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In modern industrial plants, valuable assets such as pumps, valves and other installed equipment need to be maintained at certain intervals—i.e. monitored, serviced, refurbished or replaced. Plant asset management assists in determining these intervals through continual asset condition monitoring.

The goal of an asset management solution is proactive rather than reactive maintenance wherever possible. Condition-Based Monitoring (CBM) focuses on optimizing the timing of maintenance. It seeks to avoid unexpected equipment failures on the one hand (too late maintenance) and unnecessary maintenance on the other (too early maintenance).

Unfortunately, some asset management solutions can actually do more harm than good. Operators are frequently overwhelmed by nuisance alarms and alerts that distract their attention from running the process. This situation can result in unnecessary shutdowns, or cause operators to disregard online asset management tools, which, in turn, leads to valid alarms being ignored.

More and more end users are implementing FOUNDATION fieldbus due to its ease in installation and the amount of available information. Fieldbus-based asset management solutions support condition-based monitoring of process equipment, whereby robust diagnostics allow for early detection of the condition of assets. Think of it as true diagnostics, not forensic analysis; the difference being alerts and warnings are sent to the right person before a failure occurs that could have a catastrophic impact on the equipment and/or the process.

FOUNDATION technology has greatly simplified plant asset management by enabling “role-based diagnostics,” meaning the right information is sent to the appropriate person, when they need it, without flooding others in alarms. Fieldbus devices offer greater value than older analog 4–20 mA devices through their ability to indicate data quality — that is, whether signals communicating setpoints, PVs, etc. have good, bad or uncertain quality. This improves diagnosis of equipment problems and helps validate measurement or control actions by field instrumentation.

It is helpful to think of a FOUNDATION fieldbus diagnostics alert as a “check engine” light on an automobile. The technology’s diagnostic features provide an indication that something is wrong with a particular device, as well as a standardized way to interpret and apply this information for maintenance and repair purposes.

Per the NAMUR NE107 recommendations, FOUNDATION fieldbus facilitates routing of alerts to appropriate personnel based on user-selectable severity and priority categories. It also includes a standard and open interface for reporting all device alarm conditions. In addition, fieldbus diagnostics provide recommended corrective actions and detailed help, as well as an indication of the overall health of the device.

Thanks to FOUNDATION fieldbus, industrial facilities can avoid wasting money and resources on irrelevant or ineffective asset management strategies, and can take the appropriate control or maintenance actions when they are truly needed. Plant personnel are able to make better decisions, in less time, and save or extend the life of valuable assets.

All the best,

Richard J. Timoney
President & CEO
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2010 General Assembly: Fieldbus Gains Ground In A Tough Economy
Houston event attracts end users adopting FOUNDATION automation infrastructure

Bechtel's Dave Brown Discusses High Speed Ethernet
Control industry veteran offers insights on HSE for control in the field

ARC Study Examines Benefits Of Control In The Field
New white paper discusses value proposition of fieldbus-based controls

HSE: Key to CIF Strategies For Improved Plant Automation
Distributed architecture via linking devices provides true networked solution

New DSP Program Supports Fieldbus Product Development
Participants offer tools and services for bringing innovative equipment to market

Emerging Global Markets Reveal Demand For Fieldbus Solutions
From the Middle East to Latin America, plants choose FOUNDATION technology

Bill Tatum, Foundation Marketing Manager, Speaks At ABB Event
Workshop offers look at tomorrow's generation of digital communications

Digital Integration Delivers Smart Mill Benefits To Celulosa Arauco
Environment, safety, and quality goals realized in unusually successful start-up

FEATURES
The Fieldbus Foundation’s 2010 General Assembly, held March 24-25 at the Houstonian Hotel in Houston, Texas, provided strong evidence that FOUNDATION fieldbus is advancing as the automation architecture of choice in the process industries — even in today’s tough economy. Attendees from around the world took part in the event, which featured presentations by leading experts in FOUNDATION technology.
Houston was a logical choice as the site for this year’s General Assembly, since the U.S. Gulf Coast region is one of the most developed markets for FOUNDATION fieldbus, and is regarded by many as the central hub of the process automation industry in North America.

**Focus on asset management**

Based on the theme “FOUNDATION Fieldbus – Asset Management Made Easy,” the 2010 General Assembly included a comprehensive, end user-oriented agenda consisting of fieldbus project case studies and tabletop exhibitions. Technical sessions highlighted the advantages of FOUNDATION fieldbus as a solution for improving plant asset management, reliability and economic performance.

The latest FOUNDATION technology developments, including FOUNDATION for Safety Instrumented Functions (FF-SIF), control in the field, field diagnostics, and wireless, are designed to meet the business needs of process industry plants coping with a lingering recession and decreased product demand.

The General Assembly program on Wednesday, March 24th, provided updates on Fieldbus Foundation activities around the world. In addition, a diverse group of automation end users described their successful experiences with FOUNDATION technology in process control applications. The day concluded with a welcoming reception for all attendees.

The Fieldbus Foundation conducted its annual business meeting for members on Thursday, March 25th.

**Reliance executive delivers keynote**

The General Assembly keynote address was delivered by B.R. Mehta, senior vice president, Reliance Industries Ltd., who

Attendees from around the world took part in this year’s General Assembly, which featured presentations by leading experts in FOUNDATION technology.
described the installation of FOUNDATION fieldbus at the new Jamnagar Refinery & Petrochemicals complex in Jamnagar, Western India. Mehta serves as chairman of the Fieldbus Foundation’s End User Council-India and is a member of its End User Advisory Council (EUAC) worldwide. In addition, he is chairman of the Instrumentation Experts Club in Mumbai, India, and sits on the Board of Governors for Automation 2010 — India’s largest industrial automation exhibition and conference, planned for September 21-24 in Mumbai.

During his keynote address, Mehta described how Reliance Industries sought to deploy a world-class control system utilizing the latest technology to achieve operational excellence at the Jamnagar refinery complex. This facility, which is recognized as the largest refinery installation of FOUNDATION technology to date, is India’s largest private sector enterprise. The Jamnagar operation has a production capacity of 580,000 barrels per day (bpd), and together with Reliance’s neighboring 660,000 bpd existing refinery, forms the world’s largest refining complex with a 1.24 million bpd capacity.

Mehta said, “As part of the Jamnagar Export Refinery Project (JERP), our goal was to create next-generation control systems utilizing the rich intellectual property of our refining process, coupled with the latest automation technology, in order to achieve operational excellence unparalleled in the world. In particular, the mission of process automation was to provide operational excellence in monitoring, controlling, and managing the process and the business; and to achieve an optimal level of integration between process control, operation support, and business support systems.”

