

Supplement to Fisher® FIELDVUE® DVC6000 SIS Series Digital Valve Controllers for Safety Instrumented System (SIS) Solutions Instruction Manual

Control and Safety Valve Diagnostics Unleashed: Enable Valve Alert Reporting on Non-Smart Communicating Systems



WARNING: This instruction manual supplement is not intended to be used as a stand-alone document. It *must* be used in conjunction with the following manuals:

Fisher® FIELDVUE® DVC6000 Series Digital Valve Controllers for Safety Instrumented System (SIS) Solutions Instruction Manual (D103230X012) and

The appropriate Safety Manual for FIELDVUE® DVC6000 SIS Series Digital Valve Controllers for Safety Instrumented System (SIS) Solutions (0-20 mA or 0-24 VDC [D103035X012] or 4-20 mA [D103294X012]).

It may also be helpful to reference the Instruction Manual Supplement for HART® Communicating Fisher® FIELDVUE® Instruments—Using FIELDVUE® Instruments with the Smart HART® Loop Interface and Monitor (HIM) (D103263X012).

Failure to use this application guide in conjunction with above referenced manuals could result in personal injury or property damage. If you have any questions regarding these instructions or need assistance in obtaining any of these documents, contact your Emerson Process Management sale office.



Introduction

FIELDVUE instrumentation provides NO EQUAL diagnostics capabilities that clearly differentiate Fisher control valve packages from other control valve packages. However, end-users often do not have a HART or fieldbus-capable control system that enables them to get the benefit of FIELDVUE diagnostic capabilities.

There are two easy ways to unleash the power of valve diagnostics in such an environment:

Wireless—the THUM® adapter, or

Hardwiring—using HART to analog converters

This document provides a hardwiring technical solution, using the **Smart HART Loop Interface and Monitor (HIM) from Moore Industries**, shown in figure 1, that will enable conventional analog control system users to benefit from FIELDVUE diagnostic capabilities.



Figure 1. Moore Industries HART® Loop Monitor

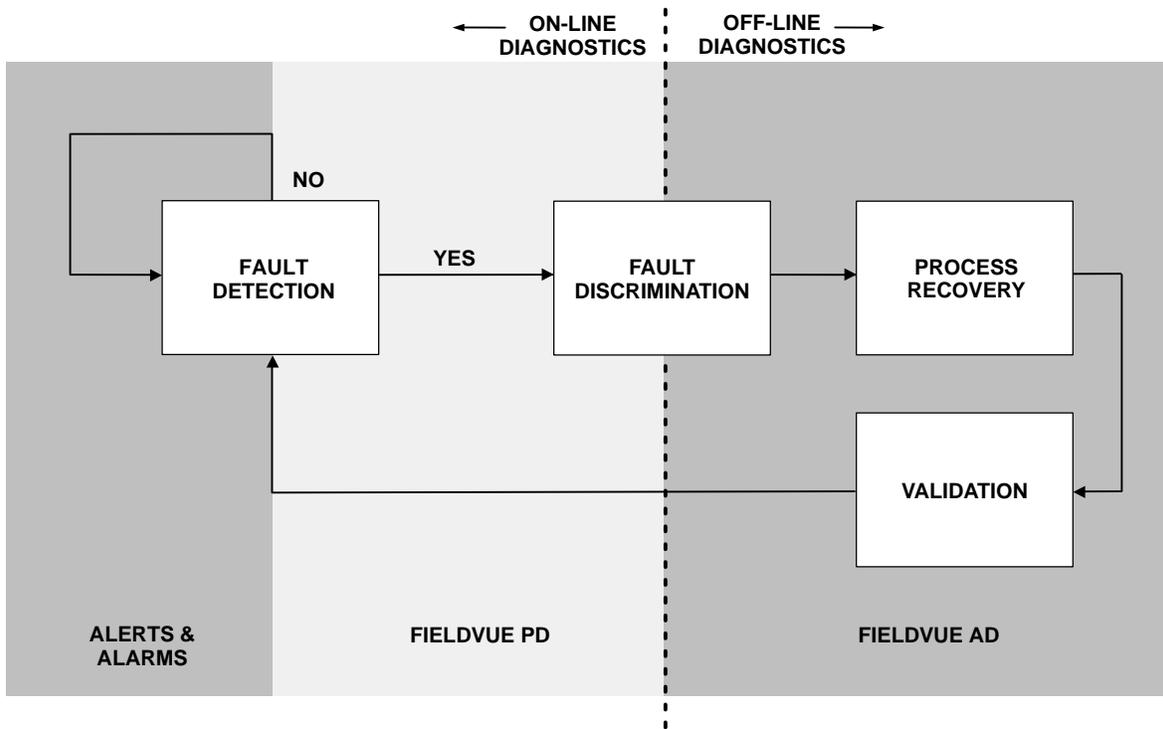


Figure 2. Four Phases of Valve Diagnostics

Using the Moore HIM to Convert a HART® Signal into Analog and Digital Control Signals

