



Predator Virtual CNC™ v5.1 – What's New

Latest features and benefits in v5.1

Before Installing v5.1

Microsoft Internet Explorer v5.x or later is required to be installed before installing Predator Virtual CNC v5.1.

Backup everything; especially your data and any customized reverse posts you have been using. v5.1 is backwards compatible with v5.0, v4.x and previous v3.x releases.

NOTE: Normally no changes to existing reverse posts are required. However, v5.1 of Predator Virtual CNC fixes a bug which may require a slight change to some reverse posts. The bug fix is for 5 axis VMCs with dual rotary tables, which had the 4th and 5th axis rotary table register definitions backwards within the reverse post. Simply swap the Move4Axis and Move5Axis register definitions within your reverse post.

Why v5.1?

By design, this release is intended to improve compatibility with a greater range of CNC controls and fix a few bugs. Details of what's new are explained throughout this document and within the online help.

Installing v5.1

If you are running Windows 98 or NT v4.0, and Microsoft's Install Services has never been installed, v5.1 will do this automatically at the very beginning. This will require a re-boot prior to completing the installation of Predator Virtual CNC.

NOTE: Installing Predator Virtual CNC v5.1 on the Windows NT v4.0 platform requires service pack 6 to be installed.

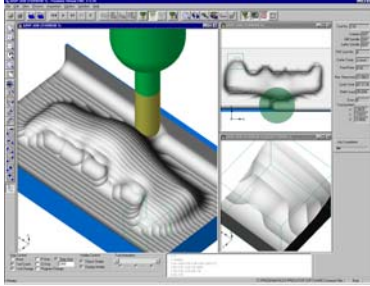
By default installation occurs in the \program files\predator software\virtual cnc 5.1 directory. If you were previously running v5.0 we recommend uninstalling v5.0 prior to installing v5.1.

Predator Virtual CNC v5.1 by default will also install Predator Editor v6.1. If the Predator Editor v6.1 is already installed it will not appear during the install.

© 1994 – 2004 Predator Software Inc. All rights reserved.

THIS IS A LIVING DOCUMENT. The information contained in this document represents the current view of Predator Software Inc. on the issues discussed as of the date of publication. Because Predator Software Inc. must respond to changing market conditions, it should not be interpreted to be a commitment on the part of Predator Software Inc., and Predator Software Inc. cannot guarantee the accuracy of any information presented after the date of publication.

Predator Virtual CNC



Network Installations of v5.1

By committing to store the product installation on a server, users will enjoy automatic healing of all critical files upon running Predator Virtual CNC. For example, suppose a user accidentally deletes pvcnc.exe. Under normal circumstances he would be down and the software would fail to run. With v5.1 when the user double clicks the desktop shortcut all critical files are checked and if necessary restored from the network server and the software begins to run automatically.

The easiest way to perform a network installation is to step through the following:

1. Copy the contents of the \virtualcnc directory on the CD to a \setup\vcnc 5.1\ or similar directory.
2. Run the setup.exe from the \setup\vcnc 5.1\ directory.

NOTE: Should any automatic healing be necessary, Predator Virtual CNC will be able to automatically extract the necessary files from the appropriate cab files stored in the \setup\vcnc 5.1\ directory. If you install from a CD, Predator Virtual CNC will be forced to prompt for the CD.

What's New in v5.1?

New! Predator CNC Editor v6.1

V6.1 adds 40+ popular requests made by our users and fix a few bugs.

NOTE: A 6-page document detailing the 40+ new features and enhancements is available upon request. A summary of the 40+ new features is available in the What's New section within the online help of the Predator CNC Editor.

New! Complex Lathe Cycles support

A new function keyword has been added to support complex profiles within lathe cycles. Refer to the following .RPL examples:

```
"G71",multi@4      :      TurnCycle (Horizontal Box_Strategy Pocket)
"G72",multi@4      :      TurnCycle (Horizontal Box_Strategy)
```

NOTE: The G72 does not have the pocket function keyword, which disables support for complex profiles. The G71 has the additional pocket function keyword, which enables support for complex profiles. Just like CNC controls that support complex profiles, Predator Virtual CNC offsets the profile and does not provide full collision detection.

