for a greener tomorrow

MITSUBISHI ELECTRIC
Changes for the Better

FACTORY AUTOMATION

NUMERICAL CONTROL (CNC)
M800/M80 Series

Infinite Possibilities

High productivity, usability and flexibility delivered by breakthrough performance.
The next-generation CNC M800/M80 Series empowers the manufacturing industry with unlimited possibilities and the capability to create innovative value.

The Best Partner for Your Success

CNC-DEDICATED CPU

Mitsubishi Electric's first CNC-dedicated CPU, the sum of our industry-leading technologies.

Development of convention-breaking CNCs

Leading the way in today's industrial globalization, the innovative products of Mitsubishi Electric continue to exceed the expectations of users around the world. The outstanding performance of our CNC lineup consistently wins praise from users for their high levels of productivity, intuitive usability, and superior functionality. However, to develop the new M800/M80 Series, we went back to the drawing board and completely reexamined our cutting-edge control technologies. The result is a breakthrough in the control of high-speed, high-precision machining.

User performance requirements demand a commitment to development

The story of the new M800/M80 Series began with conventional development to produce incremental evolutionary improvements. But our goal was a revolutionary leap in CNC performance. Our project team determined that the only way to significantly boost processing performance and totally satisfy user demands would be the creation of a CPU optimized for CNC control. This insight inspired Mitsubishi Electric's first-ever attempt to develop a CNC-dedicated CPU and opened a new chapter in CNC development.

In-depth analysis and simulations achieve one volition

Pursuit of a dedicated CNC CPU began with design validation on an unprecedented scale as well as high-precision simulations to verify processing performance.
Achieving a leap in processing performance demanded the integration of innovative technologies beyond optimizing processor manufacturing processes. Overcoming numerous hurdles and maximizing the potential of the processor, we succeeded in producing a CNC-dedicated CPU that achieves unprecedented high-speed processing performance.

Experience the revolutionary high-speed processing of the new CNC-dedicated CPU

Incorporating the CNC-dedicated CPU in the new series not only results in phenomenal processing speed, but also reduces the number of required parts, leading to fewer possibilities of failure and increasing product quality. Equipped with Mitsubishi Electric's first-ever CNC-dedicated CPU, the long-awaited M800/M80 Series is the fruit of an original development process and the sum of our latest technologies. With the utmost confidence, we are proud to introduce the M800/M80 Series and invite customers to experience performance of the future today.

The Mitsubishi Electric CNC Development Project Team

Fine segment processing capability

High capability in program processing enables a shorter cycle time.

PLC process capability (PCMIX value)

High processing capability of the PLC enables large-scale ladder logic to be processed at high speed.

CNC-to-drive communication capability

Optical Communication speed between the CNC Control and Drive system has been increased. This improves the system responsiveness, leading to more accurate machining.

ADVANCED DESIGN

Display and keyboard designs have been updated.
The advanced construction and sophisticated flat profile take machine design to the next level.
The display incorporates a touchscreen as a standard option providing intuitive smart phone like operational features for 10.4" type and wider display units.

Won the Machine Design Award 2016

Won the Good Design Award 2015

19-type touchscreen provides easy operability (for M800W/M80W Series only)

Software keyboard

Software operation panel

Document viewer

Memo pad (handwritten)

19-type vertical display unit provides two-split multiple windows for various applications

A 19" vertical display has been added to the M800W/M80W Series platform. The display provides a split multiple widow that can be customized by arranging a keyboard, operation panel, document viewer or other applications that can be added to the display.

The slim personal computer unit enables greater flexibility in operation panel design

M800W/M80W Series personal computer unit boasts 50mm thick (excluding protrusions). This provides a higher degree of flexibility in operation panel design.

Slim 9.5mm shape (excluding protrusions)

Advanced display and keyboard designs

M700V/M70V

M800/M80

The M800/M80 Series can use a standard SD card which is an easily sourced device. The SD card can be inserted or removed independently of USB memory. The flip-up door provides greater durability.

Possible to be mounted not only from the front side of machine tools but also from the inner side of cabinets.

Display redesigned for enhanced visibility of keyboard

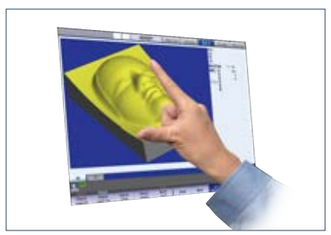
The display and keyboard have been redesigned. Measuring only 9.5mm thick (excluding protrusions), the possibilities of machine tool design have been expanded. In addition, their gray-scale colors can be easily harmonized with machines in different colors. The surfaces of display and keyboard are flush, providing beauty and usability as well as increased operability.
10.4-type and larger displays have touchscreen made of beautiful, long-life glass, which allows you easy day-to-day maintenance.
Vertical mount and horizontal mount keyboards are included in the product line.

INTUITIVE USABILITY

Touch operation provides you unprecedented ease of use.

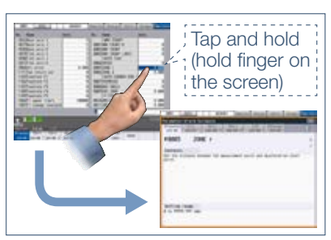
Smartphone-like intuitive touch operation

The display features a capacitive touchscreen that is commonly used in smartphones and tablets, allowing for intuitive and easy operation. With a simple flick of the finger, for instance, you can monitor the desired part of program, or view and select a menu key on the next page without the need for tedious key operation.
In 3D graphic check, you can view a 3D model at any desired size, in any desired position. Usability has been improved further by introducing the "tap and hold" and "double-tap" functions. Guidance for a specific item can now be viewed by holding your finger on the item. Also, it is now possible to open the edit window with a "double-tap".

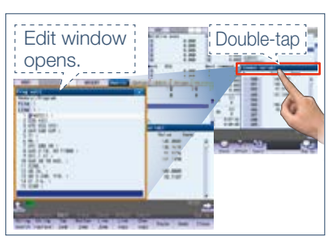


Pinch-in/Pinch-out

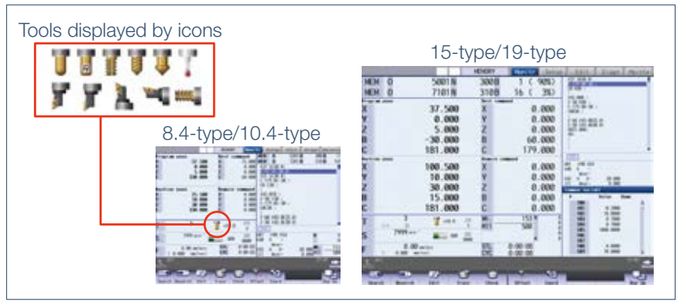
Slide and scroll (flick)



View guidance (tap and hold)



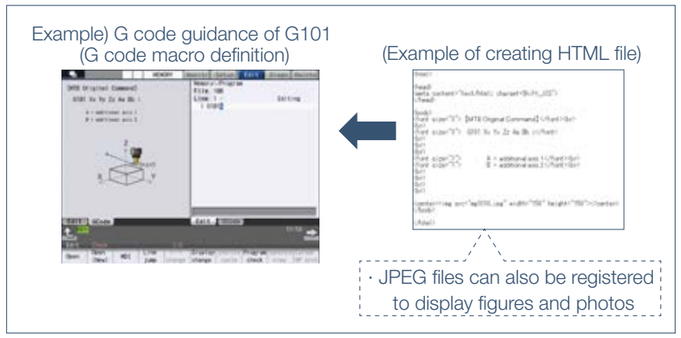
Open edit window (double-tap)



Various features and operation menus are indicated using easy-to-recognize icons. Tool icons tell you the tool type, left- or right-hand, lifetime and other information at a glance.

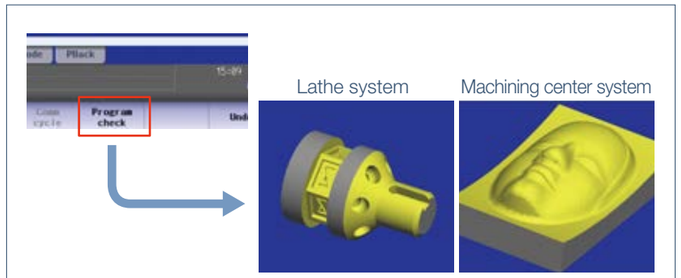
Advanced universal design with a focus on ease of use

The easy-to-use interface inherited from M700V/M70V Series has been upgraded to provide greater visibility and usability for the operators. Icons and operational menus are easily recognized and are available for anyone to use.
The Simple Monitor screen displays the information required for lathes and machining centers respectively in an enlarged view. The icons on the screen tell you the status of tools and spindles. All of these interface features are worth a try.



Improved user-friendliness through enriched guidance function

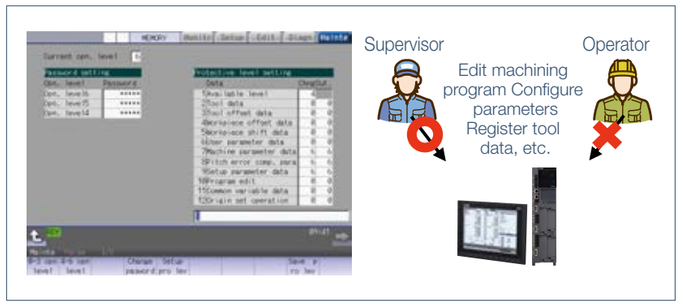
Guidance functions (parameter, G code and alarm) provide you with the necessary information immediately at the time of setup, programming and maintenance.
The G code guidance function on Edit screen is now able to display custom G codes made by a machine builder, leading to even greater user-friendliness.



A click of the menu button navigates you to 3D graphic check of the currently edited program. For lathe system, the 3D check supports for both milling and turning.

Improved usability in a lathe application through tool icons, 3D cutting simulation and other dedicated features

One of the highlights in M800/M80 Series is improved usability for lathes. The easy-to-see tool icons indicating the tool shape and the cutting direction can satisfy both inexperienced and experienced operators. The 3D graphic check function for lathe system supports turning and milling, allowing even a complex NC program to be easily checked.



Up to 8 levels of access permission helps to prevent you from dispatching defective works. Permissible operation can be set individually for each access level.

Reduction of defects parts caused by human errors

M800/M80 Series has a feature called "User level-based data protection", which allows you to set multiple levels of access permission. Permissible operation range can be set for each operator according to their roles in production. This feature can effectively prevent operation errors and other human errors, resulting in less defective production parts from being made.

