

A man in a black polo shirt is seen from behind, operating a large industrial machine. The machine is teal and grey, with a control panel featuring a screen and various buttons. The machine has "INDEX GFG 250" written on its side. The background shows a factory environment with overhead lighting and structural elements.

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# Retrofit and Modernization as a Solution

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## Machine Retrofit, if ...



...your machine is mechanically in good shape  
but CNC and drives are obsolete

... you want to equip your machine with additional  
functionalities

... the delivery of a new machine would take too long

... you want to reduce investment in new machines

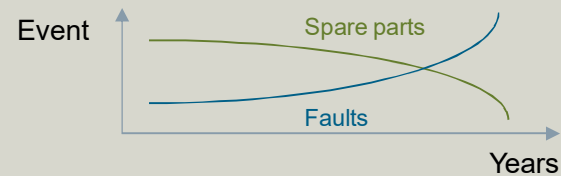
# Challenges regarding retrofit

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## Machine availability

Long unplanned downtimes

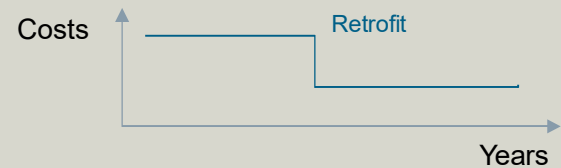
Spare parts availability



## Machine life time

Extended lifetime

Reduction of variable costs

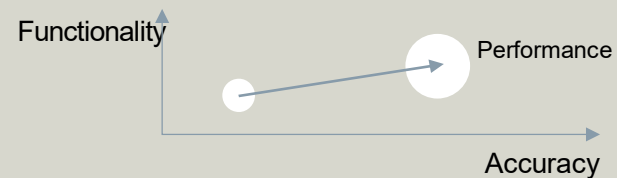


## Technology

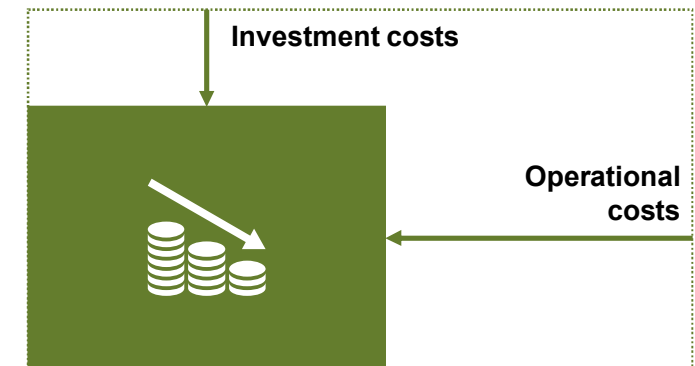
Performance

Accuracy

Functionality



## Unit costs



## excellent know-how and competence – Project phase 1: Analysis/concept

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Analysis

Implementation

Acceptance

### Measures

- **Machine assessment at the customer**
- **Define the scope of the retrofit** “retrofit in steps” or “complete retrofit”
- **Preparation of the entire project processing**  
schedule, partners, responsibility, etc.
- **Clarification of the framework for the retrofit**  
Compliance with norms and guidelines (machine guidelines, device/product safety regulations, risk analysis, safety concept, CE certification, etc.)

### Business Impact

- **Joint cooperation along project**
- **Consideration of special wishes**
- **Smooth project execution through**
  - Exact time management
  - Definition of the areas of responsibility
- **Calculable cost due to fixed prices**



