

OpenCNC 6.4 Integrator Release Notes

What is Covered in this Document

This version of the Integrator Release Notes describes changes made to OpenCNC from version 6.3.1 to 6.4. Previous Integrator Release Notes for OpenCNC [6.x](#) can be found in the MDSI Documentation.

The following changes have been made to OpenCNC:

- [Windows XP Compatible](#)
- New Ethernet I/O System supports a wide variety of [popular Ethernet cards](#)
- [Upgraded from Venturcom 5.1.1 to 5.5](#)
- Improved drivers for the [Vigilant PCI-ENC DAC and IP-ENC DAC](#) to detect encoder faults
- Added driver for [Vigilant PCI-DIG144E](#) Board that supports 128 I/O
- Improved performance of [varGroup.exe](#)
- Added the [macroProbeVariables.var](#) to the Programs folder
- Added [mill spindle probe macros](#) for G38 and G39
- Improved [Automation Direct Ethernet I/O](#) to provide better diagnostics and flexibility
- [winAxTune](#) allows the user to export changes to the Start (.ost) file

Windows XP Compatibility

OpenCNC 6.4 is Windows XP compatible. This is due to the Venturcom RTX 5.5 real-time software upgrade. Windows NT and Windows 2000 are still supported.

Upgrading from Windows NT or 2000 to Windows XP

Users upgrading an OpenCNC system from Windows NT or 2000 to Windows XP are recommended to install on a completely new or formatted hard drive using the NTFS format. Installing Windows XP onto a hard drive partition with Windows NT or Windows 2000, may cause severe problems with recognizing the Windows XP partition.



Supported Ethernet Cards

The following cards are now supported for OpenCNC 6.4:

- 3COM 3C905B PCI NIC
- 3COM 3C905C PCI NIC
- NE2000 Compatible ISA Network Interface Card
- Intel 8255X
- Realtek RTL81x9
- Digital 21X4X
- National DP83815
- Intel 82543GC (Gigabit Ethernet)
- AMD 79C97X

Upgrade to Venturcom RTX 5.5

RTX 5.5 provides Windows XP support and allows two real-time devices to share one IRQ. Also, TCP/IP software has been upgraded to version 2.0. TCP/IP no longer requires a separate installation, instead it can be installed when installing RTX 5.5.

Note: Previous versions of Venturcom RTX must be uninstalled before installing RTX 5.5.

When installing Venturcom RTX, the runtime license number/pac number is:

5029-PAC-32106-23266-01577

Refer to the [Venturcom RTX Software](#) section of the manual for installation instructions.

Vigilant PCI-ENC DAC and VIP-ENC DAC Drivers

The new Vigilant drivers for PCI-ENC DAC and VIP-ENC DAC have firmware modifications which provide the encoder fault status information to OpenCNC. Once OpenCNC receives the encoder fault status, it causes the watch dog timer relay to open. This capability is only intended to detect some cases of noise on the encoder lines. It will not detect a broken or shorted encoder wire unless that condition allows excessive noise on the wiring. The following variables have been added specifically for the new Vigilant PCI-ENC DAC and VIP-ENC DAC:

- [vigEncStatLatch](#)
- [vigEncStatLchIP](#)
- [vigEncStatus](#)
- [vigEncStatusIP](#)



New Vigilant PCI-DIG144E Driver

The Vigilant [PCI-DIG](#) family of digital I/O boards is now supported. The PCI-DIG144E is a half-size PCI bus card with 144 TTL-level digital I/O, and a Vigilant Expander Bus interface. The PCI-DIG96 is a 96 channel I/O board without the Vigilant Expansion Bus interface, and the PCI-DIG168 combines the Vigilant PCI-DIG144E with a 24 channel expander board (ExpDigRel24). The new driver for these three boards is **ioVigilantDIG144.rtss**.