He continued, “In seeking the optimal plant control solution, our team of experts from operations, maintenance and projects visited all major DCS vendor technology laboratories, as well as various end user sites in China. We also considered references from other major petroleum industry companies in terms of technology advancement. In the end, we concluded that FOUNDATION fieldbus is a well-proven automation platform, which is non-proprietary, open and interoperable, and involves continuous supplier innovation. The FOUNDATION infrastructure is vendor-neutral and standards-based, and provides
A number of major plant automation suppliers exhibited their Foundation fieldbus products and services at the Fieldbus Foundation’s 2010 General Assembly.

Emerson Process Management showed how it has used enhanced Electronic Device Description Language (EDDL) technology to implement “Device Dashboards” for its AMS Suite: Intelligent Device Manager platform. According to Emerson, these dashboards significantly improve productivity while configuring and diagnosing Foundation fieldbus devices. Also on display was Emerson’s 475 Field Communicator — an intrinsically safe field configuration tool for HART and Foundation fieldbus.

MooreHawke, the fieldbus division of Moore Industries, showcased working demos of their fieldbus physical layer products. This included TRUNKSAFE, the industry’s first redundant Foundation fieldbus physical layer. TRUNKSAFE provides a cost-effective, yet highly reliable strategy to maintain continuous communications between field devices and a host system in the event of any single point failure (such as open or short circuit). MooreHawke also displayed their TRUNKGUARD family of fieldbus device coupler and power conditioner physical layer components.

MTL Instruments demonstrated two new advancements for connecting Foundation fieldbus segments in hazardous locations. The introduction of power supply redundancy for MTL’s Fieldbus Intrinsically Safe Concept (FISCO) networks now allows the technique to be used in applications requiring the highest levels of system availability. For “High Energy Trunk” applications, the new 9370-FB Fieldbus Barrier supports long trunk cable lengths and heavily loaded segments, while making major improvements in safety and ease of maintenance.

Yokogawa demonstrated its CENTUM VP 4.02 with Asset Management solution PRM (Plant Resource Manager) with Foundation fieldbus devices such as EJX910, YTA320, YVP and ADMAG with FieldMate. CENTUM VP 4.02 provides commissioning innovation to reduce engineering time for Foundation fieldbus segments, which includes parameter validation check and multiple segment download. PRM with predictive diagnosis capability improves Foundation devices availability, and FieldMate on Tough-book provides simplified field device configuration and calibration for maintenance.

end users with a common framework to implement and manage the most advanced control strategies.

“Our (Reliance) specifications are now based on Foundation fieldbus, and so far our experience in handling this technology has been very good,” Mehta added. “Based on the feedback received from other plants worldwide, we believe the major benefit of the Foundation solution is in asset management. Our next goal will be to get maximum benefit out of our fieldbus installation and take full advantage of our control system capabilities.”

For more information on Mr. Mehta’s presentation, please visit http://forums.fieldbus.org.
Bechtel’s Dave Brown Discusses High Speed Ethernet

Control industry veteran offers insights on HSE for control in the field

When it comes to implementing FOUNDATION fieldbus for industrial process control, few engineers have more first-hand experience than Dave Brown. From his initial exposure to the technology while working for a major DCS supplier in the early 1990s, to his current position as control & automation engineering specialist with Bechtel Corporation, a leading global engineering and construction firm, Brown has witnessed the continued growth of FOUNDATION fieldbus throughout the process industries.

In this issue of Fieldbus Report, Dave Brown recalls the development of FOUNDATION fieldbus over his lengthy automation industry career. He provides key insights on the implementation of FOUNDATION High Speed Ethernet (HSE), and describes the results of a comprehensive test project evaluating HSE as a solution for control in the field.
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Rigorous testing at the Bechtel laboratory in Houston, Texas, confirmed the speed and robustness of a Foundation fieldbus control system utilizing HSE.

Fieldbus Report: How did you first become involved with Foundation fieldbus?

Dave Brown: I got started with the Fieldbus Foundation’s technology back in 1992 as an employee of Emerson Process Management. I was in the engineering part of the company, dealing with a lot of field issues. This led to my involvement on some of the early H1 fieldbus beta tests. John Berra of Emerson asked if I would put a team together to study the use of Foundation devices and determine what we needed to do to prepare for adoption of this technology.

FR: What did you learn from your studies?

Brown: At the time, we found that over 90% of the end user issues with fieldbus were related to installation. Our evaluations showed that the control industry needed to do a better job of educating users on how to install and operate fieldbus devices. Plant personnel required a better understanding of wiring and grounding, as well as the importance of resource and transducer blocks, microcycle times in loading, and so forth.

FR: When were you initially exposed to HSE?

Brown: By 2001 or 2002, HSE was clearly positioned as the next step in Foundation fieldbus development. The Foundation automation architecture employs the H1 bus for connection of two-wire field devices, and the high-speed HSE bus for optimization of network design and connection of complex devices such as analyzers, PLCs, remote I/O (for conventional device integration) or other devices, which are independently powered.

At the time, however, there weren’t any actual HSE systems up and running. This made it difficult to do the necessary testing out in the field. Nevertheless, we certainly recognized the potential of HSE technology for plant enterprise integration.

In 2007, I joined Bechtel Corporation, and by then, fieldbus had really taken off across the industry. Bechtel worked on a couple of major fieldbus projects that allowed me to learn a great deal about fieldbus-based control strategies beyond just H1.

Most recently, I participated in a project for a customer in the natural gas industry that evaluated methods for integrating a Foundation fieldbus system from the field level with H1, up to the control backbone with HSE. This included all of the H1 interface cards used to tie field instrumentation to the HSE bus, and then into the Distributed Control System (DCS).

FR: What were the steps involved in this testing?

Brown: The evaluation was performed at Bechtel’s test lab in Houston, Texas. We assembled a project team that included
our own in-house personnel, as well as experienced engineers from the control system vendor and end user organizations.

At the start of our work, we needed to gain an understanding of how the entire FOUNDATION fieldbus control system operated. This was my first chance to take a close look at HSE as part of an overall fieldbus architecture. The project team created a process setup enabling on-wire control on two different H1 segments, with separate H1 interface cards and a controller tied to HSE. We then studied things like bus and loop timing using a bus monitor to validate timing on the individual H1 segments, and on the HSE network.

FR: What did your evaluation show?

Brown: Our tests demonstrated the speed and robustness of a FOUNDATION fieldbus control system utilizing HSE. For example, we examined the timing relationships between control functions on two different H1 segments and found, thanks to the microcycles, that the timing stayed well within acceptable limits. In other words, HSE was almost transparent! The speed and determinism of HSE communications allowed us to do control from segment to segment without any significant problems or timing delays.

In another part of the testing, we wanted to see what would happen to network communications if we created noise on one of the H1 segments. The goal was to connect up to 12 devices per segment without encountering any serious communications problems. We would upload the devices one at a time, download any changes to the Device Description (DD) file, and then start injecting noise.

