

CNC4you

The Shopfloor Magazine

Volume 5, April 2011

SIEMENS

In this issue:



Proficient with
Sinumerik



Just Like in a
Real Workshop



All-Round Talent
for Turning and
Milling

Training partnership between the
Berufsförderungswerk Dortmund and Siemens

Knowledge Motivates

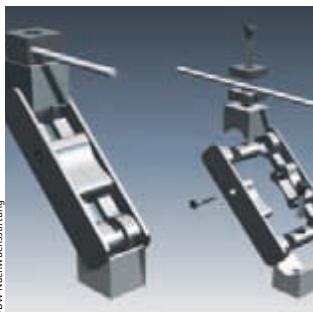
www.siemens.com/cnc4you



Siemens AG

7

Siemens Professional Education (SPE) puts the emphasis on practical training



VDW-Nachwuchsstiftung

10

The VDW-Nachwuchsstiftung (the training foundation of the German Machine Tool Builder's Association) develops CNC training materials in collaboration with Siemens – here an animated training video



Siemens AG

12

Siemens offers a comprehensive range of further education courses for Sinumerik



Siemens AG

14

The Handwerkskammer Hannover (Hannover Chamber of Crafts) uses Sinumerik 840D sl with the new Sinumerik Operate operator interface for training

3 EDITORIAL

TRAINING

4 Knowledge Motivates

Training partnership between the Berufsbildungswerk Dortmund and Siemens

6 Signposts in the Training Jungle

7 Education at the Highest Level

SPE ensures qualified vocational training in metalwork

8 Using Know-How

Certified trainers for ShopMill, ShopTurn, and Sinumerik

10 Future Capital

VDW-Nachwuchsstiftung – an engine for vocational education

11 A Strong Partner for Industry

Christiani stands for practical basic and advanced training for decades

12 Proficient with Sinumerik

Qualification with Training from Sitrain

13 Just Like in a Real Workshop

CNC training with Sinutrain for Sinumerik Operate

ON THE SHOPFLOOR

14 Up-to-Date with Sinumerik

CNC vocational training program at the Handwerkskammer Hannover

SINUMERIK 828D CORNER

16 All-Round Talent for Turning and Milling

Sinumerik 828D Basic T and Basic M

TIPS & TRICKS

18 Universal and Fast

Sinumerik Operate with extended scope of functions

19 NEWS

EDITORIAL INFORMATION CNC4you 1_2011

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Dear Readers:

Highly qualified employees are a decisive advantage for the competitiveness of the German economy. Qualified personnel who manufacture high-tech products and who are able to solve problems unassisted ensure the **innovative and competitive superiority** of organizations now and in the future.

We at Siemens are glad to make our know-how available to support **vocational training programs in the CNC** field in many ways. We work with partners such as the VDW-Nachwuchsstiftung (the training foundation of the German Machine Tool Builder's Association), the Berufsförderungswerk Dortmund (Dortmund Vocational Training Center for People with Disabilities), the Technischen Institut für Aus- und Weiterbildung Christiani (Christiani Technical Institute for Vocational and Further Training), and the chambers of crafts all over Germany. High school and college students, instructors, vocational school teachers, and trainers have the opportunity to attend courses at Siemens training centers or the training facilities of our partners, or they can train themselves through self-study online and learn how to efficiently handle the latest control technology and software for milling and turning processes.



The prerequisite for successful training, of course, is **high-quality state-of-the-art technical equipment**. Lathes and mills in our training centers are equipped with the latest Sinumerik control technology and software. **Methodically sophisticated training concepts and training materials** further support the participants in their studies. But we also highly value the quality of our trainers. All trainers participate regularly in special train-the-trainer courses, so you can be certain of receiving **state-of-the-art training**.

Read more about what Siemens has to offer for your training needs in the new *CNC4you* or visit our Web site: www.siemens.com/cnc4you.

I wish you enjoyable reading.

A handwritten signature in dark ink, appearing to read 'Engels', written in a cursive, flowing style.

Karl-Heinz Engels

Application Technician

Siemens Technology and Application Center (TAC), Erlangen, Germany



Training partnership between the
Berufsförderungswerk Dortmund and Siemens

Knowledge Motivates

The Berufsförderungswerk Dortmund (BFW, the Dortmund Vocational Training Center for People with Disabilities) successfully trains and qualifies rehabilitants and helps integrate them into the labor market. Various vocational training programs and further education courses and qualification opportunities open up new perspectives and offer a career. The CNC training partnership with Siemens is especially important.

> The BFW is a supraregional service organization for the vocational rehabilitation of adults. It is a nonprofit organization with the aim to integrate rehabil-

itants into the labor market after they have completed their qualification. Since it was established in 1971, it has qualified approximately 20,000 people. The wide range of services includes informa-

tion and consulting, preparation and qualification, and placement training for graduates. And the results are remarkable: the examination success rate is 95 percent, and the placement quota for



Siemens AG

Top: The BFW uses Sinumerik controllers for high-quality CNC training
Left: Participants in the BFW After Five workshops can find out about the latest developments in CNC technology

Workshops with partners

Under the name "After Five," the BFW in Dortmund stages workshops with its partners twice a year. In addition to the BFW and Siemens, machine manufacturers, tool suppliers, and providers of CAD/CAM and product lifecycle management (PLM) software inform participants about current developments in CNC technology. This event setup makes the workshops popular. After a short introduction, theory is put into practice during live demonstrations on CNC machines with Sinumerik controllers. The workshops highlight

the successful collaboration between the partners and Siemens.

