



GE Fanuc Automation

The Series 21*i* / 210*i*



Unprecedented Power in a Laptop-sized CNC

The first thing you'll notice about the Series 21*i* is its size. This next generation control for small lathe and machining center applications is smaller than many laptop computers. It's the thinnest and most compact CNC currently available, making it ideal for applications where space and functionality are paramount.



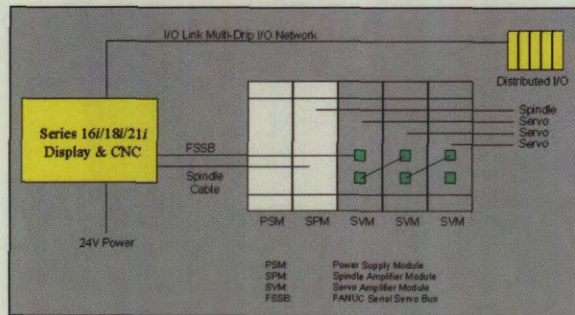
GE Fanuc harnesses the latest advances in technology to achieve this small footprint without compromising power or versatility. In creating the Series 21i, state-of-the-art VLSI and surface mount technologies have ingeniously been applied to create CNCs so compact they mount right behind the flat-panel display. The entire CNC is just 60 mm (less than 2.4 inches) deep—making the Series 21i CNC the smallest in the world!

The Series 21i controls up to four servo-controlled axes at increments as low as 0.1 μm . It supports up to two spindles plus an additional four independent axes with the loader option. A dedicated PMC processor executes ladder logic programs up to 16,000 steps at 0.085 μs /step. Combined with an all-digital servo loop which is closed in the control, the Series 21i improves machine tool cycle time and productivity. Machine precision can be improved remarkably through features like stored pitch error compensation, which corrects for lead-screw pitch error and other mechanical positioning errors. Ease of cutting is achieved using the automatic corner override feature which prevents over-cutting at corners. The extensive list of features is designed to cater to all

possible applications in the basic machine tool.

High-Speed Connectivity for Exceptional System Performance

The Series 21i CNC doesn't simply process data quickly; it is designed to move data at top speed throughout the machine tool using the least possible number of cables.



Cabling for the *i* Series CNCs consists of just four cables: power, spindle, servo, and I/O. The result is a simpler and much more compact control that is easier to maintain.

The unique FANUC Serial Servo Bus (FSSB) connects the CNC to multiple servo amplifiers over a

single high-speed, multi-drop, fiber-optic connection. Up to four traditional cables are replaced by a single fiber-optic connection—and there's a bonus: fiber-optic cables are more noise immune than electrical cables.

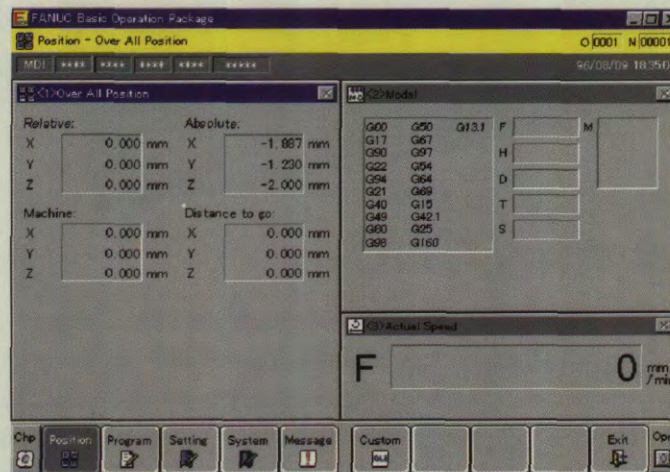
Another high-speed daisy-chained connection, the I/O Link, connects the CNC to I/O and operator station units as well as optional robots and auxiliary axis controllers, which may be distributed throughout the machine tool. Up to 1,024 input and output points may be serviced on a single I/O Link.

