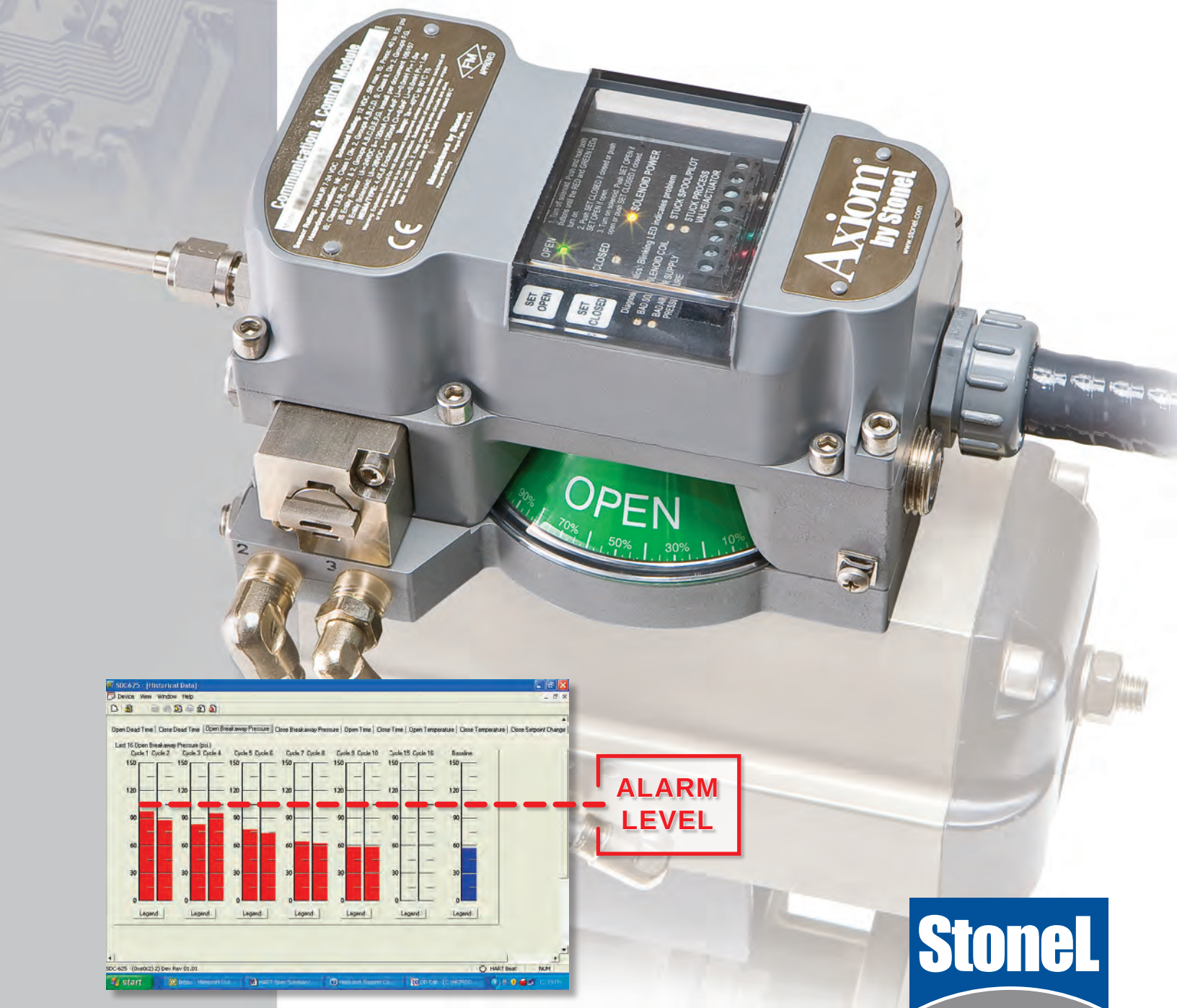
Axiom® with Diagnostics

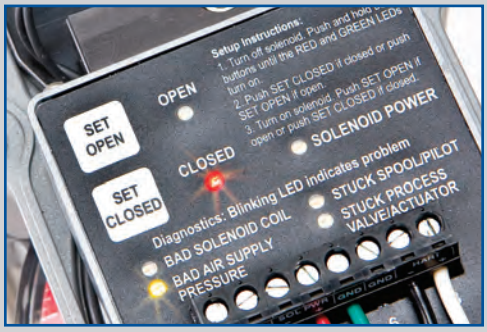
Detect automated valve problems ...before they shut down your process



ALARM LEVEL

Stonel

connecting the process



Reduce plant downtime and cut maintenance costs

The AXIOM AS-Interface and HART models feature on-board diagnostics that predict potential automated valve malfunctions. And, plant downtime may be reduced by repairing automated valves during planned shutdowns instead of process operations. If problems occur during process operation, maintenance personnel will be aided by rapidly locating failure causes, consequently speeding up valve repair and operation renewal.

