*#digitalintothefuture*

**GROB-NET⁴INDUSTRY.**

*This is who we are*

# GROB-WERKE.

*Technology at its best*

# STEP WITH US INTO A GREEN FUTURE.

At GROB, we strive for continuous progress and improvement. Not only do we strive to develop outstanding solutions and products for our customers, but we also seek to make a contribution to our environment and future generations. This is firmly anchored in our corporate philosophy and lived every day.

We therefore utilize photovoltaics and geothermal energy in our locations and support a wide variety of social projects. We also value SUSTAINABILITY in our internal departments. Our products are based on the highest energy efficiency and regenerative drive systems. We integrate our supplier network in reducing $CO_2$ footprint.

*OUR PRODUCT RANGE.*

*#machiningtechnology #universalmachiningcenters #assemblyplants #electromobility #automation #additivemanufacturing #digitalization #usedmachines #service*

*Concentrated competence worldwide*

# INTELLIGENT TECHNOLOGY IS HUMAN.

For generations, we at GROB have lived and experienced this principle by making our customer's requirements the focus of our work. The result is sophisticated technology creating more efficient production processes worldwide and delivering highest quality.

## RESEARCH & DEVELOPMENT

With a high degree of creativity and technical intuition, as well as the best engineering expertise, our developers have worked hard to earn the reputation of being a technology leader.

## ASSEMBLY

From pre-assembly to machine assembly to process commissioning – our employees demonstrate their expertise with optimally coordinated workflows.

## ENGINEERING

With method development and structured problem solving, our employees in Engineering develop innovative concepts representing milestones for precision, dynamics, and reliability.

## COMMISSIONING

With simulation techniques and virtual commissioning, we achieve the highest adherence to delivery dates and product quality.
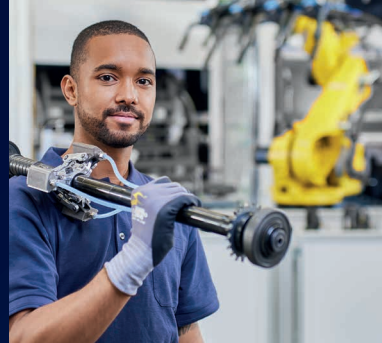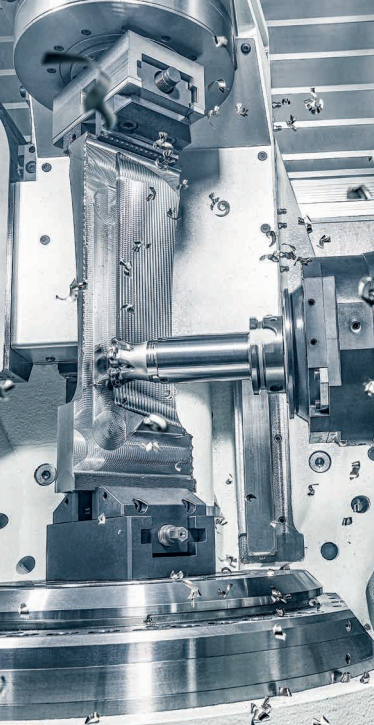
## PRODUCTION

The high degree of vertical integration along the entire value creation chain, numerous machining technologies and our employees' distinctive specialist knowledge create the best conditions for state-of-the-art production.

## TECHNICAL APPLICATION CENTERS

Our production plants in Germany, Brazil, the USA, China, Italy and India have technical application centers for the machining and electromobility sectors, where our customers can experience GROB technologies up close.

*Experience technologies of the future today*

# SOFTWARE OPTIONS.

Our modular GROB-NET⁴Industry web applications allow you to network and digitalize your production processes across all plants to make your manufacturing facility even more efficient.

