FDT Group

FDT: Open access to device intelligence

Understanding how FDT brings you increased openness in field device asset performance management…

A GUIDE FOR USERS

"With leading automation suppliers supporting both EDDL and FDT, it is becoming clear that FDT is indeed a complementary and truly open technology that allows integration of expert Windows applications from different field device vendors into PAM applications," Wil Chin, ARC Advisory Group

A publication of the FDT Group

Unlocking the Promise of Digital Field Devices

Digital field devices have been underutilized for far too long.

Historically, users often performed configuration using hand-held devices, and kept a few poorly organized records of device ranges and calibration actions. They may have seen some improvement with the advent of all-digital accuracy of measurement data. Along the way, interoperability progressed at least to the point where users were able to get the plant operational when using a field device that was not made by their DCS vendor.

Over time, field devices also became more sophisticated. Valve positioners evolved into diagnosing the mechanical properties of valves using off-line and on-line tests. Partial stroke testing of valves for safety applications became a reality. Tests for stiction, hysteresis, dynamic dead bands, multi-point step tests, and valve signatures came to market. Differential pressure transmitters became capable of analyzing input signal behaviors to detect plugged impulse lines.

Devices generally became capable of analyzing their own performance, which seemed to point in the direction of field asset performance management. The promise of fieldbus technology was that major benefits in managing the performance of field device assets would be realized.

In today's world, users want to buy best-of-breed field devices from any vendor and use them on their host system of choice. And, users need asset performance management to help improve uptime, better utilize staff, and to optimize field device utilization.

> Can a device spot problems in its own operation or in the operation of the process before serious consequences occur?
>
> Can less time be wasted on no-problem call-outs?
>
> Can the number of routine device checks be reduced?
>
> Can re-ranging or zero drift issues be made a thing of the past?

To address issues like these, the industry needed to close the gap that separated users from the promise of digital field devices.

The Fieldbus Gap

Each device vendor has a unique approach to asset performance management functions inside their device, hence the variety of fieldbus protocols. Beyond simple device configuration and startup, plant people need advanced graphical user interfaces on the host systems or at their desktops. But what if those applications need to be tailored to the specific model of field device? How can the large amounts of device data be turned into meaningful knowledge? How can the expertise of the device vendor be embedded into that user interface? Without a straightforward, standard way for device vendors to provide appropriate user interface applications to meet these needs, users' choices in bus and device vendors are severely limited.

FDT Helps Users Close the Gap

FDT technology closes the fieldbus gap by providing a standard way in which device vendors create user interfaces for advanced device management. Because FDT technology is truly open, users can have device data presented effortlessly as useful information, regardless of their chosen fieldbus protocol, device vendor or device type. FDT helps fulfill the true promise of fieldbus and complements other technologies such as Electronic Device Description Language (EDDL).

For device vendors, FDT is a way to deliver advanced device-specific applications to the plant's maintenance staff. These applications simply plug in as add-ons to the host system vendor's asset management environment. The host vendor can still create universal configuration tools based on device descriptors.

Users get the best of both worlds -- all the basics for asset management from the host system vendor, plus the specialized in-depth device analysis tools from the device vendor. Because FDT technology has no impact on the fieldbus protocol, and no impact on the field device itself, the FDT user interface plug-ins can even be created for existing devices already in service.

