Freedom to Choose. Power to Integrate.

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The Fieldbus Foundation would like to thank the following companies for their support of *Fieldbus Report*.
President’s Letter

Rich Timoney
President & CEO,
Fieldbus Foundation

Foundation Growth: Evident Around The World

Thank you for reading the latest issue of Fieldbus Report. As described in the following articles, the Fieldbus Foundation’s open, nonproprietary technology, FOUNDATION fieldbus™, has gained solid acceptance around the world. End users are achieving significant business benefits by implementing fieldbus-based controls in projects of all sizes — and across a wide range of industries.

My travels on behalf of the foundation have taken me to many areas of the global control and instrumentation market. From Korea, to Australia and Germany, I’ve met end users, suppliers, integrators and A&E firms making the move to FOUNDATION fieldbus.

I’ve seen, firsthand, how FOUNDATION fieldbus enables increased plant efficiency, improved product quality and better regulatory compliance. The technology delivers capital expense and operational cost savings that are vital in today’s competitive environment.

I’ve also talked to automation vendors realizing new business opportunities by implementing FOUNDATION technology in their field instrumentation, host systems and component products. The list of registered fieldbus products continues to grow — visit our website at www.fieldbus.org for more information.

Two recent international industry events demonstrated the success of the Fieldbus Foundation, our members, and our technology. The foundation’s exhibits attracted record crowds at the INTERKAMA+ 2006 Trade Fair in Hanover, Germany; and at ACHEMA 2006 in Frankfurt, Germany.

At INTERKAMA, we presented one of the largest demonstrations of fieldbus interoperability to date. Our stand included displays of registered devices, host systems, tools and services available from leading automation equipment suppliers.

We also conducted a briefing and reception for the German trade press. Dr. Gunther Kegel, chairman of our Europe, Middle East and Africa (EMEA) Executive Advisory Council (EAC), discussed current fieldbus technology developments. He also highlighted some of our EMEA marketing activities and German end user initiatives. This event offered the trade press a valuable opportunity to meet key executives involved in fieldbus marketing activities within the region.

A panel discussion entitled “The Trends and Field Service Configuration: EDDL Gains Support of Industrial Consortium,” was held during the INTERKAMA show. Representatives of the four member organizations that form the EDDL Cooperation Team (Fieldbus Foundation, HART Communication Foundation, PROFIBUS Nutzerorganisation e.V. and OPC Foundation) addressed issues and technical questions posed by moderator David Humphries of the ARC Advisory Group and the panel audience.

In addition, the EDDL Cooperation Team hosted a series of end user seminars covering EDDL interoperability. Seminars conducted in both English and German updated attendees on the IEC standard harmonization, EDDL technology enhancements and future developments. Live, multi-vendor and multi-communication demonstrations showed how EDDL can be used in different host systems and across multiple fieldbus protocols.

Several weeks later, at the ACHEMA show, the Fieldbus Foundation displayed the capabilities of our technology in chemical and petrochemical processing applications. Coordinated by our German Marketing Committee, the ACHEMA stand featured kiosks demonstrating registered FOUNDATION fieldbus products and compliant solutions available from major control vendors. Experts were on hand to help visitors acquire information and exchange insights with other fieldbus users.

At both events, I was impressed by the demand for FOUNDATION fieldbus and the commitment of our members from around the world. The automation industry is clearly migrating to fieldbus technology — and the foundation’s commitment to meet the needs of our most important served markets.

Also in April, NAMUR, the German Chemical Industry Association, announced an agreement to collaborate on guidelines for shielding and grounding in a fieldbus architecture, and profiles for diagnostics available in fieldbus systems.

These new initiatives are examples of end user commitment to fieldbus technology — and the foundation’s commitment to meet the needs of our most important served markets.

Thank you for your continued support.

All the best,

Rich Timoney
President & CEO
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FIELDBUS APPLICATION GUIDES AVAILABLE

The Fieldbus Foundation offers a selection of comprehensive Application Guides that can help end users get on the “Fast Track to Fieldbus.” These documents provide valuable information regarding fieldbus installation procedures, wiring guidelines, network isolation techniques, and more.

To download the Application Guides, visit: www.fieldbus.org/About/FoundationTech/Resources
Today, many end users face the critical task of selecting a digital communications technology for their process control system. This choice can hinge on a number of cost and performance considerations, so it’s important to understand the differences between bus protocols before making a major investment.
Examining the leading protocols

FOUNDATION fieldbus, HART and Profibus have established themselves as the three major digital communication standards used in the process industries today.

According to Al Dewey, principal product marketing manager for Emerson Process Management, digital protocols provide the foundation for a plant’s asset management capabilities.

Dewey said, “Selecting the right protocol, whether users are trying to start up a plant faster or streamline maintenance tasks, will provide the ability to gain real-time plant floor information from intelligent devices over the plant network into an asset management application.”

Jonas Berge, Smar Singapore general manager and author of several books on process instrumentation, offered this advice: “End users with traditional DCS-type applications found in the oil & gas, refining, petrochemical and chemical industries should carefully examine the standard network protocols when planning for the future. They should not assume all of these technologies provide the same level of performance in a process plant environment.”

Important factors to consider

End users should keep several key issues in mind when evaluating control network solutions. They include:

Commissioning

FOUNDATION fieldbus H1 system management provides auto-detection and addressing that eliminates the need for DIP switches or manual offline addressing. This saves time and money during commissioning.

Profibus PA does not have system management, and as such, is not a “plug-and-play” solution. Profibus devices must be added to the network one at a time. Some devices require addresses to be set by DIP switches.

System Integrity

FOUNDATION fieldbus H1 and Profibus PA are both digital technologies providing improved control system accuracy and integrity. FOUNDATION fieldbus H1 employs modern communication relationships, such as scheduled publisher-subscriber, whereas Profibus PA relies on a less sophisticated poll-response technique without scheduling.

HART does not have real-time digital communications. Instead, device data is delivered via digital signaling “superimposed” on top of the traditional 4-20 mA current loop used to return (or send) the process variable. Although accepted worldwide, the 4-20 mA signal has inherent weaknesses, such as the inability to detect signal distortion, limiting its effectiveness in certain applications.

Loop Performance

FOUNDATION fieldbus H1 communication is scheduled, resulting in response times several times faster than systems without scheduling using the same bus speed. Scheduling enhances loop performance by minimizing dead time and jitter. This, in turn, enables loops to operate closer to setpoint, and setpoints can subsequently be pushed closer to optimum.

Because H1 fieldbus is synchronous (isochronous), it does not need to rely on over-sampling. H1 bandwidth is divided into fixed slots for cyclic (input/output) real-time and acyclic (diagnostics and configuration) non-real-time data, precisely controlled by a schedule. Thus, non-time-critical tasks never interfere with critical control.

Thanks to H1 fieldbus scheduling, hand-held tools can be added to an active bus without affecting process applications automatically receiving the highest priority on the network.

Moreover, FOUNDATION fieldbus uses publisher-subscriber communication for real-time data, enabling one device to send data to several different devices in a single communication — reducing overhead. The improvement in response time again translates into better performing process loops.

Unlike FOUNDATION fieldbus, Profibus PA does not support scheduling and has no common sense of time among devices. Since its communication is not precisely controlled by a schedule, the loop cycle is longer and not precisely periodic.

Fault Detection

HART and Profibus PA require device management software to poll each device for its status in a round-robin fashion. With H1 technology, however, faults can be communicated to the device management software instantly, and are time-stamped in the device itself. Profibus PA and HART do not provide comparable alert reporting functionality.

Although HART systems support device diagnostics, they may be executed less frequently since the field instruments must conserve power. Plus, scanning HART devices using existing multiplexers takes several minutes. Devices have to be continually “polled” to see if there is anything to report. Because the polling is done at 1200 BPS with HART, there are limitations on how many devices can be polled for alerts in a specific timeframe.

