.7.3c: Flex Accessories Calibration Wizard

- **NOTE: The position of the trays and accessories on the FLEX rail image should be the same as on the FLEX instrument.**
4. Repeat process in order to position any Stations or Options required onto the FLEX rail.
 5. After all of the trays and accessories are added, <click> Save Configuration to save the changes, Discard Changes to discard the changes or Remove All to remove all of the trays and accessories and start over.

1.7.4 Syringe Configuration

- 1 In configuration screen <click> **New Tool** to expand the list of syringes by type: Liquid, Headspace or SPME and select the appropriately installed tool, then follow the on-screen calibration wizard to calibrate the tool.



Figure 1.7.4a: Flex Tools Menu

- 2 Select the appropriately attached syringe/tool and calibrate it by following the on-screen calibration wizard

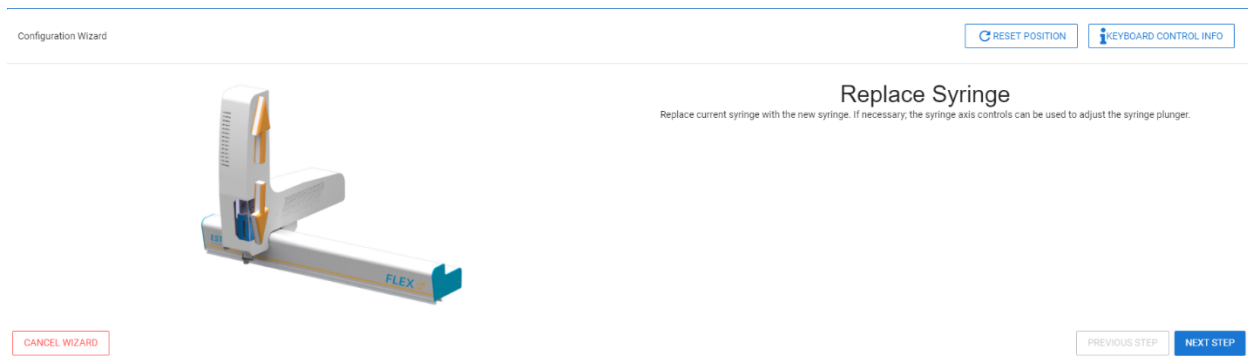


Figure 1.7.4b: FLEX Syringe Installation Wizard

- 3 **Replacing Configured Tools** <click> the active tool icon in the Tool Configuration box to open the configured library.

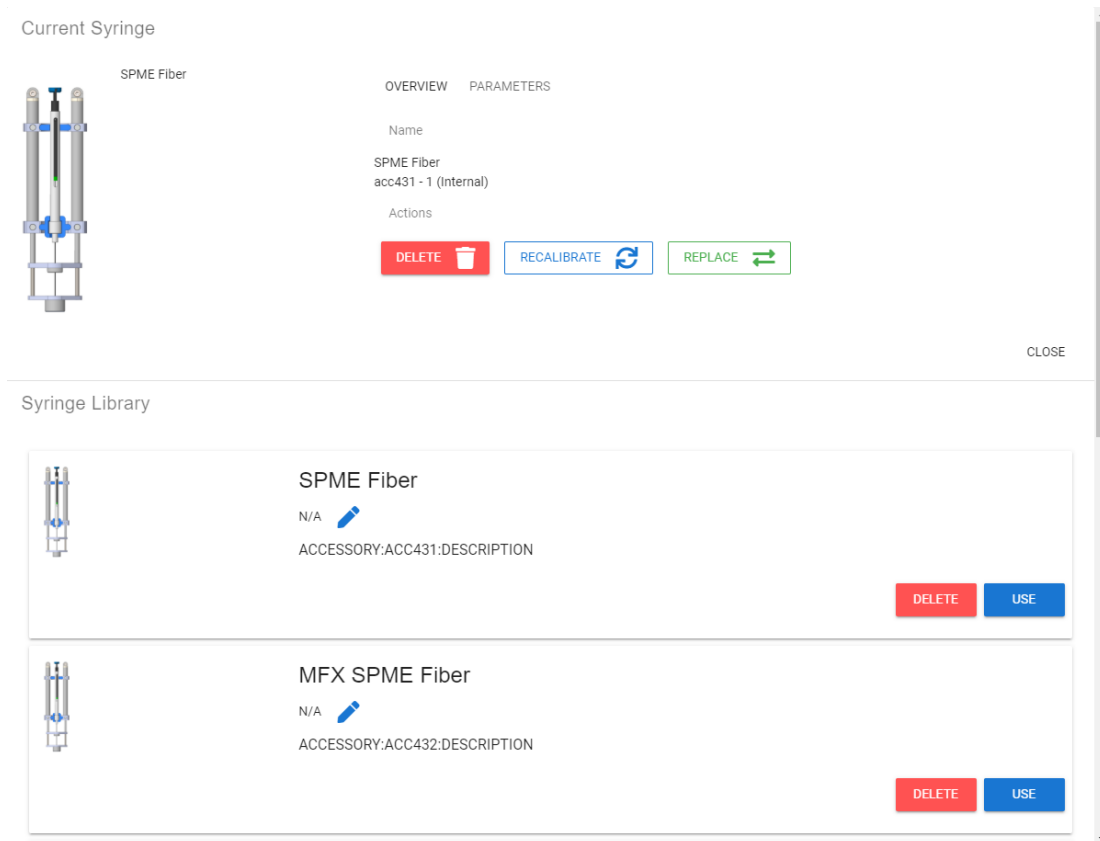


Figure 1.7.4c: FLEX Configured Tools Library

- 3.1** Users have multiple options of actions they can take from this page. One option is to <click> **Delete** to permanently remove a tool from their configured tool library.
- 3.2** If a user finds that the calibration of a configured tool needs to be redone <click> **Recalibrate** and follow the on-screen calibration wizard to recalibrate the properly installed selected tool.
- 3.3** If a user needs to replace the properly installed tool with another tool of the same type and size <click> **Replace** and follow the on-screen wizard to properly install the replacement tool.
- 3.4** To replace the currently installed tool with a different tool from your library of calibrated syringes, <scroll> to the desired tool and <click> **Use** and follow the on-screen wizards to replace with a different tool.

Chapter 2. Instrument Operation

2.1 Instrument Operation Software

2.1.1 Logon, Connect/Disconnect or Exit Software

Double <click > on the EST Analytical FlexOS icon in order to open the FLEX software. Here the user can input the username and password in order to logon to the FLEX software.

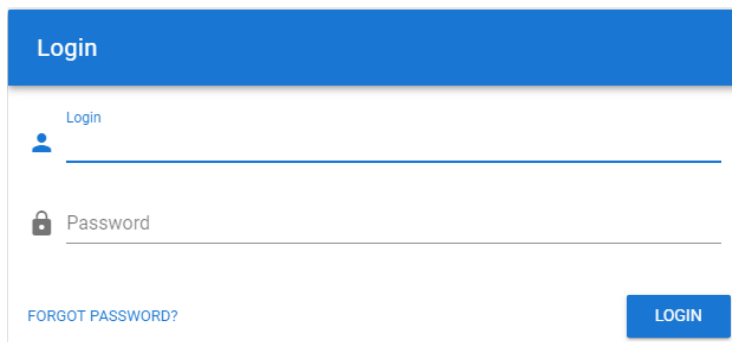


Figure 2.1.1a: User Logon

2.1.2 Instrument Status

Upon startup of FlexOS software the Instrument Status screen is the default home screen.

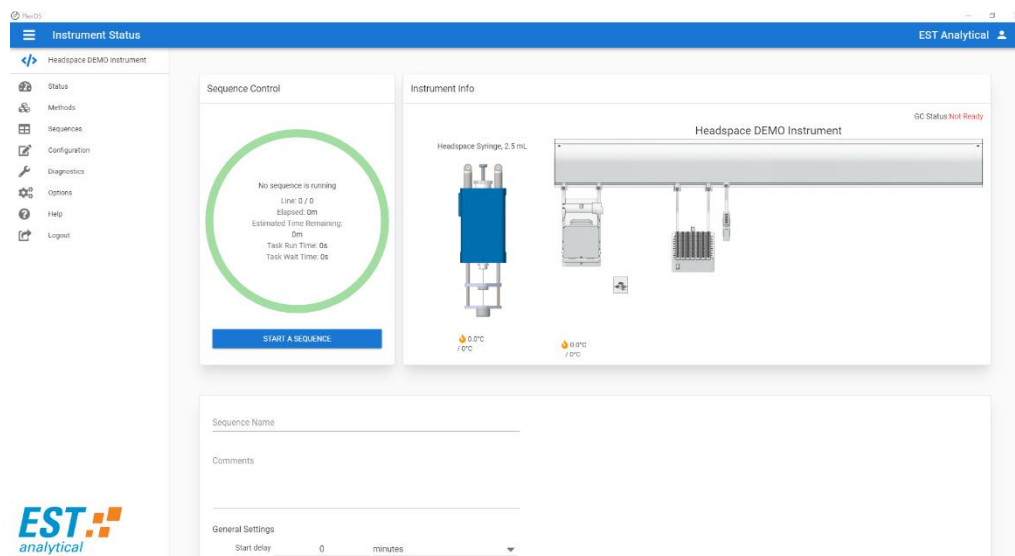


Figure 2.1.2a: Instrument Status

1. **Instrument Info** Box will show you the type and status (set temp/current temp) if any, of each accessory mounted and loaded on the rail along with the status (set temp/current temp) of the syringe installed in the head and the readiness of a connected GC.

