

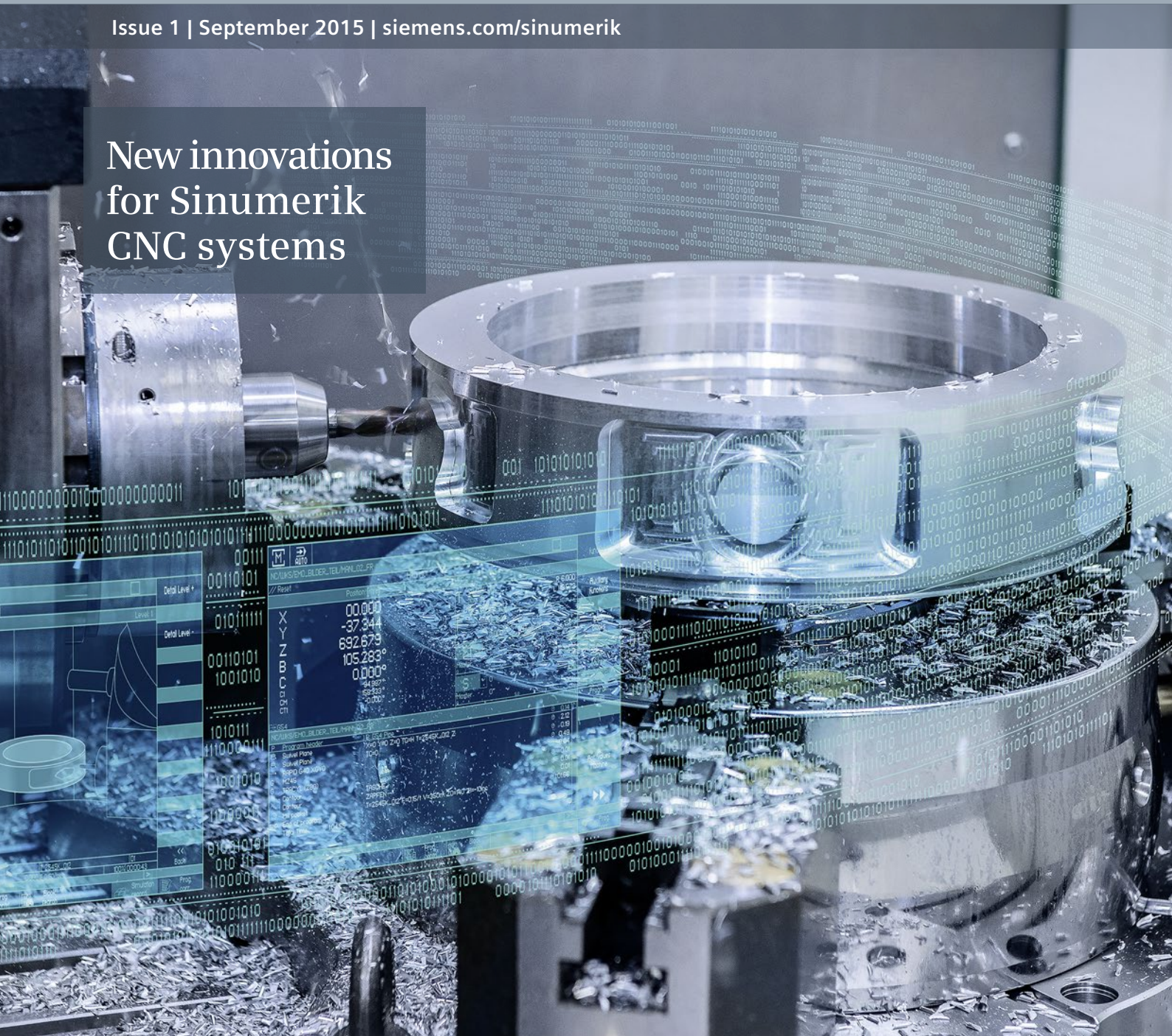
SIEMENS

SINUMERIK

InSight

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New innovations
for Sinumerik
CNC systems



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Solutions for efficient production

Simply smart

At EMO 2015, Siemens will be showcasing innovative solutions across the entire process chain, including sophisticated multi-technologies. With “smart” networked solutions, companies can increase the flexibility and efficiency of their production operations.

The increasing integration of product development and production processes, and the merging of virtual and real aspects of production represent a key step toward a new industrial era. Digitalization enables machine tool manufacturers and operators to enhance their competitiveness.

Integrated digital production

Siemens is meeting this challenge with a portfolio of products. Customers will profit from an uninterrupted CAD/CAM-CNC process chain — from product design with NX CAD/CAM, to simulation with VNCK, to manufacturing with Sinumerik. In addition, with Sinumerik Integrate for production, we offer solutions for networking machine tools and higher-level IT systems. Shopfloor-oriented companies that want to take the first steps toward digitalization will also have the opportunity to do so using smart operation — benefiting from simple machine operation with smartOperate, work preparation with smartPrepare, remote machine monitoring with smartMobile and paper-free manufacturing with smartIT.

Even more efficient and user-friendly

At EMO 2015 Siemens will also be presenting Version 4.7 of the Sinumerik Operate software, along with various technological advances. These solutions further increase the productivity and cost-effectiveness of modern five-axis and multi-tasking machines. For example, Siemens offers an attractive package for complete workpiece machining that lays the foundation for efficient and highly productive CNC machining. Sinumerik has also become even more user-friendly.

New hardware

Last but not least, numerous new Sinumerik-related developments will be presented at EMO — including drives, motors and other components for successfully automating machine tools. Details of all the new developments connected with Sinumerik can also be found in this magazine.

siemens.com/emo

Digitalization for the shopfloor

Smart solutions increase efficiency

It is now easier than ever to integrate a machine tool into production processes. smart operation enables small and medium-sized companies in particular to take their first steps toward digitalization — and to do so without significant IT know-how or major investments.