During the subsequent rounds of discussion, the participants exchange experiences and gather valuable information in a relaxed atmosphere. Interested parties from small and medium-sized firms and large organizations are invited. The workshops are very well received by the participants. "Anyone who was there usually comes back," say the organizers. "We recommend registering early, as the number of participants is limited to 60 per workshop."

graduates from rehabilitation is approximately 70 percent.

Qualified trainers ensure CNC training that is in line with labor market needs

With 950 training places, approximately 400 boarding school places, and more than 35 training programs offering state-certified diplomas, the BFW's services are adapted to the requirements of the labor market and the individual needs of the participants. A placement and consulting service accompanies and supports the participants during and after their vocational rehabilitation, in close cooperation between graduates, trainers of the BFW, and employers. The individual interests of participants and employers are taken into account.

A CNC training partnership with Siemens exists to ensure high-quality training in the field of CNC machining utilizing Sinumerik controllers. At the BFW in Dortmund, a total of 14 lathes and mills made by Deckel, Gildemeister, and XYZ Machine Tools equipped with Sinumerik controllers are available for training. In

addition to the 802D sl, 810D, and 840D sl CNCs, the latest 828D controllers with Sinumerik Operate are used. The machines are connected with training PCs for the programming and testing of the NC programs. Train-the-trainer seminars, which are regularly attended by BFW trainers, who are trained and certified by Siemens, ensure optimal knowledge transfer regarding the latest CNC technology.

At the moment, seven trainers certified by Siemens and specialized in Sinumerik controllers work at the BFW in Dortmund.

Several CNC training programs available

The BFW offers three training programs of varying durations and levels for CNC programming. Training as a CAD/CAM programmer qualifies the participants to create and use CNC programs in conjunction with 2-D and 3-D CAD systems. The trainees apply the specifications from the CAD data into operation and function sequences suitable for manufacturing. They test and check the pro-

gram sequences on computer workstations with the aid of simulation software. They set up the machines, optimize the programs, and monitor the production processes.

Training as a CNC cutting machine operator involves the setup and operation of the machines and the monitoring of manufacturing processes. Skills such as planning, controlling, programming, and setting up operations at CNC machines are taught. Both training programs have a duration of 12 months. Final qualifications are certified with in-house and external certificates.

During the NC application specialist training, the participants are qualified for work on CNC-controlled machine tools for turning, milling, and grinding. They learn how to program, operate, monitor, check, and maintain the CNC machines. The dimensionally accurate manufacture of devices and systems utilizing CNC-controlled lathes and mills is also part of the curriculum. This training program lasts 24 months and ends with the final examination at the chamber of industry and commerce.

Signposts in the Training Jungle

What good is the best technology if the know-how is lacking? Siemens and its training partners offer a package of training programs that help users make the most of their lathes and mills. Our training guide helps users identify the appropriate offering. <

For students and recent graduates

Have you finished school or your engineering studies and you're interested in CNC training? Then you are probably asking yourself: Where do I want to go from here?

Siemens Professional Education (SPE) offers you all the relevant information about CNC training.

Further info:

> www.siemens.com/SPE

For CNC users

Do you already work with Sinumerik controllers and want to receive further training on the Sinumerik 840D or 828D? Then training from Sitrain is the right choice for you. The comprehensive training program contains the right courses for beginners and advanced students.

Further info:

> www.siemens.com/Sitrain

For vocational school teachers and trainers

Are you a vocational school teacher or trainer and you want to catch up with the latest machining technologies? The VDW-Nachwuchsstiftung (the training foundation of the Association of German Machine Tool Makers) regularly stages further training events based on practical training materials that are already being used successfully by many training institutions.

Further info:

> www.siemens.com/VDW

For trainers

Are you a self-employed trainer who wants to become a training partner for Sinumerik controllers or programs? Then training by Sitrain is the right choice for you. The comprehensive training portfolio provides training for both beginners and advanced learners alike.

Further info:

> www.siemens.com/cnc4you



> www.siemens.com/cnc4you



SPE values practical training at its 42 locations

SPE ensures qualified vocational training in metalwork

Education at the Highest Level

A success rate of 100 percent and final results well above the average success rate for the chamber of industry and commerce has made Siemens Professional Education (SPE) the preferred vocational training partner for careers in the metal industry. Qualified trainers at locations throughout Germany are ideally equipped to teach customer-oriented training content.

fore includes basic knowledge and special expertise in multiaxis machining on CNC machines (turning, milling) and in CAD/CAM technology. Other courses provide knowledge and skills relating to measuring with CNC-controlled 3-D measuring machines. In addition to technical aspects, the trainees are also taught general skills such as presentation techniques, process management, teamwork, and business economics.

Training success guaranteed

Collaborating in the training program with SPE allows organizations to concentrate on their core business and processes and thus considerably reduce the cost of recruitment. Fewer company resources are tied up in basic professional training. In addition, the effort involved in administration and coordination with various public vocational schools is also minimized.

