

# HARTline

## The Power of HART Communication... See What You Can Do

Continuous device monitoring, real-time device diagnostics and multi-variable process information are within your grasp. Start using the HART-smart devices in your plant to their full potential and maximize your return – optimize assets, increase availability, lower costs and ensure compliance.

“HART devices are real-time data servers with two simultaneous communication channels on the same wire – the 4-20mA analog channel and the HART digital channel,” says HCF Executive Director Ron Helson. “Real-time integration with plant control, safety and asset management systems unlocks the Power of HART and allows users to realize the full potential of their HART-smart devices.”

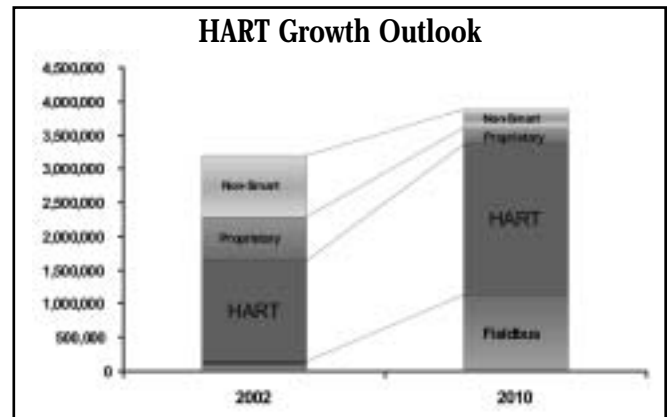
HART-enabled control system interfaces, remote I/O systems and software solutions make it easy and cost-effective to unleash the Power of HART and realize benefits in all phases of the Plant

Life Cycle: planning and engineering, installation and commissioning, operations and maintenance, and asset productivity improvement.

HART-enabled systems use both communication channels to unlock the value of intelligent device information and secure control loop integrity. Real-time diagnostics and predictive maintenance alerts enable problems to be detected within seconds and process disruptions to be avoided.

By using the full potential of the technology, you are able to leverage intelligent device

capabilities to improve operations, reduce time from problem identification to problem resolution, and continuously validate loop integrity and control information. In addition, real-time diagnostic alerts provide early warning to device or process problems.



## Troubleshooting Control Valves Made Easy Using HART

By Sandro Esposito, Dresser Masoneilan, Avon, MA

In this new era of plant management, two things are clear: many are continuously seeking methods for reducing the exposure of personnel to hazardous areas and many continue to expect more from reduced staffing. Don't you feel like troubleshooting control valves in a safe environment for a change? HART can help!

After personally spending many years as a field service engineer, I know how often valves can be installed in the most inconvenient locations and how much their performance can impact both the throughput and the safety of a plant. I think the following case studies effectively demonstrate the value and benefits of applying HART-enabled digital positioners in difficult environments.

**Case 1:** Operations from a major refining company, are complaining of an unstable control loop and suspect the valve as the problem.

This control valve is equipped with an advanced diagnostic version of the Masoneilan SVI II™ digital valve positioner. Using Masoneilan's ValVue2™ software connected to the marshalling cabinet near the control room, the trending feature is populated with the actual valve position, the control system's setpoint, via the HART Protocol.

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## Moore Industries' HIM HART Loop Monitor Facilitates Partial Valve Stroke Testing

Moore Industries' HIM HART Loop Monitor now has the ability to confirm that the Fisher® FIELDVUE® DVC6000 Series Digital Valve Controller is performing a partial valve stroke test to validate proper Emergency Shutdown (ESD) valve operation and, if the test has failed, to alert the user that the ESD valve is stuck.

As part of its unique HART diagnostic data, the DVC6000 Digital Valve Controller sends digital information on the HART loop when a partial valve stroke test is in progress or if the ESD valve is stuck. Mounted transparently on the HART loop, the HIM continuously monitors the HART data from the DVC6000.

