

SIEMENS



Process Analytics

Smart Sample System Interface (SSSI)

Intelligent Sample Conditioning Systems for the
Siemens Gas Chromatographs

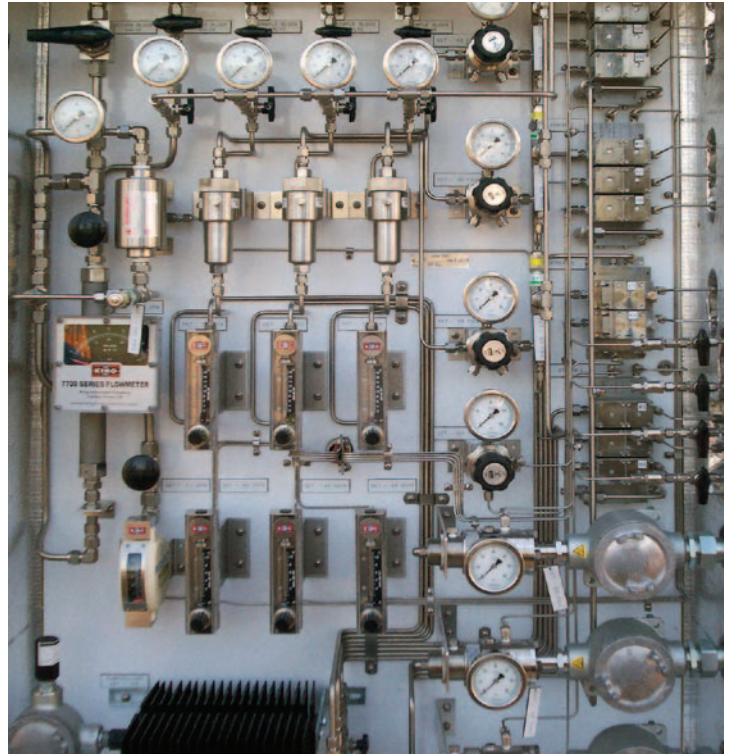
Answers for industry.

Bringing Analytical Sample Conditioning Systems into the Digital Era

Reliable sample conditioning system performance is critical for process analyzer operation as the analyzer must have a clean, timely and properly conditioned process sample in order to do the measurement. Unfortunately, due to the challenge of extracting and delivering the sample from the process to the analyzer, the maintenance of the sample conditioning system is often much higher than the analyzer itself. This results in the need for technicians to manually inspect the sample system's pressure and temperature as well as monitoring for the plugging of filters and leaking of valves.

To minimize the demands on the analyzer technician's time, Siemens has developed a Smart Sample System Interface (SSSI) that automatically collects this key operating information for the sample system and transmits that information to remote maintenance workstations. The SSSI continuously gathers the "live" status of the sample system by interrogating "smart" temperature, pressure and flow sensors. The SSSI then transmits this information to the electronics of the Maxum or MicroSAM GC using a single cable connection that can be intrinsically safe if required.

The ability to have the sample system condition inspected remotely improves the utilization of a plant's analyzer technician time. The data from the SSSI can even be integrated into the Maxum or MicroSAM network software, Analyzer System Manager (ASM), for automatic statistical monitoring of the data for higher analyzer in-service time with lower overall maintenance requirements.



Sample systems play a critical role to ensure the reliable operation of the process analyzer. Yet, traditional designs still demand routine "walk-by's" to confirm it is operating properly.



Improved measurement validity and reliability

By automating the monitoring of critical operational aspects of the sample system, the conditioning of the sample for the analyzer is greatly improved. Subsequently, higher reliability and measurement confidence of the analyzer system is achieved.

- Normal, periodic walk-by inspections only observes the system at specific times – perhaps once per day and often less. Breakdowns due to filter blockage, flow problems or leakage are not observed until the reading itself is lost from the analyzer. With SSSI, all critical maintenance elements are observed continuously – typically at least one reading on every analysis cycle. This means that changes can be detected and reported for immediate attention. For example, chronic slow fouling of a filter can be easily identified due to the continuous monitoring.
- Continuous data validation is possible on critical or quality – mandated measurements with all readings accessible remotely. This data can be logged and viewed on the Maxum or MicroSAM Workstation at any time.

