



Changes for the Better

Mitsubishi Servo System Family Catalog



for a greener tomorrow





The most sophisticated drive applications increasingly chosen by the world

MELSERVO



World-class quality, performance, and system development potential. Achieve these possibilities with Mitsubishi Servo Systems.

World-class quality and performance. Backed by the rock-solid system service capabilities of Mitsubishi Electric as a comprehensive FA supplier, MELSERVO products are playing critical roles in the growing success of manufacturers all over the world.

Providing sophistication to the world. Moving toward sophisticated drive applications. We, Mitsubishi Electric, offer to our customers global sales support and service systems.

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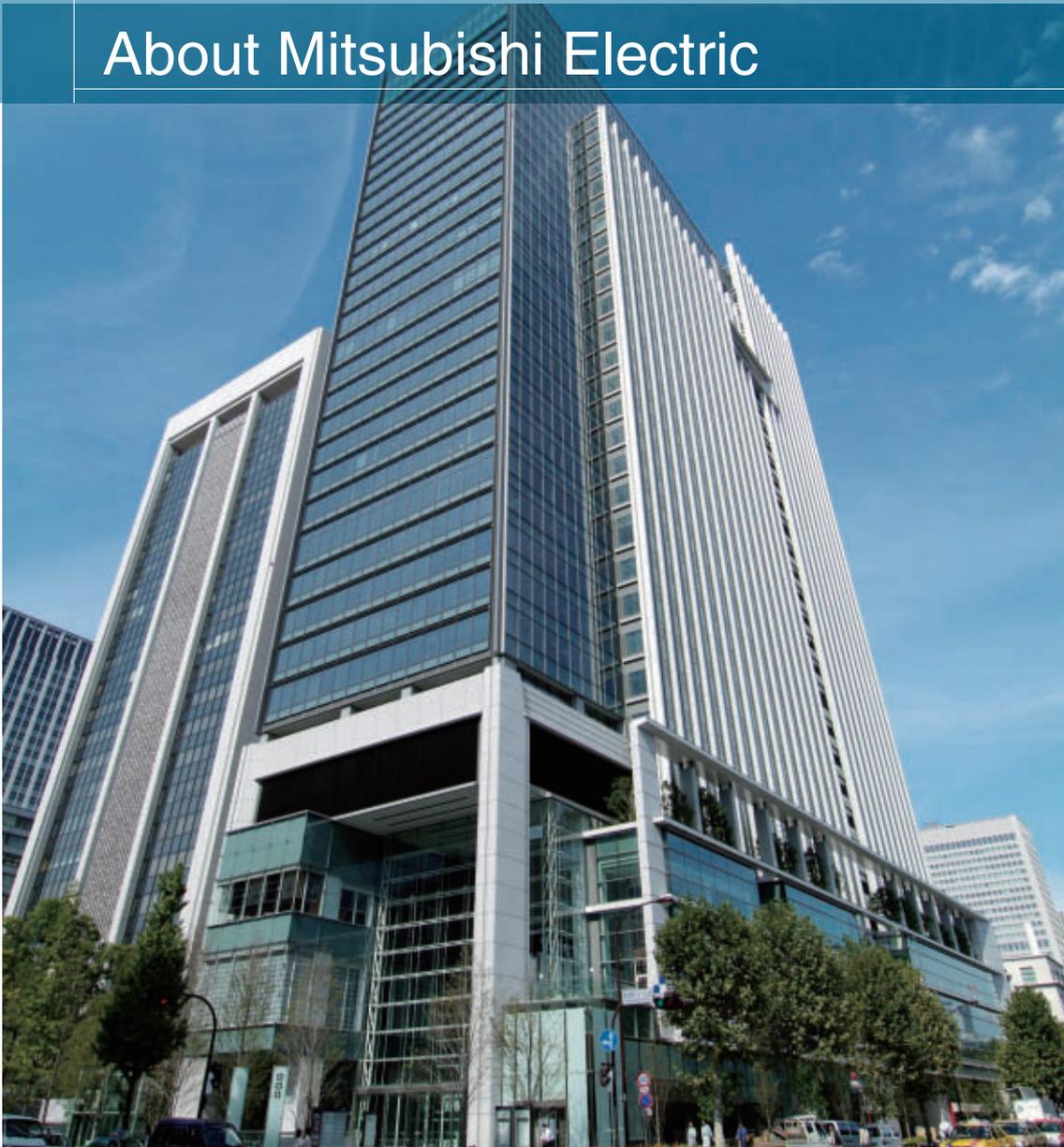
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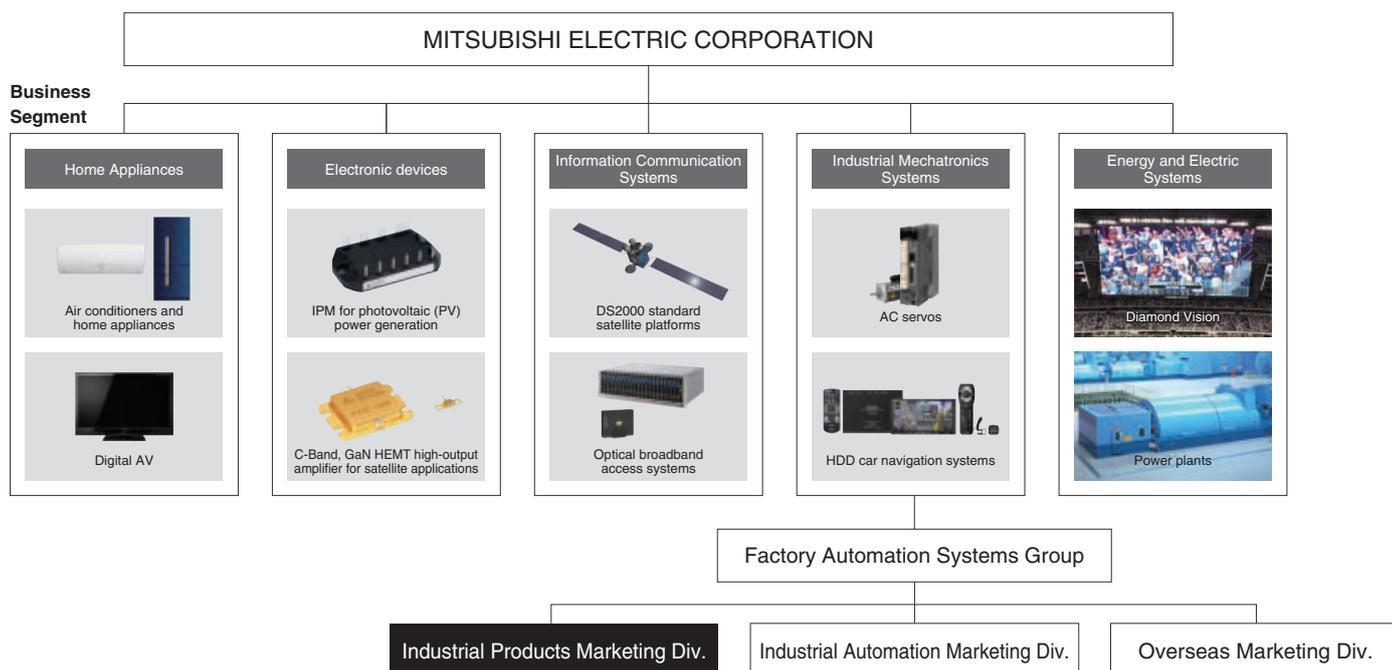
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About Mitsubishi Electric

