



DEVICE **INTEGRATION** STRATEGIES

Empowering the Intelligent Enterprise

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What is FDT® Technology?

The FDT Group AISBL is an international non-profit corporation consisting of leading worldwide member companies active in industrial automation and manufacturing. The major purpose of the FDT Group is to provide an open standard for enterprise-wide network and asset integration, innovating the way automation architectures connect and communicate sensor to cloud for the process, hybrid and factory automation markets. FDT Technology benefits both manufacturers and end users, with advancements such as the Industrial Internet of Things (IIoT) and Industry 4.0 delivered out-of-the-box – enabling modernized asset integration and access to performance data for visualizing crucial operational problems. Around the world, end users, manufacturers, universities, and research organizations are working together to develop the technology; provide development tools, support, and training; coordinate field trials and demonstrations; and enable product interoperability.

FDT Technology is comprised of two primary software components—the FDT Device Type Manager (FDT/DTM™) the driver for an intelligent device, and the FDT Frame Application (FDT/FRAME™), which can be a stand-alone configuration application or embedded in engineering applications such as a DCS, PLC or asset management solution. DTMs developed by instrumentation suppliers provide a graphical interface to support configuration, diagnostics and troubleshooting of critical measurement devices and other assets. The FRAME Application provided by the system supplier, hosts DTMs used for management of all the devices on a wide variety of process and factory networks within a facility. Together, an FDT/FRAME and a collection of DTMs and/or other device drivers create an FDT-enabled application, which can be scaled from a small collection of devices to tens of thousands of devices controlled by a single FRAME throughout the automation communication pyramid.



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FITS™ Solution Meets Industry Demands for Next Generation Technology



Lee Lane, Chairman of Board of Directors, FDT Group

We just concluded our exhibit and meeting activities at the Hannover Fair in Germany. It is great to see the heightened anticipation of our new FITS™ (FDT IIoT Server) architecture. The demonstration of augmented reality as part of a FITS solution sparked a number of interesting conversations. You might say a lot of people's eyes were opened to the possibilities once they tried the Hololens demonstration! The solution space addressed by apps accessing information from the FITS architecture continues to be fertile ground for creative concepts. The business value of many of these apps will far outlive the "cool factor" of the demonstrations. We are certainly living in an exciting and fast paced time for industrial automation.

Last year we released our first FDT annex for OPC UA. This milestone connected two leading automation information standards in the industry. As we said at the time, we could envision further integration in this area to allow our vendor community to more easily adopt the annex and our end user community to more fully leverage its benefits. I am pleased to announce that we have kicked off that next phase of activity. A panel of FDT and OPC UA experts are driving this deeper integration through enhanced development tools, support of publish/subscribe, and other sought after features. We anticipate that a portion of this work will be integrated into our tradeshow display at the SPS/IPC/Drive in Nuremberg later this year.

The FDT Group members are in the midst of reviewing a proposed FDT 2.1 specification. This minor update to the specification takes care of providing additional clarification and specificity to our current FDT 2.0 specification. We anticipate a smooth review process and should be releasing the specification to the public by October of this year. Watch our website for further information. If you have already downloaded the FDT 2.0 specification from our website, you will automatically receive notification when the new version is available.

Our Architecture and Specification working group has undertaken the task of examining the applicability of using .NET Core as a step to providing server side operating system independence. Since the FITS architecture removes the platform dependence of the client, this activity has the potential to remove the last vestige of OS dependency from the architecture. If this is an area of interest to your company, please contact our FDT Office so that we can incorporate your requirements or expertise into this investigation.

For those of you that attended Hannover Fair this year, I hope you had a chance to meet our new administrative assistant, Katie Jones. Katie comes to us with a degree and a wealth of experience in event management. You may have already had the pleasure of corresponding with her as she has already taken over responsibility for a number of member and user facing activities. Welcome, Katie to the FDT family.

Bioethanol Producer Employs Advanced Automation Technology to Optimize Integration, Operation and Lifecycle Management of Critical Assets

Brazilian company GranBio avoids unnecessary maintenance work and plant shutdowns with integrated device configuration, asset management and remote access solutions

Brazil is a dominant player in the bioethanol market. This industry is steadily growing, and biofuel is attracting attention as an environmentally friendly energy source. Production of bioethanol requires a reliable and cost-effective plant automation system, which implements intelligent field devices, collects performance-driven data, and optimizes operations throughout the lifecycle of the processes.

The following article describes how a field device management solution employing FDT® Technology helped a major bioethanol producer streamline device commissioning and maintenance tasks, and at the same time, increase productivity and savings as part of a major Greenfield project.

Background

Gran Investimentos S.A. (GranBio) is a Brazilian biotech firm that creates solutions to transform biomass into renewable products such as biofuels, biochemicals, nano materials and nutrients. It is located in the municipality of São Miguel dos Campos, in Alagoas, 55 kilometers from port in Maceió.

GranBio is the first company in South America to produce second-



Figure 1: GranBio is the first company in South America to produce second-generation ethanol to help with the production of clean energy.

generation ethanol (extracted from cane leaves, bagasse) to help with the production of clean energy. It uses a combination of technologies, including pre-treatment, enzymatic hydrolysis and fermentation, to transform sugarcane straw and bagasse into an advanced clean fuel that does not detract from food production.

Continued

Bioethanol Producer Employs Advanced Automation Technology to Optimize Integration, Operation and Lifecycle Management of Critical Assets

GranBio plans to implement an “intelligent strategy” in the construction of 12 Greenfield plants, ensuring optimal integration, operation and lifecycle management of critical assets. The company’s mission is to achieve integrated business solutions for the conversion of biomass into energy and chemicals, serving its customers with innovative technologies that contribute to a better and safer planet. Based on an intelligent structure of alliances with first-generation ethanol producers and leading technology providers, this model integrates the entire chain of production, from processing raw materials through the final product.

The first of the 12 plants by GranBio, was commissioned in September 2014, as a Greenfield unit (Bioflex 1) and the most innovative project in the sugar-based alcohol industry. The unit has capacity to produce 82 million liters of second-generation biofuel per year.

How the plant is controlled

GranBio is dedicated to reducing costs and improving production efficiency throughout the lifecycle of its operation. It employs a process automation strategy incorporating Yokogawa’s CENTUM VP production control system and other control solutions. The Plant Resource Manager (PRM) asset management solution is integrated with the system, and the database for the FieldMate device management tool is synchronized with the PRM database. The control architecture

includes 40,000 input/output (I/O) points for the distributed control system (DCS) and safety instrumented system (SIS), as well as 20,000 I/O points for communication with various subsystems.

