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FDT® GROUP

Real-Time Data

Unified Environment for Intelligent Device Management

Renewed Energy and Product Use Cases Drive Industry Excitement for FDT UE

Open, interoperability standard is simplifying the IIoT migration path for vendors and end users

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This year proved to be different and exciting delivering a productive and pivotal outcome for FDT Group with renewed energy around the FDT standard, partnership opportunities, and the return to in-person tradeshows and meetings with end users, system and device vendors, along with our leadership, technical, and marketing teams.

For the first time since the release of FDT UE, version 3.0 (June of 2020), we were able to demonstrate that FDT (IEC 62453) is truly the only open device and lifecycle management standard that supports all industrial communication protocols/networks and device datatypes, providing a unified environment to configure, operate and monitor intelligent field devices with IT/OT data-driven operations in process, hybrid and discrete applications.

Some standards focus only on 'their networks' and 'their data types' in 'their single application'. FDT has a user-driven focus — to empower the intelligent enterprise through open, scalable, and adaptable engineering applications with all intelligent device solutions. FDT opens the architecture to integrate any protocol and device datatype supporting data consistency and transparency initiatives field to cloud. Moreover, FDT offers system and device vendors value-add to differentiate their products to remain competitive without visualization limitations.

Our partnership opportunity within the OPC Foundation booth at Hannover, ACHEMA, and SPS provided excellent industry visibility to modern webUI-based DTMs and the FDT Server (also an OPC UA server and Web server) hosting environment transporting OT data consistency to IT applications enabling service-oriented device management, maintenance, and data analytic business models. Part of the innovation is the DTM (Device Type Manager). This flexible enabling part of the standard empowers protocol tunneling using Communication DTMs, and Interpreter DTMs supporting all datatypes giving users the freedom to choose the right devices for their applications. Device manufacturers can provide their data model of choice for their devices, and because the FDT standard is 'open', users aren't locked in. No matter the device datatype (EDS, IODD, GSD, DD, EDD, FDI Package, and of course native DTM's), users still benefit from a unified environment to configure, operate, and maintain all connected devices.

Vendors can jump-start development for FDT-based engineering applications and intelligent device DTM solutions based on open specifications and **common component tool** sets (that auto-enable OPC UA) — they are a reality today. End users looking to deploy FDT-based architectures to support their installed base while scaling their IIoT application can ask their vendors to support FDT UE in their specification requirements during the bidding process.

This pivotal year has brought a new level of industry excitement to the open, interoperability standard simplifying the IIoT migration path for vendors and end users alike. As a result, many FDT UE products and use cases are coming to light and we look forward to announcing some of them soon.

EMPOWERING THE INTELLIGENT ENTERPRISE

Modern Intelligent Device Management with IT/OT Data-driven Operations

Align your IIoT migration path - traditional FDT use cases natively support IIoT applications improving reliability with real-time production visibility.

Industrial Internet of Things (IIoT) connectivity dominates the industrial automation workplace, enabling modern ways to manage, monitor and maintain intelligent devices, networks and processes with diagnostic rich information.

As you look to the future, is your migration path aligned with the need for actionable data with accessibility across the enterprise?

Looking at next-generation system environments, it's important to preserve your current install-base and future-proof the application. This approach allows you to integrate newer, smarter instrumentation and support new service-oriented maintenance business models for both IT and OT operations improving reliability with real-time production visibility.

Traditional FDT Use Cases Form Foundation

Industry-driven feedback has been the basis for the growth of FDT technology since the release FDT version 1.2 (in 2001) that introduced the original software-based FDT Desktop (FDT/FRAME) configuration environment and DTM (smart device driver). The solution provides end users with a standardized device management environment in an industrial control system. The solution helps solve use cases focused on managing the entire product lifecycle of all connected assets — configuration, commissioning, monitoring, diagnosis, parameterization, replacement in one common environment enabling an effective asset management strategy.

