The Best Partner for Your Success

This is the MITSUBISHI CNC business philosophy. All the staffs who are committed to MITSUBISHI CNC business wish to be "the best partner for customers aiming at global and future-oriented development". We will continue our efforts with the aim that our CNCs be great help to the customers.

Optimum Solutions for the Future

As a global CNC provider as well as the best partner, we provide optimum technologies and supports for the users making a step toward the future. MITSUBISHI CNCs create new values in cooperation with the users.

Advanced Technologies for the Next Generation

With the sophisticated technologies we have developed as a total factory automation manufacturer, we attain advanced machining control and contribute to the highest accuracy and productivity of manufacturing worldwide. MITSUBISHI CNCs change machine tools, machining and manufacturing.

Solid Support for Day-to-day Comfort

Providing prompt responses, solid technologies and user-friendly supports, we continuously improve our after-sales service quality for users in the world so that they choose MITSUBISHI CNCs again.

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(Note) The contents of this catalog includes optional specifications. Refer to specification manuals for details.
SSS control ensures high machining stability and quality with virtually no effects resulting from cutting shape or speed. Smooth surfaces can be achieved even when small steps exist in a path, and machining time can be reduced by 5 to 30% relative to conventional systems.

The complete nano control enables all processing in nanometers, from NC operation to servo processing. This advanced machining control technology supports next-generation ultra-precision machining.

SSS control OFF
At the same cutting rate of F1700.

SSS control ON
At the increased feed rate of F3400.

Die/Mold Machining Time Reduced
Complete nano control enables high-speed and high-accuracy machining at a maximum fine-segment feed rate of 168 BPM (BPM: Block per Minute).

High-quality Machining with Balanced Accuracy and Speed
SSS control ensures high machining stability and quality with virtually no effects resulting from cutting shape or speed. Smooth surfaces can be achieved even when small steps exist in a path, and machining time can be reduced by 5 to 30% relative to conventional systems.

High-speed and High-accuracy Tapping
A high-speed error-compensation function is used for controlling the spindle and servo, enabling accurate tapping.

OMR-DD Control (Optimum Machine Response Direct Drive)
Directly compensates the synchronization error.

Prevention of Interferences in Machine
When a possibility of interference is detected on a machine model, the motor decelerates to a stop before interfering. The part to interfere is displayed in a different color.
Solutions for the Future

As a global CNC provider as well as the best partner, we provide optimum technologies and supports for the users making a step forward toward the future. MITSUBISHI CNCs create new values in cooperation with the users.

Original Screen Design Environment

- Well-developed screen design tools help bring out the uniqueness of CNCs.
- NC Designer, which helps create original screens easily, enables users to add unique customized screens that meet machine tool characteristics.
- Two types of designing methods are available: a programming-free method in which automatic programming is carried out upon laying out switches, buttons and data display frames, etc. and a programming method that enables higher level processing.

Manufacturing Support Software

We provide optimal solutions for manufacturing sites by combining various software.

Energy Savings

- **Drive units**
  Application of the power regeneration system which allows energy generated during deceleration to be efficiently used as a power supply. Use of low-loss power devices enables reductions in loss of power.

- **Spindle motors/Servo motors**
  Energy loss of spindle motors during high-speed operation has been substantially reduced. Drive current of servo motors has also been reduced by downsizing the motors while increasing their torque.

Mitsubishi Factory Automation Solutions

- Our cultivated Factory Automation technologies and experience contribute to offer the best suited systems for users.
- Our FA solutions support high and low hierarchy components, a network and even applications that control the components and network required for a manufacturing floor.
Support
for the Day-to-day Comfort

Providing prompt responses, solid technologies and user-friendly supports, we continuously improve our after-sales service quality for users in the world so that they choose MITSUBISHI CNCs again.

Global Service & Support Network

We provide satisfying after-sales services worldwide, aiming to be your best partner.

After-sales Service

- Maintenance service
  Our service centers boasting high-quality customer service system are located in various regions around the world to provide secured and reliable services for the users. We offer wide range of services such as giving prompt and precise advices and suggestions, and on-site repairs, etc.
  - Part supply
    As each service center keeps maintenance parts in stock, the down time after a failure can be minimized. We are making our efforts to provide utmost services that allow users to use their CNC machine tools more securely.
  - One-year maintenance contract
    We provide maintenance services after expiration of warranty period in one-year units. Should there be any failure, our engineer in the closest service center will be at your support immediately.

