



Predator Virtual CNC™ v5.0 – What's New

Latest features and benefits in v5.0

Before Installing v5.0

Microsoft Internet Explorer v5.x or later is required to be installed before installing Predator Virtual CNC v5.0.

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

Why v5.0?

By design, this release is intended to improve our machine simulation and compatibility with a greater range of CNC controls. Along the way we have added 50+ new features. Details of what's new are explained throughout this document and within the online help.

Installing v5.0

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

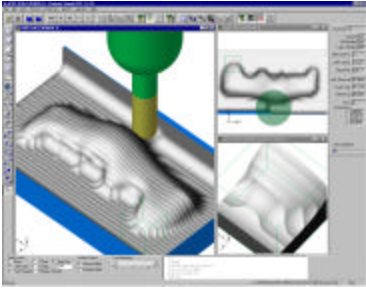
By default installation occurs in the \program files\predator software\virtual cnc 5.0 directory. If you were previously running v4.1 we recommend uninstalling v4.1 prior to installing v5.0.

Predator Virtual CNC v5.0 by default will also install Predator Editor v6.0. If the Predator Editor v6.0 is already installed it will not appear during the install.

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Predator Virtual CNC



Network Installations of v5.0

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 v5.0 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 5.0\ or similar directory.
2. Run the setup.exe from the \setup\vcnc 5.0\ 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 5.0\ directory. If you install from a CD, Predator Virtual CNC will be forced to prompt for the CD.

What's New in v5.0?

New! Predator CNC Editor v6.0

All new redesign, Predator Editor v6.0 breaks new ground with over 50 new features vs. v5.2 while improving its ease of use. In addition it is the first version to share technology with Predator Virtual CNC. Major new features include:

- Color highlighting for G & M codes
- Right mouse menus
- Unlimited file size support
- Faster performance
- Improved editing features
- Improved file compare
- Improved 3D backplotting
- New 3D verification

NOTE: A 10-page document detailing the 50+ new features is available upon request. A summary of the 50+ new features is available in the Whats New section within the online help of the Predator CNC Editor.

New! Reverse Post Directory

Within the Preferences dialog the reverse post directory can now be configured. A single set of reverse posts can be accessed on a network server by multiple Virtual CNC users.

NOTE: CNC translators or the legacy MCF and LCF files will no longer be displayed when selecting a reverse post and are officially no longer support by Predator Virtual CNC. Continued advances within Predator Virtual CNC made supporting legacy MCF and LCF files impossible. If you are running Virtual CNC v3.x or are upgrading from

Nsee then select one or more of the 150 supplied reverse posts or contact your local reseller or Predator Software to develop a new reverse post. Reverse posts provide more G & M code support than any CNC translator ever did and are user configurable.

NOTE: By default the reverse post directory is the following:

c:\program files\predator software\command files\rport 5.0\

In addition, the Predator CNC Editor uses the reverse post directory.

New! Temporary Licensing Option

An all-new option for temporary licensing via a network card is now available. Support for multiple network cards within a single PC and multiple products via a network card license is also standard. Finally, support for a network card license and a SIM license on the same PC is also available. Temporary licensing can be used for product evaluations, demos, pilots and SIM failures. Permanent licensing still requires a Predator SIM. To request a temporary license, select the Network ID button in the Upgrade dialog. Predator will display a 10-digit number for every network card installed on the PC. The 10-digit number can be emailed to sales@predator-software.com for processing. A reply with the appropriate serial number and access numbers will be sent.

New! Fadal Macro Support

All new support for Fadal Macros have been added. Macro lines on a Fadal start with a #. Support for Fadal style IF/THEN branching has been added with a new THEN keyword in the reverse post. Finally, support for Fadal style variables have also been improved.

