FANUC's high-end CNC with extremely polished machining performance

# FANUC
## Series 30*i*/31*i*/32*i*
### -MODEL B Plus

# FANUC's high-end CNC with extremely polish

## FANUC Series 30*i*/31*i*/32*i*-MODEL B Plus

### More powerful and easier to use

- Improved basic performance (required functions are included as standard)

  - Customized functions
  - Multifunctional Ethernet
  - Various essential optional functions
  - Extended memory capacity

- Renewed design
- Equipped with FANUC 's latest CNC and servo technologies
- Combination of CNC and robot (CNC-QSSR)
- Machine packaging based on the application

  - Packages (function groups for each manufacturing process)
  - Kits (function groups for each mechanical structure)

**Mach Perfor**

5-axis machine tool wit
▶ 5-axis Integrated Te

Improved productivity thr
▶ Fast Cycle-time Tec

Achieves high-quality
▶ Fine Surface Techno

Prevent sudden machine downtime with preventive maintenance
▶ Extensive failure prediction functions

Reduce recovery time by easily pinpointing faulty parts
▶ Diagnosis/maintenance functions

**Minimizing Downtime**

# ed machining performance

**ining mance**

h improved usability
chnology

ough reduced cycle times
hnology

machining
logy

## Optimal CNC based on the application

### Multi-axis and multi-path CNC

**FANUC Series 30_i_-MODEL B Plus**
Max. number of paths : 10 - 15 paths
Max. total number of controlled axes :
96 axes ( 72 feed axes, 24 spindles ) / 10 paths
72 axes ( 56 feed axes, 16 spindles ) / 15 paths
Max. number of simultaneous controlled axes : 24 axes

### CNC with support for simultaneous 5-axis control

**FANUC Series 31_i_-MODEL B5 Plus**
Max. number of paths : 6 paths
Max. total number of controlled axes : 34 axes (26 feed axes, 8 spindles)
Max. number of simultaneous controlled axes : 5 axes

### Core CNC

**FANUC Series 31_i_-MODEL B Plus**
Max. number of paths : 6 paths
Max. total number of controlled axes : 34 axes (26 feed axes, 8 spindles)
Max. number of simultaneous controlled axes : 4 axes

### Standard CNC

**FANUC Series 32_i_-MODEL B Plus**
Max. number of paths : 2 paths
Max. total number of controlled axes : 20 axes (12 feed axes, 8 spindles)
Max. number of simultaneous controlled axes : 4 axes

**Integrated support of the shop floor**
▶ **FANUC _i_HMI**

**Original screen for ease of use**
▶ Comes standard with customizability functions

**IoT integration**
▶ Extensive compatibility with field networks

## Ease of Use

# System Configuration

## CNC Control Unit (LCD mounted type/stand-alone type)

The display lineup supports a wide range of machines, from compact to large and standard to high-end, including the PANEL *i*H/*i*H Pro with *i*HMI support, a 10.4″ LCD unit, and more.

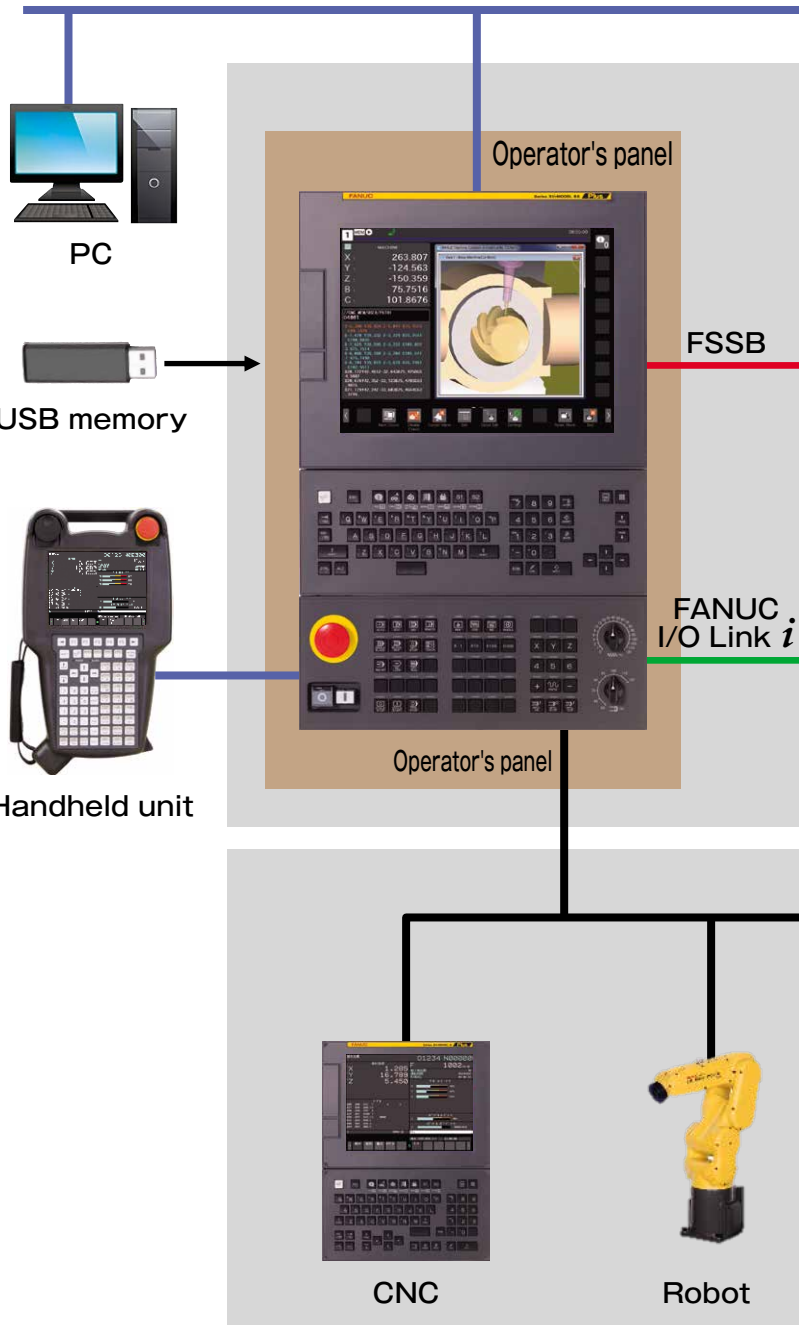PANEL *i*H Pro
21.5″

PANEL *i*H/*i*H Pro
19″

PANEL *i*H/*i*H Pro
15″

PANEL *i*H/*i*H Pro
10.4″

10.4″ LCD

## Handheld Unit

Equipped with an emergency stop button and a manual pulse generator, this handy unit line-up achieves safe manual operation of machine tools.

*i*Pendant

Handy Machine
Operator's Panel

Portable manual
pulse generator

PC

USB memory

Handheld unit

Operator's panel

FSSB

FANUC
I/O Link *i*

Operator's panel

CNC

Robot

## I/O Unit

Wide range of I/O units compatible with various installation locations and I/O devices.

