

NCGuide and NCGuidePro CNC Simulators



The key to unlocking the full potential of your operators, programmers and maintenance engineers lies in your ability to train them to use the many productivity tools incorporated into the equipment that you have purchased. Using an actual CNC or a machine tool to deliver the hands on experience that is vital to acquiring and demonstrating competence is often too expensive in investment and lost production costs.

NC Guide and NCGuidePro can simulate a wide range of CNC configurations, including lathes, machining centres and compound machining applications. Multiple display, MDI keyboard and option configurations can be selected and saved to match each of the CNCs being used in an organization.

NCGuide and NCGuidePro provide a very realistic simulated CNC environment that can be used for operational and maintenance training, part program and custom macro training, creation and testing, and custom software development, debug and testing. Simulation tools provide a safe environment where mistakes can be made and corrected without risk to the user or the machine tool. Practically everything that you can do on a CNC and machine tool can be achieved with these simulators, except for actual metal removal.

NCGuide provides an operation and part programming environment that includes the standard CNC editors and graphics simulations as well as the easy-to-use Manual Guide *i* interface. NCGuidePro adds the PMC ladder capability for a complete maintenance simulation and an advanced software development environment. When combined with other GE Fanuc software development tools, NCGuidePro provides a rich, PC-based development environment. NCGuide and NCGuidePro simulators are available at a fraction of the cost of an actual CNC or machine tool.



Cambridge Numerical Control

Units 8 & 9 Royce Court Burrell Road St. Ives Cambs PE27 3NE Tel : +44 (0)1480-468639 Email sales@cnc.uk.com

NCGuide and NCGuidePro CNC Simulators

NCGuide and NCGuidePro Features and Benefits for Training

NCGuide and NCGuidePro provide an authentic GE Fanuc and FANUC CNC simulation, providing a realistic operation, part programming, and maintenance environment at a fraction of the cost of using CNC hardware or a production machine tool. This translates into lower training costs and greater flexibility.

Additional benefits include:

- Enhances comprehension by performing hands-on exercises in a ergonomically friendly office or training-room environment.
- Increases safety by allowing operators, programmers and maintenance personnel to repeatedly practice complex actions and develop optimized processes without risks to people or machine tool assets.
- Reduces cost by emulating multiple CNC and machine combinations using the Machine Composition setting tool, the Option Setting tool, MDI keyboard and screen size selections, and CNC parameter settings, and by integrating custom screens developed and provided by the machine tool builder.
- Expands training opportunities to more employees by allowing remote access to the simulators by using a 10, 20 or 30 seat concurrent-user network license.
- Increases productivity by allowing users to attain "expert" level through repeated practice on the simulator before running actual equipment.
- Enables the development of complex machine troubleshooting scenarios that are not feasible on the actual equipment by using the machine I/O signal simulation ladders and I/O operation panel (NCGuidePro only).

Operator Training

NCGuide and NCGuidePro are ideal for operational training. All standard CNC operational screens can be selected, and all standard procedures can be practiced. Custom screens provided by the machine tool builder are supported. NCGuidePro also supports the simulation of custom operator panels, PMC ladders and machine I/O signal simulations if provided by the machine tool builder.

Common operations include:

- Creating and editing part programs.
- Searching for words and safe start blocks.
- Uploading and downloading part programs.
- Testing part programs for syntax and tool path geometry.
- Entering and editing workpiece offsets.
- Entering and editing tool geometry and tool wear offsets.
- Editing CNC parameters.
- Reviewing and clearing error messages and alarms.

Part Programmer Training

NCGuide and NCGuidePro support both conventional G-code part programming with 3D tool path simulation, and the easy-to-use, yet powerful Manual Guide *i* conversational part programming with 3D tool path and part geometry visualization.

Common tasks include:

- Creating and edit machining centre, lathe and compound machining part programs.
- Using tool path simulation to see the effect of tool and workpiece offsets.
- Using tool path simulation to observe the effect of advanced interpolation modes and canned cycles.
- Creating and debugging Custom Macro B subroutines.
- Automatically convert conversational part programs to conventional G-code run production on a wider range of equipment.
- Generate cycle time estimates.
- Experiment with advanced options before purchasing for equipment.

Cost Effective Training Tool

Low-cost, concurrent-user, network licensing means that every student gets lots of hands-on experience, when and where they need it.



Manual Guide *i* Conversational Programming

Easy to use, yet powerful and can create standard G-code



Maintenance Engineer Training

NCGuidePro provides many diagnostic and troubleshooting screens that display simulated real-time data. Some screens related to servo and spindle performance and tuning are not supported.

Common tasks include:

- Troubleshooting with the diagnostic pages.
- Troubleshooting with the operational and message history pages.
- Troubleshooting with the PMC I/O pages.
- Machine tool PMC ladder interface display and edit.
- Practice using FANUC Ladder III to upload and download PMC ladder, and to display real-time status.
- Practice troubleshooting scenarios using the manual I/O panel or the Machine I/O signal simulator.