With smart operation, shopfloor-oriented companies can use modern working methods with standard Sinumerik tools, as touch technologies offer new options for operating machines. If a shopfloor supervisor wants to check the capacity utilization of the machines from a distance, he or she can simply call up the status on a smartphone. To maximize machine capacity utilization, the next order can be prepared using programming tools

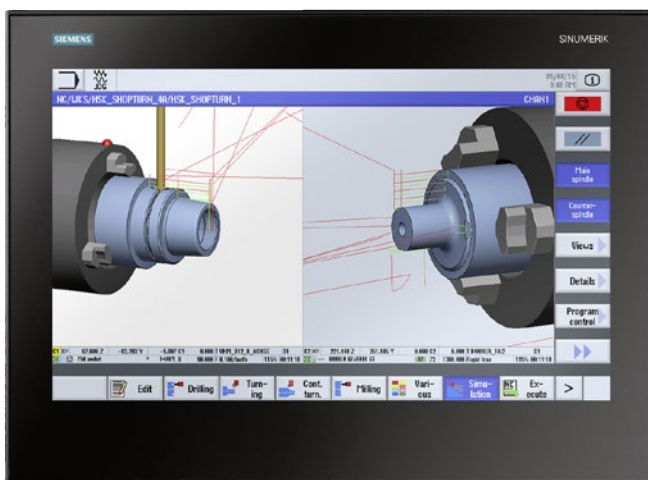
on a workstation identical to Sinumerik. The data can then simply be transferred to the machine, because Sinumerik can also easily access network drives and call up parts programs — and any other order documentation.

smartOperate for simple operation

smartOperate makes machine operation user-friendly with simple and effi-

cient operating concepts and modern touch technology. The new OP 019 black and OP 015 black operating panels, with the proven user interface Sinumerik Operate, are particularly robust thanks to their IP66 glass front and are therefore also suitable for use in harsh shopfloor environments. Thanks to their capacitive touch technology, these panels can even be used by an operator wearing work gloves. The long-lasting LED backlight provides

smartOperate: operation made simple with the innovative touch panel OP 019 black

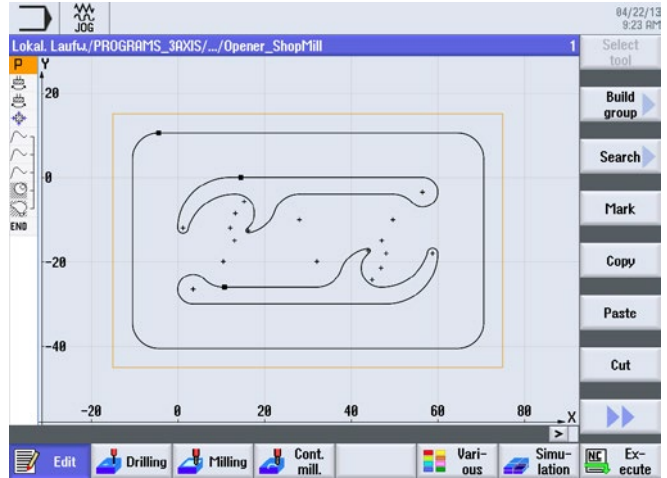


smartMobile: machine monitoring on a tablet





smartPrepare: prepare workflows on a PC with SinuTrain



smartIT: the DXF reader directly transfers DXF files into the programming for the workpiece machining operation

energy savings of 40% compared with conventional fluorescent tubes. Fast and easy-to-use zoom, and intelligent scroll functions increase efficiency in production. Screen content can be easily moved, rotated and zoomed. The operator can also easily access graphic content, for example, for simulation and mold views, or relevant parameters, settings and user data. In addition, smartOperate improves usability with variable font sizes and a cycle view as well as a work step in programGUIDE.

smartMobile for the best possible overview

Today, knowing exactly what is happening on the machine tool at any given moment is extremely important for optimized production. With smartMobile, machine operators and shopfloor supervisors can always keep an eye on the machine tool status, even when they are not standing at the machine. They can retrieve status data, such as the current job status, capacity utilization, component supply situation, disruptions or service information, on a notebook, smartphone or tablet via a secure web browser. In addition, users can quickly and easily create their own interfaces for Sinumerik 840D sl and 828D, and link

these to information and data from the Sinumerik CNC — all without the need for special programming knowledge.

smartPrepare for greater machine availability

What do machine operators do while their machines are running and performing a job? With smartPrepare, they can now use this time even more effectively. With SinuTrain, the operator can now prepare the next part offline on a PC or a laptop in advance. Thanks to its use of the original CNC kernel, SinuTrain allows 1:1 programming and simulation offline at an external workstation. SinuTrain replicates the control system exactly. Parts programs created this way can then be transferred directly to the machine tool. This saves time, ensures optimum capacity utilization, and increases availability and productivity.

smartIT for paper-free production

smartIT facilitates paper-free production with the Execution from External Storage (EES) option. EES enables data on external storage devices, such as connected USB flash drives, hard drives and network resources, to be randomly accessed directly from the machine

tool. Thus the days of searching for job-related documentation are finally over: PDFs, DXF drawings or images are available directly on the operator panel via the network connection. Printouts are no longer necessary. This saves time and minimizes errors. The new DXF viewer and reader now displays CAD data directly at the machine tool. The machine operator can select the geometry elements displayed in a DXF file and transfer them directly to the machine to program a workpiece machining operation. This reduces programming time by up to 90%. In addition, parts programs can be transferred to the machine or even run directly from an external storage medium. If required, several NCUs can jointly access a central network memory.

