

# Device Integration Strategies

Empowering the Intelligent Enterprise

# 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 has long focused on bringing plants, people and data together. With the new Fourth Industrial Revolution era now here, FDT has strengthened its standard focused on empowering the intelligent enterprise with the release of the new FDT IIoT Server™ (FITS™) platform. The enhanced solution transforms the standard into an information exchange architecture. Empowering innovative business models, FITS features a solid ecosystem of solutions (FDT Server, FDT Desktop, FDT DTM and FDT App) supporting IIoT and Industry 4.0 applications. Built from the ground up with an operating system agnostic environment and a comprehensive security solution, a FITS enabled environment boasts OPC UA integration, mobile device management and a new *FDThub*™ DTM repository. Designed to be flexibly integrated, the architecture is deployable in the cloud, on-premise, edge or desktop environment supporting FDT's heritage and future as the open, standardized, platform independent architecture for universal device integration and asset management.

## Newsletter Contributors



Endress+Hauser  
People for Process Automation



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# Editorial: FDT 3.0 IIoT Solutions Enabled Right Out-of-the Box

New toolkits auto-enable OPC UA capabilities – no additional coding required



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

The official launch of FDT 3.0 has certainly generated a great deal of interest and excitement in the industry. The global industrial and process automation press has picked up the story and conducted several published interviews. It is also an honor to see FDT 3.0 featured on the front cover of Control Engineering Europe. The secure remote access feature of FDT 3.0 is certainly a timely topic.

Within our vendor community, one of the popular FDT 3.0 topics is the developer tools that are used to develop FDT 3.0 enabled products. We call these developer tools Common Components. We have built the complete framework for compliance with the standard inside of the Common Components. We then test that framework to ensure that all the Common Components function well together regardless of the operating system on which they are deployed. This strategy allows vendors to focus their efforts on value-add features that showcase their products instead of getting bogged down in standards compliance.

The DTM and Server Common Components have been engineered to deliver platform agnostic solutions. This means that the resulting components can be deployed on Windows, Linux or Apple operating

systems. This has brought a new dimension of scalability from simple skid-based asset management to full cloud-based, data rich enterprise systems.

An amazing feature of how the new FDT 3.0 standard is engineered is that all FDT 3.0 DTMs automatically provide full OPC UA support without additional effort or coding. This means that any authorized OPC UA client can browse the project structure in the FDT Server to find the device specific, real-time information. This provides easy integration of live plant floor data into apps, dashboards, MES, ERP and CMMS applications without the need to touch the DCS or PLC configuration. We have ensured the free and easy access to this information through a built-in and fully “wired” OPC UA server within the FDT Server Common Components.

Whether you are developing DTMs, FDT Servers or FDT Desktop applications, I think you will find that FDT 3.0 Common Components enable a compelling business case for the rapid and cost-effective engineering of FDT 3.0 enabled solutions. The scalability, secure remote access and the data rich environment that FDT 3.0 provides drives the realization of next generation automation solutions from which customers will benefit today.

# FDT 3.0 Style Guide: Empowering a Standardized and Responsive Web User Interface

Optimizing Mobile and Remote Operations in the New Era of Automation

Suriya Selvaraj, Vice President of Technology, FDT Group

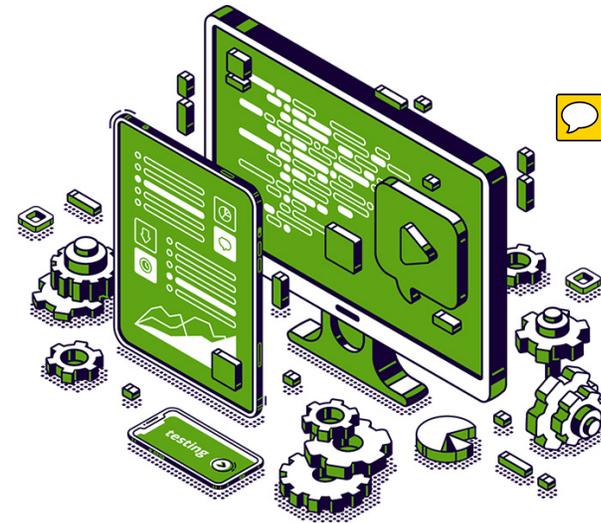


In the industrial automation sector, the Human-Machine Interface (HMI) for plant or factory operations must be optimized to ensure the best possible user experience. New HMI's must blend graphic design, human psychology and machine technology all while maintaining a uniform look and feel across all supplier solutions to execute effective asset management practices.

