

Advanced field device integration using FDT

Group

FDT

WIB-workshop, Utrecht 2006

Introduction, contents

- Requirements on fieldbus device integration into DCS
- Basic device integration
- Advanced device integration using FDT
- FDT future developments
- FDT Group develops, maintains and markets FDT technology

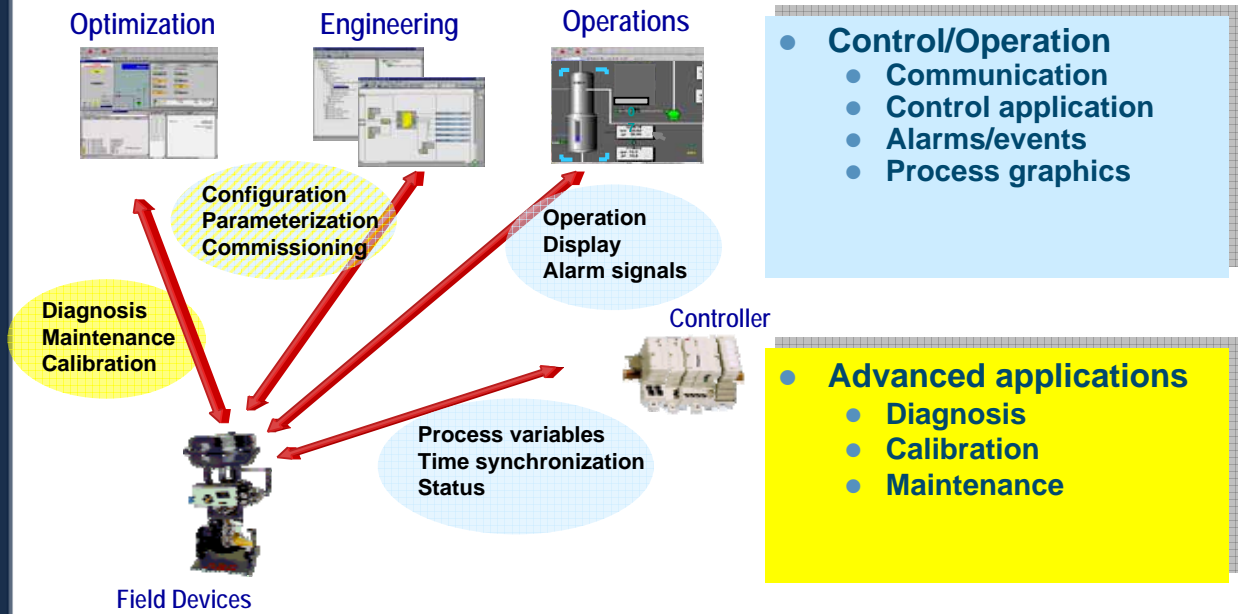
CAPITAL EXPENSE REDUCTIONS

- Lower wiring costs and elimination of marshalling panels
- Faster device commissioning & lower startup costs