Displays in 17 Languages

- Supports 17 languages.
  - Supported languages
    - Japanese
    - English
    - German
    - Korean
    - French
    - Spanish
    - Chinese (traditional)
    - Chinese (simplified)
    - Russian
    - Portuguese
    - Hungarian
    - Dutch
    - Swedish
    - Turkish
    - Polish
    - Czech

High-quality

Our top priority is to provide users with high-performance and high-quality products. We are making the best efforts to improve quality and reliability in every process from planning, development, designing and manufacturing through operation after delivery.

Training

We provide trainings on both basic and advanced operations using actual machines. Individually tailored training programs and on-site lessons are also available. Please contact us for details.

We have established FA Centers that manage service centers and service satellites in each area to enhance our service quality by providing trainings for engineers and enhancing service parts and repair facilities.
Product Line

Advanced product lines take your machine to the next level

High-grade Mitsubishi CNC M700V Series, Equipped with Advanced Complete Nano Control

- The latest RISC-CPU is installed to achieve advanced complete nano control
- High-accuracy machining with complete nano control
- Easy operability that significantly reduces machining setup time

Global Standard Mitsubishi CNC M70V Series, Pursuing High Speed and Accuracy

- Enhanced machining accuracy and reduced takt time
- Easy and advanced operation contributing to setup time reduction
- Compact size

Simple CNC E70 Series, Offering Easy Operability and High Cost Performance

- Simple operations free operators from burden
- With the latest hardware installed, this iQ CNC realizes high cost performance

IQ Platform Compatible CNC C70 Series Incorporated with Mitsubishi’s State-of-the-Art Technologies

- Compatible with the Mitsubishi FA integrated solution, “iQ Platform”
- High-performance CNC integrated with high-speed PLC offers high-speed control to reduce cycle time
- A wide variety of FA products helps construct flexible lines

Drive Units

High-performance Multi-hybrid Drive Units MDS-D/DHZ Series

- With the latest current control algorithm, basic performance is drastically enhanced (high-gain control). A combination of high-speed servo motor and high-accuracy vector helps enhance overall drive performance.
- A high-efficiency, high- and low-torque power module has enabled unit downsizing. A line of drive units driving a maximum of two spindles is available, contributing to a reduction in control panel size.
- STD (safe torque off) is now available.

All-in-one compact drive units MDS-D/DHZ Series

- Ultra-compact drive units with built-in power supplies contribute to reducing control panel size. The 2-axis type is added for further downsizing.
- High-speed optical communication enables a shorter position-communication cycle and direct communication between drives, promising further high-speed and high-accuracy machining.
- High-efficiency, high- and low-torque power modules have enabled unit downsizing, which also leads to a reduction in control panel size.
- STD (safe torque off) is now available.

Low-inertia Motor HF Series

- High-torque efficiency of the motor allows for smooth, continuous rotation.

Medium-inertia Motor HF Series

- Light and easy to maintain. Suitable for machines requiring slower acceleration.

High-speed Motor SJ-V Series

- High-torque efficiency of the motor allows for smooth, continuous rotation.

Servo Motors

Low-inertia Motor HF-KP Series

- Suitable for an auxiliary axis that requires high-speed positioning.

Linear Servo Motor LM-F Series

- Also in clean environments is possible since ball screws are not used and therefore contamination from grease is not an issue.

Direct Drive Servo Motor TM-RB Series

- For an auxiliary axis that drives a table or spindle head.

Spindle Motors

High-performance New Type Spindle Motor SJ-D Series

- Motor energy loss has been significantly reduced by optimizing the magnetic circuit.

Low-inertia, High-speed New Type Spindle Motor SJ-DL Series

- Lapping machine dedicate spindle motors have joined the line. The max spindle motor line SJ-D Series in an effort to speed up drilling and tapping.

High-performance Spindle Motor SJ-V Series

- A vast range of spindle motors is available, all ready to support diversified machine tool needs.

Low-inertia, High-speed Spindle Motor SJ-VL Series

- The spindle dedicated to lapping machines requiring faster drilling and tapping.

Tool Spindle Motors HF-KP/HP-S Series

- Taking advantage of the characteristics of a servo motor such as smallness and high-rigidity, this motors serves as a compact and high-rigidity spindle motor which is capable of high-speed rotation (60,000 rpm). This motor contributes to downsizing of spindles, such as the rotary tool spindle.

