

SIEMENS



SINUMERIK 828

The powerhouse in the compact class of CNCs

siemens.com/sinumerik

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Contents

SINUMERIK – the CNC portfolio	4
Optimum scalability	5
Hardware and system features	6
Drives and motors	8
Machining technologies	9
CNC-Performance	10
Operation and programming	12
SINUMERIK MDynamics	15
Machine cells	20
Industry solutions	22
Service and support	24
An overview of the technical data	26



We bring your manufacturing up to speed

With their unique CNC performance, SINUMERIK 828 controls, SINUMERIK 828D BASIC, SINUMERIK 828D and SINUMERIK 828D ADVANCED set productivity benchmarks when it comes to milling and turning on standardized machines as well as functions to simply automate grinding machines.

With its SINUMERIK 828 controls, Siemens Machine Tool Systems offers compact CNCs for standardized turning, milling and grinding machines. With their technology-specific system software, the range of applications extends from vertical and basic horizontal machining centers –

naturally also for moldmaking applications – through surface and cylindrical grinding machines up to two-channel turning centers with counterspindle, driven tools and Y-axis. Rugged hardware architecture and intelligent control algorithms, along with premium drive and motor technology, ensure the highest dynamic response and precision when machining. The intuitive SINUMERIK Operate user interface facilitates efficient machine operation. With their outstanding performance, SINUMERIK 828 controls master all of the demands for standardized turning, milling and grinding machines.

SINUMERIK – a CNC portfolio for the global machine tool environment



SINUMERIK 808

- Panel-based compact CNC
- Technologies: turning and milling
- Up to 5 axes/spindles
- 1 machining channel
- 7.5"/8.4" color display
- SIMATIC S7-200 PLC-based

SINAMICS
V60
SIMOTICS
S-1FL5

SINAMICS V70
SIMOTICS S-1FL6
SINAMICS V70
Spindle
SIMOTICS M-1PH1

SINUMERIK
808D

SINUMERIK 808D
ADVANCED

Entry-level class



SINUMERIK 828

- Panel-based compact CNC
- Technologies: turning, milling, grinding functions
- Up to 10 axes/spindles and 2 auxiliary axes
- Up to 2 machining channels
- 10.4" color display/
15.6" touch display
- SIMATIC S7-200 PLC-based

SINAMICS S120

SINAMICS S120 Combi

SINUMERIK
828D BASIC

SINUMERIK
828D

SINUMERIK
828D
ADVANCED

Compact class



SINUMERIK 840D sl

- Drive-based, modular CNC
- Multi-technology CNC
- Up to 93 axes/spindles and any number of PLC axes
- Up to 30 machining channels
- Modular panel concept, up to 19" color display
- SIMATIC S7-300 PLC

SINAMICS S120
Combi

SINAMICS S120

SINUMERIK
840D sl BASIC

SINUMERIK
840D sl

Premium class

Optimum scalability in the compact class

Performance

Software version 28x ADVANCED

- Up to 8 axes/spindles (M),
10 axes/spindles (T, G)
- Up to 2 machining channels
- Min. block change time ~ 1 ms (M)
- 768 tools, 1536 cutting edges
- 10 Mbyte user memory
- In addition, up to 2 help axes



PPU 290.3

Software version 28x

- Up to 6 axes/spindles (M),
8 axes/spindles (T)
- 1 machining channel
- Min. block change time ~ 1 ms (M)
- 512 tools, 1024 cutting edges
- 8 Mbyte user memory
- In addition, up to 2 help axes



PPU 281.3/280.3

Software version 26x

- Up to 6 axes/spindles
- 1 machining channel
- Min. block change time ~ 2 ms (M)
- 256 tools, 512 cutting edges
- 5 MB user memory
- In addition, up to 2 help axes



PPU 241.3/240.3

Software version 24x

- Up to 5 axes/spindles
- 1 machining channel
- Min. block change time ~ 3 ms (M)
- 128 tools, 256 cutting edges
- 3 MB user memory