CNC LINEUP

CNC LINEUP

High Performance

Standard

M800W

Premium CNC provides expandability and flexibility

- Separated type, a control unit separated from display
- Windows-based display is included in the lineup, which provides excellent expandability
- Four expansion slots are provided as standard specifications, allowing for expansion using option card slot

M800S

High-grade CNC well suited to high-speed high-accuracy machining and multi-axis multi-part system control

- Panel-in type, a control unit with integrated display
- Multi-CPU architecture allows for high performance and high functional graphics
- Windows-less display provides easy operability

M80W

Standard CNC with expandability and flexibility

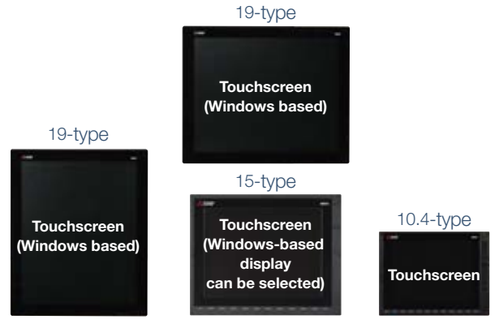
- Separated type, a control unit separated from display
- Windows-based display is included in the lineup, which provides excellent expandability
- Packaged type for selecting a machine type easily
- Two expansion slots are provided as standard specifications, allowing for expansion using option cards slot

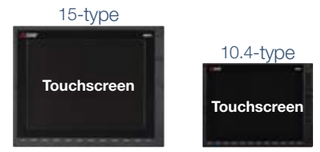
M80

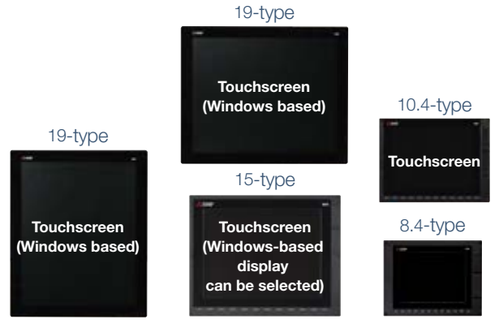
Standard CNC provides high productivity and easy operability

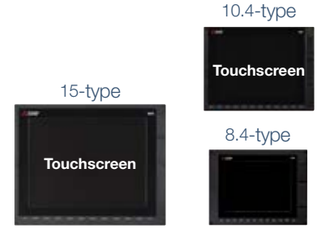
- Panel-in type, a control unit with integrated display
- Provided in package (TypeA/TypeB) for easier selection
- Windows-less display provides easy operability

Display unit size









Main Specifications

	Lathe system	Machining center system
Max. number of axes (NC axes + Spindles + PLC axes)	Standard：16 Optional：32	
Max. number of spindles	8	4
Max. number of part systems (main+sub)	Standard：4 Optional：8	2
Fine segment processing capability [kilo-blocks/min]	168	270

	Lathe system	Machining center system
Max. number of axes (NC axes + Spindles + PLC axes)	Standard：16 Optional：32	
Max. number of spindles	8	4
Max. number of part systems (main+sub)	Standard：4 Optional：8	2
Fine segment processing capability [kilo-blocks/min]	168	270

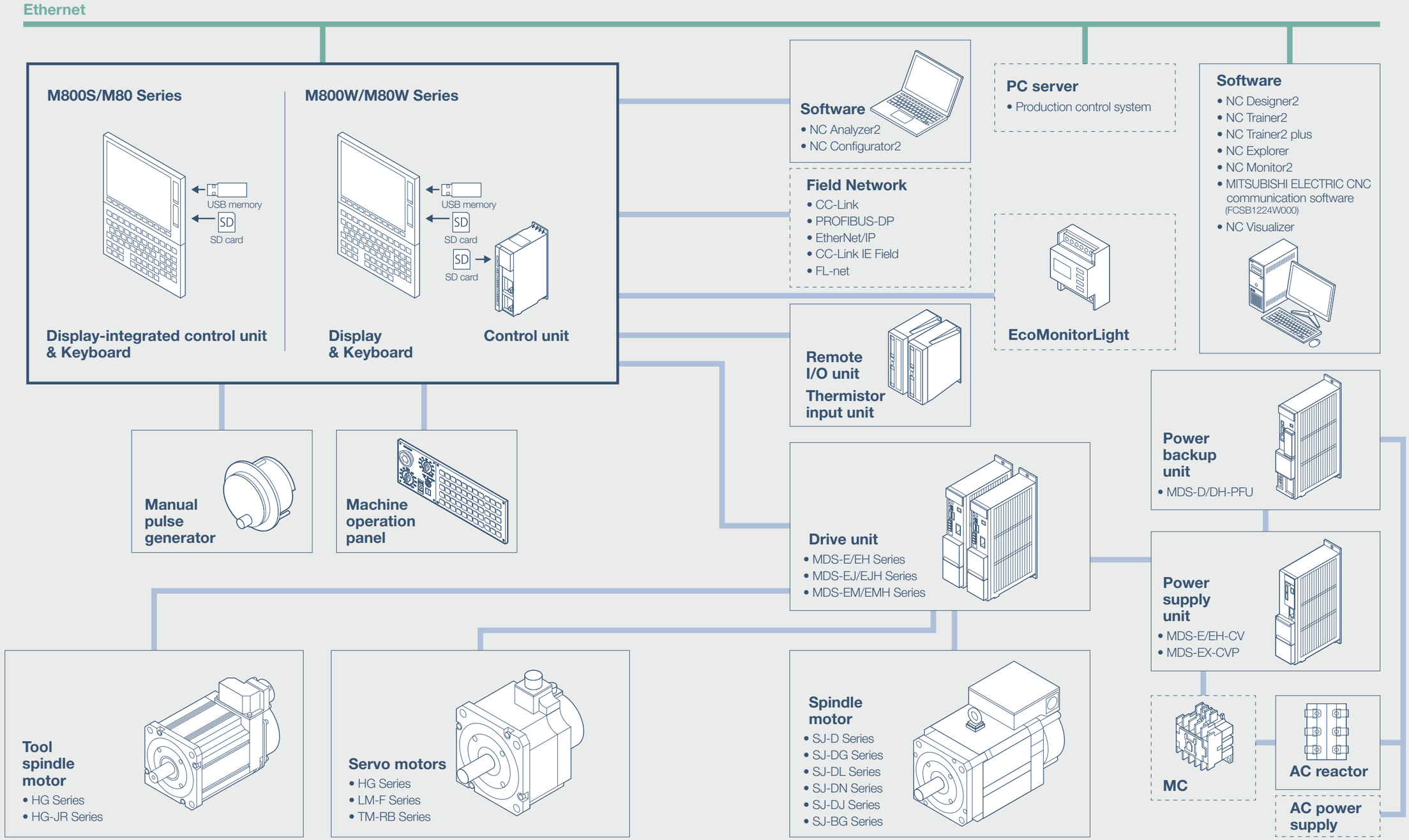
	Lathe system	Machining center system
Max. number of axes (NC axes + Spindles + PLC axes)	12	11
Max. number of spindles	4+G/B(*1)	2
Max. number of part systems (main+sub)	4	2
Fine segment processing capability [kilo-blocks/min]	67.5	135

	Lathe system	Machining center system
Max. number of axes (NC axes + Spindles + PLC axes)	TypeA：12 TypeB：9	TypeA：11 TypeB：9
Max. number of spindles	TypeA：4+G/B(*1) TypeB：4	2
Max. number of part systems (main+sub)	TypeA：4 TypeB：2	TypeA：2 TypeB：1
Fine segment processing capability [kilo-blocks/min]	TypeA：67.5 TypeB：—	TypeA：135 TypeB：67.5

(*1) G/B:Guide Bush

SYSTEM CONFIGURATIONS

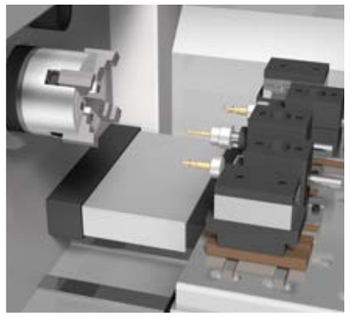
SYSTEM CONFIGURATIONS



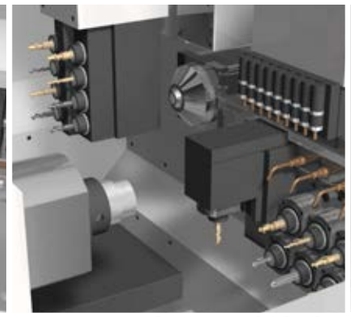
Optional parts are not provided as accessories for NC equipment.
Please purchase desired components from a Mitsubishi Electric dealership, etc.

LATHE SYSTEM

Milling features and multi-axis, multi-part system control features have been significantly improved. Progress has been made in operability, enabling operators to implement ever more complex machining in an easy and efficient manner.



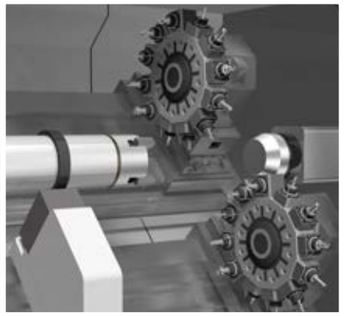
Lathe



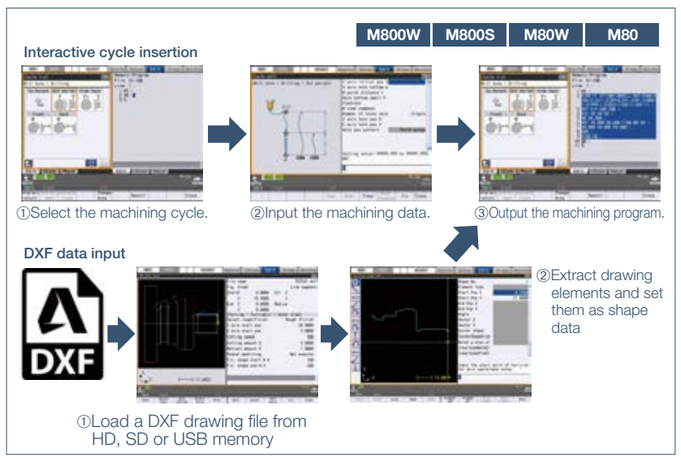
Automatic lathe

Vertical lathe

Inverted lathe



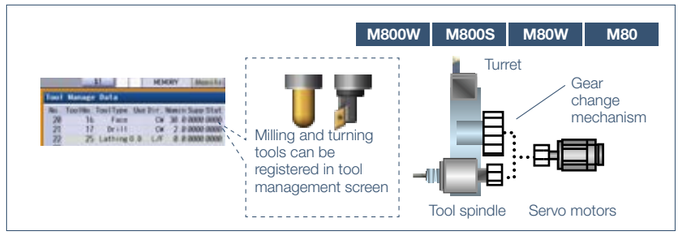
Multi-tasking lathe



Conversational programming, tool measurement, work coordinate system shift and other features have been improved, making the lathe system significantly easier to use.

