MITSUBISHI iQ Platform-compatible CNC C70 offers the maximum-scale TCO reduction effects to manufacturing sites by taking advantage of MELSEC's great convenience.

Manufacturing technologies (production site)
- Reduced tact time
- Operation efficiency enhancement
- Safety and Energy-savings
- Reduced downtime
- Early identification of failure causes
- Elimination of failure causes
- Reduction of maintenance cost
- Enhanced productivity

Design and Development
- Streamlined design and development
- Unification of development software (environment)
- Various modules suitable for each purpose/function

Safety and Energy-savings
- Conformity with safety standards
- Energy-savings
- Maximization of productivity

Maintenance
- Early identification of failure causes
- Elimination of failure causes
- Reduction of maintenance cost

Advancement
- Provides the products equipped with the latest technologies.

Reliability
- Provides the proven product groups.

Continuity
- Provides the services matching users' life cycle.

Safety and Energy-savings
- Energy-savings with a high-efficiency spindle motor, servo motor and drive unit
- Mitsubishi Electric's FA expertise fully supports the manufacturing floor

Design and Development
- Streamlined design and development through subdivision and structuring of programs
- Application of the same format as MELSEC to unify the design and development environment
- Flexible system configurations

Maintenance
- Early identification of failure causes to be identified early
- Reduction of failure rate by eliminating causes
- Reduction of maintenance cost through efficient parts replacement

Continuity
- Provides the services matching users' life cycle.

Reliability
- Provides the proven product groups.

Safety and Energy-savings
- Conformity with safety standards which conforms to the European safety standard EN ISO 13849-1 PL d

C70 system configuration List of Components Specifications
P 5 P21 P23
Case study
P17
Software Tools
P19

* This catalog contains optional specifications. Please refer to the list of functional specifications and the specification manual for details.
High-performance controllers enable optimization of diverse production processes on shop floors.

- iQ Platform is the next-generation integration platform.
- iQ stands for "integrated Q", "improved Quality", "intelligent & Quick" and "innovation & Quest".

Mitsubishi Electric helps optimize customers' production lines with the iQ Platform.

For more information, refer to the attached diagram.
A compact module equipped with CNC functions that can control up to 7 part systems and 16 axes. 

Manufacturing technologies (production site) 

Maintenance 

Design and Development 

Safety and Energy-savings 

GT Designer 

GX Developer 

GOT1000 Series 

Manual pulse generator 

Sensor 

Machine operation screen*2 
*2: Screen made by a user 
*3: Available with SVGA or higher resolution. 

For CNCs only 

Display configurations 

Machine operation screen*2 
CNC monitor screen** 
GOT1000 Series 

Drive system*1 

Optical network for drive system*1 

Drive unit (MDS-D/DH Series) 
Drive unit (MDS-D/SVJ3 SPJ3 Series) 
Drive unit (MDS-DM Series) 

Servo motor 
Spindle motor 

CNC CPU (G073NCCPU) 
Up to two CNC CPU modules can be mounted. 

CNC CPU 

Ethernet 

CNC CPU (G073NCCPU) 

Drive system*1 

Drive unit (MDS-D/DH Series) 
Drive unit (MDS-D/SVJ3 SPJ3 Series) 
Drive unit (MDS-DM Series) 

Servo motor 
Spindle motor 

C70 system configuration 

CNC CPU (G073NCCPU) Up to two CNC CPU modules can be mounted.
High-speed control shortens tact time

Speed enhancement by high-speed bus between multi-CPUs

**Ultrahigh-speed network between CNC CPUs and PLC CPUs**

For data transfer between CNC CPUs and PLC CPUs, we have newly developed a dedicated high-speed bus. Data are transferred at a high-speed cycle (0.88ms) between the high-speed shared memories of each CPU, so each CPU speed can be fully utilized.

<table>
<thead>
<tr>
<th>PLC CPU</th>
<th>CNC CPU</th>
<th>CNC CPU</th>
<th>I/O Network</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-speed shared memory between CPUs</td>
<td>High-speed shared memory between CPUs</td>
<td>High-speed shared memory between CPUs</td>
<td>I/O Network</td>
</tr>
<tr>
<td>PLC CPU</td>
<td>CNC CPU</td>
<td>CNC CPU</td>
<td>I/O Network</td>
</tr>
<tr>
<td>High-speed shared memory between CPUs</td>
<td>High-speed shared memory between CPUs</td>
<td>High-speed shared memory between CPUs</td>
<td>I/O Network</td>
</tr>
</tbody>
</table>

**Effects of high-speed PLC CPUs, high-speed CNC CPUs and high-speed bus among the CPUs**

Shortens machining cycle time.

<table>
<thead>
<tr>
<th>PLC program</th>
<th>CNC program</th>
<th>Q bus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Execute next block</td>
<td>High-speed PLC processing</td>
<td>PLC program</td>
</tr>
<tr>
<td>High-speed block processing</td>
<td>High-speed bus between CPUs</td>
<td>PLC program</td>
</tr>
</tbody>
</table>

Comparison of M-code execution time

<table>
<thead>
<tr>
<th>C64 (our conventional CNC)</th>
<th>C70</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 to 5 times faster</td>
<td></td>
</tr>
</tbody>
</table>

Speed enhancement by CNC functions

**Programmable in-position check**

When commanding positioning (G00) and linear interpolation (G01), the in-position width can be respectively specified in a machining program. This enables designation of the optimal in-position width for each machining pattern, thereby allowing tact time to be reduced.

- **Example of time reduction in machining a cylinder head**

<table>
<thead>
<tr>
<th>Without</th>
<th>With</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.8 sec (3.5%) reduction</td>
<td>7.1 sec</td>
</tr>
</tbody>
</table>

Effect of G00/G01 independent in-position check

The in-position width for positioning (G00) can be set independently of the width for linear interpolation (G01). For example, you can shorten the positioning time while maintaining the depth accuracy by setting the G01's width smaller and G00's width larger.

- **Versatile network modules allow connection with the host information system**

A wide variety of Mitsubishi PLC MELSEC-Q Series’ network modules can be used.

**Connection with host system using e-F@ctory**
High-speed control shortens tact time

Speed enhancement with drive system functions

Servo control

Basic performance has been significantly enhanced by combining the highly responsive current control (high-gain control) and a high-accuracy servo motor.

Spindle control

In addition to the high-responsive current control, lost motion compensation and an adaptive-type resonance suppression filter, etc. are installed. These can realize reduced machining time, elimination of machine vibration and enhanced machining accuracy. The connection with the detector is high-speed and highly reliable serial communication.

OMR-DD control

(high-speed synchronous tapping)

The servo axis detects and compensates the spindle’s delay directly on the high-speed optical network to minimize the synchronization error. This function is available with MDS-D/DH and MDS-DM (one-axis only).

