

Empowering the Intelligent Enterprise

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



# A New Era of Process and Factory Automation

Automation strategies are evolving in the face of a competitive global economy. The previous generation of fragmented systems is becoming increasingly integrated and interconnected, with a greater degree of standardization at all levels of the automation architecture.

The FDT Group offers an enabling technology for Empowering the Intelligent Enterprise. Providing access to both legacy and modern control assets, it is a versatile solution for the new era of automation. FDT Technology benefits both manufacturers and end users, with advancements like the Industrial Internet of Things (IIoT) and Industrie 4.0 delivered out-of-the-box, enabling modernized asset integration and access to performance data for visualizing crucial operational problems.

The FDT standard, introduced in 1998, provides an open, vendor-neutral software interface for integrating assets and delivering access to device intelligence. This includes a common environment for utilizing intelligent devices' most sophisticated features.

FDT is comprised of two primary software components: The Frame Application (FDT/FRAME™), which can be embedded in a Programmable Logic Controller (PLC) programming tool, a Distributed Control System (DCS), an asset management application, or it can be a standalone configuration tool, or just about any other type of engineering application that needs seamless access to the installed base of intelligent devices across multiple networks. The Device Type Manager™ (FDT/DTM™) is a software component for an intelligent device or communication component within a digital network. It contains all of the parameters, functions, user interface, etc., that represent the device's most sophisticated features via a graphical display supplied by the manufacturer.

Device manufacturers provide FDT/DTM software for their products, and FDT/FRAMEs 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.



***“We chose to use FDT Technology as an open solution in which the operator is not restricted to any specific manufacturer.”***

— Jane Goh, Project Consultant, Changi Water Reclamation Plant (CWRP), Singapore

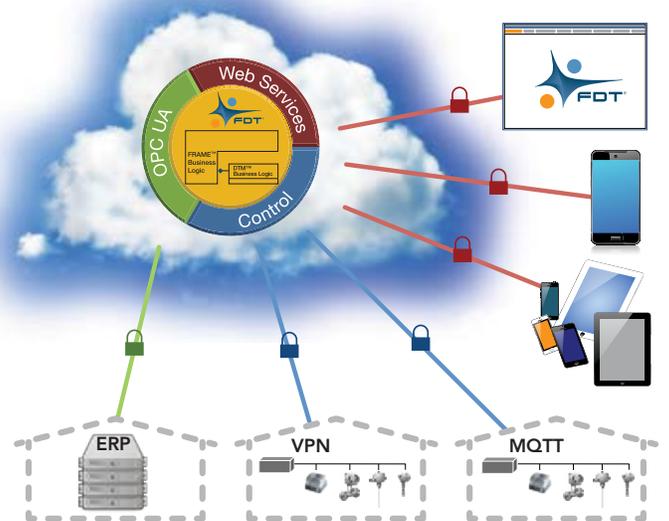
- **Mature and proven solution:** FDT Technology is incorporated in the international standard IEC 62453, as well as the North American standard ISA103 and China GB/T 29618. Most major system manufacturers today integrate the FDT/FDTE Application Interface in their solution offerings and more than 8,000 devices are supported by FDT-certified DTMs, making it the most widely adopted standard for integration of devices in industrial control systems.
- **Robust integration capabilities:** FDT's open framework integrates any network with any device and DTM. This includes the Field Device Integration (FDI) and Device Description (DD) device representations. Field equipment and higher-level systems can work together without concern for the legacy of integration technologies. FDT also provides unparalleled access to basic device parametric data, as well as advanced diagnostics and analysis.
- **Scalable and flexible architecture:** With the FDT solution, users can monitor a few critical inputs or thousands of inputs. The architecture adapts to any field communication protocol that may be needed, and the use of network tunneling allows an FDT/FDTE to seamlessly talk through any number of disparate network layers to the end device.
- **Compliant device interoperability:** The FDT Group's certification process ensures the compliance and interoperability of FDT-based products. Independent labs are audited and certified to carry out authorized FDT testing procedures.
- **Centralized for asset monitoring:** End users can take advantage of FDT's standard interface for lifecycle management of field devices — regardless of supplier or network. It is the same for automation systems and standalone tools.
- **Comprehensive Developer Tools:** Manufacturers have access to standardized, pre-engineered, and pretested "Common Components" covering the intricate technical aspects, the basic layer assuring standard compliance. This solution provides suppliers a high degree of out-of-the box compatibility and frees them to focus their efforts on providing a best-in-class experience for their products.