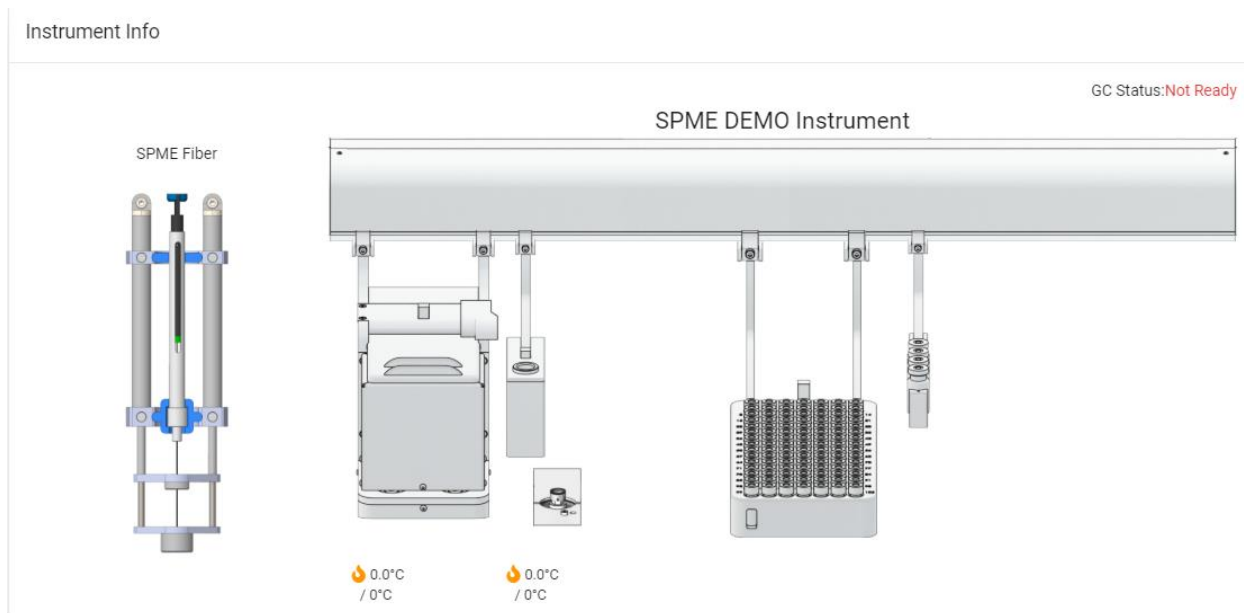


Figure 2.1.2b: Instrument Info Box

2. **Sequence Control** box will show you any information related to the currently running sequence if there is a sequence currently running or planning. The information listed includes the current step in the sequence, line of sequence, total elapsed time of running sequence, the estimated time remaining in the total sequence, the elapsed time of the currently running step of the sequence, and the time remaining on the currently running step in the sequence.

This section also has buttons for a user to **Pause** or **Abort** a current sequence. Pausing temporarily stops the running sequence and can be restarted from that same point. Aborting the sequence stops the running sequence and (if applicable) returns any vials from the incubator to their place in the vial rack/s where they were initially.

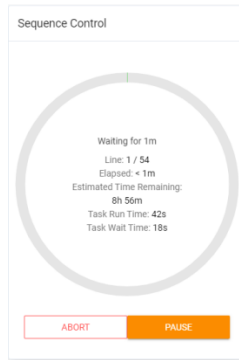


Figure 2.1.2c: Sequence Control box

- 3. Sequence Planning Box** is where sequences can be created, edited or started in the Sequence Planning Box of the status screen. When on the Status screen <scroll> to view Sequence Planning box.

Sequence Name _____

Comments _____

General Settings

Start delay 0 minutes

Run count - 1 +

Timing and Planning

Standby mode

Prep Ahead

Save & Run Save Run View Log Clear Undo

Line	Method	Tray	Vial	RPV	Sample Type	Sample Name
1*						
2						
3						
4						
5						
6						
7						
8						
9						
10						

Figure 2.1.3a: Sequence Planning Box

- NOTE: Sequence table size can be from 1 to 210 lines.**

On the top left of the box, the FLEX will display the sequence name and any comments relevant to the sequence.

Below that the user can set the sequence **General Settings**. The settings include a **Start Delay** where you can hold the start of the sequence for any number of minutes or hours needed for further prep or equilibration time. The other setting in the **General Settings** section is **Run Count**. This setting allows a user to set the sequence to repeat any number of times after completion.

NOTE: The estimated time remaining in the sequence does not include additional Sequence Run Counts.

The **Timing and Planning** section allows the user to plan some unique and time saving options into their sequence. Choosing **Standby mode** signals the flex to wait until all heated zones are up to set temp before starting the given sequence. Choosing **Prep Ahead** signals the Flex to plan (incubate and/or agitate) the timing of samples to do any of the prep steps overlapped with other samples being processed in a time that would allow the sequence to finish fastest and most efficiently (ex. If a sample has an incubation time of 45 minutes and a GC run time of only 15 minutes, the second sample will be placed in the incubator at approximately the 15 minute mark of the incubation of the first sample, and then a potential third sample could be placed into the incubator at time 30 minutes, etc. Other factors effect this planning step, but this is a simplified breakdown of the planning that takes place

Save and Run saves the sequence in the planner and then runs the given sequence.

Note: For a sequence to be saved and it needs to have a name assigned to it.

Save allows a user to save the planned sequence to be run at a later time or so that it could be exported to another system.

Run starts a planned sequence.

View Log allows a user to look back through the list of steps that have taken place in the current sequence.

Clear empties the sequence planner of any samples that were set up in the table.

Undo removes the last action taken in the planning process.

Sequence Planning Table typically has the following categories/columns:

Lines of a sequence

Method that will be used for each sample

Tray where the sample is located

Vial the position within the tray where the sample is located

RPV Runs per vial if multiple aliquots of a given sample are to be run in a sequence

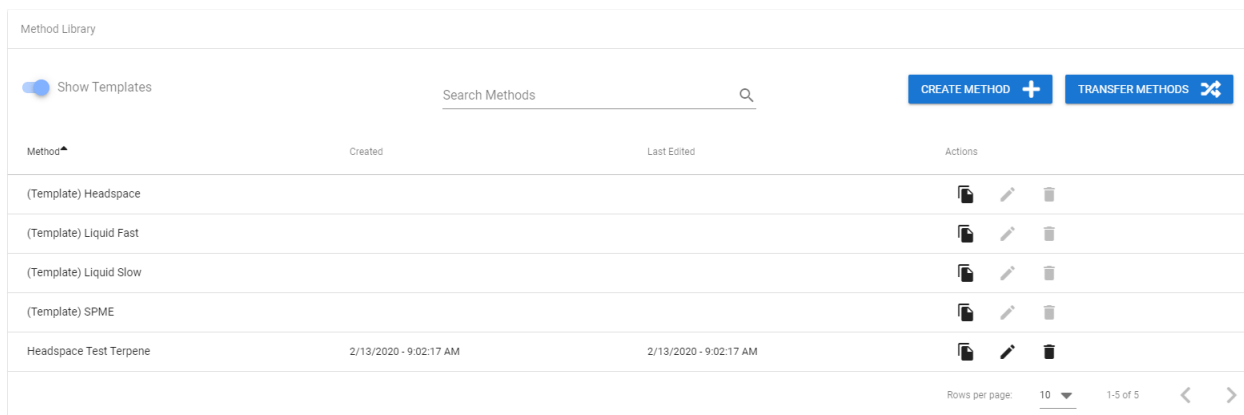
Sample Type type of sample in the given line (Sample, Blank, Calibration, Daily Calibration, BFB, DFTPP, Non-Spike, Spike, Duplicate)

Sample Name Name of a sample in a sequence

Chapter 3. Operating Instructions

3.1 Creating Methods

Methods can be created or edited in the Method Builder portion of the software. <click> **Methods** and the software screen will change to the Methods page of the software. Here a user can Search or Select from a set of methods, Create methods, Transfer methods to a separate file so they can be exported to another Flex Instrument, Copy, Edit, or Delete methods that are already created.


















Method	Created	Last Edited	Actions
(Template) Headspace			  
(Template) Liquid Fast			  
(Template) Liquid Slow			  
(Template) SPME			  
Headspace Test Terpene	2/13/2020 - 9:02:17 AM	2/13/2020 - 9:02:17 AM	  

Figure 3.1a: Methods Page

There are multiple ways to create a new Method. A user can either start by copying an existing method or one of the **Template** methods that fits the method they are trying to set up and edit it to fit their parameters accordingly. A user can also <click> **Create Method** to start a blank method.