Effects of spindle’s continuous position loop control

Orientation time is reduced

Under MDS-D/DH Series spindle control, position loop control is constantly maintained. Thus, controlling with the maximum torque is always possible with no need for position control switching. As deceleration can be performed with the maximum torque, the spindle’s orientation time has been reduced by 20%.

Heavy cutting performance improved

Heavy cutting performance has been improved due to the position loop of the spindle control. By lowering impact load fluctuation, the speed fluctuation rate has been reduced to less than 1/2 of our conventional system.

Stable productivity through automation

Tool life management

This function counts accumulated time and frequency of tool use and monitors usage state of tools (Tool life management I). The spare tool registration function is available in “Tool life management II”.

Fixed cycle

This function enables drilling, tapping, boring and other hole machining to be assigned by a patterned cycle. This allows easy programming of the same machining simply by inputting the required data.

Tool radius compensation

This function corrects the actual tool center path inward or outward from the programmed path by the tool’s radius amount.

Tool length measurement

This function automatically calculates the difference between the coordinate value of the commanded measurement position and the value where the tool actually reaches to the sensor, and then determines the tool compensation amount. If the tool has been already compensated, the compensation amount is adjusted as needed.

Nose R compensation

This function assumes the tool nose to be a half circle of radius R, and performs compensation so that the half circle touches the programmed path. This can correct the error caused by the tool nose roundness. It is possible to select whether the compensation direction is fixed, or automatically determined from the tool tip and the specified movement vector.
Various Ground fault detection for each motor systematically without stopping the motor. This “Fan stop warning” however, the fan can be replaced stopped in the event of fan stop by the module overheat alarm. With output when the fan stops rotating. Previously, the motor was monitors cooling fan’s rotation, and detects “Fan stop warning” that is Allows systematic fan replacement.

![Fan stop warning](image)

Detection of the stop of radiator fin cooling fan

![Radiator fin cooling](image)

Ground fault detection for each motor

![Ground fault detection](image)

Enhanced diagnostic functions enable failure causes to be identified early

- **Spindle motor’s temperature compensation**
  - Allows monitoring of the spindle motor’s temperature
  - Under control, a built-in thermistor detects the spindle motor’s temperature to compensate the motor constant fluctuation due to rise of temperature. It is also possible to monitor spindle motor’s temperature on CNC screen (Creating the temperature monitor screen is necessary).

- **Operation history**
  - Helps trouble diagnosis with time display
  - With this function, the CNC operation and time information is always stored, which is used for trouble diagnosis, etc. Operation history data include the CNC alarms, key inputs and CNC input/output signal changes, which are stored together with the occurrence times. These history data are backed up even during power shut-down.

- **Ground fault detection for each motor**
  - Easy to specify the faulty axis
  - Ground fault detection, which was formerly performed all at a time by a power supply unit, has changed so that the fault can be detected per motor. As detecting a faulty axis is possible, restore time will be shorter.

- **Detection of the stop of radiator fin cooling fan**
  - Allows systematic fan replacement
  - Monitors cooling fan’s rotation, and detects “Fan stop warning” that is output when the fan stops rotating. Previously, the motor was stopped in the event of fan stop by the module overheat alarm. With this “Fan stop warning”, however, the fan can be replaced systematically without stopping the motor.

- **Reduction of maintenance cost through efficient parts replacement**
  - Common maintenance parts
    - Maintenance parts are the same as for MELSEC, thus possible to use the same parts.
    - The main base, power supply and extension base are the same as those used for MELSEC, thus MELSEC Q Series’ versatile I/Os and instrumentation modules are available.
    - Possible to cut maintenance cost by using the same parts as MELSEC.

- **Back-up/Restore function**
  - Simply replace the CF card in case of troubles
  - By operating on the GOT, backup and restoration of data in GOT’s CF card is possible. Data necessary for back-up is automatically determined. Back-up into USB memory is available for GT16.
  - By using the CF card extension slot on the cabinet front, possible to insert/remove the CF card without opening the cabinet.

- **Use of connector on motor’s power line**
  - Allows for easier wiring
  - By using a connector on motor’s power line, wiring workability has improved.

- **Reduction of failure rate by eliminating causes**
  - No fans in control unit
    - Fans inside C70 control module have been removed, as cooling is executed by radiator fin. Thus, fan-related troubles (fan stop, inspiring moisture into the panel) can be avoided.

  - No fans and enhanced oil-resistance in drive unit
    - The absence of fan inside the drive unit can contribute to the avoidance of electric circuit failures that are caused by inspiring dust, oil-mist, etc. The oil resistance of radiator fin cooling fans, which are located outside the panel, has been improved by molding the stator coil (IP65).

- **Maintenance**
  - Reduced downtime
  - Enables optimal current compensation control
  - Temperature on CNC screen (Creating the temperature monitor screen is necessary).
  - These history data are backed up even during power shut-down.

- **Operation history**
  - With this function, the CNC operation and time information is always stored, which is used for trouble diagnosis, etc. Operation history data include the CNC alarms, key inputs and CNC input/output signal changes, which are stored together with the occurrence times. These history data are backed up even during power shut-down.

- **Detection of the stop of radiator fin cooling fan**
  - Allows systematic fan replacement
  - Monitors cooling fan’s rotation, and detects “Fan stop warning” that is output when the fan stops rotating. Previously, the motor was stopped in the event of fan stop by the module overheat alarm. With this “Fan stop warning”, however, the fan can be replaced systematically without stopping the motor.

- **Ground fault detection for each motor**
  - Easy to specify the faulty axis
  - Ground fault detection, which was formerly performed all at a time by a power supply unit, has changed so that the fault can be detected per motor. As detecting a faulty axis is possible, restore time will be shorter.

- **Reduction of maintenance cost through efficient parts replacement**
  - Common maintenance parts
    - Maintenance parts are the same as for MELSEC, thus possible to use the same parts.
    - The main base, power supply and extension base are the same as those used for MELSEC, thus MELSEC Q Series’ versatile I/Os and instrumentation modules are available.
    - Possible to cut maintenance cost by using the same parts as MELSEC.

- **Back-up/Restore function**
  - Simply replace the CF card in case of troubles
    - By operating on the GOT, backup and restoration of data in GOT’s CF card is possible. Data necessary for back-up is automatically determined. Back-up into USB memory is available for GT16.
    - By using the CF card extension slot on the cabinet front, possible to insert/remove the CF card without opening the cabinet.

- **Use of connector on motor’s power line**
  - Allows for easier wiring
    - By using a connector on motor’s power line, wiring workability has improved.

- **Maintenance**
  - Reduced downtime
  - Enables optimal current compensation control
  - Temperature on CNC screen (Creating the temperature monitor screen is necessary).
  - These history data are backed up even during power shut-down.
Manufacturing technologies

Maintenance

Design and Development

Safety and Energy-saving

Streamlined design and development through subdivision and structuring of programs

**PLC CPU module with large memory capacity**

Large-capacity CPUs have been added to C70's PLC CPU lines. Program capacity as well as standard ROM capacity have also been extended.

