SINUMERIK
Intelligent solutions and services for machine tools

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Increased productivity with SINUMERIK

With its SINUMERIK CNC, Siemens offers highly productive automation solutions for the shopfloor, job shops and large serial production environments. Whether individual parts or mass production, simple or complex workpieces — SINUMERIK CNC systems make sure that every workpiece is an absolute success.
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A strong partner in the world of machine tools

For years, Siemens Machine Tool Systems has been the global and innovative partner in the world of machine tools.

We set the standard when it comes to productivity

For many applications, a SINUMERIK CNC is simply the best choice — for example, when new, revolutionary machine tools are to be realized — and naturally, when maximum productivity is to be achieved for a specific machine tool application.

We are the global partner

We are close to our customers around the globe — with a tight global network of sales, service and training centers, as well as international production facilities, Siemens Machine Tool Systems is perfectly organized to address the needs of the global machine tool market.

We are the innovative partner — now and in the future

SINUMERIK controls have been setting the standard in the machine tool industry for more than 50 years.

Siemens Machine Tool Systems is there with the power of innovation and an experienced development team that is absolutely unique in the industry, so that highly productive machine tools, based upon SINUMERIK CNCs, can be implemented in the future.
We stand for quality
We continually improve our development, production and test processes in order to secure maximum availability of our hardware and software. This involves continuous quality assurance processes with pilot customers, supplier qualification, evaluating and assessing returned products at the component level, multi-stage hardware load tests, as well as intensive system and field tests to secure our software quality. This ensures that our components operate without any disturbances, even under extreme environmental conditions — for example, in the tropics.

We are the pioneer in energy efficiency
Siemens is a pioneer when it comes to sustainability and energy efficiency. Siemens Machine Tool Systems is a leader when it comes to energy-efficient equipment for machine tools.

We have the expertise to address almost any question about a machining application
The experience of our experts extends far beyond the SINUMERIK CNC. Highly-qualified machining specialists in our Technology and Application Centers (TACs) have extensive expertise. Our TACs represent the incubation cells for our technological progress — this means that all of our CNC functions are in compliance with what is required in daily use; therefore, ensuring the maximum degree of user-friendliness.
SINUMERIK CNC
In a class of its own

SINUMERIK CNCs offer the optimal solution for each and every machine tool — from basic, standard CNC machines, through standard machine tools, up to modular, high-end machines.

SINUMERIK 808D —
the entry-level CNC for basic, standard machines

SINUMERIK 808D is a panel-based CNC for the lower performance range. The compact and user-friendly entry-level solution is used for turning and milling applications. Features such as cost-efficiency, simple operation, easy commissioning and maintenance represent the perfect basis for entry-level CNC machines.

SINUMERIK 828D and SINUMERIK 828D BASIC —
the compact CNC for standard machines

SINUMERIK 828 controls are ideally-suited for standard machine tools where high unit quantities must be machined, but with a low degree of modularity. Regardless of whether you choose the SINUMERIK 828D or SINUMERIK 828D BASIC, this powerhouse in the compact class is the ideal solution for cost-sensitive markets, where high CNC performance and easy commissioning are required.

SINUMERIK 840D sl —
the open CNC for high-end machine tools

SINUMERIK 840D sl offers the absolute maximum degree of openness and flexibility. This makes the SINUMERIK 840D sl the optimal CNC for machine tools whose mechanical design must be individually-adapted to the requirements of individual users. SINUMERIK 840D sl BASIC, based upon the SINAMICS S120 Combi drive system, facilitates the entry into the modular and flexible premium class for machines with up to six axes.
A CNC portfolio for the global machine tool market

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SINUMERIK 808D

Outstanding performance, simply intelligent

SINUMERIK 808D Turning and SINUMERIK 808D Milling bring force into basic turning and milling machines. CNCs from the global technology leader, combined with a revolutionary operating concept, make the SINUMERIK 808D the perfect entry into the world of CNC.

