ROBOTIC

PROCESS TECHNOLOGY

automation | handling | integration

BERGER GRUPPE

Authorized value provider
ABB AWARD 2018
for LIFETIME ACHIEVEMENT
European Value Provider Conference

ROBOTICS AWARD 2018

Heinz Berger Maschinenfabrik GmbH & Co. KG
Kohlfurther Brücke 69
42349 Wuppertal, Germany
Tel. +49 (202) 24742-0
Fax +49 (202) 24742-42
info@bergergruppe.de
www.bergergruppe.de

CONTENT

ROBOTIC PROCESS TECHNOLOGY

ROBOTIC GRINDING AND POLISHING SYSTEMS **4–5**

ROBOTIC PROCESS TECHNOLOGY / AUTOMATION **6–15**

Sorters 6
Integration of production processes 7
Process automation and handling technology 8–9
Measuring technique 10–11
Programming and system monitoring 12–13
Berger Machine Interface 4.0 14–15

REQUEST FOR QUOTATION 16

Questionnaire for technical data

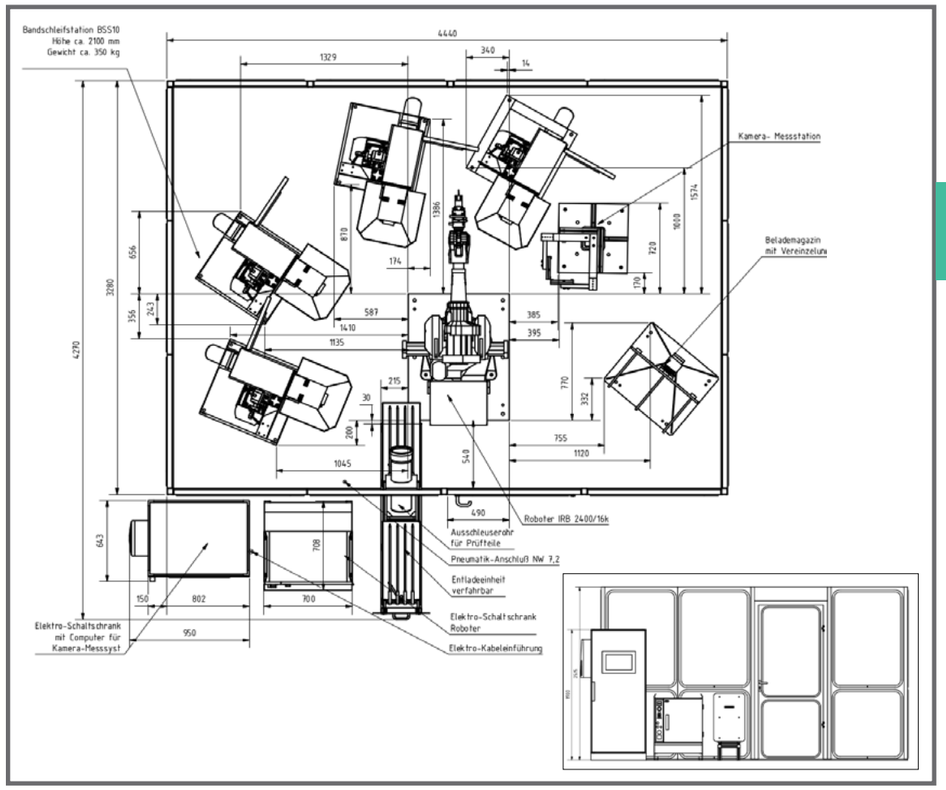
ROBOTIC

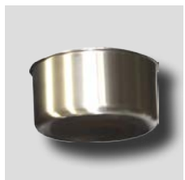
GRINDING AND POLISHING SYSTEMS

GRINDING AND POLISHING WITH ROBOTIC TECHNIQUE

The Berger Group offers solutions for robotic machining of workpieces of various sizes and geometries.

The focus is on partly standardized robot cells with different conceptual approaches.

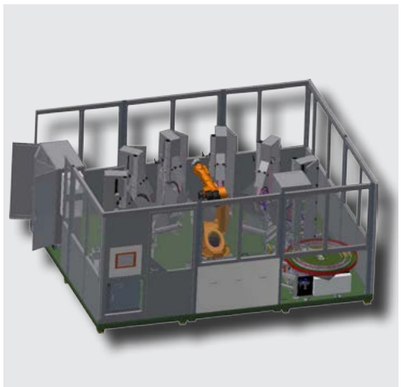




Depending on the nature of the workpiece, the robotic cell is equipped with different processing stations. Either the workpiece or the tool can be guided by the robot.

If the tool is robot-guided, the workpiece can be positioned via one or more rotary tables. Additional axes are integrated into the system so that all-round machining is possible without additional changeover time.