<table>
<thead>
<tr>
<th>Model Name</th>
<th>Program Capacity</th>
<th>Standard ROM Capcity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q03UDCPU</td>
<td>30k steps</td>
<td>1MB</td>
</tr>
<tr>
<td>Q04UDHCPU</td>
<td>40k steps</td>
<td>2MB</td>
</tr>
<tr>
<td>Q06UDHCPU</td>
<td>60k steps</td>
<td>4MB</td>
</tr>
<tr>
<td>Q10UDECPU</td>
<td>100k steps</td>
<td>2MB</td>
</tr>
<tr>
<td>Q13UDEHCPU</td>
<td>130k steps</td>
<td>4MB</td>
</tr>
<tr>
<td>Q26UDHCPU</td>
<td>260k steps</td>
<td>8MB</td>
</tr>
</tbody>
</table>

**Facilitates subdivision and structuring of sequence programs**

The number of sequence programs has been extended up to 124 to enable precise management of programs according to product or process, etc. By subdividing and structuring sequence programs, the visibility and availability of programs are enhanced.

**GOT screen drawing tool (GT Designer)** enables simple custom screen development. Possible to operate machine with the touch panel screen, instead of the conventional machine operation panel.

**CNC monitor installed**

CNC monitor has been installed, which allows editing of machining programs and setting each CNC data. The CNC monitor can be simply installed from GT Designer; thus no need to develop screen. The CNC monitor screen can be displayed by connecting to the CNC CPU’s DISPLAY interface via Ethernet or by connecting to the main base via bus. The CNC monitor requires a GOT with SVGA or XGA resolution.

**CNC CPU function expanded (macro interface function extended)**

Possible to define up to 1200 sets of variables, which are able to write/read from a PLC CPU. These variable sets can be handled as system variables in the machining program. Write/Read is performed using special instructions. This function is useful when a large number of variable sets are needed, such as for a grinder.

**NC axis/PLC axis changeover**

Even if a pallet is changed, the axis can always be controlled as an NC axis in the machining area, and as a PLC axis in the setup area, which enables setup of a rotary axis without stopping machining.

**Flexible system configurations**

Enables configuring the system optimal for your system

An independent PLC CPU allows suitable selection of the right module for your system’s size and purpose, realizing an optimal hardware configuration. PLC CPU and each I/O unit, and intelligent units are connected via Q bus; thus, conventionally used power supply, I/O and network modules for MELSEC Q Series can be used.

**Design and Development**

**Shortened design and development period**

Streamlined design and development through subdivision and structuring of programs

Flexible system configurations

Application of the same format as MELSEC to unify the design and development environment

Machine operation panel computerized and aggregated

CNC monitor installed

CNC CPU function expanded (macro interface function extended)

NC axis/PLC axis changeover

- **PLC CPU module with large memory capacity**
- **Facilitates subdivision and structuring of sequence programs**
- **GOT screen drawing tool (GT Designer)** enables simple custom screen development.
- **CNC monitor installed**
- **CNC CPU function expanded (macro interface function extended)**
- **NC axis/PLC axis changeover**

**Application of the same format as MELSEC to unify the design and development environment**

Machining operation panel computerized and aggregated

GOT screen drawing tool (GT Designer) enables simple custom screen development. Possible to operate machine with the touch panel screen, instead of the conventional machine operation panel.

**CNC monitor installed**

CNC monitor has been installed, which allows editing of machining programs and setting each CNC data. The CNC monitor can be simply installed from GT Designer; thus no need to develop screen. The CNC monitor screen can be displayed by connecting to the CNC CPU’s DISPLAY interface via Ethernet or by connecting to the main base via bus. The CNC monitor requires a GOT with SVGA or XGA resolution.

**CNC CPU function expanded (macro interface function extended)**

Possible to define up to 1200 sets of variables, which are able to write/read from a PLC CPU. These variable sets can be handled as system variables in the machining program. Write/Read is performed using special instructions. This function is useful when a large number of variable sets are needed, such as for a grinder.

**NC axis/PLC axis changeover**

Even if a pallet is changed, the axis can always be controlled as an NC axis in the machining area, and as a PLC axis in the setup area, which enables setup of a rotary axis without stopping machining.

**Flexible system configurations**

Enables configuring the system optimal for your system

An independent PLC CPU allows suitable selection of the right module for your system’s size and purpose, realizing an optimal hardware configuration. PLC CPU and each I/O unit, and intelligent units are connected via Q bus; thus, conventionally used power supply, I/O and network modules for MELSEC Q Series can be used.

**Design and Development**

**Shortened design and development period**

Streamlined design and development through subdivision and structuring of programs

Flexible system configurations

Application of the same format as MELSEC to unify the design and development environment

Machine operation panel computerized and aggregated

CNC monitor installed

CNC CPU function expanded (macro interface function extended)

NC axis/PLC axis changeover

- **PLC CPU module with large memory capacity**
- **Facilitates subdivision and structuring of sequence programs**
- **GOT screen drawing tool (GT Designer)** enables simple custom screen development.
- **CNC monitor installed**
- **CNC CPU function expanded (macro interface function extended)**
- **NC axis/PLC axis changeover**

**Application of the same format as MELSEC to unify the design and development environment**

Machining operation panel computerized and aggregated

GOT screen drawing tool (GT Designer) enables simple custom screen development. Possible to operate machine with the touch panel screen, instead of the conventional machine operation panel.

**CNC monitor installed**

CNC monitor has been installed, which allows editing of machining programs and setting each CNC data. The CNC monitor can be simply installed from GT Designer; thus no need to develop screen. The CNC monitor screen can be displayed by connecting to the CNC CPU’s DISPLAY interface via Ethernet or by connecting to the main base via bus. The CNC monitor requires a GOT with SVGA or XGA resolution.

**CNC CPU function expanded (macro interface function extended)**

Possible to define up to 1200 sets of variables, which are able to write/read from a PLC CPU. These variable sets can be handled as system variables in the machining program. Write/Read is performed using special instructions. This function is useful when a large number of variable sets are needed, such as for a grinder.

**NC axis/PLC axis changeover**

Even if a pallet is changed, the axis can always be controlled as an NC axis in the machining area, and as a PLC axis in the setup area, which enables setup of a rotary axis without stopping machining.

**Flexible system configurations**

Enables configuring the system optimal for your system

An independent PLC CPU allows suitable selection of the right module for your system’s size and purpose, realizing an optimal hardware configuration. PLC CPU and each I/O unit, and intelligent units are connected via Q bus; thus, conventionally used power supply, I/O and network modules for MELSEC Q Series can be used.