Identify Potential Problems

Check Air Supply Pressure
Alerts are activated if low or high levels exceed preset thresholds that would threaten pneumatic valve or actuator performance.

Determine Solenoid Condition
Voltage and current levels are monitored to determine the health of the solenoid coil whenever energized.

Monitor Pneumatic Spool and Pilot Valve Operation
Pneumatic valve position is monitored to determine proper shifting performance when the solenoid is energized and de-energized.

Remotely Calibrate
Set-up may be performed through control system to establish end-of-travel indication.

Field Identify with "Winking"
To positively confirm the field device identity, the control room may initiate the "wink" function that flashes both open and closed LEDs without affecting valve operation.

Local Trouble-Shooting Display
Device LED array identifies problem sources for rapid trouble-shooting and maintenance at the valve/actuator site.

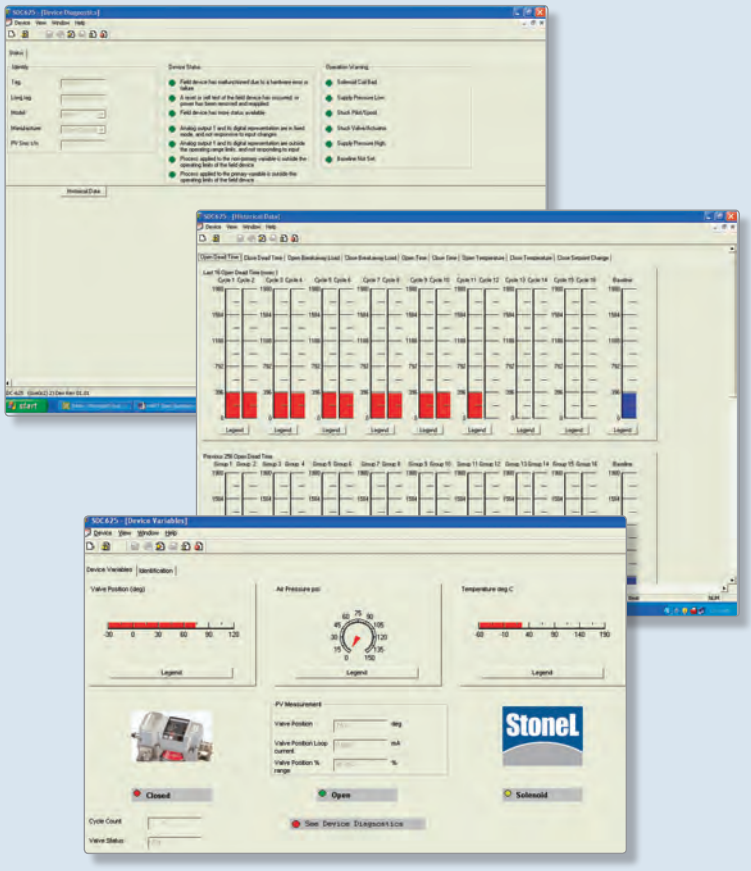
AXIOM with HART (AMI71) Features Comprehensive Predictive Diagnostics

The AMI71 is a valve monitoring and control device for discrete quarter-turn automated valves. Used in conventional applications, it has the added capability of providing diagnostic information for the pilot solenoid, spool valve, and actuator. And, the device stores historical data on each open and closed operation.

Excessive Valve Torque Changes
Open and closed breakaway actuator differential pressures are measured and compared to baseline levels during each operation. This enables operators to observe unusual pressure/torque level trends, which may ultimately lead to a malfunction.

Erratic Valve/Actuator Performance
Total travel time and dead time (time between energizing and initial actuator movement) are measured during each operation, recorded and compared to the baseline. This gives maintenance staff additional clues on potential automated valve problems.

Valve/Actuator End-stop Changes
Exact valve position is continuously measured and may be used to determine if changes have occurred at end of travel. Deviations from zero or span endpoints are graphically portrayed to alert maintenance staff of worn end-stops.



