

Run MyVirtual Machine

From virtual commissioning to job preparation

Unrestricted | © Siemens 2022

SIEMENS

Agenda

Introduction

Overview of portfolio

Top highlights at a glance

Technical details

Added value aspects

Service, support, training and quality

Ordering data and logistics

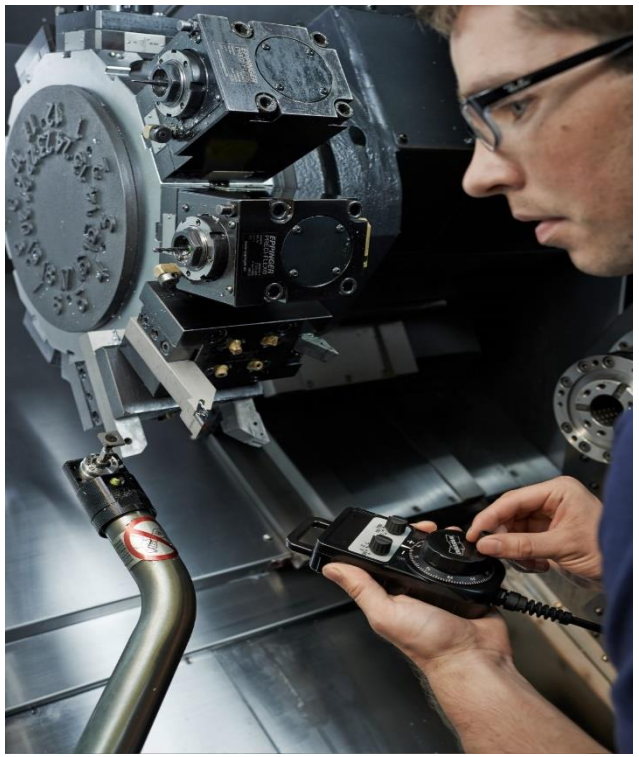
Unrestricted | © Siemens 2022

SIEMENS

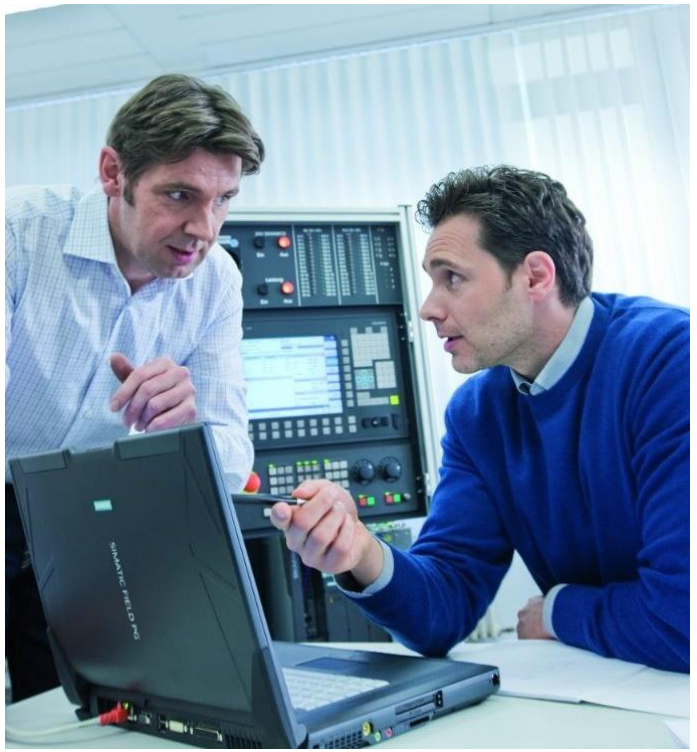
How to improve production processes?



Extended Delivery time for machine and components



Machine collisions cause additional costs and time delay for spare parts delivery



High effort and cost to setup and to maintain a training and showroom facility

Unrestricted | © Siemens 2022

SIEMENS

How to improve production processes?



Do not waste the time – start with a digital twin

Extended Delivery time for machine and components



Simulate collisions in virtual environment

Machine collisions cause additional costs and time delay for spare parts delivery



Offer virtual trainings with same behavior and look&feel as the real machine

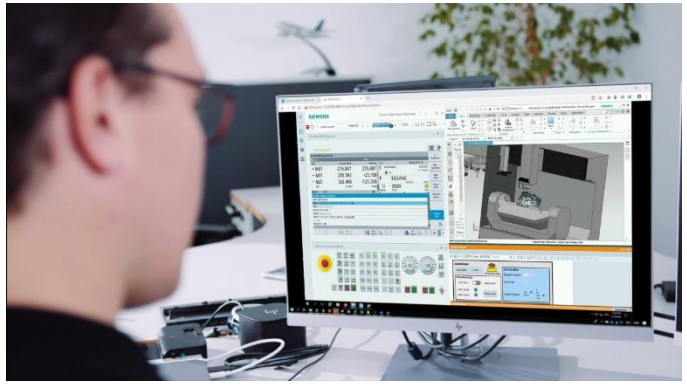
High effort and cost to setup and to maintain a training and showroom facility

Unrestricted | © Siemens 2022

SIEMENS

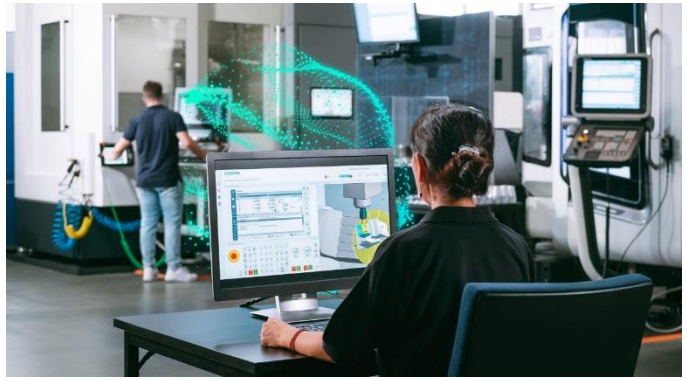
Where a digital twin is created and how can I get it for my job preparation?

