



# 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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## Join Us



# FITS™ Services a Complete Integrated Architecture

From platform independence, to native OPC UA integration and Web Services, the FDT IIoT Server™ is set to empower the intelligent enterprise through a smart, connected automation ecosystem.



**Lee Lane, FDT Group Chairman of the Board of Directors**

Our work on FITS continued right up to the start of the holiday season and now as we pick up the pace again in 2018, we can look forward to this exciting new standard at the end of this year. While we still have plenty of work to complete, it is interesting to me to think of how this new standard will benefit our end user community as it is incorporated in new products.

The FDT standard has always been heralded by end users for saving them needless trips across factory floors, campuses, and fields by allowing them to monitor and diagnose situations from the comfort of their desktop. While this capability is retained, FITS will take this to a new level by adding several new dimensions to the platform that combine to yield significant efficiencies for customers.

The FITS platform removes the dependency of the FDT client residing on a Microsoft platform and allows FDT functionality on any platform that can support a browser. This immediately brings into focus the use of smart phones and tablets as new portals for FDT features. Smart phones and tablets also bring intrinsic features like cameras, near field communications, and geo locating that allow unique, customer centric solutions to be built. Add OPC UA to this feature stack and FITS serves as an open standard platform that enables incredible efficiencies and functions that have not previously been available to this scale.

Consider the simple need of a maintenance person to access manuals for a particular device while in the field or on the plant floor. With FITS this can be as simple as using the camera on their smart phone to scan the asset ID and having the specific manual delivered right to their smart phone or tablet. Or with a simple hand gesture, obtain the current I/O or process value information for the device. This saves browsing and radio time, allowing the maintenance person to get right to work on the asset.

Imagine walking along on the factory floor or in the field and having your smart phone or tablet alert you to an asset that needs attention. By using geolocation features and the asset health capabilities of FITS, this type of app is a realistic solution that can save hours of downtime and additional trips by maintenance persons to that location.

It has long been a goal of the engineering organization in many customers to have a simple to deploy asset health portal. Since FITS is communicating with all supported devices across the facility and since asset health is a strength of FITS, an asset health portal is a straightforward application either through the use of OPC UA or through the web sockets interfaces to FITS. The vendor community may very well offer such solutions off the shelf but end users are also capable of leveraging the well published interfaces of FITS to make this possible.

## Continued FITS™ Services a Complete Integrated Architecture

Management personnel will appreciate the ability to remotely access the entire plant structure and health through secured, remote access. When away from the plant, it can be a simple matter to access a dashboard showing the real time operational status of a line or process. An engineer can use this same capability to drill into the details in order to remotely support the plant operations. Access to remote, real time data like this can increase operational efficiency and allow management personnel to supervise multiple facilities from a remote loca-

tion using a simple tablet, for example.

The possibilities are nearly endless due to the rich information that a FITS environment makes available and the published, but secured, interfaces to FITS. It will truly be exciting to see the different FITS apps that are developed by the vendor and user community. The broader integration of the fully integrated OPC UA server offers secured data access across the enterprise on an unprecedented scale.

Truly exciting times.

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# FDT Standardized Mobility Solutions and User Interface for Agile Operations

Web Services portal empowers maintenance personnel with flexible approach for cloud-based enterprise data access, mobility apps and augmented reality

Mobile technology is transforming the manufacturing environment. This trend is accelerated by the Industrial Internet of Things (IIoT) and Industrie 4.0 initiatives, whose goals include empowering an intelligent enterprise through a smart, connected automation ecosystem.

The following article describes how ongoing technology developments by FDT Group will help optimize industrial organizations and their maintenance departments by enabling cloud-based enterprise data access, robust device diagnostics, mobility applications, and the use of augmented reality in asset management and predictive maintenance programs.

## Today's Industrial Demands

Nowadays, most maintenance departments are caught between budget and cost pressures on the one hand, and increasing business requirements (e.g., regarding the availability of production plants and assets) on the other hand. In order to increase the performance capacity and efficiency of maintenance operations, appropriate processes and systems as well as adequately structured data management are needed.

Businesses and consumers have realized the value of mobility in



the way they access, analyze and interact with data. The manufacturing world is no different. Flexibility is critical on the modern manufacturing floor, and mobile platforms can provide the support needed by these organizations and their customers.