Product Line
M700V Series

High-grade Mitsubishi CNC M700V Series, equipped with advanced complete nano control

Latest RISC-CPU achieves Advanced Complete Nano Control

- The latest RISC-CPU and high-speed optical servo networks are installed, achieving high-speed and high-accuracy control, nano control and 5-axis machining
- Functions can be easily expanded by adding an expansion unit
- Ultrahigh-speed PLC engine reduces cycle time

High-accuracy Machining with Complete Nano Control

- Combination of “complete nano control” that processes everything from NC operation to servo control processing in nanometers, a state-of-the-art technology “SSS control” and “OMR control” makes it possible to achieve ultra-high-quality machining
- High-speed and high-accuracy machining at 168k blocks per minute is possible

Easy Operability that Significantly Reduces Machining Setup Time

- NC screen design has been renewed to strongly support operations from machining setup to monitoring
- The NC screen displays machining program check and machining states visually by using 3D display

Windows®XP-based Model Added to the Product Line

- Since Windows®XP is installed in M720VW, M730VW and M750VW, they facilitate developing such as MTB’s original CAM function and data managing function that can enhance the operability

Main Specifications

- Built-in PLC Basic Instruction Processing Performance
- User Macro Processing Performance
- Machining Program Processing Speed

OMR-FF Control

Unlike conventional control, which simply matches the motor path to the commands, OMR control calculates the machine’s status based on a model and applies correction to motor control in order to match not the motor position, but the machine tool position to the commands.

SSS Control (Machining Center System)

SSS control is now available for the most basic function of five-axis simultaneous interpolation control, tool center point control. It compensates uneven paths output from CAM to smoothly join the tool center point’s path. In addition, rotary axis pre-filter is available to move the rotary axis smoothly, which achieves high-grade cutting in five-axis simultaneous machining.

Control Axis Superimposition (Lathe System)

- This function enables machining using a certain part system simultaneously with that of another part system by superimposing their movements.
- This is effective when machining in multiple part systems is excuted simultaneously. It allows for an axis to shift its coordinate system relative to the system using the axis.

Guide Bushing Spindle Synchronization Control (Lathe System)

- This function is for a machine with a spindle motor to rotate a guide bushing: This function allows the guide bushing spindle motor (G/B spindle) to synchronize with a reference spindle motor (Reference spindle). The position error compensation function reduces the spindle’s vibration due to the workpiece’s torsion, and the motor’s overload.

Complete Nano Control

All operations from program values to servo commands are done in nanometer units. Interpolation is at the nano-unit level even when program commands are in micrometer units.

High-accuracy machining is realized by controlling each axis so that the tool center point moves linearly at a commanded feed rate even if the rotary axis moves in linear interpolation.
Global standard Mitsubishi CNC pursuing high speed and accuracy

**Enhanced Machining Accuracy and Reduced Tact Time**
- The minimum command unit of 0.1µm and minimum internal interpolation unit of 1nm allow highly accurate and smooth machining.
- High-speed error compensation function is incorporated in spindle and servo controls, which enables high-speed and high-accuracy tapping, etc.
- The high-speed PLC engine enhances the operation speed, contributing to cycle time reduction.

**Easy and Advanced Operation Contributing to Setup Time Reduction**
- This CNC is equipped with pop-up screens that prevent operators from being bothered with screen hierarchy, and guiding function that displays guidance on operations, programs and alarms.
- Ethernet interface is installed as standard; thus, program management can be easily realized.
- Simple programming functions NAVI MILL and NAVI LATHE are installed.

**Compact Size Achieved**
- Unit dimensions have been downsized by integrating a display with CNC control part, contributing to downsizing of control panel.
- High visibility TFT color LCD is used. 8.4-type and 10.4-type displays are available.

**Main Specifications**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Machining center system</th>
<th>Lathe system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum PLC program capacity</td>
<td>500KB [1,280m]</td>
<td>2,000KB [5,120m]</td>
</tr>
<tr>
<td>Maximum program capacity</td>
<td>20,000 steps</td>
<td>32,000 steps</td>
</tr>
<tr>
<td>Least control increment</td>
<td>0.1µm</td>
<td>0.1µm</td>
</tr>
<tr>
<td>Least command increment</td>
<td>1nm</td>
<td>1nm</td>
</tr>
<tr>
<td>Maximum number of part systems</td>
<td>5</td>
<td>11</td>
</tr>
<tr>
<td>Control axes</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Number of control axes</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Number of PLC axes</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Maximum number of spindles</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Maximum number of NC axes (in total for all the part systems)</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Maximum number of control axes (NC axes + PLC axes + spindle)</td>
<td>10</td>
<td>11</td>
</tr>
</tbody>
</table>

**SSS Control (Machining Center System)**
- Super Smooth Surface
- By judging shapes in large from commanded paths, unnecessary deceleration is reduced even when fine steps exist, thereby, realizing smooth and deviation free die-mold machining.
- Machining time can be shorter by 5 to 30% relative to our conventional system, especially more effective at a higher feed rate.