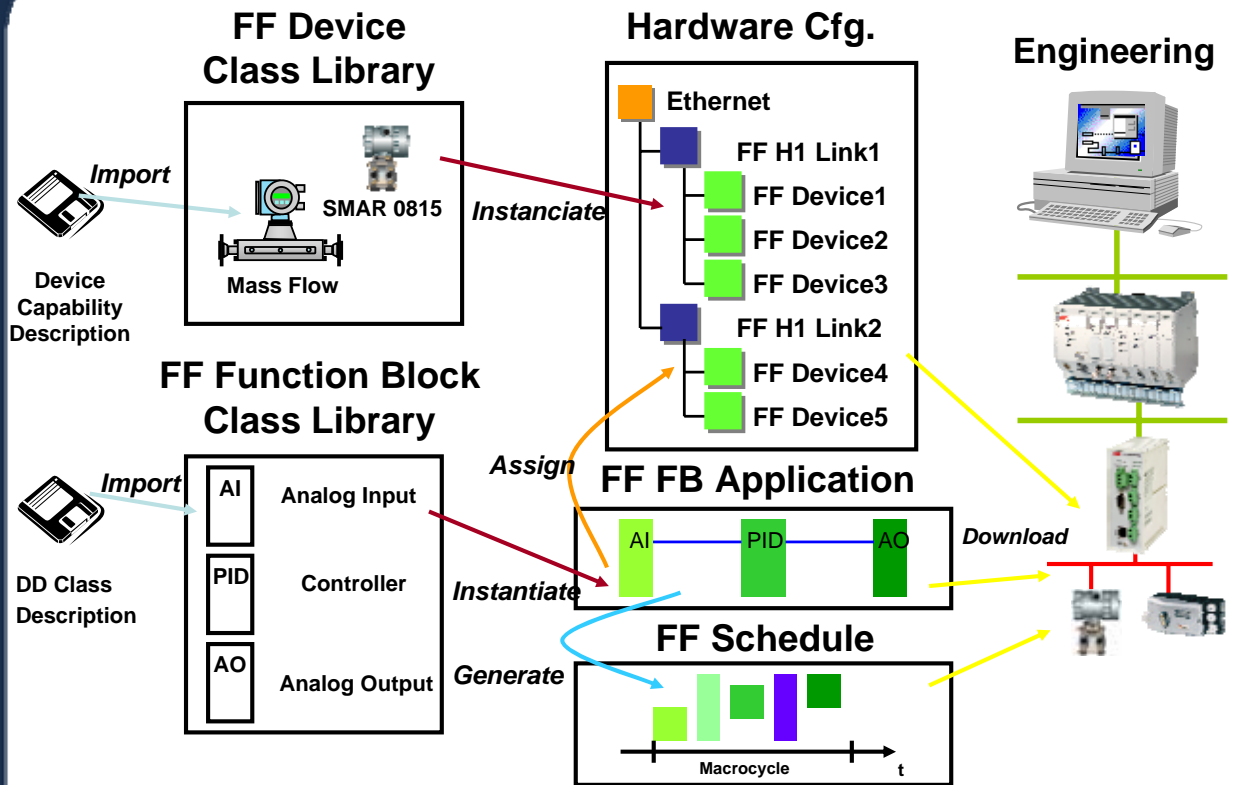
OPERATIONAL EXPENSE REDUCTIONS

- Improve efficiency of maintenance staff
- Lower instrument and valve maintenance costs
- Lower number of no action taken instrument calls
- Adopt predictive maintenance practices
- Raise process availability – through better device diagnostics, improved device uptime, reductions in unplanned shutdowns

- The whole range of devices is available with fieldbus
- Diagnostic and optimization for sophisticated devices, e.g. valve positioners, are the domain of the device vendor
- New devices have significant internal diagnostic code, but each vendor and device does it differently
- Advanced diagnostics need correspondingly advanced host user interfaces
- Using standards device vendors create the host user interfaces that will plug into any host

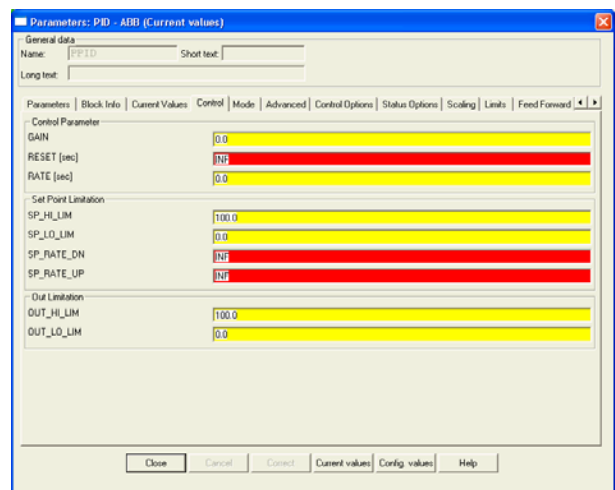
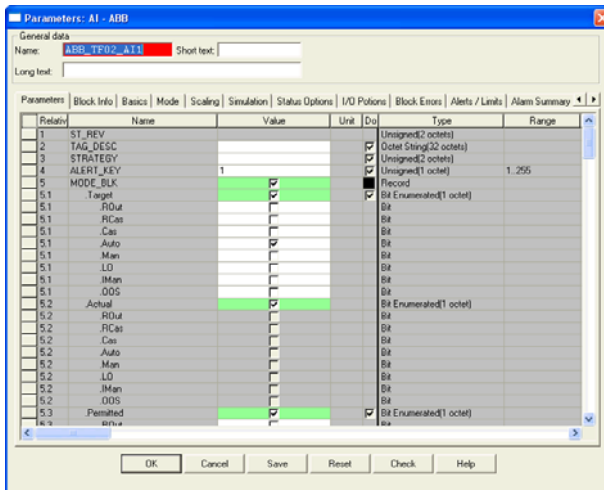


- Requirements on fieldbus device integration into DCS
- **Basic device integration**
- Advanced device integration using FDT
- FDT future developments
- FDT Group develops, maintains and markets FDT technology



