



# FIELDBUS MYTHS BUSTED

KNOW THE FACTS BEFORE YOU CHOOSE

Many myths and misconceptions continue to persist surrounding FOUNDATION technology. In this document, we bust some of the more persistent myths and misconceptions surrounding a technology that is proven in the field, reliable, and open.



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KNOW THE FACTS BEFORE YOU  
CHOOSE

## THE BUSINESS VALUE OF FOUNDATION TECHNOLOGY

### Why the Myths?

The first commercial FOUNDATION Fieldbus applications were installed in 1997. Since that time, over a million devices have been sold into a billion dollar market of products, applications and services. Man-years of project expertise and best practices have also been accumulated. Today, there are very few greenfield projects that do not incorporate some FOUNDATION technology, and there are an ever increasing number of control system modernization and migration projects that are also benefiting from the technology.

The process industries are well known for being conservative, however, and many of the old issues encountered during these early projects continue to persist as myths today. Many other myths have no basis in fact at all and it is unclear how they got started in the first place.

The good news is that these myths and customer objections can actually be turned into opportunities for the value minded salesperson. Busting these myths and uncovering the real story to the end user is a good way to point out the business value proposition that FOUNDATION can bring to the end user. We have presented some of the most common myths here in this document and provided you with the facts that bust these myths once and for all. We hope you find this document to be a useful resource, and we welcome your feedback.

## IS IT SAFE?

The most common objection to fieldbus technology is the risk. That may have been true in 1997 when the first commercial applications were installed. Today, with millions of devices installed and FOUNDATION technology controlling some of the world's largest process plants, the only risk is ignoring the benefits of this proven technology.

Please share your  
comments and feedback  
with us. Just email us at  
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## Myth: Fieldbus implementation is too Difficult

With proper training and the right partner, FOUNDATION technology actually reduces the risk in the engineering and operational phase of the project, which also increases the net present value of the capital investment. Implementing FOUNDATION technology does require different thinking and training. It is different, but not difficult. The accumulated knowledge governing FOUNDATION Fieldbus engineering, for example, has been combined into a single set of free downloadable guides from the Fieldbus Foundation.

The AG-181 System Engineering Guide can be downloaded from the Foundation web site [here](#) or by visiting the End user Resources section of our web site at [www.fieldbus.org](http://www.fieldbus.org). The guide is a comprehensive resource that contains best practices for the engineering, design, and installation of FOUNDATION Fieldbus systems. In addition to the System Engineering Guide, we offer supplemental guides on wiring and installation, intrinsically safe systems, and a guide to function block capabilities in hybrid and batch Systems.

Many resources exist today for cost effective training around the world. With eight certified training centers around the world, users now have access to the best instructors for face to face, onsite, or remote training. To ensure success, training should start in the earliest phases of the project to ensure a smooth transition after project handover.

## Myth: There is no Cost Benefit to FOUNDATION Fieldbus

When best practices for project engineering are followed the installed cost of a FOUNDATION field bus based system can easily be much less than a conventional system in several key areas. Instrumentation commissioning and checkout times are greatly reduced. What used to take a field technician hours to accomplish now takes minutes. Up to 75 percent of all startup delays directly relate to instrumentation and controls. FOUNDATION technology has the power to make commissioning easier and to reduce overall commissioning times by as much as 85 percent. This results in faster plant startup and faster time to production.

If you are a first time implementer or if FOUNDATION technology is being deployed at your site for the first time, it makes sense to invest in some training – for your instrument technicians, operators, and other people who can benefit from the technology. In our view, training is a

