MITSUBISHI ELECTRIC

Changes for the Better

Automating the World

FACTORY AUTOMATION

NUMERICAL CONTROL (CNC)
C80 Series

Our Factory Automation business is focused on "Automating the World" to make it a better, more sustainable environment supporting manufacturing and society, celebrating diversity and contributing towards an active and fulfilling role.

SUSTAINABLE DEVELOPMENT GOALS

The Mitsubishi Electric Group is actively solving social issues, such as decarbonization and labor shortages, by providing production sites with energy-saving equipment and solutions that utilize automation systems, thereby helping towards a sustainable society.

Mitsubishi Electric is involved in many areas including the following:

Energy and Electric Systems
A wide range of power and electrical products from generators to large-scale displays.

Electronic Devices
A wide portfolio of cutting-edge semiconductor devices for systems and products.

Home Appliance
Dependable consumer products like air conditioners and home entertainment systems.

Information and Communication Systems
Commercial and consumer-centric equipment, products and systems.

Industrial Automation Systems
Maximizing productivity and efficiency with cutting-edge automation technology.

OVERVIEW

Revolutionary, next-generation CNC opens a new era of production lines through compatibility with MELSEC iQ-R Series

C80 Series

Advanced technologies delivered by the breakthrough performance of our CNC-dedicated CPU.
Reliable MELSEC quality accumulated in various industrial scenes.
In addition, the CNC C80 Series can be expanded and updated over time.

Five features (productivity, expandability, usability, maintenance and safety)
empower manufacturing lines with infinite possibilities and innovative values
in terms of advancement, reliability and growth.

Productivity

C80 improves productivity through its advanced performance and functionality.

Expandability

C80 allows flexible system configuration to catch up with the MELSEC evolution.

Usability

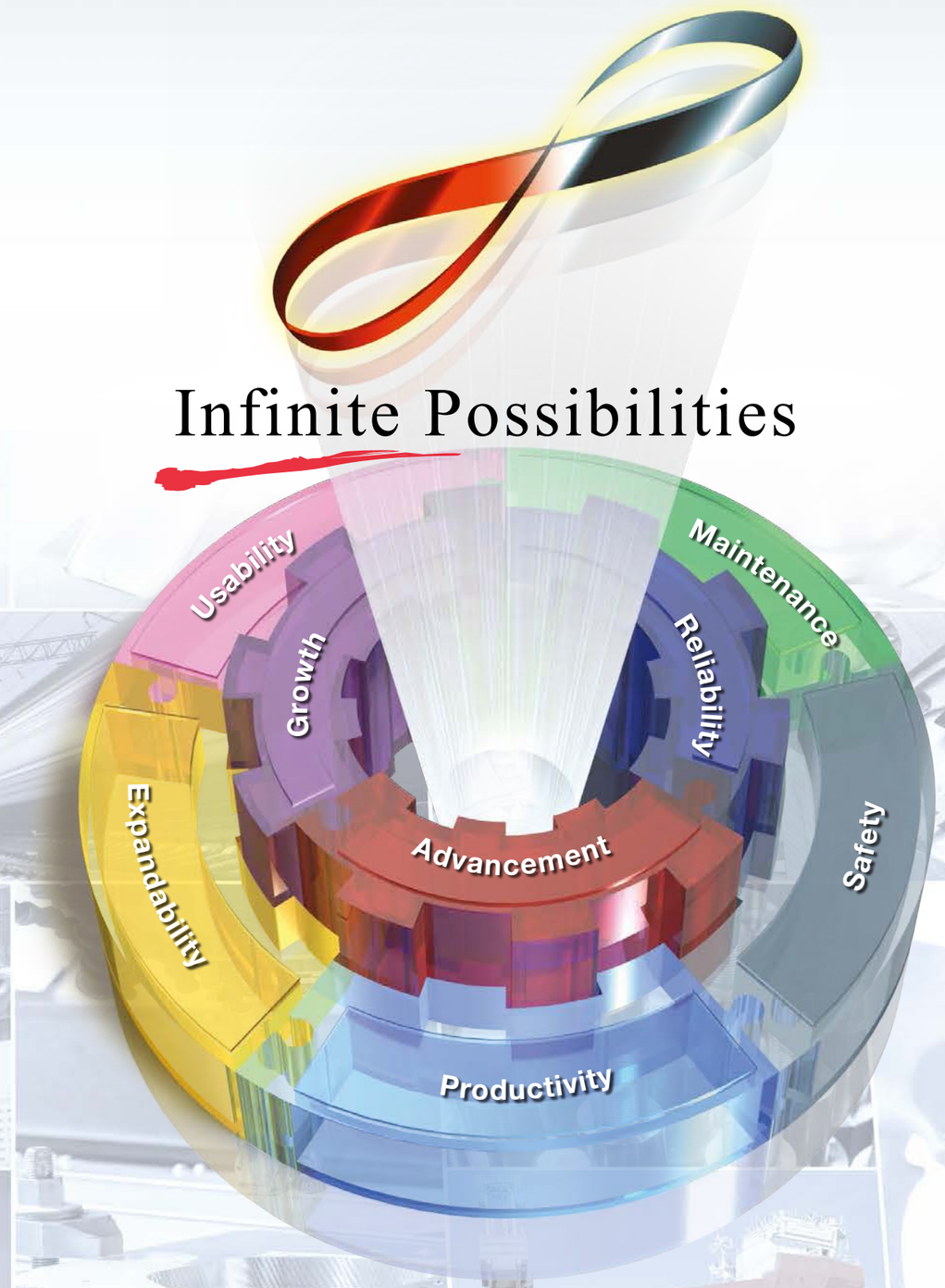
C80 provides unprecedented user-friendliness.

Maintenance

Low maintenance reduces downtime and maintenance costs.

Safety

Easily implement a plethora of safety measures compliant with global standards.



CNC SYSTEM CONFIGURATIONS

Ethernet

Display
- GOT2000 Series *1

Control unit

MELSEC iQ-R Series

C80

Computer server
- Production control system

Field network
- CC-Link IE field
- FL-net
- PROFIBUS-DP
- PROFINET
- DeviceNet
- EtherNet/IP

Software for machine assembly and adjustment
- GX Works3
- GT Works3
- NC Analyzer2
- NC Configurator2
- NC Trainer2 plus

Software for operation and maintenance
- NC Explorer
- NC Monitor2
- Communication software for Mitsubishi Electric CNC (FCSB1224W000)
- iQ Care Remote4U
- NC Machine Tool Optimizer

Signal splitter

Manual pulse generator

USB keyboard

Machine operation panel
* Made by the machine tool builder

Manual pulse generator

Drive unit *2
- MDS-E/EH Series
- MDS-EJ/EJH Series
- MDS-EM/EMH Series

Power backup unit
- MDS-D/DH-PFU

Power supply unit
- MDS-E/EH-CV
- MDS-EX-CVP

MC

AC reactor

AC power supply

Tool spindle motor *2
- HG Series
- HG-JR Series

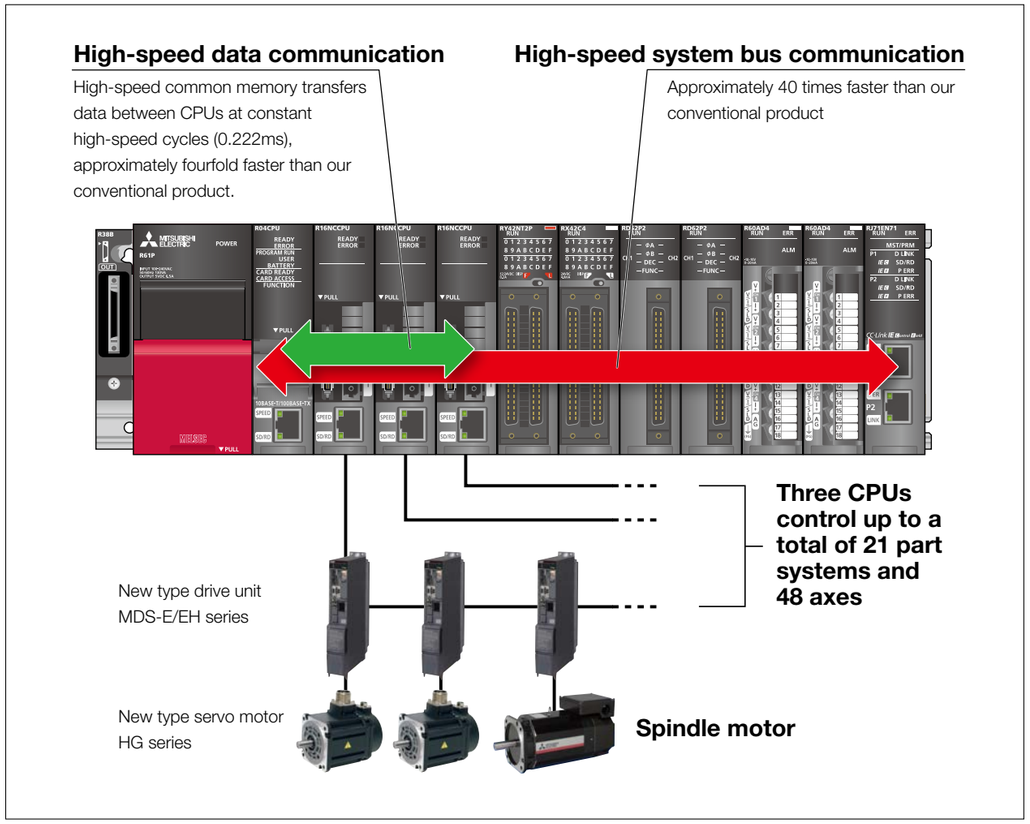
Servo motors *2
- HK Series
- HG Series
- LM-F Series
- TM-RB Series

Spindle motor *2
- SJ-D Series
- SJ-DG Series
- SJ-DL Series
- SJ-DN Series
- SJ-DJ Series
- SJ-DM Series
- SJ-BG Series

*1 For target models, refer to "List of Components".
*2 Use Mitsubishi CNC's dedicated drive unit and motor.
User-prepared: Please purchase desired components from a Mitsubishi Electric dealership, etc.

PRODUCTIVITY

Mitsubishi Electric's original CNC-dedicated CPU provides a major leap in basic performance. A newly developed high-speed system bus approximately 40 times faster than our conventional product provides high-speed, large-capacity data communication. CNC control functions and drive units have been improved, enabling high-speed, highly accurate machining. The C80 Series contributes to reducing cycle time and increasing productivity.



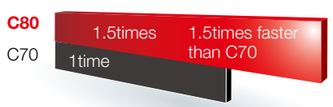
PLC processing capability (PCMIX value)

High processing capability of the PLC enables large-scale ladder logic to be processed at high speed in response to the demands in the era of IoT.

CNC-to-drive communication capability

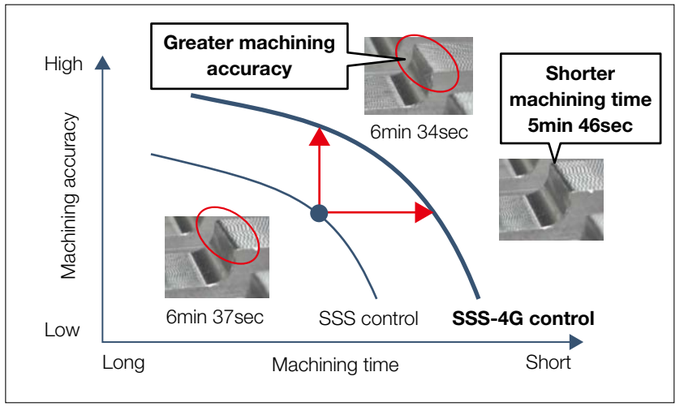
Optical communication speed between CNC and drive has been increased. This improves system responsiveness, leading to more accurate machining.

MSTB processing capability



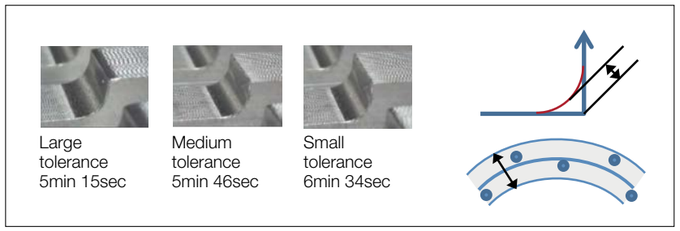
Miscellaneous command processing between CNC and PLC became 1.5 times faster than our conventional product. Shorter processing time leads to reduction in cycle time.