- robot grinding and polishing stations either integrated into existing production lines or designed as separate cells
- standard interfaces to all common robot manufacturers such as ABB, KUKA, Stäubli and Fanuc
- programming in touch-in mode or with a CAD/CAM interface
- integration of measuring systems for compensation of workpiece tolerances in position and dimensions
- different machining stations with different tools (e.g. grinding belts, grinding stones, polishing wheels) available



ROBOTIC PROCESS TECHNOLOGY /

AUTOMATION

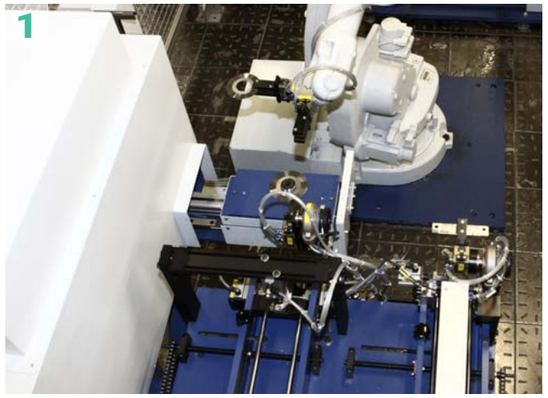
INTEGRATION OF PRODUCTION PROCESSES

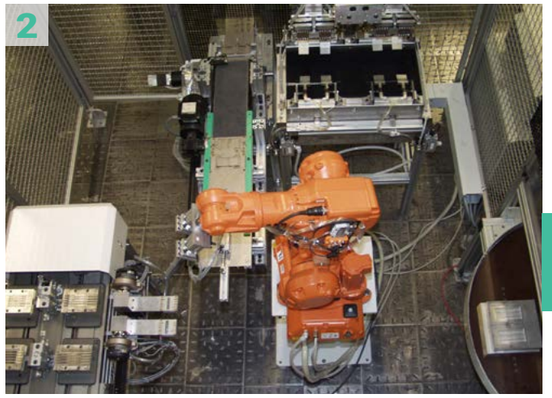
Sorters

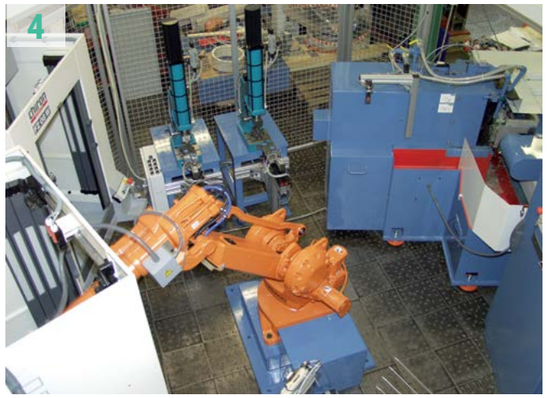
The sorting units of the SE series magazine workpieces from cut material or feed them to a magazine.

The workpieces are separated from a bunker and fed via a conveyor belt.

The position of the workpiece is detected by a camera. The position data is transmitted to a robot control system. The robot picks up the workpiece and places it in the correct position for storage.







Integration of production processes

- overlay welding
- bending presses
- drilling / Countersinking
- hardening facilities
- painting facilities
- packaging machinery

Examples of application (pictures)

1. Robot loading of a marking laser (picture 1)
2. Painting, poling, packing of jigsaw blades (picture 2)
3. Robot feeding / robot welding (picture 3)

Integration /Automation of CNC mill centes

- preparation of workpieces for subsequent grinding processing
- special device for CNC milling centres for centering, drilling, tapping and milling the carbide recess of surgical instruments
- fixture construction and development
- robot automation and process connection with grinding or bending station

Examples of application (pictures)

4. Integration of two milling centres, two bending presses and a grinding machine type BG1-CNC in combination with an indexing vertical rotary table magazine (picture 4)

PROCESS AUTOMATION HANDLING TECHNOLOGY

Robot technique for loading and unloading

For over 20 years, the Berger Gruppe has been using robots for loading and unloading conventional and CNC controlled machines.

Depending on the requirements, there is a multitude of possibilities, e.g. loading of a single machine, several machines or integration of a grinding machine into a production cell.