# AG-181: A VALUABLE RESOURCE

The AG-181 System

Engineering Guidelines

are the collected wisdom

of many thousands of

hours of fieldbus

engineering and

implementation

experience. AG-181 can

save you a lot of time and

trouble if you are new to

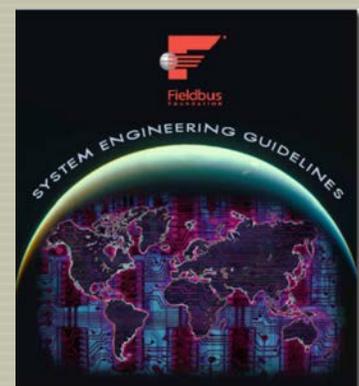
the technology and can be

downloaded for free from

the Foundation web site

under End User

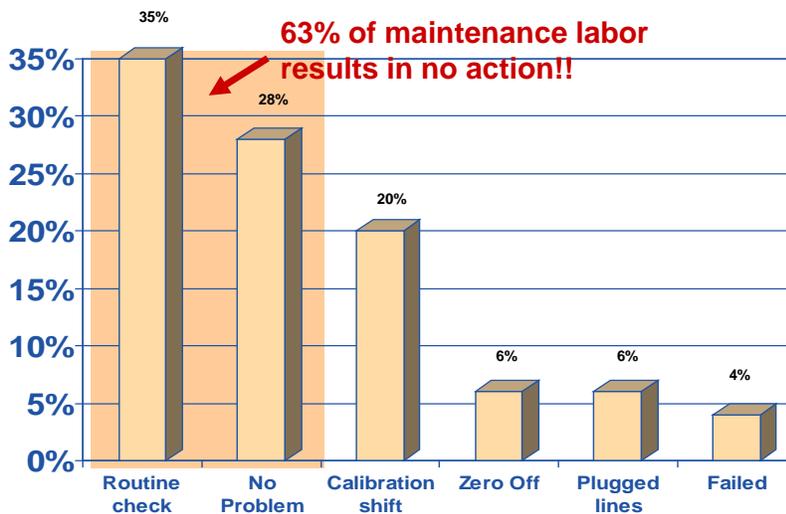
Resources.



necessary investment, but we have several certified training centers around the world, and training does not have to break the bank.

Choosing the right engineering partner also has an impact on installed cost. References are important. Fortunately, a growing number of engineering firms from large engineering contractors to independent systems integrators are becoming well versed in FOUNDATION fieldbus engineering best practices.

The real cost benefit to FOUNDATION technology is in the operational phase of the plant. Numerous end users have avoided unplanned shutdown due to the diagnostics and function block capabilities of FOUNDATION fieldbus. Many end users view maintenance as one of their key costs that can be cut. End users have estimated that more than half of maintenance activities result in no action. FOUNDATION technology with its predictive diagnostics can help users develop a proactive maintenance strategy that avoids unnecessary trips to the field for routine scheduled maintenance.



Source: Shell Global Solutions

Myth: Why should I Invest in Fieldbus when there is Wireless Technology?

Wireless technology has many advantages, but fieldbus and wireless technology are not mutually exclusive. Wireless in control applications is a long way off, and no end user is going to totally replace their control system infrastructure to support only wireless devices. The Fieldbus Foundation has made it our policy to coexist with industrial wireless technologies for process automation. Through our Wireless and Remote I/O project (WIO), the Foundation has generated specifications for gateways to incorporate either ISA 100.11a or WirelessHART data into FOUNDATION systems. Combining the wealth of diagnostic data in wireless devices with the

## BENEFITS OF CONTROL IN THE FIELD

- ❖ Improved Control Loop Performance
- ❖ Increased Reliability & Availability
- ❖ Improved Loop Integrity
- ❖ Reduced Loading on DCS/PLC & Network
- ❖ Lower Capital & Installation Costs
- ❖ Reduced Operating Costs

capability to manage that data and turn it into useful information in a FOUNDATION fieldbus system is a powerful solution.

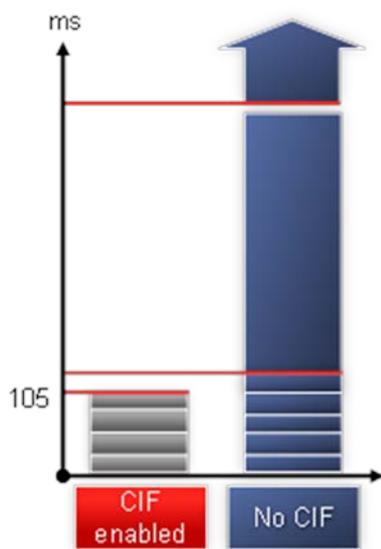
### Myth: There Aren't Enough Systems Integrators with Good Project Implementation Experience

With thousands of systems installed, there is a substantial body of knowledge that has been established around successful implementation of FOUNDATION Fieldbus project, and the list of both suppliers and systems integrators with experience in fieldbus implementation is substantial. Representatives from leading engineering firms are on the Foundation End User Advisory Council and were instrumental in the creation of the System Engineering Guide.