At the Bioflex 1 plant, FOUNDATION Fieldbus provides a bi-directional communications protocol used for communications among field devices and to the DCS. Fieldbus segments connect a wide range of digital field instruments such as flowmeters; temperature, pressure and differential pressure transmitters; control valves; and rotameters.



Figure 2: The Bioflex 1 operation is dedicated to reducing costs and improving production efficiency throughout the lifecycle of its operation.

**"Your clear path to
Asset Excellence"**

PRM[®]
Plant Resource Manager

Availability + Diagnostics = Predictability

Yokogawa's PRM Plant Resource Manager is an integrated plant asset management solution that enables centralized online monitoring of automation assets. PRM takes a step forward with its capability to create and integrate innovative diagnostics applications. Based on the FDT open standard and armed with the PRM Advanced Diagnostics Application (PAA) environment, PRM integrates diagnostic intelligence and provides a single-window solution for predictive asset management. In addition, PRM synchronises seamlessly with Yokogawa's FieldMate Device Management Wizard.

FDT 2
Compatible • Stable • Compelling



YOKOGAWA 

Continued

Bioethanol Producer Employs Advanced Automation Technology to Optimize Integration, Operation and Lifecycle Management of Critical Assets

The system also utilizes ancillary devices ranging from density and viscosity analyzers, to radar and level switches, and manifolds.

As part of the bioethanol operation, critical rotating equipment like the feeding table, picador, defroster and milling unit must be monitored. Pressure and flow control are particularly critical to the production processes.

All key parameters for ethanol processes are preconfigured in the DCS batch package. When an operator selects a recipe from the package menu, all of the preconfigured settings are selected and downloaded to individual controllers so that each sequence can be automatically started. At a human machine interface (HMI) terminal, an operator can monitor the status of the reactions in process graphic displays, trend displays, alarm summary displays, and control display windows.

When each batch operation is completed, the data are compiled for an automatically generated batch report.

Enhancing performance capabilities

Configuring digital instruments is no easy task. As industrial instrumentation is more dependent on digital communication, the success of a project will greatly depend on how easily devices are configured to exchange data across digital networks.

Today's intelligent field devices utilize a variety of digital protocols, hence the need for versatile configuration and management tools that effectively support initial setup, daily maintenance, and troubleshooting for the maximum utilization of smart instrumentation.

At the GranBio bioethanol facility, control engineers sought the maximum integration and interoperability of field

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Bioethanol Producer Employs Advanced Automation Technology to Optimize Integration, Operation and Lifecycle Management of Critical Assets

instruments with the plant DCS; the use of an intuitive and user-friendly asset management solution; and the availability of an easily updated, standards-based \configuration tool. They also required instruments with high availability and robust sensors to reduce plant shutdowns.



Figure 3: GranBio's control engineers sought the maximum integration and interoperability of field instruments with the plant DCS.

Engineers wanted to consolidate all diagnostic information on a single plant asset management application to ensure the utmost performance of instruments. A simple software interface would further allow them to synchronize their databases and configuration tool

with the asset manager.

Additionally, the Bioflex 1 site needed software for remote connection to instruments in order to eliminate the lost time involved with going to the field to access devices locally, and to improve the safety of plant personnel and reduce incidents. This included a solution enabling troubleshooting to be performed remotely and monitoring instruments' critical operating parameters to ensure they are functioning according to specifications.

Employing advanced technology

GranBio recognized the importance of implementing intelligent field devices, collecting performance-driven data, and optimizing operations throughout the lifecycle of the processes. Intelligent instrumentation makes it possible to securely get the right information into the hands of expert problem-solvers wherever they are located.

Key to a high level of performance of the Bioflex 1 operation was the implementation of applications, tools and devices compliant with the FDT standard. Recognized as an international (IEC 62453), North America (ISA 103), and China (GB/T 29618) standard, FDT provides a common environment for utilizing intelligent devices' most sophisticated features, as well as a single interface to integrate any device asset and network with access to performance-driven data – sensor to enterprise.

Within the FDT ecosystem, device manufacturers provide De-

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Bioethanol Producer Employs Advanced Automation Technology to Optimize Integration, Operation and Lifecycle Management of Critical Assets

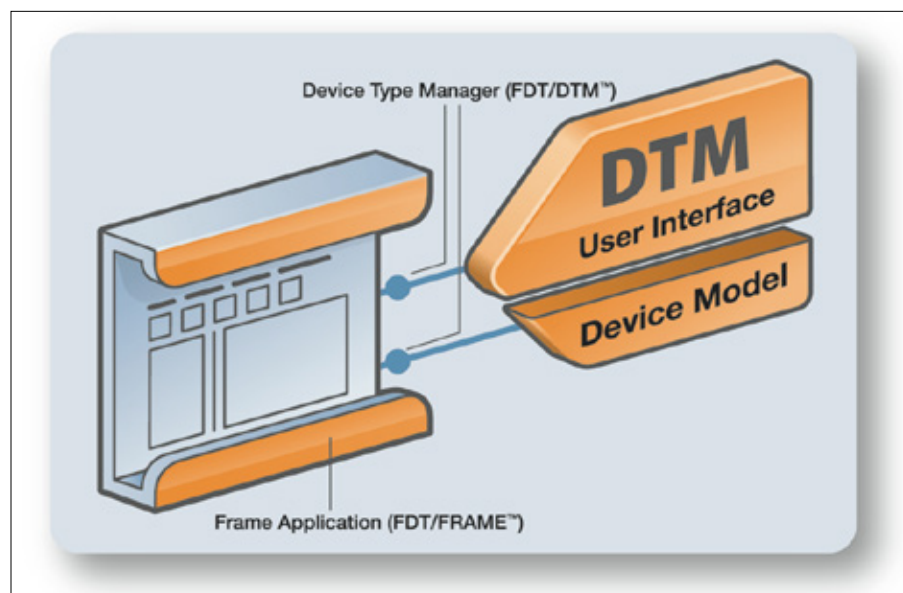


Figure 4: Within the FDT ecosystem, the FDT/FRAME can be embedded in standalone device management tools.

vice Type Manager™ (DTM™) software for their products, and FDT/FRAME™ Applications (embedded in control systems or standalone device management tools), communicate and read those DTMs – regardless of protocol for each device. This enables complete lifecycle access for configuration, operation and maintenance through a standardized user interface, no matter the supplier, device type/function, or communication protocol.

FDT creates a common communication method between devices and control or monitoring systems that are used to configure, operate, maintain, and diagnose intelligent assets. The FDT solution is not a communication protocol, but rather a standardized asset integration and data delivery technology.