New! Setup Sheet HTML

A new Setup Sheet HTML command has been added to the File menu. This command is identical to the Export HTML command within the File menu. We have duplicated it in an effort to transition customers to using the Setup Sheet HTML option exclusively. This allows us to eliminate the old non-configurable setup sheet command with the release of v6.0 of the Predator Virtual CNC.



New! Predator CNC Editor Integration

The Predator CNC Editor is now more accessible within Predator Virtual CNC. At any time the Predator CNC Editor can be launched with the current CNC program by selecting CNC Program... from the Edit menu or by clicking the CNC Program toolbar button. The current line will be automatically highlighted within the Predator CNC Editor. Finally, a new Edit button has been added within the Machine properties dialog. Clicking the new Edit button will automatically launch the Predator CNC Editor with the machine's current reverse post processor.

New! Ramp style Cutter Compensation

Support for engaging cutter compensation in a 3D linear ramp move is now supported.

New! Modal Heidenhain Cutter Compensation

Support for modal style Heidenhain cutter compensation has been added. This option can be enabled with the following parameters:

```
CYCLE_PARAM_STYLE=HEIDENHAIN  
CUTTERCOMP_STYLE=MODELESS
```

New! Lathe Tool Nose Compensation

Support for Fanuc style tool nose compensation for lathes has been added. Just like with milling, the offset values are specified with D1=0.1 within the diameter section of the machine tab. Existing lathe reverse posts have the typical G40, G41 and G42 codes set to be ignored. To take advantage of the new lathe cutter compensation review each reverse post and remove the G40, G41, G42 from the ignore section of the reverse post and add the following:

```
$CUTTERCOMP:#20  
"G40" : CutterCompCancel  
"G41" : CutterCompLeft  
"G42" : CutterCompRight
```

New! Configurable Cutter Compensation Move

A new configurable cutter compensation parameter to control tool motion with external corners has been added. This parameter should match the appropriate tool motion on the CNC. For Example:

```
[PARAMETERS]  
CutterComp_Connect=Standard  
CutterComp_Connect=Round
```

NOTE: The above parameter is supported for milling and turning.

New! Cutter Compensation Look Ahead

New look ahead checking for cutter compensation has been added. Like a CNC, Predator Virtual CNC will display an error message when processing if the compensated move gouges the part profile. Like most CNCs, this look ahead check is limited to two moves and does not provide unlimited look ahead.

New! Mitsubishi style Sub Call with Rotation

A new function keyword has been added to the reverse post to support sub program calls with a rotation angle parameter. The specified angle will rotate the sub during the sub call. Refer to the following .RPM examples:

```
"G22",multi@21      :      SubProgramCallAndRotation      ; Mitsubishi style
```

Pattern 21 should look like the following:

```
@21:#0
"L",int              :      r_subprogram_number
"\0"                 :      separator
"H",int              :      r_subprogram_gotoline
"\0"                 :      separator
"I",real             :      r_rot_center_X
"\0"                 :      separator
"J",real             :      r_rot_center_y
"\0"                 :      separator
"K",real             :      r_real_ignore
"\0"                 :      separator
"P",int              :      r_subprogram_times
```

New! Absolute Zero Programming

A new function keyword has been added to the reverse post to support absolute zero programming. This is typically a G50 or G92. Refer to the following .RPL examples:

```
"G50",multi@17      :      ChangeProgramOrigin      ; Fanuc style
```

Pattern 17 should look like the following:

```
@17:#0
"X",real             :      r_pos_X
"\0"                 :      separator
"Z",real             :      r_pos_Z
"\0"                 :      separator
"U",real             :      r_pos_U
"\0"                 :      separator
"W",real             :      r_pos_V
```

New! Modal Macro Call Parameter

A new parameter has been added to support CNCs, such as the Fadal, which calls a Modal Macro on the same line as the G66. Fanuc calls the Modal Macro on the following line. This new parameter allows both styles to be supported. This option can be enabled with the following parameters:

```
MACRO_MODAL_CALL=INCLUDE_DEF      ; Fadal style
MACRO_MODAL_CALL=EXCLUDE_DEF      ; Fanuc style
```