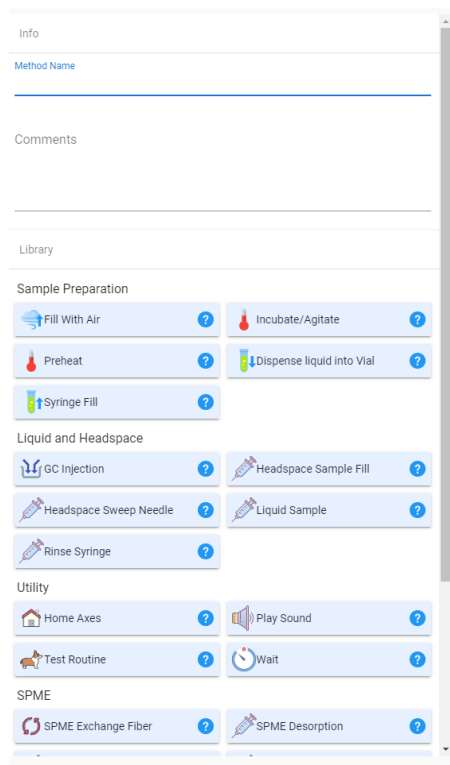


Figure 3.1b: Method Routine Selection Screen

To create a method, you will start by using the routine library. Choose the method routines needed by left clicking on the routine and dragging the routine over to the method builder portion of the screen in the order that fits your desired parameters.

After adding a routine to a blank method, the tool must be specified in the drop-down box that says “No tool selected”. There are two tabs in the drop-down box, one that lists all the tools (eg syringes) that have been configured and calibrated for that Flex, and the other lists all possible tools. In this way, you can create methods for any Flex tool; however, a method will not be allowed to run if the current Flex configuration does not have the specified tool on the instrument. Once the tool has been selected for the first routine added to the blank method, that tool will be automatically filled in for all subsequent routines.

In order to move a method routine up or down in the routine sequence, left click on the routine and hold it. Next, drag the routine up or down in the sequence as required.

A method routine can be modified to the user’s specifications. In the method routine tile edit as needed. Method routine parameter limits are set by the calibrations of the accessories and the tool selected for the method. See section 3.2 for method routine explanations.

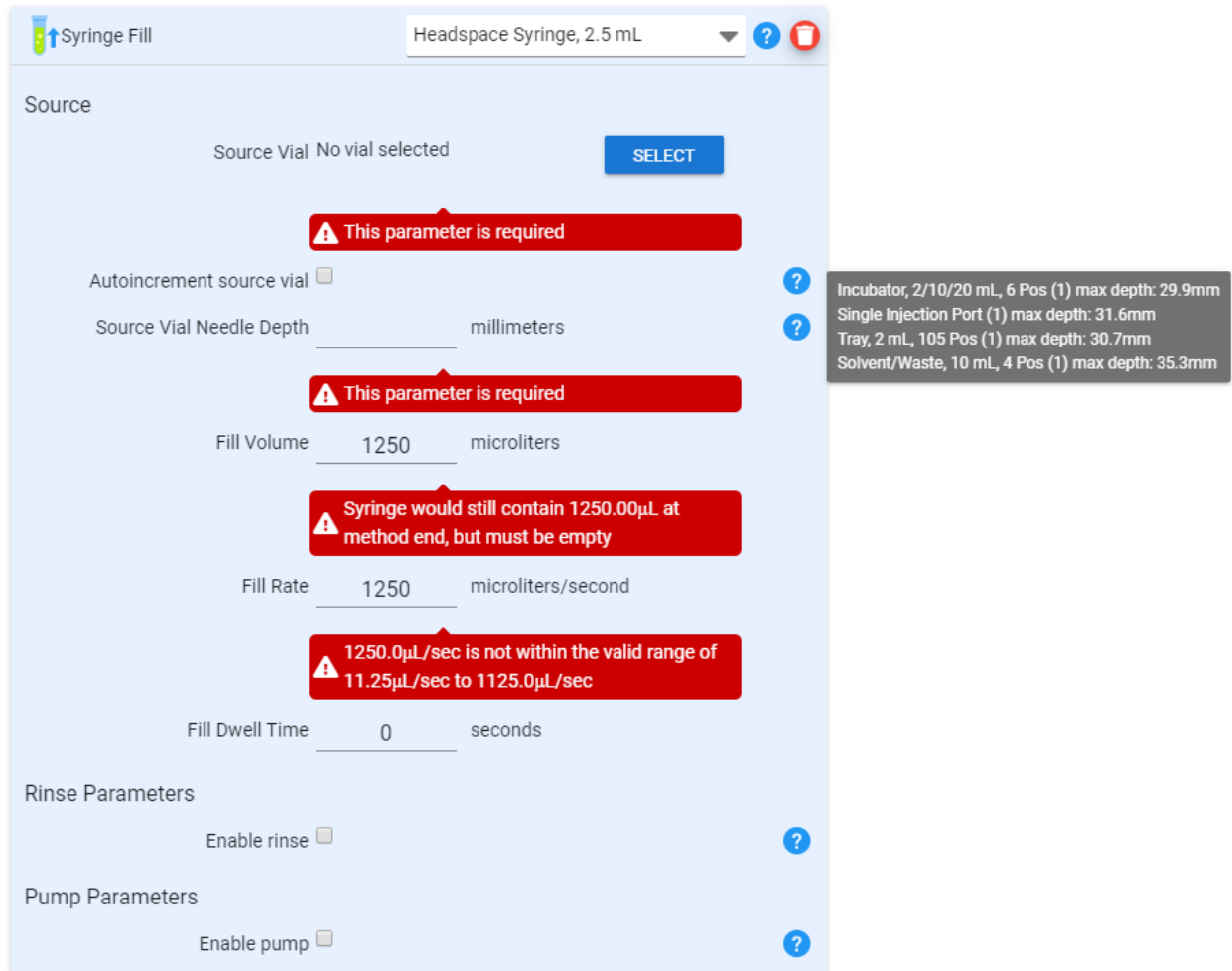


Figure 3.1c: Method Routine Tile with Requirements and Limits

After the method is created, <click> Save at the bottom of the method editor screen.
<click> New to create a new method or <click> Open to open a saved method.

3.2 Method Routines

3.2.1 General

Method Routine--General	
Parameter	Function
Method Type	Set instrument method type
Standby Mode	When enabled, system will wait for heated zones to reach set point before leaving the general routine
Auxiliary Heater	Set set-point for an Auxiliary heater. The connection for the Auxiliary heater is on the back panel of the Flex.
GC Ready	Option to choose if system should wait for a ready signal or continue with or without a ready signal
Start Delay	Option to input a start delay for the first run of the sequence only
Cycle Time	Used for prep ahead calculations in conjunction with Constant Heat Mode enabled. When enabled this time will be used to determine a load next vial time. If the Cycle time is less than the GC run time, the timer will start after the injection into the GC. (Cycle Time - GC Run Time = Load Next Vial Timer) If the cycle time is greater than the GC run time, the timer will start after loading the first vial in the incubator. (Cycle Time - GC Run time + Load Next Vial Timer)
GC Runtime	Used to calculate the Load Next Vial times. Used in conjunction with Constant Heat mode = enabled. The GC Run Time is the time from the GC Start back to GC ready
Constant Heat Mode	When enabled, the system will maintain each vial in the incubator the same amount of time. Used in conjunction with the Load Next Vial timer to prep ahead if the time permits. This enables shorter GC cycle times.

NOTE

When running SPME samples if your Cycle time is greater than your GC Run Time, enter the Cycle time as the GC Run time. You should not load multiple vials in the Incubator when running SPME

Table 3.2.1a: General Parameter Descriptions

3.2.2 Sample Prep

Method Routine--Sample Prep	
Parameter	Function
Solvent Source	Set location of solvent tray
Solvent Location	Set position of solvent in tray
Increment solvent source	Option to increment solvent source location in solvent tray
Solvent Needle Depth	Set depth of solvent needle
Solvent Needle Speed	Set solvent needle speed (%), 100% is full speed, see Table 1.3a
Solvent Rinse	Option to rinse needle in solvent
Solvent Waste Source	Set location of solvent for rinse
Solvent Waste Location	Set location to dispense solvent waste
Waste Needle Depth	Set depth of solvent needle into waste vessel
Solvent Rinse Volume	Set volume of solvent rinse
Solvent Rinse Cycles	Set number of times to rinse the solvent syringe
Solvent Rinse Fill Rate	Set rate to fill the syringe with solvent
Solvent Pump Cycles	Set number of times for syringe to pump solvent in and out of syringe
Dispense Rate	Set rate at which to dispense solvent during pump cycle
Solvent Pump Volume	Set volume of solvent during pump cycle
Solvent Volume	Set volume of solvent for sample prep
Solvent Fill Rate	Set rate to fill the syringe with solvent
Solvent Fill Delay	Option to put a delay into experiment before filling the syringe with solvent (sec)
Sample Vial Needle Depth	Set depth of needle during sample prep