With smart operation, shopfloor-oriented companies gain greater flexibility and increase their efficiency — in many cases using the standard Sinumerik tools, without having to invest in any additional infrastructure. ■

INFO

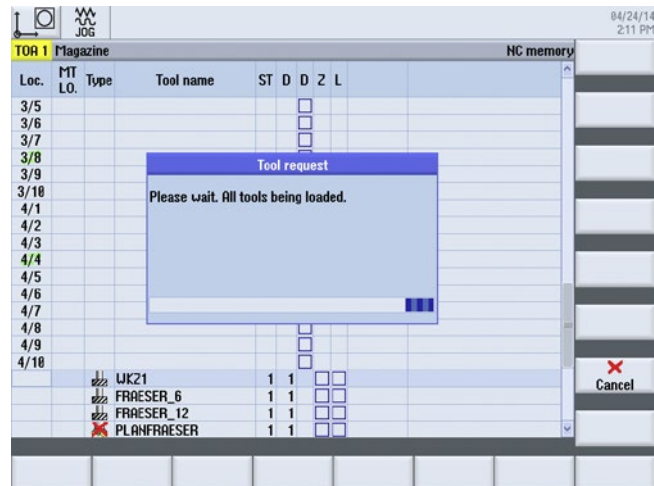
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Tool management

Easy to operate, flexible to manage

With Sinumerik Operate's enhanced tool management, loading tools is now even quicker and simpler. All the user needs to do is press the new "Load all" soft key, and all tools with loading identification are loaded. In addition, the software now contains four magazines in the standard version, making the tool management an even better value for simple machines. The magazines can be quickly configured in Sinumerik Operate and thus easily put into operation. Thanks to the multi-tool support and depiction of turning tools as icons, tools can now be managed with ease, even in complex multi-tasking machines.

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New features

- Loading list with new "Load all" soft key
- Ability to secure and load individual tools using the "in file" tool management function
- Four magazines in the standard version
- Magazine configuration using Sinumerik Operate
- Tool management for many tools and complex multi-tasking machines

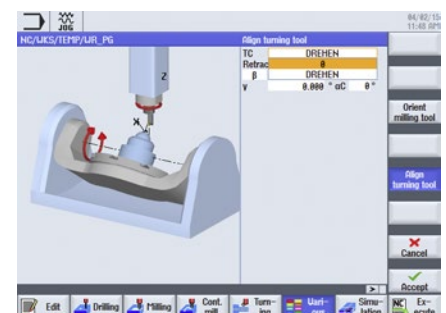
Complete machining

Efficiently produce complex parts

In its new version, Sinumerik Operate has been expanded with innovative functions for operating and programming multi-tasking machines. This allows users to produce complex parts more efficiently in complete machining. Integrated milling functions for turning, and turning functions for milling facilitate machining without the need to

change software. Thanks to the combined simulation, both turning and milling operations are correctly depicted in the same program. The tools are correctly aligned automatically, and the position of the tool and its alignment during turning or milling are displayed.

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New features

- Uniform operating philosophy
- Combined simulation
- Turning functions for milling / milling functions for turning
- Tool management for turning and milling tools
- Alignment and positioning of turning and milling tools

Four-axis roughing

Save time on turning

The expanded contour machining cycle in Sinumerik Operate allows easy programming of four-axis turning (balance cutting). This means that workpieces can be machined even more quickly, yet precisely. Two turning tools opposite one another machine the workpiece simultaneously, which considerably reduces machining time. In addition, the two turning tools opposite one another prevent workpiece distortion, significantly improving dimensional accuracy, particularly on long, thin workpieces. The programming is easily accomplished directly on the Sinumerik CNC without a CAD/CAM



system — the user only has to add two additional parameters for balance cutting. The CNC sequences are then automatically created by the contour machining cycle.

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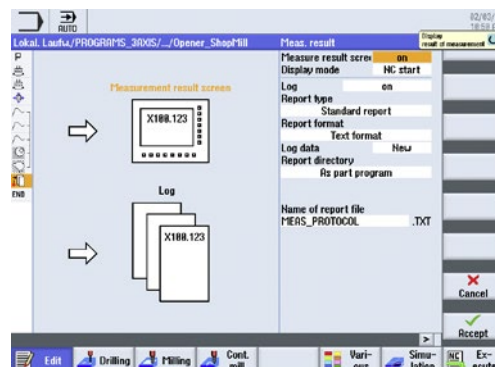
New features

- Suitable for tools with the same cutting position and cutting direction
- With active tool offset: the Sinumerik runs two independent parts programs
- Without active tool offset: coupled carriages

Logging

Process reliability guaranteed

With Version 4.7 of the Sinumerik Operate software, it is possible to easily log measurement results — both in JOG mode and in automatic mode. This ensures higher quality in the production process, as users can check more easily whether the measurement tolerances in millimeters are being adhered to. In automatic measurement, users have the entire graphic support of Sinumerik Operate at their disposal, including all the cycles. The log output is in either text or table format.



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New features

- Logging in JOG mode
- Logging in automatic mode
- Output format: .txt or .csv file
- Log types: calibrate workpiece measurement probe, calibrate tool measurement probe, tool measurement, workpiece measurement

New cycle functions

Quick overview, quick production

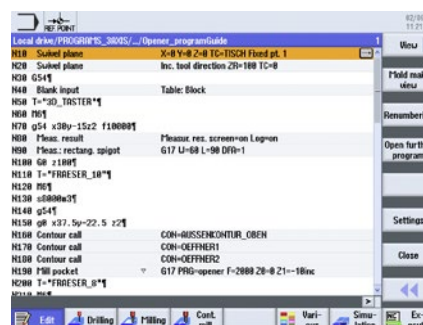
Plain text is easier to interpret than a code display, which is why, in the new Sinumerik Operate, users can display the cycles as a work step in programGUIDE, allowing them to see all the required information immediately.

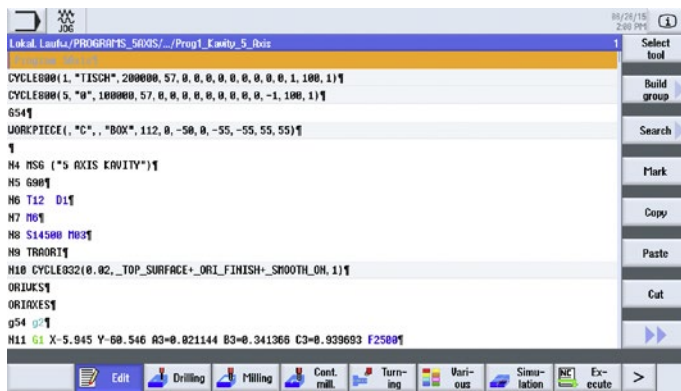
Furthermore, Sinumerik Operate now offers even simpler parameter inputting for cycles, which means the workpiece can be finished even more quickly thanks to faster programming. Users can display either the complete cycle screen or a "simple" screen, that is, reduced to the most important parameters. They then need to program only these parameters; the rest are preallocated.

