

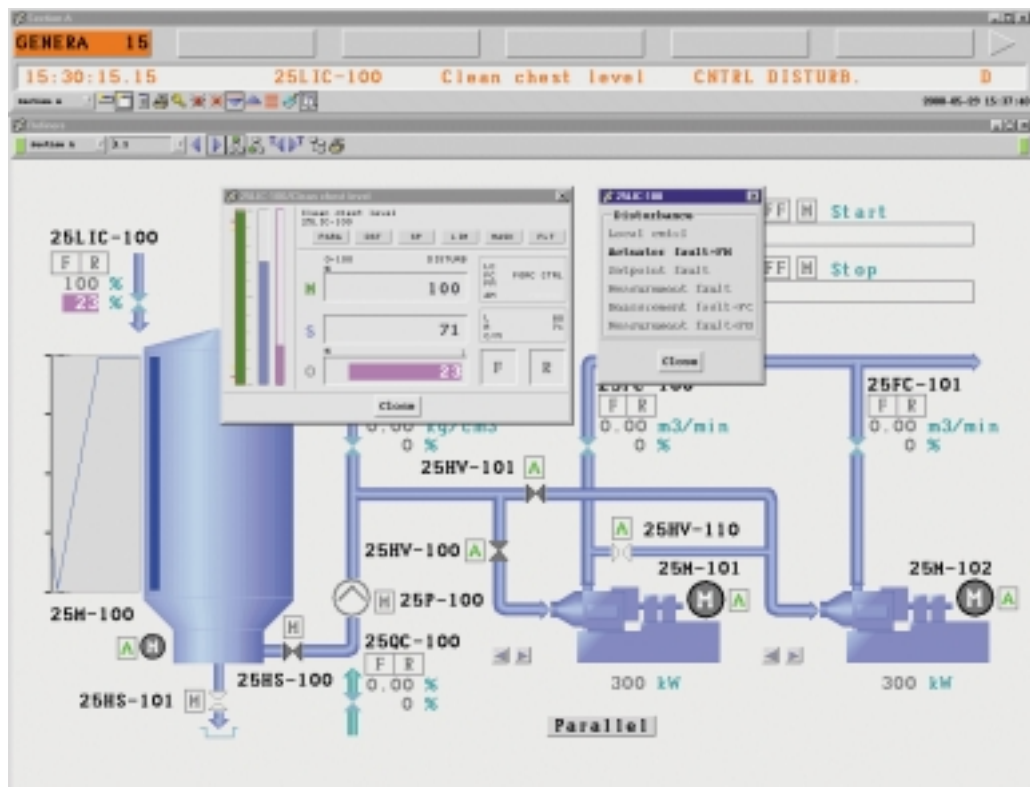
A field bus is a digital two-way multi-drop communication link, or in other words, a local area network (LAN) for field devices. Traditionally, control signals (process variable and set point) have been transmitted by varying current from 4–20mA corresponding to the range of the device. In a field bus this control signal is transmitted digitally. This method of digital transmission also allows for additional status and diagnostics information. TEXT: OLIVER JENKINS, ELLA SUOJALEHTO, JARI VEHMAS