SINUMERIK 828D
ADVANCED

SINUMERIK 828D

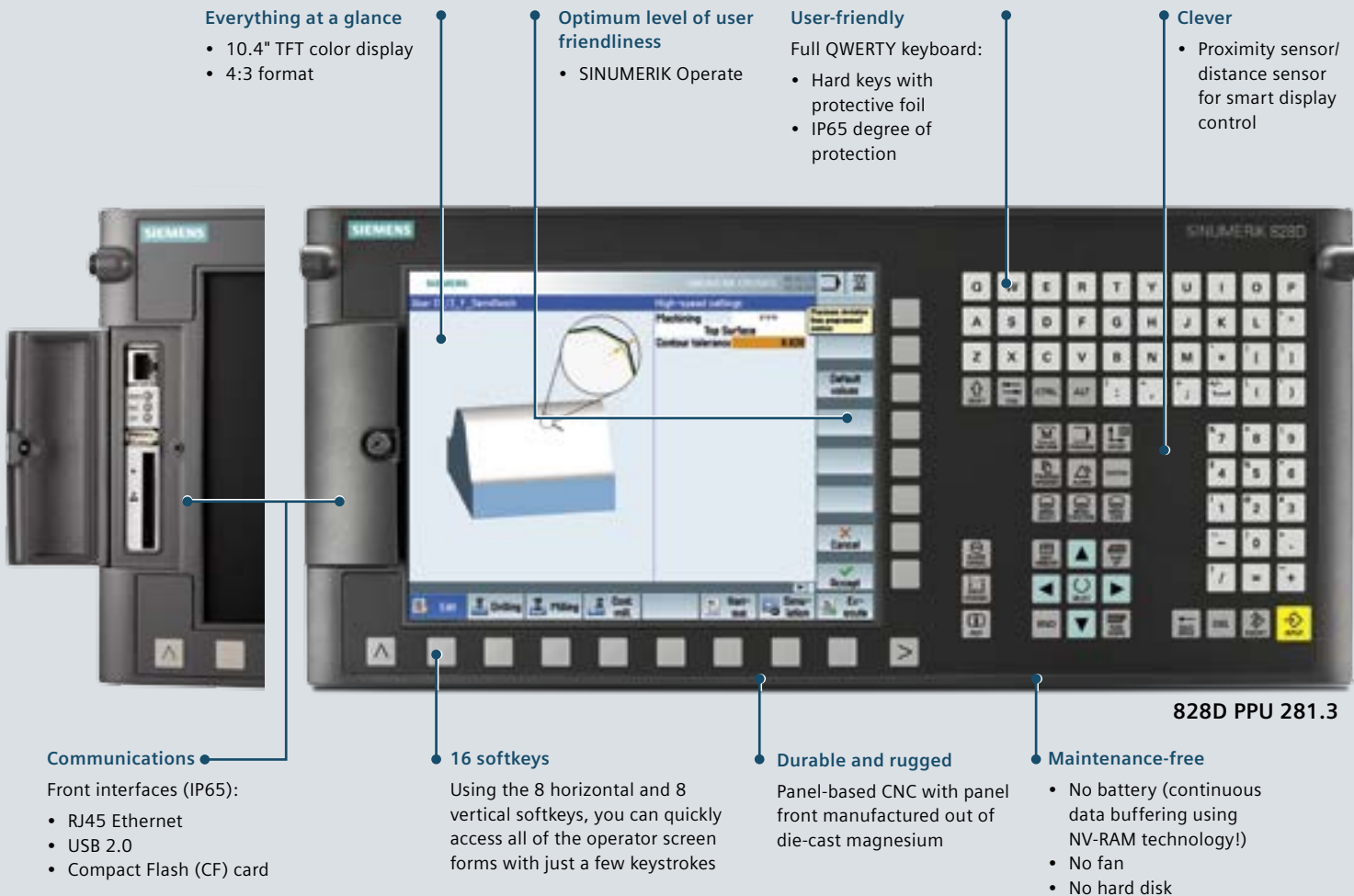
SINUMERIK 828D
BASIC

Scalable CNC performance

In addition to three high-performance CNC versions of SINUMERIK 828D, SINUMERIK 828D BASIC is the favorably priced entry into the compact class.

This means that SINUMERIK 828 CNCs perfectly address the performance required by standardized machine concepts for turning (T), milling (M) and grinding (G).

SINUMERIK 828 PPU versions (Panel Processing Unit) – an overview



All data on this page is also applicable for SINUMERIK 828D BASIC.

Optimum connection

Rear interfaces

- USB 2.0
- RJ45 Ethernet
- DRIVE-CLiQ
- PLC I/O interface
- RS232 C
- NC inputs/outputs



Everything at a glance

- 15.6" color display
- 16:9 format

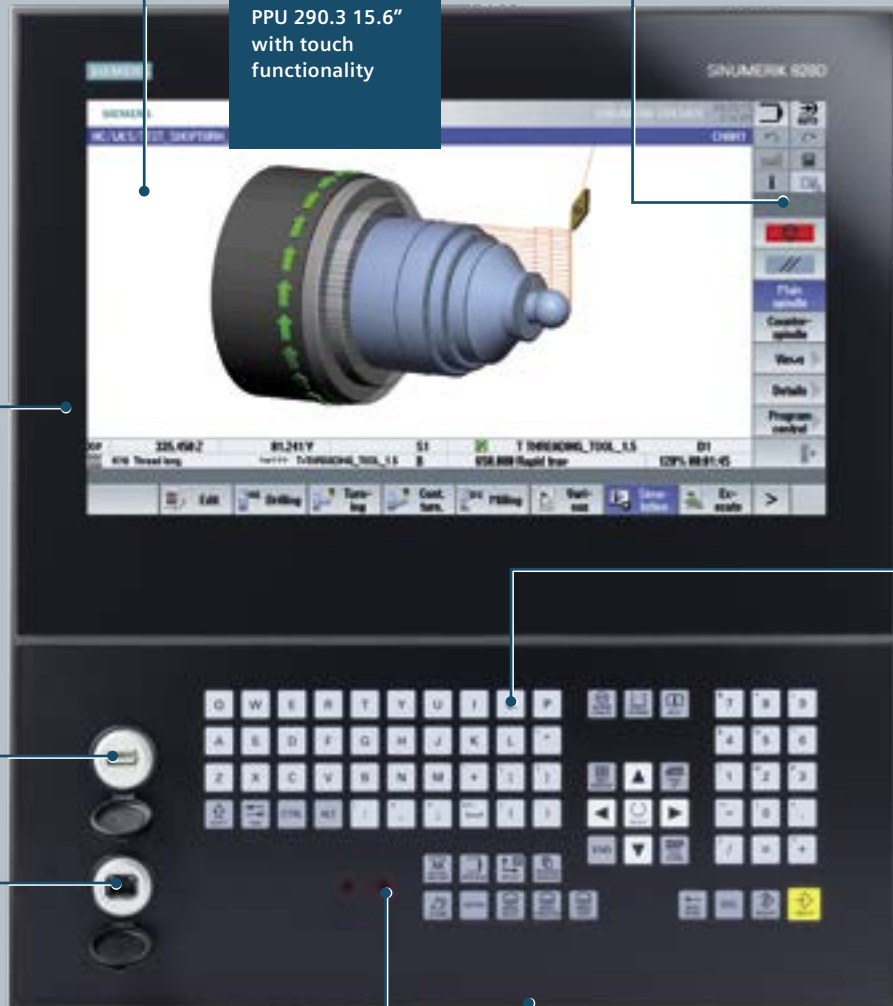
Operator friendly

- Capacitive display with multi-touch controller
- Intuitive multi-touch operation
- Softkeys selected using touch function

Optimum level of user friendliness

- SINUMERIK Operate optimized for touch operation

PPU 290.3 15.6" with touch functionality



Durable and rugged

- Panel front manufactured out of die cast magnesium with scratch-proof glass
- Panel can be operated when wearing work gloves

Full QWERTY keyboard

- Mechanical keys with protective membrane
- IP65 degree of protection

Communication functions

Front interfaces (IP65):

- USB 2.0
- RJ45 Ethernet
- IP65 even with the protective cover open

Smart

- Proximity sensor/distance sensor for smart display control

Maintenance-free

- No battery (permanent intermediate data buffering using NV-RAM technology)
- No fan
- No hard disk

Optimum connectivity:

- Electrical connection at the rear – 100 % compatible connection to PPU24x.3/28x.3



828D PPU 290.3

SINAMICS and SIMOTICS – the powerhouses behind the scenes

SINUMERIK 828 CNCs in conjunction with SINAMICS drives and SIMOTICS motors are optimally designed to address the requirements of standardized machines.



SINAMICS S120 – the highest degree of flexibility

SINAMICS S120 is synonymous with performance and flexibility when it comes to equipping machine tools. In addition to a wide range of motor modules up to a power rating of 300 kW, there is also an infeed unit with a controlled DC link. This ensures the fastest spindle acceleration rates. This is complemented by DSC (Dynamic Servo Control), which represents a unique position control technique to achieve the highest dynamic performance of feed and spindle motors.

SINAMICS S120 Combi – the optimum drive for compact machines

SINAMICS S120 Combi combines the performance of the modular SINAMICS S120 in a compact, rugged design. One infeed and up to four motor modules are integrated in one housing. By intelligently expanding the system to include two additional motor modules, the SINAMICS S120 Combi is the ideal drive for compact, standardized machine tools with a maximum spindle power of up to 29 kW and up to five feed axes.

www.siemens.com/sinamics

SIMOTICS servomotors

High static torque, high maximum speed and smooth running properties make SIMOTICS servomotors the optimum feed drives for machine tools. A high degree of protection, strong bearings and a vibration-free design ensure that these synchronous servomotors have outstanding reliability. High-quality magnetic materials result in a very high power density, so that these motors have very small dimensions and can be installed in extremely tight spaces.