Significantly easier programming

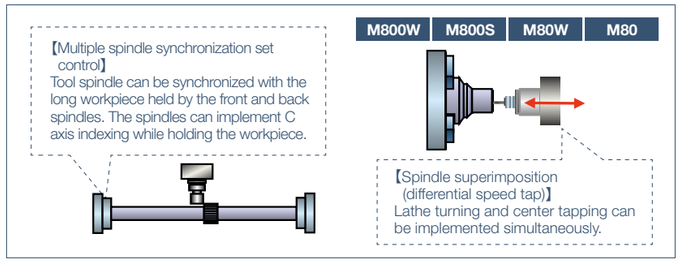
Operators can easily program machining cycles simply by entering data in an interactive manner. Now, the geometric data can be extracted from the CAD data provided in DXF format and be used for programming, in addition to the conventional data entry method.
Programmed shape can be checked in 3D graphic check before machining to check for any program error.



High-speed high-accuracy control and SSS control are available for milling using lathe system. A servo motor driven by a servo drive unit can be controlled as a tool spindle.

Improved milling features using a tool spindle

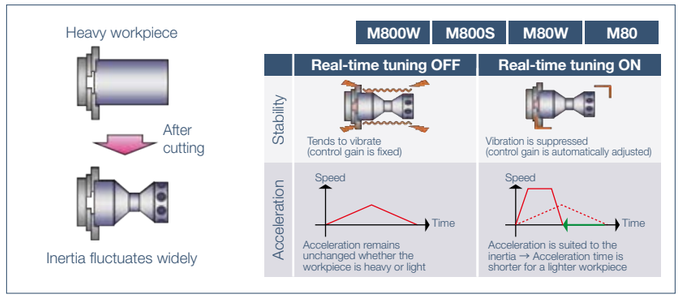
High-speed high-accuracy control features accumulated originally for machining centers are now available in lathe system. Fine milling can be implemented at high speeds on a lathe. This CNC enables a servo motor, instead of a spindle, to function as a tool spindle. Any one of the servo control axes driven by multi-hybrid drive can be used as a tool spindle. This contributes to the downsizing of machine tools.



M800 Series controls up to 8 part systems, 32 axes and 8 spindles. This CNC provides the advanced multi-axis, multi-part system control features including loader control using sub-part system, spindle superimposition and synchronization of multiple spindle sets.

Multi-axis multi-part system control features help to reduce cycle time and maintain synchronization between part systems

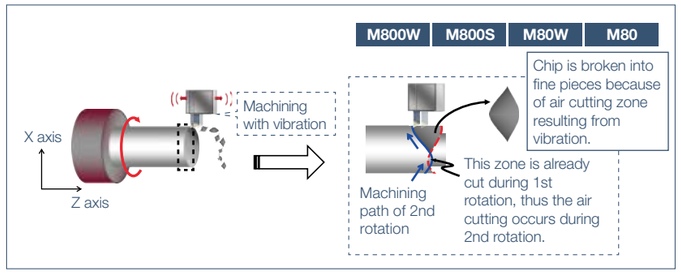
M800/M80 Series provides "Spindle superimposition control, "a feature that enables simultaneous execution of turning and center tapping, although they need to be executed individually. These features are effective in eliminating idle time, resulting in a significant reduction in tact time.
This CNC also offers features that maintain synchronization between part systems, which is required for automatic lathes, in particular. These enable operators to implement even more complex machining safely and securely.



Real-time tuning helps maintain the stability by adjusting the control gain automatically
This function estimates the work inertia and changes the speed control gain or time constant automatically according to the estimation results to suppress mechanical vibration.

Real-time tuning helps maintain machine stability by adjusting the control gain automatically

This function estimates the work inertia and changes the speed control gain or time constant automatically according to the estimation results to suppress mechanical vibration.



Chips are broken by applying vibration synchronized with the spindle rotation to the feed axis so that an air cutting zone is generated while cutting.
* Only one axis in the command part system vibrates.

Vibration cutting function improves productivity by efficiently removing chips

This function breaks chips finely by machining with the feed axis vibrating in the cutting direction. The function makes it possible to machine difficult-to-cut materials such as stainless steel easily and at high speed. Shredding long chips that easily clog the machine makes it easier to dispose of chips. Moreover, heat generation at machining is reduced, which contributes to extend the tool life.
(A vibration cutting expansion unit is required to use this function.)

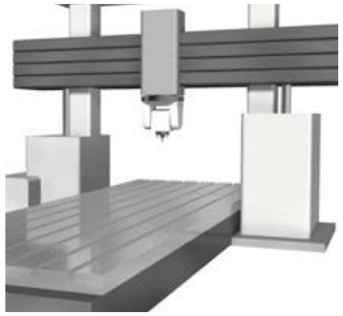
MACHINING CENTER SYSTEM

SSS control has further evolved, realizing high-speed, high-accuracy, high-quality machining.
In addition, this CNC offers features that bring out the full potential of each axis and minimize non-cutting time, leading to higher productivity.

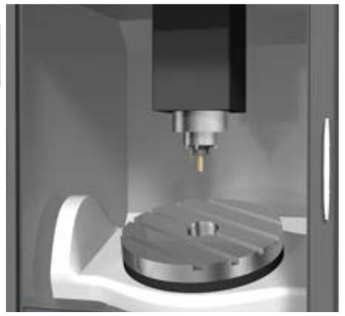
Vertical machining center

Tapping center

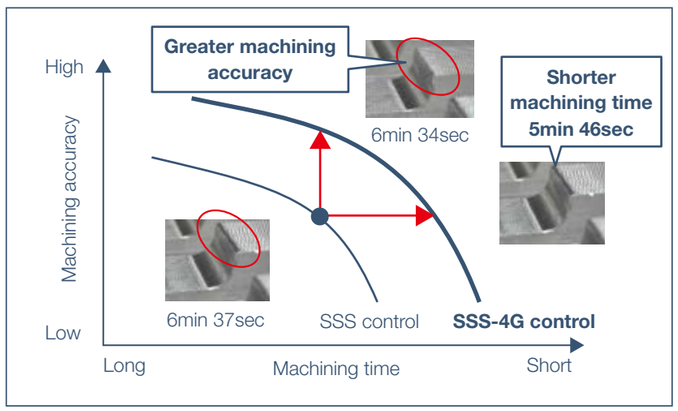
Horizontal machining center



Gantry-type machining center

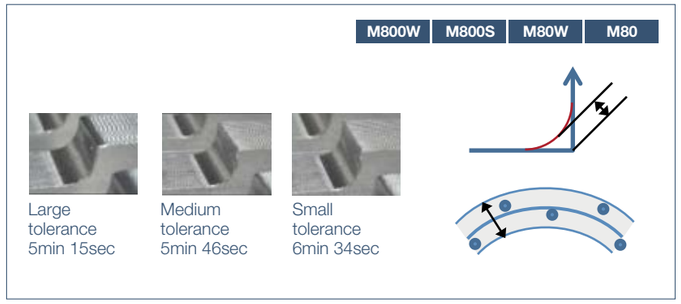


5-axis control machine

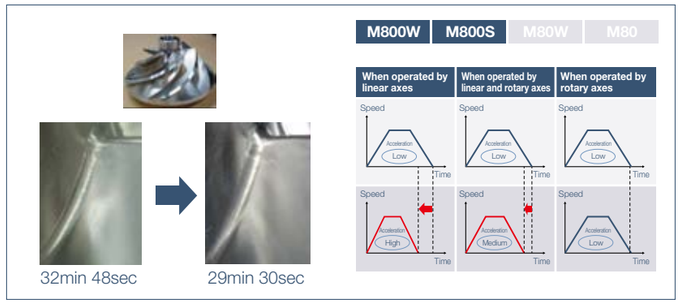


High-speed, high-accuracy, high-quality machining through SSS-4G control

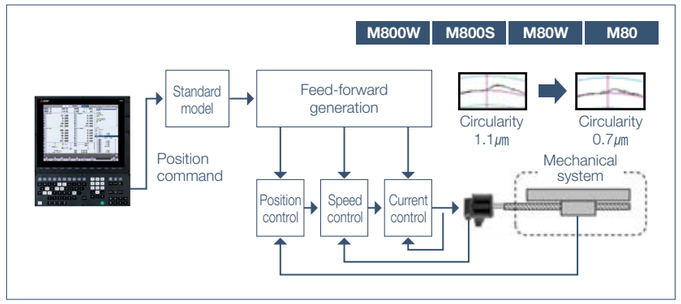
M800/M80 Series offers SSS 4th-generation (SSS-4G) control, enabling high-speed, high-accuracy, high-quality machining. SSS-4G control provides features that are effective in reducing tact time, including optimal acceleration/deceleration suited to each axis' characteristics. In addition, SSS-4G is capable of reducing machine vibration during high-speed cutting.
Compared to our previous models, SSS-4G control enables greater machining accuracy for the same length of time and requires shorter machining time with the same degree of accuracy.



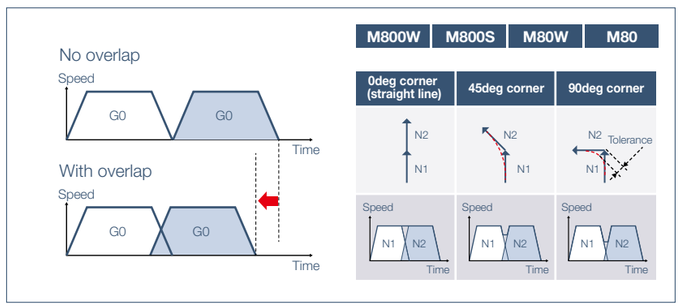
Tolerance control function provides a smooth motion within specified error tolerances. Desired machining results can be achieved using simple parameter adjustment.



"Variable-acceleration pre-interpolation acceleration/deceleration" optimizes the acceleration in accordance with the axis motion.



"OMR-FF control" makes servo control smoother and more accurate, enabling optimal position loop gain adjustment suited to each axis.



Rapid traverse block overlap function makes it possible to reduce non-cutting time. The overlap varies according to the path to keep the tolerance constant.

High productivity and high quality are our primary focus

CNC-dedicated CPU is incorporated in the M800/M80 Series, providing significantly improved fine segment processing capability. The benefits are not limited to improvements in basic performance alone. The Tolerance Control function enables operators to achieve high-quality surfaces simply by specifying the desired dimensional accuracy. This feature takes machining to a whole new level.