Compact and rugged

Thanks to a panel-based CNC design with few interfaces and an operator panel with IP65 degree of protection, the SINUMERIK 808D is the perfect answer for applications in harsh environmental conditions. The small dimensions of these units allow them to be used in compact machines. At the same time, SINUMERIK 808D facilitates user-friendly operation with shortcut keys and softkeys that you have come to expect from SINUMERIK.

Optimized for basic turning and milling applications

SINUMERIK 808D addresses specific technologies, and is perfectly configured for milling and turning. It addresses a range of applications starting from basic, standard milling machines or simple machining centers through cycle-controlled lathes, up to basic full CNC turning machines.

Ideal for entry-level machine operators

Using the new, integrated startGUIDE, the SINUMERIK 808D is the ideal control when entering the world of CNC. In addition to operation and programming, commissioning is explained interactively and in a graphical format. The standard operation and programming method makes the SINUMERIK 808D the ideal system when entering the world of SINUMERIK CNC applications.
SINUMERIK 828D and SINUMERIK 828D BASIC set the standard with their unique level of CNC performance — especially when it comes to turning and milling on standardized machines.

Rugged and maintenance-free

With an operator panel front manufactured from die-cast magnesium, this panel-based CNC design with just a few interfaces, as well as a high degree of protection, make the SINUMERIK 828 CNC a dependable partner even in harsh environments. With no fan and no hard disk, and NV-RAM memory without a battery, the SINUMERIK 828D and SINUMERIK 828D BASIC are completely maintenance-free CNC systems.

Standard turning and milling

With their technology-specific system software, SINUMERIK 828D and SINUMERIK 828D BASIC are the perfect fit for standardized turning and milling machines. Applications range from vertical and basic horizontal machining centers — and ideal for moldmaking applications — up to turning centers with counter-spindles, driven tools and Y-axis.

User-friendly

Thanks to a full QWERTY CNC keyboard with shortcut keys and a high-resolution 8.4”/10.4” TFT color display, SINUMERIK 828D and SINUMERIK 828D BASIC are very easy to operate. Equipped with USB, Compact Flash (CF) card and RJ45 interfaces at the operator panel front, CNC data is quickly and easily transferred to the machine.

Scalable CNC performance

In addition to two CNC performance versions of SINUMERIK 828D, SINUMERIK 828D BASIC represents a favorably-priced entry into the compact class. As a result, this powerhouse in the compact class perfectly addresses the performance requirements of standardized machines.
SINUMERIK 840D sl

Ultimate performance in the premium class

SINUMERIK 840D sl is considered to be the standard in premium class CNC, which is certainly justified. Maximum CNC performance, along with a degree of flexibility and openness that has not been able to be achieved until now, are the basis for almost any CNC machine.

Maximum performance

The SINUMERIK 840D sl offers an almost inexhaustible performance potential — thanks to its drive-based, high-performance NCUs (Numerical Control Units) with state-of-the-art multi-core processor technology. This means that up to 93 axes in 30 machining channels can be controlled in the NCU link. Machine tools with fewer axes benefit from the performance of the SINUMERIK 840D sl as a result of the highest degree of machining precision with the shortest machining times.

Demanding turning and milling applications are part of the wide technology spectrum

High-speed milling and turning are two of the strengths of the SINUMERIK 840D sl. The milling spectrum extends from highly productive machining centers for powertrain manufacturing in the automotive industry, up to high-speed 5-axis machining centers for moldmaking in the aerospace industry. The turning spectrum extends from multi-channel 5-axis turning centers with B-axis up to highly productive multi-spindle applications.

Beyond turning and milling applications, the SINUMERIK 840D sl can address an almost inexhaustible range of technologies ranging from grinding and laser machining, through gearwheel, up to multi-tasking machining.

The SINUMERIK 840D sl is even the first choice for new engineering and manufacturing applications including tapelaying and composites for the aerospace industry.
Modular and scalable

In addition to scalable NCU performance, the SINUMERIK 840D sl has a high degree of modularity when it comes to the operating components. With flexible M:N operation, for example, any operator panel can be combined with the NCU making the SINUMERIK 840D sl the ideal fit in the operation of high-end machine tools. With SINUMERIK 840D sl BASIC, the link with the compact SINAMICS S120 Combi drive, even compact machines can be ideally addressed.

