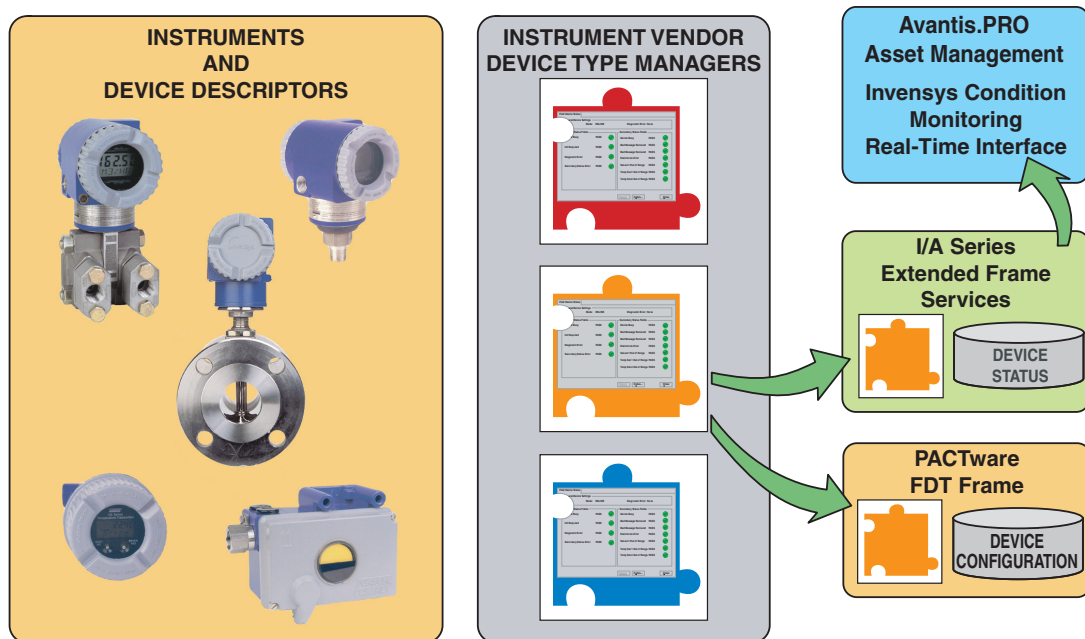


Overview of HART® Device Manager and FoxCom™ Device Manager Through PACTware™



I/A Series® systems provide extensive configuration and lifecycle management capabilities for HART® and FoxCom™ devices through a maintenance tool-set compliant with the Field Device Tool (FDT) 1.2 Standard.

FEATURES

- ▶ Supports HART instruments, from Invensys Foxboro as well as other vendors, where the vendor has a HART DD registered with the Hart Communication Foundation.
- ▶ Supports an entire network of HART devices using HART multiplexers from MTL plus Pepperl and Fuchs.
- ▶ Supports Invensys Foxboro devices with FoxCom Protocol.
- ▶ Preserves instrument vendor's investments in HART DDs, via HART DTMs converted from those DDs.
- ▶ Supports customer plug-in of advanced configuration and maintenance software from other instrument vendors, giving device vendors opportunities to create high functionality enhanced device applications for diagnostics and maintenance.
- ▶ Creates a single common database repository for instrument configuration and maintenance data, regardless of protocol.
- ▶ Gives end users freedom of choice in their selection of devices from multiple vendors.

- ▶ Provides configuration and maintenance support of an entire network of HART devices from a single I/A Series workstation or an independent, non-I/A Series personal computer.
- ▶ Provides data linking to Computer Maintenance Management Software packages for advanced asset management.

OVERVIEW OF COMPONENTS

Complete life cycle management capabilities for intelligent field devices are provided by a combination of tools that includes HART Device Manager or FoxCom Device Manager and I/A Series Extended Frame Services to link in Avantis.PRO for advanced Asset Management. The HART Device Manager and the FoxCom Device Manager provide configuration and maintenance capabilities for HART devices and FoxCom devices respectively.

The HART Device Manager for the I/A Series system consists of these components:

- ▶ PACTware™ Field Device Tool which is an FDT compliant frame
- ▶ Device Type Managers (DTMs) which support HART devices
- ▶ I/A Series HART Communication DTM which is I/A Series software to link PACTware to the system and devices.