Upgrades

FOUNDATION fieldbus H1 allows easy firmware download over the bus, as well as bumpless switch-over without disturbing other communication or the process. H1 devices can be easily upgraded to benefit from the latest features — helping stave off technology obsolescence.

Firmware download is not available with the HART and Profibus PA technologies.

Field Support

Unlike Profibus PA, FOUNDATION fieldbus H1 supports portable bus testers for troubleshooting in the field. H1 also supports hand-held communicators for diagnostics and calibration in the field.

In the end, the goal of selecting a digital protocol should be to deliver business benefits to the customer. Whether the user is seeking faster commissioning, better diagnostics, better performance, or increased system integrity, FOUNDATION fieldbus is an excellent choice to achieve these objectives.
If you could predict tomorrow’s stock prices, you’d be golden. If you could predict tomorrow’s problems in your plant, ditto.

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Economic Justification For Fieldbus Implementation

On a major process automation project, FOUNDATION fieldbus cost savings begin at the engineering stage. There is less effort to design and engineer a plant.

During construction, most cost savings are achieved because fieldbus reduces wiring and greatly reduces the physical space needed. These reductions, in turn, mean less labor to install and check out the equipment.

But the benefits don’t stop at construction. When the plant is operational, the diagnostics available using FOUNDATION fieldbus help end users increase throughput, improve quality, increase uptime, and lower maintenance and energy costs.

Few control engineers would argue with the performance advantages of FOUNDATION fieldbus versus conventional analog technology. Fieldbus provides simplified remote I/O networking, real-time data, robust diagnostics, device interoperability and tightly integrated loop control.

Nevertheless, some end users overlook the most important economic benefits of fieldbus when planning process automation projects. While the capital cost (CAPEX) savings with fieldbus are well known (less wiring, fewer cabinets, fewer field devices, etc.), users don’t always consider the operating cost (OPEX) savings delivered by the technology.
Lower equipment costs, faster commissioning

Ask Ian Verhappen about the economic justification for installing fieldbus, and he’ll say that users should focus on the total project lifecycle. Verhappen, a fieldbus training instructor for Tri-State University in Angola, Indiana, USA (www.tsutechcenter.org/fieldbusinfo.asp), and former chairman of the Fieldbus Foundation’s End User Advisory Council (EUAC), was an early adopter of Foundation fieldbus while at Syncrude Canada. He considers the technology to be a wise investment for the life of a control system project.

“It is not uncommon to see overall capital savings of 25-30% on fieldbus projects when compared to a traditional 4-20 mA system,” said Verhappen. “Fieldbus reduces termination counts, and thanks to multivariable measurements, enables a reduction in remote I/O.”

With Foundation fieldbus, end users distributing control functionality to the field level reduce equipment costs because control hardware, I/O, and communications hardware are all contained within the field transmitters. There is no need for air-conditioned rack rooms with raised floors for cabling. There are also no separate control, I/O, or large power supply cabinets, nor any control, I/O, or communications modules, control and I/O racks, or separate termination units and associated cabling. The equivalent to these are contained in the field.

Verhappen commented, “Although the initial cost of fieldbus devices and materials is a factor for some users, significant savings are realized when you account for time and labor reductions. Fieldbus has been proven to reduce installation labor by 50%, commissioning time by 75%, and engineering effort by 50%.”

According to Honeywell Fieldbus Product Manager John Yingst, fieldbus cost savings can have a major impact on the end user’s bottom line. “One of our customers credited our Foundation fieldbus-based solution with reducing their system footprint and the cost of pulling wires,” said Yingst. “A number of reports show configuration and commissioning times to be greatly reduced with fieldbus. Commissioning time involves getting at a lot of data, and fieldbus’ higher bandwidth really helps.”

Charlie Piper, product manager for system fieldbus development at Invensys Process Systems, has a similar outlook. “Advances in electronics and packaging have dramatically decreased control system footprints independent of fieldbus,” Piper said. “Fieldbus can add further reductions if the average number of devices per segment is above around six devices, coupled with elimination of marshalling cabinets.”

Improved operations, better maintenance

Verhappen regards operational and maintenance efficiencies as the primary drivers for most new fieldbus projects. He said, “It’s interesting to look at the implications of maintenance for a typical industrial process plant. Studies have shown that 40% of manufacturing cost can be attributed to maintenance, and 50% of all maintenance is corrective. Furthermore, 60% of all maintenance is unnecessary.”

Verhappen noted plants installing Foundation fieldbus have documented 10-20% savings in maintenance as a result of better field diagnostics, increased predictive maintenance data, improved asset management, fewer false alarms, and faster troubleshooting.

Many end users now make their technology decision not on traditional fieldbus features such as reduced wiring and commissioning times, but rather on the creation of knowledge-based systems empowering the workforce to implement a system of continuous improvement in operations. These users recognize that the true benefits of fieldbus occur after start-up and commissioning.

Piper explained Invensys’ approach to fieldbus-enabled asset management: “Smart, digital field instruments enable communication of data which helps predict future device performance and mechanical degradation. New technologies, such as FDT and enhancements to Device Descriptions, enable graphical user interfaces through which extensive testing and analysis of field devices is readily accomplished. For example, on valve positioners, it is possible to perform a wealth of both on-line and off-line analysis to spot valve problems.”

While most end users recognize the capital cost savings with fieldbus, they don’t always consider the operational expense savings delivered by the technology.
Recently, the Fieldbus Foundation announced the establishment of a liaison relationship with the Working Group 2.6 “Fieldbus” of NAMUR, the international process industry end user group based in Germany. This cooperation will focus on grounding & shielding and device diagnostics profiles — key issues identified by both groups as requiring further clarification and guidance.

In this issue of Fieldbus Report, Fieldbus Foundation President and CEO Rich Timoney describes his organization’s working relationship with NAMUR, and explains its impact on automation end users worldwide.

**FR:** What is the significance of the Fieldbus Foundation’s collaboration with NAMUR?

**Timoney:** As one of the cornerstone activities to which the Fieldbus Foundation’s Europe, Middle East and Africa (EMEA) Executive Advisory Council is committed, our cooperation with end user organizations such as NAMUR, represented by the NAMUR Working Group 2.6 Fieldbus, is a vital step allowing for a greater understanding of end users’ needs and requirements. This work ensures the continuance of sound technical capabilities and functionalities, and enhances the benefits achievable by implementers of FOUNDATION fieldbus.

**FR:** At the INTERKAMA+ 2006 trade fair, the Fieldbus Foundation announced that it will implement the NAMUR Recommendations and Guidelines of the Fieldbus Working Group. What affect will this move have on industry adoption of FOUNDATION technology?

**Timoney:** FOUNDATION fieldbus is the dominant digital communication solution for process control, and is gaining a strong foothold in Germany and across the EMEA region. NAMUR, as one of the most influential end user associations in the process industries, has an obvious stake in the future of our technology. They want to specify the protocols listed in the NAMUR Work Sheet NE114 as uniformly as possible to enhance operating performance.

**FR:** When will the NAMUR Guidelines be implemented in control systems and devices employing the FOUNDATION fieldbus specifications?

**Timoney:** I believe the grounding & shielding provisions will be adopted first, since they are needed to meet the NAMUR NE114 requirements ensuring sound installation practices. Diagnostic profiles as described in the NE107 guideline will follow thereafter.

*continued on page 14*
Take the PKS Challenge—see how to get so much more than an ordinary DCS.

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For more information on National Instruments FOUNDATION™ fieldbus products, visit ni.com/fieldbus.
A Closer Look At Common Fieldbus Myths

Unraveling the misconceptions about FOUNDATION technology

The last issue of Fieldbus Report described a number of myths surrounding FOUNDATION fieldbus. From installation costs, to industry adoption and international standards, the article set the record straight on the Fieldbus Foundation’s open, non-proprietary technology.

In this continuing series, we take a closer look at the misconceptions regarding field-level control and installation costs with FOUNDATION fieldbus.