NCGuide and NCGuidePro CNC Simulators

NCGuidePro Features and Benefits for CNC Software Development

NCGuidePro provides a comprehensive GE Fanuc and FANUC CNC simulation, providing a realistic user and machine interaction environment at a fraction of the cost of using actual CNC hardware or a machine tool. This translates into lower development costs and faster product development.

Additional benefits include:

- Speeds up development by performing preliminary testing in a ergonomically friendly office environment.
- Increases safety by allowing complex processes to be tested and debugged without risks to people or machine tool assets.
- Reduces test equipment costs by emulating multiple CNC and machine combinations using the Machine Composition setting tool, the Option Setting tool, keyboard and screen size selections, and actual CNC parameter settings, and by integrating custom screens and operator panels.
- Reduces research and testing bottlenecks by providing CNC access to more engineers by using a multiple-seat, concurrent-user network license.
- Increases quality by allowing exhaustive, low-cost testing on the simulator before a final test on the actual equipment.
- Enables the rapid testing of complex diagnostic systems by using the machine I/O signal simulation ladders and I/O operation panel.
- Speeds-up C-Language Executor development by enabling the use of the powerful debugging tools available in Microsoft Visual C++ Express Edition.
- Minimizes retrofit costs by providing a complete PMC ladder create, edit and test environment that can be used when the machine is disassembled, located at a remote site, or recommissioned for production.
- Improves technical support by allowing specific configurations to be saved and recalled quickly when a user requests assistance.

PMC Development

NCGuidePro supports all standard PMC screens including PMC maintenance, PMC ladder and PMC configuration. It also supports the simulation of custom operator panels using the FOCAS2 interface. Machine tool magnetics can be simulated by creating ladders for the Machine I/O Signal Simulator, by using the easy-to-configure I/O operation panel, and by using the tracing replay function.

Common operations include:

- Creating and editing PMC ladders in FANUC Ladder III and downloading them to the CNC simulator.
- Debugging with FANUC Ladder III by connecting "online" within the same PC or with two separate PCs.
- Use the ladder edit function in the CNC to create or modify ladders.
- Review and set X, Y, F and G bits, and PMC data values for test and debug.
- Trace and visualize multiple signals using the PMC trace function.
- Replay signals captured with the trace function, either in real-time or singlestep, a capability that is unique to NCGuidePro.
- Use window mode and multiple display screens to enhance productivity.

C-Language Executor Development

NCGuidePro provides a powerful CNC simulator for C-Language Executor development. Applications can be coded, built, tested and debugged on a single PC using Microsoft's Visual C++ Express Edition. Applications must be recompiled with the CNC target compiler and retested prior to release.

Common tasks include:

- Compile and build dynamic link libraries (dlls) using Microsoft Visual C++ Express Edition.
- Install the C-Language Executor application by simply copying the dll files to the Machine Configuration Setting subdirectory.
- Display application variables using the watch window in the debugger.
- Quickly set breakpoints anywhere in the application code.
- Execute the application one statement at a time using the standard step-in, step-over and step-out commands.
- Comprehensive set of C-Language Executor library calls supported

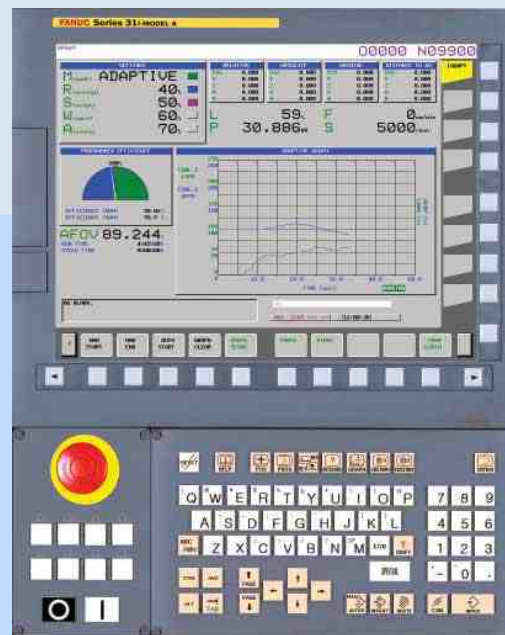
Powerful CNC software development tool

Develop, test and debug PMC ladder interfaces and custom screens before the first machine prototype is actually built.



C-Language Executor Displays

Custom screens can be developed, tested and debugged, and then incorporated into training simulators



Macro Executor Development

NCGuidePro provides a comprehensive CNC simulator for Macro Executor development. All conversational macros can be coded, built, tested and debugged on a single PC.

Common tasks include:

- Compile, link and create MEM files using the standard Macro Executor tools.
- Install the Macro Executor application by simply copying the MEM file to the appropriate Machine Configuration Setting subdirectory.
- Display the operation status, program number, sequence number, and the number of blocks in an executing P-CODE macro.
- Execute breakpoints by program number, by sequence number, by the number of executed blocks, or by iteration count.
- Execute in single-block.
- Display and modify macro variable values.
- Displaying error information regarding P-CODE that has been executed.