CNC functions ensure high speed and high accuracy



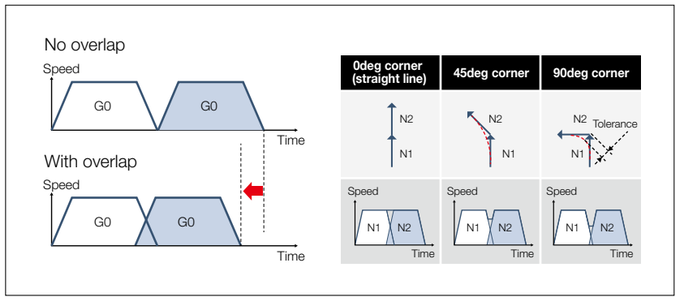
SSS-4G Control

The M80 Series is equipped with Super Smooth Surface 4th-Generation (SSS-4G) control. This feature effectively reduces tact time, including acceleration and deceleration appropriate for the characteristics of each axis. SSS-4G control simultaneously enhances cutting accuracy, reducing cutting time while maintaining the same degree of accuracy compared to our previous models.



Tolerance Control

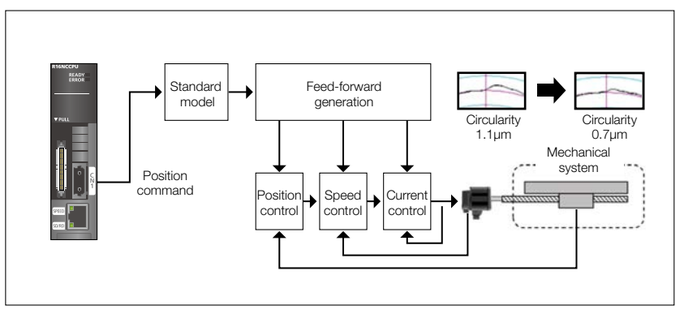
This function enables operators to make high-quality surfaces simply by specifying the desired surface dimensional accuracy and providing a smooth cutting motion within specified error tolerances.



Rapid Traverse Block Overlap

This function enables cutting of the next block to start before positioning deceleration (G00) or reference position return (G28/G30) has been completed, resulting in shorter intervals between cutting processes.

Drive function increases speed

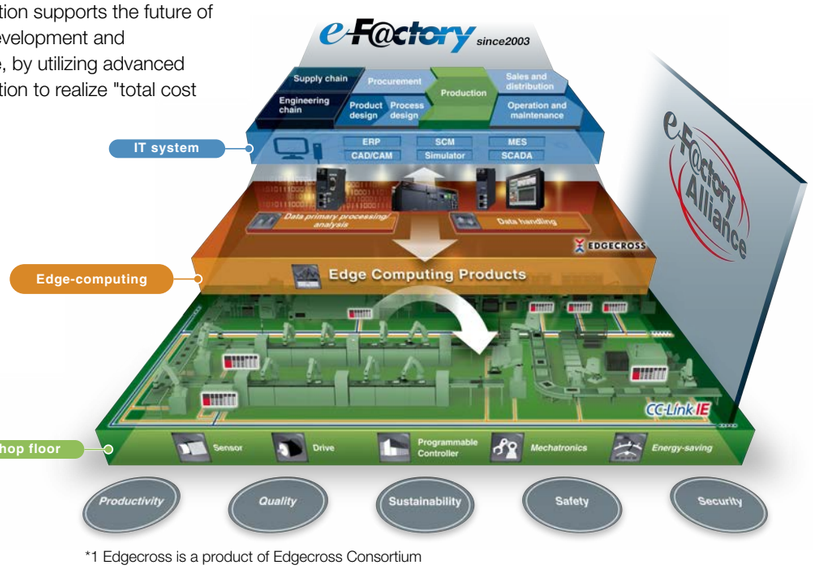


OMR-FF Control

This function optimizes the position loop gain for each axis, leading to smoother and more accurate cutting, and drawing out the full potential of the machine tools.

EXPANDABILITY e-F@ctory

The e-F@ctory integrated solution supports the future of machining in all areas, from development and manufacturing to maintenance, by utilizing advanced expertise and factory optimization to realize "total cost reduction."



*1 Edgecross is a product of Edgecross Consortium

iQ Platform

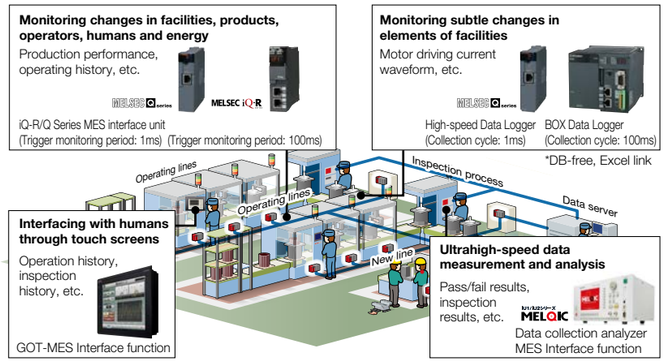
The CNC C80 Series supports the iQ Platform, the integrated FA platform that forms the core of e-F@ctory.

EDGECROSS *1

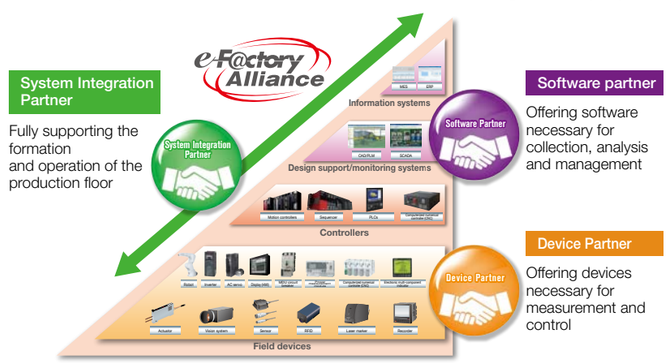
Utilization of open software platform "Edgecross" which realizes FA-IT coordination in the edge computing level enhances Edge computing and e-F@ctory.

This solution enables visualization and analysis that lead to improvements and increase availability at production sites.

The Manufacturing Execution System (MES) Interface is the link for data passing from production equipment to controlling devices.
The High-speed Data Logger collects data from each measuring device directly without requiring dedicated logging equipment.
The Box Data Logger can be connected to a network while existing equipment is running, and collect data thereafter.
The C Language Controller provides control, information processing and higher-level communication using C/C++ programming.
These products, which enable information sharing between FA and IT, implement factory-wide optimization, from higher-level information systems to facility management systems.



Data on shop floor have different characteristics according to their purposes



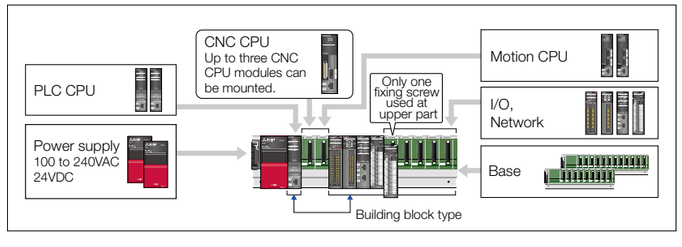
e-F@ctory Alliance

e-Factory Alliance offers our customers the optimal solution across entire supply and engineering chains through strong alliances with partners who provide software and devices highly compatible with Mitsubishi FA products, and system integration partners who build systems using those products.

Participating companies: 900 or more

(In total domestic and overseas, as of Sep. 2020)

Flexible system configurations



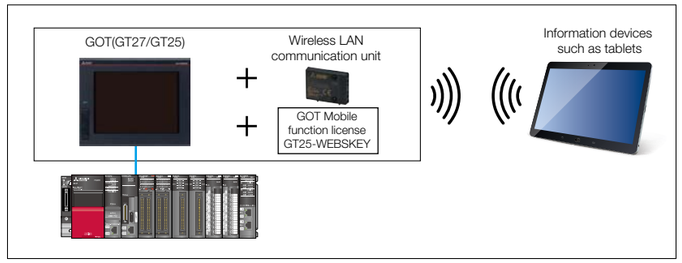
The PLC CPU is independent in the C80 Series, enabling selection according to production scale and application, and best-fit configuration of hardware.

Edge computing, the latest technology

MELIPC MI5000

One module realizes device control and information processing which were previously managed with a combination of computer and dedicated device for example. Equipped with real-time OS VxWorks®, the MELIPC realizes real-time control which cannot be achieved with general industrial computers, contributing to high-accuracy device control and information processing at high-speed.

Support for “visualization” of shop floor

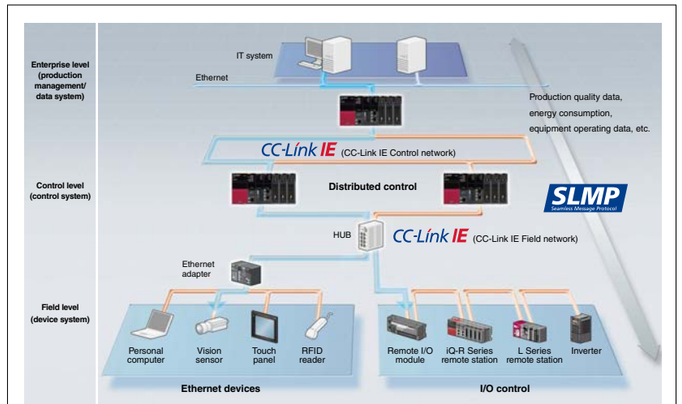


GOT Mobile

Via GOT at the worksite, connected devices can be monitored from computers and tablets in a remote location.

*A separate license (GT25-WEBSKEY) is required.

Seamless connectivity between shop floor and host information system



Field network CC-Link IE Field

Single network covers high-speed controller distributed control, I/O control and safety control.The network allows a high degree of freedom in wiring for flexible equipment layouts.

Controller network CC-Link IE Control

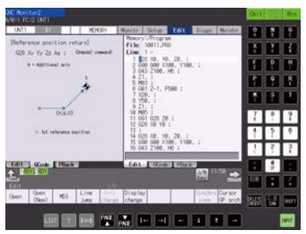
The controller network builds a highly reliable high-speed, large-capacity system and dual optical loop.

USABILITY

CNC monitor2 newly developed to simplify use through the introduction of touch-screen operation displays the equivalent screen to the M800/M80 Series standard screens available in 8.4, 10.4 and 12.1-type models.

CNC monitor2 screen designed with pursuit of ease-of-use

Monitor screen

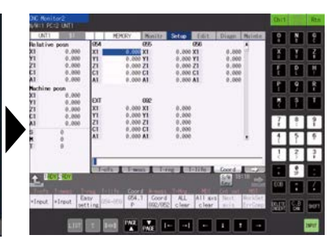


Program editor screen

Program edit screen enables direct-touch data entry, eliminating the use of cursor keys and realizing more intuitive operation.

Direct transition to CNC monitor2 screen

Example screen created by a machine tool builder
Press the [Setup] key.

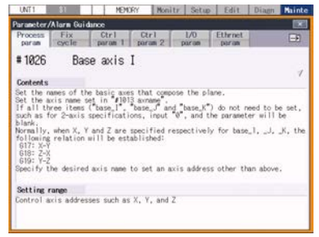


Screen switches to NC monitor2 setup.

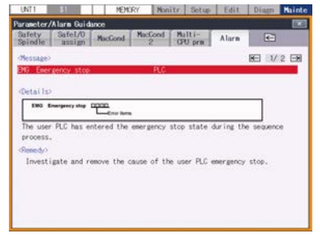
NC monitor2 allows a short-cut key to be designated for taking the operator directly to a specific CNC monitor2 screen from a machine builder-prepared screen. The key enables the operator to, for example, call up a parameter screen with a single touch instead of the conventional three-step operation. Additionally, machine builders can use CNC monitor2 screens as is, reducing the workload related to designing screens.

More convenient guidance function

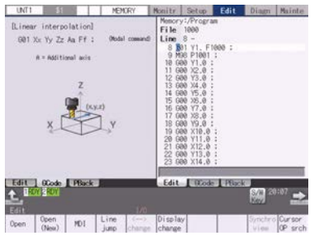
Pressing Help opens a guidance of the currently displayed screen (parameter, alarm or G-code format). This frees the operator from looking information up in a printed manual.



Parameter guidance



Alarm guidance



G code guidance

Simple screen with enhanced visibility from a long distance

Simple monitor screen

The simple monitor screen has been designed to make it easy to see and read only data required from a distance.
Switching between Normal screen and Simple screen is done from the screen menu.

*The simple display can be used only when the parameter #11019 (2-system display) is invalid.

CNC monitor2 supports 17 languages

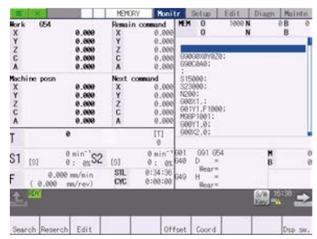
Display languages can be switched with a single parameter operation.
This provides great ease of use for users worldwide.

