

Fall 2011

# Fieldbus Report

Your Global Source for FOUNDATION™ Technology News

## Automation Infrastructure For Operational Excellence.

### In This Issue:

- Remote Operations Solution
- Host Profile Testing
- Latest Events Schedule
- FOUNDATION Growth Trend
- Control-In-The-Field
- Latest Registered Products



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**Rich Timoney**  
President & CEO,  
Fieldbus Foundation

## President's Letter

### FOUNDATION™ Technology: Reshaping Industry by Providing New Remote Operations Management Options

Many industrial operating companies have multiple production facilities that are geographically spread out over vast distances. Optimal production and productivity are hard enough to achieve on a single asset level, but interdependencies between processes and facilities complicate things even further.

Monitoring remote locations and devices is essential for efficiency, safety and security. An effective remote operations capability enables personnel to gather core plant data from a centralized location, minimizing field travel time and operational costs, and drastically improving personnel safety and overall efficiency.

In response to the needs of the process industries, the Fieldbus Foundation has developed FOUNDATION for Remote Operations Management™. This technology advancement promises to reshape the operating habits of industry by providing new and innovative management options.

As described in this issue of *Fieldbus Report*, FOUNDATION for Remote Operations Management helps meet today's critical operational and business challenges. The technology provides an open path for integration of multiple wireless and wired networks, from conventional remote I/O to ISA 100.11a and *WirelessHART*®, and enables direct access to device information and diagnostics. It extends the range and capabilities of FOUNDATION™ fieldbus to encompass many more devices throughout the plant — regardless of their communications technology. Valuable diagnostic information from wireless devices is brought into the open and standardized FOUNDATION automation infrastructure.

With FOUNDATION for Remote Operations Management, industrial organizations will realize improved data management, quality and consistency. They'll be able to monitor and manage operational activities across multiple facilities from anywhere within a network of sites, helping them better leverage their expertise between locations and

mitigate staffing issues associated with remote locations, as well as maximize production and optimize operations.

This latest *Fieldbus Report* also includes an in-depth analysis of control-in-the-field (CIF) with FOUNDATION technology. Leading experts in the process automation industry share their thoughts on this important topic. Experience has shown that CIF enables improved control performance because it is no longer necessary to communicate control-related data to the central control system. This means time delays are reduced and determinism is improved compared to using conventional systems where control calculations are performed within the DCS.

Implementation of FOUNDATION fieldbus with control-in-the-field can also reduce costs associated with wiring, power supplies, panel space, and redundancy hardware. In turn, by reducing hardware requirements there are fewer points of failure, thus adding to the reliability of the control system. The smaller number of connections between devices also increases reliability.

End users who are not yet realizing the advantages of a well planned and executed CIF strategy will gain valuable insights from this article.

One final note: please make plans to join the Fieldbus Foundation at our 2012 General Assembly, which will be held during March in Rio de Janeiro, Brazil. Exact dates and location information will be available soon.

Best Regards,

Richard J. Timoney  
President & CEO  
Fieldbus Foundation



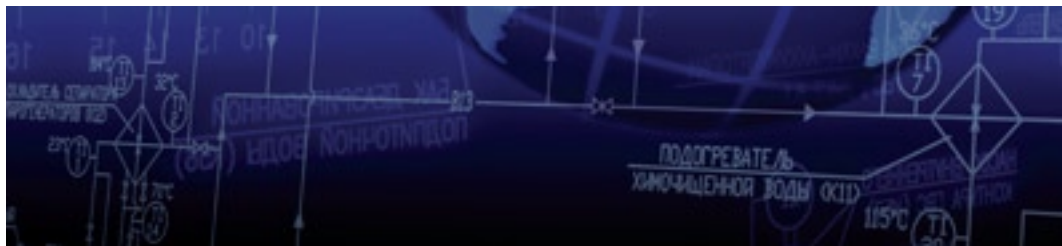
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# Fieldbus Report

Your Global Source for FOUNDATION™ Technology News

Fall 2011

## FEATURES

<b>Press Preview: FOUNDATION for Remote Operations Management™</b>	<b>6</b>
Solution integrates HSE and industry-standard wired and wireless applications	
<b>Understanding Host Profile Testing and Registration</b>	<b>10</b>
Everything you need to know to navigate the host registration landscape	
<b>Fieldbus Foundation Conducts Events Worldwide</b>	<b>15</b>
Schedule includes seminars, road shows and technology exhibitions	
<b>FOUNDATION Technology: Growth Trend Continues</b>	<b>16</b>
New installations include both Greenfield sites and unit upgrade projects	
<b>Control-in-the-Field: Considerations for Process Plants</b>	<b>19</b>
FOUNDATION fieldbus returns control functionality to the device level	
<b>List of Registered FOUNDATION Products Continues To Expand</b>	<b>26</b>
Latest registrations come from all segments of the automation market	



## AG-181 SYSTEM ENGINEERING GUIDELINES AVAILABLE

The Fieldbus Foundation offers our AG-181 FOUNDATION Fieldbus System Engineering Guidelines to help end users get on the "Fast Track to Fieldbus." This comprehensive document describes how FOUNDATION fieldbus devices are specified, installed, configured, commissioned, and maintained.

To download the AG-181, please visit:  
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# Press Preview: FOUNDATION for Remote Operations Management™

Solution integrates HSE and industry-standard wired and wireless applications



**A**t a live technology demonstration to be held on December 1, 2011, at Lee College in Baytown, Texas, members of the control industry trade press will learn how the FOUNDATION for Remote Operations Management™ solution revolutionizes operational strategies for offshore platforms, tank farms, pipeline systems and other widely dispersed automation assets.

In the oil & gas, petrochemicals, power distribution, and water/wastewater industries, among others, many operating companies have multiple production facilities that are geographically spread out over vast distances. Optimal overall production and productivity is hard enough to achieve on a single asset level, but interdependencies between remote processes and facilities complicate things even further.

Experience has shown that a comprehensive remote operations management solution enables industrial organizations to respond faster to market conditions, increase efficiency, reduce downtime, and achieve higher production availability. It also minimizes the costs and risks associated with remote site visits — enabling fewer core personnel to meet the operational requirements of numerous facilities from a single secure location.

### **Ambitious technology initiative**

In June 2007, the Fieldbus Foundation launched its FOUNDATION for Remote Operations Management initiative. This technology will advance the utilization of an open, interoperable fieldbus automation infrastructure employing wired and wireless High Speed Ethernet (HSE) integration of wired and wireless sensor networks and industrial wireless applications.

The combination of FOUNDATION™ fieldbus, advanced diagnostics, and industry-standard wireless solutions will enable end users to significantly improve their remote operations capabilities. FOUNDATION for Remote Operations Management integrates wired installations, remote I/O, ISA100.11a and *WirelessHART*®,

ensuring direct access to device information and diagnostics. Users can incorporate remote operations data into the FOUNDATION fieldbus infrastructure for robust data management.

FOUNDATION for Remote Operations Management provides a distributed function block capability with HSE serving as a larger pipeline offering increased speed and throughput. The technology supports a wired or wireless HSE backhaul network integrating various wireless FOUNDATION for Remote Operations Management devices with interfaces to wireless field device networks. It also brings all forms of conventional I/O into the native fieldbus environment easily, making digital input/digital output, analog input/analog output, and H1 (31.25 kbit/s) fieldbus available over a common Ethernet network. This approach ensures tight integration of process instrumentation within the FOUNDATION infrastructure.

### **Advantages for end users**

The Fieldbus Foundation's latest technology development promises to change the world of remote operations management for petroleum pipelines, offshore platforms, oil & gas fields, water & wastewater plants, tank farms and terminals, and mining facilities. Advanced knowledge of the process is required to operate sophisticated processes in an exclusively remote fashion, and the increased level of process and diagnostic information from fieldbus-compatible devices allows users to make intelligent decisions about the process and then act on them. This solution is key to improved integration of critical functional areas, including machinery health monitoring, safety interlocks,

fire & gas detection systems, and video surveillance.

FOUNDATION for Remote Operations Management extends the range and capabilities of FOUNDATION fieldbus to encompass many more devices throughout the plant — regardless of their communications technology. Valuable diagnostic information from wireless devices is brought into the open and standardized FOUNDATION automation infrastructure.

In particular, FOUNDATION for Remote Operations Management:

- Improves the value proposition for plant asset management
- Optimizes data structures, data quality and Electronic Device Description Language (EDDL)
- Reduces the need for remote personnel
- Lowers engineering and operational costs
- Increases reliability and availability
- Improves process integrity

The use of FOUNDATION technology in remote applications marks a step change in the visibility industrial organizations have into their operations. Remote diagnostics via fieldbus provides significant improvement in labor costs by avoiding the need to send maintenance personnel on unnecessary trips to the field to check or diagnose problems with instrumentation without the benefit of remote diagnostic data. In the oil & gas industry, for example, the use of fieldbus and the remote access to devices it affords can reduce the exposure and risk faced by operations personnel in the hazardous environment of an offshore platform.

