



## Global FIA, Inc

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## *FloPro-ChemStack™*

Global FIA 3D printed integrated manifold

### Flexible, versatile automation

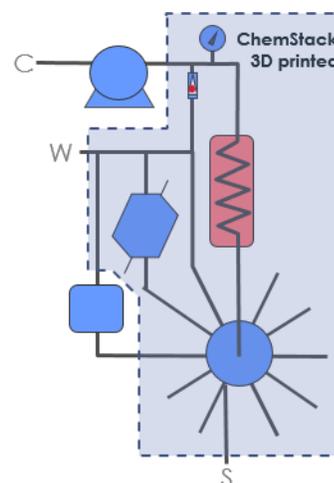
Advances in one field of technology frequently provide new opportunities in another. Such is the case with recent advances in the field of photolithographic 3D printing. Materials, print resolution and the equipment to do it have advanced to a stage where we can 3D print flow manifolds for use in flow analyzers.

Global FIA is developing the expertise to capture complex flow manifolds in a transparent monolithic block. Channels as small as .030" ID (0.7mm) are comfortably accommodated and because these channels are printed rather than machined, new possibilities with regard to geometry are possible.

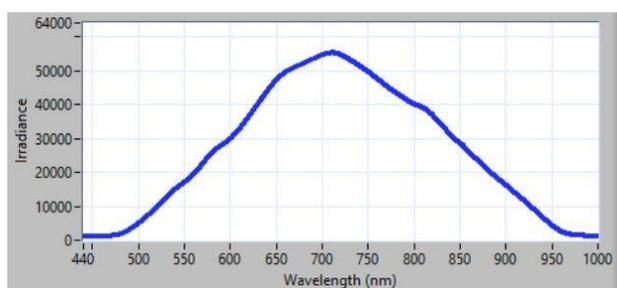
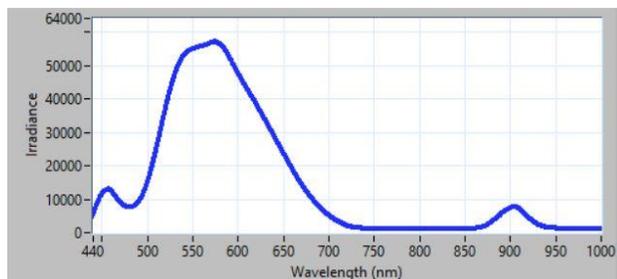
In the FloPro-ChemStack, we mounted our ChemStack manifold on a Valco multi position valve. We equipped the ChemStack with a heated holding coil, pressure transducer and pressure relief valve. Ports are provided to accommodate and external unit operation such as an enrichment column, digester or solid phase reactor. The spectrophotometric absorbance flow cell has a

20 mm path length. The sample port allows priming of the sample without drawing sample into the holding coil. Provision is made for up to six reagents, standards, blanks or wash solution. The 5mL reagent vials are directly coupled to the ChemStack. Off Stack reagent reservoirs are also accommodated.

The following diagram describes the ChemStack flow manifold.

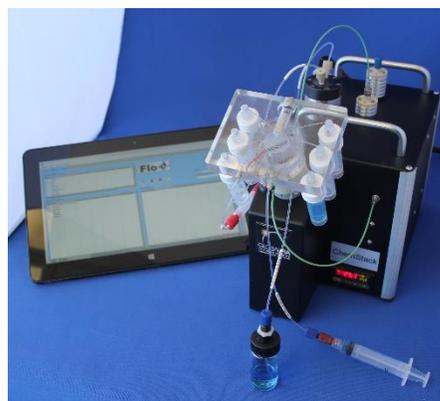


Fluids are propelled in the FloPro-ChemStack by Global FIAs high precision milliGAT pump. There are two light sources built into the system (see emission profiles below). The one will accept standard 5mm (T-1<sup>3</sup>/4) LEDs (factory supplied is a warm white LED) and a high intensity tungsten-xenon lamp. Both are easily exchanged. The detector is an Ocean Optics USB-4000 spectrometer. The heater is controlled by an Omron PID temperature controller. All devices are interfaced to global FIA's FloZF device control and data acquisition software



#### Light source emission profiles

The FloZF software is a full-feature device control and data acquisition and manipulation package with support for a range of unit operations, detectors, and sampling systems. Devices are controlled in scripted sequences. Data are acquired from detectors and sensors and are presented in both tabular and graphic form as individual profiles and a pseudo chart recorder plot. Quantification of the analyte is by means of calibration and is handled automatically by FloZF. Data can be exported to CSV files or an Excel spreadsheet. Individual results are time stamped and when the system is equipped with a GPS, they can also be plotted on a Google Earth map. The software can be stored on a computer with Windows 7 or 8. Both 32 bit and 64 bit versions are available. A USB 2.0 port is needed to communicate with the FloPro. Screen resolution should be at least 1280 x 720.



#### Wetted components

The ChemStack is an acrylic-like polymer that is vulnerable to certain organic solvents. Preliminary tests with strong acids are encouraging. Details on the Chemical compatibility of the pump are given in the pump brochure.

#### Customization

3D printing technology lends itself to customization. One 3D printer vendor claims "Complexity is free". While the standard FloPro-ChemStack will cover a large range of flow chemistries, Global FIA will gladly work with you to customize the manifold to your design needs.

#### Size

FloPro-ChemStack: 6" x 10" x 9"  
(15 cm x 25 cm x 22 cm) (W x D x H)  
Weight: 10 pounds (4.5 kg)

#### Power and communication

Power: 110-250VAC  
Communication: WiFi 802.11 ac  
Software compatible with WIN7 and WIN 8

#### Technical Point of Contact

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