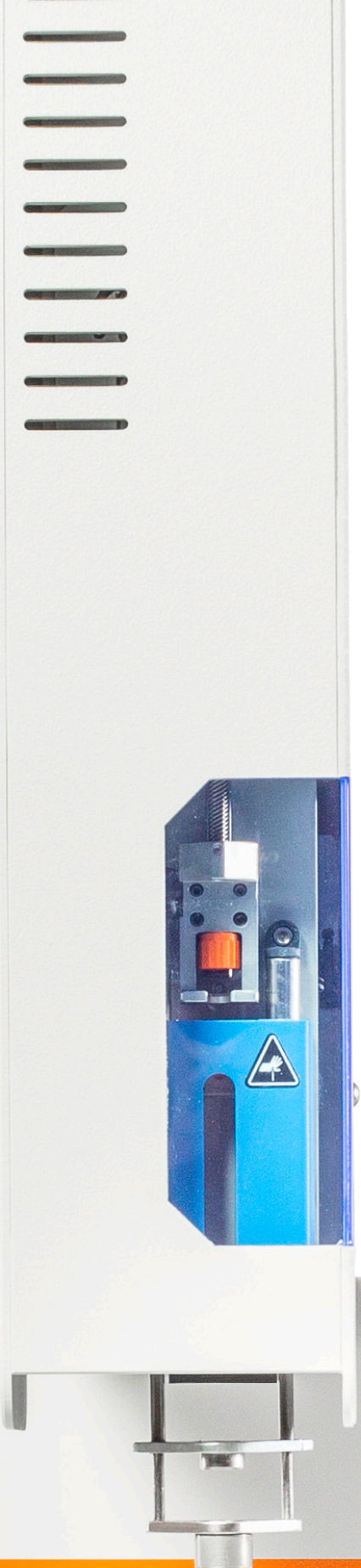


FLEX2

ROBOTIC SAMPLING PLATFORM

**Precision and Accuracy
You Can Rely On**





The Flex 2

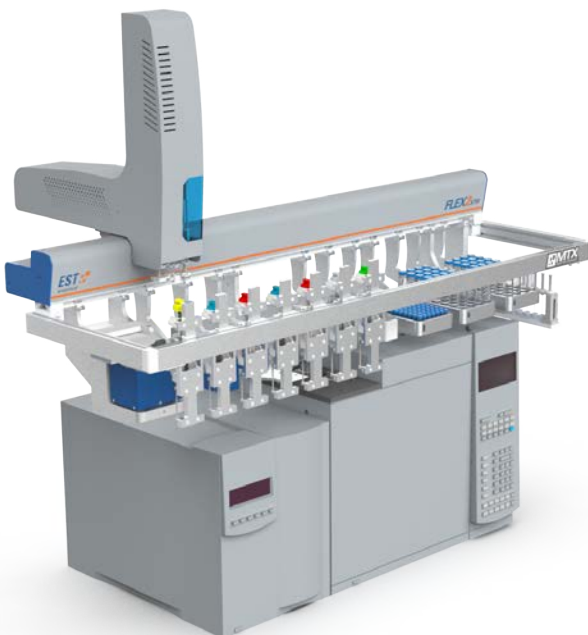
For 30 years, EST Analytical has been a leader providing automated solutions that improve productivity and efficiency in the laboratory. As an ISO9001: 2015 Certified USA based manufacturer, we offer products that are of the highest quality, reliability and value, backed with support that has no rival in the industry.

The Flex 2 Robotic Sampling Platform was designed to empower chemists who are being asked to do more with less. Robotic platforms have been around for years, but the ability to take advantage of the complete capability of the platform has been limited due to the difficulty in programming. The Flex 2 offers a new user interface that is intuitive and simple to use. Complex routines such as internal standard addition, solvent addition or agitation for extraction are accomplished through our drag-and-drop interface that makes even the most difficult routines simple to perform.