Access to high-quality process and equipment health data ultimately increases a user's profitability by minimizing downtime and increasing production, which results from well-informed operational, maintenance, and management decisions.

### **Successful project results**

At a validation team meeting in November 2010 at the Fieldbus Foundation's facility in Austin, Texas, the first FOUNDATION for Remote Operations Management device interconnecting *WirelessHART* devices to a wireless backhaul network was tested successfully. The *WirelessHART* process parameters were mapped into transducer blocks in the gateway according to the specification, and communicated over the wireless backhaul network using the HSE protocol.



The use of FOUNDATION technology in remote applications marks a step change in the visibility industrial organizations have into their operations.

**CONTINUED ON NEXT PAGE**





The Fieldbus Foundation's latest technology development promises to change operational strategies for end users with dispersed automation assets.

#### CONTINUED FROM PAGE 7

As part of the proof of concept testing, the Fieldbus Foundation's Interoperability Test Kit (ITK) system successfully tested FOUNDATION for Remote Operations Management devices over a 300 Mbit/s wireless Wi-Fi backhaul network.

In late September of this year, the Fieldbus Foundation issued a FOUNDATION for Remote Operations Management preliminary specification addressing fieldbus transducer blocks for wired HART and *WirelessHART* devices, together with updates to the system architecture and data structures related to the transducer block specification.

Part of the FOUNDATION for Remote Operations Management solution implementing wireless and remote I/O, the new technical specifica-

tions define a fieldbus transducer block used to represent HART devices within FOUNDATION for Remote Operations Management devices. Both wired HART and *WirelessHART* devices may be represented in this block. In addition, the specification describes the expected method for HART configuration tools and asset-managing hosts to access HART devices using the native HART command protocol transported through the FOUNDATION HSE network. The specification also defines structures to identify and maintain HART device status in wired multi-drop networks as well as in *WirelessHART* mesh networks connected to FOUNDATION for Remote Operations Management devices.

The FOUNDATION for Remote Operations Management transducer block specification will benefit end users who need to be able to interface HART and *WirelessHART* devices to

FOUNDATION fieldbus to improve their integration with a control system, or with FOUNDATION devices. They may also require a networked method for an asset-managing host to access a large set of HART and *WirelessHART* devices for HART configuration and maintenance purposes.

The next steps in the FOUNDATION for Remote Operations Management initiative include final validation of the wired HART and *WirelessHART* specifications. This development will give automation suppliers the opportunity to develop full FOUNDATION for Remote Operations Management devices initially running on a wired HSE backhaul. At the same time, the Wireless Sensor Interface Team and Fieldbus Foundation/ISA Cooperation teams will work to finalize the first draft of the wireless HSE backhaul specifications and address key requirements such as security. ■



## INVOLVEMENT BY FOUNDATION MEMBERS

### YOKOGAWA ◆

**Yokogawa** is promoting the ISA100.11a specification as the best wireless protocol for field devices and launched field wireless products based on it in July 2010.

Since the combination of the FOUNDATION function block and ISA100.11a works very well for wireless control applications, Yokogawa has been involved in the development of the specification for FOUNDATION for Remote Operations Management. It has participated in the wireless backhaul project from the beginning and will take part in the validation and demonstration with an ISA100.11a wireless gateway on HSE.



**EMERSON**  
Process Management

**Emerson** provided key leadership on the Fieldbus Foundation's Wireless I/O and Remote Technologies project, helping define the mapping between HART and FOUNDATION fieldbus devices. This technology was a key predecessor to the FOUNDATION for Remote Operation Management program.

Emerson will participate in the Press Day at Lee College in December 2011, as well as the FOUNDATION for Remote Operations Management demonstration planned for 2012.




**R. STAHL** was one of the founding members of the HSE-RIO and wireless technical working groups and is still very active in these areas. The company also provides the team leader for the FOUNDATION for Remote Operations Management validation team currently involved in testing and validation. Plus, R. STAHL developed the first prototype of a remote I/O for hazardous locations Zone 1 with HSE-RIO functionality and will participate in the planned demonstration activities in 2011 and 2012.

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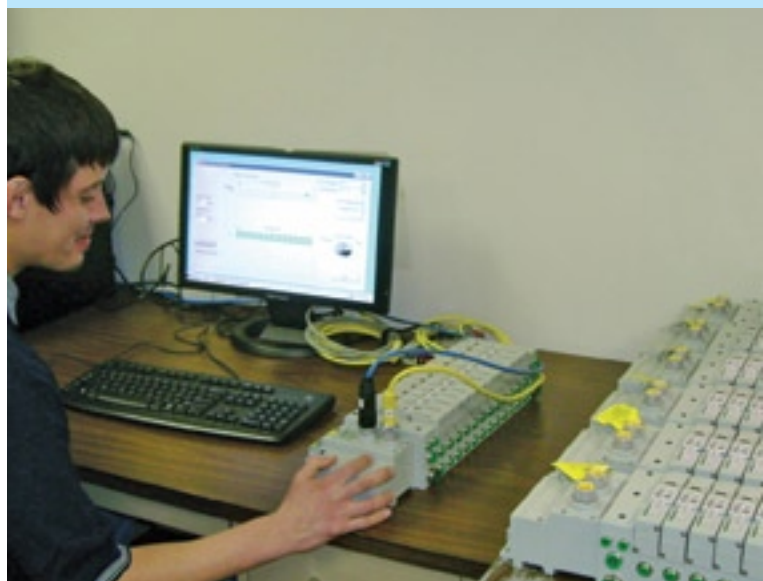
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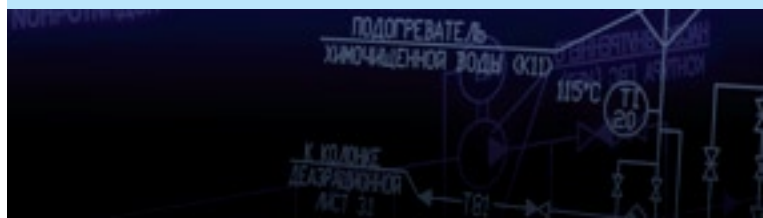

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## Understanding Host Profile Testing and Registration

**Everything you need to know to navigate the host registration landscape**



**T**he Fieldbus Foundation testing and registration process ensures interoperability and helps you get the most out of your fieldbus investment. Host profile testing and registration is particularly important, but can be more difficult to understand than device registration. The following article provides you with everything you need to navigate the host profile registration landscape.





The Fieldbus Foundation is one of the few automation industry organizations with a registration program requiring mandatory testing of critical elements of its technology. Today, our testing and registration effort encompasses FOUNDATION™ fieldbus host systems and field devices, as well as physical layer components such as power supplies, cables, and device couplers.

One of the founding principles of the Fieldbus Foundation is the support of interoperability — the ability to operate multiple devices from multiple manufacturers, in the same system, without loss of functionality. The testing and registration process at the foundation is the key to interoperability. With FOUNDATION fieldbus, interoperability is made possible by the fact that devices and software must conform to the same standard.

Products bearing the FOUNDATION Product Registration symbol have undergone a series of common tests administered by the Fieldbus Foundation. End users can select the best device for a specific measurement or control task, regardless of the manufacturer, and they know the device will provide a consistent level of functionality and interoperability regardless of

the host system or other devices used. Testing and registration ensures that you can achieve the best return on your fieldbus investment.

There are several basic paths for testing and registration within the Fieldbus Foundation including H1 testing for devices residing on the H1 network, High Speed Ethernet (HSE) testing for devices residing on the high-speed HSE network, and host profile testing for host systems. The foundation has test kits for each level of testing. Host testing and registration is of particular importance to end users. To understand why, we first need to understand what a host is.

#### What is a host?

A host is essentially something that supports FOUNDATION fieldbus messages. In a FOUNDATION fieldbus system, hosts may include configuration tools, recording devices, alarm display panels, Human-Machine Interfaces (HMI), or systems with a combination of functionality, all the way up to the integrated “DCS” type host. It may be a single instrument or consist of multiple components. It is not necessary for a host to have function blocks. A host may have an H1 interface, an HSE interface, or both. It may support safety devices, control & monitoring

devices, or both. A host system with an H1 interface should have a FOUNDATION registered communication stack and a FOUNDATION conformant physical layer interface. Hosts that include an HSE interface should have a FOUNDATION registered communication stack. A field device can also be a host if it supports host features.

#### Testing ensures interoperability

Within the Fieldbus Foundation's automation infrastructure, interoperability is possible because devices and software must all conform to the same standard, and they are tested and registered to that standard. Products bearing the FOUNDATION Product Registration symbol have undergone a series of common tests administered by the Fieldbus Foundation. End users can select the best device for a specific measurement or control task, regardless of the manufacturer.