List view

Tab cards with structured parameters

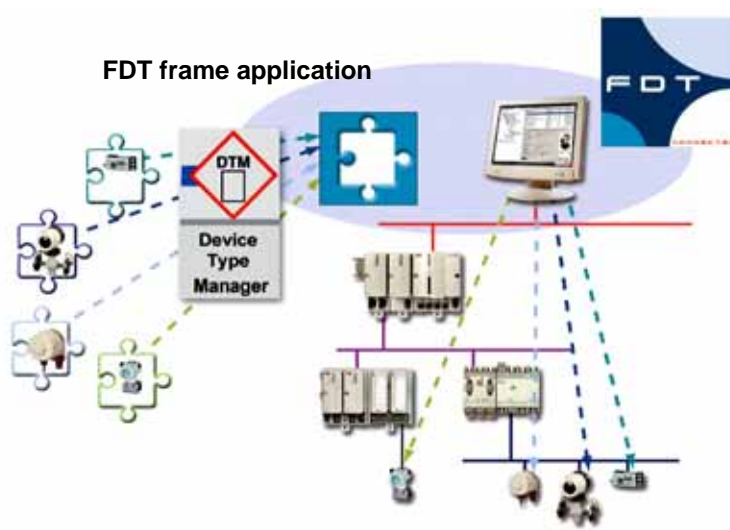


- Requirements on fieldbus device integration into DCS
- Basic device integration
- **Advanced device integration using FDT**
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- **Advanced device applications are needed for several device types, e. g.**
 - Positioner/valve diagnostics
 - Multivariable transmitter, coefficient calculation for flow measurement
 - Radar level transmitter calibration
 - Motor Controllers and Drives
 - Analytical Devices
 - Switchgears (Electrical Equipment)
 - Linking Devices or Proxys
- **Device vendors want to enhance their devices with further additional functions and graphical user interfaces**

Users will benefit from it
- **Besides field instruments, devices like motor controllers or drives offer sophisticated functionality as well**
- **Proprietary tools used today to handle the advanced device applications are not well accepted**

FDT specifies an interface that allows integration of device specific software applications into control systems and asset management tools



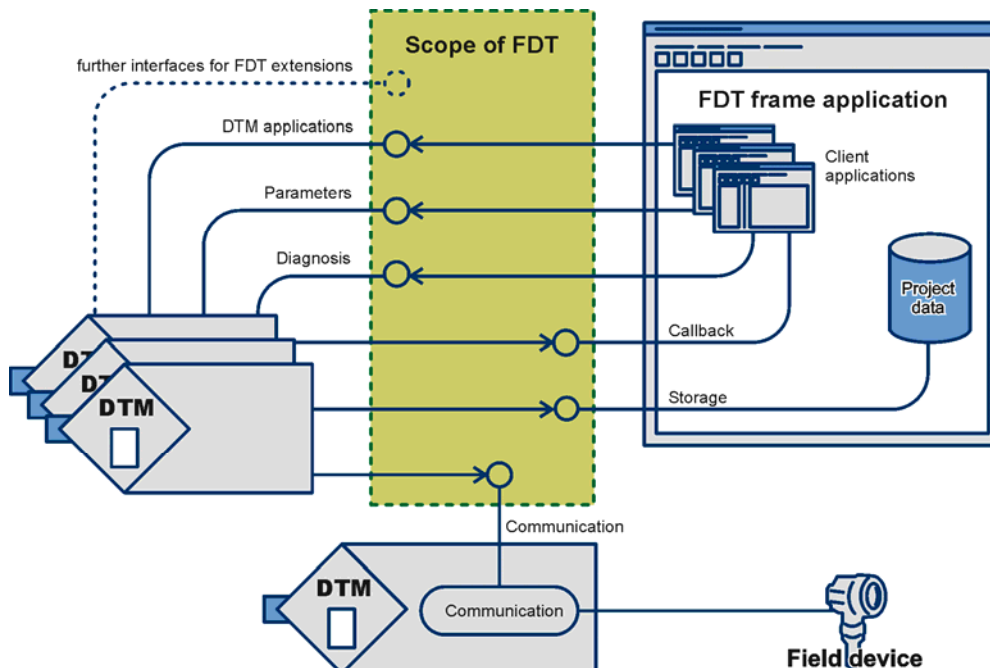
- FDT is open and vendor independent
- FDT enables using advanced device diagnosis functionality
- FDT enables device specific state of the art graphical user interface
- FDT enables freedom of choice, no proprietary tools required