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New features

- Cycle display as plain text in programGUIDE
- Reduced parameter display for cycles
- Less programming effort due to parameter selection





New features

- Adjustable font size: Auto, Normal (24), Small (20–14)
- Comments for channel-specific / global R parameters
- Syntax highlighting

Parameter settings

Better overview on the screen

To facilitate better readability in the display masks, the font in Sinumerik Operate can now be set to the optimum size for the operator, making programming even easier. The operator can choose between the settings Auto, Normal and Small. Thanks to the syntax highlighting in the editor, parts programs are now more legible and typing errors can be spotted more quickly.

In addition, users can enter comments for the R parameters, which are specified in the program instead of being fixed values, thus further facilitating clarity and programming. Alongside the channel-specific R parameters, there are also global R parameters for exchanging data between the channels.

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Quick Viewer

Quick view of molds

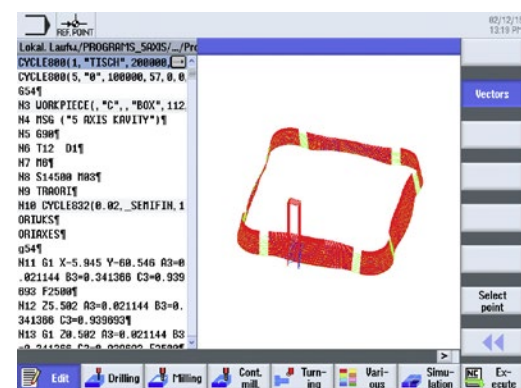
The mold-making Quick Viewer function in Sinumerik Operate allows visualization of the processing paths of large parts programs, such as those from CAM systems. With the aid of a quick view, users can get a rapid overview of the program and correct it, if necessary. With Quick Viewer, it is possible to check, for example, whether the programmed workpiece has the right shape, whether there are serious traversing errors (and if so, which set needs to be corrected), and how the approach and departure will take place. In the new version, the mold-making viewer now supports sets with G2 and

G3, polynomials, and B-splines for five-axis machining — for both vector and rotary axis programming.

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New features

- Mold-making viewer for G2 and G3 sets, polynomials and B-splines
- Support for five-axis machining
- Support for vector and rotary axis programming



Safety Integrated for Sinumerik 840D sl and Sinumerik 828D

Enhanced safety functions

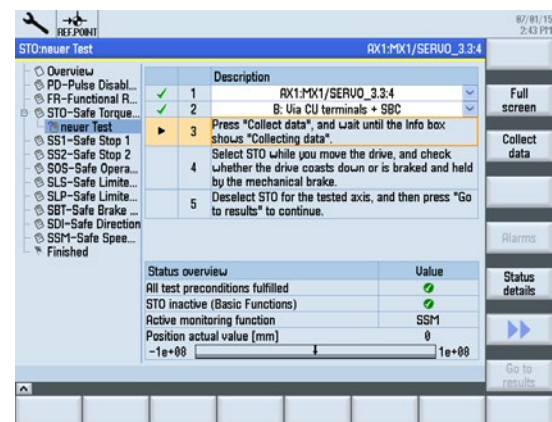
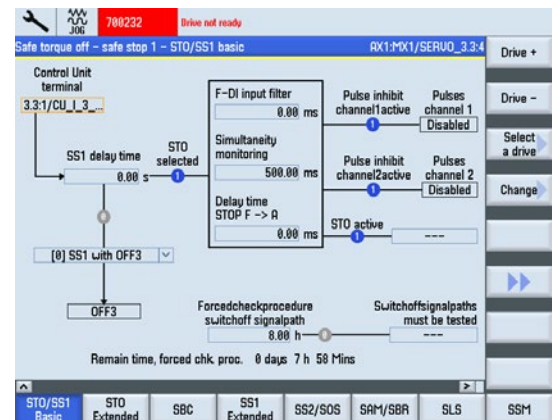
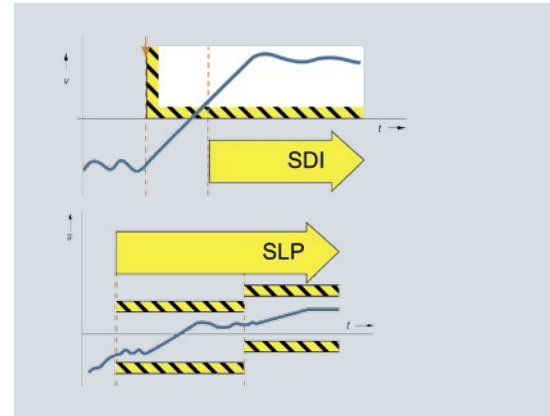
In its standard version, Sinumerik 840D sl offers up to three secure connections for securely exchanging signals via Profibus or Profinet. With the SI-Connect option in Version 4.7 of the software, users are provided with up to 16 secure connections and thus require less hardware, as the higher-level secure Simatic S7 can be eliminated. In addition, Version 4.7 immediately activates the safe operating stop when the drives are stationary, aborting the stop transition period, so that no more unnecessary waiting times are required before the safety door is opened. Last but not least, universal safety functionality is available for servo and hydraulic axes.

For the Sinumerik 828D and 840D sl CNCs, the user can call up a global checksum, which allows for quick comparison with the reference checksum. What is more, the application effort has been significantly reduced due to the safe brake test integrated in Sinamics. A further advantage is that external

axes can now also be controlled via Profinet, so only one bus system is required for peripherals and drive.