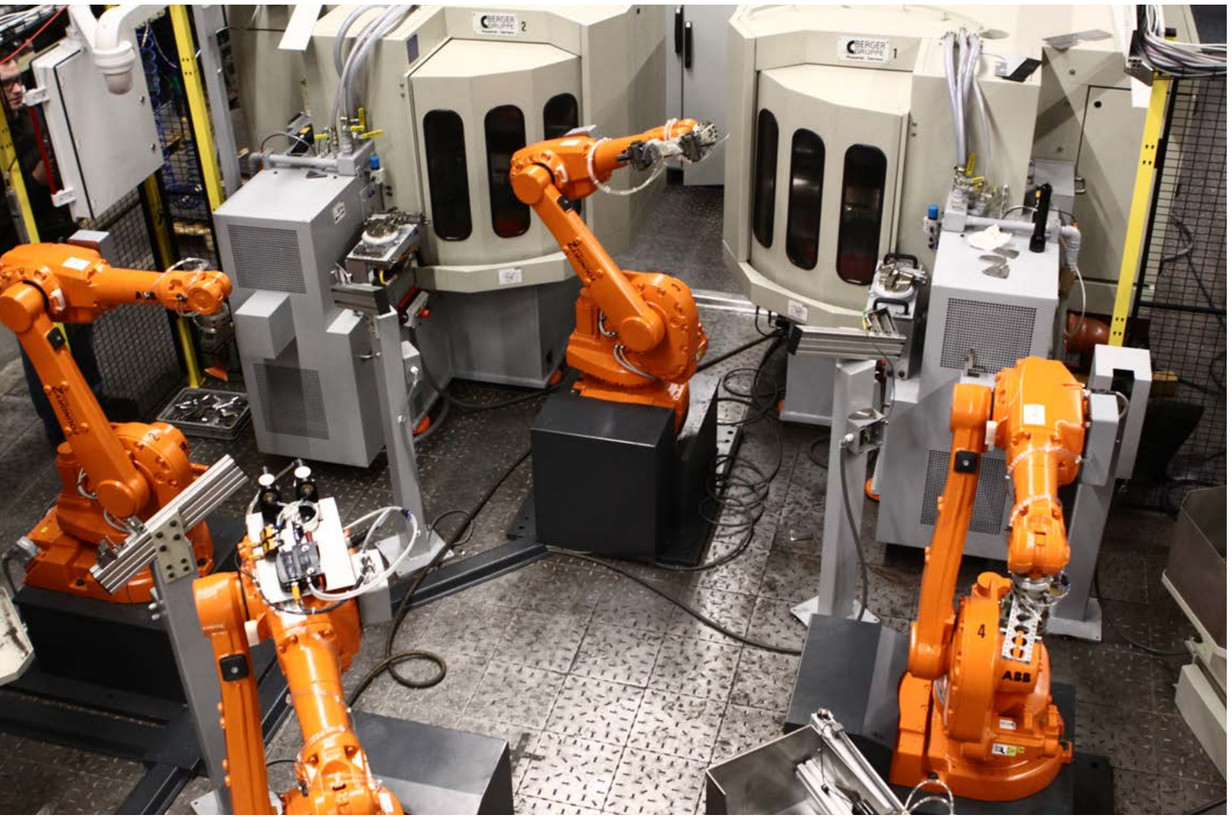
MITSUBISHI, FANUC, ESPON, KUKA, ABB, DENSO, STÄUBLI or other robot types and models are used.

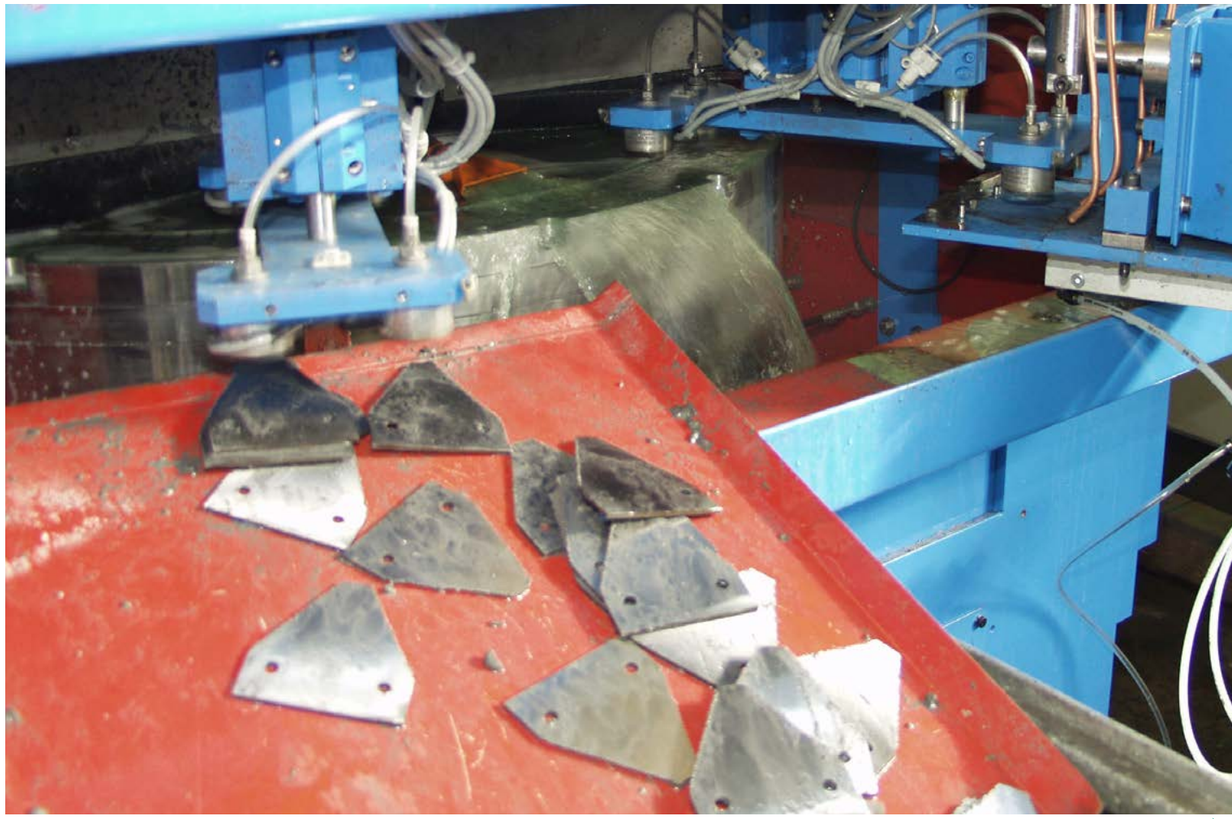
Examples of application for robot loading