Moreover, the FoxCom Device Manager consists of these components:

- ▶ PACTware™ Field Device Tool
- ▶ Device Type Managers (DTMs) which support FoxCom devices
- ▶ I/A Series FoxCom Communication DTM which is I/A Series software to link PACTware to the system and devices.

Device Type Managers provide functions such as:

- ▶ Viewing full screen displays to speed off-line configuration
- ▶ Reconfiguring the tag number, tag name, device name, location, upper and lower range values, damping time, digital or 4 to 20 mA output, type of units measured, and other configurable parameters, as required
- ▶ Accurately reranging a device without the need of applying a calibrated input signal
- ▶ Diagnosing problems and determine if it is a process or device error
- ▶ Adjusting the device output to any value for verification, troubleshooting, or loop calibration.

These tools provide an ideal means of preconfiguring intelligent field devices. Once the databases have been preconfigured, they can be easily downloaded from the I/A Series workstation to the intelligent field device after installation.

The I/A Series platform provides bi-directional FDT compliant communication services through the system and FBM modules to the devices via communication DTMs for both HART and FoxCom field devices.

Examples of information that can be communicated, displayed, and configured include:

- ▶ Model Number
- ▶ Measurement Values
- ▶ Status and Diagnostics
- ▶ Device Temperature
- ▶ Diagnostic Parameters of Positioners and Valves
- ▶ Plant EGUs
- ▶ Zero and Span
- ▶ Elevation or Suppression
- ▶ Linear or Square Root Output

- ▶ Electronic Damping
- ▶ Failsafe Direction
- ▶ Alarm Parameter Levels
- ▶ Sensor Curve Type (Temperature)
- ▶ Line Size and Meter Factor (Flow)
- ▶ Pulse Output Parameter
- ▶ Device Name, Tag Number, Tag Name
- ▶ Device Location
- ▶ Calibrator's Initials and Last Calibration Date.

To complement the I/A Series system offering, Invensys also offers the Model PC50, a stand-alone version of these tools for off-system use, such as pre-configuring devices in an instrument shop prior to system connection. The stand alone version can be loaded on a personal computer, and communicates via PC mounted modem cards for HART and FoxCom protocols.

Refer to PSS 2A-1Z3 G for the Model PC50 Field Device Tool (stand-alone version) specifications.

PACTWARE FIELD DEVICE TOOL 1.2

PACTware (Process Automation Configuration Tool) is an FDT compliant frame application. A frame application provides a graphical user interface (GUI) and acts as a container to start Device Type Managers (DTMs) in a window pane within the GUI.

While the PACTware frame is the intellectual property of the PACTware consortium, media kits are distributed by Invensys Foxboro.

Features provided by PACTware:

- ▶ Compatible with the FDT 1.2 standard
- ▶ Provides menu and toolbars with functions to print a project, save a project, upload parameters, download parameters, and so forth
- ▶ Manages a device catalog, with display capability via a Device Window
- ▶ Provides data base services to store the configured database of each instrument
- ▶ Provides a tree structure in a Project Window to structure the devices to the communication modules of the host PC.

DEVICE TYPE MANAGERS (DTMS)

DTMs from the instrument vendors provide numerous device configuration and maintenance capabilities. They plug-in to the PACTware frame for access, device cataloging, and database storage. Up to four intelligent field devices can be accessed for configuration at one time.

Invensys Foxboro HART Device and FoxCom Device DTMs

Invensys supplies DTMs for Invensys Foxboro instruments with HART and FoxCom protocols.

Figure 1 depicts a configuration screen from a FoxCom Device DTM.

Identifier Transmitter Parameter Configuration

Measurement #1

☐ Square root mode

Units: **bar** Custom...

Lower Range Value : 0.00000

Upper Range Value : 2.08859

Upper Range Limit : 2.08859

Swap Measures 1 and 2: <-->

Measurement #2

☐ Square root mode ☐ Turn Off

Units: **inH2O** Custom...