### Optimized for operator's panels with its thin and space-saving design

Standard operator's panel with key input duplication

Handles the output/input of safety signals

Compatible with original operator's panels

Safety Machine
operator's panel

I/O module for operator's panel
supporting safety function

I/O module for
operator's panel

### Optimized for power magnetics cabinets with high scalability an

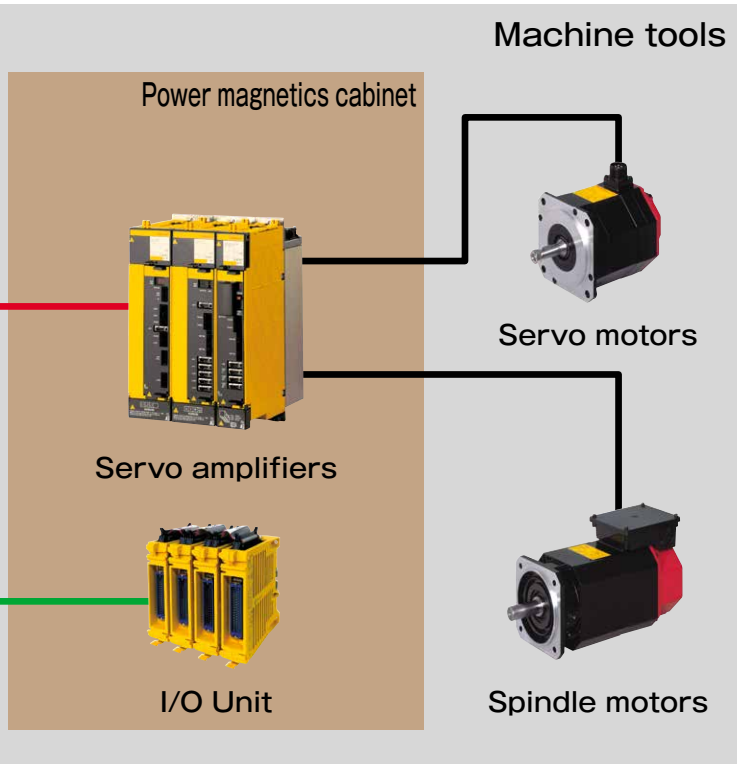Excellent cost performance with multi-point output/input

Compact and with reduced wiring

I/O unit for power
magnetics cabinet

I/O module for
connector panel

4

Ethernet

## Machine tools

Power magnetics cabinet

Servo amplifiers

Servo motors

I/O Unit

Spindle motors

## Peripheral equipment

Compatible with various field networks
· FL-net
· EtherNet/IP
· PROFINET
· Modbus/TCP
· DeviceNet
· PROFIBUS-DP
· CC-Link

Peripheral device

## Servo Motor

Line-up to meet the various needs of machine tools and contribute to the performance improvement of feed axes

**AC SERVO MOTOR**
$\alpha i$-B/$\beta i$-B series

**DD MOTOR**
D$i$S-B series

**LINEAR MOTOR**
L$i$S-B series

## Spindle Motor

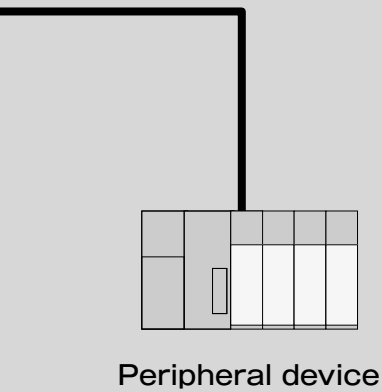Line-up to meet the various needs of machine tools and contribute to the performance improvement of spindles

**AC SPINDLE MOTOR**
$\alpha i$-B/ $\beta i$-B series

**BUILT-IN SPINDLE MOTOR**
B$i$-B series

## Servo Amplifier

Line-up to be flexibly available for a variety of machine tools and contribute to the downsizing of cabinets

**SERVO AMPLIFIER**
$\alpha i$-B series

**SERVO AMPLIFIER**
$\beta i$SVSP-B series

d extensive modules such as the multi-point output/input type and the analog/digital output/input module

Reduced wiring work with a dismountable pole terminal block

Monitor machine status with the temperature sensor and the shock sensor

Extensive modules including analog, temperature input, and high-speed counter

Terminal Type I/O module

MULTI SENSOR I/O UNIT

I/O Unit-MODEL A

Optimized for reduced wiring by enabling distributed setup

Can be positioned near sensors scattered inside and outside the machine cabinet
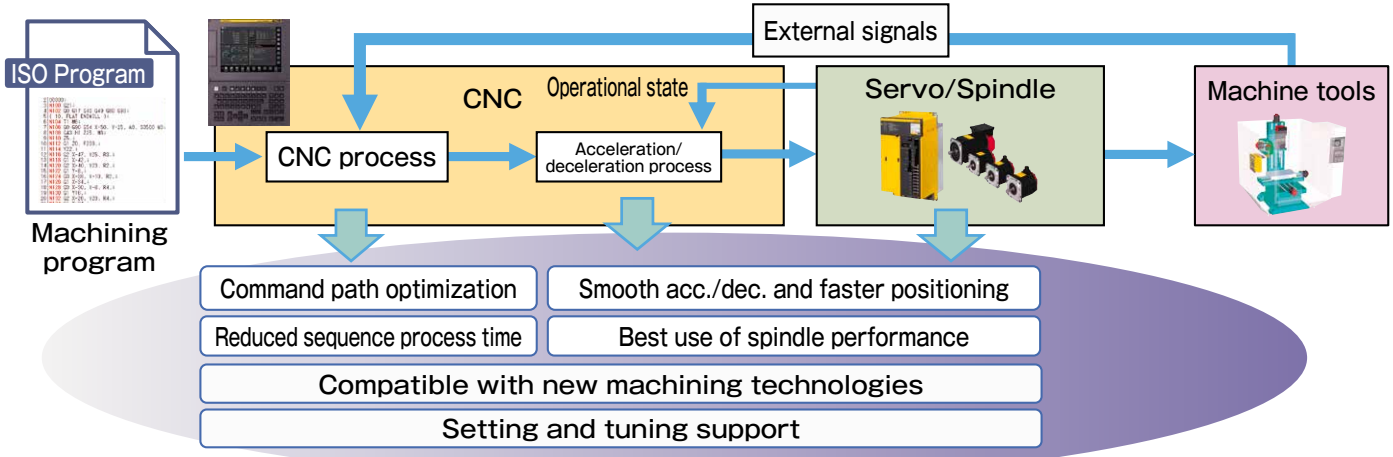
IP67 type

I/O Unit-MODEL B

# High Performance

## Fast Cycle-time Technology

Fast Cycle Time Technology refers to CNC and servo technologies that achieve reduced cycle times. It reduces cycle times of machining programs through methods such as accelerating and decelerating depending on the operational state, making the best use of spindle performance, and reducing the sequence processing time for external signals.

External signals

ISO Program

CNC
- CNC process
- Operational state
- Acceleration/deceleration process

Servo/Spindle

Machine tools

Machining program

- Command path optimization
- Smooth acc./dec. and faster positioning
- Reduced sequence process time
- Best use of spindle performance
- Compatible with new machining technologies
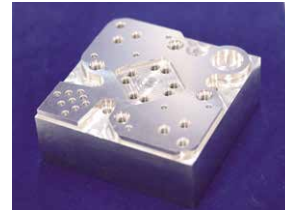- Setting and tuning support

## Fast Cycle-time setting

### Easily reduce cycle times

The Fast Cycle-time setting compares the currently set parameter setting to the FANUC default setting, allowing you to easily use the setting that most effectively reduces cycle time.

Reduced cycle time example:
Workpiece for evaluation

Before application
5 minutes 4 seconds

After application
3 minutes 50 seconds

Approx. 24% reduction

## Smart Servo Control

Smart Servo Control is a group of functions to optimize control in real time according to the change of machine conditions such as load and temperature. These functions contribute to high-speed, high-precision and high-quality machining as the control technology supporting Fast Cycle-time Technology and Fine Surface Technology.