Scalable and virtual machine engineering at machine manufacturer…



Create MyVirtual Machine

…can be reused at machine user for scalable and virtual job preparation



Run MyVirtual Machine

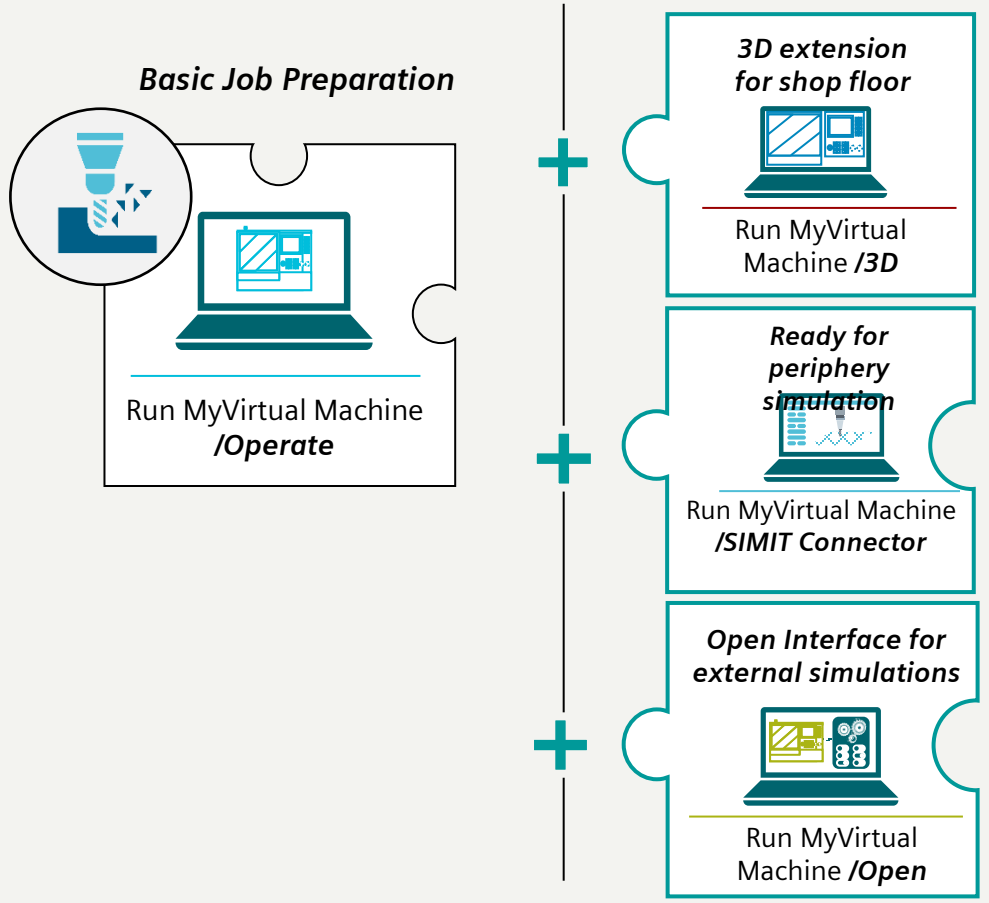
Unrestricted | © Siemens 2022

SIEMENS

Run MyVirtual Machine

SINUMERIK ONE job preparation with Run MyVirtual Machine Software

- Creation and verification of the NC programs prior to the real machining
- 3D simulation with collisions detection
- Training for operating and programming the machine with SINUMERIK ONE w/o production interruption
- CAD/ CAM integration



Unrestricted | © Siemens 2022
SIEMENS

Overview of portfolio

Unrestricted | © Siemens 2022

Shopfloor level digitalization is achieved with digitalization platforms at different levels

Examples:

In Cloud

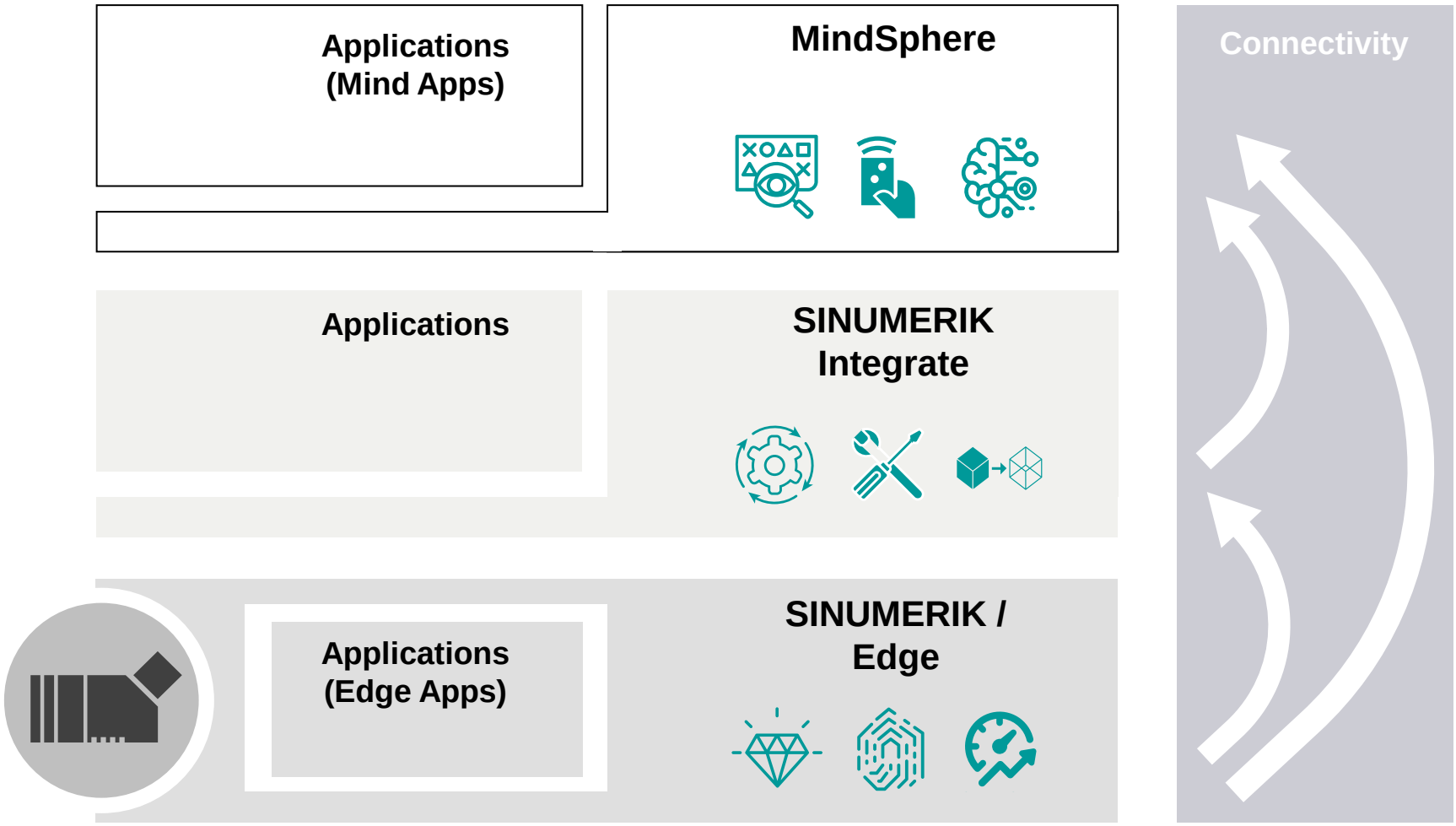
- Fleet management
- Service management
- Condition monitoring
- ... others

In Line

- Resource management and optimization
- OEE monitoring
- Shop floor programming
- ... others

In Machine

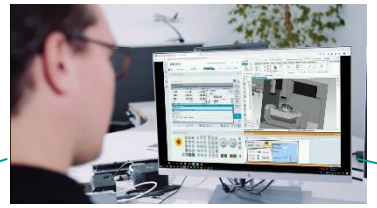
- Process monitoring
- Machining process optimization
- Extended machine functionality
- ... others



Unrestricted | © Siemens 2022

SIEMENS

The digital twin unites all relevant technical departments and enables end-to-end collaboration



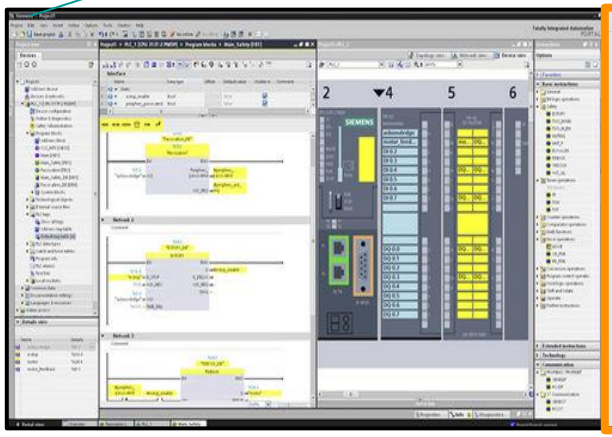
Scalable and virtual machine engineering at machine manufacturer…

