



Case study

DT - Výhybkárna a strojírna, a.s.

The switch manufacturer is ready for Industry 4.0 with noax industrial computers.



noax industrial computers increase efficiency in the production of switches

100% reliability in extreme heat, constant vibration and coolant exposure

With around the clock operations at the milling centers, the noax IPC must operate 24 hours a day, seven days a week, 365 days a year. Rates for large milling machine centers account for a large portion of the production costs. To remain competitive in the international marketplace, the optimum utilization of expensive production equipment is very important for the management of DT - Výhybkárna a strojírna, a.s. The company, from the Moravian town of Prostějov, supplies railroad and tramway switches, switch construction and a complete range of spare parts for customers from more than 30 countries. They supply products to railroad companies, transport companies, utility companies, subways trams, ports and logistics centers. Durability under sustained heavy loads is as important as functionality and reliability. The

company's research and development team focuses on the creation of special parts of the switches (e.g. frogs). World-class parts are integrated into switches or crossings, to provide passengers more safety and comfort. Switches and their parts are exposed to extreme forces under

various environmental conditions. Therefore, DT - Výhybkárna a strojírna, a.s. must pay careful attention to the design process and careful implementation of its own manufacturing, which is based on the hot and cold formation of materials (forging, bending, twisting, straightening), material processing by machining, welding, and finally, the assembly. These manufacturing operations are based on specific regulations. The drawing is the basic documentation and the thermal conditions of the workplace accompanied by dust and the effects of industrial liquids, create specific

conditions where only specialized technology can be successfully used.

Reliability at high temperatures and in the milling center's environment

Some of the manufacturing processes mentioned above take place at high temperatures. From this viewpoint, a forge is a special workplace where the summer air temperature often exceeds 122°F. "We decided on noax after carrying out tests during the summer months, when it was proven that the noax IPC managed to operate in these difficult conditions without any problems", explains the director of the Information Center (referred to as the "DIC"). "Another significant benefit is the use of the noax IPC in milling centers where workers really appreciate the immediate distribution of documentation in digital form that is used to accurately prepare for the clamping of the

workpiece to the machining table, the instant retrieval of the necessary tools, as well as the direct digital measurement of distances in the drawings. "The noax computer display (19 or 21 inches) allows for the visualization and representation of the CAD files in perfect color. "There was no need to change the existing standards for the creation of drawing documentation," says DIC.

Praise from the competition

DIC and their colleagues decided on noax because Bavarian industrial computers have excellent references from many engineering companies. DIC added, "during the selection stage of the pilot project, we examined IPCs from other companies but these did not comply with our specifications. We concluded that their technology would not be able to function reliably over the long term and under our specific conditions. At other stages of

"Our company produces products of the highest quality that are technologically unique and, when compared to our competitors, have excellent longevity. This is exactly what noax offers."



The employee heats the rail profiles to a temperature in excess of 800°C. The information needed for subsequent processing is received from the noax industrial computer, as shown in the figure on the left.

Innovation, customer focus and reliability – these characteristics are typical of DT – Výhybkárna a strojírna, a.s. The reasons why the switch manufacturer supplies customers worldwide. This also means that the products must meet the most demanding of requirements. The use of state-of-the-art technology and a product portfolio with innovative solutions guarantee an unquestionable position in the global marketplace. Innovation and reliability forms an intrinsic basis of any production process. That's why the company relies on robust noax industrial computers. They not only offer employees a reliable and ergonomically optimized product, they also ensure that DT – Výhybkárna a strojírna, a.s. will not lose its market position in the future.

Vibration, shocks, coolants, metal shavings, hot sparks and summer air temperatures of up to 140°F – noax industrial computers have been operating continuously since 2017. Their robustness and excellent reputation were the reasons why DT – Výhybkárna a strojírna, a.s. decided on noax.



the project, we implemented special technologies from certain German suppliers (e.g. tightening torque) for different machinery and workplaces." They were very satisfied to find out that this customer was also using noax IPCs because they had already verified that these IPCs would be suitable. "The greatest strength of noax industrial computers is their reliability under difficult production conditions; these include mechanical loads resulting from movement of the machine, vibration and shock. In addition, metal chips or hot sparks often fly into the air and land on top of the display and the cabinet when milling or grinding is in progress." In addition to the mechanical stresses and the heat, with air temperatures reaching up to 140°F, we also have coolants that can spill on the screen directly from the operator's hands, as they use simple gloves to control the computers. Computers are scheduled to shut down twice a year for software updates and the Christmas break. Otherwise, they have been working nonstop since 2017.

