GE Fanuc Automation

Series 0*i* C
CNC Family

The Best Value CNC with GE Fanuc Reliability

GE FANUC

The Series 0*i* CNC Controller Family

The new Series 0*i* CNC is the proud successor to the Series 0, the world's most popular CNC with more than 400,000 units in service. It demonstrates the unsurpassed performance and reliability of GE Fanuc CNCs, available on a wide range of affordable machine tools.

The Series 0*i* includes over 200 standard features that are designed to increase the productivity of your operation, and will continue to deliver results over the life of your investment.

The Series 0*i* Family of controllers features two different models: the "Series 0*i* Mate" which is GE Fanuc's CNC controller offering the best value of the Series 0*i* Family, and the full-featured "Series 0*i*". Both models are compatible with the latest GE Fanuc drive technology.
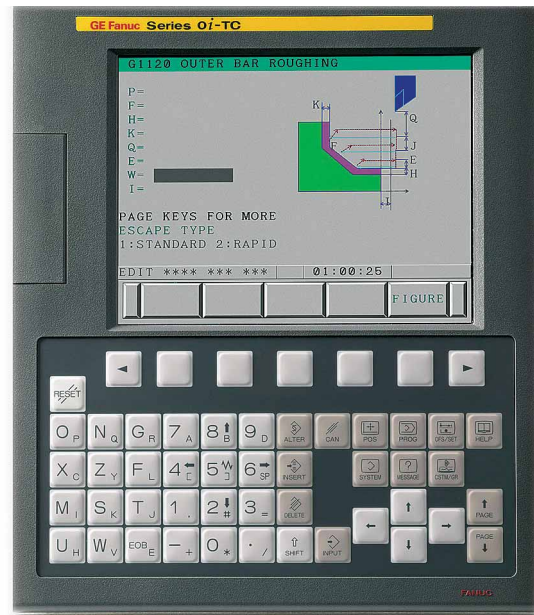
Key Features and Benefits

GE Fanuc is the industry leader for high-performance, high-reliability CNCs. Using advanced microchip technology, our CNCs are compact yet rugged. The advantages of our precise, high-performance digital servo systems will be seen in the quality of every part that you make.

With a two-year standard warranty and an average fourteen-year MTBF, it may be a long time before you need to take advantage of our technical and replacement part support. However, GE Fanuc offers a wide range of value-added services that can lower your overall cost of ownership.

Loaded with premium features to ensure maximum productivity:

- Compatibility with the previous GE Fanuc Series 0, no learning curve required
- Multi-language support
- Simple programming and operation with MANUAL GUIDE 0*i*
- Operator friendly graphic display for visual part program verification
- Extended help functions and alarm/operation history
- High-speed machining for better quality parts, faster
- Tool Life Management for maximum machine utilization
- Cutter Compensation for print dimension data input
- Canned Cycles for simplified part programming
- Custom Macro B for extending existing canned cycles, or creating new ones
- Rigid Tapping for high-quality tapping with low-cost, solid taps
- Skip Cycle Programming for on-machine probing.
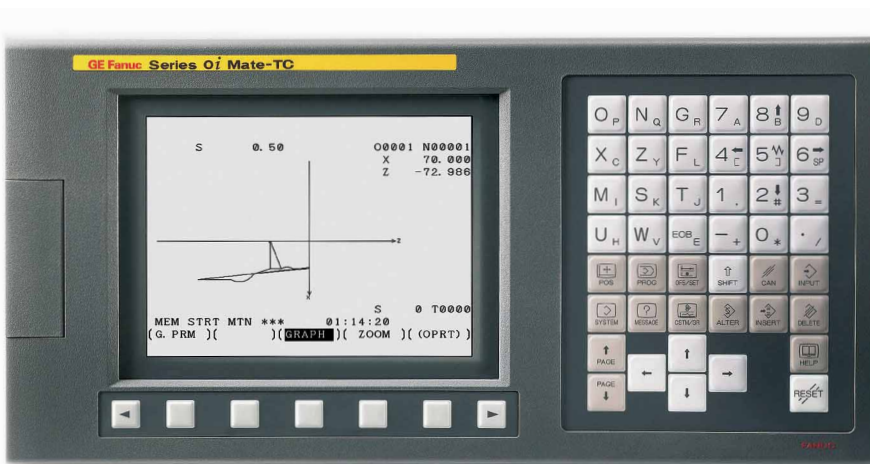
Thin and Compact