Logic creation & configuration (PLC)

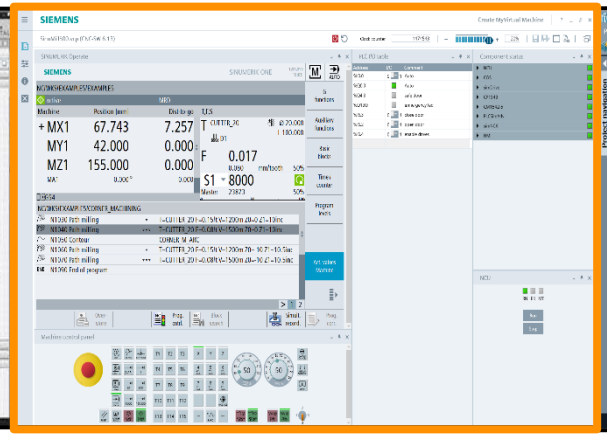
NC/PLC/HMI Simulation & Test

Periphery simulation (Inputs / Outputs)

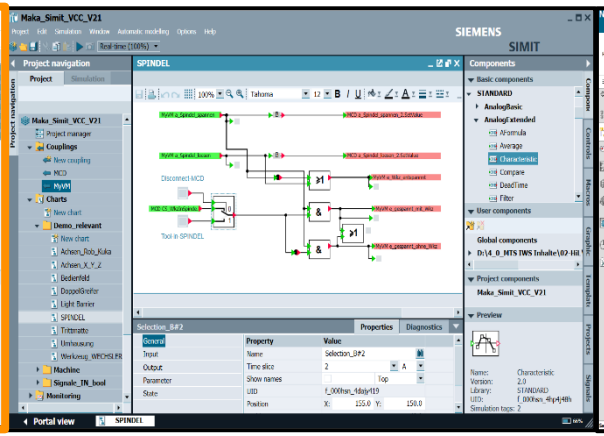
3D Mechatronics simulation



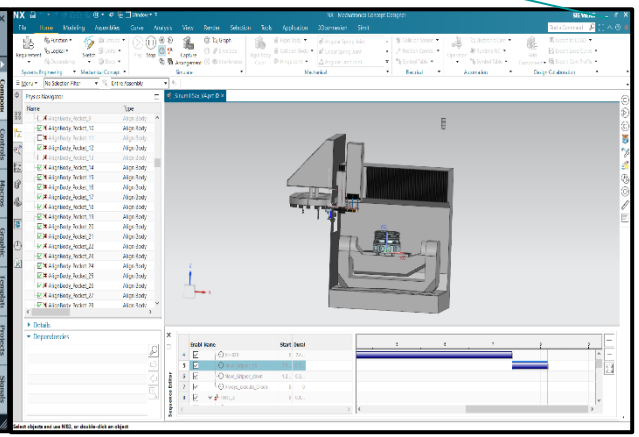
TIA Portal



Create MyVirtual Machine



SIMIT Simulation Framework



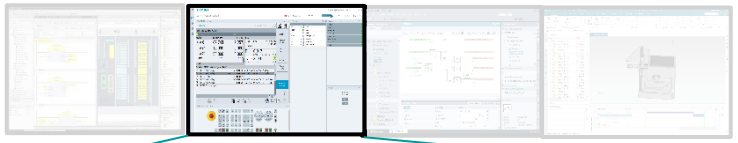
Mechatronics Concept Designer

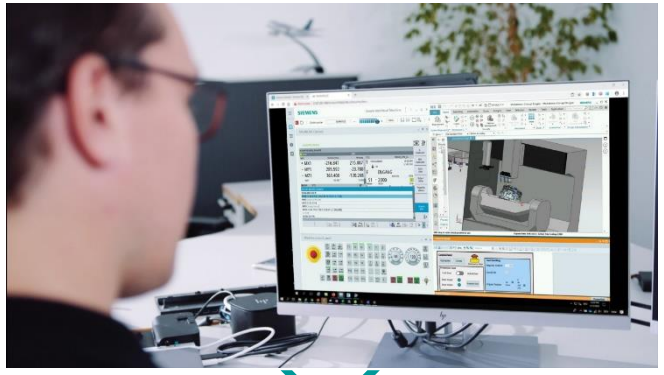
Create MyVirtual Machine is the central CNC virtual element on which most operations can be tested

Unrestricted | © Siemens 2022

SIEMENS

Where a digital twin is created and how can I get it for my job preparation?





Create MyVirtual Machine /Operate

Virtual test rack



Create MyVirtual Machine /Open

Open virtual test rack



Create MyVirtual Machine /3D

Virtual machining



Create MyVirtual Machine /SIMIT Connector

Closed-loop engineering





Run MyVirtual Machine /Operate

NC-programming station



Run MyVirtual Machine /Open

for simulation integration



Run MyVirtual Machine /3D

virtual machine for JobShopper



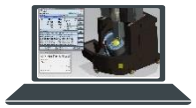
Run MyVirtual Machine /SIMIT Connector (planned)

PLC behavior simulation



NX Virtual Machine (planned)

CAM integrated virtual machine



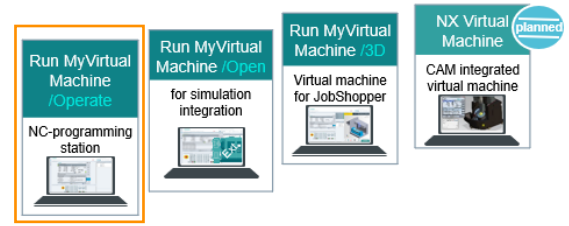
Unrestricted | © Siemens 2022

SIEMENS

Top highlights at a glance

Unrestricted | © Siemens 2022

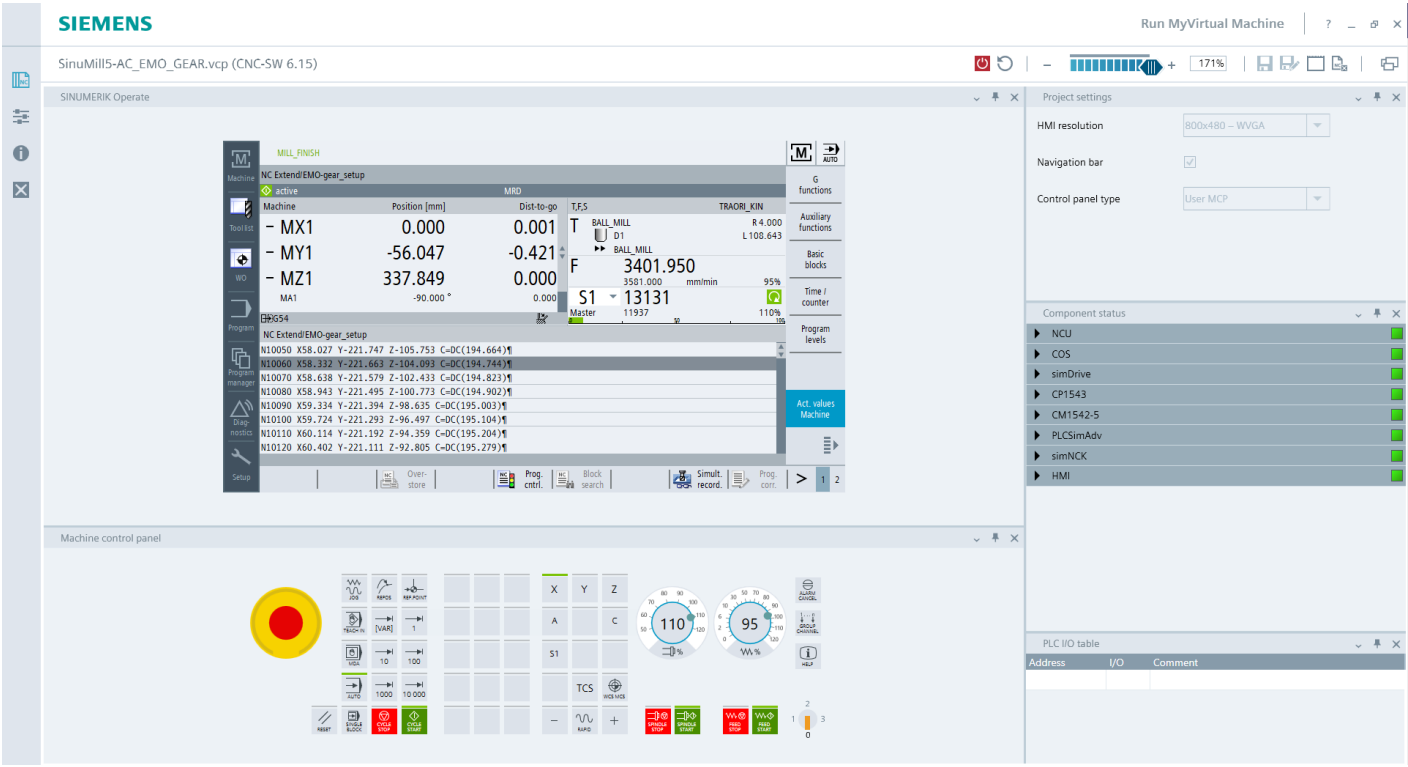
Run MyVirtual Machine /Operate
Original CNC architecture and identical operation of the machine