Host registration provides an extra measure of confidence that fieldbus systems incorporate the robust functionality of FOUNDATION technology and are able to function as part of an open, interoperable control system. The host has been of particular concern in the past because it is the key element at the system



Fieldbus Foundation testing and registration lab in Austin, Texas.

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level and can determine the success or failure of a fieldbus project. If your host is not registered and tested, you are taking some unnecessary chances and have no way of knowing if your host will work with a wide range of H1 and HSE devices from different suppliers.

#### From HIST to host profile registration

The Fieldbus Foundation has been doing host testing since its earliest days. Over the years, this process has evolved considerably. The foundation's previous Host Interoperability Support Test (HIST) provided a host test protocol with no provision for formal product registration. With HIST, the host vendor did all of the work. It soon became clear, however, that testing and registration of hosts was necessary. That's when the Host Profile Registration Process was introduced.

Under the new Host Profile Registration Process, the Fieldbus Foundation conducts functional testing with a test device and specialized test Device Descriptions (DDs) and Capabilities Files (CFs). Registered devices from different vendors are also used during testing. The host profile under test must support a clear set of required features. A host will

conform to some, or perhaps all, features as defined by the host feature checklist. However, because hosts can have various definitions, not all features may be applicable to a host implementation. Therefore, it is not expected that every host should support each feature.

Each feature contains a set of test procedures that are to be run against the host or the fieldbus system using the host. In order for a host to claim conformance to the feature, the host must be able to pass the test procedures defined by the feature. The features themselves are generic; therefore, manufacturers will derive test cases, or actual implementation steps necessary to meet the requirements of the test procedure. Fieldbus hosts successfully completing the test requirements are authorized to bear the official FOUNDATION product registration symbol.

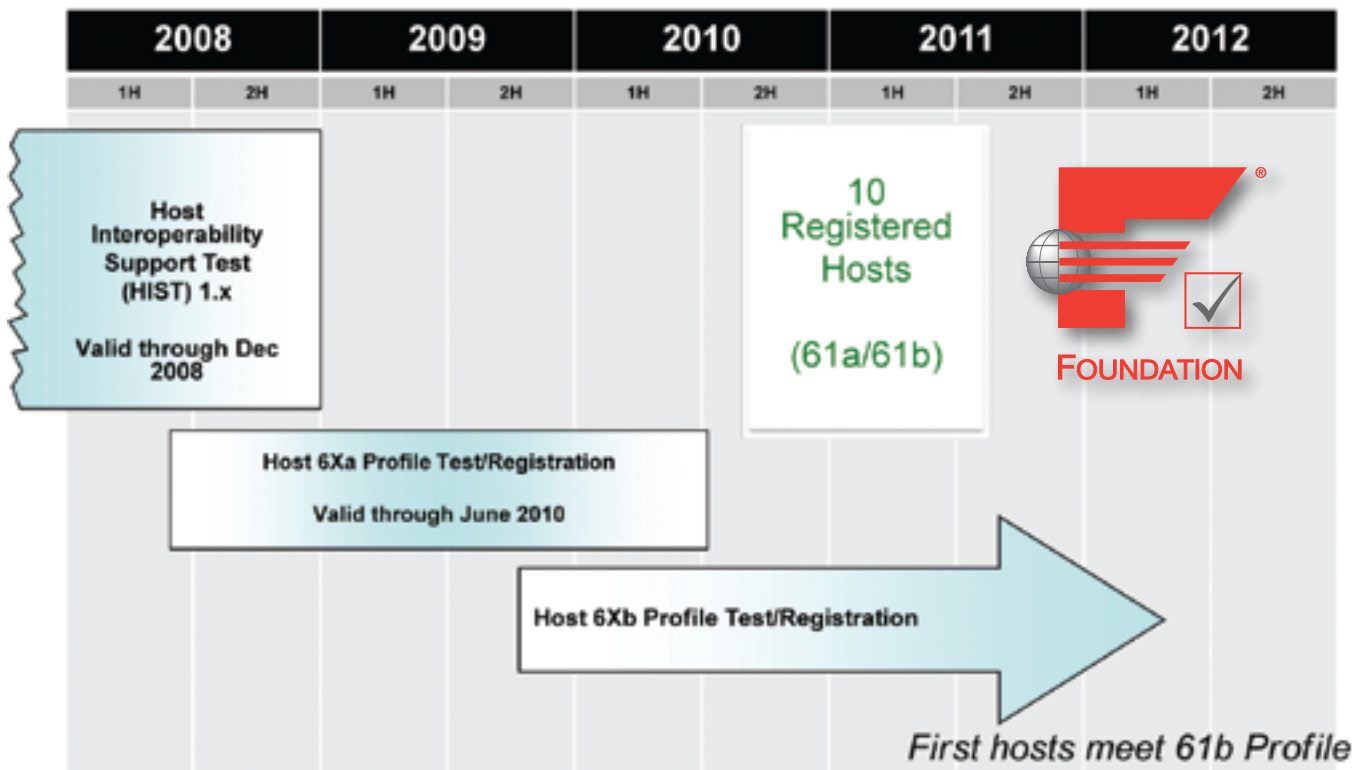
#### Host profiles and classes

A host profile defines a minimum set of FOUNDATION-specific features that must be implemented by a host to achieve compliance to a specific host class. A host may incorporate one or more hardware and software components as defined by the host manufacturer. Currently,

the Fieldbus Foundation defines five profile classes. These include:

- **Class 61 – Integrated Host:** Primary, on-process host that manages the communication and application configuration of all devices on a network.
- **Class 62 – Visitor Host:** Temporary, on-process host with limited access to device parameterization.
- **Class 63 – Bench Host:** Primary, off-process host for configuration and setup of a non-commissioned device.
- **Class 64 – Bench Host:** Primary, off-process host with limited access to device parameterization of an off-line, commissioned device.
- **Class 71 – SIF Integrated Host:** Primary on-process host for safety instrumented functions.

Each of these host classes has its own set of characteristics, primary end users, and use cases. For the Integrated Host, primary



The transition from host interoperability support testing to Host Profile a and b testing and registration.



characteristics are what you would normally associate with a DCS. Integrated Hosts are an essential part of the process, and are online or “on-process” hosts. Integrated Hosts set and manage Physical Device Tags for all devices as well as the network configuration. Integrated Hosts also manage the distributed application configuration, including the link schedule, backup link schedule, block instantiation, link objects, macrocycle, VCRs, and alerts. An Integrated Host provides full access to all resource block, transducer block, and function block parameters. It may maintain a backup/off-line database.

The Integrated Host is widely used by many people throughout the plant. Process control engineers use the host system for configuration and analysis. Operators have access to the Integrated Host through operator workstations, while maintenance will use the host through plant asset management applications. Even management can use the host through other operations management and application workstations.

Class 62 Visitor Hosts are basic on-process hosts that may have read and write access to resource and transducer blocks. However, read-only access may be provided to function blocks. Visitor Hosts do not manage the physical device tags, network configuration or distributed application configuration. They typically reside in handheld devices or PDA-like devices that are used for maintenance and have a temporary connection to the network. Visitor Hosts can also reside in specialized device applications such as online control valve diagnostic applications.

Class 63 Bench Hosts may set the network configuration for off-process testing, but both Class 63 and 64 Hosts are off-process hosts. They may also set a distributed application configuration, including link schedule, back link schedule, block instantiation, link objects, macrocycle, VCRs, and alerts. Class 63 Bench Hosts may also access all resource block, transducer block, and function block parameters. Primary users include maintenance and instrumentation personnel. Class 63 Bench Hosts are used for several applications, including testing of skid operations and setting up a new device for service. You may also use a Class 63 Bench Host for maintenance of a previously configured and operating device that is removed from the process network, or for setup of a new device for device replacement service. If you have a used device that you want to re-assign, you can use a Class 63 Bench Host to clear the device of any PD Tag, H1 address,

VCRs, LAS and function block schedules, link objects, and so on.

Class 64 Bench Hosts are primary off-process hosts for access to a prior commissioned device. A Class 64 Standard Bench Host has nearly identical requirement to a Class 62 Standard Visitor Host with the exception of device address configuration. Primary users of Class 64 Bench Hosts would be instrumentation and maintenance personnel. The Class 64 Bench Host usually resides in a handheld or PDA-type device that is connected to an off-process segment or specialized device application such as offline valve diagnostics.

The Class 71 SIF Integrated Host is the primary on-process SIF host for safety applications. Like the Integrated Host, the Class 71 SIF Host is a fixed H1 address, on-process host. It sets and manages physical device tags for all devices. It also sets and manages the network configuration and manages the distributed application configuration, and provides all the other functionality of the Class 61 Integrated Host. The difference is the additional SIF-specific functionality. Safety-specific functionality includes full access to all profiled SIF-related resource block and function block parameters. It supports the SIF protocol and maintains the SIF configuration signature, and can lock and unlock all SIF devices.