Lower Range Value : 0.00000

Upper Range Value : 840.00189

Upper Range Limit : 840.00000

Sqroot Low Flow Mode

☐ Active

☐ 10% of Flow Cut Off

External Zero

☐ Enable

☒ Disable

Output Mode

☒ Digital

☐ 4-20 mA

mA Output Fail Safe

☒ Down Scale

☐ Up Scale

Output Damping : .25 sec

Temperature Fail Strategy

☒ Fail ☐ Continue

Save Save and Download Cancel

Figure 1. Parameter Configuration Screen

Figure 2 depicts a trending screen which compares valve position, setpoint, and control difference in percentage terms. In this figure, the color of each trend indicates the metric it is trending. Each metric is shown with its own units of measurement in the Y-axis of the trend graph.

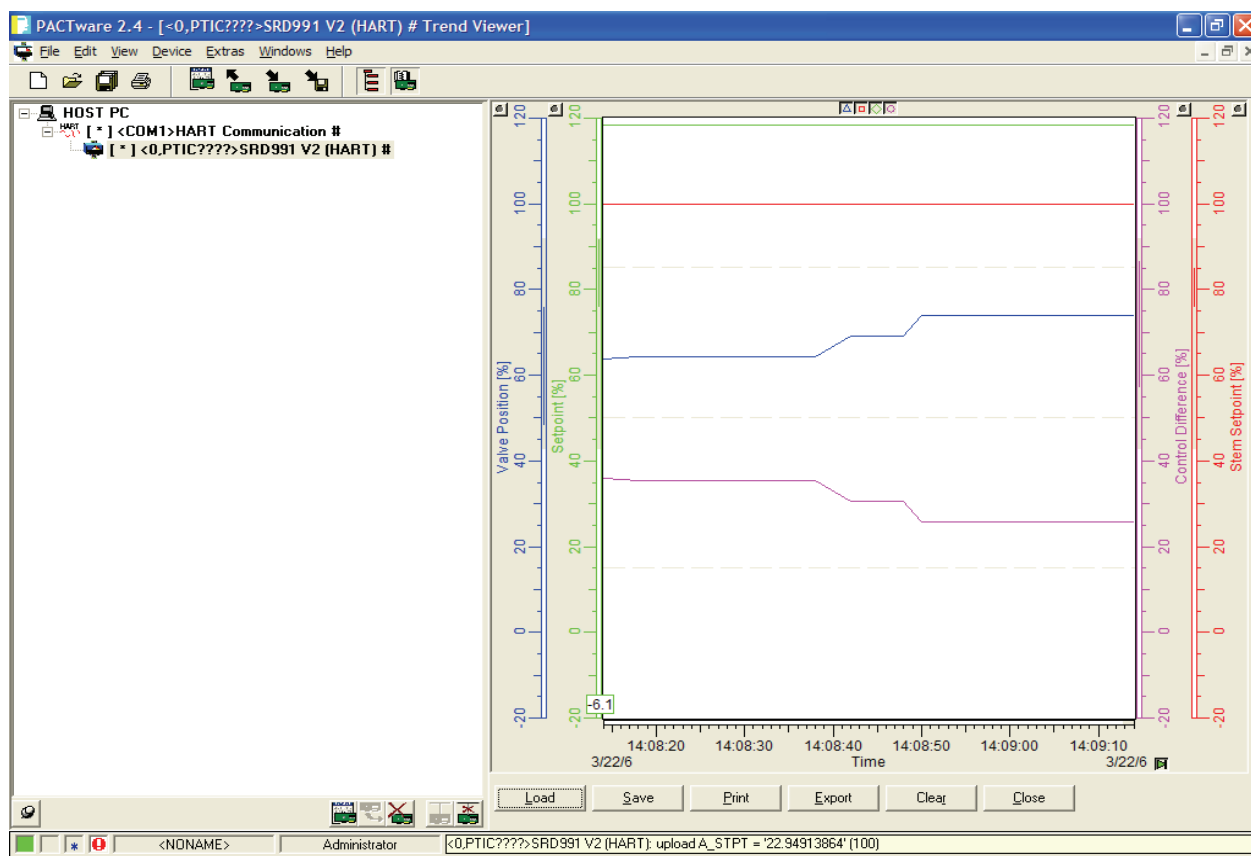


Figure 2. Foxboro Eckardt SRD991 Trend Viewer

Figure 3 illustrates a diagnostic screen from a HART device DTM.