The MODEL Cs integrate the CNC into the LCD display unit. The depth of the complete unit is just 70 mm, making it ideal for automating compact machine tools.

Ease-of-use through PCMCIA Port

PC memory and LAN cards can be inserted into a PCMCIA slot in the front panel of the LCD. Memory cards enhance ease-of-use by enabling NC programs, and parameter and tool compensation settings, to be uploaded or downloaded. Alarm and operation histories, which are logged in the CNCs, can also be retrieved easily via a memory card. When the CNC is connected to a PC via a LAN card, the servo motors can be adjusted to match the machine tool. This is made possible by running the GE Fanuc SERVO software tool on the PC.

Range of LCD displays

The Series 0i-MATE is available with a 7.2" monochrome LCD (horizontal or vertical version). The LCD displays are available as 8.4" and 10.4" color and 7.2" monochrome for the Series 0i CNC.

Premium features included

The Series 0i includes over 200 features designed to enhance your machine's productivity over the lifetime of your investment. Designed for simple turning, milling, cylindrical or surface grinding and punching applications, the Series 0i is easy to operate and program. Tools are provided to make it easy to troubleshoot any CNC, drive or machine problem.
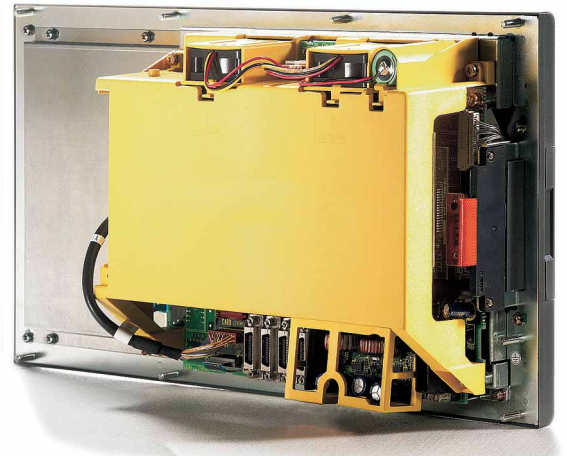
Advanced Functionality

Interpolation

In addition to Linear or Circular Interpolation, the Series 0*i* features Helical Interpolation, Cylindrical Interpolation (for cylindrical groove cutting) or Polar Coordinate Interpolation (for cam grinding or face milling using the Cartesian coordinate system).

Tool Life Management

Tools can be easily classified in various groups; tool life and tool numbers in groups can be stored in the CNC control memory in the form of simple tables.

Scaling and Coordinate Rotation
(Milling only)

Program command values can be easily scaled in a range between 0.001 to 999,999 or from 0.00001 to 9.99999. It is also possible to rotate a programmed shape around an angle, clockwise or counter-clockwise, without changing the shape definition.

AI Advanced Preview Control
(Milling only)

This function features the capability to look ahead multiple program blocks to optimize the acceleration and deceleration of the cutting speed. Machining trajectory error in corners and small radii are significantly reduced.

