Enables productivity and quality gains in the manufacturing processes of our customers.
Mikron Machining

Mikron Machining is the leading supplier of high performance machining systems which enable productivity and quality gains in the manufacturing processes of our customers.

Mikron’s high performance machining systems and solutions support industrial production companies in a wide variety of sectors by reducing unit costs, space requirements and staffing costs, and by increasing manufacturing quality. Mikron’s ultimate goal is to enable its customers to improve their production processes, product quality and profitability. With its gear-cutting machines and tools, Mikron, a company rooted in the Swiss culture of innovation, contributed significantly to the industrialization of Swiss watchmaking in the first half of the last century. Today, Mikron markets machining solutions for the highest precision manufacturing processes, supported by digital services and technologies. Pro-active and long-term customer services supplement the high-tech offering.

Highly productive transfer systems for the manufacturing of complex high-precision components made of metal such as turbocharger housings, injection nozzles and ballpoint pen tips.
Machining Systems

Efficient production solutions

High performance turnkey production solutions from A to Z to enable productivity and quality gains in the manufacturing processes of our customers.

With over 100 years of experience, rooted in Swiss innovation and quality culture, we are a long term process and technology partner to industry leaders. We show passion for precision and reliability in all we do.

Blank
- Cast
- Bar
- Wire
- etc.

Pre-machining
- Mikron RP-32
- Mikron TR-42
- Mikron TF-120

Loading Systems
- Pick & Place
- Robot
- Belt conveyor
- Vibrator
- Pallet

Machining
- Precise complete machining on Mikron systems
- Dedicated Mikron cutting tools

Unloading Systems
- Automatic
- Manual
- Deburring
- Washing

Customized high-performance machining solutions with:
- Loading and unloading system
- Pre-processing system
- Dedicated Mikron cutting tools

Major market segments

Application samples

ELECTRIC ELECTRONICS
- Multistar C-4
- Multistar C-4
- Multistar C-4
- Multistar C-4

AUTOMOTIVE
- Multistar C-4
- Multistar C-4
- Multistar C-4
- Multistar C-4

CONSUMER GOODS
- Multistar C-4
- Multistar C-4
- Multistar C-4
- Multistar C-4

WRITING
- Multistar C-4
- Multistar C-4
- Multistar C-4
- Multistar C-4

HYDRAULIC PNEUMATIC
- Multistar C-4
- Multistar C-4
- Multistar C-4
- Multistar C-4

PHARMA MEDICAL
- Multistar C-4
- Multistar C-4
- Multistar C-4
- Multistar C-4

INDUSTRIAL BUILDING
- Multistar C-4
- Multistar C-4
- Multistar C-4
- Multistar C-4

OTHERS
- Multistar C-4
- Multistar C-4
- Multistar C-4
- Multistar C-4
New unrivalled possibilities - The platform for dedicated easy reconfigurable machining solutions

Simple reconfiguration for a new application with an revolutionary patent pending concept.

- Distinct versatile technical features: Direct machining from the bar (turning or milling), up to 3 machining units working simultaneously at each station, multi-spindle-lathe and transfer machine capabilities in one single machining system.
- A set of diverse machining units in different sizes to serve all the requirements you might need. The machining units differ in size, number of axis, size of compatible spindles, strokes, stiffness and can be exchanged within the platform and re-used in various different configurations.
- Scalable: Start producing with a single cycle Mikron MultiX configuration and add supplementary cycles according to volume growth.
- 3 machine layouts, according to customer demand.

Save your investment for a new application

Remove the unit support box (with machining units) and reposition with highest repeatability.

The positioning repeatability and accuracy is guaranteed by zero point clamping systems under every box.

Configured for your specific needs such as:
- productivity, precision, stiffness, reconfigurability, size, cost, power...
  - Freely combine the platform elements and set up your machining solution.