NC program check and machining time estimation

Original Operate HMI with OEM applications

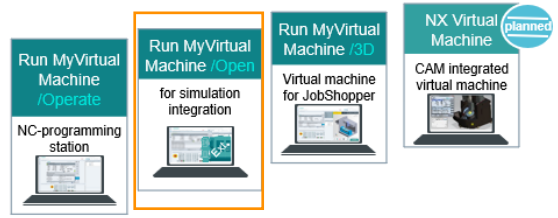
Verification of the postprocessor



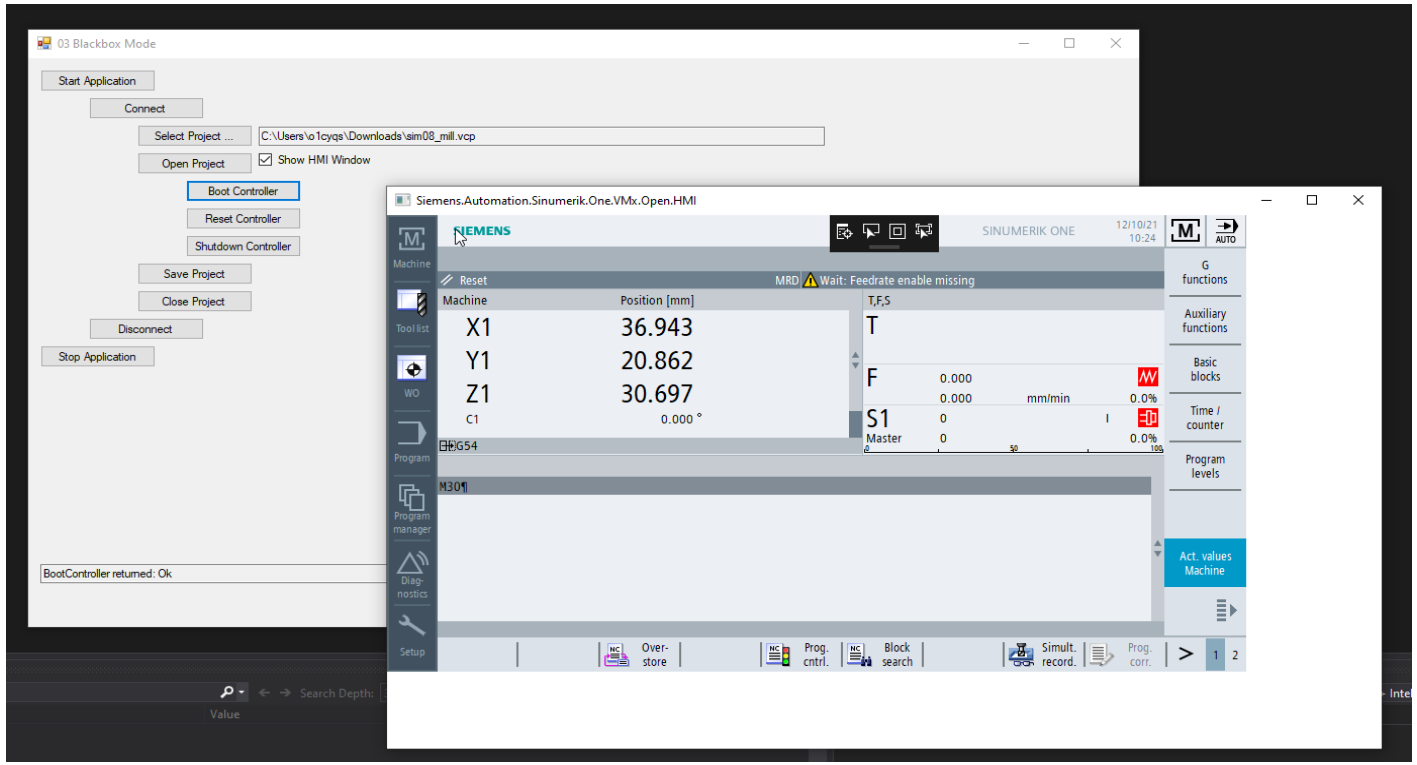
 Unrestricted | © Siemens 2022

SIEMENS

Run MyVirtual Machine /Open
API interface for connection to other simulation systems



- .NET/ C++ programming interface
- Realization of test automation
- Flexible integration into existing 3D simulations
- Ideal for the trainings



