# RobotStudio® Machining PowerPac
Increased engineering efficiency within machining applications

The RobotStudio Machining PowerPac — an add-in for RobotStudio, ABB's powerful computer-based robotics programming tool — creates and optimizes machining tool paths and reduces programming complexity and cost by improving product quality through the creation of more accurate paths.

RobotStudio is built on the ABB VirtualController, a replica of the software which runs your robots in production. It allows realistic simulations to be performed, using actual robot programs and configuration files identical to those used on the shop floor.

RobotStudio Machining PowerPac - Creating complex paths in just seconds

The Machining PowerPac is the ideal tool for programming of applications such as machining, deburring, grinding, polishing and deflashing. It can also be used with other CAD/CAM-based applications. It enables users to configure their specific application in a sequence of steps and simultaneously can move independently between these steps to adjust process parameteres accordingly. It provides several strategies to easily generate machining paths and curves on free surfaces to run the machining program, satisfying different path gene-ration requirements. The integrated postprocessor generates accurate robot paths from the CAM software and utilizes the strength of being closely integrated into the robot controller. Before finalizing the path generation, a simulation shows how the paths have been defined. In just a few steps you can create hundreds of paths with thousands of targets feeding your individual machining solution.
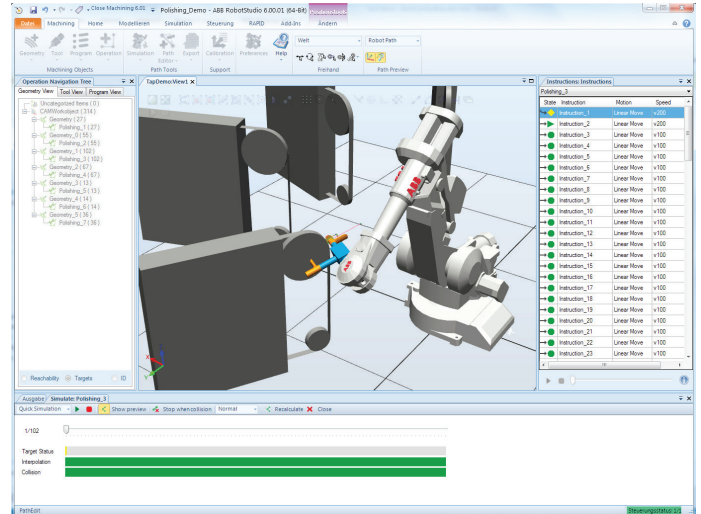
CAM converter functionality

The Machining PowePac converts CNC machine code to RAPID, where both the parsing rule and convert rule can be customized to match different machine setups. It fully sup-ports 5-axis APT/ISO standard G-Code which is also exten-dable via templates. Multiple strategies can be applied when calculating the target configuration of the imported CNC code. Users can also verify and modify the robot path offline before exporting to RAPID. The user interface design follows CAM style, and reflects the CAM engineer's background. It is easy to use with minimum requirements.

Path and target optimization

Using the Maching PowerPac you can generate precise robot paths instead of teaching and dynamically previewing the path and targets needed to follow either the surface or edge of an imported CAD model or imported CNC code. You can also optimize TCP speed, acceleration or axis settings to gain cycle time. The target robot configuration for a path has be-come more time-efficient and recommends the ideal orienta-tion to optimize the reachability of targets. Path optimization analyzes robot path for collision, singularity, wrist flips, etc. and has powerful parameters to correct these challenges. For more machining-related parameters, you can easily change the machining speed, the contact point and the different machining angles of targets along a path.

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Tool geometry creation

The software makes it easy to create corresponding machining tools of different shapes for either side or face machining. The integrated tool library contains templates to start machining and enables the management of individual tool settings.

Path and target editing

The PowerPac has a graphic instruction view that can be used to edit existing paths and targets or create new instructions. Positions of several targets can be adjusted based on reference position to obtain a smooth position change between targets. You also can specify different tool contact points and tool axis interpolation in one path to avoid collisions and smoothly change the contact point or tool axis between targets. The instruction view can be used to step between targets, making it easy to edit and simulate the created paths. In general, the instruction view is a very powerful and useful tool for offline programming.

In control of the process and non-process parameters

There are different machining templates provided in this PowerPac, supporting both position-controlled and force-controlled machining processes. All of the parameters included in these templates can be customized by the user based on different application requirements, and they can be easily re-used. Even non-process moves like approach, depart or direct transfer movements can easily be maintained and re-used.

Extended tool life time and improved path accuracy

The different path strategies increase the tool life time by machining with a tool area instead of a single point and cover also different tool contact point for different processes. As the targets and paths are automatically generated from the surfaces and edges of a CAD model, a consistent and accurate result can be achieved independent of user skills. The software will automatically create a sufficient number of targets in a path to make sure the path precisely matches the machining surface or edge.

Seamless integration

The Machining PowerPac is fully integrated into RobotStudio. All the existing tools and features of the software are available for use. The complete robot program can be downloaded to a robot controller. This is a unique feature of the virtual robot technology, a technique only available from ABB. This PowerPac supports the traditional position control processes and force-controlled processes-i.e. programs generated in Machining PowerPac work seamless with RobotWare Machining Force Control, ABB's software for force-controlled machining.

Features

– Path generation
  – Select free surface or edge to be machined
  – Set machining process parameters
  – Pre-defined path generation strategies and patterns
  – Flexible tool contact points
  – Set path and target parameters
  – Tool axis control and interpolation
  – Flexible transfer path strategies
– CAM Converter
  – Convert CAM G-code to robot RAPID language
  – Support G-code ISO 6983, DIN 66025 and APT-CL
– Path optimization and modification
  – Powerful and flexible path editor
  – Path analysis for collision, singularity etc.
– Path simulation
  – Preview and collision check
  – Quick simulation
  – Precise Virtual Controller simulation
– Program export as RAPID or RobotWare Machining Force Control
– Calibration
– Pre-defined and configurable machining templates
– Check/heal CAD models

Requirements

– RobotStudio 6.01 or higher
– Microsoft Windows 7
– Recommended hardware (selected features, see full list in manual)
  – CPU: 2.0 GHz Intel Pentium 4 or faster processor
  – Memory: min 2 GB RAM recommended
  – Available disk space: 5+ GB on the system disk,
  – 250+ MB on the installation disk

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