### Myth: Control in the Field Poses Risks and Compromises System Availability

Control in the field is one of the key enablers for achieving high availability control and a stepping-stone toward single loop integrity. If there is a malfunction in the 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. Many end users have already

managed to avoid unplanned downtime when field level control took over after a failure in the system. Field level control means not only increased availability and reliability, but also increased flexibility. Controllers are free to handle higher-level control functions such as advanced control and optimization.



CONTROL IN THE FIELD PRODUCES MEASURABLY FASTER RESPONSE TIMES

Recently, UK-based firm Industrial Systems and Control Ltd. (ISC, [www.isc-ltd.com](http://www.isc-ltd.com)) released a study called "Control in the Field: Analysis of Performance Benefits". In a series of illustrative simulation studies, ISC determined that control in the field has the potential to offer improved control loop performance due to its ability to offer faster sample rates and shorter latencies in the read-execute-write cycle of a control loop. Many end users have been taking advantage of control in the field for years and have had no problems with system availability or fault tolerance. Applications where control in the field 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 plant performance, and can determine how fast a power generation facility can handle load changes or increase process efficiency.

## Myth: I can get Most of the Field Diagnostics I need from Other Technologies

Some network technologies offer diagnostic information, either digitally or through 4-20mA technology. Digital networks can handle more diagnostic data than their analog counterparts, but their real value goes beyond diagnostic data. It's what you do with all that data to turn it into useful information to help you run your business. Only FOUNDATION Technology has the ability to take large amounts of data from field devices, digital valve positioners, and other instruments in your plant and turn it into useful information.

Problem resolution hinges on the ability of systems to put data into the appropriate context. The data from FOUNDATION devices is constantly being updated. Instead of having to poll devices for data, the data is pushed to the applications and the people that need it when they need it. Data is prioritized, to avoid alarm flooding. The data is time stamped and you can archive it and retrieve it. FOUNDATION technology also has peer to peer communication capability, allowing devices to communicate with each other, which significantly expands the diagnostic capability of the overall system.

## Myth: There are Interoperability Issues with Fieldbus Devices

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 H1 Interoperability Test Kit (H1 ITK) tests the functionality of a device and its conformity with FOUNDATION fieldbus function block and transducer block specifications. An excellent tool for troubleshooting and debugging devices, the test kit includes all hardware and software required to ensure a manufacturer's complete device interoperability as specified by the foundation's official registration testing procedure. The H1 ITK has now been updated to support powerful field diagnostics capabilities, which standardize how all fieldbus devices communicate their diagnostic data to the host system and asset management system—regardless of the vendor.

The Foundation also offers an extensive Host Registration Program. The Fieldbus Foundation's Host Profile Registration Process requires that the host profile under test must support a clear set of required features. Under the registration process, fieldbus hosts successfully completing the test requirements are authorized to bear the official Foundation product registration symbol. Hosts may include configuration tools, recording devices, alarm display panels, Human-Machines Interfaces (HMIs), or systems with a combination of functionality.

### Diagnostic Data Provided by Registered FOUNDATION Temperature Transmitter

- *Statistical Process Monitoring: Uses process “noise” to detect process problems such as hydrate formation, scaling formation, thermowell coating, etc.*
- *Predictive Thermocouple Degradation diagnostics: Process/cold-junction sensor failures, sensor drift, configuration error*
- *Extreme Temperature Tracking: Heat conducted from integral sensor to transmitter housing, transients*

## Myth: Fieldbus is only good for New Projects and not for Modernization or Migration Projects

Fieldbus technology is surprisingly well suited for modernization and migration projects, not just for large grassroots applications. FOUNDATION Fieldbus is compatible with much of the existing wiring found in today's plants. According to ARC Advisory Group, control system migration is the biggest issue facing end users today, and the installed base of process automation systems reaching the end of their useful life is around \$65 billion. Over the years, many systems have been upgraded in a phased manner, usually at the application level. Today, we see more and more of the I/O, wiring, and control infrastructure that needs to be replaced.

