

# Who Manufactures MSS Hardware ?

- Hardware for Modular Sampling Systems (MSS) is supplied by three manufacturers:

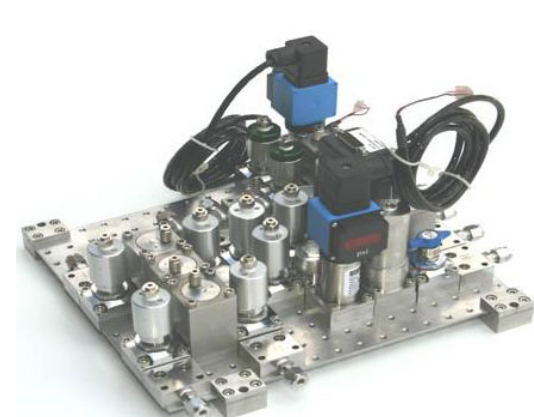
**Swagelok**



**CIRCOR**

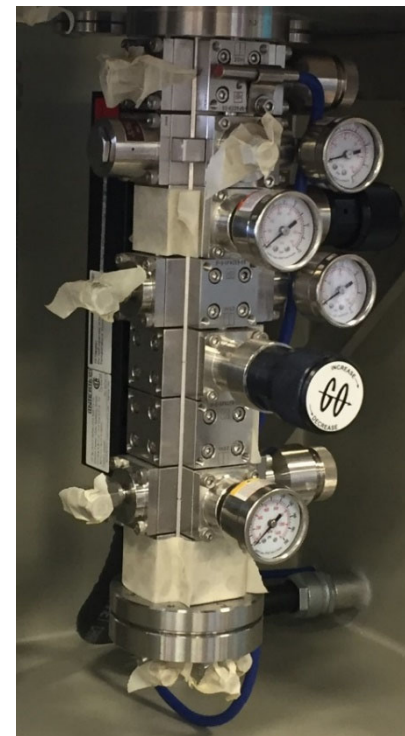


**Parker**



# Who Manufactures MSS Hardware ?

- In addition to the above, a unique 3D modular substrate (pegboard) is manufactured by Astute.
- This “3D Modular Substrate (pegboard)” allows components to be mounted on the front, sides and back, considerably reducing the space required for some applications.