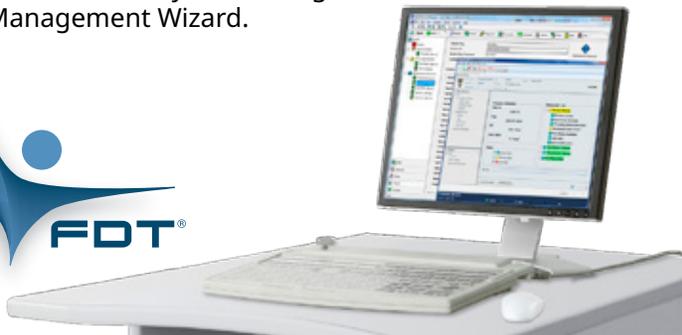
Just as mobile devices are transforming the way each of us communicates and connects, mobility solutions are dramatically changing the

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## Continued FDT Standardized Mobility Solutions and User Interface for Agile Operations

landscape of plants and factories. With visibility, information and control literally in workers’ hands, plant processes and productivity are transformed (See Fig. 1).

### Technology Enabling Field Technicians

FDT Group, an independent, international, not-for-profit industry association consisting of leading companies and organizations active in industrial automation and manufacturing, continues to advance its open standard for enterprise-wide network and asset integration. The organization was founded in 2003 for integration and lifecycle management of devices, and today it provides a uniform interface supporting connection to any device on the market from any network and any device vendor.

FDT technology 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 Device Type Manager™ (DTM™) software for their products, and the FDT/FRAME™ (embedded in control systems or standalone device management tools) communicates and reads those FDT/DTMs – regardless of protocol for each device. This enables com-



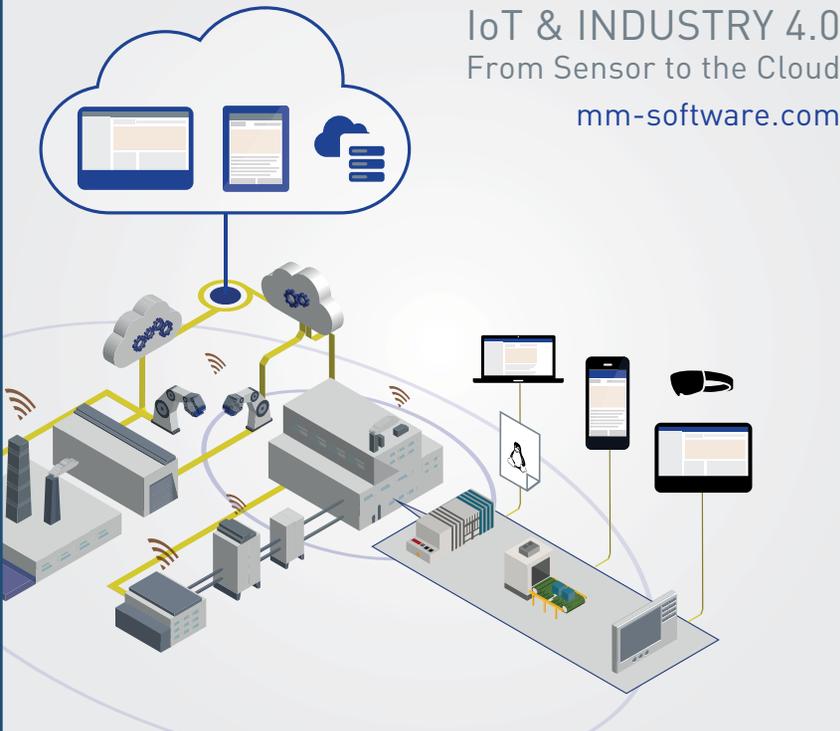
Figure 1: Today, mobility solutions are dramatically changing the landscape of plants and factories.





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plete lifecycle access for configuration, operation and maintenance through a standardized user interface, no matter the supplier, device type/function, or communication protocol.

Today, FDT is the leading device integration technology standardized internationally and widely adopted in the process, hybrid and factory automation markets with tens of thousands of FRAME-enabled applications and millions of DTMs installed and working to provide seamless integration and intelligent driven operations.