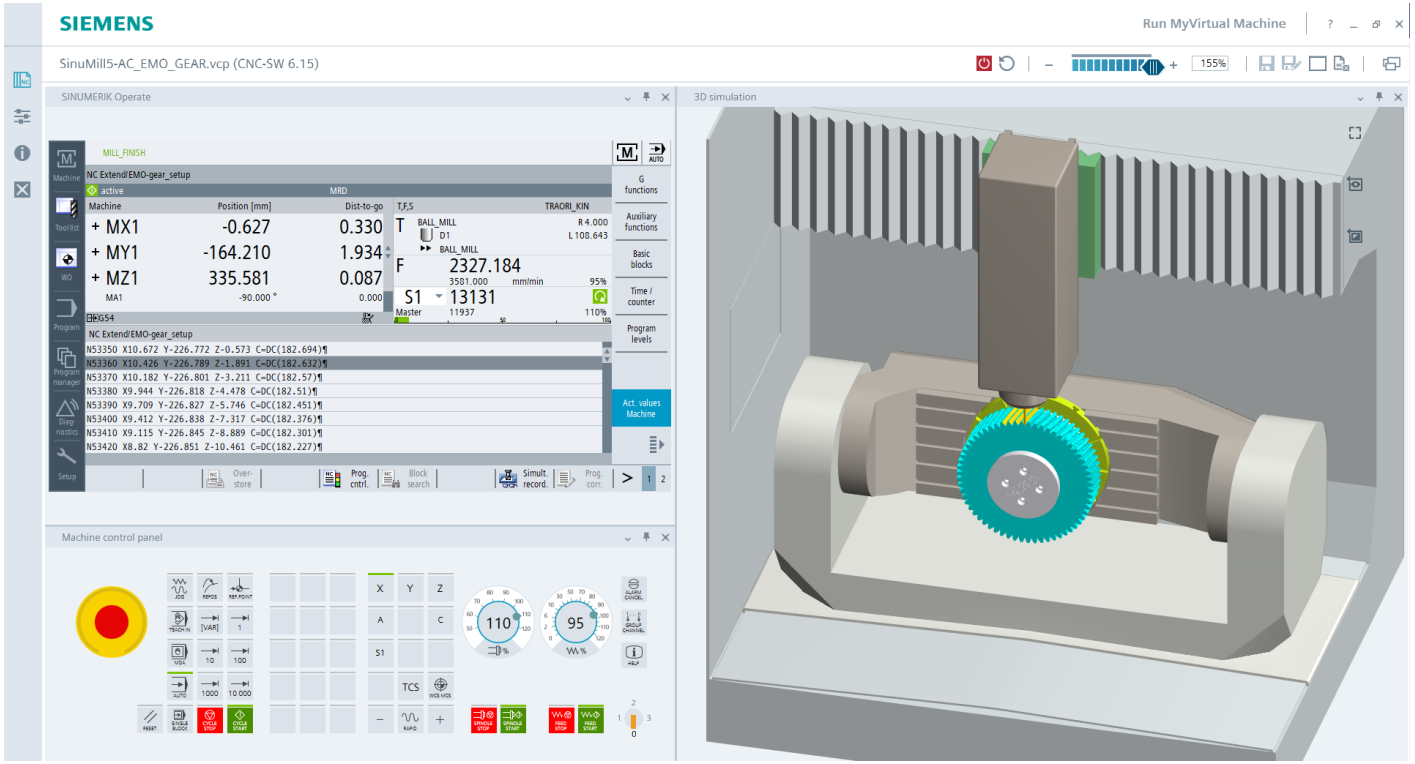
 Unrestricted | © Siemens 2022

SIEMENS

Run MyVirtual Machine /3D
Integrated 3D simulation without CAD-CAM environment

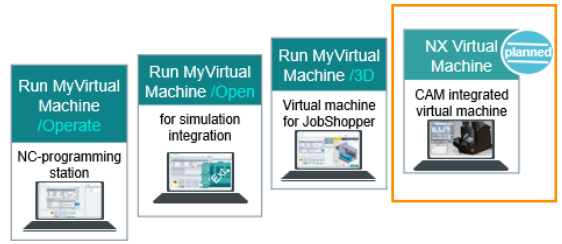


- NC program verification with kinematics simulation
- Collision detection and analysis
- Library with tools, clamping, blanks
- Ideal for trainings

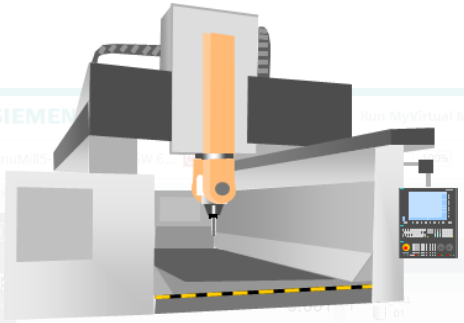


Unrestricted | © Siemens 2022
SIEMENS

NX Virtual Machine
Seamless integration of NX CAM, postprocessor and Run MyVirtual Machine



- Integrated CAD-CAM-CNC chain +
- Interaction between PLC signals and NX +
- Collision detection and analysis +



NX Virtual Machine

Required data for MachineKit:

1. 3D CAD or MCD Modell
2. Run MyVirtual Machine project (.vcp file)
3. Optional: PP + CAM-Setup

Licences:

1. Run MyVirtual Machine /Operate + /Open
2. NX CAM

Unrestricted | © Siemens 2022

SIEMENS

Technical details

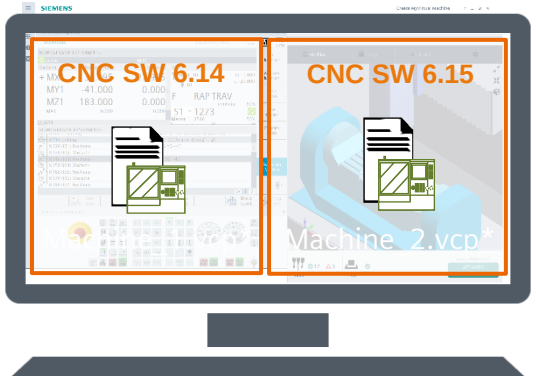
Unrestricted | © Siemens 2022

What is the Digital Twin and what is the software?

Machine Manufacturer

OEM A

Create MyVirtual Machine V1.1



OEM B

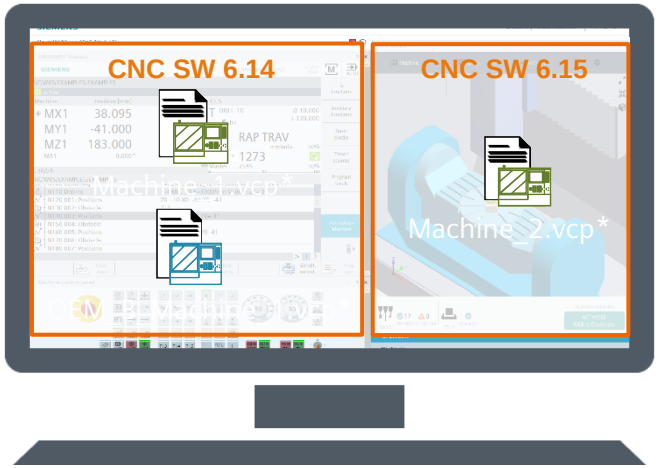
Create MyVirtual Machine V1.2



* virtual commissioning project – intellectual propery of OEM
Create & Run MyVirtual Machine – software to create /execute vcp file

Machine User

Run MyVirtual Machine V1.x



- One application for all projects and CNC software versions
- Common database (vcp) for OEM, service and user

Unrestricted | © Siemens 2022

SIEMENS

Create MyVirtual Machine vs. Run MyVirtual Machine
Functional differences

Functions	Create My Virtual Machine	Run My Virtual Machine
Project management		
• Create new projects	✓	
• Open project	✓	✓
• Use machine templates	✓	✓
• Save / save as	✓	✓
Access level		
• 1 – 3	✓	
• 4 – 7	✓	✓
Available windows and settings		
• Simulation controls	✓	✓
• PLC E/A table	✓	✓
• Status of components	✓	✓
• NCU (control board)	✓	
• Project settings	✓	✓
• MCP (Edit function only in CMVM)	✓	✓
Commissioning / diagnostics		
• TIA Portal online	✓	✓
• PLC Project upload	✓	
• PLC Project download	✓	
• Creating archives(.dsf)	✓	
• Import from archives (.dsf)	✓	

Unrestricted | © Siemens 2022
SIEMENS

Added value aspects

Unrestricted | © Siemens 2022

Value creation with the digital twins in machine engineering and operation

CAD design of the machine

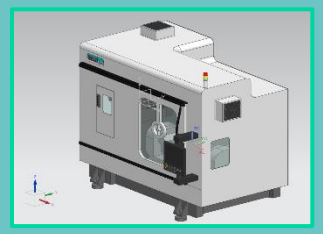
Kinematization, mech. concept, phys. behavior model

