

EDD Extensions and Standardization Provide Value to Fieldbus and HART Users

Keywords

Fieldbus, Device Description, Foundation Fieldbus, Profibus, HART

Summary

The promise of a truly interoperable environment where fieldbus devices incorporating different protocols can seamlessly work together is one step closer to reality. The three leading process fieldbus organizations -- Fieldbus Foundation (Ff), Hart Communication Foundation (HCF), and the Profibus Nutzerorganisation (PNO) -- have announced completion of the

The promise of a truly interoperable environment where fieldbus devices incorporating different protocols can seamlessly work together is one step closer to reality. How will the announcement of key extensions to the critical Electronic Device Descriptions (EDDs) impact this interoperability?

initial development phases for key extensions to Electronic Device Descriptions (EDD). EDD has been approved by the IEC as Draft International Standard 61804-2, but what does the incorporation of these new extensions to EDD mean and how will it affect device interoperability and accommodation of devices running on different protocols within a unified environment?

Analysis

ARC has always believed that fieldbus is a means to an end, and the replacement of 4-20mA technology with a standard digital network is an enabler for advanced asset management strategies and the creation of a knowledge workforce. However, the promise of a single process fieldbus environment that provides truly interoperable "plug & play" capabilities between devices and host systems and applications from multiple manufacturers remains an elusive goal.

EDD technology, however, is already incorporated into the Foundation Fieldbus, HART, and Profibus PA communication protocols. EDD is a structured text language that is both operating system and protocol independent. Through EDD, users can have access to device characteristics, parameters, and other device data that can be read by the host system for



purposes of configuration, diagnostics, and integration. When a device incorporating EDD functionality is plugged into a fieldbus or HART-compatible control system, the device and its associated characteristics are automatically recognized by the system.

EDD lies at the heart of the interoperability proposition fieldbus, but with three distinct protocols -- FF, HART, and Profibus PA, there was no standard EDD specification that worked across the board. Recognizing the increasing demand for standardization, the Fieldbus Foundation, HART

Communication Foundation, and Profibus Nutzerorganisation teamed together to create extensions to EDD and provide a single specification that could be supported by all three groups.

These enhancements to EDD were defined by a working group that included representatives from most of the major control system suppliers, including ABB, Emerson Process Management, Endress+Hauser, FlowServe, Honeywell, Siemens, and Yokogawa, as well as staff from the HCF and

FF. In their work to create a standard, the group also built in some extensions to EDD that were sorely needed, including functions such as graphical data visualization, persistent data storage, and improvements in data organization.

EDD Provides Common, Enhanced Visualization Techniques

The main impact of these extensions will be felt at the system level for the user, and will provide a more common look and feel between different devices. EDD does not create a display nor does it serve as an HMI, but it does specify the way in which certain types of data should be displayed to provide a sense of commonality. Enhancements were also made to visualization techniques, and users that wanted to see things such as valve signatures can now do so.

Reduced Development Costs

A single set of standard EDD specifications should also ease the development process for suppliers that are producing intelligent devices compatible with multiple protocols. A single EDD can be used as a template for the creation of specific EDDs for Foundation Fieldbus, HART, and

Key EDD Extensions:

- Graphical Data Visualization -- EDD provides capabilities for common graphic display for a common look and feel across different devices
- Improved Data Organization -- EDD provides information to host system about how to organize parameters
- Persistent Data Storage -- EDD provides information to the system for organization of archived data

Profibus devices. It remains to be seen just how much of an impact EDD will have on development costs and if this translates to reduced prices on fieldbus-compatible instrumentation for users.

Is EDD Standard a Path to Interoperability?

EDD as an international draft standard does mark a major step towards interoperability of devices incorporating different fieldbus protocols. With Foundation Fieldbus, EDD is a key element in interoperability, and the Fieldbus Foundation extensively tests devices to meet interoperability standards before it can be certified with the Fieldbus Foundation "Check Mark".

The Fieldbus Foundation recently went to Infracore to test the interoperability of Foundation Fieldbus devices and systems. Infracore tested 42 different devices, and 3 host systems in various combinations and permutations. They ran the test protocol for about six months, and the tests showed no anomalies with device interoperability using EDDs. In November of 2003, the Fieldbus Foundation also released the Foundation Fieldbus Interoperability Testing Kit (ITK) Automation Tool that will allow developers to automate many of the previously manual intervention steps required when performing interoperability tests on devices prior to registration with the Foundation.

The standardization of EDD and its new enhancements are a critical step toward providing users with a true plug and play environment. Each fieldbus organization, however, has its own way of implementing EDDs. EDD by itself is not a panacea for plug and play functionality. Other factors, particularly at the physical layer, can have an impact on interoperability as well.

Because there are so many factors that can have an impact on interoperability, most of the major control system suppliers have their own testing labs that determine interoperability between their own host systems and field devices from various suppliers. The supplier will verify the operation of devices under a variety of environmental conditions, including overloading the system with devices and testing the physical connections through repeated and automated connects and disconnects.

Recommendations

- ARC has long advocated the benefits of standards for the automation industry. The path of EDD towards an IEC standard will ease the process of developing fieldbus-compatible devices and systems, and should at least partially contribute to lower development costs. In ARC's view, standard EDD strengthens the argument for fieldbus adoption and users should consider making fieldbus a part of their future automation strategy.
- Choose your fieldbus partners carefully. Users should pay close attention to the resources their suppliers dedicate to proving fieldbus device interoperability and reliability.

Please help us improve our deliverables to you – take our survey linked to this transmittal e-mail or at www.arcweb.com/myarc in the Client Area. For further information, contact your account manager or the author at lobrien@arcweb.com. Recommended circulation: All MAS-P and MAS-H clients. ARC Insights are published and copyrighted by ARC Advisory Group. The information is proprietary to ARC and no part of it may be reproduced without prior permission from ARC.