\$PROGRAMMING: #10

"IF",expression : Condition

"THEN" : Then ; Fadal Style

New! User Configurable Nested Operators

All new support for user configurable strings for beginning and ending nested operations has been added to the parameter section of the reverse post. These default to Fanuc style open and close brackets. Refer to the following:

[PARAMETERS]

expression_close=')' ; Fadal Style

expression_open='(' ; Fadal Style

New! System Variable Section

A new system variable section has been added to the reverse post. Refer to the following examples:

[SYSTEM_VARIABLES]

#2201=GetCutterCompH1

#2202=GetCutterCompH2

#2203=GetCutterCompH3

#2204=GetCutterCompH4

#2205=GetCutterCompH5

#2206=GetCutterCompH6

```

#2207=GetCutterCompH7
#2208=GetCutterCompH8
#2209=GetCutterCompH9
#2210=GetCutterCompH10
#2401=GetCutterCompD1
#2402=GetCutterCompD2
#2403=GetCutterCompD3
#2404=GetCutterCompD4
#2405=GetCutterCompD5
#2406=GetCutterCompD6
#2407=GetCutterCompD7
#2408=GetCutterCompD8
#2409=GetCutterCompD9
#2410=GetCutterCompD10
#3026=GetActiveTool()
#100=50.5
#101=3.14167
#5021=GetActiveX()
#5022=GetActiveY()
#5023=GetActiveZ()

```

NOTE: Although not shown above the GetCutterCompH and D style system variables support up to D50 and H50.

In addition system variables for diameter and length offsets have been added. Refer to the above example. Finally, system variables can be assigned default values prior to processing every CNC program. Refer to the above examples where PI is assigned to the #101 variable.

New! Inverted Axes

All new support for CNC controls and Machine Tools with inverted axes is now supported. Often machine tools have an axis that is inverted and positive and negative directions are reversed. Support for this has been added to the reverse post processor with the MoveX-, MoveY- and MoveZ- commands.

\$MOVETO: #10

```

"X",real           :      MoveX-      ; Inverted X Axis
"Y",real           :      MoveY-      ; Inverted Y Axis
"Z",real           :      MoveZ-      ; Inverted Z Axis

```

NOTE: Inverted and non-inverted axes can be combined to simulate any machine orientation or style.

New! Integer Support

All new support for calculating the integer value of a variable or constant has been added to the reverse post. Refer to the following examples:

[ARITHMETIC_FUNCTIONS]

```

"INT"               :      Integer(single pre)      ; Fadal style

```

"FIX" : Integer(single pre) ; Fanuc style

New! Arc Sine Support

All new support for calculating the arc sine value of a variable or constant has been added to the reverse post. Refer to the following examples:

[ARITHMETIC_FUNCTIONS]

"ASIN" : ArcSine(single pre) ; Fanuc style

"ARCSIN" : ArcSine(single pre) ; Cincinnati 2100 style

New! Expression based Variables

All new support for complex expressions for variable names has been added to the reverse post. Refer to the following examples:

"#",expression : GetGlobalVar ; Fanuc style

NOTE: The above definition would support the following Fanuc Macro B code.

```
#100=4.5
```

```
#102=6.5
```

```
G0X#[#100+2]
```

NOTE: The above Fanuc code would rapid the CNC to X6.5

New! I,J,K Style Pecking

New Fadal and Haas's support for I, J and K style pecking has been added with appropriate registers and simulation. Cycle time calculations reflecting this style of pecking has also been updated. Previously Predator Virtual CNC only supported a simpler style pecking simulation.

New! Configurable Return Point for each Peck

Support for a configurable parameter that should match an appropriate register on the CNC to configure the return point for each peck within a pecking cycle. Cycle time calculations reflecting this style of pecking has also been updated. Previously Predator Virtual CNC always fed from the R plane during each peck. For Example:

[PARAMETERS]

```
drill_cycle_rapid_amount=.05
```

New! 4 and 5 Axis Tool Compensation

New simultaneous 4 and 5 axis tool compensation support for newer style multi-axis CNC machines with rotary tables and heads. This feature can be enabled and disabled full time by setting the following parameter:

```
rotary_style=compensated ; Fidia style
```

```
rotary_style=normal ; Cincinnati style
```

In addition, 4 and 5 axis tool compensation can be enabled and disabled with G & M codes. This allows the machine to change how it will position the tool at any time within the CNC program. Refer to the following examples:

“G96” : EnableRotaryComp ; Fidia style
“G97” : DisableRotaryComp

NOTE: Enabling or disabling this functionality positions the tool very differently. We recommend creating a few test programs to insure Predator Virtual CNC appropriately duplicates the machine’s tool positioning. For example:

```
N10 T1 M6  
N20 G90 G0 X0 Y0 Z100 A0 B0 (RESET TOOL)  
N30 Z0 (REFERENCE POINT)  
N40 Z50  
N50 A45 B45  
N60 Z0 (RETURN TO REFERENCE POINT?)
```

NOTE: At N30 the tool should go to the reference point with the tool positioned straight. At N60 the tool will be positioned at an angle and will either return to the same reference point or it will be off center. If the tool returns to the same reference point enable the rotary tool compensation feature. If the tool is positioned off center then disable rotary tool compensation.