Myth: FOUNDATION fieldbus is impractical for control in the field

Facts: FOUNDATION technology enables primary PID and secondary PID (cascade) functions, as well as feed/forward and lead/lag, to reside in smart control valve positioners/controllers. Fieldbus eliminates the need to send cyclic control information to higher levels — only supervisory and operation-related data must be passed to the central control system.

Field-centric automation strategies eliminate the complexities of a DCS environment.

Locating regulatory control in field devices improves loop reliability and performance, and increases availability. It also does away with the need for complex and costly control room hardware, and at the same time, minimizes external link requirements.

In addition, fieldbus instruments with built-in control functions provide utmost flexibility for configuring control loops. The devices’ instantiation capability simplifies incorporating and/or changing control strategies over time.

Field-level control reduces system overhead in many applications.

A field-based control scheme reduces costs associated with centralized processing capacity, power supplies, signal conditioning, panel space and redundancy hardware. Installing spare equipment to accommodate future modifications is easier — and less expensive — since the cost and complexity of hardware is reduced.

End user knowledge is essential when migrating control functionality to the field.

For instrumentation end users, knowledge is the basis of a successful strategy of control in the field. Honeywell Fieldbus Product Manager John Yingst said, “Customers have to be aware that some devices have limited control libraries, and others have long block execution times, which makes control in the field challenging. So, they have to study their equipment, and know their applications, before moving forward. In many cases, it’s best to start with field-level control on fairly basic loops.”

New supplier solutions address common concerns about bus power and security.

The supplier community has developed solutions to deal with common concerns about control in the field, particularly those related to bus power and communications security. For example, some end users believe a cable interruption or fault on a fieldbus segment will compel the actuator into fail-safe or shutdown mode.

For instrumentation end users, knowledge is critical to ensuring a successful strategy of control in the field.
Physical layer suppliers have developed new fieldbus power conditioner and device coupler solutions impervious to any single point failure. This means fieldbus segments can now be made truly redundant for power conditioning, H1 communications and field cables.

**Myth:** FOUNDATION fieldbus increases installation costs

**Facts:** FOUNDATION fieldbus delivers significant savings in total installation costs. Fieldbus systems reduce instrument wiring, which means less termination and fewer screwdriver turns. The technology also reduces hardware requirements and lowers Capital Expenditures (CAPEX).

Fieldbus reduces capital equipment costs when compared to conventional control technology.

In a study conducted by Rheinhold & Mahla (R&M), fieldbus installed costs were found to be up to 15% less than conventional instrumentation systems, and 5% less than conventional technology utilizing remote I/O.

Known as FuRiOS (Fieldbus and Remote I/O System comparison), the R&M analysis verified fieldbus reduced engineering, wiring and component costs, and enabled faster commissioning through standard coding, reduced errors, and improved error diagnosis (read the report at http://www.fieldbus.org/email/Furiosreport05.pdf).

An ARC Advisory Group study found 56.6% of end users ranked the installed cost of fieldbus to be less than conventional systems, and 81% ranked fieldbus costs to be less than conventional systems over a five-year period (read the study at http://www.fieldbus.org/pdf/ARCInsightReport.pdf).

For additional information about FOUNDATION technology, and to download detailed fieldbus technical guides, visit www.fieldbus.org.

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**NAMUR Collaboration Promises User Benefits**

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**FR:** The grounding & shielding issue with fieldbus is complex. How will the foundation’s cooperation with NAMUR address this matter?

**Timoney:** Currently, there are several different grounding & shielding solutions supported by numerous guides, standards and industries. The optimum choice of solution depends upon several factors, including the nature of the application and the location of the installation. The new Fieldbus Foundation guide seeks to comply with the NAMUR Working Group 2.6 Fieldbus NE114 guideline, which is currently under development, as well as the international practice and options for grounding & shielding of fieldbus systems.

The foundation’s manager of fieldbus products, Stephen Mitschke, is leading a collaborative working group dedicated to the compilation of a guide to help end users make an informed decision about “best practices” for the grounding & shielding of fieldbus networks.

**FR:** How is the development of a device diagnostic profile standard being handled?

**Timoney:** Stephen Mitschke is leading a second working group of manufacturers and end users to investigate the portfolio of self-check and diagnostics for field devices. This initiative will ensure the consistency of FOUNDATION fieldbus devices with the NE107 guideline requiring devices to deliver extensive diagnostics so optimum plant efficiencies can be achieved.
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Educational events provide free instructional opportunity

The Fieldbus Foundation is offering two seminar tracks to help end users and engineers Get On the Fast Track to Fieldbus. The seminar program was developed in response to growing demands, throughout the process automation industry, for comprehensive instruction on Foundation fieldbus.

The Fieldbus Educational Seminars are designed for those looking for an overview of Foundation technology or planning a fieldbus installation. They explain the basics of the technology, help attendees stay up to speed on the latest developments and new products, and provide opportunities to network with other fieldbus professionals.

Fieldbus Foundation President and CEO Rich Timoney described the seminar program as “part of our continuing effort to provide comprehensive, vendor-neutral information to help the industry get on board with Foundation technology.”

Timoney said, “We are pleased to offer an expanded series of free fieldbus educational seminars. The seminars are intended for those individuals requiring a broad understanding of fieldbus principles and implementation strategies. Attendees hear presentations by leading technology experts, and have an opportunity to find answers to their specific questions.”

Fieldbus Educational Seminar topics include: the integrated H1 + HSE fieldbus architecture, physical layer components, interoperability, fieldbus economics and the “Top Ten” fieldbus myths. In addition, the seminars feature a hands-on fieldbus interoperability demonstration performed by connecting user-selected devices to a pre-selected host system. The host is different at each location, with participants building a fieldbus network designed in parallel as part of the seminar exercise.

Numerous controls manufacturers are present at the Fieldbus Educational Seminars displaying their latest Foundation fieldbus solutions. Attendees can browse tabletop demonstrations of fieldbus-compliant control systems, devices, physical layer components, and other related equipment.

Seminar registration is free and lunch is served as part of the event. All attendees receive a registration packet containing a CD with technical guides, the Fieldbus Report supplement, and much more.

For additional seminar information, visit the Fieldbus Foundation’s website at www.fieldbus.org.
Fieldbus Projects: Delivering Results Worldwide

Major end users improve their process performance

SECCO: World-class example of control in the field

Shanghai SECCO Petrochemical Company Ltd., a joint venture between BP, Sinopec and Shanghai Petrochemical Corporation (SPC), recently commissioned a new, $2.7 billion ethylene cracker complex — one of the largest integrated petrochemical plants in the Far East. The SECCO complex is among the world’s most highly automated petrochemical facilities.

At the Shanghai complex, FOUNDATION fieldbus-based systems manage over 48,000 control loops, with about 166,000 I/O tags, 40,000 instruments and some 13,000 intelligent devices throughout the facility. They communicate with more than 23,000 field devices used to control the ethylene cracker and nine downstream derivative plants.

Over 80% of the fieldbus devices at the SECCO complex are utilized for control in the field. Around 25,000 points are hardwired to the automation system. There are over 70,000 cables in the facility.

Emerson Process Management’s PlantWeb digital architecture integrates 10 DeltaV process automation systems with a single global historian and remote operations functions. All 10 automation systems are managed from a single, centralized control room.

In the FOUNDATION fieldbus segments, SECCO employed the FPS-I type redundant fieldbus power system from MTL-Relcom. The FPS-I power supply, equipped with two redundant power supply modules, provides “hot-plugging” without interrupting power and communication on the fieldbus.

MTL-Relcom also supplied Megablock wiring components certified for Zone 2 environments. These devices are designed to prevent a short circuit in any of the individual transmitters or spur cable runs from causing a failure on the fieldbus segment.