SIMOTICS torque motors

In addition to conventional rotating motor principles, the SIMOTICS range also includes SIMOTICS 1FW6 torque motors. This is a direct drive with a very high dynamic performance.

www.siemens.com/simotics

Spindle solutions from Siemens

Siemens has supplemented its long-standing tradition in the production of electric motors to include expertise in spindle manufacturing with Weiss Spindeltechnologie GmbH. This means that Siemens Machine Tool Systems can offer a wide range of spindle solutions from a single source.

www.siemens.com/spindles

SINUMERIK 828 – first choice for every machining technology

SINUMERIK 828 offers preconfigured technology packages – whether turning and milling on standardized machines or the automation of grinding machines. Using the innovative SINUMERIK Operate graphic user interface, every machining technology – from standard up to complex – can be addressed with a standard look & feel. Some of the highlights are presented in the following.

Turning

4-axis turning is possible using two tools that operate independently of one another – also known as balance cutting. Just some of the new functions include multi-channel operation with ShopTurn, which also allows programs to be synchronized using programSYNC. The new 28x software allows simultaneous operation in two channels for lathes and grinding machines.



Milling

When it comes to milling, optimum workpiece surfaces are achieved with the highest machining speed based on Advanced Surface (standard) and Top Surface (optional) with intelligent motion control. CAD data is very simply transferred into the CNC program using DXFreader. The measure kinematics cycle (CYCLE996) has been developed to measure multi-axis kinematics, and can be directly called from the NC program. 3D simulation at the PC facilitates improved control and optimization of the production process.



Grinding and additional technologies

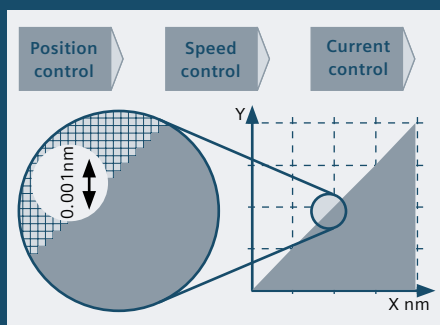
Grinding machines can be very simply commissioned by pre-assigning technological data. The new basic functions include automated measuring and setting up of grinding machines, additional grinding parameters for managing contour, dressing program and grinding tools – as well as standard grinding cycles and grinding-specific NC functions. Advanced functions ensure a higher quality and productivity. Further, using HMI Universal, the software can also be used for other applications.



SINUMERIK CNC performance – the machining standard

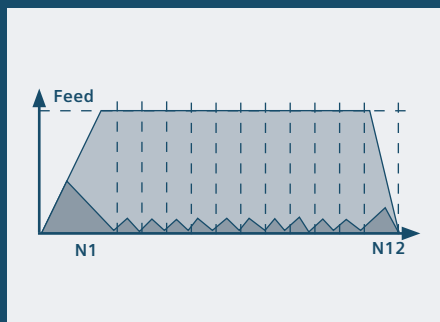
SINUMERIK CNC controls set standards relating to every aspect of machining performance.

Whether precision and speed, energy efficiency and safety, or reducing cycle times – SINUMERIK sets the pace.



Highest precision

SINUMERIK CNCs and SINAMICS drives compute with high-performance 80-bit NANOP accuracy. This eliminates rounding errors and results in an extremely high internal computational accuracy in the complete controller circuit. Further, a dynamic feed forward control ensures that the following error is almost completely compensated – and jerk limitation reduces stress on the mechanical system when axes accelerate. Using its Dynamic Servo Control, SINAMICS control technology provides additional position control in the drive – representing an additional advantage by achieving an increased level of disturbance resistance of the machine control.



Maximum speed

When machining many CNC blocks in the shortest time, for example, free-form surfaces, the machining process itself no longer defines the speed, but the performance of the CNC. Here, with its Advanced Surface and Top Surface features, SINUMERIK offers the ideal solution. Advanced Surface stands for state-of-the-art control algorithms, such as Look Ahead or the dynamic compression of linear and circular blocks in 5th degree polynomials (NURBS). Machines can be operated at their physical limits when using Advanced Surface and Top Surface.



Shortest idle times

Especially in large series production, idle times, where the machine is no longer productive, represent a critical productivity-inhibiting factor. Here, SINUMERIK provides the optimum solution with its synchronous architecture and intelligent functions, such as synchronized actions and asynchronous subprograms. For example, loading equipment can be implemented without having to make time-consuming changes to the PLC program.

Kinematic transformations

When handling complex machine kinematics, SINUMERIK CNC is in its element – from the classic face/peripheral surface transformation for lathes up to multi-side machining in swiveled planes. As a result, SINUMERIK paves the way for leading-edge machine tool applications.



Energy efficiency with SINUMERIK Ctrl-Energy

Siemens Machine Tool Systems sets the standard when it comes to energy efficiency in machine tools: SINUMERIK Ctrl-Energy encompasses a wide range of highly efficient drive and motor components, CNC/drive functions, software solutions and services. SINUMERIK Ctrl-Energy offers energy-efficient solutions over the complete machine lifecycle – from design to the operation of the machine. Users have intelligent functions at their fingertips, such as the ability to analyze the energy costs associated with a specific workpiece. SINUMERIK helps you to save energy by simply pressing the Ctrl + E shortcut key.



SINUMERIK Safety Integrated to protect personnel and machines

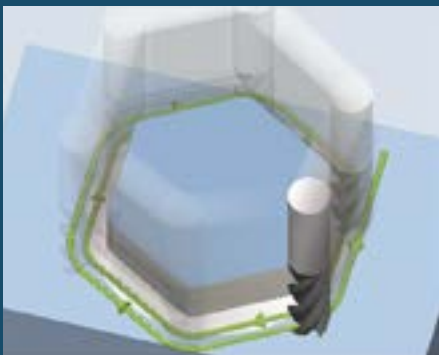
Siemens Machine Tool Systems is the pioneer when it comes to protecting personnel and machines. For almost two decades now, SINUMERIK Safety Integrated has been setting the benchmark for safety technology integrated in machine tool systems. Here, intelligent system functions permit user-friendly operation of the machine – for example, machines can be set up with the protective doors open. This provides the highest degree of safety for machine operators and the machine itself.



