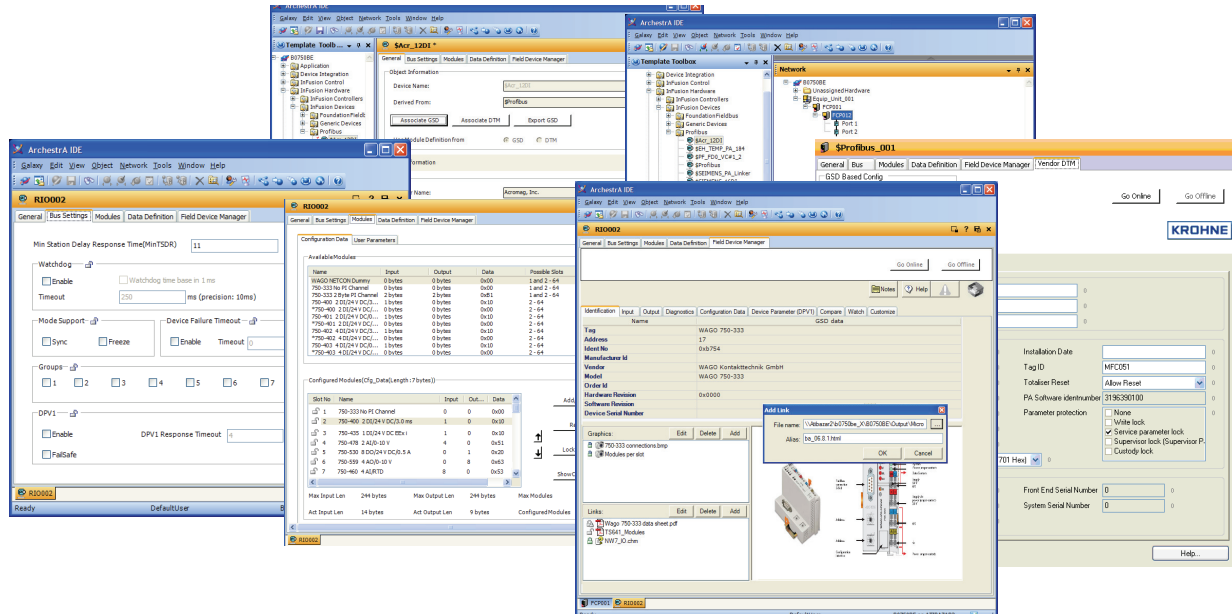


Foxboro® Control Software Field Device Manager for Profibus Devices



Achieve significant productivity and operational savings when configuring Profibus networks with the Foxboro® Control Software (FCS) Configuration Tools and the FCS Field Device Manager for Profibus Devices.

FEATURES

Key features of the Foxboro Control Software (FCS) Field Device Manager for Profibus Devices include:

- ▶ Complete lifecycle coverage of all field device tasks — configuration, commissioning, maintenance, and diagnostics — in one comprehensive tool set
- ▶ Integration of the device configuration into the control database
- ▶ GSD-informed editing tools for bus configuration, module selection, and I/O data definition
- ▶ Built-in universal Profibus device type manager (DTM) providing online access to device data and diagnostic messages
- ▶ Option to run the device manufacturer's DTM

within Field Device Manager for configuration and/or device maintenance

- ▶ Device templates that enable re-use of engineering for multiple tags of the same device type
- ▶ Convenient links to editors for the host control station and fieldbus module
- ▶ Watch screens that provide data history using tables and trend displays
- ▶ Compare screens that enable download and upload of DPV1 parameter values to align the host database with the device
- ▶ User-configured links to documents, photos, drawings, help files and other device-related resources

- ▶ Ability to create custom screens for viewing device data and diagnostic messages, and for downloading DPV1 device parameters
- ▶ Access based on log-in authentication and assigned Field Device Technology (FDT) roles
- ▶ Integration with the FCS Configuration Tools Network view and other application windows, which enable quick creation, assignment, tagging and deployment of devices
- ▶ Available Instrument Workshop edition for calibration, testing, and/or pre-commissioning of devices before their plant installation.

OVERVIEW

The Foxboro Control Software (FCS) Field Device Manager for Profibus Devices (Field Device Manager) is a software application that adds on to the FCS Configuration Tools to provide configuration support for Profibus DP and PA devices, and integration of Profibus networks into the Foxboro Control Software system. The Profibus devices are connected to the control system via the FBM222 Redundant Profibus Communication Interface.

The Field Device Manager's graphical user interface opens inside the FCS Configuration Tools, and provides easy-to-use bus configuration, module selection and data definition tools based on the device's General Slave Device (GSD) file. The device configuration is maintained in an FCS Configuration Tools Galaxy database, where it is integrated with other control system elements such as compounds, strategies and Distributed Control Interface (DCI) blocks.

Field Device Manager's built-in universal Profibus DTM provides highly customizable diagnostic displays and watch screens that facilitate deployment of the device and validation of the control strategy.

TEMPLATES AND DEVICE INHERITANCE

Field Device Manager is GSD-based. The user imports a GSD file into a copy of a Profibus device template. The GSD file, which is bound to the template, informs all choices for bus settings, module selection and user parameters for each instance of the field device type used in the plant. The template also includes controls for specifying tags for devices derived from the template (Figure 1).