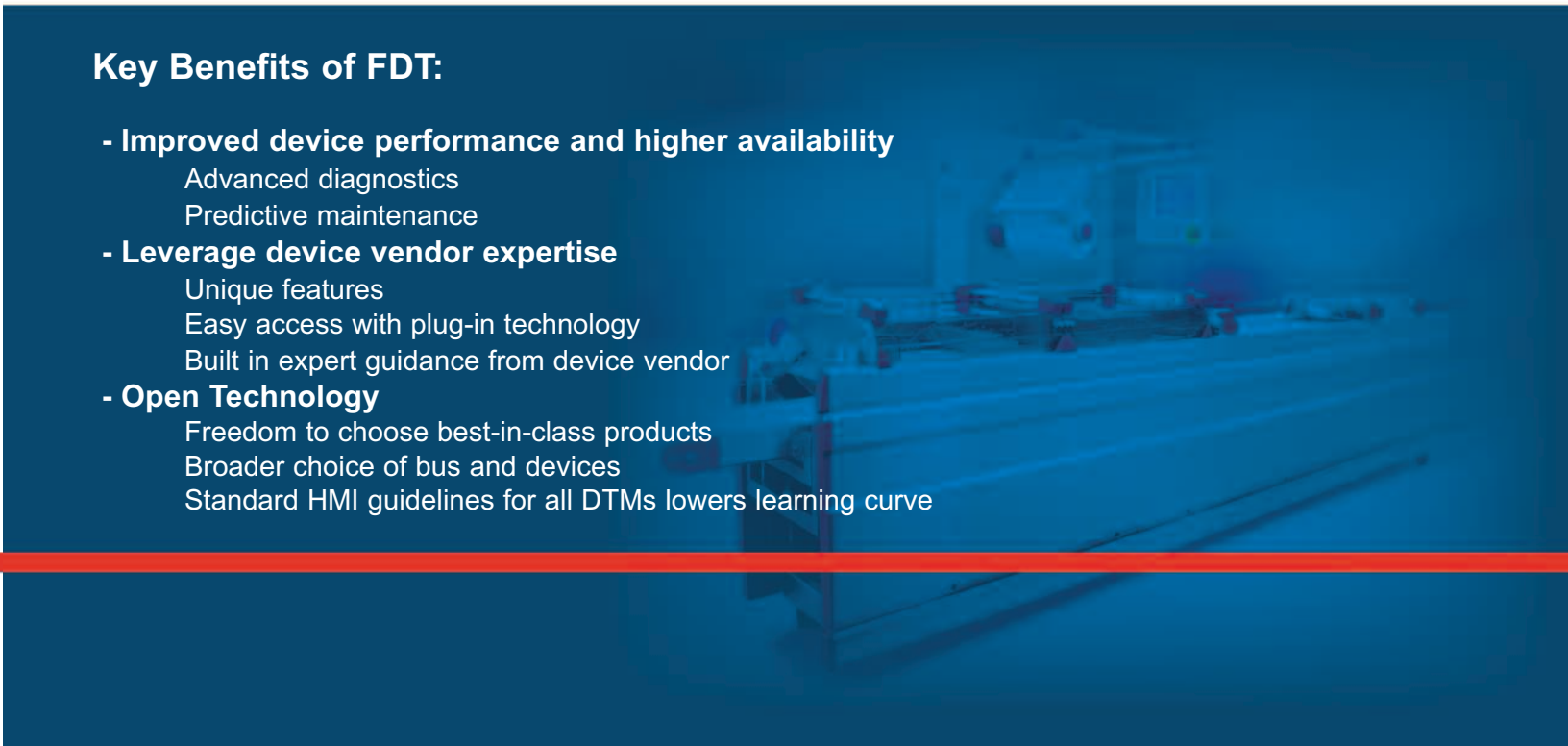
Supported protocols:

- FOUNDATION fieldbus
- HART
- PROFIBUS-DP
- PROFIBUS-PA
- PROFINET I/O
- DeviceNet
- Ethernet I/O
- Interbus
- AS-interface
- ControlNet

And more to follow!

Benefits for FDT Users

Gone are the days of proprietary plug-ins and snap-ons! Because the device vendor creates the unique features in its instrumentation, the FDT philosophy states that the device vendor is best qualified to develop the application for extracting the data and presenting it in a meaningful way. The key to FDT implementation is an application type called Device Type Managers (DTMs). These simply plug into the host system, allowing users to easily tap into the expertise of the device vendor – and help close the fieldbus gap.



Key Benefits of FDT:

- Improved device performance and higher availability
- Advanced diagnostics
- Predictive maintenance

- Leverage device vendor expertise
- Unique features
- Easy access with plug-in technology
- Built in expert guidance from device vendor

- Open Technology
- Freedom to choose best-in-class products
- Broader choice of bus and devices
- Standard HMI guidelines for all DTMs lowers learning curve

The result is better advanced diagnostics and predictive maintenance to maximize the availability and performance of the device. And, because FDT technology standardizes how device vendors develop the graphical interface, users are no longer restricted to a particular device manufacturer or fieldbus protocol.