Table 3.2.2a: Sample Prep Parameters

3.2.3 Wait

Method Routine--Wait	
Parameter	Function
Wait on Time	Option to wait to run sample routine, can choose number of hours, minutes or seconds
Wait on Input	Option to wait on input signal to run sample routine, can choose GC input or a separate source

Table 3.2.3a: Wait Parameters

3.2.4 Sample Incubate Agitate

Method Routine--Sample Incubate Agitate	
Parameter	Function
Incubate	Set incubation parameters
Incubation Temperature	Set incubation temperature (°C), temperature range of ambient to 200°C
Incubation Time	Set incubation time in increments of 0.1min
Agitate	Set agitation parameters
Agitate Type	Set agitation for orbital or oscillate motion
Agitation Speed	Set agitation speed NOTE: When using the oscillate motion, the speed of oscillation is set to 190rpm.
Agitation Delay	Set agitation delay in 0.1 min increments
Agitation Duration	Set agitation time in 0.1 min increments
Ambient Equilibration	Set ambient equilibration parameters
Ambient Equilibration Time	Set ambient equilibration time in 0.1 min increments
Equilibration Block	Set ambient equilibration location, can use sample tray or equilibration block

Table 3.2.4a: Sample Incubate Agitate Parameters

3.2.5 Rinse

Method Routine--Rinse	
Parameter	Function
Rinse/Waste Type	Set rinse/waste tray station
Rinse Position	Set rinse position
Waste Position	Set waste position
Rinse Volume	Set rinse volume
Rinse Fill Rate	Set rinse fill rate
Rinse Cycles	Set number of rinse cycles
Rinse Dispense Rate	Set rinse dispense rate
Rinse Depth	Set rinse depth
Rinse Speed	Set rinse speed
Waste Depth	Set waste depth

Table 3.2.5a: Rinse Parameters

3.2.6 Sample

Method Routine--Sample	
Parameter	Function
Sample Vial Depth	Set sample vial depth
Sample Vial Depth Speed	Set sample vial depth speed
Sample Volume	Set sample volume
Sample Fill Rate	Set sample fill rate
Sample Fill Delay	Set sample fill delay (sec)
Sample Rinse	Set sample rinse parameters
Rinse Volume	Set rinse volume
Rinse Cycles	Set number of rinse cycles
Rinse Station Type	Set rinse station type
Waste Location	Set waste location
Sample Pump	Set sample pump parameters
Pump Volume	Set sample pump volume
Dispense Rate	Set dispense rate
Pump Cycles	Set number of pump cycles

Table 3.2.6a: Sample Parameters

3.2.7 Air Volume Gap

Method Routine--Air Volume Gap	
Parameter	Function
Air Fill Volume	Set Air Fill Volume

Table 3.2.7a: Air Volume Gap Parameters

3.2.8 Sweep Needle

Method Routine--Sweep Needle	
Parameter	Function
Heated Needle	Set needle temperature (°C), needle temperature range is ambient to 150°C
Needle Sweep Time	Set needle sweep time in 0.1min increments
Syringe Pumps	Set number of syringe pumps
Syringe Pump Volume	Set syringe pump volume
Syringe Pump Speed	Set syringe pump speed

Table 3.2.8a: Sweep Needle Parameters

3.2.9 Standard Addition

Method Routine--Gas Standard Addition	
Parameter	Function
Gas Port Needle Depth	Set gas port needle depth
Gas Port Needle Speed	Set gas port needle speed
Gas Standard Pumps	Set gas standard pump parameters
Pump Volume	Set pump volume
Pump Cycles	Set number of pump cycles
Gas Standard Fill Rate	Set gas standard fill rate
Gas Standard Fill Delay	Set gas standard fill delay (sec)

Table 3.2.9a: Standard Addition Parameters

3.2.10 Solvent Dilute

Method Routine--Solvent Plug	
Parameter	Function
Solvent Plug Rinse/Waste Station	Set solvent plug source tray
Standard Solvent Plug Location	Set solvent plug source location
Solvent Depth	Set solvent needle depth
Solvent Volume	Set solvent volume
Solvent Fill Rate	Set solvent fill rate
Solvent Fill Delay	Set solvent fill delay (sec)
Solvent Pump	Set solvent pump parameters
Pump Volume	Set solvent pump volume
Pump Cycles	Set number of pump cycles
Dispense Rate	Set dispense rate

Table 3.2.10a: Solvent Plug Parameters

3.2.11 Single Port Injection

Method Routine--Single Port Injection	
Parameter	Function
Injection Target	Set injection port
Needle Depth Speed	Set needle depth speed
Needle Depth	Set needle depth
Injection Rate	Set injection rate
Injection Volume	Set injection volume
Pre-Injection Delay	Set pre-injection delay (sec)
Post-Injection Delay	Set post-injection delay (sec)
Injection Start Output	Set injection start output to be at the start or the end of the injection
Rinse Waste Station	Set the rinse waste tray
Rinse Waste Location	Set the location of the rinse waste vessel

Table 3.2.11a: Single Port Injection Parameters

3.2.12 Multiple Port Injection

Method Routine--Multiple Port Injection	
Parameter	Function
Injection Target	Set injection port order
Needle Depth Speed	Set needle depth speed
Needle Depth	Set needle depth into injection port
Injection Rate	Set injection rate
Injection Volume	Set injection volume
Pre-Injection Delay	Set pre-injection delay (sec)
Post-Injection Delay	Set post-injection delay (sec)
Injection Start Output	Set injection start output to be at the start or the end of the injection
Rinse Waste Type	Set the rinse waste tray
Waste Location	Set the location of the rinse waste vessel

Table 3.2.12a: Multiple Port Injection Parameters

3.2.13 Injection

Method Routine--Injection	
Parameter	Function
Injection Target	Set injection port
Needle Depth Speed	Set needle depth speed
Needle Depth	Set needle depth
Injection Rate	Set injection rate
Injection Volume	Set injection volume
Pre-Injection Delay	Set pre-injection delay (sec)
Post-Injection Delay	Set post-injection delay (sec)
Injection Start Output	Set injection start output to be at the start or the end of the injection

Table 3.2.13a: Injection Parameters

3.2.14 Sample Fill

Method Routine--Sample Fill	
Parameter	Function
Syringe Heater	Set syringe heater temperature (°C), temperature range of ambient to 150°C
Syringe Sample Needle Depth	Set syringe sample needle depth
Sample Depth Speed	Set sample depth speed
Sample Volume	Set sample volume
Sample Fill Rate	Set sample fill rate
Sample Fill Delay	Set sample fill delay (sec)

Table 3.2.14a: Sample Fill Parameters

3.2.15 Gas Standard Addition

Method Routine--Gas Standard Addition	
Parameter	Function
Gas Port Needle Depth	Set gas port needle depth
Gas Port Needle Speed	Set gas port needle speed
Gas Standard Pumps	Set gas standard pump parameters
Pump Volume	Set pump volume
Pump Cycles	Set number of pump cycles
Gas Standard Fill Rate	Set gas standard fill rate
Gas Standard Fill Delay	Set gas standard fill delay (sec)

Table 3.2.15a: Gas Standard Addition Parameters

3.2.16 Extraction

Method Routine--Extraction	
Parameter	Function
Fiber Guide Depth	Set fiber guide depth
Sample Vial Fiber Depth	Set vial fiber depth (cm), 1cm or 2cm dependent on fiber length
Fiber Extraction Time	Set fiber extraction time
Fiber Extraction Agitation	Set fiber extraction agitation parameters
Agitation Type	Set agitation for orbital or oscillate motion
Agitation Speed	Set agitation speed (%), 30% is the maximum extraction speed of 225rpm--NOTE: When using the oscillation motion, the speed of oscillation is set to 190rpm.
Agitation Duration	Set duration of agitation in 0.1min increments

Table 3.2.16a: Extraction Parameters

3.2.17 Desorbtion

Method Routine--Desorbtion	
Parameter	Function
Injection Target	Set injection port
Fiber Guide Speed	Set fiber guide speed
Fiber Guide Depth	Set fiber guide depth
Fiber Insertion Speed	Set fiber insertion speed
Fiber Insertion Depth	Set fiber insertion depth (cm), 1cm or 2cm dependent on fiber length
Fiber Desorption Time	Set fiber desorption time in 0.1min increments
Injection Start Output	Set injection start output to be at the start or the end of the injection

Table 3.2.17a: Desorbption Parameters

3.2.18 Condition Fiber

Method Routine--Condition Fiber	
Parameter	Function
Fiber Temperature	Set fiber temperature °C, temperature range of ambient to 350°C
Condition Time	Set condition time in 0.1min increments
Fiber Guide Speed	Set fiber guide speed
Fiber Guide Depth	Set fiber guide depth
Fiber Insertion Speed	Set fiber insertion speed
Fiber Insertion Depth	Set fiber insertion depth

