



Simply compact. Simply perfect.

The new CNC-controller
for the compact class



SINUMERIK 828D

Answers for industry.

SIEMENS



Contents

Applications	03
CNC hardware	04
Performance	05
CNC programming	06
Machine setup	11
Tomorrow's technology	12
Communications	13
Programming workstations	14
Technological Competence	15

We bring your production up to top speed.



The integrated SINUMERIK 828D, coupled with the SINAMICS drive and motor system, really gets your machine tool going. The finest CNC technology opens up unparalleled potential for turning and milling workpieces more productively.

Tailor-made for milling machines...

SINUMERIK 828D – the top performer for more advanced milling machines can handle all conceivable drilling and milling operations. It goes without saying that it can also do this in any desired swiveled workpiece plane and on cylindrical workpieces – so things really start moving on your machine. You don't need a special CNC, not even for mold and die applications. The SINUMERIK 828D's unrivalled performance guarantees mirror-smooth surfaces with minimum machining times.

...and turning machines

The SINUMERIK 828D is also a real all-round talent on turning machines. It provides a wide and comprehensive range of turning operations, which are complemented by an unequalled range of drilling and milling operations for both the face and peripheral surfaces of the workpiece. Complete machining? Of course! Anything the main spindle can do, the counterspindle can do, too. Naturally, without any restrictions. That enables the SINUMERIK 828D to get the maximum productivity out of your machine.

Compact, strong, simple... ...simply perfect!



The SINUMERIK 828D sets new standards of ruggedness and ease of operation in the compact CNC class.

Compact and robust

We've selected a compact unit, comprising of screen, CNC keyboard and CNC electronics, for the SINUMERIK 828D. This setup requires fewer interfaces and cables, so guaranteeing maximum availability. The operator panel front is made from heavy-duty, die-cast magnesium. This ensures that the SINUMERIK 828D remains in good condition even if subjected to harsh operating conditions. The elimination of wear parts, such as a fan and backup battery, makes the SINUMERIK 828D completely maintenance-free. Not even a backup battery is needed. Thanks to modern NV-RAM technology, your CNC programs are retained indefinitely, even after a lengthy shutdown.

User-friendly

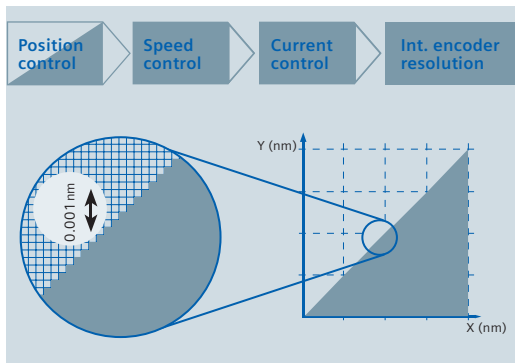
A brilliant 10.4" TFT color display and a full CNC keyboard (QWERTY) make the SINUMERIK 828D very easy to operate. By the way, the CNC keyboard has short-stroke keys to make inputting even lengthy CNC programs a pleasure. The SINUMERIK 828D's graphical user interface is designed with CNC direct keys so you get just where you want to go in a few keystrokes. The operation of turning and milling machines is identical. That saves you an enormous amount of expensive training time.



www.siemens.com/cnc4you

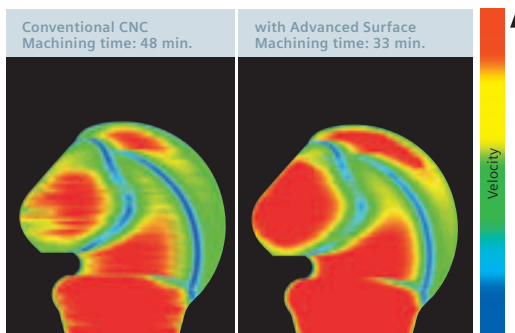
SINUMERIK 828D: the powerhouse in the compact class.

The performance of the SINUMERIK 828D is in a class of its own. Even in the compact frame size, the familiar SINUMERIK state-of-the-art technology ensures the highest possible levels of precision and productivity.



80-bit NANO^{FP} Accuracy – Accuracy beyond Micro and Nano

Thanks to state-of-the-art processor technology and software architecture, SINUMERIK and SINAMICS work with unmatched 80-bit computational accuracy. What sounds like theory has unique practical advantages. The 80-bit NANO^{FP} accuracy enables us to achieve unequaled contouring control accuracy and so, in turn, maximum workpiece precision. And that's exactly what you're entitled to expect from modern CNCs and drives.