### Smart Spindle-load Control
- Feed speed
- Over heat level
- Load
- Temperature
- Time

### Smart Rigid Tapping
- Spindle speed
- Synchronous error
- Shorter time constant
- Cutting
- Extraction

### Smart Thermal Control
- Temperature of winding
- Over heat level
- OFF
- ON
- Time

### Smart Spindle Acc/Dec

### Smart Feed-axis Acc/Dec
- Large inertia
- Small inertia
- Torque
- Speed
- Time constant
- Time constant

Servo

Spindle

### Smart Load Meter
0   223   189%
DURATION TIME 9 S

### Smart Overlap
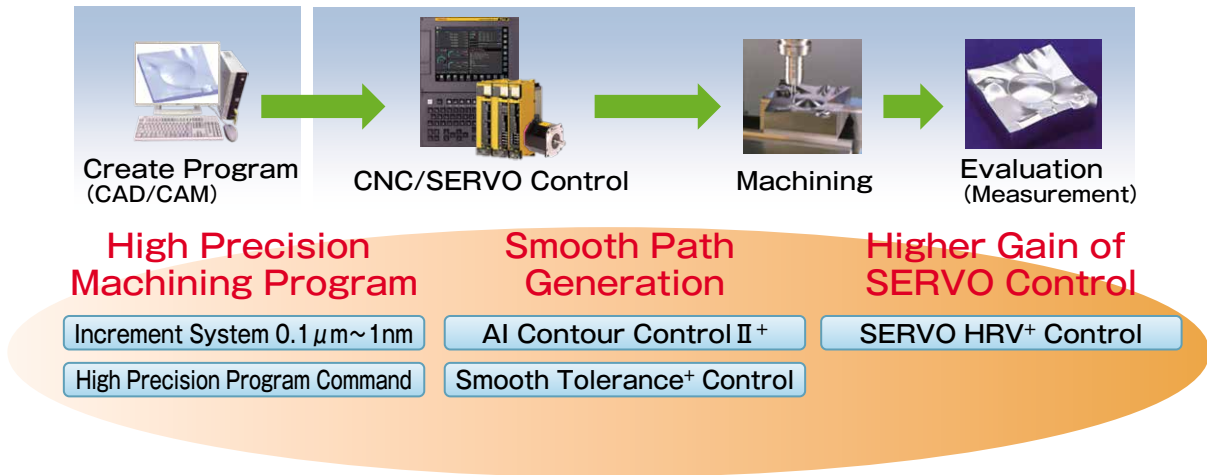- Overlap
- G00
- G01
- G00
- Work piece

### Smart Backlash Compensation
- OFF
- ON

### Smart Machining Point Control

# Fine Surface Technology

Fine Surface Technology is a collective term for CNC and servo technologies that achieve fine surface machining.
Fine Surface Technology allows for the interpolation of high precision machining program output from CAD/CAM, high-speed execution of small segment programs, the generation of a smooth tool path and accurate command follow-up.

**Create Program** (CAD/CAM) → **CNC/SERVO Control** → **Machining** → **Evaluation** (Measurement)

**High Precision Machining Program**

| Increment System 0.1 $\mu$m ~ 1nm |
| High Precision Program Command |

**Smooth Path Generation**

| AI Contour Control II+ |
| Smooth Tolerance+ Control |

**Higher Gain of SERVO Control**

| SERVO HRV+ Control |

## Fine Surface settings

Standard setting values are provided based on machining conditions (roughing, semi-finishing, or finishing), and slide bars can be intuitively used to set and adjust high-speed, high-precision machining parameters based on the machine. Machining under optimal conditions can be achieved by selecting machining processes during the machining itself using a machining program or screen operations.

## Smooth Tolerance+ Control

Smoothing continuous small blocks to realize fine surface machining
The machining path specified in continuous small blocks, like the one for mold machining, is smoothed out within the specified allowance error tolerance.
The smooth machining path reduces mechanical shock and improves the quality of the machined surface.

**Function: OFF** — **Workpiece** — **Function: ON**

Joints of blocks are visible — Smooth machined surface
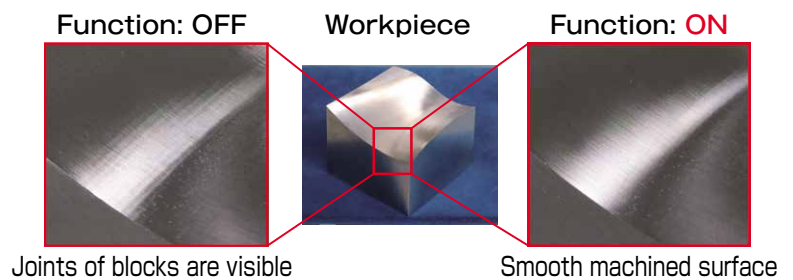
## Servo Learning Control/ Servo Learning Oscillation

Servo learning control enables high-speed, high-precision machining of workpieces that require repeatable cutting commands, such as aspherical workpieces, gears, and so on.
Servo learning oscillation that applies servo learning control also accurately tracks oscillation commands with a high frequency, thereby achieving dependable chip shredding.

**Example of the application of servo learning control**

Aspheric lens

Piston (Non-cylindrical)

Example of piston machining
Spindle: 4500min⁻¹
Swing axis: 150Hz

EllipseLong and short diameter difference=0.4mm

Error 2$\mu$m or less

Combinations with a DD or liner motor are particularly effective for achieving high-precision machining.

**Servo Learning Oscillation**

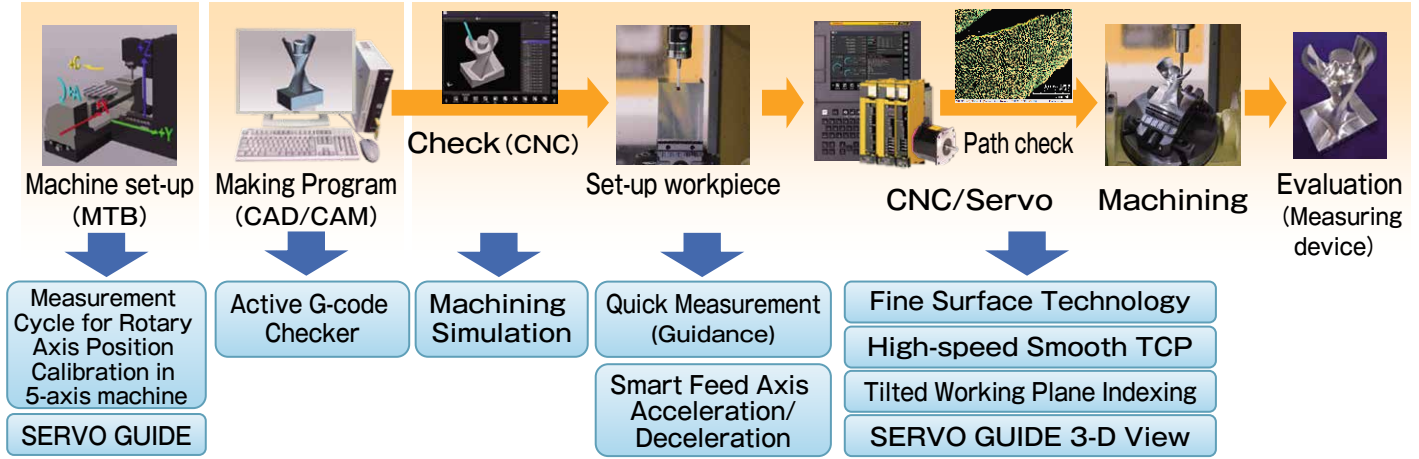Normal path

Tool moves with oscillation

Z axis direction

Oscillation

Shredded chips

# 5-axis Machining Functions Achieve a Smooth, High-
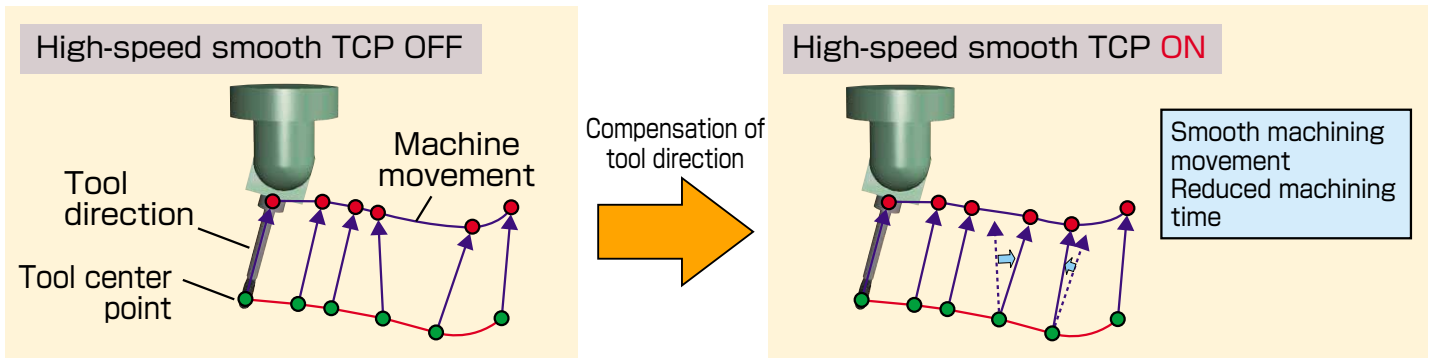
## Integrated 5-axis Technology

Integrated 5-axis technology is used to achieve 5-axis machining that is even easier to use and higher in quality. High-quality 5-axis machining is achieved through strong support for all 5-axis machining processes, from machine setup to program creation and machining evaluation. In addition to die cutting, machining that is high-speed, high-precision, and smooth is also achieved when it comes to part machining, which demands speed.