Important functions have been added to Sinumerik Operate in Sinumerik 828D. The integrated acceptance test features Safety Integrated Basic and Extended functions, allowing for easy acceptance of the safety functions without an external tool. Thanks to the graphical commissioning, safety functions can be commissioned especially clearly. With the aid of the Safety Info and Control Channel, status information can be transferred between the drive and control system, which significantly simplifies configuration for the user. In addition, further safety functions have been added to the CNC, such as Safe Direction for reliably monitoring the direction of rotation, and Safely Limited Position for reliably monitoring traversing ranges; this means that hardware limit switches can be eliminated.

siemens.com/safety-integrated



New features

- **Sinumerik 840D sl:**
 - Secure communication with up to 16 connections
 - Termination of stop transition time when the drives are stationary
 - Safety Integrated for hydraulic axes
- **Sinumerik 828D and 840D sl:**
 - Global checksum
 - Safe brake test in Sinamics converter
 - External axes via Profinet
- **Sinumerik 828D:**
 - Safe Direction and Safely Limited Position
 - Acceptance test and commissioning integrated in Sinumerik Operate
 - Safety Info and Control Channel

Sinumerik 808D and 808D Advanced

Small but powerful

Less is more. The Sinumerik 808D and 808D Advanced CNCs adhere to this principle, having been reduced to the essential functions to maximize user-friendliness. Thanks to their well-conceived CNC design, intuitive user guidance, and standardized operating and programming

philosophy, they ensure maximum productivity in simple turning and milling machines worldwide. The many system languages, such as English, Chinese, German, Portuguese, Russian, Polish and Korean, facilitate global use. In the new version, the display of Sinumerik 808D Advanced has been expanded from 7" to 8.4" to provide increased clarity and promote effective work.

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New features

- Larger display, measuring 8.4" for Sinumerik 808D Advanced (PPU161.3)
- More languages for use on the international market

Sinumerik 828D SW 28x Advanced

Top performance for the midrange

Sinumerik 828D's new 28x Advanced software enables two channels to be run simultaneously in turning and grinding machines — making the machine tool even more productive. Users have the option to machine two workpieces simultaneously with two tools, or to use four-axis turning. This ensures short machining times and maximum precision during production.

The turning/grinding software and the milling software have been expanded for large and highly efficient turning and grinding centers and milling and drilling centers. Now up to 10 axes/spindles and two additional PLC axes can be controlled. These additional PLC axes are used principally in tool changers and handling devices such as robots. They ensure faster loading and removal of workpieces, making for greater productivity in manufacturing. Tool management has also been improved and now offers a large tool magazine that makes it possible to work without interruption. A large 10-MB CNC memory has been integrated so that large parts programs can also be processed rapidly.

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New features

- 2 channels, 2 operating modes
- Turning and grinding software with up to 10 CNC axes (spindles) and up to 2 PLC axes
- Milling software with up to 8 axes (spindles) and up to 2 PLC axes
- Large tool magazine for up to 786 tools
- 10-MB CNC memory

G-Tech software for grinding

Cost-effective round and flat grinding

The G-Tech software available with the new version of the Sinumerik 828D software enables machine manufacturers to develop ultramodern grinding machines with up to 10 axes and two machining channels. Thanks to special cycles for round and flat grinding, workpieces can be programmed quickly; built-in error correction prevents clamping errors during machining. Tailor-made tool management for grinding applications simplifies set-up and programming for the user. The intuitive operator interface also ensures that first-time users can quickly find their way around.

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New features

- 3 software versions: for grinding machines with 5 axes / 1 channel, 6 axes / 1 channel and 10 axes / 2 channels
- Presets for round or flat grinding
- Graphical tool display specially developed for grinding machines
- Round and flat grinding cycles for faster parts programming
- Ability to expand HMI with Run MyScreens to design intuitive operator interfaces



Sinumerik Integrate Run MyRobot/EasyConnect

Easily set up automated cells

Various types of robots from different manufacturers can be connected to machines to perform handling tasks using the Sinumerik Integrate Run MyRobot/EasyConnect interface in Sinumerik 828 CNC controls. With the new interface, businesses of all sizes can create automated cells with a minimum of effort and additional cost, even on standard machines — and even with different CNC controls. The new automated cell set-up solution is rounded off with features for easy optimization of work processes on the machine tool and for

mobile condition monitoring and remote maintenance.

To ensure the easiest interface operation possible, Siemens has taken only the central elements from the more comprehensive standard. Robots can be connected via Industrial Ethernet (Profinet RT) or using I/O signals. The new interface allows the user to synchronize processes between the machine tool and the robot with ease, so that efficient processes can be set up in the automated cell.

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New features

- Easy connection of robots using Sinumerik 828D CNCs
- Robot connection via Industrial Ethernet or I/O signals
- Support for mobile condition monitoring and remote maintenance

PLC editor

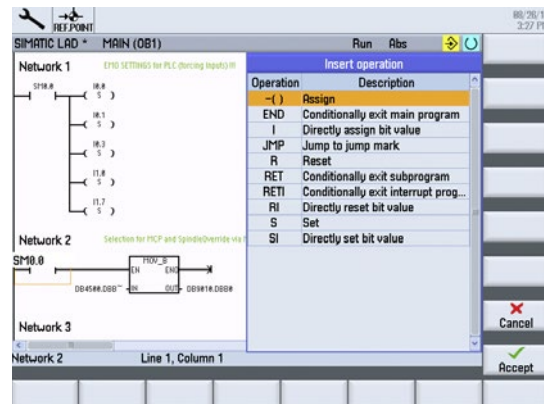
Project editing made easy

The PLC editor built into Sinumerik 828D allows users to conveniently correct and edit projects directly on the screen. This can be easily done using soft keys, meaning the user does not require any additional PC or programming tools. The PLC project comparison feature also makes it easy to recognize project changes made by others.

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New features

- Ability to edit projects directly on the screen
- Simple operation using soft keys
- Remote access combination option



New features

- Same robust die-cast magnesium casing as the PPU
- Inclusion of override spindle switch in all versions
- Emergency shutdown provision
- Simple connection via USB
- User-friendly layout

Sinumerik MCP USB

Cost-effective interface for the midrange market

The Sinumerik MCP USB machine control panel for Sinumerik 828D and 828D Basic provides users with a cost-effective solution for machine-level operation of milling, turning and grinding machines in the midrange market. In contrast to the high-end machine control panel, all versions of the new MCP USB have an override spindle switch built in and are prepared for emergency shutdown. The identical layout of the two versions of Sinumerik 828D and the simplicity of connecting via USB will prove particularly practical in everyday industrial work.

