SIEMENS

SINUMERIK 840D

Virtual NCK for Simulation Restrictions

Description of functions

Valid for

Control	*Softwareversion*
SINUMERIK 840D	7
VNCK	1.4

07/2005 Edition

SINUMERIK®-Docmentation

Printing history

Brief details of this edition and previous editions are listed below.

The status of each edition is shown by the code in the "Remarks" column.

Status code in the "Remarks" column:

A .... New documentation.
B .... Unrevised reprint with new Order No.
C .... Revised edition with new status.
If factual changes have been made on the page since the last edition, this is indicated by a new edition coding in the header of that page.

Edition	Order No.	Comment
04.04	--	**A**
09.04	--	**C**
12.04	--	**C**
07/2005	--	**C**

Further information is available on the Internet under:
http://www.siemens.com/motioncontrol

This publication was produced with WinWord V9.0 and Designer V7.0.

Other functions not described in this documentation might be executable in the control. This does not, however, represent an obligation to supply such functions with a new control or when servicing.

We have checked that the contents of this documentation correspond to the hardware and software described. Nonetheless, differences might exist and we cannot therefore guarantee that they are completely identical. The information contained in this document is, however, reviewed regularly and any necessary changes will be included in the next edition. We welcome suggestions for improvement.

Subject to change without prior notice.

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1 Restrictions

1.1 General restrictions

VNCK Version 1.4.0.0 was generated on the basis of a
Sinumerik 840D software release Version 7.1.
Please check the software release of the CNC on the machine. Correct start-up and simulation of the motion and timing response can only be ensured if the machine data also match those of an NCK 7.1 on the CNC 840D.

VNCK has been designed to simulate an NC part program with a high level of consistency with the machine.

Warning

VNCK must not be used to optimize or modify the CNC machine data. Never load machine data or start-up archives that have been processed by VNCK into the CNC on the machine tool.

1.2 System requirements

VNCK requires a PC-based system with the WindowsXP operating system that meets the following minimum requirements:
Intel Pentium or compatible with 1 GHz clock rate,
256 MB memory and
network card.
Please also observe the system requirements of the simulation system of which VNCK forms an integral part.

1.3 Block and position display

Due to the asynchronous nature of the run-in and main run in the CNC and the internal data preparation of the CNC, it may occur that

- block displays in the main run do not contain individual blocks (e.g. when a compressor is used),
- time offsets are present between the displayed blocks of the run-in and the positions in the machine or basic coordinate system as they are displayed in the connected simulator.

1.4 Restrictions due to missing drive functionality and sensor feedback on the machine tool

The numerically controlled axes of the CNC are switched to a simulation mode for VNCK, i.e. the position controller is approximated by a PT1 element. Speed, torque or drive current information is not available in VNCK. This also means that drive signals such as $AA_CUR, $AA_LOAD, $AA_POWER etc. cannot be used in NC instructions unless they are simulated via the connected simulation system. The following items are also not available:

- master-slave axes, linked axes via position controller
- travel to fixed stop (variable $AA_FXS)
- measuring cycles
- drive speed feedback, such as it is e.g. required for thread-cutting with G33, G34, G35, tapping with G331, G332, tapping with compensating chuck G63

1.5 Operating modes

VNCK has been designed to simulate a single CNC. Therefore, it is not possible to simulate the following operating modes:

- M:N operation
- NCU link (linked axes, lead linked axes)
- processing from external

1.6 Restrictions due to missing operator panel

VNCK does not contain any software to emulate the operator panel. For this reason, the simulation of the operator panel requires extensions in the connected simulation system. Otherwise, the entire operator panel functionality will not be available, including for example adjustable work offset, skipping of blocks, setting of tool/compensation data via operator panel etc. (see also Sinumerik 840D user manual). These restrictions also apply to user software that is installed on the operator panel, e.g. tool management packages.

1.7 Restrictions due to missing PLC

VNCK does not include a PLC. However, the PLC logic and PLC-controlled motions can be simulated by the simulation system of which VNCK forms an integral part. The results in restrictions in the use of

- synchronous actions if the events relate to the PLC,
- Safety Integrated,
- PLC-controlled axes,
- multiple feed rates within a single block (FMA),
- H functions (PLC function must be simulated by simulation system),
- external work offset (PLC).