**Polar Coordinate Interpolation (Lathe System)**
- This function converts the commands programmed for the orthogonal coordinate axes into linear axis movements (tool movements) and rotary axis movements (workpiece rotation) to control the contours.
- It is useful for tasks such as cutting linear cutouts on the outside diameter of the workpiece and grinding camshafts.

**3D solid program check (Machining Center System)**
- The added 3D solid model check function allows more realistic cutting check.

**Rapid Traverse Constant Inclination Multi-step Acceleration/Deceleration Function**
- Rapid acceleration/deceleration is performed according to the motor’s torque characteristics.
- As the motor’s characteristics can be utilized optimally, positioning time is reduced and cycle time is improved.

**Hobbing (Lathe System)**
- G code format is available for hobbing.
- A spur gear can be machined by synchronously rotating the hob axis and the workpiece axis in a constant ratio. A helical gear can be machined by compensating the workpiece axis according to the gear torsion angle for the Z axis movement.

**Mixed Control (cross axis control) (Lathe System)**
- The control axes of each part system can be exchanged using a program command. This enables the axis defined as the axis of the 1st part system to be operated as the axis of the 2nd part system.
Simple CNC Offering Easy Operability and High Cost Performance

Simple operations free operators from burden
- This CNC has the same screen structure as of M700V and M70V Series, allowing easy operations.
- Switching between milling and lathe systems is accomplished simply by changing the parameter.
- Various support tools help reduce initial setup time including the time for developing ladder programs and customized screens.

With the latest hardware installed, this CNC realizes high cost performance
- CNC control part integrated with a display provides compact size and high cost performance.
- Ethernet interface is installed as standard; thus, program management can be easily realized.
- Compatible with analog output, this CNC allows a spindle motor to be driven by an inverter.

Main Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>E70 Series</th>
<th>M700V</th>
<th>M70V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of control axes</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Maximum number of NC axes (in total for all the part systems)</td>
<td>8,000 steps</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Maximum number of spindles</td>
<td>8,000 steps</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Maximum number of PLC axes</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Maximum number of simultaneous contour control axes</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Number of control axes</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Maximum number of part systems</td>
<td>24</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>Least command increment</td>
<td>0.1µm</td>
<td>1nm</td>
<td>1nm</td>
</tr>
<tr>
<td>Least control increment</td>
<td>0.1µm</td>
<td>1nm</td>
<td>1nm</td>
</tr>
<tr>
<td>Maximum program capacity</td>
<td>5120 KB [600m]</td>
<td>5120 KB [600m]</td>
<td>5120 KB [600m]</td>
</tr>
<tr>
<td>Maximum PLC program capacity</td>
<td>230KB [600m]</td>
<td>230KB [600m]</td>
<td>230KB [600m]</td>
</tr>
<tr>
<td>Display</td>
<td>8.4-type</td>
<td>8.4-type</td>
<td>8.4-type</td>
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<tr>
<td>Keyboard</td>
<td>32 buttons</td>
<td>32 buttons</td>
<td>32 buttons</td>
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<tr>
<td>HMI customization function</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

* Maximum specifications including optional specifications are listed.

Nano Control

- Interpolation calculation accuracy improved
- Even with one-micron-unit commands in the machining program, interpolation is in nanometer units. As the calculation accuracy of a block intersection is improved, lines on the surface is finer.

Inclined Axis Control (Lathe System)

- Even when the control axes configuring a machine are mounted at an angle other than 90 degrees, this function enables it to be programmed and controlled in the same way as with an orthogonal axis.
- The inclination angle is set using a parameter, and axes are controlled using the movement amounts of the axes which are obtained through conversion and compensation using this angle.

Spindle/C-axis Control

The spindle’s constant position loop control has eliminated the zero point return time when switching from the spindle to C-axis.

