Delcam

Advanced
Manufacturing
Solutions

PartMaker 2011

PartMaker 2011

Important User Notices

Acknowledgements

This documentation references a number of registered trademarks and these are the property of their respective owners. For example, Microsoft and Windows are either registered trademarks or trademarks of Microsoft Corporation in the United States.

Patents

PartMaker software is subject to the following patents:

Patent granted: US 6, 112, 133 Visual system and method for generating a CNC program for machining parts with planar and curvilinear surfaces

Patent granted: US 6, 741, 905 Visual system for programming of simultaneous and synchronous machining operations on lathes

PartMaker 2011. Published on 21 December 2010

Contents

Introduction

PartMaker is the world's leading CAM system for automating the programming of multi-axis Turn-Mill centers and Swiss-type lathes.

PartMaker automates the tedious task of manual part programming by providing an easy-to-use graphical interface and powerful tools and features.

With PartMaker you can quickly define part geometry, cycle, tool, and material information, and all other parameters associated with machining a part. What's more, you can also save frequently used tool, cycle, and material information in a database to recall and reuse at any time.

Acquired by Delcam plc in 2006, PartMaker Inc. is a wholly owned subsidiary of Delcam plc. the world's leading developer and supplier of complete CAD/CAM software solutions.

About this guide

Use this guide to find out about:

- PartMaker system requirements (see page 2)
- What's new in PartMaker 2011 (see page 4)
- Accessing help and support (see page 20)

System requirements

This section lists the minimum, and the recommended, system requirements for PartMaker 2010 and higher.

Make sure the computer at least meets the *minimum system requirements* (see page 3) before you install PartMaker. However, to achieve optimal performance, the computer should meet the *recommended system requirements* (see page 2).

The following operating systems are supported:

- Windows XP

- Windows Vista

- Windows 7 (use of Window 7 64-bit versions are recommended)

Recommended requirements

The recommended system requirements for PartMaker are:

	Standard PartMaker	Parasolid Import Module (Solids)	Full Machine Simulation (FMS)	Surface Machining Wizard (SMW)	PowerMILL Companion*
Processor	Pentium 3 800 MHz or higher	Pentium 3 800 MHz or higher	Pentium 4 3 GHz or higher	Intel Core Duo processor or higher	Intel Core 2 Duo P8600 or higher
Memory speed	512 MB or more	1 GB or more	2 GB or more	4 GB or more	4 GB or more
Hard drive	40 GB	40 GB	40 GB	80 GB	120 GB
Independent video card	128 MB NVIDIA	128 MB NVIDIA	512 MB NVIDIA	1 GB NVIDIA	1 GB NVIDIA

* Processor must support SSE2 Instruction Set for PowerMILL Companion.

Minimum requirements

The minimum system requirements for PartMaker are:

	Standard PartMaker	Parasolid Import Module (Solids)	Full Machine Simulation (FMS)	Surface Machining Wizard (SMW)	PowerMILL Companion*
Processor	Pentium 3 800 Mhz	Pentium 3 800 Mhz	Pentium 4 2 GHz	Pentium 4 3 GHz	Pentium 4 3 GHz
Memory speed	512 MB	512 MB	1 GB	2 GB	2 GB
Hard drive	20 GB	40 GB	40 GB	40 GB	40 GB
Independent video card	128 MB	128 MB	256 MB	512 MB	512 MB

* Processor must support SSE2 Instruction Set for PowerMILL Companion.

What's New in PartMaker 2011

PartMaker 2011 offers all of the original features of PartMaker 2010-SP1, but with numerous improvements.

Installation

PartMaker 2011 includes several enhancements to the way in which PartMaker is installed on a standalone PC or on a network.

Changes to the installation process

Key changes to the installation process are as follows:

- You can select the language used on the Installation wizard's screens. The wizard also installs a localized version of PartMaker, if this is available for the language you selected.
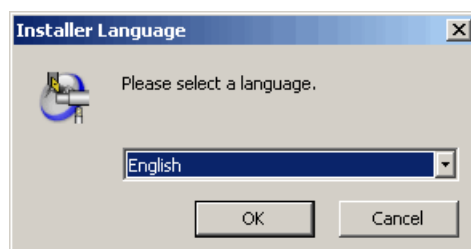
- PartMaker now uses different folders for the PartMaker application files and your User Files (such as .JOB files). By default, the application files are installed to:

  - C:\Program Files\Delcam\PartMaker_2011 for 32-bit computers

  - C:\Program Files (x86)\Delcam\PartMaker_2011 for 64-bit computers

  The default folder for User Files is C:\Partmaker.

