

Pepperl+Fuchs GmbH – Lilienthalstrasse 200 – 68307 Mannheim – Germany

Please indicate the following contact information for publication:

Tel.: +49 621 776-2222, Fax: +49 621 776-27-2222, www.pepperl-fuchs.com, pa-info@de.pepperl-fuchs.com

Editorial contact: Christa Blas (extension: -1420, fax: -1108), cblas@de.pepperl-fuchs.com

More Information from the Process

The new HART Loop Converter from Pepperl+Fuchs increases the performance of 4...20 mA field devices in many process automation applications. This device converts up to three digital HART variables that could include the 4...20mA transmitter current signal and makes them available to the host control system. These three variables enable not only the actual measured result but also process-related parameters such as reaction-time and temperature to be determined and used selectively to control the process – using the same cable and incurring no extra cost.

The bi-directional communication between field devices and host systems via HART protocol is standard practice in the process industry today. Due to the existence of the standard, digital HART protocol, the potential of more intelligent field devices is increased and the need for a universal fieldbus for process data is essentially not required. Supporting this position is the fact that the majority of actuators and sensors are now HART-compatible. These types of instruments are used for measuring process variables like flow, level, temperature, pressure or pH value, and have proven their worth over many years in the field. The advantages of HART protocol range from safe plant operation to diagnosis options and higher flexibility. Furthermore, the conventional, analog 4...20 mA Interface in a 2-wire system can continue to be used, so there are no extra costs for the customer.

<<Fig. 1>>

HART is a protocol for Master/Slave communication and permits up to two master devices - primary and secondary. The primary devices are host devices, such as a DCS, while a secondary may, for instance, be a handheld communication device. A secondary device can be installed without any adverse effect on communications between the field device and the host. There are two modes for bi-directional communication. The modes used regularly are Command and Answer, in which the field device is polled to provide dynamic measured values or instrument data. In order to increase the sampling rate, the burst mode can be used. In this case, the field device provides an updated measured value packet three to four times per second without the need to be polled. However, the burst mode is only appropriate

for point-to-point connections. The measuring circuit includes a HART-compatible field device that is linked to a control system via an analog 4...20 mA interfaces in a conventional 2-wire system. HART communication between the master and slave also takes place over this connection.

Increase process safety

For the set-up of efficient HART infrastructures, Pepperl+Fuchs supplies a variety of components that form the so-called HART Interface Solution (HIS). This includes devices for single circuits and multiplexers for up to 7,936 field devices.

<<Fig. 2>>

A recent innovation from Pepperl+Fuchs for individual field circuits is the HART Loop Converter (HLC). It converts the digital HART signals into analog 4...20 mA current signals. Here, up to three digital HART variables are captured and made available to the host system, or DCS, in the form of analog signals. These three HART variables enable not only the actual measured result but also process-related parameters such as reaction-time and temperature to be determined and used selectively to control the process!

<<Fig. 3>>

<<Fig. 4>>

This functionality for the control and monitoring of the process provided by the installed HART field device is possible without any additional cabling or modification of the infrastructure. If required, the HART Loop Converter can also be programmed to enable a single digital value to be split via a signal splitting feature that makes the signals an output on three analog channels available to a variety of systems. In addition, it is possible to perform limit switching via an optional relay. The HLC can be used as a transmitter power supply. It can also be used on a pre-existing field circuit in passive mode. The HLC only evaluates the HART signal. Analog measured value information cannot be processed. The HLC converts the digital HART data into analog 4...20 mA outputs. The 4...20 mA signal from the transmitter is not directly repeated; rather, the primary variable can be selected and converted into an equivalent 4...20 mA output signal. As soon as the HLC detects a connected HART field device, it sets the field device via a HART command into burst mode where an updated measured value packet is automatically transferred three to four times a second. These signals are then converted into analog or relay contact limit outputs. Additional isolated barriers for explosion protection are not required due to the intrinsic safety circuitry on the input.

Real-time corrosion monitoring

The combination of the HART Loop Converter with an online corrosion transmitter illustrates the new opportunities available to the operator. CorrTran MV from Pepperl+Fuchs is the first 2-wire 4...20 mA transmitter with HART protocol that simultaneously evaluates general and localized corrosion (pitting). Why is this so important?

Corrosion causes enormous damage in plants and facilities. Steam generators in particular are exposed to these expensive effects. The pure water required is not just corrosive to steam generators and condensate systems; it can cause leaks that result in unwelcome chemicals entering the process and further increasing the potential of corrosion.

<<Fig. 5>>

With CorrTran MV, it is possible to monitor the corrosion behavior in real time and react to it before more damage occurs. This means that corrosion analysis has been moved out of the laboratory and into daily process control: a new approach for monitoring corrosion in real time. Therefore, the operator is in a position to monitor the process optimally in the framework of predictive maintenance.