**Two engineers from Yokogawa contributed to the SIM team, helping to develop the FF-569 Host Profile Registration Process with other members to bring the interoperability of host systems into reality.**

**The Fieldbus Foundation's rigorous host registration program ensures plants can fully enjoy the promise of fieldbus. Emerson's DeltaV digital automation system is the first to comply with profile 61b. Profile 61b enables the system to support device-level access, which displays information in easy-to-use, task-oriented device pages.**

As a safety system host, primary users are most likely plant safety engineers for configuration and analysis applications. Operators and plant management will also use the host during shutdown operations or for operations management purposes. Maintenance personnel will interface with the SIF Host for maintenance of SIF devices and process equipment.

### **Mandatory vs. optional and prohibited features**

Host testing and registration includes various levels of features for different hosts. Depending on the type of host, these features can be mandatory, optional, or even prohibited. For each profile, individual features are marked according to a requirement.

- **Mandatory features** for a particular host must be implemented in order to achieve compliance for the relevant profile.
- **Optional features** may or may not be implemented. If implemented, the optional features will be tested and credited as part of compliance for the relevant profile.
- **Prohibited features** are restricted in that profile in order to minimize the possibility of incurring unintended operations (such as changing critical configuration parameters that have been set up by another host). A candidate cannot achieve compliance to a HIST profile if any prohibited features are available in that profile.











### **Implementation from A to B and beyond**

When you look at host profile testing information for different classes, you will probably notice an “a” or a “b” designation. For example, a host could be registered to a “Profile 61a” or “Profile 61b.” These alphabetical designations indicate different versions of host testing and registration. The “a” profiles represent the first wave of host profile testing that occurred after the original Host Interoperability Support Test. The “b” specifications represent a step forward for host testing. In this new specification, more features are mandatory. The following host features have gone from “optional” to “mandatory” with the new host profile 61b:

- **Block Instantiation** – Allows full utilization of fieldbus devices supporting instantiable function blocks. Primarily intended for control in the field (CIF).

**CONTINUED ON NEXT PAGE**

Standard colors and symbols used in NE107.

Status Signal	Color	Symbol
<b>Normal:</b> valid output signal		
<b>Maintenance required:</b> still valid output signal		
<b>Out of specification:</b> signal out of the specified range		
<b>Function check:</b> temporary non-valid output signal		
<b>Failure:</b> non-valid output signal		

#### CONTINUED FROM PAGE 13

- **Multiple Capability Levels** – For devices where certain blocks/features are optional (licensed), the standard or higher capability level can be set in the tag placeholder during system configuration to prevent unsupported blocks from being used in the control strategy. This prevents surprises during commissioning. It also makes device replacement easier.
- **Enhanced Function Blocks** – Allows full utilization of enhanced blocks (standard blocks with additional parameters).
- **Profiled Custom Function Blocks** – Allows full utilization of non-standard blocks.
- **Configuration of Scheduled Control Function Blocks** – Allows developers to build CIF control strategies.
- **DD V5.1 Device-Level Access** (enhanced Electronic Device Description Language with cross-block) – Makes fieldbus devices easier to use by enabling a dashboard with all diagnostics on the same page, and all setup on one page, regardless of which block it is in.

Beginning in 2010, all hosts tested had to be tested under the “b” profiles. Hosts tested under the “a” profiles will be able to remain in the catalog of tested and registered hosts, but there will be no further testing under the “a” profiles. When selecting a registered host, take

note of the class it was registered to in order to ensure you are purchasing the implementation you are looking for.

#### Support of NAMUR NE107 diagnostics

Support for NAMUR NE107 field diagnostics is also required as part of the second phase of host testing and registration. The Fieldbus Foundation and NAMUR, an international user association for automation technology in the process industries, collaborated on enhancements to FOUNDATION technology, which improved its usability. A key objective of this work was to unify the integration of fieldbus self-monitoring data and ensure the availability of valuable diagnostic information to process plant operators, engineers and technicians.

According to the NAMUR NE107 recommendation, “Self-Monitoring and Diagnosis of Field Devices,” fieldbus diagnostic results should be reliable and viewed in the context of a given application. The document recommends categorizing internal diagnostics into four standard status signals. It also stipulates configuration should be free, as reactions to a fault in the device may be very different depending on the user’s requirements. According to NE107, plant operators should only see status signals, with detailed information viewable by device specialists. This facilitates “information in context,” provided to the right people at the right time, in

the right format.

Using the NE107 recommendations for field diagnostics, the Fieldbus Foundation developed a profile specification enhancing the organization, integration and presentation of device diagnostics within fieldbus systems. The diagnostic profile includes a standard and open interface for reporting all device alarm conditions, and provides a means of categorizing alert conditions by severity. The technology facilitates routing of alerts to appropriate consoles based on user-selectable severity categories. In other words, it sends the right information to the right person at the right time without flooding the operator with alarms that are irrelevant to his duties. It also provides recommended corrective actions and detailed help, as well as an indication of the overall health of the device.

#### Available resources

The Fieldbus Foundation registered products page has a complete list of tested and registered hosts, devices, and other products. We also offer resources for developers, including developer training and tools. Development tools include conformance test tools, interoperability test tools, and device description development tools. You can visit the Fieldbus Foundation’s web site at [www.fieldbus.org](http://www.fieldbus.org) or e-mail us at [marketing@fieldbus.org](mailto:marketing@fieldbus.org).



# Fieldbus Foundation Conducts Events Worldwide

Schedule includes seminars, road shows and technology exhibitions

**N**o matter where you are located, it's easy to find an event related to FOUNDATION™ fieldbus. The Fieldbus Foundation has planned an expanded worldwide program of fieldbus educational seminars, road shows, technology exhibitions and other informative activities. These events serve the needs of process automation end users, device developers, engineering firms and other interested stakeholders. Make plans now to attend an event in your area. ■

## FOUNDATION Fieldbus Events Worldwide

LOCATION	DATE	EVENT INFORMATION
<b>EVENTS IN THE AMERICAS</b>		
Baton Rouge, Louisiana, USA	Nov. 9, 2011	FOUNDATION Fieldbus End User Seminar
Beaumont, Texas, USA	Nov. 10, 2011	FOUNDATION Fieldbus End User Seminar
Austin, Texas, USA	Nov. 15, 2011	Developer Training – Intro to FOUNDATION Fieldbus
Austin, Texas, USA	Nov. 16-18, 2011	Developer Training – Advanced Principles of FOUNDATION Fieldbus
<b>EVENTS IN EMEA (EUROPE, MIDDLE EAST, AFRICA)</b>		
TT Assen, The Netherlands	Nov. 10, 2011	FOUNDATION Fieldbus End User Seminar
Abu Dhabi, UAE	Dec. 12-13, 2011	Multaqa 2011 FOUNDATION Fieldbus End User Conference
Wasseling/Knappsack, Germany	Feb. 1, 2012	7th German FOUNDATION Fieldbus Conference
<b>EVENTS IN ASIA/PACIFIC</b>		
Tokyo, Japan	Nov. 16-18, 2011	JEMIMA Exhibition
Rayong, Thailand	November 2011	FOUNDATION Fieldbus End User Seminar
Kuala Lumpur, Malaysia	November 2011	FOUNDATION Fieldbus End User Seminar
Jakarta, Indonesia	December 2011	FOUNDATION Fieldbus End User Seminar

For the latest event information, please visit the Fieldbus Foundation's website at [www.fieldbus.org](http://www.fieldbus.org).

## FOUNDATION<sup>™</sup> Technology: Growth Trend Continues

New installations include both Greenfield sites and unit upgrade projects

There is a powerful value proposition for FOUNDATION<sup>™</sup> technology in the hybrid industries, including food & beverage and pharmaceuticals.



**T**he challenges facing modern industry have never been greater. Shareholders expect increased profitability and sustainable growth. Expanding global markets lead to increased competition. This reality requires new ways to reduce operating costs, streamline and/or re-orient workforces, accelerate delivery times, and develop innovative products.

For a growing number of automation end users, FOUNDATION<sup>™</sup> technology is a solution for meeting their critical business objectives.



When FOUNDATION fieldbus was first introduced in the mid-1990s, manufacturers, engineering companies, and plant personnel needed to climb the learning curve of technology, products and practices. Thousands of systems later, end users can make their fieldbus project a fast and economical success, as well as support fieldbus more easily, allowing most any plant to achieve significant project and operational results.

By all accounts, FOUNDATION technology has revolutionized the way companies automate their plants and factories. It provides an open, non-proprietary automation infrastructure enabling process integrity, business intelligence

and open scalable integration in a managed environment.

The results from major installations around the world show the FOUNDATION solution offers numerous business benefits. End users of the technology are realizing higher returns for shareholders, improved environmental safety for local communities, and increased efficiency for customers served.