When a valve stroke test is initiated, the HIM sends an alarm trip (relay) output to confirm that the test is in progress. Should the valve be stuck shut, the HIM initiates a second alarm to alert operator and maintenance personnel of the valve's potentially dangerous condition.

The HIM can also be set to send alarm trips outputs based on any of the DVC6000's diagnostic Field Device Status Byte data including if the standard HART fault conditions are detected: Smart Device Configuration Changed; Primary and Non-Primary Variable Out of Limits; Primary Variable Analog Output Out of Limits or Fixed; Cold Start; Field Device Malfunction and More Status Available.

The HIM's two or three analog outputs allow valve parameters, such as valve travel and output pressure, to be monitored and reported to the DCS via standard 4-20mA signals. [www.miinet.com](http://www.miinet.com)

## HART Enhanced DDL Validation Project Underway

In an effort to unify the Device Description Language across the major fieldbus technologies, HCF member companies from around the world are working in cooperation with HCF engineers on a validation project for new HART Device Description Language enhancements (eDDL). The project is under the direction of Ed Ladd, HCF Technology Programs.

"We are enhancing Device Description Language with an improved user interface that includes support for menus, windows, tabs and groups and added graphic support for graphs, trends, charts and dial indicators," says Ladd. "We are also providing added support for pervasive data storage and improved diagnostics for complex devices like radar level and the tracking of valve signatures."

Member companies participating in the eDDL Validation project are Berthold Technologies, Germany; Endress+Hauser, Germany; Endress+Hauser Flowtec AG, Switzerland; Fisher Rosemount Systems, US; Flowserve, US; Fluke, US; Fuji Electric, Japan; Honeywell, US and India; M-Systems, Japan; Meriam Process Technologies, US; Rosemount Analytical, US; SAAB Rosemount Tank Radar, Sweden; Siemens AG, Germany; Siemens Milltornics, Canada; and Westlock Controls, US.

## Cebrace Uses HART Functionality to Increase Plant Productivity

*By Rogerio Souza da Mata, SMAR, Brazil*

A year ago, Cebrace Cristal Plano, a large glass manufacturer in Sao Paulo, Brazil, completed a major plant upgrade using HART Communication to enhance data retrieval in their maintenance and diagnostic system. Their goal was improving overall plant maintenance quality by increasing the volume and quality of data received from plant equipment.

"Even though a Foundation fieldbus network was already in place in the plant, we chose to rely on a technology our plant technicians are more familiar with and feel more comfortable relying on in critical situations," says Benedito Adalberto Pestana, maintenance coordinator of Cebrace's engineering and automation department. "Using all the available functionality of HART instrumentation, we have increased productivity and availability with better product quality at a competitive cost."

According to Pestana, the benefits to Cebrace of using the full capabilities of their HART-enabled instruments include: an easy and quick way to monitor process conditions; reliability in the indicated and controlled process values; and productivity while diagnosing casual problems.

Pestana also notes that before the retrofit (from analog to HART) plant personnel had difficulties diagnosing and evaluating instruments real conditions. "In fact we only found a problem during regular preventive maintenance stops every three to six months," he says. "Using HART diagnostic capabilities, we now check instruments' health during daily maintenance routines."

Cebrace utilizes the Smar HART-to-FF gateway (HI302), AssetView® interface, and portable HART configurator (Palm HPC301/HPI311) to view and control instruments on both networks. The plant is built around a huge linear machine hundreds of meters long. Any disturbance can cause a major shutdown or, even worse, destroy the main oven.

"If this occurs, set up and restart lasts a minimum of 60 hours, which represents a cost of about \$30,000US in lost product," Pestana adds. "Through the use of HART technol-

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## Unleash the Power!

### HART Experts Show You the Way at ISA 2004

In one stop at the HART Booth (#1342), visitors to ISA can see new HART-based products from more than 20 of the world's leading process automation suppliers – control system interfaces, remote I/O systems and software solutions that make it easy and cost-effective to unleash the Power of HART and realize benefits in all phases of the plant life cycle.