Rigid Tapping

This function allows a fast and accurate tapping through the synchronization of the spindle position loop with the tap axis (Z-Axis).
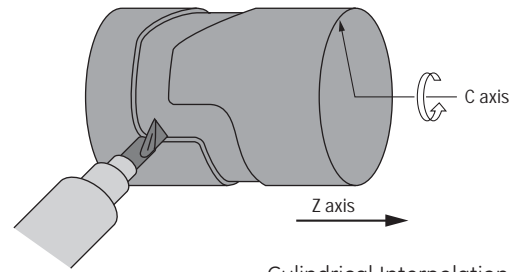
Automatic Corner Override
(Milling only)

This function automatically reduces the feedrate when cutting inner corners. It will prevent an overload of the cutter and improve the smoothness of the cutting surface.
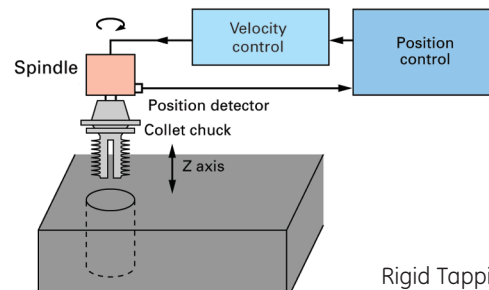

Cylindrical Interpolation

Rigid Tapping

The Series 0*i* CNC is applicable for many machining applications for new and retrofit/re-build machines.

Applications:

- Lathes
- Milling Machines
- Machining Centers
- Grinding Machines
- Drilling

Grinding Functions (examples)

- Four types of canned cycles for cylindrical grinding allow unique grinding cycles to be programmed in one block, such as traverse grinding cycles or oscillation grinding cycles
- Multi-step skip allows up to 8 skip signals from a measuring instrument or probe to be inserted in a program
- Grinding wheels wear compensation in continuous dressing
- Dresser control in normal direction, where the dresser is constantly and automatically maintained in a direction perpendicular to the dressing shape.
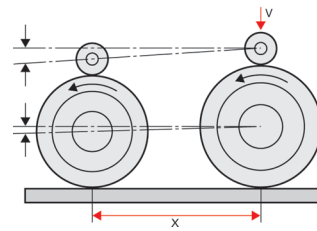
Grinding wheel wear compensation in continuous dressing
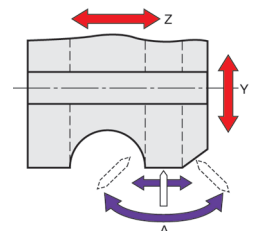
Dresser control in normal direction

Punch Press Functions (examples)

Optimum acceleration/deceleration control

The rapid traverse rate, time constant and position loop gain can be adjusted according to the positioning distance. This ensures high speed positioning and a high hit-rate.

Optimum press control

The timing of the press start signal (PF) can be adjusted according to the positioning distance. Thus, the press control is optimized.

C-axis control

The angular position of a die (tool) can be changed by a programmed command, and the tool changing time is reduced. In addition, when used for bolt hole circle and arc pattern punching, and for circular nibbling, the C-axis is controlled so that the same edge of the die faces the arc center at each punching position.
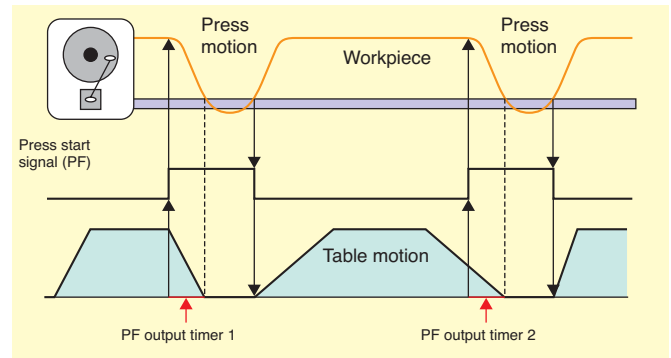
Safety zone check

The safety zone check function prevents collision between the tool and the workpiece holder, avoiding damage caused by incorrect programming or incorrect operation.
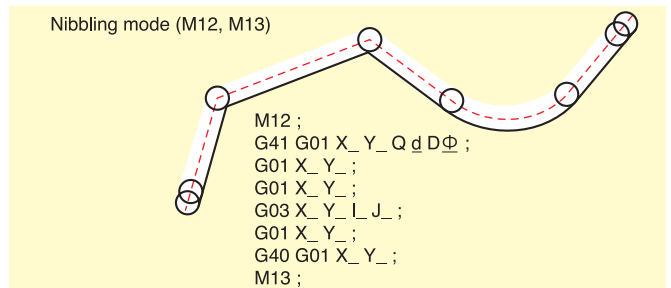
Nibbling function

Continuous, repetitive punching can be performed without halting the pressing process. Programming can be carried out using the M command for the nibbling mode - G69 for linear nibbling, and G68 for circular nibbling.