Perfect work-piece surface with Advanced Surface

The manufacture of moldmaking workpieces has always been one of the biggest challenges for a CNC. The SINUMERIK 828D is able to rise to this challenge thanks to its "Advanced Surface" technology, a unique method of calculation which aims to improve workpiece surfaces while significantly reducing machine time.

Innovative "look-ahead" mathematical algorithms calculate the forwards and backwards path motions identically. In this way, perfectly smooth workpiece surfaces can be achieved when carrying out line-by-line milling for molds.



Best orientation with kinematic transformations

Intelligent kinematic transformations ensure that the SINUMERIK 828D always maintains full orientation. Whether you're machining the front face or peripheral surface of rotating parts, or dealing with milled workpieces in rotated planes, the SINUMERIK 828D is able to transform the machining plane to ensure exactly the right position. This is done automatically. So you don't need a pocket calculator or an expensive CAD/CAM system for other purposes – SINUMERIK 828D makes it all possible.

programGUIDE: Less machining time – more output.

Every second of machining time counts when manufacturing workpieces in large batch sizes. That is why the SINUMERIK 828D boasts a flexible CNC programming language with readable high-level language elements. Thanks to programGUIDE, you can combine this flexibility with the convenience of powerful technology cycles.

CNC high-level language programming

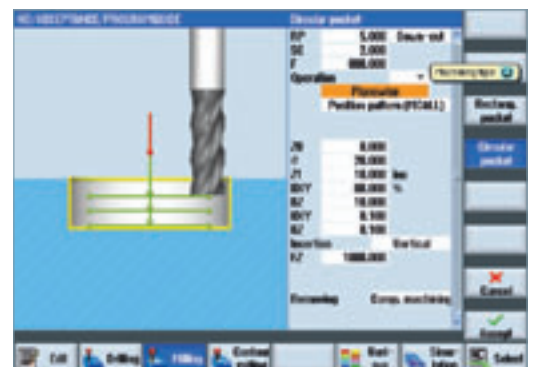
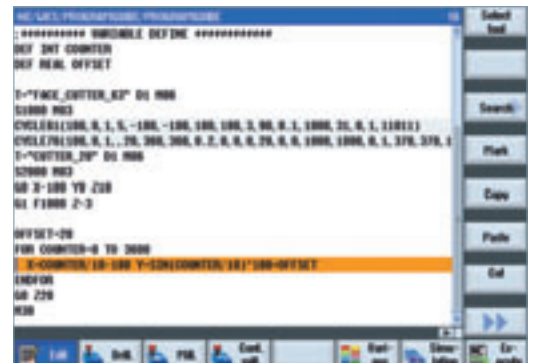
With the SINUMERIK CNC programming language, you have each individual motion of your machine and thus the machining time of your workpiece under optimal control. You can call the intelligent CNC functions with easily readable language commands. The SINUMERIK CNC programming language also allows any desired program structure, and thus the highest degree of flexibility in your CNC program. You'll be amazed at how easy it is and at the clarity of the layout of your CNC program.

Well combined: programGUIDE

programGUIDE means a perfect combination of the SINUMERIK CNC programming language and the parameterization of technology cycles. Simply select one of the many technology cycles by pressing a button, enter the desired parameters, and you've already saved programming time. The parameter entry is supported by Animated Elements. Perfect animation!

We offer also the classical way: ISO dialect

Being able to speak a foreign language is always an advantage. That also applies to a global player such as the SINUMERIK 828D. However, you can continue using classic ISO programming if you prefer. You can even mix ISO programming with the SINUMERIK CNC programming language. This enables you to get to know the unsurpassed performance capability of the SINUMERIK 828D and increase the productivity and flexibility of your machine step-by-step.





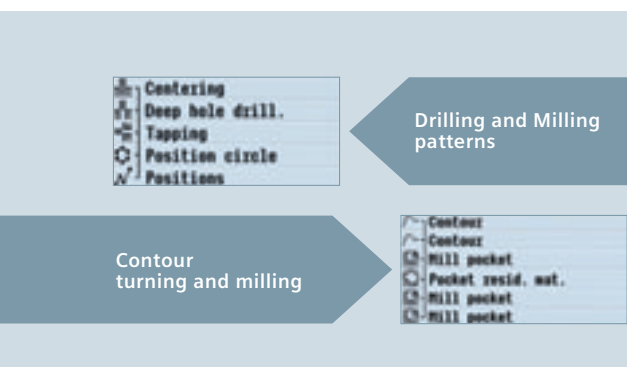
ShopMill and ShopTurn: Simple step-by-step programming.