Memory Card/USB Memory Interface

A compact flash memory card (CF card) / USB memory interface is located on the front of the display. In using CF card, the card slot can be completely covered by a lid so as to prevent foreign materials from entering (IP67).

PLC Axis

Indexing function

By setting the number of stations required for the application, the drive automatically sets up equal intervals between each station. Positioning of the axis is only possible by commanding the station number.

Example when combined with an 8.4-type display
User-friendly

HMI for Easier and More Visible Use

- Screen structure linking to the operation processes
  Operation processes are divided into three steps, “Monitor”, “Setup” and “Edit”, and necessary information is aggregated into three screens. These screens can be displayed by touching a single button on the keyboard.

- Pop-up screens
  Tabs allow the user to select necessary operations from the operation menu, and pop-up screens allow the user to access desired information while the original screen remains displayed. For displays with a touch panel, a keyboard can be displayed on the screen.

- Menu customization function
  Menu keys on the bottom of the screen can be freely arranged. Frequently used menu keys can be put together on the first page.

- 2-part system display
  The Monitor screen of the 2nd part system can be displayed together with the 1st part system. Switching screens is not necessary.

- 2-part system display
  Tabs allow the user to select necessary operations from the operation menu, and pop-up screens allow the user to access desired information while the original screen remains displayed. For displays with a touch panel, a keyboard can be displayed on the screen.

Operation Support

- Manual/Automatic backup function
  - Batch-backup of the NC data into the memory card/USB memory inserted in the front interface of the display is possible. For the built-in hard disk type M700VW Series, backup in the hard disk is also possible.
  - Data is automatically backed-up at a certain interval set by the parameter.

- Program input error warning function
  - The added 3D solid model check function allows more realistic cutting check.1
  - This function helps an operator to input and check programs. Errors are indicated when a decimal point is omitted.2

- Menu list
  Menu list buttons are newly introduced. With these buttons, the screen desired for display can be called up directly. The selected screen's function outline is also displayed.

- Simple Programming Functions with Simple Machining Menu
  NAVI MILL (Machining center system) / NAVI LATHE (Lathe system)
  - Programs are automatically created for each process when an operator selects machining process and inputs data on screen. A tool path can be graphically drawn for the program check.
  - This function also supports inclined surface machining.

- Guideline function
  By pressing the help button, guidance (operation procedure /parameter descriptions/alarm descriptions/G code format) regarding the currently displayed screen will be shown.

- Integration of program check and editing functions
  Decimal point omitted: A decimal point has been left out of the address data

1 * Available with M700V Series, M70V TypeA (M System) only.
2 * Available with M700V Series only.

Machining surface view

- Outline of the selected function appears

- Shortcut icons to each screen

- Large amount of information aggregated into one screen
  Machining conditions are displayed visually

- Icon menu displays screen images
  Counter display is automatically enlarged in the manual mode

- Pop-up window to avoid screen switching
  Visible hierarchy with two-layer menu display

- Keyboard is displayed in the pop-up window (for touch-panel displays)

- Pop-up screens
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C70 Series

iQ Platform-compatible CNC, providing the largest effect on TCO reduction

- A CNC structured in building block method on iQ Platform
- Compact and high-speed CNC CPU module "Q71/71NCPU" equipped with the multi-axis and multi-part system control
- High-speed connection between ultra-high-speed PLC CPU module MELSEC QnUD (H) CPU and CNC CPU
- Variety of modules for power supply, input/output interface, network and measurement are available
- "Mitsubishi Graphic Operation Terminal GOT2000/GOT1000", an easily customizable HMI with high performance and multiple functions
- Compatible with MELSOFT, easy-to-use engineering tools with multiple functions

Main Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Model name</th>
<th>C70</th>
<th>Machining system</th>
<th>Lathe system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of control axes</td>
<td>3</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of control part systems</td>
<td>16</td>
<td>16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of PLC axes</td>
<td>16</td>
<td>16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum number of spindles</td>
<td>8</td>
<td>8</td>
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<tr>
<td>Standard number of part systems</td>
<td>7</td>
<td>4</td>
<td></td>
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<tr>
<td>Maximum number of part systems</td>
<td>8</td>
<td>8</td>
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<tr>
<td>Program capacity [K steps]</td>
<td>4,096</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Number of files to store</td>
<td>30/40/60/100/130/260</td>
<td>30/40/60/100/130/260</td>
<td></td>
<td></td>
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<tr>
<td>Number of input/output points</td>
<td>124/252</td>
<td>124/252</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Ultrahigh-speed network between CNC CPUs and PLC CPUs

Sequence processing time is widely accelerated, including 3.5 times faster basic instruction performance compared to our conventional one. Reduced scan time also reduces the tact time.