Our tests verified what we already knew — H1 segments are very robust — but they also showed that noise issues do not affect the upper level of the system with HSE. In fact, HSE acted like an H1 segment in the way that it continued to update data even when there was significant noise or distortion on the segment.

Based on the results of our evaluation, we concluded that FOUNDATION fieldbus systems employing HSE could be utilized for very sophisticated control schemes, with control functions running in the controller, on the wire, or in both locations.

FR: Specifically, how does HSE support control in the field?

Brown: One of the biggest benefits of HSE for field-level control is the elimination of synchronization problems. This also removes some of the burden on the central controller. With other solutions, you must take control from one device segment up to the controller and then back down to another segment — sometimes creating unacceptable timing delays.

Thanks to HSE, control system communications can be established between multiple H1 interface cards without ever having to go to the controller. This minimizes asynchronous times because you have two H1 segments running at a predetermined microcycle time. As such, you
know the scan time and can easily identify the delayed error. By minimizing the need to go from one interface card to another, as well as the amount of time it takes to do so, you can accurately predict what your total controller time is going to be. This is clearly an advantage for users who must deal with deterministic times in their processes.

**FR:** What do these capabilities mean in terms of cost savings?

**Brown:** With point-to-point communications and control in the field, industrial plants can potentially minimize the number of controllers required for a given application, which translates to a reduction in capital equipment costs. They can also lower the costs associated with controller configuration.

In addition, the ability to move control functionality into the field helps plants to reduce their control system footprint — and the maintenance and support costs that go along with it.

**FR:** In your opinion, what is the future outlook for FOUNDATION fieldbus utilizing HSE?

**Brown:** I would say that 65-75% of plant automation projects now incorporate FOUNDATION fieldbus to some degree. Many control engineers have a comfort level with 4-20 mA or even HART, but once they master the installation skills required with a fully digital approach like FOUNDATION technology, their acceptance of fieldbus really increases.

With HSE, industrial plants can take advantage of a cost-effective, Commercial-Off-The-Shelf (COTS) Ethernet-based system that can be shielded for use in the most demanding industrial environments. HSE can also be paired with fiber optics, which allows users to install their controller in one building and a remote cabinet in a second location, with all of the I/O in between. As you can see, this approach is very robust and flexible.

**FR:** Do you believe control in the field with FOUNDATION fieldbus is becoming more prevalent?

**Brown:** A growing number of process plants are recognizing the advantages of moving at least some of their control functions to the field level. For instance, it’s hard to justify putting a controller out in a tank farm when you can do control on the wire. The same holds true for simple level or pressure controls. Eventually, users will move on to more sophisticated applications such as effluent treatment areas, utilities, etc.

I’ve been in the automation industry for more than 40 years, and the progression of FOUNDATION fieldbus is not unlike the path we saw with pneumatics, 4–20 mA and HART. End users may be cautious, but the trend towards adoption of fieldbus technology is very clear.

**FR:** What roles do control system suppliers and their customers play in driving adoption of HSE?

**Brown:** In the simplest terms, HSE is a protocol for effectively getting fieldbus information from Point A to Point B. It’s an open architecture for moving control data from the control system supplier’s high speed network down to H1 using HSE or up to the controller or Human-Machine Interface (HMI). Your DCS vendor can take advantage of this approach, to extend whatever protocol they use.

In my view, control system customers will drive the demand for HSE to extend their control system supplier’s offering. I think it’s only a matter of time before some of the major DCS companies who do not adopt HSE will face losing market share to competitors who fully embrace HSE as an open solution.
A new white paper released by the ARC Advisory Group confirms that Control in the Field (CIF) strategies supported by FOUNDATION fieldbus improve process control performance by allowing for superior reaction to deterministic disturbances in industrial plant operations.
Key to single-loop integrity

In the white paper titled *The Business Value Proposition of Control in the Field*, ARC, a manufacturing research and advisory firm based in Dedham, Massachusetts, describes the incorporation of a function block structure and other supporting functions in FOUNDATION fieldbus providing a complete automation infrastructure for operational excellence. Embedded control functionality in FOUNDATION devices is one of the key enablers for achieving high availability control and a stepping-stone towards single-loop integrity.

Results from testing and real-world applications demonstrate that control in the field with FOUNDATION technology has the potential to deliver a 30 percent improvement in control performance with very fast, fast and medium-speed process dynamics. CIF can also provide up to three-times higher control loop availability than a Distributed Control System (DCS).

Recently, the Fieldbus Foundation’s Europe, Middle East and Africa (EMEA) steering committee commissioned a study by Industrial Systems and Control Ltd. (ISC), a specialized control engineering consultancy with close links to the Industrial Control Centre at the University of Strathclyde, Scotland, which demonstrated the benefits of CIF. The ISC study is referenced in the ARC white paper.

According to Fieldbus Foundation President and CEO Rich Timoney, the new ARC study provides valuable insights for automation end users seeking to maximize the benefits of FOUNDATION technology. He said, “As reported by ARC, FOUNDATION fieldbus provides business value in three key areas — process integrity, business intelligence, and open and scalable integration of information across process manufacturing plants. FOUNDATION fieldbus control in the field ensures tighter control and higher availability. It is a critical element in providing significantly enhanced process integrity for many applications and control loops. This enables process industry end users to increase revenue and profits, which are the drivers for investing in new technologies.”

Timoney added, “Thanks to recent, comprehensive studies of control in the field, end users now have the first definitive proof that FOUNDATION-based CIF strategies yield significant operational improvements, which result in bottom-line business benefits.”
Shell Global Solutions International (SGSI) has performed extensive evaluation of control in the field. A statement by the company indicated, “Control in the field using FOUNDATION fieldbus technology is recommended by SGSI for simple and cascading loops, not for complex loops. Major benefits identified by SGSI are reduced process controller loading, reduced network traffic enabling more loops per segment, as well as very fast loop response.”

**True distributed control**

With control at the device level, process automation functions are truly distributed and there is no single point of failure in the control system above the H1 (field device) level. If there is a malfunction in the Human-Machine Interface (HMI) and a loss of visibility into the process, controllers, or any other component in the system and the control loop, including intelligent field devices, actuators and positioners, and the network, remain unaffected.

Field-level control also enables greater flexibility in plant automation strategies, and controllers are free to handle higher-level control functions such as advanced control and optimization. FOUNDATION fieldbus allows for “dynamically instantiable function blocks,” meaning that function blocks can be activated as needed in different system components. In addition, there is a large library of different block types that can be used aside from basic PID, such as switches, alarms, etc.