SECCO’s senior instrument counselor, Wu Guoliang, indicated that the operational status of FOUNDATION fieldbus controls has been excellent during the first year of installation. He said, “The bus information response speed fully meets the requirements of chemical process control. Basically, all the bus devices operate stably and reliably.”

SECCO specified FOUNDATION technology because of its ability to provide personnel with robust device, equipment and process health information — regardless of their physical location at the site. The company believed fieldbus’ system self-diagnostic capabilities would support its plant optimization strategies and increase operational uptime.

CSPC: Real-time diagnostics enable proactive maintenance

The new CSPC (CNOOC and Shell Petrochemicals Company Limited) petrochemical complex at Nanhai in southern China is one of the world’s largest FOUNDATION fieldbus projects for...
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It's a fact! Pepperl+Fuchs is Connecting Fieldbus Power and Knowledge.
the process industries. The installation includes 3,000 FOUNDATION fieldbus segments and 16,000 fieldbus devices.

Similar in scale to the SECCO complex in Shanghai, CSPC Nanhai is a nine-plant complex centered on an 800,000 tpa ethylene cracker. World-scale downstream plants will produce low- and high-density polyethylene, polypropylene, ethylene oxide/ethylene glycol, styrene monomer, and a range of polyols and glycols.

The CSPC site, implemented with the Yokogawa Vigilant Plant Concept, has nine Yokogawa CENTUM CS3000 systems with 200,000 tags. Again, like SECCO, the project is totally FOUNDATION fieldbus-based. Unlike SECCO, however, with its one, enormous central control room, Nanhai features three control centers with 15 field auxiliary rooms.

Johan Veerman, principal instrument and process control engineer at CSPC said, “FOUNDATION fieldbus was the obvious choice for communications. In today’s world, it’s essential to have networks integrate with each other, and to utilize the information flowing through them. Process instrumentation is being increasingly field-networked to deal with the huge quantities of field data. Compared to conventional 4-20 mA systems, fieldbus networks are more flexible in terms of wiring, information flow, maintenance, and so on.”

He added, “FOUNDATION fieldbus doesn’t just reduce the cost of wiring. It also transmits a lot of information in an intelligent way, making it possible to do remote monitoring, real-time self-diagnostics and predictive maintenance of field devices, as well as plant resource management using field communication. This will greatly reduce operating costs of instrumentation systems.”

Veerman indicated that proactive maintenance was a key design criterion on the CSPC project. “I was looking for a system to enable proactive maintenance,” he said. “One tool that can do this is Yokogawa’s Plant Resource Manager (PRM), a real-time device and advanced diagnostics software package.”

SCA: Fieldbus supports “high performance” environment

SCA Tissue’s new papermaking, converting, and distribution complex in Barton, Alabama, USA, was the first “greenfield” project in the company’s history. With the opportunity to start with a blank sheet of paper, several innovations to improve efficiencies were conceptualized and brought to life.

One major advantage of a greenfield project is that the end user does not inherit the inefficiencies or constraints of an existing operation. The Barton project allowed SCA Tissue to satisfy market demand for AFH tissue products and evaluate its production and distribution processes “from the ground up.”

At the CSPC site, FOUNDATION fieldbus enables remote monitoring, real-time self-diagnostics and predictive maintenance of field devices.

Ron Thiry, SCA’s vice president, manufacturing, stated, “The level of automation at the Barton facility is extremely high — from the automated dewiring of wastepaper bales to the use of AGVs in the warehouse. Once the rolls leave the dry end of the paper machine, they are not touched by human hands.”

The Barton tissue operation is one of the paper industry’s largest FOUNDATION fieldbus installations. PLCs, variable speed drives, transmitters, and other field devices are all connected to the bus. This significantly reduced the installation costs of the devices and provided access to the embedded intelligence in each device.

All production operations can be monitored and controlled at any of the online operator stations. Two control rooms (one in the fiber plant and one near the tissue machine) are seamlessly integrated in terms of what operators and technicians can view.

ABB’s fieldbus control platform played an important role in SCA’s “High Performance” environment. The Barton complex is a showcase tissue facility due to its automation, integration, and information sharing. The improvements in performance and efficiency have been documented and are satisfying to owners, customers, and partners.

The SCA Barton operation is a showcase tissue facility due to its automation, integration and information sharing.
Understanding SIL Ratings For Safety Environments

Why certification is important when choosing SIS products

Responding to growing concerns about industrial safety, the International Electrotechnical Commission (IEC) enacted an industry-neutral standard — IEC 61508 (functional safety of electrical/electronic/programmable electronic safety-related systems) — to drive the safety-related requirements of equipment used in Safety Instrumented Systems (SIS). Subsequently, IEC released IEC 61511 (functional safety: safety instrumented systems for the process industry sector) to help end users determine the Safety Integrity Level (SIL) needed for their safety applications.

Production processes can be optimized for safety system performance by selecting components rated for use within the desired SIL environment.
The combination of these standards has prompted process industry end users to seek open and interoperable instrumentation solutions that will improve the inherent safety of the plant while providing increased information needed for asset management and optimization.

**What is a Safety Integrity Level (SIL)?**

A Safety Integrity Level (SIL) is the required safety system performance based on risk assessment of a specific Safety Instrumented Function (SIF). SILs define the extent to which end users expect the process in question to perform safely, and in the case of a failure, fail in a safe manner.

No individual product within a SIF can carry a SIL rating; rather, individual components of processes, such as field devices, can only be certified as appropriate for use in given SIL environments. The details of this measurement are outlined in IEC 61511 (which is also available as ANSI/ISA-84.00.01). Risk Based Safety Analysis (RBSA) is an example of a method used for associating SIL values with processes. RBSA involves evaluating and quantifying the safety risks of a process, and then categorizing them as acceptable or unacceptable. Acceptable risks can be justified on the basis of moral, monetary or other considerations. Conversely, unacceptable risks have consequences too large or too costly to justify. Whatever the justification, the goal is to arrive at a safe process.

**SIS specifications for fieldbus devices**

The Fieldbus Foundation’s SIS protocol specifications, completed in 2005, are in compliance with the IEC 61508 requirements up to, and including, Safety Integrity Level 3 (SIL3). The specifications enable manufacturers to build FOUNDATION fieldbus devices meeting stringent IEC 61508 guidelines. Third-party test agencies will certify that these devices are suitable for use in SIS installations.

For the first time, end users will be able to choose devices meeting the requirements of IEC 61511 from multiple suppliers, instead of being restricted to devices designed specifically for a proprietary safety system platform.

**Choosing components for SIL environments**

Processes can be optimized for risk by selecting components, such as fieldbus SIS devices and logic solvers, rated for use within the desired SIL environment. For example, if the desired SIL value for the process is SIL3, the user should choose devices certified to be suitable for that environment.

Simply combining process components appropriate for a given SIL environment does not guarantee the process will be rated at the specified SIL level. The process SIL must still be determined by an appropriate methodology, such as Simplified Calculations, Fault Tree Analysis, or Markov Analysis.

**Why use a certified SIS product?**

A SIS product certified by a third-party agency for use within a particular SIL environment offers several important customer benefits. Reliability calculations for such products are already performed and available to the end user. This can significantly cut lead times in the implementation of a SIL-rated process. Furthermore, the customer has the assurance that associated reliability statistics have been reviewed by a qualified, neutral party.

The most important benefit to using certified SIS products is the associated certification report. Each certified product carries with it a report from the certifying body containing important information ranging from restrictions of use, to diagnostics coverage within the certified device, to reliability statistics. Additionally, ongoing testing requirements of the device are clearly outlined. A copy of the certification report should accompany any product certified for functional safety.
The Fieldbus Foundation’s Host Interoperability Support Test (HIST) is the industry’s most comprehensive testing program for verifying the interoperability of fieldbus-compliant host systems.

For end users, the HIST results provide assurance that a supplier’s host system incorporates the robust capabilities of Foundation fieldbus. The testing also reduces system integration risks, since hosts are independently tested to be able to handle the characteristics of different devices.