New! Work Offset Parameter

A new parameter has been added to support multiple styles of work offset coordinates. Most CNCs specify work offset coordinates from the machine datum. But some CNCs support work offset coordinates from the programming datum. This new parameter allows both styles to be supported. These options can be enabled with the following parameters:

```
WORK_OFFSET=MACHINE_DATUM           ; Fanuc style
WORK_OFFSET=PROGRAMMING              ; Bridgeport & Anilam style
```

New! Cycle Parameter

A new parameter has been added to support multiple methods of behavior when returning from a canned cycle. The Feed option will always return from the cycle in a feed state. The Rapid option will always return from the cycle in a rapid state. The Modal option will honor the state the CNC was in, prior to calling the cycle. These options can be enabled with the following parameters:

```
CYCLE_RETURN=FEED
CYCLE_RETURN=RAPID
CYCLE_RETURN=MODAL                   ; Fanuc style
```

New! Threading Registers

Two new incremental threading registers have been added. These options can be enabled within the pattern section of the reverse post:

```
"U",real      :      r_thread_pos_u      ; Haas style
"W",real      :      r_thread_pos_v
```

New! Seimens Support

Support for several new Seimens functions for translation, rotation and scaling. Several new registers and keywords have been added. These options can be enabled within the pattern section of the reverse post:

```
"X",real      :      r_rot_angle_x       ; Seimens style
"Y",real      :      r_rot_angle_y
"Z",real      :      r_rot_angle_z
"X",real      :      r_scale_factor_x    ; Seimens style
"Y",real      :      r_scale_factor_y
"Z",real      :      r_scale_factor_z
```

In addition, the following new keywords have been added

```
"ATRANS",mult@27 :      TranslateInc     ; Seimens style
"AROT",mult@28   :      RotationInc      ; Seimens style
"ASCALE",mult@29 :      ScaleInc         ; Seimens style
```

New! Multiple Spindle Parameter

A new configurable parameter can optionally be enabled to support of duplicate tool numbers provided they are assigned to different spindles. This parameter should match the appropriate setup on the CNC machine. For Example:

```
[PARAMETERS]
LoadTool_From_Spindle=ON           ; Enabled Duplicate T Numbers
LoadTool_From_Spindle=OFF         ; Default
```

New! Syntax Checking

Several additional syntax checks have been added to catch common typos. For example, double decimal points, double negative signs, double positive signs and combinations of the above per register are now verified with Predator Virtual CNC.

New! Multiple Spindle Support

Several new keywords have been added to load and stop multiple spindles. For example:

```
$TOOLCHANGE:#20
"M26"           :      LoadTool2           ; 2nd Spindle
"M36"           :      LoadTool3           ; 3rd Spindle
"G46"           :      LoadTool4           ; 4th Spindle

$MISCELLANEOUS:#11
"M25"           :      SpindleStop2        ; 2nd Spindle
"M35"           :      SpindleStop3        ; 3rd Spindle
"G42"           :      SpindleStop4        ; 4th Spindle
```

New! Head Attachments and Complex Machine Support

Several new keywords have been added to dynamically add attachments such as right angle heads. In addition, this functionality can be used to support complex machines. For example:

```
[PARAMETERS]
MCH_FILE=5axis_KGK_WRAH.MCH       ; With Right Angle Head

$MISCELLANEOUS:#11
"M155"           :      LoadMachine        ; Switch to 2nd Machine
"M156"           :      RestoreMachine     ; Restores 1st Machine
```

Enhanced! Tool Numbers

Improved the processing of tool numbers so they inherit a higher internal priority than diameter registers even if the user defines them to be the same priority.

Enhanced! Feed Rates with Lathe Cycles

Support for feed rates within lathe canned cycles have been improved.

Enhanced! Temporary Licensing

Temporary licensing has been improved to show the number of days remaining in the status bar.

Enhanced! Heidenhain style Radius and Chamfer Moves

Support for Heidenhain style radius and chamfer motion when combined with cutter compensation has been added.

Enhanced! Unigraphics APTCL Support

Support for Unigraphics ATPCL files has been improved with an updated reverse post. Additional support for tool definitions, scanning of tools, and 4 & 5 axis positioning has been added. The following new parameter option has been added.