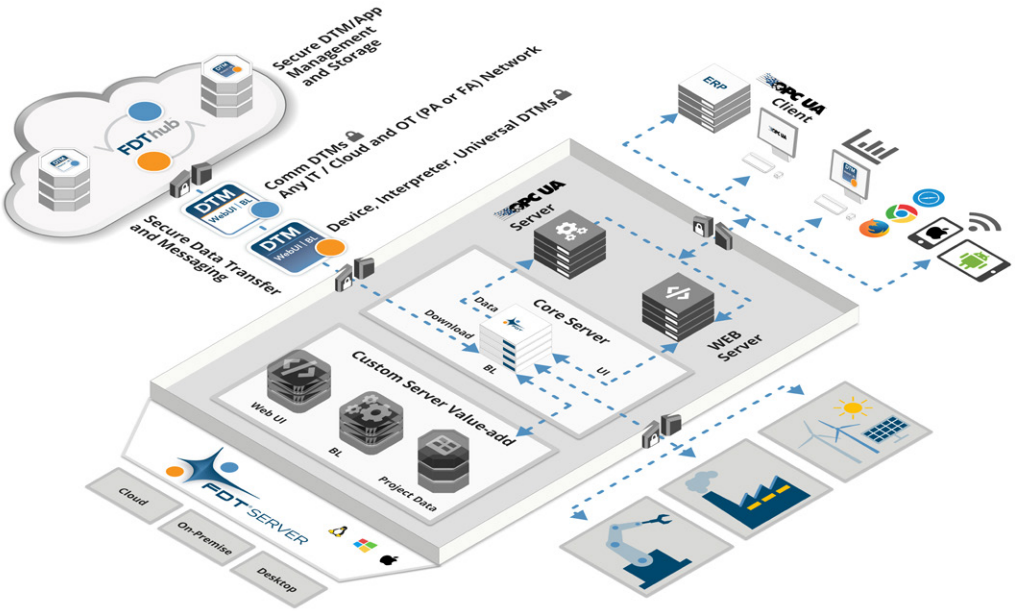
From the earliest days, FDT's focus delivering 'data consistency' provides users with uniform intelligent device diagnostic insights for alerts, status information (NE107), device-specific performance and process information. Using Comm DTMs to standardize the communication channel to the operations of the mapped IT/OT network or protocol, FDT offers end to end data transparency independent of the topology of protocols (nested communications) all the way to the field-level to any vendors device/type/representation (DD, EDD, FDI, DTM, IODD, ESD, GSD, etc.) in process, hybrid and discrete applications.

FDT's open, scalable and adaptable architecture simplifies device management and maximizes operator productivity by providing a unified way to integrate and work with all connected devices for easier training and handling of all assets in different situations — in the vendor tool, in the system environment, and in the service tool. It also consistently stores the data of all devices streamlining device management.

What A Modern FDT Unified Environment Can Do For IT and OT Teams

The latest version of the standard, FDT Unified Environment (FDT UE), based on FDT3, has evolved to a distributed FDT Server (also an OPC UA server and web server) solution that delivers OT data consistency to IT applications supporting service-oriented device management, maintenance and data analytic business models.

Deployable in the cloud, at the edge or on-premise, the new FDT Server supports traditional FDT intelligent device management use case business benefits in a modern browser-based interface environment. Additionally, the solution natively supports OPC UA unifying field-level data via information modeling, eliminating information silos allowing IT/OT data to reach decision-makers throughout the enterprise.



FDT Server Features:

- Software-based
- Field-to-Cloud
- Data-Centric
- Secure-by-Design
- Platform Independence
- Native OPC UA Server
- IT/OT Data Modeling
- Web Server – Mobility/Apps
- Universal Device Integration
- Service-Oriented Maintenance
- Common Component
- FDT*hub* – DTM Repository

Now, critical data is reachable via any authenticated FDT, OPC UA or mobile/app client. This opens the door to manufacturer service maintenance support.

The solution streamlines project engineering and gives users a complete data-centric asset management solution, with access to all advanced real-time diagnostic insights. This improves predictive maintenance strategies and reduces unplanned downtime.

With the new FDT Server architecture, expect new levels of achieving data consistency from your current install-base while scaling your IIoT application. Since device data is now centrally stored for the whole device lifecycle, from initial commissioning to dismantling, system operators or service employees can use the central server to execute device service operations via a mobile device so all changes to the device can be tracked in a central audit trail. These means that software updates on a DCS, PLC or other engineering applications are eliminated as the solution is web-based and accessible via thin clients.