**GROB⁴INTERFACE** – easy route to machine communication

**GROB⁴ANALYZE** – machine feedback for the CIP

**GROB⁴ANALYZE OFFICE CLIENT** – flexible data analysis

**GROB⁴LINE** – watch the machine on your smartphone

**GROB⁴TDX** – transfer tool data automatically

**GROB⁴TRACK** – machine axes in view at all times

**GROB⁴OPTIMIZATION** – motorized spindle process evaluation

**GROB⁴COACH** – programming, simulation and training

**GROB⁴CONNECT** – connection from the real world to the ERP system

*Moving into a digital future*

# GROB-NET⁴INDUSTRY.

Transparency and connectivity in your production process – our modularly developed GROB-NET⁴Industry web applications let you network and digitalize your production processes across all plants. From planning to engineering to maintenance, GROB-NET⁴Industry combines all relevant modules for increasing productivity and offers you an all-round package for modern production in the Industry 4.0 era.

- Transparent production

- Control-independent software

- Integrated support concept

- Low system requirements

*OUR SOFTWARE PORTFOLIO.*

*#grobnet4industry #interactiveapplication #cloud4machine*

*Easy route to machine communication*
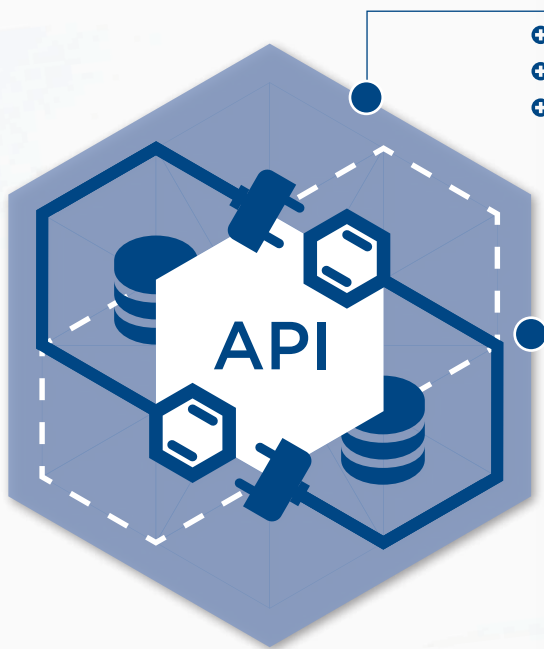
# GROB⁴INTERFACE.

GROB⁴Interface is the crucial link for networking your machine with other systems. It provides you all information relevant to digitalizing processes and elevating production towards Industry 4.0. The data obtained can be applied for numerous purposes, allowing you to control production and increase efficiency.

## SMART SOLUTION FOR INFORMATION TRANSFER

⊕ Easy data transfer straight from the machine control system
⊕ Possibility to connect to various systems (TDM, MES and many more)
⊕ Watchdog function

**API**

## OPC UA FOR OLD MACHINES AND NEW MACHINES

⊕ Output of various data formats (XML, JSON, CSV, REST)
⊕ API for the transfer of machine data to MES and ERP systems
⊕ Various extensions, such as OPC UA converters for old machines
⊕ Custom parameter function for all types of NC, PLC, and HMI data
⊕ MTConnect adapter

## YOUR BENEFITS

⊕ Simple installation
⊕ No additional sensors required
⊕ Control system-dependent and manufacturer-neutral
⊕ New insights into production
⊕ Efficiency increase through transparency
⊕ Permits highly efficient production