- surgical scissors with rotary magazine
- tools, garden shears or circular knives with vertical stacking magazine
- pocket knife blades with step conveyor

Examples of application for robot

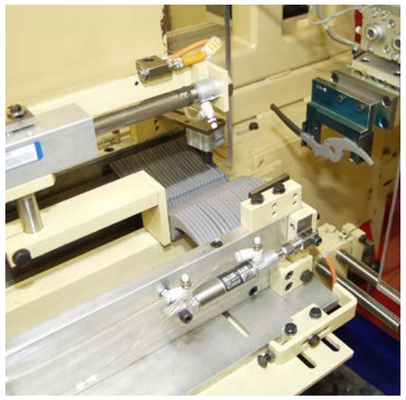
- sharpening and/or deburring of knife blades from a magazine with sharpening machines series SM-CNC





CNC feeding systems for loading and unloading

- CNC control of horizontal and vertical transfer and loading axes
- position-accurate approach via brushless AC servo drives
- simple programming of paths and positions with the workpiece program
- freely programmable approach speed up to 100 m/min
- stable, low-wear and low-maintenance axes with toothed belt or ball screw spindle
- large loading capacity for several hours of non-stop production
- space-saving, clear design with free access to all sides of the machines
- magazine tower, chain magazine, stacking magazine, rotary indexing table, step conveyor available
- Interlinking of different machine types
- NC servo axes 180° with electromagnetic gripper, e.g. for loading of rotary table grinding machines RTS2/3 (picture above)
- Short changeover times through recall of programmed positions and paths



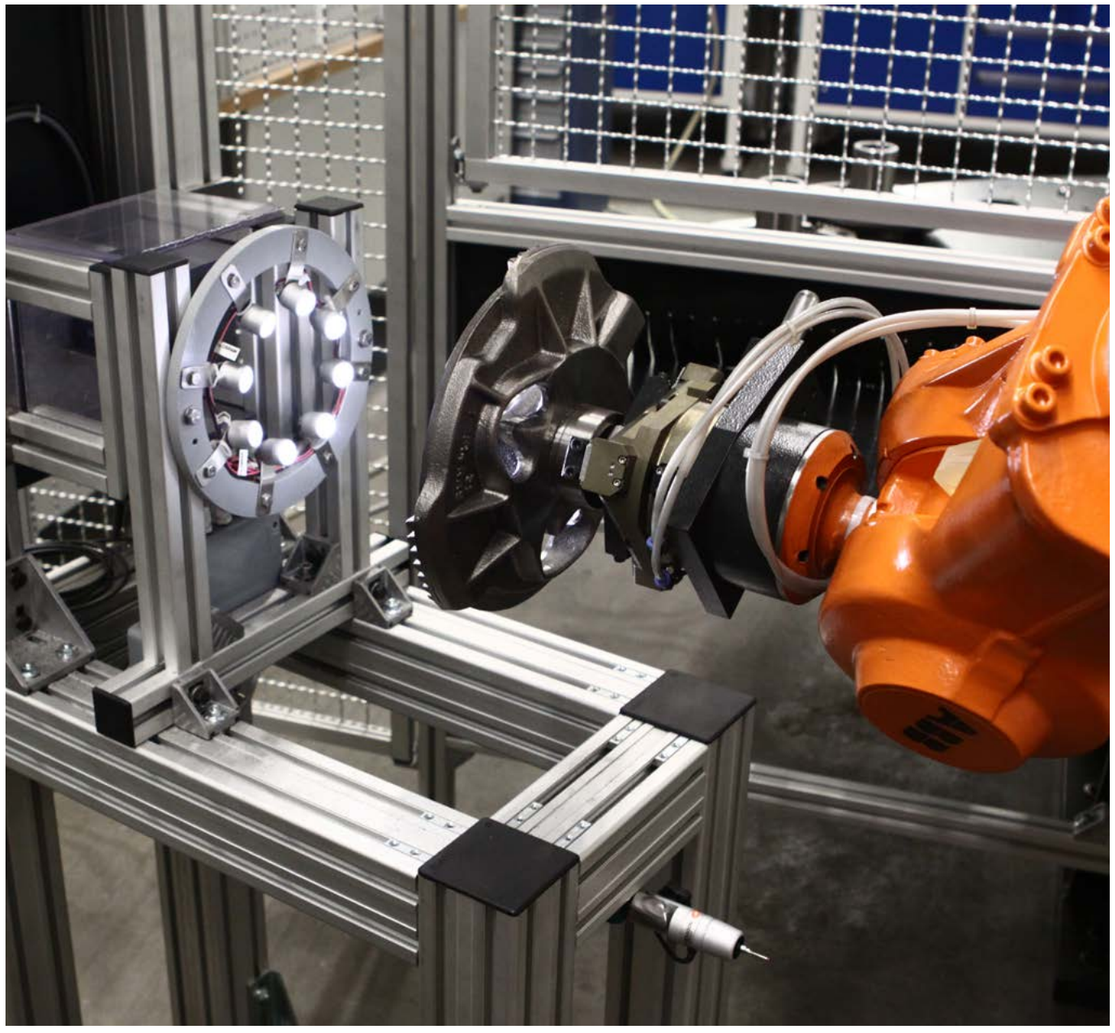
Pneumatic feeding systems for loading, transfer and unloading