CYCLE_PARAMS_STYLE=Unigraphics ; Unigraphics style APTCL

Enhanced! Animation

Improved the performance of running Animation at the fastest speed. In addition, we improved machining vertical walls with Animation's fastest speed. Collision detection has been improved to eliminate extremely subtle view dependencies. Finally, 4 and 5 axis simultaneous Animation has been improved when tool shanks and tool holders are used.

Enhanced! Solid

Improved the display of very detailed solid stock and cut models. An example would be a thin sheet metal stock with a series of punched holes. STL Compare from a solid model has been improved with better image quality. In addition, the default Automatic Sub-Division calculations have been improved for enhanced visualization of solid models. Finally, several new options defined within the Edit Preferences allow Solid models to have Default, Improved and Best image quality. The default option is the standard image quality that Predator Virtual CNC has traditionally offered. The new options for Improved and Best are 2x and 4x better than the default option. Improved image quality does require 2x and 4x more memory and will result in slower rendering times.

Enhanced! Turbo

STL Compare from a turbo model has been improved with better image quality.

Enhanced! Deep Zoom

STL Compare from a deep zoom view has been improved with better image quality.

Enhanced! Machine Definitions

Standardized all the numeric values within the machine definition to be relative from the machine datum. This includes rotary axis pivot points, travel limits, spindle gauge values, tool change positions, and tool home positions. Finally, Predator Virtual CNC now supports 4 and 5 axis initial rotary angles within the machine definitions.

Enhanced! Rewind Button

The rewind button now supports the initial rotary angles within the machine definitions. The rewind button has also been enhanced to support CNC programs with a Predator Header.

Enhanced! Programmable Offsets

Improved programmable offsets, typically a G10, to support incremental values. In addition, support for using a G10 to load global offsets such as a G53 is now supported.

Enhanced! Preferences

All preferences are now stored within the registry. Multiple users can now have their own preferences for background color and numerous other defaults. This eliminates the need for CONFIG.INI, NSEE2000.INI and RGB.DAT files. In addition, the Solid model dialog has several new options to control the display quality. These new options are Default, Improved and Best. The default option is the standard image quality that Predator Virtual CNC has traditionally offered. The new options for Improved and Best are 2x and 4x better than the default option. Improved image quality does require 2x and 4x more memory and will result in slower rendering times.

Enhanced! Machine Preview

The machine properties dialog's preview area has been improved with a new green tool change icon. This icon shows the tool change position relative to the other important machine definitions. In addition, the machine datum is now shown with a black M. These new machine preview icons will simplify creating and editing machines within Predator Virtual CNC. Finally, the spindle text has been updated from sp0 to sp1 for the first spindle. The additional spindle texts have been updated from sp1 to sp2, sp2 to sp3 and sp3 to sp4.

Enhanced! HTML based Online Help

Updated online help by expanding several topics with new details.

Enhanced! STL Compare

The option Show Design has been improved to support offset values. The STL Compare has been improved to support the new configurable image quality options. A bug was fixed that was reporting intermittent gouge and excess areas. Overall image quality has been improved when there are dramatic differences between designed and machined. Extremely excessive areas within STL Compare are now displayed in a blue color.

Enhanced! STL Export

When exporting a Solid model the coarse and fine options have been improved to output a watertight STL file.

Enhanced! STLFix

The utility STLFix has been improved to be easier to use with several new menus, shortcut keys and toolbar buttons that are identical to Predator Virtual CNC. Improvements include a new Close command, Zoom Fit toolbar buttons, Zoom Window toolbar buttons, etc. In addition, STLFix has been improved to support rotation about the X, Y and Z axis. Finally, the background color has changed from black to a pale green.

Enhanced! STL Stock and Fixture Preview

The stock and fixture preview tab has been improved to support STL rotations and location changes.

Enhanced! CNC Panel

Read only CNC programs are now supported within the CNC panel. In addition, programs with the Predator Header are automatically recognized during initial display. Finally, a bug within the CNC panel when multiple CNC programs per job has been fixed.

Enhanced! Heidenhain Slot Cycles

Predator Virtual CNC will automatically display a warning if the tool diameter is significantly smaller than the diameter of a Heidenhain slot cycle.

Enhanced! Inspection

The size of the inspection dialog is now adjustable. In addition, point selection has been improved when feature recognition is unchecked. Predator Virtual CNC will automatically default the filter selection to the Surface option after feature recognition is disabled.