More than anything, users are looking to avoid a functional replacement in their migration strategy – replacing their old system with a new system that has exactly the same functionality and architecture. As more end users replace their legacy hardware and applications, they are realizing the value of FOUNDATION Technology to get more diagnostic data from their devices, reduce unplanned downtime, and cut down on the amount of wiring, I/O, and associated labor and infrastructure required in a conventional 4-20mA system. You don't even necessarily have to replace your existing wiring. Test kits are available to determine if existing wiring is compatible with FOUNDATION technology, but overall the technology is compatible with existing wiring. Special wire or cable may bring installation benefits, but is not required.

## Myth: FOUNDATION Fieldbus for Process Safety Systems Will not Work

TÜV granted Protocol Type Approval for the Fieldbus Foundation Safety Instrumented Functions (FF-SIF) specifications in 2006. The specifications outlined by the Fieldbus Foundation comply with the IEC 61508 standard for functional safety of electrical/electronic/programmable electronic safety-related systems requirements up to, and including Safety Integrity Level 3 (SIL 3). With the release of the FF-SIF specification, suppliers are developing products and systems that will be able to incorporate fieldbus diagnostics, partial stroke testing, and network monitoring and management capabilities to

process safety systems. Many major end users such as Aramco and Shell have beta systems running FF-SIF logic solvers and devices running today, and have openly stated that they would like to deploy this technology on all of their upcoming major projects.

No changes were made to the fundamental H1 protocol for implementation in safety instrumented systems, but additional



BUSINESS CASE FOR ADOPTION OF FOUNDATION FIELDBUS SAFETY INSTRUMENTED FUNCTIONS

device diagnostic functions and fault detection capabilities were required. In addition to the device diagnostics, the primary advantage to using FF-SIF as the network for safety applications is the network diagnostics that are possible. Traditional analog-based networks lack the ability to detect noise, corruption, and faults in the network. More importantly, the data handling capability of FOUNDATION technology means that you can commission your safety system faster. Users modernizing their legacy safety instrumented systems must also replace the entire system, from the devices to the

logic solver, to be compliant with safety standards such as ISA 84 and IEC 61508 and 61511. FF-SIF offers reduced time to startup, easier regulatory approval, and reduced installed costs for process safety systems.



FOUNDATION FIELDBUS CAN SAVE A LOT OF VALUABLE SPACE ON SKID MOUNTED EQUIPMENT

### Myth: Fieldbus is Just for the Refining or Chemical Industry, not for Hybrid or Regulated Industries

Today, 10 of the top 20 food and beverage companies and 24 of the 25 top pharmaceutical companies are using FOUNDATION technology. FOUNDATION technology makes it easier for regulated industries to achieve compliance. Pharmaceutical manufacturers are increasingly designing their plants for fast track construction by connecting multiple pieces of OEM skid mounted equipment together.

FOUNDATION technology makes it easy to integrate different skids from different OEM suppliers quickly under a single network and automation infrastructure. The reduced footprint of FOUNDATION technology also lends itself well to the limited space requirements of many skid-mounted systems. Dealing with changes in scope that include adding new field devices after initial segments were installed is less painful because it is not necessary to install a home run cable for the device to the control cabinet.

### Fieldbus Devices Result in a Flood of Alarms and Alerts

Fieldbus devices do provide a greater level of diagnostic data. Fieldbus devices do not, however, create alarms for operators by default or issue an alarm whenever there is a diagnostic issue with the device. Operators should only be alerted to device problems when they can have an impact on their operation. Fieldbus diagnostics can also be prioritized based on the impact a particular failure has.

## TURNING MYTHS INTO OPPORTUNITIES

The myths and misconceptions presented here can be used quite effectively to demonstrate the business value, return on investment, and improved operational performance that FOUNDATION technology provides. In today's digital age, there is no reason not to include an evaluation of FOUNDATION technology for your automation requirements, whether it is a modernization project or a grassroots facility. The Fieldbus Foundation has numerous resources to help suppliers and end users implement successful projects, develop quality products. Contact the Fieldbus Foundation at [marketing@fieldbus.org](mailto:marketing@fieldbus.org) for more information or go to the Fieldbus Foundation Web Site at <http://www.fieldbus.org>.