Fieldbus Foundation President and CEO Rich Timoney commented, "End users understand that FOUNDATION technology is more than a communication network. Initially, its primary advantage was portrayed as reduced wiring, installation, and commissioning costs. Today, industrial plants are realizing greater benefits on the operational expenditure side in the form of quality improvements because of bi-directional digital communications and improved process efficiency due to linked intelligent devices

that are capable of remote diagnostics."

Timoney indicated that developing markets such as Brazil, Russia, India and China are experiencing the greatest FOUNDATION technology growth. Industry adoption is increasingly widespread, with major installations found in oil & gas, petrochemicals, refining, metals/mining, water & waste, pulp & paper, utilities and others.

There is also a powerful value proposition for FOUNDATION technology in the hybrid industries — namely, food & beverage and pharmaceuticals, particularly when it comes to easing the process of validation and regulatory compliance and the integration of batch procedural operations with continuous processes. The fieldbus function block structure lends itself to these processes very well.

In addition, FOUNDATION technology has reached a level of acceptance where it is now a standard for control and instrumentation projects of all types and sizes. Major industrial manufacturers are requiring that FOUNDATION-based control solutions be included in the specifications for both new plant construction and unit upgrades. ■

## MAJOR END USERS ADOPT THE TECHNOLOGY

Yokogawa's largest FOUNDATION fieldbus project to date is the Takreer (Abu Dhabi Oil Refining Company) Refinery in the United Arab Emirates (UAE) with over 18,000 fieldbus devices. This is a very large refining operation, including crude complex, offsites, tank farm and utilities. Other large Yokogawa projects include Petro Rabigh (Rabigh Refining & Petrochemical Company) in Saudi Arabia, which is a world-class integrated refinery and petrochemical plant with more than 12,000 fieldbus devices; and CSPC (CNOOC and Shell Petrochemicals Co. Ltd.), a major petrochemical complex located in Huizhou, China, with over 16,000 fieldbus devices.

Emerson is involved in projects around the world that have shown FOUNDATION fieldbus offers cost-effective benefits in diverse applications, from a handful of devices to tens of thousands I/O points.

The Indian Oil Corporation Limited (IOCL) has constructed the PARADIP refinery on the eastern coast of India with a capacity of 12 MTPA running on FOUNDATION technology. R. STAHL supplied complete fieldbus installation components for the high power trunk on this project, including several thousand Zone 1 isolating device couplers, most of them mounted in stainless steel enclosures with terminators, isolation switches, etc. This will be the second largest FOUNDATION fieldbus installation in India after the Reliance Jamnagar refinery in Gujarat.



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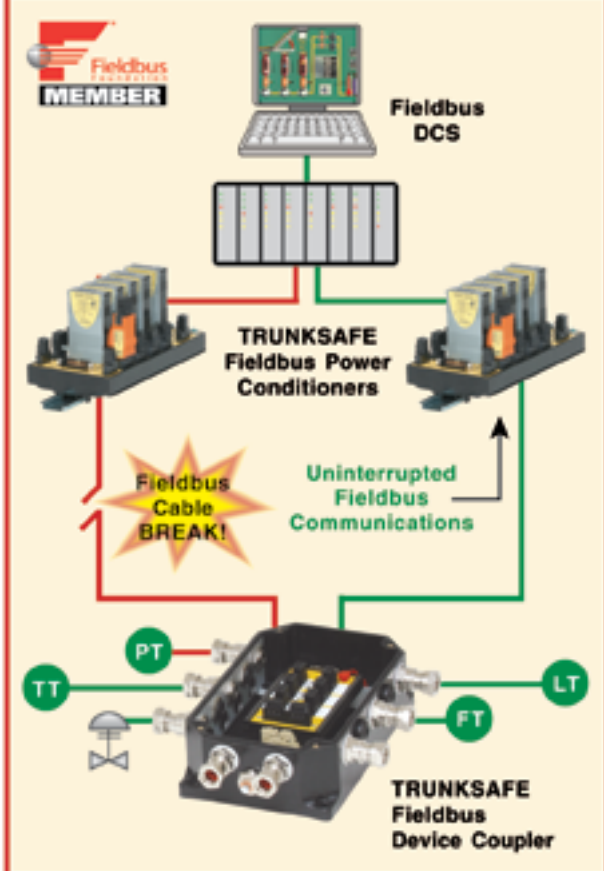
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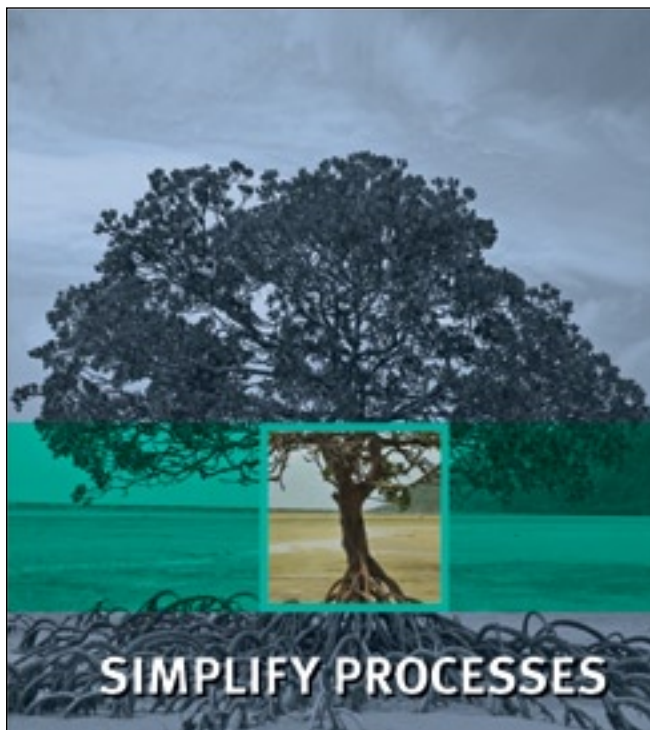
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# Control-in-the-Field: Considerations for Process Plants

FOUNDATION™ fieldbus returns control functionality to the device level

**I**n the world of FOUNDATION™ fieldbus, many end users are considering control-in-the-field (CIF), which involves distributing control functionality among instruments at the device level. Some industrial plants regard CIF as an effective solution for improving single-loop integrity and reducing their control system footprint, while others believe it compromises reliability and availability, and provides little direct economic impact on the manufacturing enterprise. The following article provides an in-depth look at this important issue.



## SIMPLIFY PROCESSES



### The best solutions are usually very simple.

Process automation is very much like other aspects of life. Complex systems are driven by astonishingly simple processes. Consider fieldbus. It offers straightforward communication from the control system to each field device. Control commands, closed loop control, and monitoring enable the management of the most complex processes.

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By the mid-1990s, a new breed of “smart” field instrumentation was changing the outlook for users of the conventional distributed control system (DCS). The rise of FOUNDATION fieldbus profoundly impacted plant automation strategies, enabling end users to move control functionality to field devices and freeing higher-level resources for real-time production control.

FOUNDATION fieldbus is fully compliant with the international IEC 61158/61784/61804 standards, and thus, the only solution capable of supporting deployment of control strategies into field devices using standard and advanced function blocks (e.g., analog input, analog output, and PID control; and arithmetic, integrator, splitter and timer).

The premise of control-in-the-field is simple. With control at the device level, process control tasks are truly distributed, and there is no single point of failure in the system above the H1 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. In cases where control resides in the DCS, field-level control can add another level of redundancy.

Industrial facilities installing FOUNDATION fieldbus are free to implement batch and logic control at the field level. The technology enables primary PID and secondary PID (cascade) functions, as well as feed/forward and lead/lag, to reside in the smart control valve positioner/controller.

#### How does CIF work?

As previously indicated, FOUNDATION fieldbus is unique among digital bus technologies in that it makes possible the return of control to the field level. This means that as long as you have power to the field instrument and motive force for the output device/actuator, you will continue to be able to control your process — regardless of what is happening in the control room.

An important characteristic of FOUNDATION technology is its function blocks, which are designed to be part of the “schedule” (i.e., communication and control execution are synchronized to each other). This means: 1) communication of the measurement is scheduled after the analog input (AI) block finishes execution; 2) execution of the PID block is scheduled to start as the measurement value arrives; 3) communication of the manipulated variable is scheduled after the PID block finishes execution; and 4) execution of the analog output (AO) block is scheduled to start as the manipulated variable arrives. As a result, dead time is minimized and sampling is precisely periodic with minimal jitter.

It is the PID function block that makes control-in-the-field and (as a result) single-loop integrity possible. In addition to the PID function block residing in one device on the network — typically the AO device, to optimize bandwidth usage — every fieldbus segment employing control-in-the-field requires that at least one device on the network be a “link master” device. This device assumes



FOUNDATION technology enables end users to move control functionality to field devices — freeing higher-level resources for real-time production control.

control of all network traffic in the event the connection to the control system is lost.