## FDT IIoT Server (FITS™) Simplifies the Ecosystem Exchange

To empower the future of IIoT and Industrie 4.0, FDT Group has developed the FDT® IIoT Server (FITS™), enabling mobility, cloud and fog enterprise applications, as well as sensor-to-cloud and enterprise-wide connectivity. 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 simplifies the move to IIoT, combining OPC UA integration, web services and rich control network interoperability to optimize connectivity and information exchange for the next generation of automation. It features robust layered security addressing all components of the server architecture.

FITS protects legacy investments in FDT through advanced business logic, well-defined interfaces and common components, and provides for operating system agnostic implementation of the technology while supporting the current integrated architecture.



# Solutions for Diverse Industrial Applications

From refining and power generation, water and wastewater, chemicals, oil & gas, offshore and marine, to pharmaceuticals, food processing and machinery, there is a diverse scope of applications for FDT Technology. End users employing this solution are IIoT-enabled and can mix and match field communication protocols, control system platforms and device suppliers, thus simplifying integration in process, hybrid and discrete manufacturing.

- **Freedom to choose best-in-class products:** The FDT standard provides the freedom to select products that best fit a given application without system integration restrictions. Additionally, it supports the diverse array of simple to the most sophisticated intelligent devices, for complex or critical applications with “device drivers” like a DTM, or other device representations such as a Device Description (DD), Electronic Device Description (EDD), FDI Device Package, IOOD and others, allowing the use of plug-and-play devices as needed.
- **Single access to device data:** FDT makes important device data available when and where it’s needed for automation, asset management and engineering systems, providing performance data for operational excellence.
- **Complete asset lifecycle support:** FDT Technology plays a vital role in the entire automation device lifecycle, offering adaptability for asset support requirements from configuration and parameterization, through operations and maintenance.
- **Greater ease of use:** With a single window to access information from a wide variety of machines and plant equipment, industrial firms can easily access and extract intelligent information via OPC UA from their most crucial assets.

- **Power of predictive analytics:** FDT’s support for intelligent device information monitoring optimizes the lifecycle cost of plants while enhancing maintenance activities, increasing safety and improving product quality. Operations are also helped since many FDT applications comply with the NE107 guidelines that define alert and notification symbols for fast and clear problem recognition and resolution.
- **Protection of technology investments:** Thanks to the FDT standard, plants and factories can deploy automation with greater confidence. This is due to interoperability of new and existing assets and communication protocols within the installed base. Systems and devices have the same look and feel across any network for any version of a DTM.



***“With FDT-enabled solutions, we use just one tool for almost every device. The capability...to be product, supplier, host system and protocol independent...allows for standardized work processes.”***

— Janos Horvath, Head of Instrumentation and Control, SI Group, Switzerland

# Meeting the Needs of End Users and Suppliers

As a standard developed ahead of its time, FDT is the revolutionary solution for the new era of automation platforms, which bridges the gap for installed legacy assets. FDT also makes it easier to access field equipment in the many facilities that use one or multiple communication networks. End users have fewer software tools to learn and maintain. There is also less complexity to contribute to plant failures, and less engineering and training effort to configure, commission and start-up automation systems.

The capabilities enabled by FDT Technology within an embedded FDT/FRAME offer additional benefits for automation suppliers. The ability to provide customers with a single engineering environment to configure, commission and manage field assets

reduces total cost of ownership and creates enormous competitive advantages.