To support next-generation solutions in the era of IIoT and Industrie 4.0, FDT Group is developing a solution known as “FITS™” (FDT IIoT Server). The FITS solution protects industry investments in FDT through advanced business logic, well-defined interfaces and common components, and enables operating system (OS) agnostic implementation of the technology while sup-

porting today’s integrated automation architecture. The IIoT server employs FRAME and DTM business logic at the heart of its client-server architecture and can scale to suit the needs of a single manufacturing facility or an entire industrial enterprise.

FITS implements OPC UA natively to enable mobility, cloud, and fog enterprise applications, as well as sensor-to-cloud and enterprise-wide connectivity – making it possible to share information between higher-level applications and the server architecture. Using FDT-enabled control solutions, which can be configured using the open OPC Unified Architecture (UA) protocol, the management of networks and devices is enhanced, giving access to data at all levels in the enterprise without protocol-specific handling and providing support for a wide range of devices.

Thanks to FDT, the ability to integrate diverse plant information enables



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## Continued FDT Standardized Mobility Solutions and User Interface for Agile Operations

personnel to mitigate process upsets and instrument malfunctions. The combination of measured values, valve openings and device diagnostics helps identify specific deviations in operation and instrument performance. This level of interoperability and true advanced diagnostics is optimizing modern plant and factory operations.

### Web Services Focused on Mobility

FDT Group is dedicated to meeting the requirements for mobile device connectivity on the industrial shop floor and in the field. Its goal is to enable automation end users to employ the functionality they appreciate in the FDT integration standard on all of the leading mobile platforms. This mobility integration will provide access to additional data – at any time and anywhere – with flexible deployment options.

The FDT/FRAME and FDT/DTM are

at the core of the FITS server and surrounded by three portals: Web Services, OPC UA and Control. For the purposes of this article, the discussion will focus on the Web Services portal designed to mobilize industrial maintenance personnel. FDT mobility takes the technology's founding principles and empowers the industrial workforce with agile operations optimizing process efficiencies.

FDT 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 DTMs and FRAME-enabled systems, or write custom apps and programs (See Fig. 2).

### Tools for a Smarter Workforce

For the simplest to the most complex maintenance operations, FDT-enabled



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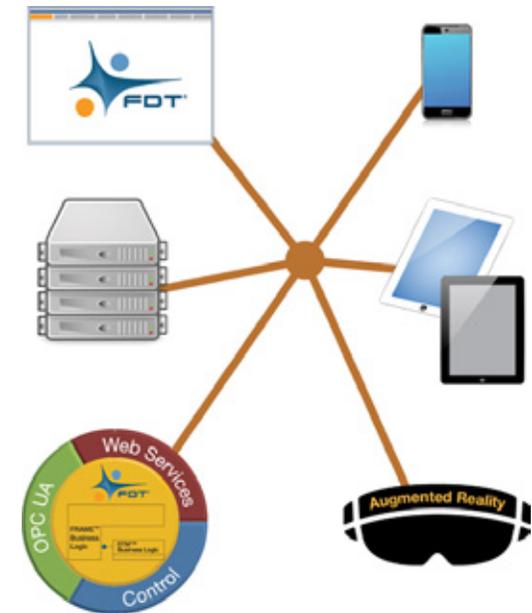


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## Continued FDT Standardized Mobility Solutions and User Interface for Agile Operations

mobile applications will empower plant personnel to work smarter, faster and more effectively. They will gain the ability to complete tasks and record notes directly at the instruments they are maintaining and repairing. In fact, field workers who use mobile devices to access equipment maintenance data will report more frequently and with higher accuracy.

With apps employing FITS Web Services, for example, maintenance technicians will no longer be bound to a centralized tool or handheld device connected to an individual instrument; instead, they can use tablets, smart phones and other mobile devices to carry out their daily activities. This includes solutions bringing FDT data much closer to the engineer or technician, and enabling troubleshooting and monitoring of instruments' critical operating parameters to be performed remotely to ensure they are functioning



**Figure 2.** FDT has created a standardized approach for mobile access using browser technology or apps where the mobile device can be authenticated to access the FITS server.

according to specification. Additional maintenance benefits will include the ability for field workers to take pictures or scan bar codes with their secure, authenticated smart phones or tablets to provide a host of device-specific

## Continued

### FDT Standardized Mobility Solutions and User Interface for Agile Operations

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information. Programmers will have the option to write algorithms to simplify reporting.