Table 3.2.18a: Condition Fiber Parameters

3.2.19 Single Magnet Mixer

Method Routine--Single Magnet Mixer	
Parameter	Function
Incubation	Set incubation parameters
Incubation Temperature	Set incubation temperature (°C), temperature range of ambient to 150°C
Incubation Time	Set incubation time in increments of 0.1min
Stir	Set stir parameters
Stir Speed	Set stir speed (Low/Medium/High)
Stir Delay	Set stir delay in 0.1 min increments
Stir Duration	Set stir time in 0.1 min increments
Ambient Equilibration	Set ambient equilibration parameters
Ambient Equilibration Time	Set ambient equilibration time in 0.1 min increments

Table 3.2.19a: Single Magnet Mixer Parameters

3.2.20 SPME Rinse

Method Routine--SPME Rinse	
Parameter	Function
Rinse Location	Set rinse location, Position 5 or 6 in Incubator
Fiber Guide Depth	Set fiber guide depth
Fiber Rinse Depth	Set rinse depth (1 or 2 cm)
Fiber Rinse Time	Set rinse time in 0.1min increments
Fiber Rinse Agitate	Set rinse agitation parameters
Agitation Type	Set agitation for orbital or oscillate motion
Agitation Speed	Set agitation speed (%), 30% is the maximum extraction speed of 225rpm for orbital motion--NOTE: When using the oscillation motion, the speed of oscillation is set to 190rpm.
Agitation Delay	Set agitation delay in 0.1 min increments
Agitation Duration	Set agitation time in 0.1 min increments

Table 3.2.20a: SPME Rinse Parameters

3.2.21 Vial Displacement

Method Routine--Vial Displacement	
Parameter	Function
Displacement Volume	Set displacement volume
Syringe Fill Rate	Set fill rate
Sample Fill Delay	Delay time before the sample fill (sec)
Displacement Cycles	Number of displacement cycles
Syringe Dispense Rate	Set dispense rate
Vial Depth	Set vial depth
Vial Depth Speed	Set vial depth rate speed
Solvent Pump	Set if solvent pump is needed
Pump Volume	Set pump volume

Dispense Rate	Set dispense rate
Pump Cycles	Set number of pump cycles

Table 3.2.21a: Vial Displacement Parameters

3.2.22 Sample Mix

Method Routine--Sample Mix	
Parameter	Function
Sample Mix Location	Choose from position 5 or 6 in the incubator
Sample Mix Speed	Set agitation speed
Sample Mix Time	Set sample mix Time in 0.1min increments

Table 3.2.22a: Sample Mix Parameters

3.2.23 Auxiliary Output Control

Method Routine--Auxiliary Output Control	
Parameter	Function
Auxiliary Output	GC Start
Duration	Duration of the output signal in seconds

Table 3.2.23a: Auxiliary Output Control Parameters

3.3 Sequence Planning

3.3.1 New Sequences

When starting a new sequence from the **Status** screen the first column to fill should be the **Method** column. <click> the folder button in the method column to select from the list of available methods.

Note: Selecting a method will trigger the configuration checks that ensure the accessories and tools configured on the instrument match with the software configuration and with the selected method.

Selecting the source **Tray** from the list of configured trays on the rail will determine which tray the samples will be collected from.

The **Vial** drop down list will allow a user to select one, various, or a list of vials where the samples will be taken from. To select one vial <click> on the numbered slot where the vial is placed. To select multiple separate vials <hold> Ctrl and <click> the desired vial numbers. To select a list of vials <drag> over the set of vial numbers to be selected. Any of the multiple selections will copy the filled columns down the list throughout the selected sample lines.

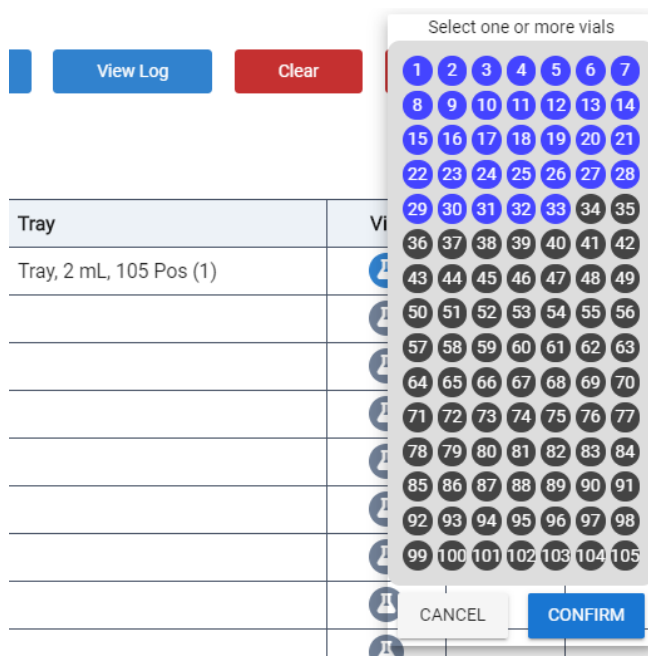


Figure 3.3.1a: Vial Selection Drop Down list

RPV (Runs Per Vial) gives the option to have sequence lines repeatedly sampled multiple times in a row. If left blank this value defaults to 1.

Sample Type drop down list allows a user to select from many commonly used types of samples for each line such as; sample, blank, calibration, daily-calibration, BFB, DFTPP, spike, non-spike, or duplicate.

Sample Name can be added to give distinct titles to each sample in the sequence.

After a sequence has been planned a user can **Save and Run**, **Save**, or **Run** the sequence. They can also **Clear** the sequence or **Undo** the last item if there were mistakes made in the planning.

3.3.2 Active Sequences

While a sequence is actively running a user can add samples to the end of the sequence by clicking on the first open line at the end of the sequence and planning line(s) by following the steps from 3.3.1. They can also add or subtract lines throughout the sequence by <right clicking> at a desired spot in the sequence and selecting from the

drop-down list to choose one of the listed actions. You can also change the order of the sequence by <selecting> **Move to top** to move a single sample to the top of the list or **Set position in run** to move to a new sample in the sequence and run from that line on.

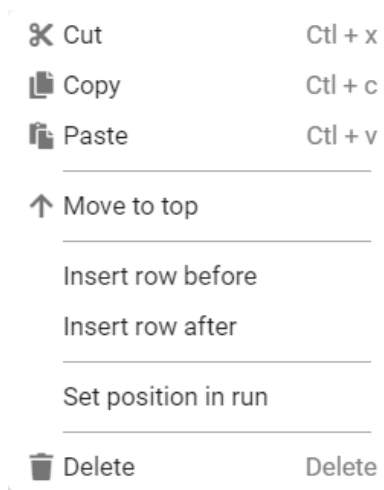


Figure 3.3.2a: Sequence Planner Right Click Drop-down list

After any of these actions are complete <click> **Update** and the sequence planner will proceed according to the changes made. During or after an active run a user can also select **View Log** to read through the list of planning steps taken or being planned as part of troubleshooting.

⚙️

Save and Run
Update
Run
View Log
Clear
Undo

⚠️ You have unsaved changes

Line	Method	Tray	Vial	RPV	Sample Type	Sample Name
1*	✓ Liquid Test	Tray, 2 mL, 105 Pos (1)	1	1		
2	✓ Liquid Test	Tray, 2 mL, 105 Pos (1)	2	1		
3	✓ Liquid Test	Tray, 2 mL, 105 Pos (1)	3	1		
4	Liquid Test	Tray, 2 mL, 105 Pos (1)	4	1		
5	Liquid Test	Tray, 2 mL, 105 Pos (1)	5	1		
6	Liquid Test	Tray, 2 mL, 105 Pos (1)	6	1		
7	Liquid Test	Tray, 2 mL, 105 Pos (1)	7	1		
8	Liquid Test	Tray, 2 mL, 105 Pos (1)	8	1		
9	Liquid Test	Tray, 2 mL, 105 Pos (1)	9	1		
10	Liquid Test	Tray, 2 mL, 105 Pos (1)	31			
11			⚠️			
12			⚠️			