## excellent know-how and competence – Project phase 2: Implementation/execution



Analysis

Implementation

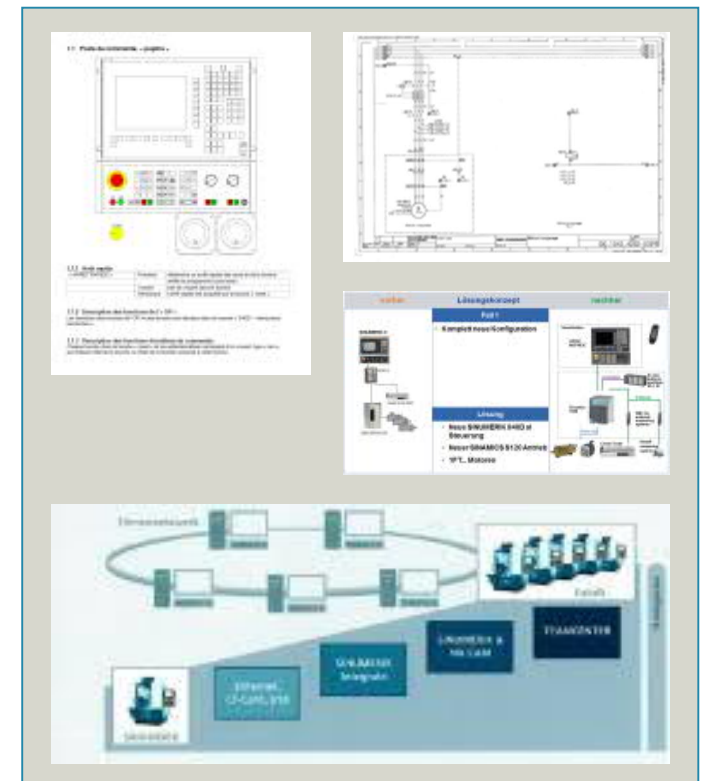
Acceptance

### Measures

- **Project lead** by experienced specialists
  - **Function analysis**
  - Definition of **replacement concept**, e.g. full or partly modernization
  - **Project planning** (CNC, drives, software, control cabinet, etc.)
  - Application of **retrofit solutions** with SINUMERIK 840D sl and SINAMICS S120
  - **Integration** of SINUMERIK in **digital** environment (ready for Industry 4.0)
  - Creation of **circuit diagram** and **documentation**
  - **Commissioning** on-site

### Business Impact

- **Use of existing drives** and **measuring systems**  
**Cost optimization** by incorporating own contribution
- **Short machine downtime**



## excellent know-how and competence – Project phase 3: Acceptance/completion

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Analysis

Implementation

Acceptance

### Measures

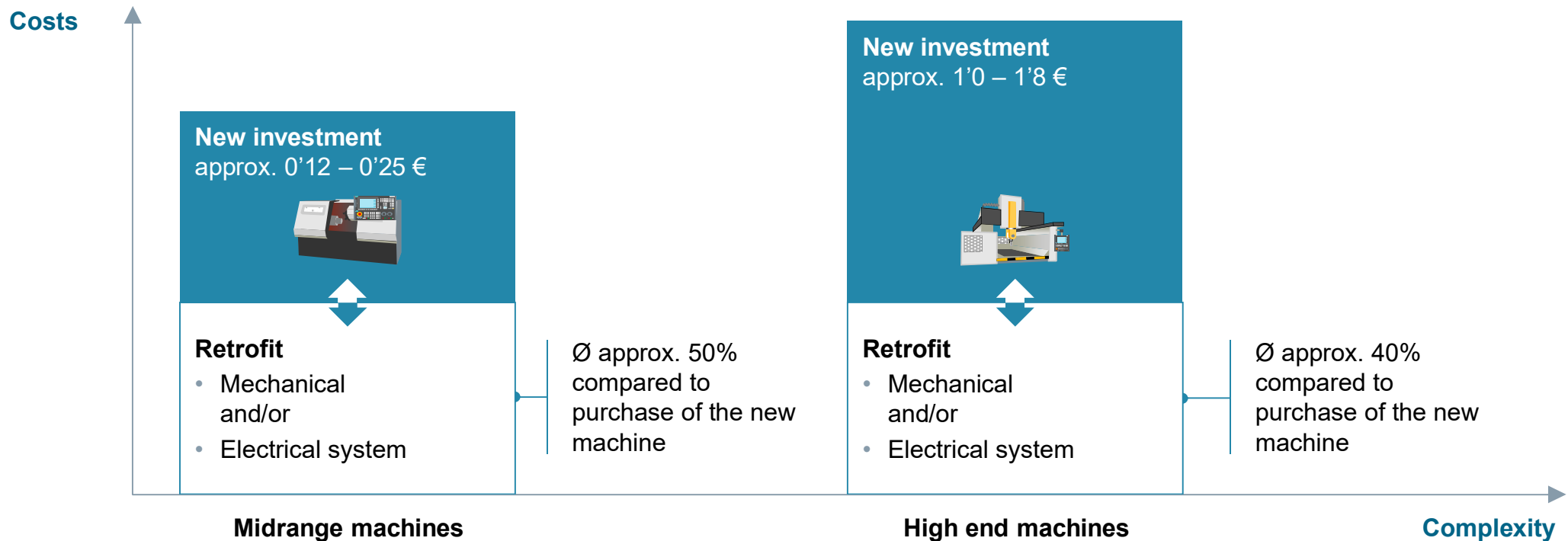
- **Acceptance on-site** incl. test of all relevant functions
- **Machine handover**  
(e.g. acceptance work piece, new documentation, specification of any further measures in the report)
- **Training of all relevant stakeholders** and **instruction of the operating personnel**  
(individual training if required)