Machine set-up (MTB) → Making Program (CAD/CAM) → Check (CNC) → Set-up workpiece → Path check → CNC/Servo → Machining → Evaluation (Measuring device)

| | | | |
|---|---|---|---|
| Measurement Cycle for Rotary Axis Position Calibration in 5-axis machine | Active G-code Checker | Machining Simulation | Quick Measurement (Guidance) |
| SERVO GUIDE | | | Smart Feed Axis Acceleration/ Deceleration |

Fine Surface Technology
High-speed Smooth TCP
Tilted Working Plane Indexing
SERVO GUIDE 3-D View

## High-speed Smooth TCP that Achieves Smooth High-speed and High-quality 5-axis Machining  30*i*-B/31*i*-B5 Plusのみ

### High-speed and smooth simultaneous 5-axis machining

High-speed smooth TCP makes the machining movement smooth by compensating tool direction to decrease the unevenness, and improves the quality of the machined surface and reduce machining time.

High-speed smooth TCP OFF

Tool direction
Machine movement
Tool center point

Compensation of tool direction →

High-speed smooth TCP ON

Smooth machining movement Reduced machining time

### High-precision simultaneous 5-axis machining using Smooth tolerance$^+$ control

By combining high-speed smooth TCP and smooth tolerance$^+$ control, the quality of the cutting surface is improved greatly by smoothing the tool center point path even if machining programs consists of unnecessarily small segments.

TCP and Smooth tolerance$^+$ control ON

Smooth machine control point path
Tolerance
Tool direction
Small segments
Smooth Tool center point path

Joint of block
Workpiece

| High-speed smooth TCP | OFF | High-speed smooth TCP | ON |
|---|---|---|---|
| Smooth tolerance$^+$ control | OFF | Smooth tolerance$^+$ control | ON |
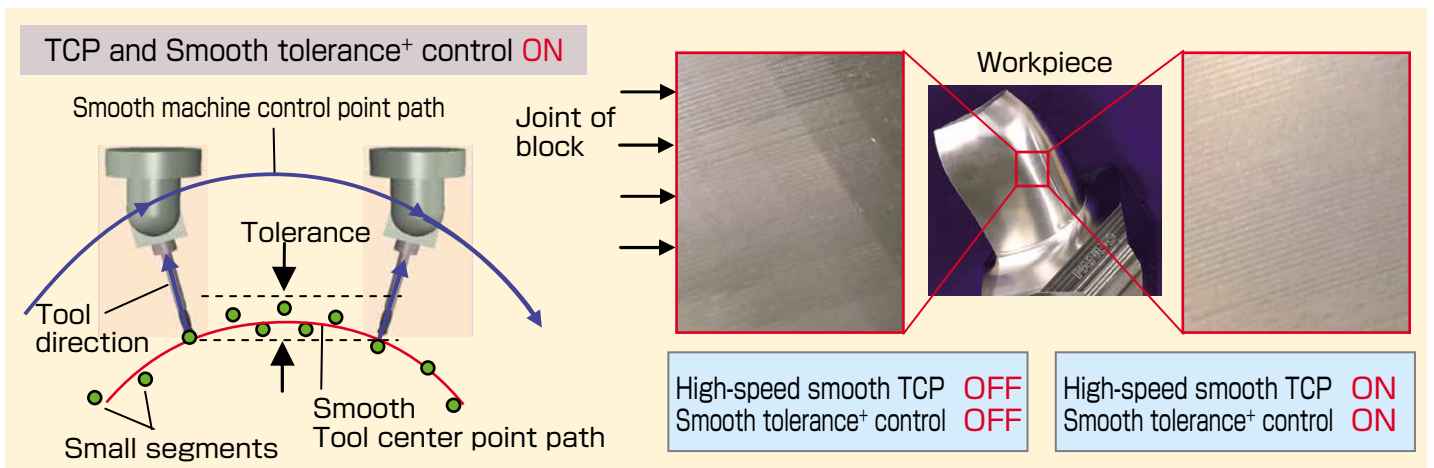
## Tilted working plane indexing

For machining a hole, pocket, or another figure on a tilted plane on a workpiece, specifying the working plane with plane (X, Y) makes programming very easy. The tilted working plane indexing enables this specification and also positions the tool automatically so that the tool becomes perpendicular to the tilted working plane without specifying the tool direction.

Guidance screen

Coordinate conversion — Original machining program — Tool axis direction control
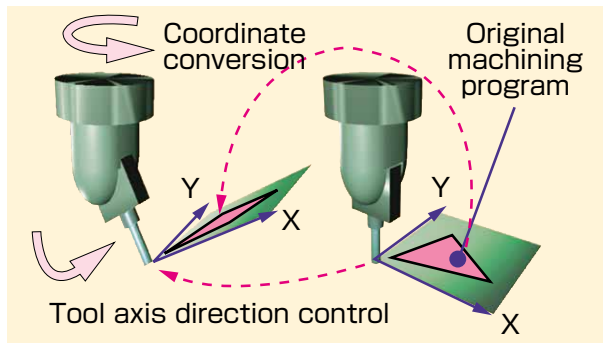
## Rotary Axis Position Calibration in 5-axis Machine

Using measurement cycle for rotary axis position calibration in 5-axis machine, you can easily measure the center position of the rotary axis. Measurement results will be automatically applied to the machine configuration parameters. It reduces the time taken for adjustment and enables high-precision 5-axis machining. All 5-axis machine configurations, including table rotation, tool rotation, and composite types are supported.

Probe — Rotary axis — Datum sphere — Rotary axis
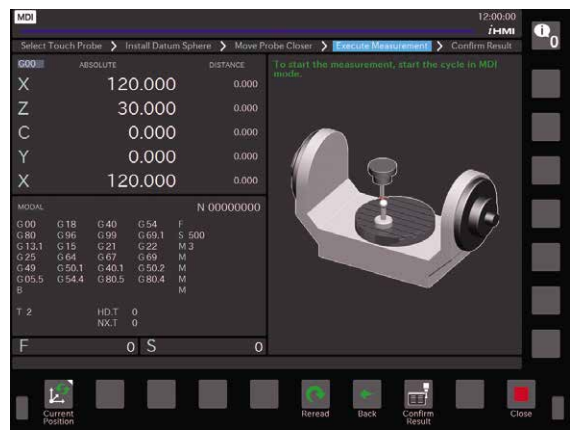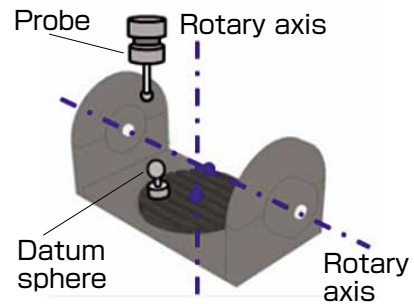
Rotary axis position measurement cycle input screen

## FANUC SERVO GUIDE 3-D View Function

Servo tuning tool, FANUC SERVO GUIDE can display "3-D tool path" and "Time based waveform of each servo axis" in the same window.
Enhanced display or color-coded display of path deviation makes it easy to find a point to be tuned.
FANUC SERVO GUIDE is useful servo tuning tool for 5-axis machining, which saves time for tuning parameters and precision evaluation.