- **Efficient design and engineering:** With FDT, end users can leverage a single, open engineering environment for handling field devices from any manufacturer in any communication system. Everything can be operated and managed through a single system interface.
- **Simpler and faster commissioning:** FDT takes advantage of advanced mobile solutions so devices can be configured via a standardized graphical interface, with information accessed from any location. End users can perform offline configuration, and when devices are connected during commissioning, parameter sets can be loaded to individual devices — saving an enormous amount of time.
- **Enhanced operational performance:** By employing information from smart devices, the operations and maintenance phases of the plant lifecycle are dramatically improved. Sensor-to-enterprise integration, with tunneling through multiple protocols, is an essential driver of operational excellence.
- **Enriched diagnosis capabilities:** FDT Technology supports improvements ranging from predictive maintenance strategies, to greater plant reliability and lower maintenance costs. It also enables remote access to devices, helping pinpoint and address asset problems and eliminating trips to the field.
- **Greater overall adaptability:** The open FDT architecture was specifically designed to allow integration of new standards for enterprise connectivity, mobility applications and more in the years ahead. As such, end users are assured of utmost adaptability to their changing needs.



***“FDT provided an easy and secure configuration environment to make device changes — independent of the number or complexity of the devices.”***

— Andy Ellams, Process Development Manager, PZ Cussons, United Kingdom

# FDT Today – Integrating Tomorrow’s Technology

The FDT Group continues to advance its free and open standard to keep pace with the changing requirements of process, hybrid and factory automation. Recent developments allow for faster execution for mega installations incorporating thousands of input/output (I/O) devices, as well as improved control system security on the wire.

The current FDT specification maintains proven FDT heritage, but includes numerous performance enhancements while ensuring backward compatibility to the existing installed base. FDT supports an optimized user interface with graphical representations of device parameters. Common Components create a library of FDT routines to simplify development of compliant products and certification of FDT/DTMs. For added security, all FDT/DTMs are digitally signed, providing tamper-proof data delivery and non-repudiation.



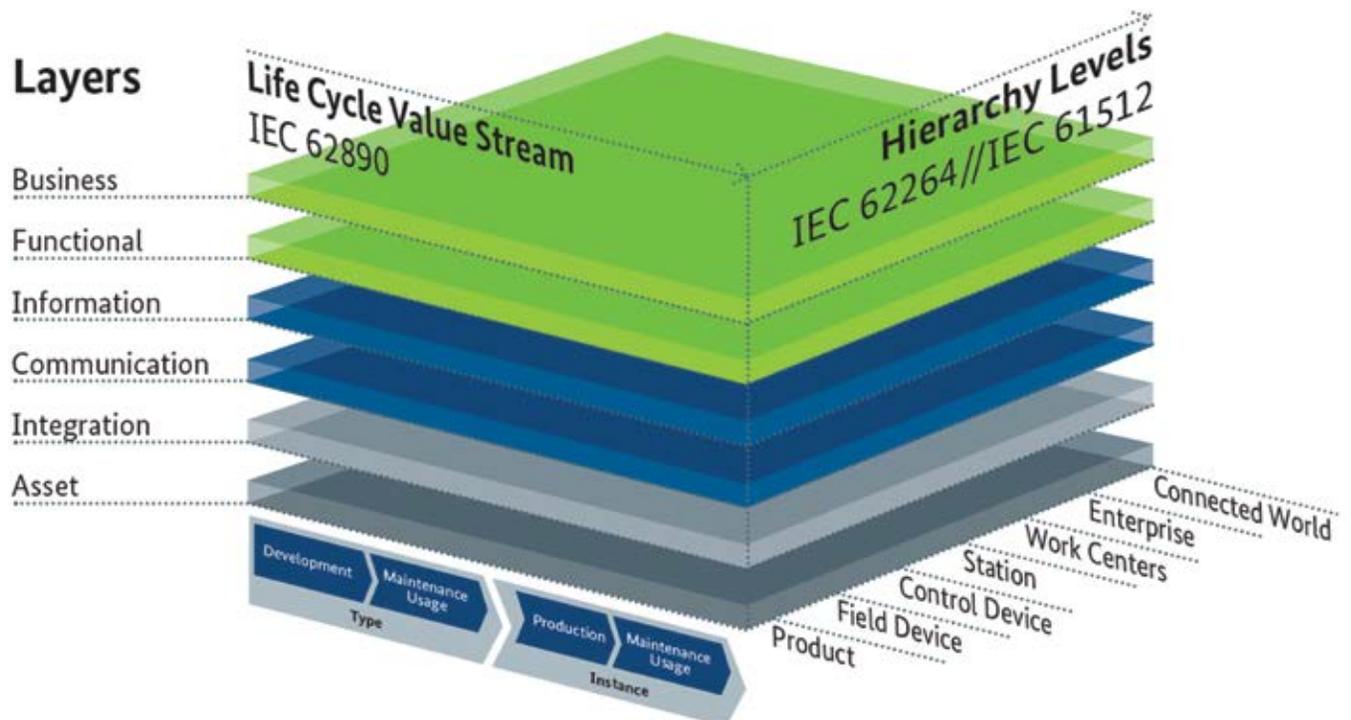
**Complete Interoperability:** FDT Technology supports heterogeneous control architectures, allowing best-in-class network and asset integration, as well as the cascade of information from sensor to the enterprise.