To provide the prerequisites for successful professional qualification, SPE relies on experienced training professionals who possess expert knowledge in line with actual practice but who also have pedagogical and didactical skills. Regular experience-oriented seminars and courses offer the trainers the opportunity to extend their practical knowledge and use it profitably.

> SPE coordinates all the training activities of Siemens AG and its subsidiaries. In addition to its own 7,140 trainees and students, another 2,700 junior employees from about 180 companies are currently being trained at one of the 42 SPE locations in Germany. About 85 percent of the Siemens trainees and students in the dual education system will pursue a technical career after completing their training program, which is aligned with the examination requirements of the chamber of industry and commerce. Since 2008, Siemens has also been running the +250 program for underprivileged young people (e.g., those with below-average school results

and/or an immigration background), who are supervised and attended to by qualified and highly motivated trainers.

Perfectly prepared

About 2,100 trainees are being trained as industrial mechanics, cutting machine operators, heavy equipment fitters, and toolmakers. The centers for CNC training are located in Berlin, Bocholt, Chemnitz, Karlsruhe, Mülheim/Ruhr, and Nuremberg. Highly modern multiaxis machines with simultaneous machining are available here.

Independent and project-oriented work at the machines optimally prepares the trainees for the requirements of their future occupations. The training there-

Certified trainers for ShopMill, ShopTurn, and Sinumerik

Using Know-How

"Excellent Support"



U. Seiger

Computer scientist and mechanical engineer Uli Seiger has been involved in control technology and NC programming for more than 25 years. Because customized application integration into specified manufacturing structures and, above all, education and training have always been a central part of his career, he decided several years ago to become a self-employed trainer and instructor for the various Siemens systems.

with Sinumerik-controlled machines. Regardless of whether you are experienced with ShopMill or ShopTurn, whether you are familiar with Siemens standard cycles or proficient in DIN/ISO programming, the user interface allows the user to decide which programming alternatives he or she wants to use. This flexibility allows Sinumerik Operate to be used from individual-part to high-volume production. Other systems are much more restricted.

Why did you decide to become certified as a self-employed trainer?

Seiger: A permanent structural change and flexible adaptation to changing market situations demands a strong partner from the industry. Because I am continuously challenged by changing requirements in programming and training, it made sense to become certified by Siemens.

Mr. Seiger, what are the advantages for you as a self-employed certified trainer?

Seiger: The benefit lies in the first place with the customer, since the certification involves much closer contact with individual contact persons at Siemens, in particular where the implementation of different customer requirements is concerned. Also, I can respond much more effectively to customer preferences via direct access to the latest solutions and documentation, using, for example, a server link.

How do you assess the quality of the training and support provided by Siemens?

Seiger: Due to the deep knowledge of the qualified employees, especially at TAC Erlangen, a permanent transfer of knowledge takes place during training for certification. I was also able to obtain important information that I could later use at the customer's site merely from the vast extent of technical equipment. And the support is excellent. Technical support is often a must for prompt implementation of customer requirements in training and production. My certification as a self-employed trainer gives me direct access to information and allows me to provide fast, reliable service.

Mr. Seiger, thank you for the interview.

Mr. Seiger, when were you certified as a self-employed trainer, and which controllers or programs are you certified for?

Seiger: I got my first certification in the spring of 2008 at the Technology and Application Center (TAC) in Erlangen, Germany. I have since added other programming systems and technologies. I am certified for Sinumerik 802D sl, 840D, 840D sl, and even for the new Sinumerik 828D technology. Regarding the programming systems for ShopTurn, ShopMill, Sinumerik Operate, and the DIN programming range, I am certified for the Sinumerik controllers for turning and milling.

Sinumerik Operate recently became available for the 840D sl and 828D controllers. Where do you see the advantages of Sinumerik Operate?

Seiger: Siemens sets new standards for the operation of CNC machines with Sinumerik Operate. I am enthusiastic about the open structure, which offers the user incredible freedom

Manufacturers of controllers often do not have the capacity to answer inquiries for on-site customer training on short notice. Highly qualified self-employed CNC experts can fill this gap, but they lack access to the customers. The certified trainer, provided by Siemens, is a profitable solution for all involved. We spoke to self-employed trainers Uli Seiger and Hans-Peter Moser regarding their experiences as certified trainers.

"Easier Access to Customers"



Hans-Peter Moser is a manufacturing engineer who worked for a radar systems company in Ulm for many years. In March 1999, he became a self-employed trainer and was able to implement his experience with Sinumerik controllers at training centers in Baden-Württemberg as an instructor and trainer.

Mr. Moser, when did you become certified as a self-employed trainer, and for which controllers or programs are you certified?

Moser: After meeting Karsten Schwarz from Siemens, I became the first certified external trainer for ShopMill and ShopTurn with Sinumerik 802D, 810D, and 840D in October 2007 at the Technology and Application Center (TAC) in Erlangen. In January 2010, I then received certification for the new Sinumerik Operate user interface on the Siemens Sinumerik 828D and 840D.

Sinumerik Operate recently became available for the 840D sl and 828D controllers. Where do you see the advantages of Sinumerik Operate?