FIELDVUE diagnostics allow you to **better manage abnormal situations** and/or implement **preventive maintenance** on control and safety valves.

The practice of valve diagnostics includes four phases:

- Fault Detection
- Fault Discrimination
- Process Recovery
- Validation

The first phase, *Fault Detection*, is the only phase that requires a FIELDVUE instrument (as the *diagnostic tool*) to be capable of automatically reporting the unanticipated or abnormal situation. The other three phases can be performed by temporarily attaching asset management software to the FIELDVUE instrument.

By converting a HART signal into an analog and digital control signal, the Moore HIM can be used to automatically report a FIELDVUE instrument alert on a conventional analog control system.

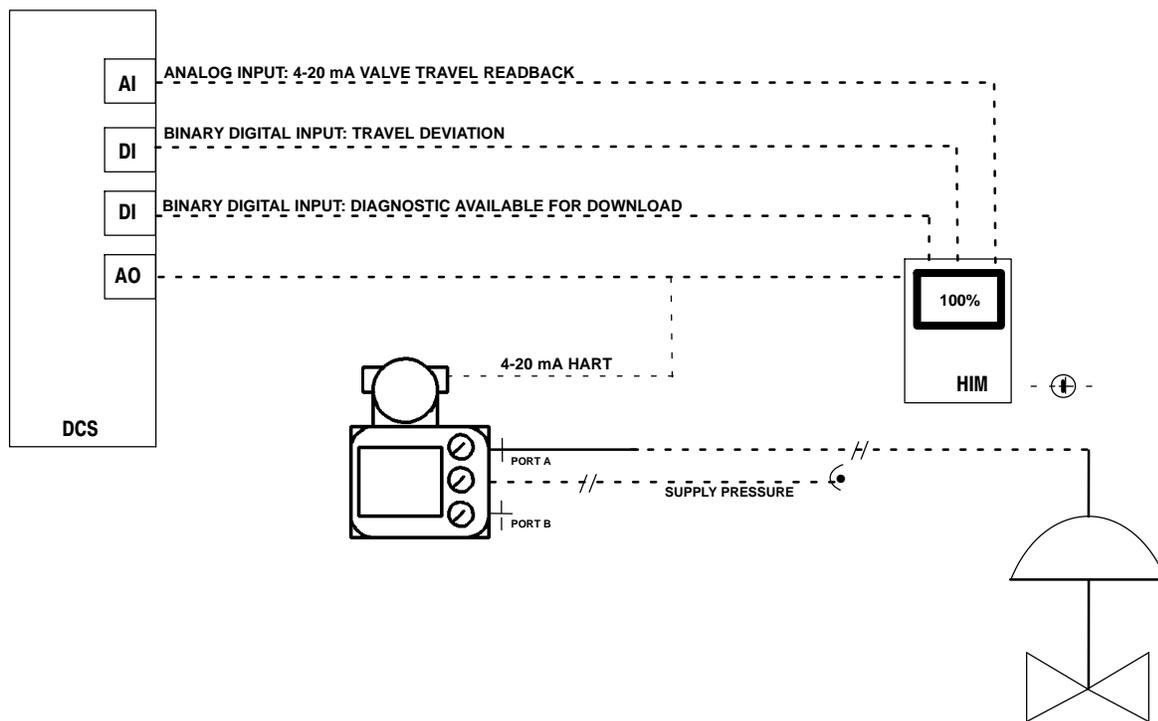


Figure 3. Using the HIM in a Conventional Analog Control System

Example: Control Valve

In this example, shown in figure 3, the HIM is used to automatically report on a conventional analog control system:

- the real valve travel is 4-20 mA analog input
- Travel Deviation alert is a binary digital input, and
- Diagnostic Data is available as a binary digital input

When the valve deviates from the set parameters, an alert is reported in the conventional system, allowing the operator to trigger a point-to-point diagnostic on the valve (*second phase of the valve diagnostic practice: Fault Discrimination*). In this same way, the Diagnostic Data Available alert indicates to the operator that the valve has deviated from the set parameters and that this data is available for download to facilitate the Fault Discrimination phase.