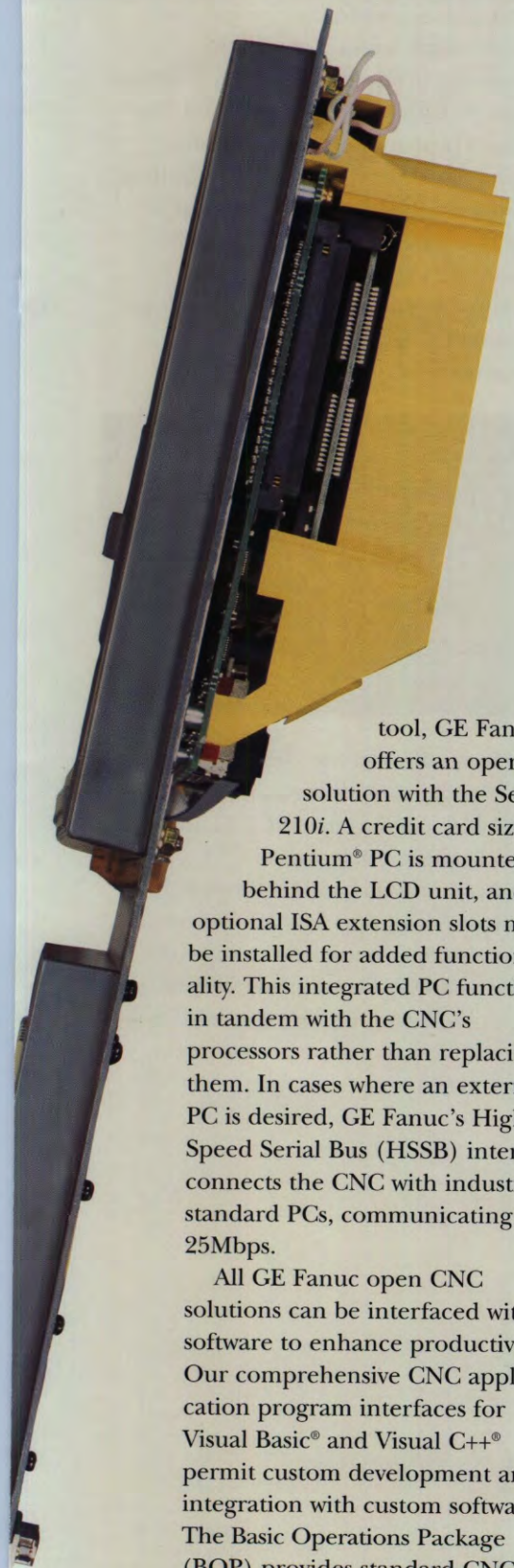
PCMCIA for Quick Updates

It's easy to install new software or to troubleshoot from remote locations. That's because the Series 21i CNC features a PCMCIA card slot mounted on the front of the LCD unit. Simply insert a memory card, and you can transfer part programs, parameters, and ladder logic. Insert a modem card, and you can download programs, troubleshoot, and complete routine maintenance, all from a remote location.

The CNC That's Open for Business

For those who require a more sophisticated operator interface, need to collect SPC data, or who simply wish to use CAD/CAM and other off-the-shelf software tools right on the machine





tool, GE Fanuc offers an open solution with the Series 210i. A credit card size Pentium® PC is mounted behind the LCD unit, and optional ISA extension slots may be installed for added functionality. This integrated PC functions in tandem with the CNC's processors rather than replacing them. In cases where an external PC is desired, GE Fanuc's High-Speed Serial Bus (HSSB) interface connects the CNC with industry standard PCs, communicating at 25Mbps.

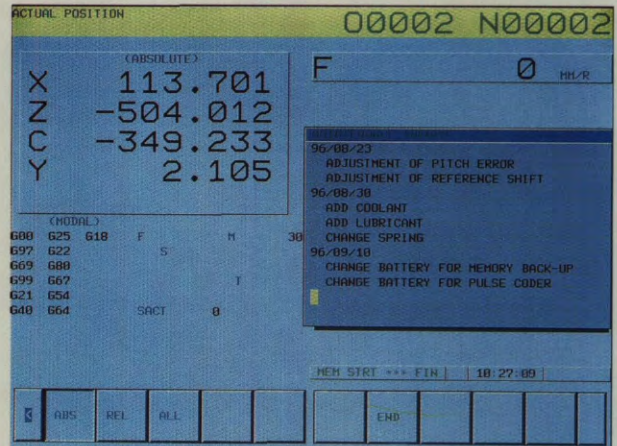
All GE Fanuc open CNC solutions can be interfaced with software to enhance productivity. Our comprehensive CNC application program interfaces for Visual Basic® and Visual C++® permit custom development and integration with custom software. The Basic Operations Package (BOP) provides standard CNC, PMC, and maintenance displays for your personal computer. These

applications are fully customizable and integrate with off-the-shelf products using Microsoft's OLE 2® interface.