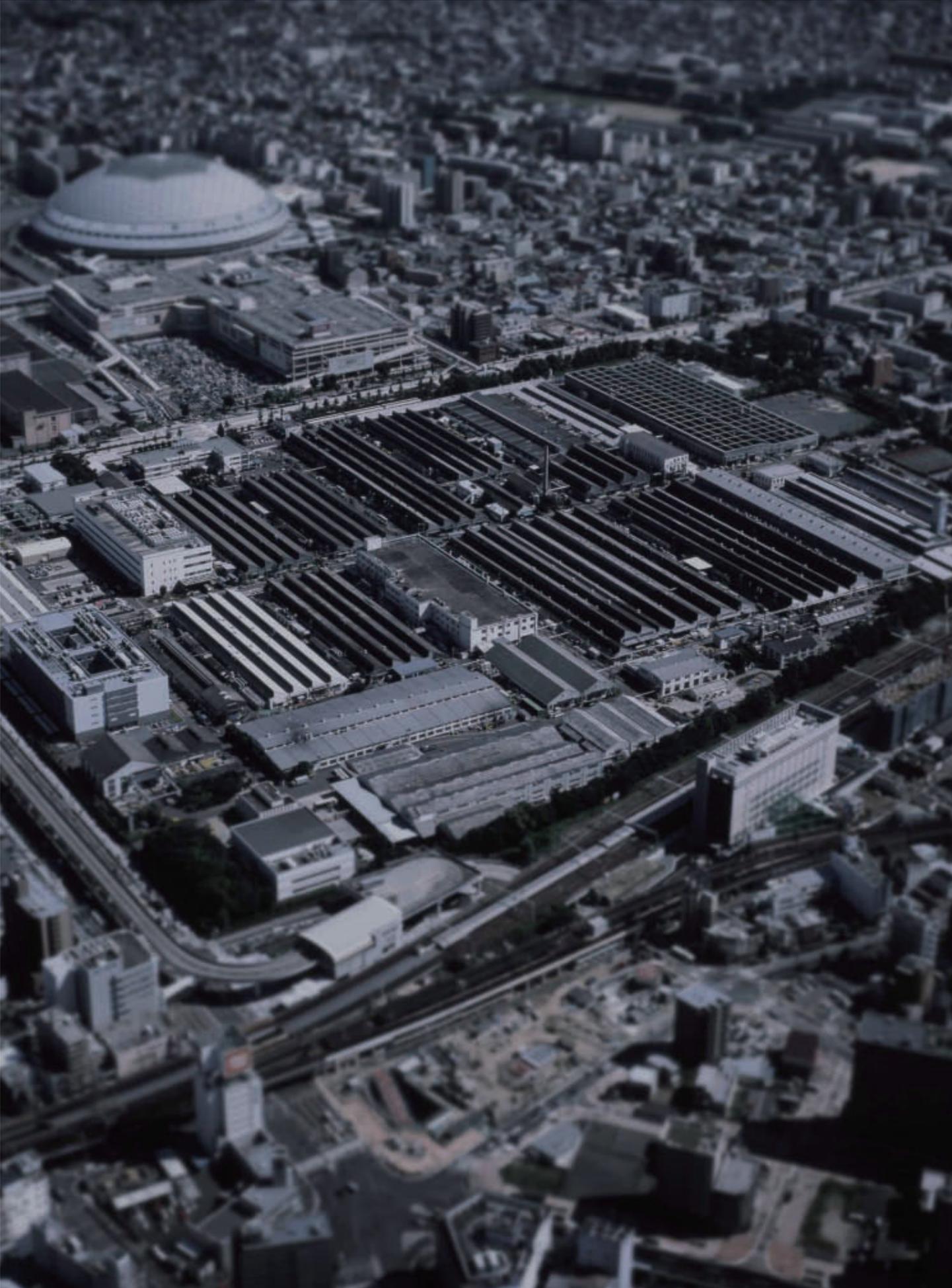


Expanding Our Business From Homes to Outer Space With Our Corporate Statement - “Changes for the Better”

Mitsubishi Electric Corporation was established in 1921 as a manufacturer of transformers, motors, and products like electric fans. Over the years Mitsubishi Electric has expanded its business areas from Japan's first mainline electric locomotives to integrated manufacturing of elevators and escalators, transistorized computers, and Japan's first satellite. Today, Mitsubishi Electric is one of the world's leading electrical and electronic manufacturers, covering everything from household appliances to outer space equipment, and is developing world-class business operations in five areas: (1) Energy and electric systems such as turbine generators, large display devices, and elevators; (2) Industrial mechatronics systems such as programmable controllers, servos, and car multimedia products; (3) Information communication systems such as wireless communication devices, satellites, and network security systems; (4) Electronic devices such as power modules, and high-frequency, optical, and LCD devices; and (5) Home appliances such as LCD televisions, room air conditioners, and refrigerators. Mitsubishi Electric's corporate statement, "Changes for the Better", expresses its commitment to enhancing the quality of society, industry and life, and contributing to an even better tomorrow.



Mitsubishi FA Business

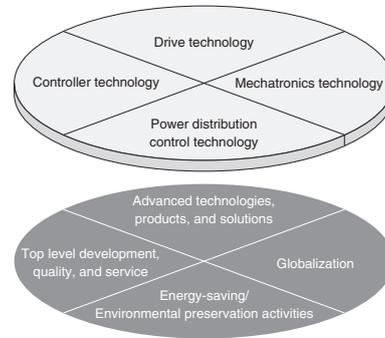


Mitsubishi Electric strives to be the best in customer satisfaction by providing total solutions.

In the 80 years since starting with general-purpose motors, the Factory Automation system Group of Mitsubishi Electric has developed mechatronics products and supported the manufacturing economies of Japan, China, other parts of Asia and the rest of the world. While developing our technologies in factory automation control, drive control, mechatronics, and production control, we have continuously expanded our product lines including controllers, driving devices, mechatronics products, and power distribution control products. Furthermore, we are among the first to offer not only product components but also an innovative manufacturing environment through e&eco-F@ctory and iQ Platform.