The interactive HART booth features a wide array of new HART-enabled instruments, systems and solutions...showing practical ways to leverage the intelligence in HART-smart devices (using both 4-20mA and digital communication channels) to deliver continuous, real-time device diagnostics and process information.

Visitors to the HART booth will see the latest HART products and HART-smart solutions from participating HCF member companies: ABB, American Level Instruments, Emerson Process Management, Endress+Hauser, Eurotron, Fisher Controls, Flowserve, Harold Beck and Sons, Honeywell, Krohne, MACTek, Masonellan, Meriam Process Technologies, Micro Motion, Moore Industries, MTL, P+F/Elcon, Phoenix Contact, Rosemount, Siemens, SMAR, Spectrum Controls, Thermo Electron and Yokogawa.

Magician Paul Gertner performs in the HART booth every hour. His captivating show both entertains and educates attendees on the value and benefits of HART Communication. Gertner has appeared at The White House, on HBO, NBC's World's Greatest Magicians, and The Tonight Show.

Free copies of the newly updated 4th Edition *Complete HART Guide* CD-ROM are available to all visitors to the HART booth.

### PRODUCT SPOTLIGHT

The **Dresser Masoneilan HART-based SVI II Digital Positioner** fully integrates with AMS™ Suite software. By using the Emerson Process Management device driver (that is available for download at both the Emerson and Masoneilan websites), users can configure, calibrate and diagnose any control valve equipped with the Masoneilan SVI II.

By supporting features such as audit trail and calibration management, the driver provides the benefits of tracking the calibration history of valves and effectively planning resources for upcoming shutdowns.

The integration of AMS Suite and SVI is further enhanced with AMS ValVue2 SNAP-ON™ connectivity. This HART Communication software is launched from the AMS environment providing in-depth valve diagnostic capabilities and a user-friendly interface to commission control valves.

Features such as Setup Wizard, process trending, valve signatures, and device cloning are among the more powerful benefits of AMS ValVue2 SNAP-ON functionality.

[www.masoneilan.com](http://www.masoneilan.com)

### HART Plant of the Year Recipients to Be Announced at ISA

Recipients of the 2004 HART Plant of the Year Award will be announced to the world press at the HCF ISA Press Conference in Houston, Texas (Tuesday October 5). This is the first time the names of the selected plants have been withheld until the ISA show. The award is presented annually by the HCF to recognize innovative use of HART Communication in real-time process applications.

Even as the 2004 recipients are recognized, the HCF begins its search for 2005

candidates. If you are aware of a plant that is using HART Communication for more than configuration and calibration, or a plant that is using the real-time diagnostics and process variables of HART-enabled devices with its control system, then you have a candidate!

The HCF encourages nominations for HART Plant of the Year from all world areas. Nominations are accepted through May of each year. For more information on the HART Plant of the Year, go to [www.hartcomm.org](http://www.hartcomm.org).

### Cont. . . Cebrace Uses HART

ogy, we are able to maintain online preventive maintenance full time and reduce maintenance costs at least 50 percent."

"Our next goal is to have a link between our maintenance database software and the HART field device management tool (Smar Assetview)," Pestana adds. "Then we'll be able to automatically generate service orders for calibration or any maintenance action and ultimately realize more and more availability."

Pestana also notes that Cebrace personnel are very satisfied with their HART-based upgrade because "we know we are using the most advanced instrumentation in the market and can

rely on invaluable support from our partnership with SMAR."

HART integration via Smar AssetView allows Cebrace to monitor process-related variables, diagnostic status, and information 24 hours a day, seven days a week, and to access all field devices from every station plantwide (even worldwide if an Internet connection is available) in a single, web-based, integrated software environment ([www.smar.com](http://www.smar.com)).

For a more information on the Cebrace application, look for HARTLine 2003 No. 4 at [www.hartcomm.org/news-main/newslettermain.html](http://www.hartcomm.org/news-main/newslettermain.html).