Dig. control cabinet as behavior model of the I/O devices

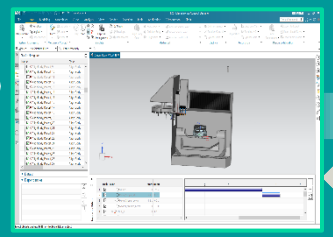
Virtual CNC with NC, PLC, HMI

Commissioning

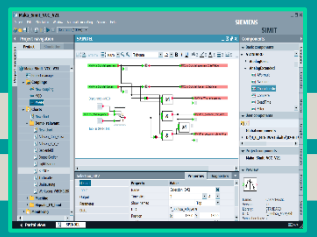
NX CAD



NX MCD

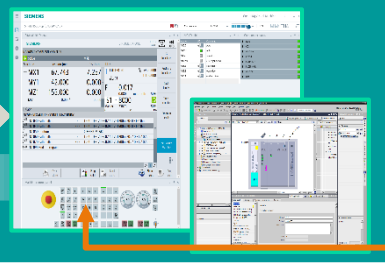


SIMIT



Create MyVirtual Machine

/Operate + /SIMIT Connector

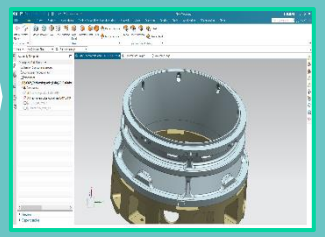


Teamcenter

Exchange kinematization and virtual control projecting

Work preparation

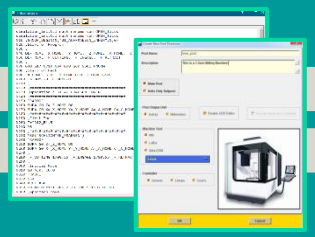
NX CAD



NX CAM



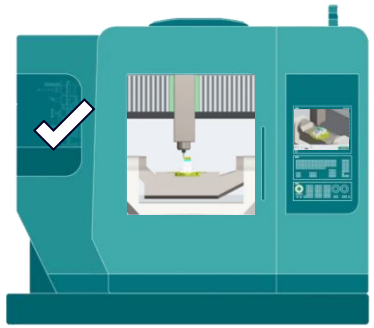
Post processor



NX Virtual Machine

Run MyVirtual Machine /Operate +/Open





CAD design of the workpiece

Generation of tool path and production strategy

Compilation of tool path into specific G code

Integr. simulation in NX CAM based on org. control behavior

Unrestricted | © Siemens 2022

SIEMENS

Use-Cases

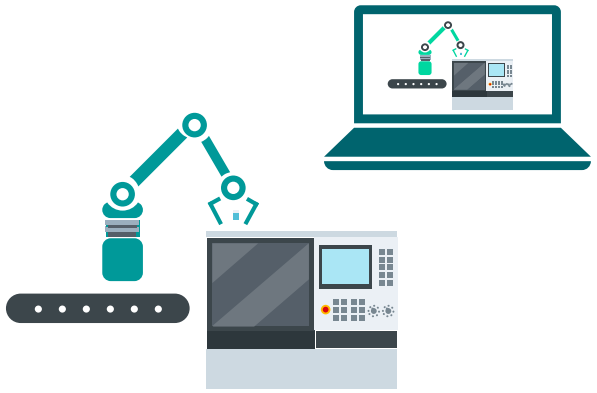
Use of the digital twin in everyday business

Unrestricted | © Siemens 2022

SIEMENS

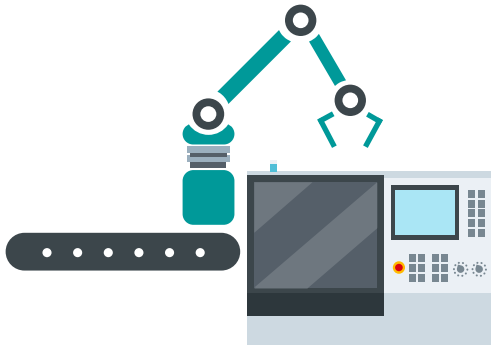
Machine in delivery
Faster start of production

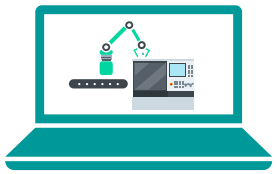
Machine Manufacturer | ***Delivery*** | ***Machine User***



Virtual preparation

Ramp-up time







- Regular interaction with machine buyer and pre-acceptance tests using the digital twin
- Significant reduction of ramp-up time for machine user based on preparation on a virtual model

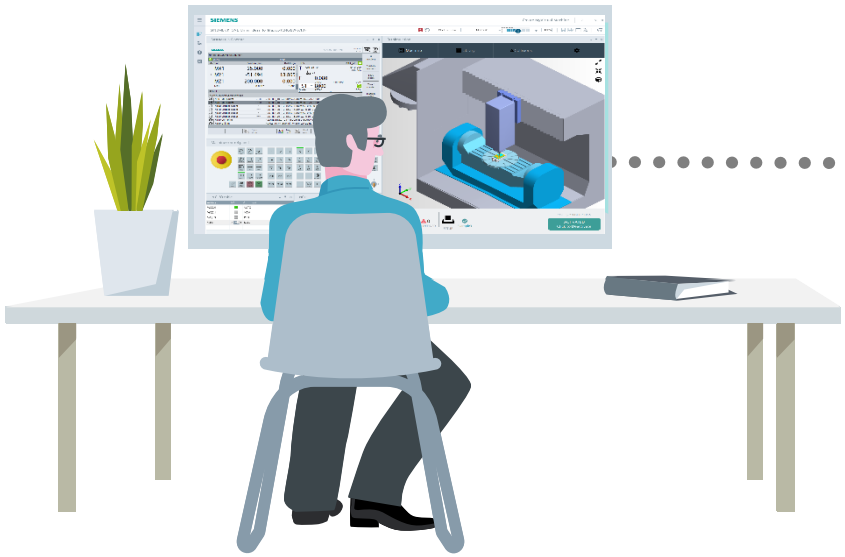
Unrestricted | © Siemens 2022

SIEMENS

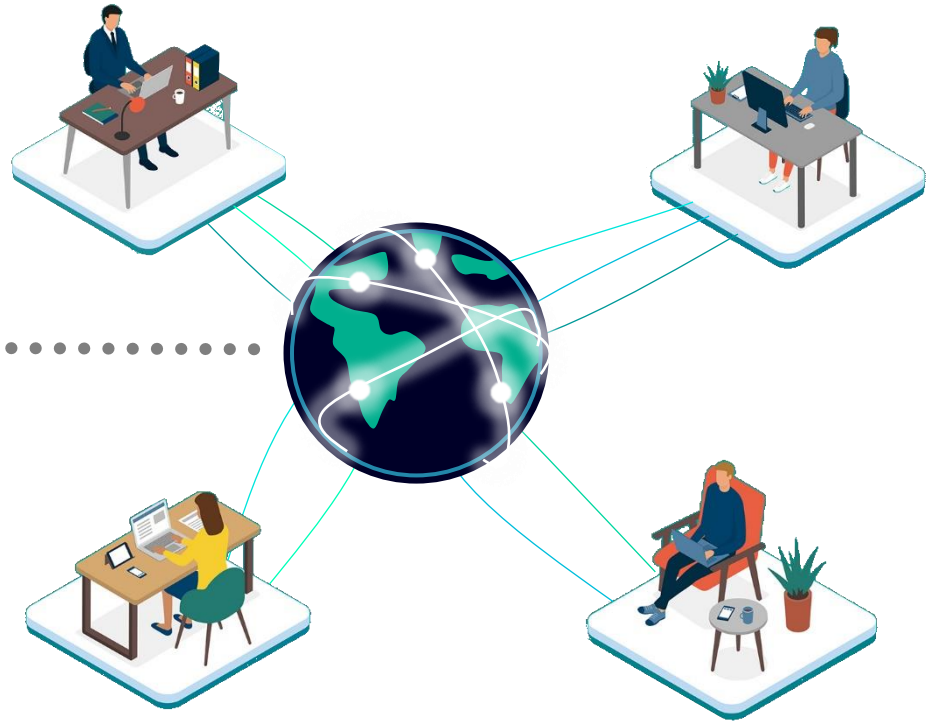
Machine in operation
The digital twin as a training environment