You can also define a device type by associating the device manufacturer's DTM with the template, in which case the GSD information is extracted from the DTM and bound to the template. You can then access the device specific DTM in the Vendor DTM tab to configure and maintain the devices.

The screenshot shows the 'Field Device Manager' window for a device template named '\$SRD991'. The interface includes several tabs: 'General', 'Bus Settings', 'Modules', 'Data Definition', and 'Field Device Manager'. The 'Field Device Manager' tab is active, displaying 'Object Information' and 'GSD Information' sections.

Object Information:

- Device Name: \$SRD991
- Derived From: \$Profibus
- Buttons: Associate GSD, Associate DTM, Export GSD
- Use Module Definition from: ☒ GSD ☐ DTM

GSD Information:

- Vendor Name: INVENSY FOXBORO ECKARDT
- Device Model Name: SRD991
- Profibus IdentNo: 0xd991
- Device Revision: V1.3
- GSD Revision: 3
- Hardware Revision: 3
- Software Revision: 8, 9 or 10

Device Instances:

- Mask Prefix: SRD
- Number of Digits: 3
- Mask Preview: SRD001

Figure 1. Device Template for a PA Positioner

The device templates provide the ability to engineer a typical field device type once, and propagate the configuration to multiple instances of the same device type, achieving maximum reusable

engineering. Individual parameter values set in the template can be locked such that they cannot be changed in the device instances, or they can be left unlocked allowing the user to edit individual device configurations, overriding selections copied from the template. Changes made at the template level to locked parameters are propagated to the devices that have already been created from the template.

DEVICE CREATION

To create a Profibus device in the FCS Configuration Tools, the user simply drags the device template to the host FBM222 and drops the template on one of the two FBM ports (Figure 2).

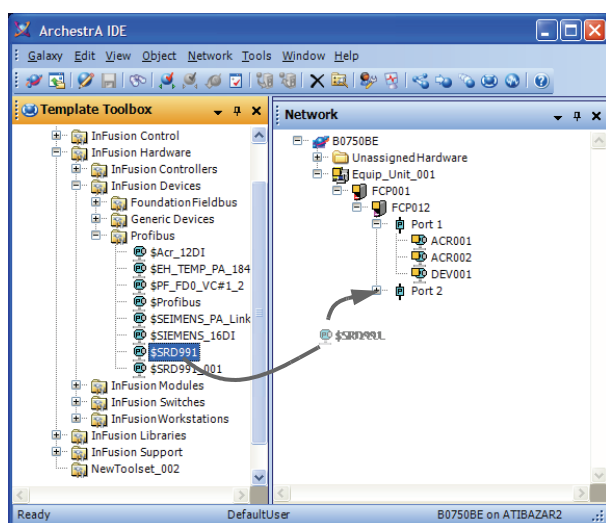


Figure 2. Adding a Profibus Device

The user then double-clicks the new device to open it in the Field Device Manager, sets the device address, and then views and modifies the bus settings, module selection, and other configuration choices inherited from the template.

As part of the device creation, the FCS Configuration Tools set up an equipment control block (ECB201) that represents the device in the I/A Series® system control software. The Field Device Manager General

tab provides a hotlink to an editor for the device ECB, where the user can specify block display settings, configure parameters for collection by FCS History, and set runtime access permissions.

CONFIGURATION TOOLS

The Field Device Manager provides tabbed pages for editing bus settings (Figure 3), selecting modules and user parameters (Figure 4), and defining device I/O (Figure 5).

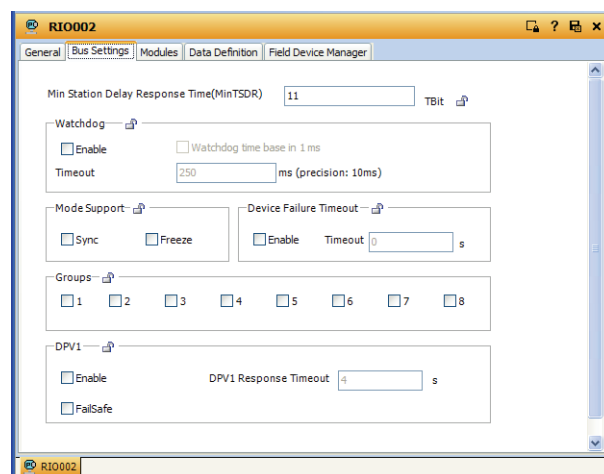


Figure 3. Editing Device Bus Settings

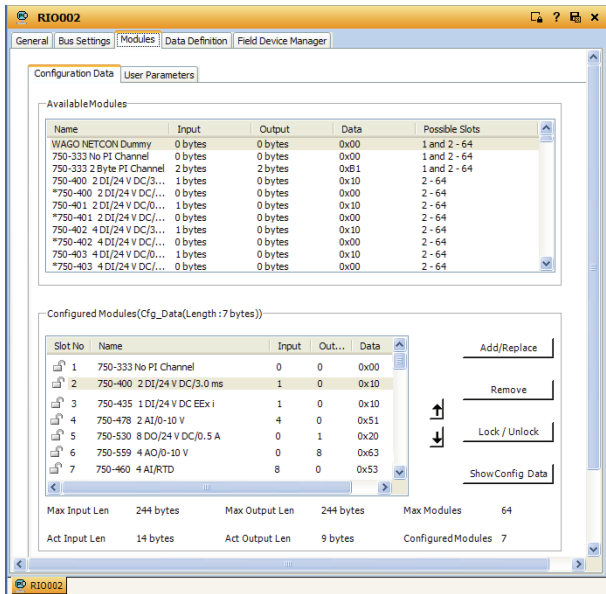


Figure 4. Configuring Modules in a Remote I/O Device

Configuration choices, whether made at the device template level or in an individual device, are always device-appropriate as the device configuration remains linked to the GSD for device description.

