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Total Communication

EDDL allows interoperability for devices to constantly gather information

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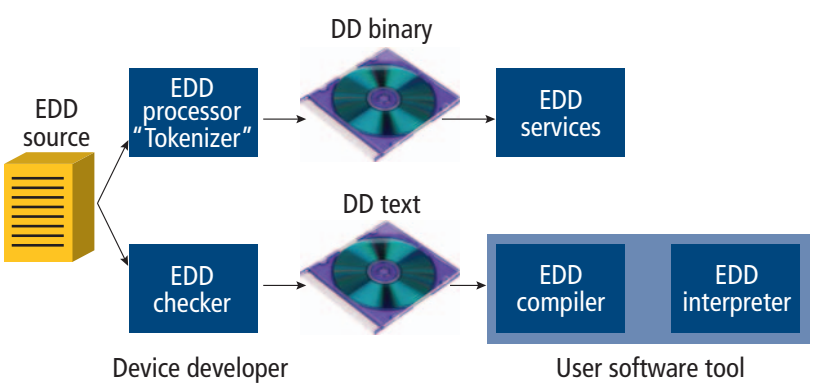
No matter what control system a plant is using, it is now easier for users to choose best-in-class instruments for their networks. The technology that allows this is Electronic Device Description Language (EDDL).

For a user to garner Foundation Fieldbus (FF) certification, EDDL is a requirement, and it is the only device description language supported by the HART Communication Foundation. Because of that, virtually every Process Control Systems vendor worldwide supports EDDL. On top of that, Electronic Device Descriptions' (EDD) are available for any FOUNDATION, HART, and some Profibus based field devices.



EDDL breakdown
The EDD development process compresses binary to prevent tampering and subsequent problems. The tokenized files are relatively small, and therefore files for many types and versions of devices can store in the limited flash memory of a handheld communicator.

EDDL is the international standard for integrating intelligent field devices with systems—IEC 61804-3 and the ISA104 committee just adopted it as an ANSI/ISA standard for use in industrial automation applications. Using this technology, it is possible to provide an interoperable environment where distributed process control systems or handheld communicator can gather information available in modern automation sensors and actuators to configure, calibrate a device, diagnose problems, and provide data and alarms for user-interface displays.

In the grand scheme of things, it is not necessary to understand how EDDL works in order to reap the benefits. However, understanding the technology may be helpful. The EDD file created by an instrument or device designer uses EDDL syntax to describe a device and all its parameters in detail. This can include parameters such as process variable, setpoint, high-low limits, and ambient temperature. Also, EDDL supports Methods, a scripting language based on a subset of ANSI C used to support step-by-step, interactive setup, and calibration procedures. Device designers can define where all the important parameters should appear on an UI display, such as in columns or bar charts, and in which order. Using EDDL, device manufacturers have an unrestricted opportunity to provide technicians access to their devices, with the full scope of their functions, where all the menus and parameters appear as intended by the manufacturer.

The file written using EDDL becomes "tokenized" to a compressed binary to prevent tampering and subsequent problems. The tokenized files are relatively small, and therefore users can store files for many types and versions of devices in the limited flash memory of a handheld communicator.

A control system supplier may obtain the EDD for every instrument and field device. Once the EDD files load into the control system, the field devices can be set up with the UI displays described by the field device designer.

Structurally true

EDDL provides a well-defined structure for supporting the most simple to the very complex field device. Since EDD's are text-based interpreted by the host system, these files are independent of operating systems and control platforms. This structure allows the same EDD to have a common look and feel across applications, which reduces the learning curve and supports multiple host applications. Also, this enables field device additions to come into play without affecting the runtime stability of the control system. Taken together, these technology advantages can add longevity and stability of the instrumentation and control system over the plant lifecycle.