**Design and Development**

**Shortened design and development period**

Streamlined design and development through subdivision and structuring of programs

Flexible system configurations

Application of the same format as MELSEC to unify the design and development environment

Machine operation panel computerized and aggregated

CNC monitor installed

CNC CPU function expanded (macro interface function extended)

NC axis/PLC axis changeover

- **PLC CPU module with large memory capacity**
- **Facilitates subdivision and structuring of sequence programs**
- **GOT screen drawing tool (GT Designer)** enables simple custom screen development.
- **CNC monitor installed**
- **CNC CPU function expanded (macro interface function extended)**
- **NC axis/PLC axis changeover**

**Application of the same format as MELSEC to unify the design and development environment**

Machining operation panel computerized and aggregated

GOT screen drawing tool (GT Designer) enables simple custom screen development. Possible to operate machine with the touch panel screen, instead of the conventional machine operation panel.

**CNC monitor installed**

CNC monitor has been installed, which allows editing of machining programs and setting each CNC data. The CNC monitor can be simply installed from GT Designer; thus no need to develop screen. The CNC monitor screen can be displayed by connecting to the CNC CPU’s DISPLAY interface via Ethernet or by connecting to the main base via bus. The CNC monitor requires a GOT with SVGA or XGA resolution.

**CNC CPU function expanded (macro interface function extended)**

Possible to define up to 1200 sets of variables, which are able to write/read from a PLC CPU. These variable sets can be handled as system variables in the machining program. Write/Read is performed using special instructions. This function is useful when a large number of variable sets are needed, such as for a grinder.

**NC axis/PLC axis changeover**

Even if a pallet is changed, the axis can always be controlled as an NC axis in the machining area, and as a PLC axis in the setup area, which enables setup of a rotary axis without stopping machining.

**Flexible system configurations**

Enables configuring the system optimal for your system

An independent PLC CPU allows suitable selection of the right module for your system’s size and purpose, realizing an optimal hardware configuration. PLC CPU and each I/O unit, and intelligent units are connected via Q bus; thus, conventionally used power supply, I/O and network modules for MELSEC Q Series can be used.

**Design and Development**

**Shortened design and development period**

Streamlined design and development through subdivision and structuring of programs

Flexible system configurations

Application of the same format as MELSEC to unify the design and development environment

Machine operation panel computerized and aggregated

CNC monitor installed

CNC CPU function expanded (macro interface function extended)

NC axis/PLC axis changeover

- **PLC CPU module with large memory capacity**
- **Facilitates subdivision and structuring of sequence programs**
- **GOT screen drawing tool (GT Designer)** enables simple custom screen development.
- **CNC monitor installed**
- **CNC CPU function expanded (macro interface function extended)**
- **NC axis/PLC axis changeover**

**Application of the same format as MELSEC to unify the design and development environment**

Machining operation panel computerized and aggregated

GOT screen drawing tool (GT Designer) enables simple custom screen development. Possible to operate machine with the touch panel screen, instead of the conventional machine operation panel.

**CNC monitor installed**

CNC monitor has been installed, which allows editing of machining programs and setting each CNC data. The CNC monitor can be simply installed from GT Designer; thus no need to develop screen. The CNC monitor screen can be displayed by connecting to the CNC CPU’s DISPLAY interface via Ethernet or by connecting to the main base via bus. The CNC monitor requires a GOT with SVGA or XGA resolution.

**CNC CPU function expanded (macro interface function extended)**

Possible to define up to 1200 sets of variables, which are able to write/read from a PLC CPU. These variable sets can be handled as system variables in the machining program. Write/Read is performed using special instructions. This function is useful when a large number of variable sets are needed, such as for a grinder.

**NC axis/PLC axis changeover**

Even if a pallet is changed, the axis can always be controlled as an NC axis in the machining area, and as a PLC axis in the setup area, which enables setup of a rotary axis without stopping machining.
**Highly Reliable Safety Observation Function which Conforms to the European Safety Standard EN ISO 13849-1 PL d**

**Safety Observation Function**
- **Safety Signal Comparison (Duplex Safety Circuit)**
  - PLC CPU and CNC CPU observe the consistency of safety signals input/output in two systems.
  - User's safety sequence is executed by both PLC CPU and CNC CPU.
  - If a safety signal comparison error occurs, emergency stop will activate to shut down power to the drive system.
- **Emergency Stop Duplexing**
  - Safety signal is input/output by 2 systems.
  - Each CPU shuts down power in the event of an error.
  - Door signal is input into the drive unit (speed monitoring by each door is possible).

**CNC Speed Observation Function**
- CNC CPU and Drive unit CPU observe to see if motor's command speed and feedback speed exceed the safe speed when the machine's protection door is open.
- If an exceeding speed is detected, it causes emergency stop to shut off the drive system power.
- Possible to enable/disable speed observation for the axes for each door (up to 16 doors).

**Dual Signal Module Specification (Q173SXY)**
- Signals are connected to 20 input points and 12 output points in 2 systems.
- Up to 3 modules can be mounted.

**Other Safety Related Functions**
- **Edit Lock (Program Protect)**
  - The edit lock function inhibits machining program B or C (group with machining program numbers) from being edited or erased to protect the programs.
- **Operator Authentication (GOT)**
  - The operation and browse level (authority) can be set for each operator by password to "strengthen security" and "prevent operation mistakes".
- **Stored Stroke Limit**
  - Set the tool's prohibited area to avoid collision.
- **Door Interlock**
  - European Safety Standards CE Marking (machine directive) prohibits machine protection door from being opened during axis traveling. Door interlock function decelerates and stops all the control axes when door open signal is input from PLC, and then performs Ready OFF to shut down the drive inside the servo drive unit to disable the motor driving.

**Energy-Savings with a High-Efficiency Spindle Motor, Servo Motor, and Drive Unit**

**Drive Unit (MDS-D/DH Series, MDS-DM Series)**
- 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 the torque.

**Mitsubishi Electric's FA Expertise Fully Supports the Manufacturing Floor**

**Mitsubishi Factory Automation Solutions**
- We provide best suited systems for users from our accumulated Factory Automation expertise and experience.
- We support from lower to upper components and networks required in manufacturing, as well as the applications needed for control.
Case Study

One CNC can control up to 7 part systems and 16 axes. Up to two CNC modules can be mounted. This can be applied to from multi-axis lathe and machining center to multi-axis and multi-part system transfer machine.

### Compound lathe (two spindles and two turrets, equipped with workpiece conveying robot)

One CNC CPU can control both the 2-part system lathe turning and transfer loader control. Possible to control both synchronization and separate operations between the right and left sides.

### Compound lathe (with milling function)

One CNC CPU can control both the 2-part system lathe turning and milling.

### Machining center (horizontal)

One CNC CPU can control both milling and auxiliary control such as tool magazine and ATC arm.

### Transfer machine

One CNC CPU can control up to 7 part systems and 16 axes.

### Processing robot cell

One PLC CPU plus up to three other CPUs (CNC, robot and motion controller) can be mounted on a single base. Note that if two CNC CPUs are used, up to three CPUs including the PLC CPU can be mounted.