KEY FEATURES

- ✓ Global partner with superior support
- ✓ ISO9001 Quality Management System Certified
- ✓ Improved location positional accuracy with new encoder motors
- ✓ Reduced positional noise
- ✓ Compatible with any GC or as a stand alone workstation
- ✓ Two rail sizes are available: 82cm a 123cm
- ✓ Multi-SPME fiber change capability
- ✓ Multi-tool change capability
- ✓ Advanced positional awareness
- ✓ New electronics
- ✓ Robust communication protocol





Liquid Injection

The Flex 2 offers a wide range of capabilities, but none is as important as its precision and accuracy during liquid injections and sample preparation. All steps and speeds in the process are programmable. Viscous samples can be handled by slowing plunger speeds and needle discrimination can be decreased on high molecular weight samples with hot needle injections. All parameters are easily programmable using our innovative drag-and-drop Flex 2, FlexOS control software.



LIQUID ROUTINES INCLUDE:

- ✓ High precision improves %RSD
- ✓ A wide variety of syringe sizes
- ✓ Control of plunger and injection speeds
- ✓ Multiple injection port capability
- ✓ Air gapping
- ✓ Liquid Injection Range
 - 0.5 μ l to 10 μ l with standard 10 μ l syringe
 - 50 μ l to 500 μ l with optional 500 μ l syringe





Sample Preparation

One of the key design concepts of the Flex 2 Robotic Sampling Platform was to open the true power of a XYZ system to the chemist. Robotic platforms can only be utilized to their full potential if the user can program their complex routine themselves.

The power of our innovative Method Development software is demonstrated in its ability to perform complex sample preparation routines. Mixing, heating, addition of standards or solvent, derivatization agents with wait times and multiple syringe rinses can all easily be programmed. Many customers choose to utilize the Flex 2 on a bench top, without being mounted on a GC, to simply take advantage of its ability to reliably perform automated sample preparation.

Check out our Method Development software. Create simple complex routines without the need for a third party programmer.



SAMPLE PREPARATION

- ✓ Automated internal standard addition
- ✓ Automated derivatization
- ✓ Automated dilutions
- ✓ Mixing
- ✓ Heating





Headspace

The key to success in headspace analysis is precise temperature control. Very small variations in temperature can change results by more than 10%. The precise temperature control offered by the Flex 2 incubator station eliminates this variable. The Flex 2 design also eliminates valves and transfer lines found on other systems which can cause high carryover, discrimination and degradation of thermally-labile compounds. With fewer parameters to control, method development and troubleshooting are simplified.

EST Analytical offers a wide range of application notes from various industries using headspace analysis. To download our application notes, visit www.estanalytical.com/flex-app-notes.



KEY FEATURES

- ✓ 6 position incubator with precise temperature control up to 200°C
- ✓ Orbital and Oscillation mixing at various speeds
- ✓ Intelligent automation maximizes throughput
- ✓ Various syringe sizes available up to 5ml (2.5ml standard)
- ✓ Multiple vial sizes can be used with inserts in the incubator (20ml standard)
- ✓ 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



Don't see what you are looking for? Contact EST! We routinely customize solutions for a wide variety of industries.





Solid Phase Micro Extraction (SPME)

SPME has become one of the most powerful tools used by chromatographers over the past decade. With a wide variety of phases available, samples can be selectively enriched to provide more sensitivity while reducing unwanted compounds.

During the extraction process, the SPME fiber is traditionally exposed to the sample while in the sample incubator. At the same time, the incubator is set to move in an orbital rotation to decrease extraction time. This orbital rotation can, over time, cause damage to the fiber. Through the Flex 2, FlexOS control software, the user can choose to move the incubator in an oscillating movement instead of orbital movement which dramatically reduces stress on the fiber and extends fiber lifetime.

Multi Fiber Exchange (MFX)

MFX takes SPME automation to a new level for both routine and research laboratories. MFX allows the system to automatically change between 6 or even 12 fibers that are installed on the system. For routine analysis these could all be a single SPME fiber type. Sequences can be programmed to perform, for example, 50 extractions. The fiber can then be changed, a QC sample run, and an additional 50 samples can be analyzed and so on.

Research and method optimization with SPME can be a trial and error process which takes time and a lot of manual intervention with other systems. With MFX, multiple fibers can be run under different conditions to automate method optimization.



KEY FEATURES

- ✓ SPME option includes conditioning station
- ✓ Orbital and oscillation of the 6 position incubator during extraction
- ✓ Optional single-magnet mixer station
- ✓ Unlike other techniques, SPME fully automates extraction and desorption



EST Analytical is a global company. No matter where you are, we have a support solution for you.