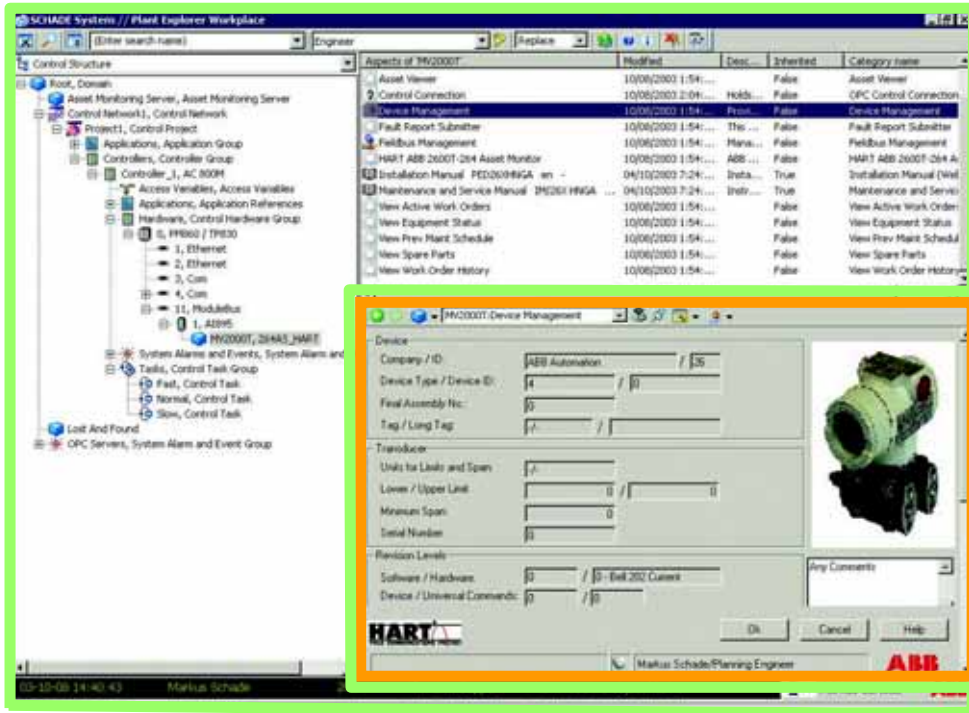
DTM

- Device Type Manager
- Represents the device
- Supplied by device vendor

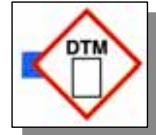
Frame Application

- Launches the DTM
- Supplied as part of host system
- Manages the device instances