Leading control system suppliers, such as ABB, believe that FOUNDATION fieldbus High Speed Ethernet (HSE) is the key to doing control in the field. With HSE running in ABB’s System 800xA, for example, field-level control can be accomplished with devices on multiple segments at the same time. No controller intervention is required to move signals from one segment to another.

According to ARC Analyst Larry O’Brien, principal author of the new white paper, control in the field improves control loop performance due to its ability to offer faster sample rates and shorter latencies in the read-execute-write cycle of control loops. While the advantages of increased integrity, flexibility and reliability can be attributed to all control in the field loops, control loop performance benefits can be most significant in fast process loops, including many flow and pressure loops and some temperature, pH, position and speed loops. The improved flow and pressure control provided by control in the field means that the performance of slower loops could also be improved because of the complex interactions of control loops in process plants.

**Improved process performance**

In the first of a series of simulation studies, titled *Control in the Field: Analysis of Performance Benefits*, ISC examined the differences in timing and sequencing associated with control in the field with a fieldbus system versus a fieldbus system employing control in the host (DCS) to establish typical latencies and sample rates that limit control performance. Many different scenarios and process dynamics were tested.

As described in the ARC white paper, ISC found that in typical fast process applications, control in the field provides improved performance over control implemented in the DCS. Improvements in response time of between 10 and 30 percent were recorded, in addition to improvements in disturbance rejection of up to 20 percent.

The white paper concludes that the performance improvements of control in the field must ultimately be linked to a business value proposition, which is the measure of value for the implementation of any new technology in the plant. Additional benefits above and beyond control performance include reduced product variability, faster and easier grade changes, reduced time to startup, increased availability, and greater energy savings.

To download a free copy of the ARC white paper, *The Business Value Proposition of Control in the Field*, please visit the Fieldbus Foundation’s website at www.fieldbus.org.
HSE: Key to CIF Strategies For Improved Plant Automation

Distributed architecture via linking devices provides true networked solution

Among the major suppliers of process automation systems, few companies have taken a more active role in the implementation of **FOUNDATION** fieldbus High Speed Ethernet (HSE) than ABB. The company developed one of the first HSE linking devices registered by the Fieldbus Foundation in June 2001. It was also among the initial suppliers to register an HSE-compliant host system in April 2009.

ABB was recently selected to take part in a comprehensive testing project to evaluate the suitability of **FOUNDATION** HSE, as implemented for Control in the Field (CIF), for a major process industry end user.

Mark Taft, ABB Group Vice President, Control Systems Business, and Fieldbus Foundation board member, said his company’s selection of HSE for its **FOUNDATION** fieldbus networking structure was driven by the benefits the technology brings to customers. “HSE provides opportunities for peer-to-peer communication between field devices on different H1 segments without the need to route through a process controller, as well as multiple controller access to field devices,” commented Taft. “These latest test results showing the true robust nature of the infrastructure are a great validation of our selecting HSE as the best way to implement **FOUNDATION** fieldbus.”

Taft continued, “Having made the choice to use HSE, it has proven to be a key component of our plant level network strategy demonstrating the Power of Integration that System 800xA can offer. Along with other Ethernet-based protocols like ModbusTCP, IEC-61850 for electrical integration, and our latest offerings, PROFINET and DeviceNet using Ethernet/IP, we are able to offer end users their choice of networking protocols.

“The benefits to the customer are two-fold. First is the ability to have a single, unified network design for distributed I/O and control using the features and benefits of Ethernet. This is a single network for all protocols, and if built from a fiber component base, one that is immune to much of the electrical noise that can plague copper-base wiring systems in process facilities. Second is that Ethernet easily overcomes most of the distance issues that can be present with normal wired solutions. Widely distributing a common Ethernet network really does reduce wiring — the original benefit often touted for **FOUNDATION** fieldbus — by reducing all of the segment home runs to one Ethernet network.”

ABB Sales Support Engineer, Control Systems, Steve Walker, described his company’s role in the recent HSE testing. “For the **FOUNDATION** fieldbus test program, we implemented a control system utilizing HSE via linking devices designed to connect H1 segments in either a single or redundant configuration. This approach makes it possible to distribute linking devices across the plant with HSE as the network backbone. It also saves on the cabling expense of running H1 segments to the control room,” said Walker. “The use of **FOUNDATION** fieldbus back-up Link Active Scheduler (LAS) functionality in field devices, as well as redundancy at the HSE bus and supervisory device, ensures a high degree of system integrity. Field instrumentation can be integrated by importing standard DD and CF files as provided by registered fieldbus devices.”

According to Walker, **FOUNDATION** fieldbus control platforms fully implementing HSE provide a true networked solution, which allows the process owner to design an overall control infrastructure that reflects both the functional and geographic requirements of the process. This differs from a system design dictated by connecting individual H1 segments directly to controllers. Additionally, an HSE-based solution provides options to deliver redundancy further into the field environment for critical applications, and offers reliable visibility of field control even during those rare times when controller hardware fails.

“Our experience shows that a **FOUNDATION** fieldbus system can actually be less expensive to deploy than a comparable HART system,” said Walker. “That’s because **FOUNDATION** fieldbus with HSE is easily made remote, so that the user is not required to bring the entire control platform out to the H1 devices. Plus, the use of fiber optics makes it easy and cost-effective to undertake large fieldbus installations.

He added, “The **FOUNDATION** HSE solution also simplifies the implementation of control functionality at the field level. Device data can be communicated across the HSE backbone and sent down different H1 segments — regardless of the distance.

For more information, please see the ABB white paper titled *Benefits of FF HSE with System 800xA*, which can be found on the “Technology Articles” tab at [www.controlglobal.com/knowledge_centers/abb](http://www.controlglobal.com/knowledge_centers/abb).
Yokogawa’s InsightSuiteAE service solutions show you how to operate your plant assets at optimum efficiency while keeping maintenance costs to a minimum.

One such solution is field digital baseline tuning. With this service, we can help you maximize the effectiveness of your FOUNDATION™ fieldbus devices by making all asset conditions clearly identifiable at a glance, improving asset availability, and enabling a planned, predictive, and condition-based maintenance (CBM) approach.
The Fieldbus Foundation created its new FOUNDATION Developer Services Program (DSP) to help automation suppliers around the world advance their FOUNDATION product development efforts. The program provides a wide range of technical support making it faster — and easier — to bring fieldbus equipment to market.
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A growing number of Fieldbus Foundation members want to enter the expanding Fieldbus technology market. However, some organizations may view fieldbus device development as a daunting task. Due to limited resources, they may be required to outsource a portion of the development process. This is where the Foundation DSP solution steps in.

Who was DSP designed for?
The Foundation DSP Program is intended for companies preparing to design and manufacture products employing Foundation technology. All Fieldbus Foundation Class A-G members with an active IP license are eligible to participate in the program. The term for qualified participants is three years and membership is renewable for three-year periods. Services that can be qualified in the DSP include H1 device services, High Speed Ethernet (HSE) device services, and host system services. More services may be added in the future.