Workpiece
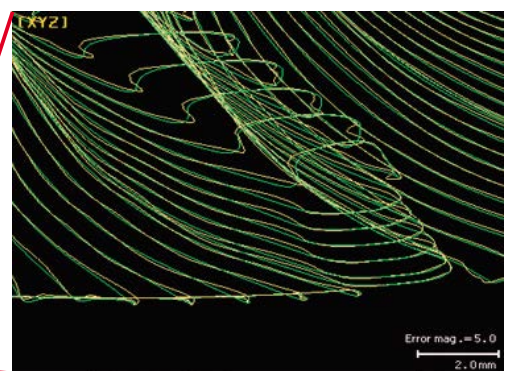
3-D tool path

## Improved *i*HMI Set-up Guidance Function

Since the *i*HMI set-up guidance function can be used to create a measurement program, it is possible to automate the setting of the workpiece coordinate system for mass-production machining.
It is also possible to set the workpiece coordinate system without creating a measurement program by operating manually according to the *i*HMI guidance.
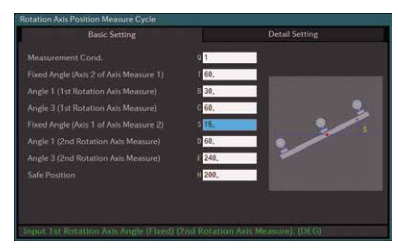
Measurement application

9

# Many Customizable Functions

Customizable functions are available, which allow machine tool builders to customize their own machine tools

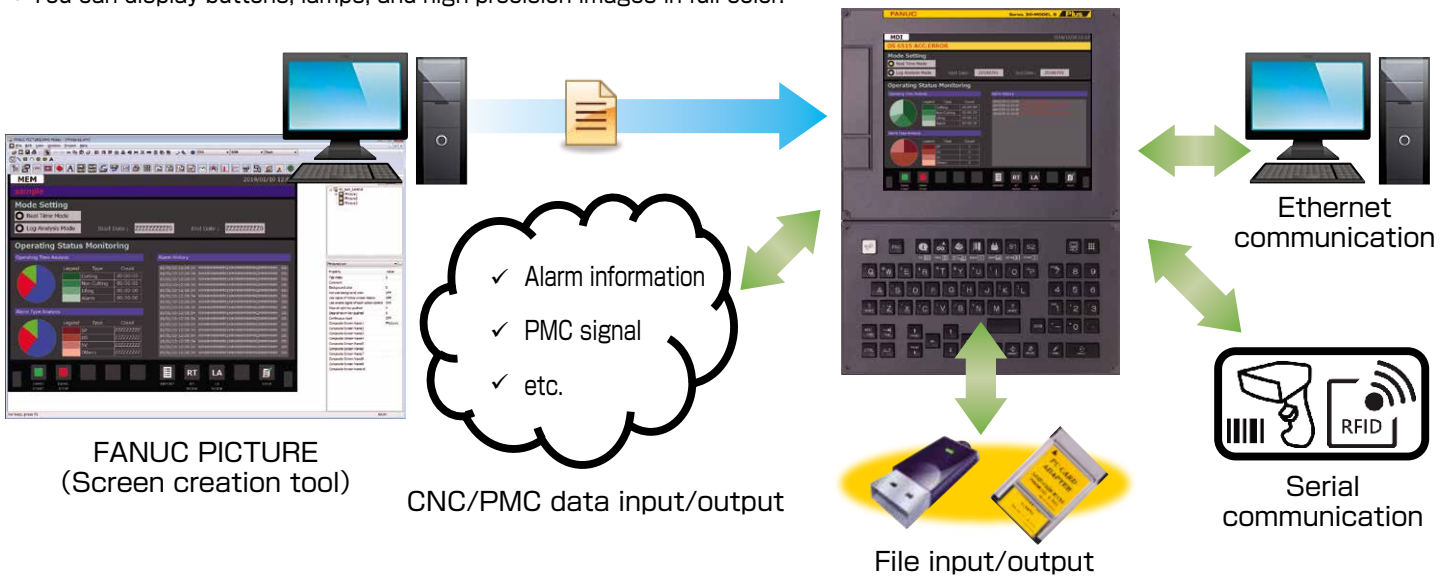## Customizing Operation Screens

### FANUC PICTURE

This tool enables you to create a machine operation screen simply by pasting screen components such as buttons and lamps on the PC.

- The screen creation tool is FANUC's proprietary easy-to-use user interface that is optimized for creating screens for CNCs.
- Screens that are created can be displayed and operated on various CNC models.
- Complicated controls such as network communication and file control can be easily implemented by using general-purpose scripts.

In addition, in PANEL $i$H/$i$H Pro, it is possible to create screens that leverage the performance of display devices.

- You can display the font for each language of any desired size.
- You can display buttons, lamps, and high precision images in full color.



FANUC PICTURE
(Screen creation tool)

✓ Alarm information
✓ PMC signal
✓ etc.

CNC/PMC data input/output

Ethernet communication

Serial communication

File input/output

### C Language Executor

Machine tool builders can create their own operation screens, which enables unique CNC display and operation.

- C language is used for programming.
- Multi window display enables creation of pop-up menus.
- Operation screens using the touch panel can be created.
- In addition to standard ANSI functions, many functions are available for CNCs and PMCs.
- High-level tasks to which high execution priority is assigned can monitor signal and position information.



## Implementing Original Sequence Control Based on PMC

### FANUC LADDER-Ⅲ

For machine customization, a machine tool builder's own sequence control can be incorporated into the built-in PMC. A PMC sequence program can be created on a personal computer by using FANUC LADDER-Ⅲ, a very easy-to-use programming tool with many useful functions.

- A program can be created with ladder and function block.
- A program can be coded using signal names instead of signal addresses.
- Online monitoring and editing can be performed by connecting a personal computer with the CNC via Ethernet.
- Including PMC Function Library which enables you to integrate functions such as PMC axis control easily.
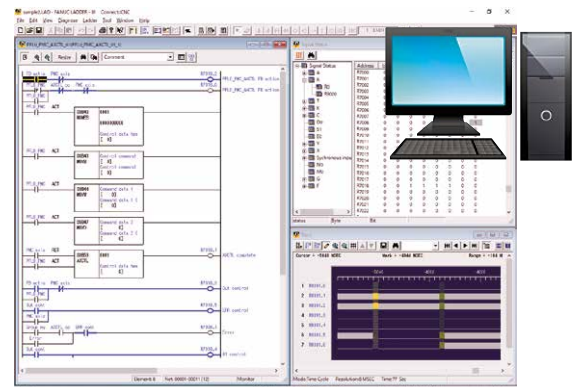
# Flexible Support of Various Mechanical Configurations

**Ease of Use**

## Expanded Multi-axis and Multi-path Functions

### Multiple functions for multi-axis and multi-path control

- A single CNC can achieve complex control of a multi-path lathe with many turrets, compound machine tool with a milling head, or automatic lathe requiring many axes and command systems.
- This CNC provide many functions required for multi-path control, such as synchronous/ composite control, superimposed control, flexible axis assignment, waiting function, and interference check.
- A combination of high-speed, high precision control technology that FANUC has cultivated for years and multi-axis multi-path control technology further promotes improvements in precision and efficiency of lathes and automatic lathes.
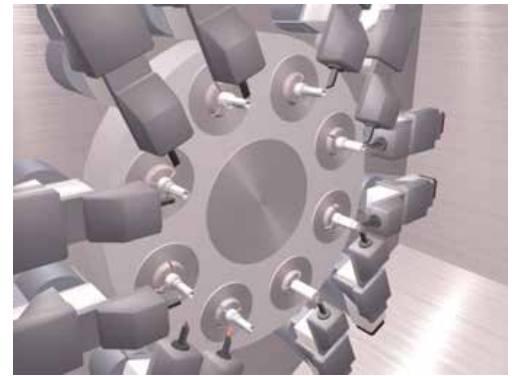
Rotary index machine

## Multi-path Program Management Function

### Program management function is suitable for machining by multi-path programs.

- All part programs for machining can be created and selected by one operation easily.
- These programs can be displayed and edited on one screen simultaneously (maximum 3 programs).
- These multi-path programs for one machining can be input or output to as one file.

