INDUSTRIAL COMMUNICATION

REFERENCE Chemical Industry

Troubleshooting in Record Time – PROFIBUS Monitoring and Device Configuration

Evonik Goldschmidt

As part of the Chemicals Business Area of Evonik Industries AG, the Consumer Specialties Business Unit, along with Evonik Goldschmidt GmbH in Essen, belong to a group of companies with a total of about 39.000 employees and sales of €13.1 billion.
The business unit's unique expertise is the precise control of physicochemical processes at interfaces. Evonik offer customized additives, raw materials, and processing aids, but also complete system solutions. The products are based on an extensive pallet of fatty chemical derivatives, organic oligomers, and modified silicones, as well as combinations of these.The areas of application vary widely, and include skin and hair care products, cleansers and cosmetic treatments, polyurethane foams, the manufacture of plastics and paper, and release coatings for self-adhesive products.

Two thirds of all users consider permanent monitoring of PROFIBUS networks necessary. Still, only a few have actually implemented it today. Perhaps this is due to the lack of solutions that can be implemented easily and without big effort and expense. Trebing + Himstedt now provide a remedy with their xEPI 2 with integrated diagnosis and other valuable functionalities. What is sure is that at Evonik Goldschmidt, the web-based tool has passed its first real application test with flying colors.

Within the scope of a field test, Evonik Goldschmidt in Essen, Germany has thoroughly tested the Trebing + Himstedt xEPI 2 and its functions as a diagnostic unit and configuration interface. The chemical business implemented the versatile gateway, which causes no interferences whatsoever on the bus when operating in diagnosis mode, in three installations in different PROFIBUS systems and with various PROFIBUS masters: an Emerson DeltaV control system, a Siemens Simatic S7, and even a 12-15-year-old A250 Schneider Electric control system connected to digital communication via third-party PROFIBUS card.

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Images: Evonik Industries AG

It did not take long until the diagnosis tool provided the first valuable results and insights. “The PROFIBUS isn’t something that breaks down constantly. When it’s up and running, it keeps running,“ says Dirk Deckers, who works in the Electrical Engineering and Process Control Service Department in Evonik Goldschmidt’s Consumer Specialties business unit in Essen. “Although the bus seemed to be functioning perfectly, for the first time ever we realized all the things going on on the bus, and we immediately identified scores of irregularities.“ For the most part, the malfunctions could be removed immediately by small re-configurations of channel diagnoses. The site service, besides project handling also responsible for supervision of all installations on the site, will work through the remaining diagnosis telegrams at the next opportunity, to ease the load on the bus and stop it from constantly being busy with itself.

Troubleshooting in the Blink of an Eye

With the test application progressing, Deckers’ absolutely favorite feature quickly emerged: the automatic email alert function. After starting his computer, he immediately knows if there are any problems or not – even more quickly than the company itself in some cases. As the engineer puts it, “The best thing about it is that I only need to start searching and checking at all if there is an email in my inbox. All I want to know is if there has been a problem or change at the bus. That’s all I really care about.“ And he adds, “Besides that, the integrated diagnosis functions narrows the troubleshooting extremely down.“ That is because the clever tool informs the user on whether there are problems with the bus or if it is a case of a failed channel. So users will not get stuck in bus failures if it is all about one single channel. Only card and device then remain as sources of error.

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Evonik equipment is subjected to constant optimization processes; there are always some changes or extensions. The bus runs stable but hardly unaffected. It is like open-heart surgery – including the high risk of error. Incorrectly attached bus connectors, for example, can turn the DP line into an antenna and cause (partial) downtime. Such failures are hard to identify. Mostly, things still keep running smoothly, but if not, Deckers and his colleagues are faced with a real challenge. Valuable production hours could be spent troubleshooting. But with permanent monitoring of the PROFIBUS network, whoever is in charge can track what kind of work has been done when and at which spot – which means that failures can be located much more quickly. Translated into practice, Deckers and his colleagues

just encountered the following situation: Within the scope of commissioning work at a running system, a new bus station had been connected which did not automatically log on to the bus. Deckers could fix things easily in no time. “It was fairly obvious that the device’s PROFIBUS interface was likely to be defective. So we exchanged it and were done with it. With this Trebing + Himstedt tool, I can and will only win atevery future implementation,“ the engineer describes the situation.