AXIOM with AS-Interface Diagnostics (AMI96) for Networking Applications

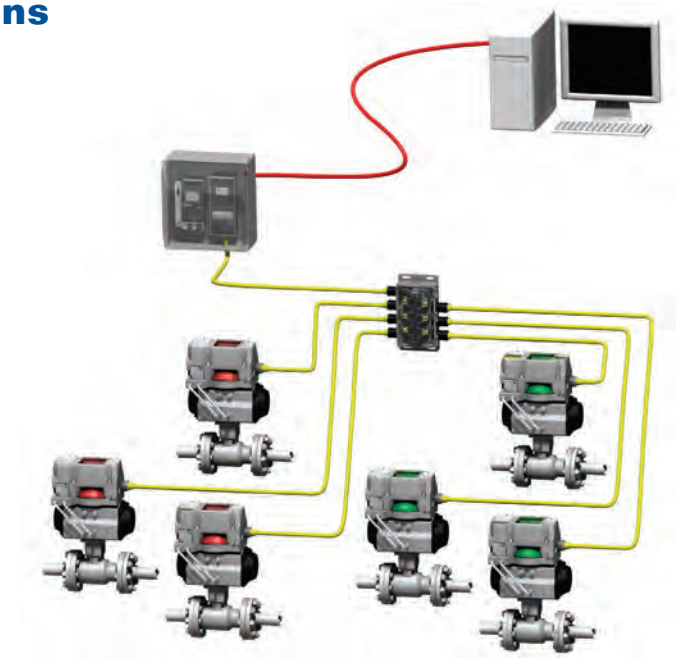
The AMI96 offers basic diagnostics for AS-Interface network applications that enables end-use customers to increase uptime and reduce maintenance costs. AXIOM AS-Interface diagnostic systems interface with any version 2.1 or greater masters/gateways.

Electrical connections

The Axiom with AS-Interface diagnostics uses standard (1-31) addressing with a 4DI/4DO profile to maximize the diagnostic data available via the network. Diagnostic units may be integrated on the same network as other AS-Interface devices.

Control System Interface

Interface up to 31 AXIOM units into your control system. Communication bits may be mapped into standard DCS or PLC as desired. No special software is required. See the StoneL FieldLink program for information about the cost saving benefits and easy installation of the AS-Interface protocol.

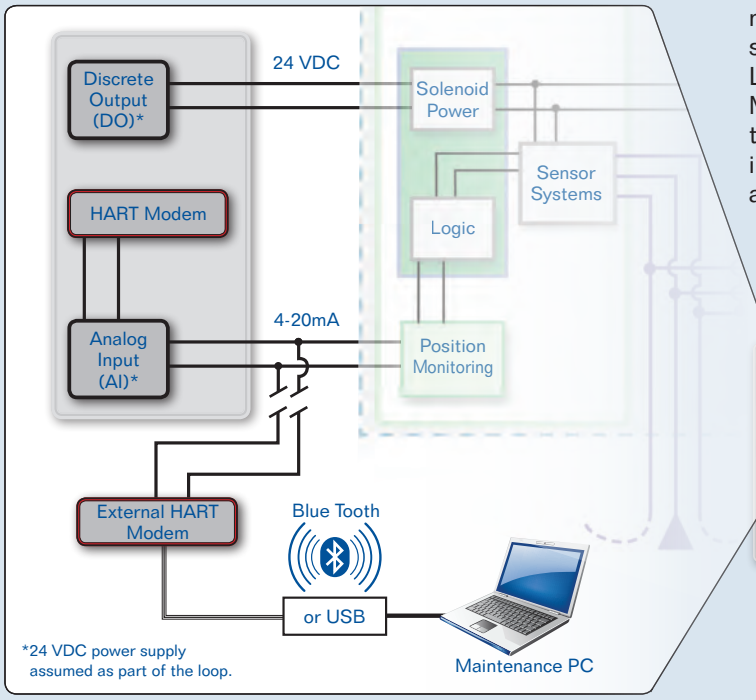


Integral c-module sensor systems and pneumatics are similar to the HART diagram below.

Easy Control System Integration

System Connections

Two, 2-wire connections attach to the control system to provide discrete solenoid control and continuous position monitoring. A standard 24VDC discrete output (DO) powers and controls the solenoid valve. Intrinsically safe solenoid pilot may also be selected. A conventional 4 to 20mA analog input (AI) provides continuous exact valve position feedback into the control system.