Multi-Tool Changer

Unlock the power of an easy to use automated platform with the new Multi Tool Exchange (MTX) option from EST analytical. The option comes standard with three tools, but depending upon the size of the rail (Standard vs XTR), users can have many more tools ready to use.

MTX enables the true capability of the XYZ platform through use of the FlexOS software platform. The easy to use interface makes the tool changing process simple and easy to use which enables any user to easily create complete sample preparation methods.



KEY FEATURES

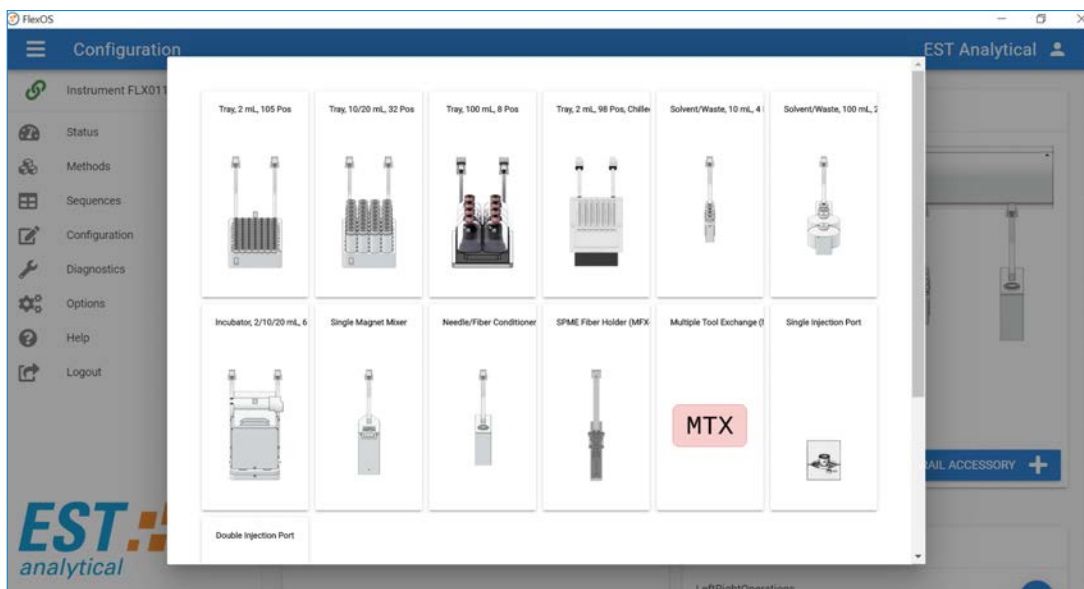
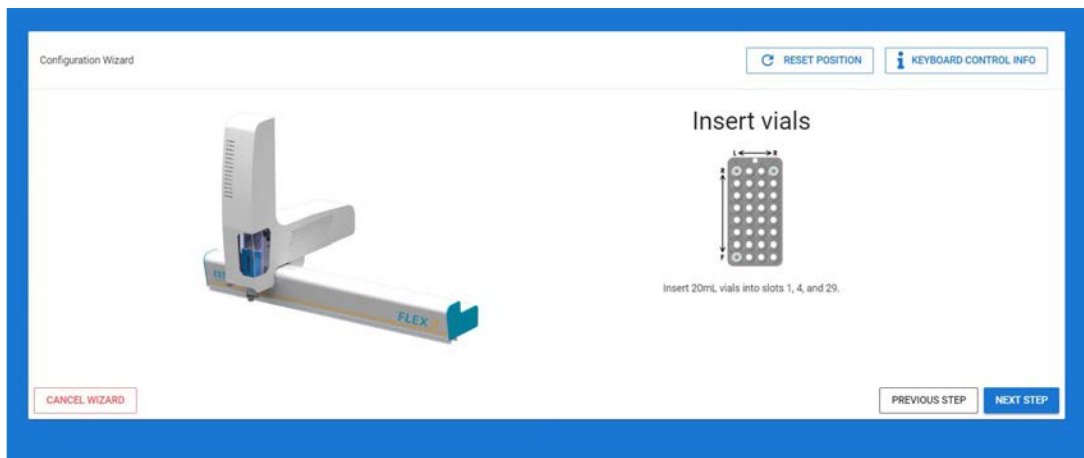
- ✓ Add Internal standard to a 20ml HS vial before incubation and perform headspace analysis all unattended
- ✓ Automated dilutions with larger volume syringes, followed by a 1 ul injection using a 10ul syringe
- ✓ Change between SPME and Headspace to evaluate different techniques to selectivity and sensitivity
- ✓ Change between different SPME fibers to optimize your SPME application or to have a fresh SPME fiber available for high throughput analysis