Moser: In addition to the ease of use of Sinumerik Operate, I am particularly impressed by the significantly improved

simulation graphics. The programmed workpiece is now displayed perfectly on the screen, for both turning and milling. The operator can therefore see whether the programmed workpiece meets the drawing specifications before machining. The revised simulation process of Sinumerik Operate is also very useful for swivel kinematics, especially for the milling process, because the entire workpiece is now displayed in all planes in the simulation view.

What made you decide to become certified as a self-employed trainer?

Moser: I worked exclusively for the Handwerkskammern (chambers of crafts) in Baden-Württemberg from 1999 to 2007 and was looking for a new challenge. I wanted to move my training activities to the free market. It was good to have a strong partner like Siemens at my side for this step.

Mr. Moser, what are the advantages for you as a self-employed certified trainer?

Moser: The Siemens contact network is very helpful. This gives us access to customers who are otherwise usually not available to self-employed trainers. I can also put together all the relevant documents that I need from the Siemens database. And last but not least, the qualification certificate that I received as a self-employed trainer is a valuable reference for customer prospecting.

How do you assess the quality of the training and support provided by Siemens?

Moser: The personal interaction and the handling of the latest CNC control technology are aspects of the training that I find particularly positive. The training room at the TAC, with its multimedia equipment, is really excellent, and we as self-employed trainers can use it for our own training courses. I consider the support from Siemens to be a continuous process of mutual further training. Siemens provides me with the know-how and I give the company feedback about the customers. This helps us both become more efficient.

Mr. Moser, thank you for the interview.

VDW-Nachwuchsstiftung – an engine for vocational education

Future Capital

Using a wide range of teaching and training materials, the VDW-Nachwuchsstiftung (the training foundation of the German Machine Tool Builder's Association) provides an easy introduction to CNC programming for trainees and instructors alike. The materials developed in cooperation with Siemens combine the latest technological developments with the specifications of current syllabi.



Animated training video for CNC milling

"The content of the training materials for the various work areas is based on the specifications of the field-based curricula for occupations such as cutting machine operator, toolmaker, and industrial and precision mechanic," Urhahne explains. The technical topics are presented as in-process topics during the individual training situations. "The explanations are kept general and come without results because the trainees are expected to solve the tasks for themselves," the VDW project manager points out. Students and teachers will find drawings, worksheets, exercises, videos, and animations for the practically oriented CNC documentation in the VDW KnowledgeBase.

Optimal transfer of knowledge

The teaching and training materials are now being used in about 150 vocational schools in North Rhine-Westphalia and Baden-Württemberg. The VDW-Nachwuchsstiftung confirms a positive response to its efforts to promote the exchange between industry and schools. "The materials provided perfectly reflect topics that are relevant for the classroom, not only from a technical but also from a didactical point of view, so that optimum transfer of knowledge is ensured. And this ultimately leads to continuous improvement in the quality of training for machine tool engineers," Urhahne concludes.

Current dates for training courses and events on the subject of CNC milling and turning with Sinumerik controllers, among other things, can be found at www.vdw-nachwuchsstiftung.com. <



With the founding of the VDW-Nachwuchsstiftung, the previous vocational training activities of the VDW were brought together, and the cornerstone was laid for future-oriented and sustainable preparation of trainees in the machine tool industry. "Well-trained employees have contributed a great deal to the success of the German machine tool industry," explains Michael Urhahne, project manager of the VDW-Nachwuchsstiftung. "Our aim is to reach young people and recruit them for the machine tool industry. We also want to improve the training of young people who choose a technical career so that they are fit to face future market demands."

Training materials for students and instructors

In collaboration with Siemens, materials for hands-on training were developed for CNC milling with the ShopMill operating and programming interface. Materials for CNC turning with ShopTurn are being developed and are scheduled to be completed by summer 2011, when they will be presented to Siemens for acceptance. In addition to the students' materials, documents have also been compiled for further training courses for teachers; the further training of vocational school teachers and instructors is also part of the VDW-Nachwuchsstiftung's program.

More information >

www.christiani.de

Contact >

info@christiani.de

Visitors to Didacta could examine the comprehensive portfolio of Christiani and Siemens

Christiani stands for practical basic and advanced training for decades

A Strong Partner for Industry

Expertise gathered over many years and a comprehensive range of vocational training offerings make Christiani a recognized partner to industry, trade, vocational schools, and technically interested private customers. The basis for this is an innovative portfolio, optimum service, and highly motivated staff.

> The development of high-quality didactic products for vocational training programs for technical occupations, especially for the metal industry, has been a decades-long tradition at the Dr.-Ing. Paul Christiani Technical Institute for Vocational Training in Constance, Germany. Industrial automation components are integrated into practical tasks here.

Christiani has been a partner in the Siemens Automation Cooperates with Education (SCE) program since 2005 and, thanks to this partnership, is able to offer even better industrial products especially for Siemens automation technology. The contact with Siemens experts also enables innovations to quickly enter Christiani's product development process.