» Simple reconfiguration for a new application with an revolutionary patent pending concept.
» Distinct versatile technical features: Direct machining from the bar (turning or milling), up to 3 machining units working simultaneously at each station, multi-spindle-lathe and transfer machine capabilities in one single machining system.
» A set of diverse machining units in different sizes to serve all the requirements you might need. The machining units differ in size, number of axis, size of compatible spindles, strokes, stiffness and can be exchanged within the platform and re-used in various different configurations.
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**New unrivalled possibilities - The platform for dedicated easy reconfigurable machining solutions**

2 configuration examples... of thousands of possibilities for you

**MIKRON MultiX S-24**

- **Sleeve**
  - Automotive industry
- **Nozzle body**
- **Sleeve complex**
- **Watch bracelet**
- **Injector plate**
- **Typical part size**: Ø20x60mm

**Configuration**: With focus on speed and productivity. Mainly for the high volume production of small parts.

- 24 stations
- 3-axis machining units
- Double cycle
- Rotating collets / turning units

**Application samples** for similar Mikron MultiX configurations

** typical part size**: Ø20x60mm

**CONTROL**

FANUC Series 30i, ideally suited for complex high-speed, precision machining, equipped with multiple axis and multi-path functionalities.

**MIKRON HMI - SOFTWARE**

The modular software and the Mikron HMI is designed to be extremely user-friendly and adaptable to every configuration – it makes operating, configuring and re-configuring your machine easy and efficient. Many software options lead to a constant cycle time optimization and supports you in all different stages.

- For best adaption: Standardization of mechatronic platform elements, customizable components
- For best performance: Production scheduling, temperature monitoring, reduced inactivity
- For best quality: SPC monitoring, automatic correctors management
- For highest security: System data backups

**miS 4.0 ready** Collect data, monitor machine performance as well as conditions and predict maintenance tasks.

The miS4.0 module is an IPC that collects, stores and normalizes data, allowing you to have complete overview and control of your production and machines.

- Production Monitoring
- Condition Monitoring
- Failure Analysis
- Mikron cloud and IoT platform (SAP Leonardo)

**AUTOMATIC TOOL CHANGERS**

- **ATC with 4 positions, integrated in spindle**
- **HSK-F40**
- **ATC with 8 positions on disk, in horizontal unit place embedded**
- **HSK-A40**
- **ATC with 20 positions on chain, in horizontal unit place embedded**
- **HSK-A32**
Mikron Multistar

The fastest transfer machine in the world

Case History Socket on Mikron Multistar CX-24

The challenge
- High Volume production of approx. 12 million pieces/year
- Part Dimension: Ø 2.54mm L 15mm
- Raw material (brass) supply from wire coil
- Approximately 20 operations such as turning, milling, drilling, reaming, deburring, forming, 100% extraction force measurement integrated in the process
- Tolerances: External Ø (turned) ±0.01mm, Internal Ø (reamed) ±0.01mm, length between machined surfaces ±0.02mm

The traditional solution
- Production area: 136.2 m²
- Machines: 16
- Employees: 3.2 + 3.2 + 3.2
- Cost/part
- Raw material from bar-stock

Mikron: The innovative solution
- Production area: 38.64 m²
- Machines: 1 Mikron Multistar CX-24 & 1 Mikron TF-120
- Employees: 0.5 + 0.5 + 0.5
- Cost/part
- Raw material from wire coil

Models available
- Mikron Multistar NX-24 (100% programmable)
- Mikron Multistar CX-24
- Mikron Multistar LX-24

- Workpiece size: diameter from 0.4 up to 35 mm and max. length of 60 mm
- Machine with 12 or 24 stations
- Compact construction
- Full CNC or mechanically driven versions
- Available with one, up to 4 simultaneous cycles, depending on the part complexity and the required volumes
- In single cycle output up to 150 parts/minute
- Quick and simple tool change

Typical Multistar workpieces made from steel, aluminum, brass, beryllium-bronze & copper
The new generation of transfer machines

Mikron NRG

The traditional solution

- Production area: 193 m²
- Machines: 7
- Employees: 18
- Cost/part: 5 double-spindle machining centers with motorized tools
- 2 measuring systems (100% control)
- Productivity: 750'000 pcs/year

Mikron: The innovative solution

- Production area: 127 m²
- Machines: 1 Mikron NRG
- Employees: 3
- Cost/part: Efficiency: 92%, Precision: ± 4.5 µm
- System integrated with: bar saw Mikron TB-200, robotized measuring station, palletized system, bar loader, filtration
- Productivity: 1'500'000 pcs/year

