

» Application Story «

Atom-Applications HMI iNOEX



iNOEX relies on Intel Atom processor-based HMIs with the Kontron Nano Client Panel PC

A robust x86 Human-Machine Interface for hot environments

The Intel Atom processor-based Kontron Nano Client panel PC with stainless steel housing has been implemented as a visualization client and HMI (Human Machine Interface) into a new ultrasonic measurement system from iNOEX, which has been developed for pipe centering to achieve optimum wall thickness. With this new measurement technology, the die head used to produce large-sized and thick-walled pipes can be quickly centered, reducing start-up scrap and saving considerable costs. When faced with the choice of an appropriate HMI, a robust, fanless, and completely-sealed IP66 design was particularly important for iNOEX.

To produce large pipes, granulate material or powder is heated in an extruder and pressed through an extrusion die. Depending on the pipe diameter, production speed is only a few meters per minute. Such extrusion lines can reach lengths of up to 60 meters. Previously, there had been no way to directly measure the wall thickness of a pipe in a vacuum tank during the extrusion process. Only after the pipe had been extruded and cooled could it be measured and any necessary adjustment of the die head take place. This process wasted a great deal of time and material, and one was not always sure whether the die was set precisely upon the second attempt. This has now changed with the introduction of the new ECCO centering unit from iNOEX. The system is suitable for pipes made of PE, PP, and PVC, and can be used for pipe diameters starting at 90 mm and wall thicknesses from 1.8 mm to 120 mm. It can be installed both with the in-house MAXFLEX calibration sleeve as well as with any other customer-available calibration sleeve. The ultrasonic sensors are mounted directly on the calibration sleeve. The measurement is performed automatically, without any necessary operator input. The wall thickness distribution data is then displayed on a 10-inch monitor. Thus, the die settings can be quickly and accurately adjusted to compensate for pipe sections that are too thick or too thin. In this way, the pipe is exactly centered after only a few meters and the production process can continue precisely under the desired conditions. The fast start-up process and prevention of start-up scrap reduce costs significantly allowing the ultrasound measurement system to pay for itself after only a few months.

A client with JAVA for hot plastic lava

For this human-machine interface, iNOEX looked for a rugged, cost-effective client that would function reliably for many years in the typical dusty industrial environment. A 10-inch monitor was already a requirement, to ensure easy readability even from short distances. In addition, the system should support Linux and Java, because the data that are logged and transferred from the actual ultrasonic data sensor are stored centrally on this measurement device.

Intel Atom processor: x86 efficiency

In the standard version, the data are transferred via Ethernet to an Intel Atom processor-based panel PC. With outstanding performance and low power requirements, this processor technology fits perfectly into Java- and Linux-based software environments. Due to less heat generation, it also allows for robust, fully-enclosed system designs. Compared to previous generations of x86 systems with similar performance, the system features improved power dissipation and therefore runs much cooler. Additionally, Atom-based system designs can be flatter and more compact. The processors are also more cost efficient than previous generations with comparable performance. Consequently, the Intel Atom processor technology offers

many improvements for open HMIs based on x86 processor technology. Moreover, the benefit arguments of power and cost savings that up until now favored the use of RISC-based HMIs are today also arguments for the new x86 SFF processors, because they now feature all these same strengths, too. So if developers need something more than RISC at a highly cost-effective price point, then the new x86 HMIs based on Intel Atom processors are by far the best choice.

Fast system development following processor introduction

iNOEX opted for the Kontron Nano Client, which the company began implementing into the new ECCO centering tool while Kontron concurrently handled the system development. "Since the introduction of the Intel Atom processors in the spring of 2008, we knew that we wanted to have this processor," said Martin Deters, technical director at iNOEX, "so we looked around for a manufacturer that could quickly and reliably launch a suitable platform." Kontron's extensive product portfolio and board level products along with its premier membership in the Intel Embedded Alliance were all attractive to iNOEX. "In the IPC market, processor technology often lags a generation or two behind. We, however, sought out a supplier that regularly presents products based on newly launched processors and implements them into a wide range of products. This ensures relatively early design security and mature software support. Kontron has proven that it is particularly nimble in implementing the latest processors, so this was the natural choice."

Attractively-positioned price

In addition, Kontron was also able to secure an attractive price for the system. This was possible due to the synergetic effect of product development, the company's global positioning, and most importantly the cost-effective high-volume manufacturing of board-level products in its factory in Malaysia. In general, system development and assembly of panel PCs for Kontron's European customers take place in Europe. The specific panel PC board for the Atom processor was made in Germany, which further accelerated the logistics for the German client.

The system in detail

The Kontron Nano Client is currently used by iNOEX in the 10-inch version. It is equipped with a 45nm Intel® Atom™ Z5xx processor and the highly-integrated Intel® System Controller Hub US15W, and offers up to a 1.6 GHz CPU and a maximum of 1024 MB of soldered RAM. Thus, the compact Nano Client can also run even demanding web-based visualizations. With 1 x Gigabit Ethernet and 1 x USB 2.0, it offers all required interfaces for HMI or terminal applications. Essential for pipe extruding equipment is the

Compact Flash solution for data storage, which features no moving parts and excellent shock and vibration protection. The 24-volt DC power supply rounds out the industry-standard feature set. The Kontron Nano Client family with 15-inch monitor has been available since March 2009 and 10.4-inch versions became available in November 2009. In the standard version, Kontron Nano Clients support Windows CE, Windows XP Embedded, and embedded Linux along with a variety of protocols such as http, XML, and RDP (Remote Desktop Protocol).

A complete PC used only as a computer screen?

With the introduction of the “low budget” segment for x86 processors, the use of a complete x86 panel PC as a visualization HMI without additional functionality is growing. This is due to its flexible architecture which allows great freedom in the design of individual interfaces, and also because, especially in the field of visualization, software developers are keen to develop for the x86 platform so the newest innovations are always available. Therefore, developers who wish to meet the highest standards in the field of visualization and at the same time steadily update their HMIs with the latest graphics features are advised to choose an open x86 platform. In the case of iNOEX, open source Linux and Java were used. The Ethernet interface between the central data server and the panel PC “monitor” allows the panel to be flexibly implemented, both in regards to its installation site as well as in its use. Such a modular design is future proof and also makes the development of other versions more efficient because its ports are open and standardized. Moreover, the customer is ensured the long-term availability of an installation. The “visualization” component is easily upgradeable at any time, even if the current system has been discontinued.



With iNOEX's new measurement method, the die head used to produce large-sized and thick-walled pipes can be quickly centered, reducing start-up scrap.

CITATION



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About Kontron

Kontron designs and manufactures embedded and communications standards-based, rugged COTS and custom solutions for OEMs, systems integrators, and application providers in a variety of markets.

Kontron engineering and manufacturing facilities, located throughout Europe, North America, and Asia-Pacific, work together with streamlined global sales and support services to help customers reduce their time-to-market and gain a competitive advantage. Kontron's diverse product portfolio includes: boards & mezzanines, Computer-on-Modules, HMIs & displays, systems & platforms, and rugged & custom capabilities.

Kontron is a Premier member of the Intel® Embedded and Communications Alliance and has been a VDC Platinum Vendor for Embedded Computer Boards 5 years running. Kontron is listed on the German TecDAX stock exchange under the symbol "KBC".

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