When it comes to manufacturing small batches or individual parts, programming time is the key factor for ensuring productivity. Here, the SINUMERIK 828D is in its element. With ShopMill/ShopTurn sequence programming, the SINUMERIK 828D boasts the most straightforward CNC program editor in the world.



ShopMill/ShopTurn sequence programming

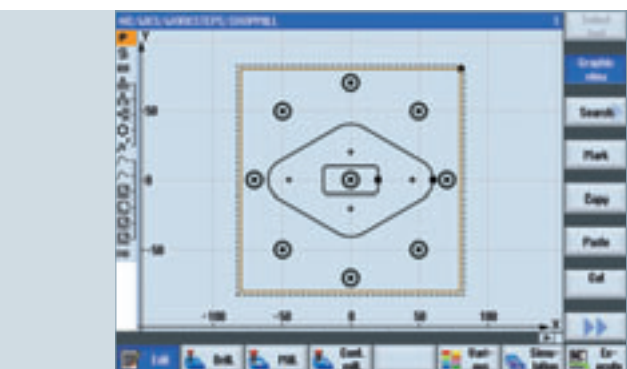
You can program a SINUMERIK 828D the same way as you mentally break down the machining of a workpiece into technological steps. Processes such as drilling, centering, grooving or pocket milling are displayed in the form of steps. This makes the CNC programs – even those used for complex machining processes – extremely compact and easy to read. This unique level of programming convenience ensures the shortest possible programming times, and thus the maximum productivity of your machining process.



Linking machine sequences saves valuable time

Automatic linking means you only have to enter the position pattern of machining sequences – such as centering, deep-hole drilling and tapping – once. The SINUMERIK 828D then derives the optimal machining sequence from this linking. This is not only clear, but also saves valuable programming time.

Linking also helps you when you want to resume work from an interruption point. Simply put the cursor on the position pattern, enter the step and position number, and off you go.



Dynamic line graphics lets you see the whole picture

All geometric elements in the CNC program are displayed true to scale thanks to the dynamic broken-line graphics. Throughout the entire program, the broken-line graphics adapt automatically to the geometric input. Even if elements are changed or added, they are displayed perfectly on the screen, without simulation. Naturally, CNC simulation is also available in ShopMill/ShopTurn sequence programming. However, this will not be required until the end of the process and, when it is, optimum process stability will also be ensured.

Technology cycles: Suitable for every type of program.

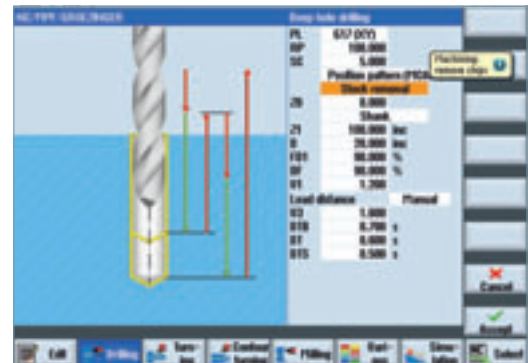


We take our position as technology leader seriously, and that also goes for the SINUMERIK 828D. We provide a tailor-made technology cycle for even the most complicated type of machining to guarantee you the shortest possible programming time coupled with maximum machine productivity.

Wide range of drilling and milling cycles

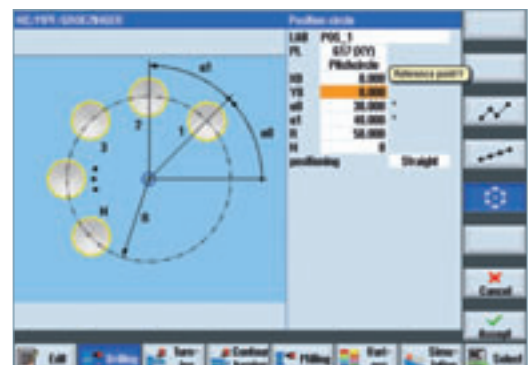
Deep-hole drilling, tapping, milling of circular pockets, thread milling, an easy-to-use engraving cycle and a whole lot of more: the SINUMERIK 828D offers a unique assortment of drilling and milling cycles for standard geometries.

You don't only have this ease of operation on your milling machine. You can also use your full range of drilling and milling cycles for machining end faces and peripheral surfaces on turning machines.