Safety Observation Function

This function enables safety signal comparison, speed observation and duplicated emergency stop. This function complies with the European safety standard EN ISO 13849-1 PL d.

Building Block Type

- Variety of network modules for Mitsubishi PLC MELSEC Q Series are available.
- Motion controllers and robots are compatible with iQ Platform, enabling system expansion.

Multi-axis, Multi-part System Control

One CNC CPU module up to 7 part systems and 16 axes. Up to two CNC CPU modules can be installed on iQ Platform.

GOT Displays

- Customized screens can be easily developed with the GOT Screen Design Software (GT Works3). It is possible to operate a machine via a touch panel instead of a conventional machine operation panel.
- NC Monitor is installed in SVGA and XGA models as standard, which enables setting of each NC data and editing of machining programs, etc.
User Support Tools/Development Tools

User Support Tools Provide an Improved CNC Environment
Rich Development Tools Help Bring out the Uniqueness of CNCs

NC Designer
Screen Design Tool
- NC Trainer is an application for operating the screens of MITSUBISHI CNC M700V/M70V/E70 Series and machining programs. This application can be used for learning operating CNC and checking the operations of the machining programs.
- NC Trainer plus can also be used for checking the PLC program and custom screens.

NC Explorer
Data Transfer Tool
By connecting the NC and host personal computer via Ethernet, data such as machining programs can easily be shared. This tool is free of charge. Please contact us.

NC Maintainer
A software tool for a personal computer to carry out maintenance (such as parameter setting, NC diagnosis and PLC program diagnosis) of MITSUBISHI CNC on customer’s display.

NC Trainer/NC Trainer plus
MITSUBISHI CNC Training Tool
- NC Trainer is an application for operating the screens of MITSUBISHI CNC M700V/M70V/E70 Series and machining programs. This application can be used for learning operating CNC and checking the operations of the machining programs.
- NC Trainer plus can also be used for checking the PLC program and custom screens.

Remote Monitoring Tool
Remote Monitoring Tool
Remote Monitoring Tool (C70) is free of charge. Please contact us.

Remote Monitoring Tool Data Transfer Tool Servo Adjustment Support Tool

M70V
M700V
C70
M70V
M700V
C70
M70V
M700V
C70
M70V
M700V
C70

NC Trainer (M700V, M70V, E70)
Servo Selection Tool
- By selecting the machine configuration model and inputting the machine specifications, the optimal servo motor meeting specifications can be selected. Other selection functions which fully support drive system selection are also available.
- This tool is free of charge. Please contact us.

NC Trainer
MITSUBISHI CNC Training Tool
- By laying out ready-made standard parts, you can easily create original screens without programming.
- Using the C language source generation function of NC Designer, customized functions can be added by programming in C language. (Dedicated development environment necessary)

NC Monitor
Remote Monitor Tool
Remote Monitoring Tool
- Remote Monitoring Tool (C70) is free of charge. Please contact us.

NC Analyzer
Servo Adjustment Support Tool
- Servo parameters can be automatically adjusted by activating the motor using machining programs for adjustment or vibration signals, and measuring/analyzing the machine characteristics.
- Main functions:
  - Bode diagram measurement display, speed loop gain adjustment, position loop gain adjustment, notch filter setting, acceleration/deceleration time constant adjustment, circularity adjustment and servo waveform measurement.

NC Configurator2
Parameter Setup Support Tool
- By laying out ready-made standard parts, you can easily create original screens without programming.
- Using the C language source generation function of NC Designer, customized functions can be added by programming in C language. (Dedicated development environment necessary)

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### Automation Related Products

#### PLC | MELSEC-Q Series Universal Model

Introducing the high-speed QCPU (QnUDVCPU) for faster processing of large data volumes.

- Realize high-speed, high-accuracy machine control with various Q0 Platform compatible controllers and multiple CPUs.
- Easily connect to GOTs and Programming tools using built-in Ethernet port.
- 25 models from 10k step small capacity to 1000k step large capacity, are available.
- Seamless communication and flexible integration at any network level.