**The Multi-tool Exchange can easily be added to the rail*

Flex Software: Calibration

During SetUp, trays and other devices are added to the rail from a built in library. Each device can be easily calibrated using a simple to use configuration wizard with pictures and step by step instructions.



Drag Accessories to the rail from a built-in library of available options. Need something different? Let us know and our team can develop it for you!

Flex Software: Run Status

From the Run Status Screen, a complete overview of the system is possible. Temperature set points, sequence status, estimated time to complete the sequence is displayed.

The screenshot displays the 'Instrument Status' interface for a 'Headspace DEMO Instrument'. The left sidebar contains navigation options: Status, Methods, Sequences, Configuration, Options, Help, and Logout. The main area is divided into 'Sequence Control' and 'Instrument Info'. The 'Sequence Control' section shows a large circular progress indicator with the text 'Wait for incubator to heat', 'Line : 1 / 84', 'Elapsed : < 1m', and 'Remaining : 14h 2m'. Below this are 'ABORT' and 'PAUSE' buttons. The 'Instrument Info' section shows a schematic of the instrument with various status indicators: 'Headspace Syringe, 1 mL', 'Agitation Off', 'Door Closed', 'O/S Filled', and temperature controls set to '46.1°C / 65°C' with a 'GC Not Ready' warning. At the bottom, there is a 'SEQUENCE TABLE' and 'SEQUENCE LOG' section with a table showing the current sequence steps.

Status	Method	Tray	Vial #	RPV	Sample Type	Description
Running	Headspace	Tray, 2 mL, 105 Pos (1)	1	1		
Queued	Headspace	Tray, 2 mL, 105 Pos (1)	2	1		
Queued	Headspace	Tray, 2 mL, 105 Pos (1)	3	1		
Queued	Headspace	Tray, 2 mL, 105 Pos (1)	4	1		



The software displays each step in the method with the time left to complete each step.

Flex Software: Method Development

This is the key element that enables chemists to maximize the true power of the Flex 2 platform. The user can simply choose a routine and drag it over to a list of tasks for the autosampler to perform.

Once it is added to the task list, the user can program the details for that specific task. Methods are automatically checked for certain criteria to avoid errors and/or conflicts.

The screenshot displays the FlexOS Method Development interface, which is organized into three main sections:

- Method Details:** Located on the left, it includes a text field for the method name (currently "Liquid Slow - Example"), a comments section, and a validation status at the bottom indicating "This method has no validation issues." Buttons for "CANCEL" and "SAVE METHOD" are also present.
- Routine Library:** A central column containing a list of routines categorized into "Sample Preparation", "Liquid and Headspace", and "Utility". Each routine has a small icon and a question mark icon. The routines listed are: Fill With Air, Incubate/Agitate, Preheat, Dispense liquid into Vial, Syringe Fill, GC Injection, Headspace Sample, Headspace Sweep Needle, Liquid Sample, and Rinse Syringe.
- Method Tasks:** The rightmost section, which shows a sequence of tasks added to the method. The tasks are:
 - Wait:** Configured with "Time passed" as the wait mode and a duration of 0 minutes. The tool is set to "Liquid Syringe, 10 µl".
 - Rinse Syringe:** Configured with "Liquid Syringe, 10 µl" as the tool. It includes settings for Solvent/Waste Station (Solvent/Waste, 10 mL, 4 Pos (1) - Position 1), Solvent Needle Depth (5 millimeters), Waste Position (Solvent/Waste, 10 mL, 4 Pos (1) - Position 1), and Waste Needle Depth (5 millimeters). Rinse parameters are set to 1 cycle, 10 microliters solvent volume, 40 microliters/second fill rate, and 40 microliters/second empty rate.
 - Liquid Sample:** The tool is set to "Liquid Syringe, 10 µl".