One benefit EDDL provides is interoperability across multiple hosts, devices, and technologies. This flexibility allows the end user to choose the best combination of price and performance for devices and software. This interoperability simplifies the control system integration process, because all a system integrator or end user has to specify in the bid process is all instrumentation and control equipment conform to the International Standard, EDDL. Competitive bids are easier to evaluate because the end user does not have to worry if specific software packages are available to support various devices. With EDDL, all control systems support comparable EDDL devices. Interoperability means operators and maintenance personnel can easily find the calibration and diagnostic information needed for a particular device, and all EDDL-compatible devices will provide the necessary information in a 'look and feel' of the host system.

EDDL is a declarative technology. The EDD file format is readable by devices including handheld communicators, control systems, PC's, and other process interface devices EDD-enabled. An EDD is a text-based description of the field device and its properties. EDDL, being text-based, is independent of operating systems and control platforms. Operating system and platform independency, along with backward compatibility, are some of the advantages of the technology. Through the use of EDDL, it is possible to avoid problems caused by operating system upgrades, control system revisions, and new versions of the device software from multiple suppliers different than that of the host system.

FAST FORWARD

- EDDL provides interoperability across multiple hosts, devices, and technologies.
- A host can use the EDD to compare data in any device against data stored in an external database.
- Cyber-safe EDD is compressed text documents with Method scripts, which are interpreted programs. Malicious cannot embed into downloaded files.
- No need to uninstall old program components or to install new program components to add support, just copy a file.

EDDL provides information operations and maintenance personnel need in an understandable and useful format. It also gives engineers the ability to use charts, plots, and diagrams. That ability, plus the expanded help capability within the EDD make it easier for users to access device information. EDDL provides a well-defined structure for supporting the most simple to the very complex field device. This structure allows the same EDD to have a common look and feel across applications, which reduces the learning curve and supports multiple host applications.

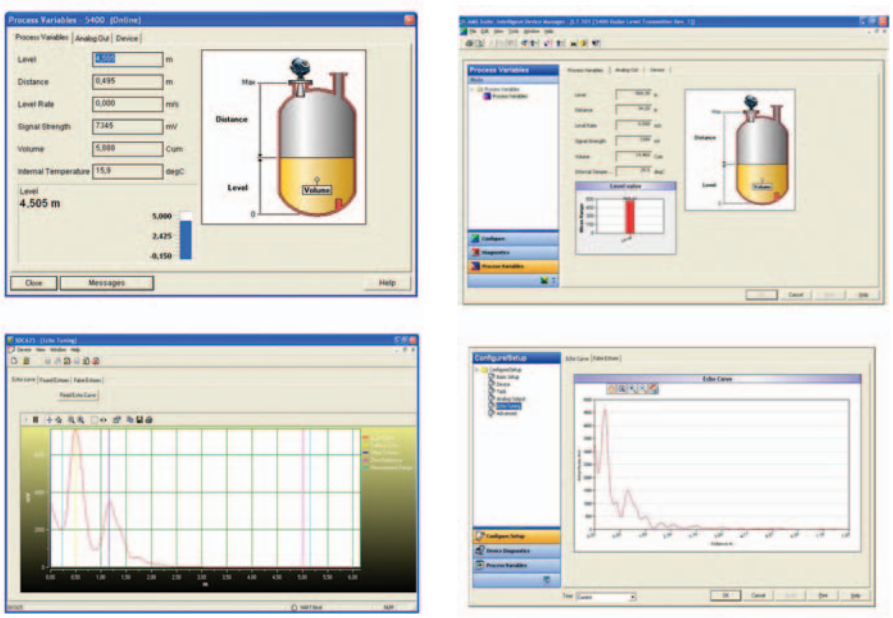
Familiar graphics

Graphical visualization supported by EDDL such as graphs and charts take full advantage of the capabilities of the host automation system. These capabilities can benefit engineers and maintenance personnel by providing a consistent look and feel during device configuration and maintenance. Also, they can benefit process operators during periods of abnormal operation by enabling accurate and timely decision-making. The interface may include the familiar "tree menu" structure on the same screen with new graphic Windows-like menu structures, which can make the setup of a device easier to understand. In addition, device developers can describe not only the device features but also soft-tools that will allow the user and host to better analyze the digital information coming from the device. EDDL technology helps eliminate the need to use separate and standalone device-specific software applications or add-ons to meet host system integration requirements.