Collaboration at Didacta

The excellent collaboration between the two companies is documented by their joint appearance at education fairs such as Didacta or World Didac in Basel, Switzerland. At these fairs, Siemens presents its Sinutrain software for close-to-reality

CNC training, which interested parties can then buy from Christiani. A machine manufacturer is also on hand at the Siemens booth so that the software can be tested on the spot. Siemens' partner at Didacta 2011 in Stuttgart, in addition to Christiani, was the Optimum Company from Hallstadt, Germany. The company, which specializes in all kinds of machining and metalworking machines, brought along a 3-axis milling machine equipped with Sinumerik 828D. Since the Sinutrain software and the controller share the same user interface, the customers could also track the machining processes that were completed live on the machine in Sinutrain.

The VDW-Nachwuchsstiftung (the training foundation of the German Machine Tool Builder's Association) was also present in the Siemens booth and introduced its latest training materials for instructors. These training materials are optimally adapted to the Sinumerik CNC and were developed by technicians and teachers based on practical criteria. The materials will also be available through Christiani in the future. <

Christiani products for vocational training

Christiani is organized into five divisions that handle vocational qualification:

- > **Publishing house:** develops and supports various media for commercial/technical vocations
- > **Examination service:** supplies the examination material for intermediate and final examinations in electrical and metalworking vocations
- > **Automation technology:** develops a number of modular systems for vocational training in automation technology – from the simple module to complex computer integrated manufacturing (CIM) systems
- > **Media service / examinations:** compiles examination questions for trade and industry associations and stores and sends them under strict security precautions
- > **Christiani Academy:** offers an extensive advanced training program for technical topics – from full training courses and brief courses to correspondence courses.

More information >

www.siemens.com/sitrain

Contact >

info@sitrain.com

all photos: Siemens AG

Sitrain offers a wide range
of courses on Sinumerik

Qualification with Training from Sitrain

Proficient with Sinumerik

Sitrain offers a wide range of further training – from in-person courses to innovative online and offline learning materials. The participants learn how to use Siemens Industry products and systems efficiently and therefore make a major contribution to increasing the productivity of their systems.

> Qualified employees are among the most important resources of any organization. Organizations can select the appropriate training for basic, advanced, or specialized knowledge for their employees from the consecutive Sitrain training modules. Modular Sinumerik training units are available for advanced CNC training that teaches participants all there is to know about Sinumerik 840D sl or Sinumerik 828D, the new compact CNC for the workshop environment. Greater confidence in the handling of Siemens products not only pays off for the company but also benefits employees by increasing motivation.

From practice to practice

The basis for all further training is courses specific to target groups directed by competent trainers with

extensive practical experience – worldwide. If desired, courses can also be held on-site at the factory. All the courses offer a well-balanced mixture of theory and practice. The participants work on specially designed training equipment, which ensures that they are able to use Sinumerik CNCs efficiently at the end of the course. Since the training courses make processes and relations comprehensible, they also provide the basis for optimal use and perfect adaptation of individual products. The reward is a considerable reduction in the engineering effort, major savings in time and expenses, and avoidance of negative effects.

But attending a course can only be successful if a participant has the required basic knowledge. To be certain, you can find out via one of the online Sitrain aptitude tests whether the course you are considering suits you. <

Sitrain portfolio for Sinumerik at a glance

- > Sinumerik general
- > Sinumerik 840D sl
- > Sinumerik 828D
- > Sinumerik 840D
- > 5-axis transformation 840D
- > Tool management
- > Motion control information system (MCIS)

All courses on the Sinumerik 840D sl and 828D can be found at

www.siemens.com/sitrain-sl or
www.siemens.com/sitrain-sinumerik828d

In addition to the Sinumerik courses, Sitrain offers training for the entire Siemens Industry line of products and systems.

www.siemens.com/sitrain

CNC training with Sinutrain for Sinumerik Operate

Just Like in a Real Workshop

More and more complex training profiles require universal solutions for CNC training. From the teaching of basic skills to the final exam, Sinutrain – based on Sinumerik Operate – presents itself as the ideal teaching method for efficient training on the innovative functions of Sinumerik CNC controllers.

> With Sinutrain, Siemens offers a comprehensive Sinumerik Operate-based portfolio of optimized procedures for efficient CNC training – which utilize an identical control and are perfectly customized for the various individual requirements. The CNC training software makes it much easier for beginners and trainees to learn the machine functions because it contains training tasks and integrated exercises, and its modules can be completed individually so that self-study is easier. But trainees can also study the exact operations that they will need to perform later at the machine and therefore optimally familiarize themselves with details

of the controller, work space, and tool changes.

A wide range of functions on standard PCs

Sinutrain can be run on standard Windows PCs without additional hardware and requires few PC resources thanks to the advanced software architecture. Based on the real Sinumerik CNC core, Sinutrain enables user-friendly CNC operation. On the basis of the DIN 66025 programming language, NC programs can be created and simulated in the DIN/ISO, ShopMill, and ShopTurn variants that are also used on real machines – in several languages. Five European languages and Chinese are integrated as standard; other language versions can be downloaded from the Internet. ShopMill and ShopTurn operation programming combines different machining operations so that programming effort is minimized and production is more efficient. In addition to milling and turning, Sinutrain also offers

the broad range of technologies supported by Sinumerik Operate on the machine. The possibility of connecting to CAD systems also speeds up the programming. All necessary data are available at the push of a button in the online help files. This ensures training that comes very close to real conditions.