With FDT-compliant solutions, GranBio enjoys the flexibility of true open technology and freedom-of-choice in working with different automation suppliers. Interoperability makes it possible to select the best device for a particular application. The company knows that regardless of the installed asset, interoperability will be ensured through the use of FDT drivers (i.e., FDT/DTMs™).

FDT Technology also enables greater access to centralized information via the Industrial Internet of Things (IIoT). The more information engineers and operators have, the easier the decision-making. It is very important to be able to gather all information in a single database in the control room that facilitates fast and informed decisions.

Thanks to FDT, the ability to integrate diverse plant information enables operators to mitigate process upsets and instrument malfunctions. The combination of measured values, valve openings and device diagnostics helps control room personnel identify specific deviations in operation and instrument performance. This capability also allows the rapid segregation of the team that must act to address issues involving maintenance, operation, or processes. When

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Bioethanol Producer Employs Advanced Automation Technology to Optimize Integration, Operation and Lifecycle Management of Critical Assets

an adverse situation arises, online information is crucial to mitigate the source of the problem.

Improving work practices

GranBio specified Yokogawa's PC-based FieldMate as the configuration tool for the Bioflex 1 Greenfield project. The choice of this versatile device management solution was based on the need to have a unique tool for all instruments, including the configuration of FOUNDATION

DATION Fieldbus devices, generation of configuration reports, and the use of an interface similar to the asset management application. Engineers also wanted to consolidate various databases and monitor instruments online.

Employing an embedded FDT/FRAME, FieldMate enhances and streamlines maintenance workflow procedures for device configuration, tuning and local maintenance. It is an alternative to costly handheld terminals when implemented in notebook form, providing extended functionality, clear graphical displays, a trend panel and parameter database, maintenance information records, and more.

The FDT-based tool facilitates effective configuration and diagnostic routines. It can be used from the plant's central control room to set field device parameters, and is applied from the beginning of instrument life for maintenance, diagnostics and replacement. The tool is helpful for not only configuring new instruments, but also checking faults, testing instruments and diagnosing problems that could require intervention or replacement.

As part of the control strategy for the Bioflex 1 facility, PRM performs various asset management tasks and sends diagnostic information to the DCS. Plant personnel can open instrument status with the system faceplate – greatly facilitating the detection of devices failures or operating problems. With the FieldMate field configuration tool, all activities are synchronized with the PRM database, creating a



Figure 5: Employing an embedded FDT/FRAME, FieldMate greatly enhances and streamlines maintenance workflow procedures.

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Bioethanol Producer Employs Advanced Automation Technology to Optimize Integration, Operation and Lifecycle Management of Critical Assets

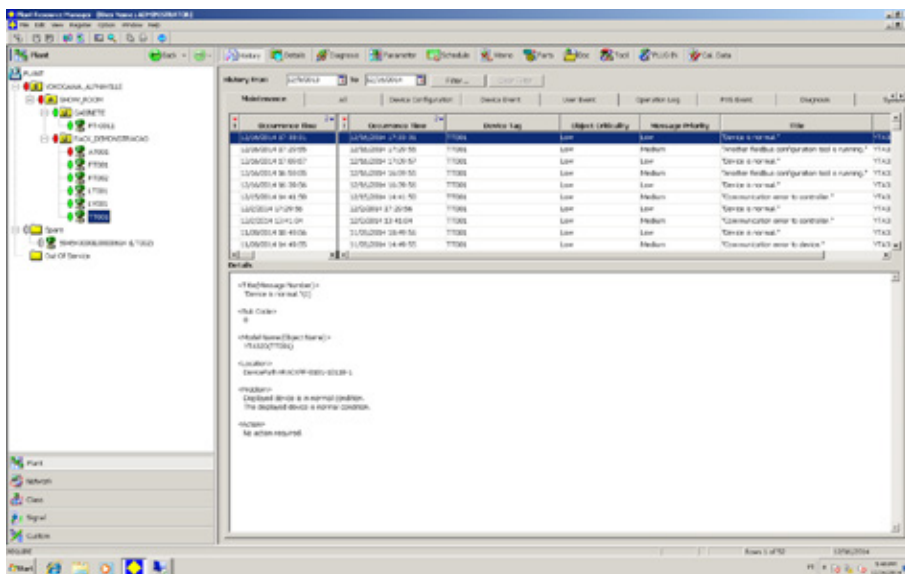


Figure 6: The PRM application performs asset management tasks and sends diagnostic information to the DCS.

unique history record for use in auditing maintenance actions.

Plant operators can now access the status of an instrument directly through the common process control system HMI – greatly facilitating improved performance. When a variable presents suspicious values, it is easy to check for any malfunctions. Operators can decide if the instrument is reliable, and if everything is correct, they can maintain safe operating measures. Centralized information allows

them to make crucial decisions quickly. Moreover, the ability to combine diverse data enables operators to mitigate process problems and instrument failures.

An important feature of this solution is the ability to detect deviations that could lead to asset failure. By implementing a robust asset management application with FDT Technology, the plant can take advantage of effective preventive maintenance strategies. For example, PRM could detect a diagnostic error and alert the maintenance department of an instrument failure. A technician opens the DTM to investigate, decides local action is needed, synchronizes the database with FieldMate, and then goes into the plant to do the repair work.

Realizing operational benefits

GranBio has realized significant operational and business benefits from its implementation of state-of-the-art automation technology. Acting in a preventive way based on the information provided by interoperable and intelligent plant assets, the company has been able to reduce costs associated with unnecessary interventions, removing equipment from service for tests, and stopping the plant for repairs and maintenance.