Languages supported

Japanese	Chinese (traditional)	Swedish
English	Chinese (simplified)	Turkish
German	Korean	Polish
Italian	Portuguese	Russian
French	Hungarian	Czech
Spanish	Dutch	

VGA added to product line

SVGA



VGA

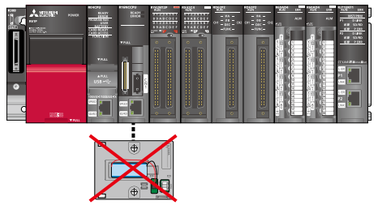
CNC monitor2 supports VGA in addition to the conventional SVGA resolution, which expands the availability of GOT2000 Series.

MAINTENANCE

The C80 Series has greatly improved maintenance features compared to our conventional product, including the ability to acquire three times the alarm and warning history data. The program number and PLC number of the machining program executed can also be acquired, leading to early problem solving and less downtime.

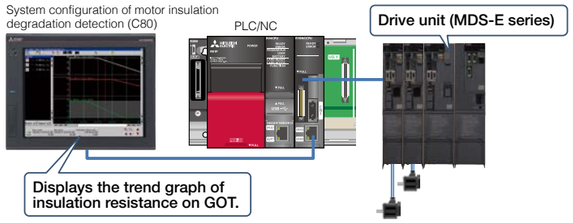
CNC CPU requires no batteries

The CNC CPU backs up NC data (e.g., parameters, machining programs and alarm history) without the use of batteries. Trouble-some battery management and battery exchange are no longer required, leading to a reduction in maintenance costs.



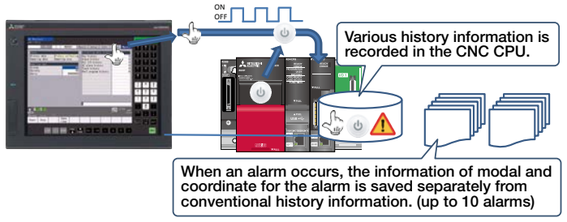
Motor insulation degradation detection function

Insulation resistance value measured by a drive unit can be displayed.
The trend graph displayed on GOT can be used for preventive maintenance.



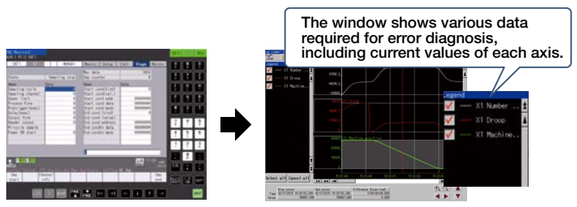
Operation history

This function traces various histories and NC operating information to analyze and solve troubles etc.
This information is recorded in the history data file, it can be displayed on the screen and can also be output to a file.



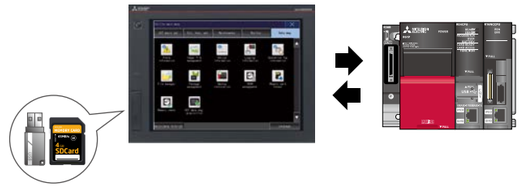
Log viewer function

GOT log viewer function displays the NC sampling data. This enables waveforms to be diagnosed on the spot for early trouble-shooting.
In addition, the trends of insulation resistance value can be checked on the viewer. (Displays last 13 months data on a monthly basis)



GOT backup/restoration

The C80 Series supports data storage (backup) and writing (restore) of not only C80 parameters and programs, but also PLC CPU data into SD memory card or the USB memory of the GOT. The system can be restored using GOT only, enabling parts to be exchanged for quick system restoration.



On-board ladder edit of GOT

Use the GOT "Sequence program monitor (R Ladder) function" to edit sequence ladder programs without requiring GX Works on a computer. Ladder program operation status can be confirmed as well.

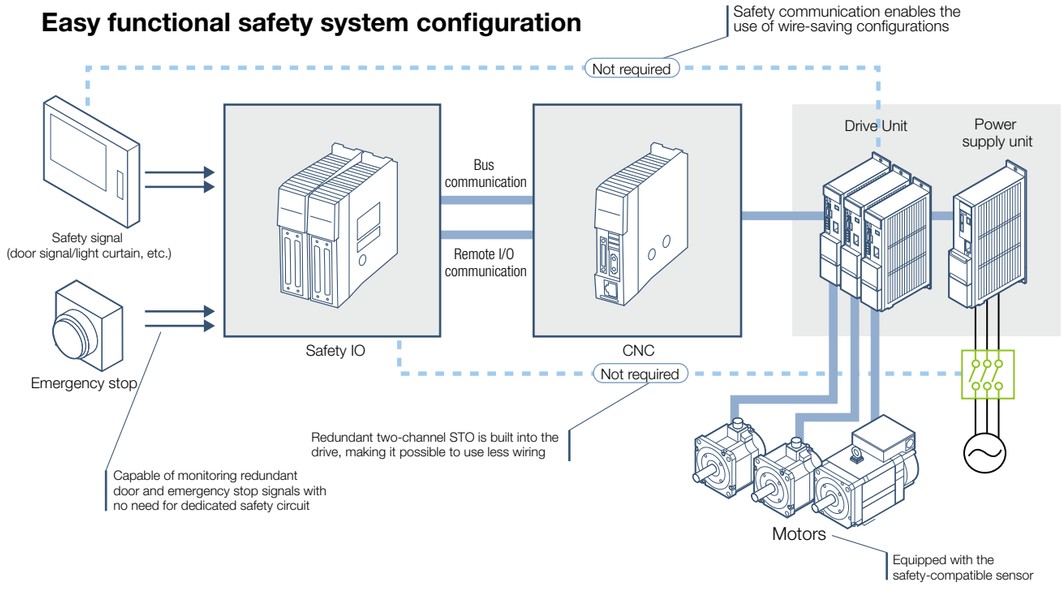
SAFETY

The C80 Series provides a range of safety features collectively called the “Smart Safety Observation Function”. This function has achieved full conformity with the safety standards that cover the entire system including CNC, drive, I/O, sensors and communication.

Smart Safety Observation Function

Safety-related I/O observation
Safely-Limited Speed (SLS)
Safe Operating Stop (SOS)
Safe Brake Control/Safe Brake Test (SBC/SBT)
Safe Stop (SS1/SS2)
Emergency stop observation
Safely-Limited Position (SLP)
Safe Speed Monitor (SSM)
Safe Cam (SCA)
Safe Torque Off (STO)
Safety Communication Network (SCN)

Easy functional safety system configuration



SOFTWARE TOOLS

Flow from machine design and development to operation and maintenance

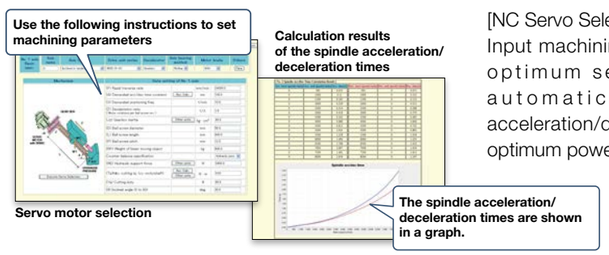
Machine design → Electrical circuitry design → Machine assembly and adjustment → Operation and maintenance

•NC-related processes

Servo selection	PLC development	Parameter creation	Operation and maintenance
NC Servo Selection	GX Works3	NC Configrator2	NC Explorer
	Display screen creation	Servo/spindle adjustment	NC Monitor2
	GT Works3	Machine adjustment	Operation monitoring and remote diagnostics
	Debug	NC Analyzer2	NC Machine Tool Optimizer*
	NC Trainer2 plus*		iQ Care Remote4U*

*Refer to individual catalogs or software tool catalogs for details.

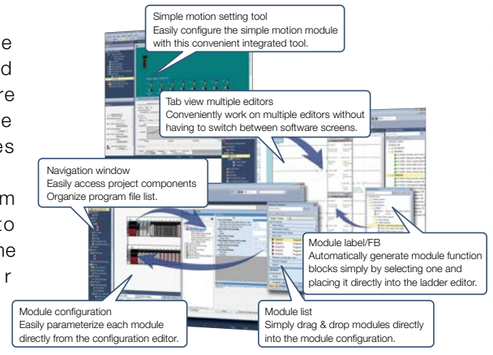
•Machine design



[NC Servo Selection]
Input machining parameters to determine the optimum servo motor. This function automatically calculates spindle acceleration/deceleration time and selects the optimum power supply module.

•Electrical circuitry design

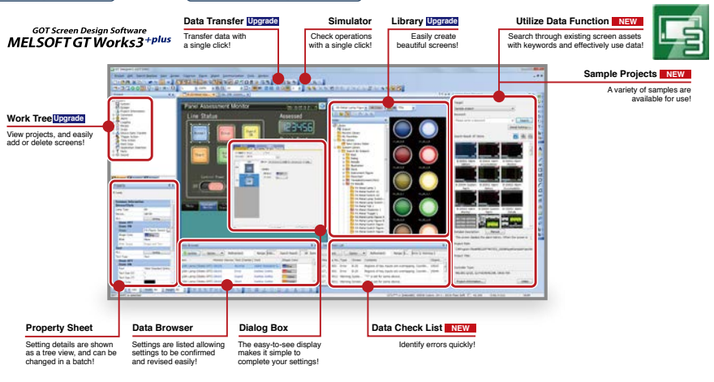
[GX Works3]
GX Works3 is the programming and maintenance software designed for the MELSEC iQ-R Series control system.
Graphic-based system configuration helps to reduce engineering time to 60% over our conventional product*1



[Global operation realized with multi-language support]
To meet today's global production needs, the GX Works3 supports multi-language features at various levels, such as a multi-language software menu system and language-switching for device comment functions.

*1: Based on new project test benchmarks between GX Works2 and GX Works3.

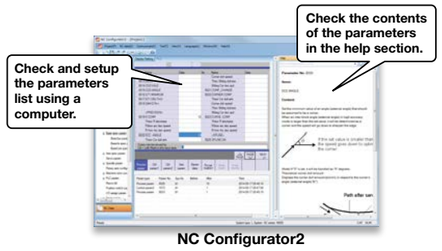
[GT Works3]
This integrated software is used to create professional screen designs for GOTs. Developed based on the concepts of simplicity, streamline and user-friendly, this powerful tool pushes operational boundaries to deliver infinite design possibilities.



For compatible versions, please contact us.
*GT Desinger3 screen image

For details on GX Works3, please refer to the GX Works3 catalog (L(NA)08334).
For details on GT Works3, please refer to the GT Works3 catalog (L(NA)08170).
For details on each software tool, refer to the software tools catalog (BNP-A1246).

•Machine assembly and adjustment

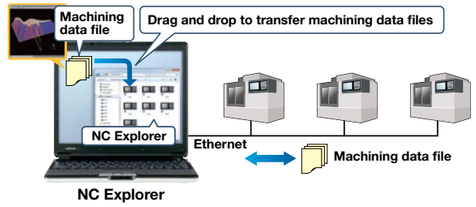


NC Configurator2

[NC Configurator2]
NC parameters required for NC control or machine operation can be edited on a computer. It is also possible to create initial parameters simply by inputting the machine configuration.

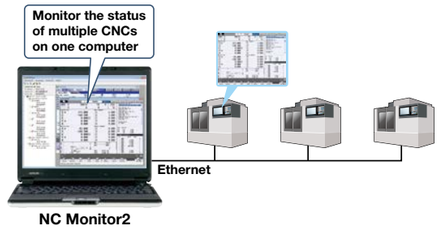
[NC Analyzer2]
Servo parameters can be adjusted automatically by measuring and analyzing machine characteristics. Measurement and analysis can be done by running a servo motor using the machining program for adjustment, or using the vibration signal. This function can sample various types of data.

•Operation and maintenance



NC Explorer

[NC Explorer]
CNC machining data can be managed using Windows® Explorer on a computer when the computer is connected to multiple CNCs via Ethernet.



NC Monitor2

[NC Monitor2]
Taking advantage of connection with a factory network, CNC operation status can be monitored from remote locations. Several CNCs can be connected and monitored simultaneously.

DRIVE SYSTEM

•Drive units

High-performance Servo/ Spindle Drive Units MDS-E/EH Series

- The servo control-dedicated core processor realizes improved control speed, leading to enhanced basic performance. When combined with a higher resolution motor sensor and enhanced high-speed optical communication, this drive contributes to high-speed, high-accuracy control.
- The motor power connector is equipped with an anti-misinsertion mechanism. This helps to eliminate connection errors.
- Improved diagnostic and preventive maintenance features
- Safe Torque Off (STO) and Safe Brake Control (SBC) are also incorporated as additional safety features.