SINUMERIK Operate – the state-of-the-art operating concept for the 21st century

SINUMERIK Operate provides the highest degree of operator convenience at the machine tool – therefore setting the standard for efficient machine tool operation.

www.siemens.com/sinumerik-operate



Innovative details for user-friendly operation

With Animated Elements, SINUMERIK Operate makes it very easy to enter parameters. Animated Elements completely redefine what graphic programming and operation really mean – using a unique display with moving image sequences.

Shortcuts in SINUMERIK Operate allow data to be quickly entered at the operator panel – saving operators a lot of time.



Program Manager for a better overview

Simple data handling – just the same as when using a PC: SINUMERIK makes it all possible with its Program Manager. Contents in the DXF, BMP, PDF, JPG and HTML formats of various storage media are transparently displayed. CNC programs can be transferred from the data server to the CNC memory by simply copying and pasting. And now it has been made even simpler: Large moldmaking workpieces can be selected in the Program Manager, and directly executed via the company network, USB stick or CF card.

SinuTrain for SINUMERIK Operate

The SinuTrain NC programming station, which is identical to the control system, brings SINUMERIK Operate – including animated machine operator panel – to the PC. This facilitates convenient job preparation in a familiar work environment. NC programs can be directly generated here, and as a result of the original SINUMERIK CNC kernel, can be verified before they are transferred to a real machine. Users profit from higher machine availability and reliability. Further, SinuTrain can be ideally used for training personnel on how to operate and program SINUMERIK – as well as presenting and testing new SINUMERIK functions.

www.siemens.com/sinutrain



SINUMERIK SINUMERIK Operate – intuitive handling, faster setup

Based on an intelligent JOG mode and intuitive tool management, SINUMERIK Operate graphically and interactively supports all of the typical setup functions. This keeps unproductive times to an absolute minimum.

Intelligent JOG mode

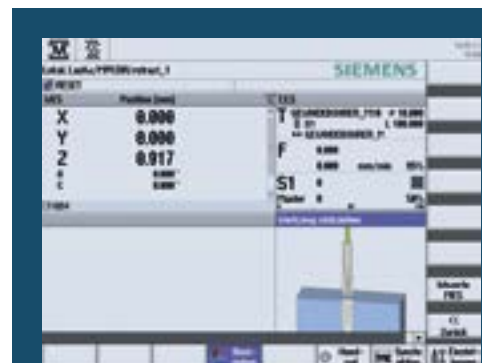
In SINUMERIK Operate, the intelligent JOG mode provides graphic, interactive support for all typical setup functions for turning and milling machines. This means that a probe can be simply loaded with just three clicks. On lathes, face turning of a blank or boring soft clamping jaws is also directly realized in the intelligent JOG mode – without having to generate a part program. The extended retract function allows a tool to be retracted after a power failure, and to be returned to the precise point of interruption after power has been restored.

Measuring tools and workpieces

Measuring tools and workpieces are optimally supported in the intelligent JOG mode. It is sufficient to probe an edge, corner or holes in order to determine the clamping position, including the basic rotation of the tool – also in swiveled workpiece planes. Measuring tools is also a simple operation for SINUMERIK. Irrespective of whether the tool geometry is simply “scratched” or determined using a tool measuring system – by pressing just one key, the geometry is transferred into the tool offset memory of the CNC.

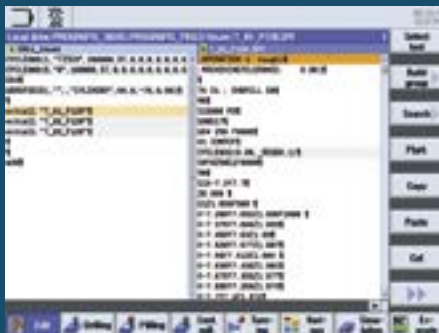
Transparent tool management

SINUMERIK provides the perfect central command station when it comes to tool management. Tool data and magazine location information are clearly displayed on a screen. The selection of a suitable magazine location is completely automatic: simply select a tool, press a key and SINUMERIK CNC does the rest. It goes without saying that each tool’s lifetime is monitored, and when required, the appropriate replacement tool is loaded.



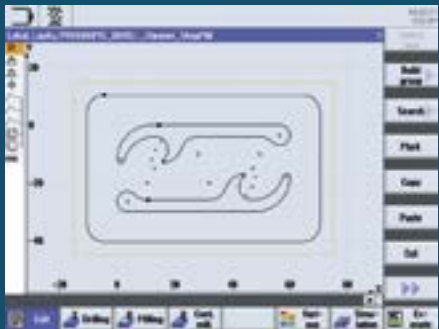
SINUMERIK Operate – perfect for every programming task

With various programming languages, SINUMERIK supports every CNC programming method that is used around the world – from machining individual parts up to large series production.



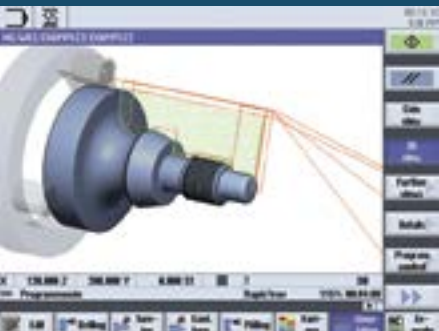
For large series ...

Shortest machining times for large series production and with the highest flexibility for special applications: SINUMERIK CNCs make this possible with advanced CNC programming based on high-level language elements. Using programGUIDE, SINUMERIK CNC programs can be easily combined with high-performance technology and measuring cycles. Even classic ISO codes can be programmed. As a result, SINUMERIK is especially attractive for machine operators who prefer this classic programming method.



... and small series

The programming time is a decisive productivity factor for small series production and individual parts. ShopMill and ShopTurn machining step programming methods are simply unbeatable in this discipline. Machining operations such as drilling, centering, plunging and pocket milling are shown in the form of machining steps. Even for complicated machining operations, CNC programs are extremely compact and easy to read. Using dynamic broken-line graphics, which are absolutely unique in the market, all of the geometrical elements can be displayed to scale in the CNC program.



CNC simulation for reliable and safe processes

SINUMERIK CNC simulation guarantees maximum process reliability and safety as the real geometries of the tools are always used. The simulation shows the precise image of the required machining operation.

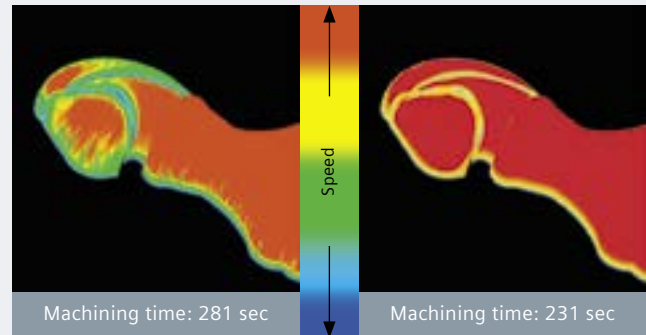
Whether face and peripheral surfaces or swiveled workpiece planes, the SINUMERIK CNC simulation function simulates every machining type.