Reduced installation and engineering costs

Smart sampling system designs can reduce a customer's total system installation and engineering costs.

- All connections from the GC electronics to the sampling system – whether electronic or pneumatic – are eliminated and replaced with a single serial electrical communication cable.
- Analog electrical connections to GC can be eliminated since all the electrical sensor signals are coupled to the GC through the serial bus.
- Installation is dramatically simplified with only one signal cable controlling everything including stream switching.



Embedding smart sample system capability into process analyzers systems dramatically reduces the man-hours consumed by maintenance technicians performing "routine" walk-by inspections just to confirm the system is working.

Building blocks of a Smart Sample System Design

GC Components – Physical and Functional Explanation

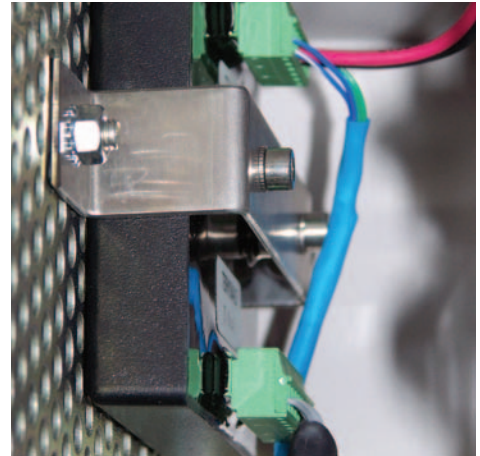
The heart of the SSSI product is the communication bus that links the smart devices in the sample system with the Maxum or MicroSAM electronics. This bus is the same bus that is already part of the Siemens GCs that now can be "extended" down to the sample system. The cable is certified to meet Division II / Zone 2 area classifications and can be set up in an Intrinsically Safe configuration for Division I / Zone 1 areas. An external electrical junction box is provided for a convenient way to connect the interconnecting cable to the SSSI bus and route it to the SCS.

SCS Components

The bus is used to connect to one or more of the smart sensors specifically designed for use in sample systems:

- Siemens Remote Valve Control Module (RVCM)
- Siemens Pressure – Temperature Transmitter (PTX)
- Siemens Flow – Pressure – Temperature Transmitter (DMT)
- Siemens I/O Extender – Integrates 3rd party sensors

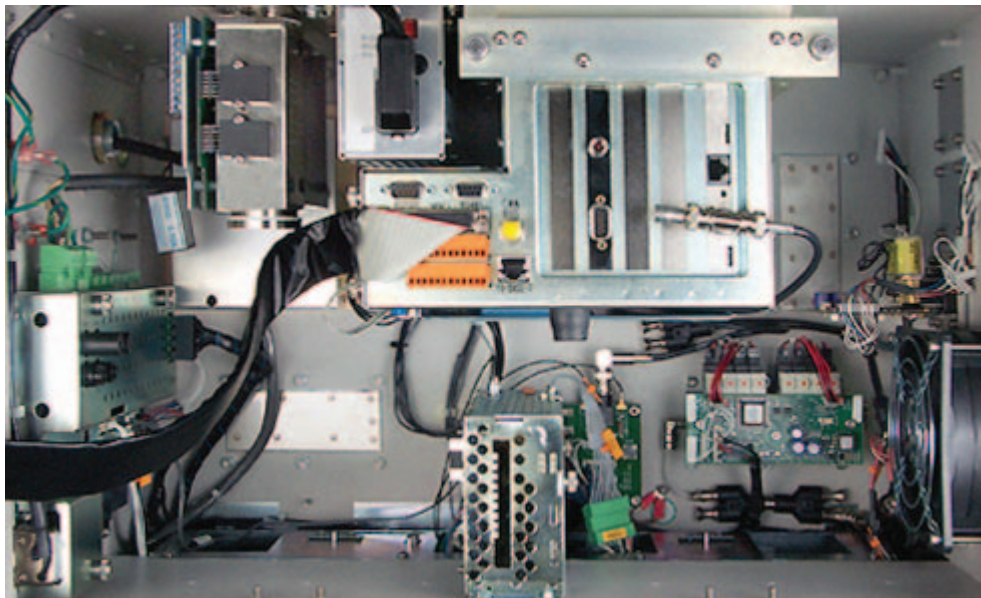
These smart sensors can be used in traditional sample systems or sample systems based on the ISA SP-76 standard as well as retrofitted into most existing Maxum or MicroSAM GC systems if desired.



