CNC for High Speed Cutting? MDSI is The Solution

German manufacturer steps up its delivery of HSC machines with OpenCNC® software CNC from MDSI®

Rolf WISSNER GmbH has been manufacturing High Speed Cutting (HSC) milling and laser machining centers in Göttingen, Germany, for more than twenty years. Numerous patents are testament to the company's pioneering achievements in the field of HSC. As well as products from the large CNC suppliers, Rolf WISSNER GmbH uses the OpenCNC software CNC from MDSI (Ann Arbor, Michigan) for its controls. OpenCNC provides the machine manufacturer from southern Lower Saxony with powerful HSC performance at a reasonable price. Users of WISSNER machines also appreciate the easy-to-use Windows-based user interface of the software CNC.

Rolf WISSNER GmbH was one of the first companies to specialize in the manufacture of HSC milling and laser machines 20 years ago. At that time, however, hardly any of the classic CNCs met the two critical requirements of high-speed cutting: a block processing time of less than 0.1 milliseconds and support of the Adaptive Look Ahead-Technology. Therefore WISSNER started examining the possibility of migrating to a software CNC. Although this was in the mid-1990s, already the team at Rolf WISSNER GmbH believed that software CNCs had high potential. Extensive exploration of the available software CNCs led the company to OpenCNC® software CNC from MDSI. "Already at that time, OpenCNC was way ahead of the market in terms of functionality and performance," remembers Rolf Wissner, managing director of Rolf WISSNER GmbH. "This made it easy for us to decide to include the software CNC in our portfolio instead of investing the overhead for developing our own controls to that level."

Rolf Wissner, Ingmar Klipp:
Higher performance and flexibility at lower cost: Rolf Wissner and Ingmar Klipp rely on the software CNC OpenCNC from MDSI.

Rolf Wissner on the advantages of OpenCNC software CNC machine control from MDSI

- *Cost-efficient, no proprietary hardware or motion control cards; only standard PC components*
- *Simple and inexpensive updates for hardware and software facilitate service and support*
- *Software does not break down, thus reduced spare parts/storage requirements*
- *Controls do not age, but get better and faster*
- *Windows-based user interface*
- *Easy connection of PC with OpenCNC to the corporate network*
- *Very fast route to executable program*

Pure performance

To the manufacturers and their customers, the performance of the controls is vital. In this respect, OpenCNC has so far fully convinced both the WISSNER team and their customers. "The route to the executable program is unbelievably short: enter data and you're done," emphasizes Ingmar Klipp, control engineer and project manager responsible for OpenCNC at WISSNER. "The software CNC enables even enormous amounts of geometric data to be transferred easily, quickly and without limits using copy and paste."

Software CNCs such as OpenCNC mean almost unlimited storage space for programs and data. The use of only one processor for CNC and PLC (single CPU) accelerates enormously the data exchange within the system. The resulting computer power released is used for process-oriented processing.

"With OpenCNC our customers can always bring performance right up to date by replacing standard PC components, for example by installing the latest Gigahertz CPU from Intel."

In addition, the single-CPU concept allows the seamless integration of real-time-oriented interfaces and the use of real-time software such as the Significant Events technology from MDSI. Users can thus retrieve machine and production data in real time without additional hardware - even via the Internet, ensuring higher-quality parts and a lean production process.

Unlike classic closed controls, OpenCNC becomes faster and faster over time. Most customers of Rolf WISSNER GmbH are small and medium-sized companies that use their HSC machines for up to 20 years. "As good as our machining centers may be - if they are fitted with classic controls they won't become faster in the long run; if anything they'll become more vulnerable," says Rolf Wissner. "With OpenCNC our customers can always bring performance right up to date by replacing standard PC components, for example by installing the latest Gigahertz CPU from Intel." The software CNC directly benefits from the increasingly powerful but also cheaper PC hardware components.

Unlike classic controls, OpenCNC customers can install regular software updates - also directly over the Internet. In this way, OpenCNC is always state-of-the-art. "We are already testing the next release of OpenCNC, which is in the final stage of the release process at MDSI," adds Ingmar Klipp. "With improved algorithms for high-speed cutting, this version increases machine performance by up to 25 percent while further optimizing surface quality."

Advantage Windows

With OpenCNC, PCs - and thus also Windows as the operating system - are being used more and more with the machines, and not only as front ends as is the case with classic controls. This offers enormous advantages. The control PC can easily be integrated in the corporate network. The HSC machining center can be directly connected to the NC programming system via Ethernet. Users receive their NC program simply via the Windows network or via e-mail on their machine. In addition, OpenCNC allows remote maintenance and the connection of a webcam.

"Many of our customers are very grateful for the simple and direct connection of their CAD/CAM systems to OpenCNC," explains Rolf Wissner. "The Windows user interface is also very much appreciated." In times where skilled staff are still rare and expensive, OpenCNC's intuitive user interface and the resulting short training times save the manufacturer and the customers enormous amounts of time. While users require up to a week of training for classic controls, half a day is sufficient for OpenCNC. Furthermore, once an operator is trained on the software CNC, he can run any kind of OpenCNC machine tool: lathes, mills, grinders, gear hobs, gantrys, water jets, machining centers, and more.