Multi-hybrid Drive Units MDS-EM/EMH Series

- Multi-hybrid drive units are capable of driving a maximum of three servo axes and one spindle. This contributes to downsizing machines and offers technical advantages.
- The motor power connector is equipped with an anti-misinsertion mechanism. This helps to eliminate connection errors.
- Safe Torque Off (STO) and Safe Brake Control (SBC) are also incorporated as additional safety features.
- The fan unit facilitates fan exchange.
- An MDS-EMH drive unit is available for 400V systems.

All-in-one Compact Drive Units MDS-EJ/EJH Series

- Ultra-compact drive units with built-in power supply contribute to smaller control panel size.
- A 2-axis type has been added for further downsizing.
- The servo control-dedicated core processor realizes improved control speed, leading to improved basic performance. When combined with a higher resolution motor sensor and enhanced high-speed optical communication, this drive contributes to high-speed, high-accuracy control.
- Safe Torque Off (STO) and Safe Brake Control (SBC) are also incorporated as additional safety features.
- An MDS-EJH drive unit is available for 400V systems. (Note 1)

PWM Converter MDS-EX-CVP Series

- Products of the PWM converter series which provides a stabilizing DC voltage function and boost function. The MDS-EX-CVP Series reduces the output deceleration of the spindle motor and improves output in the high-speed range.
- Available for 400V system power supply units only.

•Servo motors

Medium-inertia, High-accuracy, High-speed Motors HK Series

- Latest servo motor to help increase productivity.
- Range: 0.5 to 7 [kW]
- Maximum rotation speed: 2,000 to 6,000 [r/min]
- High power density design has improved motor efficiency.
- One-touch lock of the power connector for easy mounting (Note 2).
- Battery-free encoder helps reduce maintenance costs.

Medium-inertia, High-accuracy, High-speed Motors HG Series

- Sensor resolution has been significantly improved. These servo motors, which boast smooth rotation and outstanding acceleration capabilities, are well-suited as feed axes of machine tools.
- Range: 0.2 to 11 [kW]
- Maximum rotation speed: 2,000 to 6,000 [r/min]
- Safety support sensors are included as standard specification. Three sensor resolutions (i.e., 1, 4 or 67 million pulses/rev) are available.
- These motors can also be used as a tool spindle motor.
- The small-sized connector allows horizontal cable connection to save space in machines. (Note 3)

Linear Servo Motors LM-F Series

- These motors can be used in clean environments, since no ball screws are used, eliminating possible grease contamination.
- Elimination of transmission mechanisms, including backlash, enables smooth, quiet operation even at high speeds.
- Range:
  Maximum thrust: 900 to 18,000 [N·m]

Direct-drive Servo Motors TM-RB Series

- High-torque, direct-drive motors combined with high-gain control provide quick acceleration and positioning, making rotation smoother.
- Suitable for rotary axes that drive tables or spindle heads
- Range:
  Maximum torque: 36 to 1,280 [N·m]

•Spindle motors

High-performance Spindle Motors SJ-D Series

- Motor energy loss has been significantly reduced by optimizing the magnetic circuit.
- High-speed bearings are incorporated as a standard feature, helping to achieve higher speed, lower vibration and improved durability.
- Range: 3.7 to 26 [kW]
- Maximum rotation speed: 8,000 to 12,000 [r/min]

High-output, High-speed Spindle Motors SJ-DG Series

- The addition of S3 rating (%ED rating) has improved output and torque acceleration/deceleration characteristics.
- A balance adjustment ring added to the counter-load side allows for fine tuning.
- Range:
  S3 rating: 5.5 to 15 [kW]
- Maximum rotation speed: 10,000 to 12,000 [r/min]

High-torque Spindle Motors SJ-DN Series

- Higher torque characteristics than those of the SJ-D Series with the same output. This series can be driven with a small-capacity multi-hybrid drive unit.
- Suitable for heavy cutting. Helps to improve productivity.
- Range: 7.5 to 18.5 [kW]
- Maximum rotation speed: 8,000 [r/min]

Low-inertia, High-speed Spindle Motors SJ-DL Series

- This series of spindle motors is dedicated for use in tapping machines that require faster drilling and tapping.
- The latest design technologies make it possible to attain lower vibration and greater rigidity even with lighter weight.
- Range: 0.75 to 7.5 [kW]
- Maximum rotation speed: 10,000 to 24,000 [r/min]

Compact, Lightweight Spindle Motors SJ-DJ Series

- Spindle motors that are smaller and lighter than the SJ-D Series with the same output. This helps to further downsize machines.
- Range: 5.5 to 15 [kW]
- Maximum rotation speed: 8,000 to 12,000 [r/min]

High-output High-torque IPM Spindle Motors SJ-DM Series

- The use of magnets allows for higher output and torque, leading to reduced cycle time.
- The SJ-DM Series can provide torque characteristics comparable to the former SJ-D Series of the next frame number.
- Maximum rotation speed: 12,000 [r/min]

Built-in Spindle Motors SJ-BG Series

- The electrical design has been optimized to increase the continuous rated torque per unit volume, contributing to downsizing spindle units.
- Options for mold and cooling jacket specifications are available.

Tool Spindle Motors HG-JR Series

- Compact tool spindle motors are designed to have the small, high-output characteristics of servo motors yet offer high-speed rotation (8,000r/min). These motors contribute to downsizing spindle size, like rotary tool spindles.
- Range: 0.75 to 1.5 [kW]
- Maximum rotation speed: 8,000 [r/min]
- Small-sized connector allows horizontal cable connection to save space in machines. (Note 3)

(Note 1) For servo motors only
(Note 2) Available only for flange sizes 90SQ., 130SQ. and 176SQ.
(Note 3) Options supported (Flange size 90SQ only)
* Use Mitsubishi Electric CNC's dedicated drive unit and motor.

LIST OF COMPONENTS

CNC-CPU unit

Product	Model	Remarks
CNC control module	R16NCCPU-S1	

GOT2000 related unit

SD card

Product	Model	Model code	Remarks
SD card	NZ1MEM-2GBSD	1WC535	2GB SD memory card for GOT

GT27 Model

Product		Model	Model code	Remarks
GT27 Model	GT2715	GT2715-XTBA	1EA790	15" XGA[1024×768 dots]TFT color LCD 65536 colors (Multimedia & Video/RGB compliant Multi-touch compliant) 100 to 240VAC, User memory Memory for storage (ROM): 57MB, Memory for operation (RAM): 128MB GT Designer3 Version (GOT2000) 1.117X or later is required.
	GT2712	GT2712-STBA	1EA780	12.1"* SVGA [800×600 dots] TFT color LCD 65536 colors (Multimedia & Video / RGB compliant Multi-touch compliant) 100 to 240VAC, User memory Memory for storage (ROM): 57MB, Memory for operation (RAM): 128MB GT Designer3 Version1 (GOT2000) 1.155M or later is required.
		GT2712-STBD	1EA781	12.1"* SVGA [800×600 dots] TFT color LCD 65536 colors (Multimedia & Video / RGB compliant Multi-touch compliant) 24VDC, User memory Memory for storage (ROM): 57MB, Memory for operation (RAM): 128MB GT Designer3 Version1 (GOT2000) 1.155M or later is required.
	GT2710	GT2710-STBA	1EA770	10.4"* SVGA [800×600 dots] TFT color LCD 65536 colors (Multimedia & Video / RGB compliant Multi-touch compliant) 100 to 240VAC, User memory Memory for storage (ROM): 57MB, Memory for operation (RAM): 128MB GT Designer3 Version1 (GOT2000) 1.155M or later is required.
		GT2710-STBD	1EA771	10.4"* SVGA [800×600 dots] TFT color LCD 65536 colors (Multimedia & Video / RGB compliant Multi-touch compliant) 24VDC, User memory Memory for storage (ROM): 57MB, Memory for operation (RAM): 128MB GT Designer3 Version1 (GOT2000) 1.155M or later is required.
	GT2708	GT2708-STBA	1EA740	8.4"* SVGA [800×600 dots] TFT color LCD 65536 colors (Multimedia & Video / RGB compliant Multi-touch compliant) 100 to 240VAC, User memory Memory for storage (ROM): 57MB, Memory for operation (RAM): 128MB GT Designer3 Version1 (GOT2000) 1.155M or later is required.
		GT2708-STBD	1EA741	8.4"* SVGA [800×600 dots] TFT color LCD 65536 colors (Multimedia & Video / RGB compliant Multi-touch compliant) 24VDC, User memory Memory for storage (ROM): 57MB, Memory for operation (RAM): 128MB GT Designer3 Version1 (GOT2000) 1.155M or later is required.
	GT2710	GT2710-VTBA	1EA760	10.4"" VGA [640×480 dots] TFT color LCD 65536 colors (Multimedia & Video / RGB compliant Multi-touch compliant) 100 to 240VAC, User memory Memory for storage (ROM): 57MB, Memory for operation (RAM): 128MB GT Designer3 Version1 (GOT2000) 1.165X or later is required.
		GT2710-VTBD	1EA761	10.4"" VGA [640×480 dots] TFT color LCD 65536 colors (Multimedia & Video / RGB compliant Multi-touch compliant) 24VDC, User memory Memory for storage (ROM): 57MB, Memory for operation (RAM): 128MB GT Designer3 Version1 (GOT2000) 1.165X or later is required.
	GT2708	GT2708-VTBA	1EA730	8.4"" VGA [640×480 dots] TFT color LCD 65536 colors (Multimedia & Video / RGB compliant Multi-touch compliant) 100 to 240VAC, User memory Memory for storage (ROM): 57MB, Memory for operation (RAM): 128MB GT Designer3 Version1 (GOT2000) 1.165X or later is required.
		GT2708-VTBD	1EA731	8.4"" VGA [640×480 dots] TFT color LCD 65536 colors (Multimedia & Video / RGB compliant Multi-touch compliant) 24VDC, User memory Memory for storage (ROM): 57MB, Memory for operation (RAM): 128MB GT Designer3 Version1 (GOT2000) 1.165X or later is required.
	GT2705	GT2705-VTBD	1EA721	5.7"" VGA [640×480 dots] TFT color LCD 65536 colors (Multi-touch compliant) 24VDC, User memory Memory for storage (ROM): 32MB, Memory for operation (RAM): 80MB GT Designer3 Version1 (GOT2000) 1.165X or later is required.
Protective sheet		GT27-15PSCC	1EK313	Surface treatment: anti-glare, Sheet color: transparent, USB environmental protection cover area: open, Number of sheets included in a set: 5
		GT25-12PSCC	1EK307	For 12.1"" Clear type, Transparent, With a hole for the USB environmental protection cover, A set of 5 sheets.
		GT25-10PSCC	1EK304	For 10.4"" Clear type, Transparent, With a hole for the USB environmental protection cover, A set of 5 sheets.
		GT25-08PSCC	1EK301	For 8.4"" Clear type, Transparent, With a hole for the USB environmental protection cover, A set of 5 sheets.
		GT25-05PSCC	1EK316	For 5.7"" Clear type, Transparent, With a hole for the USB environmental protection cover, A set of 5 sheets.