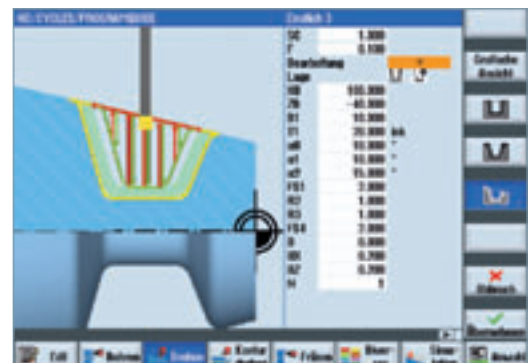
Free choice of positon patterns

Drilling and milling cycles can be assigned to any position patterns such as lines, circles or grids. This enables you to generate complex position patterns with just a few inputs. The kinematic transformations enable you to use the position patterns without any calculation whatsoever, even on inclined workpiece surfaces or on the end faces and peripheral surfaces of turned workpieces.



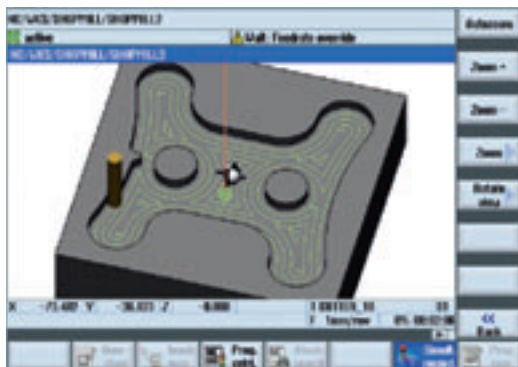
Powerful turning cycles

The performance capability of the turning cycles is just as good as that of the drilling and milling cycles. For example, the cycles for standard geometries such as turning shoulders, thread undercuts and trapezoid grooves, to name just a few. It goes without saying that you can use the turning cycles in all workpiece quadrants, that means even for machining inside contours. All these cycles, including drilling and milling cycles, are also available on the counterspindle without any restrictions.



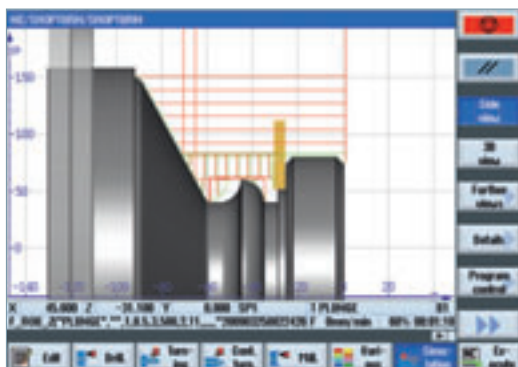
CNC-Programming made easy

Whether you use the flexibility of programGUIDE or the super fast programming with ShopMill/ShopTurn steps – in both cases you can use the complete range of technology cycles. That means we're offering you one uniform operating "feel," no matter whether you're producing large batches or one-off parts.



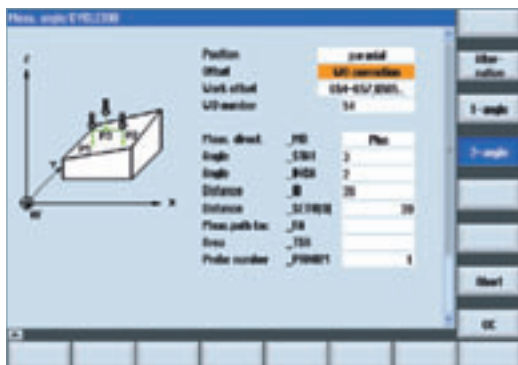
Solid machining and stock removal from contours

The technology cycles are not restricted to creating standard geometries. An intelligent solid-machining cycle enables you to produce any desired contour pocket – and of course, with islands. This can also be done with rotating tools on turning machines. What applies to milling contours also applies to contours with rotation. SINUMERIK 828D offers a first-rate contour stock removal cycle for this purpose. This cycle facilitates not only the usual longitudinal and face cutting, but also contour machining with recess and plunge-turning tools.



Convenient detection of residual material

How do you handle steeply falling contours of rotation? Your 80° cutting insert simply can't get in there. No problem! The SINUMERIK 828D detects where the residual material is. You can then machine this with a suitable tool, a plunge-cutting tool for example. You can also take advantage of this ease of operation when milling. Simply start machining with a large milling cutter. You can then remove the residual corners with a smaller cutter. The SINUMERIK 828D calculates all this automatically, so drastically reducing the machining time.