The User Interface (UI) design for measurement and control applications has critical importance within modern industrial operations, as it leverages operator behavior and machine communication together delivering the best “human-centric” user interface experience possible.

User interface design for today's web-based environment isn't just about buttons and menus; it's about the interaction between the user and the application or device, and in many cases, it involves the interaction between multiple users through that device.

Experience has shown that a well configured UI is key to ensuring an effective user experience (UX) with industrial automation systems.

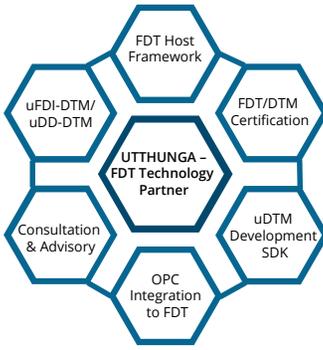


**Figure 1. Advancements of FDT® technology have helped to optimize HMI solutions for modern plant and factory operations.**

And the design of an optimized Web UI requires adherence to a Style Guide, which is a development tool that brings cohesion to a digital product's user interface experience. Style Guides employed for Web UIs focus on intuitive user interactions - ensuring that the interface has elements that are consistent, uniform, and easy to access and understand.



## Utthunga - Your Trusted Partner for all your Device Integration Needs!



### Utthunga's Device Integration Services

FDT/DTM device integration technologies enable consistent commissioning, configuration, and maintenance of field devices. In spite of having an overlap in their functionalities, vendors are recommended to invest in FDT/DTM technologies to achieve a wide range of interoperability to support various FDT/DD host systems.

As your FDT technology partner Utthunga's service portfolio covers comprehensive consulting, software development support for field devices and communication components and assist you with future maintenance requirements. Our robust and cost-effective in-house FDT/DTM conversion tool, **uFDI-DTM** and **uDD-DTM**, takes DDI Device Package as input and convert into FDT 1.2/2.0 Device DTM.

#### Our services include:

- FDT Consultation and Advisory
- FDT Interoperability service
- FDT 1.2/2.0 to FITS Migration
- FDT Host Framework Development
- FDT Host integration with OPC UA devices
- Automation Test Framework for FDT components
- FDT/DTM Development and Certification
- FITS based mobile app Development
- Asset Health Monitoring Application Development

At Utthunga, we understand the challenges that end users, control system manufacturers, and device manufacturers face and we offer thorough device integration services that cover all the aspects of device integration, configuration, and engineering.

For over 13 years, we have partnered in the digital transformation journeys of our customers to co-create products and services delivering clear ROI. For more details on our FDT solution visit our website [www.utthunga.com](http://www.utthunga.com) or email us [contact@utthunga.com](mailto:contact@utthunga.com).

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### FDT 3.0 Style Guide: Empowering a Standardized and Responsive Web User Interface

Recent advancements of FDT® technology have helped to optimize HMI solutions as part of new, innovative business models for automation suppliers. They are driving secure remote access, real-time remote operations and modernized asset management strategies for industrial end users around the world.

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### Understanding the FDT 3.0 Standard

FDT Group, founded by a group of

automation manufacturers during the Third Industrial Revolution, developed FDT technology as an open, integration standards-based solution to fix interoperability issues for control system and device end users. The FDT standard has been defining UIs for industrial automation users since its creation, and today it is widely deployed as the industry's de-facto integration platform.

The newly launched FDT 3.0 standard builds off its solid foundational base and brings enhancements empowering an FDT Server with embedded OPC Unified Architecture (UA) and Web Servers. The standard supports digital transformation for manufacturers seeking an innovative technology that supports new business models by enabling an open, enterprise-wide, IIoT data-centric integration platform

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### FDT 3.0 Style Guide: Empowering a Standardized and Responsive Web User Interface

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offering built-in security and features to mobilize real-time remote operations.

For suppliers of industrial control products and solutions, implementation of the FDT 3.0 standard is the forward-looking strategy supporting the new era of automation. FDT technology has evolved to support the Industrial Internet of Things (IIoT) and Industry 4.0, including applications opening the door for standardized skid-to-cloud architectures while providing sensor-to-enterprise-wide integration.