Tests confirm Foundation technology features

HIST provides generic test procedures performed or witnessed by qualified Fieldbus Foundation staff on Foundation fieldbus systems. These procedures are intended to show a host system incorporating features defined by the Fieldbus Foundation, such as Device Tag Assignment, Device Description (DD) Services and Capabilities Files (CF), is capable of supporting interoperability.

As specified in the HIST documentation, each feature contains a set of test procedures that are run against the host or the fieldbus system using the host. Many test procedures require features supported from both the device(s) and the host.

A host is able to claim support for a Foundation fieldbus feature if it passes the test procedures defined by that feature. Since the features themselves are generic, manufacturers derive the test cases or actual implementation steps necessary to meet the requirements of the test procedure.

Working group maintains test specifications

The Fieldbus Foundation has an active working team called the System Integration and Maintenance (SIM) team. This group, made up of host suppliers, device manufacturers, and end users, strengthens rigorous test specifications.
suppliers, device manufacturers and end users, is responsible for the maintenance of several specifications, including FF-569 “Host Interoperability Support Test (HIST).”

The SIM team is involved in two major tasks: defining host profiles and defining additional functional testing for host applications. The current HIST profile list includes several individual features a host may support. The profiles will define which features are required for a host application to assure interoperability between the host application and field devices. In order for a host to meet a given profile, the supplier must demonstrate that the system complies with the mandatory features.

It should be noted that different host profiles have different sets of required features. For example, a hand-held configuration tool will have a different set of profiled features than a Distributed Control System (DCS).

Additional functional testing strengthens HIST

The SIM team is in the process of developing additional functional testing to be incorporated into the HIST procedures. The first features that will implement these tests relate to DD and CF support.

The goal of the functional testing is to ensure end users can select a FOUNDATION fieldbus instrument, and using registered DDs and CFs, access the features of the device without any special files or modifications.

As part of the functional testing, a series of test DDs and CFs, along with a standardized test device, will be used to validate that a host properly implements the requirements of the FF-901 “Device Description Interoperability Specification.” For example, test DDs will help verify that the host can properly render new Device Description Language (DDL) visualization enhancements such as windows, images, charts and graphs.

The test DDs and CFs will be made available to both host system suppliers and device developers through the Fieldbus Foundation’s DL-006 Device Description Library.

For more information about HIST procedures, visit www.fieldbus.org.
IMPROVE CONSISTENCY AND REDUCE COST WITH ONE SOLUTION. LET’S TALK.

Listen.

Think.

Solve.

Improve your process using the one architecture that unifies control disciplines and provides actionable information. You’ll stay informed and make more effective business decisions. See how Integrated Architecture can help you achieve operational excellence. RockwellAutomation.com/think/process.
With FOUNDATION fieldbus technology now widely accepted around the world, leading automation suppliers are offering a choice of innovative solutions helping end users achieve more power to connect more instruments to fieldbus segments in Class I, Division 1, and Class I, Division 2, hazardous locations.

Some physical layer suppliers utilize the Fieldbus Intrinsically Safe Concept (FISCO) and Fieldbus Nonincendive Concept (FNICO) techniques to provide more power on bus networks. Others choose approaches like the High Power Trunk (HPT) concept for solving hazardous area and general-purpose fieldbus applications.

Recent advancements increase bus power

Honeywell Fieldbus Product Manager John Yingst sees new developments on the horizon for the fieldbus physical layer. “With FOUNDATION fieldbus long past the ‘critical mass’ stage, wiring and power conditioning products have not only become extremely reliable, but we are seeing some real competitive pressures and significant design improvements,” Yingst said. “Suppliers are responding to user demands for more cost- and space-efficient products.”

He continued, “While fieldbus instruments don’t really require more power than conventional devices, efficiency upgrades in power conditioners are a welcome improvement. Host vendors, like Honeywell, are working closely with manufacturers of power conditioning products to integrate their solutions into the process automation environment.”

Bernd Schuessler, Pepperl+Fuchs business development manager, described similar benefits from innovations in power conditioning technology. “With the advent of ‘third-generation’ fieldbus power conditioners, end users can finally enjoy the same benefits in terms of power, cable length, and number of devices per segment in hazardous location applications as they do in general purpose applications,” said Schuessler. “Modern segment design concepts are supported by new fieldbus power supplies and conditioners offering built-in redundancy as well as online physical layer diagnostics. These features are not available with conventional techniques.”

Schuessler added, “The HPT concept does not limit the energy on the fieldbus trunk cable to Intrinsically Safe (IS) or nonincendive levels. Rather, the energy on the spur connections is limited to the instrument. This allows end users to get the maximum number of devices on a segment while also being able to perform live maintenance on the instruments and achieve maximum cable length. Depending on the application, the protection happens in the field inside the junction box.”

New solutions provide system flexibility

André Fritsch, R. STAHL product manager, instrumentation, thinks remote I/O networking solutions as a fieldbus add-on for other signals provide greater flexibility for those designing FOUNDATION fieldbus systems. “End users can now select Ex e/Ex i field device couplers, approved for Zones 1 and 2, and for Division 2, allowing for the operation of IS field devices according to FISCO on a non-IS fieldbus. They have the option of connecting up to four FISCO field devices, or up to eight non-IS field devices, per device coupler,” said Fritsch. “These IS circuits also provide short-circuit protection and are competitive pressure drives physical layer innovation

Device couplers approved for Zones 1 and 2 allow for the operation of intrinsically safe field devices according to FISCO on a non-IS fieldbus.
galvanically isolated from the non-IS bus.

As a unique feature, field device couplers can incorporate an integrated intelligent power management capability reducing startup current and limiting the maximum short-circuit current to one spur only, even if several spurs are short-circuited.

According to Mike O’Neill, international sales director for MooreHawke Fieldbus, advancements in fieldbus device couplers provide users with an additional option: automatic segment termination. He stated, “It is now possible to manually de-energize device coupler channels using a key-operated magnetic interlock. This allows individual fieldbus devices to be disconnected from the fieldbus segment without de-powering the entire segment, even in Zone 1 areas.”

Fault-tolerance increases user confidence

O’Neill believes increased confidence in the FOUNDATION fieldbus physical layer encourages the use of control in the field — overcoming previous concerns that cable problems could lead to power loss at the final actuator and result in unwarranted plant trips.

“The ability to make fieldbus segments completely fault-tolerant is the most significant event for physical layer designs since the introduction of electronic spur short-circuit protection,” O’Neill said. “Today’s segment termination solutions can automatically bypass a broken or shorted trunk cable. This final step in eliminating single point failures will have a significant effect on user confidence, and on the accepted rules for fieldbus segment design.”

Device developers have answers of their own

At TopWorx, designers have taken a different approach to optimizing fieldbus networks. They’ve developed new valve controller technology requiring only one function block, thus reducing the number of segments needed in a typical fieldbus installation. Traditional valve controllers normally require a minimum of three function blocks to handle two switch inputs and a solenoid output. The result is quicker device execution time, more devices per segment, fewer segments, and reduced hardware and software licensing costs.

Managing physical layer improves efficiency

Beyond new segment design innovations, Tim-Peter Henrichs, TURCK fieldbus marketing manager, believes the fieldbus physical layer should be managed as part of a modern asset management system. He said, “The exchange of information between the control system and field devices always occurs via the physical layer components — regardless of the topology. The availability of a system is always directly dependent on the availability of the physical layer components.

“Our objective is to continuously introduce more transparency regarding the physical layer. Managing physical layer components is key to effective and efficient system operations, and will save time and money through scheduling maintenance appropriately and more effectively utilizing the assets that are available.”

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Advancements in fieldbus device couplers provide users with an additional option: automatic segment termination.
Advantages Of Professional Consulting Services

Experts can help ease the transition to digital-based control

Today, many companies want to speed their implementation of FOUNDATION fieldbus. End users need assistance with application training, segment design, commissioning, troubleshooting and maintenance. Device developers need help utilizing fieldbus communication stacks, Device Descriptions, Function Blocks and other tools.