However, you can specify different folders during the installation process if you wish:
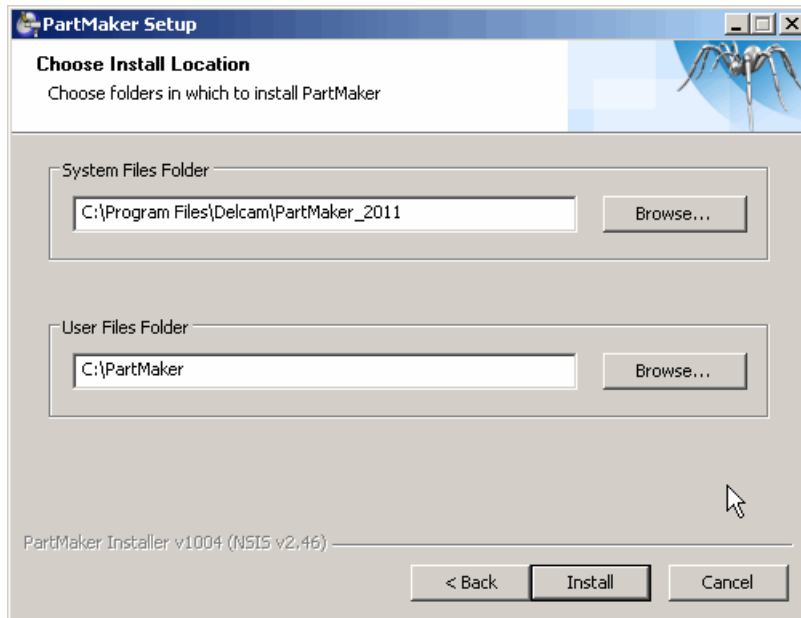
- Delcam Exchange, Delcam's CAD translation software and viewer, is now installed as part of the installation. To find out more about this product, see the Delcam Exchange website (http://www.ps-exchange.com/).

Network installations

PartMaker 2011 provides a new network implementation of PartMaker that uses the standard Delcam method of product licensing. The product is licensed, using a combination of a dongle (which plugs into a USB or parallel port on the computer) and a Product Authorization File (PAF), which you install onto the computer.

Using a PAF-protected version of PartMaker offers several advantages, including the ability to download updates for PartMaker and any licensed post processors from within the PartMaker application.

A separate network installation (PartMaker v2011-**H)** is available for existing network installations that use NetHASP licensing.

> *The installation folders for PartMaker 2011-H remain the same as for 2010-H,; that is, both system and user files are installed into **C:\PartMaker.***

Users of Pro/E and AutoDesk Inventor View

Instructions on how to set up these applications for use with PartMaker 2011 are now provided on the PartMaker installation CD, as described in *Working with solids* (see page 12).

Using Bar-Fed Mill machines with PartMaker

PartMaker/Turn-Mill 2011 offers the ability to program parts for machining on Bar-Fed Mill (BFM) machines. These machines are usually equipped with a Bar Feeder, a Tool Head and a Tool Changer and are a popular choice for companies producing small, complex parts.

Instead of a sub-spindle, BFM machines have a work-holding device that is capable of various orientations. PartMaker users familiar terms to describe these work-holding devices; namely, collet, chuck and vise.

To support programming of a BFM, the **Spindle Settings** dialog has been changed so you can now specify a **Machine Type** of **Turn-Mil**l or **Bar-Fed Mill**:

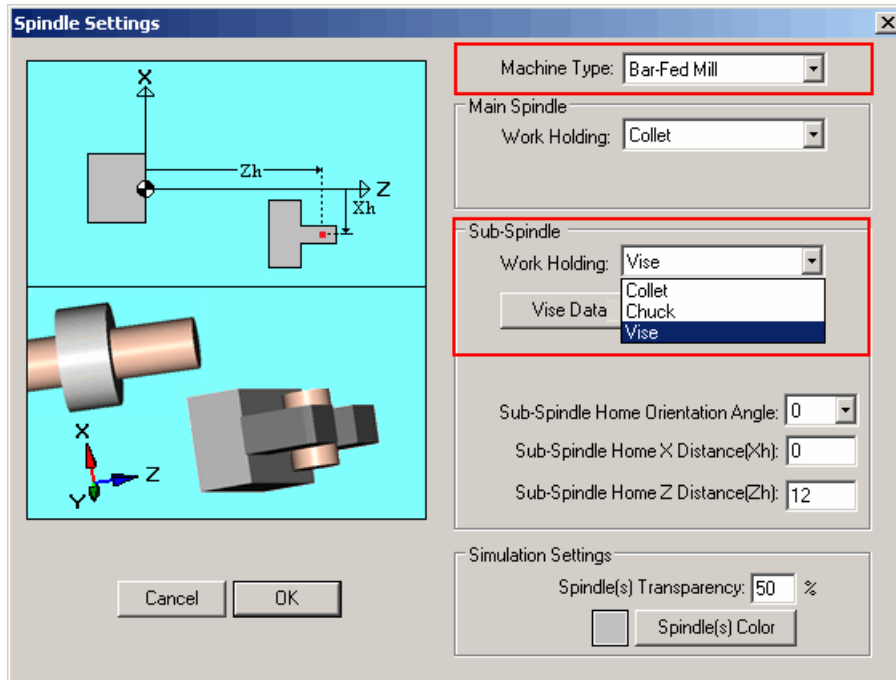## Machine Type of Turn-Mill

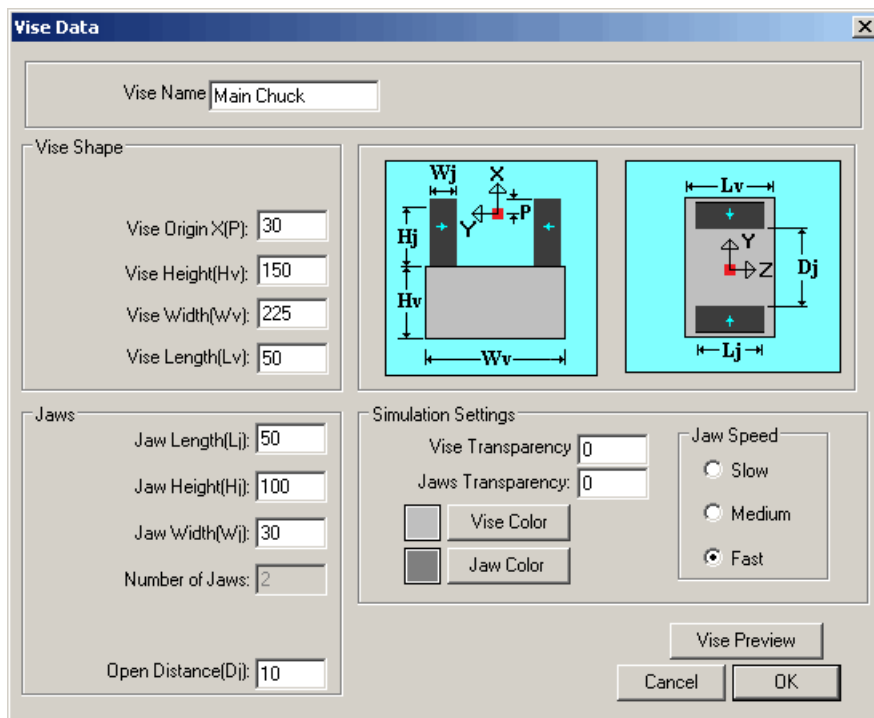- Work Holding allowed on either spindle is **Collet** or **Chuck:**
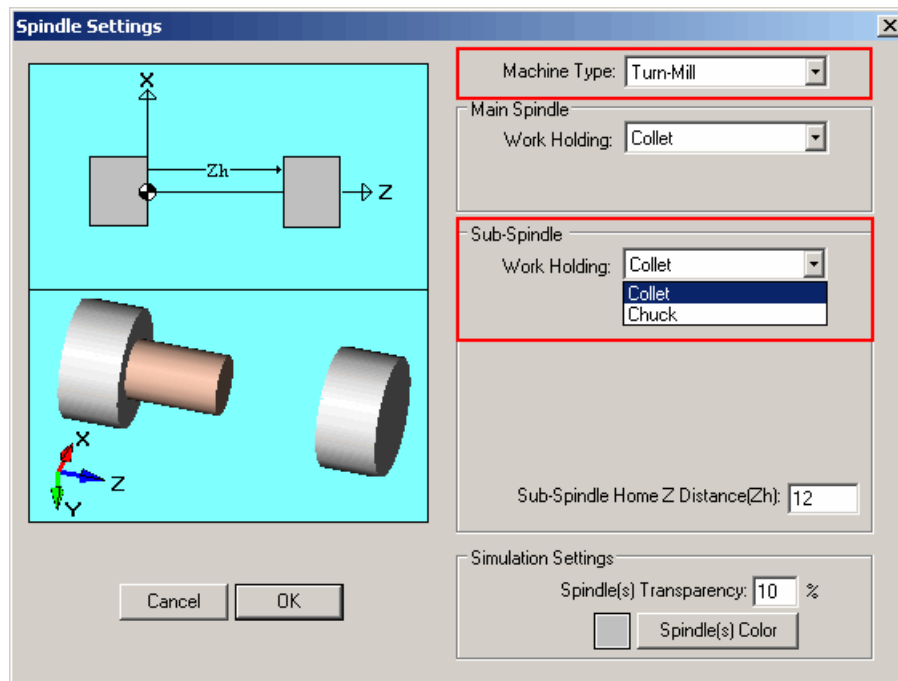
Machine Type of Bar-Fed Mill

▪ Work Holding allowed on the Main spindle is **Collet** or **Chuck**. Work Holding allowed on the Sub- spindle is **Collet, Chuck** or **Vise:**

▪ When you click the **Vise Data** button on the **Spindle Settings** dialog, the **Vise Data** dialog is displayed:

- When a **Vise** is selected as the sub-spindle Work Holding, an icon appears in **Setup** dialog to the right of the **Settings** button for all sub-spindle faces. For example:
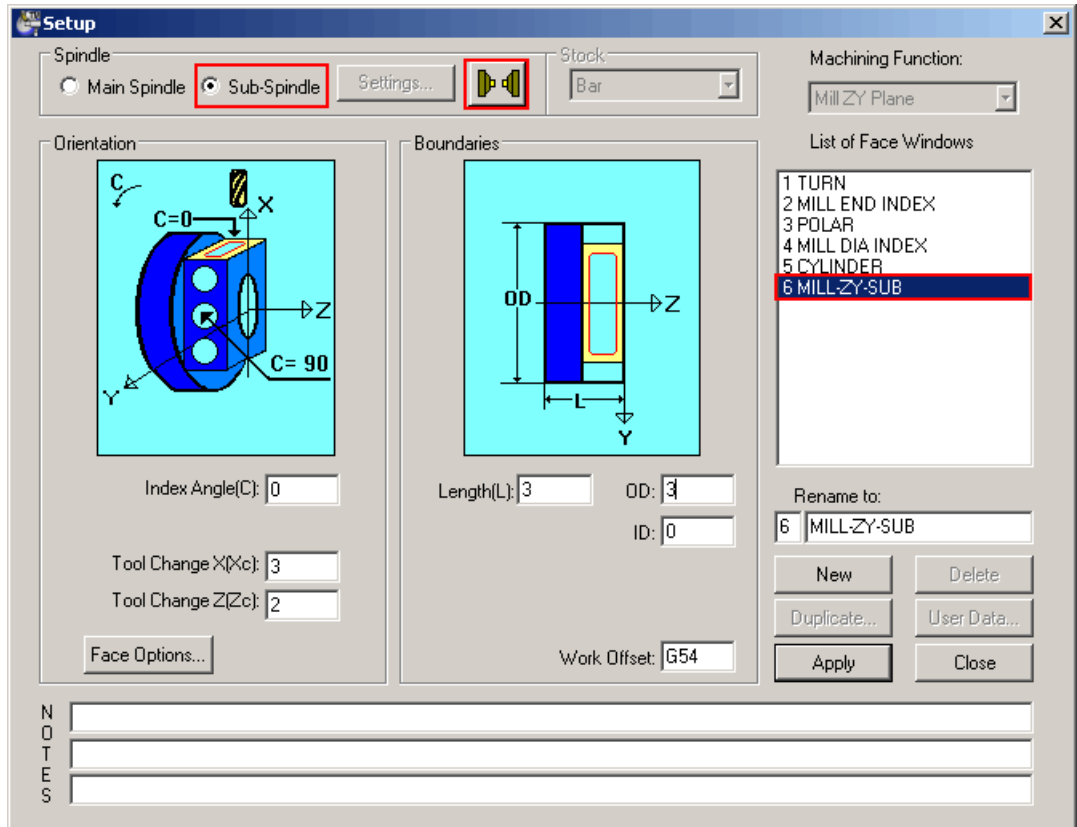
- Clicking this icon displays the **Sub-Spindle Machining Position** dialog. Use this dialog to enter the distance between spindles during machining (**Machining Distance (W)**), as well as the **Sub-Spindle Orientation Angle** of 0 or 90 degrees:
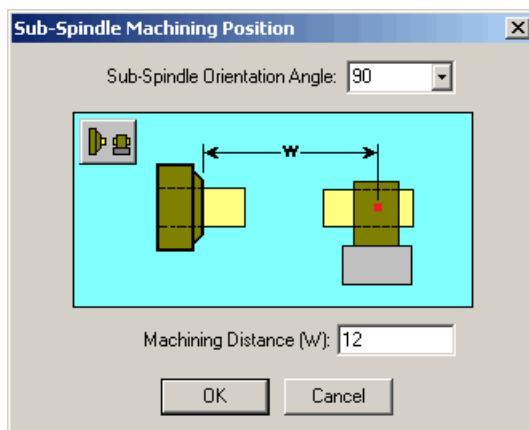
- Additional options to configure Full Machine Simulation (FMS) for BFM machines are available in the **Sub-Spindle Properties** dialog for users creating FMS kits.

Tool enhancements

PartMaker 2011 includes several enhancements to tools.

Improved tool management with a master tools database

PartMaker 2011 introduces a Master Tools Database file. This enables your company to manage its tool inventory in a single file, which is saved as a comma-separated values (.CSV) file. Using an external database program, such as Microsoft Excel, employees who are not familiar with PartMaker can easily manage your tool inventory, if required.

You must license the Advanced Tools module to use this feature.

Once your Master Tools Database file is set up, you can quickly import tools from this file into a PartMaker Tool Data file (**.TDB**), before you start programming a part. Similarly, if you create new tools in PartMaker you can easily export these tools from PartMaker into the Master Tools Database file. To manage the transfer of tool data between files, use the new **Manage Tools Files** dialog:
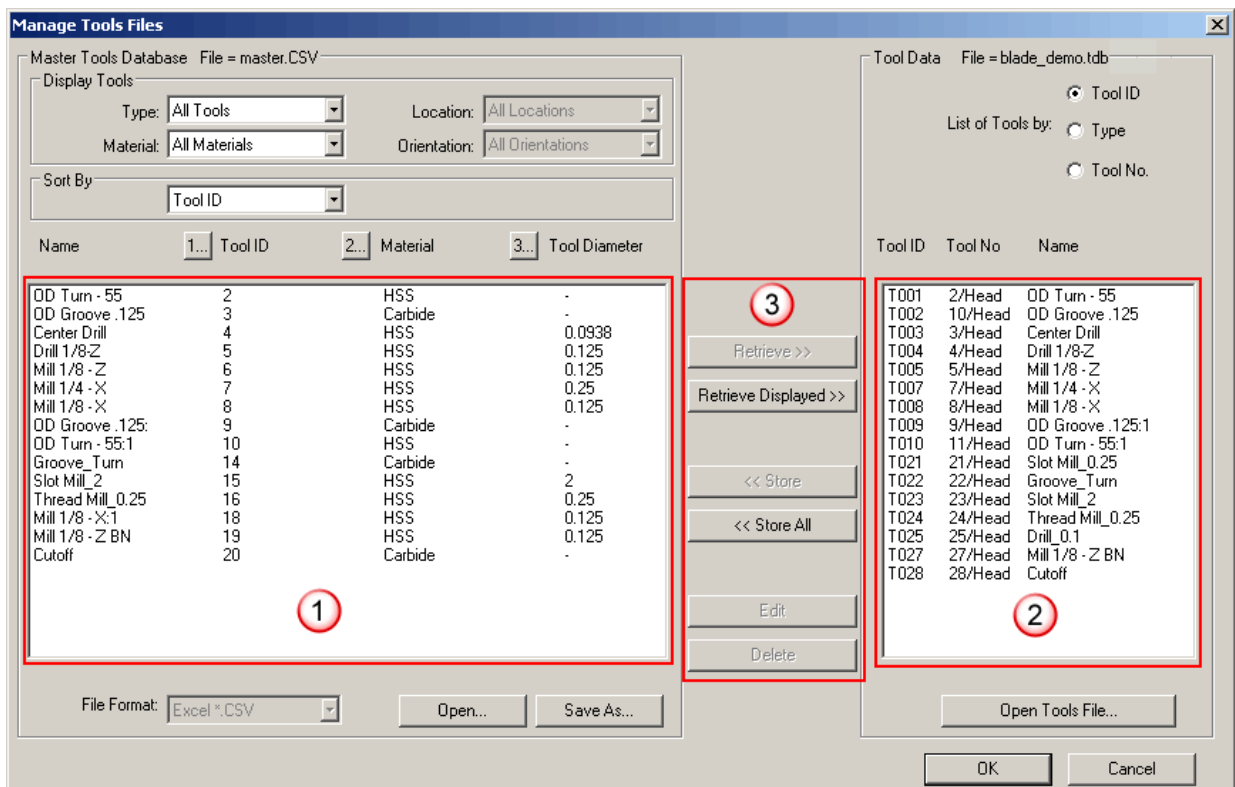