The FDT IIoT Ecosystem consists of a platform agnostic FDT Server and FDT Device Type Manager™ (FDT/DTM™). Both components are essential to unlocking universal device integration and a data-centric platform to mobilize the industrial workforce with modern and diverse deployment options, including cloud, enterprise, edge, on-premise, and single-user desktop environments.

The FDT Server is a pivotal IIoT hub empowering the intelligent enterprise. This distributive, multi-user server solution employs a web services portal allowing access from authenticated mobile devices or any major browser along with an OPC UA Server for enterprise access to real-time plant floor data. Its rich features ensure any industrial communication protocol or vendor device can

be seamlessly integrated as part of smart manufacturing practices.

FDT 3.0 technology encompasses several essential classes of DTMs: Device DTMs, Universal DTMs, Interpreter DTMs, Communication DTMs, and Gateway DTMs. The DTMs within FDT 3.0 are essential for the visualization of smart devices across the enterprise. They contain the business logic software that defines online and offline parameters—device model and bus mapping for each automation device. FDT/DTMs encapsulate all device-specific data, functions and business rules. These standardized “drivers” are enabled with a customizable web UI employing HTML 5.0 and JavaScript focused on displaying a graphical representation of parameterization, diagnostic and prognostics across mobile devices and browsers. Although the DTMs’ appearance and functionality are engineered by the device vendor, they conform to the FDT standard to provide a common structure across all manufacturers.

#### **New Style Guide Optimizes DTM Visualization**

The FDT user interface is tried and proven for efficiency due to its ease of use. Recent technology developments have enhanced its overall UX with a standardized Web UI, which optimizes visualization of DTMs and enables the implementation of robust remote monitoring and control solutions within industrial plants and factories.

## Mobilizing Real-time Remote Operations

FDT is a technology on the move. Now, with FDT 3.0 the standard is a completely platform-independent, single-server, cloud-based solution. Imagine an embedded Web Server mobilizing field device management — even with browser access. And an OPC UA server natively integrated for enterprise access to real-time device data from higher-level systems.

Bottom-line — FDT mobility expands secure access to critical device data increasing productivity and creating a safer workplace.

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



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### FDT 3.0 Style Guide: Empowering a Standardized and Responsive Web User Interface

The new generation of FDT DTM-based Web UIs combine the best features of traditional HMI solutions with the utilization of modern open-source hardware, software, and networking technologies to address long-standing developer issues related to proprietary hardware and software, and maintainability. These Web UIs allow developers to implement state-of-the-art functionality such as touch-capable virtual keyboards, touchpads and mouse-and-keyboard solutions. In addition, a set of frameworks to integrate dynamic variables employing modern HTML technology allows for less writing of code and more functionality.

The FDT 3.0 IIoT Ecosystem development environment, known as FDT Common Components, simplifies the journey to innovative IIoT and

I4.0 solutions by enabling automation system and device suppliers to take a well-established standard and create customized, data-centric, cross-platform FDT solutions. This ecosystem includes an updated FDT 3.0 Style Guide empowering a standardized, responsive-by-design web user interface for new solutions developed by the supplier community. No other standard offers a more comprehensive, template-based approach for the industrial UI.

FDT Group is the first industrial standards organization to require Style Guide compliance for automation developers as part of its product certification process. It is also the first organization in the automation market to include responsive technology features in its style document. Style guide and DTM compliance go hand-in-

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### FDT 3.0 Style Guide: Empowering a Standardized and Responsive Web User Interface



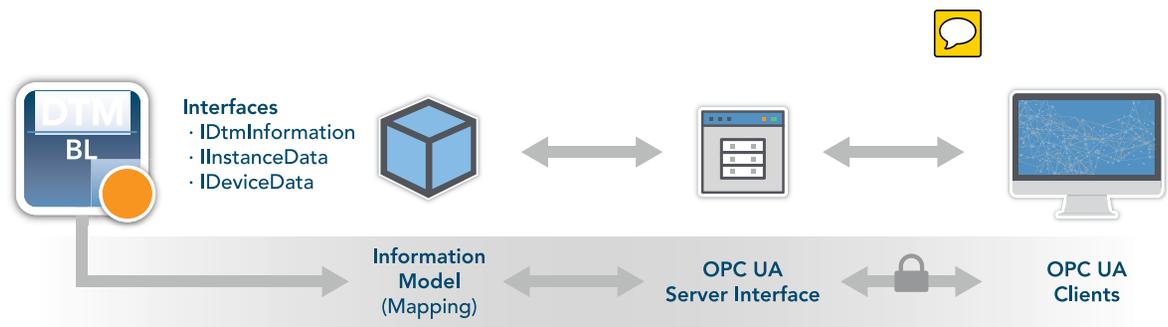
hand with FDT 3.0.

