



**SIEMENS**

*Ingenuity for life*



The background image shows a large industrial machine, possibly a CNC lathe or mill, in a factory setting. The machine is white and blue, with a control panel on the left. Overlaid on the image are various digital graphics: a gauge in the top right, a line graph showing data from 2016 to 2018, and binary code (0s and 1s) scattered throughout. The overall color scheme is dominated by blue and white, with a futuristic, high-tech feel.

# Digitalization for production with machine tools

CNC Shopfloor Management software

[siemens.com/machinetools-digitalization](https://www.siemens.com/machinetools-digitalization)



## Higher engineering productivity

Quickly and flexibly from the idea to the machine

For you as machine builder, there are two main objectives. On one hand, a higher degree of efficiency and flexibility in development, e.g. with consequential virtualization of the development process. On the other hand, supplementing portfolios to digitalize customers' production environments – all the way up to new business models.

### Boosting productivity and efficiency in the machine development process

It is becoming increasingly more important to be able to flexibly respond to change requests and individual customer requirements. Short delivery times are facilitated by more efficient mechanical and electrical development.

### Digital twin increases flexibility

With digitalization, a virtual machine model is created very early in the development process. This digital twin supports optimization of the new machine design, with virtual commissioning, marketing the machine, running-in parts in production up to retrofit and service. You save time, increase the quality of your machines and become more flexible.

### Virtual CNC commissioning shortens the commissioning time of real machines

You can significantly shorten the machine development process when using the NX Mechatronics Concept Designer. Through virtual commissioning, the capital-intensive phase of the actual commissioning can be significantly reduced. To achieve this, the digital twin is linked with the real SINUMERIK to test and optimize the machine functions under almost real conditions.

### A virtual environment for increased safety and security

Virtual commissioning offers you maximum safety and security. Potential damage to the real machine during commissioning or running-in can be avoided. Not only this, machine users can test their part machining programs at an early phase – and essentially under real conditions in a virtual environment.

### Manage MyMachines for machine builders

Manage MyMachines is an application for the Cloud-based, open IoT operating system called MindSphere from Siemens. This MindSphere Application centrally collects data in the Cloud, and provides a customized status overview of a machine tool at any time. Further, the improved service processes are immensely important. The basis for this is knowing the actual machine and production data – along with the associated historical data so that changes can be identified and displayed. Based on expert know-how, possible fault causes can be identified – and this is how new digital business models develop.



## Higher productivity in production

Optimizing performance in your production environment

**As a company operating machines, for you it is important to intelligently integrate your machine tools into production processes. The precondition is that production planning and production – along with the various machines – are all networked using the SINUMERIK Integrate platform. This allows programs and data to be transferred error-free.**

### Improving part production and productivity

Seamless and integrated digitalization helps to handle demand peaks, product changes and the introduction of new products – and all of this in spite of the increasing complexity of job planning and production. This is how you reduce errors at interfaces between various processes as well as rounds of corrections.

### Virtual tests in parallel with real operation

Based on the digital twin supplied by the machine builder, you can plan and optimize all production steps before the new machine even starts to run. This reduces the equipping time and increases profitability. Using the original SINUMERIK software – the “virtual NC kernel” (VNCK) – you can simulate machining under almost the same conditions as in the real physical world. This allows you to optimize your machine in advance. SinuTrain – the NC programming station identical to the control itself – allows programs to be programmed offline at a PC and then directly transferred to the CNC.

### Optimizing idle times for maintenance and service

Using Analyze MyCondition, machine tools that are connected to the local SINUMERIK Integrate server can be consequentially monitored using various test and trigger options.

### Potential for improvements in the machining process

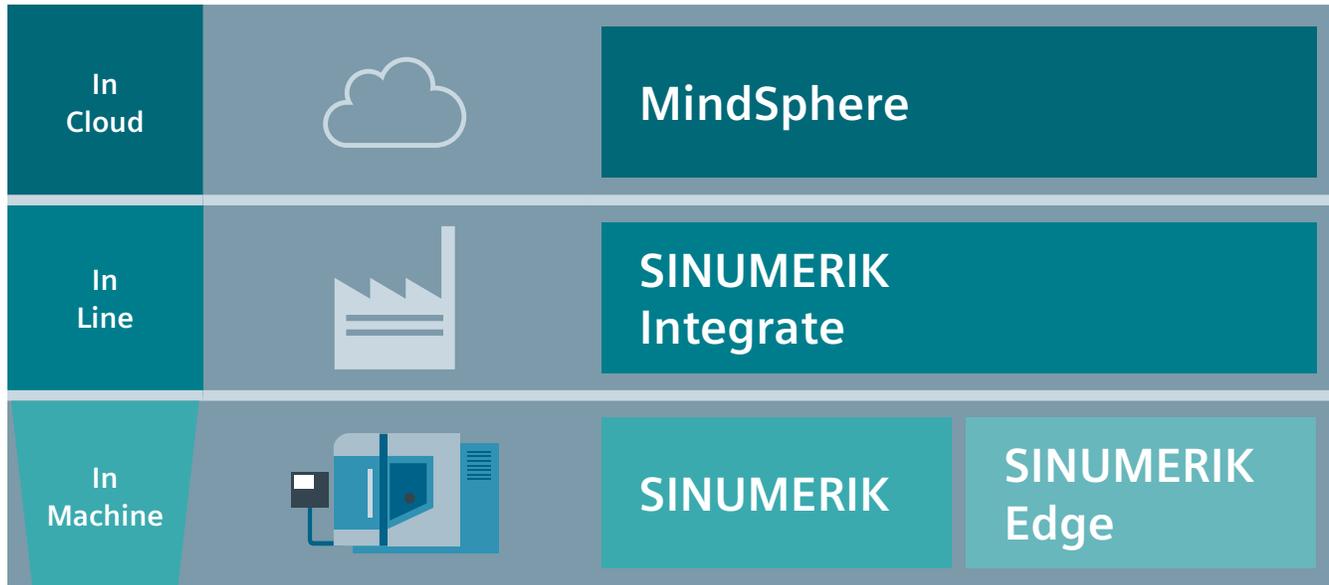
In operation, machine processes are continually checked for improvement potential and optimized. Analyze MyWorkpiece Toolpath allows NC programs to be analyzed and optimized at an early phase so that machines can operate optimally. Using Cloud-based services, you can also analyze data across various locations and facilities.

### Manage MyMachines for companies operating machines

The MindSphere Application Manage MyMachines improves reliability, enhances productivity and reduces inspection and maintenance costs. You can concentrate on your core business, but at the same time, the states of your machines and their associated history are always transparent.

# CNC Shopfloor Management software – ecosystem

With the three levels – “In Cloud”, “In Line” and “In Machine” – an IT architecture fit for the future is created with CNC Shopfloor Management software. These levels correspond to the three platforms – MindSphere, SINUMERIK Integrate and SINUMERIK/SINUMERIK Edge. These provide a wealth of tailored functions that range from the field up to the Cloud. This is complemented by the opportunity of creating new business models, in the service domain for instance. By leveraging digitalization, potential for optimization – unknown up until now – can be tapped into so that productivity and competitiveness can be sustainably increased.



An overview of all software packages is available at [siemens.com/machinetools-digitalization](https://www.siemens.com/machinetools-digitalization)

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Siemens Industry Inc.  
100 Technology Drive  
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