Once the modules have been selected, the Data Definition tab enables the creation of input and output parameters, diagnostic messages and parameters, and if the device supports DPV1 functionality, DPV1 device parameters. Parameter definitions include starting byte and bit position, bit length, data type, optional byte-swapping, complement definition, and plain-language names and descriptions for easy identification.

The parameters can be selected for display in the various standard and user-defined screens in Field Device Manager. The parameters are also shown in the FCS Configuration Tools browsers that enable quick and accurate specification of point number syntax in the control strategy DCI blocks.

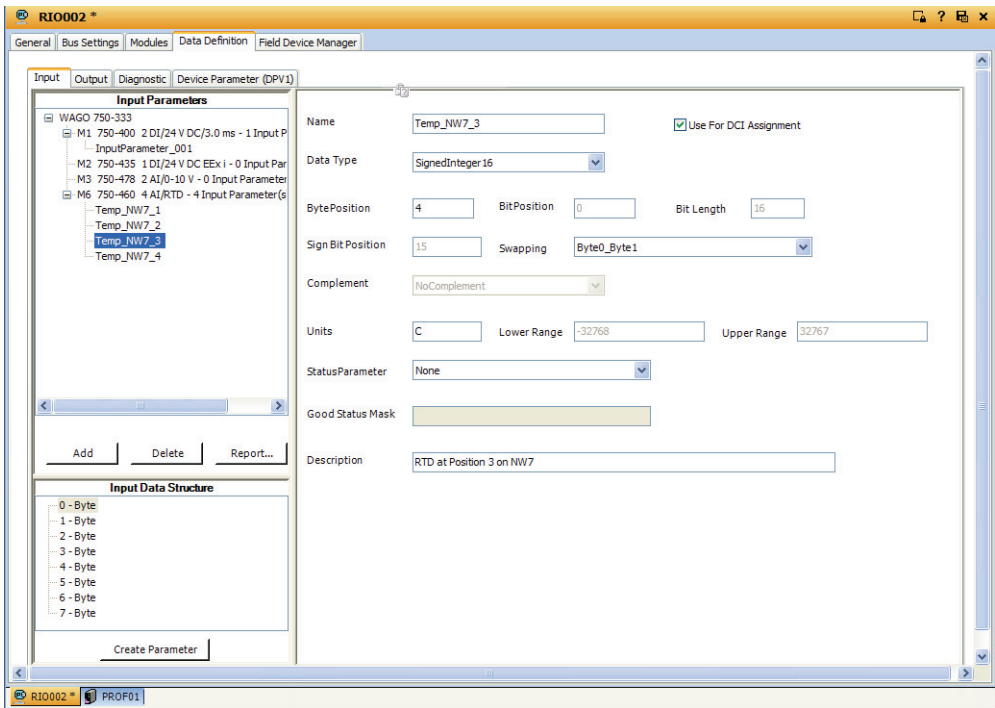


Figure 5. Parameters Configured in the Template Can be Edited at the Device Level

CONTROL CONFIGURATION

Profibus devices are connected to I/A Series control blocks using DCI blocks. DCI block types include single and redundant input and output blocks for common data types such as integer and real. The DCI blocks are mapped to Profibus data of the different Profibus data types.

The FCS Configuration Tools' Strategy Editor provides graphical tools for adding DCI blocks to a control strategy, linking them to control blocks, and specifying the block execution order within the strategy. The user then opens a Device Browser in the editor to map the DCI blocks to the slave devices and their parameters created in the Data Definition tab (Figure 6).