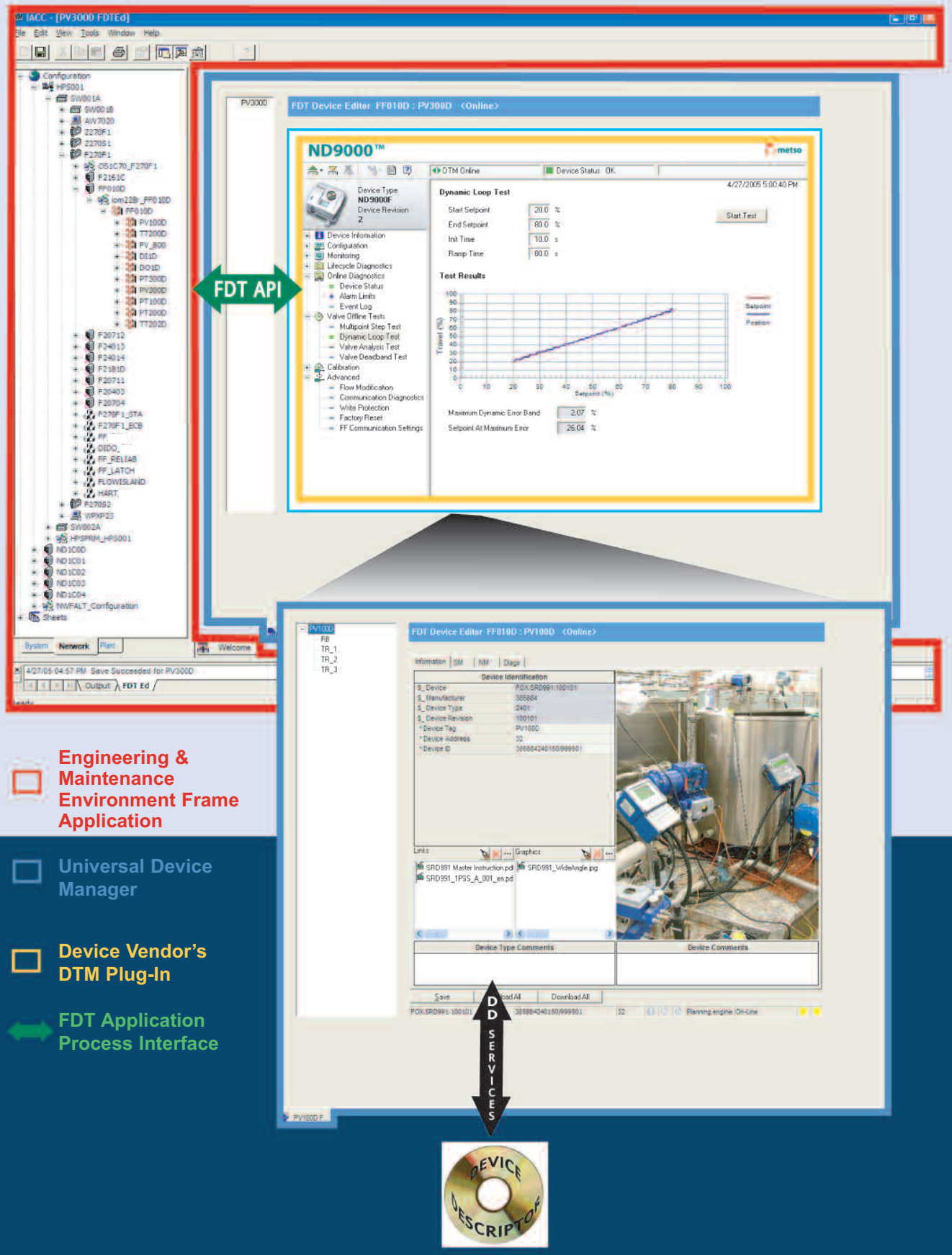
FDT plug-ins are novice- and user-friendly. The device vendors can even build in familiar Windows style help systems. The FDT plug-ins are extremely powerful, taking advantage of all the graphical interface capabilities like trends, charts, histograms, choice lists, navigation trees and other familiar aspects made possible by programming in whatever Windows language the device vendor chooses as best. Behind the scenes, the device vendor can utilize whatever analysis functions the programming language makes possible, e.g. a wide range of mathematical and data storage capabilities.

How FDT Works

FDT technology comprises three key components: the Frame Application, Device DTMs, and Communication DTMs. To better understand the functionality of these components, consider the analogy of the Internet -- a standard web browser allows users to view countless web pages created by many content providers.

The host system supplier typically creates the Frame Application, just as Microsoft supplies the Internet Explorer web browser. Just as a web browser opens a web page that contains code from the company that makes the web page, an FDT frame opens the Device DTM, which is the plug-in software from the device vendor.