M800/M80 Series brings out the full potential of machine tools

M800/M80 Series provides new features that can maximize the full potential of machine tools, including: Variable-acceleration pre-interpolation acceleration/deceleration provides optimized acceleration, with each axis' characteristics fully exercised. For example, allowing a linear axis to accelerate irrespective of rotary axis responsiveness.
"OMR-FF control" allows for optimal position loop gain adjustment suited to each axis, leading to smoother and more accurate cutting.
Other than the above, this CNC has new functionality effective for higher productivity, including "Rapid traverse block override function" that helps reduce non-cutting time by overlapping feed blocks.

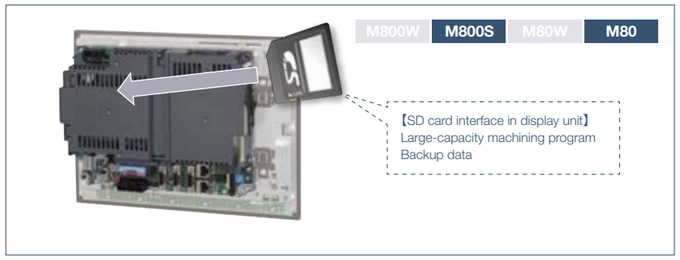
Necessary features are available on your machine. M80 Series includes SSS control and inclined surface machining features.

The SSS control function provides smoother surfaces at higher speeds and the inclined surface machining control function makes it possible to issue normal program commands to an arbitrary plane (inclined surface) in space. The tool center point control supports for a system with four simultaneous contour control axes. These and various other features are incorporated in the M80 Series.

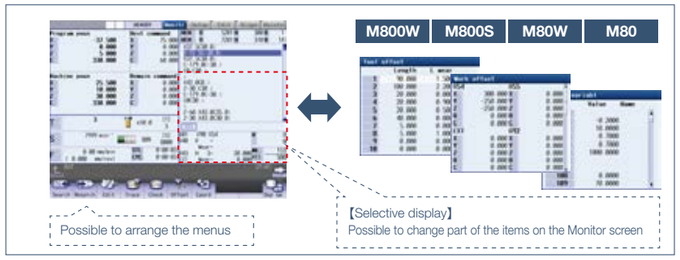
CUSTOMIZATION

A high level of screen customization is attainable more easily in a shorter period of time.
Highly scalable hardware and advanced drawing application make it possible to increase the added value of machine tools.

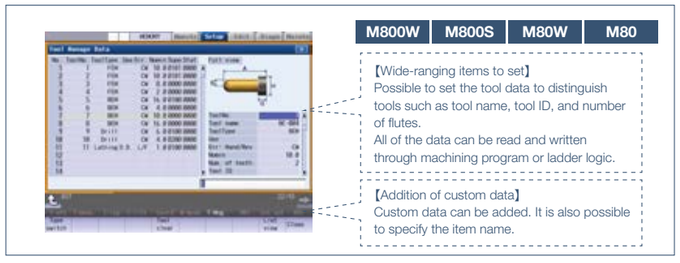
M800W/M80W Series is equipped with a 19-type vertical display with a two-split multi-window screen.
Home application in the lower half can freely be customized.



Additional SD memory card interface on backside of display.
An SD card can store large-capacity machining programs.



Standard screens can be customized using the selective display and rearranging menus.
Screens matching operators' preferences and needs enable even greater ease of use.



Tool-related information is collected and centrally managed on the Tool Management Screen.

19-type vertical display boosts the added value of machine tools

The display shows the standard CNC screen on the upper half, while offering the lower half (home application) to be freely customized. It is also possible to add some originality to machines to increase their added value. However, it is difficult to design the whole screen at the same time. This screen layout can satisfy such needs. Combined with customers' ideas, the possibilities are infinite.

Support for large-capacity custom data using the SD memory on the back of display

The panel-in type CNC with integrated display has the SD card interface on the back of the display. By installing an SD memory card, large-capacity machining programs can be stored.
You can also store custom software.

Customize the standard screens as per the preference of operators

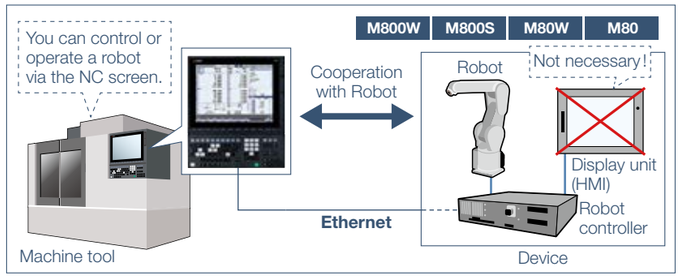
Each operator has their own set of frequently used menus. This CNC allows operators to rearrange their menus and hide any unused ones so they can easily navigate to their desired screen. This CNC has a function called Selective Display, which enables partial customization of the Monitor screen. Selectable Display allows you to constantly display tool offsets, common variables, or a custom screen made by a machine builder.

Enhanced tool management screen

The CNC provides new tool management screen, where you can gather and manage tool-related information with greater convenience.
A wide range of setting items such as tool name and tool ID are readily available. You can read or write tool data or add custom data via ladder or machining program.

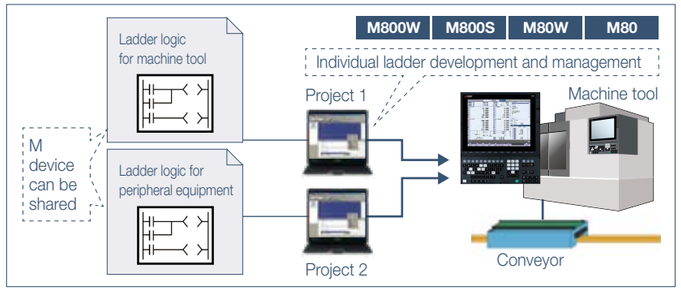
SUPPORT FOR AUTOMATION

Supports increasing automation needs. Automation can be realized more easily by simple connection and control of the peripheral devices.

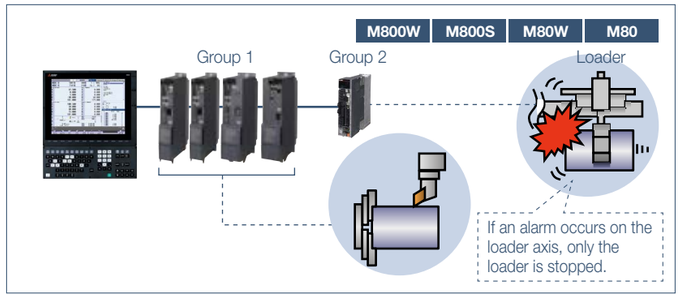


Now that a robot can be controlled from the CNC, robot-dedicated HMI is no longer necessary. The robot can be jogged via the NC screen.

Renewed I/O communication method allows for the control of up to 64 stations and 2,048 points per channel.
Various peripheral equipment can be controlled by the CNC alone.



Multi-project PLC enables control of ladder logic for peripheral equipment separately from that for machine tools. This leads to efficient development and management of ladder logics for peripheral equipment.



During an alarm, operation of individual machine groups can be stopped.
Machining is not interrupted when an alarm occurs on peripheral equipment (e.g., loader).

Direct robot control for operating a robot directly by a CNC

Robot motion can be controlled and programmed using the CNC.
For example, you can run an NC program that coordinates the loading/unloading of workpieces by the robot with the machining of workpieces by the machine tool.
You can also interactively create G code programs to control the robot; you do not need knowledge of robot language to introduce robots.

Renewed I/O units allow the control of a number of peripherals

I/O units have been redesigned. The renewed I/O communication method makes it possible to significantly increase the maximum number of contact points per channel, enabling a number of peripheral equipment and devices to be controlled by CNC alone.

Built-in PLC makes it easier to control and manage peripheral equipment and units

Built-in PLC functionality for I/O control has been improved. This CNC supports Multi-project PLC, a feature that enables ladder logics for peripheral equipment to be managed separately from those for machine tools. This creates a more efficient environment for operators working together in developing and managing ladder logics.

New feature capable of stopping peripheral equipment incorporated

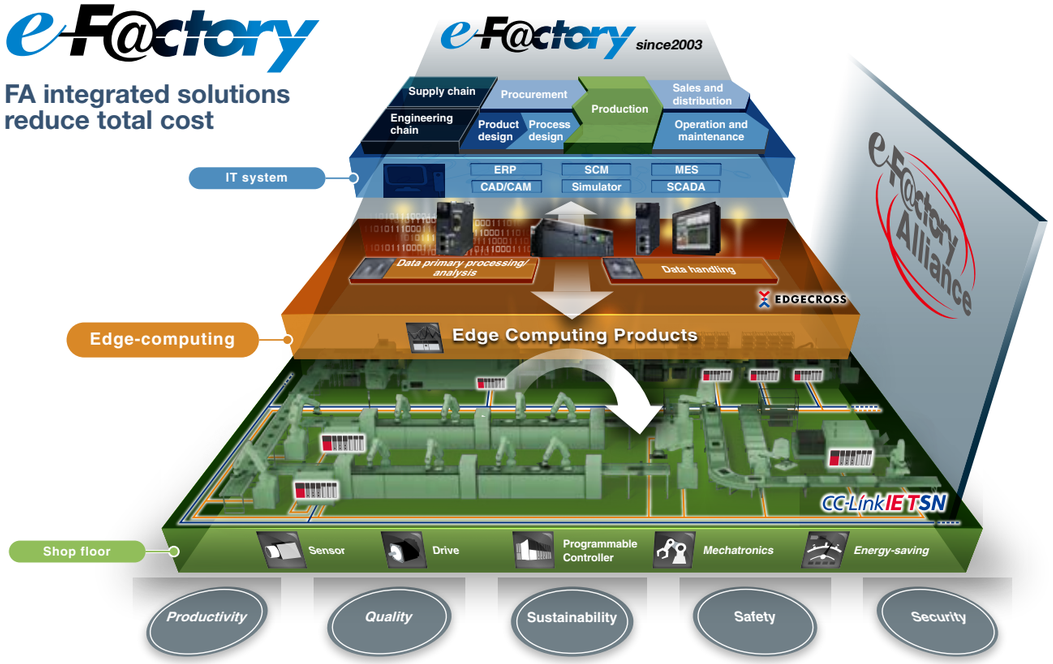
M800/M80 Series has a feature called Machine Group-based Alarm Stop, which stops operation of individual machine groups if an alarm occurs when control is combined with the MDS-E/EM/EJ Series.
This feature allows continuation of machining even when an alarm occurs on a loader, magazine or other peripheral equipment.

e-F@ctory SUPPORTS FACTORY-WIDE OPTIMIZATION

Our FA integrated solution "e-F@ctory" supports to reduce the total cost across the entire supply chain and engineering chain by utilizing our FA and IT technologies and collaborating with e-F@ctory Alliance partners. Mitsubishi CNC enables visualization and analysis that lead to improvements and increase availability at production sites by utilizing the information at production sites where the machine tools are used.

e-F@ctory

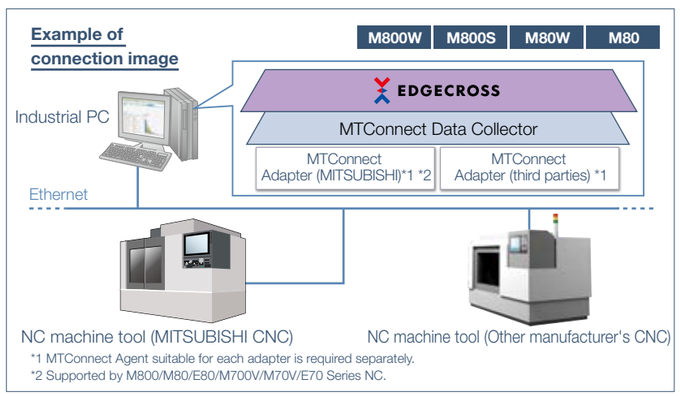
FA integrated solutions reduce total cost



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.