The smart sample system interface connects to the existing Maxum bus through a simple connection module.



A choice of power supplies are available to power the devices connected to the bus including an Intrinsic Safe version of desired.



The Smart Sample System Interface connects to the bus built into all Maxum Process Gas Chromatographs and automatically integrates the information into the Data Tables of the GC.



The Remote Valve Control Module simplifies analyzer stream switching including calibration and validation streams by replacing individual control tubing between the GC and sample system with a single cable.



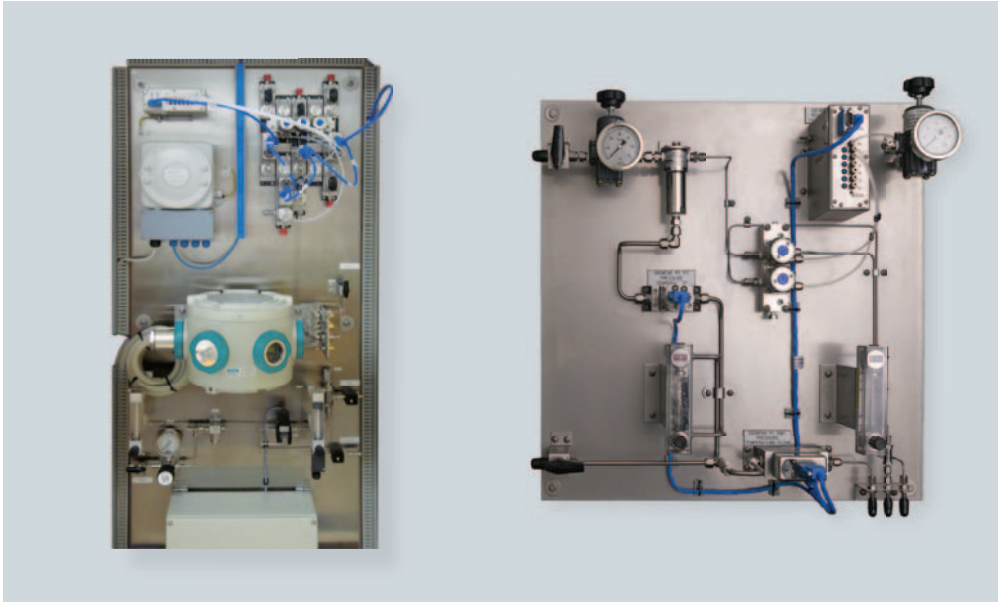
The PTX confirms sample temperature and pressure integrity of the sample line it is connected to.



The DMT provides precise sample flow and temperature measurements as well as confirming the pressure drop across filters.



The I/O Extender brings in non-Siemens sensors onto the communication bus to the Maxum or MicroSAM GC.



Smart sample system components can be added to non-conventional modular sample system (left: example of a complete MicroSAM solution) and conventional sample system design (right).

Take control of the performance of your analyzer's sample system

Track

Rather than wasting valuable technician's time doing needless walk-by inspections of the sample system's condition, the SSSI smart sensors monitor in real time key temperature, pressure and flows.

- Track the life of sample system filters
- Track the calibration sample pressure and flow
- Track the sample return back pressure

Predict

By tracking the real performance of the analyzer's sample system, preventative maintenance schedules can be established to minimize interruptions to the analyzer's performance.

- Predict filter plugging before it impacts sample flow
- Predict when calibration bottles are going to start running low
- Predict when back pressure upsets prevent sample flow

Optimize

Having actual performance data for the sample system enables system designs to be optimized as well as balancing the technician's time where and when it is genuinely needed.

- Optimize technician inspection schedules for analyzers
- Optimize calibration and validation bottle purchases
- Optimize sample system designs for minimum maintenance