FOUNDATION fieldbus and single-loop integrity provide increased reliability of the control loop, which is different than what is offered through redundancy. By definition, redundancy involves the installation of a similar, typically identical device with identical functionality. In the event of loss of communications with the H1 interface card, fieldbus will continue to control at the last set point as long as there is communications/power. And, as long as the input/output devices are functional, there will be reliable control without redundancy.

With the FOUNDATION fieldbus solution, end users have utmost flexibility in designing their plant automation infrastructure. Control systems employing the technology can be utilized for very sophisticated control schemes, with control functions running in the controller, on the wire, or in both locations.

For example, control systems such as Emerson's DeltaV solution support control-in-the-field, in the host, or a combination of the two. The system can configure control algorithms in both the controller and CIF, and mix them in the same loop. Its control strategy templates also work for both central control and CIF, and its auto-tuning software can tune PID control in fieldbus devices. In addition, users have access to a large library of function block types that are time-synchronized with the fieldbus devices for CIF performance.

### Key role of HSE

A major factor in the industry's adoption of control-in-the-field was the completion of the Fieldbus Foundation's High Speed Ethernet (HSE) specifications. Had FOUNDATION fieldbus' digital device and bi-directional communications technology been available 30 years earlier, the first DCS and programmable logic controller (PLC) systems might not have been developed.

FOUNDATION fieldbus makes it easy to distribute control to the field in HSE linking devices. In the fieldbus network architecture, the HSE linking



device holds the key to integrating H1 fieldbus segments into the high-speed Ethernet backbone. It functions as a “bridge” between HSE and H1 channels, interconnecting field devices to each other and to other hosts, and is an essential component for integrating system communication with direct I/O access and advanced control applications.

A single HSE linking device can interconnect four H1 fieldbus segments and accommodate up to 16 devices per segment (for a total of 64 devices per linking device). Plus, each linking device has a capacity of more than 300 function blocks to perform advanced or more complex control functions.

Locating control functionality in HSE linking devices unifies the control structure across the control room and the field. Linking devices can be situated in close proximity to the process where points of communications converge. This approach also minimizes the effects of any loss of supervisory control. The failure of a single device only affects a fraction of the overall control capabilities.

Automation end users can implement a control system utilizing HSE via linking devices designed to connect H1 segments in either a single or redundant configuration. This 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.

The use of FOUNDATION fieldbus back-up Link Active Scheduler (LAS) functionality in

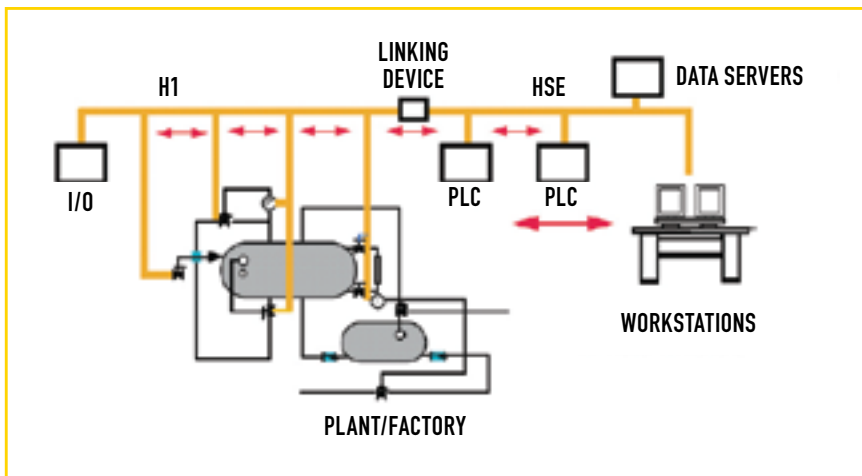
field devices, as well as redundancy at the HSE bus and supervisory device, ensure a high degree of system integrity. Field instrumentation can be integrated by importing standard device descriptions (DDs) and capabilities files (CFs) as provided by registered fieldbus devices.

FOUNDATION fieldbus control platforms fully implementing HSE offer 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.

One of the most significant reasons for implementing control-in-the-field with HSE is the elimination of synchronization problems, which 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 — often creating unacceptable timing delays.

### Industry experts weigh in

For this article, *Fieldbus Report* asked leading automation industry suppliers and end users for their perspective on control-in-the-field with FOUNDATION technology, and how it impacts



Locating control functionality in HSE linking devices unifies the control structure across the control room and the field.

the control execution in fieldbus follows a rigid schedule, variable update and final control element actuation is done in very precise time intervals. Lack of synchronization of the DCS controller with the I/O cards does not allow the same type of periodicity. For example, PID control calculates the integral and derivative assuming that the updates always occur in the same period, and when there are variations, variability increases.

“When employing CIF, end users should select devices and ancillary equipment of good quality and with features and performance that help achieve their objectives. A well planned and executed installation provides an excellent return in terms of reduced maintenance costs and process uptime,” Peluso concluded.

Amit Ajmeri, consultant, wireless and field network technology, Yokogawa Corporation,

plant operational performance and project life-cycle costs.

Marcos Peluso, a distinguished technologist with Emerson Process Management, believes control-in-the-field provides an ideal solution for regulatory control applications in today’s process plants. “CIF can be used to control individual loops or as part of a DCS-based

advanced control scheme,” said Peluso. “The DCS can send set points or calculated variables for the regulatory loops. Depending on the function blocks available in the field devices, CIF allows for control strategies like cascade, overriding, split, and cross limit.”

He continued, “CIF control performance is better than control performed in the DCS. As



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In conjunction with FieldPlus™, MTL are introducing two new fieldbus products:

- the **F300 series Megablocks** designed for general purpose, Zone 2 and Division 2 hazardous area applications
- and the **9189 Fieldbus Power System**, designed to provide N+1 redundant power for eight FOUNDATION™ fieldbus H1 segments.





has his own view of CIF. He said, "Complex loops will be hard to implement using CIF, so first start with simple and cascaded loops and decide where you want to put the PID control function block. If your DCS has synchronized data transfer from the controller to the fieldbus I/O card as per calculated macro-cycle, you will see the same performance improvement regardless of whether you are running CIF or control in the DCS. CIF will expose PID control parameters to anyone outside the DCS access as they reside in the field device, so extra security must be implemented to make sure unauthorized people can't access this information. Once the operating procedures are established, data security will not be an issue."

Ajmeri also has some advice for end users considering the use of CIF. "Check with your DCS supplier to see if they have synchronized FOUNDATION fieldbus I/O scan. Also, pay close attention to all PID block parameters and default configuration of PID blocks, which can be different from vendor to vendor," he said. "In addition, be sure to implement procedures for PID block data security and management of authorized data access, and create device replacement procedure for CIF devices. Training will be very important, too."

Dave Huffman, marketing support manager, ABB, commented, "There has been some analysis done to indicate that the pure cyclic control achieved with the H1 LAS can provide better control than may be achievable in some cases with centralized control designs for certain difficult loops. But in general, I suspect the overall quality of control is about the same for the large majority of control loops operating today if owners make it a priority to properly tune their loops regardless of where the PID functions reside."

"In regards to HSE, it is possible to gain controller resources by moving control to the field devices. End users can eliminate the need to involve the controller for any of the communications or system loading when control functions are done in the field devices."

Huffman added, "Industrial plant engineers need to start using the technology in the way it was designed so they can realize the full

advantages of FOUNDATION fieldbus. Just implementing it as an I/O system doesn't make sense unless they truly intend to make use of asset management features."

John Rezaabek, process control specialist for ISP Chemicals and chairman of the Fieldbus Foundation's End User Advisory Council, believes CIF has an important place in the process plant environment. In an article published on *ControlGlobal.com*, he wrote, "If you have an investment in intelligent field devices that can handle 80 percent of the control in your

plant, why put the entire burden on your host? Users should let hosts churn away at the more demanding advanced control and optimization, and leave the day-to-day, garden-variety PID to the field devices."

### Implications for end users

For many end users in the process industries, control-in-the-field offers improved control performance because it is no longer necessary to communicate control-related data to the central control system. This means time delays

Faster processes, such as those at power generation facilities, tend to benefit more from control-in-the-field.



are reduced and determinism is improved, compared to using systems where control calculations are performed within the DCS.

Implementation of FOUNDATION fieldbus with control-in-the-field can also reduce costs associated with wiring, power supplies, panel space, and redundancy hardware. In turn, by reducing the hardware requirement there are actually fewer points of failure, thus adding to the reliability of the system. Similarly, the smaller number of connections between the devices increases system reliability.

The increased reliability and availability of the process made possible by CIF has a significant effect on the number of unplanned incidents taking place. Greater plant availability has a positive effect on a company's bottom line. The same is true for enhanced accuracy of control, which enables operators to reduce raw material and energy use, increase output, and improve final product quality.