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Sinumerik 840D sl NCU 7x0.3B PN

More memory means greater productivity

The new scalable NCU 7x0.3B PN makes Sinumerik 840D sl even more flexible and adaptable. Three versions are available: 710.3B PN, 720.3B PN and 730.3B PN. Version 4.7 of the software now offers a more generous user memory, and the DRAM memory has also been doubled to 2 GB. This ensures maximum productivity and quality, particularly when manufacturing complex parts; it also speeds up the operation and simulation programs. Further, mold construction programs require up to 15% less time, and the more powerful versions consume less electricity than their predecessor models. Long-term availability is ensured by the system's compatibility with the 710.3 PN, 720.3 PN and 730.3 PN models.

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Sinumerik HT 8 and contour handwheel

Easy machine operation

The Sinumerik HT 8 mobile handheld unit is perfect for the machine-oriented operation, monitoring and programming of robots, machine tools and production machines. It is characterized by its robust housing with an IP65 protection rating and a 7.5" TFT color display with touch operation. In addition to an emergency stop button on the front of the device, the handle on the back of the device also has two acknowledgement buttons for zero position, agreement position and panic position. These can be easily synchronized in the latest version of the device.

The contour handwheel is used for set-up and touching in conventional turning machines and grinding machines. The contour handwheel has a velocity-generating effect on all programmed traversing movements in auto and MDI CNC operating modes. The feed rate is derived from the handwheel pulses, while the direction of the handwheel's rotation defines the direction of travel. With Sinumerik 840D sl, the contour handwheel can now also be operated via Profinet.

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New features

- Synchronization of the acknowledgment button contacts with the Sinumerik HT 8
- Contour handwheel operation via Profinet

New features

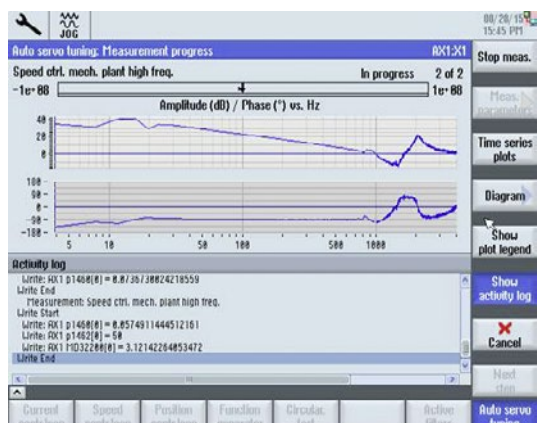
- More memory for users
- Faster operation and simulation
- 10%–15% shorter program runtime for the NCU 730.3B PN
- Reduced power requirements



Auto Servo Tuning

AST in production

The Auto Servo Tuning (AST) function in Sinumerik Operate allows axes / path axes to be automatically optimized in manual mode without the need for manual intervention, thus minimizing the time required. Users can display the optimizations not just on the machine but also offline, while the optimization results can also be stored for archiving and analysis purposes. In the event of strong fluctuations between masses — for example, due to different workpieces or clamping operations — the new version of Sinumerik Operate also allows AST to be launched from the parts program. It is particularly effective when used in torque motors and linear motors.



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New features

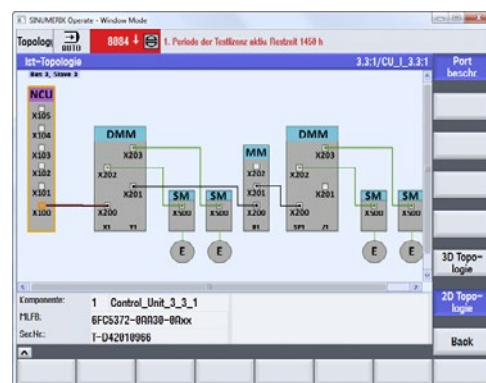
- Cross-channel alignment of interpolated path axes
- Ability to display and alter optimizations (e.g., filters) offline
- Storage of optimization results for transfer, archiving and analysis purposes

Advanced commissioning / Sinumerik Operate/PC — commissioning

Commissioning functions expanded

Machine data for memory formatting in Sinumerik 840D sl and Sinumerik 828D can now be altered without the need to archive the data in advance. Initiating the PLC reboot in parallel to NCK start-up also accelerates the system's start-up time. Furthermore, archive loading times are reduced thanks to optimized NCK resets, and the addition of a graphic topology display makes commissioning easier for users. The commissioning function in Sinumerik Operate/PC has also been expanded for Sinumerik 840D sl with the addition of an effective safety acceptance test.

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New features

- Facilitation of commissioning by graphic topology display
- Ability to alter machine data for memory formatting without the need to archive in advance or to restart
- Shorter archive loading times thanks to optimized NCK resets
- Accelerated control system booting due to parallel PLC start-up
- Effective safety acceptance test with Sinumerik Operate/PC — commissioning



Sinumerik Integrate Create MyHMI /3GL

Multi-touch applications possible

Users can design their own user interfaces with Create MyHMI /3GL thanks to the openness of Sinumerik 840D sl. Create MyHMI /3GL allows applications to be created either based on C++ with Qt-API or only C++ or .NET. From Version 4.7 SP2 onward, Qt 4.8-based multi-touch applications are now also possible for the NCU and the PCU. The level of functionality in Qt/C++, .NET and C++ programming has also been considerably enhanced.

siemens.com/sinumerik-integrate



New features

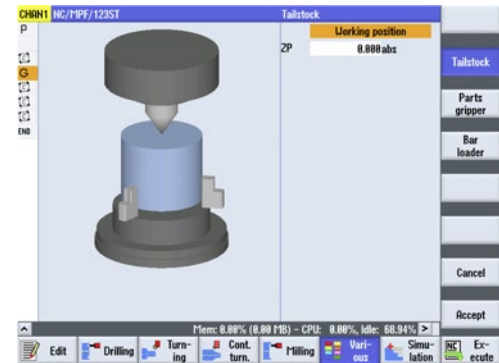
- Qt 4.8-based multi-touch applications
- Qt interfaces: display panels in the machine section; header manipulation; use of XD3 graphics; creation of completely individual user interfaces
- .NET interfaces: tool management service; tachograph service
- C++ interfaces: archive service; trace data recorder service; infrastructure services

Sinumerik Integrate Run MyScreens

Create more attractive images

With Run MyScreens, Sinumerik 840D sl and Sinumerik 828D are equipped with a configuration tool that allows users to expand the screen interface to suit their own needs. Innovations in the configuration language, such as simplified syntax, mean that configuring the software is now even quicker and more effective. Expanded string and file functions, such as the option to read and write text files and drive data, make data input more user-friendly. The main highlight is that 3D animated graphics can now also be used in Run MyScreens applications. Users' cycle screens in particular can benefit from animated help images, as they allow movements to be depicted by graphic means.