GT25 Model

Product		Model	Model code	Remarks
GT25 Model	GT2512	GT2512-STBA	1EA580	12.1"" SVGA [800×600 dots] TFT color LCD 65536 colors 100 to 240VAC, User memory Memory for storage (ROM): 32MB, Memory for operation (RAM): 80MB GT Designer3 Version1 (GOT2000) 1.155M or later is required.
		GT2512-STBD	1EA581	12.1"" SVGA [800×600 dots] TFT color LCD 65536 colors 24VDC, User memory Memory for storage (ROM): 32MB, Memory for operation (RAM): 80MB GT Designer3 Version1 (GOT2000) 1.155M or later is required.
	GT2510	GT2510-VTBA	1EA560	10.4"" VGA [640×480 dots] TFT color LCD 65536 colors 100 to 240VAC, User memory Memory for storage (ROM): 32MB, Memory for operation (RAM): 80MB GT Designer3 Version1 (GOT2000) 1.165X or later is required.
		GT2510-VTBD	1EA561	10.4"" VGA [640×480 dots] TFT color LCD 65536 colors 24VDC, User memory Memory for storage (ROM): 32MB, Memory for operation (RAM): 80MB GT Designer3 Version1 (GOT2000) 1.165X or later is required.
	GT2508	GT2508-VTBA	1EA530	8.4"" VGA [640×480 dots] TFT color LCD 65536 colors 100 to 240VAC, User memory Memory for storage (ROM): 32MB, Memory for operation (RAM): 80MB GT Designer3 Version1 (GOT2000) 1.165X or later is required.
		GT2508-VTBD	1EA531	8.4"" VGA [640×480 dots] TFT color LCD 65536 colors 24VDC, User memory Memory for storage (ROM): 32MB, Memory for operation (RAM): 80MB GT Designer3 Version1 (GOT2000) 1.165X or later is required.
	GT25 Handy GOT	GT2506HS-VTBD	09J922	Display section: 6.5" VGA, TFT color LCD, 65536 colors, panel color: black, power supply: 24VDC GT Works3 Version1.195D or later.
	GT25 Handy Connector conversion box	GT16H-CNB-42S	09V701	For converting the Handy GOT signals into individual signals for the terminal block, D-sub connector, and Ethernet RJ-45.
	GT25 Handy External connection cable (to connect the connector conversion box)	GT16H-C30-42P	09V702	For connection between the Handy GOT and the connector conversion box (GT16H-CNB-42S) 3m
		GT16H-C60-42P	09V703	For connection between the Handy GOT and the connector conversion box (GT16H-CNB-42S) 6m
		GT16H-C100-42P	09V704	For connection between the Handy GOT and the connector conversion box (GT16H-CNB-42S) 10m

MELSEC iQ-R Series modules

Product		Model	Model code	Remarks
PLC CPU		R04CPU	1FMA00	Program capacity, 40K steps; basic operation processing speed (LD instruction), 0.98ns
		R08CPU	1FMA01	Program capacity, 80K steps; basic operation processing speed (LD instruction), 0.98ns
		R16CPU	1FMA02	Program capacity, 160K steps; basic operation processing speed (LD instruction), 0.98ns
		R32CPU	1FMA03	Program capacity, 320K steps; basic operation processing speed (LD instruction), 0.98ns
		R120CPU	1FMA04	Program capacity, 1200K steps; basic operation processing speed (LD instruction), 0.98ns
SD memory card		NZ1MEM-2GBSD	1WC535	SD memory card, 2Gbytes
Extended SRAM cassette		NZ2MC-1MBS	1FMB00	1Mbytes
Main base		R35B	1FME00	5 slots, for MELSEC iQ-R Series modules
		R38B	1FME01	8 slots, for MELSEC iQ-R Series modules
		R312B	1FME02	12 slots, for MELSEC iQ-R Series modules
Extension base		R65B	1FME07	5 slots, for MELSEC iQ-R Series modules
		R68B	1FME06	8 slots, for MELSEC iQ-R Series modules
		R612B	1FME05	12 slots, for MELSEC iQ-R Series modules
RQ extension base		RQ65B	1FME08	5 slots, for MELSEC-Q Series modules
		RQ68B	1FME03	8 slots, for MELSEC-Q Series modules
		RQ612B	1FME04	12 slots, for MELSEC-Q Series modules
Extension cable		RC06B	1FM001	0.6m cable for extension and RQ extension base units
		RC12B	1FM002	1.2m cable for extension and RQ extension base units
		RC30B	1FM003	3m cable for extension and RQ extension base units
		RC50B	1FM004	5m cable for extension and RQ extension base units
Power supply		R61P	1FMC00	AC power supply; input, 100 to 240VAC; output, 5VDC/6.5A
		R62P	1FMC02	AC power supply; input, 100 to 240VAC; output, 5VDC/3.5A, 24VDC/0.6A
		R63P	1FMC01	DC power supply; input, 24VDC; output, 5VDC/6.5A
		R64P	1FMC03	AC power supply; input, 100 to 240VAC; output, 5VDC/9A
Input	AC	RX10	1FM103	AC input, 16 points; 100 to 120VAC (50/60 Hz)
	DC (PositiveCommon/ Negative Common Shared Type)	RX40C7	1FM100	DC input, 16 points; 24VDC, 7.0mA
		RX41C4	1FM101	DC input, 32 points; 24VDC, 4.0mA
		RX42C4	1FM102	DC input, 64 points; 24VDC, 4.0mA
		RX41C4-TS	1FM113	DC input, 32 points; 24VDC, 4.0mA, Spring clamp terminal block
Output	Relay	RY10R2	1FM153	Relay output, 16 points; 24VDC/2A, 240VAC/2A
		RY18R2A	1FM15A	Relay output, 8 points; 24VDC/2A, 240VAC/2A
	Triac	RY20S6	1FM157	Triac output, 16 points; 100 to 240VAC/0.6A
	Transistor (Sink)	RY40NT5P	1FM150	Transistor (sink) output, 16 points; 12 to 24VDC, 0.5A
		RY41NT2P	1FM151	Transistor (sink) output, 32 points; 12 to 24VDC, 0.2A
		RY42NT2P	1FM152	Transistor (sink) output, 64 points; 12 to 24VDC, 0.2A
	Transistor (Source)	RY40PT5P	1FM154	Transistor (source) output, 16 points; 12 to 24VDC, 0.5A
		RY41PT1P	1FM155	Transistor (source) output, 32 points; 12 to 24VDC, 0.1A
		RY42PT1P	1FM156	Transistor (source) output, 64 points; 12 to 24VDC, 0.1A
		RY41PT1P-TS	1FM15E	Transistor (source) output, 32 points; 12 to 24VDC, 0.1A, Spring clamp terminal block
I/O combined	DC input/ transistor output	RH42C4NT2P	1FM200	DC input, 32 points; 24VDC, 4.0mA Transistor (sink) output, 32 points; 12 to 24VDC, 0.2A
Connector		A6CON1	13L101	Soldering 32 point-connector (40-pin connector)
		A6CON2	13L102	Solderless terminal connection 32 point-connector (40-pin connector)
		A6CON3	13L103	Flat-cable pressure displacement 32 point-connector (40-pin connector)
		A6CON4	13L124	Soldering 32 point-connector (40-pin connector, bidirectional cable mountable)
Spring clamp terminal block		Q6TE-18SN	1W4299	For 16-point I/O modules, 0.3 to 1.5mm² (22...16AWG)
Connector/terminal block conversion module		A6TBX70	13L112	For positive common input modules (3-wire type)
		A6TBXY36	13L106	For positive common input modules and sink output modules (standard type)
		A6TBXY54	13L109	For positive common input modules and sink output modules (2-wire type)
Connector/ terminal block conversion module	cable	AC05TB	13L006	For A6TBXY36, A6TBXY54, and A6TBX70 (positive common/sink type), 0.5m
		AC10TB	13L007	For A6TBXY36, A6TBXY54, and A6TBX70 (positive common/sink type), 1m
		AC20TB	13L008	For A6TBXY36, A6TBXY54, and A6TBX70 (positive common/sink type), 2m
		AC30TB	13L009	For A6TBXY36, A6TBXY54, and A6TBX70 (positive common/sink type), 3m
		AC50TB	13L010	For A6TBXY36, A6TBXY54, and A6TBX70 (positive common/sink type), 5m
		AC80TB	13L026	For A6TBXY36, A6TBXY54, and A6TBX70 (positive common/sink type), 8m* *Common current 0.5A or lower
		AC100TB	13L027	For A6TBXY36, A6TBXY54, and A6TBX70 (positive common/sink type), 10m* *Common current 0.5A or lower
Relay terminal module		A6TE2-16SRN	13L131	For 40-pin connector 24VDC transistor output modules (sink type)
Relay terminal module	cable	AC06TE	13L021	For A6TE2-16SRN, 0.6m
		AC10TE	13L022	For A6TE2-16SRN, 1m
		AC30TE	13L023	For A6TE2-16SRN, 3m
		AC50TE	13L024	For A6TE2-16SRN, 5m
		AC100TE	13L025	For A6TE2-16SRN, 10m
Analog input	Voltage input	R60ADV8	1FM503	8 channels for voltage inputs -10 to 10VDC, -32000 to 32000; 80µs/CH
	Current input	R60ADI8	1FM504	8 channels for current inputs 0 to 20mADC/0 to 32000; 80µs/CH
	Voltage/ current input	R60AD4	1FM501	4 channels for voltage/current inputs -10 to 10VDC, -32000 to 32000; 0 to 20mADC, 0 to 32000; 80µs/CH
Analog output	Voltage output	R60DAV8	1FM505	8 channels for voltage outputs -32000 to 32000, -10 to 10VDC; 80µs/CH
	Current output	R60DAI8	1FM506	8 channels for current outputs 0 to 32000, 0 to 20mADC; 80µs/CH
	Voltage/ current output	R60DA4	1FM502	4 channels for voltage/current outputs -32000 to 32000, -10 to 10VDC; 0 to 32000, 0 to 20mADC; 80µs/CH
Temperature control	Platinum temperature-measuring resistor	R60TCRT4	1FY40E	RTD (Pt100, JPt100), 4 channels for input
		R60TCRT4BW	1FY40F	RTD (Pt100, JPt100), 4 channels for input, heater disconnection detection
	Thermocouple	R60TCTRT2TT2	1FY40C	Thermocouple (B, R, S, K, E, J, T, N, U, L, PL@, W5Re/W26Re), 4 channels for input (2 channels can also be used for RTD input)
		R60TCTRT2TT2BW	1FY40D	Thermocouple (B, R, S, K, E, J, T, N, U, L, PL@, W5Re/W26Re), 4 channels for input (2 channels can also be used for RTD input), heater disconnection detection

Product		Model	Model code	Remarks
High-speed counter		RD62P2	1FM50B	5/12/24VDC input, 2 channels; counting speed, max. 200k pulse/s; external output, transistor (sink type)
		RD62D2	1FM50C	Differential input, 2 channels; max. counting speed, 8M pulse/s; external output, transistor (sink type)
		RD62P2E	1FM50D	5/12/24VDC input, 2 channels; counting speed, max. 200k pulse/s; external output, transistor (source type)
Ethernet		RJ71EN71	1FM601	1 Gbps/100Mbps/10Mbps, 2 ports Multi-network connectivity (Ethernet/CC-Link IE)
Serial communication		RJ71C24	1FM604	Max. 230.4kbps; RS-232, 1 channel; RS-422/485, 1 channel
		RJ71C24-R2	1FM605	Max. 230.4kbps; RS-232, 2 channels
		RJ71C24-R4	1FM606	Max. 230.4kbps; RS-422/485, 2 channels
MES Interface		RD81MES96N	1FTD00	1000BASE-T/100BASE-TX/10BASE-T Database connection (MX MESInterface-R is required)
CC-Link IE Control		RJ71GP21-SX	1FM602	1 Gbps, fiber-optic cable, control/normal station
CC-Link IE Field		RJ71GF11-T2	1FM600	1 Gbps, master/local station
CC-Link		RJ61BT11	1FM603	Max. 10Mbps, master/local station, CC-Link Ver.2 supported
CC-Link Remote I/O module	Screw terminal block type	AJ65SBTB1-16D	1W5131	Input 16 points: 24VDC (positive/negative common shared) 1-wire type Terminal block type Response time 1.5ms
		AJ65SBTB1-32D	1W5141	Input 32 points: 24VDC (positive/negative common shared) 1-wire type Terminal block type Response time 1.5ms
		AJ65SBTB1-16TE	1W5128	Output 16 points: 12/24VDC (0.1A) Transistor output (source type) 1-wire type Terminal block type
		AJ65SBTB1-32TE1	1W5452	Output 32 points: 12/24VDC (0.5A) Transistor output (source type) 1-wire type Terminal block type
	Waterproof connector type	AJ65FBTA4-16DE	1W5108	Input 24VDC (negative common) 4-wire type Thin, waterproof type Response time 1.5ms
		AJ65FBTA2-16TE	1W5103	Output 16 points: 12/24VDC (1.0A) Transistor output (source type) 2-wire type Thin, waterproof type
DeviceNet		RJ71DN91	1FM613	Max. 500kbaud, master/local station
PROFIBUS-DP		RJ71PB91V	1FM615	Max. 12Mbps, master/local station
EtherNet/IP		RJ71EIP91	1FM616	EtherNet/IP™ Scanner Module

(Note) For other related units, please contact us.