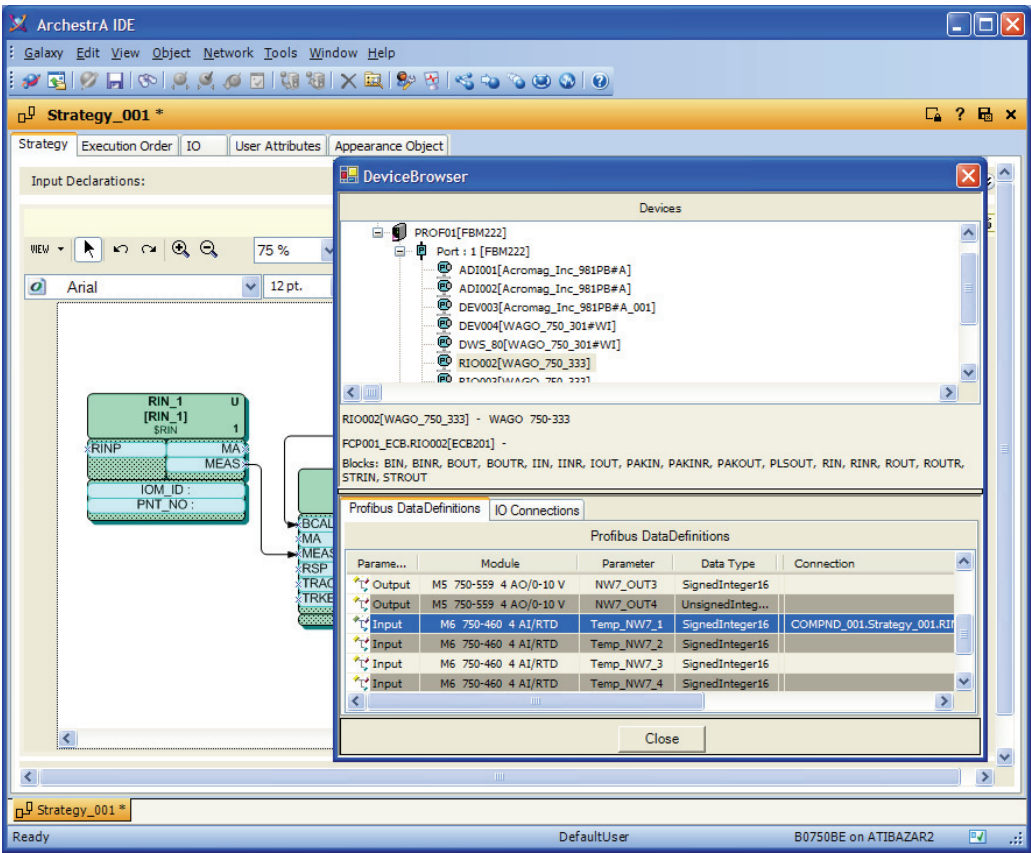


Figure 6. Strategy Editor Device Browser Connects DCI Blocks to Slave Device Data

UNIVERSAL PROFIBUS DTM

Field Device Manager's built-in Profibus DTM includes the following set of standard tab pages:

- Identification tab (Figure 7) displays information about the specific device such as the device manufacturer and type, and hardware and software versions. The tab also provides user-configured links for quick and easy access to any document or image useful in engineering or maintaining the field device. The documents images can be linked to the Identification tab in the template or a device instance.
- Input tab (Figure 8) and Output tab provide real-time displays of the parameters defined in the Data Definition tab (or the Vendor DTM if the parameters were configured with the device manufacturer's DTM).
- Diagnostics tab displays diagnostic messages specified in the GSD and those which you define in the Data Definition tab based on either device diagnostics or DPV1 device parameters (Figure 9).

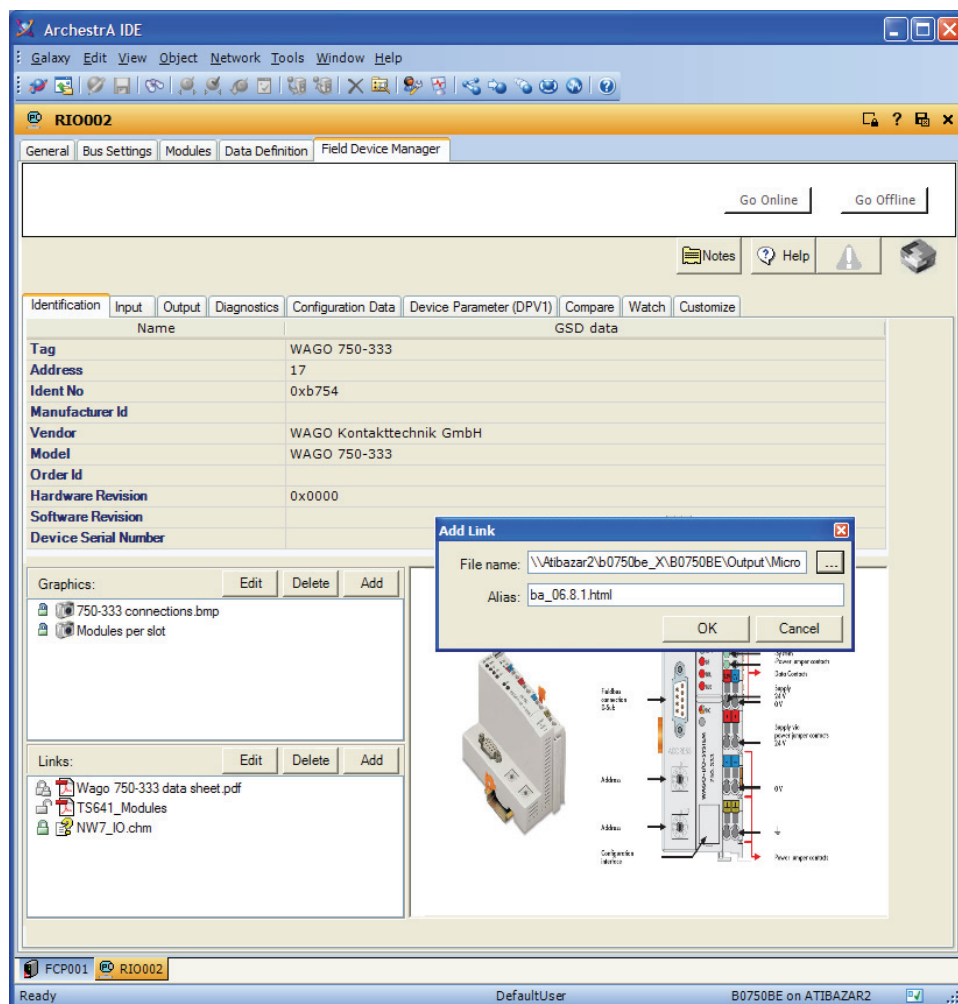


Figure 7. Hyperlinks to Documents and Drawings Can be Made on the Identification Tab