Best accuracy with measuring cycles

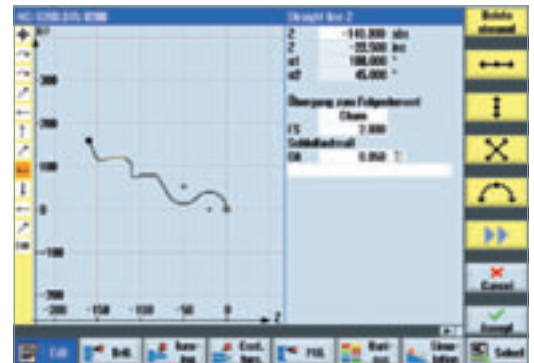
The SINUMERIK 828D ensures continued workpiece accuracy during the machining process with an assortment of measuring cycles. Do you want to take a measurement to correct the fit of a tool? Simply call up the measuring cycle in the CNC program, and the measured geometric deviation is immediately included in the tool's wear value. And if you want to log the measurements, the measuring cycle writes the measurement results into a log file, so you can verify the accuracy of your workpieces at any time.

The best support and the highest degree of process stability.

The SINUMERIK 828D has a hard-working team of useful helpers to make sure that your technology cycles run properly. Everything has been perfectly thought through: contour generation, the setting of the machining position and brilliant CNC simulation.

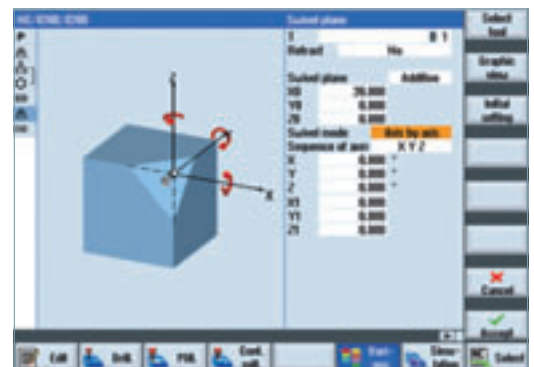
Geometry processor also for complex contours

Even complex contours can be generated directly on the CNC thanks to the integrated geometry processor. Partially defined contour elements are automatically calculated. Grinding stock allowance required for turned workpieces? All you have to do is input the allowance. The SINUMERIK 828D will take care of any additional calculations. In addition, DXF files can also be processed. Simply install the SINUMERIK CAD reader on your PC to convert your DXF files into the SINUMERIK geometric format.



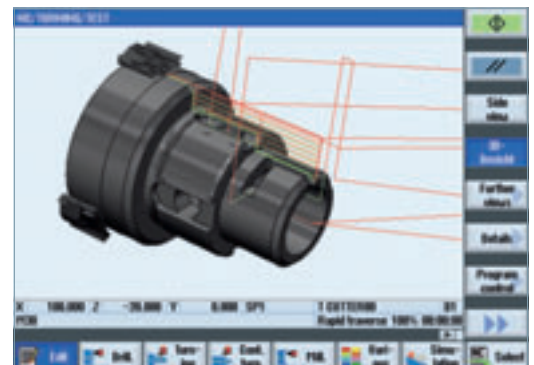
Easy machining with swivel and counterspindle cycles

Swiveling a plane sounds extremely complicated. But it isn't. The SINUMERIK 828D provides a swivel cycle specifically for this purpose. Simply entering the desired coordinate rotation automatically brings the machining into the correct position. We also provide an easily understandable cycle for machining with a counterspindle, no matter whether you use the counterspindle for supporting the workpiece or for machining the back face of the workpiece. The SINUMERIK 828D handles spindle synchronization, gripping, pulling and, if necessary, parting the workpiece fully automatically.



CNC simulation for maximum program quality

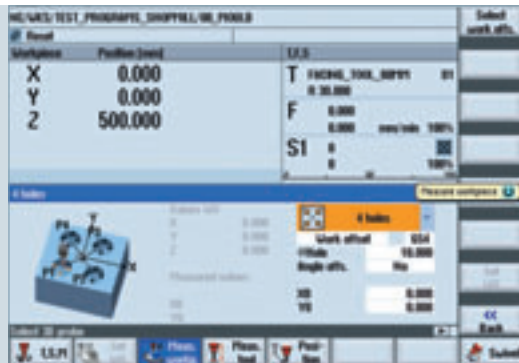
The SINUMERIK 828D's simulation feature guarantees maximum process stability because it uses the actual geometrical data of the tools installed on the machine. Therefore, the SINUMERIK 828D doesn't only show brilliant colorful pictures, it shows an exact image of the desired machining process. Whether it is being used for end and peripheral surfaces or rotated machining planes, the SINUMERIK 828D can simulate machining whatever the circumstances. Worried about detailed machining? Not a problem for the SINUMERIK 828D. You can zoom in to the smallest corners of the CNC simulation without having to restart it.