IT/OT Data Access and Mobility

The IIoT provides remote access to connected machines and devices to enable transformative operational and process performance improvements. These improvements in plant reliability deliver value to the bottom line — and you can accomplish this with actionable information from intelligent devices that provide the analytics needed to avoid unscheduled shutdowns.

Getting there can require a culture shift to understand and use the diagnostic information from intelligent devices and a workforce ready to change from analog to digital practices. This shift can provide a competitive advantage as employees and decision-makers take advantage of information access, analytics and visualization throughout the enterprise. Real-time collaboration practices can help plants move forward with reliability improvements and even improve plant safety, quality and compliance.

Risk Avoidance

Plant and reliability improvements in operations and performance are driving the need to connect and use real-time information from installed intelligent assets. Leveraging existing assets — devices, systems and workforce — to become part of the IIoT can be a low-risk, high-return investment.

The key is to get the right information to the right people at the right time in actionable format so that information can be used to avoid potential problems. Big Data and IoT are made possible by retrieving information from intelligent devices, and now you have many options to integrate smart assets with smart solutions, including asset management, smart or configurable I/O and internet protocols.

Deploying an FDT data-centric integration environment future proofs your application with access to the aging infrastructure.

Next Steps

The IIoT offers endless productivity improvements in automation, operations information, and advanced analytics through smart devices and systems that link machines through open platforms and enable them to think, learn and react in real-time.

- Take inventory of your intelligent devices and talk with your device suppliers to get FDT Device Type Managers (DTMs).
- Check to see if your system is FDT-enabled. If it is, pick a device and test out a DTM to see what you are missing.
- Talk to your device supplier about an FDT solution if you are not yet FDT-enabled. There are single-user standalone configuration and device management software options like PACT*ware* (FDT Desktop solution) available for free. FDT is scalable and flexible with the option to integrate at your pace. PACT*ware* 6.1 offers complete backward compatibility to all DTM generations (FDT3, FDT2 and FDT1.2) and other device representations.

New to FDT?

FDT is a globally adopted standard (IEC 62453, ISA/ANSI 103 and GB-T 29618-2017) supported by all major system and device vendors in the industry who deploy FDT in their system and device offerings. FDT is known as the de facto integration standard with millions device DTMs deployed and serviced by FDT hosting environments (engineering application). Today, FDT users experience a true unified environment for intelligent device and lifecycle management to all connected assets and data-driven maintenance solutions.

Looking to simplify your IIoT migration path?

Contact your integrator, system or device suppliers and specify **FDT (3.0) UE (FDT Server and WebUI DTMs)**, for brownfield or greenfield applications that are migrating to IIoT architectures. New FDTUE-enabled IIoT architected applications benefit from modern intelligent device management, maintenance and service-oriented strategies. The standardized solution natively supports IT/OT data access, mobility/app and services capabilities that is scalable to deploy in the cloud, or on-premise.

Interested in an a FDT UE demo? Contact the FDT Group at **inquiry@fdtgroup.org** to schedule a demo today! We look forward to hearing from you.

USE CASE

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

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

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-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.

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.

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

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. 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.

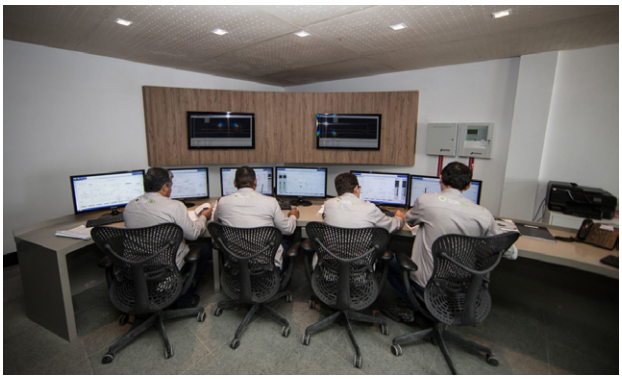


Figure 3: GranBio's control engineers sought the maximum integration and interoperability of field instruments with the plant DCS.

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

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.