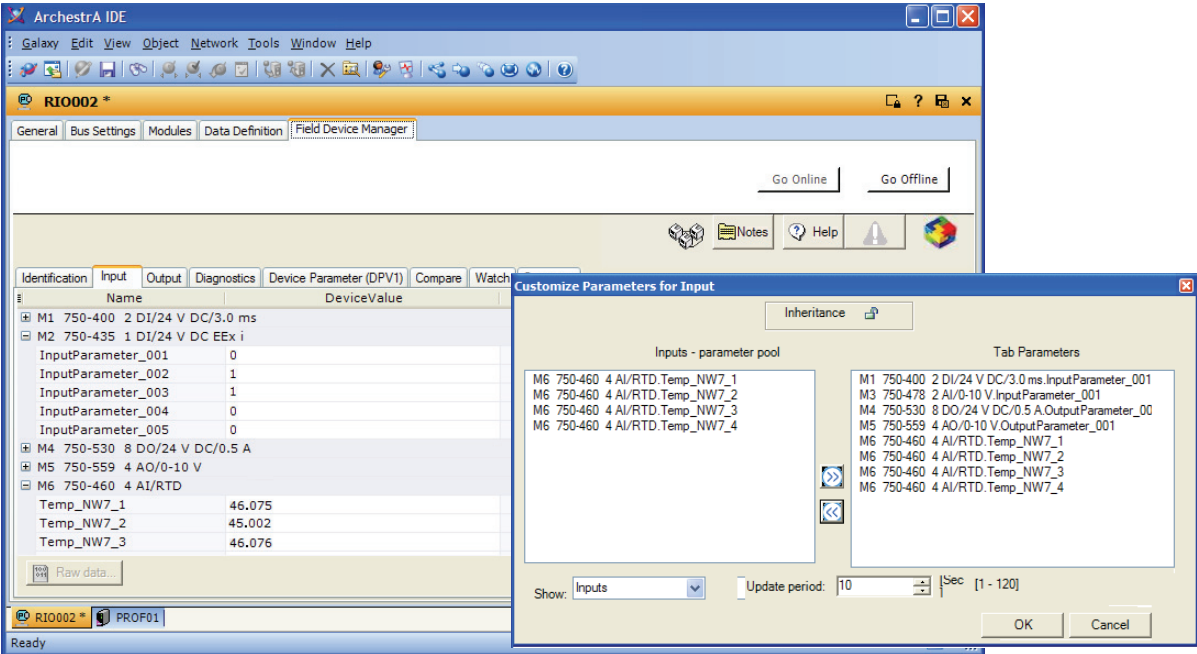


Figure 8. Selecting Input Parameters for Online Display in Field Device Manager

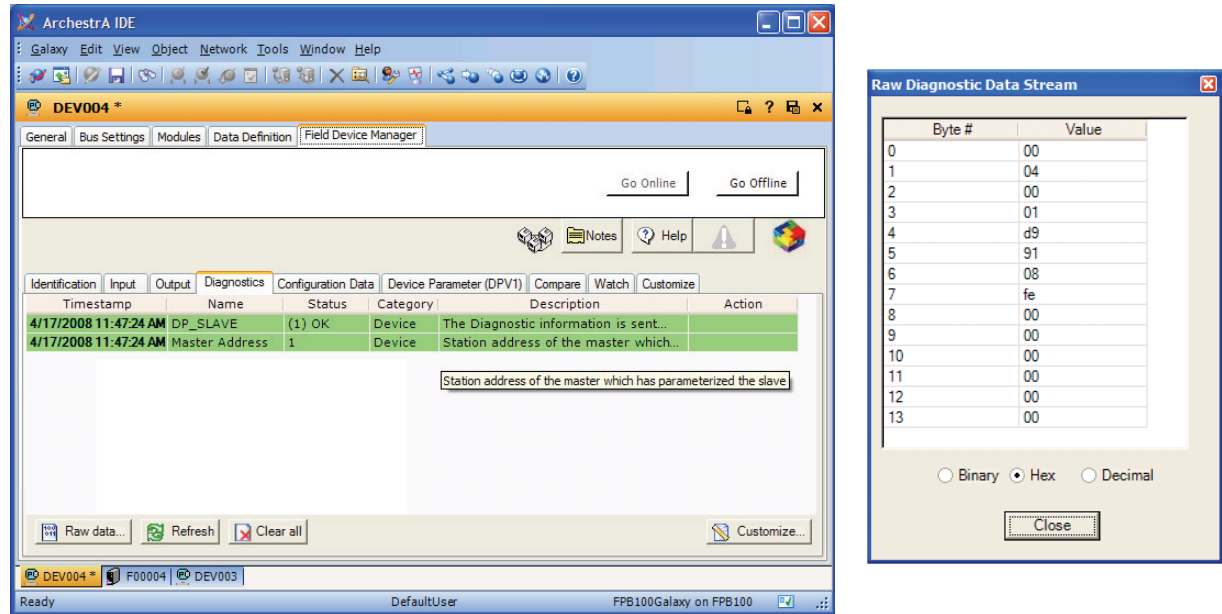


Figure 9. Field Device Manager Displays Diagnostics Messages as well as Raw Device Diagnostic Data