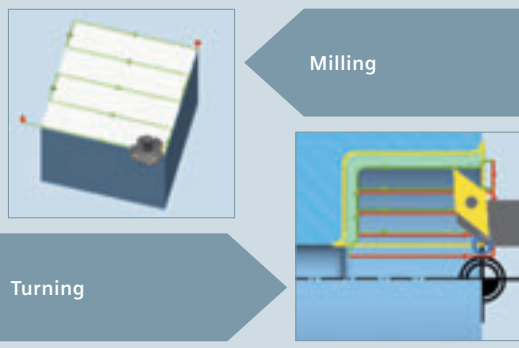
Machine setup made easy.

Once the CNC program has been written, the machine just needs to be set up. No matter what you're doing, entering the tool data, measuring the tool lengths, determining the workpiece zero, milling the face of a blank, or boring the chuck jaws, this is exactly where the SINUMERIK 828D proves its value by helping you to save valuable time.



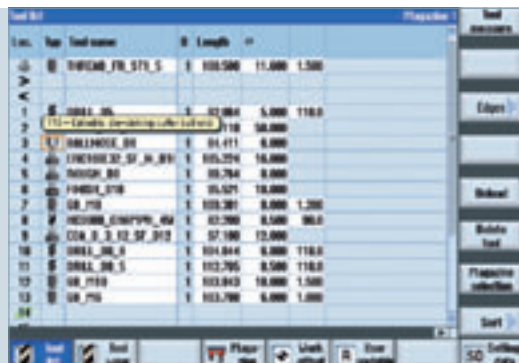
Measurement of tool and work-piece

Can the workpiece be set up as easily as the CNC programming? Of course it can! All you need to do is trace the edge, corner or boreholes and the system will determine the clamping position including the workpiece's basic rotation – even for sloping workpiece surfaces. Tool measurement is also child's play for the SINUMERIK 828D. Whether you are determining the tool geometry by "scratching" or using a tool measurement system, all you need to do is press a button and the geometry will be stored in the CNC's tool offset memory.



Setup without part program

Blanks often need to be shaped prior to machining. The SINUMERIK 828D does not require any additional CNC part program for this purpose. A workpiece can be face-milled or face-turned simply by setting the relevant parameters in setup mode. Simply select NC Start and off you go. You can also use this ease of operation whenever you want to bore the chuck jaws. The SINUMERIK 828D can do this at the touch of a button.



Well organized tool management

The SINUMERIK 828D has a perfect command center for managing your tools. Tool data and magazine location information are clearly shown in a screen. A suitable magazine location is selected automatically: simply select a tool, press a button and the SINUMERIK 828D offers you a suitable magazine location. In addition, the SINUMERIK 828D monitors the service lives of your tools and switches in suitable replacement tools, as and when required. By the way, you can give your tools recognizable names instead of uninformative numbers. If you haven't done so before, you'll see the advantages of this user-friendliness as soon as you read the CNC program.

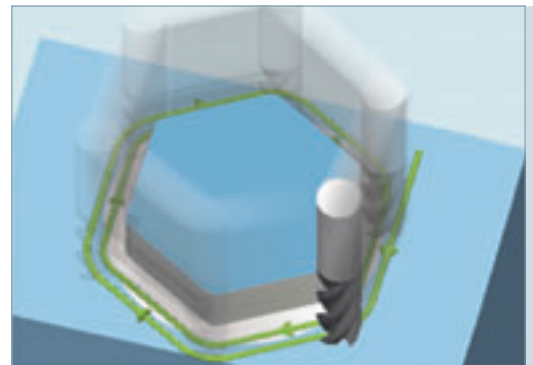
SINUMERIK 828D: Tomorrow's technology, today.



Can you imagine having to do without your computer's graphic capabilities or the convenience of your mobile phone? So that you don't have to do without anything on a CNC, we've integrated future-oriented functions into the SINUMERIK 828D.

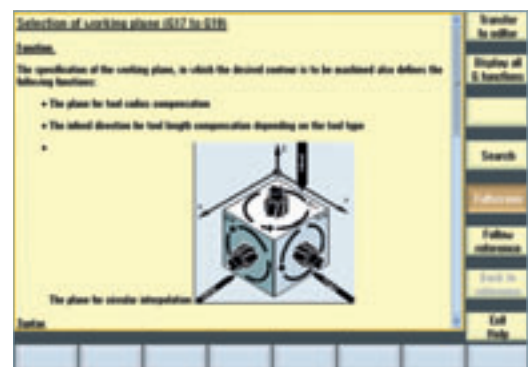
Interactive GUI with Animated Elements

What do the parameters that are input daily into a CNC actually do? The answer is obvious: they are responsible for the machine's movements. That is why the SINUMERIK 828D offers a completely new and highly convenient method of input support: Animated Elements. This input support completely redefines graphic programming and operation thanks to a unique display involving sequences of moving pictures. The questions as to the difference between chipbreaking and stock removal when drilling or the exact tracing sequence for corner measurement have now been answered with absolute processing reliability.