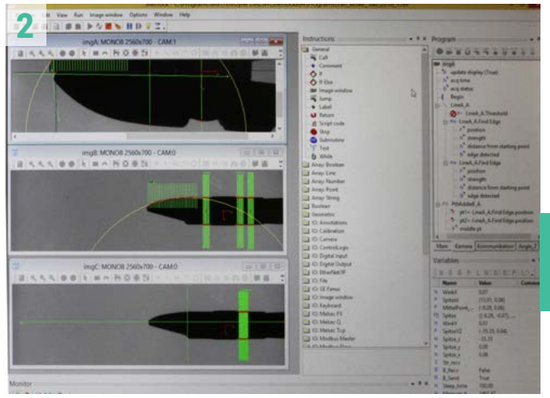
- in conjunction with conventional and CNC controlled machines using pneumatic cylinders
- various solutions available
- storage system

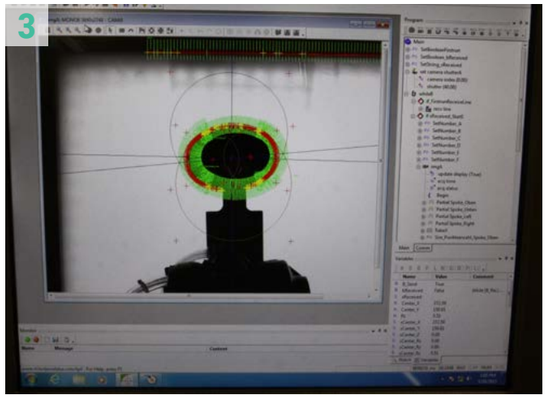
MEASURING TECHNIQUE

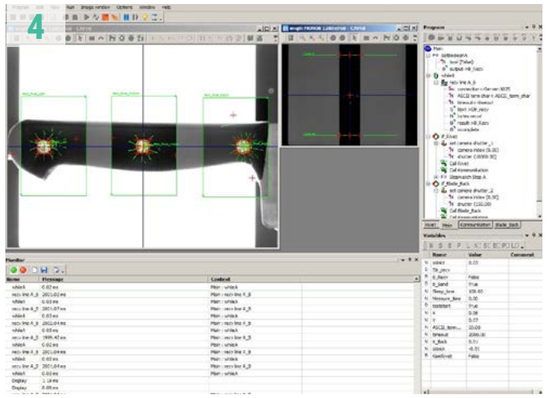
Measurement of workpieces with camera and laser measurement technology

By means of cameras, laser or mechanical probes, the workpieces can be measured before or after machining and thus the machining program can be influenced.









Examples of application (pictures)