① Displays tools stored in the Master Tools Database file.

② Displays tools stored in the PartMaker Tools Data file.

③ Use the buttons on the dialog to transfer tools between files.

Specifying a programmable tool inclination

In PartMaker/SwissCAM and PartMaker/Turn-Mill, you can now specify a programmable tool inclination for live, fixed-angle tools for machines that do not have an articulated Tool Head. Such tools can be used on Turn-Mill or Swiss machines.

The new options for specifying a programmable tool inclination are on the **Tool Properties** dialog. The values you specify are used in Full Machine Simulation and post processing
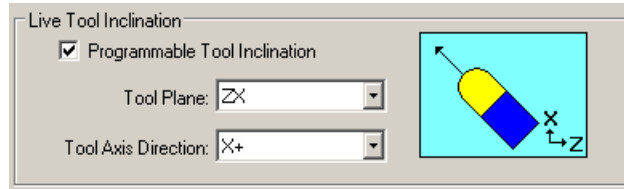
More tools provided as standard

In PartMaker 2011 the following tools are provided as standard:

- Slot Mill
- Dove Tail
- Corner Rounding
- Thread Mill

Previously, these tools required a license for the Advanced Tools module.

Setup sheets

Setup sheets are used to provide specific instructions for operators who run generated NC programs on machines. In PartMaker, setup sheets are created in HTML format (using a Setup Sheet template) and can be printed out or viewed online.

Setup sheets are not available in PartMaker/WireEDM.

PartMaker 2011 includes several enhancements to Setup sheets.

Include mid-processing cutting pictures in Setup sheets

If you are using a Setup Sheet template that supports mid-process cutting pictures, you can use the **Part View** options on the **Generate Setup Sheet** dialog to include pictures of the part being machined at each step in the machining process.

> The default template, *PRS_process_pictures.html*, provided with your PartMaker installation, includes support for mid-process cutting pictures.

Including mid-process pictures shows exactly how the part should be machined and so can reduce setup time and reduce the possibility of errors.

You can choose whether to display the cutting pictures in Standard or Isometric views, with or without toolpaths shown. The following example shows cutting pictures in Standard view, with no toolpaths shown:

Setup sheet templates

PartMaker 2011 includes several new Setup Sheet templates, as well as improvements to existing templates.

PartMaker 2011 includes several new Setup Sheet parameters for use in templates. These are:

```
{work-shift}
{material-file-name}
{collet-nose-ext}
{process-id}
{work-offset-main}
{work-offset-sub}{work-shift}
{material-file-name}
{collet-nose-ext}
{process-id}
{work-offset-main}
{work-offset-sub}
{part-picture}
```

Working with solids

PartMaker allows you to import a solid 3D model of a part. Once a model has been imported you can extract geometry from the model and/or program directly on the solid model itself.

To import solid models into PartMaker you must have licensed the Solids Import module.

PartMaker 2011 includes the following enhancements for working with solid models:

- A new option on the **Solids Options** dialog allows you to choose whether you want to view the profiles and holes from all Face windows on the solid model, or whether you want to view only those profiles and holes from the active Face window:

If you choose to view profiles and holes from all Face windows on the solid model, clicking on a profile or hole on a solid model makes the Face window in which the profile or hole is programmed the active window. It also makes the work group containing the profile or hole the current work group.

- A new option on the **Toolpath Verification** dialog allows you to specify whether you want to verify every toolpath in every Face windows, or only those in the active Face window:
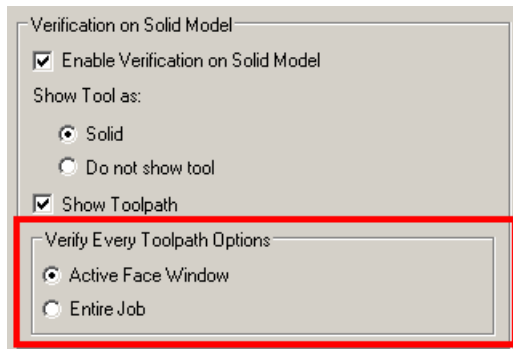
- PartMaker 2011 is now compatible with the following types of files:

  - SolidWorks 2011

  - Parasolid v23.0

  - ProE/Wildfire-5

- PartMaker 2011 uses a new configuration procedure to complete the installation of the Pro/E import module. This procedure is documented in the \PM-Common\Documents\proe_installation_instructions.doc file, which is installed in your PartMaker User Files folder.