# MSS Involves Logical “Layers”

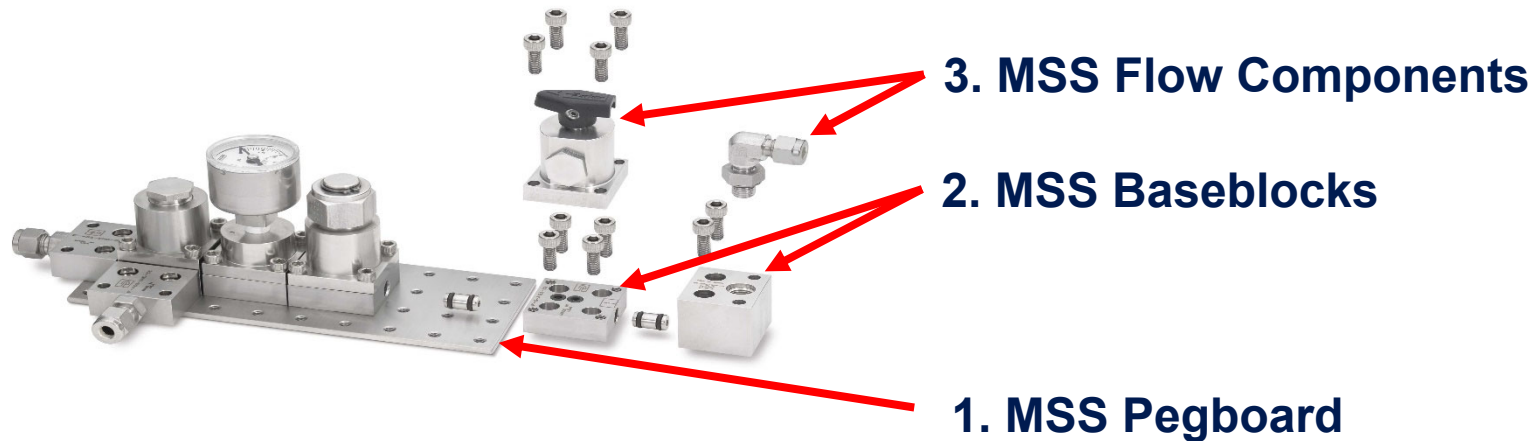
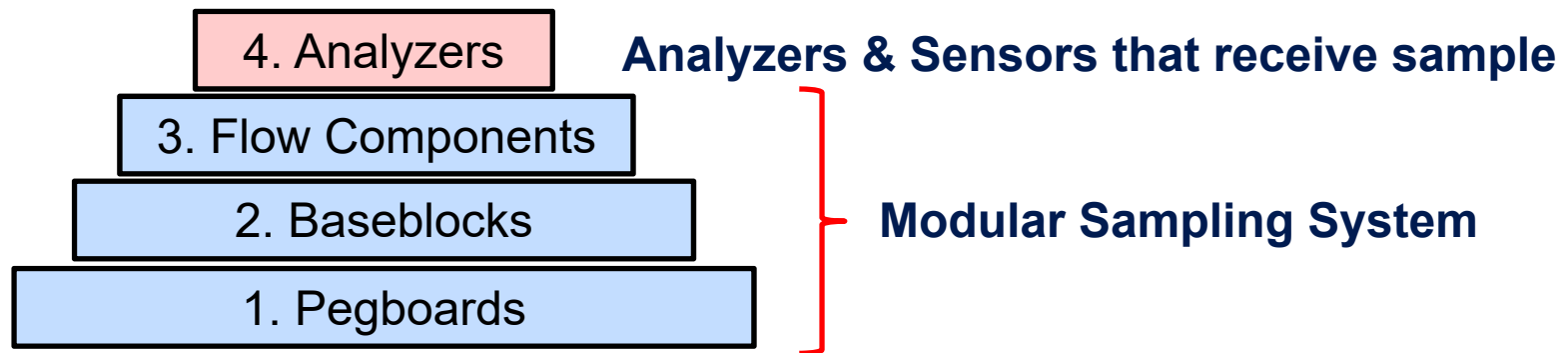


Image © Parker IntraFlow

# Who Manufactures MSS Hardware ?

Let's look at what products are available for each of these Logical Layers:

1. Pegboards
2. Connector Baseblocks
3. Flow Components
4. Analyzers & Sensors
5. PLC Control and Communication
6. Analyzer Monitoring Systems



# 1. MSS Pegboard Manufacturers

**Pegboards are available in different sizes and styles.  
It is best, however, to choose one style for each project.**

Product	Parker	Astute	CIRCOR	Swagelok
Stainless (Unheated)	Yes	No	Yes	Yes
Aluminum (Heated)	Yes	No	No	No
Stainless 3D	No	Yes	No	No