Benchmark for open architectures

The openness of the SINUMERIK 840D sl is second to none. Using SINUMERIK Integrate, the CNC can be optimally adapted to the machine's technology, and SINUMERIK Integrate ensures a high degree of flexibility in the production automation environment. For example, the operating system can be supplemented and adapted — even robots and handling systems can be integrated. With the openness in the CNC kernel and in the drive, unique mechanical concepts can be implemented; such as the use of adapted closed-loop control algorithms or specific kinematics transformations.

Communication at every level

Using PROFINET, the leading Industrial Ethernet standard, the SINUMERIK 840D sl is perfectly embedded in the Siemens Totally Integrated Automation (TIA) environment. TIA stands for a unique level of integration — from the field through the production, up to the company supervisory level. The result — every component within the automation solution optimally interacts with one another. This allows you to achieve maximum transparency and availability of the production process.
Siemens is simply world-class when it comes to drive technology — and therefore has outstanding drive solutions for machine tools.

**SINAMICS V60 — small and powerful**

The SINAMICS V60 drive is simply unbeatable when it involves a price-sensitive entry-level machine. The compact design of the single-axis motor modules without any fan ensures the highest degree of ruggedness. Thanks to intelligent commissioning, the motor modules can be adapted to the requirements of the feed axes by simply setting a few parameters.

**SINAMICS S120 — the highest degree of flexibility**

SINAMICS S120 is synonymous with performance and flexibility when it comes to CNC machines. 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 shortest spindle acceleration times and facilitates perfect reactive power compensation for the complete machine ($\cos \phi = 1$). 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.

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**SINAMICS S120 Combi — the ideal drive for compact CNC machines**

SINAMICS S120 Combi combines the performance of the modular SINAMICS S120 in a compact, rugged design. Here, an infeed and up to four motor modules are integrated in one housing. By intelligently expanding the system to include two more motor modules, the SINAMICS S120 Combi is the ideal drive for compact, standard CNC machines with a spindle power of up to 15 kW and up to five feed axes.
**SIMOTICS motors** represent the driving force for the SINUMERIK CNC and the SINAMICS drive in the machine with the highest precision and dynamic performance.

**SIMOTICS servomotors**
High standstill torques, the fastest speeds and smooth-running characteristics make SIMOTICS servomotors the optimal feed drive for CNC machines. A high degree of protection, strong bearings and a vibration-free design mean that these synchronous servomotors have outstanding reliability. High-quality magnetic materials result in a very high power density — and therefore very small motor dimensions. As a result, these motors can be installed in extremely tight spaces.

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**SIMOTICS linear and torque motors**
Going beyond conventional rotary motor principles, the SIMOTICS range also encompasses linear and torque motors with a high dynamic performance. When using SIMOTICS 1FN3 and 1FN6 linear motors, elasticity, backlash and friction, as well as natural oscillation of the machine's drivetrain, can almost be completely eliminated. Based upon SIMOTICS 1FW6 torque motors, completely new technologies can be addressed, such as turning on milling machines — also known as multi-tasking.

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**Spindle solutions from Siemens**
Siemens has supplemented its long tradition in building electric motors to include a high level of expertise in spindle manufacturing with Weiss Spindle Technology. This allows us to offer you a wide range of spindle solutions from a single source. The result is a portfolio that ideally supports each spindle solution type. This portfolio starts with the classic 1PH8 mounted spindle motors and 1FE1 synchronous built-in spindle motors, through mechanical spindles, up to hybrid and 2SP1 motor spindles.
SINUMERIK CNC performance
The machining standard

SINUMERIK controls set standards relating to every aspect of machining performance. Whether precision and speed, reducing cycle times or energy efficiency and safety — SINUMERIK CNCs set the pace.

The highest precision
SINUMERIK CNCs and SINAMICS drives compute with high-performance 80 bit NANO™ accuracy. This eliminates rounding errors and results in an extremely high internal computational accuracy in the complete controller circuit. Feed forward control ensures that errors are almost completely compensated — and jerk limitation reduces stress on the mechanical system when axes accelerate. Thanks to Dynamic Servo Control, SINAMICS drives offer additional position control — and as an additional feature, disturbance resistance for 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 system. With the Advanced Surface feature, SINUMERIK CNC offers you 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 fifth degree polynomials (NURBS). This means that machines equipped with SINUMERIK controls can be operated at their physical limit.