NCGuide and NCGuidePro CNC Simulators

NCGuide and NCGuidePro System Requirements

Hardware:

Minimum

Pentium 4 1.3 GHz or Intel Core Duo 1.83 Ghz,
512 MB RAM
300 MB Hard disk space
Display: 1280 x 1024 resolution (2048x1536 for the 15" display simulation)
CDROM or DVD drive
USB port (for license key)

Recommended

Pentium 4 2.8 GHz or Intel Core Duo 1.83 Ghz,
512 MB RAM
300 MB Hard disk space
Display: 1280 x 1024 resolution (2048x1536 for the 15" display simulation)
CDROM or DVD drive
USB port (for license key)

Software Operating System:

Windows 2000 (SP4) or Windows XP Professional

NCGuide and NCGuidePro CNC Simulators

NCGuide and NCGuidePro deliver an economic solution to more effective training by providing a realistic hands-on experience at a fraction of the cost of actual CNC equipment or machine tools. Cost-effective concurrent network licensing means that every student gets access to a system in a safe environment to perform multiple repetitions of all important procedures, validating competence before they are exposed to the actual equipment.

NCGuidePro also delivers an economic solution to more effective software development by providing an integrated development, test and debugging environment at a fraction of the cost of an actual CNC or machine tool. Cost-effective concurrent network licensing means that more engineers get access to a system in a safe environment to perform exhaustive testing of custom applications, even before the first prototype machine is produced

NCGuide

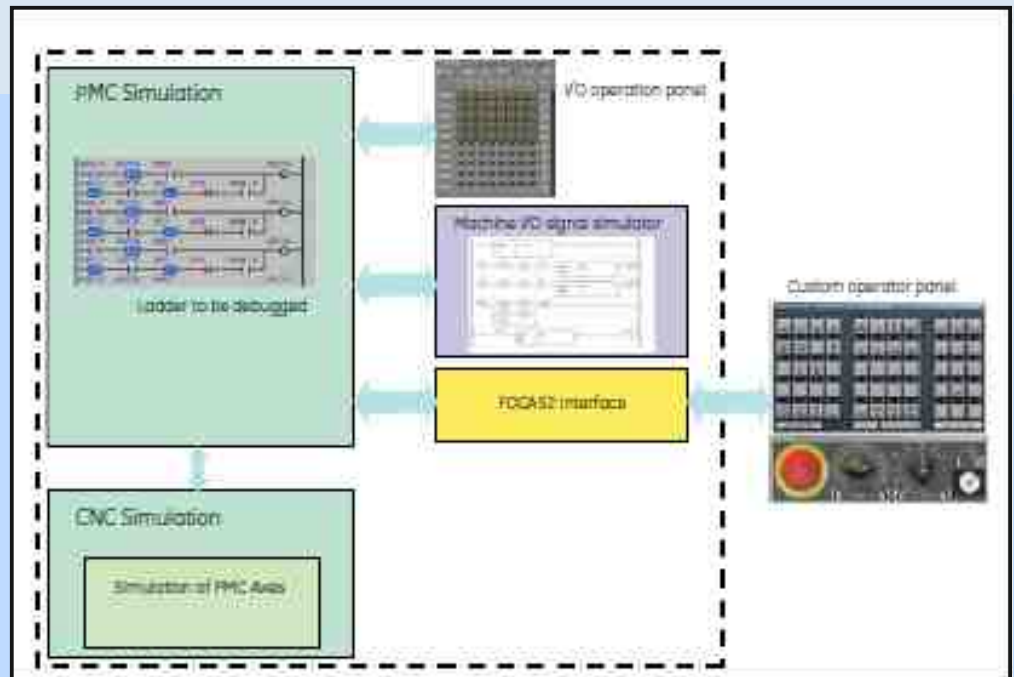
NCGuide is primarily intended to support operational and part program training. It provides most standard screens and both standard G-code and Manual Guide *i* conversational programming. Machine tool builder supplied custom C-Language Executor and Macro Executor screens can be incorporated into the simulation.

NCGuidePro

NCGuidePro is a complete CNC simulator for advanced operation and maintenance training, and for CNC software development by incorporating the PMC simulator. It provides a FOCAS2 interface to allow machine tool builders to incorporate their custom operator panels. Machine magnetics can be simulated using the Machine I/O signal simulator, the manual I/O panel, and traced signal replay function.

PMC, machine signal and custom operator panel simulation

Engineers developing, testing and debugging PMC ladders can use a variety of tools to fully exercise the design before the actual machine tool is even ready for integration.



Cambridge Numerical Control

Units 8 & 9 Royce Court Burrell Road St. Ives Cambs PE27 3NE Tel : +44 (0)1480-468639 Email sales@cnc.uk.com