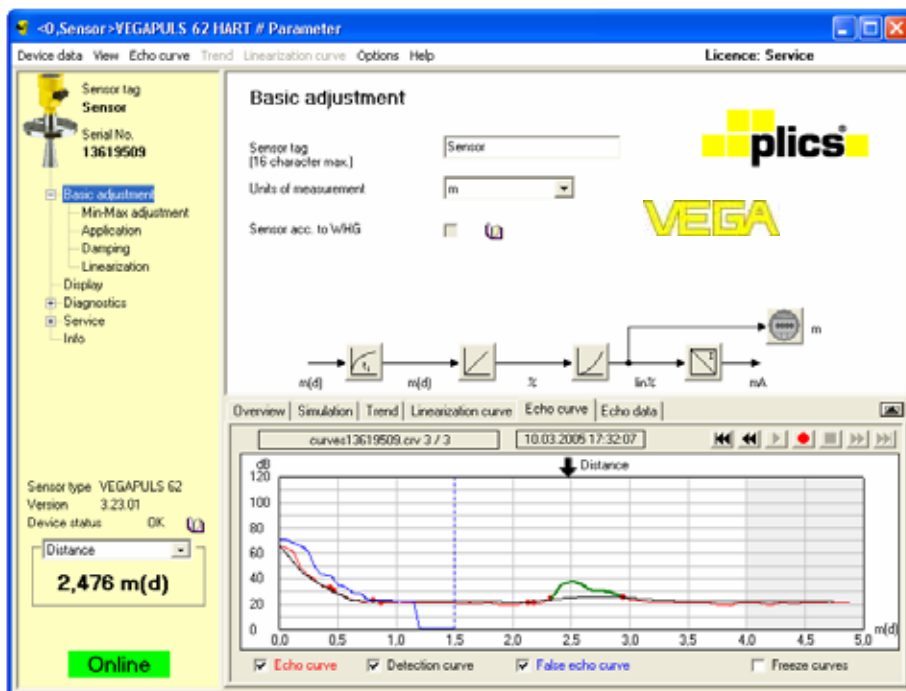


Frame Application

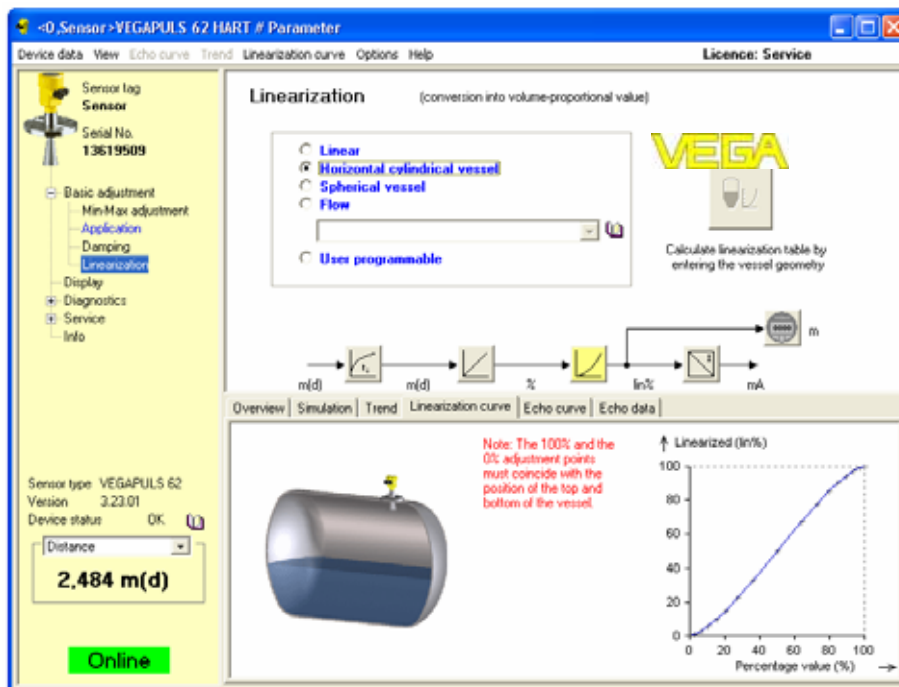


DTM

- DTM used for device calibration

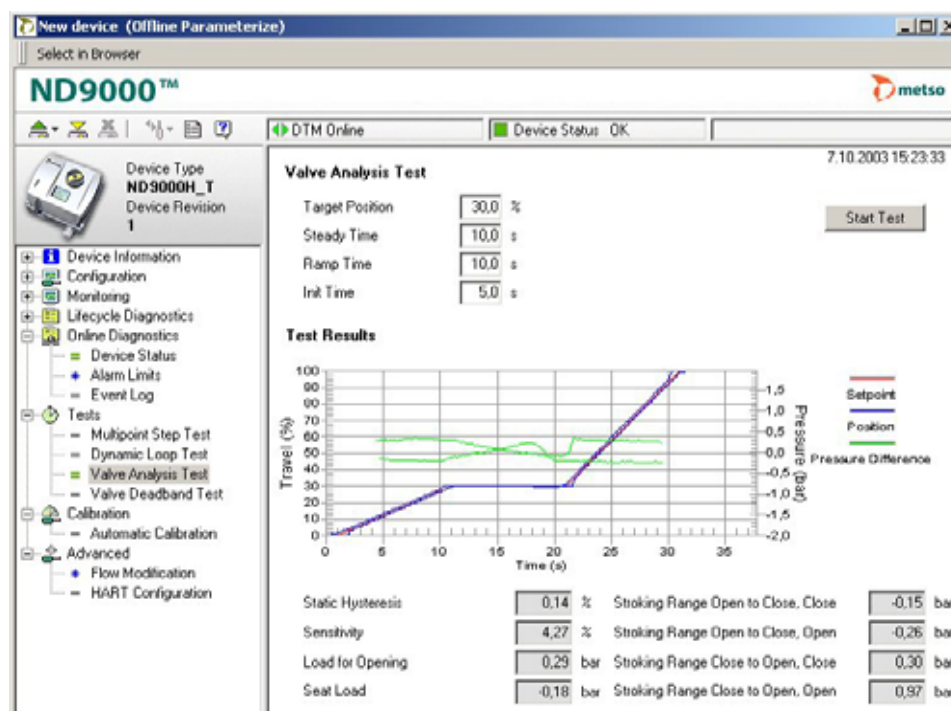


- DTM used for linearization



Group Example 2.1: Valve positioner

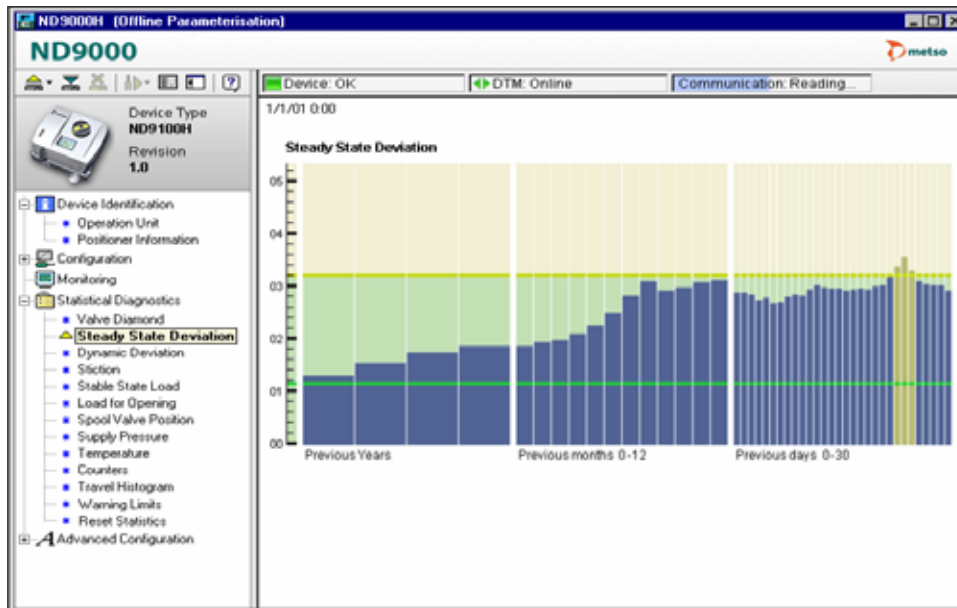
- DTM enables advanced valve diagnostics



Group Example 2.2: Valve positioner

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- Control valve diagnostics enables better decisions for shut down planning



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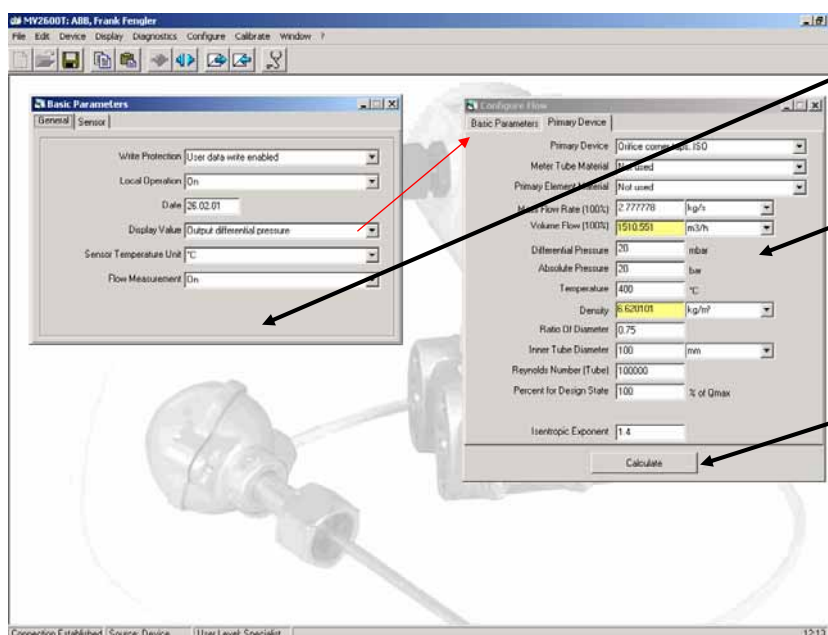