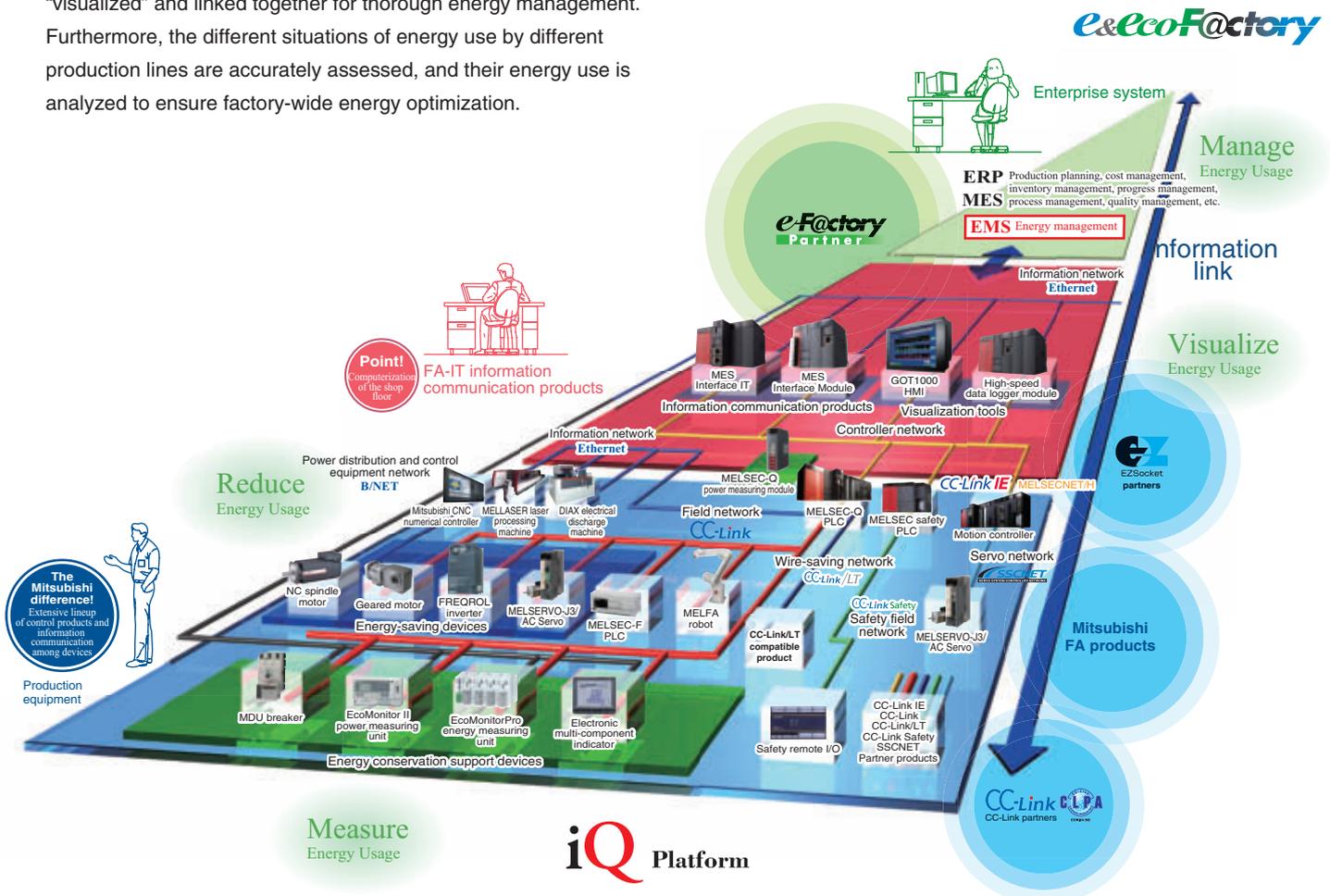
As a comprehensive FA supplier, Mitsubishi Electric will continue to offer FA products that meet customer demands throughout the world.

Total FA Solutions



e&eco-F@ctory achieves factory-wide optimization through effective utilization of energy information.

Transforming a factory into an e&eco-F@ctory means optimizing the factory from an energy perspective. In an e&eco-F@ctory, production and energy information are “visualized” and linked together for thorough energy management. Furthermore, the different situations of energy use by different production lines are accurately assessed, and their energy use is analyzed to ensure factory-wide energy optimization.



History

		1980	1985	1990	1995
Servo amplifier		 <p>● Launch of Mitsubishi's first servo amplifier MR-A/S0</p>	 <p>● First to introduce a completely digital servo MR-SA/SB/SC/SD</p>	 <p>● Industry's smallest servo (at the time) MR-J</p>  <p>● Launched super-miniaturized series MR-C</p>	 <p>● Most advanced servo (at the time) MR-H</p>  <p>MR-J2</p>  <p>● Launched the MR-J2-Super MR-J2-Super/J2M</p>
	Industry Needs	<ul style="list-style-type: none"> ● Improvement of productivity ● FMS 	<ul style="list-style-type: none"> ● Maintenance-free ● High-speed response ● Low-cost 	<ul style="list-style-type: none"> ● Miniaturized ● Low-noise ● Reduced wiring 	<ul style="list-style-type: none"> ● Compliant with standards ● Environment resistance ● High-speed and High-performance
Servo motor	Linear				
	Core type				
	Coreless type				
	Rotary	<p>Large capacity</p> <ul style="list-style-type: none"> ● 0.5 to 22kW <p>HA-SAL</p>			<p>● 0.5 to 22kW</p> <p>HA-LH</p>
Medium capacity	<ul style="list-style-type: none"> ● 0.2 to 7kW <p>HA-A</p> 	<ul style="list-style-type: none"> ● 0.2 to 22kW <p>HA-SA</p> 	<ul style="list-style-type: none"> ● 0.5 to 7kW <p>HA-SH</p>	<ul style="list-style-type: none"> ● 0.5 to 7kW <p>HC-SF/SFS</p> 	
Small capacity	<ul style="list-style-type: none"> ● 50 to 600W <p>HA-SQ/SC</p>		<ul style="list-style-type: none"> ● 50 to 600W <p>HA-FE/FH</p>	<ul style="list-style-type: none"> ● 50 to 750W <p>HC-KF/KFS</p>	
Direct drive motor					
Servo system controller	Motion controller				 <ul style="list-style-type: none"> ● A-series PLC compatible ● 1-CPU Built-in PLC ● Max. 8-axis control/Max. 32-axis control <p>A172SH/A173UHCPUN</p>
	Simple motion module				
	Positioning module				<ul style="list-style-type: none"> ● A-series compatible <p>AD75M</p>
Network	Servo system controller network (SSCNET)				<ul style="list-style-type: none"> ● High-speed (5.6Mbpsx2) ● Centralized parameter management ● ABS standard <p>SSCNET</p>
	Field network				<ul style="list-style-type: none"> ● 10Mbps <p>CC-Link</p>

Passing our technologies and experiences from one generation to the next, Mitsubishi Electric continuously strives for cutting-edge technology.