- Helps reduce size and wiring of the control panel.
- Helps reduce cycle time.
Software tools supporting CNC operation and development environments

Remote Monitor Tool
By connecting a personal computer to a CNC module, various data can be checked and set using the same HMI (Human Machine Interface) as the CNC monitor. This tool can be downloaded from MELFANSweb free of charge.

MS Configurator/servo adjustment support tool
Serve parameters can be automatically adjusted by activating the motor with machining programs for adjustment or vibration signals, and measuring/analyzing the machine characteristics. This tool can be downloaded from MELFANSweb free of charge.

GX Developer/sequence programming tool
The MELSEC programming tool, offering a wide array of functions and easy use, allows for convenient program design and debugging. Linking with a simulator or other utility allows for the efficient programming.

NC Configurator/CNC parameter set-up support tool
CNC data necessary for CNC control and machine operation (such as parameters, tool data and common variables) can be edited on a personal computer. The edited data can be then transferred to the CNC.

Servo selection tool
By selecting the machine configuration model and inputting the machine specifications, the optimal servo motor that meets the specification can be selected. Other selection functions which totally support the drive system selection are also available. This tool can be downloaded from MELFANSweb free of charge.

GT Designer/screen design support tool
Screen design software with many user-oriented functions, making custom screen creation easy.

GT SoftGOT1000 (supported by GOT1000) / HMI software
Screen data created by GT Designer is available on personal computers and panel computers.

For compatible versions, please contact us. *GT Designer2 Version 2 screen image

Better linkage with other applications and more flexibility when creating screens
- Internal device interface functions: Using these functions, user-created applications can read/write data from/to the GOT internal devices. It is possible to construct advanced systems by linking data to user applications such as a data logger.
- Startup of other applications: In full-screen mode, other applications can be started with touch switches on the monitor screen of the GT SoftGOT1000.

Connection with MELSEC instrumentation
- GT SoftGOT1000 and FX Developer monitoring tools can be connected to easily establish an instrumentation monitoring system.

A part of functions available on GT1000 (such as CNC monitor) is not available on SoftGOT1000.
CNC related module

<table>
<thead>
<tr>
<th>Product name</th>
<th>Model name</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Battery set</td>
<td>GT1090B2F</td>
<td>One each of the battery holder and a battery unit connection cable (using GT1089B4TC or GT1089B4TC1 and battery, GBM841).</td>
</tr>
</tbody>
</table>

Cable for CNC CPU

<table>
<thead>
<tr>
<th>Product name</th>
<th>Model name</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSC1</td>
<td>Manual pulse generator : 1ch</td>
<td>5V power supply is available</td>
</tr>
<tr>
<td>FSC2</td>
<td>Manual pulse generator : 2ch</td>
<td>For connection with signal splitter</td>
</tr>
<tr>
<td>FSC3</td>
<td>Manual pulse generator : 3ch</td>
<td>For connection with signal splitter</td>
</tr>
<tr>
<td>GBM841</td>
<td>Optical servo communication</td>
<td>ROB type with reinforced sheath for wiring outside the panel</td>
</tr>
<tr>
<td>GBM850</td>
<td>Optical servo communication</td>
<td>ROB type with reinforced sheath for wiring inside the panel</td>
</tr>
<tr>
<td>H100</td>
<td>Fire connection with optical pulse</td>
<td>5V power supply is available</td>
</tr>
<tr>
<td>H101</td>
<td>1ch manual pulse generator</td>
<td>5V power supply is available</td>
</tr>
<tr>
<td>H102</td>
<td>1ch manual pulse generator</td>
<td>5V power supply is available</td>
</tr>
</tbody>
</table>

Dual signal module

<table>
<thead>
<tr>
<th>Product name</th>
<th>Model name</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dual signal module</td>
<td>GT102541</td>
<td>16 relay monitoring unit (all 16 relays are open)</td>
</tr>
<tr>
<td>Dual signal module</td>
<td>GT101567</td>
<td>For connection with logic 16-bits parallel inputs up to 16 relays</td>
</tr>
<tr>
<td>Terminal block</td>
<td>FC-O110AF</td>
<td>Terminal block conversion unit (purchase from Mitsubishi Electric Engineering)</td>
</tr>
<tr>
<td>Cable</td>
<td>FA-6034-L38N-4M-W</td>
<td>Terminal block conversion unit connection cable (length = 4m)</td>
</tr>
</tbody>
</table>

Peripheral unit

<table>
<thead>
<tr>
<th>Product name</th>
<th>Model name</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signal splitter</td>
<td>GT102152</td>
<td>Option necessary for 2 or 3-axis manual pulse generator</td>
</tr>
<tr>
<td>Manual pulse generator</td>
<td>GT102159</td>
<td>5V power supply</td>
</tr>
<tr>
<td>Manual pulse generator</td>
<td>GT102160</td>
<td>12V power supply</td>
</tr>
</tbody>
</table>

Drive unit

<table>
<thead>
<tr>
<th>Model name</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDS-D-SVJ3/SPJ3 Series</td>
<td>Manual pulse generator (2ch)</td>
</tr>
<tr>
<td>MDS-DM Series</td>
<td>Multi-axis integrated power regeneration type</td>
</tr>
<tr>
<td>MS1000/1000 Series</td>
<td>Resistance regeneration type</td>
</tr>
</tbody>
</table>

Use Mitsubishi CNC's dedicated drive system (drive unit, servo motor and spindle motor).

Other drive units, servos motors and spindle motors, which are not Mitsubishi CNC's dedicated products, such as Mitsubishi general-purpose AC servo drive, cannot be used.

For the Mitsubishi CNC's dedicated drive system, please refer to "MITSUBISHI CNC DRIVE SYSTEM GENERAL CATALOG".

For other related units, please contact us.

MESEL related module

Main base

<table>
<thead>
<tr>
<th>Product name</th>
<th>Model name</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>MELSEC CPU</td>
<td>MELSEC-1</td>
<td>High-speed main base unit</td>
</tr>
<tr>
<td>PLC CPU</td>
<td>GT102128</td>
<td>12 slots</td>
</tr>
<tr>
<td>GT102129</td>
<td>8 slots</td>
<td></td>
</tr>
</tbody>
</table>

Universal model CPU

<table>
<thead>
<tr>
<th>Product name</th>
<th>Model name</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>GT102141</td>
<td>Programmable CPU, high-speed model, 100-240VAC, 12-slot main base unit</td>
<td></td>
</tr>
<tr>
<td>GT102142</td>
<td>Programmable CPU, 100-240VAC, 8-slot main base unit</td>
<td></td>
</tr>
<tr>
<td>GT102143</td>
<td>Programmable CPU, 100-240VAC, 5-slot main base unit</td>
<td></td>
</tr>
<tr>
<td>GT102144</td>
<td>Programmable CPU, 100-240VAC, 3-slot main base unit</td>
<td></td>
</tr>
<tr>
<td>GT102145</td>
<td>Programmable CPU, 100-240VAC, 2-slot main base unit</td>
<td></td>
</tr>
</tbody>
</table>