Machine Manufacturer

- ✓ Time and location-independent training via Teams, Skype & Co.
- ✓ Safe training environment also for self-learning
- ✓ Learning without interrupting the machine or even production



Machine User



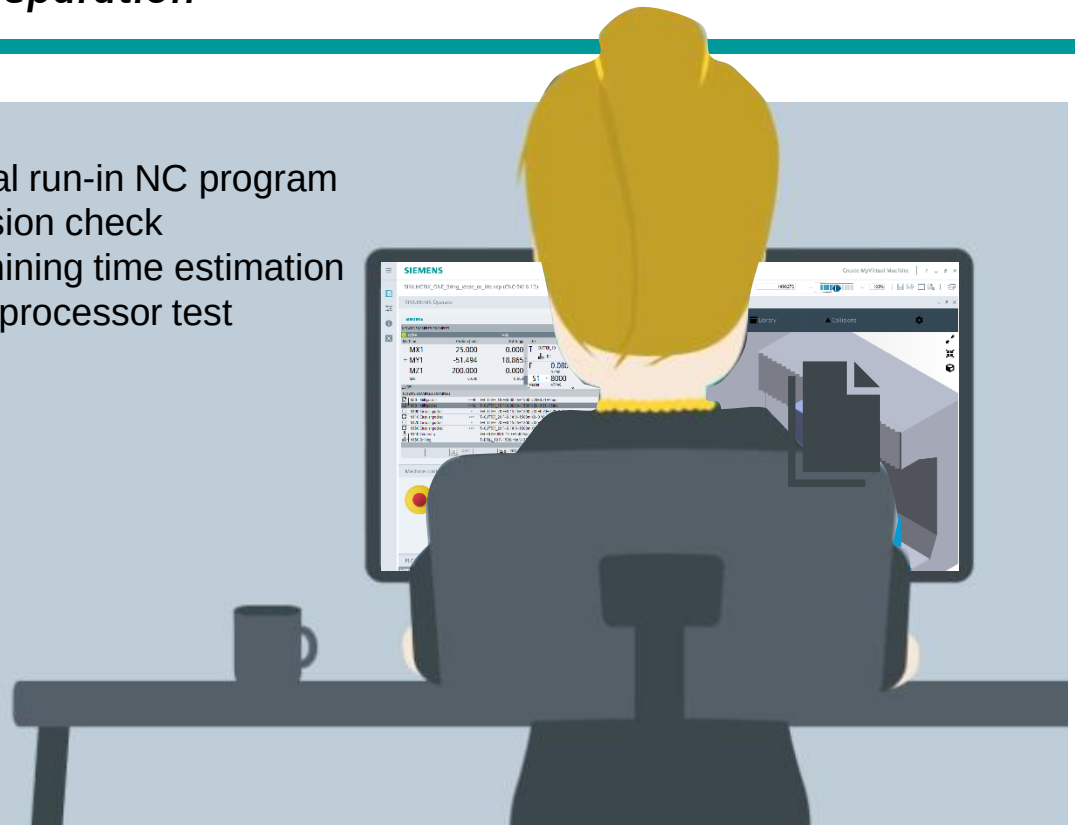
Unrestricted | © Siemens 2022

SIEMENS

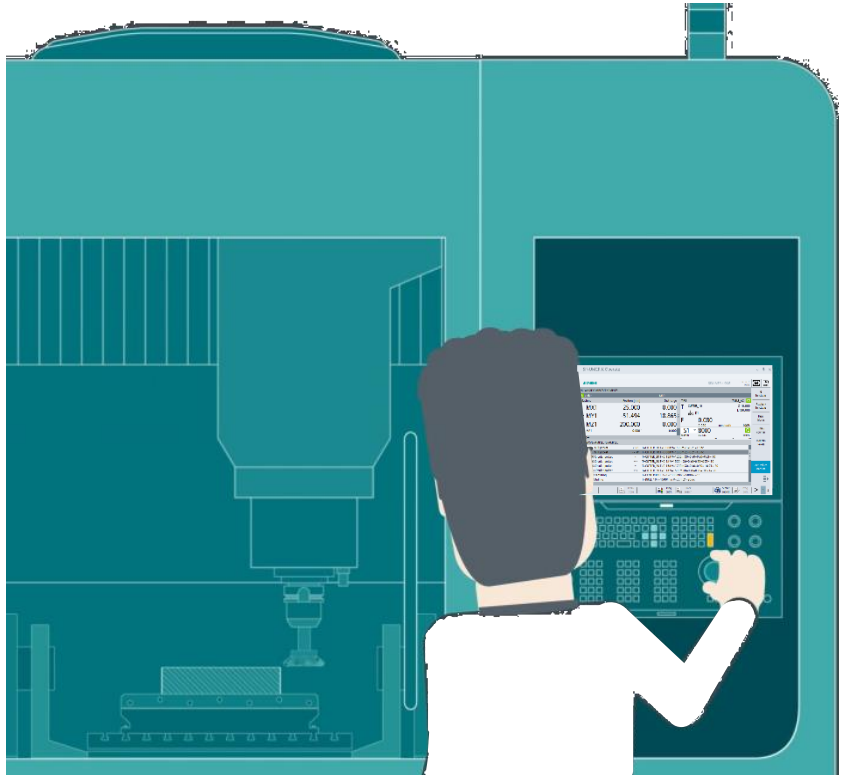
Machine operation
Export of a digital twin for work preparation

Work preparation

- ✓ Virtual run-in NC program
- ✓ Collision check
- ✓ Machining time estimation
- ✓ Post processor test