Thanks to Foundation DSP, Fieldbus Foundation members have access to an elite group of development services providers with the know-how to make fieldbus solutions a reality. Qualified DSP participants can be trusted to have the tools, training and experience necessary to assist on a wide range of Foundation fieldbus development projects.

3. Competency. All technical staff related to DSP service offerings must have either:
   a) Attended the Foundation’s Advanced Technical Workshop in the last three years or,
   b) Actively participated in relevant foundation specification development, validation, or other working groups, teams or committees.

4. Policy and procedures. One person from each Foundation DSP project team must attend a presentation on Fieldbus Foundation policies and procedures.

5. Case study. Qualified developers must provide at least one case study for services delivered in the last three years, relating experience in each service offering to be provided under the DSP program.

6. Customer references. DSP participants must also provide at least three references for relevant services delivered in the last three years.

How to learn more
Foundation DSP participants and their development tools and services will be featured in a special section of the Fieldbus Foundation’s website (www.fieldbus.org), as well as in a forum designed specifically for the program. Participants are also authorized to display the official DSP logo in their marketing materials, and will receive discounts on Foundation DSP training and consulting services.

To learn more about the Foundation DSP Program, please contact the Fieldbus Foundation at 512.794.8890 or e-mail member.services@fieldbus.org.
Emerging Global Markets Reveal Demand For Fieldbus Solutions

From the Middle East to Latin America, plants choose FOUNDATION technology

By empowering both suppliers and end users, FOUNDATION fieldbus has achieved a growing adoption rate throughout the automation market. The installed base of FOUNDATION technology has reached record levels with hundreds of thousands of fieldbus systems, and millions of devices, currently in service around the world.

In emerging global markets, adoption of FOUNDATION fieldbus is exceptionally diverse. The list of current end users includes, among other leading companies, Shell, Saudi Aramco, Gazprom, NAM, Sonatrach, Sasol, BASF, Bayer, and Evonik Degussa.
FOUNDATION technology has been implemented in a number of large Greenfield projects throughout the Middle East and Commonwealth of Independent States & Baltic States (CIS&B). In addition, there is growing interest in fieldbus across the African continent, with significant installations found in Egypt, Angola, Nigeria, Algeria and South Africa.

In Western and Eastern Europe, more and more Brownfield projects involving FOUNDATION technology are being undertaken in the oil & gas, chemical, and pulp & paper industries.

Path of technology growth

FOUNDATION technology attracted early adopters in the U.S. refining industry during the 1990s, and has since gained a strong acceptance in European pharmaceutical plants, South American oil & gas operations, Asian chemical complexes, and developing areas worldwide.

Today, fieldbus projects in the Middle East, Asia/Pacific, South America and other emerging industrial markets account for a large percentage of the technology’s total installed base.

In the Asia/Pacific region, for example, FOUNDATION technology is recognized as the de-facto industry standard among major oil & gas and petrochemical producers. China has several of the largest FOUNDATION fieldbus installations to date, including multiple sites with over 15,000 registered devices in service.

Emerson Process Management recently won a contract to apply its PlantWeb® digital plant architecture with the Ovation® expert control system at the Pingdingshan Luyang coal-fired power plant in China’s Henan Province. This project will be the first large-scale implementation of the PlantWeb architecture utilizing FOUNDATION fieldbus in a Chinese power plant.

In addition, Microcyber Inc. has implemented a FOUNDATION-based Distributed Control System (DCS) at the Tianjin Conducted Coking coal plant in China using H1 fieldbus technology.

Demand for FOUNDATION technology is also increasing rapidly across the Middle East and Africa. Major installations, including grassroots and modernization projects, have been undertaken at hydrocarbon processing facilities from Oman and Qatar to Saudi Arabia and Bahrain.

MTL’s Fieldbus Intrinsically Safe Concept (FISCO) power supplies have been selected for installation on the first production, storage and offloading vessel (FPSO) for the Angola “Deepwater” program. FOUNDATION fieldbus was the operator’s preferred instrumentation technology for current and future FPSOs on the Deepwater field.

Increasing organizational support

To facilitate end user implementation of FOUNDATION fieldbus, Fieldbus Foundation-sponsored marketing societies and End User Councils (EUCs) have now been established in many of the world’s largest industrial centers.

In Singapore, for instance, the Fieldbus Foundation Marketing Society Singapore (FFMSS) has actively supported both existing and prospective implementers of FOUNDATION technology since 1997 through its program of events specifically tailored for the end user and engineering contractor — including end user seminars, road shows, participation at trade shows and exhibitions.

In Japan, leading companies like Yokogawa have contributed to the success of the Fieldbus Foundation’s End User Council-Japan (EUC-J). Yokogawa participated in Diagnostics Practices, an activity of EUC-J, at the FOUNDATION fieldbus training site at Waseda University in Tokyo. The company contributed its CS3000 Distributed Control System (DCS), Plant Resource Manager (PRM), and various field devices for the demonstration system.

The Fieldbus Foundation Middle East Marketing Committee (FFMEMC) was formally established in 2004, and recently the group staged its fifth annual “Multaqa” gathering in Qatar for the region’s automation user community. It is planned that Multaqa will continue on a bi-annual basis in different countries across the Middle East. The next event will be held in Abu Dhabi in 2011.

The Fieldbus Foundation Southern Africa Marketing Committee (FFSAMC) was launched in 2007, and is committed to promoting an increased awareness and adoption of FOUNDATION fieldbus technology within the Southern African region through promotional activities and a range of end user-focused events.
Bill Tatum, Foundation Marketing Manager, Speaks At ABB Event

Workshop offers look at tomorrow’s generation of digital communications

The Fieldbus Foundation’s marketing manager, Bill Tatum, will present *Foundation Fieldbus: Beyond the Industry Standard*, at ABB's Automation & Power World 2010 customer event, to be held May 18-20 in Houston, Texas.

Last Spring, amid the worst recession in a generation, more than 3,000 automation professionals from 40 countries and several industries learned from experts by attending this event.

This year, Automation & Power World will include over 400 educational workshops and hands-on training sessions as well as 100,000 square feet of exhibits dedicated to automation, manufacturing and power solutions.