Basic power supply module

<table>
<thead>
<tr>
<th>Product name</th>
<th>Model name</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply</td>
<td>QCPU</td>
<td>24VDC, built-in flash memory 15MB</td>
</tr>
<tr>
<td>GT102146</td>
<td>DC input voltage: 100 to 120VAC, output voltage: 65VDC, output current: 6A</td>
<td></td>
</tr>
<tr>
<td>GT102147</td>
<td>DC input voltage: 24VDC, output voltage: 65VDC, output current: 8A</td>
<td></td>
</tr>
<tr>
<td>GT102148</td>
<td>DC input voltage: 100 to 120VAC, output voltage: 65VDC, output current: 8A</td>
<td></td>
</tr>
</tbody>
</table>

GOT related unit

GT16 model

<table>
<thead>
<tr>
<th>Model name</th>
<th>Model name</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>GT16M-STBA</td>
<td>15.0&quot; XGA [1024×768 dots] TFT color LCD, high brightness, wide viewing angle, 64-bit color, built-in Ethernet, Program capacity: 260k steps, optimum for high-end applications</td>
<td></td>
</tr>
<tr>
<td>GT16M-STBD</td>
<td>15.0&quot; XGA [1024×768 dots] TFT color LCD, high brightness, wide viewing angle, 64-bit color, built-in Ethernet, Program capacity: 260k steps, optimum for high-end applications</td>
<td></td>
</tr>
<tr>
<td>GT16M-STCA</td>
<td>15.0&quot; XGA [1024×768 dots] TFT color LCD, high brightness, wide viewing angle, 64-bit color, built-in Ethernet, Program capacity: 260k steps, optimum for high-end applications</td>
<td></td>
</tr>
<tr>
<td>GT16M-STCB</td>
<td>15.0&quot; XGA [1024×768 dots] TFT color LCD, high brightness, wide viewing angle, 64-bit color, built-in Ethernet, Program capacity: 260k steps, optimum for high-end applications</td>
<td></td>
</tr>
<tr>
<td>GT16M-STCC</td>
<td>15.0&quot; XGA [1024×768 dots] TFT color LCD, high brightness, wide viewing angle, 64-bit color, built-in Ethernet, Program capacity: 260k steps, optimum for high-end applications</td>
<td></td>
</tr>
<tr>
<td>GT16M-STCD</td>
<td>15.0&quot; XGA [1024×768 dots] TFT color LCD, high brightness, wide viewing angle, 64-bit color, built-in Ethernet, Program capacity: 260k steps, optimum for high-end applications</td>
<td></td>
</tr>
</tbody>
</table>

GT16 model is also available

(Note) This model requires a GOT with SVGA or XGA resolution.

For other related units, please contact us.
### Specifications

#### Installation environment conditions

**CNC CPU module**

- **Operating altitude**
  - 2000m (6561.68ft.) or lower

- **Operating ambient humidity**
  - 5% to 95%RH, non-condensing

- **Operating temperature**
  - 0°C to 55°C

- **Overvoltage category**
  - II or less

#### Outline drawings

**CNC CPU module (Q173NCCPU)**

**Main base/Extension base**

**Signal splitter**

*(Note) Signal splitter allows DIN rail installation only.*

**Battery for CNC CPU (Q173NCCPU)**

**Manual**

The manuals relating to the C70 are listed below. All of the latest versions of the manuals can be downloaded from MELFANSweb.

<table>
<thead>
<tr>
<th>Classification</th>
<th>Manual title</th>
<th>Manual No.</th>
<th>Model code</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>C70</td>
<td>C70 Instruction Manual</td>
<td>IB-1500269</td>
<td>IB-1500891</td>
<td>Details of hardware and function specifications</td>
</tr>
<tr>
<td>C70</td>
<td>C70 Programming Manual (Machining Center System)</td>
<td>IB-1500259</td>
<td>IB-1500891</td>
<td>Programming with G code for machining center system</td>
</tr>
<tr>
<td>C70</td>
<td>C70 PLC Interface Manual</td>
<td>IB-1500250</td>
<td>IB-1500891</td>
<td>Specification of multi-axis integrated power regeneration type units</td>
</tr>
<tr>
<td>C70</td>
<td>C70 Programming Manual (Lathes/Systems)</td>
<td>IB-1500275</td>
<td>IB-1500891</td>
<td>Programming with G code (for lathes)</td>
</tr>
</tbody>
</table>

#### Signal splitter

- **Model code**: Q68BQ65BQ63B
- **Part explanation**: For MITSUBISHI’s servicing (not used)
- **Part no.**: 100-019

#### Battery for CNC CPU (Q173NCCPU)

- **Guaranteed lifetime**: 27,000hr
- **Power-on time ratio**: 50% (When the total power-on time is 12 hours and the total power-off time is 12 hours, the power-on time ratio is 50%).
- **Back-up time**: 3 minutes

### Manual

The manuals relating to the C70 are listed below. All of the latest versions of the manuals can be downloaded from MELFANSweb.
### Functional Specifications

<table>
<thead>
<tr>
<th>Class</th>
<th>M systems</th>
<th>L system</th>
<th>General explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control axes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of basic control axes (NC axes)</td>
<td>25</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Number of programmable control axes (PLC axes)</td>
<td>16</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Number of simultaneous control axes</td>
<td>8</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Unit system</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positioning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum limit of positioning</td>
<td>8</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Linear interpolation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Circular interpolation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Absolute positioning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incremental positioning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hard stops &amp; brake control</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit system</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of control axes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of PLC control axes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum number of PLC axes available in the control system</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positioning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of simultaneous control axes</td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Number of axes with which simultaneous interpolation is possible</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Data memory

<table>
<thead>
<tr>
<th>Class</th>
<th>M systems</th>
<th>L system</th>
<th>General explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program memory</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total memory</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blank capacity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total memory</td>
<td>1000KB</td>
<td>1000KB</td>
<td></td>
</tr>
<tr>
<td>Blank capacity</td>
<td>125KB</td>
<td>125KB</td>
<td></td>
</tr>
<tr>
<td>Total memory</td>
<td>60KB</td>
<td>60KB</td>
<td></td>
</tr>
<tr>
<td>Blank capacity</td>
<td>30KB</td>
<td>30KB</td>
<td></td>
</tr>
<tr>
<td>Total memory</td>
<td>15KB</td>
<td>15KB</td>
<td></td>
</tr>
<tr>
<td>Blank capacity</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Tool system

<table>
<thead>
<tr>
<th>Class</th>
<th>M systems</th>
<th>L system</th>
<th>General explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program format</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Format 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Format 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Format 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Format 4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Feed