Changes to varGroup Feature

varGroup.exe has been improved. The varGroup program now reads a control file specified by a "-c" argument. This file lists the variable group numbers and variable files used. varGroup arguments "-f" and "-g" have been removed.

The line in the start (.ost) file required to start varGroup.exe should appear after the "oprProg" line. An example (all on 1 line) is shown below:

```
p "C:\Program Files\MDSI\X.X\Programs\varGroup" -c "C:\Program  
Files\MDSI\X.X\Machines\demoLathe\varGroupControl.txt"
```

The variable control file must contain one line for each variable group used. Each line contains a variable group number and variable file name. For example, to write to group 0 and group 1, the following lines would appear in the control file:

```
0 "C:\Program Files\MDSI\x.x\Machines\demoLathe\group0.vgf"  
1 "C:\Program Files\MDSI\x.x\Machines\demoLathe\group1.vgf"
```

The backup file capability ("-b" argument) and C-functions **vgRdBack()** and **vgWtBack()** have been removed from OpenCNC 6.4.

varGroup.exe has been modified to allow writing to a variable file when the file is read-only. The read-only status of the file will be restored after the varGroup write is complete.

Note: The OpenCNC update program makes changes to your current start file, updating the variable group statements, as well as creating the varGroup control file (**varGroupControl.txt**) in your **Machines** directory.

Refer to the [Variable Group Functions](#) section of the manual for more information.

macroProbeVariables.var

Added [macroProbeVariables.var](#) file to the Programs folder of OpenCNC 6.4. This .var file defines the macro probe variables. These variables are no longer defined by the interrupt program (e.g. intTech80). Machines which use any of the probe macros must



have the following line added to the Start (.ost) file immediately following the "accMsg" line:

```
v "C:\Program Files\MDSI\x.x\Programs\macroProbeVariables.var"
```

Note: The OpenCNC update program automatically adds this line. Mill and Lathe applications wishing to use MDSI probe macros need this reference to **macroProbeVariables.var** in the .ost file starting with OpenCNC 6.4. The Lathe probe macros have not been altered to allow the PLC or other macros make use of the newly defined global variables.

Mill Spindle Probe (G38 and G39)

The PLC or other macro is permitted to access measured and programmed data from the new mill spindle macro. The **macroSpindleProbe.exe** mill spindle probing macro has been added for the [G38](#) (0 degree A axis) and the **macroSpndPrbA90.exe** mill spindle probing macro has been added for the [G39](#) (90 degree A axis) only.

Previous probing methods still work properly but implementations will only support the new macro method.

The following new probing variables have been added:

Variable	Description
axProbeCycleLast[]	The last probe cycle run for a given axis.
axProbeDirLast[]	Direction of axis move for the last probe cycle.
axProbeCenter[]	Per axis center if circle, slot, or sphere.
axProbeSlotWidth[]	Compares slot width actual and expected values.
probeDataReady	Indicates that all data has been output for a given cycle.
probeDiameter	Diameter of the circle or sphere.
probeSurfaceAng	Angle B value. With axProbeSlotWidth[] can determine X and Y widths.

For more details on other changes made for the mill spindle cycle, refer to the [Mill Spindle Probing](#) section of the manual.

Changes to Automation Direct Ethernet I/O

The following variables have been added specifically for the Automation Direct Ethernet I/O:

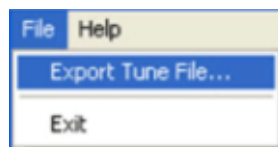
Variable	Description
ioEnetADCyTime[]	Time between the current and previous Ethernet I/O updates in milliseconds.
ioEnetADCyTimeMn[]	The calculated minimum time between the current and previous Ethernet I/O updates in milliseconds.
ioEnetADCyTimePk[]	The calculated peak time between the current and previous Ethernet I/O updates in milliseconds. This variable is useful for diagnosing intermittent cable faults or Ethernet I/O degradations of performance.
ioEnetADErrCycls[]	The actual number of consecutive Ethernet I/O scans with error. This variable is reset to 0 when an I/O scan completes without an error.
ioEnetADMxErrCyc[]	The maximum number of consecutive I/O scans allowed with an error. This variable should be set in the tune file. The default value is 5.
ioEnetADRWTime[]	Time to do an Ethernet I/O update for the most recent Ethernet I/O update cycle.
ioEnetADRWTimeMn[]	Minimum time to do an I/O update for the most recent Ethernet I/O update cycle.
ioEnetADRWTimePk[]	Peak time to do an I/O update for the most recent Ethernet I/O update cycle.