Quick View for moldmaking

Quick View facilitates the visualization of geometries in toolmaking and moldmaking in the shortest amount of time. Critical areas can be quickly identified as the actual CAM files are displayed.

SINUMERIK MDynamics – synonymous with outstanding milling results

Cutting-edge operation, unique technology cycles,
ultimate shopfloor programming and high-quality
CNC simulation – together with premium motion
control – combined in one package: This is the
outstanding SINUMERIK MDynamics milling package.



Advanced Surface

Advanced Surface and Top Surface get the most out of the machine

Advanced Surface and Top Surface are synonymous with milling at physical machine limits – with the highest velocity and precision, the best surface quality – and not just for moldmaking. When it comes to milling, optimum workpiece surfaces are achieved with the highest machining speed based on Advanced Surface (standard) and Top Surface (optional) with intelligent motion control.

Optimum surface quality with Top Surface

When milling complex free-form surfaces, surface irregularities can occur as a result of calculation tolerances in the CAD/CAM program. With the Top Surface option, the CNC can remove these irregularities from the CAD/CAM data while machining. The innovated COMPSURF compressor optimizes the data from the CAD/CAM system for the subsequent path control of the SINUMERIK, so that a higher tolerance is obtained with respect to inaccurate

data. This allows an optimum surface quality to be achieved.

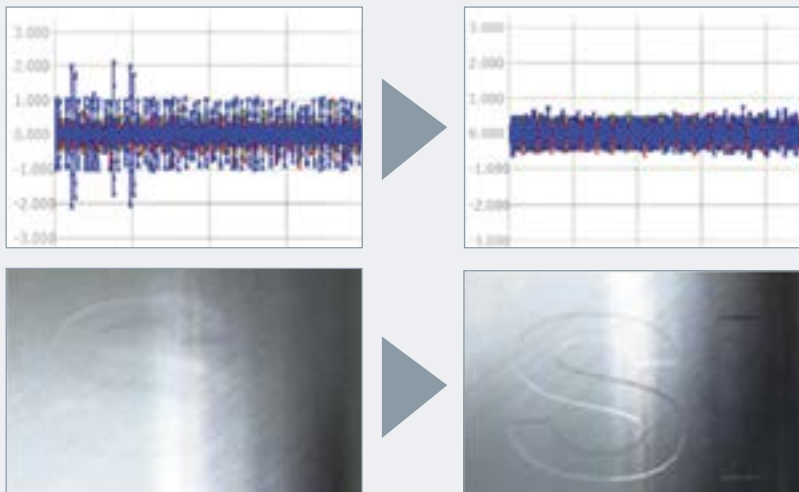
High Speed Settings

The user-friendly High Speed Settings cycle simplifies parameterizing moldmaking applications. With just a few parameters, SINUMERIK is set to the machining task – roughing, finishing or prefinishing – as well as the required machining tolerance.

The sum makes the difference

Advanced Surface and Top Surface, High Speed Settings, kinematic transformations, SINUMERIK Operate for efficient operation and programming – as well as a comprehensive portfolio of technology and measuring cycles – create a unique set of highlights for demanding and sophisticated milling machines. And superlative milling has a name: SINUMERIK MDynamics.

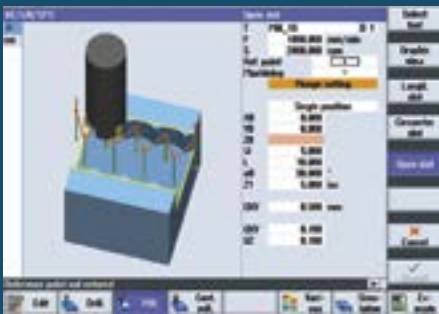
www.siemens.com/sinumerik-mdynamics



Top Surface

Premium technology cycle packages – turning, milling and more

With a powerful technology cycle package for turning and milling, Siemens Machine Tool Systems once again proves its technological leadership in CNC technology.



Technology cycles for all machining operations

SINUMERIK control systems offer a range of drilling, milling and turning cycles that are absolutely unique in the market: From simple machining operations such as centering, deep-hole drilling, milling circular pockets and turning grooves up to more complex operations such as engraving, deep-hole milling and trochoidal milling of hard metals. Based on intelligent kinematic transformations, technology cycles are available at all machining levels. For example, at face or peripheral surfaces of turned workpieces, or in swiveled planes of milling workpieces.

Multiple clamping for ShopMill machining step programming

Milling machines become even faster and even more flexible: ShopMill machining step programs can be automatically compiled for multiple clamping with fewer tool changes. CNC programs are automatically generated – and multiple clamping is supported for both identical and different workpieces.



Solid machining and stock removal with residual material detection

In addition to standard geometries, when using SINUMERIK, even complicated geometries can be machined without a CAD/CAM system – thanks to the integrated geometry computer and intelligent stock removal cycles. The range extends from the contour milling of pockets with a maximum of twelve islands, up to contour plunging on turning machines – and all of this with automatic residual material detection. This means that the ideal tools can be used for every machining phase. The result – optimum machining quality and significant time-savings.



Measuring cycles for the highest precision

Integrated measuring cycles ensure workpiece precision during the machining process. Tool geometries and work offsets are corrected automatically, so that the required production tolerances are maintained, even for high batch quantities. The integrated reporting function ensures that the workpiece quality is optimally documented.

Simple data transfer using an integrated DXF reader

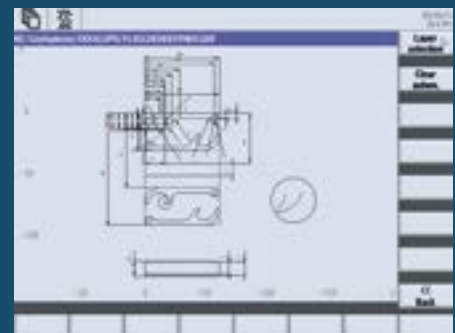
The new DXF reader option is an important factor when it comes to paperless production environments. The DXF reader supports the display of this CAD data format and direct transfer into the CNC program. Programming times can be slashed by up to 90% if, at the CNC, the contour or positions for the drilling template no longer have to be completely programmed, but instead, data can be transferred using the CAD reader. This means that DXF files can be directly opened on the CNC, and data transferred to the CNC program with a mouse click!

Editor-based flexibility

SINUMERIK Operate now provides an even faster overview in the editor: The syntax is highlighted so that part programs are easier to read – and typing errors can be more quickly identified. Displaying cycles as machining steps in programGuide facilitates straightforward plain text interpretation. Adaptable cycle screen forms mean that cycle parameters can be even more simply entered. Users can choose between displaying all of the parameters, or just concentrating on the most important ones. In this case, only the open parameters have to be programmed, the rest are preassigned.