GranBio Chief Engineer Cássio Lourenço Aparecida commented: “GranBio is very satisfied with the configuration and asset management tools based on FDT Technology. With these solutions, our criti-

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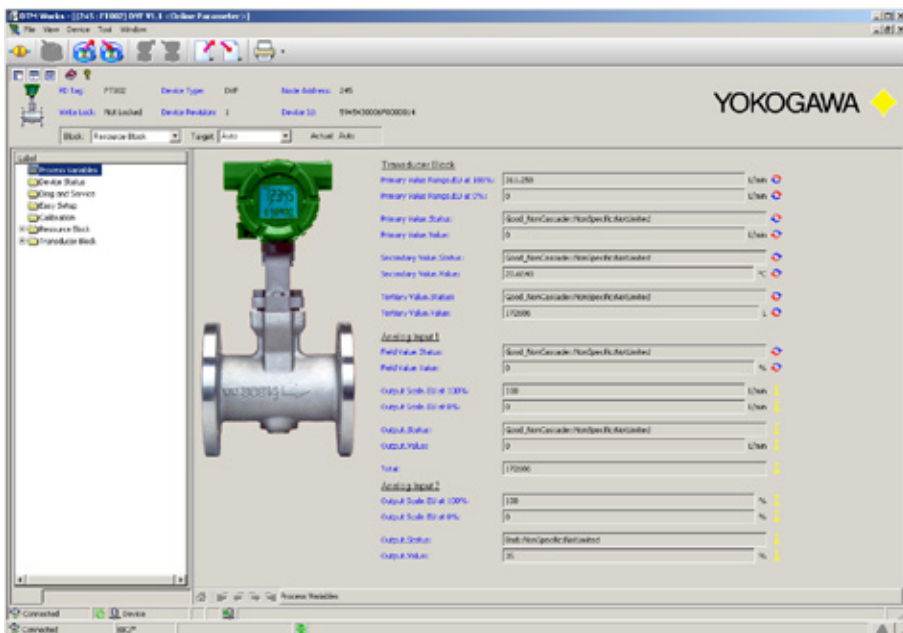


Figure 7: FDT/DTMs provide a powerful device configuration solution for plant personnel.

cal maintenance and operating objectives have been met.”

To date, the Bioflex 1 plant has reduced maintenance costs by 46 percent and lowered costs involved with device interventions and plant shutdowns by 35 percent.

In addition, the availability of remote access has minimized the need to access hazardous industrial areas – reducing worker ex-

posure to risks. Accessing data with mobile devices allows remote analysis by specialists in support of the plant’s maintenance and operations groups. Asset management tasks have gotten simpler and safer, resulting in a 27 percent reduction in incidents and a 15 percent reduction in accidents.

Most notably, the use of FDT-based tools was decisive in executing the commissioning and fast start-up of the Bioflex 1 plant. The user-friendly interface, coupled with intuitive descriptions, enabled the rapid training of assembly and maintenance personnel. The FOUNDATION Fieldbus protocol provided access to various parameters using FDT/DTMs in a single environment. This contrasts with the use of handheld devices with complicated menus, which can lead to frequent errors.

Furthermore, remote access to instruments enabled greater agility in work practices, thus allowing commissioning to be completed in advance of the project deadline. Remote access to instrument information enabled the maintenance group to create routines for verification, and preventive maintenance plans were created based on the health status of the instruments.

The return on investment (ROI) from this Greenfield project occurred during the commissioning period. All technology investments were justified by time and cost savings in the completion of configuration work. The new tools employed by plant personnel are now reducing maintenance and operational costs.

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Bioethanol Producer Employs Advanced Automation Technology to Optimize Integration, Operation and Lifecycle Management of Critical Assets



Figure 8: Remote access to instruments enables greater agility in work practices.

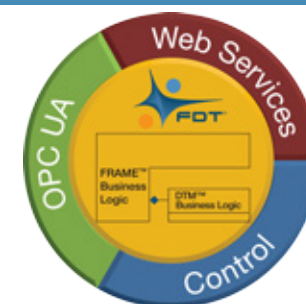
Conclusion

At GranBio's Bioflex 1 plant in Brazil, an advanced tool integrating commissioning, configuration and startup tasks, together with online monitoring and recording of asset-related events, enabled the creation of an intelligent infrastructure to work preventively.

At the heart of the plant's device management solution is the ability to access open instrument information directly from the DCS. Integration of plant-wide controls with a robust asset management capability facilitates the diagnosis of failures and effective operational decisions.

Due to its successful implementation and use of the FDT standard, GranBio has decided to standardize on the technology for its remaining 11 Greenfield plant projects and all future automation investments.

FDT Technology Forum Event - USA



This one-day, complementary event is designed for developers and users to learn how FDT IIoT Server FITS™ empowers the intelligent enterprise for process and factory applications.

September 12, 2017
Lake Forest, CA

FITS™: Taking Industrial Control to the Next Level

FDT IIoT Server optimizes enterprise operations by simplifying the automation ecosystem exchange, increasing manufacturing efficiency, and improving reliability

The Industrial Internet of Things (IIoT) and Industrie 4.0 are here and they're changing the way manufacturers think about business. The desire for increased connectivity and access to valuable "smart data" available from intelligent assets is the key factor to empower modern plants and factories with control strategies for the new era of automation.

To truly enable IIoT, industrial manufacturers need an innovative architecture allowing control from end-to-end for real-time analytics – enabling smarter business and operational practices. A big part of this approach involves collecting data near the source, at the edge of the network. It also means polling as close to the devices as possible.

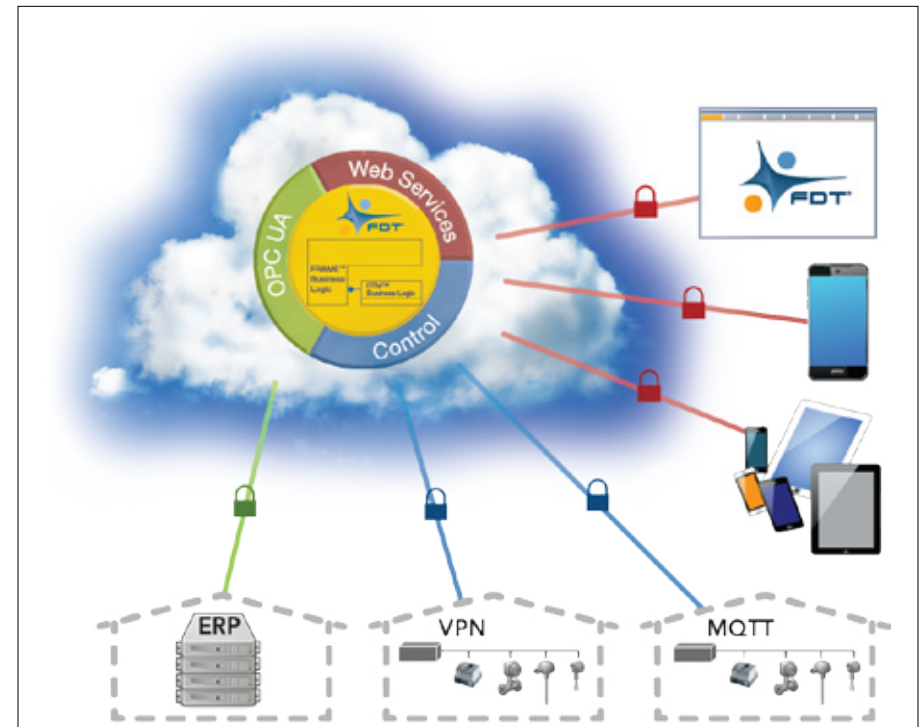
The following article describes how FDT Group's new IIoT server solution promises to optimize device and network connectivity, and expand information sharing, for today's intelligent enterprise.