CASE HISTORY ADAPTER on Mikron NRG

The challenge

- 5 different “Adapter Plate” models. Length from 15 to 35 mm
- Material: AlMgSi starting from bar Ø 57 mm
- Operations: from 30 to 40 according to the type
- Target tolerance: ± 6 µm with Cpk 1.33
- Yearly volume: 750'000 pcs on 3 shifts

Full CNC high-precision rotary transfer machine
- Workpiece dimension: up to 80 x 80 x 80 mm and Ø 65 x 100 mm
- Compact and modular construction with 12 stations, anytime adaptable to individual production needs
- ATS (Advanced Thermal Stabilization): the temperature of all elements remains stable
- Up to 3 machining units per station
- Up to 35 machining units work simultaneously
- Up to 22 automatic tool changers (ATC) on board
- Up to 96 cutting tools on board
- Machining on 6 faces in one clamping
- Milling or drilling on one station with three units simultaneously
- Per spindle interpolation with up to 5 CNC axes
INDIVIDUAL LINKS for luxury watch bracelets

Produced from stainless steel on a Mikron VX-10 machining system, working directly from bar:

- Production rate: 8 pcs/min
- Production of different lengths from the same wire, automatically sorted

Machining on 6-sides, from bar, wire or blank

Complete machining on 6 sides

Mikron VX-10, pre-machining directly on wire or on bar stock

» Full CNC high precision rotary transfer machine with 10 or 12 workstations for the production of variable batch sizes.
» Maximum workpiece dimensions up to 40x40x80 mm (optional 40x40x160)
» Vertical table, thermostable main motor with inner cooling for maximum precision
» Table positioning: ± 2 μm
» Complete machining on 6 faces from coil, bar or blank
» 4-axis pre-machining of bar before clamping

Other possible segments: eyewear components, automobile applications, lock industry, electrical contacts, mobile phone and laptop computer components, medical applications.
Pre-machining Equipments

Mikron machining systems are designed to produce precision workpieces directly from wire coil or bar stock. However, it is often expedient to manufacture small blanks on Mikron wire processing machines to achieve a higher output rate on the transfer machines in the downstream process.

WIRE SHEARING MACHINE
Mikron TR-42/2
Mikron TR-42/4
Reliable accuracy, high production machine for straightening and shearing of wire material.

WIRE CUTTING MACHINE
Mikron TF-120
Machine for straightening and sawing of wire material.

- High productivity, up to 200 pieces/minute, according to material and size, by using 2 saws simultaneously
- High cutting accuracy, repeatability ±0.05 mm
- Possibility to cut up to 4 pieces simultaneously, depending on material and size
- Direct piece loading from the TF-120 to the Multistar
- Easy programmable machining cycles, such as cutting speed and output rate
- Straightening and sawing of wire material

WIRE CUTTING MACHINE + PRE-TURNING UNIT
Mikron TF-120 + pre-turning unit
Pre-turning operation from wire with turning head.
Mikron miTool

The next level of tool monitoring
Mikron miTool monitoring becomes crucial to avoid unexpected machine downtime, machine breakage, tool damage, material scrap and the likely issues. Surface finish and tolerances can be improved with the detection of tool wear and damaged and expensive tools can be changed before any severe damage takes place.

Mikron miTool is easy to install and customers benefit greatly in terms of efficiency and expenditure.

- Prevention of damage due to tool breakage or tool overload
- Sensorless with automated learning of load limits (Option to integrate vibration and temperature sensors)
- For turning, milling and drilling and smallest tool sizes (up to 1.5 mm diameter)
- Powerful algorithm for efficient monitoring after the first workpiece. It has a built-in learning function, allowing it to compensate for differences in processes.
- The system maximizes the service lives of both the tools and Mikron high performance machines

WHAT MAKES Mikron miTool SO SPECIAL FOR YOU
- Highest sensibility and quality of data points deliver the finest and exact monitoring curves
- Intuitive icon driven graphical interface for easiest use and monitoring by operators
- Intelligent algorithm for advanced process optimization and cutting tool wear identification
- Mikron miTool is able to storage data and history for each tool configuration and monitoring curve
- Dashboard with statistical overview for each tool allows the optimization of the entire production process
- Mikron miTool permits all modifications (set up, regulations...) without machine stop
- Automatic actions programmable for each channel e.g. save data in database, send notification, preventively stop the machine
- Perfectly integrated into Mikron high performance systems

Intelligent powerful algorithm for optimal intervals to change several cutting tools at the same time leads to higher machine efficiency and economy (less machine stops).