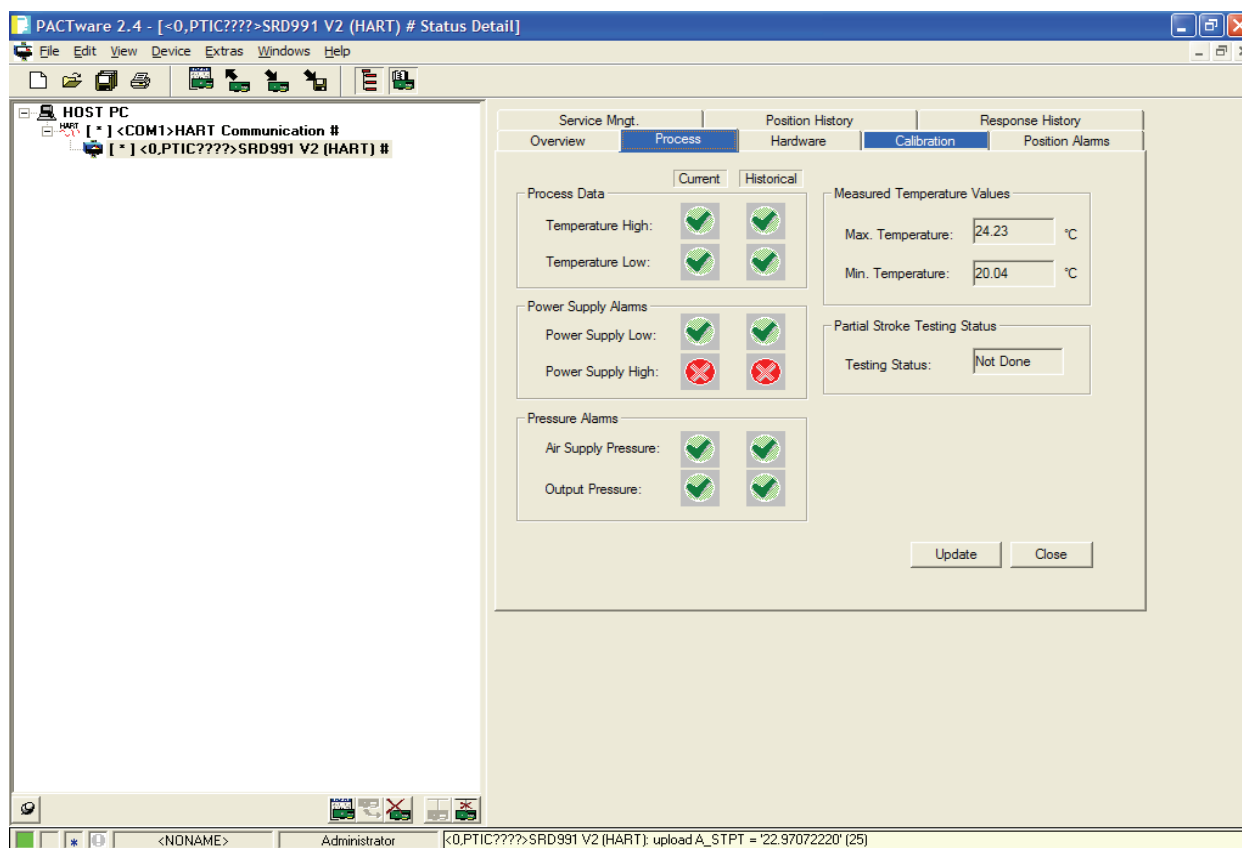


Figure 3. Foxboro Eckardt SRD991 Diagnostic Status Detail

DTMs for Non-Foxboro HART Instruments

I/A Series systems can also provide comprehensive configuration and maintenance capabilities for non-Foxboro instruments. Many other instrument vendors provide DTMs for their own devices. Figure 4 and Figure 5 illustrate a configuration screen and an echo curve screen produced by a vendor's device DTM.

In cases where a DTM is not available for the instrument from the device vendor, contact Invensys Foxboro for a list of supported DTMs. In most cases, Invensys Foxboro can supply a DTM converted from a HART DD.

I/A SERIES COMMUNICATION DTMS

Communications connectivity through the I/A Series system for integration of PACTware to the system and the HART and FoxCom devices is provided by communication DTMs provided by the I/A Series platform. Communications pass through the I/A Series Control Network, Control Processors, and FBMs. These DTMs make the underlying communication services within the system transparent to the Device Type Managers and other FDT compliant applications. These communication DTMs are contained within the Device Manager components' CD-ROM.