Pattern function

Having defined punching commands in a pattern for 1 block, it is possible to repeat this operation in multiple positions. Eight types of pattern commands are offered.

Optimum press control

Nibbling function (M12, M13)

```
M12 ;
G41 G01 X_ Y_ Q d DΦ ;
G01 X_ Y_ ;
G01 X_ Y_ ;
G03 X_ Y_ I_ J_ ;
G01 X_ Y_ ;
G40 G01 X_ Y_ ;
M13 ;
```

Nibbling function

Bolt hole circle

G26 I r J θ K n

Punching arc

G88 I r J θ K $\Delta\theta$ PΦ Q d
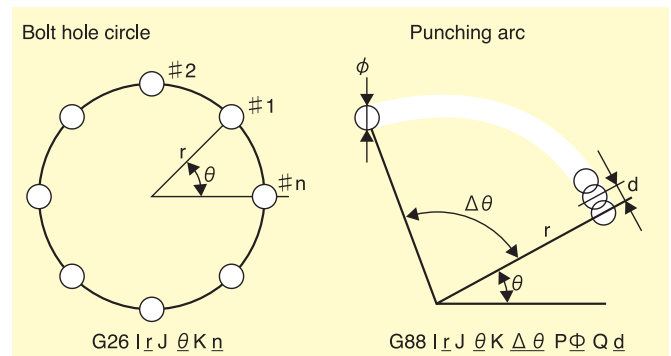
Pattern function

Operator Friendly CNC

Quick and Simple Program Development

The Series 0*i* CNC features MANUAL GUIDE 0*i*, a conversational programming environment, which allows quick and simple development of part programs for lathes, milling machines or machining centers. Conversational operator software, Manual Guide *i*, is available for the 10.4" color LCD display. This simplifies programming on the shopfloor, offering rapid development of part programs with guidance, all on one screen. 3D simulation of the machining process helps to reduce the time for part program checking, virtually eliminating errors.

MANUAL GUIDE 0*i* is available for monochrome or color screens, and is built around the following functionality.

- ISO Code programming assistant
- G-Code and M-Code assistant
- Contour programming assistant
- Advanced canned cycles

ISO Code Programming Assistant

MANUAL GUIDE 0*i* has adopted the ISO code as a base for its part programming language. Simple motion, such as lines or arcs, can be entered using the simple G-Code; complex motions such as pocket machining and drilling patterns can be entered using machining blocks. The assistant helps the operator throughout the process and generates the program automatically.

It is also possible to mix programs generated by a CAD/CAM system with a program created manually or with MANUAL GUIDE 0*i*.

On-screen Operator Guidance

Graphic display

Allows the operator to visualize the part program on the CNC display before machining. Programming errors can be quickly corrected without cutting expensive material.

Advanced assistance functions

- History and Help function: it is possible to display, at any time, the operation history of the machine as well as the list of alarms that have occurred. This monitoring is done automatically by the CNC. In addition, extensive help screens will assist the operator when a fault occurs or if he is not familiar with a particular function.
- Servo waveform display: Simplifies the tuning and diagnostics of the drive system; it visualizes the position error or torque commands.

G-Code and M-Code Assistant

At any time during the design of a part program, it is possible to use the Assistant, which describes a particular G- or M-Code. The description of the code is textual and graphical. It is possible for a machine tool builder to customize the M-Code assistant, adding new M-Codes or modifying the existing ones to fit the particular machine requirements.