Understanding the FITS solution

To advance its support for the next generation of automation, and meet the demands of the end user community, FDT Group has developed the FDT IIoT Server (FITS™). This technology will help make IIoT a reality via a broad ecosystem that spans the process, hybrid and factory automation markets, and involves controls and instrumentation suppliers, end users, standards organizations, etc. – all aimed at promoting interoperability, security and mobility through new, adap-

tive manufacturing assets.

FITS is intended to protect legacy investments in the FDT standard through advanced business logic, well-defined interfaces and common components, while also providing the foundation for a modern,



FDT Group's FDT IIoT Server (FITS™) is designed to support IIoT and Industrie 4.0.

Continued FITS™: Taking Industrial Control to the Next Level

integrated automation architecture.

The FITS solution greatly simplifies the move to IIoT. With core FDT components (i.e., FDT/FRAME™ and FDT/DTM™ business logic) at the heart of the architecture, three interfaces empower a flexible implementation strategy: OPC Unified Architecture (OPC UA) integration, Web Services and rich control network interoperability to optimize connectivity and information exchange. The architecture can scale to suit the needs of a single manufacturing facility or an entire industrial enterprise. In addition, the FITS solution features robust layered security addressing all components of the server architecture. It leverages vetted industry standards and encrypted communications, with Transport Layer Security (TLS) utilizing Hyper Text Transfer Protocol Secure (HTTPS) and Web Socket Secure (WSS) communication protocols.

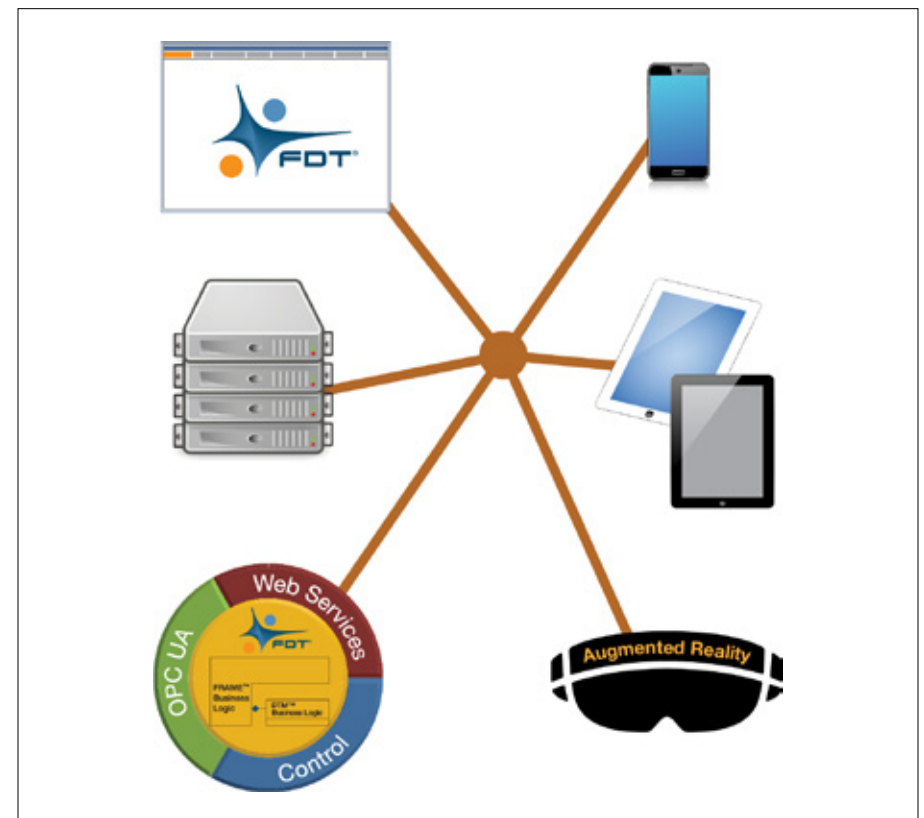
Delivering real-time analytics

FDT Group developed FITS to support increased enterprise information exchange in the industrial sector. The organization implemented OPC UA natively on its IIoT server to enable sensor-to-cloud, enterprise-wide connectivity – making it possible to share information between higher-level applications and the server architecture.

Together, FDT and OPC UA employ a publish-subscribe methodology allowing sensor, network and topology information to permeate the enterprise, including mobile devices, Distributed Control Systems (DCSs), Programmable Logic Controllers (PLCs), Manufacturing Execu-

tion Systems (MESs), Enterprise Resource Planning (ERP) systems, the cloud, IIoT and Industry 4.0.

FDT's approach further provides access to real-time plant informa-



FDT Web Services provide a mobile access approach utilizing standard browsers.

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FITS™: Taking Industrial Control to the Next Level

tion and asset health data with NAMUR NE107 diagnostics available throughout the plant topology via its network tunneling capability.

A key enhancement to the FITS architecture, Web Services, provides a standardized mobile access approach utilizing browsers, apps, standalone applications, or anything else capable of interfacing via web sockets. Users can take advantage of standard browsers to gain access to Device Type Managers™ (DTMs) and FDT/FRAME-enabled systems, or write custom apps and programs.