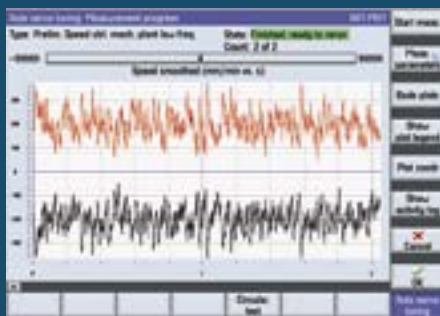
Reporting function for the highest process conformity

Reporting in JOG as well as in the automatic mode is an important component for quality assurance. In the setup mode on general purpose machines, data reporting ensures that machining is even more precise and machining results simpler to reproduce. The report is generated in all of the usual office formats so that it is available on a PC for downstream processing.



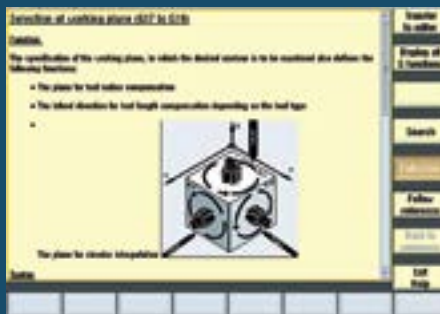
SINUMERIK Operate – everything on board for optimization and diagnostics

SINUMERIK Operate offers the ideal onboard resources to optimize axes, diagnose faults and perform maintenance work and service tasks. External PC-based software tools are not required.



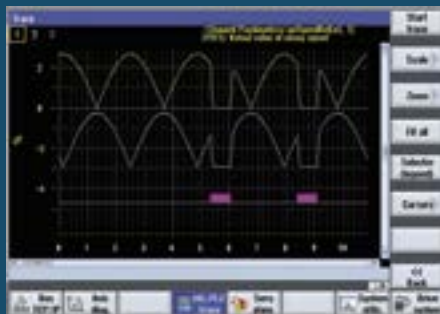
One-click optimization

With its Auto Servo Tuning (AST), SINUMERIK Operate offers fully automatic optimization of control parameters to achieve maximum dynamic performance and accuracy of the machine axes – on board and with just one click! This simplifies commissioning the machine. In operation, the machine can be regularly optimized, thus ensuring maximum precision over the entire life of the machine.



All information on board

Using context-sensitive graphic onboard help, SINUMERIK technical documentation can be called up on the CNC screen. As a result, all of the information on the input fields, CNC language commands as well as system messages and system parameters, are directly available at the machine – manuals no longer have to be printed out. This simplifies operation and programming, while making commissioning, diagnostics and maintenance far more user-friendly and efficient.

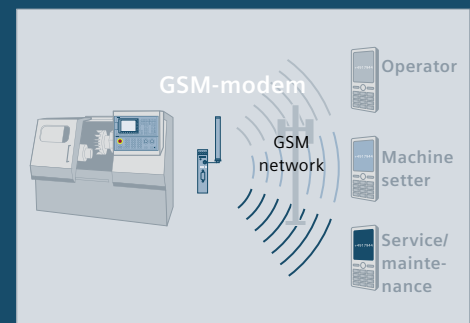


Diagnostics

Especially in large series production, machine downtimes can result in enormous loss of production. SINUMERIK Operate offers intelligent integrated diagnostics if problems arise so that machine operation can be resumed as quickly as possible. In addition to bus diagnostic tools for drive, peripheral and network components, there is also a powerful trace function. This is used to trace and troubleshoot NC, PLC and drive signals.

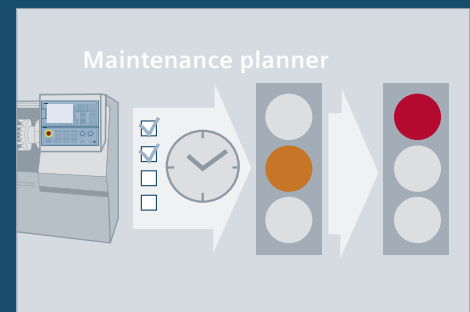
Always in the know with Easy Message

The process status of a machine can always be seen at a glance – and Easy Message makes it possible. All of the important status information is sent to your mobile phone by text message (SMS) – for example, tool life, the availability of blanks and even upcoming machine maintenance schedules. This means that you are always up to date, even if you are not standing at the machine. This feature increases machine efficiency and the overall productivity of the production process – while facilitating preventive maintenance.



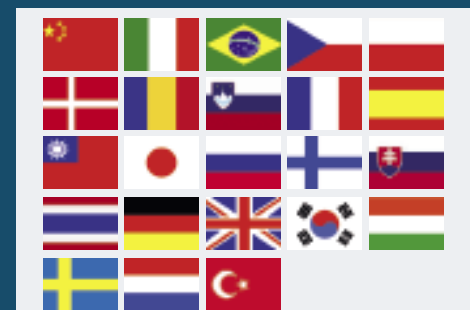
SINUMERIK 828D maintenance planner – all maintenance activities are shown on the screen

Using the onboard maintenance planner, it is even easier to plan and implement regular maintenance schedules. Advance warning messages support machine operators when preparing the work – and predefined actions play a role in protecting both the operator and the machine. The onboard maintenance planner almost completely replaces printed maintenance manuals.



SINUMERIK Operate – it speaks your language

SINUMERIK Operate is available in over 20 languages. With this comprehensive package of languages for the graphic user interface, SINUMERIK CNCs support the global marketing of machine tools.



Machine cells – for higher productivity and flexibility in production

Machine cells play a decisive role in making production more productive and flexible.

The decisive issue here is that all systems can be simply integrated: Machine tools can be integrated into production workflows using smart operation – and robots for handling tasks can be more easily integrated using Run MyRobot/EasyConnect.

Smart operation at machine tools

When implementing a machine cell, it is especially important to create seamlessly integrated and automatic machining sequences for the complete machine tool.

- Job preparation
- All of the necessary data and information is available at the machine
- Efficient machine operation
- Use of mobile devices to visualize machine states

Siemens offers a comprehensive portfolio to do this based on smart operation.

All of the job information available at the machine

With SINUMERIK Operate, a wide range of file types can be directly viewed at the machine. This means that all order documentation – such as part programs, DXF drawings and pictures – are available at the operator panel through the network. And even if these are stored in project directories, a subdirectory, on external storage media or in the network. Hard copies are no longer required at the machine, they don't have to be brought there, stored, archived and searched for. This saves time and avoids mistakes as documents are always close at hand.