Programming Assistant

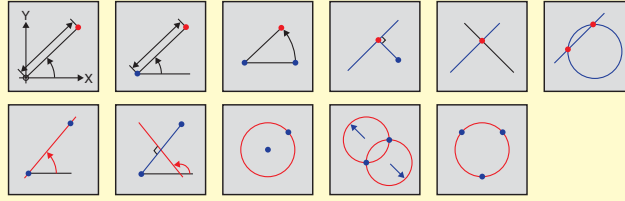Servo Waveform Display
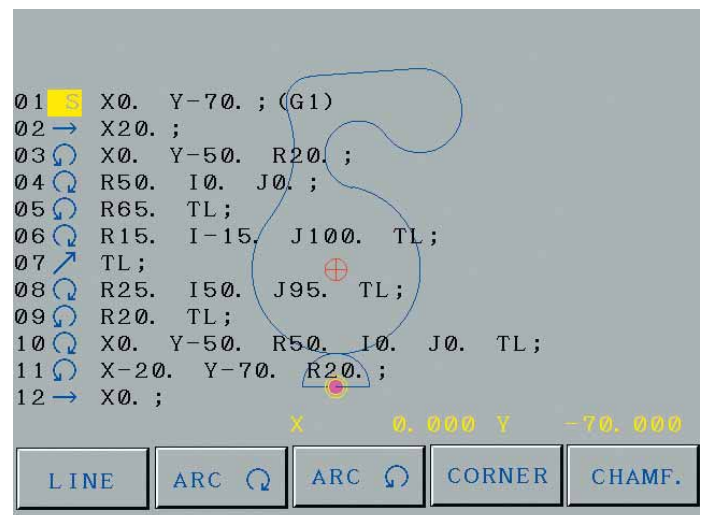
Contour Programming

Contour Programming

MANUAL GUIDE 0*i* features contour programming to allow the user to create complex contour figures with a combination of lines and circles. 11 types of fundamental contour elements are available.
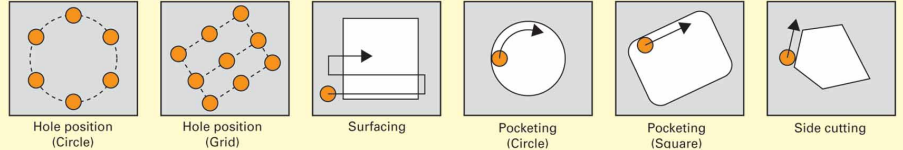
Advanced Graphical Canned Cycles

In order to ease the programming of lathes or milling machines, MANUAL GUIDE 0*i* features various canned cycles. The operator simply fills the required fields on the graphical CNC screen and the program will be created automatically.
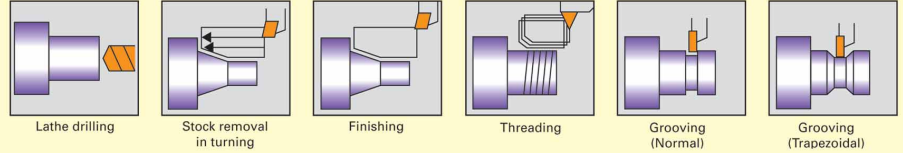
11 types of auxiliary figure calculation

Milling cycles

| Hole position (Circle) | Hole position (Grid) | Surfacing | Pocketing (Circle) | Pocketing (Square) | Side cutting |

Turning cycles

| Lathe drilling | Stock removal in turning | Finishing | Threading | Grooving (Normal) | Grooving (Trapezoidal) |

Product Specifications

CNC Hardware

- Up to 4 Programmable Axes and 2 Spindles
- 32-bit Main Processor
- 256K Byte (640m / 2100ft) Part Program Storage
- 48 Workpiece Offset Pairs (Milling Version)
- 400 Tool Offset Pairs (Milling Version), 64 Tool Offset Pairs (Turning Version)
- Embedded PMC (PLC) with up to 24,000 steps and 0.033µs per step
- Flash memory for CNC and PMC (PLC) Programs as well as the System Software
- Easy Field Backup and Restore of the CNC Memory on a PCMCIA Card
- Wide Variety of Display Units (from 7.2" LCD Monochrome to 10.4" LCD Color)