For more details, please refer to [Installing Ethernet I/O](#).

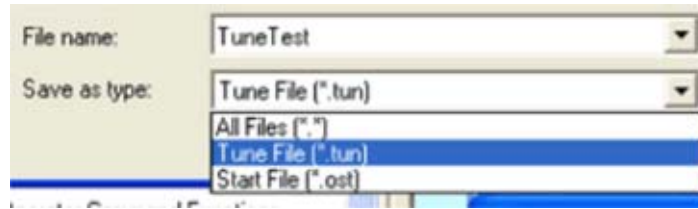
winAxTune Export Change

winAxTune now allows the user to save the changed variable settings to a Start (.ost) file. To do this, use the following procedure.

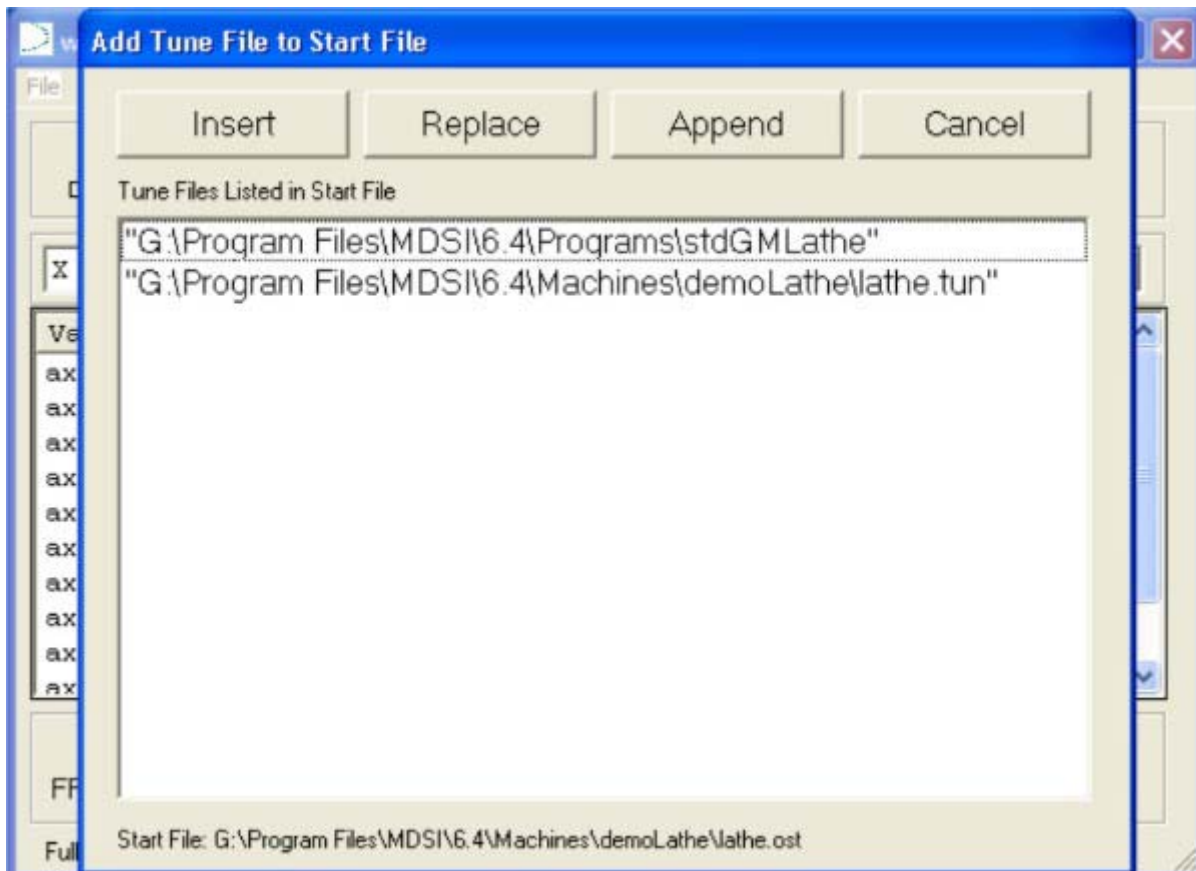
1. After the Data, PID, and Feed Forward changes have been made to a machine, select **File > Export Tune File...**