Figure 4. VEGA Level Adjustment

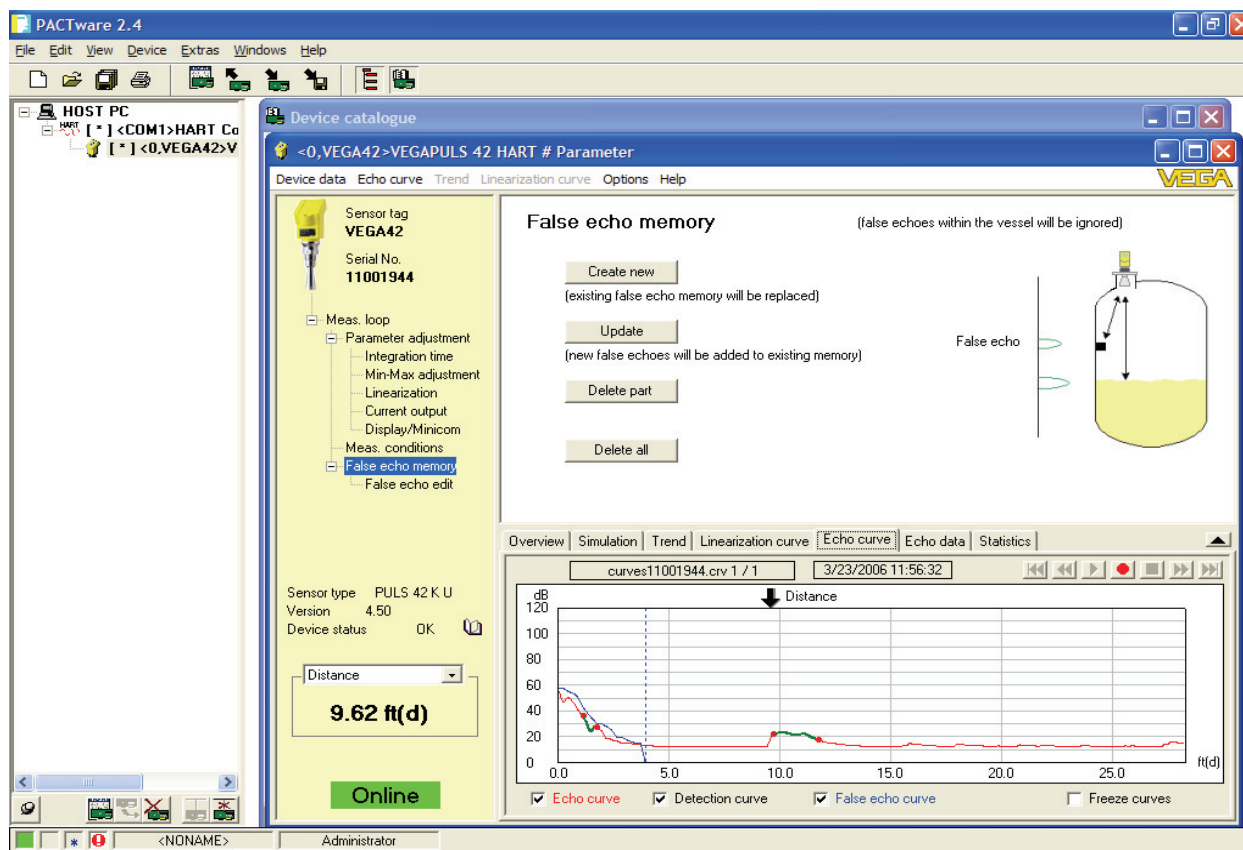


Figure 5. VEGA Echo Curve

I/A SERIES EXTENDED FRAME SERVICES

Extended Frame Services (EFS) provides FDT compliant data collection services to link real-time instrument maintenance information to Invensys Condition Monitoring. Desired information from HART and FoxCom devices may be scanned by EFS and stored in a relational database with a standard schema. In turn, EFS communicates selected asset management data, such as device identification information, device health status, and DTM supplied cycle counts for valve positioners to the Invensys Conditioning Monitoring application. The Invensys Condition Monitoring application monitors this asset management data within EFS and creates a work order within Avantis.PRO when a device

malfunctions.