In 1987, Mitsubishi Electric announced MELSERVO-SA, the first completely digital hardware logic product at a time when analog products were at their zenith. Since then, we have pioneered servo technology in Japan with innovations like “model adaptive control” and “real time auto-tuning.” Carrying that heritage forward, we aim to not only continue offering servo systems rated highest for customer satisfaction but also achieve global acclaim for these products.

2000	2005	2010
<p>Series - the industry's fastest servos (at the time)</p>	<p>MR-J3</p>	<p>●2-axis type MR-J3W</p>
<p>MR-E</p>	<p>MR-E Super</p>	<p>●Launched One-touch servo MR-JN</p>
<ul style="list-style-type: none"> ●Networking ●Improvement of productivity (Per unit time, per unit area) 	<ul style="list-style-type: none"> ●Diagnostic functions ●Ease of startup ●Widened scope of servo application 	
<p>LM-H</p>	<p>LM-F</p>	<p>LM-H2</p>
	<p>LM-K,KA</p>	<p>●Continuous thrust 120 to 2400N LM-K2</p>
<p>LM-T</p>	<p>LM-U2</p>	
	<ul style="list-style-type: none"> ●Continuous thrust 50 to 800N 	
<p>●0.5 to 2kW HF-SE</p>	<p>●5 to 55kW HA-LP</p>	<p>●0.5 to 15kW HF-JP</p>
<p>●0.5 to 7kW HF-SP</p>	<p>●50 to 750W HF-KP/MP</p>	<p>●0.5 to 2kW HF-SN</p>
<p>●100 to 750W HF-KE</p>	<p>●50 to 750W HF-KN</p>	
		<p>Rated torque 2 to 240N-m TM-RFM</p>
<ul style="list-style-type: none"> ●Q-series PLC compatible ●Multi-CPU Scaled-up ●0.88ms: 1 to 8 axes ●Max. 32-axis control <p>Q173/Q172CPUN</p>	<p>●Q-series PLC/SSCNET III compatible</p> <ul style="list-style-type: none"> ●0.44ms: 1 to 3 axes ●Max. 32-axis control <p>Q173H/172HCPU</p>	<p>●Single Axis Motion Controller</p> <p>MR-MQ100</p>
		<ul style="list-style-type: none"> ●Stand-Alone Motion Controller ●Built-in PLC <p>Q170MCPUCPU</p>
		<ul style="list-style-type: none"> ●iQ Platform compatible ●0.44ms: 1 to 6 axes ●Max. 32-axis control <p>Q173D/172DCPU</p>
<ul style="list-style-type: none"> ●Q-series compatible <p>QD75M</p>	<p>●MR-J3/SSCNET III compatible QD75MH</p>	<p>LD77MH</p>
<ul style="list-style-type: none"> ●Multi-axis synchronous 	<p>●Multi-axis (16 axes) QD74MH</p>	
	<ul style="list-style-type: none"> ●High-speed processing (50Mbpsx2) ●High-reliability (optical communication) <p>SSCNET III</p>	
		<ul style="list-style-type: none"> ●1Gbps <p>CC-Link IE Field</p>

Progress ahead of technology and satisfaction.

Servo Application Examples

Industry leading performance MELSERVO supports various system configurations.

Mitsubishi Electric servo systems have built a track record of outstanding performance across a broad range of fields including liquid crystals and clean conveyors.

Going beyond servo amplifiers and motors, Mitsubishi Electric offers system level solutions that include programmable controllers, motion controllers, and networks to satisfy a broad scope of needs.



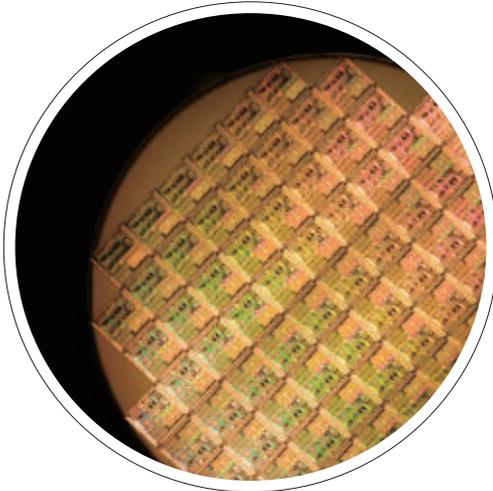
Material handling

Mitsubishi Electric servos support a wide variety of distribution and material handling systems. High-speed material handling and high-accuracy positioning with our servos promote efficiency and labor-savings in your production and handling line.