New! Fadal style Macro Language

Support for Fadal style macro language has been added. Improvements to global and local variables, parameters and expressions have been made to Predator Virtual CNC. Fadal macro lines begin with a # and support a very specific syntax.

New! Fadal style Line Repeats

Added support for Fadal style line repeats with the L register while maintaining support for Fadal style L sub program calls.

New! THEN Support

Added support for the THEN style keyword. The THEN keyword is supported by Fadal and Cinninati controls.

New! BackStep for SURFCAM INC files

Fixed a bug when backstepping a SURFCAM INC file.

New! D# for Dia. Comp. Register and D# for Dia. Comp. System Variable

Fadal’s supports D numbers for both diameter compensation registers and diameter compensation system variables. Specific Fadal only support had to be added to allow duplicate D word definitions and special logic to support both definitions within a single reverse post.

New! H# for Len. Comp. Register and H# for Len. Comp. System Variable

Fadal’s supports H numbers for both length compensation registers and length compensation system variables. Specific Fadal only support had to be added to allow duplicate H word definitions and special logic to support both definitions within a single reverse post.

New! Surface based STL stock files in Turbo

Support for surface based STL files have been added for stock in the Turbo model. Predator Virtual CNC will automatically create a 3D watertight stock shape from the STL file. This stock shape can be exported for use by Animation, Solid, Machine

Simulation models within Predator Virtual CNC or other 3rd party applications.

New! Fidia External Sub Programs

Support for Fidia style external sub program calls have been added to v5.0 of Predator Virtual CNC.

Improved! HTML based Online Help

Updated online help by expanding several topics with new details

Improved! Subroutines and Sub Programs Support

Support for having both subroutines and sub programs to be intermixed before and after the main program. Previously sub programs had to be at the top and subroutines at the bottom or the other way around.

Improved! Haas G70, G71 and G72 Support

Improved modality and support for G70, G71 and G72 cycles within the G81-G89 canned cycles has been added.

Improved! Haas G12 and G13 Support

Improved modality and support for G12 and G13 cycles when used with G81-G89 canned cycles. Support for L0 within a G12 and G13 has also been added.

Improved! Reference Move Support

Improved G28 and G29 style reference move simulation with configurable reference point positions. Reference moves can now be applied to three positions, including the tool change point, the machine home point and the intermediate point only. Refer to the following examples:

```
Reference_Move=Intermediate  
Reference_Move=Tool_Change  
Reference_Move=Machine_Home ; Recommended style
```

NOTE: The machine_home parameter requires that an appropriate home position be defined within the machine definition.

Improved! Modal Macro Calls

Improved modal macro calls or G66 to support parameter passing.

Improved! Modal Diameter Offsets

Improved diameter offsets, typically D1, D2, etc., to be modal.

Improved! Lathe Grooving

Improved lathe grooving support, typically G74 and G75. Single point simulation is now supported. In addition, support for missing step over values are not specified or step over values that exceed the width of the groove has been added. The appropriate behavior can now be simulated using the following parameters:

```
lathe_groove_incx=.2  
lathe_groove_incz=.2  
lathe_groove_increments=use_parameters ; Fanuc style  
lathe_groove_increments=use_defaults ; Optional style
```

Improved! Writing JPEGs

Improved the option that writes JPEGs every x number of lines from a previous maximum of every 999 lines to an unlimited number of lines.

Improved! Machine Simulation Performance

Machine simulation without collision detection is now exponentially faster than in previous versions.

Improved! Collision Detection Performance

Machine simulation with collision detection is now exponentially faster than in previous versions. Depending on the part shape, part size, machine type and tool motion very large jobs that might have taken days to simulate now process in minutes. A recent 5 axis benchmark of a 140 meg G code program took 27 minutes to process in v5.0 vs. 7 days with v4.1.

Improved! Cutter Compensation in the XZ and YZ Planes

Cutter compensation has been enhanced to support cutting in the XZ and YZ planes.