Based on persistent data storage support of EDDL, manufacturers can now store data from the device in a host application without requiring the device to recognize conventions for saving the data under the host system. In this instance,

Radar level gauge diagnostics

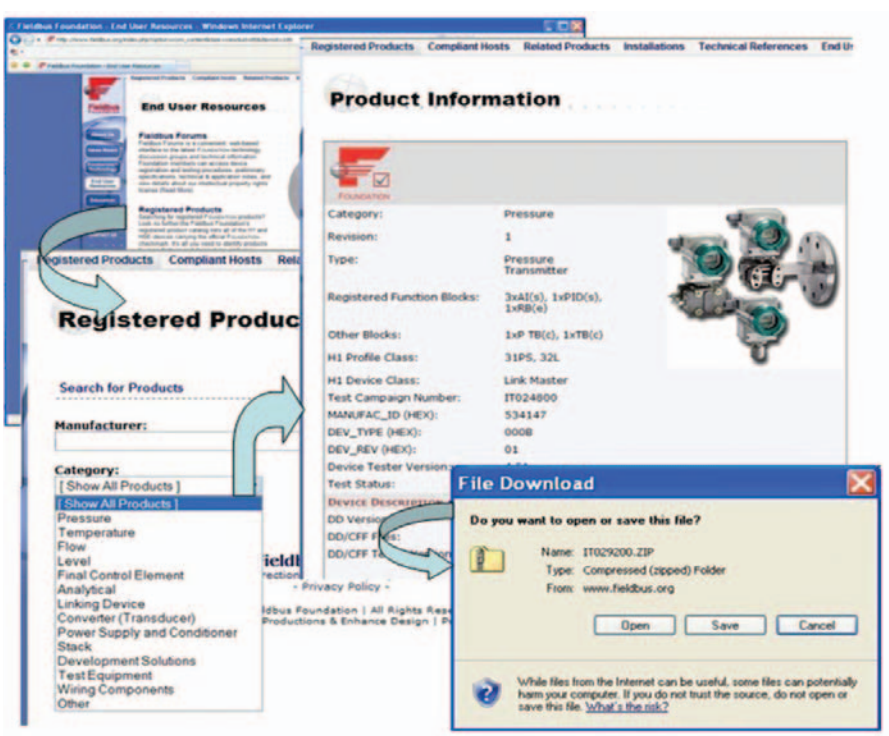
Host 1 Host 2



A radar level gauge with two different hosts. The same information has a different 'look and feel.' The device determines what will be displayed, while the host control system determines how it will look. This ensures all displays on a given process control system have the same look and feel, regardless of the device supplier.

On the download

Downloading device EDD's from the web.



the EDDL interpreter works as a go-between, taking instructions from the EDD and initiating the archiving procedure. EDDL can also automatically provide data suitable for asset management and maintenance purposes. For example, EDDL can specify certain data from the instrument—such as a valve signature—should remain 'persistent data' for diagnostic purposes. This keeps the data available for comparison to the current valve signature for problem analysis and allows a user to plot, display in a chart, or compare the data to other instrumentation. Thus, applications that gain support include visualization of complex data, radar gage level configuration, valve curves, analyzers, and motor controls. All of that can occur without writing custom code.

A device EDD standardizes only the data-relevant aspects, not the shape and color of the elements. Thus, systems and tool developers can achieve a look and feel reflecting their own product and design philosophy. For users of a tool or operating system, this means all their devices can have a consistent look and feel. However, the information accessed and displayed using an EDD comes from the supplier of the device EDD. With EDDL, a user does not have to configure a display—EDDL will produce a display for a device.