GE Fanuc's CIMPLICITY® HMI product further extends usability with simple screen design tools and preconfigured networking to other CNCs, PLCs, or host computers.

Keeping You Informed

The Series 21i CNC is available with a full selection of monochrome and color LCD displays. No matter what your choice, you'll enjoy superior VGA-style graphics that help make the pre-configured screens for servo setup, machine operation, and waveform display exceptionally easy to follow. The periodic maintenance screen and the maintenance information screen, for instance, contain information that will contribute



to regular, comprehensive maintenance, while the alarm and operation history screens record all alarms and operator responses, providing valuable data for troubleshooting.

Easy Integration with Your Network

The Series 21i offers several communications options which facilitate unmanned operations and remote diagnostics. DNC2, RS-232, or RS-422 make it possible to connect the CNC to a PC for cell networking and data collection. The open architecture Series

210i, which integrate PCs into the machine tool environment, enables the user to select from a host of third-party hardware and software. Networking your CNC is now as simple as networking your office.



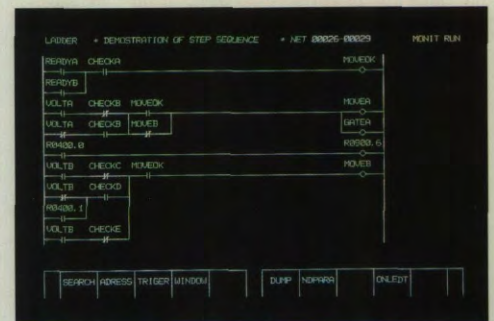
Series 21i / 210i CNCs Highlights

Models Available	MA, TA	
Max Controlled Axes	4	
Simultaneously Controlled Axes	4	
Controlled Path	1	
Loader Control Axes	4	
Max Spindle Control	2	
Power Motion Manager	■	
PMC Systems	RA1	RA5
μS per Step	5.0 μS/step	0.085 μ S/step
Max Steps	5,000 steps	16,000 steps
Part Program Storage Length	320 m (512K)	
Maximum Resolution	0.0001 mm	
	0.00001"	
	0.0001°	
Number of Expansion Slots Available	0, 2	
Expansion Slot Option Boards Available	Loader Control	
	Local CPU	
	HSSB	
Macro Executor	■	
Custom Macro B	■	
Open CNC System	■	
Communications—DNC2	■	
Remote Buffer	■	
Display		
Ladder Monitoring/Editing	■	
Servo/Spindle Setup	■	
Alarm/Operation History	■	
Periodic Maintenance	■	
Servo Waveform Display	■	
Stored Pitch Error Compensation	■	
Linear/Circular Interpolation	■	
Cylindrical Interpolation	■	
Polar Coordinate Interpolation	■	
Polar Coordinate Command	■	
Rigid Tapping	■	
Cutter/Tool Nose Compensation	■	
Canned Cycles	■	
Modem (PCMCIA) Interface	■	
Fine Acc/Dec Control	■	
Tool Life Management	■	
Scaling	■	
Spindle Simple Synchronous	■	
LCD Options		
Monochrome	7.2" and 9.5"	
TFT Color	8.4" and 10.4"	
Touch Screen	Optional	

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Customization Means Flexibility

Being able to adapt the control to a specific application is critical to improving productivity for machine tool users. As with all GE Fanuc CNCs, the Series 21i provides ladder creation, display, and editing right at the control. Using our macro executor feature, it's easy to create canned cycle or measuring cycle code. The macro executor supports machining program creation control as well as data input/output.



Above all, with the GE Fanuc Series 21i, you get the performance and reliability that has made GE Fanuc the most requested supplier of CNCs in the industry. The Series 21i continues this tradition with pride. It combines the latest advancements in manufacturing technology and GE Fanuc's time proven control software to produce a CNC which delivers exceptional performance for small machines.

For every great solution,
 there is a better one.



GE Fanuc Automation

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