Drag routines to the right to create a sequence of tasks for the Flex 2 to perform.

Flex Software: Sequence and Integration

Sequences can be created easily by choosing from the Method library, the sample position and sample type. The line can be easily duplicated for all of your samples by highlighting the samples in your tray.

Integration with Agilent software means a single sequence can be developed with just a few mouse clicks.

The screenshot shows the 'flex-daybreak' software interface. On the left, there are panels for 'Sequence Information' (with 'Settings' and 'Validation' sections), 'Parameters' (with 'General Settings' and 'Timing and Planning' sections), and a 'CANCEL' / 'SAVE SEQUENCE' button. The main area is a table with columns: Method, Tray, Vial #, RPV, Sample Type, and Description. The table contains 23 rows of 'Blood Alcohol' samples, with the 24th row highlighted in blue. Below the table, there are dropdown menus for 'Tray, 10/20 mL, 32 Pos (1)', 'Vial # 24', 'RPV 1', and 'Sample Type Calibration'.

	Method	Tray	Vial #	RPV	Sample Type	Description
1	Blood Alcohol	Tray, 10/20 mL, 32 Pos (1)	1	1	BLANK	
2	Blood Alcohol	Tray, 10/20 mL, 32 Pos (1)	2	1	CALIBRATION	
3	Blood Alcohol	Tray, 10/20 mL, 32 Pos (1)	3	1	CALIBRATION	
4	Blood Alcohol	Tray, 10/20 mL, 32 Pos (1)	4	1	CALIBRATION	
5	Blood Alcohol	Tray, 10/20 mL, 32 Pos (1)	5	1	CALIBRATION	
6	Blood Alcohol	Tray, 10/20 mL, 32 Pos (1)	6	1	BLANK	
7	Blood Alcohol	Tray, 10/20 mL, 32 Pos (1)	7	1	SAMPLE	
8	Blood Alcohol	Tray, 10/20 mL, 32 Pos (1)	8	1	SAMPLE	
9	Blood Alcohol	Tray, 10/20 mL, 32 Pos (1)	9	1	SAMPLE	
10	Blood Alcohol	Tray, 10/20 mL, 32 Pos (1)	10	1	SAMPLE	
11	Blood Alcohol	Tray, 10/20 mL, 32 Pos (1)	11	1	SAMPLE	
12	Blood Alcohol	Tray, 10/20 mL, 32 Pos (1)	12	1	SAMPLE	
13	Blood Alcohol	Tray, 10/20 mL, 32 Pos (1)	13	1	SAMPLE	
14	Blood Alcohol	Tray, 10/20 mL, 32 Pos (1)	14	1	SAMPLE	
15	Blood Alcohol	Tray, 10/20 mL, 32 Pos (1)	15	1	SAMPLE	
16	Blood Alcohol	Tray, 10/20 mL, 32 Pos (1)	16	1	SAMPLE	
17	Blood Alcohol	Tray, 10/20 mL, 32 Pos (1)	17	1	CALIBRATION	
18	Blood Alcohol	Tray, 10/20 mL, 32 Pos (1)	18	1	SAMPLE	
19	Blood Alcohol	Tray, 10/20 mL, 32 Pos (1)	19	1	SAMPLE	
20	Blood Alcohol	Tray, 10/20 mL, 32 Pos (1)	20	1	SAMPLE	
21	Blood Alcohol	Tray, 10/20 mL, 32 Pos (1)	21	1	SAMPLE	
22	Blood Alcohol	Tray, 10/20 mL, 32 Pos (1)	22	1	SAMPLE	
23	Blood Alcohol	Tray, 10/20 mL, 32 Pos (1)	23	1	SAMPLE	
24	Blood Alcohol	Tray, 10/20 mL, 32 Pos (1)	24	1	Calibration	
25						
26						
27						

The screenshot shows a grid of 32 numbered buttons (1-32) arranged in an 8x4 grid. Below the grid are two buttons: 'BACK' and 'REPEAT ROW FOR 20 SAMPLES'.

Create a single sequence and run it from your GC software



CONTACT US

PHONE

(513) 642-0100

EMAIL

EST@ESTanalytical.com

WEBSITE

ESTanalytical.com

ADDRESS

503 Commercial Drive
Fairfield, Ohio 45014