*Communication protocols for*

# INDUSTRY 4.0 AND IIOT.

<table>
<tr><th colspan="4">GROB⁴INTERFACE ▸ LICENSING MODELS</th></tr>
<tr><th></th><th>BASIC</th><th>ADVANCED</th><th>PROFESSIONAL</th></tr>
<tr><td>FANUC control systems</td><td>•</td><td>—</td><td>—</td></tr>
<tr><td>SIEMENS/HEIDENHAIN control systems</td><td>•</td><td>•</td><td>•</td></tr>
<tr><td>Standardized machine data</td><td>•</td><td>•</td><td>•</td></tr>
<tr><td>Tool data</td><td>—</td><td>•</td><td>•</td></tr>
<tr><td>Individual NC/PLC PARAMETERS</td><td>—</td><td>•</td><td>•</td></tr>
<tr><td>Trace data*</td><td>—</td><td>—</td><td>•</td></tr>
<tr><td>High-frequency data*</td><td>—</td><td>—</td><td>•</td></tr>
<tr><td>Conversion to OPC UA data format**</td><td>•</td><td>•</td><td>•</td></tr>
<tr><td>Conversion to MTConnect data format**</td><td>•</td><td>•</td><td>•</td></tr>
</table>

*SIEMENS control systems      **Add-on                                      • Standard — not available

OPC UA is a data exchange standard for industrial communication (machine-to-machine or PC-to-machine communication). The open-source interface standard is independent from the manufacturer or system supplier of the application, from the programming language the respective software was programmed in, and from the operating system the application is running on.

## YOUR BENEFITS

- ⊕ Best quality and efficiency
- ⊕ OPC UA license with simple PLC data model
  (immediately accessible simple PLC data model)
- ⊕ GROB-NET⁴Industry OPC UA adapter
  (immediately accessible data model without additional programming;
  no control system licenses required; no PLC modifications required;
  simple installation; excellent scalability)
- ⊕ Available also for older control systems that have no OPC UA licensing

*Feedback from the machine for the CIP*

# GROB⁴ANALYZE.

GROB⁴Analyze analyzes your machine data accurately and in real time and visually prepares these data to optimal effect. The module identifies non-productive phases, allowing the reasons behind weaknesses to be swiftly determined and rectified. GROB⁴Analyze, then, is a helpful tool for your Continuous Improvement Process (CIP).

## A SIMPLE AND FLEXIBLE SOLUTION FOR MACHINE DATA LOGGING (MDL)

- Easy access via the GROB⁴Portal
- Direct connection to the machine control system
- Data and report export module*
- Long-term storage of data for analysis (option)

## GROB⁴ANALYZE FUNCTIONALITIES

- Top-to-bottom view for different users
- Machine status display and analysis
- NC, tool, alarm, and override data
- Display of individually configurable parameters
- Data export to CSV and PDF

## YOUR BENEFITS

- Data provisioning for an effective CIP
- Determination of savings and optimization potentials
- Optimal use of available capacities
- Support for cause identification
- Identification of non-productive phases
- Creation of reports for production managers*

* Available in the advanced version

*Flexible data analysis*

# GROB⁴ANALYZE OFFICECLIENT.

The GROB⁴Analyze OfficeClient is the perfect supplement to GROB⁴Analyze. You will receive a detailed export of important machine data for detailed and flexible analysis. This is simplified further by using MS Office solutions – Access and Excel. Creating the analyses is quick and easy.

## EVALUATIONS AND ANALYSES BASED ON MACHINE DATA

- Ready-made evaluations for a quick start
- Detect dependencies easily
- Simple desktop installation

## GROB⁴ANALYZE OFFICECLIENT FUNCTIONALITIES

- Direct export of data from the cloud: NC, program, alarm, and status information with timestamp

## YOUR BENEFITS

- Detect dependencies between NC programs, alarms, and tools
- Draw conclusions for the CIP process
- Can be updated at any time and data is usable long-term
- Low cost

*Hall layout function*

# ALL SYSTEMS AT A GLANCE.

Increasingly complex and time-critical production tasks require an overview of the entirety of all plants and machines. We meet these requirements with our newly developed feature – an individually configurable hall layout.

