Yamatake's Fieldbus Solutions

Technologies Flourish with FOUNDATION Fieldbus

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Yamatake Corporation

YAMATAKE

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The Yamatake Group is celebrating its 95th year as a leading supplier of advanced measurement and control technologies to the process, factory and building automation industries. Under a major consolidation and reorganization completed in 1998, the Group substantially upgraded its capabilities to promptly deliver world-class products and services to customers of process, factory and building automation.

In the process industries, Yamatake has installed thousands of Distributed Control Systems and solutions since 1975, as well as delivered millions of Smart Field Instruments, such as pressure transmitters, electromagnetic flowmeters, control valves and smart valve positioners, to the global market.

As one of the founding members of the Fieldbus Foundation begun in 1994, Yamatake has been pursuing Fieldbus technology from the start, and has been contributing to both technology development and marketing promotion of the FOUNDATION fieldbus.

The Digital Era

Sensing, control and actuation are the basic elements of process measurement and control systems, and Yamatake has been developing these elements in all eras of instrumentation, such as pneumatic, analog and digital instrumentation.

Thanks to the latest digital technology developed over Yamatake's long history, the three elements may be freely allocated in such appropriate locations, as field instruments and digital control systems. FOUNDATION fieldbus technology offers the freedom to use them by specifying digital protocol and Virtual Field Device Model for flow, level, temperature and pressure measurement and control equipment.

Yamatake has now completed a strong platform for executing the three elements of sensing, control and actuation by combining Yamatake's own measurement and control technology with that of FOUNDATION fieldbus. This systematic integration, through a field-based, bottom-up approach, can only be achieved by Yamatake's field expertise acquired over the years.

Solutions and Advantages

From basic measurement and control through to advanced information management, such as diagnostic systems, Yamatake offers a number of unique solutions through its "Industrial DEO System" - Dependable and Open System, and Smart Field Instruments.

Reliable, field-proven transmitters such as "ST3000 Series S900" for pressure, "ThermoPLUS" for temperature, the most robust electromagnetic flowmeter "MagneW 3000 PLUS HENRI", remote-installable valve positioner with valve diagnostic algorithm "AVP203", and the world's smallest field mountable BTU analyzer "HGC303" are examples of Yamatake uniqueness for solving the customer's problem in a "smart" way.

As a control valve specialist with 70 years' experience, we provide sophisticated calibration function, mechanical diagnostic and plant/process diagnostic functions, as well as asset management solutions with built-in CV diagnostic data processing.

System engineering to build up solutions in process control, as well as maintenance capabilities and even energy metering applications are also part of Yamatake's competitive deliverables.

Users of Yamatake instruments and systems can now enjoy solutions with such advantages as significant energy, time and cost savings.

Our Commitment

Yamatake will continue to provide field level modernization solutions with the introduction of new types of digital field instruments, asset management solutions and instrumentation engineering services.

It will also offer production information management solutions to meet global user demands for quality, delivery and productivity improvements.

Yamatake is committed to delivering the most optimum solutions to customers while improving fieldbus technology itself.

Smart transmitters are now fieldbus-enabled

ST3000/S900 series pressure and differential pressure transmitters have been Yamatake's most popular transmitters worldwide since 1983 because of their high reliability in process measurement. These robust transmitters now have the extra feature of adding FOUNDATION fieldbus to an already great design for users' measurement and control requirements.

S900 fieldbus transmitter is equipped, not only with a fieldbus H1 communication chip and an AI function block, but also with a PID algorithm and a unique DIAG function block. The PID algorithm is incorporated into the design of the robust DCS controller to ensure precise control even out in the field. The algorithm is programmed into the fieldbus architecture, which is the instrumentation industry's first open-platform electric protocol. The DIAG function block enables diagnostic parameters for self-diagnostics, and can also be programmed to perform routine maintenance, which keeps the cost of ownership low.

However, interoperability is the most appealing aspect of fieldbus for instrumentation because it allows devices from different vendors to be used together. That is why Yamatake has been working with other manufacturers to develop instrumentation solutions that satisfy both the vendor and user communities.

MagneW flowmeter is fieldbus-enabled

Flow measurement is one of the most important variables in an application's instrumentation measurement and control scheme. For measuring liquid flow, an electromagnetic flowmeter, such as Yamatake's MagneW, is considered an ideal choice, especially in applications involving liquids with a conductivity of 3 S/cm or greater.

Fieldbus technology provides significant improvements in each phase of installing a MagneW electromagnetic flowmeter. In the procurement phase, for example, users only need to consider material for the process because other parameters are configurable from the host. In the engineering phase, set-up parameters for are no longer separated from system parameters. They can be found in the host's synchronized database (i.e. CAL_Hi/Lo, range, unit and revision No). In the commissioning phase, simulated PV is the most convenient function for the test procedure. In the operating phase,

parameters such as alarm states and values (i.e. totalized flow) provide operators with real-time data from the process. And finally, in the maintenance phase, calibration parameters, including size and Ex_Factor, can facilitate maintenance operation in the event of an error message.
Yamatake states that MagneW demonstrates its commitment to supplying "solutionoriented"
fieldbus products to its customers worldwide.