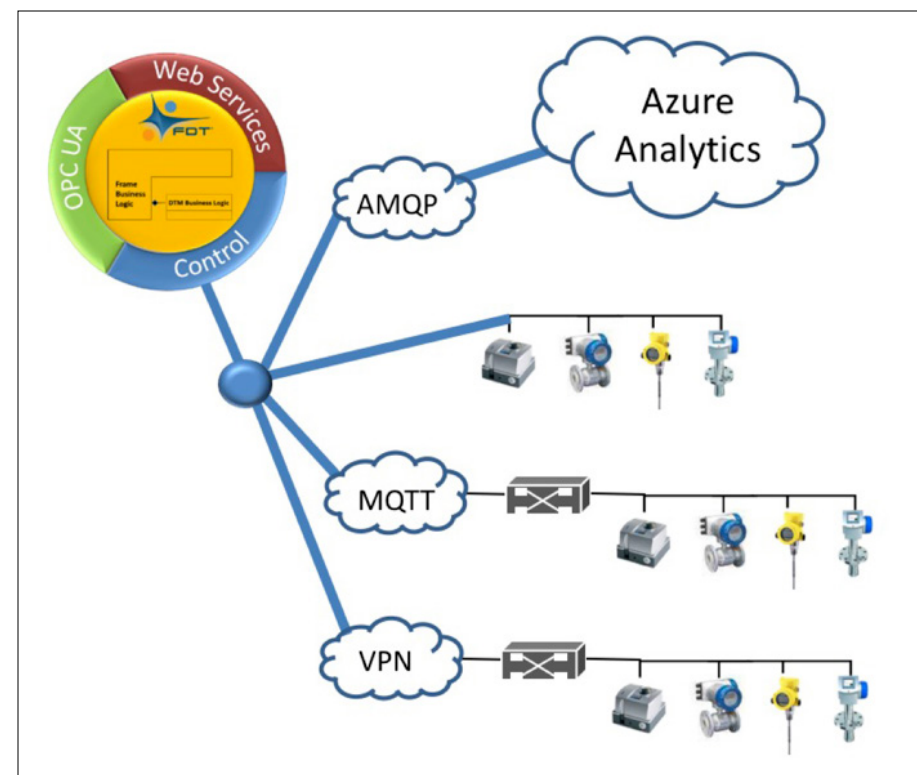
Enabling flexible deployment

With FITS, enterprise connectivity remains intact no matter how the server is deployed, whether it is directly connected to the IIoT, interfaced in the fog, located in the cloud, or established as a standalone application. Connectivity with industrial control systems can be achieved via several optional approaches:

- Traditional direct connections
- Secure remote connections
- Cloud connections
 - Edge devices via the Message Queuing Telemetry Transport (MQTT) protocol
 - Virtual Private Network (VPN) to firewall
 - Azure AMQP
 - Any other cloud method (i.e., a different FDT COMM DTM)
- Single server for multiple plants/locations

- Enterprise-wide from a single cloud instance

The versatility of the FITS solution enables plants and factories to: 1.) Extend connectivity beyond enterprise boundaries to smart devices, 2.) Offer connectivity capabilities optimized for sensors and



The FDT IIoT Server provides options for industrial control system connectivity.

Continued FITS™: Taking Industrial Control to the Next Level

devices, 3.) Deliver relevant data to intelligent decision-making assets to derive business value, and 4.) Enable increased scalability of deployment and management of solutions.

For example, a fog computing strategy provides decentralized computing by bringing the intelligence of the cloud closer to end devices, such as pumps, motors, sensors, relays, etc. Intelligence is pushed down to the Local Area Network (LAN) level of the network architecture, and data from the control system program is sent to an OPC server or protocol gateway, which converts the data into a protocol Internet systems understand.

MQTT is one of many internet-enabled publisher/subscriber messaging transport applications available for edge devices, offering increased communication and data collection. Remote access applications enable remote users to monitor and control machines through secure VPN connections. Database integration allows smart devices to log data directly to database servers over a LAN. Custom server/client applications integrate smart devices on tablets for monitoring and control, moving the touch screen out of the panel and into the operator's hands.

The Azure Advanced Message Queuing Protocol (AMQP) is a wire-level messaging protocol that can be used for cross-platform messaging applications. The protocol defines the mechanics of message transfer between two parties. Azure Stream Analytics is a real-time event-processing engine that helps to unlock insights from data

and makes it easy to set up real-time analytic computations on data streaming from devices, sensors, applications, systems, etc. A FITS instance can push data to cloud applications such as Azure by using either OPC UA or an AMQP Gateway DTM.

Empowering Enterprise Integration

A key feature of FDT for operational management and maintenance applications, among others – and an indication of its pivotal position in an intelligent, connected enterprise – is the ability to seamlessly tunnel through a myriad of networks to transparently communicate with end devices. Communication tunneling (i.e., the open integration of gateways and the integration of communication drivers via communication servers) occurs without the host needing to intervene in any way and without modifying the communications stack of any of the networks through which the tunneling occurs. With this approach, devices are arranged in a hierarchy and interconnect through different protocols. FDT enables seamless device data exchange, operation and maintenance via a computer to a higher-level network, as well as a reduction in the amount of software and hardware the end user needs to implement compared to other technologies.

In a typical industrial facility, communication tunneling might start from an Ethernet network hosting a control system, passing through several network layers to configure or communicate with a smart device. The FDT standard is written such that the end user has no

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FITS™: Taking Industrial Control to the Next Level

awareness that routing through different networks is taking place. It's as if they are directly connecting to the device and can access all of its intelligent features. This solution can accommodate traditional direct connection of the automation network, as well as secure remote connection of a cloud-based architecture encompassing edge devices.

FDT currently supports more than 16 automation industry networks, and its open architecture allows users to add networks to meet changing industry demands, including new IIoT/Industrie 4.0 networks. But the technology doesn't simply allow them to coexist – it ensures seamless, end-to-end communications across disparate networks. The FDT standard provides true interoperability.

Conclusion

FDT Group developed the FITS architecture to optimize the scale and functionality of the IIoT capabilities of its technology stack for enterprise-wide network and asset integration, as well as diverse control system connectivity. Indeed, FDT is the established, open standard, built to integrate and automate the ecosystem exchange by empowering the intelligent enterprise of industrial automation – standards, protocols, systems, devices, data exchanges, services, and more.

FDT Group Meet our new members:



For more information on FDT membership, [click here](#).

FDT Group Announces Latest Web Services Features of FDT IIoT Server (FITS™)

Enhancements include cloud-based enterprise data access, mobility apps, and use of augmented reality to help optimize asset management and preventive maintenance

The FDT Group, an independent, international, not-for-profit industry association supporting FDT® Technology, today announced the latest features of its FDT® Industrial Internet of Things (IIoT) Server (FITS™) solution. Unveiled at HANNOVER MESSE 2017 in Hannover, Germany, the FITS enhancements benefit industrial maintenance departments by enabling cloud-based enterprise data access, mobility apps and the use of augmented reality to view virtual content.



Through FITS, FDT Group is committed to making the IIoT a reality via a broad ecosystem that spans the process, hybrid and factory automation markets, and involves controls and instrumentation suppliers, end users, standards organizations, etc. — all aimed at promoting interoperability, security and mobility through new, adaptive manufacturing assets. This next-generation technology is intended to protect legacy investments in the FDT standard through advanced business logic, well-defined interfaces and common components, while also providing the foundation for a modern, integrated automation architecture.

