Platform SINUMERIK Integrate – Numerous applications

Availability and productivity

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1. Job Preparation and Execution:

a. Virtual machine with the VNCK:

With SINUMERIK Run MyVNCK, machine manufacturers and end users can create their own control-specific virtual world, because Run MyVNCK brings the original SINUMERIK CNC kernel into the virtual machine. This gives a best possible emulation of the real control function. Higher machine availability as a result of offline programming, optimization and productivity enhancement through optimally retracted programs in the virtual machine.

b. SinuTrain – the control-oriented programming station:

SinuTrain brings SINUMERIK Operate, including an animated machine control panel, to the PC. NC programs can be created directly here and can be verified thanks to the original SINUMERIK CNC kernel before they are transferred to the real machine. This enables high availability of the real machine and hence increased productivity.

c. Manage MyPrograms:

Manage MyPrograms allows central management and distribution of CNC programs in machineries featuring different CNC controller types. This increases efficiency, flexibility, transparency and process reliability with distributed roles in production.

d. Manage MyTools:

Manage MyTools supports the operator when performing a tool demand analysis for manufacturing orders, mirrors the number of tools required against the machine magazine assignment and supports the tool setup process.

2. Production Efficiency and Flexibility

a. Manage MyMachines:

With the MindApp Manage MyMachines on the MindSphere platform, you increase the productivity and efficiency of your machine with new insights and transparency of relevant machine data, the status and a clear view of the machine history.

b. Analyze MyPerformance:

Analyze MyPerformance calculates the effectivity of the entire plant and provides important indicators for measures to increase efficiency. Through automatic recording of machine data and conditions, it provides all the data required for production optimization.

c. Access MyData:

The open, flexible software Access MyData enables convenient exchange of data between products on the SINUMERIK Integrate platform and complementing or higher-level software systems.

3. Machine Availability:

a. Analyze MyCondition:

Analyze MyCondition is a powerful application that provides various test cycles and hence helps operators and service engineers to determine the machine condition and monitor the wear on the machine over time. Continuous evaluations results in trends that can be detected early and measures can be taken and planned at the right time.

b. Access MyMachine:

Access MyMachine allows worldwide, failsafe remote operation/monitoring of a machine tool. Comprehensive fault diagnostics and correction options are immediately available. Hence it results in faster problem elimination and increased machine availability.

4. Machine process improvement:

a. Analyze MyWorkpiece /Toolpath:

With Analyze MyWorkpiece /Toolpath you increase productivity and component quality by analyzing/optimizing NC programs and SINUMERIK trace data with modern 3D visualization. As a result, errors in the NC program are recognized at an early stage and optimization is possible by reducing the idle time and by prior checking of the workpiece quality via simulation on the machine.

b. SINUMERIK Edge:

SINUMERIK Edge, a hardware and software solution, which processes and analyzes process data in real-time system. By means of a configurable preselection, non-sensitive data can be transferred to the cloud and used, for example, to visualize all locations. It enables all kinds of descriptive, diagnostic, predictive and prescriptive analytics.

5. Miscellaneous

a. Run MyCC /AJET:

It is a compile cycle that enables the CNC to switch over automatically between positioning and machining mode. Workpieces can be produced faster without quality cutbacks due to intelligent adjustment of the dynamic response settings. It requires no technological experience due to implicit activation via the programming.

b. Run MyCC /NOCO:

Run MyCC /NOCO is useful for column milling machines. The nodding compensation function monitors the other axes and models the system. Since the acceleration movements of all axes are known, nodding movements can be predicted and compensated by a function similar to a feedforward control thus increasing performance of machine tool even when subjected to physical stress.

c. Create MyInterface (CMI) & Remote Procedure Call (RPC):

CMI /RPC offers individually configurable communication interface between host computer and the machines for the implementation of automated manufacturing, particularly control of machine as well as machine groups (production line) by transfer of NC programs, monitoring of alarms and control of tool status.

d. Tool Ident Connection:

The Tool Ident Connection function allows tool identification systems to be linked to SINUMERIK CNCs for operation in conjunction with the standard tool management system. It supports automatic tool identification by e.g. RFID, machine readable codes, etc.

e. Execution from external storage (ESS):

ESS provides simple data management on your machine that is independent of the storage location. With ESS, it is possible to execute part programs from external memories resulting in a virtually unlimited size of the part program memory. It is Cost-effective method to extend internal machine memory.

f. Path length evalutation:

When Path length evaluation function is activated, the selected control data (axes speed, number etc.) is automatically sent and recorded. This also provides an insight of mechanical wear and tear. This results in increased productivity through improved maintenance intervals and information leading to higher uptime.

g. ShopFloor Intergrated Resource Management:

Shopfloor Integrate Resource Management (SFI RM) offers a consistent software solution for tool cycle management. The Tool Management using Manage MyTools connected to Teamcenter gives overall as well as detailed views on allocation, remaining lifetime, assembly instructions, spare parts and tools in stock. Cost savings and stock size reduction potentials can be identified.

h. Archive API:

Using Archive API, the postprocessor-builder can easily extract the necessary data from the NC-archive generated by the SINUMERIK.

i. Virtual Commisioning:

Virtual Commissioning allows the joint development of mechanical and electrical systems along with the automation. This overall system approach helps machine builders implement individual and flexible machine concepts in the shortest possible time.

j. SINUMERIK Virtual Commissioning Services:

SINUMERIK Virtual Commissioning Service shortens machines time-to-market by using a digital twin. The real commissioning can be accelerated by up to 70 percent.

The mechanical development and electrical design departments save time by cooperating in parallel. Before the real machine is built, its digital twin is connected to the real control system, and the machine is commissioned virtually.

With the use of SINUMERIK 840D sl hardware-in-the-loop – or in other words, connecting the virtual machine model to the real-life control system – we help prepare and support the real-time commissioning process on a project-specific basis through Virtual Commissioning.

SINUMERIK Virtual Commissioning Services provides a coordinated product portfolio.

k. DXF Reader:

DXF files are digital workpiece drawings which are mainly the output of CAD systems. With the DXF reader option, DXF files can be opened directly on the CNC within SINUMERIK Operate in order to extract contours and points.

l. CCG Compiler:

The CCG compiler generates CNC programs in the polynomial format to allow the machining of non-circular contours on a cylindrical grinding machine or turn-mill/mill-turn machine.

m. Run MyCC /EMC:

EMC can significantly boost the productivity of the machine tool, as it can be operated overall with higher speeds. Predictive algorithms based on a virtual machine model ensure that the machine does not become unstable as a result of its natural frequencies at these high machining speeds.

n. Run MyCC /PROT:

Run MyCC /PROT supports collision protection of up to 20 axis pairs that could collide with each other. The axes concerned can also be active in different channels. A maximum spacing can also be monitored.

o. Create MyConfig:

The CMC is used by the machine manufacturer to create and run a project for automated commissioning/production of machines with SINUMERIK 840D sl or 828D controllers. For example: Modular data management for modular series machines (including topology), upgrades of controllers at the end customer, etc. It reduces the production time for machines and upgrade time for end customers.

p. Create MyHMI/3GL or Create MyHMI /WinCC:

Create MyHMI /3GL enables OEM to implement their own integrated operating and display functions, integrate individual program screens and create their own operating areas.

q. Lock MyCycles:

Lock MyCycles encrypts OEM cycles safeguarding your technological lead against unauthorized access or reverse engineering.

r. Run MyRobot /Machining or Run MyRobot /Handling:

Run MyRobot /Machining/Handling makes operation, programming and diagnosis possible for a KUKA robot doing machining tasks with SINUMERIK. Hence it does not require special training for robot programming hence saves on costly training and maintenance.

In order to protect plants, systems, machines and networks
against cyber threats, it is necessary to implement – and
continuously maintain – a holistic, state-of-the-art indus-
trial security concept. Siemens' products and solutions only
form one element of such a concept.
For more information about industrial security, please visit
http://www.siemens.com/industrialsecurity.