The central elements of CorrTran MV are modern, patented algorithms and data analyses, which measure general corrosion rates and localized corrosion (pitting). To determine the general corrosion rate, the measurement of linear polarization resistance is used. In addition, during a measuring cycle, the corrosion sensor carries out an electrochemical noise measurement which allows a measurement of pitting. At the end of each cycle, the corrosion rate and pitting value are calculated and made available to plant personnel in the form of a 4...20 mA signal via HART. The HART Loop Converter expands the analog process information with the additional data in the HART variables.

Summary

The operator has the opportunity to expand the potential of new and installed HART devices with the HART Loop Converter from Pepperl+Fuchs. The HLC is suitable for measurements such as mass flow rate, temperature and pressure, as well as for positioners or the CorrTran MV online corrosion transmitter. So, with limited extra effort, more comprehensive measurement and diagnosis information is available to the user - all via a 2-wire cable.

About Pepperl+Fuchs

Pepperl+Fuchs is a leading developer and manufacturer of electronic sensors and components for the global automation market. For more than 60 years, our continuous innovation, high quality products, and steady growth has guaranteed us continued success.

One Company – Two Divisions

Pepperl+Fuchs – PROTECTING YOUR PROCESS

The **Process Automation Division** is a market leader in intrinsically safe explosion protection. We offer comprehensive, application-oriented system solutions, including customer-specific control cabinet solutions for the process industry. A large portfolio of components is available from our various product lines: isolated barriers, fieldbus infrastructure solutions, remote I/O systems, HART interface solutions, level measurement devices, purge and pressurization systems, industrial monitors and HMI solutions, power supplies, separator alarm systems for oil and petrol separators, signaling equipment, lighting as well as emergency shutdown equipment and accessories.

Pepperl+Fuchs – SENSING YOUR NEEDS

With the invention of the inductive proximity sensor in 1958, the company set an important milestone in the development of automation technology. Under the motto “Sensing your needs”, customers benefit from tailor-made sensor solutions for **factory automation**. The main target markets of the factory automation are machine and plant construction, the automotive industry, storage and material handling, printing and paper industry, packaging technology, process equipment, door, gate and elevator construction, mobile equipment, renewable energies.

The division offers a wide product range of industrial sensors whether it’s inductive, photoelectric or ultrasonic sensors, rotary encoders, identification systems, barcodes, code readers for data-matrix-codes and vision sensors.

Key words: HART Loop Converter, signal Converter, HART protocol, HART Interface Solution, HART signals, HART variable, analog signals, corrosion monitoring

Author: Dipl.-Ing. Stefan Pflüger
Product Marketing Manager Interface technology
Division Process Automation

Characters: 5,893, without space characters

Characters short text: 501, without space characters

Pictures: No. MC7522_100816_06, No. 4676_080130_02,
No. MC7522_100816_04, No. MC7522_100816_05,
No. MC7522_100817_01

August 2010

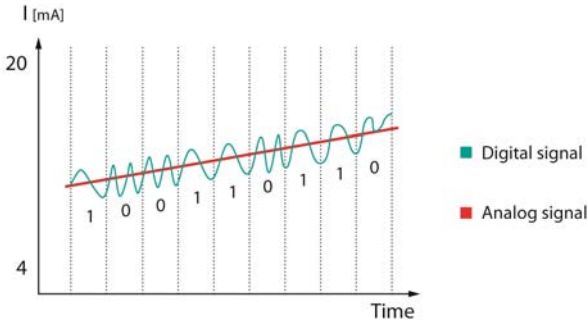


Fig. 1: Simultaneous transfer of analog and digital signals



Fig. 2: More information with the new HART Loop Converter

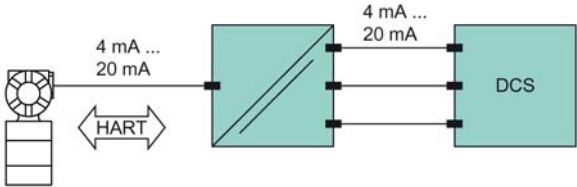


Fig. 3: HART Loop Converter as a supply device

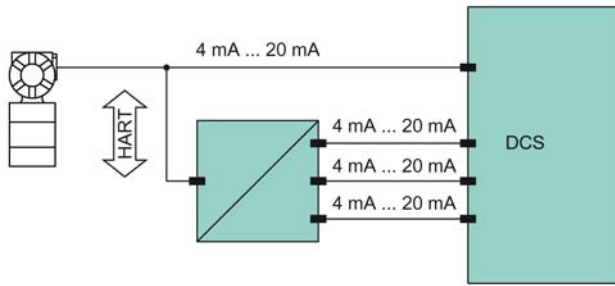


Fig. 4: HART Loop Converter as a supplement to an existing installation



Fig. 5: CorrTran MV compact version