The shortest idle times
Especially in large serial production, idle times, where the machine is no longer productive, represent a critical productivity-inhibiting factor. Here, with its synchronous architecture and intelligent functions, such as synchronized actions or asynchronous sub-programs, SINUMERIK provides the optimal solution. For example, the loading of equipment can be implemented without having to make time-consuming interventions in the PLC.
Kinematic transformations

SINUMERIK CNC is in its element when it comes to the handling of complex machine kinematics — from the classic face / peripheral surface transformation for turning machines through multi-side machining in swiveled planes, up to dynamic 5-axis transformation in tool- and moldmaking, as well as in the aerospace industry. The SINUMERIK 840D sl supports every type of special transformations up to milling with robot kinematics — therefore paving the way for advanced machine tool applications.

Energy efficiency with SINUMERIK Ctrl-Energy

Siemens Machine Tool Systems sets the standard when it comes to energy efficiency — SINUMERIK Ctrl-Energy encompasses a wide range of high-efficiency drive / motor components, CNC / drive functions, software solutions and services. SINUMERIK Ctrl-Energy offers energy-efficient solutions over the machine’s entire lifecycle — from the 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 the workpiece. SINUMERIK CNC helps you to save energy by simply pressing the Ctrl + E shortcut key.

Protection for people and machine with SINUMERIK Safety Integrated

Siemens Machine Tool Systems is the leader when it comes to the protection of people and the machine. SINUMERIK Safety Integrated has set the standard for machine tool safety technology. Here, intelligent system functions permit user-friendly operation of the machine. For example, machine setup 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 system for the 21st century

SINUMERIK Operate offers you such an easy-to-use graphical user interface that's setting the standard for efficient machine tool operation.

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Interactive input with Animated Elements

With Animated Elements, SINUMERIK Operate makes it very easy to enter parameters. Animated Elements completely redefine what graphical programming and operation truly mean — using a unique display with moving (animated) image sequences.

Program manager for a better overview

SINUMERIK's program manager makes data handling just as easy-to-use as a PC, where data from various storage media are displayed. A CNC program can be transferred from the data server to the CNC's memory by simply copying and pasting. And it's even easier — large moldmaking workpieces can be executed right in the program manager, directly via the company's network or a Compact Flash (CF) card.

SinuTrain for SINUMERIK Operate

SinuTrain training software makes SINUMERIK Operate even closer to reality on the PC, including the animated machine operator panel. The expertise you gain in the training course can be easily transferred into real life applications. This powerful tool facilitates offline programming at the PC — NC programs can be transferred directly to the CNC.

Thanks to SINUMERIK Operate and the original SINUMERIK NC kernel, there are no restrictions in the operation, programming or execution of NC programs.

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Intuitive handling, shorter setup times — based upon 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 graphical, interactive support for every typical setup function for turning and milling machines. This means that a tool can be simply loaded with just three clicks. On lathes, face turning of a blank or boring soft clamping jaws are directly realized in the intelligent JOG mode — without having to generate a part program. This means that non-productive times are reduced to an absolute minimum.

Tool and workpiece measuring
Tool and workpiece measurement is 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 a simple procedure for the SINUMERIK CNC. Regardless 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 CNC’s tool offset memory.

Transparent tool management
SINUMERIK offers the perfect command when it comes to tool management. Tool data and magazine location are clearly displayed on the screen. A suitable magazine location is automatically selected by simply selecting a tool and pressing a key — the 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 serial production.

For large series …
Achieve the shortest machining times for large serial production and with the highest flexibility for special applications — SINUMERIK controls make this possible with advanced CNC programming based upon 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 classical programming method.

… and small serial production
For small serial production and individual parts, programming time is a decisive factor — and both ShopMill and ShopTurn machining step programming are unbeatable. Machining operations such as drilling, centering, plunging or 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. It goes without saying that the simulation shows the precise image of the required machining operation — not just bright, colorful graphics.