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Group Example 3: Multivariable Transmitter

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- DTM used to calculate coefficients for dp flow transmitter



- Switch Flow Measurement "On"
- The calculation values of the Primary Device entered here are the basis for the flow calculation
- Calculate and you get special parameters as result.
- Download parameters in device.

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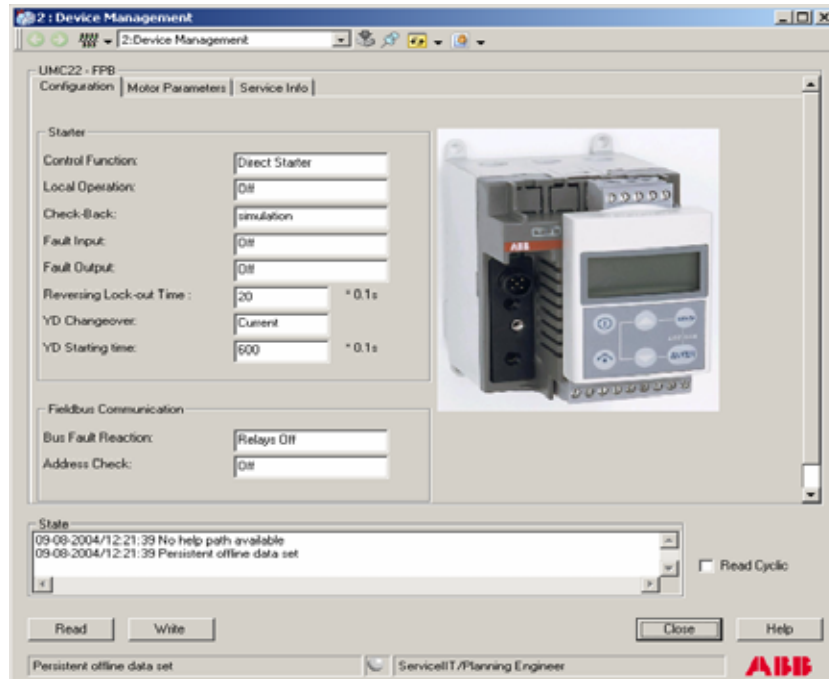
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Group Example 4: Universal Motor Controller