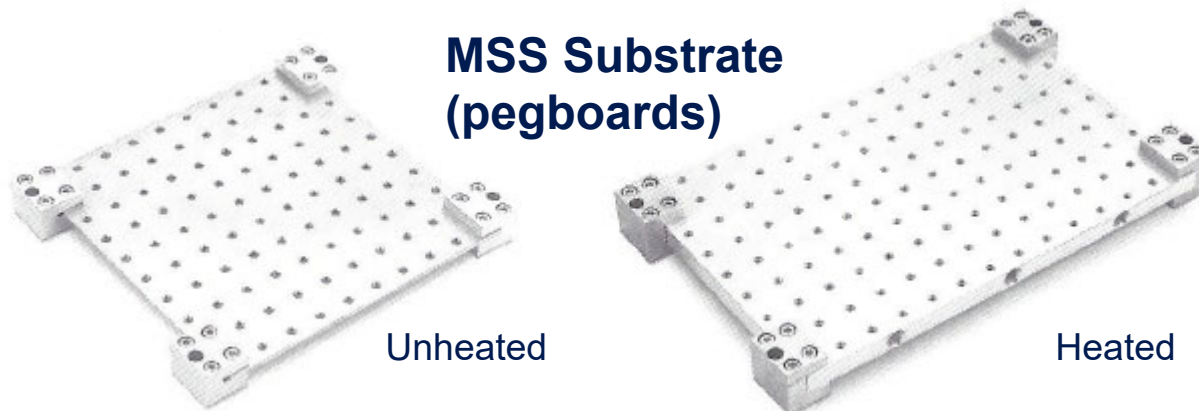


Image © Parker IntraFlow



## 2. Connector Baseblocks

**Connector Baseblocks all have compatible base dimensions.  
O-rings and screw sizes may vary with manufacturer.**

Product	Parker	CIRCOR	Swagelok
Standard 007 O-ring (Baseblocks)	Yes	Yes	Yes
Standard 008 O-ring (Connector)	No	No	Yes
Caphead Screw #10-32 NF	Yes	No	No
Caphead Screw #8-32 NF	No	Yes	Yes





# 3. MSS Flow Components

**MSS Flow Components include devices such as:**

## MSS Flow Component

Manual & Actuated Valves

Coalescing Membrane & Sintered Filters

Rotameters and Flow Sensors

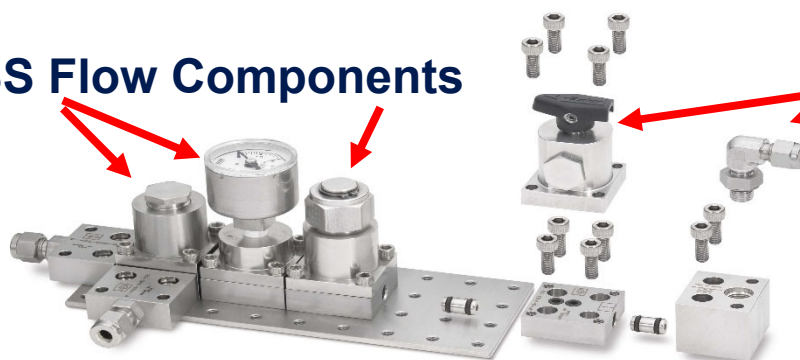
Flow & Pressure Controllers

Flow, Press & Temperature Transmitters

Flow, Press & Temperature Switches

**All MSS Flow Components have the same base dimensions, but may be any height.**

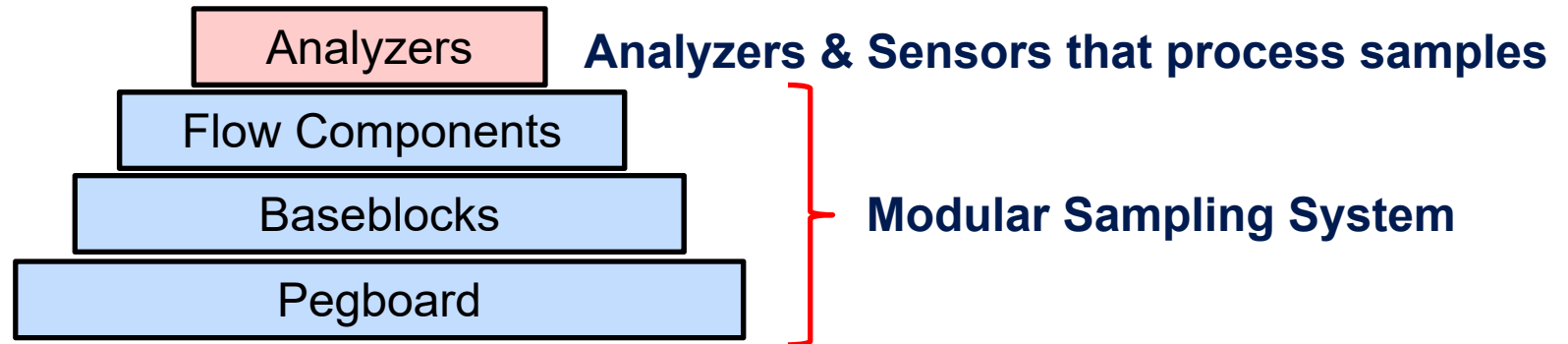
**MSS Flow Components**



**MSS Flow Components**



# Analyzers are Separate from the MSS



**Sensors and Analyzers are not part of the Modular Sampling System. They connect to it through a standardized baseblock Interface.**