### Business Impact

- **Immediate start of production**
- **Improved machine performance due to state-of-the-art technology**
- **High machine availability through customized service programs**



# Machine Retrofit offers great benefits in comparison with the investment in new machine



- Great financial benefit achieved with **large machines** (e.g. Gantry-type milling machine)
- High financial benefit for **midrange machines** with **new prices >100,000 €**

# Retrofit and Modernization with the right Products

# The perfect solution for all performance classes

## SINUMERIK 840D sl, the CNC for the premium class

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### SINUMERIK 808D

.....Entry-level class



- Panel-based compact CNC
- Technologies: Turning and milling
- Up to 5 axes/spindles
- 1 machining channel
- 7.5"/8.4" color display
- S7-200-based PLC

### SINUMERIK 828D

... Compact class



- Panel-based compact CNC
- Technologies: Turning, milling, grinding
- Up to 10 axes/spindles / 2 auxiliary axes
- 2 machining channels
- 10.4"/15.6" color display
- S7-200-based PLC

### 840D sl SW 4.8\*:



- Innovation
- Performance
- Quality
- Productivity

### SINUMERIK 840D sl

.....Premium class



- Drive-based modular CNC
- Multi-technology CNC
- Up to 93 axes/spindles
- Up to 30 machining channels
- Modular panel concept up to 24" color display
- SIMATIC S7-300 PLC 317/319-3PN/DP

\* Valid as of SW 4.8 SP1

# SINUMERIK 840D sl

## More consistency and performance for all CNC technologies

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**Turning**



**Milling**



**Grinding**



**Multitasking**

- "Best in class" at cross-technology applications by multitasking
- Sustainable performance improvements for many applications
- Uniform and consistent operating and programming



**Gear cutting**



**Composites**



**Robotics and  
handling**



**Additive  
manufacturing**



**Nibbling, laser  
machining, ...**

# SINUMERIK 840D sl

## Scalable up to the highest performance

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### SINUMERIK 840D sl Basic ✓

- SINUMERIK 840D sl Basic is the favorably-priced entry with full functionality.
- SINUMERIK 840D sl Basic is the combination of an **NCU 710.3 PN** with the **SINAMICS S120 COMBI**.



### SINUMERIK 840D sl ✓

- SINUMERIK 840D sl is scalable up to the highest performance for maximum productivity & quality.
- The performance is scalable by being able to select between **NCU 710.3 PN**, **NCU 720.3 PN** and **NCU 730.3 PN**.