Whether face or peripheral surfaces, swiveled workpiece planes or even machining in several channels, SINUMERIK CNC simulation simulates every machining type. With the moldmaking quick view, even very large part programs can be displayed on the screen within seconds.
Everything onboard for optimization and diagnostics — SINUMERIK Operate offers the ideal onboard resources to optimize axes, carry out fault diagnostics and perform maintenance work and service tasks. External PC-based software tools are not required.

One-click optimization
With its Auto Servo Tuning (AST) functionality, SINUMERIK Operate offers automatic optimization of control parameters to achieve maximum dynamic performance and accuracy of the machine axes — and with just one click. This simplifies machine commissioning — and the machine can be post-optimized regularly during operation. This ensures maximum precision over the entire life of the machine.

All information onboard
Using context-sensitive graphical 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, which means that operation and programming have been simplified; commissioning, diagnostics and maintenance have been made far more efficient and user-friendly.

Diagnostics
Especially during large serial production, machine failures can result in huge production losses. SINUMERIK Operate provides intelligent onboard diagnostics, so in case of a problem, the machine is up and running again 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.
With its SINUMERIK controls, Siemens Machine Tool Systems is the only CNC manufacturer that offers a product portfolio covering every important technology in the machine tool industry. Siemens sets the standard when it comes to combining various technologies for multi-tasking machines.

We master the standards ...

Using pre-configured technology packages, SINUMERIK controls are ideal for turning and milling machines. Also the associated multi-tasking concepts, i.e. turn-milling and mill-turning can be addressed using pre-defined solutions. Beyond this, SINUMERIK offers modular system functions. These allow other standard technologies to be addressed, such as grinding, gearwheel machining, laser cutting and handling.

... and the specialities

Based upon the unique level of system openness, in addition to standard technologies, SINUMERIK also offers solutions for new machine concepts such as the machining of composite materials. These solutions are based upon unique features, such as an open architecture in the CNC kernel and in the drive. This makes SINUMERIK synonymous with maximum technological competence from a single source, extending from standard all the way up to special applications.

SINUMERIK Operate — one operator interface for every machining technology

Using the innovative SINUMERIK Operate graphical user interface, every machining technology can be addressed with a standard look-and-feel. This provides production facilities with a high degree of flexibility when it comes to the organization and deployment of their personnel.
With a powerful technology cycle package for turning and milling, Siemens Machine Tool Systems proves its technological leadership in CNC technology once again.

Technology cycles for every machining operation

SINUMERIK controls offer a range of drilling, milling and turning cycles that are absolutely unique in the marketplace — from basic machining operations such as centering, deep-hole drilling, milling circular pockets and turning grooves, up to more complex machining operations such as engraving, deep-hole milling and the trochoidal milling of hard metals. Based upon intelligent kinematic transformations, technology cycles are available at all machining planes. For example, at the face or peripheral surfaces of turned workpieces, or in swiveled planes of milling workpieces.

High-end solid contour machining and stock removal

In addition to standard geometries, when you use SINUMERIK CNC, 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 12 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 segment. The result — ideal machining quality with 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 automatically corrected, so that the required production tolerances are maintained even for high-batch quantities. The integrated recording function ensures that the workpiece quality is optimally documented. For 5-axis machines, a special measuring cycle determines the exact machine geometry, which helps to compensate machine tolerances while workpieces are being machined.
When you combine cutting-edge machine tool operation with unique technology cycles, you have the ultimate in shopfloor programming and high-quality CNC simulation — together with premium motion control.

**Advanced Surface gets the most out of your machine**

Advanced Surface is synonymous with milling to the physical limits of the machine. State-of-the-art look ahead algorithms and intelligent block compression ensure maximum machining speed with the highest surface quality and precision — for 3-axis, 3+2-axis and dynamic 5-axis machining operations.

**5-axis machining at the highest level**

SINUMERIK CNCs offer the optimum kinematic transformations for modern milling machines — from peripheral surface transformation with slot wall correction for cylindrical workpieces, through statically-swiveled planes for multi-side machining, up to dynamic 5-axis transformations (TRAORI) for demanding tool-, moldmaking and aerospace applications.