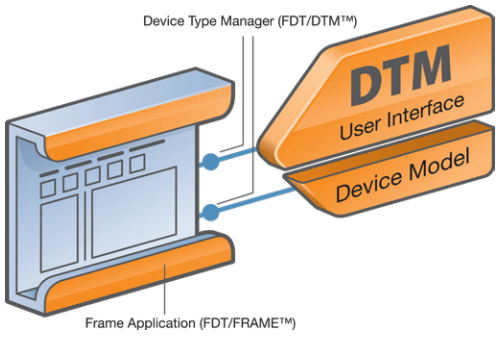


Figure 4: Within the FDT ecosystem, the FDT/FRAME can be embedded in standalone device management tools.

Within the FDT ecosystem, device manufacturers provide Device 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 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 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.

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

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 unique history record for use in auditing maintenance actions.

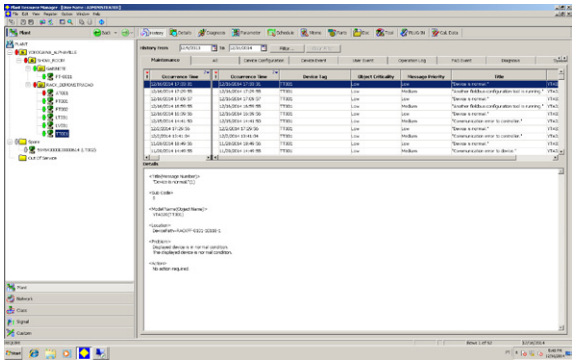


Figure 6: The PRM application performs asset management tasks and sends diagnostic information to the DCS.

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 critical maintenance and operating objectives have been met."

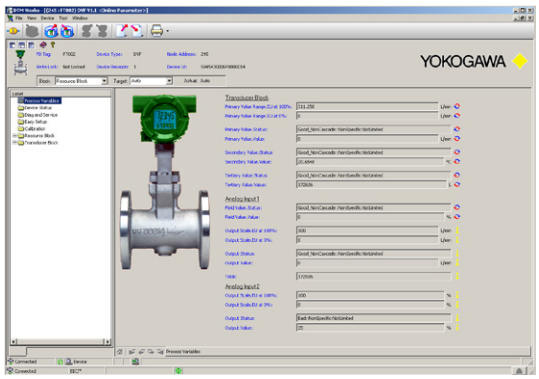


Figure 7: FDT/DTMs provide a powerful device configuration solution for plant personnel.

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 exposure 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.

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

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.

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.

case study

Altivar Soft Starter ATS480 Integrated Digitally for Easy Engineering, Selection and Downtime Reduction

THE SOLUTION PROVIDES OPERATIONAL INTEGRITY FOR PEOPLE, PROCESSES, AND ASSETS

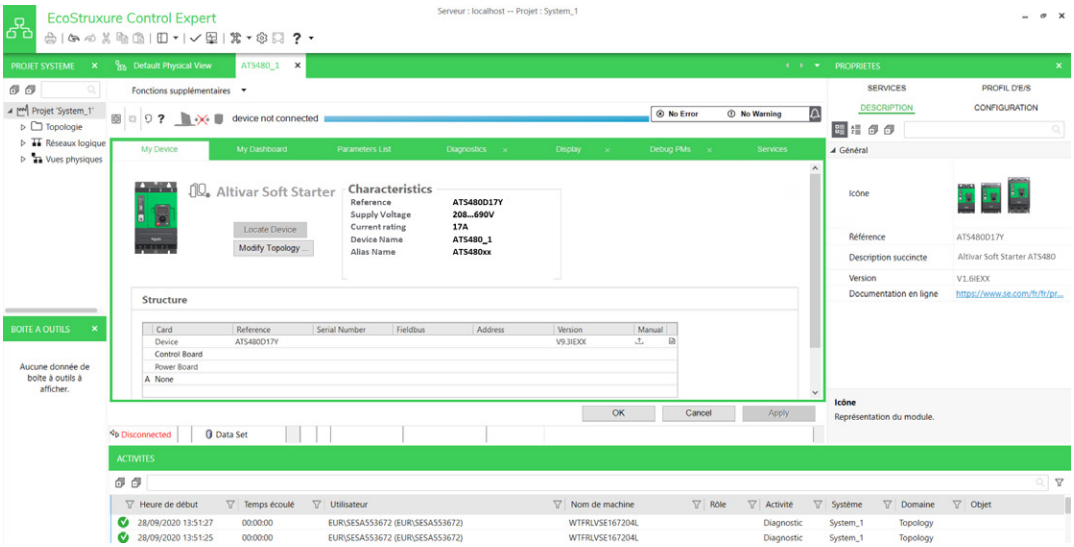
The new Altivar Soft Starter ATS480 is using FDT/DTM technology for intelligent device management (configure, control, diagnostics and maintenance) directly in EcoStruxure Control Expert, EcoStruxure Process Expert and SoMove software using the same software brick (DTM). FDT/DTM technology standardizes the communication interface between field devices and host systems. The DTM contains a uniform data structure for managing soft starter parameter access.