TOOL LIFE 10’000 PC

<table>
<thead>
<tr>
<th>Nº. of tools per day</th>
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</tr>
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<tbody>
<tr>
<td>2</td>
<td>12</td>
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100% tool wear detected in 5 days with the same tool.

TOOL LIFE 14’000 PC

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<td>8.6</td>
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70% tool wear detected in 5 days with the same tool.

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5 CUTTING TOOLS CHANGED AT 5 STOPS

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The next level of tool monitoring

Case History
Mikron miTool

on Mikron VX

The challenge
The customer produces 6.13 mio parts per year (OEE 80%) for the automobile industry on Mikron VX.

Target: Reduce tooling costs, improve part quality and increase machine efficiency.

Productivity 17.4 Pcs/min
Daily working time 1'440 min/day
Annual working days 306 days/year
OEE 80%
6'133'709 Pcs/year

CUTTING TOOL MONITORED WITH Mikron miTool STATION 5 (SEE DRAWING ABOVE):

Cutting tool costs Station 5 211.00 chf/Cutting tool

Tool wear deteriorates the part quality and can generate vibrations for the other machining units.

EXISTING / TRADITIONAL TOOL MONITORING STATION 5

TOOL LIFE 10’000 PC

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Time to change the cutting tool

| Time for tool change | Nº. of tools per day | Nº. of tools per week | Nº. of tools per year |
|----------------------|----------------------|----------------------|
| 10 minutes           | 2                    | 12                   | 613                  |
| 60 minutes           | 2                    | 12                   | 613                  |
| 2'191 minutes        | 2                    | 12                   | 613                  |

TOOL LIFE 14’000 PC

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Time to change the cutting tool

| Time for tool change | Nº. of tools per day | Nº. of tools per week | Nº. of tools per year |
|----------------------|----------------------|----------------------|
| 7 minutes            | 1.4                  | 8.6                  | 438                  |
| 43 minutes           | 1.4                  | 8.6                  | 438                  |
| 2'701 minutes        | 1.4                  | 8.6                  | 438                  |

Δ daily: -3 minutes
Δ weekly: -17 minutes
Δ yearly: -876 minutes

Approx 37,000 CHF savings / year with one cutting tool monitored (cutting tool cost:pc 211.00 CHF).
The machine is 876 min more in production.

The machine is 876 min more in production.
Mikron
Service Solutions

Flexible and modular

We ensure quick, competent and uncomplicated service and support for our customers. We work together with you to design a service solution profile tailored to your individual needs.

Technical Support – repair your machine
- Helpdesk
- Remote Diagnostics
- Augmented Connection
- Service Assignment

Service & Maintenance – prevent machine stops
- Technical Evaluation
- Preventive Maintenance
- Spindles & Groups Overhaul
- Extended Warranty
- Software Backups

miS4.0 – predict your machine maintenance
- Production Monitoring
- Condition Monitoring
- Failure Analysis
- Mikron cloud and IoT platform
- Mikron miTool – The next level of monitoring

Business Support – keep & improve machine productivity
- Process Monitoring (OEE Improvement)
- Training
- Energy Consumption
- New Applications & Simulations
- Engineering
- Interactive Troubleshooting
- Startup & Production Support
- Service Level Agreements

Spare Parts – reliable supply of original Mikron spare parts
- Original Mikron spare parts
- Xchange Modules

2nd life – guarantee continuous use of your investment
- Machine Overhaul
- Retooling
- Safety & Environments
- Updates & Upgrades
- Retrofitting

Contact your Service Center today, we gladly be of assistance.

- Production sites
  Switzerland, Agno
- Strategic partnership or presence

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