**High-Speed Settings**

The High-Speed Setting cycle is user-friendly and simplifies the parameterization of moldmaking applications — using just a few parameters, SINUMERIK is set to the required machining tolerance and to the particular machining task such as roughing, finishing or semi-finishing.

**The combination makes the difference**

Advanced Surface, High-Speed Settings, kinematic transformations and SINUMERIK Operate for machine tool operation and programming — as well as comprehensive technology and measuring cycles — create a unique combination of exciting features for sophisticated milling machines.

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Multi-tasking made easy — the standard CNC functions integrated in SINUMERIK, as well as the uniform look-and-feel when it comes to operating and programming with SINUMERIK Operate, maximize CNC performance and ease-of-use when it comes to multi-tasking turning operations.

Powerful CNC functions

With just a few parameter entries, intelligent kinematic transformations transform milling machines into turning machines — and turning machines milling machines. In conjunction with additional CNC features, such as cross-technology tool management and state-of-the-art velocity control, completely new CNC applications are opened up — from turning on milling machines, up to machining free-form surfaces on turning machines.

Standard operation

The standard look-and-feel of SINUMERIK Operate for every machining technology allows several technologies to be combined on one machine — and of course, with the highest degree of standardization when it comes to operation and programming that is expected from SINUMERIK. In addition, SINUMERIK CNC technology cycles for drilling, milling, turning and measuring are adapted to the particular multi-tasking machine. As a result, the maximum degree of standardization is achieved for every multi-tasking machining operation performed on a machine.

Universal CNC programming

Comprehensive CNC programming tools that go beyond technology limits ensure that CNC systems are efficiently programmed for multitasking machines — from machining step programming for individual parts, up to multi-channel programming in large serial production environments. Powerful CNC simulation permits part visualization across every technology and offers the highest degree of process reliability and safety for all kinematic versions of state-of-the-art multi-tasking machines.
In addition to CNC technology, Siemens offers an extensive portfolio for IT integration—from standard data transfer using SINUMERIK Operate, up to PLM data management with TEAMCENTER.

**Standard data transfer**

As a result of the LINUX, respectively Windows® operating system, SINUMERIK controls master all of the usual data transfer techniques—such as USB, Compact Flash (CF) card and TCP/IP Ethernet—without the need for emulation or file conversion programs.

**SINUMERIK Integrate**

SINUMERIK Integrate perfectly integrates SINUMERIK controls into the IT environment of today's plants. This is achieved by using a powerful software suite.

- **Manage MyPrograms**
  
  NC programs are organized and managed throughout the network

- **Manage MyTools**
  
  Tools are managed throughout the network

- **Analyze MyCondition**
  
  Machine states are evaluated for condition-oriented maintenance

- **Analyze MyPerformance**
  
  Machine data and operating states are acquired and visualized throughout the factory

- **Access MyMachine**
  
  Remote diagnostics, from peer-to-peer via LAN to the Internet

- **Access MyBackup**
  
  Interface to backup and assign versions to CNC data

- **Create MyInterface**
  
  Communication interfaces to connect to master computer applications

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**SINUMERIK and NX CAM**

Using NX CAM, the well-known solution for CNC programming, companies can maximize the production yield of their modern CNC machines. In addition to a wide range of flexible technologies for CNC programming, NX CAM also includes a part manufacturing solution. This encompasses a library of clamping resources, as well as options for data management, process planning and options to directly connect to the shopfloor. Being closely tied to the SINUMERIK CNC results in an integrated and seamless CAD/CAM/CNC process chain — which ensures maximum productivity when it comes to high-quality workpiece manufacturing.

