

REFERENCE Steel Industry

Diagnostics Made Easy – Unified Monitoring of PROFINET and PROFIBUS Networks



Salzgitter Flachstahl

is the biggest steel subsidiary of Salzgitter AG, one of Europe's leading steel technology companies. In 2009, more than 4,300 employees produced ca. 3.3 million tons of crude steel and generated a sales volume of EUR 1.8 bn. Among the most important customers of the flat products are automakers and their component suppliers, steel tube manufacturers, cold-roll companies and the construction industry. The integrated metallurgical plant produces hot wide strip, band steel, strip, cold thin sheet and surface-coated products ranging in thickness from 0.4 to 25 mm and up to 2,000 mm in width as well as various special steels.

SZST Salzgitter Service und Technik

As a central service provider with steel expertise, SZST Salzgitter Service und Technik supports its customer Salzgitter Flachstahl as a partner, consultant and solution provider. True to the motto "Service for Steel", the company provides assistance throughout the entire range of services and thus ensures smooth and efficient production processes.

Plant-wide and cross-protocol network monitoring for PROFIBUS, PROFINET and Industrial Ethernet – this is arguably every user's wish. Easy to operate with troubleshooting in record time. This is the solution now launched by Trebing + Himstedt with the TH SCOPE. SZST Salzgitter Service und Technik GmbH thoroughly tested the unified diagnostics solution at an SIL-based installation at Salzgitter Flachstahl GmbH and do not want to miss it any more.



Safety First

Within the scope of its strategic investment program, "Salzgitter Steel 2012", the parent company has invested several hundred million Euros in the Salzgitter plant and considerably expanded the existing installations during the last few years. The steel company's scope of modernization included a state-of-the-art update of its logistics, material transport, and coil field warehouse of its line for hot-rolled sheet. In the future, an automated exit conveyor and two high-performance gantry cranes take over the work of traditional mandrel pilers, providing significantly more efficiency and, not least, safety. The challenge: To ensure maximum safety, the warehouse is fenced in and equipped with respective safety features. Safety interruption of crane work in case of problems is guaranteed at any time. At the same time, the warehouse is also the classical interface between plant and rail services, subjecting the control of signal systems as well to extremely high safety requirements. Monitoring of the fencing and all accesses has therefore also been executed in a failsafe way in safety category 3.



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Christian Harbich,
I&C department, SZST



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Project-responsible SZST and maintenance staff of the line for hot-rolled steel quickly agreed when it came to automation of the safety-related fence: For the first time at the site, PROFINET in combination with PROFIsafe was to be the backbone of the automation system. The latter was developed by the PROFIBUS User Organization specifically for failsafe signal exchange for its fieldbus systems PROFIBUS DP, PROFIBUS PA and PROFINET.

The arguments in favor of this solution: The spatial extent of the warehouse and several strands in a typical star topology. Because of its manageable number of stations, the project was an obvious choice for the start into PROFINET technology. As explains Christian Harbich from the SZST I&C department: “We really wanted to address the subject and test and ‘learn’ as much as possible. We try to constantly stay cutting edge technologically and to introduce our customers to new technologies at our in-house exhibitions. This allows us to act promptly in response to any specific customer requirements.”



Diagnostics as a Must

There was absolutely no discussion whatsoever about diagnostics. For the automation experts, it was clear from the beginning that the PROFINET was to be permanently monitored. Adequate diagnostics is a major criterion for the central service provider. Demands are respectively high, not least motivated by a certain self-interest. Because SZST, as the plant operator’s service provider, needs to be able to act quickly if necessary. “Our customers producing steel – that is our business we live on. If the system does not work and we are unable to store and

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remove coils due to some failure, the production line in the worst case is down until the fault has been remedied,” Harbich underlines. For years, Harbich has already been monitoring his PROFIBUS installations with the web-based diagnostics solution xEPI 2, predecessor of the cross-protocol TH SCOPE from Trebing + Himstedt. His experience with this concept being highly positive, the engineer approached the Schwerin-based software developer regarding similar PROFINET diagnostics possibilities at a very early stage. At the time, the product was still under development. However, when the enterprise contacted him later to ask about his interest in a field test, he agreed immediately. The new TH SCOPE now enables PROFIBUS, PROFINET and Industrial Ethernet network monitoring in one single system. The respective networks are accessed via the TH LINK, which is available either as a stationary mounted device or for mobile service via notebook. The clever concept also includes an automatic alert in case of failures and allows integration of the diagnostics information into higher-level systems.