The Altivar™ Soft Starter ATS480, Soft starters for Process and Infrastructures from 4 to 900 kW, is the next evolution of soft starters that are digitally optimized to meet cyber security standards. Designed to address process infrastructures, ATS480 simplifies project execution and maximizes the availability of your applications, even in the most demanding environments.

With EcoStruxure tools (EcoStruxure Motor Control Configurator, EcoStruxure Motor Management Design, EcoStruxure Plant Builder, EcoStruxure Automation Device Maintenance, …), integrated automation system, and ATS480 Device Type Manager, process engineering time is drastically reduced from selection to project execution.

With ATS480 DTM, associated derived function block (DFB), and faceplate:

- Quickly write the PLC program in EcoStruxure Control Expert
- Integrate ready-to-use faceplate in AVEVA System Platform
- Adapt and modify parameters without stopping the installation
- Set, monitor, and diagnose from the engineering station
- DFB and faceplate available in General Purpose libraries



Altivar Soft Starter ATS480 DTM parameterization in EcoStruxure Control Expert

Advantages of the DTM library in EcoStruxure Control Expert:

- Single tool for configuration, setup, and diagnostics
- Network scan for automatic recognition of network configuration
- Ability to add/remove, copy/paste configuration files from other soft starters in the same architecture
- Single input point for all parameters shared between the ePAC (programmable controller) and the Altivar Soft Starter ATS480
- Creation of profiles for implicit communication with the ePAC as well as dedicated profiles for programs with DFBs (derived function blocks)
- Integration in the fieldbus topology
- Soft starter configuration is an integral part of the EcoStruxure Control Expert project file (STU) and the archive file (STA)

Ecostruxure Plant Integration

The association of Altivar Soft Starter ATS480 with Schneider Electric automation control systems like EcoStruxure Process Expert (for hybrid systems) offers a high-performance, global automation and motor control solution with optimized Total Cost of Ownership (TCO). The solution provides operational integrity for people, processes, and assets, with improved maintenance support to help reduce downtime ensuring operation continuity. It offers operational insight by accessing more information to optimize the process. Based on market standards (FDT/DTM, Ethernet, etc.), it is a sustainable, scalable solution that enables processes to be adapted easily and affordably. An integrated automation system powered by EcoStruxure offers the following benefits:

- More efficient projects
- Optimized operations

ATS480 DTM library

New Altivar Soft starter ATS480

Product selector for ATS480

Proline Promag W 0 x DN full bore – The world's first electromagnetic flowmeter for unrestricted measurements

- Measure reliably – independent of flow profile and mounting location
- The first and only electromagnetic flowmeter with no inlet and outlet runs (0 x DN) as well as no pipe restriction (full-bore design) and thus no pressure loss
- Installation directly after bends, perfect for space-restricted areas and on skids

Do you want to learn more?
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Endress+Hauser
People for Process Automation

case study

YOKOGAWA

Oprex™ Vortex Flowmeter VY Series and DTM Improves Reliability with Self-Diagnostics

Introduction

Yokogawa Electric Corporation provides the OprexTM Vortex Flowmeter VY Series with enhanced self-diagnosis and condition-based maintenance. Compare with other flowmeter types, vortex flowmeters can handle a wider range of fluid types, temperatures, and pressures. Yokogawa developed the world's first vortex flowmeter in 1969 and introduced the YEWFLO series of general-purpose flowmeters to the market in 1979. It has so far sold more than half a million units around the world.

Digitalization and Inheritance

This new series has been developed with the aim of supporting the implementation of digital transformation (DX) in large plants in the form of efficient and planned condition-based maintenance using FDT technology.