MELSEC Q Series modules

Product		Model	Model code	Remarks
Extension base		Q63B	1W4E07	3 slots, 1 power supply module required, for Q Series modules
		Q65B	1W4E03	5 slots, 1 power supply module required, for Q Series modules
		Q68B	1W4E04	8 slots, 1 power supply module required, for Q Series modules
		Q612B	1W4E05	12 slots, 1 power supply module required, for Q Series modules
		Q52B	1W4E14	2 slots, power supply module not required, for Q Series modules
		Q55B	1W4E15	5 slots, power supply module not required, for Q Series modules
Extension cable		QC05B	1W4006	0.45m cable for connecting extension base unit
		QC06B	1W4000	0.6m cable for connecting extension base unit
		QC12B	1W4001	1.2m cable for connecting extension base unit
		QC30B	1W4002	3m cable for connecting extension base unit
		QC50B	1W4003	5m cable for connecting extension base unit
		QC100B	1W4004	10m cable for connecting extension base unit
Power supply		Q61P	1W4C11	Input voltage: 100 to 240VAC, output voltage: 5VDC, output current: 6A
		Q63P	1W4C02	Input voltage: 24VDC, output voltage: 5VDC, output current: 6A
		Q64PN	1W4C12	Input voltage: 100 to 240VAC, output voltage: 5VDC, output current: 8.5A
Output	Transistor (Independent)	QY68A	1W4310	8 points, 5 to 24VDC, 2A/point, 8A/module, response time: 10ms, sink/source type, 18-point terminal block, with surge suppression, all points independent
Analog output	Voltage/ current output	Q62DA-FG	1W4571	2 channels, input (resolution): 0 to 12000, -12000 to 12000, -16000 to 16000, output: -12 to 12VDC, 0 to 22mADC, conversion speed: 10ms/2 channels, 18-point terminal block, channel isolated
MELSECNET/H	Optical loop (SI)	QJ71LP21-25	1W4516	SI/QSI/H-PCF/broadband H-PCF fiber optic cable, dual loop, control network (control/normal station) or remote I/O network (remote mater station)
	Coaxial bus	QJ71BR11	1W4511	3C-2V/5C-2V coaxial cable, single bus, control network (control/normal station) or remote I/O network (remote master station)
FL-net(OPCN-2)	Ver.2.00	QJ71FL71-T-F01	1W4593	10BASE-T, 100BASE-TX
AS-I		QJ71AS92	1W4524	Master station, AS-Interface Specification Version 2.11 compatible
DeviceNet		QJ71DN91	1W4518	Master station/local station combined use, for QCPU, DeviceNet(Release2.0) compatible.

Peripheral unit

Product		Model	Remarks
Dual signal module	Dual-signal modules	R173SXY	IO redundant monitoring module (Up to three modules)
	Terminal block	FA-TBS40P	Terminal block conversion (separately prepared: Mitsubishi Electric Engineering) UL supported
	Terminal block	FA-LTB40P	Terminal block conversion (separately prepared: Mitsubishi Electric Engineering)
	Cable	FA-CBL□□FMV-M	Terminal block conversion connection cable (length □□= 05: 0.5m, 10: 1m, 20: 2m, 30: 3m, 50: 5m) (separately prepared: Mitsubishi Electric Engineering)
Signal splitter		FCU7-HN387	Option (Necessary when manual pulse generator is used for two or three axes)
FL-net (OPCN-2) Interface module		ER-1FL2-T	10BASE-T, 100BASE-TX

Parts

Product	Model	Remarks
Manual pulse generator	UFO-01-2Z9	5V specification
	HD60C	12V specification, for the operation board signal splitter connection, 12V power supply separately necessary
Encoder	OSE 1024-3-15-68	6000r/min, no straight type connector enclosed, new JIS key, 68 square flange
	OSE 1024-3-15-68-8	8000r/min, no straight type connector enclosed, 68 square flange
	OSE 1024-3-15-160	6000r/min, no straight type connector enclosed, new JIS key, 160 square flange
Grounding plate	Grounding plate D	With cable clamp A(2)
	Grounding plate E	With cable clamp B(1)

INSTALLATION ENVIRONMENT CONDITIONS

CNC CPU module

Item	Specification				
Ambient operating temperature	0 to 55°C				
Ambient storage temperature	–25 to 75°C				
Ambient operating humidity	5 to 95%RH, non-condensing				
Ambient storage humidity	5 to 95%RH, non-condensing				
Vibration resistance		Frequency	Constant acceleration	Half amplitude	Sweep count
	Under intermittent vibration	5 to 8.4Hz	-	3.5mm	10 times each in X, Y and Z directions (80 min.)
		8.4 to 150Hz	9.8m/s²	-	
	Under continuous vibration	5 to 8.4Hz	-	1.75mm	-
		8.4 to 150Hz	4.9m/s²	-	
Shock resistance	147m/s², 3 times in each of 3 directions X, Y and Z				
Operating ambience	No corrosive gases or inflammable gases				
Operating altitude	2000m (6561.68ft.) or lower (Note 3)				
Installation location	Inside control panel				
Overvoltage category (Note 1)	II or less				
Pollution level (Note 2)	2 or less				

C80, which is open equipment, must be installed within a sealed metal control panel (IP54 or higher). C80 must also be used and stored under the conditions listed in the specifications table above. The following environmental conditions are also required for the layout design.
• No large amount of accumulated dust, iron filings, oil mist, salt, or organic solvents • No direct sunlight • No strong electrical or magnetic fields • No direct vibrations or shocks

(Note 1) Assumes that module is connected between a public power distribution network and local machinery.
Category II applies to equipment for which electrical power is supplied from fixed facilities. The surge voltage withstand level for the rated voltage of up to 300V is 2,500V.
(Note 2) Indicates the degree to which material accumulates in terms of the environment where the equipment is used.
Pollution level 2 means that only non-conductive pollution can occur. However, temporary conductivity may be caused by accidental condensation.
(Note 3) Do not use or store C80 Series modules under pressure higher than the atmospheric pressure of altitude 0m. Doing so may cause operation failure.

LIST OF MANUALS

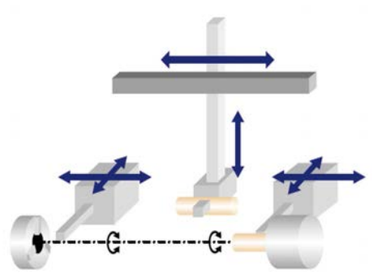
Manuals relating to the C80 are listed below. For the latest versions, please contact us.

Classification	Manual title	Manual No.	Intended purpose/contents
C80	M800/M80/E80/C80 Series Specifications Manual (Function)	IB-1501505	·Model selection ·Outline of various functions
	M800/M80/E80/C80 Series Specifications Manual (Hardware)	IB-1501506	·Model selection ·Specifications of hardware
	M800/M80/E80/C80 Series PLC Interface Manual	IB-1501272	·Electrical circuitry design ·Interface signals between NC and PLC
	M800/M80/E80/C80 Series Programming Manual (Lathe System) (1/2)	IB-1501275	·G code programming for lathe system ·Basic functions, etc.
	M800/M80/E80/C80 Series Programming Manual (Lathe System) (2/2)	IB-1501276	·G code programming for lathe system ·Functions for multi-part system, high-accuracy function, etc.
	M800/M80/E80/C80 Series Programming Manual (Machining Center System) (1/2)	IB-1501277	·G code programming for machining center system ·Basic functions, etc.
	M800/M80/E80/C80 Series Programming Manual (Machining Center System) (2/2)	IB-1501278	·G code programming for machining center system ·Functions for multi-part system, high-accuracy function, etc.
	C80 Series Connection and Setup Manual	IB-1501452	·Detailed specifications of hardware ·Installation, connection, wiring, setup (startup/adjustment)
	C80 Series Instruction Manual	IB-1501453	·Operation guide for NC ·Explanation for screen operation, etc.
	C80 Series Maintenance Manual	IB-1501454	·Cleaning and replacement for each unit ·Other items related to maintenance
	C80 Series Alarm/Parameter Manual	IB-1501560	·Alarms ·Parameters
Drive system (servo/ spindle)	MDS-E/EH Series Specifications Manual	IB-1501226	·Specifications of regenerative power modules
	MDS-E/EH Series Instruction Manual	IB-1501229	·Handling of regenerative power modules
	MDS-EJ/EJH Series Specifications Manual	IB-1501232	·Specifications of resistor regeneration type units
	MDS-EJ/EJH Series Instruction Manual	IB-1501235	·Handling of resistor regeneration type units
	MDS-EM/EMH Series Specifications Manual	IB-1501238	·Specifications of multi-axis integrated, regenerative power modules
	MDS-EM/EMH Series Instruction Manual	IB-1501241	·Handling of multi-axis integrated, regenerative power modules
	DATA BOOK	IB-1501252	·Specifications of servo drive unit, spindle drive unit, motor, etc.
iQ-R	MELSEC iQ-R Module Configuration Manual	SH-081262	Outline of system configuration, specifications, installation, wiring, maintenance, etc.
	MELSEC iQ-R CPU Module User's Manual (Startup)	SH-081263	Outline of specifications, procedures before operation, troubleshooting, etc. for CPU module
	MELSEC iQ-R CPU Module User's Manual (Application)	SH-081264	Outline of memory, functions, devices, parameters, etc. for CPU module
	QCPU User's Manual (Hardware Design, Maintenance and Inspection)	SH-080483	Outline of specifications, necessary knowledge to configure the system and maintenance-related descriptions for Q series CPU module, etc.
	GX Works3 Operating Manual	SH-081215	Outline of functions, programming, etc.
GOT	GOT2000 Series User's Manual (Hardware)	SH-081194	Outline of hardware such as part names, external dimensions, installation, wiring, maintenance, etc. of GOTs
	GOT2000 Series User's Manual (Utility)	SH-081195	Outline of utilities such as screen display setting, operation method, etc. of GOTs
	GOT2000 Series User's Manual (Monitor)	SH-081196	Outline of each monitor function of GOTs
	GOT2000 Series Connection Manual (Mitsubishi Electric Products)	SH-081197	Outline of connection types and connection method between GOT and Mitsubishi Electric connection devices
	GT Designer3 (GOT2000) Screen Design Manual	SH-081220	Outline of screen design method using screen creation software GT Designer3

CASE STUDY

One CNC CPU controls up to seven part systems and 16 axes. Up to three CNC CPUs can be mounted on a single base. The C80 Series modules can control not only the machines in automobile parts production lines, but also various other machines.

Lathe system (two spindles and two turrets, equipped with workpiece loading robot)



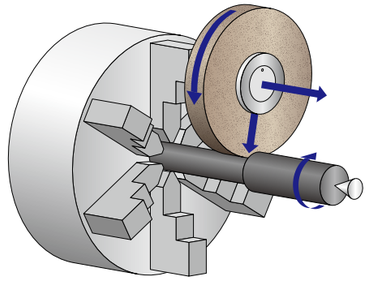
[Point to adopt C80 Series]

- Multi-part system control (up to 7 systems) enables independent control of lathe machining and work loading.
- iQ Platform-based robot control is supported.
- The system enables concurrent use of networks (field network, between controllers) are required in manufacturing lines.

[Main functions]

- Multi-part system control (start point designation timing synchronization, etc.)
- Machine group-based alarm stop
- Rapid traverse block overlap
- Connection to various networks

Grinder



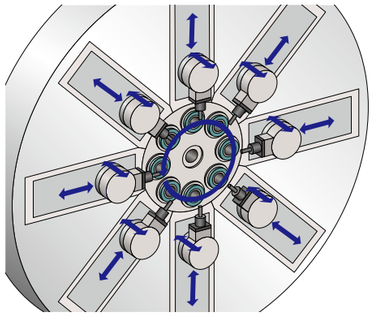
[Point to adopt C80 Series]

- GT Works3 helps design a variety of customized screens.
- Tool offset and tool life management functions support automation.
- Subprogram control allows modular part programming.

[Main functions]

- Tool offset and tool radius compensation
- Tool life management
- Subprogram control (up to eight nesting levels)

Multi-station machine



[Point to adopt C80 Series]

- C80 modules support up to three CPUs mounted, which enables multi-axis multi-part system control (up to 21 part-systems and 48 axes).
- A great number of tools can be managed through tool offset and tool life management functions.

[Main functions]

- Timing synchronization between part systems(*)
- Start point designation timing synchronization(*)
- Multi-part system program management(*)
- Multi-part system simultaneous high-accuracy control(*)
- Number of tool offset sets [machining center system: up to 400 sets, lathe system: up to 256 sets]
- Number of tool life management sets [machining center system: up to 400 sets, lathe system: up to 256 sets]

(*) Specifications for each CNC CPU.