With the FDT 3.0 standard and its updated Style Guide, the approach to the DTM interface includes a completely uniform, responsive design focused on mobilizing secure remote access independent of the device, system, browser, phone, operating system, etc. The Style Guide describes elements of the automation interface in the HTML5 JavaScript world, so it is based on a state-of-the-art approach. The FDT 3.0 Web UI is suited to a new generation of workers who are digital natives and expect to use web-oriented technologies.

With FDT's approach, a device vendor can support simple to complex devices with custom parameters to meet the engineering needs of their customer base. The vendor has complete control of parameterization while the Style Guide provides the consistent and uniformed approach to represent relevant data at a glance. There is the same user experience, no matter the DTM.

Benedikt Spielmann, marketing manager for industrial communications, Endress + Hauser, has been closely involved with Style Guide updates as part of the FDT 3.0 standard development

effort. He said, "The goal of our FDT working group was to create a Style Guide that helps users of FDT-enabled systems do their jobs



**Figure 2. The FDT/DTM Web User Interface.**

more efficiently with a modern graphical user interface. We wanted to ensure a uniform UI with the same look and feel, presenting information in a consistent fashion across different vendors, devices and applications. This is especially important with new mobile solutions being deployed in industrial facilities.

# FieldCare SFE500

## Universal Device Configuration

- Access field devices of all protocols and vendors using DTMs and DDs
- Touch enhanced GUI for tablet use
- Supports 21 languages and Windows10
- Monitor asset health or connect to Life Cycle Management system

[www.endress.com/fieldcare](http://www.endress.com/fieldcare)



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### FDT 3.0 Style Guide: Empowering a Standardized and Responsive Web User Interface

“From a vendor perspective, the new Style Guide drives digitalization while helping to reduce development effort and maintain interoperability. It establishes a graphical format for creating a standardized interface for DTMs that is already embedded and accepted in the industry. This, in turn, results in greater acceptance among end customers.”

Spielmann added, “The new FDT standard makes full use of HTML5 technology and offers true platform independence. This approach offers many more opportunities for DTM developers to implement the best possible UI, and thus provide the best available user experience to their customers. By supporting responsive designs, the updated Style Guide helps developers maintain an optimal viewing experience across all screen

formats on mobile devices, whether it be tablets, cell phones or remote PCs.”

Style Guide conformance is required for a standardized/uniform approach for FDT 3.0 DTMs—all major navigation and information points are presented in the same fashion, no matter the manufacturer, device or device type. Additionally, all FDT 3.0-compliant DTMs show NAMUR NE 107 status symbol recommendations for improved predictive maintenance, diagnosis and issue resolution. FDT provides a single interface with the same look and feel, which is responsive by design to create the best UX for interfacing with each device. Its Web UI is streamlined and efficient for asset management and optimized maintenance strategies.

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### FDT 3.0 Style Guide: Empowering a Standardized and Responsive Web User Interface

#### Delivering Benefits for Developers and End Users

Ultimately, the new FDT 3.0 Style Guide gives DTM developers a templated way of utilizing responsive designs in their products to meet market criteria for the new era of automation. End users benefit from greater consistency in terms of device navigation, as well as a uniform graphical user interface providing intuitive interactions for effective day-to-day monitoring activities.

Automation suppliers can obtain the updated FDT 3.0 Style Guide and other development tools directly from FDT Group and access the necessary licenses and specifications for their development initiatives. Specification licenses are mandatory for FDT 3.0 development (FDT Group members receive significant discounts on these items). Additionally, all DTMs are certified under the new FDT 3.0 standard requirements. They are the driving force for the standardized IIoT ecosystem for sensor-to-cloud and enterprise-wide interoperability.

For more information, please visit [www.fdtgroup.org](http://www.fdtgroup.org).