Figure 3.3.2b: Active Sequence Planner Options

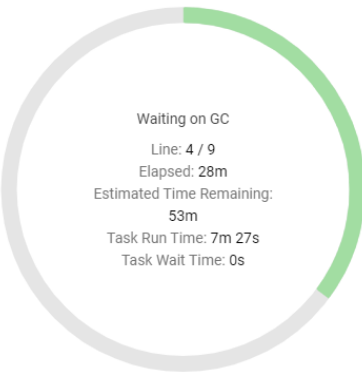
#	Time	Type	Message
1	10/2/2020 - 1:49:12 PM	User	User: system
2	10/2/2020 - 1:49:12 PM	Planning started	
3	10/2/2020 - 1:49:13 PM	Planning complete	Plan has 24 steps and will execute in 52m 00s seconds
4	10/2/2020 - 1:49:14 PM	Sequence started	Start Line: 0 - Sequence Name: - Total Lines: 9
5	10/2/2020 - 1:49:14 PM	Line started	Line: 1 - Head Type: Liquid Syringe, 10 µl - Location: Tray, 2 mL, 105 Pos - Position: 1 - Method: Liquid Test - Runs Per Vial: 1 - Description: null - Sample Type: Unknown - Comment:
6	10/2/2020 - 1:49:14 PM	Routine started	Line: 1 - Routine: 1 - Task: 1 Waiting for 1m - Run per vial: 1
7	10/2/2020 - 1:50:14 PM	Routine complete	Line: 1 - Routine: 1 - Task: 1 Waiting for 1m - Run per vial: 1
8	10/2/2020 - 1:50:14 PM	Routine started	Line: 1 - Routine: 2 - Task: 1 Take Sample - Run per vial: 1
9	10/2/2020 - 1:50:31 PM	Routine complete	Line: 1 - Routine: 2 - Task: 1 Take Sample - Run per vial: 1
10	10/2/2020 - 1:50:31 PM	Routine started	Line: 1 - Routine: 3 - Task: 1 Fill with air - Run per vial: 1
11	10/2/2020 - 1:50:31 PM	Routine complete	Line: 1 - Routine: 3 - Task: 1 Fill with air - Run per vial: 1
12	10/2/2020 - 1:50:31 PM	Routine started	Line: 1 - Routine: 4 - Task: 1 Inject - Run per vial: 1
13	10/2/2020 - 1:50:35 PM	GC started	GC started
14	10/2/2020 - 1:50:38 PM	Routine complete	Line: 1 - Routine: 4 - Task: 1 Inject - Run per vial: 1
15	10/2/2020 - 1:50:38 PM	Line complete	Line: 1 - Head Type: Liquid Syringe, 10 µl - Location: Tray, 2 mL, 105 Pos - Position: 1 - Method: Liquid Test - Runs Per Vial: 1 - Description: null - Sample Type: Unknown - Comment: - Duration: 00:01:24
16	10/2/2020 - 1:59:21 PM	Line started	Line: 2 - Head Type: Liquid Syringe, 10 µl - Location: Tray, 2 mL, 105 Pos - Position: 2 - Method: Liquid Test - Runs Per Vial: 1 - Description: null - Sample Type: Unknown - Comment:
17	10/2/2020 - 1:59:21 PM	Routine started	Line: 2 - Routine: 1 - Task: 1 Waiting for 1m - Run per vial: 1
18	10/2/2020 - 2:00:21 PM	Routine complete	Line: 2 - Routine: 1 - Task: 1 Waiting for 1m - Run per vial: 1
19	10/2/2020 - 2:00:21 PM	Routine started	Line: 2 - Routine: 2 - Task: 1 Take Sample - Run per vial: 1
20	10/2/2020 - 2:00:37 PM	Routine complete	Line: 2 - Routine: 2 - Task: 1 Take Sample - Run per vial: 1
21	10/2/2020 - 2:00:37 PM	Routine started	Line: 2 - Routine: 3 - Task: 1 Fill with air - Run per vial: 1
22	10/2/2020 - 2:00:37 PM	Routine complete	Line: 2 - Routine: 3 - Task: 1 Fill with air - Run per vial: 1
23	10/2/2020 - 2:00:38 PM	Routine started	Line: 2 - Routine: 4 - Task: 1 Inject - Run per vial: 1
24	10/2/2020 - 2:00:42 PM	GC started	GC started
25	10/2/2020 - 2:00:45 PM	Routine complete	Line: 2 - Routine: 4 - Task: 1 Inject - Run per vial: 1
26	10/2/2020 - 2:00:45 PM	Line complete	Line: 2 - Head Type: Liquid Syringe, 10 µl - Location: Tray, 2 mL, 105 Pos - Position: 2 - Method: Liquid Test - Runs Per Vial: 1 - Description: null - Sample Type: Unknown - Comment: - Duration: 00:01:24
27	10/2/2020 - 2:09:28 PM	Line started	Line: 3 - Head Type: Liquid Syringe, 10 µl - Location: Tray, 2 mL, 105 Pos - Position: 3 - Method: Liquid Test - Runs Per Vial: 1 - Description: null - Sample Type: Unknown - Comment:
28	10/2/2020 - 2:09:28 PM	Routine started	Line: 3 - Routine: 1 - Task: 1 Waiting for 1m - Run per vial: 1
29	10/2/2020 - 2:10:28 PM	Routine complete	Line: 3 - Routine: 1 - Task: 1 Waiting for 1m - Run per vial: 1
30	10/2/2020 - 2:10:28 PM	Routine started	Line: 3 - Routine: 2 - Task: 1 Take Sample - Run per vial: 1

Figure 3.3.2c: Log Table Example

During an active sequence a user can also choose to **Abort**, or **Pause** the running sequence if necessary, from the buttons in the Sequence Control box.

Note: If a sequence is aborted for any reason the user may be prompted to close the application and power cycle the instrument to avoid any errors.

Sequence Control



Waiting on GC
Line: 4 / 9
Elapsed: 28m
Estimated Time Remaining:
53m
Task Run Time: 7m 27s
Task Wait Time: 0s

ABORT PAUSE


Figure 3.3.2d: Active Sequence Control Options

Chapter 4: Parts, Service and Maintenance

4.1 Maintenance

4.1.1 Cleaning the FLEX

1. Wipe the outside of the FLEX with a clean, damp, lint-free cloth. Cloth should be dampened with water only. Avoid any cleaning agents that could cause a hazard as a result of a reaction with parts of the equipment or with the material contained in it.
2. Use canned air to remove any dust or lint from the fans or inside the unit.

 **CAUTION:** Take care to note possible pinch points labeled on the FLEX so as not to injure a hand.

 **ATTENTION:** Prenez soin de noter les points de pincement possibles marqués sur le FLEX afin de ne pas blesser la main.

4.1.2 Maintenance/Service

The FLEX will require minimal maintenance or use of consumables. The interval at which maintenance is required depends on autosampler use and sample type. Before performing any maintenance please contact technical support. See section 1.7.3.

In order to maintain the safety integrity provided by the instrument for parts containing liquids, during maintenance, **ONLY** use replacement parts provided by EST Analytical.

 **CAUTION:** Before Performing any Maintenance or Servicing any component of the FLEX, the instrument must be:

- Turned off
- Disconnected from the power supply
- Hot Surfaces must be given time to cool
- After servicing instrument, all covers need to be placed back on the instrument.

 **ATTENTION:** Avant d'effectuer des travaux d'entretien ou toute composante du FLEX, l'instrument doit être:

- Eteint
- Déconnecté de l'alimentation
- Surfaces chaudes faut donner le temps de refroidir
- Après instrument entretien, tous les couvercles doivent être placés sur l'instrument.

4.2 Technical Support

To ask technical questions or to obtain technical service please contact EST Analytical:

- Within the United States call toll free: **(800) 283-3510**
- Email Tech Support at: support@estanalytical.com
- Outside of the United States call: Regional Authorized Distributor.

Before calling for technical assistance or service:

- Note the serial number of the instrument.
- Note the type of problem you are experiencing and the conditions under which the problem occurred.
- Note the exact wording of the error message (if applicable).
- Please have the manual open and available.

4.3 Replacement Parts

To obtain pricing and availability please contact EST Analytical Customer Service or your local authorized dealer or visit our website at

<https://www.estanalytical.com/product-category/flex/>

(800) 283-3510 -Toll Free within the U.S. or Canada

(513) 642-0100 - Outside the U.S. and Canada

4.3.1 Fuse Replacement

The FlexOStains one fuse located on the rear panel adjacent to the System Power cable. If the fuse needs replacement, power down the FLEX, unplug the FLEX from the main power and replace the fuse with the same type and rating. (2.5A 250V Slow Blow.)

Appendix A: Chemstation/MassHunter Sequence Import

Note: In this section the MassHunter/Chemstation terms are used interchangeably and will depend on the software package you employ.

1. <click> **Configuration** in order to enter the Instrument Configuration screen.
2. <scroll> down to Software Integrations in the Options box in the left-hand column.

Options

General
Instrument Name
Instrument 0163082516

Rail Type
Standard

GC Settings
GC Ready Mode
Contact Closure

Contact Closure: GC is ready when circuit is completed. TTL: GC is ready when high signal is received

Inverted
If enabled, GC will be considered ready when contact is not closed or when low signal is received.

Syringe Settings
Syringe Maintenance Position
Left Right Front Rear Up Down
250 steps 1200 steps 1100 steps

This is the position that the head will move to during syringe maintenance. It's only necessary to change this setting if the head cannot safely reach the default maintenance position.

Software Integrations
External software integration
Integrate with Agilent ChemStation

Integration path
C:\Users\acronstein\Documents\integrationtest

Figure Appendix Aa: Software Integrations Options in Configuration Screen

3. Select from the drop-down box (No external integration, Chemstation or MassHunter) of External Software integration options the GC software with which you would like to integrate your sequence.
4. <click> the **Folder** icon and select path for where the sequence file will be stored for imoortation to GC/MS software. Select folder that contains the method and sequence folders. Do not select the sequence folder.
5. <click> **Status** to view Sequence Builder - Build a Sequence - Select GCMS method under the column Chemstation Method and enter the DataFile Prefix only in the **Data File Prefix** line of the **Timing and Planning** section. The sequence builder will add sequential numbering after you add vials to sequence. Save Sequence when finished.