FUNCTIONAL SPECIFICATIONS

○Standard △Optional □Selection

class	C80 Lathe system	C80 Machining center system	General explanation
1 Control axes			
1 Control axes			
1 Number of basic control axes (NC axes)	○2	○3	The NC axis, spindle, and PLC axis are generically called the control axis. The NC axis can be manually or automatically operated using a machining program. The PLC axis can be controlled using a sequence program. The number of axes that is within the max. number of control axes, and that does not exceed the max. number given for the NC axis, spindle and PLC axis, can be used.
2 Max. number of axes (NC axes + Spindles + PLC axes)	16	16	
1 Max. number of NC axes (in total for all the part systems)	16	16	
2 Max. number of spindles	7	7	
3 Max. number of PLC axes	8	8	
4 Max. number of PLC indexing axes	8	8	The number of PLC axes available to be used as indexing axis.
5 Number of simultaneous contouring control axes	4	4	Number of axes with which simultaneous interpolation control is possible.
6 Max. number of NC axes in a part system	8	8	Max. number of NC axes possible to control in the same part system.
7 Axis name extension	○	○	The axis name (command axis name) to issue the absolute/incremental command to NC control axis can be expanded to two letters.
2 Control part system			
1 Standard number of part systems	1	1	One part system is the standard.
2 Max. number of part systems (main + sub)	○7	○7	Up to seven part systems.
1 Max. number of main part systems	○7	○7	
2 Max. number of sub part systems	○2	—	
3 Control axes and operation modes			
2 Memory mode	○	○	Machining programs stored in the memory of the CNC module are run.
3 MDI mode	○	○	MDI data stored in the memory of the CNC unit are executed.
4 High-speed program server mode			
3 FTP high-speed program server mode	△	△	This function allows high-speed transfer of machining programs from the FTP server to the large-capacity buffer memory in CNC CPU via Ethernet to execute the program.
2 Input command			
1 Data increment			
1 Least command increment			The data increment handled in the controller includes the input setting increment and command increment. Each type is set with parameters.
Least command increment 1μm	○	○	Possible to command in increments of 0.001mm (linear axis) and 0.001° (rotary axis).
Least command increment 0.1μm	○	○	Possible to command in increments of 0.0001mm (linear axis) and 0.0001° (rotary axis).
2 Least control increment			The least control increment determines the CNC's internal operation accuracy.
Least control increment 0.01μm (10nm)	○	○	Possible to control in increments of 0.00001mm (linear axis) and 0.00001° (rotary axis).
Least control increment 0.001μm (1nm)	○	○	Possible to control in increments of 0.000001mm (linear axis) and 0.000001° (rotary axis).
3 Indexing increment	○	○	This function limits the command value for the rotary axis.
3 Positioning / Interpolation			
1 Positioning			
1 Positioning	○	○	This function carries out positioning at high speed using a rapid traverse rate with the travel command value given in the program.
2 Unidirectional positioning	—	△	The G code command always moves the tool to the final position in the direction determined by parameters.
2 Linear / Circular interpolation			
1 Linear interpolation	○	○	Linear interpolation is a function that moves a tool linearly by the travel command value supplied in the program at the cutting feedrate designated by the F code.
2 Circular interpolation (Center / Radius designation)	○	○	This function moves a tool along a circular arc on the plane selected by the travel command value supplied in the program.
3 Helical interpolation	○	○	With this function, any two of three axes intersecting orthogonally are made to perform circular interpolation while the third axis performs linear interpolation in synchronization with the arc rotation. This control can be exercised to machine large-diameter screws or 3-dimensional cams.
4 Spiral / Conical interpolation	—	△	This function interpolates arcs where the start point and end point are not on the circumference of the same circle into spiral shapes.
5 Cylindrical interpolation	△	△	This function transfers the shape that is on the cylinder's side surface (shape yielded by the cylindrical coordinate system) onto a plane, and when the transferred shape is designated in the program in the form of plane coordinates, the shape is converted into a movement along the linear and rotary axes of the original cylinder coordinates, and the contours are controlled by means of the CNC unit during machining.
6 Polar coordinate interpolation	△	△	This function converts the commands programmed by the orthogonal coordinate axes into linear axis movements (tool movements) and rotary axis movements (workpiece rotation) to control the contours. It is useful for cutting linear cutouts on the outside diameter of the workpiece, grinding cam shafts, etc.
7 Milling interpolation	△	—	When a lathe with linear axes (X, Z axes) and rotary axis (C axis) serving as the control axes is to perform milling at a workpiece end face or in the longitudinal direction of the workpiece, this function uses the hypothetical axis Y, which is at right angles to both the X and Z axes, to enable the milling shape to be programmed as the X, Y and Z orthogonal coordinate system commands.
3 Curve interpolation			
3 Spline interpolation (G05.1Q2 / G61.2)	—	△	This function automatically generates spline curves that smoothly pass through rows of dots designated by a fine-segment machining program, and performs interpolation for the paths along the curves. This enables high-speed and high-accuracy machining.
4 Feed			
5 Thread cutting			
1 Thread cutting (Lead / Thread number designation)	○	△	Thread cutting with a designated lead can be performed. Inch threads are cut by designating the number of threads per inch with the E address.
2 Variable lead thread cutting	○	—	By commanding the lead increment/decrement amount per thread rotation, variable lead thread cutting can be performed.
3 Synchronous tapping			* With digital I/F spindle
1 Synchronous tapping cycle	○	○	This function performs tapping through synchronized control of the spindle and servo axis. This eliminates the need for floating taps and enables tapping to be conducted at a highly accurate tapping depth.
2 Pecking tapping cycle	△	△	The load applied to the tool can be reduced by designating the depth of cut per pass and cutting the workpiece to the hole bottom with a multiple number of passes.
3 Deep-hole tapping cycle	△	△	In the deep-hole tapping, the load applied to the tool can be reduced by designating the depth of cut per pass and cutting the workpiece to the hole bottom with a multiple number of passes.
4 Multiple spindle synchronous tapping	△	△	This function enables two or more spindles to perform synchronous tapping at a time, thereby improving the tapping efficiency.
4 Chamfering	○	—	Chamfering can be enabled during the thread cutting cycle by using external signals.
6 Circular thread cutting	—	—	Circular thread in which the lead is in longitudinal direction can be cut.
8 High-speed synchronous tapping (OMR-DD)	○	○	The servo axis directly detects and compensates the spindle's delay in tracking by using the communication between drive units over the high-speed optical servo network. By minimizing the synchronization error, the accuracy of the synchronous tapping is increased.
11 Thread cutting override	△	—	The thread cutting feedrate can be changed by changing the spindle override depending on rough cutting, finish machining, etc.
12 Variable feed thread cutting	△	—	This function changes the cutting feedrate by the spindle override at the time of the thread cutting. The machining condition during thread cutting can be changed.

○Standard △Optional □Selection

class	C80 Lathe system	C80 Machining center system	General explanation
5 Program memory / editing			
1 Memory capacity			
1 Memory capacity (number of programs stored)			Machining programs are stored in the NC memory. (Note) For a multi-part system, the specifications shown here is the total for all part systems.
500kB [1280m] (1000 programs)	○	○	
1000kB [2560m] (2000 programs)	△	△	
2000kB [5120m] (2000 programs)	△	△	
2 Editing			
1 Program editing	○	○	This function enables program editing such as correction, deletion and addition.
2 Background editing	○	○	This function enables one machining program to be created or edited while another program is running.
3 Buffer correction	○	○	During automatic operation (memory) or MDI operation, this function initiates single block stop and enables the next command to be corrected or changed. When a program error has occurred, the function enables the block in which the error occurred to be corrected and operation to be resumed without having to perform NC resetting.
5 Multi-part system simultaneous program editing	○	—	When an operation to open a machining program in the NC memory is performed on the edit screen, machining programs are opened in the right and left areas at the same time; the specified machining program of the displayed part system in the edit area being selected and the machining program of another part system with the same name in the unselected edit area.
6 Special program editing display for synchronization between part systems	△	—	When the left and right edit areas are displaying the same named programs of different part systems stored on the NC memory, the display is switched to the synchronized display of the left- and right- side programs aligned using the timing synchronization symbols.
6 Operation and display			
1 Structure of operation / display panel			
11 GOT (GOT2000 Series GT27 / GT25 12.1 / 10.4 / 8.4 / 5.7)	○	○	Select a GOT in its lineup. For details, refer to catalogs : "GOT2000 series".
2 Operation methods and functions			
1 Operation input	○	○	In addition to the method of directly inputting numeric data, a method to input the operation results using four basic arithmetic operators and function symbols can be used for specific data settings.
2 Absolute value / Incremental value setting	○	○	When setting the data, the absolute/incremental setting can be selected from the menu.
3 Multiple display connection	○(GOT)	○(GOT)	Using an Ethernet hub, one CNC module can be connected to and switched between up to eight displays. (Note that the max. number of connectable displays is limited depending on the machine operation panel specifications.)
4 Common display to multiple NCs	○(GOT)	○(GOT)	Using an Ethernet hub, one display can be connected to and switched between up to 64 CNC modules. (Note that the max. number of connectable displays is limited depending on the machine operation panel specifications.)
5 Displayed part system switch	○	○	The part system displayed on the screen can be changed.
6 Menu list	○	○	The menu list function displays the menu configuration of each screen as a list, making it possible to directly select the menu for other screens.
7 Display switch by operation mode	○	○	The screen display changes when the screen mode selection switch is changed.
8 External signal display switch	○	○	The screen display changes with the signal from PLC.
9 Screen saver	○(GOT)	○(GOT)	The screen saver function protects the display unit by turning the backlight OFF after the length of time specified in a parameter.
10 Parameter guidance	○	○	This function displays the details of the parameters or the operation methods according to the state of the screen currently displayed.
11 Alarm guidance	○	○	Guidance is displayed for the alarm currently issued.
14 Screenshot capture	○(GOT)	○(GOT)	This function allows to output a bitmap file of a screen displayed on the setting and display unit to USB memory or SD card.
15 User selectable menu configuration	○	○	This function allows to change the display order of the main menu in the "Monitor", "Setup" and "Edit" screens, and to change display / non-display selection.
19 MTB selectable menu configuration	○	○	Menu items on the "Monitor", "Setup" and "Edit" screens (of MITSUBISHI standard format) can be moved within a screen or hidden as desired. The custom screen menu items added by machine tool builders, on the contrary, cannot be moved or hidden.
8 Spindle, Tool and Miscellaneous functions			
1 Spindle functions (S)			
1 Spindle control functions			The spindle rotation speed is determined in consideration of the override and gear ratio for the S command given in automatic operation or with manual numerical commands, and the spindle is rotated.
6 Spindle-mode servo motor control	△	△	This function controls a spindle using the combination of servo motor and servo drive unit (MDS-E Series) which controls NC axis.
15 Multiple spindle synchronization set control	○	○	By setting the parameter, spindle synchronization I, tool spindle synchronization IA/IB (spindle-spindle, polygon), tool spindle synchronization II (hobbing) and spindle superimposition control can be executed simultaneously for multiple sets of spindles.
11 Operation support functions			
4 Interrupt operation			
16 Machining interruption	△	△	Machining interruption is a function which enables interrupt operations while a program is normally executed.
12 Program support functions			
1 Machining method support functions			
7 Axis control			
1 Chopping			
1 Chopping	△	△	This function continuously raises and lowers the chopping axis independently of program operation. During the grinding operation, chopping can produce a better surface accuracy than using abrasive grain.
8 Multi-part system control			
3 Mixed control			
2 Arbitrary axis exchange control	△	△	An arbitrary axis can be exchanged freely across part systems in the multiple part systems. The machining can be freer by exchanging an axis which can be commanded for machining programs in each part system.
11 High-speed parts machining			
1 Rapid traverse block overlap	△	△	This function enables the next block to start (overlap) without waiting for positioning (G00) or reference position return (G28/G30). Consequently, cycle time of machining can be reduced.
3 High-speed and high-accuracy functions [kBPM: k Block per Minute]			
3 SSS control	—	△	With SSS (Super Smooth Surface) control, the large area path information is used instead of just the angle between the blocks. Thus, optimum speed control that is not adversely affected by minute steps or waviness is possible. This enables machining with a fewer scratches and streaks on the cutting surface compared to the normal high-accuracy control function. Multiple part systems simultaneous high-accuracy function is required to conduct the SSS control in the second or following part systems.
4 Tolerance control	—	△	This function enables the smooth operation within the tolerance error range. The desired machining result can be obtained with simple parameter adjustment.