**TEAMCENTER**

This product from Siemens PLM Software is the central information source for product and process expertise in companies. Thanks to a comprehensive Product Lifecycle Management (PLM) solution portfolio, TEAMCENTER links every station of the product lifecycle to this central source. The portfolio encompasses requirements and engineering process management, simulation process management, as well as production process management. The latter is a single, scalable, reliable and secure source for production information, which supports lifecycle processes from development, all the way through to production.
Many years of industry expertise is convincing

As a long-time partner to the machine tool industry, Siemens Machine Tool Systems is in the position to address the needs of companies that are operating CNC machines. Based upon our many years of outstanding industry expertise, SINUMERIK controls can always provide the ideal solution for cost-effective manufacturing — for example in automotive, aerospace, power generation, electronics and medical part production.

We are certain that our focus on end-user industries will be proven in the future, as well. Global trends, such as the continuous population growth and the rising demand for communication resources, are leading to an ever-increasing demand for highly-productive and innovative CNC machines.

We are your partner for machine tool automation — including complete manufacturing automation

We have been maintaining direct contact with end-users in our core industries for decades. We know the challenges that they face and the requirements that they place on current and future machines. This expertise flows directly into our product development and guarantees that SINUMERIK controls are closely-aligned to addressing market requirements.

In addition to machine tool automation, Siemens can act as the general contractor for the manufacturing automation of your entire plant. Customers will also benefit from this as a result of integrated and seamless automation solutions from a single source — ultimately helping you to achieve a highly-productive manufacturing environment.
The ideal solution for each and every industry

Every industry has its own specific requirements. Siemens Machine Tool Systems can offer the appropriate solutions — whether standard automation for the automotive industry or special technologies such as taping for aerospace — we have the ideal solution. This is supplemented by an industry-specific portfolio of support services with training and hotline, as well as local service, spare parts and repair. This allows us to ensure maximum productivity in manufacturing, service and maintenance.

Outstanding international support

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

We set the trends in manufacturing

Siemens Machine Tool Systems is an innovation leader in the machine tool market. The development of innovative, cutting-edge solutions is a given for us. This is reflected in our leading IT integration and simulation solutions to easily network manufacturing IT, while securing maximum machine tool productivity and availability.
Basic services — what you can expect from Siemens

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 technical hotline experts answer every question related to SINUMERIK CNC — and of course, in your local time zone and in even your own language.

usa.siemens.com/cnc-support

Spare parts and repair
A tight-knit, flexible and responsive spare parts and repair network in more than 70 regions around the world ensures that replacement parts are quickly available — and at reasonable prices.

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

- **Manufacturing IT**
  Process optimization through the implementation of the SINUMERIK Integrate product suite

- **Extended Machine Contracts**
  Tailored machinetool service contracts that fit your budget

- **Spares Plus**
  Preventive spare parts management

- **Productivity Improvement**
  Reduce the cycle times of your existing machines

- **Machine Retrofit**
  General overhaul of CNC machine tools that gives new life to old iron

usa.siemens.com/cnc retrofit
# Technical information

## SINUMERIK CNCs

<table>
<thead>
<tr>
<th>SINUMERIK 808D</th>
<th>SINUMERIK 828D/840D sl</th>
<th>SINUMERIK 840D sl</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Configuration</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mechanical design</td>
<td>Panel-based</td>
<td>Panel-based</td>
</tr>
<tr>
<td>CNC performance versions</td>
<td>PPU141</td>
<td>PPU24X (828D BASIC) PPU26X PPU28X</td>
</tr>
<tr>
<td>Display size (TFT color display)</td>
<td>7.5&quot;</td>
<td>8.4&quot; (828D BASIC) / 10.4&quot;</td>
</tr>
<tr>
<td>Maximum number of axes/spindles</td>
<td>4</td>
<td>6 (milling) / 8 (turning)</td>
</tr>
<tr>
<td>PLC adaptation control</td>
<td>SIMATIC S7-200-based</td>
<td>SIMATIC S7-200-based</td>
</tr>
<tr>
<td>CNC user memory, up to</td>
<td>1 MB</td>
<td>5 MB</td>
</tr>
<tr>
<td>Additional CNC user memory on hard disk</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Operation with SINAMICS V60 drives</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Operation with SINAMICS S120 Combi drives</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Operation with SINAMICS S120 Booksize drives</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Torque motor operation</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Linear motor operation</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>Technology</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turning</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Milling</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Gear hobbing</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Multi-tasking (mill-turning, multi-channel turn-milling)</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Additional technologies</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>Axis functions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acceleration with jerk limitation</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Feed forward control</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Dynamic Servo Control in the drive</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>Interpolation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interpolating axes (up to)</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Linear, circle, helix</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Splines</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Advanced Surface</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Look Ahead</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Compressor</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>Tools/tool management</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of tools/cutting edges (up to)</td>
<td>64/128</td>
<td>256/512</td>
</tr>
<tr>
<td>Unit quantity/tool lifetime monitoring with management of replacement tools</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>Compensations</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measuring system and lead screw error compensation</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Temperature compensation</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Other compensations (sag, volumetrics)</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

