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## Keeping fieldbus communications healthy

### Diagnostic Manager got even smarter

**With its Advanced Diagnostic Modules (ADM) Pepperl+Fuchs provides intelligent components to monitor the quality of fieldbus communications of FOUNDATION fieldbus H1 and PROFIBUS PA networks. The associated Diagnostic Manager is a smart software tool to translate the information provided by the ADMs into actionable information. The very latest version of the Diagnostic Manager not only features a wealth of improvements. It also introduces a built-in expert system that takes fieldbus physical layer monitoring to new levels of insight and efficiency. It is able to accurately diagnose incidents based upon past experience and offers clear text information to direct the user to possible causes. Pepperl+Fuchs are convinced that more than ever before, advanced diagnostics add efficiency to the complete system lifecycle – all the way from commissioning to daily operation and targeted maintenance.**

The FieldConnex line of fieldbus interface products from Pepperl+Fuchs is designed to offer tangible benefits throughout the complete life cycle of a fieldbus installation. They are characterized by a unique set of features to optimize system design, speed up installation, simplify commissioning, increase plant availability and assist in troubleshooting. One key element to reach these targets are the Advanced Diagnostic Modules (ADM). Added to a fieldbus segment, these smart components serve as “watchdogs” to continuously monitor all crucial parameters, such as device polarity, jitter, noise or duplicate addressing. They automatically trigger an alarm as soon as any critical condition is perceived, because any of the monitored values falls below a preset value.

The Diagnostic Manager is the software that gathers all the performance values provided by the ADMs in order to analyse it and reveal possible problems way before they can effect system operation or even lead to a plant shutdown. The software can run on a server located

directly in the control room. It turns the complete fieldbus infrastructure into an open book that can be read even without expert knowledge.

Pepperl+Fuchs are now introducing their latest version of the Diagnostic Manager. "We have carefully listened to our customers. The result is an impressive list of improvements that turns the Diagnostic Manager more than ever before in a valuable tool that will dramatically speed up commissioning and take the guesswork out of troubleshooting," explains Andreas Hennecke, FieldConnex Product Marketing Manager at the Process Automation Division of Pepperl+Fuchs.

### **Built-in expert system**

The most outstanding improvement of the new Diagnostic Manager is a built-in expert system. It automatically learns the communications behavior of a segment during commissioning and over time and is able to intelligently diagnose any situation on the basis of past experience. As a result, users are provided with specific warnings, as soon as the software detects any condition that might lead to a critical situation. Such warnings are complemented by incident-related information in clear text, that points to possible causes and recommends remedies.

Equipped with such well-founded information, field technicians are no longer faced with the sometimes time-consuming task to search for the actual cause of a problem, but usually know what needs to be done, before they arrive on site. In this way, the time needed for troubleshooting is reduced to an absolute minimum, plant shutdowns are avoided to a great extent and the availability of the complete system is improved considerably.

### **Saving time, increasing efficiency**

The new, updated Diagnostic Manager software offers a number of significant improvements that will take commissioning of a fieldbus segment, monitoring of its physical layer and troubleshooting to new levels of efficiency.

One example is the commissioning wizard, which is now easier to operate and creates better reports. It is designed to check communication quality of the physical layer right from the start and has proved to reduce the time needed to put a segment into service by up to 80%. Such impressive time savings are achieved, because verifying and documenting correct communication within a fieldbus segment requires only a few mouse clicks and can take place with all field instruments connected. This eliminates many of the time consuming and repetitive tasks previously associated with commissioning and guarantees best-possible and well documented performance levels.

## **Detecting, reminding, documenting**

Due to automated tag reading, the ADM is now able to read and document tags and device IDs in combination with any FOUNDATION fieldbus host. Devices newly connected to the fieldbus infrastructure are detected automatically and the user is reminded to run the commissioning wizard to verify and document their correct operation.

Many displays are rearranged and show related tasks. The system overview now shows measurement values on sliders with color-coded limits for “maintenance required” – a user definable warning and “out of specification” – a violation of limits typically defined in the respective IEC standard.

## **Total control from the control room**

In addition to the new software version of the Diagnostic Manager, Pepperl+Fuchs also introduce their new FieldConnex Diagnostic Gateway. This gateway greatly improves interoperation between the individual ADMs of a fieldbus infrastructure and the Diagnostic Manager in the control room. It allows information exchange in both directions via an Ethernet to enable features, such as remote setup of ADMs.

Along with the gateway comes another improvement, which is the simple and self-configuring setup of the Diagnostic Manager. All ADMs are identified automatically and the software configures itself accordingly. This results in fewer configuration errors during installation and setup of the ADM infrastructure, which further adds to efficiency and reliability.

The combination of the Diagnostic Manager and the FieldConnex Ethernet Gateway results in a highly intuitive monitoring system which provides deep insight into the fieldbus physical layer directly from the control room. With this technology, the physical fieldbus layer becomes fully transparent and can be managed for maximum available without the need for detailed expert knowledge.

## **Taking the hassle out of troubleshooting**

The oscilloscope function of the Diagnostic Manager displays fieldbus signals in waveform, thereby offering the fieldbus expert valuable information about the actual signal quality. The updated software includes an improved version of the oscilloscope that offers more trigger events and automatically captures up to 10 shots in a row. Each bit and telegram is identified with type and value, as well as source and destination address.

All these innovations and improvements turn the updated Diagnostic Manager into an invaluable tool to design stable fieldbus segments right from the start, keep a close eye at their everyday operation and assist the field technician in troubleshooting.



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Fig. 1: Eye catcher



Fig. 1: Physical layer diagnostic display: Messages with time stamps and clear-text interpretation identify potential causes – powered by the built-in expert system.



**Fig. 2: Monitoring display shows all physical layer measurements in one concise display with moving sliders and memory for maximum values.**



**Fig. 3: the new FieldConnex Diagnostics Gateway Bus to Ethernet and detects all connected Advanced Diagnostic Modules. During setup the system configures itself.**