By participating in Automation & Power World, end users will have the unique opportunity to learn about and compare the different digital and analog communication protocols. The Fieldbus and Wireless Technology track provides an overview of the information required to optimize the application of fieldbus technology. Topics to be covered in this track include:

- Overview and comparison of HART, Foundation fieldbus, and PROFIBUS (WCS-150-1A)
- FDI: A universal solution for device integration (WCS-144-1)
- Fieldbus and device integration with System 800xA (WCS-125-1)
- Designing fieldbus systems (WCS-116-1)
- FDT: The powerful choice for device integration (WCS-123-1)
- Foundation fieldbus: Beyond the industry standard (WCS-124-1)
- PROFIBUS and PROFINET: An introduction (WCS-155-1)
- Wireless and asset management for industrial use (WIN-113-1B)

In his workshop, Bill Tatum will train attendees by providing a look beyond basic process automation, to tomorrow’s generation of digital communications. Attendees will gain an understanding of where Foundation fieldbus is headed with regards to advanced NAMUR NE107 diagnostics, Safety Instrumented Functions (SIF), wireless technology and remote I/O.

Anyone working with Foundation fieldbus or budgeting for fieldbus-related projects, including system engineers, plant operators, system integrators and plant managers, can benefit from attending this workshop.

To learn more, or to register for the event, please visit [www.abb.com/a&pworld](http://www.abb.com/a&pworld).
Digital Integration Delivers Smart Mill Benefits To Celulosa Arauco

Environment, safety, and quality goals realized in unusually successful start-up

Various Contributing Authors, Celulosa Arauco Nueva Aldea (see page 30)
Ricardo Mirkin, Project Manager, Emerson Process Management

More than 3,000 FOUNDATION fieldbus devices help automate a “smart” pulp mill in Nueva Aldea, Chile.
To compete in the global pulping industry, pulp manufacturers need world-class mills producing high quality pulp efficiently and reliably. Profitability is challenging as material costs rise, along with energy and transportation costs. The environment must be protected, leading to ever-stricter environmental and other regulations.

Celulosa Arauco has chosen to meet these challenges head-on by turning to digital automation as it builds the world’s largest Smart Mill in Nueva Aldea, Chile, capable of producing 856,000 air-dried tons of Kraft cellulose per year. The digitally integrated mill got off to an unusually successful start, achieving 93.6% of targeted production in its first six months of operation, on a monthly basis, and have since ramped up to full production according to plan.

A key factor in the mill’s success is the use of the latest digital architecture and bus technology, which contributed to the fast startup and continues to provide predictive diagnostics that prevent problems long before they lead to shutdowns. “The plant automation technology used on this project has enabled us to improve safety and reduce emissions,” said Gunars Luks Guzman, Mill Manager at Nueva Aldea. “We’ve also managed to maintain production at the targeted levels. I’m proud to have been a part of this project.”

Celulosa Arauco is one of the world’s largest forestry companies measured by plantation area and production of Kraft wood pulp and sawn timber and wood panels. The company has combined annual capacity of approximately 3.1 million metric tons of bleached and unbleached Kraft pulp. Its 610,000 hectares constitute the largest holding of forest plantations in Chile.

The pulp mill is actually phase two of the Nueva Aldea project. Phase one, consisting of a wood processing plant that includes a sawmill and plywood manufacturing plant, was put into operation at the end of 2004. Of the total project cost of $1.4 billion, $150 million was spent on phase one, $850 million was invested in the pulp mill, and $400 million on forestry and other indirect items. The mill includes two fiber lines, one for radiata pine and the other for eucalyptus.

The mill has brought many jobs to a region of high unemployment. An average of 3,300 people were working on site during the construction of the pulp mill and the entire project will provide permanent employment for 1,200 people including 200 at the pulp mill.

Environment, safety and quality are top goals

“The three most important goals of this plant are the protection of the environment, safety of our employees, and production quality,” Luks said. Arauco chose equipment that complies with the Best Available Technologies (BAT) directive of the European Union, which is required for pulp mills operating in Europe as of September 2007. Safety and environmental concerns have also led the plant to obtain ISO/IEC 14000 and 18000 auditing and certification. Underlining its environmental commitment, the plant pioneered in performing tertiary treatment of its effluent stream, which is carried out by only five other pulp mills in the world.

The Nueva Aldea mill also includes a biomass power plant, which generates 30,000 kilowatts of electricity and supplies power to the local electrical grid as well as the mill. The biomass power plant is expected to reduce greenhouse gas emissions by a approximately 2.2 million tons of carbon dioxide through 2025. The United Nation’s CDM Executive Board has issued approximately 240,000 tons of certified emissions reduction (CER) credits for the project, representing the CO₂ equivalent saved each year.

Technology selection

Automation strategy is critical to the Nueva Aldea plant. The plant’s management selected Emerson Process Management’s PlantWeb™ digital plant architecture and DeltaV™ digital automation system with the objective of achieving safety, environmental compliance, quality and throughput. Training, simulation, startup and commissioning were managed through Emerson and Arauco teamwork.

“The whole plant from beginning to end was automated — from the moment we feed the logs into the chipper until a bale of pulp emerges at the end,” said Alejandro Erazo, Distributed Control Systems Project Engineer for Arauco. “Our objective was to use the most modern technology in the market and use it in the best way possible, to make each part of the project easier, from engineering to configuration to startup throughout the plant.”

Mauricio Quintana, Systems Supervisor added, “The fact that the automation system is built for digital bus technology allowed us to interconnect several types of networking protocols.”

A key factor in the mill’s success is the use of the latest digital architecture and bus technology.
for instance, was used for all the instrumentation, comprising the world’s largest pulp mill installation of this technology. We used DeviceNet for motor control center, motor controls and other devices. Profibus was used for discrete remote I/O points and also to interconnect many PLCs.”

**Complete digital automation solution**

Emerson automation and service experts from Argentina and Chile worked with Celulosa Arauco to provide a completely integrated digital solution: Emerson wrote a Functional Description Specification (FDS) for managing the automation of the project; Arauco delivered the FDS to vendors who returned their digital configuration data for entry into the system’s database. This proved valuable in efficiently integrating the work of a number of suppliers.

Emerson supplied the Smart Mill infrastructure built around its PlantWeb digital architecture and FOUNDATION fieldbus networking. The solution integrates 3,300 FOUNDATION fieldbus devices including flow, level, pressure and temperature instruments, valves, and with digital valve controllers. Predictive diagnostics information is collected from intelligent devices throughout the mill by predictive maintenance software, which delivers alarms and data to operations and maintenance personnel.

In this completely integrated mill, the architecture and its digital system control include more than 2,100 Rockwell E3 and E3+ motor control centers (MCCs) through DeviceNet, more than 3,500 discrete remote I/O points through Profibus DP, and more than 340 variable speed drives through Profibus DP. The DeltaV system also interfaces with more than 15 programmable logic controllers (PLCs) through Profibus DP and special analyzers through Modbus. Emerson also provided FOUNDATION fieldbus consulting, standard definitions, and automatic database generation and other services.