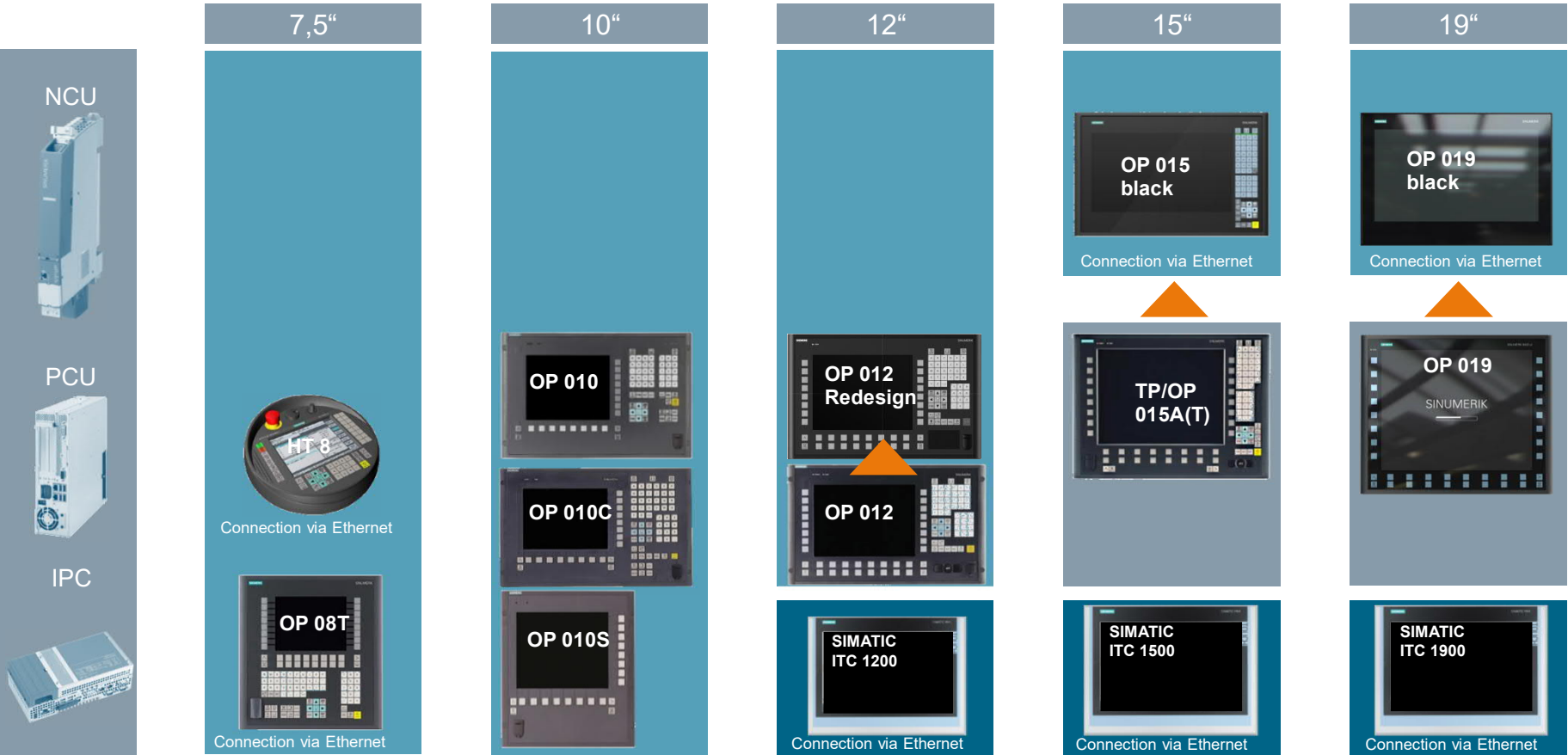


# Operator Panels for SINUMERIK

## Powerful, robust and modular







✓ 840D sl

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# Motor Modules SINAMICS S120 drive system



SINAMICS S120 – versions					
Modular drive system for demanding single-axis/multi-axis applications					
AC/AC devices for single-axis applications		DC/AC devices for multi-axis applications			
Blocksize	Chassis	Booksize Compact	Booksize	Chassis	Cabinet Modules
					