Employee motivation

Noax offers a two year warranty on all industrial computers, with the option to extend to five years. Noax has been providing service and support for its industrial computers for at least ten years, thus ensuring long-term investment. The noax in-house service team also supports customers with competent advice and prompt customer support. Before the introduction of the German industrial computers into its production halls, employees had to carry out their work using discarded laptops or desktop computers. These devices were simply not suitable for use in harsh industrial environments, so they typically failed after a short period of time, which regularly lead to staff frustration. This suddenly changed with

the implementation of noax computers. The production hall staff were particularly impressed by the ease of operation with the help of a touch screen and functional design. "We must not un-



Metal chips and hot sparks will not damage the highly robust touch screen.

derestimate the psychological impact of noax industrial computers on the employees", he adds. Of course, they get nice, new computers, but, above all, they get reliable computers! That's why they have a sense of appreciation that has greatly increased their work ethic and motivation", he con-

tinues. "Also, the ergonomic design of the noax touch screen is well thought out and the ultra-high resolution display, and eye-catching design allows for legible color display when reading a drawing. The touch screen can, be operated with protective gloves, which makes working much easier. "Not only has motivation improved but the use of noax industrial computers has positively changed the measurable production quantities – employees now do the same amount of work but faster! Thanks to the study of digital documentation, it's possible to prepare the next order while the current order is in production (topped tools, ...). This overlap has really saved a lot of time."

12% increase in efficiency

The MES (Manufacturing Execution System) provides all the work and machine productivity data. DIC found that the efficiency of the workplaces deployed increased by 12%. In addition, MES also provides employees with information on the current state of the work in progress. This was very positively reflected in adherence to delivery dates. For DIC, the common features of noax and DT – Výhybkárna a strojírna, a.s. are the unlimited functionality, longevity and high quality: "Our company produces products of the highest quality that are technologically unique and, when compared to our competitors, have excellent longevity. This is what noax offers. This is what our company has ingrained into the company's vision and its strategic plans, so we decided on noax."

"The ergonomic design of noax computers, the high capacity touch screen and the full HD resolution provides a clear display of colors when reading drawings, and played a deciding role when making the decision. The touch screen can also be operated with protective gloves."



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Company Profile:

The company is based in Prostějov and specializes in the development, construction, production, assembly and regeneration of switches for railway, tram and subway lines. Customers include transport companies that operate their own tram and subway networks and railway companies. In addition to the Czech Republic and Slovakia, the company also exports its products to various countries in Europe, America and Australia. Outside its main plant in Prostějov, the company has a manufacturing plant in Slovakia.

For more information, please visit:
www.dtv.s.cz

Requirements and Applications

Objectives:

- ✓ Machine and operating data acquisition, workforce management planning
- ✓ Fast and automatic processing of recorded data
- ✓ Automation and acceleration of production processes
- ✓ Production staff support
- ✓ Visualization of CAD files 2D and 3D
- ✓ Improvement in delivery deadlines

IPC Requirements:

- ✓ Completely enclosed housing design in accordance with IP65 rating
- ✓ Clear, easy-to-read touch screen display
- ✓ Resistant to shocks, vibrations, oil and coolants, and electromagnetic radiation
- ✓ Operation at temperatures up to 60°C
- ✓ Operation under voltage fluctuations
- ✓ Operational reliability and stability
- ✓ Easy maintenance by IT staff
- ✓ Touch screen operation using gloves
- ✓ Operates for at least 10 years
- ✓ Login/logout using an RFID reader

Overview of Components

Hardware:

- Steel S21WP and Compact C19 industrial computers
- Customized all-in-one motherboard
- Robust PCAP touch screen
- Bright, high-contrast TFT display
- Comprehensive IP65 protection
- Enclosed, with no external fans
- Wireless communication interface (WLAN, RFID, Bluetooth)

Software:

- Operating system:
Windows 10 IoT Enterprise
- DWG documents browser – AutoCAD DWG TrueView, DraftSight
 - MES from Act-in

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Case Study arranged in 2019

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