A Microsoft Access application was developed to provide output for configuring the digital automation system directly through an ODBC connection. Information on all system I/O interface cards, FOUNDATION fieldbus cards and devices, Profibus devices, DeviceNet devices, and single I/O channels was captured in the application. Indexing and integrity checking was performed to detect possible errors and loss of data.

A simple form provided the ability to assign I/O interface cards according to availability of their respective carrier slots. Once the I/O slots were loaded, the form was used to allocate FOUNDATION fieldbus, Profibus or DeviceNet segments to available interface ports. A subform showed the list of devices attached to any selected segment. With all the buses assigned to corresponding I/O card ports, the final step was to create tables for bulk export to the DeltaV digital automation system.

The application provided the option to select which type of objects to import into each particular process. Special reports were created for hardware integration and system configuration. Other reports with more detailed information such as physical location for each signal in control cabinets,
device settings, instrument ranges, alarms, etc. were used for software configuration.

This automated approach to the database generation greatly reduced the amount of time required for configuration, resulted in an error-free database population, and provided a source of information that was re-used for documentation and training, simulation, and test sheets.

**Digital technology speeds configuration and startup**

“A very good example of the benefits of digital bus technology is provided by the intelligent motor control configuration,” Erazo said. “In previous projects where we had no intelligent motor controls, configuration of a complete Motor Control Center for 30 motors could take two weeks to one month. Now it takes just half a day to do the same job.”

“Configuring a valve is also much faster than before. On previous projects, we could spend up to half a day trying to get a valve to move to the chosen setpoint as part of the calibration process. Today, all we have to do is press a button and it self-calibrates. If a problem ever occurs with the valve we can get the diagnosis immediately. By using FOUNDATION fieldbus and the diagnostic capabilities of the predictive maintenance software, we can quickly determine whether the problem is with the actuator or the transmitter, or if it’s only a calibration problem.”

“A key advantage of the predictive maintenance software is the amount of information it provides,” said Juan Jorge Cáceres, Maintenance Manager. “It tells us the state of calibration and if there is a malfunction, such as an actuator problem in a valve, so that we can fix it before it forces us to shut down parts of the plant. The advanced diagnostics also help us prevent damage to the environment and increase the utilization of the plant.”

Erazo added: “Digital bus technology makes it possible to do our diagnostic and often our repair work from the main control areas rather than on the ground. Wireless networks enable our technicians to go all over the plant with their laptops, testing equipment much faster than in the past. We had practically no errors in the digital automation system and we started up the plant successfully and quickly. The wide use of technology made configuration of the plant easier.”

To further ensure a smooth startup, Emerson performed off-line testing using complete high fidelity simulation with the system to validate operations and configuration, and to familiarize operators.

We checked all the logics programmed in the digital system for the different areas, area by area, together with the vendor of the associated machine,” said Erazo. “We did it by simulating the real process in the plant, so that we could be 100% certain that the logic was good and we wouldn’t have any problems during start-up.

In addition to simulator training, operators found consoles easy and intuitive. “I didn’t take a training class on how to operate with the system but it turned out not to be necessary,” commented Marcos Vidal, Superintendent in the mill’s liquor area.

“That’s because the system is very easy
to operate. It’s very similar to Windows. Built-in diagnostics make it easy to detect and determine the cause of problems.”

**Project has met its goals**

“Our priorities are the safety of our people, the environment and production,” Quintana said. “The system, along with all the associated connectivity tools, diagnostics, smart controls, etc., has helped us achieve these goals. The system is open and provides a wide range of connectivity so in the future it will allow us to continue developing and expanding, and taking advantage of the communication standards in the market.”

“Start-up at Nueva Aldea went according to plan,” Luks said. “From the beginning of the project we began to plan the installation of the equipment from the point of view of risk matrices. We assessed all the risks that each stage of the operation could face, from receiving and start-up to production at the factory. This created a level of concern and attentiveness that has made it possible to operate not only without major accidents but practically without any incidents at all to speak of.”

“We adopted a gradual start-up curve that meant we had control of the processes at all times, maintaining as top priority personal safety and environmental protection, and we were able to achieve our goals,” continued Luks. “Our environmental performance is so good that we will soon be able to generate additional revenues by entering the carbon offset market. The equipment and control technology used have helped us achieve prime quality from the first days of plant operation.”

“The plant is designed to turn out 856,000 tons of cellulose a year,” Luks concluded. “By April, we reached 93.8% of that target, on a monthly basis. Digital technology has helped us reach this production level while maintaining the safety of our people and of the environment. As with all projects, this one demanded much dedication and energy on the part of all the participants. It was a pleasure to work with each and every one of them. Despite the huge scope of this project, it was completed on time largely due to the great support we received. Pulp production was at 93.8% of target full capacity within six months of start-up.”

“Following the very successful start-up, we have continued to increase our output in a sustainable way, allowing Nueva Aldea to become a development pillar for the entire region.”

Celulosa Arauco Nueva Aldea

**contributing authors:**

Juan Jorge Cáceres, Maintenance Manager

Alejandro Erazo, Arauco Engineering Department, DCS Project Engineer

Marco Vidal Cruz, Operations Superintendent, Liquor Area

Mauricio Quintana M., Supervisor, Systems Accionamientos

Gunars Luks Guzman, Mill Manager

An effective automation strategy is critical to the Nueva Aldea pulping operation.
Conventional process control withholds valuable information. PlantPAx turns it into intelligence.

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NEW YOKOGAWA LOW-POWER AUTONOMOUS CONTROLLER KEY FOR REMOTE ASSET MANAGEMENT

The new STARDOM low-power autonomous controller FCN-RTU from Yokogawa Electric Corp. is a key for remote asset management. Registered as Integrated Host Class system, it brings FOUNDATION fieldbus to remote applications where infrastructure is inadequate and conditions are inhospitable and hazardous. FOUNDATION technology enables diagnosis and calibration of devices from the centralized location, which lowers operation expenditure (OPEX) by reducing periodic patrol to the site and unexpected device failure. FCN-RTU has a number of design features that make it well-suited for geographically distributed applications such as well-head control. These include:

**Hardware features:**
- Low power consumption CPU with power fail-safe file system
- Flexible power supply module (wide voltage range from 10-30 VDC for solar power applications)
- Variety of communication choices (three RS-232 serial ports and one RS-422/485 port)
- Explosion protection (FM non-incendive, ATEX Type “n,” and CSA)

**Software features:**
- AGA calculation (gas flow rate calculation)
- Field-proven libraries for regulatory control
- Autonomous features (embedded Web server, logging functions)
- International Standard Programming Language (all five IEC61131-3 languages for control functions and Java language for information transmission)

**YOKOGAWA**
http://www.yokogawa.com

SOFTING’S SMART FOUNDATION FIELDBUS KIT

Softing’s Fieldbus Kit 2 (FBK-2) is an industry-hardened, yet economical off-the-shelf communication board for the rapid development of FOUNDATION fieldbus H1 and PROFIBUS PA field devices for Intrinsically Safe (IS) and non-Intrinsically Safe environments.