The FDT architecture is being enhanced to include operating system (OS) agnostic support for standard browsers, and mobility standardization for the development of fit-for-purpose apps to ease maintenance efforts for the new era of automation. Accessible through FITS Web Services, a standardized mobile access approach utilizing browsers, apps, standalone applications or anything else capable of interfacing via web sockets, any mobile device authenticated to access the server will have full access to the topology with tunneling capability to manage assets on any network.

The updated FITS features will spur the development of new apps to optimize asset management, preventive maintenance and other

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FDT Group Announces Latest Web Services Features of FDT IIoT Server (FITS™)

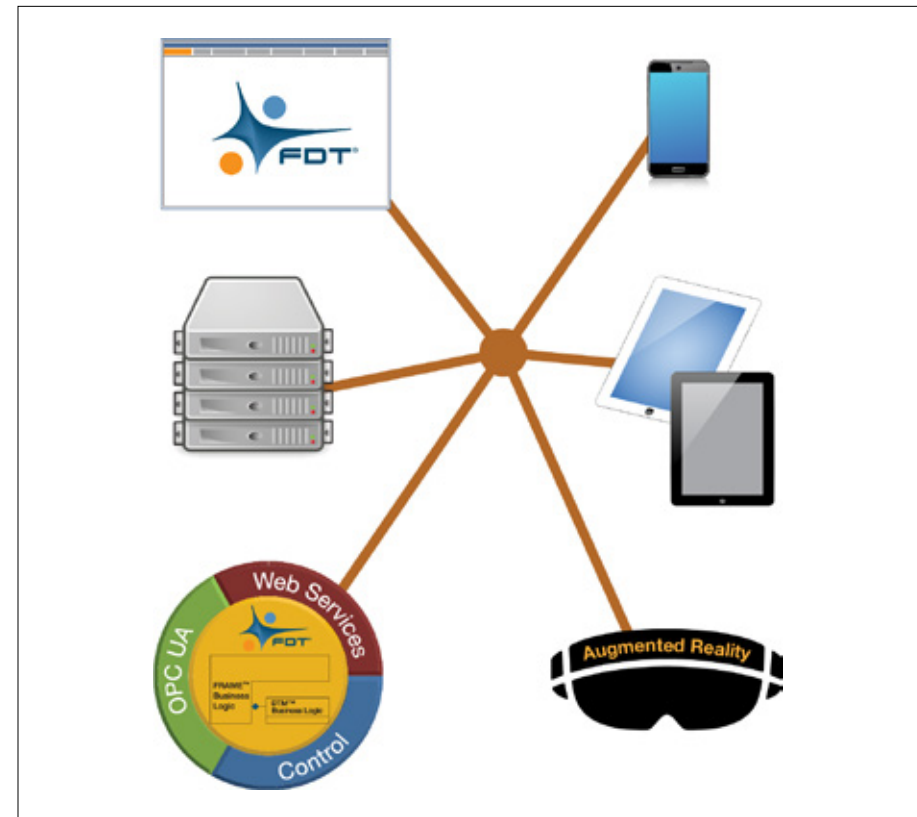
critical functions at modern industrial facilities. They include:

- FITS prototyping with a focus on Web Services and mobile device use cases. This includes Web browser and app-based access to the IIoT server. Whereas FDT maintains its core communication and diagnostic capabilities, it now offers remote access to data through mobile devices and web sockets so that other applications can take part in the seamless exchange of information. FITS opens up the automation architecture to allow for more points of access from a data and user interface perspective.

- Apps employing FITS Web Services to deliver business value to the control industry. Plant personnel are no longer bound to notebook computers, but have the ability to use tablets, smart phones and other mobile devices to carry out their daily activities. For example, field technicians can take pictures or scan bar codes with their smart phones to provide a host of device-specific information. Programmers also have the option to write algorithms to simplify reporting. In addition, it is now easy to write apps communicating with FITS through web sockets. Device vendors and other third parties can deliver apps to support FITS Web Services, focus on specific use cases, or provide helpful tools. Future apps will function similar to a plug-in to an FDT/FRAME™, but will be easier to standardize via a Web application programming interface (API).

- Augmented reality with FITS using a holographic human-machine Interface (HMI) made possible by Microsoft's HoloLens computing

device. Augmented reality is aimed at achieving context-sensitive increases in human perception so as to relocate information transfer, as well as the traditional, screen-based operation of machines, into space itself. With this approach, users can view real-time and analytic data in a hands-free operation. This includes visualizing sensor status,



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FDT Group Announces Latest Web Services Features of FDT IIoT Server (FITS™)

viewing displays of live data and obtaining support for sensor location. They can maintain their normal field of view with transparent data glasses; virtual content is superimposed over real/physical content.

FDT Group Managing Director Glenn Schulz said, “Today, plants and factories utilizing FDT-enabled systems are already benefitting from open access to the Industrial Internet. To advance our support for the IIoT and Industrie 4.0, and to simplify the automation ecosystem exchange, FDT Group has developed a solution known as FITS. It enables mobility, cloud, and fog enterprise applications, as well as sensor-to-cloud and enterprise-wide connectivity employing FRAME™ and DTM™ business logic at the heart of its client-server architecture.”

For automation end users, FITS is delivered as an open, standardized architecture concept, designed to empower the intelligent enterprise and simplify the ecosystem exchange. Users can switch standard protocols for any level of their backbone architecture. It is a versatile approach allowing deployment flexibility. The enhanced architecture is scalable to suit the needs of a single manufacturing facility or an entire industrial enterprise.

FITS is specifically designed to allow sensor, network and topology information to permeate the enterprise, including mobile devices, distributed control systems (DCSs), programmable logic controllers (PLCs), enterprise resource planning (ERP) systems, the IIoT and Industrie 4.0.

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FDT Technology currently supports more than 16 automation industry networks, and its open architecture allows users to add networks to meet changing industry demands, including new IIoT/Industrie 4.0 networks such as Message Queuing Telemetry Transport (MQTT). FDT's ability to seamlessly nest or tunnel through a myriad of networks to transparently communicate with the end device demonstrates its pivotal position in today's smart, connected enterprise.

For more information, please visit www.fdtgroup.org.