2. Select **Tune File (*.tun)** from the **Save As Type:** pulldown and type name for the tune file.



3. Select the **S**ave button.
4. The **Add Tune File to Start File** window will be displayed with a list of Tune Files in the Start (.ost) file.



5. At this point, the user can select one of the following buttons.
 - Insert - Places the new tune file name into the Start (.ost) file before the highlighted line.
 - Replace - Replaces the highlighted line tune file with the new tune file name.
 - Append - Places the new tune file name into the Start (.ost) file following the highlighted line. If no line is highlighted, it file is placed at the bottom of the last line.
 - Cancel - Abort the operation and return to winAxtune.

Other Improvements

- Fixed problem with pciInt.exe displaying 384 when the value should have been 128.
- Added a check of the tune file variables **defAccelMax**, **axAccelMax[]**, **defJerkMax**, and **axJerkMax[]** when variable **defHighSpeedMach** is set to 1. High speed machining requires that accel and decel values for all moving axes be equal during a sequence of cut-to-cut motions (G01, G02, G03), and all jerk values for moving axes be equal during the same motions.

OpenCNC performs a check of these values when the motions are generated during the running of the part program (not when the tune file is read). When an error occurs in a block that reports unequal **axAccelMax[]**, **axDecelMax[]**, or **axJerkMax[]** values with **defHighSpeedMach** = 1, one of the following solutions can be used:

1. Don't define any **axAccelMax[]**, **axDecelMax[]**, or **axJerkMax[]** values in the tune file, and only use **defAccelMax** and **defJerkMax** for all axes.
2. Add a G09 (exact stop) command to the previous block. This will break the cut-to-cut (and high speed machining) operation, but will allow different accel or jerk values for motions in adjacent blocks.

Note: Within a single block using a high speed cut-to-cut motion, multiple axes can not be simultaneously moved which have different accel/decel or jerk values. They must be programmed in separate blocks and G09 must be used. Also, an axis can not have a different accel and decel value.

- Removed **MC_SETDRILLAXIS** from ISaGRAF's common.eqv file.
- Added the following capabilities to the table probe macro:
 - S0 - Calibration of tool diameter (M2), tool length and diameter (M0), Calibration of tool length (M1) call block altered
 - S2 - Set tool diameter
 - S3 - Set tool length and diameter
- Added a command-line timeout value to winMenu. Previously, if it took longer than 30 seconds for a program to launch out of winMenu, a warning message would be displayed. The timeout can now be set to any value from 30 to 300 seconds via the command line.

