



Modular Sample Systems The Complete Solution

What is the New Sampling and Sensors Initiative or NeSSI?

NeSSI is the New Sampling and Sensors Initiative, which was started within the Center for Process Analytical Chemistry (CPAC) as an ad-hoc group of about ~250 people from international companies and universities. Companies integral to CPAC and NeSSI (i.e. sponsors, users, suppliers, participants), not including various universities are ABB, CIRCOR, ExxonMobil, Chevron, Siemens, Emerson, Swagelok, Parker Hannifin, Dow, Air Products, Honeywell, UOP. Their charter was to:

- 1. Improve Sample Conditioning System reliability and serviceability
- 2. Provide lowest cost of ownership by optimizing capital costs and operational costs
- 3. Use a standardized, non-proprietary platform for mechanical and communications technology

Result: ANSI/ISA-76-00.0-2002

ANSI/ISA-76.00.02 is the North American for the modular sample systems that specifies the footprint, fluid ports, and mounting ports for components that mount to the surface of a mechanical 'backbone', or substrate. Any manufacturer can supply components meeting these specifications and they will fit on any substrate that conforms to this standard. The corresponding international standard is IEC 62339-1:2006



Benefits of Modular Systems



Standardization of Design – No more need to treat every sample system as a blank sheet of paper. By starting with a modular approach a sample system can be constructed from its basic function groups: Stream Switching, Bypass & Filtration, and ARV & Analyzer Sample Flow

Compact footprint – The block to block assembly eliminates the need for NPT and compression fitting between sample system components, reducing the spacing required and overall footprint of the system

Foundation for next generation analyzers – This system provides a building block for future improvements in sample handling systems, be it the intelligent devices that are being launched in the marketplace today or the next generation of analyzers that will be able to mount directly on substrate

Get your analyzer back online as fast as possible

"At least 80% of our analyzer problems are caused by the sample system"

Petrochemical Analyzer Specialist



By using the above CT76 stick design approach for your sample handling system you can greatly reduce the downtime of critical analyzers due to sample system problems.

Fewer leaks – Because the system has fewer NPT fittings and a rigid structure, the chance of a system developing leaks are minimized. The o-ring approach is more forgiving than NPT during assembly, and the rigid 'backbone' minimizes the vibration between components that can lead to leaks

Faster component replacement – In the unlikely event of a failure, an individual component can be quickly replace by removing 4 screws and installing the new component. Alternatively you can remove the entire stick, replace it with a spare, and service the stick in the maintenance area as opposed to try to troubleshoot a system in the field.

Upgrade path for future improvements – Because the substrate is reusable, should you wish to modify your system in the future you will only have to add the necessary components and tubesets, the rest of your system stays the same and you do not have to rework the entire system. Upgrading from rotameters to digital flowmeters is easy and requires not modification in stick dimensions. Your investment in this new technology will not be obsolete.

"No question about it, where-ever I can use CT76 systems I do. They are simply a better way of building sample systems"

Refinery Analyzer Technician

Enhanced Engineering CT76 Design Tool

CIRCOR Tech CT76 Design Tool is an add-on program for Microsoft Office Visio that provides sales people, engineers, and customers an easy to use and accurate method to visually develop a concise specification of what the end user requires. It accurately tracks what's been added, subtracted, and changed in the system you are configuring to help verify that it meets your design criteria or customers' needs. The CT76 Design Tool generates a BOM in an Excel spreadsheet.

- ▶ The CT76 Design Tool improves productivity and the quality of your submittals
- Increase sales and enhance customer service by quickly responding to requests for proposals
- Reduce errors, omissions, and misunderstandings through clear and accurate visual submittals
- D Generate proposed design drawings in a fraction of the time it takes without automation
- Minimize or eliminate re-work due to inconsistencies between drawings
- Produce appealing visuals that represent your CT76 layouts more effectively than with CAD drawings

Digital Technology

By integrating the sample conditioning system with a PLC via a CIM76[™] gateway, you can receive valuable performance information pertaining to operational data and system health. Also offered is diagnostic and alarm information which can allow for faster resolution of an issue.

CIRCOR developed the CIM76 gateway and chose an open standard of digital communication based on the CANbus Bosch 2.0b standard CANbus due to it's robust design, inexpensive hardware, and the fact that it is widely used in the automotive industry. This removes the necessity of expensive extra hardware (gateway interface) when compared to proprietary communication platforms. The CIM76 allows for seamless integration between CANBus devices, such as those shown below, and any PLC network protocol as well as bridging the gap between intrinsically safe and non-IS areas. Four traditional analog 4-20 mA inputs are also available for maximum versatility. As a standalone device, the CIM76 doesn't use any of the PLC's processing power.

CT76 DMT 2000 Multivariable Flowmeter

- Provides fluid pressure, flow rate, temperature, and flow/pressure control in a single compact device
- Specifically designed for ANSI/ISA-76.00.02-2002 and IEC-62339:1 modular surface mount fluid delivery systems (NPT versions available)
- Compatible with CAN Bus for NeSSI™ Gen 2, Intrinsically-Safe Digital Bus (Class 1 Div 1, or Zone 0,1) and Non-incendive Modbus RTU (Class 1 Div 2, Zone 2) applications
- Integrated high differential pressure bypass, protection from accidental pressure upsets and hydraulic hammer (PATENT PENDING)
- All stainless steel construction for IP65 and corrosive high-temperature environments

CT76 DVM 2000 Solenoid 6 Pack

- Extremely low power (~0.2W per valve, 1.2W total) minimizes energy consumption needed for hazardous areas
- Pilot solenoids rated for 10 million cycles
- Compatible with CANbus for Intrinsically–Safe Digital bus applications (Class 1 Div 1, or Zone 1) and Non-incendive Modbus RTU applications (Class 1 Div 2, Zone 2) applications
- All stainless steel construction for IP65 and corrosive high-temperature environments

CIM76 Communications Gateway

- Provides a gateway between the CANbus network devices and corresponding PLC control system
- Isolater-repeater to maintain an Intrinsically-safe CANbus in a C1D1 environment and bridge the gap to a C1D2 environment
- 4 analog (4-20 mA) inputs available for non CANbus devices
- Performs the higher level CANbus functions of bus speed management and error arbitration
- Available in EtherNet/IP, PROFINET, and Modbus/TCP network communications protocol
- Requires CIDI 9.5VDC power supply for IS CANbus and C1D2 24 VDC for processors







Smart Sample System The Complete Solution



www.circortech.com • ctsales@circortech.com