## Cont. . . Troubleshooting Control Valves

The resulting graph depicts a stick-and-slip problem induced by unwanted friction in the control valve, inducing instability in the control loop. Identifying the underlying problem eliminated the need for sending personnel in the field, reduced the troubleshooting time and provided key information to prepare the work order (order parts, schedule maintenance, etc).

If this valve had not been fitted with a HART-enabled positioner, it is likely that a crew would have had to obtain work permits, investigate using proper protective equipment, and worst of all, go in with an uncertainty of the root cause.

**Case 2:** Utilizing diagnostic data to establish predictive maintenance at a major chemical plant.

A control valve maintenance budget is the second in importance for most industrial plants, mainly because of a reactive and/or an unnecessary preventive approach. Using the diagnostic data provided via the HART Protocol, a chemical plant is predicting the life of bellows seal equipped valves.

These engineered sealing mechanisms are costly to replace in parts, time and in the procedure of handling dangerous chemicals. Our SVI™ positioner family maintains in its non-volatile memory, real-time information such as time open, closed and near closed. Combining this data with the cycles and the travel odometer, this customer obtains the remaining life of the bellows.

According to the chemical plant personnel, significant maintenance cost savings were realized.

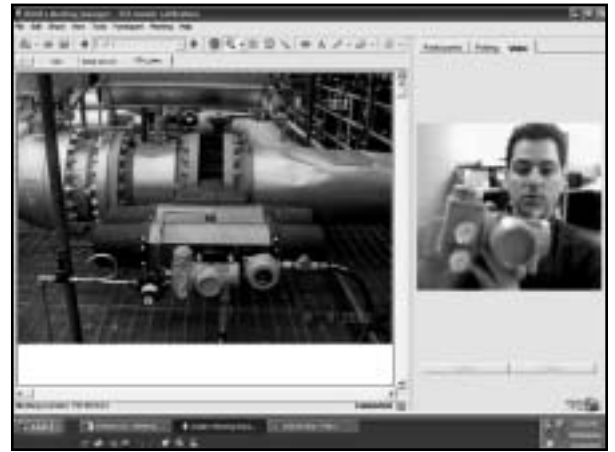
**Case 3:** Express assistance required from a factory expert in a secluded region.

Here, a control valve was not behaving properly to a setpoint change, which prevented ramping up the plant to its normal throughput. The site was in a secluded area in South America that would require at least 24 hours to access.

Using a secured Maseonilan website, the factory expert and site technician were connected in seconds. The site technician was running ValVue2 software and was connected to the HART-enabled positioner. The factory technician was remotely viewing the software. In no time, the problem was identified—inappropriate calibration of the positioner—and quickly resolved.

As these cases illustrate, the HART Protocol is a proven transport mechanism of field device information over an existing twisted pair of wires that allows users to assess the health of control valves in a safe working environment.

With the growing popularity of HART over the past 10 years, it is now easier than ever to take full advantage of the diagnostic data from HART-based devices. Software, hardware, system integration and sophisticated



Valve in secluded area; Factory expert, 4000 miles away; Secure website

troubleshooting packages are widely available and waiting to be deployed in any environment.



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COMMUNICATION FOUNDATION

9390 Research Blvd. Suite I-350  
Austin, TX 78759-6540 U.S.A.  
512-794-0369, FAX 512-794-3904  
HCF Europe +41 (0)61-333-2275  
[www.hartcomm.org](http://www.hartcomm.org)

Ron Helson, Executive Director  
Jean-Luc Griessmann, HCF Europe  
Wally Pratt, Chief Engineer  
Paul Baker, Support Engineer  
Ed Ladd, Technology Programs  
Keith Kleinschmidt, Support Administrator  
Irina Kadukova, Training/Web Support  
Melissa Boyd, Administration  
Liz Patranella, Media Relations

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**HCF Membership** is open to anyone interested in the use of HART technology. Join now, share the benefits!

**Organization...** Not-for-profit user funded.

**Expertise...** Vendor-neutral technical support, training.

**Standards...** Best practices and technology specifications.

## Welcome New Members

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