<table>
<thead>
<tr>
<th>Class</th>
<th>M systems</th>
<th>L system</th>
<th>General explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feedrate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hole entry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hole entry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hole entry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hole entry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hole entry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hole entry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hole entry</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Feedrate control methods

<table>
<thead>
<tr>
<th>Class</th>
<th>M systems</th>
<th>L system</th>
<th>General explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feedrate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>interpolation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>interpolation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>interpolation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>interpolation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>interpolation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>interpolation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>interpolation</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Overload

<table>
<thead>
<tr>
<th>Class</th>
<th>M systems</th>
<th>L system</th>
<th>General explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overload</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overload</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overload</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overload</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overload</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### threaded

<table>
<thead>
<tr>
<th>Class</th>
<th>M systems</th>
<th>L system</th>
<th>General explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>threaded</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>threaded</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>threaded</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>threaded</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>threaded</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>threaded</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Main memory

<table>
<thead>
<tr>
<th>Class</th>
<th>M systems</th>
<th>L system</th>
<th>General explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main memory</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main memory</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main memory</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main memory</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Maintenance

<table>
<thead>
<tr>
<th>Class</th>
<th>M systems</th>
<th>L system</th>
<th>General explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maintenance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maintenance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maintenance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maintenance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maintenance</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Other

<table>
<thead>
<tr>
<th>Class</th>
<th>M systems</th>
<th>L system</th>
<th>General explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Conclusion

The functional specifications for the C700 Series are as follows:

- **Control axes**
  - Number of basic control axes (NC axes): 25
  - Number of programmable control axes (PLC axes): 16
- **Unit system**
  - Positioning: 4 simultaneous control axes
  - Number of axes with which simultaneous interpolation is possible: 4
- **Data memory**
  - Total memory: 1000KB
  - Blank capacity: 125KB
  - Total memory: 60KB
  - Blank capacity: 30KB
  - Total memory: 15KB
- **Feedrate control methods**
  - Interpolation: linear interpolation, circular interpolation, absolute positioning, incremental positioning, hard stops, and brake control.
  - Main memory: 1MB
  - Maintenance: regular maintenance and additional maintenance.

This information provides a comprehensive overview of the specifications for the C700 Series, ensuring that users have the necessary details to operate the system effectively.
### Operation and Display

**Standard**
- Front panel display
- Keypad display
- LCD display

**Optional**
- LCD/Monitor display
- LCD panel
- Display panel

**Selection**
- LCD display
- Monitor display
- Flat panel display
- A-B-C-D display

### Display Methods and Functions (CNC Function) [Standard/Optional/Selection]

<table>
<thead>
<tr>
<th>Display Method</th>
<th>Function</th>
<th>Standard</th>
<th>Optional</th>
<th>Selection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color display (EDT)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digit display (EDT)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Text display (EDT)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number display</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time display</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Date display</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clock display</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sub-display</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Display Functions (Standard)

- Screen capture
- Displayed part system switch
- Color display (GOT)
- Polish
- Simplified Chinese characters
- Chinese
- Spanish
- English

### Additional Languages

- C70
- M system
- L system
- No limit

### Special Function (Standard/Optional/Selection)

- Machining program input/output
- Additional languages
- Standard
- Optional
- Selection

### Special Function (Optional)

- Machining program searching
- Machining program creating and editing
- Spindle, tool and workpiece related settings
- User parameter settings
- Manual numeric command issuing and tool length measurement

### Special Function (Selection)

- Color switch
- Screen capture
- Displayed part system switch
- Color display

### Output/Contents

- CNC data
- Common variable input/output
- Machining program input/output
- Additional languages
- Displayed part system switch
- Color display

### Operation

- Screen capture
- Displayed part system switch
- Color display

### Display Contents

- CNC data
- Common variable input/output
- Machining program input/output
- Additional languages
- Displayed part system switch
- Color display

### Output/Contents

- CNC data
- Common variable input/output
- Machining program input/output
- Additional languages
- Displayed part system switch
- Color display

### Display Contents

- CNC data
- Common variable input/output
- Machining program input/output
- Additional languages
- Displayed part system switch
- Color display

### Output/Contents

- CNC data
- Common variable input/output
- Machining program input/output
- Additional languages
- Displayed part system switch
- Color display

### Display Contents

- CNC data
- Common variable input/output
- Machining program input/output
- Additional languages
- Displayed part system switch
- Color display

### Output/Contents

- CNC data
- Common variable input/output
- Machining program input/output
- Additional languages
- Displayed part system switch
- Color display

### Display Contents

- CNC data
- Common variable input/output
- Machining program input/output
- Additional languages
- Displayed part system switch
- Color display

### Output/Contents

- CNC data
- Common variable input/output
- Machining program input/output
- Additional languages
- Displayed part system switch
- Color display

### Display Contents

- CNC data
- Common variable input/output
- Machining program input/output
- Additional languages
- Displayed part system switch
- Color display

### Output/Contents

- CNC data
- Common variable input/output
- Machining program input/output
- Additional languages
- Displayed part system switch
- Color display

### Display Contents

- CNC data
- Common variable input/output
- Machining program input/output
- Additional languages
- Displayed part system switch
- Color display

### Output/Contents

- CNC data
- Common variable input/output
- Machining program input/output
- Additional languages
- Displayed part system switch
- Color display
**Coordinate System**

<table>
<thead>
<tr>
<th>Class</th>
<th>CTB</th>
<th>M system</th>
<th>L system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine coordinate system</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Coordinate system setting</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Automatic coordinate system setting</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Coordinate system selection</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Coordinate system type and setting</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Machine tool code</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Coordinate system for rotary axis</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Coordinate system for external workpiece coordinate offset</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Local coordinate system</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Coordinate system for rotary axes</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Coordinate system for external workpiece coordinate offset</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Origin set/cancel post</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Counter side display</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

**General explanation**

The machine coordinate system is used to ensure the positional precision of machine tools. The machine coordinate system is a system for setting up the machine, and the positional accuracy of the workpiece is guaranteed when the same positional accuracy is maintained by various settings performed during machine operation.

The machine coordinate system is set to the right position by returning the spindle after the machine has been turned ON in an absolute position, or is returned to the origin position automatically (after the machine has been turned OFF) when the power is turned OFF.

By default, the coordinate system is the standard machine coordinate system (MMC), and you can select other coordinate systems when necessary. Return when the machine coordinate system (zero point of coordinate position) is selected as the fundamental coordinate system.