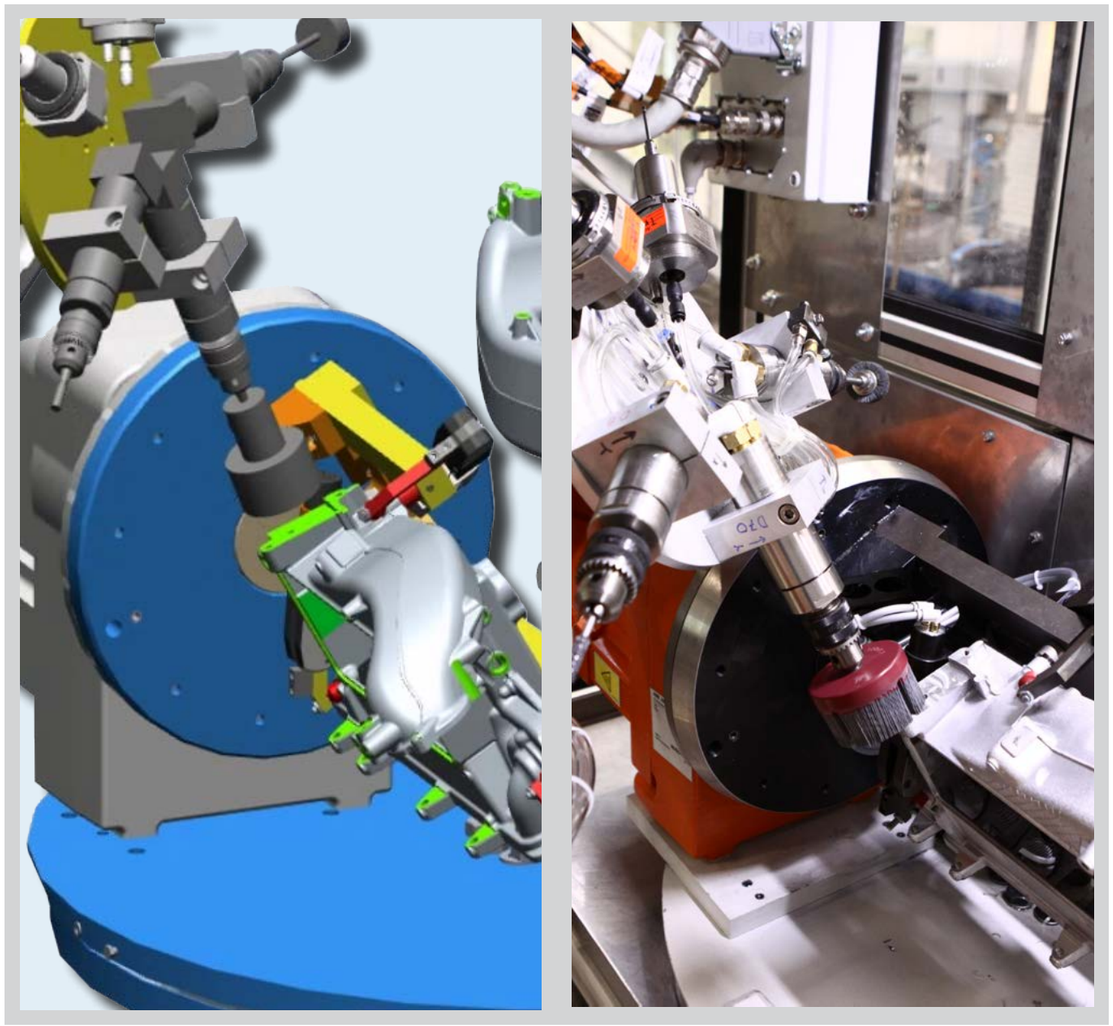
1. 3D measurement with probe (picture 1)
2. Compensation of workpiece tolerances by camera measuring system (picture 2)
3. 3D-measurement with camera (picture 3)
4. Camera measuring system with graphic interface for part measurement (picture 4)

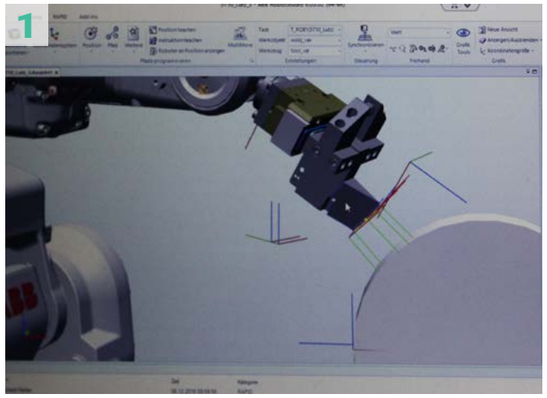
PROGRAMMING / SYSTEM MONITORING

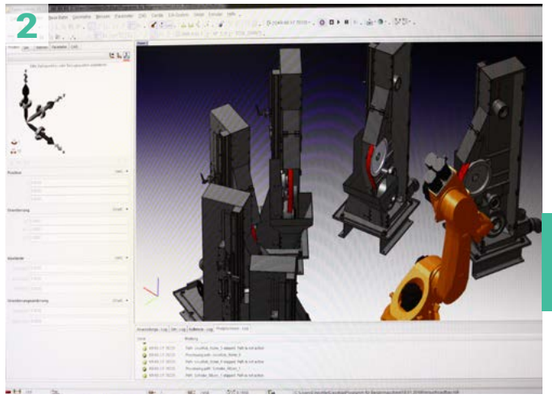
Programming

The programming can be done offline with appropriate software – e.g. RobotStudio (pictures below).

The processes can also be simulated or the machining times determined.







System monitoring

The system states can be monitored by means of an app for monitoring system states with e-mail notification or in conjunction with a central PC.

Warnings are shown on the display or sent by e-mail.