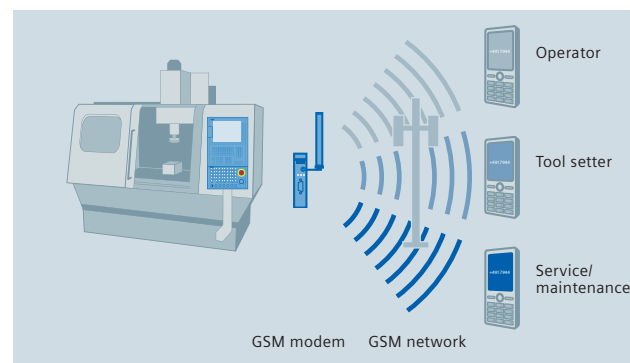
Online help system

For every text box on the operating screens, the SINUMERIK 828D automatically provides help in the form of cursor text. And if that doesn't answer all of your questions, the SINUMERIK 828D backs this up with a comprehensive Help system containing a multitude of interesting details and graphics. Does that sound familiar? Obviously, it's just like the help you have on your PC at home. The times of having to sit in front of your CNC wading through bulky paper documents are now gone.



Everything under control with Easy Message

Does machine #3 in row 2 need new blanks or is the milling cutter on machine #7 in row 1 still within the tolerance range? The SINUMERIK 828D tells you everything you need to know. Let the processing status of your machine be sent to your mobile phone as a text message (SMS), and increase the productivity of your production process. Simply insert a SIM card of your choice, enter your mobile number into your user profile, select the information you would like to have (tool management information, for example), and you're immediately kept up-to-date.



State-of-the-art communications: All data under control.

Whether you insert a USB stick or Compact Flash (CF) card, connect a notebook or integrate completely into the company network – there's never any problem. With the SINUMERIK 828D you benefit from state-of-the-art computer technology.

CNC memory and front ports even for huge data transfer

The SINUMERIK 828D is already equipped with a basic 3 or 5 MB user memory.

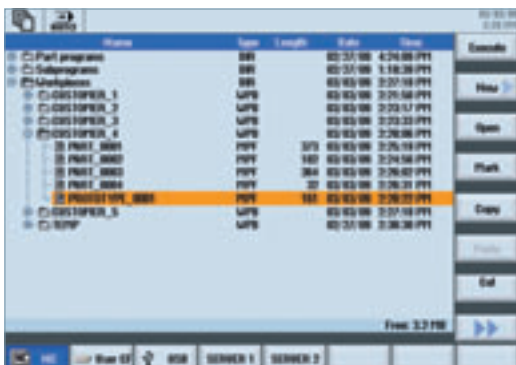
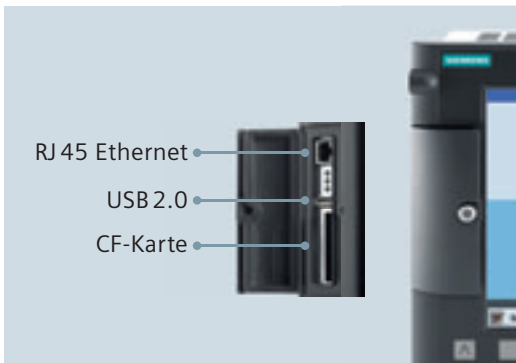
However, if you need more memory, such as for large mold-making programs, then simply plug a Compact Flash (CF) card into the front port and the memory is instantly expanded. There's no need to worry about leaving the CF card plugged in. You also have another USB port on the front for data transmission. Simply save CNC programs on a memory stick and copy them into the CNC memory or onto the CF card.

All inclusive for best networking

Do you archive your CNC programs on a notebook? We provide the perfect PC tool for that. Simply connect the notebook to the front Ethernet port of the SINUMERIK 828D. No expertise in networking is required. Simply plug-and-play. With the RCS-Commander, data can easily be exchanged between your notebook and CNC using the drag-and-drop method. The SINUMERIK 828D can be integrated into any company network via an additional 100Base-T Ethernet port... all without the need for additional software protocols. Simply connect, configure and get on the information superhighway.