## CREATE AN OVERVIEW OF ALL MACHINES AND GENERATE ADDED VALUE

- ✚ Easy configuration
- ✚ Flexible display of machine statuses, part counters, and material flows
- ✚ Integration into Cloud⁴Machine



## YOUR BENEFITS

- ✚ Configuration possible by your own personnel
- ✚ Quick overview of all plants, halls, lines, and machines
- ✚ Identify bottlenecks fast and efficiently
- ✚ Immediate visualization of faults for the operator

*Digital networks*

# FOR ALL MACHINES AND CONTROL SYSTEMS.

Digitalization requires the collection of data of all existing machines and is necessary regardless of their age or control system. However, the degree of integration must first be clarified. In many cases, it is sufficient to determine the runtime and downtimes, to ensure transparency, and to enable a corresponding notification system for maintenance or on-call service.

## CREATE A CONNECTION TO ALL MACHINES AND GENERATE ADDED VALUE

- ⊕ Easy commissioning
- ⊕ Minimum alignment work
- ⊕ Flexible adaptation to a wide range of functions
- ⊕ Integration into Cloud⁴Machine

## BROWNFIELD CONNECTIVITY

- ⊕ Connection of any machine of any age
- ⊕ Independent of manufacturer, control system, and function
- ⊕ Flexible adaptation to any status
- ⊕ Versatile combinations

## YOUR BENEFITS

- ⊕ Integration possible by your own personnel
- ⊕ Cost-effective and solid hardware
- ⊕ Data can be used directly for other applications
- ⊕ Flexibly expandable

*The machine in view via smartphone*

# GROB⁴LINE.

GROB⁴Line allows your GROB machine to be connected to the Internet. Consequently, it can be monitored and controlled via a smartphone. Combined with the messaging function that sends messages (e. g., machine standstill, alarm messages or job finished) to defined smartphones, the machine operator in charge can respond immediately and minimize unnecessary stoppage times.

## SIMPLE AND INTUITIVE REMOTE ACCESS TO YOUR MACHINES

- ✚ Smartphone app for iOS (from version 8) and Android (from version 5)
- ✚ Intuitive administration in the GROB⁴Portal
- ✚ Rule configurator for customizations
- ✚ Access via smartphone or computer

## GROB⁴LINE FUNCTIONALITIES

- ✚ Mobile, dynamic display of machine data
- ✚ Information about status, alarm messages, tool, and NC program at a glance
- ✚ E-mail notification for machine standstill
- ✚ Definition of alarm messages for proactive e-mail notification
- ✚ Deletion of error messages and NC start directly via smartphone*
- ✚ Historical timeline diagram

## YOUR BENEFITS

- ✚ Improved manpower utilization
- ✚ On-call service/shift support
- ✚ Less downtime
- ✚ All information received, no matter what the locations
- ✚ Mobile monitoring of lightly-manned/unmanned machine operation

*In the GROB⁴Line Professional version

*Automatic transfer of tool data*

# GROB⁴TDX.

GROB⁴TDX enables your tool data to be automatically transferred to your machine. During tracking in the tool storage room, the tool is automatically identified in order to link the tool data with it and submit to a database digitally. The identification can be done in different ways (barcode/DMC* (Data Matrix Code)/RFID chip).

## POWERFUL TOOL MANAGEMENT SYSTEM
## BASED ON STATE-OF-THE-ART TECHNOLOGY

- Tool data in real time
- Live view of your tool magazine
- Exact inventory overview of your tools and parameters
- Work queue monitor for the tool storage room

## GROB⁴TDX FUNCTIONALITIES

- Automatic transfer of tool data
- Central tool loading lists and difference lists
- Web-based overview of all tools, purchase orders, etc.
- Available for SIEMENS and HEIDENHAIN control systems (incl. third-party products)
- Paperless loading process

## YOUR BENEFITS

- Reduction in tool change time
- Improved tool deployment planning and utilization
- Reduction in search and wait times
- Inventory optimization

## *Machine axes in view at all times*
# GROB⁴TRACK.

GROB⁴Track monitors the health status of your machine. Thanks to an automated analysis function, the machine state is known at all times and unscheduled downtimes can be avoided. This allows you to precisely plan preventive maintenance work and initiate spare part orders at the right time.