The sensing mechanism are fully compatible with previously released YEWFLO Series products. The vortex shedder bar has a robust and integrated design and is the only device in the industry to feature dual built-in flow sensors and a built-in temperature sensor. The integrated unit can be partially removed and reinstalled, making it easy to maintain or replace when necessary.

OpreX™ Vortex Flowmeter VY Series

VY Series DTM maximizes the digital performance

Utilizing readings from a built-in temperature sensor and data from pressure gauges and other external instruments, the Vortex Flowmeters VY Series can perform precise temperature and pressure-compensated calculations and energy calculations, eliminating the need for external calculation devices.

On the other hand, to use the instrument effectively, sophisticated settings are required for many parameters, which are generally difficult to handle on handheld terminals with limited information. VY series DTM using FDT technology can be operated on a PC screen, and parameters are arranged and displayed in a menu configuration with related parameters, providing an intuitive user experience, thereby maximizing the instrument's performance.

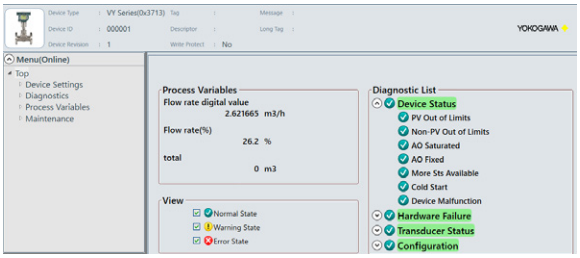

Fig.1 Screen of device status for VY Series DTM

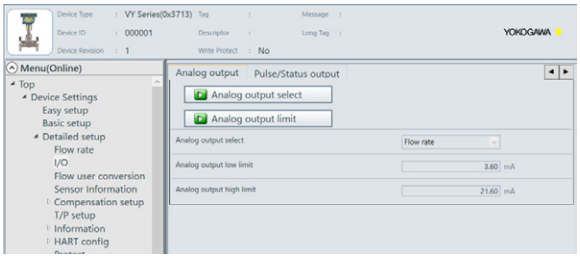

Fig.2 Screen of parameter setting for VY Series DTM

FSA130 Verification Tool based on FDT technology provides DX

The digitalization of internal signals is taken further in the VY Series, enabling self-diagnostics to cover all components, including the vortex shedder bar and sensor element. This improves reliability and qualifies these flowmeters for use in safety instrumented loops (compliant with SIL2). With the VY Series, it is also possible to track device integrity parameters and use this data to indicate when sensor capability is expected to deteriorate. Utilizing 'FSA130 Magnetic Flowmeter / Vortex Flowmeter Verification Tool' and 'FieldMate Versatile Device Management Wizard*', the integrity of VY Series flowmeters can be easily checked from a PC in a remote location such as an instrumentation room, eliminating the need to go on site to perform maintenance checks.

* PC based configuration tool that performs numerous tasks, including initial setup, daily maintenance, troubleshooting, and configuration backup for device replacement

Fig. 3 shows the results of the device verification execution. The Verification Tool helps users to perform device verification in a wizard format without being aware of complicated parameter settings and displays a summary of the results. The tool also supports report (PDF file format) output, helping to improve the efficiency of daily maintenance operations.

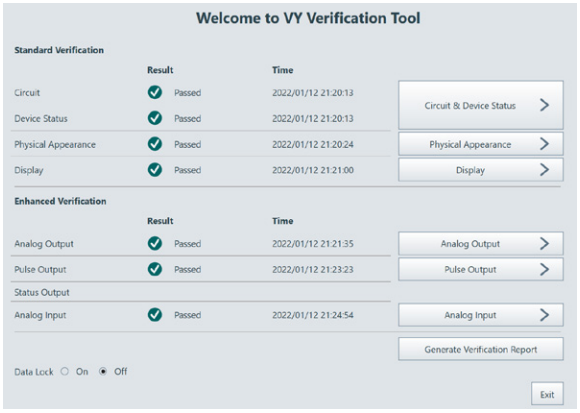

Fig.3 FSA130 verification results screen for all function blocks for VY Series

Fig. 4 shows the waveform monitoring screen, a function of the FSA130. It displays the flow sensor signal waveform used to calculate the flow rate of the device (Upper waveform [Blue line]: Vortex signal after device computing, Lower waveform [Red line]: Pulsed signal waveform of vortex signal). The stability of the device output can be visually confirmed.