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Project Manager, Electrical Engineering and Process Control Service, Evonik Goldschmidt

In a worst-case scenario, firms expect stand-by engineers to react quickly, including night-time cases. But if it takes an hour for a colleague to arrive on the spot, “quick” becomes somewhat relative. The solution: the colleague on call starts up his notebook at home, logs on to the terminal server via secure, so-called “demilitarized zone (DMZ), starts the web interface and can diagnose the production network. And in no time, he can inform the electrician where to look for the failure. “The xEPI 2 has reduced reaction times extremely. A few hours of batch-plant downtime easily amount to a loss of EUR 50,000 or more, depending on the product,“ underlines Deckers. “So if there is a device that I can purchase at a fraction of this sum, I surely don’t have to think twice.“ The company Turck, too, believes in the cost-saving gateway and has integrated the solution in its own product portfolio.

And Trebing + Himstedt being Trebing + Himstedt, the company tops it all off when it comes to ease-of-use and security: First, handling of the clever diagnosis tool is easy and intuitive; second, users do not have to install any software to make it operable – an inestimable benefit. “Everything web-based facilitates our work. We don’t have to do any updates and so we won’t have any problems with software versions,“ notes a pleased Deckers. And where IT security is concerned, tools that work on the basis of web browsers definitely have the edge as well.

From the Desk straight into the Device

The initial basic function of the Ethernet-PROFIBUS-Interface, however, was quite different: as the name may suggest, the original purpose of first-generation gateways was to connect production network and fieldbus level. This enables central and manufacturer-independent configuration of field devices. “There are several manufacturers who provide pure PROFIBUS access,“ explains Deckers. “That’s nice to have. But what is really clever about the xEPI 2 after all is its permanent bus monitoring on top of that. The device is always in action; it provides me with information and keeps me up-to-date.“ Users simply have to switch online between the different functionalities supported by the gateway.

Still, despite putting the main focus on the diagnostic functionality, the Electrical Engineering and Process Control Service Department does appreciate the value of the bus access. Because, if necessary, it allows staff members to “see“ directly into the transducer from their desks. Even adaptations of scale ranges or nullifications would be possible. Says Deckers, smiling: “With this integration, we can diagnose a good many things without leaving our desks, and can comprehensively inform ICA electricians in advance. That’s quite convenient and pretty comfortable. It’s only that now we are a little short of exercise.“ In the past, that was quite a different matter: tucking your laptop under your arm, mounting the bicycle, hurrying into the plant, checking cables. What kind of environment do I have here? Can I connect

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via HART or do I have to hook up directly onto the transducer? Do I have the right laptop, meaning the right software? Only then could service personnel access the respective device, configure it or start troubleshooting. Today, the xEPI 2 allows access to all HART-based sensors via FDT device integration technology from the desk. “That is great, a really neat piece of work. It’s been only today that I have used this feature again. In one plant, pumps have been put onto rubber pads. Suddenly, the container level was wrong because that physical elevation changed the suction position. We simply adjusted the respective parameters, even after the modification had been approved and released by the company. We were done in ten minutes,“ explains Deckers. This saves an enormous amount of time and money.

By summer, Evonik wants to complete a plant which is entirely HART-based and can thus be completely configured via the free FDT frame application, PACTware. And the chemical enterprise does not accept compromises. If suppliers cannot provide the required device drivers (DTMs) for their products, the company rather works with other, comparable manufacturers who move with the times.

A Tool with Genuine Added Value

For Evonik Goldschmidt, the functionality to act as a central access point for manufacturer-independent field device configuration is an additional benefit. The major aspect and advantage, however, is the diagnosis function. “In new plants and systems, we will consequently use the xEPI 2 for permanent monitoring of our PROFIBUS networks in the future; and we will successively refit exiting installations with the tool as early as possible,“ emphasizes Deckers. The diagnostic unit is the first solution of its kind to enable parallel and continuous monitoring of a high number of PROFIBUS networks during operation. This means that, with little effort and without special know-how, problems can be identified at a very early stage and causes of malfunctions can be located extremely quickly. In the case of the chemical corporation’s facility in Essen, which is operational 24/7, 363 days a year, the clever gateway greatly contributes to minimizing unscheduled downtime, increasing availability, and saving a lot of time and money. The Trebing + Himstedt xEPI 2 is a cost-efficient, competitive all-rounder that has quickly become indispensable.

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