mapp CNC
mapp CNC fully integrates CNC applications into the machine control system – including synchronization with microsecond precision.

mapp CNC can be combined with programs written in C/C++, IEC 61131 languages, G-code and user-defined commands.

The preconfigured components of mapp CNC make implementing CNC technology easier than ever before.

Your benefits – mapp CNC

"Our comprehensive array of CNC functions is fully integrated in the machine control system. That frees up valuable resources to focus on innovation."

Lukas Meßner
Product Manager, mapp CNC

Reduce your costs
mapp CNC works with standard automation hardware. You can control multiple CNC axis groups using a single PLC.

Integrate your know-how
mapp CNC can be combined with programs written in C/C++, IEC 61131 languages, G-code and user-defined commands.

Unite CNC and machine control
mapp CNC fully integrates CNC applications into the machine control system – including synchronization with microsecond precision.

CNC programming has never been so easy
The preconfigured components of mapp CNC make implementing CNC technology easier than ever before.
mapp is revolutionizing the creation of software for industrial machinery and equipment. mapp components – mapps for short – are as easy to use as a smartphone app. Rather than write lines and lines of code to build a user management system, alarm system or motion control sequence from the ground up, developers of machine software simply configure the ready-made mapps with a few clicks of the mouse. Complex algorithms are easy to manage. Programmers can focus entirely on the machine process.

mapps are fully networked and can exchange data automatically using mapp Links. This lets you do things like set up an entire energy management system with a few mouse clicks:

When you add the mapp Energy component to the application, it automatically retrieves the energy data it needs from all the axes.

If a new axis or entire CNC system is added, mapp Energy automatically retrieves its energy data.

Guaranteed software quality
mapp components are created following the principles of agile software development – with a focus on quality. Automated tests can be run ahead of time during the development process using test-driven development. Tests are performed at five different levels and new tests are added all the time. Additionally, each new or modified function is developed according to the two-man rule. All of these practices contribute to guaranteed high software quality.
mapp CNC makes it easier than ever to use tools. Tool dimensions and orientation can be stored and recalled when switching tools. New tools can even be added at runtime. Tool data is used for path planning and for kinematic transformation of the tool center point (TCP).

The CNC library makes it easier than ever to develop CNC machines. Templates for CNC systems with up to six linear or orientation axes (plus additional axes) allow you to configure countless machine variants with the ease of drag and drop. And all without writing a single line of code.

The enormous range of CNC functionality is easily accessible using G-codes and M-codes (DIN 66025). Thanks to the mapp Motion interpreter, it’s also possible to execute programs in Structured Text or user-defined languages. Applications can also be created using PLCopen Part 1 / PLCopen Part 4 interfaces in all IEC 61131 languages as well as C and C++. Even programs generated automatically from CAD/CAM systems can be easily integrated.

Frames are used to define the position and orientation of coordinate systems in Cartesian space. The data can be predefined in tables or configured at runtime. This allows you to set and adjust the positioning of the machine and workpiece. Movements can be programmed relative to a processing station or tool changer.

Geometric compensation can be used to account for sources of imprecision on the machine, such as production-related tolerances, misalignments or elastic deformations. Simple configuration options for deviations in two or three dimensions can be used multiple times or in combination to achieve high precision throughout the workspace.

The tools function makes it easier than ever to use and manage tools. Tool dimensions and orientation can be stored and recalled when switching tools. New tools can even be added at runtime. Tool data is used for path planning and for kinematic transformation of the tool center point (TCP).

mapp CNC provides an integrated spindle controller that makes it easy to implement applications such as turning, drilling or threading. All the necessary functions are integrated, including constant cutting speed and feed per revolution. Positioning tasks can also be implemented using a spindle by seamlessly switching between speed and position control.

Extensive selection of CNC functions
The CNC library makes it easier than ever to develop applications and deploy them. Developers can choose from a wide range of tools for all types of CNC systems.