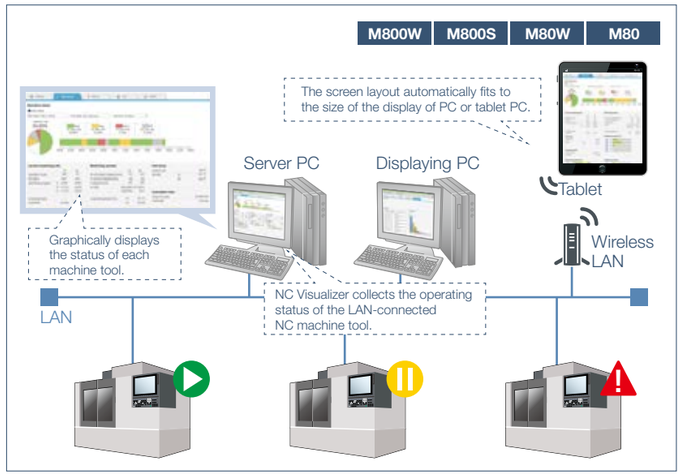
*1 Edgecross is a product of Edgecross Consortium



*1 MTConnect Agent suitable for each adapter is required separately.
*2 Supported by M800/M80/E80/M700V/M70V/E70 Series NC.

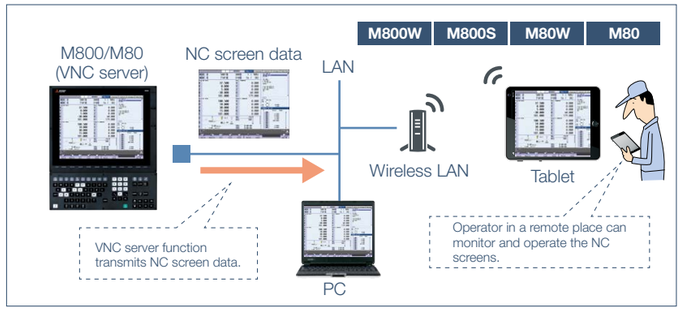
MTConnect Data Collector can import machine tool data into Edgecross

The data collected from MTConnect compatible device can be imported into Edgecross and used for edge applications etc. MTConnect is an open protocol for machine tools.
By using the MTConnect Adapter which is compatible with MITSUBISHI CNC, you can easily collect and utilize various data of the machine tool which works with MITSUBISHI CNC.
You can also collect various data from the machine with CNC made by other manufacture via third-party MTConnect Adapter.



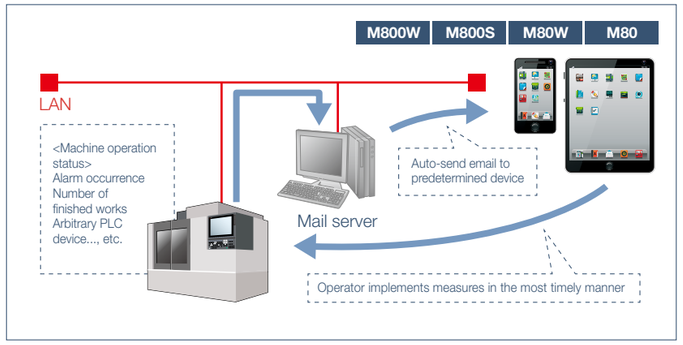
NC Visualizer enables to visualize the operating status of machine tools easier.

To build the "Operation monitoring system", install NC Visualizer, an operation monitoring application, to your server PC.
NC Visualizer displays the machine tool's status such as "operating", "stopped", "alarm", and "power OFF" in a list, which helps operators to improve the productivity or to analyze the cause of alarms.
In addition, the operators can monitor the operating status with an external PC/tablet PC via a Web browser.



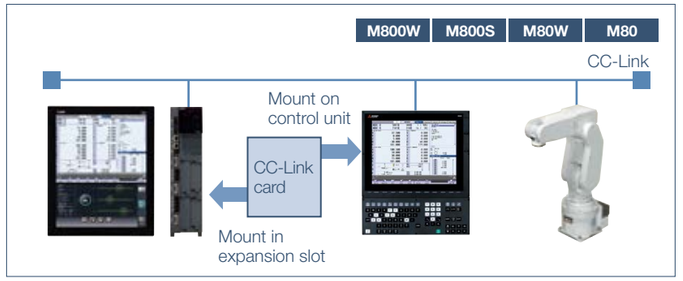
VNC server function enables the operator to remotely monitor and operate the NC screen.

The NC screens can be displayed on an external PC/tablet PC.
Operator can monitor the machine tool's status and operate the NC screen without going to the factory floor, which helps to improve the operation efficiency.
(The function is enabled on a non-Windows-based NC display. No external computer is required.)



Operator mail notification lets you know the machine status at anytime and anywhere

This sends you an e-mail about machine condition automatically at the specified timing to a computer, tablet or smartphone. No dedicated line is needed, so you can set up easily.
Machine condition can be monitored at anytime, anywhere. This helps you to deal with emergent situations timely, leading to shorter downtime and higher productivity.



Compatible with CC-Link (master/slave), PROFIBUS-DP (master), CC-Link IE Field (Master/Local) and EtherNet/IP.
Possible to connect to peripheral equipment and devices conforming to a range of field networks.

Compatible with a range of field networks that facilitate connection to peripherals

With the aim of configuring factory automation systems, compatibility with a range of field networks has been implemented, enabling connection to peripherals.
Insert the option card into the standard expansion slot of the M800W/M80W Series CNC or on the back of the display for the M800S/M80 Series.

MAINTENANCE

Detailed alarm history information

At the time of alarm occurrence, the detailed information of alarm history is output in a separate file from the existing alarm history.
Understanding detailed information such as modal and coordinates at the time of occurrence enables you to perform early troubleshooting.

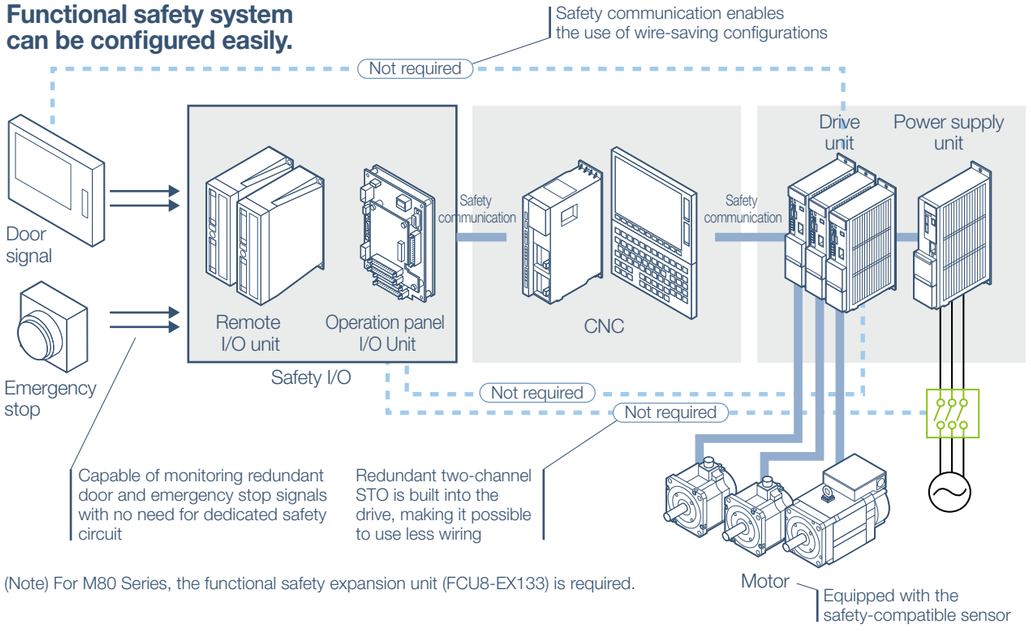
FUNCTIONAL SAFETY

M800/M80 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)

Functional safety system can be configured easily.



(Note) For M80 Series, the functional safety expansion unit (FCU8-EX133) is required.