Modularity in machinery construction

Flexibility for successful machine concepts







Applications in plant and machine construction

The response to complex requirements

# SIMOTICS - Motors

## - Servo, Linear, Torque, Spindle

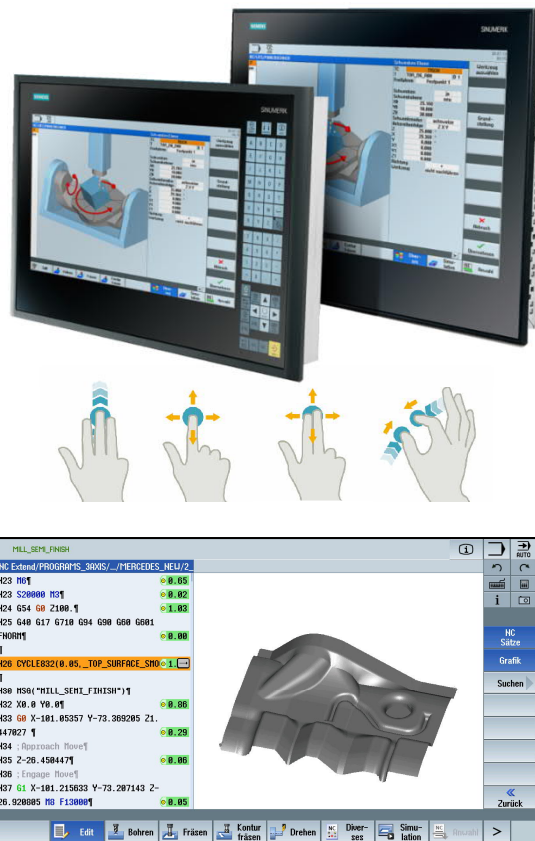
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Compact motors		Linear motors	Torque motors	Spindle motors	
<b>1FK7</b>	<b>1FT7</b>	<b>1FN3</b>	<b>1FW6</b>	<b>1PH8</b>	<b>1FE1</b>
Compact motor for smaller power applications	Compact motor for precise and dynamic smaller power applications	The linear motor for highly dynamic and high-precision applications	The integrated torque motor for applications with high torques and high accuracy	Compact motor for high powers	Synchronous Integrated motor for highest speeds
Self-cooling	Self-cooling	Water cooling	Water cooling	External ventilation	Water cooling
					
0.05 to 8.2 kW	0.88 to 10.5 kW		6.6 to 65.2 kW	2.8 to 250 kW	4 to 104 kW
2,000 to 6,000 RPM	1,500 to 6,000 RPM	98 to 519 m/min	28 to 430 RPM	Up to 12,000 RPM	Up to 40,000 RPM
0.08 to 37 Nm	1.4 to 61 Nm	200 to 10,375 N	119 to 4,760 Nm	10 to 2,459 Nm	4.5 to 820 Nm

# To improve operating efficiency

- through state-of-the-art operating technologies and functions

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## Feature / function

- Rugged panels OP015 / OP019 black with IP66
- Multitouch technology with comprehensive gesture-based control
- Mold making view, adaptation of the font size, syntax highlighting
- Cross-technology tool management
- Digital workpiece drawings direct transfer to NC programs using DXF reader

## Benefits

- Robust and reliable for rugged workshop environments
- Simpler and faster operation and simulation
- Structured and more transparent programming
- Easier and faster tool management
- Programming contours and positions faster

# The perfect solution for all performance classes SINUMERIK 828D, the CNC for the compact class

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## SINUMERIK 808D

.....Entry-level class



### 828D SW4.8\*:



- Innovation
- Quality
- Productivity

- Panel-based compact CNC
- Technologies: Turning and milling
- Up to 5 axes/spindles
- 1 machining channel
- 7.5"/8.4" color display
- S7-200-based PLC