- On-board HART and serial Modbus/RTU interface to bridge existing devices into the H1 or PA world
- Pre-certified protocol stack and communication board hardware is ready-to-use
- No additional costs for fieldbus physical-layer testing are incurred
- Software maintenance is included to ensure continual compliance to the ever evolving specifications
- Small foot-print (40x40mm) to fit into most existing device housings
- Mature and smart solution that connects thousands of field devices

On request, Softing’s FOUNDATION fieldbus development team is ready to customize this device to fit specific requirements.

**SOFTING**

RID14 AND RID16 FOUNDATION FIELDBUS FIELD INDICATORS

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- LAS capable
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PHOENIX CONTACT PHYSICAL LAYER OFFERS NUMEROUS BENEFITS

A modular approach to fieldbus physical layer components from Phoenix Contact provides infrastructure connection between the process fieldbus controller and field devices. The new concept, says the company, combines industrial electronic packaging and data communications competencies to deliver a high-value fieldbus infrastructure solution. It provides a number of benefits:

- The fieldbus is expanded without disrupting communication;
- Modular segment protection enables flexibility within the fieldbus network;
- Valuable enclosure space is saved because only the needed number of device couplers are installed;
- Scalability for fieldbus segment protection boosts control; and
- Fieldbus integrity equals a hot swappable modular design.

Get more details by visiting the Phoenix Contact website.

**PHOENIX CONTACT**
www.phoenixcon.com/fieldbus

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EMERSON ANNOUNCES NEW OPTIONS FOR ROSEMOUNT® SINGLE LEAD GUIDED WAVE RADAR (GWR) LEVEL TRANSMITTERS FOR CHALLENGING APPLICATIONS

Emerson Process Management has enhanced the single probe offering of the Rosemount® 5300 Series Guided Wave Radar (GWR). The new options include a thicker rod for longer measurement lengths and a Hastelloy C-276 probe and wetted parts for applications in corrosive, hot and high pressure environments. The new, thicker 13mm probe is designed for an extended measurement range and is available in stainless steel for standard operating temperatures and pressures. The new Hastelloy C-276 probe and wetted parts option make the transmitter ideal for use in corrosive, hot and high pressure environments.

HONEYWELL’S ST 3000 ADVANCED DIAGNOSTICS AVAILABLE WITH FOUNDATION FIELDBUS

The release of new on-board advanced diagnostics takes the ST 3000’s diagnostic capability one level forward, now providing information useful to operations, maintenance, reliability, safety and process control personnel. These more impactful, process-related diagnostics allow personnel to become more pro-active in day-to-day operations, conduct routine root cause analysis, and manage transmitter assets more cost-effectively. On-board diagnostic functions including time-tracking, PV reading and meter body temperature reading are automatically available without external software programs.

INSTALLING FIELDBUS IN REAL-LIFE APPLICATIONS

Many automation engineers are coming face-to-face with real fieldbus applications for the first time. Fieldbus is a wonderful technology with many benefits, but fieldbus installation requires some additional considerations over and above normal 4–20mA projects. In this in-depth white paper, we discuss some of those issues, and show you how to deal with them. To get your copy, go to: www.miinet.com/moorehawke.

THE NEW MTL9370-FB — FIELDBUS BARRIERS, ONLY BETTER

MTL’s new range of Fieldbus Barrier wiring hubs establish a new benchmark for Foundation fieldbus networks.

The 9370-FB Series Fieldbus Barrier retains the major benefits of the “High Energy Trunk” technique whilst removing the drawbacks associated with existing implementations. Gone are the inflexible, custom-built field enclosures and complex wiring looms. The result is lower cost, safer operation and higher reliability throughout the life-cycle of the fieldbus network, with benefits not only for the plant operator but for all parties involved in the design and installation process.

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**PEPPERL+FUCHS’ AWARD WINNING ADVANCED DIAGNOSTICS MODULE NOW AVAILABLE IN MOBILE CONFIGURATION FOR MAXIMUM FLEXIBILITY**

The Mobile Advanced Diagnostic Module from Pepperl+Fuchs is a comprehensive physical layer measurement tool for FOUNDATION fieldbus H1 and Profibus-PA installations that can be used in Zone 2/Class I, Div. 2 areas. The Mobile ADM creates a visual picture of the fieldbus communication signal to facilitate faster commissioning work and easy, efficient troubleshooting. Diagnostic data is easily integrated directly into DCS/PLC device configuration and asset management tools. For more information, call (330) 486-0002 or e-mail sales@us.pepperl-fuchs.com.

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www.fieldconnex.info

**INSTRUMENT TECHNICIANS AND AUTOMATION ENGINEERS CAN BRING ASSET MANAGEMENT TO THE FIELD**

Intelligent devices provide the foundation for performance-enhancing asset management programs. The latest version of FactoryTalk AssetCentre enables instrument technicians and automation engineers to centrally-store configuration of isolated networks and/or smart process devices to improve diagnostic and troubleshooting capabilities. This field-enabled process device solution allows users to check out device files, edit the configuration data remotely while connected to the device, and check the file back in to create a new master device configuration file. This gives users the ability to customize their FOUNDATION fieldbus device settings, perform realtime calibration and monitoring, and archive diagnostic and configuration information within the PlantPAx architecture. This asset management tool can be used to improve compliance to change management and product quality initiatives, improves technician productivity and process throughput while reducing risk. The solution is ideal for project commissioning when the automation system is not fully functional, OEM applications or projects that engage multiple control architectures.

ROCKWELL AUTOMATION
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**ISBUS FIELDBUS TECHNOLOGY: ADVANCED FIELDBUS POWER SUPPLY PROVIDES UNIQUE INTEGRATED FEATURES FOR PHYSICAL LAYER DIAGNOSIS**

In addition to the ISbus Fieldbus Power Supply System, R. STAHL introduces a new, innovative power supply for FOUNDATION fieldbus H1 applications. The Advanced Fieldbus Power Supply features a wide range of additional diagnostic functions for monitoring fieldbus segments. The power supply generates a warning message if the transmission quality in the bus deteriorates, thus allowing users to intervene in time before the segment fails. Due to attractive pricing just approximately 10% above the simple Fieldbus Power Supply, the high-performance type enables complete, continuous plant monitoring without considerably raising the investment costs.

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Today, FOUNDATION fieldbus dominates the worldwide process automation market—and is a growing solution for the hybrid industries. It's the "technology of choice" for both early adopters and new end users around the globe, especially in developing markets such as Asia-Pacific, Latin America and Eastern Europe.