The time is right to consider FIELD BUS

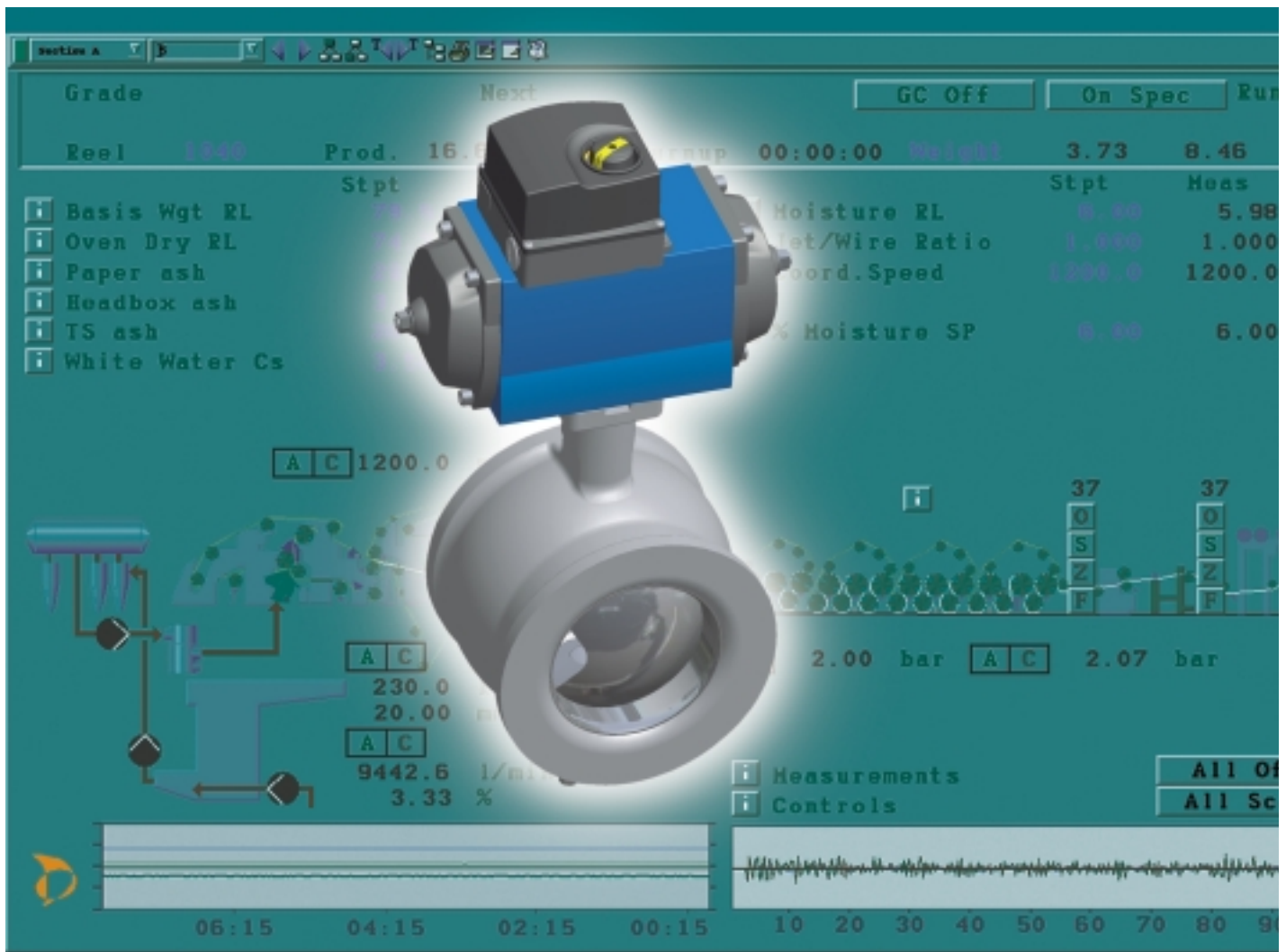
A field bus (of one type or another) can be found across the whole plant structure. From Ethernet, through industrial LAN to control networks and discrete devices, it can bring a broad range of generic advantages. Field buses can also bring significant benefits to manufacturing systems in process control.

Customer choice

Metso Automation supports both the major process control field buses, Profibus and Foundation Fieldbus, throughout its field devices and control systems. Alongside this, the company strongly supports sensor device networks AS-interface (ASi), DeviceNet, and Modbus.



Real-time diagnostics information from field-bus-based devices substantially benefits process management.



Fast and accurate control performance cuts down process variability.

The decision over suitability for specific applications is a complex one, but basically Profibus evolved from PLC architectures and has advantages in manufacturing system integration, installed base, component availability and relative cost. Where Foundation Fieldbus has its strengths is in the areas of advanced control strategies, simplified interfaces and the potential for greater data flow when taking advantage of field based control.

To date, focus on field bus has strongly emphasized the initial capital expenditure savings, such as wiring, I/O, system hardware and system engineering. Metso Automation is focused on ensuring these generic benefits, but in addition, focuses on the entire lifecycle of the plant, including the capability to improve production efficiency and reduce running costs.

Generic benefits

Whether the protocol is Foundation Fieldbus or Profibus PA, there are significant benefits over traditional 4–20mA systems.

Lower initial expenditure are achieved through reduction in cabling and I/Os. This impacts engineering, cabinet space and commissioning.

Production efficiency is achieved through flexible control strategy implementation and faster response (elimination of A/D converters on the control side). Fast and accurate control performance cuts down process variability.

Life cycle cost savings: On-line diagnostics enables focused maintenance planning, rapid root cause troubleshooting and reduction in shutdown spares usage. Information exchange with the field device

is faster and more reliable than before. An increased flow of information, directly to advanced control systems has a strong impact on operational expenditure.