Enhanced! Machine Properties

The Check Table tab has been enhanced to be more intelligent based on the machine type and the Moving Parts tab. Finally, read only machine definitions are now supported.

Enhanced! External Sub Program Calls

The performance of processing external sub program calls is exponentially faster than previous releases.

Enhanced! SAV Files

The use of SAV files has been improved with a new preview option within the Open Job dialog. A bug introduced with v4.1 and the use of SAV files has also been fixed.

Enhanced! Circular Interpolation

Circular Interpolation has been improved to support X, Y, and Z values with 5 digits are specified after the decimal point. A bug with circular interpolation with horizontal machining centers has been fixed.

Enhanced! Sequence Numbers

Support for sequence numbers has been improved when duplicate sequence numbers within different sub programs are called. A new parameter has been added:

Enhanced! 4 and 5 Axis Support

Support for 4 and 5 axis programming with multiple construction views has been added. On a Fanuc compatible CNC this is typically done with G68 and G69 codes.

NOTE: This method of CNC programming does not require the user to specify T codes within the job.

Enhanced! Reverse Posts

Extensive improvements to all of the included reverse posts to improve functionality and readability, reduce technical problems, and improve the overall ease of use. For example, improved tool changes, tool home, work offsets, and canned cycles.

Enhanced! Expression Support

Supporting expressions within a reverse post processor is now easier and requires less typing. Previously the expression keyword required the multistrictord keyword to also be specified. Within v5.1 of Predator Virtual CNC the expression keyword can be used stand-alone and automatically applies the multistrictord functionality. For example:

```
"X",expression          :      MoveX
```

Enhanced! Installation

Improved uninstall process to insure that all example machines and reverse posts are not uninstalled. These files become customer data once initially installed.

NOTE: During an install v5.1 of Predator Virtual CNC will not overwrite any existing example machines and reverse posts. These files become customer data once initially installed.

Enhanced! Upgrade Dialog

The upgrade dialog automatically strips spaces and tabs for serial #s and access #s.

Bug Fix! Inspection and Predator CNC Editor

Fixed a bug with launching the Predator CNC Editor from within the Inspection dialog.

Bug Fix! Scrolling with Complex Jobs

Fixed a bug with scrolling CNC code when the JOB had two or more CNC programs.

Bug Fix! Lathe Radius and Chamfer Moves

Fixed a bug with lathe radius and chamfer moves within a G1, linear move.

Bug Fix! Lathe Threading

Fixed a bug with G76 style threading.

Bug Fix! Lathe Cycle

Fixed a bug with G94 style lathe cycles.

Bug Fix! Backplot

Fixed a bug with occasionally displaying double arcs one on top of another.

Bug Fix! Surfcam INC support

Fixed two bugs with Surfcam's part edge style programming when machining full arcs and arc to arc profiles. Fixed an intermittent bug with transferring the tool height for chamfer tools. Finally a bug machining ID threads from Surfcam's INC files has been fixed.

Bug Fix! Mastercam C-Hook

Fixed a bug with the Mastercam C-Hook and Predator Virtual CNC's revision checking for newer NCI files.

Bug Fix! Machine Properties

Fixed a bug with saving the X- spindle direction within the machine properties.

Bug Fix! Lathe Holder and Insert Depth

Fixed a bug with lathe holders and insert depths with large diameter parts. The depth for lathe holders and inserts are now a fixed percentage of the holder width.

Bug Fix! Dual Rotary Tables

Fixed a bug with 5 axis VMCs with dual rotary tables, which had the 4th and 5th axis rotary table register definitions backwards within the reverse post.

Bug Fix! Export CADL

Fixed a bug with exporting CADL files from lathe jobs. In addition a bug with user specified paths has been fixed.

Bug Fix! Export SURFCAM INC

Fixed a bug with exporting SURFCAM INC files.

Bug Fix! Export MASTERCAM NCI

Fixed a bug with exporting Mastercam NCI files.

Bug Fix! Cutter Compensation in the NC Panel

Fixed a bug with displaying the status when canceling diameter compensation in the NC panel.

For the latest on Predator Virtual CNC, check our web site at

<http://www.predator-software.com>