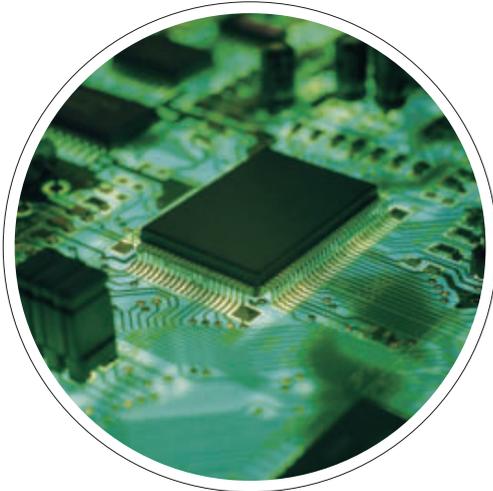
Food processing machines

Mitsubishi Electric servos play important roles in a wide variety of food product manufacturing processes such as shaping, filling, cutting, and packaging of food products made of all kinds of ingredients and in all shapes and sizes.



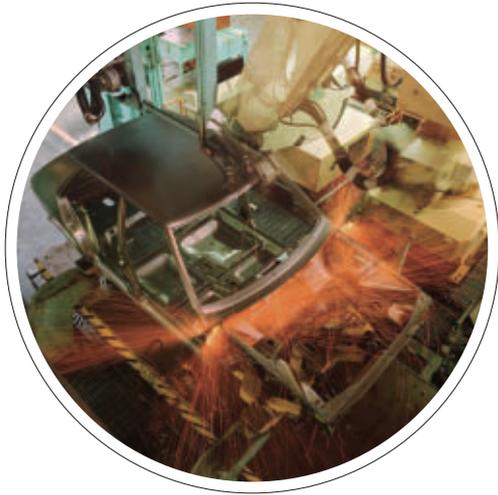
Semiconductor manufacturing Equipment

In today's semiconductor manufacturing process, wafer diameter is getting larger and components smaller. To meet the requirements of higher quality and productivity, Mitsubishi Electric's high-performance servos and high-resolution encoder achieve fast and accurate positioning at stable speeds.



Mounters

Flexible mounting of electronic components with high speed and density is demanded in printed circuit board applications. Mitsubishi Electric offers a high level of servo system solutions for rapid mounting of highly miniaturized components and for flexible mounting of irregular shapes.



Automobile
manufacturing
lines

Motion control using linear and circular interpolation and electronic cams in various types of processing lines support automobile manufacturing by boosting the productivity and flexibility of the assembly line.



Knitting
and
embroidery
machines

Mitsubishi Electric servos satisfy the textile industry's specific needs of multiobjective production and quality improvement. Our latest technologies enhance the uniformity of quality and production speed.



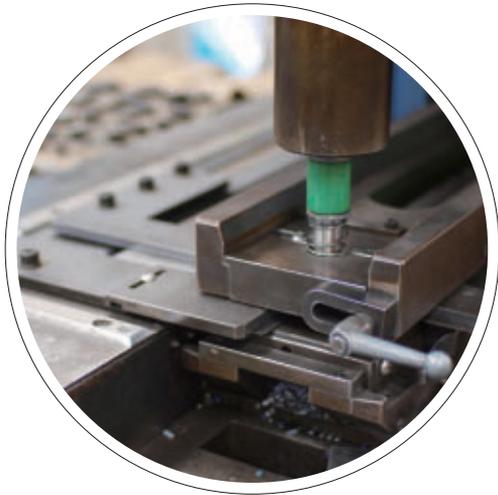
LCD
manufacturing
systems

In addition to the high-speed and high-accuracy positioning control, linear servos and a broad array of other actuators play important roles in the manufacturing of constantly evolving flat panel displays.



Printing
machines

Mitsubishi Electric provides high-accuracy synchronous system solutions for the paper feeding, printing, cutting, and assembly functions within the printing process. We make high-speed, high-quality printing possible.



Molding
machines

Various shapes of works are molded with high precision by motion control using electronic cams and by high-response servos with high-precision encoders.



Machine
tools

High-performance servos enable fast and accurate positioning, and support high-speed handling of works. We promote the sophisticated machining capabilities that are a key part of the world's most advanced manufacturing.

HUMAN MACHINE I/F

CONTROLLER

Our Total Solution for Your Satisfaction

Mitsubishi Servo Systems

Mitsubishi Electric has always set a new standard in servo technology with products such as the MELSERVO-J3 servo amplifier, which achieved the highest level of speed and accuracy, and SSCNET III, one of the industry's fastest* servo system controller networks. For years, we have accumulated technologies and experiences as a total supplier for factory automation systems. In addition to a broad range of component products, we provide a whole range of solutions best suited for your system by integrating our products. The Mitsubishi Electric servo system is the answer to your application needs throughout the world.

* Based on Mitsubishi Electric research as of May 2011.