Data File Prefix
AGT

Save and Run Save Run View Log Clear Undo

⚠ You have unsaved changes

Line	Method	Tray	Vial	RPV	Sample Type	Sample Name	Chemstation Method	Date File
1*	Headspace Test M...	Tray, 2 mL, 105 Pos (1)	1				integrationtest	AGT1
2	Headspace Test M...	Tray, 2 mL, 105 Pos (1)	2				integrationtest	AGT2
3	Headspace Test M...	Tray, 2 mL, 105 Pos (1)	3				integrationtest	AGT3
4	Headspace Test M...	Tray, 2 mL, 105 Pos (1)	4				integrationtest	AGT4
5	Headspace Test M...	Tray, 2 mL, 105 Pos (1)	5				integrationtest	AGT5
6	Headspace Test M...	Tray, 2 mL, 105 Pos (1)	6				integrationtest	AGT6
7	Headspace Test M...	Tray, 2 mL, 105 Pos (1)	7				integrationtest	AGT7
8	Headspace Test M...	Tray, 2 mL, 105 Pos (1)	8				integrationtest	AGT8
9	Headspace Test M...	Tray, 2 mL, 105 Pos (1)	9				integrationtest	AGT9
10	Headspace Test M...	Tray, 2 mL, 105 Pos (1)	10				integrationtest	AGT10
11	Headspace Test M...	Tray, 2 mL, 105 Pos (1)	11				integrationtest	AGT11
12	Headspace Test M...	Tray, 2 mL, 105 Pos (1)	12				integrationtest	AGT12
13	Headspace Test M...	Tray, 2 mL, 105 Pos (1)	13				integrationtest	AGT13

Figure Appendix Ab: Flex Sequence Builder

- Export Sequence - <click> **Sequences** to view Sequences page → Under the appropriate sequence, <click> **Export to Chemstation** button

Sequences EST Analytical

Headspace DEMO Instrument

Sequence Library

Search Sequences

NEW SEQUENCE TRANSFER SEQUENCES

Sequence	Created	Edited	Actions
headspace test	2/18/2020 - 10:45:45 AM	2/20/2020 - 2:11:39 PM	[Export to ChemStation] [Refresh] [Delete] [Play]
integrationseq	10/6/2020 - 11:29:19 AM	10/6/2020 - 11:29:19 AM	[Export to ChemStation] [Refresh] [Delete] [Play]
newwww	10/1/2020 - 1:14:34 PM	10/1/2020 - 1:14:34 PM	[Export to ChemStation] [Refresh] [Delete] [Play]
S&R test	5/8/2020 - 3:44:44 PM	5/8/2020 - 3:44:44 PM	[Export to ChemStation] [Refresh] [Delete] [Play]
sequence test	3/16/2020 - 8:31:33 AM	3/16/2020 - 8:31:33 AM	[Export to ChemStation] [Refresh] [Delete] [Play]