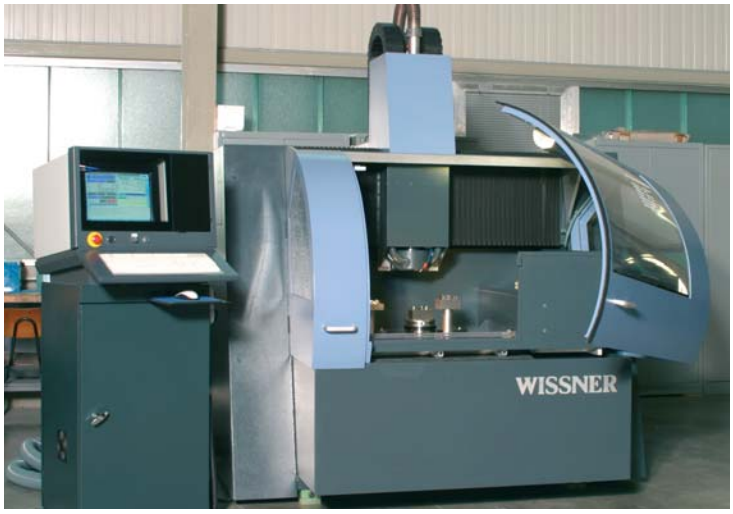
At the latest with the introduction of Windows NT and 2000, the argument that software CNCs are not stable under Windows has been eliminated once and for all in WISSNER's experience. Users can even install additional software on their computer, for example for PDA entries or a CAD viewer for clamping sketches.

5-axis pipe cutting machine:
Rolf WISSNER GmbH uses OpenCNC both on its economy machines for price-conscious customers and on complex machining centers such as this five-axis pipe cutting machine.

Higher performance, lower cost

"In terms of total cost of ownership (TCO) OpenCNC saves considerable costs without becoming slower and more vulnerable," Rolf Wissner says. "This is especially important with our small and medium-sized customers, where machines must run for up to twenty years."

WISSNER uses OpenCNC for the company's economy models of their machines, which are targeted to price-conscious customers. But OpenCNC is also used in WISSNER's special-purpose machines with complex machining centers such as a five-axis pipe-cutting machine. The flexibility of being able to use the software CNC on different types of machine saves the manufacturer a lot of overhead.



HSC milling machine:
With its block processing time of less than 0.1 milliseconds and its Adaptive Look-Ahead technology, OpenCNC easily fulfills the basic requirements of HSC controls, as with the GAMMA 605 HSC milling machine from WISSNER.

Rolf WISSNER GmbH

Rolf WISSNER GmbH, based in Göttingen, Germany, has been developing, designing, building and selling leading-edge HSC milling and laser machines for more than 20 years. Because of its focus on HSC, the company has various forward-looking patents. With its 40 employees (excluding sales), it manufactures simple stand-alone systems right through to process-engineered and, if necessary, linked systems. The mechanics of the product lines ALPHA, GAMMA, EPSILON and WiTEC are based on FEM-optimized modules and combined with proprietary software and hardware.

Saving money with software

Another major cost advantage is the fact that the software cannot break down, the way hardware does. For WISSNER this means fewer spare parts and thus reduced storage space requirements.

Compared with classic controls, OpenCNC gives users considerable savings when it comes to service and support. Because of the short and thus inexpensive training, customers reach productivity faster, and they save money because of the absence of hardware defects. Instead of having to rely on manufacturer support, in 99 percent of cases WISSNER can solve problems with a purchase from the PC dealer around the corner. This also increases investment security.

Undreamt-of flexibility

Thanks to the true and open software architecture, manufacturers can directly manipulate the CNC kernel if necessary. "Once you are familiar with OpenCNC, the controls offer undreamt-of flexibility for your own adjustments," says Rolf Wissner. "This saves me a lot of money that the manufacturer could charge for adjustments, and I can optimize the controls again and again to meet my changing needs." Once created, the control routines for specific machines can be relinked again and again. This reduces programming time for a new control system to no more than half a day.

OpenCNC's open and flexible architecture also allows customers to standardize their controls, and then any employee can work on any machine.

OpenCNC user interface:
With its Windows-orientation, OpenCNC allows the control PC to be easily integrated in the corporate network. The HSC machining center can be directly connected to a CAM programming system via Ethernet.

"With our customers, mainly small and medium-sized companies, the machines must run for up to twenty years, and during this time OpenCNC saves considerable costs ..."

OpenCNC excels at high-speed cutting

The latest joint project of Rolf WISSNER GmbH and the Fraunhofer Institute in Berlin also testifies to the machining speed of OpenCNC. The software CNC controls a five-axis HSC machining center for micromachining. The machine reaches an acceleration of more than two G, cuts with an average of less than 0.1 millimeters, and manages 180,000 spindle rotations per minute, with individual components of the machine being cooled separately. The HSC machine sets new standards in the promising market of machining shapes for small plastic parts or electronic components.

With WISSNER machines, OpenCNC shows its performance on high-speed machines for mold-making and model-building and its suitability for cutting hardened steel, copper and graphite as well as aluminum at high speed. OpenCNC's Adaptive Look-Ahead Logic provides high-speed machining via a smart CNC software program that looks ahead only the number of blocks necessary for each individual application and adapts the cutting speed accordingly.

OpenCNC terminal:
The performance can always be brought right up to date by replacing standard PC components.

Result

The experiences of Rolf WISSNER GmbH with OpenCNC illustrate the potential of software CNCs. The performance and especially the flexibility outstrip classic controls by far - at lower cost for the manufacturer and the customer. Rolf Wissner stresses again: "We save costs on the acquisition and assembly of the controls, the programming, and the service and support." For customers, standard PC hardware and software updates as well as the Windows operating system and the Windows-based user interface mean reasonable acquisition costs and state-of-the-art control technology that is easy to use and integrate in the corporate network.

"Once you are familiar with OpenCNC, the controls offer undreamt-of flexibility for your own adjustments."

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