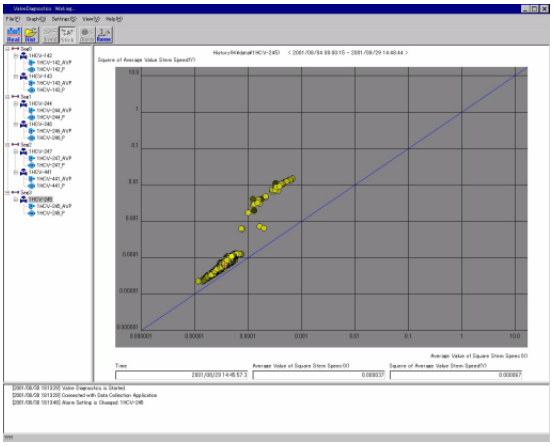
Smart Valve Diagnostics To Prevent Abnormal Situations In Process Operations

Problems in field instruments, especially control valves, cause abnormal situations where process operations cannot be effectively continued. In order to avoid such situations, frequent maintenance of control valves, which requires huge amount of time and cost, is necessary in daily plant operations. Yamatake introduces "Smart Valve Diagnostics" the first preventive solution which enables the process operator and/or maintenance engineer to understand the valve's condition and decide the necessary recovery and maintenance action BEFORE the process actually goes into an abnormal situation.

Smart Valve Diagnostics consists of three major functions:

- Real-time and direct monitoring of control valve behavior.
- Early detection of abnormal and unexpected situation of the valve.
- Alert and suggestion to authorized persons.

Real-time/direct monitoring and Early detection are well packaged in Yamatake's SVP3000 Alphaplus Series AVP303 and AVP203 Fieldbus-compatible smart valve positioners together with its unique diagnostic algorithm. Alert and suggestion are provided by a package software running on the customer process operation system which is connected to AVP303/203 via



FOUNDATION fieldbus.

Yamatake's innovative diagnostic technology in AVP303/203 goes far beyond what have traditionally been considered "diagnostic" functions - that is, the monitoring of such valve parameters as total valve stem operating distance and response time.

Statistical analysis, then, is done periodically in a framework of FOUNDATION fieldbus architecture to calculate reference indexes to represent current valve conditions. This condition information is published to the process control system to be subscribed by alert software. This new approach not only includes signal processing and failure identification criteria, it also predicts the direction of valve performance which may worsen over time due to unexpected causes. For example, valve stick monitoring and early detection algorithm are designed by systematically modeling failure mechanisms to enable the diagnosis of sticky valve stem motion in slurry applications.

One of the customer installations of Smart Valve Diagnostics reported that the process downtime for maintenance would be reduced by over six hundred hours per year.

Yamatake is working to develop more advanced solutions that help customers in solving problems with field instruments, as well as time and cost saving both.

Yamatake offers new temperature enabler

Temperature transmitters are a costly investment for a plant. However, customers' requirements for these devices are becoming increasingly important as they seek to ensure production of economical, high-quality products. In response to these needs, Yamatake has enhanced its ThermoPLUS line of transmitters. The new ThermoPLUS features a fieldbus interface, which makes it a great temperature transmitter, as well as a temperature enabler and controller running on an open architecture.

The new ThermoPLUS has been designed to accept signals from temperature sensors, such as thermocouples. It can accept inputs of different voltages, and is capable of outputting converted variables and parameters to an H1 line in compliance with FOUNDATION fieldbus standards by using Yamatake's own DIAG function block. Other ThermoPLUS functions for field measurement and control interoperability include:

Analog input: three from two raw inputs,

one terminal temp., one differential temp. for both inputs combined

- Selector: input selector (1)
- Chracterizer: Signal characterizer (2)
- Diagnostics: DIAG (1)
- Control: PID (2)

Open control technology has had its limitations until now. However, an open control architecture is a step toward building a fully functional process automation system. Yamatake believes the FOUNDATION fieldbus architecture will be widely recognized as the obvious choice for realizing future open control architectures. As a result, Yamatake's fieldbus devices are being designed for the next stage in process automation.

Fieldbus Foundation MEMBER

Refined in the Field — Yamatake

Let us solve your problems with our latest line-up of innovative products and systems built on fieldbus technology and expertise refined in the field.

ST3000 Series 900
Smart Pressure Transmitter

MagneW3000 PLUS
Electromagnetic Flowmeter

ThermoPLUS Advanced
Temperature Transmitter

Control Valve and SVP3000
Alphaplus Smart Valve Positioner

Industrial-DEO
Open Automation System

At Your Service

Established in 1906, Yamatake is a leading manufacturer in the field of measurement and control. We have installed millions of field instruments — pressure transmitters, electromagnetic flowmeters, control valves, valve positioners, as well as process automation systems — all over the world.

Integrating unique technologies with field expertise, we work closely with our customers at their site to be sure of providing the optimum solution.

At Yamatake, we help our customers to boost productivity, safety, and convenience while reducing energy use and running costs.

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