Top Priority: Simplicity

“Our major requirements for diagnostics tools are easy handling and a clear and unambiguous diagnosis, which means I am instantly able to see where to look for the failure,” says the engineer. “It just has to be simple. We have tested all functionalities offered by the TH SCOPE. It works excellently.”

An SZST standby service is on call 24/7 for the entire warehouse management system to which the plant belongs. Diagnostics possibilities provided to the technicians have to be easy to use. They need to be able to use the tool without extensive expert knowledge and they have to see any device failure instantly. “With Trebing + Himstedt, diagnostics really is easy. It only takes a few minutes to orientate and to know how to use the solution,” Harbich is pleased. Explaining the application to maintenance staff takes a mere 30 minutes, not more. The colleagues quickly understand what is important. No wonder – the tool displays diagnoses in plaintext, and with the traffic light principle it takes only a single glance to see if everything is in order.

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At the moment, a second diagnostics tool is used in the plant – a purely telegram-based software solution. “But we do not want to diagnose telegrams only specialists can deal with,” Harbich says. “There is so much you can do with this software – much too much. The tool is way too complicated for our technicians who do not deal with this every day.” Staff members simply do not have the time to familiarize with the software as thoroughly as the tool requires.

Universal yet Custom-Made

And Harbich continues: “The handling and diagnostics the TH SCOPE solution provides is exactly what we need in the maintenance department. The simple fact that we do not have to install any software because of the web-based concept is a huge benefit.” The diagnostics tool is easy to understand and use; there is no software maintenance involved, and no client licenses etc. are required – all of which and more has to be considered upon software purchases. No need for any of this with a web-based application. An important factor because at SZST, a lot of employees are to use the diagnoses. A Web interface is ideal for this scenario.

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“We have programmed diagnoses for PROFINET ourselves earlier on. It works, but engineering costs and effort are simply disproportionate to a complete system such as the one from Trebing + Himstedt – mounting, very little configuration, and operational a mere half hour later,” the I&C expert adds.

The time it takes to troubleshoot of course always depends on the respective kind of failure. The remote access allows the engineer and other authorized users to access and diagnose the networks of the coil field warehouse from their office. Specific recommendations on error cause and remedy are also provided directly via the remote access, enabling staff to respond instantly. If, let's say, one of the many switches has failed, this can be seen at a single glance. And best of all: If the switch does not have to be replaced, five minutes later the system is up and running again.

At least one hour – that is what Harbich estimates SZST saves in each case of irregularity, because no one has to actually go on site and troubleshoot directly in the plant.

“Thanks to the unified diagnostics, switching from PROFIBUS to PROFINET is no problem. In the TH SCOPE, the look & feel for both technologies is identical. PROFINET provides some additional features, like the topology functionality which is very helpful. For us, continuous monitoring is key,” Harbich reports. Another pretty clever feature that convinced the engineer is the inventory function. With these data, users can immediately see what parts are currently installed and which components need to be replaced. When parts are exchanged, standby staff do not have to search endlessly for part numbers, serial numbers, firmware version ... no catalogs have to be rummaged through and, above all, no one needs to go directly on site. Harbich used this feature intensively during the field test and he could provide Trebing + Himstedt with valuable feedback on aggregation and visualization of the data. His input has now been implemented in the finale product release.

Immediate Payoff

The tester concluded: “The solution convinced me. I would like to see future tenders for new building projects include adequate diagnostics as a requirement.” Field test findings have shown that, in Harbich's view, the enabled diagnoses' benefit far outweighs the cost for the solution, installation and start-up: “All the more as the tool is not really expensive. For us, the TH SCOPE is ideal, because it should already have paid off after just a few service operations.”

SZST Salzgitter Service und Technik expect the diagnostics tool to save a considerable amount of cost in the future. After all, there is a huge difference between an engineer or specialist with their respective hourly wage rate troubleshooting a failure for two hours and a technician or maintenance staff member doing the same for a mere five minutes. The customer saves money and also profits from reduced downtime etc. As Harbich sums up the diagnostics solutions's benefits aptly: “We are convinced of Trebing + Himstedt because we can increase our own efficiency and optimize our costs.”

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