Updating systems

It is common in plants for handheld communicators and intelligent device management software to see use in the day-to-day maintenance and operation. These tools can configure commission, diagnose, calibrate, and fine tune all the different device types based on their respective EDD. The EDD source file was created for an instrument never requiring an upgrade, revision, or patch to work with a new or upgraded control system or handheld. However, to take advantage of the latest enhancements that manufactures have implemented in the device EDD, it is best to periodically verify the latest EDD is in device maintenance and support. If a manufacturer introduced a new EDD for a device, then it is a simple matter to

incorporate the latest EDD into the control system and handheld.

Since the EDD is a text file written with EDDL, a user can import this file into the DCS by simply copying EDD files for each of the different devices into the computer or handheld communicator. Such an update can occur any time, and once loaded, the EDDL interpreter may automatically utilize the EDD file. Since EDD is completely independent of the operating system, such an update has no impact on system runtime stability.

The user can obtain the latest version of the EDD for a device the manufacturer. Also, the latest EDD files for a device are available through the Fieldbus Foundation, HART, and Profibus International web sites. For example, a user may download the EDD files for the devices registered by the Fieldbus Foundation from their web site in its compressed binary format. EDD files are also available through control system supplier and the device vendor via a download or a CD-ROM.

EDDL is the international standard tool in the process industry for field device diagnostics, setup, and online information access. The IEC61804-3 standard defines this technology. The ISA104 committee came about to adopt IEC61804-3 as an ISA/ANSI standard. Using this technology, a user can readily access data from more than 20 million EDDL-compatible instruments installed in the field—plus all the new field instruments. EDDL is transparently backward compatible to 1990. Moreover, since virtually every control system on the market today has access to asset management software, all the stored data or online data of the devices described with EDDL is easily accessible.

RESOURCES

Open industry standards improve bottom line
www.isa.org/link/BottomLine

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http://www.isa.org/intech/20060803

***Industrial Data Communications*, 4th Edition**
www.isa.org/link/IDC_bk

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View the online version at www.isa.org/intech/20071105.

A look at EDDL

Parameter reconciliation. A host can use the EDD to compare data in any device against data stored in an external database

Offline configuration and save. The host does not rely on any code from the device manufacturer. Thus a host can support offline configuration and save for all devices.

Configuration printing. EDDL describes the data and how it should be displayed. Thus a host can render displays and print-outs for all devices.

Help text support. The host does not rely on for example the Windows help system. EDDL describes the data including labels and help text.

Cyber security. EDD is compressed text documents with method scripts, which are interpreted not executed programs. Thus malicious code cannot be embedded in downloaded files.

Access to external information. The host can use the information about the attributes declared by EDDL to present data as well as making it available through other applications.

Support for computer workstations and handheld communicators. EDD is platform independent and may be used with workstations or handheld field communicators

Support for different communications protocol. EDDL theoretically works with any bus or Ethernet protocol. So far it is being used with devices communicating HART, FOUNDATION fieldbus, and PROFIBUS.

Support for a broad range of instruments. EDDL applies to simple as well as sophisticated devices including valve positioners and variable speed drives.

Compatible with future versions of Windows. Because EDDL is a declarative technology, it is platform independent not affected by changes in operating system.

Full capability. EDDL handles all aspects of the device and system life cycle, from configuration and commissioning to advanced diagnostics and performance analysis.

Consistent Interface to devices from different vendors. Since EDDL is a declarative technology, the style (look & feel) comes from the host. This ensures colors are used consistently and buttons and other controls function uniformly.

Prevents conflicts between different versions of a device. Each version of each device type from every vendor has its own dedicated EDD file, thus device versions do not conflict.

Complies with NAMUR NE 105. Most of those requirements are met simply because EDDL is a declarative technology avoiding problems associated with hardware drivers.

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