## SINUMERIK 828D

... Compact class



- Panel-based compact CNC
- Technologies: Turning, milling, grinding
- Up to 10 axes/spindles / 2 auxiliary axes
- 2 machining channels
- 10.4"/15.6" color display
- S7-200-based PLC

\* Valid as of SW 4.8 SP4

## SINUMERIK 840D sl

.....Premium class



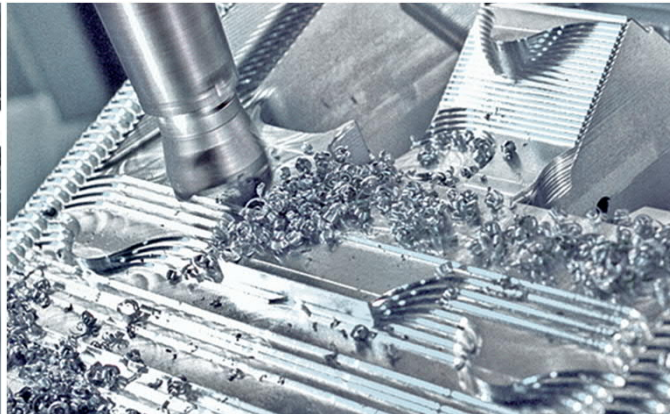
- Drive-based modular CNC
- Multi-technology CNC
- Up to 93 axes/spindles
- Up to 30 machining channels
- Modular panel concept up to 24" color display
- SIMATIC S7-300 PLC 317/319-3PN/DP

## SINUMERIK 828 Perfect for the core CNC technologies

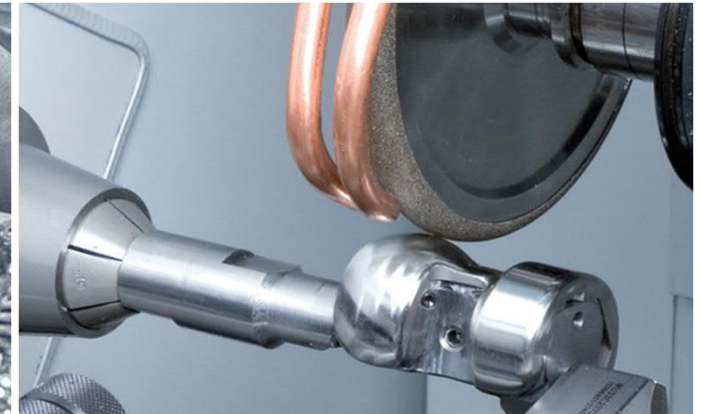
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**Turning**



**Milling**



**Grinding**

- **Turning:** 2-channel machining and Balance Cutting for short machining times and balancing force in Z axis
- **Milling:** "Best in Milling" – Top Surface, 2-channel machining, Collision Avoidance ECO, Nodding Compensation ECO/Advanced, Advanced Position Control ECO and Cogging Torque Compensation
- **G-Tech:** 2<sup>nd</sup> channel machining, support of both type of grinding technology – surface and cylindrical

# SINUMERIK 828 ... Compact class

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## Feature / function

- Higher processor performance
- Digital Input with higher voltage stability
- ECC – Error Correcting Code
- Pull-relief for the DRIVE-CLiQ and PN cables
- 1GB Ethernet interface X130
- 1 additional USB port (USB 3.0)
- **More robust touch-operation 15,6" PPU290.4**
  - New touch sensor much more stable against EMC disturbances

## Benefits

- Higher functions capability
- Higher robustness regarding EMC
- Reduction of SW errors due to memory read/write access
- Reduction of bus disturbance and connector damage
- Faster communication
- Connection of (USB) MCP, hard disk, keyboard, etc.
- More efficient and reliable operation
- Higher operation speed due to faster touch sensor reaction time

# The perfect solution for all performance classes

## SINUMERIK 808D, the CNC for the Entry-level class

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### SINUMERIK 808D

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# SINUMERIK 808D ADVANCED

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Outstanding Performance,

Simply intelligent!