Close to reality

With the excellent animated machine control panel alone, Sinutrain offers a completely realistic machine tool simulation without additional hardware. Authenticity can be increased even further if desired: both student and teacher workstations can be linked directly to machine tools. This allows machining programs created at a student's or teacher's workstation to be sent to the machine tools, for example. Sinutrain can also be perfectly adapted to the axis configurations of different machines. This ensures maximum compatibility between the CNC programs created offline and the machine tools in the shop. <



Sinutrain makes Sinumerik functions very easy to learn on the PC

CNC vocational training program at the Handwerkskammer Hannover

Up-to-Date with Sinumerik

The Handwerkskammer Hannover (Hannover Chamber of Crafts) offers a well-grounded vocational training program for technical and executive personnel in trade and industry. In order to provide practical training in CNC technology, the Education and Training Center in Garbsen, Germany, is equipped with machines from Spinner with the Sinumerik 840D sl CNC controller and the Sinumerik Operate user interface.



Only regularly updated vocational training can ensure progress and innovation. This is the motive for the Handwerkskammer Hannover to offer a wide range of seminars, workshops, and training courses. These range from courses on general conduct and leadership to seminars on labor law and company insurance to practical training in metal- and woodworking, electrical engineer-

ing, electronics, and other fields. Trainees, skilled workers, prospective foremen, and executives in medium-sized enterprises will find the appropriate subjects for their professional training here.

Practical training

As Andreas Jockisch, coordinator for the metalwork department, explains, the practical orientation is valued highly at the Handwerkskammer Hannover. In his

opinion, a vocational training program can be successful only if the participants study state-of-the-art technology. This includes not only equipping the seminar rooms with modern presentation technology but also, and above all, learning and training with up-to-date machines and systems.

Therefore, the metalwork department purchased commercially available CNC machines six years ago in the course of a



Milled complex parts with engravings or pockets made during various courses at the Chamber of Crafts





all photos: Siemens AG

“Sinumerik Operate offers practical, intuitive user guidance for rapid programming of numerous complex geometries such as pockets with islands or engravings on any surface.”

*Andreas Jockisch,
Coordinator, Metalwork Department,
Handwerkskammer Hannover*

thorough modernization of the machine labs and service portfolio. A few months ago, this machinery was again brought up to date through investment in a TC600 turning center and a VC560 vertical machining center from Spinner. Because these are machines that set the current industrial standard, they offer all the possibilities for the manufacture of turned and milled parts and feature state-of-the-art motor power output, configuration features, and work spaces. The trainers in Garbsen find machining centers equipped with Sinumerik 840D sl controllers particularly useful. Karl-Heinz Liebau, a trainer in the metalwork department, points out, “This allows us to use the machines optimally both for initial vocational training and for further training and retraining.”

Intuitive operation with Sinumerik Operate

This ability is supported in particular by the Sinumerik Operate user interface,

which unites the advantages of the HMI software proven in Sinumerik with the ShopMill and ShopTurn and program-GUIDE programming software. Users can switch easily between programming in DIN/ISO code, in high-level language, or in work steps with graphical user guidance. “Therefore, on these machines we can train apprentices in the basics of programming with DIN/ISO as well as offering practical further training at the latest state of the art in CNC machining to personnel with several years of professional experience,” Liebau reports.

Other highlights are the very comprehensible, intuitive user guidance and graphical support in the programming. Jockisch explains: “Sinumerik Operate offers practical, intuitive user guidance for rapid programming of numerous complex geometries such as pockets with islands or engravings on any surface.” The operator receives optimal support from the animated graphics and the simulations that can be opened on the color screen at the push of a button. He or she can therefore check the work steps for geometries and potential collisions on the screen before machining a workpiece.

Technology transfer for trade and industry

“The machines equipped with the Sinumerik 840D sl system and the Sinumerik Operate operator interface allow us to

provide an effective technology transfer for trades and trade-oriented industrial enterprises,” Jockisch explains. This includes, among other things, allowing participants to ask questions regarding machining operations and introduce their workpiece samples during the practical training. Solutions are then worked out in workshops in the course of further training and verified via actual workpieces on the machining centers.

But technology transfer also includes presentations and workshops for executives who want to study the potential of state-of-the-art CNC machining centers made by Spinner. A lively partnership has been established between the training center and the regional representatives of Spinner and Siemens, Petra Köhn and Ingo Bartsch, respectively. The seminar rooms and the metalwork training center in Garbsen are frequently used, for example, to demonstrate the advantages of the latest technologies in metalwork to interested parties. The Technology Days, which will be held for the fifth time in 2011, also serve this objective. Interested parties can find out about multi-axis machining on turning and milling centers and workshop-oriented programming in detail here. <

Sinumerik 828D Basic T and Basic M

All-Round Talent for Turning and Milling

The robust, uniquely accurate new Sinumerik 828D Basic, versions T and M, is the ideal low-cost introduction to compact-class CNC machine tools, especially for standardized lathes and mills.