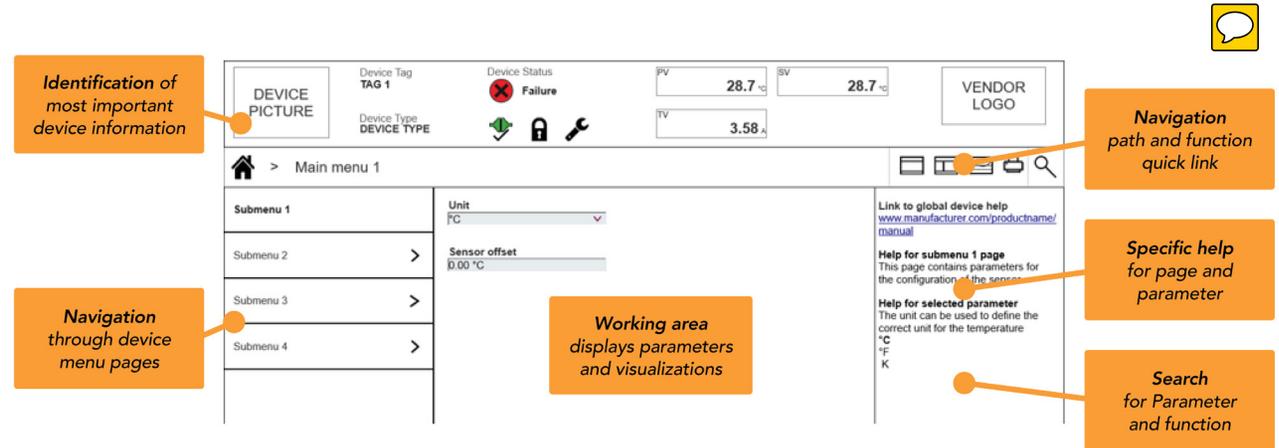


Figure 3. DTM Layout Overview.



Figure 4. New FDT 3.0 DTMs employ a responsive design approach for use with all types of mobile devices.

# Reduce DCS System Complexity with a Modern I/O Solution

Plant-wide approach that scales from skids to large operations

Frank Schirra – Architect, Strategic Process Solutions  
Rockwell Automation

Plant operation teams want a simplified approach to their control system strategy that enables productivity gains in all areas of the plant. Traditional systems limit the scope and available support of their products which results in higher overall costs. What is needed is a plant-wide approach that scales from skids to large operations that is easy to support while providing actionable information to all parties. With **PlantPax®**, **distributed control system**, Rockwell Automation offers a gateway DTM for **FLEX 5000™ HART enabled I/O Modules** that enhances process instrument management capabilities.

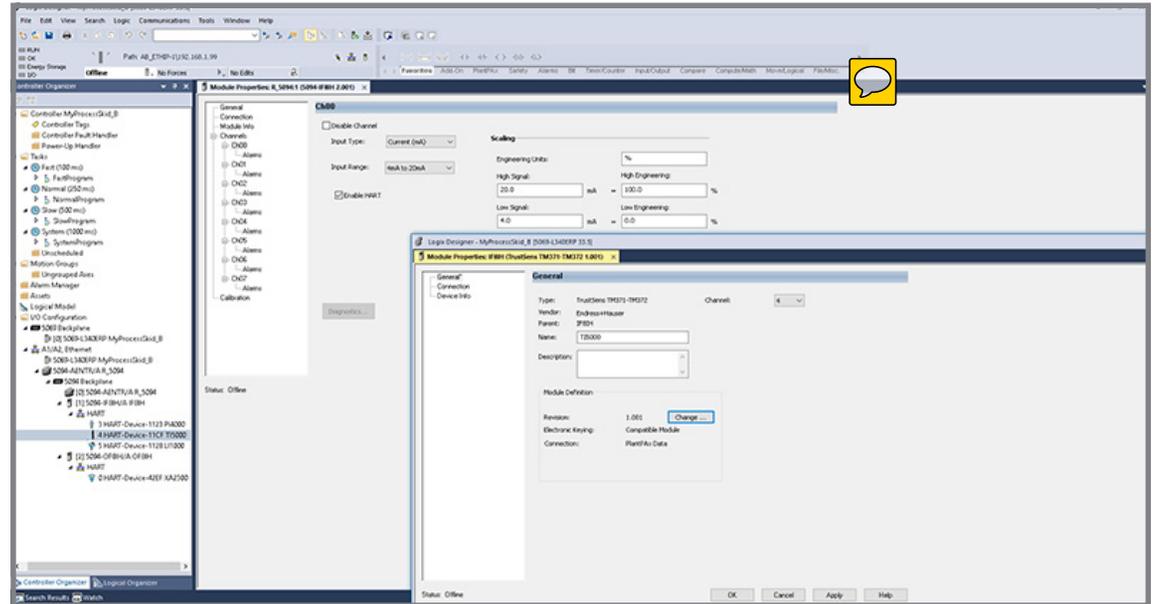


Figure 1: FLEX 5000™ HART Premier Integration within Studio 5000

multiple network architectures and topologies. To help reduce downtime and get your plant up and running quicker than before, easy access to additional process diagnostics is achieved with HART Premier Integration in Studio 5000 Logix Designer® software. Furthermore, features like auto discovery of HART devices and PlantPax DCS predefined HART data types are available to simplify workflows and reduce engineering time