Path 1   Path 2   Path 3
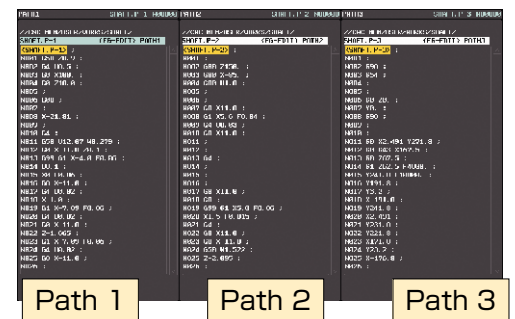
Editing all programs on one screen

# Easy Robots Connection and Control

**Ease of Use**

## CNC-QSSR

QSSR (Quick and Simple Startup of Robotization) functions support the quick and easy introduction of robots into machine tools. Two functions are available, QSSR CONNECT and QSSR G-CODE.

### QSSR CONNECT

This function makes it easy to connect robots to machine tool, to program and to verify the status of operation.

- Easy connection using one Ethernet cable
- Easy setup using the guidance function
- Easy robot operation from CNC program by using quick commands (M-codes)
- Confirm robot status and manual JOG feed from the machine tool screen
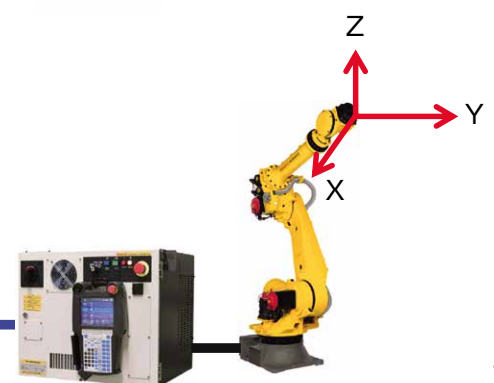
HUB
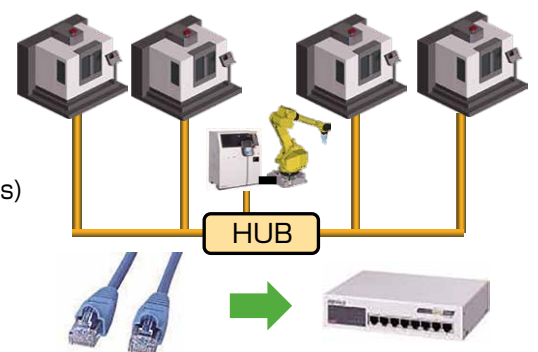
### QSSR G-CODE

This function makes it possible to control robots from CNC.

- By using CNC program (G-code commands), robots can be controlled like a loader
- By using familiar machine tool handles, robots can be positioned and taught easily from CNC screen

G-codes

Z
Y
X

Manual handles

# Network Support Functions

Advancing the IoT adaptability of CNC machine tools with extensive network functions

## Ethernet / Industrial Ethernet / Field Network

Multi-function Ethernet is included as standard in addition to embedded Ethernet. Moreover, information communication functions such as NC program transfer and remote diagnosis are supported as standard, as is control I/O communication. Multi-function Ethernet enables high-speed communication using a dedicated processor, and can be used for various types of industrial Ethernet communication.

Various types of field networks are also supported as options. Industrial Ethernet and field networks enable connection with various peripheral devices, that includes the control of peripheral devices such as waterproof I/O devices and the collection of sensor information. It is also possible to read information from collision sensors, temperature sensors, etc., through an I/O Link*i*-connected multi-sensor I/O unit.
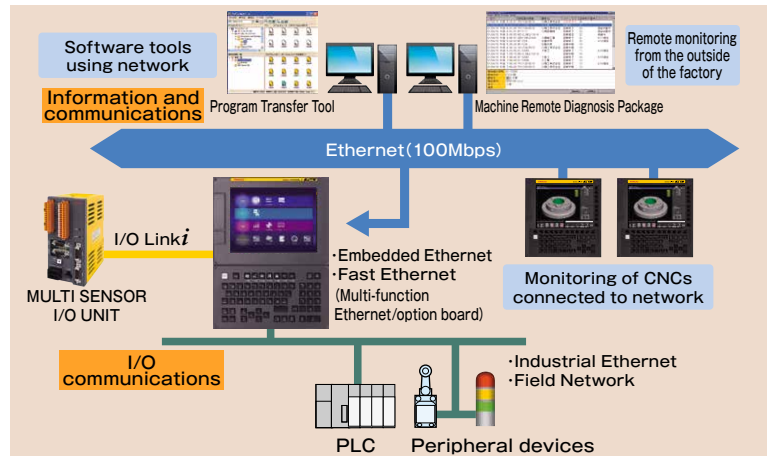


## Supported Industrial Ethernet/Field Networks

- FL-net
- EtherNet/IP (master/slave)
- PROFINET (master/slave)
- Modbus/TCP (slave)

- DeviceNet (master/slave)
- PROFIBUS-DP (master/slave)
- CC-Link (slave)

## FANUC MT-LINK*i* (Operation Management software)

### MT-LINK*i*

MT-LINK*i* is a software product that can collect, manage, and help visualize various information of machines connected via Ethernet.

It helps visualize the machines in factories, and contributes to minimizing downtime.

- It can collect device information not only from machine tools equipped with FANUC CNCs, but also from FANUC robot controllers, OPC-compatible PLCs, and MTConnect-compatible machine tools.
- Information of existing devices that do not have Ethernet I/F can also be collected by using an Ethernet I/O converter.
- Many standard screens that display various pieces of information such as the operational states and operational results of machines are available.
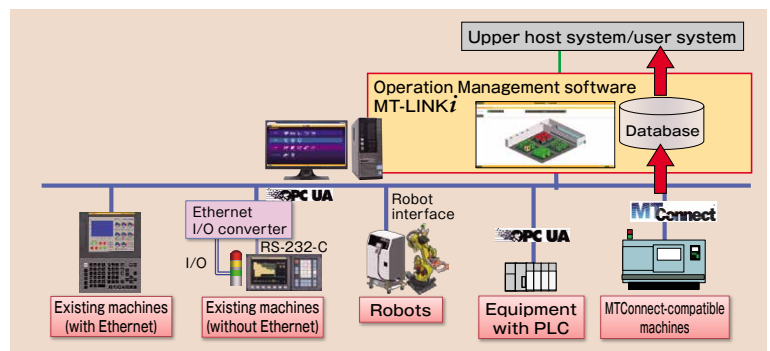


Standard screen example)



Overview screen     Operational results screen

### Visualization of machine operation

A combination of MT-LINK*i* and SERVO VIEWER makes servo data and various status signals to be collected, achieving the visualization of detailed machine operations.

- High-speed sampling (1ms) servo data is efficiently collected from multiple machine tools.
- Various schedule and trigger functions enable efficient analysis by collecting only required data at the right timing.
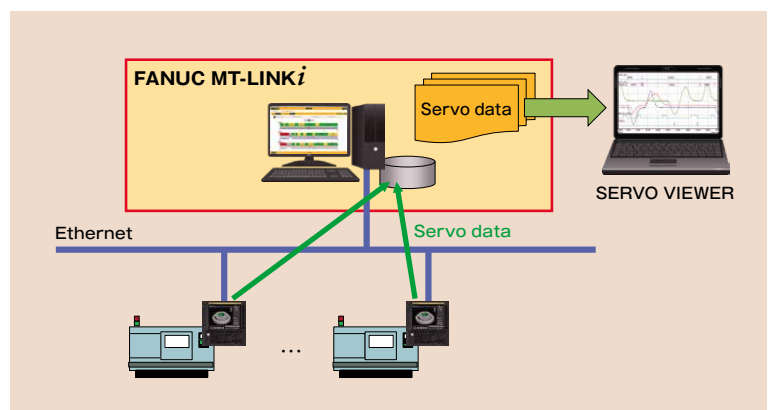
# Powerful PMC

## High-Speed, Large Capacity, and Multi-path PMC

### High-Speed and Large Capacity

The internal PMC functions can also process large-scale sequence control at a high speed through the use of a powerful dedicated processor and the latest custom LSI.

- Program capacity Max. 300,000 steps (Total of all PMC paths)
- Internal relay (R) Max. 60,000 bytes
- Data table (D) Max. 60,000 bytes
- PMC paths Max. 5 paths (Max. 40 ladder programs)

### Multi-path PMC

One PMC can execute up to five independent ladder programs, including loader control and peripheral equipment control.