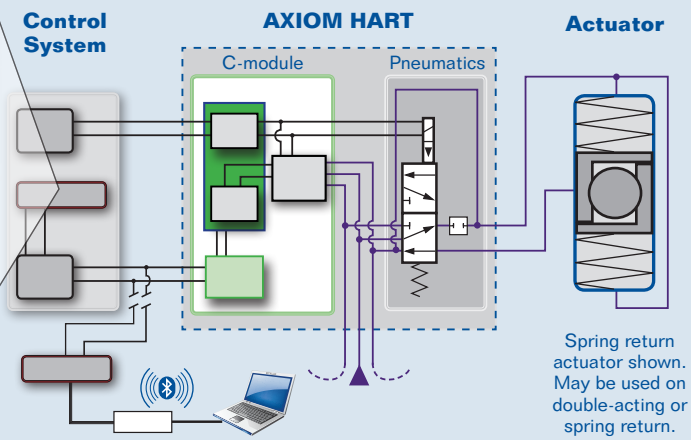


Diagnostics

The HART communication signal is overlaid on the 4 to 20mA analog position monitoring input. The signal may be read via internal modem in the DCS system or external modem. External modems may transmit information to a DCS or to a remote PC via a hardwired or a wireless connection.

HART Diagnostics Software Integration

Integration to various DCS or asset management systems may be achieved using open, standardized technologies such as enhanced EDDL (Electronic Device Description Language) or FDT/DTM (Field Device Tool/Device Type Manager). Most DCS vendors use one or both of these technologies, which provides open access to device intelligence and allows easy use of all features and benefits available from the AXIOM HART device.



Spring return actuator shown. May be used on double-acting or spring return.

Model Selector

AMI	Function	Pneumatic Valve	No Ext. Override	External Override	Latching Ext. Over.	Enclosure	Conduit/ Connectors	Capabilities	Visual Indicator
	71 4-20mA with HART Diagnostics *Select pneumatic valve option _D or _E* **96** AS-Interface *Select pneumatic valve option _D*	**Single Solenoid** 24 VDC (0.5 watt) 12 VDC Intrinsically Safe *(HART only)*	**1D** **1E**	**3D** **3E**	**5D** **5E**	**A** North America (NEC/CEC) **V** International (IEC) **L** Brazilian	**02** (2) 1/2" NPT **05** (2) M20 **10** (1) 4-Pin Mini-Connector (ASi) **11** (1) 5-Pin Mini-Connector (HART) **13** (1) 4-Pin Micro-Connector (ASi) **15** (1) 5-Pin Micro-Connector (HART)	**D** Diagnostics *(Available with Function 71 or 96)*	**RA** Red Closed/ Green Open

Manifold and mounting system required for all and sold separately.

Model Examples: **AMI711DA02DRA**
AMI961DA10DRA

(Note: Specify -T suffix for extended temperature.)

Specifications

General

Cycle Life	1 million cycles *(pneumatic valve dependent)* Cycle life may be extended by installing solenoid spool service kit ST604470.
Temperature Rating	-18° to 50° C (-0° to 122° F) Extended temperature when –T suffix specified. -40° to 80°C (-40° to 176°F)
Pressure Sensing Accuracy	± 2 psi (0.13 bar)
Supply Pressure	40 psi (2.7 bar) minimum 120 psi (8.2 bar) maximum

HART Diagnostic Specifications HART

Position Feedback	
Current Output	4-20mA
Voltage	14-30 VDC (24 VDC nominal)
Communication	HART Version 7.0
Loop Resistance	250 ohms (min.) to 500 ohms (max.) at 24 VDC
Position Accuracy	± 1% of full scale
Solenoid Power	0.5 watt (0.02A @ 24 VDC) 0.5 watt Intrinsically Safe (IS) (0.04A @ 12 VDC)

AS-Interface Diagnostic Specifications

Protocol	AS-Interface (AMI96) Version 2.1 or greater
Input Voltage	26.5 to 31.6 VDC (AS-I power supply)
Devices per Network	31
Input Configuration	(1) Open & (1) Closed (1) Low Supply Pressure (1) Bad Solenoid Coil or Stuck Spool/Pilot Valve* (1) Stuck Process Valve/Actuator *Indicated as ASi peripheral fault. Local display indentifies specific problem.
Output Configuration	(1) Discrete Output (1) Wink Operation (1) Remote Set Open (1) Remote Set Closed
Solenoid Power	0.5 Watt (0.02A @ 24 VDC)

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