# WE WILL GET YOU READY FOR IIoT & INDUSTRY 4.0

Innovative Software Solutions from Sensors to the Cloud



www.mm-software.com

## Continued

### Reduce DCS System Complexity with a Modern I/O Solution

The following FLEX 5000™ HART modules are available:

- 5094-IF8IH - Analog 8 input isolated HART
- 5094-OF8IH - Analog 8 output isolated HART
- 5094-IF8IHXT - Analog 8 input isolated HART (Extreme environment)
- 5094-OF8IHXT - Analog 8 output

isolated HART (Extreme environment)



[View a complete list of Flex 5000 I/O modules.](#)

Engineers and maintenance technicians can now use the new FLEX 5000™ HART Channel DTM together with the FactoryTalk® Linx™

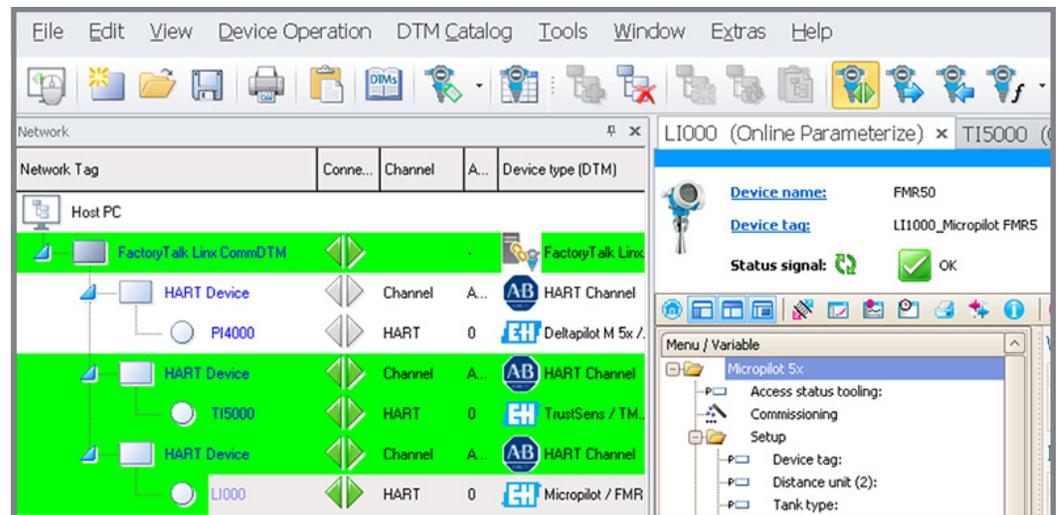


Figure 2: HART Channel DTM within the FDT FRAME application Endress+Hauser FieldCare SFE500

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### FDT 3.0 Style Guide: Empowering a Standardized and Responsive Web User Interface

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CommDTM to connect remotely to various sub-networks across any facility size. The Gateway DTM allows you to connect all eight channels on a 5094 HART input or output module and supports auto discovery as well. Together with an FDT compatible FRAME application like Endress+Hauser FieldCare you have full access to commission, maintain or monitor the NAMUR NE107 health status of your process instrument. This not only improves transparency, but also reduces maintenance costs while increasing plant availability.

Simplify your control system strategy with a plant-wide approach and enable productivity gains in all areas of the plant. A modern DCS will enable enhanced process instrument management capabilities with [FLEX 5000™ HART enabled I/O Modules](#).

To download the latest FactoryTalk Linx CommDTM or the latest HART I/O Gateway and Channel DTMs, please visit our [Product Compatibility and Download Center](#) (PCDC) click on “Find downloads” and search for “DTM”.

# Join the FDT Group

FDT is the disruptive technology for modern industrial operations, it is a key enabler of the Fourth Industrial Revolution empowering the intelligent enterprise with innovative business models supporting the Internet of Things (IIoT) and Industrie 4.0 applications.

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)



## FDT Group Members



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

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