- Ladder programs can easily be developed according to each user's machine configuration.
- Cost reductions are achieved by eliminating external PLCs or other devices for peripheral equipment control.

### Function Block function

- This function enables repeated ladder circuit patterns to be arranged in function blocks and easily reused.
- The PMC function libraries attached to FANUC LADDER-III include functions ready for immediate embedding such as PMC axis and peripheral device control, and can be freely customized.
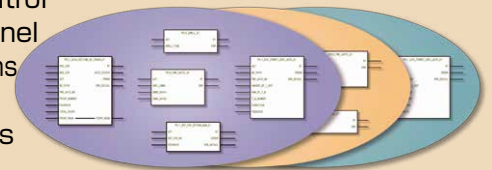


Multi-path PMC

| 1st ladder Machine control | 2nd ladder Loader control | 3rd ladder Peripheral equipment control |
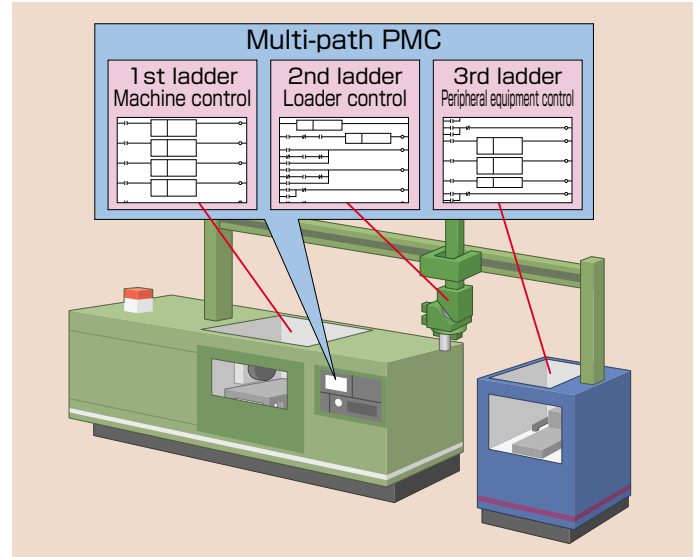
#### Reuse ladder circuits as function blocks
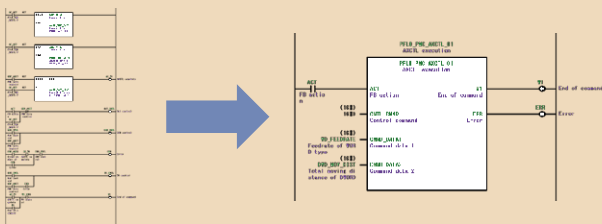


#### A full range of libraries are included in FANUC LADDER-III

- PMC axis control
- Operator's panel
- Spindle functions
- I/O devices
- CNC functions
- Others

# Safety Functions

## Improvement of the Safety of Machine Tool and Machining Line

### Dual Check Safety Function

This is a safety function integrated into the CNC that conforms to ISO 13849-1 PL d.
Multiple processors perform dual monitoring of the actual positions, speed, and safety-related I/O of servo motors and spindle motors, securing a high level of safety by providing duplicated paths for cutting off power.

### Network safety function

By combining this function with the Dual Check Safety function, safety functionality of the machining line is achieved.

- Safety function by FL-net
- EtherNet/IP Adapter Safety function
- PROFINET IO Device Safety function

### Safe Torque Off (STO) function

This is a safety function integrated in servo amplifiers that conforms to IEC 61800-5-2.
Motor power can be safely cut off by the duplicated cut-off path within the amplifier.

Dual Check Safety Function
· The machine can be operated safely while the protective door is open

Optimization of set-up tasks

Network safety function
· Achieves the safety functionality of the machining line



Safety I/O signal
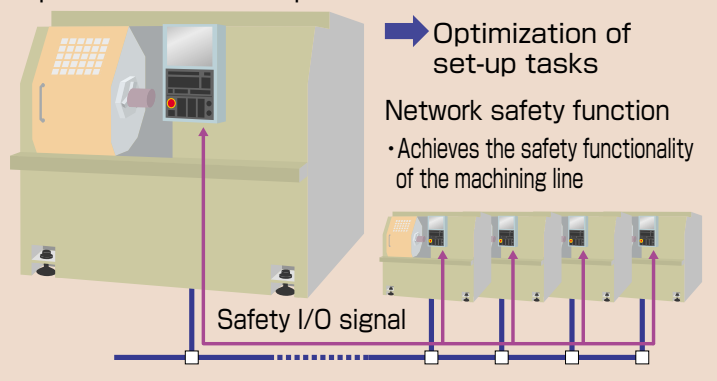
# Easy Maintenance

## Functions for minimizing downtime

## Contribution to Preventive Maintenance

### Leakage Detection Function

In a harsh environment of a cutting coolant, the coolant may infiltrate into a motor and the machine may stop suddenly due to the insulation deterioration.
The Leakage Detection Function built into the amplifier automatically measures the insulation resistance of motors, and detects the insulation deterioration before the machine leads to stop, enabling preventive maintenance.



Sending insulation resistance value to CNC

Insulation deterioration

Auto measurement of insulation resistance

### Cooling Fan Warning Function

By monitoring a decrease in the rotational speed of each cooling fan motor of the CNC and the servo amplifier, signs of fan abnormalities can be detected.
This function enables preventive maintenance.
Fans are stored in a cartridge and can be replaced quite easily, so maintainability is enhanced.
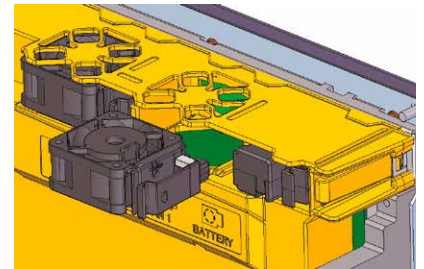


## Failure Part Detection

### Trouble Diagnostic Function

Various failure detection functions provided to the I/O Link $i$ and FSSB can detect interruptions in the power supply to the I/O modules or servo amplifier and identify disconnection locations of the communication cable.
In addition to that, I/O Link $i$ can detect the ground fault of each DO.

The trouble-shooting function enables you to see diagnosis information helpful in determining the status when an alarm occurs on the CNC screen.

- Trouble-shooting guidance screen
- Trouble-shooting monitor screen
- Trouble-shooting graph screen





DO alarm detection

Disconnection detection

I/O Link $i$

Power failure detection
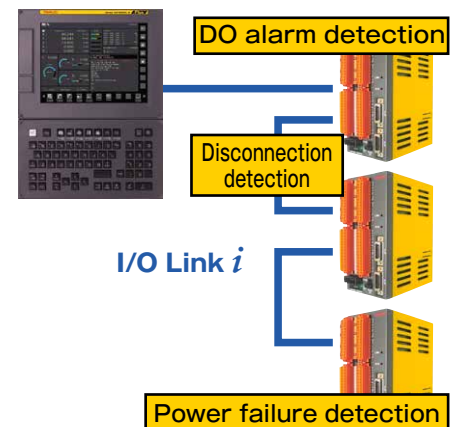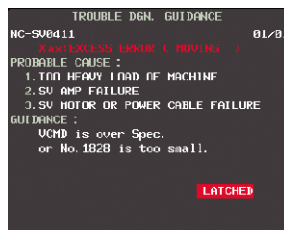
### Encoder Communication Check Circuit

This check circuit enables a quick recovery from encoder communication alarm by identifying which part such as encoder, feedback cable or servo amplifier has failed.
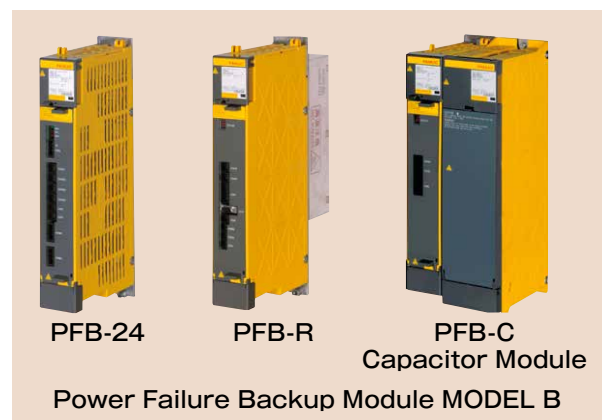


## Prevent Machine Damage at Power Failure

### Machine Protection at Power Failure

Damage of machines and workpieces at power failure is prevented where a power supply is unstable or in a lightning-prone areas.