### PRECISE PLANNING OF PREVENTIVE MAINTENANCE WORK

- Automatically triggered axis recording without any additional sensors
- Data transmission to the Cloud
- Data evaluation
- Ball screw status report as PDF

### GROB⁴TRACK FUNCTIONALITIES

- Standardized axis recording
- Envelope curve analysis
- Ball screw condition monitoring
- Comparison with reference axis recordings

## YOUR BENEFITS

- Unscheduled machine shutdowns avoided
- No additional sensor technology required
- Software-based analysis without additional machine hardware
- Change of state automatically notified via e-mail
- Quality-relevant wear detected at an early stage

*Motorized spindle process evaluation*

# GROB⁴OPTIMIZATION.

Extend the service life of your motorized spindles and tools and reduce costs. GROB⁴Optimization MSP helps you develop your full potential and supports the optimization of your process.

## BASIC PACKAGE

- Improve your machining operation with little effort
- Quick setup in less than one hour
- Installation of the industrial PC and setup of the HMI display or web browser (incl. a virtual machine in the customer network)

## GROB⁴OPTIMIZATION FUNCTIONALITIES

- Recording of vibration and temperature values by sensors using GROB spindle diagnostics (GSD)
- Combined data recording when tolerances are exceeded at the time the fault occurs (including NC program step, tool, rotational speed, vibrational acceleration, and feed)
- Display of results including evaluation options (directly on the HMI or web-based)
- Provision of proposals for optimization you can implement yourself

## YOUR BENEFITS

- Individual optimization of process parameters
- Cost savings thanks to the extended service life of the tool and motorized spindle
- Detection and possible elimination of surface quality issues (identification of problematic tools or processes by vibrations)

*Programming, simulation, training*

# GROB⁴COACH.

GROB⁴Coach comprises a programming, simulation and training software and simplifies the development of NC programs on the control-identical software. Furthermore, it creates the prerequisites for simulating the machining operation. Its training software permits effective, PC-supported CNC training for novices and experts.

## SIMPLE, USER-ORIENTED SOFTWARE BASED ON THE CNC KERNEL

 Programming, simulation and training software

## GROB⁴COACH FUNCTIONALITIES

 For moving the part program from the machine onto the PC and for 3D visualization of the part program in automatic mode
 Programming environment with integrated Online Help function on the PC
 Effective, PC-supported CNC training for novices and experts

## YOUR BENEFITS

 Simulation of the machining operation
 Simple familiarization with machine-specific CNC programming languages and the machining parameters
 Safe and practically oriented familiarization with machine operation on machines with an identical control system
 Convenient programming of NC programs on software with identical control systems
 Shorter production ramp-up phases for new machines with GROB⁴Coach training opportunities

*Connection from the real world to the ERP system*

# GROB⁴CONNECT.

GROB⁴Connect links your machine to the ERP, MES, PLM, and TDM system. Via web technology, your production-related data can be transferred directly to the machine operator. The machine operator can enter job order feedback, such as tool requirement, into the ERP system directly via the machine control system.

## AN ULTRA-MODERN MES SYSTEM WITH SIMPLE USE OF ERP PROCESSES

- ⊕ Advice and realization for implementing paperless production
- ⊕ Web interface in the machine control system
- ⊕ Integrative SAP interface
- ⊕ Web applications for Office PCs

## GROB⁴CONNECT FUNCTIONALITIES

- ⊕ All process-relevant data of the ERP system available on the machine itself
- ⊕ Clearly arranged input screens on the machine control system for job management, reporting, personnel planning, CAM management, and maintenance and repair
- ⊕ Control-independent transmission of machine data to the ERP system