Example

```
"C:\Program Files\MDSI\6.4\Programs\winMenu.exe"  
-m 1  
-timeout 60  
-maxMenuRows 15  
-f "c:\Program  
Files\MDSI\6.4\Machines\demoMill\mill.men"
```

- Fixed problem in slide jog which allowed negative overtravel when using [defNewSCurveUse](#).
- Corrected display of the first touch point to the two axes of interest for the spindle probe S7 cycle.
- Improved the CD installer program to automatically logon and run again after a reboot which follows a software install. The CD batch file which installs NT 4 SP6a (on NT 4 SP3 or less) will also cause an autologon and launch the CD installer following a reboot. This feature only works when the user/administrator password is set to blank, and only on Windows NT, 2000, and XP. If the password is not blank, the autologon will not occur, but the CD installer will automatically start once the user has logged on.
- Fixed German translation of winPos **Part Coord** button as well as centered the button properly.
- Added 'subsystem ID' to the PCI header information the PCI-ENC DAC checks when scanning the PCI Bus. This avoids conflicts between the PCI-ENC DAC and the PCI-VigilantDIG144/96.
- Now using Indramat SERCOS SoftSercans v2.0, which allows the use of PCI-bus SERCOS cards.
- Added [Yaskawa G5 Spindle](#) support.
- Fixed problem where incorrect values were stored during slide jog probing for [axLocProbTrig\[\]](#) and [axJogRatePobe\[\]](#) if [jsAxisBase\[0\]](#) > 0.
- Corrected divide overflow fault condition when the number of roughing passes was calculated to be 1 in the threading macro.
- Modified code to prevent the parser from overlaying unprocessed look ahead microcommands that caused the "bad microcommand length" fault.
- [mStrVariables](#), [mdsiVariableReadByNameVB](#), and [mdsiVariableWriteByNameVB](#) are now supported by the .variable property of the Macro Support Library.
- Fixed problems in winVar where array indexes were not selected or highlighted correctly. Also fixed problems when dragging or shift-picking multiple indexes.
- Fixed issue where orientation values would not successfully write into the offset table for the second job stream.
- Fixed issue where the second job stream moved axes to incorrect positions.
- [G53](#) (machine coordinates) are now interpreted as absolute coordinates independent of modal [G90/G91](#) state.
- [G90](#) (absolute) or [G91](#) (incremental) programmed in a [G58](#) (automatic withdraw) block no longer affect the modal condition of the incremental mode flag.
- [G33](#) no longer re-synchronizes after every G33 block.
- Added the new ioEnetAutoDirect utility [EthernetTIO](#) for Automation Direct Ethernet I/O hardware. This software is used to scan base modules, connect to base modules, and read/write to I/O points for testing purposes.
- Prevented multiple I/O symbols from using the same number in the symbols file.
- Fixed a runtime error with winFix and winOff when an offset value outside the valid range is entered.
- Changed winVar's "Save As" to display a full path rather than just a filename.
- Allowed different lead screw, backlash, and external compensations to be applied to the gantry master and slave axes.

The following items have been added to or improved in the OpenCNC documentation

- MDSIHelp Build Manual For Print capability now adds the full file path to all of its links and does not overwrite previous versions that have been saved.
- MDSIHelp now allows German characters in the names of files.
- MDSIHelp now accepts .htm and .html file extensions.
- Added information on [Converting an existing Windows driver to an RTX device](#).
- Added documentation on the [Yaskawa G5 Spindle](#).
- Added status messages of the Yaskawa G5 and M5 spindles and servo to the [mechStatus\[\]](#) variable description.
- Added alarm messages of the Yaskawa G5 and M5 spindles and servo to the [mechAlarm\[\]](#) variable description.
- Documented [winDataTool](#).
- [G50](#) and [G51](#) Scaling documentation has been added for the lathe.
- Fixed linking problems when searching documents.
- MDSIHelp clears the search results after a rebuild.
- Added documentation on [mill spindle probing](#).
- Added documentation on [timers](#) in PLC Logic.
- Documented the following variables: [axInteg\[\]](#), [defLocOptionsOff](#), [defUserRtxTimer](#), [jsSubDisplayHiLt\[\]](#), [jsTriggerCount\[\]](#), [mExtCompOn](#), [mPoundVarCount](#), [mToolLenCorrSav](#), [mToolCorrVal](#), [plcJogMult\[\]](#), [prbMethod](#).