HARDWARE

[mm]

Control unit

M800W/M80W Series (Separated-type)

Separated from display

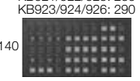
M800W : 90×180×380 (W×D×H)
M80W : 60×180×380 (W×D×H)

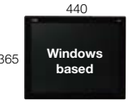
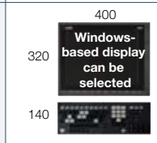
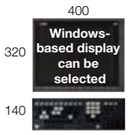
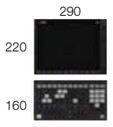
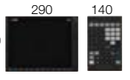
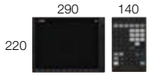
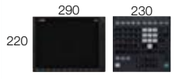
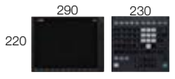
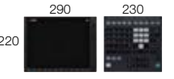
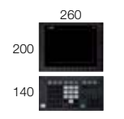
M800S/M80 Series (Integrated type)

Integrated on back of display

Machine operation panel

FCU8-KB921 FCU8-KB923 Standard specification A	Key switch: 55 points, LED: 55 points MITSUBISHI standard key layout	KB921/922/925: 260 KB923/924/926: 290
FCU8-KB925 FCU8-KB926 Standard specification B		
FCU8-KB922 FCU8-KB924	Key switch: 55 points, LED: 55 points Custom specification key layout	
FCU8-KB931 Standard specification A	Rotary switch (Spindle override, cutting override) Selective switch (memory protection) Emergency stop button	
FCU8-KB941 Standard specification B		



Display	Keyboard	M800W Series	M800S Series	M80W Series	M80 Series
19-type Touchscreen	–		—		—
19-type, horizontal Touchscreen	–		—		—
15-type Touchscreen	**FCU8-KB083 Clear key Full keyboard**				
10.4-type Touchscreen	**FCU8-KB047 Clear key Full keyboard**				
10.4-type Touchscreen	**FCU8-KB041 Clear key ONG(XZF) layout for L system FCU8-KB046 Clear key ONG(XYZ) layout**				
10.4-type Touchscreen	**FCU8-KB048 Clear key ABC layout**				
8.4-type	**FCU8-KB026 Clear key ONG(XYZ) layout FCU8-KB028 Clear key ONG(XYZ) layout**	—	—		
8.4-type	**FCU8-KB029 Clear key ONG layout**	—	—		

SPECIFICATIONS

○Standard △Optional
□Selection (Additional unit)

		Lathe system						
		M800W Series		M800S Series		M80W Series	M80 Series	
		M850W	M830W	M850S	M830S		TypeA	TypeB
Number of control axes	Max. number of axes (NC axes + Spindles + PLC axes)	○16 △32	○16 △32	○16 △32	○16 △32	12	12	9
	Max. number of NC axes (in total for all part systems)	○16 △32	○16 △32	○16 △32	○16 △32	10	10	7
	Max. number of spindles	8	8	8	8	4+G/B(*1)	4+G/B(*1)	4
	Max. number of PLC axes	8	8	8	8	6	6	6
	Number of simultaneous contouring control axes	8	4	8	4	4	4	4
	Max. number of NC axes in a part system	○8 △12	○8 △12	○8 △12	○8 △12	8	8	5
Max. number of part systems (main+sub)		○4 △8	○4 △8	○4 △8	○4 △8	○4	○4	○2
Max. number of main part systems		○4 △8	○4 △8	○4 △8	○4 △8	○2	○2	○2
Max. number of sub part systems		○4 △8	○4 △8	○4 △8	○4 △8	○2	○2	○1
Control unit-side High-speed program server mode		△	△	–	–	○	–	–
Display unit-side High-speed program server mode		△/–(*3)	△/–(*3)	△	△	○/–(*3)	○	○
Least command increment		○0.1μm △1nm	○0.1μm △1nm	○0.1μm △1nm	○0.1μm △1nm	○0.1μm	○0.1μm	○0.1μm
Least control increment		○1nm	○1nm	○1nm	○1nm	○1nm	○1nm	○1nm
Max. number of tool offset sets		○128 sets △999 sets	○128 sets △999 sets	○128 sets △999 sets	○128 sets △999 sets	○256 sets	○256 sets	○99 sets
Built-in PLC capacity		○128000 △512000	○128000 △512000	○128000 △512000	○128000 △512000	○64000	○64000	○32000
Multi-project [number of projects stored]		○2 △6	○2 △6	○2 △6	○2 △6	○3	○3	○2
Touch gesture operation(*2)		○	○	○	○	○	○	○
Data protection by user's level		△	△	△	△	○	○	○
Workpiece coordinate system shift		○	○	○	○	○	○	○
3D solid program check		○	○	○	○	○	○	○
Interactive cycle insertion		△	△	△	△	○	○	○
Multiple spindle synchronization set control		○	○	○	○	○	○	○
Spindle superimposition control		△	△	△	△	○	○	–
High-accuracy control(G61.1/G08)		△	△	△	△	○	○	○
High-speed high-accuracy control Ⅱ (G05P10000) maximum [kBPM]		△168	△168	△168	△168	○67.5	○67.5	–
High-speed high-accuracy control Ⅲ (G05P20000) maximum [kBPM]		–	–	–	–	–	–	–
SSS control		△	△	△	△	○	○	○
Tolerance control		△	△	△	△	○	○	○
Variable-acceleration pre-interpolation acceleration/deceleration		–	–	–	–	–	–	–
OMR-FF		△	△	△	△	○	○	○
Rapid traverse block overlap		△	△	△	△	○	○	○
Spindle-mode servo motor control		△	△	△	△	○	○	○
Real-time tuning 1 (speed gain)		△	△	△	△	○	○	–
Real-time tuning 2 (rapid traverse time constant)		△	△	△	△	○	○	–
Tool center point control		–	–	–	–	–	–	–
Inclined surface machining command		△	△	△	△	○	○	–
3-dimensional manual feed		△	△	△	△	○	○	–
Finish shape view programming		△	△	△	△	○	○	○
VNC server		-/△(*3)	-/△(*3)	△	△	-/○(*3)	○	○
Direct robot control		□	□	□	□	□	□	□
CC-Link (Master/Local)		□	□	□	□	□	□	□
PROFIBUS-DP (Master)		□	□	□	□	□	□	□
CC-Link IE Field (Master/Local)		□	□	□	□	□	□	□
EtherNet/IP		□	□	□	□	□	□	□
FL-net		□	□	□	□	□	□	□
MES interface library		△	△	△	△	○	○	○
Machine group-based alarm stop		△	△	△	△	○	○	○
Smart safety observation		△	△	△	△	○	□	□
Vibration cutting control		□	□	□	□	□	□	□

SPECIFICATIONS

○Standard △Optional
□Selection (Additional unit)

		Machining center system						
		M800W Series		M800S Series		M80W Series	M80 Series	
		M850W	M830W	M850S	M830S		TypeA	TypeB
Number of control axes	Max. number of axes (NC axes + Spindles + PLC axes)	○16 △32	○16 △32	○16 △32	○16 △32	11	11	9
	Max. number of NC axes (in total for all part systems)	16	16	16	16	8	8	6
	Max. number of spindles	4	4	4	4	2	2	2
	Max. number of PLC axes	8	8	8	8	6	6	6
	Number of simultaneous contouring control axes	8	4	8	4	4	4	4
	Max. number of NC axes in a part system	○8 △12	○8 △12	○8 △12	○8 △12	8	8	5
Max. number of part systems (main+sub)		○2	○2	○2	○2	○2	○2	○1
Max. number of main part systems		○2	○2	○2	○2	○2	○2	○1
Max. number of sub part systems		○2	○2	○2	○2	–	–	–
Control unit-side High-speed program server mode		△	△	–	–	○	–	–
Display unit-side High-speed program server mode		△/–(*3)	△/–(*3)	△	△	○/–(*3)	○	○
Least command increment		○0.1μm △1nm	○0.1μm △1nm	○0.1μm △1nm	○0.1μm △1nm	○0.1μm	○0.1μm	○0.1μm
Least control increment		○1nm	○1nm	○1nm	○1nm	○1nm	○1nm	○1nm
Max. number of tool offset sets		○200 sets △999 sets	○200 sets △999 sets	○200 sets △999 sets	○200 sets △999 sets	○400 sets	○400 sets	○400 sets
Built-in PLC capacity		○128000 △512000	○128000 △512000	○128000 △512000	○128000 △512000	○64000	○64000	○32000
Multi-project [number of projects stored]		○2 △6	○2 △6	○2 △6	○2 △6	○3	○3	○2
Touch gesture operation(*2)		○	○	○	○	○	○	○
Data protection by user's level		△	△	△	△	○	○	○
Workpiece coordinate system shift		–	–	–	–	–	–	–
3D solid program check		○	○	○	○	○	○	○
Interactive cycle insertion		△	△	△	△	○	○	○
Multiple spindle synchronization set control		–	–	–	–	–	–	–
Spindle superimposition control		–	–	–	–	–	–	–
High-accuracy control(G61.1/G08)		△	△	△	△	○	○	○
High-speed high-accuracy control Ⅱ (G05P10000) maximum [kBPM]		△168	△168	△168	△168	○67.5	○67.5	○67.5
High-speed high-accuracy control Ⅲ (G05P20000) maximum [kBPM]		△270	△270	△270	△270	○135	○135	–
SSS control		△	△	△	△	○	○	○
Tolerance control		△	△	△	△	○	○	○
Variable-acceleration pre-interpolation acceleration/deceleration		△	△	△	△	–	–	–
OMR-FF		△	△	△	△	○	○	○
Rapid traverse block overlap		△	△	△	△	○	○	○
Spindle-mode servo motor control		△	△	△	△	○	○	○
Real-time tuning 1 (speed gain)		△	△	△	△	○	○	–
Real-time tuning 2 (rapid traverse time constant)		△	△	△	△	○	○	–
Tool center point control		△	△(*4)	△	△(*4)	○(*4)	○(*4)	–
Inclined surface machining command		△	△	△	△	○	○	–
3-dimensional manual feed		△	△	△	△	○	○	–
Finish shape view programming		△	△	△	△	○	○	○
VNC server		-/△(*3)	-/△(*3)	△	△	-/○(*3)	○	○
Direct robot control		□	□	□	□	□	□	□
CC-Link (Master/Local)		□	□	□	□	□	□	□
PROFIBUS-DP (Master)		□	□	□	□	□	□	□
CC-Link IE Field (Master/Local)		□	□	□	□	□	□	□
EtherNet/IP		□	□	□	□	□	□	□
FL-net		□	□	□	□	□	□	□
MES interface library		△	△	△	△	○	○	○
Machine group-based alarm stop		△	△	△	△	○	○	○
Smart safety observation		△	△	△	△	○	□	□
Vibration cutting control		–	–	–	–	–	–	–

Refer to the specifications manuals for details.
(*1) G/B:Guide Bush (*2) The 8.4-type display unit is incompatible. (*3) Windows-based display unit/ Windows-less display unit
(*4) Limited to the simultaneous 4-axis contouring control.

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 advanced 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

- The multi-hybrid drive units are capable of driving a maximum of three servo axes and one spindle. This contributes to the downsizing of 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.
- Fan unit contributes to easier fan exchange
- MDS-EMH 400V system drive unit is available.

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

- Ultra-compact drive units with built-in power supplies contribute to smaller control panel size.
- The 2-axis type is added for further downsizing.
- The servo control-dedicated core processor realizes an increase in 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.
- MDS-EJH 400V system drive unit is available (Note 1).

PWM Converter MDS-EX-CVP Series

- Product of the PWM converter series which has a stabilizing DC voltage function and boost function. MDS-EX-CVP series reduces the output deceleration of the spindle motor and improves output in the high-speed range.
- Only 400V system power supply unit is available.