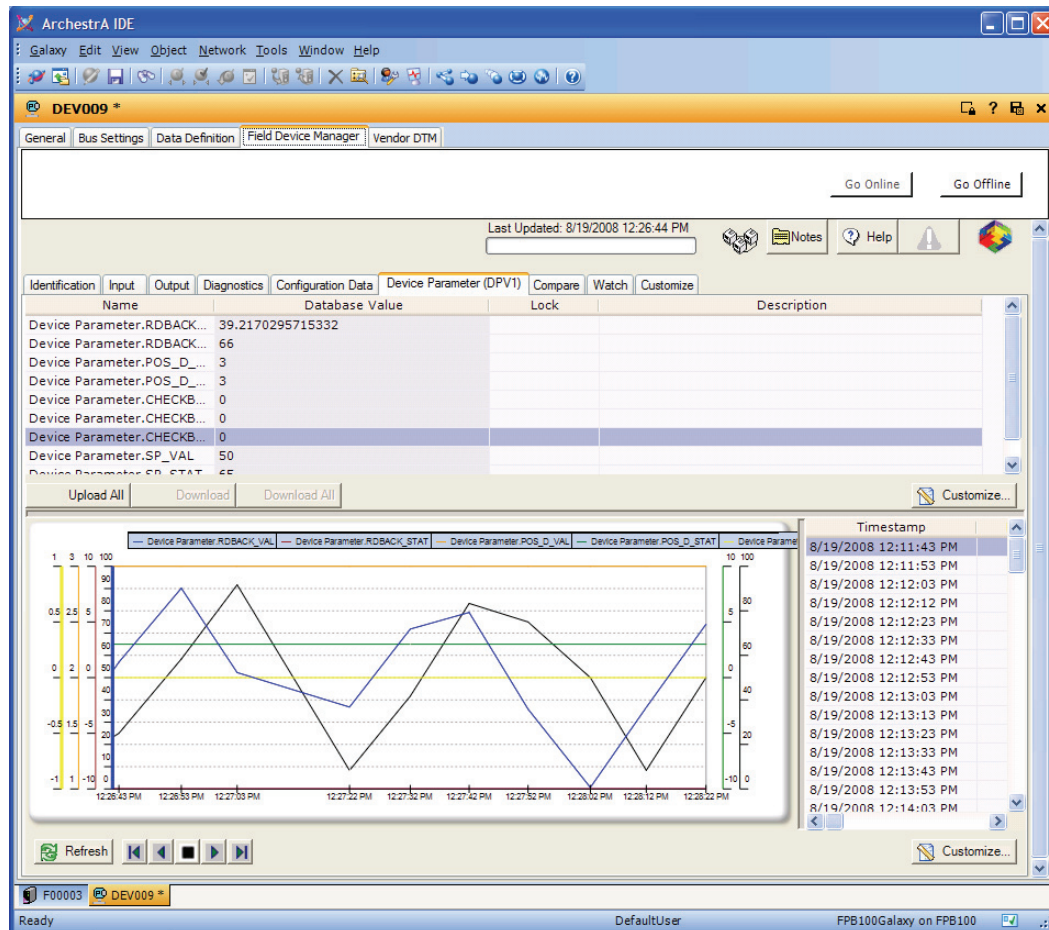


Figure 10. The Device Parameter (DPV1) Tab Enables Downloads to DPV1 Devices and Trend Displays of Up to Eight Device Parameters

- ▶ Watch tab allows you to track up to eight parameters with a data table and a trend display.
- ▶ Configuration Data tab, which is displayed only when the Field Device Manager is online to the device, compares the configuration data in the device with the data set in the FCS Galaxy.
- ▶ Customize tab provides tools for adding custom tabs and parameter groups, setting access permissions for Field Device Manager functions based on the user's log-in information, and setting up downloads to selected devices.

Field Device Manager also displays the following tabs

for devices that support DPV1 functions:

- ▶ Device Parameter (DPV1) tab displays selected device parameters in a grid format and a trend display (Figure 10). The tab enables upload and download of parameters that are defined as writable.
- ▶ Compare tab enables you to identify differences between DPV1 device parameter values in the FCS Galaxy and the values read from the device, and then reconcile the two sources by either uploading or downloading selected parameters.

The Tab Configuration dialog box, which is accessed from the Customize tab, enables addition of other tabs using one of three formats: Input/Output, Watch and Device Parameter (DPV1). Whether a tab is visible and enabled depends on the FDT roles assigned to the user and the access specified for those roles in the Set Permissions dialog box.

USING A DEVICE-SPECIFIC DTM

Field Device Manager provides the option of using a DTM supplied by the device manufacturer to configure and maintain the device. Selection of the device-specific DTM is made at the template level, at which point GSD information is extracted from the DTM and bound to the device template.

When the device DTM is associated with the device

template, the manufacturer’s user interface is made available for the template and derived devices in Vendor DTM tab in Field Device Manager (Figure 11).

You have a choice of configuring the device template and the derived device instances using the device DTM or the FCS configurators in other Field Device Manager tabs. Whichever tool is selected, both the vendor DTM and the universal Profibus DTM are available for managing devices as they are brought online.

NOTE

Manufacturer-supplied DTMs may vary in their compliance with Profibus and FDT specifications. Please confirm the applicability of vendor-supplied DTMs for your project.