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New features

- Enhanced configuration language (new simplified syntax, do-while loop, "switch" condition)
- Enhanced string and file functions (read and write text files and drive data, string processing, password function)
- 3D animated graphics with animated elements

Sinumerik Integrate Create MyHMI /WinCC

The simple way to create operator screens

Create MyHMI /WinCC V13 SP1 is an optional package for WinCC Advanced V13 SP1. This software allows customized user interfaces to be created for Simatic panels and PC systems, and used in conjunction with Sinumerik 840D sl NCUs beginning with Version SW4.5 SP2. In addition to offering an extensive range of WinCC functions, it also allows the NC/GUD variables, machine/settings data and NC/DB2 alarms to be visualized. Migration of WinCC flexible projects is possible.

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New features

- Use of Simatic Comfort Panels or Mobile Panels
- Support for all Sinumerik Operate languages for DB2 alarms
- Integration of Step 7 V5.5 projects

Sinamics S120 HLA / PM240-2 power modules

Powerful and compact

The Sinamics S120 Hydraulic Drive supports high forces in small spaces. It consists of a highly dynamic hydraulic control system and the compact, space-saving Sinamics S120 HLA interface module. Commissioning, operation, diagnostics and servicing are carried out with extreme ease in Sinumerik Operate, and automatic valve characteristic identification has also been integrated into the commissioning screens. In addition, the Sinamics S120 Hydraulic Drive is equipped with Safety Integrated functionality, including personal and equipment protection in accordance with category 3 and PL d. The safety functions built into the drive

allow for quick response times and a simple control cabinet configuration. The simple installation and minimal use of hardware increases the availability of the machine. Frame sizes A–C of the PM240-2 power modules can also be used for applications with Sinamics S120 beginning with firmware Version 4.7. The new PM240-2 modules offer higher power densities in smaller dimensions. The output range extends from 0.55 kW to 15 kW for a nominal output of 400 V. The modules also boast an impressively robust design that is suitable for use in even the harshest of industrial settings. The optimized fan design ensures lower noise levels.



siemens.com/sinamics-s120

New features

- **HLA module:**

- Safety Integrated functions now also for hydraulic axes
- Native support for Drive-Clq encoders and all the encoder evaluations / encoders available for Sinamics in addition to the support for SSI and TTL encoders provided by the onboard interfaces
- Commissioning with automatic characteristic curve measurements integrated into Sinumerik Operate

- Simplified structure in comparison with Simodrive HLA (less space required, no monitoring modules, no filter modules for SSI encoders)

- **PM240-2 power modules:**

- High power densities and smaller dimensions
- IP20/21 protection rating
- Optimized fan design to reduce dirt and noise emissions from fans and cooling elements

Sinamics S120 system components

For Sinumerik applications and smaller widths

The TM31 and VSM10 are now approved for Sinumerik applications in Version 4.7 of the software. With the VSM10, the exact fluctuations of the mains voltage can be recorded. This ensures smooth operation of the line modules in the event of unfavorable conditions in the power supply, for example, strong voltage fluctuations or brief interruptions. Additional drive-related digital and analog inputs and outputs are available with the TM31.

The TM41 and DMC20 have also been modified. Along with their new appearance, the width of these two system components has been reduced from 50 mm to 30 mm, thus decreasing the amount of space they occupy in the control cabinet.



New features

- **DMC20 / TM41:**
Smaller width (30 mm)
- **TM31:**
Expansion of digital and analog inputs and outputs
- **VSM10:**
Precise recognition of mains voltage fluctuations

siemens.com/sinamics-s120

C-/D-Type Sinamics S120 Booksize Optimized connection technology

Sinamics S120 Booksize modules are available as C-type or D-type modules, that is, either with a dual overload and thus optimized for continuous load applications (C = continuous motion) or with a triple overload for highly dynamic intermittent load applications (D = discontinuous motion). The new motor modules are more user-friendly and come with a motor connection plug that is more accessible and better positioned. In addition, the fan can be replaced without

having to dismantle the motor module. The Booksize modules also take up less space in the control cabinet. And as the triple overload is now available for currents up to 30 A, the new motor modules allow the width to be reduced in cases designed for use with the maximum current. The overall height is reduced thanks to an innovative motor

connection design. The stable construction with solid mounting plates also makes the new Booksize modules remarkably robust.

siemens.com/sinamics-s120



New features

- Space-saving installation in the control cabinet
- Improved connection system for easier assembly
- Better maintenance thanks to the new design for fans and motor connectors
- 100% compatibility with previous Booksize motor modules (via an adapter in the case of spare parts)

Simotics S-1FT7, S-1FG1 and M-1FE2

Power for dynamic and precise machine tools

Even more compact, dynamic and precise: introducing the impressive new Simotics S-1FT7 servomotor. The naturally cooled motor is now available in sizes up to shaft height 132 and has even higher torque, making it perfect for use as a feed motor in large machines. With the Simotics S-1FG1 servo-gear motor, Siemens offers a full portfolio of motors with integrated gears for machine tools from a single source. Thanks to its high energy efficiency and extremely flexible torque ratio and output direction, it is perfect for auxiliary units such as pallet changers, chip conveyors and feeder units. The Simotics M-1FE2 in size 180 built-in motor is designed for machining larger workpieces. The higher torque and output of the spindle motor guarantee the best possible performance, even in large turning or milling centers and demanding machining applications. The large inner diameter of 200 mm ensures higher productivity.