DDs for Configuration & Methods
FDT Software for Advanced Diagnostics



Engineering & Maintenance Environment Frame Application

Universal Device Manager

Device Vendor's DTM Plug-In

FDT Application Process Interface

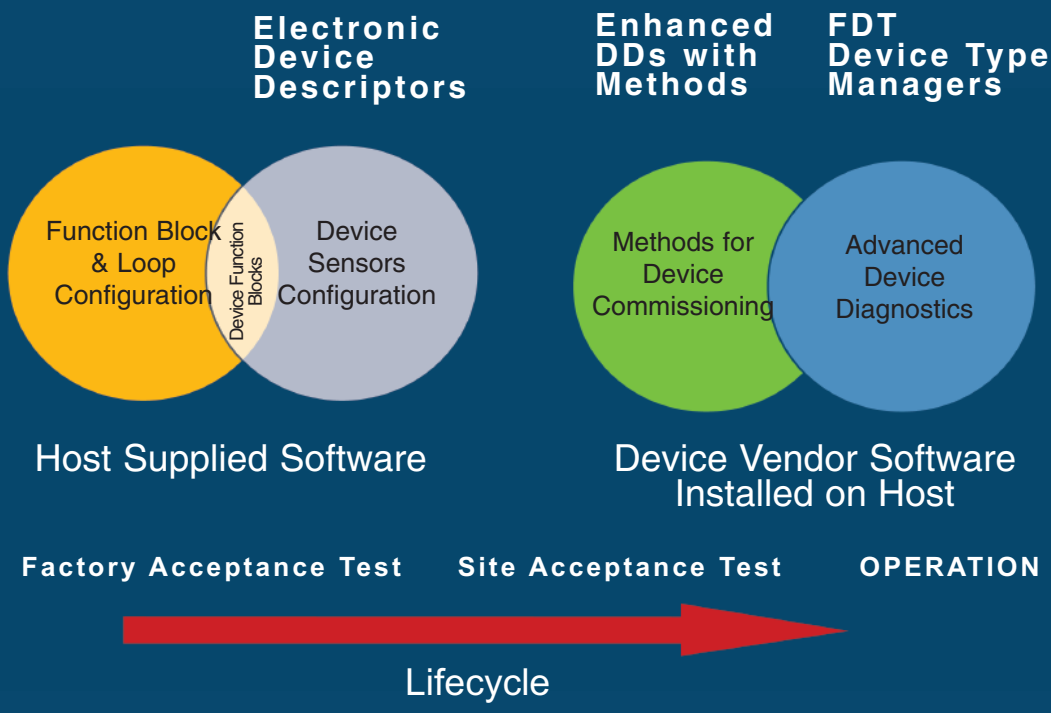
FDT Complements New Enhanced Device Description Technology

Similar to a web browser, the Frame Application has menu bars, toolbars, and a navigation tree. Visually, the frame application surrounds the device vendor's DTM. Like opening a web page from a 'favorites' navigation tree, a user can navigate down a tree that lists the field device tags, click on one, and open the device vendor's DTM inside the frame.

And, like web pages that let users interact with a reservation system or a shopping service, the Device DTMs let the user interact with the field device in a wide variety of ways. The Device DTM vendor can create a graphically rich user interface that does virtually anything possible in an advanced Windows PC-type interface. The illustration on the previous page shows a typical user interface; note the use of familiar Windows type graphics.

The third part of the technology, the Communication DTM, provides a standardized communication Application Process Interface (API) inside the PC, interfacing between the Device Vendor's DTM and the host system's specific driver that handles pass-through communications from the PC down to the fieldbus interface card.

The host system vendor supplies a Communication DTM for each supported fieldbus protocol. This ensures that the details of the PC, network, interface cards, and pass-through protocols of the host system, are transparent to the device vendor's DTM. This correlates back to the internet analogy where: the web page is transparent to the PC it's running in, the brand of the network interface card in the PC, or whether communication is DSL or broadband cable.



FDT Complements New Enhanced Device Description Technology

Following the Collaborative Asset Lifecycle Management model, FDT complements Electronic Device Description Language (EDDL) technology from design, installation and commissioning, to operation and maintenance, and eventual asset replacement.

Functionally, EDDL technology is well-suited for device vendors to pass device parameter descriptions to the host system vendor's configuration tool. The host vendor's configuration and asset management environment, working together with EDDL, fulfill functions during the design, configuration, database download, and device startup stages of the plant life cycle.

Furthermore, FDT is an excellent technology in the most critical part of the life cycle -- run time operation. It takes the user interface to the next level by enabling specialized user interfaces for advanced performance analysis and diagnostic analysis of the device. This targets improved device uptime and maintenance staff productivity.

While complementary, the two technologies meet different functional needs, and are very different internally. FDT standardizes interfaces between software modules contained within the PC used for asset management. EDDL standardizes a language device vendors use to describe their device. Together EDDL and FDT are an example of how technologies can work together for improving plant performance across the entire asset lifecycle.

FDT is a truly open technology that gives users the best of both worlds. It provides access to all the basics for asset management from the host system vendor. It provides access to the specialized in-depth device analysis tools from the device vendor. And, it complements EDDL technology in the plant life cycle.

For more information please visit www.fdtgroup.org or email at info@fdtgroup.org

More than 30 of the leading, most influential automation companies support FDT.