Clear overview with Program Manager

And how does the SINUMERIK 828D organize the data with this multitude of transmission media? Just like your PC, the SINUMERIK Program Manager shows you all the storage media on a clearly laid-out screen. For example, if you want to transfer a CNC program from the data server into the CNC memory, just press copy and paste, and your CNC program is instantly in the right place. You can also machine large mold and die workpieces directly via the company network or Compact Flash (CF) card. Simply select a program from the program manager and start machining.



More productivity beyond the shopfloor.

The efficiency of your production process is determined not only by the performance of the CNC and machine, but also by the work preparation. Here again, we help you to reduce your production costs substantially with an offline programming and training system and a top-class CAD/CAM system.

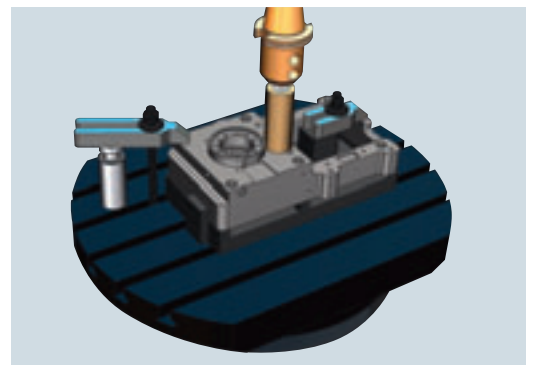
SinuTrain programming and training system

Wouldn't it be great if you could set up your part programs conveniently on a PC? No problem! With SinuTrain, we offer you a software system that behaves exactly like your SINUMERIK 828D does on the machine. You can write and simulate a part program conveniently with programGUIDE or with ShopMill/ShopTurn steps. Then just copy it onto the CNC and you're ready to start machining. You can also use SinuTrain as a fully adequate training system for a trainer and several trainee workstations. This enables you to prepare yourself optimally for working with your SINUMERIK 828D.



NX CAM – a complete solution

NX CAM is a complete, tried-and-tested system including CAD, CAM, machine simulation, post-processor and comprehensive PLM functions – from turning to complex milling. It goes without saying that NX CAM and SINUMERIK have been perfectly matched to keep the entire production process under the best possible control. And that doesn't just apply to big industry. With NX CAM Express, we also offer a solution specifically tailored to the needs of small- and medium-sized companies. You'll find our full range of PLM functions on the web at www.plm.automation.siemens.com.



All-round technological competence.

We're always here to give you expert support on all technological issues you might encounter. An extremely well-qualified team of machinists, trainers and service engineers can help you to optimally set up your machining process and keep your production running smoothly at top speed.



Well trained with SITRAIN

Our SINUMERIK training program is extremely practically oriented. In our operating and programming courses, we always accompany the teaching of theoretical knowledge with practical experience on real machines. Just visit our SITRAIN portal at www.sitrain.com, and select the training you need at one of our many convenient training centers.



On site service and support

Our service and maintenance technicians are always available to keep your production running smoothly. Their excellent technical training and quick response times guarantee to keep machine downtime to the minimum. You will find our global experts by pointing your web browser to www.automation.siemens.com/partner.



In close proximity: Technology and application centers

We employ highly-qualified machining specialists in our technology and application centers (TAC's), which are available to give you advice and support at all times. Incidentally, we regard our global TAC's as "breeding grounds" for our technological advancement – to guarantee that all CNC functions are ideally geared to practical use and are as user-friendly as possible. Further information is available under: www.siemens.com/cnc4you



Get more information

Everything you need to know about SINUMERIK CNC equipment:
www.siemens.com/sinumerik

Everything you need to know about shopfloor production:
www.siemens.com/cnc4you

Everything you need to know about our service portfolio
SINUMERIK Manufacturing Excellence at:
www.siemens.com/sinumerik/manufacturing-excellence

Information on training sessions:
www.siemens.com/sinumerik/training

Siemens AG
Industry Sector
Drive Technologies
P.O. Box 31 80
91050 ERLANGEN
GERMANY

www.siemens.com/sinumerik

Subject to change without prior notice
Order No.: E20001-A960-P610-X-7600
DISPO 06311
WÜ/20457 GD.MC.10.TIGE.52.9.02 WS 05091.0
Printed in Germany
© Siemens AG 2009

The information provided in this brochure contains merely general descriptions or characteristics of performance which in actual case of use do not always apply as described or which may change as a result of further development of the products. An obligation to provide the respective characteristics shall only exist if expressly agreed in the terms of contract.

All product designations may be trademarks or product names of Siemens AG or supplier companies whose use by third parties for their own purposes could violate the rights of the owners.