SINUMERIK 808D ADVANCED ⇒ the *optimum solution* for the basic machines

# SINUMERIK 808D ADVANCED

## - Preconfigured for turning and milling

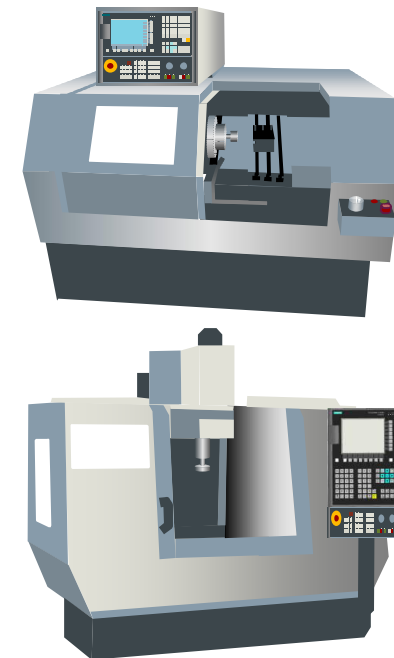
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### SINUMERIK 808D ADVANCED Turning:

- Up to 6 axes/spindles in one machining channel
- Up to 3 axes interpolating
- Preconfigured system software for full-CNC lathes
- Support axes coupling function
- Support basic turn-milling by Transmit/Tracyl without Y axis option

### SINUMERIK 808D ADVANCED Milling:

- Up to 6 axes/spindles in one machining channel
- Up to 4 axes interpolating
- Preconfigured system software for VMC
- Enhanced mold & die cutting performance
- Support gantry machine



SINUMERIK 808D ADVANCED is suitable for basic turning and milling machines. Due to the optimized supported axes number and options, basic turn-milling application can be controlled as well.

# Customer benefits with Siemens as global partner and the technical solution by CNC Design

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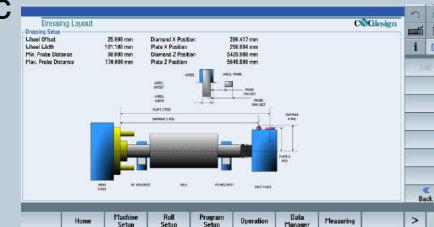
## Siemens Ltd. Vietnam

- Retrofit and Modernization with the right state-of-the-art Products selection on your requirements
- accompany the Retrofit Project from planning till acceptance and further Services.



## CNC Design Thailand

- 27 Years Siemens authorized Partner for Solutions
- 20 years experience and developing Retrofit solutions for Roll Grinder application
- Only with Sinumerik
- Optional variable Machine Packages ready to run
- Retrofit of the mechanic



## Machine End user in Vietnam

The optimized solution to increase machine performance and ensure high machine availability for your future Production

## References ... benefit from unique expertise!

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## Reference: Retrofit @ Alstom – Gantry welding plant

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### Wagon building in Salzgitter



**ALSTOM**

#### Goal

- Spare parts and support guarantee
- New sensor systems
- Reduction of ancillary times (e.g. loading of programs)

#### Solution

- Complete modernization of the plant with
- SINUMERIK 840D
  - New drives
  - Control cabinet and sensors

#### Business Impact

- Ancillary times are reduced (faster loading of programs)
- Productivity improvement
- Saving on investments



Increase  
productivity



Create  
sustainability



## Reference: Retrofit @ Sonaca – Hydraulic machine

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### Retrofit and Optimization of a Full Hydraulic Machine



### Challenge

- No spare parts for old controller
- Critical machine in continuous production
- Hydraulic servo vanes obsolete
- Slow production cycle due to manual mode

### Solution

- Hydraulic optimization
- New servo vanes
- Risk assessment
- Integration of linear measurement systems

### Benefits

- From manual mode to semi-automatic
- Improved failure analysis



Increase  
productivity



Create  
sustainability



Reference:  
Retrofit @ CNH New Holland

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Thank you for your attention

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