#### Choosing the right applications

Implementing control-in-the-field enables certain applications to be more efficient than

is possible with conventional instruments or control-in-the-host. This is because field-based control runs independent of the host control system and can execute as quickly as quarter-second loop times. The typical DCS scans I/O on a one-to-five-second cycle. Faster cycle times and more accurate measurements mean operating closer to the physical constraints of the system, and hence increased throughput without the need to purchase larger equipment.

In a typical industrial operation, the faster processes tend to benefit more from control-in-the-field. The advantages of field-level control are reduced in situations where processes are intentionally tuned for slow controller response or where the slow rate and saturation limits may constrain a faster response. There are also many specialized loops that require very fast sample rates, but may require sensors and actuators that are non-fieldbus compliant.

Applications where CIF strategies are especially effective include compressor anti-surge control; many flow and pressure loops; and some fast temperature, pH, position and speed

loops. Power generation has long been one of the major users of FOUNDATION fieldbus, even in nuclear applications. There are many important pressure and flow loops in a typical power generation facility that have an impact on overall performance, and can determine how fast a power plant can handle load changes or increase process efficiency.

#### Conclusion

For today's automation end users, many significant advantages can be gained from implementing a FOUNDATION technology solution employing control-in-the-field. First, CIF provides single-loop integrity, thus minimizing the possibility that a control strategy failure will result in a partial or complete shutdown of a processing unit. Second, CIF reduces both fieldbus network communication traffic and process automation system controller loading. Lastly, CIF reduces total automation system lifecycle costs by lowering equipment, installation and commissioning costs, and providing the information necessary to implement predictive maintenance practices. ■



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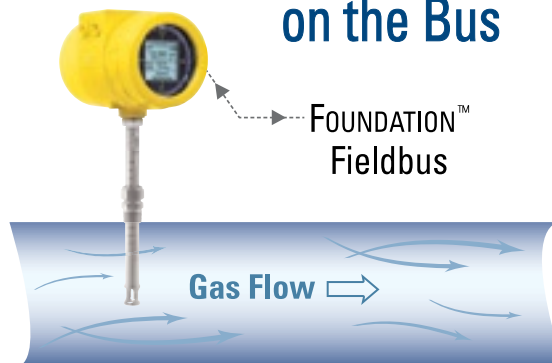
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# List of Registered FOUNDATION™ Products Continues To Expand

**Latest registrations come from all segments of the automation market**

The Fieldbus Foundation is registering a growing number of FOUNDATION™ fieldbus products, from all segments of the automation market. The foundation is one of the only automation industry organizations with a registration program requiring mandatory testing of critical elements of its technology. This effort encompasses FOUNDATION fieldbus host systems and field devices, as well as physical layer components such as power supplies and device couplers.

The table below identifies the latest registered FOUNDATION products. ■



**FOUNDATION**

Official Fieldbus Foundation registration "checkmark."



## MANUFACTURER

## TYPE

## MODEL/DEVICE NAME

### NEW AND UPDATED REGISTERED H1 DEVICES

Emerson Process Management	Multi-Input Temperature Transmitter	2240S
Honeywell Industrial Automation & Control	Electromagnetic Flowmeter	TWM1000
Invensys - Foxboro	2-Channel Temperature Transmitter Head Housing	RTT80
Magnetrol	Mass Flow Transmitter	Model TA2 2x
Tokyo Keiso Co., Ltd.	Torque Tube Displacement Level Transmitter	FST4000FF
Tokyo Keiso Co., Ltd.	Torque Tube Displacement Level Transmitter	FST4000FB
Tyco Valves & Controls	Discrete Valve Controller	AVID ZR-F
Westlock Controls	Discrete Valve Controller	FPAC EL40106
Yokogawa Electric Corporation	FF-Pneumatic Converter	YPK

### UPDATED DEVICE DESCRIPTION AND CAPABILITY FILE

Flowserve Corporation	Electric Valve Actuator	Limiterorque MX
Flowserve Corporation	Electric Valve Actuator	Limiterorque QX

### NEW AND UPDATED REGISTERED POWER SUPPLIES, CONDITIONERS AND COUPLERS

MTL Instruments	8-Segment Redundant Fieldbus Power Supply System	9191-FP module with 918x-CA-Px redundant carrier
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For a complete list of registered FOUNDATION fieldbus products, please visit the "Registered Products" page of the Fieldbus Foundation's website at [www.fieldbus.org](http://www.fieldbus.org). To learn more about FOUNDATION fieldbus interoperability, please download the free whitepaper available on the "Technical References" page of the foundation website.



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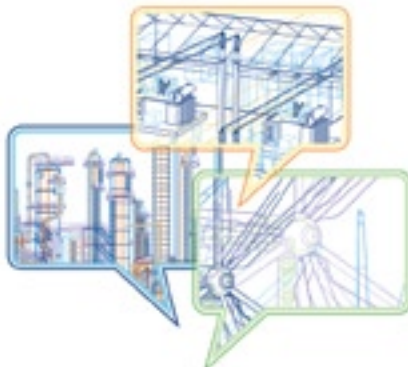
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# Fieldbus Product Highlights

## RID14 AND RID16 FOUNDATION FIELDBUS FIELD INDICATORS

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  - Function block interconnection
  - NEW! Listener Mode reduces costs and traffic on the bus
- Further function blocks like PID, arithmetic or integrator block support flexibility
- Advanced Diagnostic block offers detailed information on status or failures
- LAS capable
- Various housing designs in glass-reinforced plastic, aluminum or stainless steel

**ENDRESS+HAUSER** • [www.products.endress.com/RID14](http://www.products.endress.com/RID14) • [www.products.endress.com/RID16](http://www.products.endress.com/RID16)



## PHOENIX CONTACT RELEASES NEW SOLUTIONS FOR FOUNDATION FIELDBUS

Phoenix Contact has added two new families to its ever-growing process infrastructure portfolio. A new line of preconfigured junction boxes makes it easy to connect and protect process instruments, and a redundant fieldbus power supply can prevent downtime in critical applications.



In the field, FB-...-SS stainless steel and FB-...-AL aluminum enclosure assemblies include internal components for trunk connection, termination, surge protection and flexible shielding for easy connection. The user can snap in the necessary type and number of modular device couplers, FB-2SP or FB-ISO, based on the hazardous area and isolation requirements. This reduces installation costs by avoiding unused capacity and minimizing enclosure size. At the same time, a one-to-one coupler to instrument relationship increases operational integrity.

In the control cabinet, the redundant power supply features a per-segment modular base for connectivity and signal conditioning. This improves overall process integrity while saving critical cabinet space and avoiding unused capacity cost. Power modules include Auto Current Balance (ACB) technology and Preventive Function Monitoring with an integrated remote indication contact per module.

The overall breadth of the Phoenix Contact offering provides the solution to almost any process automation challenge.

**PHOENIX CONTACT** • [www.phoenixcontact.net/processfieldbus](http://www.phoenixcontact.net/processfieldbus)

## YOKOGAWA LAUNCHES NEW VERSION OF CENTUM® VP

### Adoption of Advanced Field Digital Technology Strengthens FOUNDATION for Operational Excellence

Yokogawa Electric Corporation launched the Release 5 of the CENTUM® VP integrated production control system, the company's flagship product and a cornerstone of the VigilantPlant® concept that aims to help customers realize the ideal plant.

Field digital technology has been introduced in many industries and is contributing to the reduction of the needs of field wiring, as well as the increase of maintenance efficiency in manufacturing plants. Efficient maintenance schemes with advances in field digital technology is now one of the key factors for highly productive plant operation. Control systems must be capable of handling a massive amount of field data at comfortable speeds.

Key development of CENTUM VP Release 5, a new field control station (FCS), can fully satisfy such needs in the field digital era. It will demonstrate its powerful capabilities by improving the use of plant information and reducing lifecycle costs with simplified engineering.

CENTUM VP Release 5 contains various new features including the new FCS mentioned above. For more information about CENTUM VP Release 5, visit the Yokogawa website.