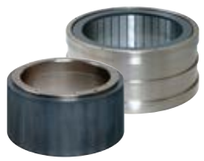
•Servo motors

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

- Sensor resolution has been significantly improved. The servo motors, which boast smooth rotation and outstanding acceleration capabilities, are well-suited to serve 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. Sensor connectors are screw-locked and have enhanced vibration resistance. Three sensor resolutions (i.e., 1, 4 or 67 million pulses/rev) are available.
- This can also be used as a tool spindle motor.
- Small-sized connector allows horizontal cable connection, which helps to save space in machines. (Note 2)

Linear Servo Motors LM-F Series

- Use in clean environments is possible since no ball screws are used, eliminating possible contamination from grease.
- 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, which makes rotation smoother.
- Suitable for rotary axes that drive tables or spindle heads
- Range: Maximum torque: 36 to 1,280 [N·m]

•Spindle motors

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

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

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

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

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 speed: 8,000 to 12,000 [r/min]

High-torque Spindle Motors SJ-DN Series

- Higher torque characteristics than those of SJ-D series with the same output. This series has made it possible to drive with the small-capacity multi-hybrid drive unit.
- Suitable for heavy cutting. This helps to improve productivity.
- Range: 7.5 to 18.5 [kW]
- Maximum speed: 8,000 [r/min]

Compact, Lightweight Spindle Motors SJ-DJ Series

- Spindle motors that are smaller and lighter than those of SJ-D series with the same output. This helps to further downsize machines.
- Range: 5.5 to 15 [kW]
- Maximum speed: 8,000 to 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 the downsizing of spindle units.
- Options for mold specification and cooling jacket specification are prepared.

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, which helps to save space in machines. (Note 2)

(Note 1) For servo motors only
(Note 2) Options supported (Flange size 90SQ only)
* Use Mitsubishi Electric CNC's dedicated drive unit and motor.

SOFTWARE TOOLS

Process flow from machine design and development to operation and maintenance

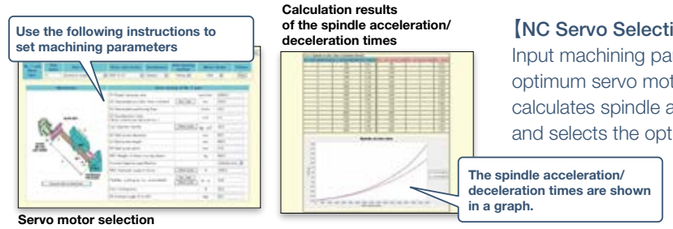
Machine design → Electrical circuitry design → Machine assembly and adjustment → Operation and maintenance

•NC-related processes

Machine design	Electrical circuitry design	Machine assembly and adjustment	Operation and maintenance
Servo selection	Custom screen creation	Parameter creation	Training
NC Servo Selection	NC Designer2	NC Configrator2	NC Trainer2
	NC Compiler2	Servo/spindle adjustment	Operation
	Debug	Machine adjustment	Maintenance
	NC Trainer2 plus	NC Analyzer2	NC Explorer
			NC Monitor2
			NC Visualizer [*]

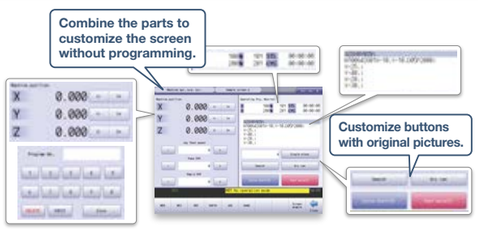
[*] Refer to page 18 for details.

•Machine design



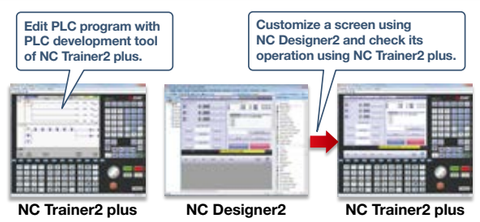
【NC Servo Selection】
Input machining parameters to determine the optimum servo motor. This function automatically calculates spindle acceleration/deceleration time and selects the optimum power supply module.

•Electrical circuitry design



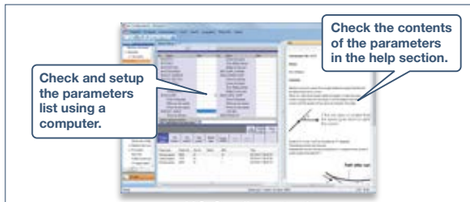
【NC Designer2】
We provide a developmental environment where the MTB can customize screens easily. Two types of screen development methods are available; the interpreter method (programming without C++) for simple screen development, and the compilation method with a complex controller (programming with C++).

【NC Compiler2】
NC Compiler2 is required when the compilation method is applied.



【NC Trainer2 Plus】
NC Trainer2 plus supports customization development; it helps to program the ladder programming of the user PLC to be developed by machine tool builders and debug it and check the operations of customized screens.

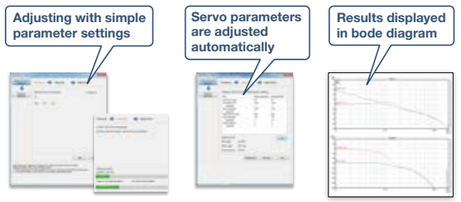
•Machine assembly and adjustment



【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.

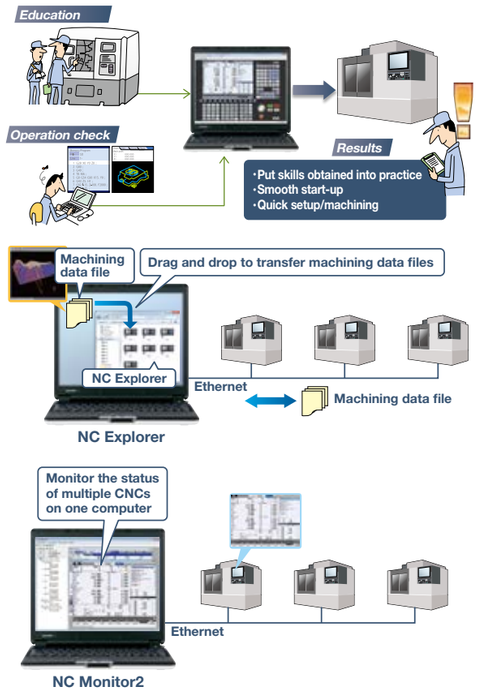
For details on each software tool, refer to the software tools catalog (BNP-A1224).

•Machine assembly and adjustment



【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

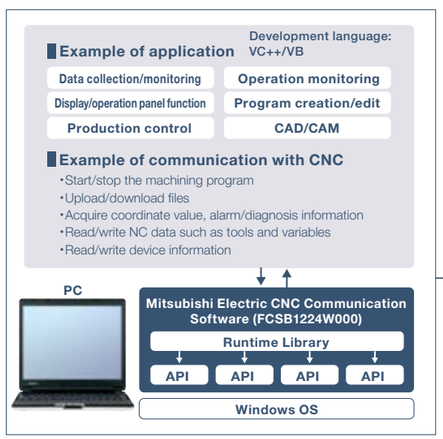


【NC Trainer2】
NC Trainer2 plus supports customization development; it helps to program the ladder programming of the user PLC to be developed by machine tool builders and debug it and check the operations of customized screens.

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

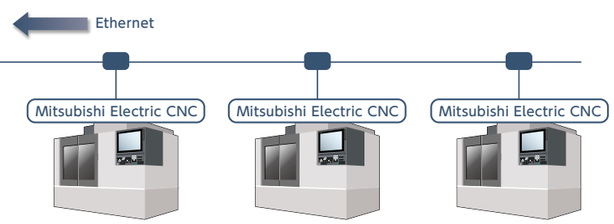
【NC Monitor2】
Taking advantage of connection with a factory network, CNC operation status can be monitored from remote locations. Several CNCs can be connected and monitored simultaneously.

Application development support



【Mitsubishi Electric CNC Communication Software (FCSB1224W000)】
This software provides a bunch of API functions. They facilitate development of an Windows application which requires connection and communication with Mitsubishi Electric CNC(*). You can use the common interfaces for any Mitsubishi Electric CNC model, which leads to high efficiency in development.

(*) The compatible model is Mitsubishi Electric CNCs after M700/M70.



GLOBAL SALES & SERVICE NETWORK

■:Production site ●:FA Center ○:Service Center/Service Satellite

Providing reliable services in regions around the world
- our Best Partner commitment to you

Germany FA Center/
IAM Showroom

Korea FA Center/IAM Showroom

Tokyo Head Office

Nagoya Works

North America FA Center

Thailand FA Center

Taichung FA Center

Brazil Votorantim FA Center

EUROPE
·MITSUBISHI ELECTRIC EUROPE B.V.
European Service Headquarters
(Dusseldorf, GERMANY)
TEL: +49-2102-486-5000
FAX: +49-2102-486-5910
·South Germany Service Center (Stuttgart)
·France Service Center (Paris)
·France Service Satellite (Lyon)
·Italy Service Center (Milan)
·Italy Service Satellite (Padova)
·U.K. Service Center
·Spain Service Center
·Poland Service Center
·Hungary Service Center
·MITSUBISHI ELECTRIC TURKEY A.Ş
Turkey Service Center
·Czech Republic Service Center (Service Partner)
·MITSUBISHI ELECTRIC RUSSIA LLC
Russia Service Center
·Sweden Service Center
·Bulgaria Service Center (Service Partner)
·Ukraine Service Center (Kiev) (Service Partner)
·Belarus Service Center (Service Partner)
·South Africa Service Center (Service Partner)

KOREA
·MITSUBISHI ELECTRIC AUTOMATION
KOREA CO., LTD. (KOREA FA CENTER)
Korea Service Center
TEL: +82-2-3660-9609
FAX: +82-2-3664-8668
·Korea Daegu Service Satellite

THAILAND
·MITSUBISHI ELECTRIC FACTORY
AUTOMATION (THAILAND) CO.,LTD.
Thailand Service Center (Bangkok)
TEL: +66-2-092-8600
FAX: +66-2-043-1231-33
·Bowin Service Center (Chonburi)
·Korat Service Center

JAPAN
·MITSUBISHI ELECTRIC CORPORATION
(TOKYO HEAD OFFICE, NAGOYA WORKS)
·MITSUBISHI ELECTRIC MECHATRONICS
ENGINEERING CORPORATION
(Headquarters)
TEL:+81-52-722-6620
FAX:+81-52-722-6662

TAIWAN
·MITSUBISHI ELECTRIC TAIWAN CO., LTD.
(TAIWAN FA CENTER)
Taiwan Taichung Service Center
TEL: +886-4-2359-0688
FAX: +886-4-2359-0689
·Taiwan Taipei Service Center
·Taiwan Tainan Service Center