- PartMaker 2011 no longer provides AutoDesk Inventor View on the PartMaker CD. Users of AutoDesk Inventor View need to follow the download instructions in the \PM-Common\Documents\Read_Inventor_Installation.txt file, which is installed in your PartMaker User Files folder.

Working with notes and dimensions

Notes and dimensions provide a useful way of annotating geometry when working in CAD model. PartMaker 2011 includes several enhancements to the way in which you can use notes and dimensions:

- Ability to use **user-defined fonts for notes and dimensions** added in CAD mode:
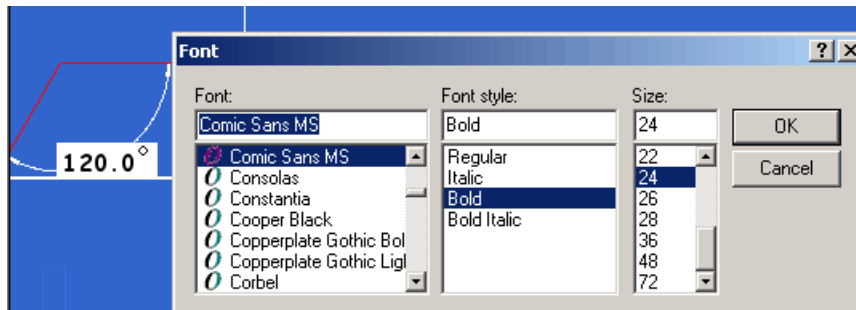
- Ability to **view notes and/or dimensions in CAM mode**, as well as in CAD mode:
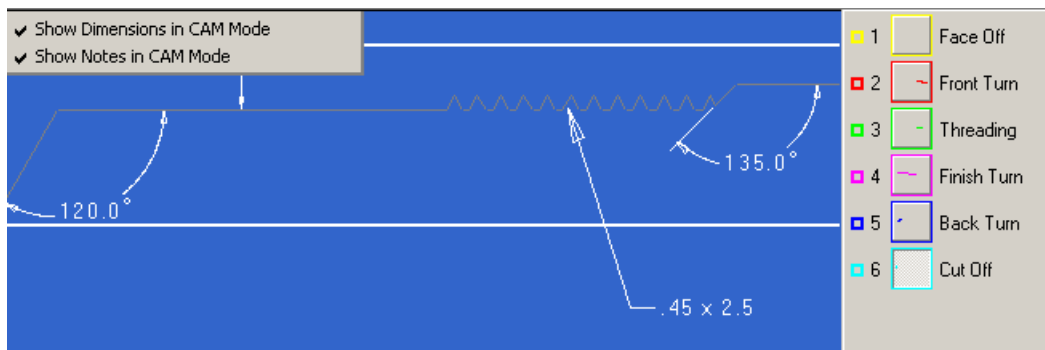
- Ability to **convert notes into profiles for engraving** in PartMaker/SwissCAM, PartMaker/Turn-Mill and PartMaker/Mill by creating a note (see 1), selecting a menu option (see 2) so that PartMaker creates a profile and adds it to the current profile group (see 3):

Simulation

PartMaker's simulation features allow you to visualize the part you have programmed being machined, so you can identify any errors before the part is machined.

PartMaker 2011 includes the following enhancements to simulation:
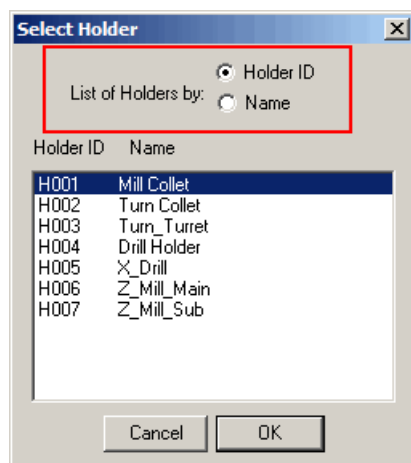
- Quicker simulation for complex 4-axis and 5-axis milling.

- Simulation of Pinch Milling in M2S0 mode is now available in Basic, Advanced and Full Simulation.

- Ability to sort holders alphabetically when selecting holders for a Full Machine Simulation file:

Programming sub-spindle faces using Mill ZY Plane

PartMaker 2011 changes the way in which sub-spindle faces are handled when programming in a **Mill ZY Plane**, so that 2D geometry, profiles and holes are mirrored with respect to the Z-Axis (the signs of Y coordinates are inverted). PartMaker automatically applies this behavior when you transfer geometry from a solid model or when you program directly on a solid model.

This change resolves a discrepancy in earlier versions of PartMaker, where a toolpath appeared on one side of a profile in the 2D Face window and on the other side of the profile in the Solids window.

As a result of this change, toolpaths created in earlier versions of PartMaker will change as follows when used in PartMaker 2011:

- Arc directions are reversed (for example, clockwise to counter-clockwise).

- Tool positions change sides (for example a tool position of Left becomes Right).

When you open an old job file (created prior to PartMaker 2011) containing a sub-spindle face programmed using the Mill ZY Plane in PartMaker 2011, PartMaker displays a message informing you that the job file will be converted to use the new programming behavior.

Please check all sub-spindle Mill ZY toolpaths to ensure that the conversion follows your desired tool motion.

Once a job file has been converted, do not use that file with earlier versions of PartMaker.