## YOUR BENEFITS

- ⊕ Fast and flexible planning and control potentials
- ⊕ Digital and networked production processes – "paperless production"
- ⊕ Real-time feedback to the ERP system from production
- ⊕ Cost transparency over each component
- ⊕ More machining time on the machine through shorter pathways
- ⊕ Automated workflows for improved process quality while reducing costs
- ⊕ Adjustable individually for each customer
- ⊕ Autonomous addition and adaption of applications (programming skills required)

# GROB-Net⁴Industry
# PRODUCT OVERVIEW.

## GROB-NET⁴INDUSTRY ▶ PRODUCT OVERVIEW

| | GROB⁴ INTERFACE | GROB⁴ LINE | GROB⁴ ANALYZE |
|---|:---:|:---:|:---:|
| Six-month test with new machines | — | • | • |
| Cloud product | — | • | • |
| Installation in the plant network | • | — | — |
| Installation on the machine (IPC) | — | — | — |
| Data collection software | • | — | — |
| Smartphone app with live data | — | • | — |
| Standstill notification | — | • | — |
| Historical data visualization | — | • | • |
| Reporting | — | — | • |
| Digital tool management | — | — | — |
| Axis status analysis | — | — | — |
| Process parameter optimization | — | — | — |
| Increased spindle and tool life | — | — | — |
| Simulation and training software | — | — | — |
| MES software | — | — | — |
| MES modules Qm, Ih, Ftg | — | — | — |

| | GROB⁴ TDX | GROB⁴ TRACK | GROB⁴ OPTIMIZATION | GROB⁴ COACH | GROB⁴ CONNECT |
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• Standard    — Not available

*Friendly, committed, competent*

# GROB SERVICE.

From 24-hour service and a comprehensive range of spare parts and training courses to professional machine maintenance and analysis: The GROB service spectrum offers you a comprehensive range of products and services and is available to you worldwide thanks to our global production plants and service branches.

- ⊕ Worldwide service network

- ⊕ Available 24/7/360

- ⊕ One hotline for everything

- ⊕ We are right where our customers are

*OUR SERVICE PORTFOLIO.*

*#hotline #webshop #serviceagreements #replacementparts #repaircenter #overhaul&optimization #motorizedspindleservice #grobtechnicalacademy*

*Worldwide throughout the machine service life*

# GROB – GLOBAL AND INTERNATIONAL.

From Bavaria to the world: Since our founding in 1926 in Munich, we as a global, family-managed company have been on a constant growth trajectory developing and manufacturing systems and machine tools. Our customers include the world's leading automotive manufacturers, their suppliers, and renowned companies from the aerospace, mechanical engineering, and other industries. With our production facilities in Germany, Brazil, the USA, China, Italy and India, as well as 14 worldwide service centers and sales branches, we are represented around the globe, ensuring the highest quality.

FOUNDED IN 1926

6 PLANTS

14 SALES
AND SERVICE BRANCHES WORLDWIDE

**NORTH AMERICA**

Bluffton, Ohio, USA
Detroit, Michigan, USA
Querétaro, Mexico

**SOUTH AMERICA**

São Paulo, Brazil

*Our global production sites*

**Mindelheim,** Germany

**São Paulo,** Brazil

## EUROPE

Mindelheim, Germany
Pianezza, Italy
Stratford-upon-Avon, Great Britain
Hengelo, Netherlands
Senlis, France
Baar, Switzerland
Poznań, Poland
Győr, Hungary

24/7 SUPPORT

8,300 EMPLOYEES WORLDWIDE

## ASIA

Dalian, China
Bangalore, India
Beijing, China
Shanghai, China
Yokohama, Japan
Suwon, South Korea
Haiphong, Vietnam
Bangkok, Thailand

**Bluffton,** USA          **Dalian,** China          **Pianezza,** Italy          **Bangalore,** India

**GROB**

# GROB-WERKE GmbH & Co. KG

Pioneers in designing and building highly innovative
production and automation systems for over 95 years.

*#machiningtechnology #universalmachiningcenters
#assemblyplants #electromobility
#automation #additivemanufacturing #digitalization
#usedmachines #service*