**Improved cyber security:** The FDT Group’s comprehensive cyber security infrastructure addresses potential cyber attacks on automation assets. This allows FDT solutions to be implemented in a way that avoids possible threat vectors, providing unparalleled protection when integrated in control system vendor applications and hosted within a secure end-user IT platform.



**Increasing worker mobility:** Industrial organizations can deploy the functionality of FDT on leading mobile platforms. Placing information and control in workers’ hands increases visibility so plant processes and productivity can be transformed to achieve new production and maintenance levels.



© Plattform Industrie 4.0 und ZVEI

The FDT standard is represented as the device integration solution in the German Reference Architecture Model RAMI 4.0.



#### **Harnessing IIoT and Industrie 4.0:**

FDT is the established standard for device integration for the Connected World as described in the RAMI4.0 model. It supports an IIoT-connected enterprise, creating a single system infrastructure that standardizes the connection of industrial networks, automation systems and devices. Remote access to connected machines, production units and devices also drives performance improvements. Additionally, the Industrie 4.0 and Modular Automation initiatives employ FDT to unify system engineering, configuration and diagnosis. FDT supports seamless routing across different networks, and combined with standardized architectures for smart automation, eliminates special methodologies for higher-level systems or external applications to obtain devices information.



#### **Expanding enterprise connectivity:** FDT Group/

OPC Foundation collaboration has leveraged their respective technological strengths. OPC provides a uniform interface for many different client applications, whereas FDT provides network/device configuration and access to devices. The FDT-OPC UA industrial device information model enhances the configuration of networks and devices, and gives the enterprise access to data without the complexity of protocol-specific handling.



#### **Implementing cloud connectivity:** FDT's

method of communicating device and machine data using the FDT/OPC UA information model provides an effective combination of local control and monitoring with global overview and aggregation. Whether operating locally or in the cloud, FDT helps put "Big Data" in context and supports better and faster decision-making.

***"Thanks to the use of FDT Technology...we can monitor pumps and conveyor belts and, if necessary, adjust the parameters accordingly. Potential failures are detected and prevented in a timely manner."***

— Andreas Reilard, Operations Manager, Techno-Agrar, Germany



# FDT "Ecosystem" – Comprehensive Industry Support

The FDT Group is an open, independent, not-for-profit association of leading major industrial automation companies dedicated to supporting FDT Technology as an international standard. A wide range of tools, information, and technical support is available for implementing FDT in the new era of automation.

Companies seeking to develop FDT-enabled products will find a wealth of assistance:

- FDT-enabled Open Source Engineering Platforms
- FDT/DTM and FDT/FRAME Common Components
- dtmINSPECTOR Test Tool
- Integration Laboratory at Dietz Automation
- FDT-accredited Certification Testing Sites
- Development Assistance and Support
- Complete, Standalone Frame Applications
- Consulting and Engineering Services
- Technology Training & Workshops



## FDT Service Providers and Integration Lab



Empowering the Intelligent Enterprise

### Learn More

To find out more about how the FDT standard is *Empowering the Intelligent Enterprise*, visit our website at [www.fdtgroup.org](http://www.fdtgroup.org), email [info@fdtgroup.org](mailto:info@fdtgroup.org), or contact your local automation supplier offering compliant products.

5 Industrieweg | 3001 Heverlee | Belgium | +32 (0)10 22 22 51