Rows per page: 10 1-5 of 5

Figure Appendix Ac: Chemstation Sequence Export

7. In MassHunter software package select Load Sequence.

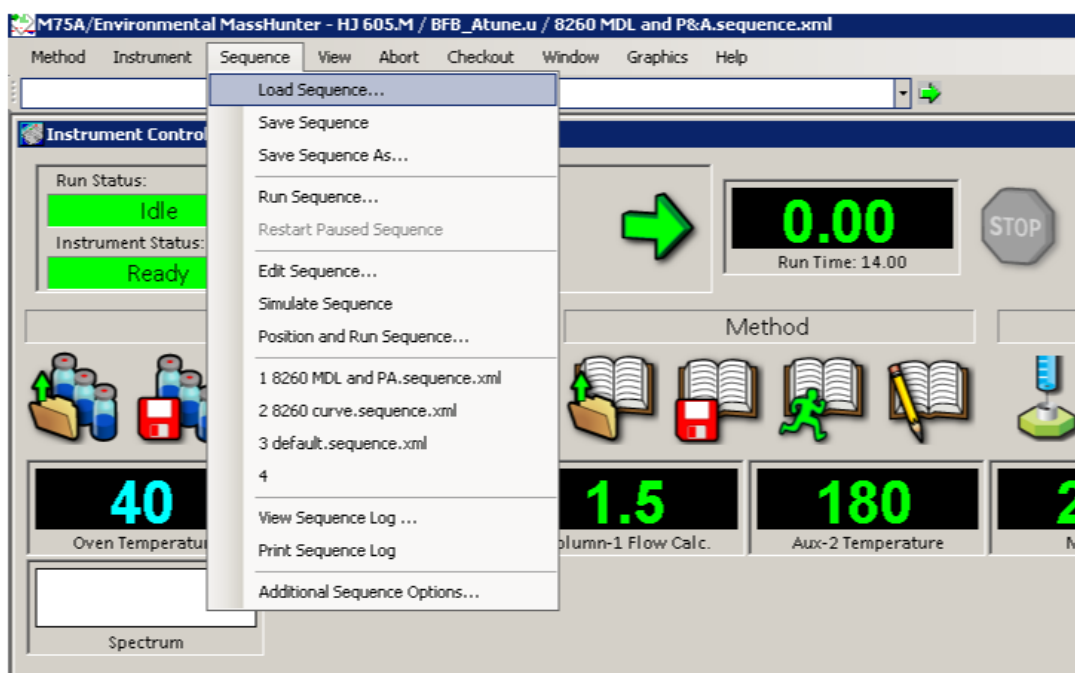


Figure Appendix Ad: Mass Hunter Load Sequence

8. Select saved exported sequence.

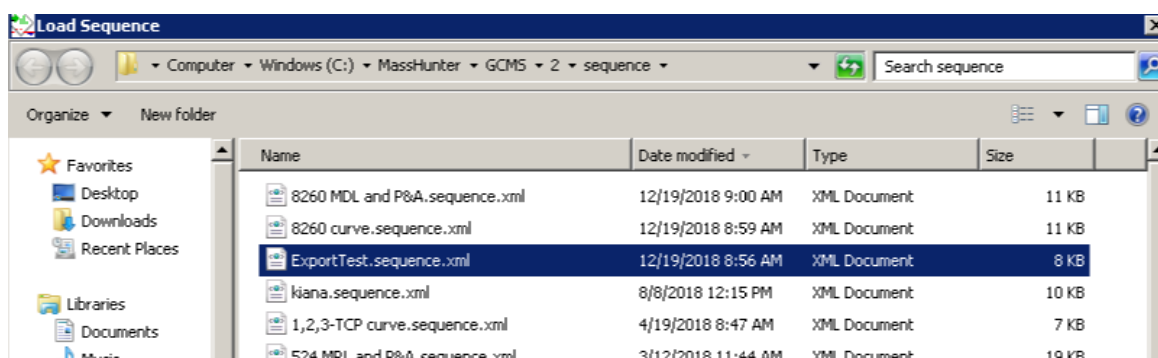


Figure Appendix Ae: Select Exported Sequence

9. Select Edit Sequence

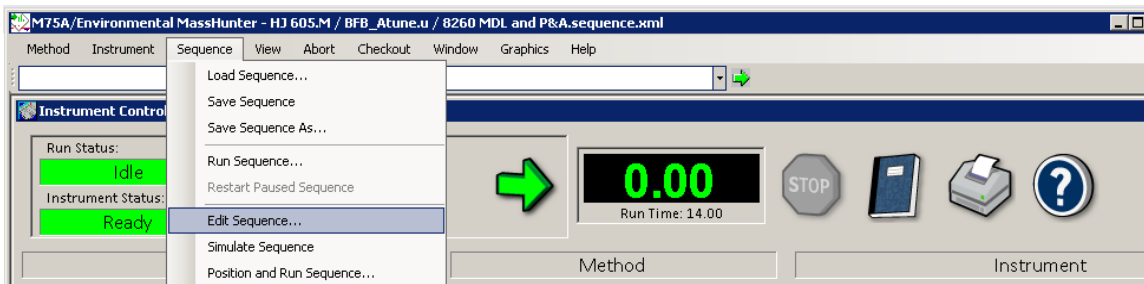


Figure Appendix Af: Edit Sequence

10. Select Tools / Import Sequence.

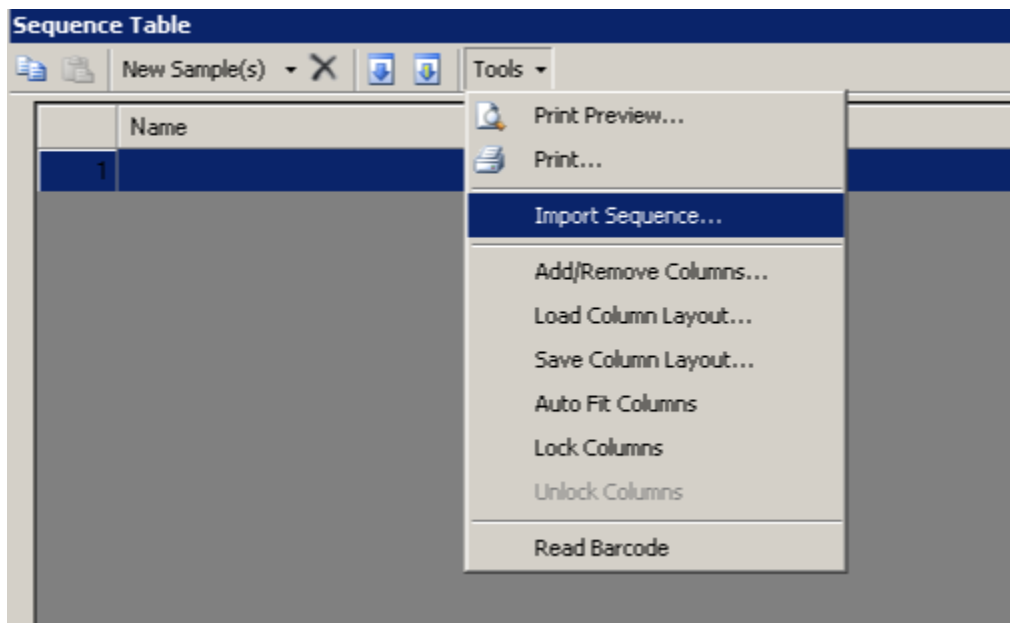


Figure Appendix Ag: Tools/Import Sequence Screen

11. Select Sequence to import

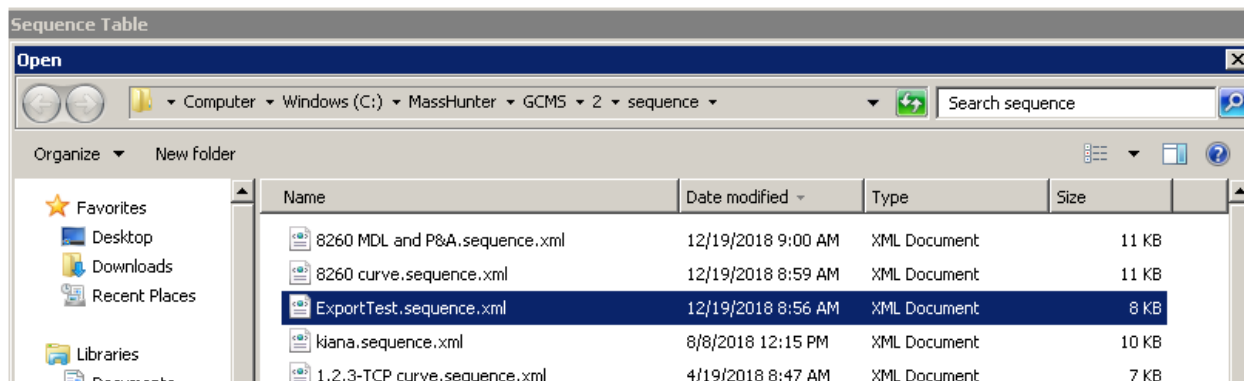


Figure Appendix Ah: Select Sequence Screen

12. Sequence imported for editing

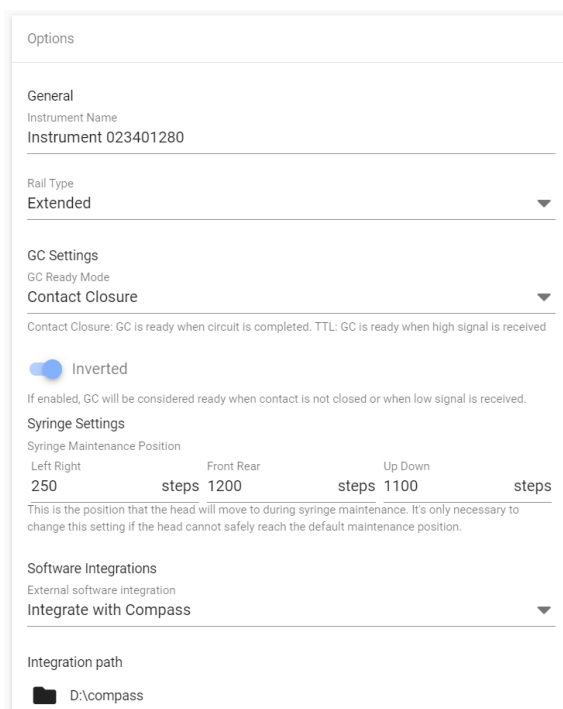
Name	Vial	Method Path	Method File	Data Path	Data File
1	1	C:\MassHunter\GCMS\2	EPI SIM SPME	C:\MassHunter\GCMS\2	
2	2	C:\MassHunter\GCMS\2	EPI SIM SPME	C:\MassHunter\GCMS\2	
3	3	C:\MassHunter\GCMS\2	EPI SIM SPME	C:\MassHunter\GCMS\2	
4	4	C:\MassHunter\GCMS\2	EPI SIM SPME	C:\MassHunter\GCMS\2	
5	5	C:\MassHunter\GCMS\2	EPI SIM SPME	C:\MassHunter\GCMS\2	
6	6	C:\MassHunter\GCMS\2	EPI SIM SPME	C:\MassHunter\GCMS\2	
7	7	C:\MassHunter\GCMS\2	EPI SIM SPME	C:\MassHunter\GCMS\2	
8	8	C:\MassHunter\GCMS\2	EPI SIM SPME	C:\MassHunter\GCMS\2	
9	9	C:\MassHunter\GCMS\2	EPI SIM SPME	C:\MassHunter\GCMS\2	
10	10	C:\MassHunter\GCMS\2	EPI SIM SPME	C:\MassHunter\GCMS\2	
11	11	C:\MassHunter\GCMS\2	EPI SIM SPME	C:\MassHunter\GCMS\2	
12	12	C:\MassHunter\GCMS\2	EPI SIM SPME	C:\MassHunter\GCMS\2	
13	13	C:\MassHunter\GCMS\2	EPI SIM SPME	C:\MassHunter\GCMS\2	
14	14	C:\MassHunter\GCMS\2	EPI SIM SPME	C:\MassHunter\GCMS\2	

Figure Appendix Ai: Imported Sequence

Appendix B: Scion Compass Integration

With Scion Compass integration enabled, an XML file is generated for each sample as it is processed. This XML file is read by the Scion Sample Streamer application to coordinate Compass parameters such as User, Group, Project, RunName, Compass Method, and other custom fields.

1. <click> **Configuration** in order to enter the Instrument Configuration screen.
2. <scroll> down to Software Integrations in the Options box in the left-hand column.



The screenshot shows a configuration window titled 'Options'. It is divided into several sections:

- General**: Instrument Name is set to 'Instrument 023401280'.
- Rail Type**: A dropdown menu is set to 'Extended'.
- GC Settings**: GC Ready Mode is set to 'Contact Closure'. Below this, a note states: 'Contact Closure: GC is ready when circuit is completed. TTL: GC is ready when high signal is received'.
- Inverted**: A toggle switch is turned on (blue). A note below says: 'If enabled, GC will be considered ready when contact is not closed or when low signal is received.'
- Syringe Settings**: Syringe Maintenance Position is shown as a table:

Left Right	Front Rear	Up Down
250	steps 1200	steps 1100

A note below the table reads: 'This is the position that the head will move to during syringe maintenance. It's only necessary to change this setting if the head cannot safely reach the default maintenance position.'
- Software Integrations**: External software integration is set to 'Integrate with Compass'.
- Integration path**: A folder icon is followed by the path 'D:\compass'.

Figure Appendix Aa: Software Integrations Options in Configuration Screen

3. Select from the drop-down box Integration with Compass.
4. <click> the **Folder** icon and select path for where the XML files will be generated for Scion Sample Streamer.
5. Press the SAVE button at the bottom of the options section.
6. <click> **Status** or create a NEW SEQUENCE on the **Sequences** view to enter Compass Integration options.

General Settings

Start Delay minutes ?

Run Count ?

Timing and Planning

Standby Mode ?

Prep Ahead ?

Compass User

Compass Group

Compass Project

Save and Run Save Run View Log Clear Undo

Line	Method	Tray	Vial	RPV	Sample Type	Sample Name	Integration Meth...	Custom fields
1*	<input checked="" type="checkbox"/>							Fields
2	<input checked="" type="checkbox"/>							Fields
3	<input checked="" type="checkbox"/>							Fields
4	<input checked="" type="checkbox"/>							Fields

7. Enter the Compass User, Group, and Project.
8. The Sample Name will be reported as the RunName in the XML file.
9. Using the folder selection icon, select the Compass Integration Method (.meth file).
10. Custom fields can be configured with direction from Scion.

NOTE: The integration method for multiple samples can be edited at the same time. Select and highlight the desired rows, then click on the Integration Folder selection icon for any one of the selected rows. Choose the desired .meth file and press Open. The selected method file is displayed in the Integration Column for those rows.

Questions:

Please Contact EST Technical Support for assistance.

Email: support@estanalytical.com

Phone: (800)283-3510