Examples of application (pictures)

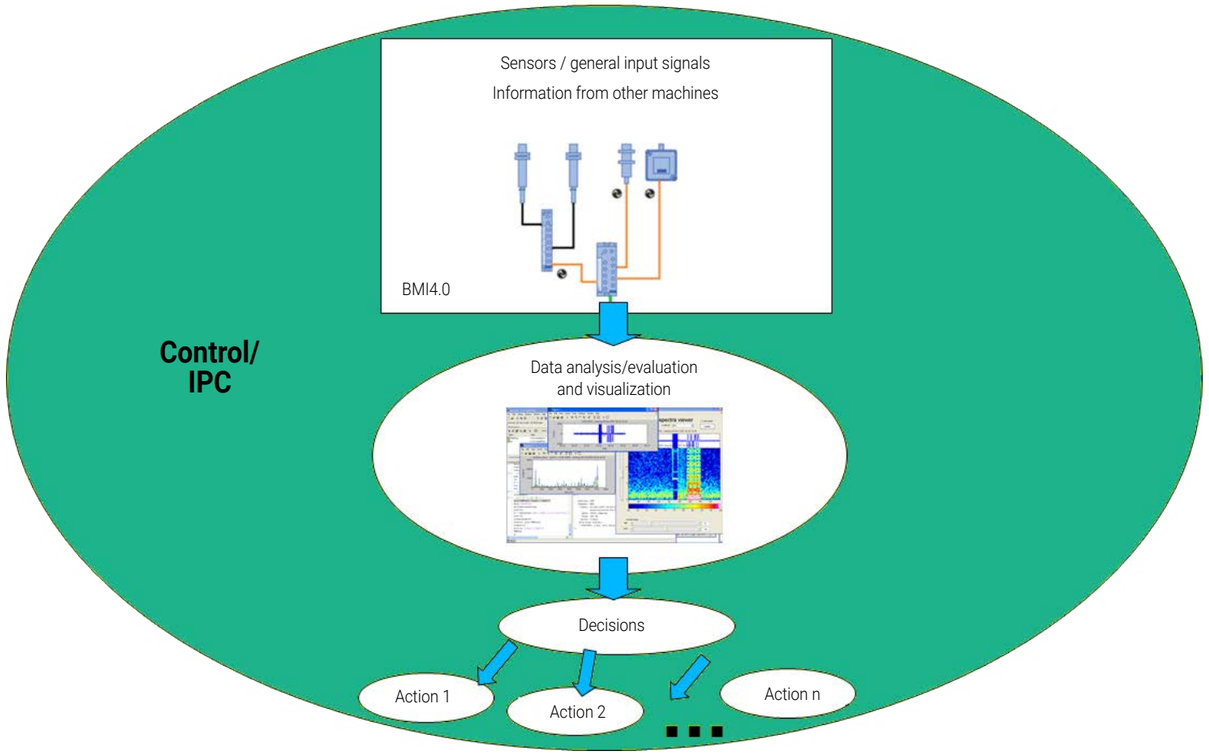
1. Robot programming in conjunction with RobotStudio: guiding of the workpiece (picture 1)
2. 3D offline programming in conjunction with KUKA robots (picture 2)
3. Monitoring of the system status with a central computer (picture 3)
4. Monitoring of the system status with e-mail monitoring (picture 4)