NETWORK

SERVO AMPLIFIER

SERVO MOTOR

SOLUTION

GOT1000	PC/AT compatible computer	SOFTWARE		Motion controller engineering environment	MELSOFT MT Works2
				PLC engineering software	MELSOFT GX Works2
				Servo setup software	MR Configurator2
				Capacity selection software	

Motion controller

Motion controller for iQ Platform

Q173DCPU (max. 32 axes)
Q172DCPU (max. 8 axes)

Stand-alone motion controller
Q170MCPU (max. 16 axes)

Single axis motion controller
MR-MQ100 (1 axis)

Programmable controller

MELSEC Q series

MELSEC L series

MELSEC FX series

SSCNET III compatible Positioning module

QD75MH **QD74MH**

SSCNET III compatible Simple motion module

LD77MH

SSCNET III compatible Positioning module

FX3U-20SSC-H

Pulse train Positioning module

QD75P / **QD70P**
QD75D / **QD70D**



MR-J3-B

MR-J3-□B **MR-J3-□BSafety** **MR-J3-□B-RJ006** **MR-J3-□B-RJ004** **MR-J3-□B-RJ080W**

SSCNET III compatible Drive safety compatible/ Fully closed loop control Fully closed loop control Linear servo compatible Direct drive motor compatible

MR-J3W-B

MR-J3W-□B

SSCNET III compatible/ 2-axis type

MR-J3-A

MR-J3-□A

General-purpose interface compatible

MR-JN-A

MR-JN-□A

General-purpose interface compatible/ Built-in positioning function

MR-E Super

MR-E-□A

General purpose interface compatible

MR-J3-T

MR-J3-□T

CC-Link compatible/ Built-in positioning function

HF series

HF-KN 50 to 750W **HF-SN** 0.5 to 2kW
HF-KP 50 to 750W **HF-SP** 0.5 to 7kW
HF-MP 50 to 750W **HF-JP** 0.5 to 15kW

HC series

HC-LP 0.5 to 3kW **HC-RP** 1 to 5kW **HC-UP** 0.75 to 5kW

HA series

HA-LP 5 to 55kW

Linear servo motor

LM-H2 series Rating: 60 to 960N
LM-U2 series Rating: 50 to 800N
LM-F series Rating: 300 to 3000N (natural cooling) / Rating: 600 to 6000N (liquid cooling)
LM-K2 series Rating: 120 to 2400N

Direct drive motor

TM-RFM series Rating: 2 to 240N-m



Mitsubishi Electric's integrated FA solution for achieving seamless information collaboration between information systems and control systems, and enabling lateral integration of production sites.



Mitsubishi Electric's integrated FA platform for achieving lateral integration of controllers & HMI, engineering environments and networks at production sites.

Controller SSCNET III compatible, pulse train output

From multi-axis and high-speed systems to simple positioning

Our extensive product lines cover advanced controllers for the iQ Platform/SSCNET III; a stand-alone motion controller in which a power supply module, a PLC, and a motion controller are integrated; and a simple motion module.

iQ Platform/SSCNET III compatible Motion Controller



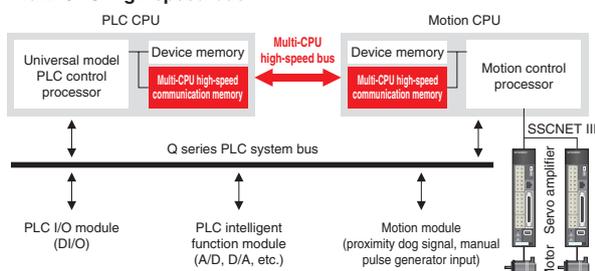
Q173DCPU/ Q172DCPU



High-speed control of up to 14k words per 0.88ms is achieved through high-speed data transfer with a PLC, newly equipped with a multi-CPU high-speed bus.

- ⊙ The high-speed communication cycle between multi-CPU is synchronized with motion control and reduces control losses.
- ⊙ A motion operation performance is doubled (0.44ms/6 axes) from the prior model, resulting a shorter operation tact time.
- ⊙ Commands to the servo amplifier are issued as fast as a 0.44ms cycle, enabling high-precision synchronous control, and speed and position controls.
- ⊙ This controller is equipped with various motion functions such as interpolation functions, speed control, electronic cam, tracking control, etc.

Multi-CPU high-speed bus



		Q173DCPU	Q172DCPU
Number of control axes	SV13/SV22	Max. 32 axes	Max. 8 axes
	SV13	0.44ms/1 to 6 axes	0.44ms/1 to 6 axes
		0.88ms/7 to 18 axes	0.88ms/7 to 8 axes
Operation cycle	SV22	1.77ms/19 to 32 axes	
		0.44ms/1 to 4 axes	0.44ms/1 to 4 axes
	SV13	0.88ms/5 to 12 axes	0.88ms/5 to 8 axes
1.77ms/13 to 28 axes			
	3.55ms/29 to 32 axes		
Servo amplifier	SSCNET III compatible servo amplifier		
Network	SSCNET III (2 systems)	SSCNET III (1 system)	
Number of expansion base stages	Max. 7 stages		

Stand-alone Motion Controller



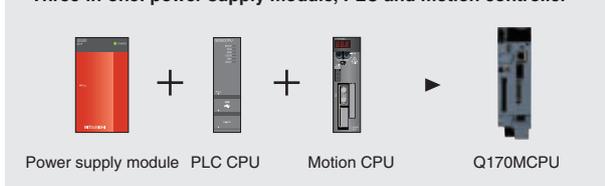
Q170MCPU



A power supply module, a PLC and a motion controller are integrated into one module. This controller also features built-in interfaces for an incremental synchronous encoder and a mark sensor. Thus, space-saving is possible without worrying about model selections.