# Who Manufactures Analyzers & Sensors for MSS?

Many companies supply Analyzers & Sensors for use with Modular Sampling Systems such as:

Example Manufacturers (in Alphabetic order)	
APIX	GE Sensing
Applied Analytics Inc.	H2Scan
Bronkhorst	MarqMetrix
Drager	Mettler-Toledo
Emerson (Brooks)	Porter
Equitech International	Star
Endress & Hauser (Kaiser)	Teledyne



# What do MSS Analyzers & Sensors Look Like ?

Sensors and Analyzers connect to the MSS via a standardized baseblock interface. They may either:

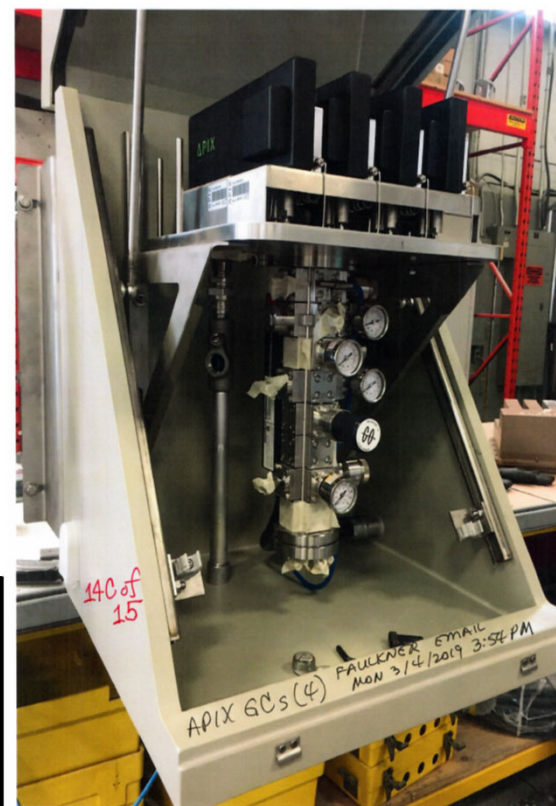


Mount directly  
within a flow  
Module

or

Connect to the  
Analyzer via a  
sample line.

*Teledyne Oxygen Analyzer*



*Chromatographs*



# What Type of Sensors & Analyzers are Available ?

**MSS Sensors and Analyzers include chemical and physical properties devices such as:**

- Colorimeter
- Conductivity
- Density
- Dissolved O<sub>2</sub>
- Gas Chromatograph
- Moisture sensor
- NIR analyzer
- Oxygen O<sub>2</sub> sensor
- ORP sensor
- pH sensor
- Raman probe
- Refractive Index
- UV analyzer

# Example MSS Analyzer Details

## UV / NIR Spectrograph

Applied Analytics Inc.

- corner-cube reflector;
- optical fiber source/signal;
- single modular block format

## MIR Spectrograph

Equitech International.

- single modular block format
- photo at right



# Example MSS Analyzer Details

## NDIR

STAR Instruments Inc.

- NDIR on 2-block MSS Footprint for CO2 measurement in the 3-30% range (gaseous service).
- NDIR on 2-block MSS Footprint has been characterized for Phosphate and Nitrate measurements (liquid service).
- MSS M8 or M12 connector is standard.