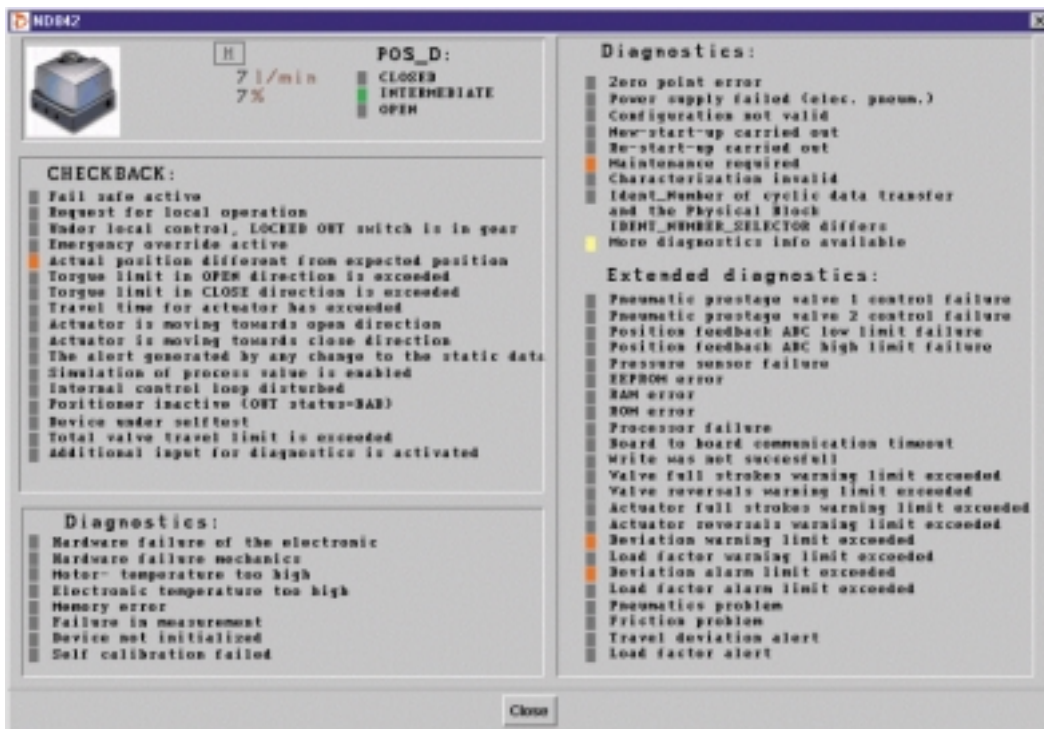
Personnel safety: Diagnostic collection and storage inside the device can significantly reduce the number of trips into the field. This is particularly important in keeping safety integrity levels (SIL) to a minimum.

Easy set-up and commissioning: With a single segment running out to several devices, the need for cable checks is significantly reduced. Building or modifying control strategy is significantly simplified with the introduction of concepts like standard function blocks. Some device manufacturers have ensured that local keypad calibration, popular in HART devices, is also available for the field bus. Whilst support-

ing generic configurator software from the Foundation Fieldbus or Profibus, Metso Automation is committed to the only open protocol multi-vendor device management software based on the Field Device Tool (FDT) specification.

Field bus is a building block for Future Care

Field bus is an important technology in Metso's Future Care concept. Future Care is a long-term partnership providing technology know-how and resources to complement the plant owner's capabilities throughout the life cycle of the process and equipment. The integration of the plant assets and production information, which the field bus will ensure, is a key element in strengthening the plant competitiveness.



To ensure the optimum solution for specific applications, Metso Automation has developed ND800 for both Foundation Fieldbus H1 and Profibus PA.

Field bus is an important technology in Metso's Future Care concept.

While the purchase of an asset or technology can be relatively simple, obtaining the best performance from it is more difficult. Future Care tools and solutions are designed to build long term knowledge out of the information the field bus devices provide. This knowledge is used to improve process performance, drive down maintenance costs and minimize shutdown time.

Metso Automation's Field Bus products

Smart-Pulp PA

Easy access for calibrating or reading diagnostics data is essential for most of the analytical transmitters in the pulp and paper industry. Often grade changes or unexpected process disturbances can cause headaches for operators.

For example, consistency transmitters on multi-grade machines may require several recipes to be configured into the transmitter

memory for successful consistency control.

Field-bus-based solutions provide calibration windows on the operator's monitor for recipe changes and diagnostics by clicking the mouse. This is a real benefit when real-time data is needed for decision making.

Metso Automation has launched the first Profibus based consistency transmitter, Smart-Pulp PA, to the market. The Foundation Fieldbus version will be launched soon. Those who are familiar with the analogue version of Smart-Pulp won't see any difference in operating the transmitter. The same functionality is still available but users get data more easily than before.

ND800 FF/PA

The ND800 Intelligent Field bus Positioner has evolved from Metso Automation's high integrity positioner platform. To ensure the optimum solution for specific appli-

cations, Metso Automation has developed ND800 for both Foundation Fieldbus H1 and Profibus PA. On-line valve diagnostics are continuously stored throughout the life of the device. The ND800 Intelligent Field bus Positioner utilizes sophisticated software to continuously receive accurate data related to the performance and condition of the field device. Essential on-line valve diagnostics maximize runtime performance, and can reduce valve maintenance expenditure by up to 50%.

The performance trends of the valve and its impending need for servicing are closely monitored and maintenance can be planned for when it is truly necessary.

Unlike some other device vendors, Metso's Foundation Fieldbus device includes both AO and PID function blocks as standard. The AO control block application includes scaling and reversing options, while the PID control block application has advanced features

including set-point ramp speed plus a derivation filter and selector. The closed loop response speed is easily adjustable and multiple tuning options are provided. The device can be used either as a basic device or a link master, allowing control in the field.

The ND800 Intelligent Field bus Positioner is just one element in an evolving dimension of process care solutions that promise to bring unprecedented process stability and efficiency. Metso is playing an active role in developing open architecture device management software that provides the ability to integrate all products regardless of the protocol being used. By applying these latest technological developments to its long established product reliability, Metso Automation is raising process plant efficiency to a new level. ■