



Wilmington Section ISA  
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Wilmington Section ISA

ISA—The Instrumentation, Systems, and Automation Society



Check out our web page at <http://www.isa.org/community/wilmi>

### Wilmington ISA - Section Event

#### Joint ISA & IEEE Section Meeting "Industrial Networks"

(Fieldbus to Ethernet)

Presented by  
Mark Fondl

Industrial Communication Technologies

5:30 pm Tuesday, January 27, 2004  
Del Tech Staunton Campus  
Rt 7 exit from I95

#### ISA SENSOR

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# The Sensor

January 2004

## Meeting Event

Tuesday, January 27th:

**Topic: Industrial Networks**

### "Fieldbus to Ethernet"

A key in the usefulness of any technology in Automation is in the appropriate use of that technology. This is especially important as standard commercial technologies target the industrial environment. This presentation will review the evolution of networks from early serial communications to the latest versions of EtherNet/IP and Foundation Fieldbus. The presentation will cover the use and integration of current Fieldbus technology into and on-to Ethernet. Techniques being deployed to encapsulate protocols over Ethernet, newer protocols EtherNet/IP, and the latest software tools will be covered to review how installed legacy systems are being connected to a common infrastructure. Parallel architectures that enable control and operations personnel to manage and configure equipment remotely. Selection criteria on what the benefits of various networking technologies will be reviewed. Vendor neutral this presentation will cover how most companies are addressing the networking area.

The presentation will review some of the latest Networking software tools for the Industrial applications and why they are required. These tools provide the ability to install Ethernet technologies with the

## FUTUREEVENTs

**February 24, 2004  
Section Meeting**

**March 23, 2004  
Section Meeting**

**April 27, 2004  
Shrimp Boil**

**Please update your email!**

same functionalities and characteristics that have been available from proprietary industrial networks.

**Presented by:  
Mark Fondl  
President  
Industrial Communication  
Technologies**

Mark Fondl is president of Industrial Communication Technologies Inc. (Newburyport, MA) a company that specializes in software and hardware products that assist both plant floor and networking specialist support the deployment of Ethernet communications. Mark is also founder of Network Vision a company that has developed IntraVUE software assisting controls people with Ethernet applications.

Prior to ICT, Mark was VP and General Manager of the Automation Division of Lantronix. Headquartered in Irvine, California, Lantronix is a leading provider of network-enabling

technology that makes it possible to manage, configure, control and communicate with nearly any intelligent device over the Internet and shared networks.

Mark's career highlights also include his tenure as VP, Worldwide Marketing for Schneider Automation where he developed the product roadmap termed "Transparent Factory" which became a framework for linking plant-floor automation systems with enterprise business systems via Internet and Ethernet technologies. A year after its debut in 1997, Transparent Factory won a ComputerWorld Smithsonian award for its technological contribution to the manufacturing sector.

Mark also served on the Board of Directors of the Fieldbus Foundation between 1996 and 1999, and was a key player to move toward the current FF-HSE technology that moved to an Ethernet based foundation.

**Please contact:  
Michael Morkun at  
michael.b.morkun@usa.dupont.com  
or Joe Baker at  
joe.baker@us.endress.com if  
you plan on attending.**

**Location:  
Del Tech Staunton Campus  
Rt 7 exit from I95**

**Sandwich buffet will be served  
at 6:00 PM**

**November 18th Meeting Notes:  
By Cullen Langford**

Carl Annarummo, Flow Consultant for Rosemount Inc. addressed issues around flow meter application. We all enjoyed the very knowledgeable, humorous, and very well done presentation.

Carl started by stating that flow meter selection is not a “no brainier” but instead is a process of starting with the bag full of all the flow meter technologies and then intelligently discarding technologies and devices which are not appropriate for any of a number of reasons. It is a matter of finding the “least of all evils” because no meter can be perfect. Even the characteristics of the control system to be employed become an issue considering control and signal requirements. Speed of response and robustness of the measurement are to be considered.

Flow meters can be grouped in a number of ways; most commonly are Head meters, Velocity meters, Mass meters and positive displacement. Head meters such as orifice, venturi, and nozzle are sensitive to both velocity and fluid density. Velocity meters are almost purely velocity sensitive. Mass meters, like coriolis and thermal meters are primarily sensitive to mass flow.

Every meter is affected by the properties of the flowing fluid. It is necessary to consider not only the normal pressure and temperature while metering but the possible extremes during upsets and mis-operation.

It is vital to learn such details as plans for steam cleaning or acid washing during the meter selection process, not later after failure. Fluid viscosity can seriously compromise any attempt to measure flow. Depending on the technology, properties like conductivity, lubricity, abrasive content, multiple fluid phase, solids content, the possibility of slug flow, all enter into the engineering process. The area electrical classification must be considered. Corrosive properties of the fluid can eliminate certain meters. As an example, the coriolis meters will fail to contain the fluids after only a small amount of corrosion.

The piping arrangement is important for satisfactory operation. Flow downward will most likely lead to a meter only partly filled and useless. Modern magnetic flow meters using a variety of field energizing schemes differ in speed of response and application requirements.