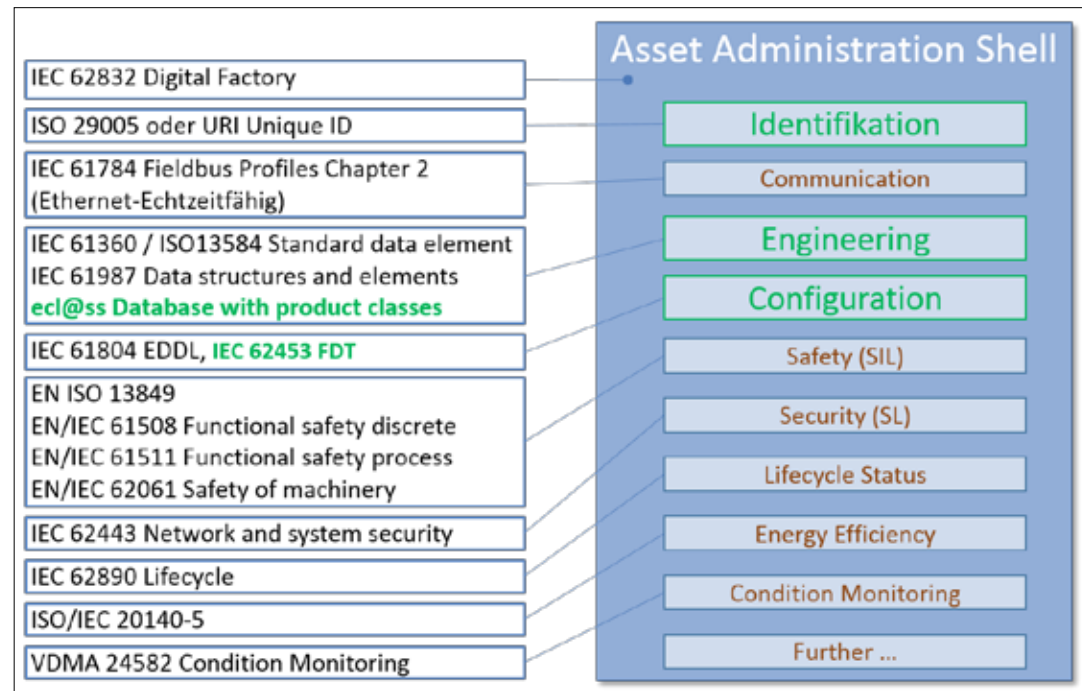
FDT Integrates OPC UA and Industrie 4.0

Technology enhancements make device-specific information from Device Type Managers (DTMs) available via FDT/OPC UA information model

The FDT Group, an independent, international, not-for-profit industry association supporting FDT® Technology, today announced new features in its standard supporting integration of devices into the Industrie 4.0 framework. Unveiled at HANNOVER MESSE 2017 in Hannover, Germany, the technology enhancements leverage the OPC Unified Architecture (UA) to make device-specific information from Device Type Managers™ (DTMs™) available via the FDT/OPC Unified Architecture (UA) information model.

Since 2014, the FDT Group and OPC Foundation have worked together to provide greater access to critical information throughout the industrial enterprise. The FDT standard is the hub of data from tens of millions of DTM-enabled devices installed in the field, while the OPC UA standard provides an infrastructure to make this information available to thousands of other applications and platforms.

With the FDT/OPC UA annex for information modeling, intended for implementation by automation system manufacturers in FDT/FRAMEs™ embedded in engineering systems, distributed control systems (DCSs), asset management systems and other applications, the FDT Group and OPC Foundation have taken an important step forward towards helping end users in the factory, hybrid and process automation markets realize the promise of the Industrial Internet of



Things (IIoT) and Industrie 4.0 for the "Connected World."

FDT Group's new OPC UA features are focused on integration of intelligent devices as part of an overall IIoT/Industrie 4.0 strategy.

They include:

- Providing device-specific information such as network configurations, device parameters, and device-related documents (e.g., references to fieldbus profile definitions and other semantic information)

EPack Compact Power Controllers

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Continued FDT Integrates OPC UA and Industrie 4.0



from DTMs within the German Reference Architectural Model RAMI 4.0 for use in integrating field devices.

- Representing different partial models of a device instance as functional groups, which may share the same data. This allows for efficient reuse of data and avoids unnecessary overhead

such as duplication. The FDT/OPC UA demonstration at HANNOVER MESSE 2017 highlights how data for different partial models according to Industrie 4.0 may be provided based on the latest FDT/DTMs™.

According to FDT Group Managing Director Glenn Schulz, his organiza-

Continued FDT Integrates OPC UA and Industrie 4.0

tion's collaboration with the OPC Foundation continues to advance solutions for enterprise-wide data access across the industrial sector. "The industrial Internet is ushering in an era of connected industrial ecosystems," Schulz said. "Our efforts in support of Industrie 4.0 are focused on automation, interoperability, seamless exchange of data, and contemporary manufacturing technologies to realize the vision of a smart plant or factory."

Lifecycle management is at the heart of all FDT-compliant applications, and the FDT/OPC UA annex, released in November 2016, eases the exchange of critical information throughout the industrial automation ecosystem. By incorporating this specification, FDT/FRAME-enabled control solutions can be configured as an OPC UA server. The client can request a secure connection with the server and access topology, health, and other data.

Standard integration of information provided by FDT/DTMs into the OPC UA information model is essential for device diagnostics, configuration and remote asset management, as well for integration with manufacturing execution systems (MES). The FDT/OPC UA information model enhances the management of networks and devices, helping to optimize the enterprise by giving access to data without the need for protocol-specific handling and providing support for a wide range of devices.

FDT provides network/device configuration and access to devices, whereas OPC UA provides a uniform interface for many different client

FDT Technical Overview Brochure



This brochure provides an in-depth description of FDT; including an overview of the technology, historical development, practical applications of FDT in use and implementations, and so much more.

[Click here](#) to download the brochure

applications. The combined FDT/OPC UA approach enables unification of asset management for Industrie 4.0 applications, supporting Industrie 4.0 devices as well as legacy Industrie 3.0 networks and devices.

The FDT standard is represented in the RAMI 4.0 solution, and with the FDT/OPC UA annex, sensor-to-cloud, enterprise-wide connectivity is granted with seamless data communications.

For more information, please visit www.fdtgroup.org.

Join the FDT Group

FDT Technology continues to be at the forefront of industrial automation advancement, with a truly open and standardized architecture to address the critical needs of the 'Connected World' of the Industrial Internet of Things (IIoT) and Industry 4.0. FDT Group has a strategic vision focused on the "Connected World" enabling a FDT/IIoT architecture supporting mobility, on-the-wire security, and comprehensive interoperability through an ecosystem of automation vendors providing tomorrow's new adaptive manufacturing assets.

Join other leading companies in the FDT Group today. There are unique advantages for the entire industrial automation industry – end users, suppliers/developers, service providers, universities, and individuals.

For membership information, please visit www.fdtgroup.org



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