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- DTM used to configure motor controller and display diagnostic information



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Group Example 5: Communication Components

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- DTM used to analyze the quality of wiring after installation and during the life cycle

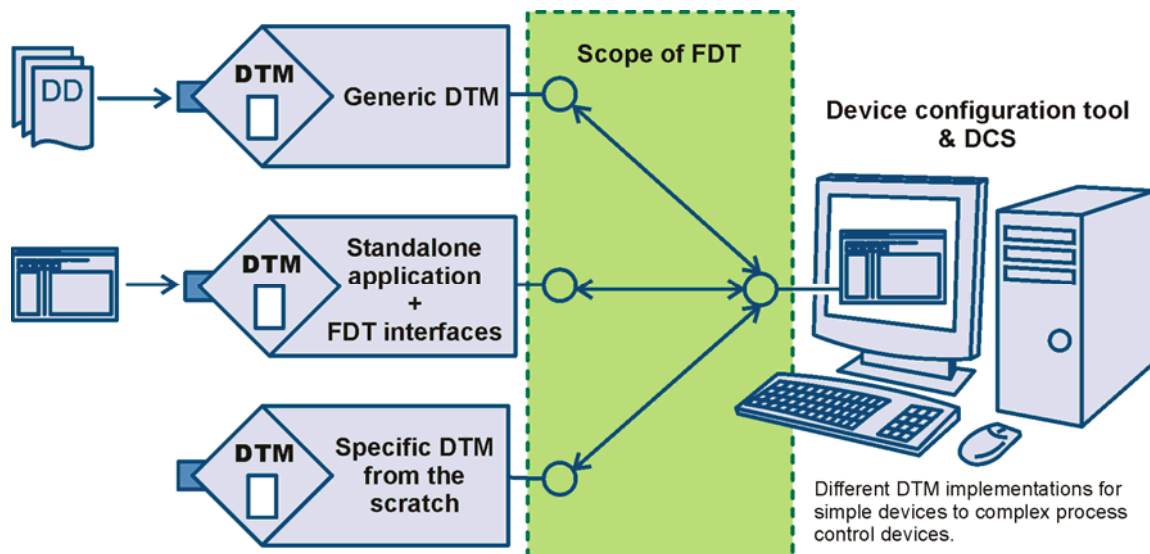
Label	Actual	Target	Failure
Module A	Isolated Module	- not set -	<input checked="" type="checkbox"/>
Module B	Isolated Module	- not set -	<input checked="" type="checkbox"/>

Label	Low Out...	Low Main...	Actual	High Mal...	High Out...	Hyst.	Reset
Voltage [V]	9.0	9.0	29.7	29.0	32.0	1.0	Reset
Current [mA]	0	45	500			30	Reset
Unbalance [%]	-84	-84	0	84	84	20	Reset
Min Signal Level [mV]	200	200	789			100	Reset
Max Signal Level [mV]			940	1200	1200	100	Reset
Noise [mV]			29	100	100	25	Reset
Jitter [us]			1.0	3.2	3.2	0.0	Reset

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- **FDT Group initiated a large interoperability test at Reinhold & Mahla Prozesstechnik (former Infracore)**
 - **Six different frame applications and 25 certified DTM's of 12 different suppliers participated**

Summary: R&M confirmed that the FDT Technology can be recommended for usage in today's and future plants, interoperability is given, and certified DTMs are mature and showed good functionality in the tests. The detailed test results will be presented by R&M at the FDT Group General Assembly and User Forum.