Improved! String Labels

The use of alphanumeric labels within CNC programs has been improved. Siemens, Cincinnati and Okuma based CNC controls utilize string based labels with GTOs, canned cycles, and sub program calls. Refer to the included reverse post for additional details. The processing speed for string labels has also been improved with this release.

Improved! Siemens style Sub Programs with Labels

Siemens style sub program calls with label jumps are now supported by Predator Virtual CNC.

Improved! Fadal style Comments

Improved support for Fadal style G code programs with mixed mode comments via both an * and () while maintaining support for * for multiplication and () for nested operands.

Improved! STL Stock and Fixtures

Increased the maximum number of STL based stock and fixture files per job from 16 to 64. In addition support for very large STL stock and fixture files has been improved in machine simulation to improve performance for zooms, rotations, pan and fit operations.

Improved! Backstepping

Predator Virtual CNC v5.0 improves backstepping with SURFCAM INC files and Mastercam NCI files. In addition, a bug has been fixed when backstepping arcs.

Improved! Turbo Model

Turbo models have been improved with v5.0 with support for better vertical walls. In addition cusp shapes have been improved with certain tool shapes and tool motion.

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Improved! Saving Stock Files

The saving of stock and fixture files has been improved to support any filename. Previously the filename defaulted to the name of the job and operation number.

Improved! Machine Defaults

Machine defaults for cycle overrides are now 100%. This simplifies creating a new machine within Predator Virtual CNC.

Improved! Check Table Labels

Setting up collision detection for machine simulation has been improved with easier to understand labels within the Check Table tab.

Improved! Deleting Job and Setup Files

By default Predator Virtual CNC will automatically delete setup files when a job is deleted.

Improved! Machine Datum

The machine datum has been separated from the 4th axis rotary center position. Previously Predator Virtual CNC required that these two points be the same. The center of the 4th axis center is now specified from the machine datum. Existing machines will default to the 4th axis center being coincident to the machine datum. Fixture offsets values whether specified via G10 style or G54-G59 style are now specified from the machine datum.

NOTE: STL files that are used for machine simulation still require that the origin of the STL file be the 4th axis rotary center position.

Improved! Cutter Compensation in the XZ and YZ Planes

Cutter compensation has been enhanced to support cutting in the XZ and YZ planes.

Improved! Bad STL Detection with Machine Simulation

Machine simulation requires watertight STL files for each moving component. In previous versions a minimum level of error checking was provided to insure good watertight STL files. V5.0 adds extensive error detection for every STL file used with machine simulation. This insures that the machine simulation and collision detection routines will process without any error or glitches due to bad STL input.

Improved! Surfcam INC support

Compatibility with Surfcam 2002 Plus has been improved to take advantage of the latest features within Surfcam.

Improved! Mastercam NCI support

Mastercam NCI support has been improved to provide better tool change compatibility. In addition, support for multi-axis rapid moves has been improved.

Improved! Virtual CNC Viewer for Developers

Software developers can now seamlessly integrate Predator Virtual CNC verification and simulation technology within their own applications. V5.0 of the Predator Virtual CNC Viewer includes an optional line-by-line mode in addition to a file mode. In addition, new documentation and source code samples are available along with a new Windows Installer based installation.

NOTE: Volume ATL licensing is available directly from Predator Software.

NOTE: A Predator Virtual CNC Viewer license is included with every Predator Desktop, Predator MDC, Predator Travelers, Predator Tool Crib and Predator Gage Crib license.

Bug Fix! Round Function

Fixed a bug with rounding. Previously it was not rounding up, but simply truncating.

Bug Fix! Separator Function

Fixed a bug with separators being defined as a space.

Bug Fix! Delete All Function within Inspection

Fixed an intermittent bug with the Delete All button within the Inspection command.

Bug Fix! Mastercam C-Hook

Fixed an intermittent bug with the Mastercam C-Hook that would fail to properly launch Predator Virtual CNC.

Bug Fix! Display Machine within Stock tab

Fixed a bug when displaying the programming point, the green square, when the display machine button is click within the Stock tab. Previously the green square would move to some arbitrary position and now show the true position.

Bug Fix! Fanuc style G94 Facing Cycles

Fixed a bug with Fanuc style G94 facing cycles.

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

<http://www.shopfloorautomations.com>

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