Highlights for the automation and robot handling:

- DXF reader
- 100 MB NC memory expansion
- Execution from an external memory (execution from external storage, EES)
- SinuTrain for SINUMERIK Operate as workstation preparation



Handling robots in the production environment

Robots must be able to be simply integrated via the control when using them for loading and unloading machine tools. Different types of robots from various manufacturers can be linked to machines with SINUMERIK 828 CNCs via the SINUMERIK Integrate Run MyRobot/EasyConnect interface. With this new interface, companies of any size can simply implement machine cells without involving high additional costs. This is also possible for series machines, and even for different SINUMERIK CNCs. The new solution for setting up machine cells is rounded off by features for simple optimization of machining sequences at the machine tool as well as for mobile condition monitoring and remote maintenance

Highlights for the automation and robot handling:

- Auto Servo Tuning (AST)
- SINUMERIK Integrate Run MyRobot/Easy Connect
- Remote diagnostics AMM (SINUMERIK Integrate Access MyMachine)
- PLC auxiliary axis expansion, e.g. for robot handling
- Network drives: ftp, Linux, Windows

Interface for higher efficiency

SINUMERIK Integrate Run MyRobot/EasyConnect is based on a standard defined by VDW/VDMA for connecting robots or handling systems to machine tools. Increasingly more machine tool builders and robot manufacturers are providing this interface for their systems. This allows robots to be very simply connected to the machine via this predefined interface. The machine control program no longer has to be modified when it involves standard loading and unloading operations. The same applies to robots, as they can also be connected after making some very simple modifications. As a consequence, the integrator (e.g. machine tool dealer) can concentrate on the essential issues when implementing the production cell. For instance, optimizing workflows to achieve the highest possible degree of productivity.

Solutions for every industry that are fit for the future

We know where machine tools will be needed in the future.

We leverage our industry expertise to support our customers to ensure that their businesses will remain successful in the future.

www.siemens.com/machinetool

Electronics



Many years of industry expertise is convincing

As partner to the machine tool industry for decades, Siemens Machine Tool Systems is aligned to address the needs of companies operating machine tools. Based on our many years of extensive industry expertise, SINUMERIK controls can always provide the ideal solutions for cost-effective component manufacturing. We are certain that our strategy of focusing on end user industries will also prove itself in the future. Global trends, such as continuous population growth and rising demand for communication resources, are leading to an ever-increasing demand for highly productive and innovative CNC machines.

We are a partner for machine tools up to the complete production automation environment

We focus on establishing direct contact to end users in our core industries – something that we have been doing for decades. We know the challenges that companies operating machine tools face, and the requirements that they have relating to current and future machines. This know-how directly flows into our product development. This guarantees that SINUMERIK controls are closely aligned to address market requirements. As full-line supplier, in addition to automating machine tools, Siemens can also engineer the production automation of complete plants and systems. Customers benefit from seamlessly integrated automation solutions from a single source to achieve highly productive production environments.

Aerospace



Automotive



Medical



Power Generation



Key industries

The optimum solution for every industry

Every industry has its own specific requirements. Siemens Machine Tool Systems can offer optimum concepts and solutions. This is supplemented by an industry-specific portfolio of support services with training and hotline, as well as local service, spare part and repair concepts. This allows us to ensure maximum productivity in manufacturing, service and maintenance.

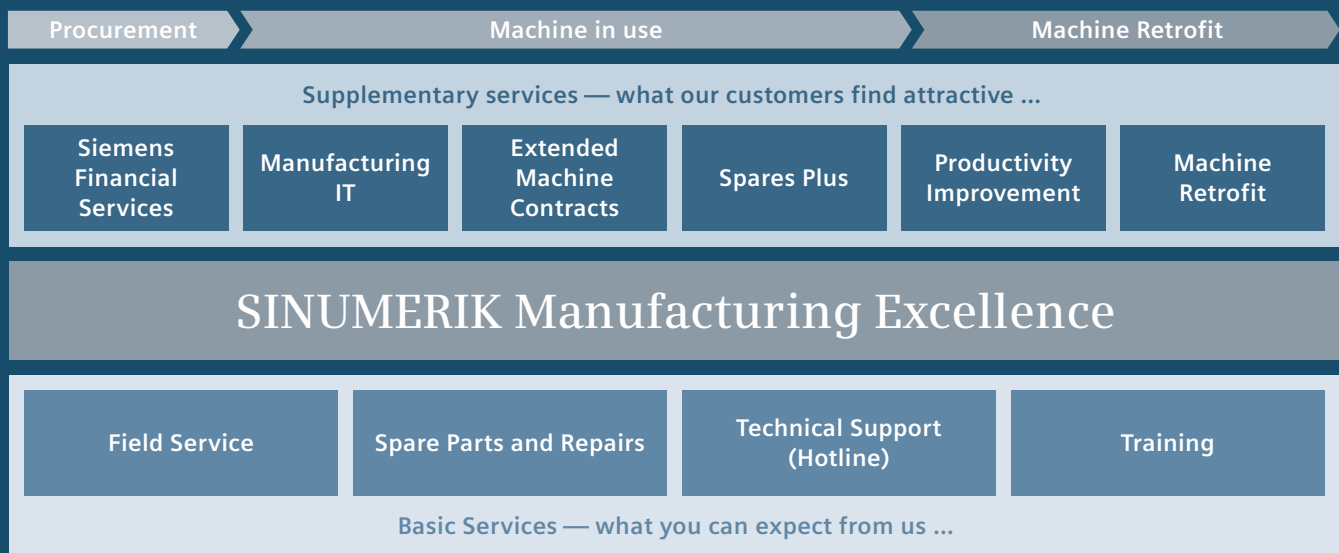
Outstanding international support

Our industry solutions are employed around the globe, and our international organization ensures that we can optimally support machine tool end users around the world.

We set trends in manufacturing

Siemens Machine Tool Systems is seen as innovation leader in the machine tool market. The development of innovative, cutting-edge solutions is a given for us. To complement all of this, we also offer leading-edge IT integration and simulation solutions for optimally networking production and IT environments to secure maximum productivity and availability.

SINUMERIK Manufacturing Excellence – service and support at the highest level



Basic Services – what you can expect from us

Field Service

As a global company, Siemens Machine Tool Systems also has a global service team to provide fast and expert service, repair and maintenance around the world in more than 60 regions.

Technical Support (Hotline)

In more than 25 regions around the world, our hotline experts answer every question related to SINUMERIK CNCs – and of course, in your time zone and in your language!

www.siemens.com/industry/onlinesupport

Spare parts and Repairs

A closely meshed, flexible and accommodating spare parts and repair service network ensures that spare parts are quickly available at reasonable prices in more than 70 regions around the world.

SINUMERIK Training

SITRAIN offers professional training courses for operation, programming, commissioning and maintenance of SINUMERIK controls in more than 30 countries around the globe.

www.siemens.com/sitrain

Field service, spare parts, hotline support and training form the basis of our service and support portfolio.