### Extensive selection of CNC functions

- **Flexible. Integrated. Comprehensive.**

#### Usage example: 5-axis milling

The resolution of a database is limited to coordinates using the **Spatial Database** function.

The tool function can be used to manage any number of tools.

CNC programs can be used to perform coordinates automatically from CAD/CAM systems, are transformed into CNC programs for CNC systems with up to 6 axes.

The measurement function reads the exact position of the machine head.

This allows you to set and adjust the positioning of the machine head in high-precision environments for a processing station or tool change.

- **Compressor**
  - for compressor processes kinematic twice as many as the previous tool.
  - for tool parameterisation
  - for tool parameterisation
  - for tool parameterisation

- **Function description**
  - Names and properties of all functions
  - Examples of CNC systems with up to 6 axes
  - Examples of CNC systems with up to 6 axes

- **Advantages**
  - Increased productivity
  - Safe operation
  - Intuitive jogging
  - High path precision

- **Features**
  - Patents used to define the position and orientation of complex systems: 6-axis systems
  - Torque, orientation, translation, and position control

- **Measurement**
  - Measurement function for the tool position and the tool head of the tool head of the tool head of the tool head of the tool head.
  - Tool movement can be stopped when a trigger signal occurs.

- **Special**
  - Mapp CNC provides an integrated tool path generation function that makes it easy to implement applications on different tool paths.
  - Tool paths are integrated, including constant cutting speed and feed rate.
  - Positioning tasks can be executed simultaneously, and tool paths can be accelerated with near-zero path precision.

- **Jerk-limited path planning**
  - for jerk-limited path planning
  - for jerk-limited path planning
  - for jerk-limited path planning

- **Compress**
  - for compressor processes kinematic twice as many as the previous tool.
  - for tool parameterisation
  - for tool parameterisation

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### Function description

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1TGMPCNC.00-01</td>
<td>Controller for a Cartesian mechanical system; limited to 4 path-controlled axes (including slave axes)</td>
</tr>
<tr>
<td>EC*</td>
<td>Controller for a Cartesian mechanical system</td>
</tr>
<tr>
<td>1TGMPCNCSX.00-01</td>
<td>Controller for a mechanical system with up to 4 axes; limited to 4 path-controlled axes (including slave axes)</td>
</tr>
<tr>
<td>EC*</td>
<td>Controller for a mechanical system with up to 4 axes; unlimited number of path-controlled axes</td>
</tr>
<tr>
<td>EC*</td>
<td>Controller for a mechanical system with up to 5 axes; unlimited number of path-controlled axes</td>
</tr>
<tr>
<td>EC*</td>
<td>Controller for a mechanical system with up to 6 axes; unlimited number of path-controlled axes</td>
</tr>
<tr>
<td>EC*</td>
<td>Controller for an unlimited number of axis groups; unlimited number of path-controlled axes</td>
</tr>
</tbody>
</table>

### Advantages

- Numerous functions, including:
  - Choice of programming language
  - Interfaces for PLCopen Part 1 & 4
  - High path precision with full dynamics
  - Easy installation
  - Intuitive jogging
  - Safe operation
  - Inverse kinematics
  - Consideration of all axis limits

### Additional functions

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1TGMPCNCJERK.10-01</td>
<td>Jerk-limited path planning</td>
</tr>
<tr>
<td>1TGMPCNCCDC.10-01</td>
<td>Accounts for the cutter diameter during path calculation</td>
</tr>
<tr>
<td>1TGMPCNCDCOMP.10-01</td>
<td>Smoothes the programmed contour during path calculation</td>
</tr>
<tr>
<td>1TGMPCNCWSM.10-01</td>
<td>Monitors the workspace</td>
</tr>
<tr>
<td>1TGMPCNCGEOC.10-01</td>
<td>Compensates for geometric deviations</td>
</tr>
</tbody>
</table>

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Want to learn more about a specific function? Just enter the model number listed above in the search field at [www.br-automation.com](http://www.br-automation.com). There, you’ll find manuals, downloads and more.
Integrated automation
Global presence
Solid partnership