SINUMERIK synchronous architecture

Synchronized actions –

Asynchronous subprograms
<table>
<thead>
<tr>
<th>Transformations</th>
<th>SINUMERIK 808D</th>
<th>SINUMERIK 828D / SINUMERIK 828D BASIC</th>
<th>SINUMERIK 840D sl</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face / peripheral surface transformation</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Multi-side machining (3+2-axis machining)</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Dynamic 5-axis machining (TRAORI)</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Additional machine-specific kinematic transformations</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>CNC operation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SINUMERIK Operate BASIC</td>
<td>–</td>
<td></td>
<td>–</td>
</tr>
<tr>
<td>SINUMERIK Operate</td>
<td>–</td>
<td></td>
<td>–</td>
</tr>
<tr>
<td>Animated Elements</td>
<td>–</td>
<td></td>
<td>–</td>
</tr>
<tr>
<td>startGUIDE: graphical interactive commissioning, onboard tutorials</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>User interface on NCU / PPU (Linux) / PCU50 (Windows®)</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Training and offline programming tool</td>
<td>(808D on PC)</td>
<td>(SinuTrain)</td>
<td>(SinuTrain)</td>
</tr>
<tr>
<td><strong>CNC programming</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SINUMERIK CNC programming language with high-level language elements</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Online ISO dialect interpreter</td>
<td>–</td>
<td></td>
<td>–</td>
</tr>
<tr>
<td>Technology cycle support programGUIDE BASIC</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Technology cycle support programGUIDE</td>
<td>–</td>
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</tr>
<tr>
<td>Technology cycles for drilling, milling and turning</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Cycles for process measurements (with cycle support)</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>ShopMill / ShopTurn machining step programming</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>CNC simulation for turning / milling</td>
<td>(2D)</td>
<td>(3D)</td>
<td>(3D)</td>
</tr>
<tr>
<td><strong>Onboard optimization and diagnostics</strong></td>
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<td></td>
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<tr>
<td>Context-sensitive onboard help system</td>
<td>–</td>
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<tr>
<td>Onboard servo and drive optimization (AST)</td>
<td>–</td>
<td>–</td>
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<tr>
<td>Onboard signal, bus and network diagnostics</td>
<td>–</td>
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<td>–</td>
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<tr>
<td>Onboard maintenance and service tools</td>
<td>–</td>
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<tr>
<td><strong>IT integration</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard data transfer</td>
<td>RS232C / USB</td>
<td>RS232C / USB / CF card / Ethernet</td>
<td>RS232C / USB / Ethernet</td>
</tr>
<tr>
<td>IT integration with SINUMERIK Integrate</td>
<td>–</td>
<td>only Access MyMachine (RCS)</td>
<td></td>
</tr>
<tr>
<td><strong>Safety functions</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SINUMERIK Safety Integrated</td>
<td>–</td>
<td></td>
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</tr>
<tr>
<td>SINUMERIK Ctrl-Energy</td>
<td>–</td>
<td></td>
<td>–</td>
</tr>
<tr>
<td>Ctrl-E Analysis (determining the energy usage of the machine)</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Ctrl-E Profile (energy management of the machine during idle times)</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Automatic reactive current compensation</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Automatic flux reduction for induction spindle motors</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

– not available
available (certain functions are available as CNC option, please ask your machine tool manufacturer)
The information provided in this brochure contains merely general descriptions or characteristics of performance which in case of actual 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.

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