Surface Machining Wizard (SMW)

The Surface Machining Wizard (SMW) implements toolpath machining strategies for milling free-shape surfaces. It is an optional module that can be licensed for PartMaker/Mill, PartMaker/Turn-Mill and PartMaker/SwissCAM.

PartMaker 2011 includes the following enhancements to the Software Machining Wizard (SMW):

- New **Surface Swarf Finishing strategy** added, which allows the swarfing of selected surfaces without the need to create swarf profiles:
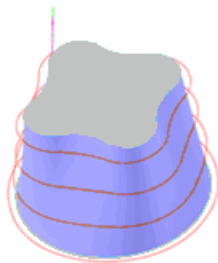
- Quicker calculation time for very long surface machining toolpaths.

PartMaker/PowerMILL interface

PRODUCT>'s interface to PowerMILL allows you to import toolpaths programmed in PowerMILL directly into PartMaker, so you can take advantage of PowerMILL's complex machining strategies within PartMaker.

PartMaker 2011 includes the following enhancements to the PartMaker/PowerMILL interface:

- Improved performance, including faster simulation and faster import of toolpaths.

- Toolpaths that have not been fully calculated in PowerMILL are no longer imported into PartMaker.

- Improved zooming when using the PowerMILL Viewing style, so its behavior matches the zoom feature in PowerMILL.

- New pictures of cutting strategies on the **PowerMILL Toolpath Group Parameters** dialogs.

- PartMaker 2011 is compatible with projects created in PowerMILL v2011 and lower versions.

General improvements

PartMaker 2011 contains the following general improvements:

- Numbers are now displayed with up to eight decimal places for improved precision.

- New **Optional Pass** option on **Profile Group Parameters** dialog for pockets:
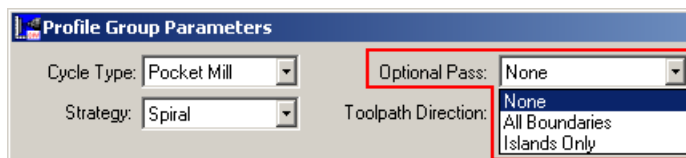
- Improvements to the toolpath calculations for:

  - Rough Turning toolpath when using different X and Z Finish allowances.

  - Turning toolpaths with a **Cycle Type** of **Contouring** for profile curves containing small fillets when the **Corner Rounding** option is not selected in the **Defaults for Turning** dialog. A small fillet is defined as an arc, where the radius is less than [Tool Nose Radius + Finish Allowance].

- Milling toolpaths with a **Cycle Type** of **Contour Mill**, where the profile curves contain small fillets when the **Corner Rounding** option is not selected in the **Defaults for Milling** dialog. A small fillet is defined as an arc where the radius is less than [Half of Tool Diameter + Finish Allowance].

- Additional import and export options for improved compatibility with other CAD/CAM systems:

  - New **File > Import > DWG File** option to import AutoCAD Drawing (.DWG) files.

  - New **File > Export > DGK File** option to export a solid model to .DGK format, which is suitable for use with other Delcam applications.

  - **File > Import > STEP File** option is now available as standard to customers who have licensed the Solids Import module, and does not require separate licensing.

- Various improvements to the user interface, including new product icons and an updated look-and-feel for the help that is consistent with other Delcam products.

ConfigPost

PartMaker uses Post files to convert processes in the Process Table into NC program code. Using ConfigPost you can create and save custom Post files.

ConfigPost 2011 includes the following enhancements:

Reserved words

The following reserved words have been added:

- `<cut-off-sub-grip-z>`
- `<first-face-use>`
- `<inclined-tool-region>`
- `<sub-spindle-distance>`
- `<sub-spindle-orient>`
- `<total-c-angle>`

Refer to the ConfigPost online help for more information about any of these reserved words.

General Information, Mill dialog

Some of the values for the **5-Axis Simultaneous Milling** drop-down list box on the **General Information. Mill** dialog have changed as follows:

- **(X,Y) Before C-Angle Rotation** is now **(X,Y,Z) in Rotating Coordinate System**

- **(X,Y) After C-Angle Rotation** is now **(X,Y,Z) in Machine Coordinate System**

Help and support

If you are a new PartMaker user, you may want to use the following resources to help you get started:

- Help and documentation (see page 20).

- Training (see page 20).

If you experience any problems when installing or using PartMaker, contact technical support (see page 21).

If you require any modifications to the Distribution Post files you have licensed, refer to the Post Processor modification policy (see page 22).

Help and documentation

To help you get started, PartMaker is supplied with a comprehensive online Reference Help, which you can access from the **Help** menu. Further documentation is also provided on the PartMaker Documentation CD.

You can also download documentation from the Delcam Customer Downloads Center (http://updates.delcam.com/login.php), as described in *Technical support for PartMaker* (see page 21).

Training for PartMaker and ConfigPost

A wide variety of PartMaker and ConfigPost training programs are available from PartMaker, Inc., Delcam plc and their sales agents. For details of the training provided by:

- PartMaker, Inc, see the Training section of the PartMaker website (http://www.partmaker.com/general/training.asp.).

- Delcam plc, see the Training section of the Delcam website (http://www.delcam.com/general/about.training.asp).

- Delcam plc sales agents, contact your sales agent directly. The Delcam website contains a list of sales agents and their contact details (http://www.delcam.com/general/about/resellers.asp).

Technical support for PartMaker

Customers with an annual maintenance agreement can obtain technical support for PartMaker. This support may be provided by phone, email or by accessing technical support information available on the Internet.