**YOKOGAWA** • [www.yokogawa.com](http://www.yokogawa.com)





# Fieldbus Product Highlights

## TRULY INTEGRATED CONTROL AND INSTRUMENTATION ... ONLY FROM ABB

Only ABB delivers the extended automation functionality that gives you the visibility and control you need to run your plant more efficiently — optimizing your precious time, resources and money. Find out how truly integrated control and instrumentation can save you money ... **get your FREE copy of our asset optimization white paper at: [www.abb.com/systrummentation](http://www.abb.com/systrummentation).**

**ABB** • [www.abb.com/systrummentation](http://www.abb.com/systrummentation)



Power and productivity  
for a better world™



## 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.

**EMERSON PROCESS MANAGEMENT** • [www.emersonprocess.com](http://www.emersonprocess.com)

## HONEYWELL OFFERS UNMATCHED FIELDBUS BENEFITS WITH NEW FIM8

Honeywell's high-performance Fieldbus Interface Modules completely and transparently integrate FOUNDATION fieldbus with the Experion® PKS system. Fieldbus Interface Modules (FIMs) help provide the benefits you expect from this powerful technology. The new FIM8 represents the latest advances in capacity, cost-effectiveness and performance from Honeywell. The FIM8 supports up to 8 FOUNDATION fieldbus H1 links per module in the same footprint as the redundant FIM4. This increased density can reduce total installed cost when the solution involves a high number of fieldbus devices. Honeywell's FIMs feature a high-capacity design that delivers system-wide integration of data access, control, connections, diagnostics, and alarms with the Experion® PKS system. The FIM8 provides the highest density of H1 links in a single module, while providing for maximum availability through the optional redundancy feature.

**HONEYWELL** • [www.honeywell.com](http://www.honeywell.com)



## THE LARGEST FOUNDATION FIELDBUS INSTALLATION IN THE WORLD CHOSE THE FOXBORO I/A SERIES® SYSTEM. THERE'S A REASON.

The robust I/A Series System excels at meeting demanding requirements for uptime, system speed, size and longevity. Our fieldbus solutions offer faster startups, easier device commissioning, and truly open support to manage any device from any vendor. The result is a high availability solution with superior device management, making it easier to engineer and start-up a plant in a fraction of the time.

**INVENSYS** • [www.iom.invensys.com/EN/Pages/Foxboro\\_DCSIASeries\\_FieldbusTechnologies.aspx](http://www.iom.invensys.com/EN/Pages/Foxboro_DCSIASeries_FieldbusTechnologies.aspx)



## MICROCYBER DEVELOPS MODBUS-TO-FOUNDATION FIELDBUS CONVERTERS

As one of the leading suppliers of premium industrial communication products (FOUNDATION fieldbus, Profibus PA, HART and Modbus), Microcyber has developed a converter for MODBUS to FOUNDATION fieldbus (NCS-MF105). It is able to integrate device/board with MODBUS communication interface to FOUNDATION bus system. As a MODBUS host, NCS-MF105 communicates with the device with MODBUS-RTU interface, and can achieve read/write operation for MODBUS register data via fieldbus transducer blocks, and convert MODBUS data to fieldbus communication system via standard AI, AO, DI, DO function blocks. Also, Microcyber provides OEM Board Solutions and Fieldbus Development Toolkits.

**MICROCYBER** • [www.microcyber.cn/en/product.asp](http://www.microcyber.cn/en/product.asp)

## REDUNDANT FOUNDATION FIELDBUS PHYSICAL LAYERS

One difficulty still remains with fieldbus technology: all segment communications and power integrity are vulnerable to a single broken, twisted wire pair. The MooreHawke TRUNKSAFE Fault-Tolerant Fieldbus System 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 on a FOUNDATION fieldbus physical layer.

**MOOREHAWKE** • [www.miiinet.com/moorehawke](http://www.miiinet.com/moorehawke)



# Fieldbus Product Highlights

## 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 while removing the drawbacks associated with existing implementations. Gone are inflexible, custom-built field enclosures and complex wiring looms. The result is lower cost, safer operation and higher reliability throughout the lifecycle of the fieldbus network, with benefits not only for the plant operator, but for all parties involved in the design and installation process.

- Live pluggable modules for safer maintenance
- Standard enclosures eliminate "customized" wiring
- Optional surge protection — even as a retro-fit
- Smaller footprint gives up to 70% space savings

**MTL** • [www.mtl-fieldbus.com](http://www.mtl-fieldbus.com)



## PEPPERL+FUCHS INTRODUCES NEWEST VERSION OF ITS ADVANCED DIAGNOSTIC MODULE DTM SOFTWARE



Advanced Diagnostic Modules (ADM) monitor the quality of fieldbus communication for FOUNDATION fieldbus H1 and PROFIBUS PA networks, and Diagnostic Manager software includes a number of updates that dramatically speeds fieldbus commissioning and takes the guesswork out of troubleshooting for ADM users. The most significant improvement is a built-in expert system that automatically learns the communications behavior of a segment during commissioning, and over time is able to diagnose any situation on the basis of past experience. Additional updates of significance include: Automated tag reading to enable reading and

documenting tags and device IDs in combination with any FOUNDATION fieldbus host, and an improved oscilloscope which offers more trigger events and automatically captures up to 10 shots in a row; each bit and telegram is identified with type and value, as well as source and destination address.

**PEPPERL+FUCHS** • [www.fieldconnex.info](http://www.fieldconnex.info)

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

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 can be used to improve technician productivity and process throughput while reducing risk. The solution is ideal for project commissioning when the automation system is not fully functional, as well as for OEM applications or projects that engage multiple control architectures.

**ROCKWELL AUTOMATION** • [www.rockwellautomation.com](http://www.rockwellautomation.com)

**PlantPAx**  
Process Automation System



## R. STAHL OFFERS SCALABLE PHYSICAL LAYER DIAGNOSTICS — TAILORED TO YOUR NEEDS

With the new scalable diagnostics concept, customers can choose exactly the level of diagnostics that they need — and are willing to pay for. Each Fieldbus Power Supply features integrated physical layer diagnostics of signal level, noise, jitter and unbalance. Perfect for installation or troubleshooting, the Fieldbus Power Supply can be connected to a PC via a front-side serial interface and all information is displayed on the screen without the need to install special drivers or DTMs. For pro-active alarming requirements, the Advanced Fieldbus Power Supply has adjustable warning levels, a relay contact and three LEDs to warn of any deterioration of the fieldbus quality. The brand new Diagnosis Communication Module reads the physical layer information from up to eight segments. Via an Enhanced DD system, integration is easy to achieve.

**R. STAHL** • [www.stahl.de](http://www.stahl.de)

## NEW SITRANS LR560 IS THE FIRST 78 GHZ RADAR LEVEL TRANSMITTER FOR CONTINUOUS LEVEL MEASUREMENT OF SOLIDS

Siemens Industry Automation Division has launched Sitrans LR560, the first radar level transmitter operating at 78 GHz frequency. Sitrans LR560 is a non-contacting 2-wire FMCW (Frequency Modulated Continuous Wave) radar level measurement transmitter with a measurement range of 100 meters (328 ft). The transmitter emits a narrow four-degree beam which avoids silo wall obstructions and other installation interferences, allowing it to be installed practically anywhere on the top of the silo. As the first radar transmitter to operate at 78 GHz frequency, it emits a short wavelength to provide exceptional signal reflection even from solids with a steep angle of repose. The graphical Quick Start Wizard guides the user to get Sitrans LR560 operational in minutes for accurate and reliable level measurement readings without any additional fine-tuning. Sitrans LR560 is available with HART®, PROFIBUS PA, or FOUNDATION™ fieldbus protocol.

**SIEMENS** • [www.siemens.com/sitranslr560](http://www.siemens.com/sitranslr560)



## SMAR RELEASES SIMULATION VIEW FOR CONTROL STRATEGY SIMULATION

Smar presents the ultimate software that helps improve your business by analyzing the impact of new FOUNDATION fieldbus control strategies prior to live implementation by customers. All procedures can be done offline, without causing disruptions in service. Using its powerful features, technicians are able to develop and simulate strategies based on FOUNDATION fieldbus function blocks and ladder logic according to the IEC 61131-3 standard. The simulated data are available through SYSTEM302's OPC™ server to any OPC™ client. Houston, TX — [sales@smar.com](mailto:sales@smar.com) — 1-800-762-7833.

**SMAR** • [www.system302.com](http://www.system302.com)



# Flexible fieldbus modularity



## Reduce costs and prevent downtime

Increase the availability of your process with our single-channel fieldbus barrier and redundant power supply. The modular fieldbus system offers tailored installation, fast module replacement and flexible expansion.

### Field junction box

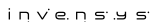
- Increase system availability with single-loop integrity
- Easy and fast installation of prewired junction box

### Redundant power supply

- Modular structure for increased system availability
- Integrated diagnostic function with relay output
- Maximum service life thanks to Auto Current Balance Technology (ACB)

For additional information call  
800-322-3225 or visit  
[phoenixcontact.net/processfieldbus](http://phoenixcontact.net/processfieldbus)

## Sponsors



# Automation Infrastructure For Operational Excellence.

The Fieldbus Foundation is “Changing the Playing Field” in industrial automation. The scope of FOUNDATION™ technology makes it a process automation infrastructure—one of the most advanced and scalable solutions available.

This infrastructure is supplier-neutral and standards-based, providing end users with a common framework to implement and manage strategies for operational excellence and continuous improvement in process manufacturing.

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. Find out more.

Visit [www.fieldbus.org](http://www.fieldbus.org).



**Fieldbus**  
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Process Industry  
Fieldbus Market Share