○Standard △Optional □Selection

class	C80 Lathe system	C80 Machining center system	General explanation
13 Machine accuracy compensation			
1 Static accuracy compensation			
1 Backlash compensation	○	○	This function compensates the error (backlash) produced when the direction of the machine system is reversed.
2 Memory-type pitch error compensation [sets]	○10	○10	Machine accuracy can be improved by compensating the errors in the screw pitch intervals among the mechanical errors (production errors, wear, etc.) of the feed screws.
3 Memory-type relative position error compensation	○	○	Machine accuracy can be improved by compensating the relative error between machine axes, such as a production error or aging.
4 External machine coordinate system compensation	△	△	The coordinate system can be shifted by inputting a compensation amount from the PLC. This compensation amount will not appear on the counters (all counters including machine position).
5 Circular error radius compensation	△	△	With commands designated during arc cutting, this function compensates movement toward the inside of the arcs caused by a factor such as servo delay.
6 Ball screw thermal expansion compensation	△	△	This compensates the axis feed error caused by a ball screw's thermal expansion, etc. using the values set by the PLC.
8 Position-dependent gradually increasing-type backlash compensation	△	△	With this function, the gradually increasing-type lost motion which depends on the distance from the point where the machine movement direction is reversed can be compensated by controlling the variation of backlash compensation amount according to the distance from the direction reversal point.
9 Two-way pitch error compensation	△	△	Two-way pitch error compensation function is used to compensate the pitch error in each direction by setting the pitch error compensation amount when moving in the positive and negative direction.
2 Dynamic accuracy compensation			
1 Smooth high-gain (SHG) control	○	○	This is a high-response and stable position control method using the servo system. SHG control realizes an approximately three-fold position loop gain compared to the conventional control method.
2 Dual feedback	○	○	Use position feedback with a motor-side encorder in ranges with high acceleration to enable stable control. In ranges with low acceleration, use position feedback with the machine-side encorder (scale). This will make it possible to increase the position loop gain. A machine-side encorder (scale) is separately required.
3 Lost motion compensation	○	○	This function compensates the error in protrusion shapes caused by lost motion at the arc quadrant changeover section during circular cutting.
4 OMR II (Backlash with filter)	△	△	The OMR (Optimal Machine Response) control function estimates the machine or motor model (moment of inertia, clone friction, viscosity coefficient, etc.) that can cause a path error (deviation of the actual tool path from the programmed path). High-accuracy machining is achieved by carrying out feed forward control based on that model. This allows error cased by quadrant protrusions during circular interpolation or quadrants on the inner side of the path to be greatly reduced. OMR-II is a function that focuses on the quadrant protrusions, and improves the path error with this. Quadrant path compensation is included in OMR-II.
6 OMR-FF	△	△	OMR-FF control enables fine control by generating feed forward inside the drive unit and can realize the strict feedback control to the program command than the conventional high-speed accuracy control.
15 Safety and maintenance			
4 Maintenance and troubleshooting			
12 Backup / Restore	○	○	This function stores the setting information (sequence programs, parameters and the setting values, etc.) of a connected device to the installed data storage in GOT, and restores those data to the device as needed.
5 Functional safety			
2 Smart Safety observation			
1 Safety-related I/O observation	△	△	Using the dual circuits for processing signals input/output to/from the machine (safety signal compare sequence) and dual execution of safety signal process logic made by users (safety PLC), if one circuit has broken down, the other circuit can detect errors, which improves the safety of signal process.
2 Emergency stop observation	△	△	Emergency stop signal is doubled and observed to see whether there is any error. When one emergency stop signal is in open state, the whole system can be set in emergency stop condition.
3 Drive safety function			
1 SLS (Safely-Limited Speed)	△	△	Axis speed (command speed, FB speed) is observed doubly to see whether the speed exceeds the safe speed.
2 SLP (Safely-Limited Position)	△	△	Axis absolute position (command position, FB position) is observed doubly to see whether the position exceeds the safe position range.
3 SOS (Safe Operating Stop)	△	△	Axis stop speed (command speed, FB speed) is observed doubly whether the speed exceeds the safe stop speed. Axis stop position (command position, FB position) is observed doubly whether the position exceeds the safe stop position range. Observe axis stop position deviation (difference between command position and FB position) doubly to see whether the deviation exceeds the safe stop position deviation.
4 SSM (Safe Speed Monitor)	△	△	This function uses the safety signals to inform that the axis speed (command speed, FB speed) is equal to or below the safe speed.
5 SBC / SBT (Safe Brake Control / Safe Brake Test)	△	△	The brakes connected to motors are activated by this function. Because there are two circuits for activating the brakes, one circuit can activate the brakes even when the other circuit is broken down. Furthermore, Safe Brake Test (SBT) can diagnose the circuits for activating the breaks and the effectiveness of the brakes (deterioration due to abrasion, etc.).
6 SCA (Safe Cam)	△	△	This function uses the safety signals to inform that the axis absolute position (command position, FB position) is within the range of safe position.
7 SS1 / SS2 (Safe Stop)	△	△	[Safe stop 1 (SS1)] STO function is activated after an axis is decelerated and the speed (command speed, FB speed) becomes equal to or below the safe stop speed. [Safe stop 2 (SS2)] SOS function is activated after an axis is decelerated and the speed (command speed, FB speed) becomes equal to or below the safe stop speed.
8 STO (Safe Torque Off)	△	△	This function shuts OFF power supply to axes. Because there are two power shutoff circuits, one circuit can shut OFF the power supply even when the other circuit is broken down.
9 SCN (Safety Communication Network)	△	△	This function performs safety communication between master station and local station using CC-Link IE field network.
17 Machine support functions			
6 External PLC link			
1 CC-Link (Master / Local)	△ (MELSEC)	△ (MELSEC)	Refer to manuals of each unit of MITSUBISHI Programmable Controller "MELSEC iQ-R series" for information on the function and the performance.
2 PROFIBUS-DP (Master)	△ (MELSEC)	△ (MELSEC)	Refer to manuals of each unit of MITSUBISHI Programmable Controller "MELSEC iQ-R series" for information on the function and the performance.
3 CC-Link IE Field network (Master / Local)	△ (MELSEC)	△ (MELSEC)	Refer to manuals of each unit of MITSUBISHI Programmable Controller "MELSEC iQ-R series" for information on the function and the performance.
4 PROFINET	△ (MELSEC)	△ (MELSEC)	Refer to manuals of each unit of MITSUBISHI Programmable Controller "MELSEC iQ-R series" for information on the function and the performance.
5 EtherNet/IP	△ (MELSEC)	△ (MELSEC)	Refer to manuals of each unit of MITSUBISHI Programmable Controller "MELSEC iQ-R series" for information on the function and the performance.
8 FL-net	△ (MELSEC)	△ (MELSEC)	Refer to manuals of each unit of MITSUBISHI Programmable Controller "MELSEC iQ-R series" for information on the function and the performance.
9 DeviceNet (Master)	△ (MELSEC)	△ (MELSEC)	Refer to manuals of each unit of MITSUBISHI Programmable Controller "MELSEC iQ-R series" for information on the function and the performance.
7 Installing S/W for machine tools			
4 APLC release (Note 1)	△	△	APLC (Advanced Programmable Logic Controller) release is a function that allows the user-generated C language module to be called from the NC. Control operations that are difficult to express in a sequence program can be created with the C language.
10 GOT2000 screen design tool GT Works3	○	○	This integrated software is used to create professional screen designs for GOTs.
8 Others			
2 CNC remote operation tool			
1 NC Monitor2 (Note 1)	○	○	NC Monitor2 is a PC software tool that monitors information in the NC unit connected with the Ethernet.
2 NC Explorer (Note 3)	○	○	NC Explorer is a software tool to operate the machining data files of each NC unit connected with a host personal computer by Ethernet connection from the Explorer on the host personal computer.
3 Automatic operation lock	○	○	Automatic operation lock function prevents the falsification of APLC (C language module) by a third party.
4 Power consumption computation	○	○	Present power consumption and accumulated power consumption can be acquired with this function. The present power consumption notifies the instantaneous power consumption and the accumulated power consumption notifies the integrated value of the present power consumption.
6 GOT Window	○	○	This is the interface to display the variety of NC data on GOT connected to the CNC CPU. This reads out the running machining program No., the running machining program and the coordinate values, etc. by the device read command.
7 Log Viewer	○	○	This function enables the recorded data by the data sampling function of the NC to display with a graph on the GOT, and to store the data as a file.

(Note 1) Please contact us to purchase this tool.
(Note 3) This tool is free of charge. Please contact us.

Refer to the specifications manuals for details.

GLOBAL SALES & SERVICE NETWORK

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WARRANTY

Please confirm the following product warranty details before using MITSUBISHI ELECTRIC CNC.

1.Warranty Period and Coverage

Should any fault or defect (hereafter called "failure") for which we are liable occur in this product during the warranty period, repair services shall be provided at no cost through the distributor from which the product was purchased or through a Mitsubishi Electric service provider. Note, however, that this does not apply if the customer was informed prior to purchasing the product that the product is not covered under warranty. Also note that we are not responsible for any on-site readjustment and/or trial run that may be required after a defective unit is replaced.

[Warranty Term]

The term of warranty for this product shall be twenty-four (24) months from the date of delivery of the product to the end user, provided the product purchased from Mitsubishi Electric or a distributor in Japan is installed in Japan (but in no event longer than thirty (30) months, including distribution time after shipment from Mitsubishi Electric or a distributor).

Note that, in the case where the product purchased from Mitsubishi Electric or a distributor in or outside Japan is exported and installed in any country other than where it was purchased, please refer to "2. Service in Overseas Countries" below.

[Limitations]

(1)The machine tool builder is requested to conduct an initial failure diagnosis, as a general rule. The diagnosis may also be carried out by Mitsubishi Electric or our service provider for a fee at the machine tool builder's request.

(2)This warranty applies only when the conditions, method, environment, etc., of use are in compliance with the terms, conditions and instructions that are set forth in the instruction manual, user's manual, and the caution label affixed to the product, etc.

(3)Even during the term of warranty, repair costs will be charged to the customer in the following cases:

(a) a failure caused by improper storage or handling, carelessness or negligence, etc., or a failure caused by a problem with the customer's hardware or software

(b) a failure caused by any alteration, etc., to the product made by the customer without Mitsubishi Electric's approval

(c) a failure which could have been avoided if the customer's equipment in which this product is incorporated had been equipped with a safety device required by applicable laws or has any function or structure considered indispensable in the light of industrial common sense

(d) a failure which could have been avoided if consumable parts designated in the instruction manual, etc. had been duly maintained and replaced

(e) any replacement of consumable parts (including the battery, relay and fuse)

(f) a failure caused by external factors such as inevitable accidents, including without limitation fire and abnormal fluctuation of voltage, and acts of God, including without limitation earthquakes, lightning, and natural disasters

(g) a failure which could not have been foreseen under technologies available at the time of shipment of this product from Mitsubishi Electric

(h) any other failures which are not attributable to Mitsubishi Electric or which the customer acknowledges are not attributable to Mitsubishi Electric

2.Service in Overseas Countries

If the customer installs a product purchased from Mitsubishi Electric in a machine or equipment and exports it to any country other than where it was purchased, the customer may sign a paid warranty contract with our local FA center.
This applies in the case where the product purchased from us in or outside Japan is exported and installed in any country other than where it was purchased.

For details please contact the distributor from which the product was purchased.

3.Exclusion of Responsibility for Compensation against Loss of Opportunity, Secondary Loss, etc.

Regardless of the gratis warranty term, Mitsubishi Electric shall not be liable for compensation for:

(1)Damage arising from any cause found not to be the responsibility of Mitsubishi Electric.

(2)Lost opportunity or lost profit incurred by the user due to a failure of a Mitsubishi Electric product.

(3)Special damage or secondary damage, whether foreseeable or not, compensation for accidents, and compensation for damages to products other than Mitsubishi Electric products.

(4)Replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

4.Changes in Product Specifications

Specifications shown in our catalogs, manuals or technical documents are subject to change without notice.

5.Product Application

(1)For use of this product, applications should be those that will not result in a serious damage even if a failure or malfunction occurs in the product, and a backup or fail-safe function should operate on an external system when any failure or malfunction occurs to the product.

(2)Mitsubishi Electric CNC is designed and manufactured solely for applications to machine tools for industrial purposes. Do not use this product in applications other than those specified above, especially those which have substantial influence on public interest or which are expected to have significant influence on human lives or properties.

Creating Solutions Together.


Low-voltage Power Distribution Products


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Compact and Modular Controllers


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Visualization: HMIs


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Collaborative and Industrial Robots


Processing machines: EDM, Lasers


SCADA, analytics and simulation software

Mitsubishi Electric's product lineup, from various controllers and drives to energy-saving devices and processing machines, all help you to automate your world. They are underpinned by software, innovative data monitoring, and modelling systems supported by advanced industrial networking and Edgecross IT/OT connectivity. Together with a worldwide partner ecosystem, Mitsubishi Electric factory automation (FA) has everything to make IoT and Digital Manufacturing a reality.

With a complete portfolio and comprehensive capabilities that combine synergies with diverse business units, Mitsubishi Electric provides a one-stop approach to how companies can tackle the shift to clean energy and energy conservation, carbon neutrality and sustainability, which are now a universal requirement of factories, buildings, and social infrastructure.

We at Mitsubishi Electric FA are your solution partners waiting to work with you as you take a step toward the realization of sustainable manufacturing and society through the application of automation.
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Note: not all products are available in all countries

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User support videos are available, including how to backup/restore data and replace batteries, and an introduction to our products and technologies.

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⚠ Safety Warning

To ensure proper use of the products listed in this catalog, please be sure to read the instruction manual prior to use.

MITSUBISHI ELECTRIC CORPORATION HEAD OFFICE: TOKYO BLDG., 2-7-3 MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN

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