Work execution



Unrestricted | © Siemens 2022

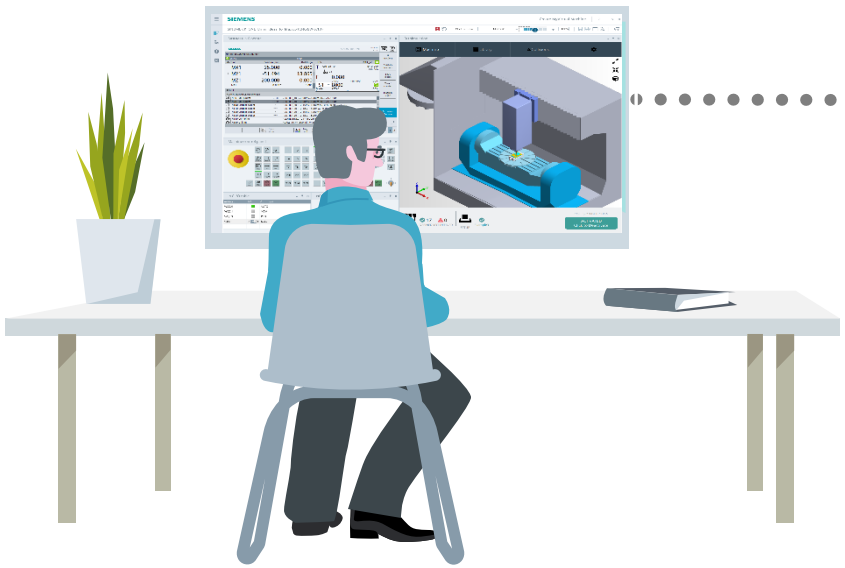
SIEMENS

Machine in service
Reuse of digital twin for service and after sales

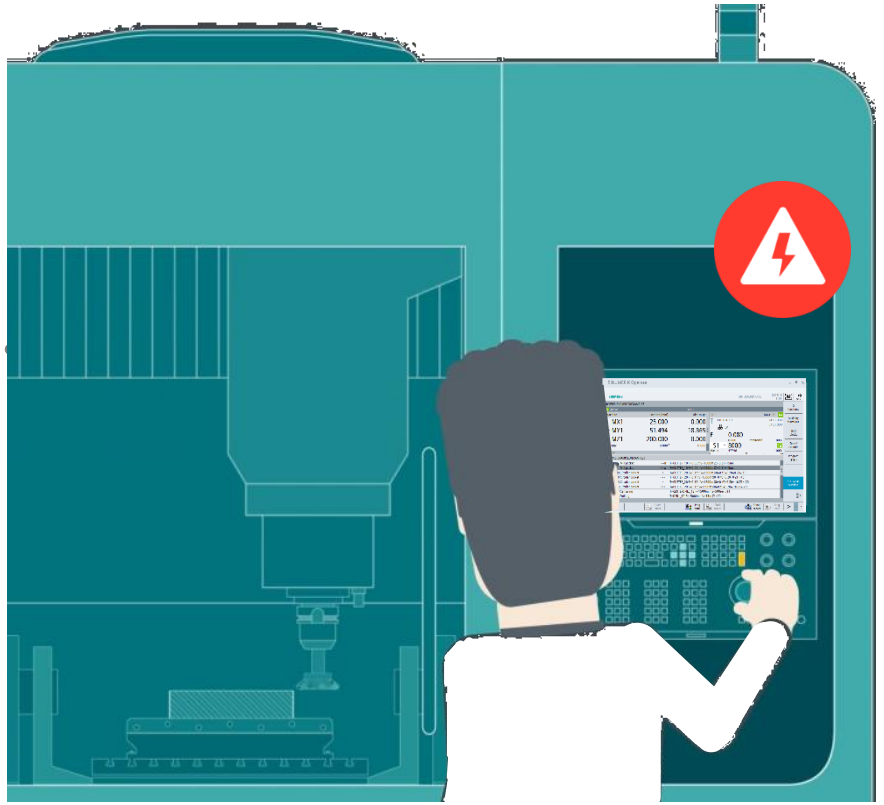
Machine Manufacturer

- ✓ Reuse existing machine model to reproduce customer's problem
- ✓ Aftersales: Evaluation of the implementation of subsequent customer requests with the help of the digital twin

Machine User







Unrestricted | © Siemens 2022

SIEMENS

Service, support, training and quality

Unrestricted | © Siemens 2022

Create MyVirtual Machine
Services and trainings

Product	Content	Service type	Contact
Create MyVirtual Machine /Operate	Same look&feel as SINUMERIK Rack but in a virtual environment	No dedicated training necessary	Stefan Windhausen
Create MyVirtual Machine /Open	Training (Intern/Extern)	customized	Stefan Windhausen
Create MyVirtual Machine /3D	Webbased Training (Intern/Extern)	customized	Stefan Windhausen
Run MyVirtual Machine /Operate	Same look&feel as SinuTrain	No dedicated training necessary	Stefan Windhausen
Run MyVirtual Machine /Open	Training (Intern/Extern)	customized	Stefan Windhausen
Run MyVirtual Machine /3D	Webbased Training (Intern/Extern)	customized	Stefan Windhausen

Unrestricted | © Siemens 2022
SIEMENS

Create MyVirtual Machine /SIMIT Connector + SIMIT + MCD
Services and trainings

Product	Service	Service type	Contact
Create MyVirtual Machine /SIMIT Connector + SIMIT + MCD	SINUMERIK ONE Virtual Commissioning Consulting	Standard service	Stefan Windhausen
	SINUMERIK ONE Virtual Commissioning Implementation	Standard service	Stefan Windhausen
	SINUMERIK ONE Virtual Commissioning Training (Intern/Extern)	Standard service (training)	Stefan Windhausen
SIMIT	Training (Intern/Extern)		SITRAIN
NX MCD	Training (Intern/Extern)		Nexeo (external)

Unrestricted | © Siemens 2022
SIEMENS

Ordering data and logistics

Unrestricted | © Siemens 2022

Create MyVirtual Machine
Ordering data

Product	License-type	Product-ID
Create MyVirtual Machine /Operate	Floating Node-locked[1)] Academics[2)]	MCS4250f MCS4250n MCS4250a
Create MyVirtual Machine /Open	Floating Node-locked[1)] Academics[2)]	MCS4255f MCS4255n MCS4255a
Create MyVirtual Machine /3D	Floating Node-locked[1)] Academics[2)]	MCS4210 MCS4210n MCS4210a
Run MyVirtual Machine /Operate	Floating Node-locked[1)] Academics[2)]	MCS4220 MCS4220n MCS4220a
Run MyVirtual Machine /Open	Floating Node-locked[1)] Academics[2)]	MCS4230 MCS4230n MCS4230a
Run MyVirtual Machine /3D	Floating Node-locked[1)] Academics[2)]	MCS4240 MCS4240n MCS4230a

Floating: server based licenses, can be used with several working stations (not simultaneously). Recommend to order

[1)]**Node-locked Server:** Server license, that is locked to specific Clients (work stations / PC)

[1)]**Node-locked Standalone:** Local license file, that is locked to a specific Client (work stations / PC)

[2)] **Academics:** for non commercial use. Available as floating only

- Fore more information request detailed license description

We recommend to use floating licenses

Unrestricted | © Siemens 2022

SIEMENS

Create MyVirtual Machine /SIMIT Connector + SIMIT + MCD
Ordering data

Product	License-type	Product-ID/MLFB	Offer from
Create MyVirtual Machine /SIMIT Connector	Floating Node-locked* Academics	MCS4212 MCS4212n MCS4212a	SISW MC
SIMIT Simulation Platform (S V10.3)	Single-user license	6DL8913-0AK30-0AB5	RC
SIMIT Simulation Platform SUS (S)	Software Update Service	6DL8913-0AX00-0AL8	RC
Mechatronics Concept Designer (standalone)	Floating	NX91113	SISW
Mechatronics Concept Designer on NX	Floating	NX30535	SISW
SINUMERIK ONE Virtual Commissioning Consulting		MC4R27VC33	SISW MC
SINUMERIK ONE Virtual Commissioning Implementation		MC4R27VC11	SISW MC
SINUMERIK ONE Virtual Commissioning Training		MC4R27VC22	SISW MC

Floating: server based licenses, can be used with several working stations (not simultaneously). Recommend to order
***Node-locked Server:** Server license, that is locked to specific Clients (work stations / PC)
***Node-locked Standalone:** Local license file, that is locked to a specific Client (work stations / PC)
- Fore more information request detailed license description

Unrestricted | © Siemens 2022
SIEMENS

Disclaimer

© Siemens 2022

Subject to changes and errors. The information given in this document only contains general descriptions and/or performance features which may not always specifically reflect those described, or which may undergo modification in the course of further development of the products. The requested performance features are binding only when they are expressly agreed upon in the concluded contract.

All product designations may be trademarks or other rights of Siemens AG, its affiliated companies or other companies whose use by third parties for their own purposes could violate the rights of the respective owner.