Consultants make digital transition easier

The growth of FOUNDATION fieldbus has given rise to professional consulting services addressing both supplier and end user requirements. Ian Verhappen, an expert in the consulting arena, leverages his experience with fieldbus technology to provide services ranging from system engineering, audits and migration plans, to network design, HAZOP studies and risk assessment.

“Industry is undergoing a step change, moving into an integrated digital environment with more data available than ever before,” said Verhappen. “This is where professional consultants can help by offering their skills to enable end users to make better use of fieldbus data, and to design more reliable digital control systems.”

Services support user implementation

Leading automation vendors offer services designed to ease customer migration to fieldbus technology. For example, ABB has consulting services addressing all phases of fieldbus implementation. Services include basic and advanced training/support for technology applications, network design, project team development, engineering, commissioning, and maintenance/troubleshooting.

Emerson Process Management’s Fieldbus Consulting Group helps end users execute fieldbus projects efficiently, climb the learning curve quickly, avoid mistakes, and reduce risks. The Group performs economic analysis of fieldbus benefits for project justification; develops bid specifications, plant engineering standards and procedures; explains areas of change in engineering; and participates in project planning.

Community colleges and other educational institutions also recognize the widespread adoption of fieldbus and are offering instructional courses for developers and end users. At the Fieldbus Center at Lee College in Baytown, Texas, USA (www.knowthebus.org), users can attend fieldbus training courses heavily weighted in hands-on applications. The Center’s facilities closely mirror the actual work environment of those involved in plant operation and instrument maintenance.

Likewise, the Southern Alberta Institute of Technology (SAIT), which is located in Calgary, Alberta, Canada (www.sait.ca/fieldbus), offers customized fieldbus training to end users wishing to train large groups of their employees. Typically, this type of training is performed at the company’s site with the aid of SAIT-developed portable fieldbus training units. SAIT has also developed a series of certified courses leading to FOUNDATION fieldbus professional certification.

At Tri-State University (TSU), Angola, Indiana, USA (www.tsutechcenter.org/fieldbusinfo.asp), new technologies like FOUNDATION fieldbus are tracked and reviewed by an Emerging Technologies Focus Team. TSU has instituted a comprehensive fieldbus instructional curriculum and delivers customized training solutions to industries in the U.S. Great Lakes region.

This group of highly skilled professionals identifies new technologies making an impact on industry today, and develops certification and degree programs for launch at the TSU Technology Center.

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Helpful tips to assist fieldbus device developers

For device developers, migration from HART technology to the advanced capabilities of FOUNDATION fieldbus can be a simple, cost-effective procedure unlocking new sales opportunities in today’s fastest growing instrumentation market.

However, device manufacturers developing FOUNDATION fieldbus H1 or HSE options for existing HART instruments should consider a few details not immediately obvious from the fieldbus standard or specification.

According to Smar Singapore General Manager Jonas Berge, developers incorporating FOUNDATION technology into their instrumentation family should remember the following helpful tips:

- Follow the standard transducer blocks for device profiles such as pressure and temperature transmitters. This improves consistency across manufacturer platforms, simplifies device replacement, and enables future field calibrators to work without Device Descriptions (DDs).
- Support sub-schedules to permit some loops on the bus to execute faster than others. Also, support dual schedules so that a new control strategy can be downloaded and switching can occur instantaneously.
- Support incremental downloads to permit changes in the control strategy on the fly.
- Support firmware downloads with bumpless switchover so users can easily upgrade device firmware to benefit from the latest diagnostics and control enhancements.
- Support fast link settings for H1 devices. The standard link is 48 mS, but if more aggressive link settings (e.g., slot time, minimum inter-PDU delay, maximum response delay) are supported, the time required for each link can be reduced. This results in much shorter bus cycles than seen for older devices.
- Support Multi Variable Container (MVC) subscription in output devices, such as valve positioners and actuators, so the central controller publishing all output values for the bus at the same time can optimize communication and controls. Similarly, multi-channel input devices should support MVC publishing.
- Carefully review the fieldbus mode and status mechanism. Use Digital Input (DI) blocks sparingly to indicate device status such as local override, hand operation, failsafe interlocks, etc. Instead, internal device status should be indicated to operators using the mode parameter and employed in the control strategy using status flags.
- Ensure function blocks execute as fast as possible in order to reduce the overall bus cycle. This may require optimizing code and incorporating microcontrollers, which are sufficiently fast for most applications. An arithmetic co-processor may be helpful as well.

Increasingly, instrumentation suppliers are packaging solutions enabling a seamless upgrade from HART to FOUNDATION fieldbus communications.
Assistant shortens product time-to-market

Instrumentation manufacturers entering the digital marketplace can use consulting services to decrease their time-to-market for new fieldbus products. From hardware integration and customized templates, to system testing and standards certification, service providers can make sure Foundation technology is integrated into a supplier’s devices as effectively and economically as possible.

Companies like Softing AG offer turnkey hardware and software development solutions for fieldbus devices, as well as consultancy services helping with network interfaces and migration from analog instrument designs to modern fieldbus communication.

“Most new fieldbus suppliers have questions about device registration, host compatibility and other technology considerations,” said Dr. Ernst Flemming of Softing. “We are here to provide the answers they need.”

Softing offers an off-the-shelf “Fieldbus Kit” enabling the rapid development of Foundation fieldbus H1 devices for Intrinsically Safe (IS) environments. It can be used in conjunction with existing HART devices to create a complete fieldbus product. The kit is small enough to be integrated into most existing device housings.

The Fieldbus Foundation itself offers various levels of services for the development, testing and registration of fieldbus devices and host systems. The foundation staff assists manufacturers in executing interoperability and conformance tests for fieldbus devices, and provides project management support for the development of compliant products.

Advantages Of Professional Consulting Services

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Assistance shortens product time-to-market

System Integration

Makes it run like clockwork

To ensure that your plant runs smoothly, our accredited Fieldbus laboratory exhaustively tests our instruments in several different control systems. Your benefit: optimal fit and no-risk integration.

Interoperability

In addition to being certified by the appropriate user organisation, our instruments are also tested in a multi-vendor environment before market release.

Integration

We integrate our instruments into major host systems, e.g. ABB, Emerson, Honeywell, Rockwell, Siemens and Yokogawa.

Functionality

Optimum device operation is ensured by DDs, EDDs and DTM. We also take care that our instruments are properly integrated into systems such as AMS and PDM.

Support

Our Fieldbus Laboratory offers customer courses, service and support in all aspects of fieldbus technology.

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TopWorx discrete valve controllers make it easy to connect automated on/off valves to FOUNDATION Fieldbus. Whether your application is rotary or linear, explosion-proof, non-incendive, or intrinsically safe, TopWorx has a suitable solution for you.

Better yet, with TopWorx you are able to standardize on a single solution across all your plants worldwide. Only TopWorx offers all major global agency certifications in a single model: UL/CSA, Cenelec/ATEX, CE Mark, JIS, GOST, InMetro, and SAA.*

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The TopWorx difference
- Two wire bus + sensors + pilot valve
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*Not all certifications available initially. TopWorx and Valvetop are registered trademarks of TopWorx, Inc.
Seattle Steam achieves robust steam boiler operation

Seattle Steam is a district heating company located in Seattle, Washington. Founded in the late 1800s, the company maintains 18 miles of pipe buried under the streets of downtown Seattle in a one-square-mile area. Customers purchase steam for heating buildings and water, and in the case of hospitals, for use in sterilization processes.

Seattle Steam’s steam generating operation had been modernized several times over its history, and in 1996, the company decided a new boiler control system was in order. The project would involve replacing outdated pneumatic controls that were increasingly difficult for plant personnel to maintain.