Beyond this, SINUMERIK Manufacturing Excellence addresses every machine tool need with its intelligent services.

www.siemens.com/sinumerik/manufacturingexcellence



Supplementary services – what our customers find attractive

With a wide range of additional services, SINUMERIK Manufacturing Excellence increases your machine tool productivity – from the initial design, through use, up to machine retrofit and even modernization.

- Siemens Financial Services – financial solutions that perfectly fit your needs
www.siemens.com/sfs
- Manufacturing IT – process optimization through the implementation of the SINUMERIK Integrate product suite
- Extended Machine Contracts – tailored machine tool service contracts that fit your budget
- Spares Plus – preventive spare part management
- Productivity Improvement – reduce the cycle times of your machines
- Machine Retrofit – general overhaul of CNC machine tools

Retrofit solutions

Modernize and retrofit machines without having to worry about the drive system – made possible using the SINUMERIK retrofit solution for connecting up to five analog drives: With one Panel Processing Unit per axis and 2 HLA modules for up to four additional analog axes plus one DRIVE-CLiQ axis. Communication is realized via DRIVE-CLiQ.

On-site service

This service is available for 24 months at no charge, and can then be subsequently extended up to 36 months for the second commissioning – up to a maximum of 72 months.

www.siemens.com/automation/oss

Machine users can obtain even better service by registering their machine online using IdentSNAPSHOT:

www.siemens.com/identsnapshot

Technical data

	SINUMERIK 828			
	SINUMERIK 828D BASIC	SINUMERIK 828D		SINUMERIK 828D ADVANCED
	SW 24x	SW 26x	SW 28x	SW 28x ADVANCED
Configuration				
Mechanical design	Panel-based			
Operation with SINAMICS S120 Combi	●	●	●	●
Operation with SINAMICS S120 Booksize	●	●	●	●
Maximum number of axes and spindles that are capable of interpolation (milling/turning/grinding)	5/5/5	6/6/6	6/8/-	8/10/10
PLC auxiliary axes, up to	–	2	2	2
Channels, up to	1	1	1	2
CNC user memory, up to	3 MB	5 MB	8 MB	10 MB
Additional CNC user memory on CF card/USB stick	●	●	●	●
Minimum block change time	~3 ms	~2 ms	~1 ms	~1 ms
Current/speed controller cycle	125 µs			
Current/speed controller cycle, e.g. for high-speed spindles	62,5 µs			
Display size (TFT color displays)	10,4"	10,4"/15,6"	10,4"/15,6"	10,4"/15,6"
PLC adaptation control	S7-200-based			
PLC I/O interface based on PROFINET	●	●	●	●
OPC UA	●	●	●	●
Standard data transfer	RS232C/USB/CF-card (10,4" only)/Ethernet			
Axis functions				
Travel to fixed stop with Force Control	●	●	●	●
Acceleration with jerk limitation	●	●	●	●
Dynamic feed forward control	●	●	●	●
Advanced Position Control (APC)	–	–	–	–
Dynamic Servo Control in the drive	●	●	●	●
Interpolation				
Simultaneously interpolating axes, up to	4	4	4	4
Straight line, circle, helix	●	●	●	●
Splines, polynomials, involutes	●	●	●	●
Advanced Surface, Top Surface, compressor	Milling			
Look Ahead, number of blocks	50	100	150	150
Look Ahead, number of blocks active with compressor	150	600	600	600
Couplings				
Synchronous axis pair (gantry axes)	●	●	●	●
Synchronous spindle/polygon turning	●	●	●	●
Master value coupling/cam table interpolation	–	–	–	–
Electronic gearbox	●	●	●	●
Transformations				
Face/peripheral surface transformation TRANSMIT	●	●	●	●
Multi-side machining (3+2 axis machining)	●	●	●	●
SINUMERIK synchronous architecture				
Motion-synchronized actions	●	●	●	●
Asynchronous subprograms ASUB	●	●	●	●
Compensations				
Measuring system and spindle pitch compensation (bidirectional)	●	●	●	●
Temperature compensation	●	●	●	●
Sag compensation	●	●	●	●
Additional compensations (cogging torques, etc.)	●	●	●	●

	SINUMERIK 828			
	SINUMERIK 828D BASIC	SINUMERIK 828D		SINUMERIK 828D ADVANCED
	SW 24x	SW 26x	SW 28x	SW 28x ADVANCED
Tools/tool management				
Number of tools/cutting edges in the tool list, up to	128/256	256/512	512/1024	768/1536
Unit quantity / tool lifetime monitoring with management of replacement tools	●	●	●	●
CNC operation				
SINUMERIK Operate	●	●	●	●
Animated Elements	●	●	●	●
SinuTrain training and offline programming tools	●	●	●	●
CNC programming				
SINUMERIK CNC programming language with high-level language elements	●	●	●	●
Online ISO dialekt interpreter	●	●	●	●
programGUIDE	●	●	●	●
Viewing HTML, PDF, BMP, JPEG, DXF	●	●	●	●
DXF reader, importing contour elements	●	●	●	●
Technology cycles for drilling, milling, turning and grinding	●	●	●	●
Cycles for process measurements (calibrating workpiece probes, workpiece measurement, tool measurement)	●	●	●	●
ShopMill/ShopTurn machining step programming	●	●	●	●
programSYNC (multi-channel operation and programming)	–	–	–	●
3D CNC simulation for turning/milling	●	●	●	●
Balance Cutting	–	–	–	●
Simulation in parallel to the main machining time (simulation of program X, while program Y is being used)	–	–	–	–
Additional functions to increase machine performance (residual material detection, multiple clamping, contour processor, etc.)	●	●	●	●
Onboard optimization and diagnostics				
Context-sensitive onboard help system	●	●	●	●
Onboard servo and drive optimization (AST)	●	●	●	●
Onboard signal, bus and network diagnostics	●	●	●	●
Safety functions				
SINUMERIK Safety Integrated (drive-based)	●	●	●	●
Open Architecture				
Open user interface SINUMERIK Integrate Run MyScreens (OA EasyScreen)	●	●	●	●
Openness in the CNC kernel and in the drive	–	–	–	–
SINUMERIK Ctrl-Energy				
Ctrl-E analysis (determining the energy usage of the machine)	●	●	●	●
Ctrl-E profile (machine energy management during non-productive times)	●	●	●	●
Automatic reactive current compensation (with Active Line Module)	●	●	●	●
Automatic flux reduction for induction spindle motors	●	●	●	●

– not available

● available (certain functions are available as CNC option, please ask your machine tool manufacturer)

Everything about SINUMERIK CNCs
can be found at:

siemens.com/sinumerik

Learn more about our
solutions for machine
tools:

> Detailed information and
videos about our products
and services



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