EFS is an optional capability which is used to link the Hart Device Manager or FoxCom Device Manager to Invensys Condition Monitoring. Examples of asset management information that can be gathered and communicated by EFS include:

- ▶ Manufacturer ID
- ▶ Device Type
- ▶ Device Type ID
- ▶ Bus category
- ▶ Date of manufacture
- ▶ Version

- Device health status
- Value travel supplied by DTM
- Four HART process variables
- Extended device status.

Avantis.PRO is the Invensys offering for Enterprise Asset Management. Avantis.PRO provides planning and scheduling of asset management functions, including preventative maintenance, materials management, supply chain management, and work order management. Invensys Condition Monitoring,

working in conjunction with Avantis.PRO, provides performance based preventive maintenance, condition monitoring, and predictive alerts by using I/A Series function blocks and the AIM*Historian.

HART DEVICE MANAGEMENT ARCHITECTURE

Figure 6 shows the typical device management architecture for HART devices or FoxCom devices where the PACTware application frame resides directly on the I/A Series workstation along with the Communication DTM and the device DTMs.

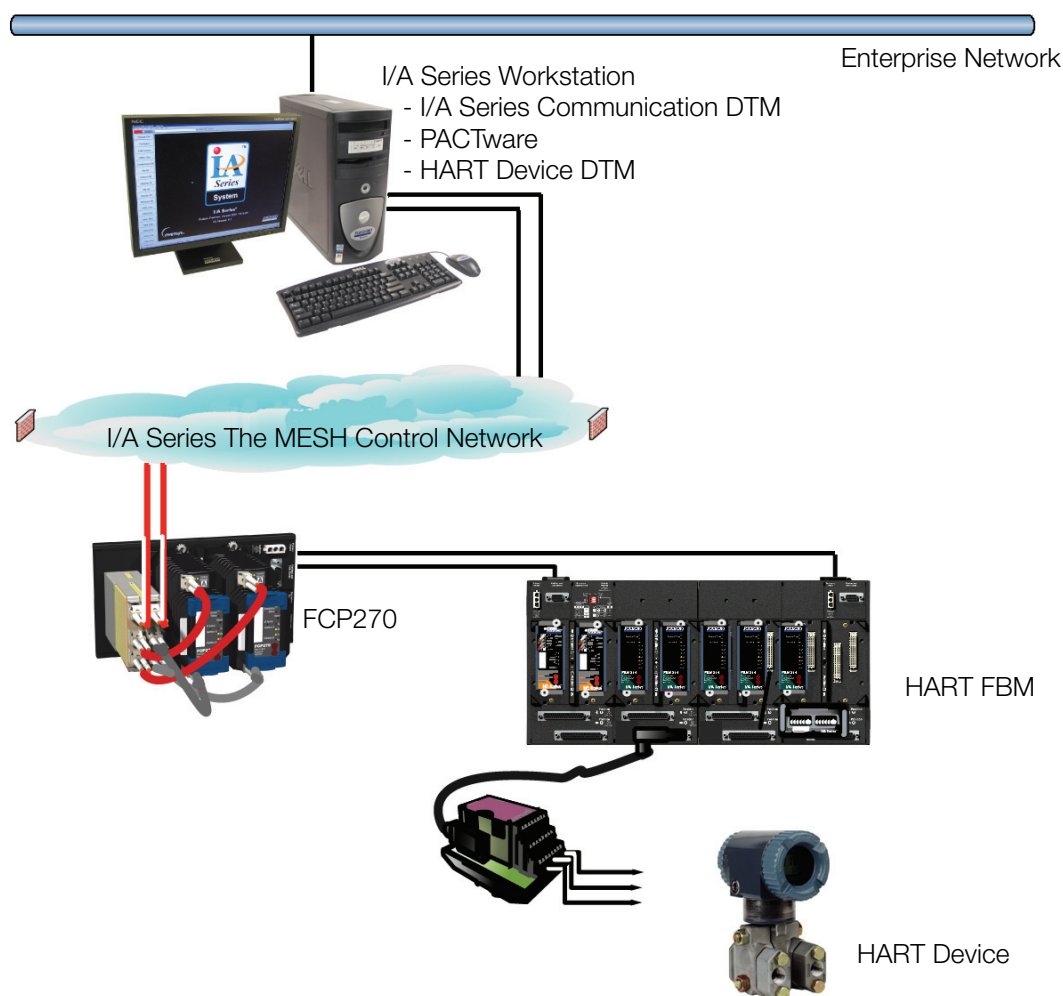


Figure 6. Device Management Architecture for HART Devices

Figure 7 shows a typical configuration where the PACTware application frame resides directly on the I/A Series workstation. The PACTware application frame is utilized to configure and manage the HART devices connected directly through the HART FBM,

and additionally HART devices connected to other subsystems through HART multiplexers (for example, a Triconex Controller). The Triconex system is directly monitoring and controlling the HART devices attached to it through the HART multiplexers.