The Sinumerik 828D Basic CNC controller in the T version for turning and the M version for milling is the perfect introduction to the 828D class. Together with Sinamics drives and Siemens motors, it is designed to address the needs of standardized lathes and mills. As in the Sinumerik 828D, the screen, keyboard, and CNC electronics are combined into a unit that requires only a few interfaces and cables and ensures maximum availability. The robust structure and the control panel made of die-cast magnesium help manufacturing companies machine reliably, accurately, and productively in harsh environments. Since there are no wearing parts, the CNC is maintenance-free.

Maximum precision, simple operation

Modern processor technology and software architecture based on the 80-bit NANOF floating-point precision in the CNC and Sinamics drive ensure the high performance and precision of the new Sinumerik for beginners. Siemens segment manager Andreas Grözing explains: "This rules out quantization errors in the software and provides the greatest precision in path guidance. This is reflected in maximum workpiece accuracy." But the Sinumerik Operate graphical user interface also lends the control-

ler a modern look. The Windows-style appearance is similar to that of a PC in many details. The Animated Elements function also brings the planned machining operations to life in moving picture sequences. This enables reliable and intuitive execution of programming and setup processes. Programmers are also able to accomplish their complex work at an external workstation. For this, the SinuTrain software for Sinumerik Operate can be installed on separate PCs, offering a user interface that is identical to that of the machining workstations. The programs can then be exchanged between the PC and the machine by USB stick or network. Three programming methods are available: the graphically supported, workshop-oriented ShopTurn or ShopMill work-step programming interface; the Sinumerik CNC programming language with programGuide cycle support for efficient machining of both high-volume series and individual parts; and classic ISO code programming.

Numerous integrated cycles

The Sinumerik 828D Basic T and M CNCs also have a wide range of machining cycles. These include a contour machining cycle or contour milling with remaining material detection, high-speed settings, engrave cycles, an end-cutting

Technology in detail

Saving and reading out of tool data and zero-point settings of programs

The effort required to set up and tool the machine for each workpiece is extremely high, especially for individual part and small series production. In such cases, it is very helpful if the tooling data for the manufacture of the same workpiece can also be archived when saving the program. This function is available as of software release 4.3 of Sinumerik 828D.

> In the program manager, simply mark the program for which the setting data are to be archived. Then click the "Archive" and "Save setting data" soft keys. Select which data are to be saved in the window that then opens. These include tool data, magazine assignments, zero points, and basic zero points.

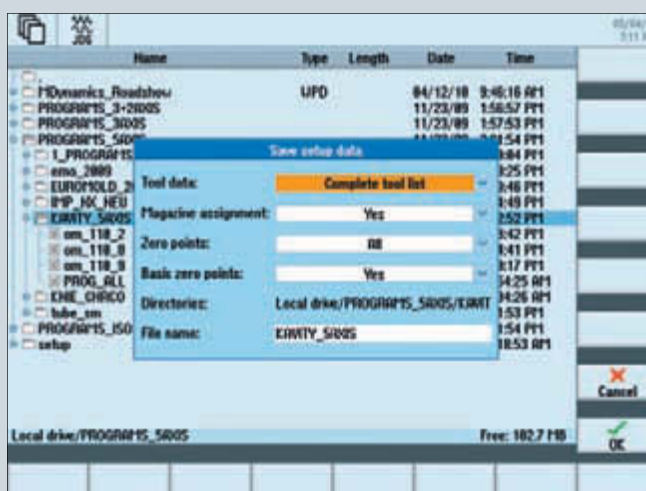
> When saving, you can choose whether only the setting data used in the program are to be saved or the complete tool data and zero points. When you select "OK," the controller automatically creates an INI file, which is stored in the program folder. The INI file and the program can be archived together, for example, on a server.

> When machining the workpiece again, copy the program together with the INI file back into the NC folder. When you double click on the INI file, a window opens in which you specify which of the saved setting data are to be read in. If, for example, tools of the same name already

exist, prompting ensures that existing tool data are not simply overwritten.

> After reading in the saved setting data, machining is now possible without time-consuming setting up of the tools

and zero points. This function allows the very simple transfer of programs that have been programmed previously in SinuTrain to the controller with the complete setting data, without entering the tools again.



Saving setting data with a complete tool list, including magazine assignment and all zero points

Siemens AG

cycle, and milling cycles of contour pockets and necks with up to 12 islands, depending on the version. When programming of the workpiece is finished, it can be machined virtually as a 3-D graphic with the integrated CNC simulation. Errors can be detected and corrected quickly in this way.

With the Sinumerik MDynamics technology package, including the new intelligent Advanced Surface motion guid-

ance, Sinumerik 828D Basic M is also ideally equipped for machining mold-making workpieces.

Process data via SMS

The Easy Message feature is provided to keep the machining process running reliably after setup. This allows the production manager and his or her team to obtain access to all relevant process data via SMS – regardless of where they are.

"If, for example, a machine needs new stock, the Sinumerik 828D Basic can send the appropriate information via SMS," Gröziinger points out. Easy Message also supports predictive maintenance. An integrated maintenance planner issues a message well in advance when work is necessary. The user only needs to set up a GSM modem, insert a SIM card, and enter the user profile of the cell phone numbers to use Easy Message. <

Sinumerik Operate with extended scope of functions

Universal and Fast

Highly organized and intuitively operable – these are the features that immediately catch the eye when you look at Sinumerik Operate for the first time. The operating and programming interface for machine tools now unites the proven HMI Advanced, ShopMill, and ShopTurn components.