Source: R&M Sept. 2006

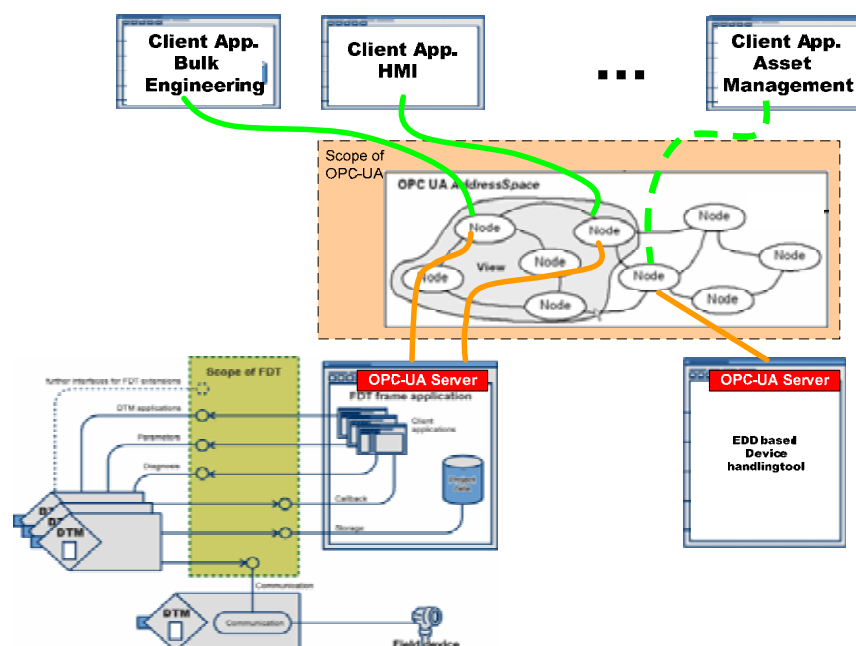
... and at the NAMUR General Assembly Nov. 9, 2006

- **FDT is specified for many communication protocols used in process and factory automation:**
 - **HART**
 - **PROFIBUS**
 - **FF**
 - **Interbus**
 - **CIP (Devicenet)**
 - **PROFINET (end 2006)**
 - **AS-Interface (end 2006)**
 - **Modbus (beginning of 2007)**
- **Nested communication enables device parameterization over hierarchical heterogeneous networks**

- **FDT**
 - ... is vendor independent
 - ... is fieldbus independent by design
 - ... is highly scalable
 - ... achieves seamless integration
 - ... supports the complete lifecycle of field devices

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- Mission: „Define OPC UA Information model to enable consistent access to device data managed within a FDT frame application



- Compatible to the work done in ECT

FDT enables device vendors to develop DTMs for their products to meet end user needs.

These DTMs can be operated in many systems and asset management tools.

- **Open technology**

independent of device or system supplier

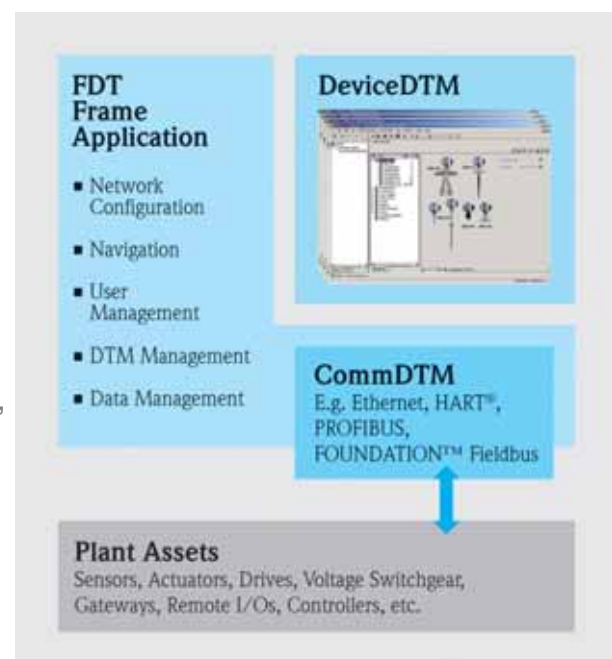
- **Independent of device type**

sensor, actuator, remote I/O, drives, etc.

- **Independent of communication protocol**

Foundation Fieldbus, HART, Interbus, PROFIBUS, under development: AS-i, CIP (ControlNet, DeviceNet, Ethernet IP), PROFINET IO, Modbus

- **FDT is in the process to become an IEC standard**



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- Our mission is
 - to promote, enhance and support the **usage of FDT** technology in Factory Automation, Process Automation and Hybrid Applications
 - to **preserve** end user, device manufacturer and control system manufacturer investments
 - to continuously maintain the FDT **standard** consistent with leading-edge technology
 - to ensure stability, **interoperability** and **compatibility** of FDT based products
 - to ensure that FDT products are **certified**



- FDT enables the device vendor to write applications (DTMs) fitting best to their device
- DTMs provide state of the art graphical user interface
- DTMs operate on many control systems or asset management tools without extra effort
- Users can freely choose devices and systems

- Visit FDT Group website:
www.fdtgroup.org

Group

Thank you for your attention!

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Open access to device intelligence



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