Communication

- Ethernet Communication
- Fieldbus Support (Profibus-DP, DeviceNet, FL-Net)

Programming

- Manual Guide 0*i*
- Manual Guide *i* (10.4" LCD display only)
- Advanced Setup and Tuning Tools
- PMC (PLC) Ladder Display and Editing
- Online Help Functions and Assistants
- Handwheel Jog
- Mirror Image, Scaling or Coordinate System Rotation
- Linear, Circular, Polar, Cylindrical and Helical Interpolation
- Imperial or Metric Operation
- Background Editor and Help Function
- MDI (Manual Data Input), RS232 or DNC Data Input
- Optional Stop and Block Skip
- Multi-Step Skip, Continuous Dressing and Infeed Control (Grinding Option)
- Data Server
- Many Customization Capabilities (HMI, Macro Functions, Operator's Panel)

Drive System

- Compatible with GE Fanuc's Digital AC Servo Motors and Drives (ALPHA *i* and BETA *i* Series)

Note: Some features are not available on the 0*i* Mate CNC. For a complete list of features, refer to the Series 0*i* detailed product specification table.

GE Fanuc delivers a total solution.

GE Fanuc Automation, a joint venture between GE and FANUC LTD of Japan, delivers automation hardware and software designed to help users reduce costs, increase efficiency and enhance profitability. With solutions and services catering to virtually every industrial segment, GE Fanuc Automation provides a diverse array of capabilities and products, including controllers, embedded systems, advanced software, motion control, CNCs, operator interfaces, industrial computers, and lasers. Headquartered in Charlottesville, VA, GE Fanuc Automation is a part of GE Industrial and combines the diverse global strengths of the GE family with the local presence customers need to design, develop and maintain their automation investments.

Machine Tool Controls and Solutions

You can improve your plant's overall efficiency by enhancing the quality of your products, controlling costs and reducing waste. To do so requires an experienced and reliable partner who can offer innovative control systems in addition to bringing you Overall Equipment Effectiveness (OEE) solutions for your plant. With GE Fanuc you get exceptional solutions as well as the expertise and global services to support you.
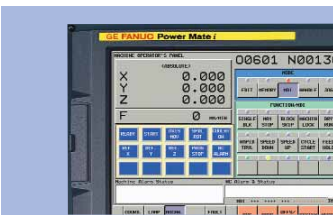
CNCs

Improve your machine tool efficiency with GE Fanuc's wide range of highly reliable control systems, featuring powerful navigation and programming tools.
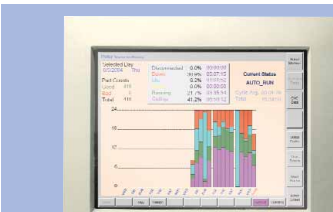
CNC PC Communications

Communication options critical to improvements in your machine tool productivity, such as simple part program transfers and remote diagnostics, can be easily configured to integrate with all your existing systems.

CNC Productivity Solutions

Dramatically enhance your Overall Equipment Effectiveness by improving your machine tool's productivity and precision with any one of our robust applications, tailored to fit your specific needs.

Global reach with local presence

We reach out to our customers through a worldwide network of manufacturing, sales, distribution, service and support.

GE Fanuc Automation Information Centers

Americas:
1 800 GE FANUC or 434 978 5100

Asia Pacific:
86 21 3222 4555

Europe, Middle East and Africa:
800 1 GE FANUC or 800 1 4332682
or 1 780 401 7717

Europe, Middle East and Africa (CNC):
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Additional Resources

For more information, please visit the GE Fanuc web site at:

www.gefanuc.com/cnc

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