Seattle Steam had no preconceived notions about process automation technology. However, management viewed reliability as critical and wanted to utilize a PC-based computing platform rather than a proprietary Distributed Control System (DCS). It preferred an open, interoperable, standards-based control system providing the freedom to choose "best-in-class" solutions from different vendors.

Demanding combustion control application

Key to Seattle Steam’s automation project was the need to implement air/fuel cross-limiting control on its boiler operation — a challenging application for most control systems. Cross-limiting combustion control minimizes the chance of a dangerous ratio of air and fuel within a combustion process. This is implemented by always raising the air flow before allowing the fuel to increase, or by lowering the fuel flow before allowing the air flow to drop.

Applying additional dynamic limits to air and fuel set points can increase fuel savings by maintaining the air/fuel ratio within narrow limits during and after transition. This reduces heat loss by protecting against the demand signal making the air/fuel ratio too lean.

For Seattle Steam, cross-limiting combustion control would ensure: better optimization of fuel consumption; safer operating conditions by reducing the risk of explosion; faster combustion characterization setup; improved diagnostics and troubleshooting; and better process visibility.

Control functions handled by field devices

After considering various options, Seattle Steam decided upon a fieldbus-based control system provided by Smar International. The project proved to be one of the first commercial fieldbus installations in North America, and one of the initial implementations of control at the field level.

With the Foundation fieldbus system, cross-limiting control for the boilers is handled entirely by field devices. One differential pressure transmitter measures fuel flow, while another transmitter measures air flow. Each device utilizes standard fieldbus function blocks to implement the control strategy.

The control system employs a unique hardware solution functioning as an interface, linking device, bridge, controller, gateway, fieldbus power supply, and distributed I/O subsystem. Using open Foundation fieldbus and OPC standards, the device integrates all of the hardware and software needed to monitor, control and maintain the steam plant boilers, including intelligent instruments and Human Machine Interface (HMI) software.

The fieldbus controls restored single-loop integrity to Seattle Steam’s operations and minimized the chance of introducing errors into the process. Full redundancy and fault isolation also ensured increased safety and uninterrupted operation. For example, plant operators can turn off their computers, and as long as power is maintained to the fieldbus system, the boilers remain stable.

In addition, Seattle Steam realized significant hardware and installation cost savings by implementing Foundation fieldbus. Compared to traditional single-loop controllers, the fieldbus system reduced I/O requirements and the labor involved in wiring field instruments.

Thanks to Foundation technology, Seattle Steam has a dependable technique for cross-limiting combustion control in its steam plant operation. The fieldbus-based system has performed reliably during many years of continuous operation.
The clear path to optimum control and asset intelligence: extremely reliable instrumentation networked with digital visibility

> Challenge:
I want to select the best field networking technology that will give my plant a competitive edge.

> Solution:
For every opportunity to renew and/or add field installations, Yokogawa recommends FOUNDATION fieldbus™. Our FOUNDATION fieldbus™ solutions provide you with the maximum opportunity to improve your asset utilization throughout the plant life cycle, leveraging reliable instrumentation and predictive digital intelligence.

Intelligent and Stable Field Devices
Yokogawa field devices are FOUNDATION fieldbus™ ready and deliver accurate process measurement and advanced diagnostic information with low installed cost and near zero maintenance. Web-enabled technology allows these devices to continually upgrade their capabilities online.

Integrated Plant Resource Manager (PRM)
Yokogawa PRM enables you to manage your field assets centrally and with ease, integrating device information and device diagnostics information across different protocols and multiple suppliers. Maintenance is made easy and cost effective with PRM watching your assets on your behalf.

CENTUM CS 3000 R3 Fieldbus Host System
Yokogawa host systems are designed to help you harness the true power of FOUNDATION fieldbus™. CS 3000 scales easily from single-node system to a one-million-tag super large system, hosting the wealth of digital field information. The 99.99999% availability track record and Vnet/IP 1GB Ethernet control network brings you a powerful combination of system reliability and openness.

For more information on these products, visit promo.us.yokogawa.com and enter key code AD9601.
Emerson’s DeltaV™ System Enhanced for Abnormal Situation Prevention

Emerson Process Management’s version 8.4 of DeltaV™ system software extends PlantWeb® Alerts to HART® devices and improves FOUNDATION fieldbus device alarming and also includes enhancements to help users prevent abnormal situations.

Conditional alarming has been extended to FOUNDATION fieldbus devices, enabling the devices to deliver critical predictive alarms for immediate attention by operations staff to avoid unplanned downtime. Operators need to know when critical field devices require attention and not be bothered when devices and processes are operating normally. By adding conditional alarming support for analog input, discrete input, and PID function blocks for FOUNDATION fieldbus devices, it is possible to suppress nuisance alarms that interfere with attention to process operations. Configuration of conditional alarms “on” and/or “off” delay times can significantly reduce the numbers of nuisance alarms that are caused by temporary transient conditions. For more on the v8.4 release, visit www.EasyDeltaV.com/version84.

Emerson Process Management • www.EasyDeltaV.com/version84

Fault-Tolerant FOUNDATION Fieldbus Physical Layer Protects Against Single Points of Failures

The TRUNKSAFE™ Fault-Tolerant Fieldbus System from MooreHawke (a division of Moore Industries-International, Inc.) provides a cost-effective and simple way to maintain FOUNDATION fieldbus communications between the DCS and field devices without interruption in the event of either an open-circuit or short-circuit cable fault.

Designed for important and plant-critical fieldbus segments (those that if lost, will cause process unit or plant shutdown), TRUNKSAFE is comprised of two redundant fieldbus DC power conditioners integrated with a specially-engineered device coupler. Together, they substantially increase segment availability since no single point failure will shut down the network. In addition, more than one critical application can be confidently, and economically, implemented on a fieldbus segment. For example, four critical spurs can be driven with one failsafe segment, with only a quarter of the traditional system hardware required.

Other features include auto-resetting short-circuit protection and the company's patented “Automatic Segment Termination,” which eliminates the most common fieldbus installation error: segment failure from under- or over-termination. TRUNKSAFE delivers diagnostic capabilities at every level, including host or field cable open- or short-circuit, low DC output voltage, high segment noise, power status on the trunk, on each spur and the status of auto-termination (ON/OFF).

MooreHawke • www.miinet.com/moorehawke
Rockwell Automation Receives HIST Approval for its FOUNDATION Fieldbus Solution

Rockwell Automation’s FOUNDATION fieldbus solution has successfully completed Host Interoperability Support Test (HIST) testing, providing independent validation of the solution’s capabilities. Rockwell Automation’s FOUNDATION fieldbus Linking Device (1757-FFLD) and RSFieldbus Configuration Software (9308-RSFBxx) extend the distributed process control capability of Rockwell Automation’s Integrated Architecture. With the 1757-FFLD, users have the flexibility to do process control with any Logix processor while employing the advanced capabilities of network-based process instrumentation. The 1757-FFLD includes the unique ability to bridge both FOUNDATION fieldbus HSE and EtherNet/IP networks to FOUNDATION fieldbus H1 device networks. Bridging these networks facilitates information flow between the control layers. Transferred information can include device configuration (such as setup, operation, and diagnostic data) and plant floor process information (such as temperature and flow data).

Rockwell Automation • www.ab.com/networks/fieldbus.html

Yokogawa Introduces Field Device Management Tool

The Yokogawa FieldMate™ Versatile Field Device Management Tool is a new field device management solution operating in a PC/handheld-based environment. FieldMate provides access to parameter configuration for FOUNDATION fieldbus intelligent field devices, regardless of the manufacturer, in addition to legacy field communication protocols such as HART and Profibus. It also enables easy operation for device configuration, diagnostics, and problem resolution, while automatically storing work activity in a traceable field maintenance database. By consolidating work flow maintenance, know-how can easily be shared among users.