Before contacting technical support, please refer to the documentation and help supplied with PartMaker to see if you can find information to solve your query.

Internet support

You can also access software releases, documentation, technical notes and videos from the Delcam Customer Downloads Center (http://updates.delcam.com/login.php).

Phone and email support

If you are unable to resolve your query, make sure you do the following before contacting technical support:

- You know the name and version of the PartMaker product you are using.

- You are able to describe the problem in detail. You may find it useful to document exactly what happened.

- If possible, be sure you can reproduce the problem. A support technician may ask you do this while you are on the phone.

- Be prepared to submit job (.job), tools (.tdb), cycles (.cdb) and Post Configuration files (.pst and .sub), as well as sample NC programs as attachments to an email message Always try to zip your files using the WinZip program to make it easier and quicker to send the files by email.

    *PartMaker will automatically zip the files if you use the **Help- > Technical Support** option within PartMaker and select the **Send Files** button.*

To contact your local provider of technical support:

- For PartMaker, Inc in the United States, email support@partmaker.com or phone 215-643-5077.

- For Delcam plc in the United Kingdom, email support@delcam.com or call 0121 683 1010.

- For other countries, contact your local sales agent. Contact details for Delcam sales agents are available on the Delcam website (http://www.delcam.com/general/about/resellers.asp).

PartMaker post processor modification policy

To request modifications to a post processor (Post) file supplied with PartMaker, contact technical support (see page 21) to request a Post Modification Request (PMR) form. You should then complete the form with details of the modification(s) you require.

Modifications to post processor (Post) files fall into the following categories:

- **Error Correction**: Technical support is provided to correct any error in post processor output reported on a Post Modification Request (PMR) form by customers with a current maintenance agreement.

    An error is defined as any post processor output (or lack thereof) that causes the machine to alarm or output that does not machine the part correctly, as shown by PartMaker's simulation and verification features. This work is provided, without charge, to customers with an annual maintenance agreements. Error corrections take priority over other types of PMRs.

- **General functionality improvements**: These are changes that improve the overall functionality of the Post file for all PartMaker users, not just a single customer. Functionality improvements add functionality to a post processor to complete areas of a machine-specific addendum that have not yet been implemented, but are supported by the machine and are available in PartMaker's user interface. For example:

    - A specific machining function face window.

    - A specific canned cycle.

    - A specific synchronous mode of operation.

    - A specific material control process.

     *Support of user-specific attachments does **not** fall into the category of general functionality improvements.*

  General functionality improvements requested on a PMR form by customers with a current maintenance agreement are provided free of charge.

- **Tailoring to user-specific requirements**: Tailoring (or "tweaking") post processor output to user-specific requirements applies to fully functional, correctly working post processors. Modifications in this category reflect your specific programming preferences, which are usually related to the style or format of the output being produced.

  Delcam encourages customers to use ConfigPost (ConfigPost/Lite should be sufficient in most cases) to make user-tailored modifications on their own. Customers who are unfamiliar with ConfigPost/Lite should arrange for training in how to use this program. Technical support that provides advice on how customers can make such changes using ConfigPost/Lite is provided to customers with a current annual maintenance agreement who have received training in how to use ConfigPost/Lite.

- **Post processor customization by PartMaker, Inc**: Post processor modifications that do not fall into any of the categories above are classified as post processor customization. These are usually extensive changes that cannot be expressed using a PMR. Adding accessories, such as a robot arm or a measuring probe, could require a customized post processor. If you want PartMaker, Inc. to create a customized post processor, contact your sales agent with details of your requirements to obtain a cost estimate for the work. Any customization work is scheduled based on the urgency of the request and availability of personnel.
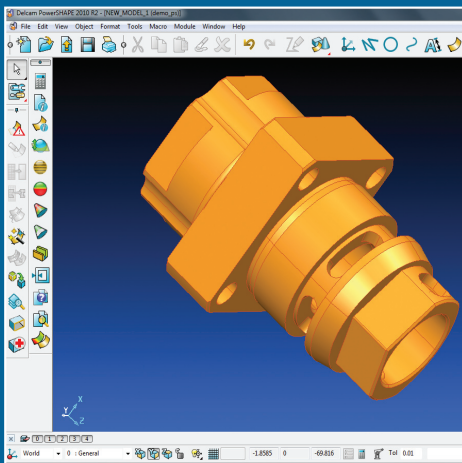
PartMaker 2011
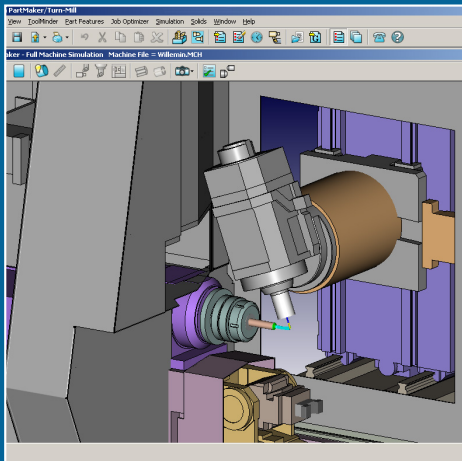
PartMaker 2011
New Functionality

Delcam TV
http://delcam.tv

PowerSHAPE Companion
for PartMaker 2011

PartMaker Website
http://partmaker.com

THE QUEEN'S AWARDS
FOR ENTERPRISE:
INNOVATION
2010

Powering your productivity