**Product Specifications**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program capacity</td>
<td>10k steps to 1000k steps</td>
</tr>
<tr>
<td>Instruction execution time (%)</td>
<td>0.25s per 100 points</td>
</tr>
<tr>
<td>Basic instruction processing speed</td>
<td>120 ns to 1.9 ns</td>
</tr>
<tr>
<td>External connection interface</td>
<td>USB (all models equipped), Ethernet, RS-232, memory card, extended SHRM cassette</td>
</tr>
<tr>
<td>Function module</td>
<td>1:2, high-speed output, polling, status, motion, expansion, miscellaneous, various modes</td>
</tr>
<tr>
<td>Module extension style</td>
<td>Building block type</td>
</tr>
<tr>
<td>Network</td>
<td>Ethernet, CC-Link IE field network, CC-Link, CC-Link/LT, MELSECNET-H, SCSNET II (H), Anywire, RS-232, RS-422</td>
</tr>
</tbody>
</table>

#### Magnetic Starter | MS-T Series

Exceed your expectations.

- 10A frame model is over 16% smaller with a width of just 36mm!
- New integrated terminal covers.
- Reduce your coil inventory by up to 50%.
- Be certified to the highest international levels while work is ongoing to gain other country.

**Product Specifications**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frame</td>
<td>10A to 32A</td>
</tr>
<tr>
<td>Applicable standards</td>
<td>Certification to various standards (including IEC, JIS, CE, UL, TÜV, CQC)</td>
</tr>
<tr>
<td>Terminal cover</td>
<td>Standard terminal cover improves safety, simplified ordering, and reduces inventory, etc.</td>
</tr>
<tr>
<td>Improved rating</td>
<td>Wiring and operability are improved with streamlined wiring terminal specifications, etc.</td>
</tr>
<tr>
<td>Operation coil rating</td>
<td>Voltage range specified according to coil type (up to 140 V Serie)</td>
</tr>
<tr>
<td>Duration units</td>
<td>Drives (Input): Auxiliary Contact Block, Operator Control, Parameter Block, Master Unit, MOTION Interface</td>
</tr>
</tbody>
</table>

#### Robot | MELFA F Series

High speed, high precision and high reliability industrial robot.

- Compact body and slim arm design, allowing operating area to be expanded and load capacity increased.
- The fastest in its class using high performance motors and unique driver control technology.
- Improved flexibility for robot layout design considerations.
- Optimal motor control tuning set automatically based on operating position, posture, and load conditions.

**Product Specifications**

| Degree of freedom                  | Vertical-6, Horizontal-4 |
| Installation                       | Vertical 300mm, horizontal 2000mm |
| Maximum load capacity              | Vertical 300kg, horizontal 3,000kg |
| Maximum reach                     | Vertical 2,000mm, horizontal 5,000mm |

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### WARRANTY

Please confirm the following product warranty details before using MITSUBISHI CH2.

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 warranty 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.

2. **Warranty Term**

   The term of warranty for this product shall be twenty-four (24) months from the date of delivery 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.

3. **Limitations**

   (1) The customer is requested to conduct an initial failure diagnosis by himself/herself as a general rule. It can also be carried out by us or our service provider upon the customer’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 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 failure caused by improper storage or handling, carelessness or negligence, etc., or a failure caused by the customer’s hardware or software problem.
   - A failure caused by any alteration, etc., to the product made by the customer without Mitsubishi Electric’s approval.
   - 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 any function or structure considered to be indispensable in the light of common sense in the industry.
   - A failure which may be regarded as avoidable if consumable parts designated in the instruction manual, etc., are duly maintained and replaced.
   - 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.

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* Trademarks
  - MELSEC, MELSER, EZMotion, EZMotion, iQ Platform, MELSOFT, GOT, CC-Link, CC-Link IE and CC-Link IE, AnyWire, RS-232, RS-422
  - MITSUBISHI CH2 is a trademark of Mitsubishi Electric Corporation in Japan and/or other countries.
  - CompactFlash and CF are either trademarks or registered trademarks of SanDisk Corporation in the United States and/or other countries.
  - Windows is a registered trademark of Microsoft Corporation in the United States and/or other countries.
  - Ethernet is a registered trademark of Xerox Corporation in the United States and/or other countries.
  - Other company and product names that appear in this manual are trademarks or registered trademarks of the respective companies.

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#### 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 be specified on an external system to the product when any failure or malfunction occurs.

(2) Mitsubishi CH2 are 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.