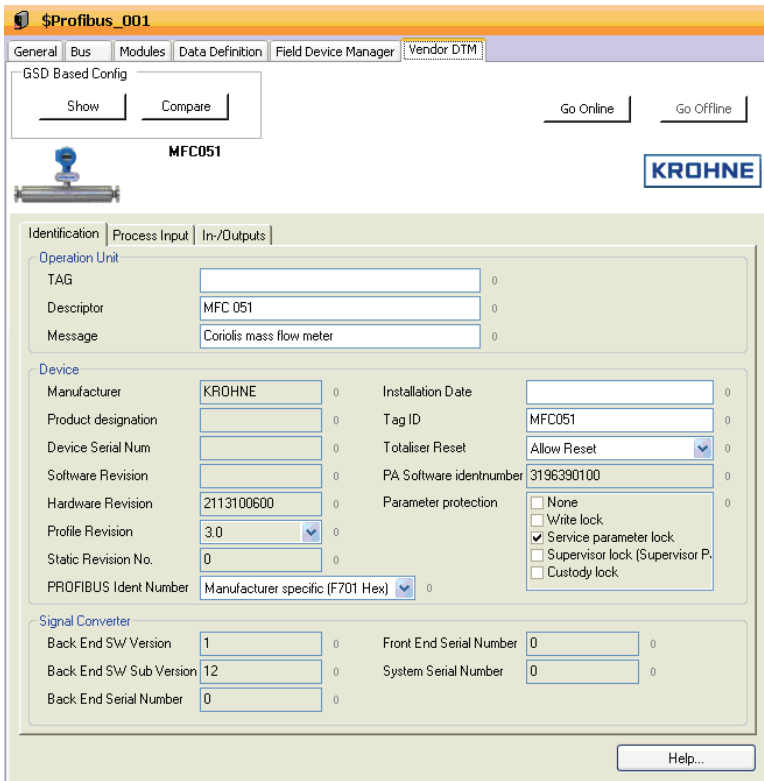


Figure 11. The Device Manufacturer’s DTM is Opened in the Vendor DTM Tab for Configuring and Maintaining Devices

MASTER BUS SETTINGS

The Field Device Manager is also used to configure the master bus settings for each port in the host FBM222 (Figure 12). When you select a baud rate for the port from a pull-down list and press the Default button, the editor supplies the appropriate values for various timing parameters such as minimum station response time, which can be edited individually as needed. With a click of the Validate button, you can verify the bus settings of the FBM and all connected Profibus devices on the port using the definitions in the GSD files. The CalculateTTR button on Bus Settings tab allows you to optimize the target token rotation time for each port.

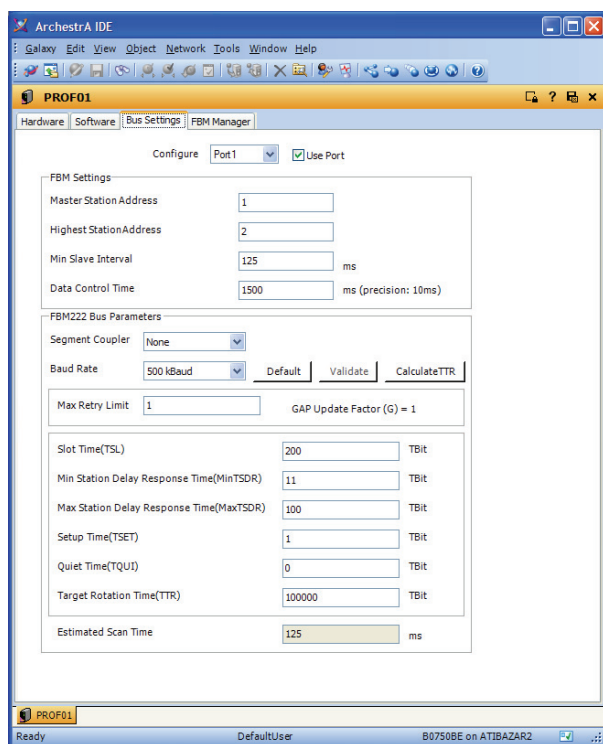


Figure 12. Setting Master Bus Parameters

DEPLOYMENT

The device configurations can be deployed to the I/A Series system as part of a control database deployment, which also downloads the host FBM222 configuration and the DCI and control blocks contained in the various control strategies. The FBM222 uses the downloaded configurations to initialize the connected devices and manage cyclic and acyclic data exchange between the devices and the control station. After the initial deployment, the FCS Configuration Tools provide a more selective deployment in which later changes to the device configurations can be made with minimal interruption to the process.

The FCS Configuration Tools provide a variety of tools for monitoring the device as it is brought online and initialized from the FBM222 master. The Field Device Manager for the FBM222 includes a communication DTM that provides diagnostics and live lists for each port, while Field Device Manager for the device offers online displays of device data and screens that compare the physical device to the configuration database.

COMMISSIONING WIZARD

You can also deploy devices using the FCS Commissioning Wizard. The wizard matches a physically connected slave device with a configuration in the FCS Galaxy database (Figure 13, left side) and enables you to take one or more of the following commissioning actions (Figure 13, right side):

- ▶ Deploy the device, that is, download the device ECB to the I/A Series system
- ▶ Download to a device DPV1 device parameters that were configured with a vendor DTM
- ▶ Upload from a device DPV1 device parameters to a vendor DTM and the FCS Galaxy
- ▶ Bring the device online to the control system and begin cyclic and acyclic data exchange
- ▶ Change the device address.