New features

- **Simotics S-1FT7:**
 - Shaft height 132
 - Shorter overall length (more compact)
 - Higher maximum torque (more dynamic) and lower power requirements compared with Simotics S-1FT6
- **Simotics S-1FG1:**
 - Wide range of torque and gear types
 - Direct gear assembly via adapter plate
 - Higher efficiency than asynchronous motors
- **Simotics M-1FE2:**
 - Highest torque density thanks to permanent magnets
 - Large inner diameter
 - Two versions (with and without cooling jacket)



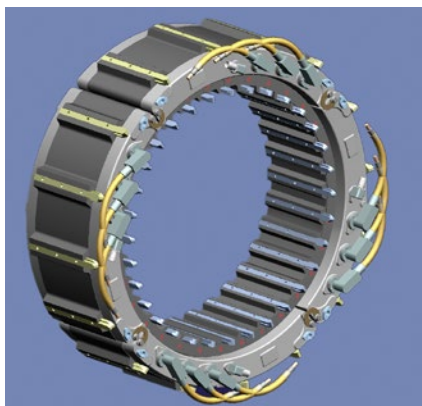
siemens.com/simotics

Segment motors

Maximum torque for rotary tables and turning spindles

The new segment motors are available in two versions: axial and radial. The high torque (up to 442,000 Nm for the axial version and more than 1,000,000 Nm for the radial) makes both of these direct drives suitable for very large diameters. They also have a flexible design and can be operated with a reduced number of stator segments.

siemens.com/simotics



New features

- Maximum torque (up to 442,000 Nm axial / > 1,000,000 Nm radial)
- Scalable torque to suit the diameter and the number of segments
- Segmented stator or rotor
- Radial platform design: higher peripheral speeds; insensitivity to axial misalignment

The Weiss spindle portfolio

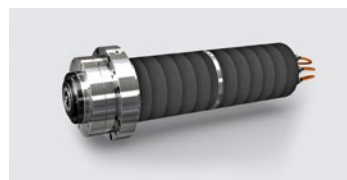
Cost-effective customized spindle solutions

Weiss GmbH supplies cost-effective motor spindle solutions for standard machines and complex machine tools. The compact, robust milling spindles based on Simotics M-1PH8 technology are now also available in water-cooled and air-cooled versions in shaft height 132. With speeds of up to 4,500 rpm, they perform impressively in drilling and milling machines — for example, for steel beam machining and special machine construction. The spindles based on Simotics M-1PH8 with shaft heights 80 and 100 are easy to assemble and quick to put into operation. With speeds of up to 24,000 rpm, they enhance productivity and improve surface quality when used in standard machining centers and robot applications.

The popular 2SP1 standard spindle delivers high availability at a low cost.

The innovative customized spindle and motor solutions offer optimum spindle performance of up to 80,000 rpm and optional features such as electromechanical unclamp units for all turning, milling and grinding machine centers. The optional SMI24 spindle sensor module for Weiss spindles boosts the productivity of spindles through faster, digitalized data transmission. Spindles with SMI24 take up less space in the control cabinet, as less hardware is required. An integrated spindle monitor is also available for Sinumerik 840D sl and 828D in the form of the SMI24 sensor module.

weissgmbh.com



New features

- Milling spindles based on Simotics M-1PH8 technology: compact spindle dimensions — also with an unclamp unit and rotary union
- 2SP1 standard spindle: inexpensive motor spindle with 18,000 rpm for high-quality surfaces
- Customized spindle and motor solutions with the highest spindle performance and optional features in line with the latest technological developments
- Spindle sensor module SMI24: rapidly digitalized signal transmission integration via Sinamics; elimination of the need for SMC, TME, I/O peripheral module and cables

Solution
PartnerAutomation
Drives

SIEMENS

AfM Technology GmbH**New functions in
machining**

AfM Technology is a global Siemens Solution Partner providing services for Sinumerik 840D sl CNC control systems as well as for the Volumetric Compensation System (VCS) and VCS Rotary technology for rotary axes. Sinumerik 840D sl uses a laser to measure volumetric deviations in the entire workspace of the machine tool. These data are then used to calculate the correction data for the Sinumerik software option VCS. This increases the precision of the machine throughout the entire workspace, which generally means that time-consuming corrective measures are no longer required for the machine tool.

afm-tec.com**New features**

- Up to 85% increase in precision due to the volumetric compensation in Sinumerik 840D sl
- Less reworking and lower rejection rates
- Interchangeability of CNC programs between different machines

Solution
PartnerAutomation
Drives

SIEMENS

Promotec GmbH**Integrated digital production**

The Siemens Solution Partner Promotec offers a modular system for tool-breakage and process monitoring in machining for Sinumerik 840D sl. The modular process monitoring system Promos optimizes the machining process by detecting collisions, imbalances in the bearings, tool wear and tool breakage. Hardware and software add-ons can also be incorporated to extend the functions — without requiring any additional space.

The NC software solution Prosin does not require any additional hardware for monitoring tool breakage on the Sinumerik 828D and 840D sl CNCs. Tool monitoring is based on a readout of the current values for the digital drives. The operating controls are conveniently integrated into the standard screen interface of the Sinumerik CNC.

With Promos and Prosin, potential damage to the machine, tool and workpiece can be avoided, and repair costs and downtime minimized.

promotec.com**New features**

- Modular Promos solution for comprehensive machine tool monitoring
- Low-cost Prosin solution for detecting tool breakage without the need for additional hardware
- Optimized machining process and lower costs

Sinumerik application examples

Visit our Siemens Industry Online Support Portal and find helpful application examples for Sinumerik in the Automation Technology product tree under "Sinumerik CNC automation system".

This collection of completed, tested and documented application examples can be used free of charge.

The latest application examples:

- Sinumerik 840D/840D sl: technology database for Sinumerik Operate
- Sinumerik 840D sl: safe coupling of two Sinumerik 840D sl controls

Download the application examples at
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Just scan the QR code with your smartphone and go directly to the application examples.

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