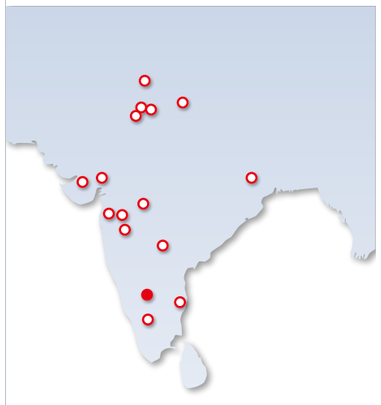
OCEANIA
·MITSUBISHI ELECTRIC AUSTRALIA PTY. LTD.
Oceania Service Center
TEL: +61-2-9684-7269
FAX: +61-2-9684-7245

AMERICA
·MITSUBISHI ELECTRIC AUTOMATION INC.
(AMERICA FA CENTER)
Central Region Service Center (Chicago)
TEL: +1-847-478-2500
FAX: +1-847-478-2650

·Minneapolis, MN Service Satellite
·Detroit, MI Service Satellite
·Grand Rapids, MI Service Satellite
·Lima, OH Service Satellite
·Cleveland, OH Service Satellite
·Indianapolis, IN Service Satellite
·St. Louis, MO Service Satellite
·South/East Region Service Center
(Georgia)
·Charleston, SC Service Satellite
·Charlotte, NC Service Satellite
·Raleigh, NC Service Satellite
·Dallas, TX Service Satellite
·Houston, TX Service Satellite
·Hartford, CT Service Satellite
·Knoxville, TN Service Satellite
·Nashville, TN Service Satellite
·Baltimore, MD Service Satellite
·Pittsburg, PA Service Satellite
·Newark, NJ Service Satellite
·Syracuse, NY Service Satellite
·Ft. Lauderdale, FL Service Satellite
·Lafayette, LA Service Satellite
·Western Region Service Center
(California)
·San Francisco, CA Service Satellite
·Seattle, WA Service Satellite
·Denver, CO Service Satellite
·Canada Region Service Center
(Tronto)
·Edmonton, AB Service Satellite
·Montreal, QC Service Satellite
·Mexico Region Service Center
(Queretaro)
·Monterrey, NL Service Satellite
·Mexico City, DF Service Satellite
·Aguascalientes, AGS, Service Satellite

BRAZIL
·MITSUBISHI ELECTRIC DO BRASIL COMÉRCIO
E SERVIÇOS LTDA.
Votorantim Office
TEL: +55-15-3023-9000
·Blumenau Santa Catarina office
·MAQSERVICE – Canoas, RS Service Satellite

India CNC Technical Center



INDIA
·MITSUBISHI ELECTRIC INDIA PVT., LTD.
CNC Technical Center (Bangalore)
TEL : +91-80-4655-2121
FAX : +91-80-4655-2147
·Chennai Service Satellite
·Coimbatore Service Satellite
·Hyderabad Service Satellite
·North India Service Center (Gurgaon)
·Ludhiana Service Satellite
·Panth Nagar Service Satellite
·Delhi Service Satellite
·Jamshedpur Service Satellite
·Manesar Service Satellite
·West India Service Center (Pune)
·Kolhapur Service Satellite
·Aurangabad Service Satellite
·Mumbai Service Satellite
·West India Service Center (Ahmedabad)
·Rajkot Service Satellite

ASEAN FA Center/
IAM Showroom

ASEAN
·MITSUBISHI ELECTRIC ASIA PTE. LTD.
(ASEAN FA CENTER)
Singapore Service Center
TEL: +65-6473-2308
FAX: +65-6476-7439

INDONESIA
·PT. MITSUBISHI ELECTRIC INDONESIA
Indonesia Service Center (Cikarang)
TEL: +62-21-2961-7797
FAX: +62-21-2961-7794

VIETNAM
·MITSUBISHI ELECTRIC VIETNAM CO.,LTD.
Vietnam Ho Chi Minh Service Center
TEL: +84-28-3910 5945
FAX: +84-28-3910 5947
·Vietnam Hanoi Service Center

MALAYSIA
·MITSUBISHI ELECTRIC SALES MALAYSIA SDN. BHD.
Malaysia Service Center (Kuala Lumpur Service Center)
TEL: +60-3-7960-2628
FAX: +60-3-7960-2629
·Johor Bahru Service Satellite

PHILIPPINES
·MELCO FACTORY AUTOMATION PHILIPPINES INC.
Head Office
TEL: +63-2-8256-8042
FAX: +632-8637-2294
·Philippines Service Center

MITSUBISHI ELECTRIC
AUTOMATION MANUFACTURING
(Changshu) Co., LTD.

Shanghai FA Center/
IAM Showroom

CHINA
·MITSUBISHI ELECTRIC
AUTOMATION (CHINA) LTD.
(CHINA FA CENTER)
Shanghai Service Center
TEL: +86-21-2322-3030
FAX: +86-21-2322-3000*8422
·Qingdao Service Center
·Suzhou Service Center
·Wuhan Service Center
·Ningbo Service Center
·Hefei Service Center
·Beijing Service Center
·Tianjin Service Center
·Xian Service Center
·Dalian Service Center
·Chengdu Service Center
·Shenzhen Service Center
·Dongguan Service Center
·Xiamen Service Center

WARRANTY

Please confirm the following product warranty details before using MITSUBISHI 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, we shall provide repair services at no cost through the distributor from which the product was purchased or through a Mitsubishi Electric service provider. Note, however that this shall not apply if the customer was informed prior to purchase of 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 product to the end user, provided the product purchased from us in Japan is installed in Japan (but in no event longer than thirty (30) months, Including the distribution time after shipment from Mitsubishi Electric or its distributor).
Note that, for 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; please refer to "2. Service in overseas countries" as will be explained.

[Limitations]
(1) The machine tool builder is requested to conduct an initial failure diagnosis, as a general rule. It can also be carried out by us or our service provider upon the machine tool builder's request and the actual cost will be charged.
(2) This warranty applies only when the conditions, method, environment, etc., of use are in compliance with the terms and 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 shall 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 the customer's hardware or software problem
(b) a failure caused by any alteration, etc., to the product made by the customer without Mitsubishi Electric's approval
(c) a failure which may be regarded as avoidable, if the customer's equipment in which this product is incorporated is equipped with a safety device required by applicable laws or has any function or structure considered to be indispensable in the light of common sense in the industry
(d) a failure which may be regarded as avoidable if consumable parts designated in the instruction manual, etc. are duly maintained and replaced
(e) any replacement of consumable parts (including a 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 earthquake, lightning, and natural disasters
(g) a failure which is unforeseeable under technologies available at the time of shipment of this product from our company
(h) any other failures which we are not responsible for or which the customer acknowledges we are not responsible for

2. Service in Overseas Countries

If the customer installs the product purchased from us in his/her machine or equipment, and export it to any country other than where he/she bought it, the customer may sign a paid warranty contract with our local FA center.
This falls under 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 customer purchased the product.

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

Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation to:
(1) Damages caused by any cause found not to be the responsibility of Mitsubishi.
(2) Loss in opportunity, lost profits incurred to the user by Failures of Mitsubishi products.
(3) Special damages and secondary damages whether foreseeable or not, compensation for accidents, and compensation
for damages to products other than Mitsubishi products.
(4) Replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

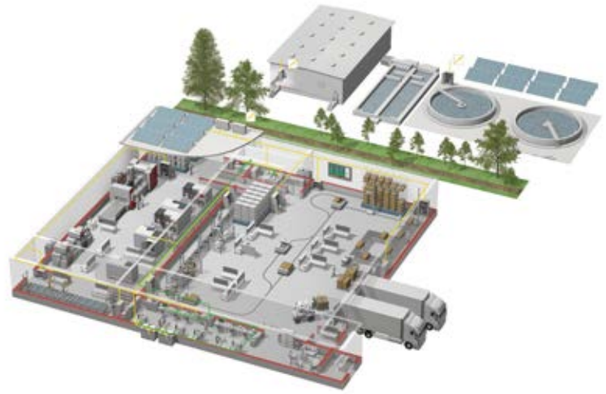
4. Changes in Product Specifications

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

5. Product Application

(1) For the use of this product, its applications should be those that may not result in a serious damage even if any failure or malfunction occurs in the product, and a backup or fail-safe function should operate on an external system to the product when any failure or malfunction occurs.
(2) Mitsubishi CNC is designed and manufactured solely for applications to machine tools to be used for industrial purposes.
Do not use this product in any applications other than those specified above, especially those which are substantially influential on the public interest or which are expected to have significant influence on human lives or properties.

YOUR SOLUTION PARTNER



Mitsubishi Electric offers a wide range of automation equipment from PLCs and HMIs to CNC and EDM machines.

A NAME TO TRUST

Since its beginnings in 1870, some 45 companies use the Mitsubishi name, covering a spectrum of finance,commerce and industry.

The Mitsubishi brand name is recognized around the world as a symbol of premium quality.

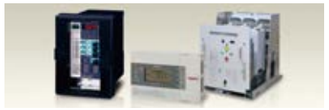
Mitsubishi Electric Corporation is active in space development, transportation, semi-conductors, energy systems, communications and information processing, audio visual equipment and home electronics, building and energy management and automation systems, and has 237 factories and laboratories worldwide in over 121 countries.

This is why you can rely on Mitsubishi Electric automation solution - because we know first hand about the need for reliable, efficient, easy-to-use automation and control in our own factories.

As one of the world's leading companies with a global turnover of over 4 trillion Yen (over $40 billion), employing over 100,000 people, Mitsubishi Electric has the resource and the commitment to deliver the ultimate in service and support as well as the best products.

* Not all products are available in all countries.

Low voltage: MCCB, MCB, ACB



Medium voltage: VCB, VCC

Power monitoring, energy management

Compact and Modular Controllers

Inverters, Servos and Motors

Visualisation: HMIs

Numerical Control (NC)

Industrial / Collaborative Robots

Processing machines: EDM, Lasers, IDS

Transformers, Air conditioning, Photovoltaic systems

Global Partner. Local Friend.

Visit us on

⚠ 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 Nagoya Works is a factory certified for ISO 14001 (standards for environmental management systems) and ISO 9001(standards for quality assurance management systems)

ISO 14001 JACO EC 98 J 2017 UKAS MANAGEMENT SYSTEMS 0051

ISO 9001 BUREAU VERITAS Certification UKAS MANAGEMENT SYSTEMS 0008

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

K-KL2-4-C0140-L NA2011 Printed in Japan [IP]

Printed Nov. 2020