Beyond cloud services with mobile applications, the use of augmented reality via a holographic human-machine Interface (HMI) and Microsoft's HoloLens computing device will further address critical lifecycle management issues. Augmented reality is aimed at increas-



**Figure 3: Combining cloud services with mobile apps and the use of augmented reality via a holographic human-machine Interface (HMI) will further address lifecycle management issues.**

ing context-sensitive human perception so as to relocate information transfer, as well as the traditional, screen-based operation of machines, into space itself. Consequently, technicians are able to view real-time data and analytics using hands-free operation, visualizing status and live data for each sensor location. They have a normal field of view using transparent glasses with the virtual content superimposed over the real or physical content (See Fig. 3).

### 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. FITS is now set to empower the industrial workforce with flexible deployment and mobility solutions intended to optimize facilities with agile operations.

With the advanced FITS architecture, FDT maintains its core communication and diagnostic capabilities, but also offers secure remote access to data through mobile devices and web sockets so that other applications can take part in the seamless exchange of information. Indeed, FITS will open the automation architecture to allow for more points of access from a data and user interface perspective.

# China Adopts FDT2 as National Standard

Updated FDT® standard supports intelligent enterprises in the age of IIoT and Industrie 4.0

FDT Group™ today announced that a cooperative initiative undertaken by China's National TC124 On Industrial Process Measurement, Control and Automation of SAC (TC124/SAC); Instrumentation Technology and Economy Institute, P.R. China (ITEI); China Instrument Manufacturer Association (CIMA); Southwest University; and the FDT Professional Committee has resulted in an national standard for device integration based on industry-leading FDT® 2.0 technology.

The Chinese GB/T 29618-2017 Field Device Tool (FDT) Interface Specification incorporates the latest technology enhancements by the FDT Group, an international non-profit corporation dedicated to providing an open standard for industrial enterprise-wide network and asset integration. The updated standard was announced at a joint organizational meeting held on November 15 in Beijing, China.

FDT is transforming the way industrial automation architectures connect and communicate sensor to cloud. Ongoing advancement of this technology is leveraging major developments like the Industrial Internet of Things (IIoT) and Industrie 4.0 to enable end users to realize the true potential of decentralization, interoperability and integration, as well as a unified view of all data and functions across process, factory and hybrid control applications.

The FDT 2.0 specification, employing a future-proof architecture based on Microsoft .NET technology, offers all the properties needed by modern software right up to web- and client/server-based systems. Release of the GB/T 29618-2017 standard incorporating FDT



2.0 will better guide the integration and application of various field buses and devices, and help promote the widespread implementation of standards-based automation solutions.

According to Tian Zhaoying, vice director of the 2nd Industry Department, Standardization Administration, People's Republic of China (SAP), standardization is an important requirement for intelligent manufacturing. "The purpose of our ongoing efforts is to enable the effective implementation of advanced industrial standards while promoting social and economic development within China," he said. "The Chinese FDT Professional Committee and ITEI actively assisted the development of FDT so this advanced technology could be widely



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implemented by our country's manufacturing community."

Mei Ke, vice president of ITEI, believes the updated FDT 2.0 specification will meet current requirements for standardizing communication and configuration interfaces between field devices and host systems, and is a key tool for the integration of intelligent manufacturing centers.

Li Yueguang, vice president of CIMA, also noted the technical advantages of FDT 2.0 in system integration and interconnection, and expressed hope that domestic enterprises in China would quickly integrate compliant solutions as part of their smart manufacturing strategies.

FDT Group Managing Director Glenn Schulz expressed gratitude for establishment of the Chinese national standard for device integration technology. "There is growing demand for FDT-enabled solutions employing FDT 2.0 technology in developing industrial

markets around the world," Schulz said. "Based on robust .NET technology, the FDT 2.0 standard maintains proven FDT heritage, but includes numerous performance enhancements while ensuring backward compatibility with our existing installed base."

