Sinumerik 828D — the new CNC for the shopfloor

Powerhouse in the Compact Class

The new Sinumerik 828D is tailored to the requirements of sophisticated machine tools typically used in a modern shopfloor. Key criteria during development of the controller included compact dimensions, maximum performance, extremely simple operation and easy servicing and maintenance.

Compact, strong, simple.
These three words describe the expectations of CNCs used in shopfloor production. The Sinumerik 828D was developed with these factors in mind and specifically for this area. The focus of applications for the new CNC are vertical milling centers that also can be equipped with machine units for machining cylindrical workpieces and inclined workpiece surfaces. It is also suitable for inclined-bed turning machines with a tool turret. One of the toughest challenges for the developers of the Sinumerik 828D was the limited amount of installation space available in very compact machine tools. Despite the relatively small dimensions of the control panels, the controller also needed to be extremely user-friendly.

The result is a very compact solution with a 10.4" TFT color display and a full QWERTY CNC keyboard. For maximum robustness, the control panels are made of tough diecast magnesium and the short-stroke keys on the CNC keyboard are covered with embossed protective film to ensure they are splash-proof.

To make the new CNC low-maintenance, wearing parts such as fans or hard
drives were eliminated. User data is reliably buffered by integrated state-of-the-art NV RAM memory modules – no need for an expensive buffer battery.

**Maximum productivity and precision**

Productivity and machining precision remain the key requirements for any CNC. For maximum hardware performance and system functionality, the Sinumerik 828D – just like the high-end Sinumerik 840D sl – comes fully equipped with 80-bit NANO© precision, which allows machine concepts with a precision of up to 0.1 micrometers.

Milling free-formed surfaces is, however, the ultimate stress test for any CNC. The controller not only has to process an extremely high number of CNC commands in the shortest possible time but must also ensure the workpiece is moved on a path with a steady curvature to achieve the smoothest possible surface finish.

The Sinumerik 828D masters this task effortlessly thanks to Advanced Surface technology. These completely innovative algorithms guarantee virtually identical speed and contour profiles during reverse line-by-line freeform milling and achieve extremely smooth workpiece surfaces. This means that there is no need for costly manual finishing of mold-making workpieces.

**CNC programming for all applications**

The Sinumerik 828D is equipped with various CNC programming methods to meet the demands of the international machine tool market. The controller is equipped with fully graphical ShopMill and ShopTurn workstep programming with unique workstep inter-linking and dynamic line graphics for manufacturing one-off parts or small series. Large workpiece batches benefit from the Sinumerik CNC programming language offering the high degree of flexibility required by sectors such as the automotive industry and its suppliers. The programGuide function combines the flexibility of the Sinumerik CNC programming language with the convenience of machining cycles to provide users with a huge range of easily accessible technological options.

**Perfect for milling and turning**

The Sinumerik 828D includes an extensive technological package. This includes machining cycles for drill thread milling, trochoidal milling of hard materials and milling freely definable pocket geometries with up to 12 isolated contours. Material is swiftly removed through the use of large milling tools. The system software detects filigree corners automatically so that the residual material can be removed with smaller, more suitable tools. This saves valuable time during the machining process. Users of turning machines with powered tools also benefit from the full scope of drilling and milling cycles, including position patterns, on the end face and lateral.
The new Sinumerik 828D offers many innovative features such as Advanced Surface. These features enable the end-user to produce smoother surfaces with a significantly reduced machining time. The controller can be integrated into virtually any machine thanks to its compact dimensions — with no loss of convenience or performance.

Mario Hiroshi Assada, head of Romi Application Development

The technological edge of the Sinumerik 828D also shows during turning processes. The controller features a contour turning cycle to enable oscillating tool delivery and prevent the typical plate grooves caused by hard material surfaces. According to leading tool manufacturers, this function can extend tool life by up to 30%. Free segmentation of machining is the absolute highlight of the contour cycle. This enables programmers to machine workpieces step-by-step using the best tools for the job. Residual material is automatically detected to track the unprocessed blank. Steep residual contours can then be removed via contour burring or plunge turning. The Sinumerik 828D has a range of measurement cycles to ensure consistent accuracy of the workpieces during the machining phase. Measurement results are logged automatically in a report file to ensure that proof of workpiece precision can be provided at any time.

Ground-breaking technology
State-of-the-art PC operation and communication technology form a further key element of the Sinumerik 828D. Context-based online help is one of the highlights in this area. Information accompanied by detailed graphics is available at the touch of a button, regardless of which menu the operator is currently using. Most parameters entered into a CNC controller during the course of the day are for programming machine movement. The Animated Elements function (see page 5) uses short moving image sequences to visualize input parameters so that the difference between swarf milling and deburring during deep-hole drilling or synchronous and conventional milling in a circular pocket is obvious at first glance. This not only simplifies CNC programming, but also increases process reliability, for instance when touching workpiece zero points.

Users do not require additional data transfer software as data can be transferred conveniently via Compact Flash (CF) card or USB stick — in the same file format as on a PC. The Ethernet networking capabilities of the Sinumerik 828D also represent the latest IT developments. No optional CNC hardware or additional software on data servers is required to connect the system to a factory network. If a factory network is too extensive to implement, a portable PC can be connected directly to the front interface on the Sinumerik 828D via a network cable without any adjustment of network settings needed.

With Easy Message, the Sinumerik controller can send a text message to a mobile phone that gives information on the operational status of the machine. This can significantly increase machine availability for very little expense. For instance, the machine operator can set the system to send a text message when the workpiece counter reaches a certain value to let the user know that new material needs to be loaded into the machine’s rod feed system. A hardware package in the form of a GSM modem and a transmission antenna is all that is needed to use Easy Message functionality.