1.8 Restrictions due to missing machine control panel

The following functionality is only available to a limited degree, if simulated by the simulation system, or is not available at all:

- handwheel offset
- feed with handwheel override FD, FDA
- reference point approach via MSST

1.9 Further restrictions in the NC language scope

The following NC language elements cannot be used or can only be used with restrictions or with special extensions of the simulation system:

DRFOF	DRF OFF
FFWOF	Feed forward OFF
FFWON	Feed forward ON
FD	Feed DRF
FDA	Feed DRF axial
FXS	Fixed stop
G4	Dwell time
G74	Reference point approach
MEAC	Continuous measure without deleting distance to go
MEAS	Measure
MEASA	Measure with deleting distance to go
MEAW	Measure without deleting distance to go
MEAWA	Measure without deleting distance to go
MMC	HMI Comand
OS	Oscillating ON/OFF
OSC [6]	Constant smoothing tool orientation
OSCILL	Axis assignment for oscillation – enable oscillation
OSCTRL	Oscillating control options
OSE	Oscillating: final position
OSNSC	Oscillating: number spark out cycles
OSOF [1,6]	Smoothing tool orientation OFF
OSP1	Oscillating: Position 1
OSP2	Oscillating: Position 2

OSS [6]	Smoothing tool orientation at end of block
OSSE [6]	Smoothing tool orientation at start and end of block
OST1	Oscillating: Stop in position 1
OST2	Oscillating: Stop in position 2
PDELAY-OF [6]	Punch with delay OFF
PDELAY-ON [1,6]	Punch with delay ON
PON [6]	Punch ON
PONS [6]	Punch ON slow
REPOSA	Repositioning linear all axes
REPOSH	Repositioning semi circle
REPOSHA	Repositioning semi circle all axes
REPOSL	Repositioning linear
REPOSQ	Repositioning quarter circle
REPOSQA	Repositioning quarter circle all axes
RMB	Repositioning mode start of block
RME	Repositioning mode end of block
RMI [1]	Repositioning mode interrupt
RMN	Repositioning mode of nearest orbital block
SON [6]	Stroke ON
SONS [6]	Stroke ON slow
SPIF1 [1,6]	Stroke/punch interface 1
SPIF2 [6]	Stroke/punch interface 2
SPOF [1,6]	Stroke/punch OFF
SPN [6]	Stroke/punch number
SPP [6]	Stroke/punch path
SR	Sparking out retract path
SRA	Sparking out retract external
ST	Sparking out time
STA	Sparking out time axial
WAITS	Wait for spindle position

1.10 Restrictions concerning HMI-Advanced

VNCK does not contain any graphical user interface to interactively operate the software. This has to be provided by the connected simulator.

The software HMI-Advanced for PC cannot be used or can only be used with restrictions or with special extensions in connection with VNCK.

The limitations specified in the software function structure on the installation CD-ROM have to be observed in order to be able to properly install and execute VNCK. Incompatible versions of HMI-Advanced have to be removed completely before installing VNCK.

1.11 Bug Report and Temporary Restrictions

Using VNCRegisterCommand() with the commandType VNC_REGISTER_CMD_CHANNEL_SYNC cannot be used. Alternatively the appropriate commands can be registered by using the commandType VNC_REGISTER_CMD_PATTERN for each single command.

Using VNCRegisterCommand() with the commandType VNC_REGISTER_CMD_LABEL it is not possible to use the ignoreType VNC_REGISTER_CMD_ALL_LABELS.

Using the bootMode VNC_BOOTTYPE_SIM_DATA_CC only Windows compiled dll files of the compile cycles according to the vnck version can be used. Soon you can use standard elf files.

Since up to now the request for events describing anew target of a path type spline, polynom, evolvents or compressed blocks doesn’t force the definition and implementation of callback functions to these types the events ‘SIMNewMotionSpline’ and ‘SIMNewMotionSplineAllAxes’ are used to transfer at least the start and the target position of such a new path element.

The correct processing of multi channel NC part programs can not be ensured. The communication and synchronization can be affected by missing control functions which does not belong to NCK.

Even if the usage of an SRAM file generally succeeds it can't be ensured that an SRAM generated on a PC can be used correctly on an other PC. This is caused by operating system depending conditions in using a, memory mapped file'.

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Suggestions

Corrections

For publication/manual:

SINUMERIK 840D

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Restrictions

Manufacturer/Service Documentation

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Description of functions

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Should you come across any printing errors when reading this publication, please notify us on this sheet. Suggestions for improvement are also welcome.

Suggestions and/or corrections