**Program start**

<table>
<thead>
<tr>
<th>Program start</th>
<th>CTB</th>
<th>M system</th>
<th>L system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automatic operation start</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

This function enables the tool to be returned manually to the machine's default origin position (coordinate position 0). This function is enabled by the following functions:

- Manual interruption
- Manual numerical value command
- Manual emergency stop
- Manual tool change
- Manual position return

**Program end**

<table>
<thead>
<tr>
<th>Program end</th>
<th>CTB</th>
<th>M system</th>
<th>L system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine tool code</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

This function enables the tool to be returned manually to the machine's default origin position (coordinate position 0). This function is enabled by the following functions:

- Manual interruption
- Manual numerical value command
- Manual emergency stop
- Manual tool change
- Manual position return

**Operative support functions**

<table>
<thead>
<tr>
<th>Operative support functions</th>
<th>CTB</th>
<th>M system</th>
<th>L system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual numerical value command</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

This function enables the tool to be returned manually to the machine's default origin position (coordinate position 0). This function is enabled by the following functions:

- Manual interruption
- Manual numerical value command
- Manual emergency stop
- Manual tool change
- Manual position return

**Automatic operation start**

<table>
<thead>
<tr>
<th>Automatic operation start</th>
<th>CTB</th>
<th>M system</th>
<th>L system</th>
</tr>
</thead>
</table>

This function enables the tool to be returned manually to the machine's default origin position (coordinate position 0). This function is enabled by the following functions:

- Manual interruption
- Manual numerical value command
- Manual emergency stop
- Manual tool change
- Manual position return

**Manual operation**

<table>
<thead>
<tr>
<th>Manual operation</th>
<th>CTB</th>
<th>M system</th>
<th>L system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual interruption</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

This function enables the tool to be returned manually to the machine's default origin position (coordinate position 0). This function is enabled by the following functions:

- Manual interruption
- Manual numerical value command
- Manual emergency stop
- Manual tool change
- Manual position return

**Manual numerical value command**

<table>
<thead>
<tr>
<th>Manual numerical value command</th>
<th>CTB</th>
<th>M system</th>
<th>L system</th>
</tr>
</thead>
</table>

This function enables the tool to be returned manually to the machine's default origin position (coordinate position 0). This function is enabled by the following functions:

- Manual interruption
- Manual numerical value command
- Manual emergency stop
- Manual tool change
- Manual position return
Program:
- Subprogram control
  - If system is set for multiple subprograms, it can be used as a 1st layer of program.
- User macro
  - If system is set for multiple user macros, it can be used as a 1st layer of program.
- Machine identification
  - This function enables the machine programs using a user-defined function. This function can be used as a 1st layer of program.

Machine control:
- User macro
  - This function can be used as a 1st layer of program.
- Machine identification
  - This function can be used as a 1st layer of program.

Program ability functions:
- Multi-part system control
  - This function can be used as a 1st layer of program.
- Fixed cycle for turning machining
  - This function can be used as a 1st layer of program.
- Compound type fixed cycle for turning
  - This function can be used as a 1st layer of program.
- Balance cut
  - This function can be used as a 1st layer of program.
- Start point designation timing
  - This function can be used as a 1st layer of program.
- Timing synchronization between different part systems
  - This function can be used as a 1st layer of program.
- Chopping
  - This function can be used as a 1st layer of program.
- Corner chamfering/Corner R
  - This function can be used as a 1st layer of program.
- Coordinate rotation by program
  - This function can be used as a 1st layer of program.
- Mirror image for facing tool posts
  - This function can be used as a 1st layer of program.
- Mirror image by G code
  - This function can be used as a 1st layer of program.
- Coordinate rotation by G code
  - This function can be used as a 1st layer of program.
- Fixed cycle for turning machining
  - This function can be used as a 1st layer of program.

Program ability functions:
- Variable command
  - This function can be used as a 1st layer of program.
- 600 sets
  - This function can be used as a 1st layer of program.
- 300 sets
  - This function can be used as a 1st layer of program.

General explanation:
- When a cutting mode command is issued, the CNC system is set to the cutting control modes required for tapping.
- The tool offset amounts, that are set from the display can be input using program programs.
- The 1st and 2nd part systems.
- To machine the workpiece (balance cutting). In addition, since the workpiece is simultaneously cut from both sides of the workpiece and using them in synchronization, accuracy. In cases like this, the deflection can be minimized by holding tools may result, making it impossible for the workpiece to be machined with any start point.
- The synchronizing point can be placed in the middle of the block by designating the different part systems are to be synchronized or in cases when the operation of different part systems are to be synchronized. This function enables the program for cutting to be selected so as to be executed in the 1st layer of program.
- This function compensates for the workpiece deflection caused by deflection of the machine. In cases like this, the deflection can be minimized by holding tools may result, making it impossible for the workpiece to be machined with any start point.
- A series of cuts is performed: first, the tool departs from the center of the circle, and then the tool moves to the outside of the circle. This function enables skip operations to be performed by signals which are input to the control unit.
### Machine Functions

<table>
<thead>
<tr>
<th>Class</th>
<th>CTB</th>
<th>General Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M system</td>
<td>L system</td>
</tr>
<tr>
<td></td>
<td>Optional</td>
<td>Standard</td>
</tr>
</tbody>
</table>

#### Quality Assurance

- **Machine functions**
  - System maintenance
  - Machine function monitoring
  - Backup (MS Configurator)
  - Servo automatic tuning
  - Program display lock
  - Program protection (Edit lock B, C)
  - Door interlock I
  - Door interlock II
  - Door interlock III
  - External deceleration
  - Interlock
  - Chuck/Tailstock barrier check

#### Class and System

- **Safety and Interlock**
  - Multi-ladder program register and built-in PLC basic function
  - Built-in PLC support functions
  - Built-in PLC support functions

#### PLC Support

- **Machine support functions**
  - Built-in PLC development tool (MELSEC-Q series)
  - Built-in CNC development tool (MELSEC-Q series)
  - Built-in CNC development tool (MELSEC-Q series)
  - Built-in CNC development tool (MELSEC-Q series)

#### Configuration

- **Configuration information**
  - MDS-DH-V1/DH-V2 (400V)
  - MDS-D-V1/D-V2 (200V)
  - MDS-D-SVJ3 (200V)
  - MDS-D-SPJ3 (200V)
  - MDS-DM-V3 (200V)

#### PLC Configuration

- **PLC connection**
  - CC-Link (Master/Slave)
  - CC-Link/LT
  - RS-422/RS-232C

#### CNC Operation

- **JOG operation**
  - CNC exclusive JOG operation
  - Built-in JOG operation

#### PLC Interface

- **PLC interface**
  - MITSUBISHI Graphic Operation Terminal (GOT)
  - MITSUBISHI Graphic Operation Terminal (GOT)
  - MITSUBISHI Graphic Operation Terminal (GOT)

#### PLC Setting

- **Program management**
  - Program management
  - Program management
  - Program management

#### Other

- **Options**
  - Built-in PLC configuration tool
  - John's Option A
  - John's Option B
  - John's Option C
  - John's Option D
  - John's Option E

---

*Note: The table above is a simplified representation of the document content. For detailed information, please refer to the original document.*
Safety Warning

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

Eco Changes is the Mitsubishi Electric Group’s environmental statement, and expresses the Group’s stance on environmental management. Through a wide range of businesses, we are helping contribute to the realization of a sustainable society.