FieldMate incorporates a document linkage feature that allows instruction manuals, work orders, and other Windows®-compatible documents to be linked to specific devices for streamlined information access. With its versatility and numerous integrated features, this new Yokogawa PC-based field maintenance solution is a tool that can save time and reduce the complexity of engineering and maintenance tasks — from field technicians to the control systems engineer.

Yokogawa • www.yokogawa.com/iab/vigilantplant/ae/iab-ae-availability-en.htm

ABB’s System 800xA FOUNDATION Fieldbus Device Integration Provides Plantwide Process Improvements

ABB’s System 800xA seamlessly integrates fieldbuses and field devices into the extended automation system environment, enabling system level engineering, operation, and maintenance of field equipment. Its architecture supports process availability requirements with redundancy at all levels and allows for installation of devices in all plant environments, including hazardous areas. Only ABB delivers the extended functionality that gives users the visibility and control they need to run plants more efficiently — saving precious time, resources and money.

ABB • www.abb.com/controlsystems

Gammapilot M FMG60 Provides Level Measurement Under Extreme Conditions

The Gammapilot M radiometric level transmitter is used for level limit detection, continuous measurement, interface layer and density measurement where extreme or critical conditions necessitate the use of a non-intrusive method, e.g. toxicity, abrasion, high temperatures, high pressures, baffles, etc. It uses the latest FOUNDATION fieldbus technology and offers a wide range of standard function blocks such as Integrator, Input Selector, Signal Characterizer, Arithmetic and PID to support the benefits of field-based control loops.

Endress+Hauser • www.endress.com/level

Honeywell Manages Diversity of Fieldbus Project Implementations

Best-in-class project implementations require an integrated approach. Honeywell fieldbus project methods, templates and tools support consistent global project execution, from front-end engineering and design through installation and commissioning, acceptance and lifecycle management. With global skilled resources and best-practice standards, Honeywell implements projects as easily as those for conventional instrumentation. Project sizes range from hundreds to tens of thousands of devices, and applications include refining, off-shore and on-shore oil & gas, boilers, chemical plants and pharmaceuticals.

Honeywell • www.honeywell.com/ps

Invensys’ InFusion Field Device Manager Supports Both FDT and Enhanced EDDL

A key component of the new InFusion Enterprise Control System from Invensys is Field Device Manager — an open toolset to configure, commission, maintain, and diagnose FOUNDATION fieldbus devices throughout their entire life cycle. Field Device Manager provides a comprehensive, fully integrated engineering and maintenance environment and is the first to offer support for both FDT and Enhanced EDDL technologies.

Invensys • www.foxboro.com/FF
F800 Power Supply Gives On-line Diagnostics

On-line diagnostics assist in troubleshooting and commissioning. The MTL F800F Fieldbus Diagnostic Module is a FOUNDATION fieldbus device that plugs into the F800 module carrier and continuously monitors the performance of each of the eight fieldbus segments, providing information on the network health. As a functioning fieldbus H1 device, the diagnostic information integrates seamlessly into any fieldbus control system.
MTL Instruments • www.mtl-fieldbus.com

National Instruments Introduces NI-FBUS Software Version 3.2

The NI-FBUS software version 3.2 includes features such as:
- NDDS 5.0 Support
- EDDL Features
- OPC DA 3.0
- Add Interface Wizard
- Device Property and Image
- .NET Library
- Device Live List
- NI License Manager

NI-FBUS Communications Manager and Configurator are included. The software is free for download; no license activation is required for offline mode.
National Instruments • www.ni.com/fieldbus

Pepperl+Fuchs Offers New Isolated Fieldbus Power Supply

The KLD2-FBPS-1.25.360 isolated fieldbus power supply provides 25 V and 360 mA of supply current with minimal heat dissipation, and supports redundant 24 V power. The individual modules can be mounted adjacent to one another without spacing. The galvanic isolation and passive design make it a highly reliable power supply and an excellent design choice for single segment power needs. The KLD2-FBPS-1.25.360 power supply is part of the FieldConnex® fieldbus installation system and supports the innovative High Power Trunk Concept and Physical Layer diagnostics.
Peppler+Fuchs • www.fieldconnex.info

Smar Offers “Fourth Generation” Automation System

Smar SYSTEM302 is a fourth generation Process Automation System that combines configuration, operation and maintenance with several digital protocols used today, such as FOUNDATION fieldbus H1, HART, Modbus, Profibus, DeviceNet and ASI, utilizing the FOUNDATION fieldbus HSE control network technology.
Features include: Multi-user platform; user access control; version control management; flexible distribution of control and management tasks; secure integrity for project configuration data; Windows®-based users and groups management; integrated database for field device information; smart instrument identification; integrated configuration, operation and diagnostic tools; flexible function blocks for integrated regulatory control and logic; FOUNDATION fieldbus, Modbus, HART, Profibus, DeviceNet and ASI connectivity; HSE host for multiple clients; and asset management.
Smar • www.smar.com

Softing Enables Quick Migration from Existing Architectures to FOUNDATION Fieldbus

Softing’s Fieldbus Kit (FBK) provides the quickest solution to integrate FOUNDATION fieldbus H1 and PROFIBUS PA technologies into new or existing process instruments. The FBK hardware contains the fieldbus protocol software, making it easy to integrate this functionality into existing architectures. In addition, Softing can assist in customizing the software to handle device-specific properties and also can offer training, creation of Device Description files, pre-certification testing, and application support.

TopWorx DXP Connects On/Off Valves in Hazardous Areas

The TopWorx DXP makes it easy to connect automated on/off valves to FOUNDATION fieldbus. The DXP is UL, CSA, and ATEX certified for use in Class I Division 1 & 2 hazardous areas with no seal-off fittings required. The unique modular design allows customers to mix and match a variety of options in a single model. Besides fieldbus networks, other options include GO Switch, P+F, mechanical limit switches, integral low-power pilot valves, and mounting kits to attach to any valve or actuator.
3300 Fern Valley Road, Louisville, KY 40213 USA
Phone (502) 969-8000 – Fax (502) 969-5911
TopWorx • www.topworx.com

TURCK Delivers Connectivity, Interfacing and Sensing Components

TURCK offers a complete range of connectivity, interfacing and sensing components that bring consistency and efficiency to fieldbus installations and gets plants online faster. New and notable products include: IM series isolating modules with slim 18 mm housings providing a wide range of functions necessary for measurement and control applications; a multi-segment FOUNDATION fieldbus power conditioner that provides up to 500 mA of conditioned power to each segment; and Vprox® 773 sensors designed with potted-in cables or quick disconnects for exceptional versatility in both valve and damper applications in locations classified as hazardous. Users can find these and more products by requesting TURCK’s new Process Brochure B4100 today.
3000 Campus Drive, Minneapolis, MN 55441 USA – Phone (800) 553-0016
Application Support (800) 553-0016 – Fax (763) 553-0708
Turck • www.turck.com/process

Yamatake Delivers Hybrid Smart Positioner, SVP3000 Alphaplus

The SVP3000 Alphaplus Model AVP304 obtains a unique function that is realized by hybrid technology. The Model AVP304 adopts two signals — analog and FOUNDATION fieldbus. Users need not worry about positioner selection, since the Model AVP304 can control a valve both by analog signal and FOUNDATION fieldbus signal. The FOUNDATION fieldbus signal is for diagnostic purposes. Remote-type valve positioner, Model AVP204, is also available. The SVP3000 Alphaplus and control valve maintenance support system “Valstaff” provide Stick Slip detection which is a dynamic diagnostic.
Yamatake • www.yamatake.com
The key to interoperability

Electronic Device Description Language (EDDL) is contained in more than 20 million field devices from the world’s leading control manufacturers.

EDDL benefits include:
- Platform Independence
- Ease of Use
- Safe Operation
- Lower Costs
- No Investment Risk
- Scalable Solutions

EDDL – Benefits for all players

To learn more about the benefits of EDDL, visit www.fieldbus.org/eddl.