- Gravity-axis drop prevention
  The holding brake of gravity axis are quickly activated by detecting power failure in the circuit incorporated into the amplifier.
- Stop distance reduction [1]
  Feed axes are quickly stopped to avoid a crash in high-speed machine tools.
- Retraction [2]
  The tool is retracted from the workpiece while keeping synchronization in gear cutting machines and others.



PFB-24    PFB-R    PFB-C Capacitor Module

Power Failure Backup Module MODEL B

[1], [2]  "Power Failure Backup Module (Hardware)" or " Power Failure Backup Function (Software)" shall be applied.

# Powerful Software Tools

## Providing support for the development projects of machine tool builders

### FANUC CNC GUIDE

Software tool" FANUC CNC GUIDE" which simulates CNC operations on a PC to fully utilize the ever advancing CNC functions.
The software tool can be used for development and educational purposes.

- CNC GUIDE
- CNC GUIDE Academic Package

### CNC GUIDE

Development and debugging custom screens and ladder programs can be effectively performed on the PC. Because you can actually debug on a PC in the office before changing the customized software for the actual machining tool, it will improve efficiency of development work.

- FANUC PICTURE
  Checks behavior of the operation screen created with FANUC PICTURE on the CNC GUIDE
- C Language Executor
  Checks behavior of C language program for CNC by compiling it for PC
- PMC Simulation
  Simulation of the ladder program performed on the PC

Supports various functions such as Multi-path PMC and Function Block



CNC GUIDE and FANUC PICTURE

### CNC GUIDE Academic Package

Can perform operation training of CNC on the PC.
It is possible to train operators without using the actual machining tool.
We provide materials for classroom use for 16/32 students and self-study at home for 1 or 3 years.

- Operation in MEM and MDI mode/Automatic operation
- Editing the machining program and machining cycle in EDIT mode
- Use of macro variables and system variables
- Operation by calling sub-program and DNC
- Displays the same alarm as the machine at the time of error
- Machining simulation (cutting animation, tool path drawing)



CNC operation training

### Support of Efficient Servo Tuning for High-Speed and High-Precision Machining

### FANUC SERVO GUIDE

FANUC SERVO GUIDE supports you to perform tuning of the servo and spindle in an integrated manner, including creating test programs, setting parameters and measuring data. You can use it easily by connecting a PC to a CNC directly.
In addition to the motions of each servo axis and spindle axis, you can observe program execution status inside the CNC and PMC signals as waveform data and analyze the machine operation in detail. Continuous measurement for a long period is also possible.
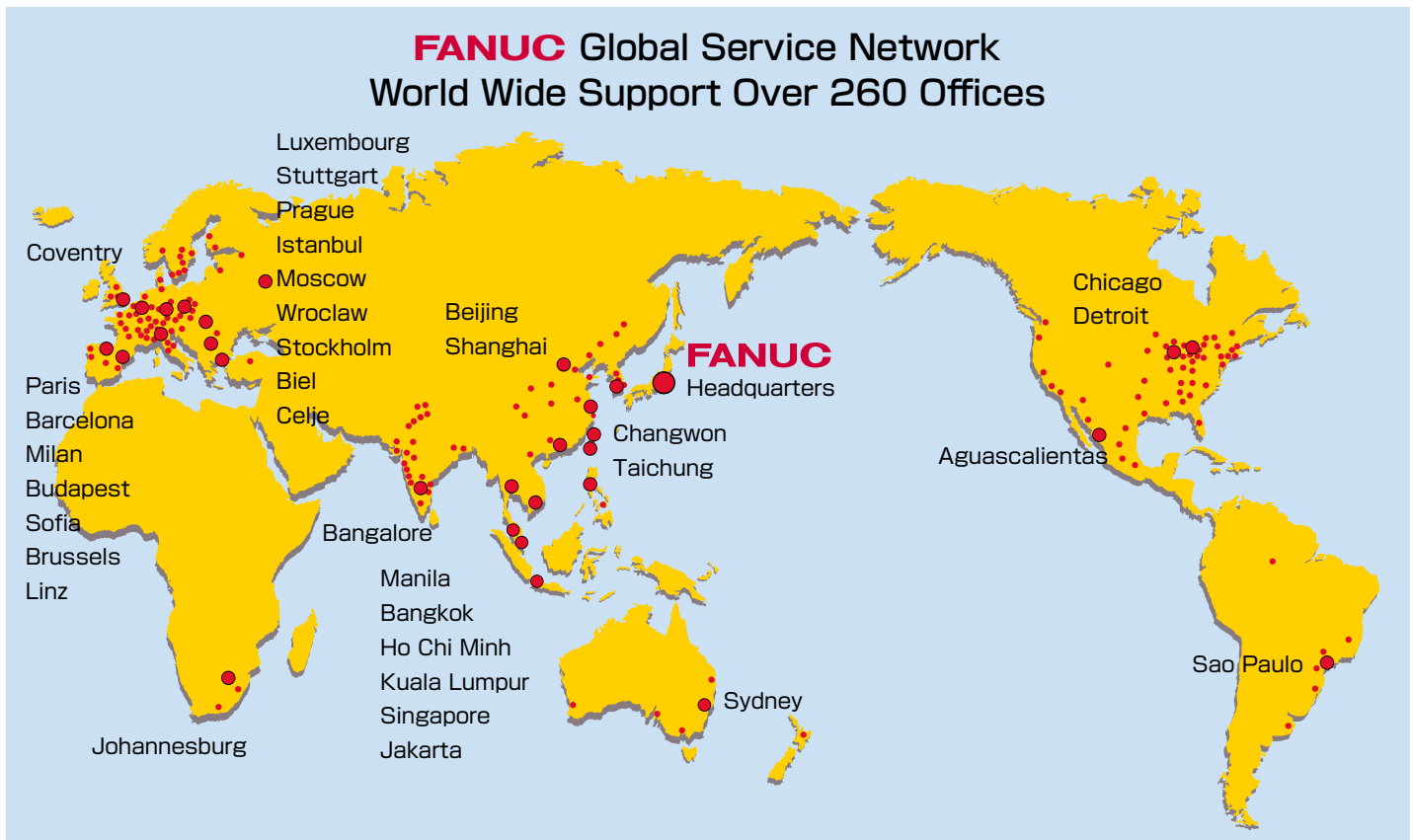Tuning Navigator offers automatic process for tuning gain, filter and others and enables you to perform the advanced servo tuning in a short time. The automatic tuning function for protrusion compensation significantly shortens the time of tuning for high-speed and high-precision.



15
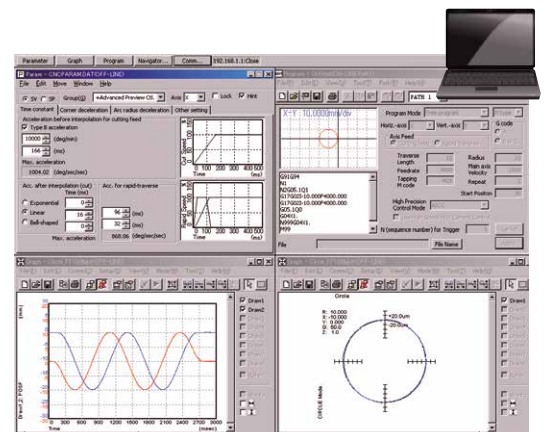
# Maintenance and Customer Support

## Worldwide Customer Service and Support

FANUC operates customer service and support network worldwide through subsidiaries and affiliates. FANUC provides the highest quality service with the prompt response at any location nearest you.

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FANUC ACADEMY operates versatile training courses to develop skilled engineers effectively in several days.

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　　　　　　 Japan 401-0597
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FS30$i$-B Plus(E)-01, 2020.9, Printed in Japan