> The extended scope of functions of the Sinumerik Operate operating and programming interface now offers the user even more convenience. Since it unites work-step and high-level-language programming in one interface, NC programming and production planning can be completed even faster. Sinumerik Operate includes functions that allow users to display the measurements of a workpiece during setup. Animated Elements make operation and programming of the CNC controller for machining cycles very straightforward. Complex workpieces can be set up and manufactured quickly in one clamping.

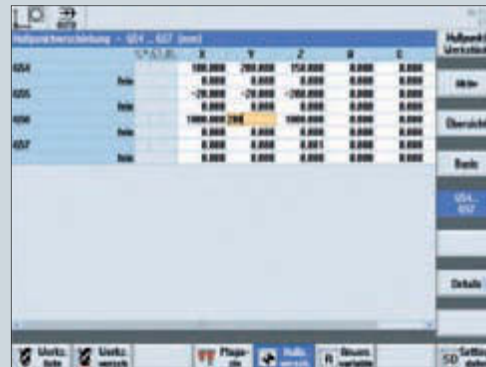
The user interface also offers optimized tool and program management. It allows the user to configure the display of his or her tool list individually. Job-related data are displayed clearly and are instantly recognizable. Simulation of 5-axis machining processes offers a number of different tool views so that the results of the programming can be checked immediately.

Sinumerik Operate also offers unique programming methods for all areas of application. The ShopMill and ShopTurn

Details on technology



Animated elements not only make the machining processes transparent but also considerably simplify operation and programming for the user



Undo function with “insert” – as long as no Input key has been pressed or data transferred to the boxes – is another feature of the programming



Selection via Insert key and/or with any key

You will find more information in our Sinumerik Operate flyer. Simply order or download from our informational material site at www.siemens.com/sinumerik.

work-step programming is tailor made for the production of single parts and small batch sizes. The G-code program is combined with cycle support in

programGUIDE. It stands for maximum flexibility and is highly suitable for medium to large batch sizes. Sinumerik also supports ISO-code programming. <

Sinumerik in the Largest Training Association in Hesse, Germany

The C+P Training Center, founded by the building and furnishing company Christmann and Pfeifer (CP), is now the largest training association in the metal and electrical sector, with approximately 400 trainees in total. Members can have their trainees trained here in various metalworking occupations and electrical trades. C+P Bildung GmbH is now also a training partner for Sinumerik and offers vocational and advanced training of skilled workers in the metal and electrical industry. The simple and realistic Sinutrain training software, linked with ShopTurn and ShopMill, is used during theoretical instruction in which trainees learn everything about CNC technology.

For this, C+P Bildung provides a modern training center with new Hardige machines equipped with ShopMill and ShopTurn workshop software. "For us, there was no alternative to ShopTurn for the lathe machining processes, but we also chose Sinumerik for milling because anyone who has learned ShopTurn will find it easy to operate ShopMill; that's the big advantage of Sinumerik," says training manager Thorsten Weinmann. "In addition, we can also introduce the future skilled workers to the advantages of this software during their vocational training."



Pleased with the good partnership (from left to right): training manager Thorsten Weinmann, Thorsten Herfel (Siemens), and CEO Bernd Feige

Another TAC opened in Piacenza, Italy

Perfectly located between the industrial cities of Milan and Parma, the second Centro Tecnologico (Technology and Application Center, TAC) was opened officially in Piacenza, Italy, on February 11 and 12. More than 300 guests visited

the newly created Sinumerik Competence Center for the northern Italian industrial region over the two days. Numerous partners from industry – from tool manufacturers to clamping device and measuring equipment manufacturers to machine distributors and CAD/CAM specialists – were involved in the successful start.

Four machine tools are available over an area of approximately 800 square meters for training purposes. One lathe and one mill from SAMU with Sinumerik 802D sl, a DMG CTX 1250 alpha turning and milling center, and a horizontal milling center from Heller (the latter both equipped with Sinumerik 840D sl) can be used. The new TAC also has training rooms equipped with Sinutrain workstations and CAD/CAM software for holding courses for machine operators and other target groups for which special training materials have also been developed.

One of the focal points of TAC Piacenza is training courses that are specially designed for the vocational training programs of service and application technicians employed by machine tool distributors and for instructors from vocational and advanced training institutions, who will be trained on machine tools equipped with Sinumerik. Workshops are also held regularly with partners and bring Sinumerik users in northern Italy up to the latest state of the art.



The opening of the new TAC in Piacenza offered the opportunity for an intensive exchange of ideas



SinuTrain

Geared to the real world

SinuTrain® is a CNC training software for the PC, which is identical to the control. It facilitates user-friendly operation and CNC programming close to that in reality – based on the new SINUMERIK® Operate user interface. SinuTrain is suitable for all of the usual programming methods, is

available in several languages and can be optimally adapted to the axis configurations of various machines. Therefore, ensuring a maximum degree of compatibility between CNC programs generated offline and machines in the production environment.