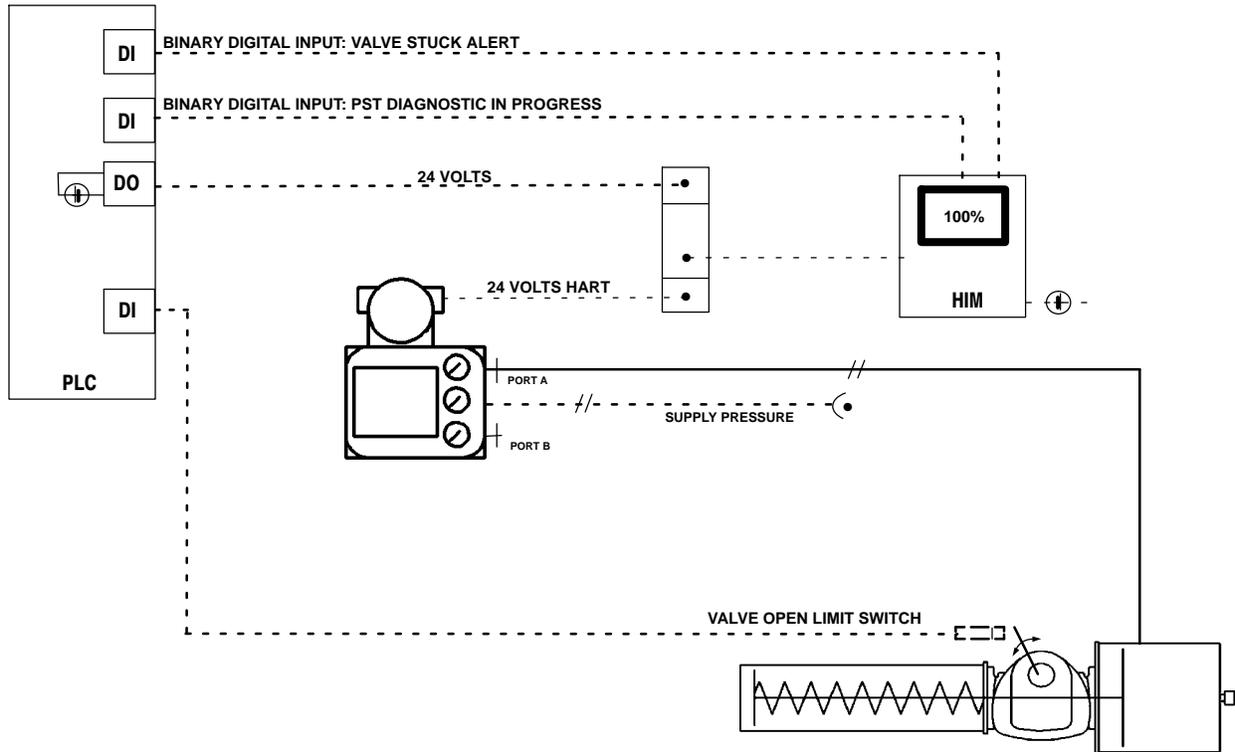


Figure 4. Using the HIM in a Safety Control System

Example: Safety Valve

The DVC6000 SIS digital valve controller can be used in conjunction with the HIM to provide additional diagnostic coverage. Installed transparently across the 4-20 mA or 24 volt instrument loop, the HIM receives the HART digital process data and converts the digital information into up to three scalable, isolated analog (4-20 mA) process signals and two relay outputs that are readily accepted by an existing safety or control system, such as the DCS or PLC.

The HIM can be used to hardwire to a PLC (through its two relay outputs) the following DVC6000 SIS alerts:

- Valve Stuck, and
- Diagnostic in Progress (PST in Progress)

The Moore HIM can also be used to automatically report the safety valve position. In some instances, this may eliminate the need for external limit switches.

Additionally, as shown in figure 4, the HIM can also be used to disable an open external limit switch on a safety valve during a Partial Stroke Test sequence.

Note

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