FDT was built to support a comprehensive, open architecture for the connected world of industrial automation networks and assets. The backbone architecture, standardized independent of industrial automation networks, allows for a comprehensive networking integration model allowing for seamless integration mapping to connect intelligent assets relaying device-specific diagnostics data enterprise-wide.

For more information, please visit the [FDT Group website](#).

### About China Instrument Manufacturer Association FDT Professional Committee

The China FDT Organization was



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## Continued China Adopts FDT2 as National Standard

established in 2010 and joined the China Instrument Industry Association in 2011. The FDT Working Group supports Chinese enterprises in independently developing innovative products conforming to the FDT standard. The objective is to effectively promote the technological advancement of the automation industry in China and enhance the competitiveness of the country's automation technologies. The China FDT Organization is responsible for organized technical promotion, on-site exchanges, user forums and other activities. It is also actively involved in standards formulation, and in 2013 released the first FDT national standards.

### About FDT Group AISBL

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# New FDT Group Member CKD Recognized for Fluid Control and Automation Expertise

CKD offers advanced pneumatic control technology as latest company supporting FDT® technology

CKD, a leading manufacturer of fluid control instrumentation and automation solutions based in Komaki, Aichi, Japan, is the newest member of FDT Group. This independent, international, not-for-profit industry association consists of leading companies and organizations active in industrial automation and manufacturing. Its major purpose is to provide an open standard for enterprise-wide network and asset integration for seamless exchange of performance driven data.

Founded in April 1943, CKD provides automated machine systems and devices, pneumatic control components, fluid control components, and drive and fine system components for a wide range of demanding applications. The company operates plants in Japan, China, Thailand, Korea, Malaysia and Indonesia, and has sales offices all over the world. Its products are used in the automotive, semiconductor, pharmaceutical, and food and beverage industries, among others.

CKD Hiroyuki Mizuno, General Manager, said, “FDT Group membership will provide new business opportunities to our company. FDT® technology is a recognized integration standard developed with an open architecture to meet today’s changing industry demands. This solution enables secure connectivity throughout the system and provides end users with peace of mind that newer solutions will plug and play.”

He added, “CKD will study the feasibility of developing a Device

Type Manager™, or FDT/DTM™, for use with Ether-CAT-compatible pneumatic valves and other field devices in the future.”

FDT Group Managing Director Glenn Schulz welcomed CKD to his organization and praised the company’s proven commitment

to automation industry technology advancement. “CKD is a forward-looking company that recognizes the benefits of FDT, which is built to support the connected world of industrial automation networks and assets. Standardized independent of network protocols, FDT allows for a comprehensive integration model for connecting intelligent assets relaying device-specific diagnostic data across the industrial enterprise.”

FDT technology is recognized for transforming the way industrial automation architectures connect and communicate with one another. Ongoing development of this technology will enable end users to realize the true potential of decentralization, interoperability, integration, as well as a unified view of all data and functions across process, fac-



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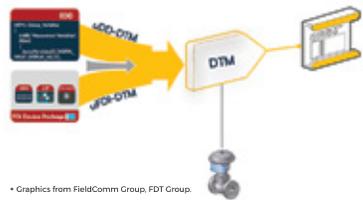
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With powerful and smart features, uFDI- DTM™ and uDD-DTM™ stand out in the market eradicating the problem of high investment faced by the device vendors in the device integration technologies.

The use of new FDI Device Packages and reuse of existing EDDs in their FDT frame applications make them a suitable choice for the end users. uFDI-DTM™ and uDD-DTM™ have been rewarding to the business of various device vendors and their customers.



## Continued New FDT Group Member CKD Recognized for Fluid Control and Automation Expertise

tory and hybrid control applications.

To advance its support for the Industrial Internet of Things (IIoT) and Industrie 4.0, and to simplify the automation ecosystem exchange, FDT Group has developed the FDT IIoT Server (FITS™) solution. FITS 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.

FDT Group membership offers unique advantages for the entire industrial automation industry, including end users, suppliers/developers, service providers, universities, and individuals. Members are involved with providing innovative FDT-enabled products, solutions and services, and have the opportunity to join working groups, technical project groups and marketing committees to help direct the technology.



# 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](http://www.fdtgroup.org)



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