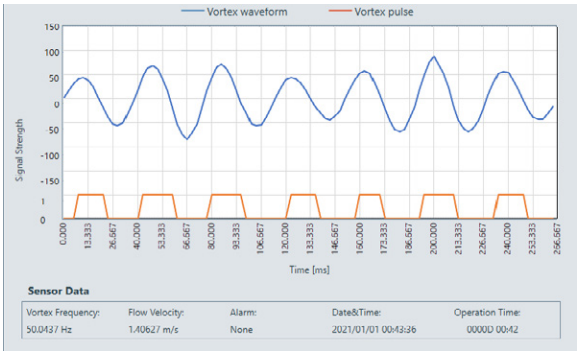

Fig.4 Screen of waveform monitoring for FSA130

Fig. 5 shows the vortex sensor prediction screen results. During long-term operation of a vortex flowmeter, the characteristics change due to the aging of the sensor element and the effects of fluid deposits on the shedder bar. These changes are accumulated within the instrument and graphically displayed as predicted future values. This function helps the user to know when it is time to maintain the vortex flowmeter or perform other maintenance, thus supporting condition-based maintenance activities.

Fig.5 Screen of Vortex Sensor Prediction for FSA130

System configuration

Figure. 6 shows an example of the system configuration. VY Series FDT 2.0 DTM is included in the Device Files that are bundled with the FieldMate software installed on PC. FSA130 Verification Tool runs on the VY Series FDT2.0 DTM. Other external measuring instruments can be used to check/record the health of the VY Series more accurately.

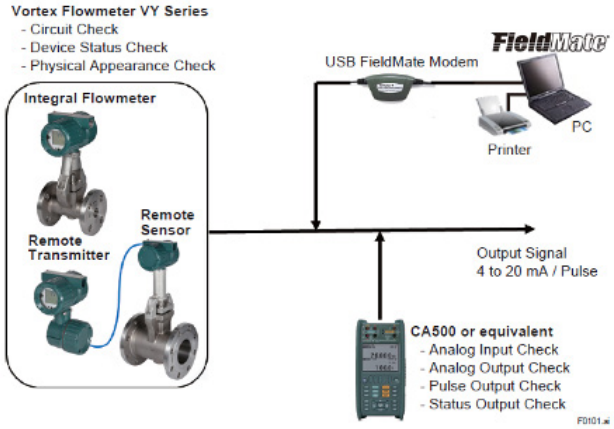

Fig. 6 System configuration

Conclusion

The VY series is based on Yokogawa's long-history of achievement incorporates the latest digital technologies such as condition monitoring and energy compensation functions, resulting in a highly reliable and easy-to-use product. Furthermore, FDT technology helps the VY series to maximize its capabilities for any customer. Together with these technologies, we will realize and develop the functions required by our customers.

case study

Endress+Hauser
People for Process Automation

Remote instrument verification: Check the pulse of your assets everywhere

REMOTE HEARTBEAT VERIFICATION GIVES YOU MORE FLEXIBILITY TO CHECK THE FUNCTION OF YOUR ASSETS IN A MORE MODERN AND EFFICIENT WAY

To minimize process interruption times, Endress+Hauser developed Heartbeat Technology several years ago. Heartbeat Verification uses the self-monitoring capabilities of a field device to verify the meter functionality. This means that the components of the meter are verified to meet factory specifications. If a device passes a Heartbeat Verification, then it is very likely to perform as expected. That's why such a device would, with a very high degree of probability, also be calibrated successfully.

Numerous customers benefit from Heartbeat Verification in more than one way — by optimizing the calibration process and even prolonging calibration intervals. The solution now manages Heartbeat Verifications remotely in our IIoT ecosystem Netilion. This means that — wherever you are — you can trigger instrument verifications remotely.

Remote Heartbeat Verification gives you more flexibility to check the function of your assets in a more modern and efficient way, saving time and costs for carrying out verifications or calibrations the conventional way. And on top of that, you also ensure compliance with the rules defined in your industry while reducing safety risks — triggering device verification does not require entering hazardous areas.

Learn more about Heartbeat Verification

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