An intelligent meter selection requires that a number of requirements be well defined. Some sorts of meters are more robust and thus flow indication is more reliable than others. Other meters may have better accuracy but are more susceptible to failure. It is important to understand the differences between accuracy, repeatability, and sensitivity to errors from density change and so on.

Permanent pressure loss across the meter becomes an issue in certain installations. This is associated with pumping costs in larger flows. All of this comes at a cost.

“Use what you need, pay for what you need”. It is necessary to understand that the catalogs show the product in the best possible light.

Claims for accuracy are under the best of conditions. Carefully look at the predicted accuracy for the actual application. Meter accuracy claims are usually for 100% of scale and fall off seriously at lower flows. The price of the meter is only the start of the costs. Piping requirements, mounting requirements, required accessories, calibration, certification, re-calibration requirements, power and wiring, freeze proofing, insulation, access for maintenance, all of these enter into the installed cost and to the total cost of ownership.

**Getting to know your  
committee members:  
Treasurer - Tammy Mukoda**

Tammy is an Instrument Engineer at DuPont. She received her BScE degree from the University of Florida in 1988 and started her career with DuPont at a titanium dioxide plant in Mississippi as a Process Engineer. In 1991, Tammy transferred to the Edge Moor Plant in Delaware where she worked on the plant’s DCS conversion project. At Edge Moor, Tammy worked in R&D, Training, Process Control and in a Six Sigma role. One year ago, Tammy transferred to DuPont Engineering to work in the project engineering center.

After her day job, Tammy moonlights as a taxi driver providing transportation to soccer and hockey fields and basketball courts.

<p>Tammy is married and has two athletic and very busy children. She manages her son's traveling soccer team, teaches Sunday school and enjoys every minute outside of work with her family.</p>	<p>Perhaps even our operating systems will change for security. The economy looks to be in full recovery which could be good news for us, or for the people of China, or both. For my part, I wish you a happy and successful new year and may each day bring your dreams closer to reality.</p>	<p>the difference between a sensor bus, which transmits simple I/O, a field bus, which allows distributed configuration and intelligence, and a control network, which is used to connect multiple control systems and exchange large amounts of data. The author also explains some of the common terms, such as deterministic and latency, used to describe networks and the trend in OPC for data servers and clients.</p>
<p><b>President's corner</b> <b>Nick Sands</b></p> <p>Its a new year, 2004, (hard to believe isn't it, 4 years past the end of time ;-)). The new year leads to reflections of the year past and expectations for the year ahead. Who am I to buck that tradition.</p> <p>2003 started in an economic slump, at least for many of us. Talk of the upcoming war injected real uncertainty into many peoples lives. In many ways the picture was darker a year ago than it is today. Security was a hot topic in process control, which I do not think will change for awhile yet given the interest in the SP99 committee and our continued security alerts. Wireless grew into the hottest topic in instrumentation and networking, replacing fieldbus. Perhaps the two will merge to make the next big thing.</p> <p>2004, viewed though my crystal mug (crystal balls are much less useful), looks bright despite the darkening of TV screens with election commercials. Safety will probably make its way back to the top of the heap with the forecasted release of the updated S84 standard on safety instrumented systems. Security will not fade, but guidance will probably be issued by the SP99 committee. Security needs may force changes in our OPC as COM/DCOM becomes as full of holes as swiss cheese.</p>	<p><b>Book Review: Nick Sands</b> <b>Choosing Which Bus to Ride - BBB (Borrow)</b> <b>Automation Network Selection by Dick Caro</b></p> <p>If you are working on a the design of a new control system or an upgrade from an older control system, this book is a must read. Dick Caro, former chairman of the ISA SP50.2 (Fieldbus ) committee is very knowledgeable and able to explain the features of the different automation networks, such as Filedbus, DeviceNet, and AS-interface, so that many engineers with limited network experience can understand. The book is very much technical in nature, so the plot is thin, but the network information and history make it a quick read. (BTW, WISA's own ISA Fellow Cullen Langford chaired the Fieldbus committee for many years and is credited in the first chapter of this book.)</p> <p>Caro's intent, at which I believe he succeeds, is to lay before the user the enough information to help them understand the features of the various networks and the decision making process. First he has to educate a reader (like me) enough to follow the rest of the book. This introduction to industrial networks covers such basics as the ISO/OSI seven layer model for network protocols (you will find yourself later noticing the same physicallayers in several different networks), and</p>	<p>The meat of the book begins in the network application section, where the author gives examples of typical applications for networks, and discusses the different networks that are suitable and why. He starts with the simplest application, a sensor network for several discrete devices like solenoids or position switches, and works through many other control applications like chemical processes, motor control, HVAC systems, and elevators. It is very interesting to learn how the features of a network meet the needs of the different applications. In some cases the network of choice is the network that is available as certain networks are supported more broadly by certain types of vendors. After reading this section the user has a better feel for the technology and an understanding of the author's position that there is no one network that does it all, not because of technology but because of politics.</p> <p>The main disadvantage for this book is that the audience is limited and the information may be out dated. The book is not inexpensive at \$42, (ISA Member price) but if you can read the book without buying it, there are more timeless booksavailable. For these reasons, I rate the book a borrow (3Bs)</p>