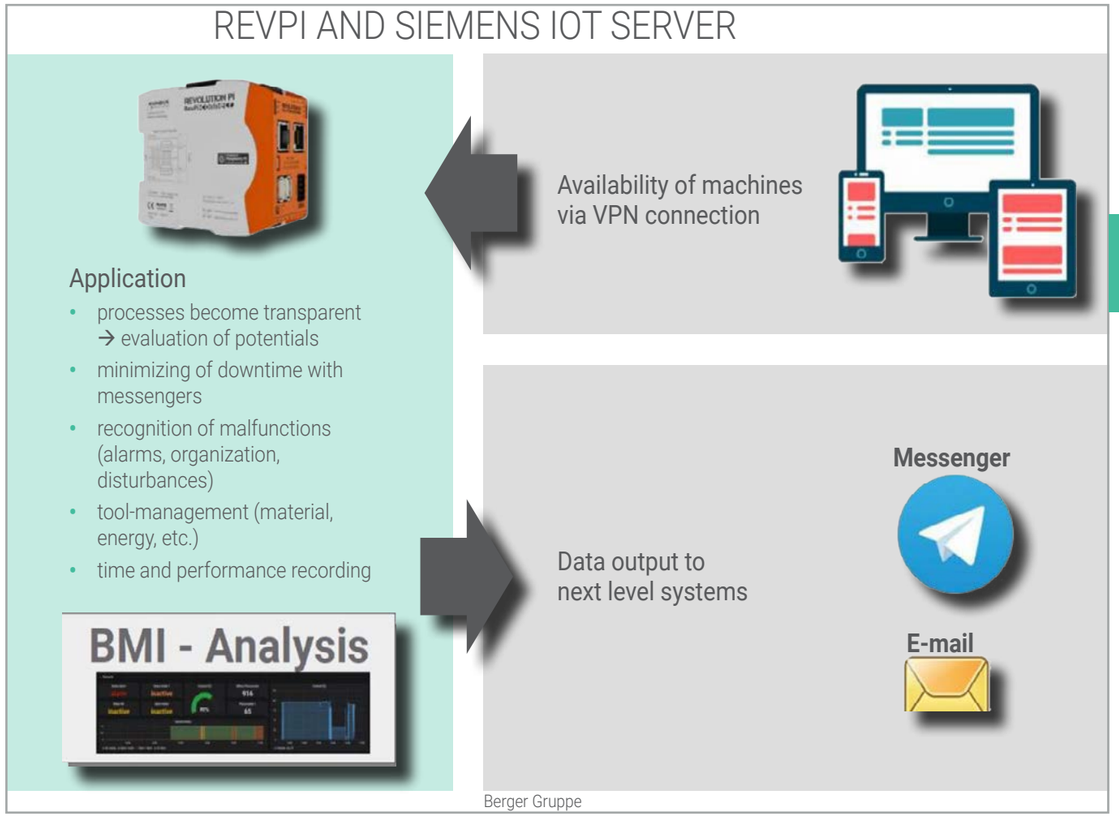
BERGER MACHINE INTERFACE 4.0

SENSOR TECHNOLOGY, DATA EVALUATION/REDUCTION AND RESOURCE CONTROL WITH ACTIONS

Functions of BMI4.0

- universal bus-based detection of sensor signals at a machine such as coolant temperatures, engine load, AE signals for spindle monitoring, air pressure and volume
- data reduction and visualization with evaluation software
- networking with IOT or company network
- programming of interfaces for individual connection to existing BDE or ERP systems with OPC server





Advantages of BMI4.0

- prerequisite for Intelligent Resource Management (IRP)
- prerequisite for preventive maintenance and real-time monitoring of the machine park
- acquisition of process data for process optimization and recognition of process dependencies
- optimization of downtimes and set-up times, thus optimal capacity planning

Industry 4.0

Robotics and KI, IO-Link system description: Sensor Signal Acquisition

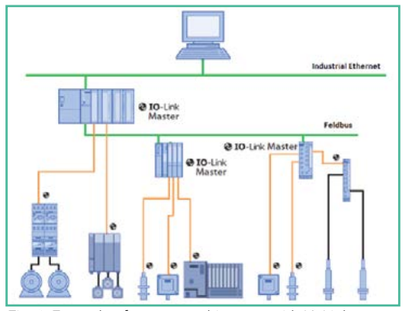


Fig. 1: Example of system architecture with IO-Link

Examplel: Berger Maschine Type RFS4/NT
Application O-Link for the detection of sensor signals

db888.dbd18	Spindle flow rate (l/min)	F	16.0000
db888.dbw4	Flow rate grinding water (%)	D	128
db888.dbd18	Temp. grinding water (°C)	F	34.0000
db888.dbd22	Temp. spindle water (°C)	F	29.7932
db888.dbd26	Total air consumption (m³)	F	4984.9510
db888.dbd38	Act. air consumption (m³/h)	F	4.3000
db888.dbd34	Temp. compressed air (°C)	F	38.6000
db888.dbd44	Temp. control cabinet	F	32.2000
db888.dbd54	Hydraulic pressure (bar)	F	0.0000
db888.dbd48	Hydraulic temperature (°C)	F	31.9000

REQUEST FOR QUOTATION

QUESTIONNAIRE FOR TECHNICAL DATA

Company	_____
Contact	_____
E-Mail	_____
Phone/Fax	_____

WORKPIECE	Workpiece			
	Lot size			
	Batch size			
	Number of types			
	Sample			
	Drawing			
PROCESSING	Contour milling	Polishing		
	Back grinding	Scalloped grinding		
	Flat grinding	Serrated grinding		
	Flat bevel grinding	Bolster Machining		
	Hollow grinding	Handle Machining		
	Glazing	Sharpening		
MACHINE	Automatic loading/unloading	central	decentralized	
	Autonomy, capacity magazine			
	Coolant system			
	Flow Control for coolant supply			
	Magnet valve for coolant flow start/stop			
	Chiller for coolant system			
	Coolant tank	single-shell	double-shell	
	Exhausting device			
	Connection	central	decentralized	
	Full enclosure			
	Safety fence			
	Tension			
	Preferences control	Andron	Bosch	Siemens
	Preferences robot	ABB	KUKA	
	Starting up	customer's site		
	Transport			
	Guarantee extension			

Please send the questionnaire to sales@bergergruppe.de.

Heinz Berger Maschinenfabrik GmbH & Co. KG
Kohlfurther Brücke 69
42349 Wuppertal, Germany
Tel. +49 (202) 24742-0
Fax +49 (202) 24742-42
info@bergergruppe.de
www.bergergruppe.de

back to content