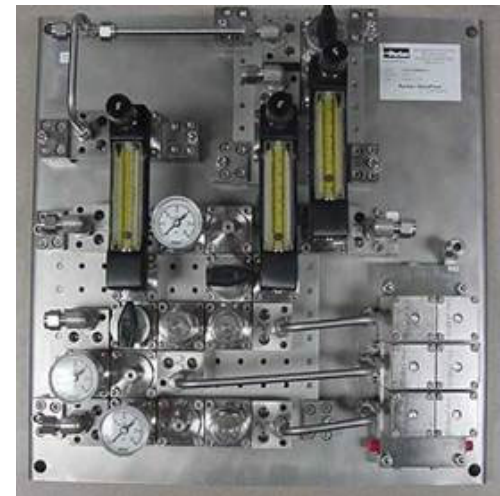
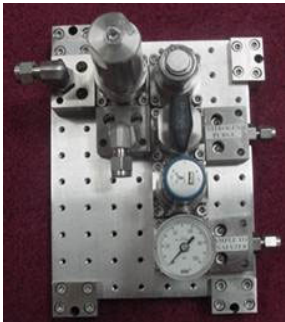
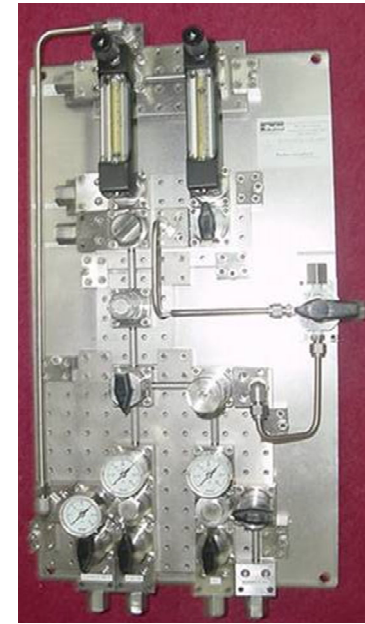
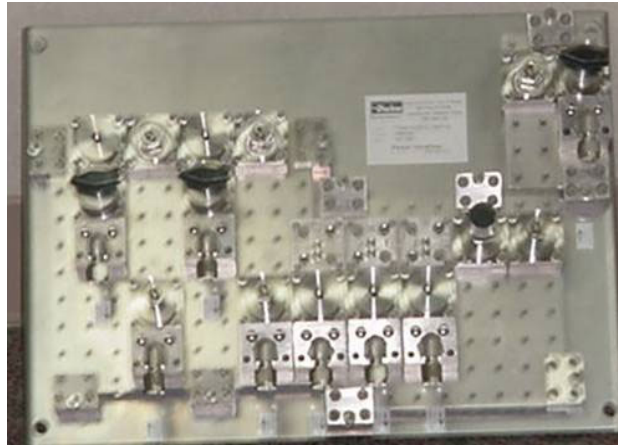
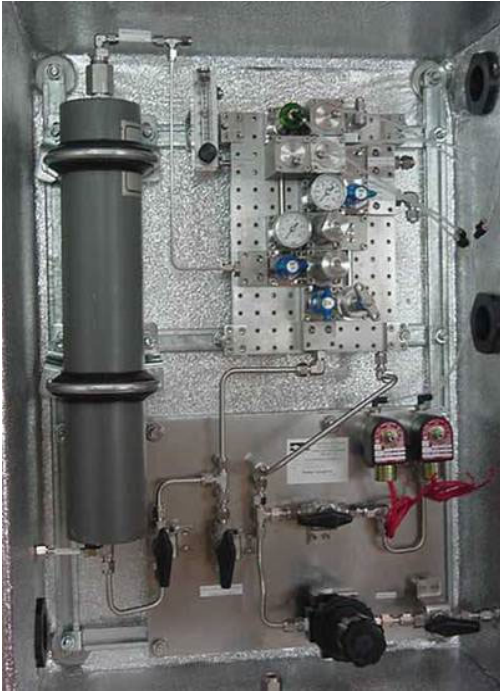
## Refractive Index

Applied Analytics Inc.

- Refractive Index analyzer on 1-block MSS Footprint.
- Unit will characterize Refractive Index to 0.00001 RI units.
- Fiber-optic connections only to the MSS-mounted sensing probe.
- Controller and user-friendly interface can be mounted remotely.



# Parker IntraFlow™ Applications



# Example MSS Analyzers

For a more complete list of MSS Products, See

<https://Products.Entercon.Biz>