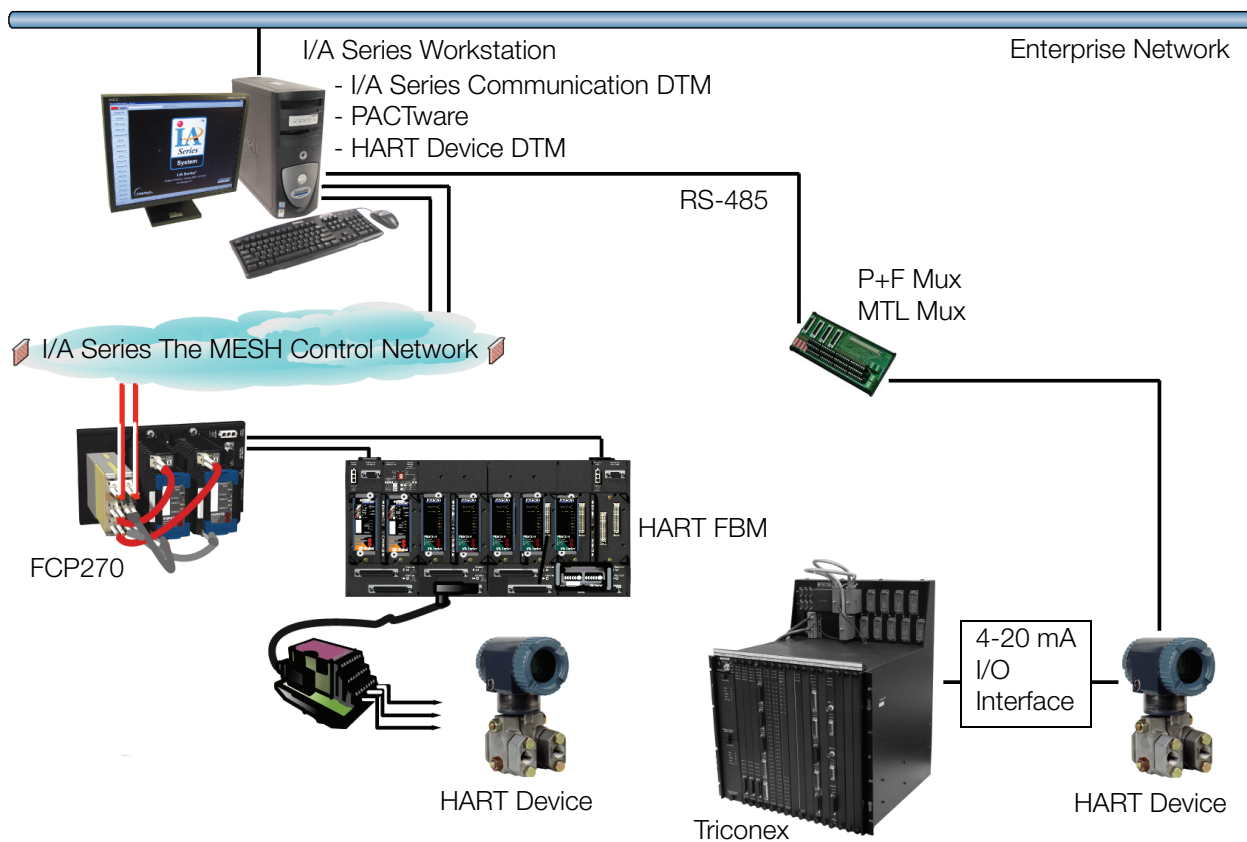
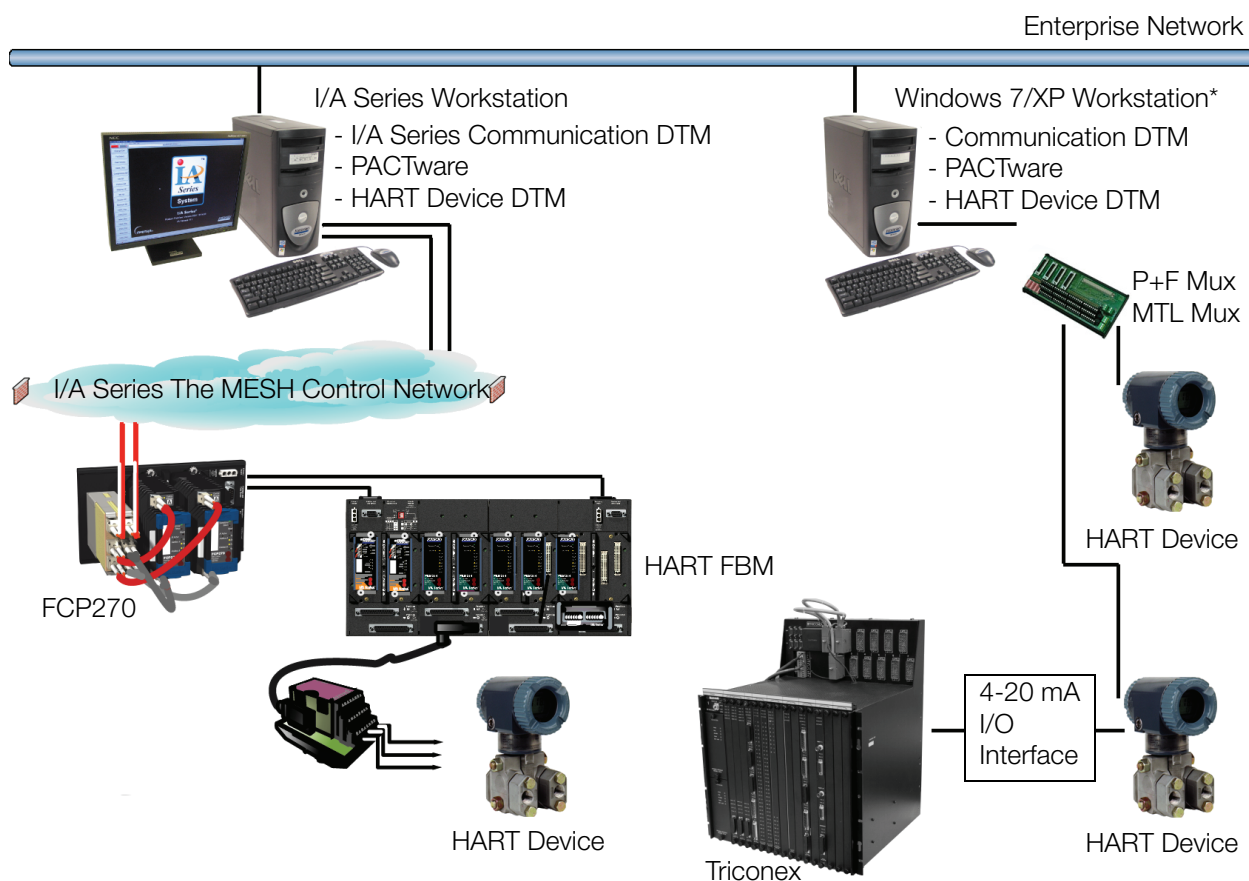


Figure 7. HART Multiplexer Support with PACTware Operating on I/A Series System

Figure 8 shows a configuration where the PACTware application frame resides on an independent, non I/A Series PC. PACTware is utilized to configure and manage the HART devices connected directly through the FBM214, and additionally HART devices

connected to other subsystems through HART multiplexers (for example, a Triconex Controller). The Triconex system is directly monitoring and controlling the HART devices attached to it through the HART multiplexers.



*The Windows 7® or Windows XP® workstation is a non-I/A Series workstation and does not require an I/A Series workstation license.

Figure 8. HART Multiplexer Support with PACTware Operating on Separate PC

REFERENCE DOCUMENTS

Also refer to the following document.

PSS Number	Description
PSS 21S-10B16 B3	Foxboro Control Software Field Device Manager for HART Devices