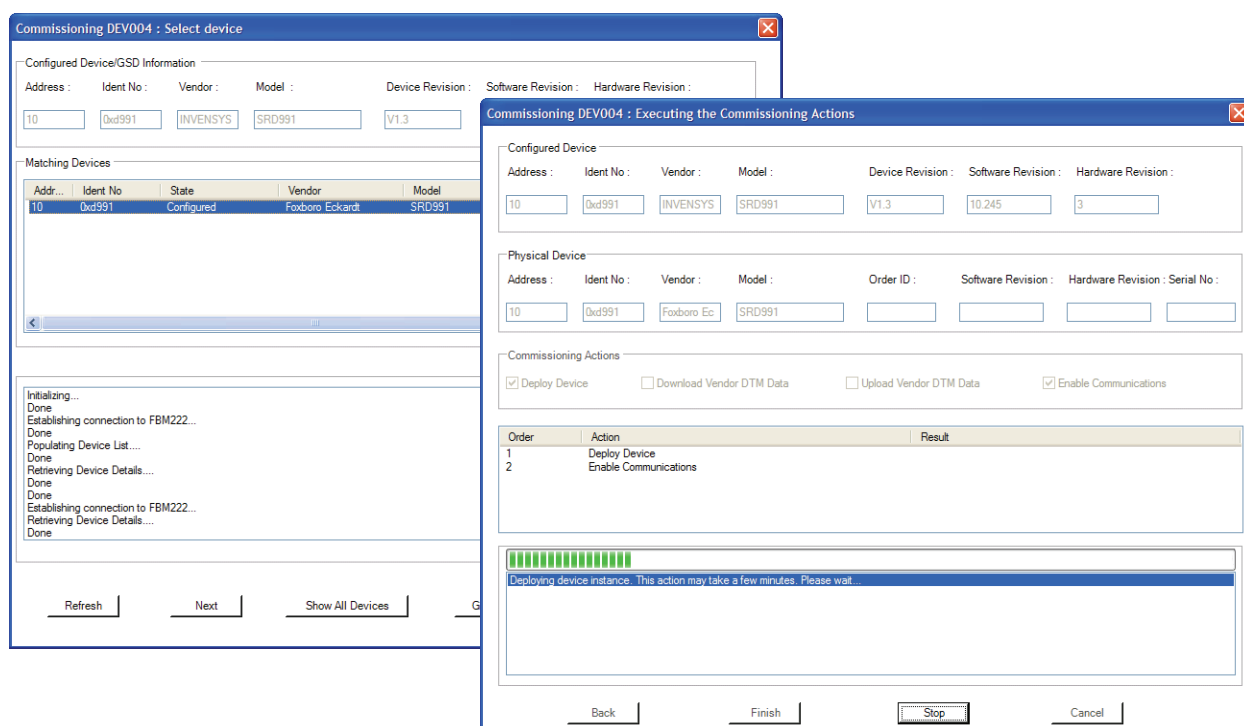


Figure 13. The Commissioning Wizard Provides for Device Deployment, Download and Upload of DPV1 Device Parameters, and Device Initialization

FIELD DEVICE MANAGER – INSTRUMENT WORKSHOP EDITION

The full Control Room edition of Field Device Manager has all the features previously described. This edition is used on FCS workstations with I/A Series Control Processors and FBM222s. In addition, the FCS Configuration Tools and Field Device Manager (without the universal Profibus DTM) are offered in a bundled Instrument Workshop edition. This off-platform edition uses a third-party interface card and communication DTM to provide DPV1 communication with the devices, and the device manufacturer's DTM to calibrate, pre-commission, and test instrumentation prior to installation and connection to the FBM222.

HARDWARE AND SOFTWARE REQUIREMENTS

CONTROL ROOM EDITION REQUIREMENTS

Computer

- ▶ Follow the hardware requirements for the FCS Configuration Tools (FCS) as specified in *Foxboro Control Software Configuration Tools* (PSS 21S-10B3 B3).

System Hardware

- ▶ The MESH control network-connected station committed as AW70 or WP70 at V8.4.2 or later
- ▶ ZCP270 or FCP270 at Version 8.4.2 or greater, with FBM222

Media

- ▶ FCS Field Device Manager for Profibus-DP Devices media kit for I/A Series workstation, version 8.4.2 or greater

Field Device Manager requires an S39 FCS Platform License.

INSTRUMENT WORKSHOP EDITION REQUIREMENTS

- ▶ Laptop, desktop, or server class computer with 2.18 Ghz (or faster) Intel Pentium® 4 processor (or higher), minimum of 16.0 GB free hard disk space, and minimum of 2.0 gigabytes RAM
- ▶ DVD/CD drive
- ▶ Video Graphic Accelerator Card: 32 MB of memory
- ▶ Communications Network: 100 MHz TCP/IP Ethernet
- ▶ Compatible third-party interface card for one Profibus port
- ▶ Third-party Profibus communication DTM
- ▶ Profibus junction devices, power supplies, and fieldbus terminations as necessary to connect the field devices.

SIZING GUIDELINES

The FCS Field Device Manager for Profibus along with the FBM222 provide the following capacity limits:

- ▶ 125 Profibus slave devices assigned to an FBM222 port

Refer to *FBM222, Redundant PROFIBUS Communication Interface Module*

(PSS 21H-2Z22 B4) for additional information on the FBM222.

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