- ⊙ Compact size of 52(W) × 178(H) × 135(D) mm.
- ⊙ Overall system can be made further compact by combining the controller with 2-axis servo amplifier "MR-J3W" which has uniform mounting dimensions.
- ⊙ The MELSEC Q series module, available in more than 100 types, can be mounted on the expansion base which does not require a power supply module, allowing the system to be expanded freely.
- ⊙ This controller has the same basic motion performance as the iQ Platform compatible controller.

Three-in-one: power supply module, PLC and motion controller



	Q170MCPU	
Number of control axes	SV13/SV22	Max. 16 axes
	SV13	0.44ms/1 to 6 axes
		0.88ms/7 to 16 axes
Operation cycle	SV22	0.44ms/1 to 4 axes
		0.88ms/5 to 12 axes
	1.77ms/13 to 16 axes	
Servo amplifier	SSCNET III compatible servo amplifier	
Network	SSCNET III (1 system)	
Number of expansion base stages	Max. 1 stage (model not requiring a power supply module)	

Single Axis Motion Controller

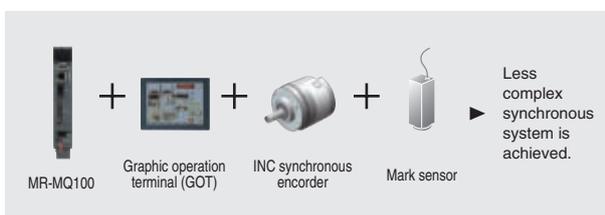


MR-MQ100



This is a high-functional compact motion controller with built-in interfaces for incremental synchronous encoder and mark detection signal.

- ⊙ By connecting with SSCNET III compatible servo amplifier, broad range of motors can be used, including rotary/linear servo motors and direct drive motors.
- ⊙ Synchronous control with standard speed is possible by connecting an incremental synchronous encoder.
- ⊙ Graphic operation terminal (GOT) can be connected via RS-422 communication interface as well as Ethernet interface.
- ⊙ This motion controller receives and sends input/output signals (Input: 16 points, Output: 16 points) and analog input/output data (A/D: 2 points, D/A: 2 points) from/to MR-J3-D01 extension IO unit, and uses them for control.

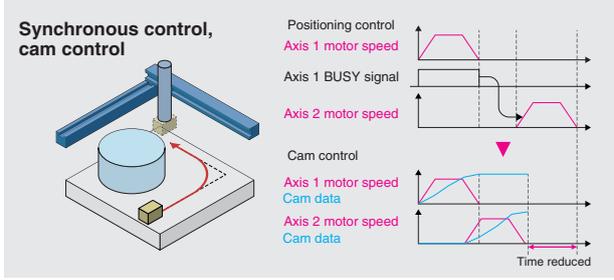


	MR-MQ100
Number of control axis	1 axis
Operation cycle	0.44ms/axis
Servo amplifier	SSCNET III compatible servo amplifier
Network	SSCNET III (1 system)
Expansion base	None



LD77MH4/LD77MH16

This MELSEC L series compatible module is capable of positioning and also achieves highly advanced motion control including speed, torque, synchronous and cam controls with operations similar to a positioning module.



	LD77MH16	LD77MH4
Number of control axes	Max. 16 axes	Max. 4 axes
Operation cycle	0.88ms/1.77ms*	0.88ms
Servo amplifier	SSCNET III compatible servo amplifier	
Network	SSCNET III (1 system)	

* The default value is 1.77ms. If necessary, check the operation time and change it to 0.88ms.

Q series PLC compatible **Positioning Module**

QD75MH



This SSCNET III compatible positioning module is available as a 1, 2 or 4-axis model. It is equipped with various positioning functions.
 ◎1-axis/2-axis/4-axis control



QD74MH



This SSCNET III compatible positioning module is perfect for systems using many axes for simple positioning. It is equipped with various positioning functions.
 ◎8/16-axis control



QD75P/**QD75D**

This pulse train output compatible module is available as QD75P for open collector or QD75D for differential pulse train output.
 ◎1-axis/2-axis/4-axis control



QD70P/**QD70D**

This pulse train output compatible module is available as QD70P for open collector or QD70D for differential pulse train. This module is perfect for systems using many axes for simple control.
 ◎4/8-axis control



FX series PLC compatible **Positioning Module**

FX3U-32MT/ES

Equipped with the industry's highest standard of high-speed processing and positioning functions, this PLC helps achieve a system with high cost-performance.
 ◎3-axis control



FX3U-20SSC-H



This SSCNET III compatible positioning block has various functions including real-time monitoring of servo information, and achieves reduced wiring by using fiber-optic cables.
 ◎2-axis control



FX2N-10GM/20GM

This positioning module is used independently or with the FX PLC. The 20GM model supports 2-axis interpolation control.
 ◎1-axis/2-axis control



FX_{2N}-10GM

FX2N-1PG-E/10PG

This pulse train output block is used with the FX PLC. The 10PG model is capable of high-speed and high-precision positioning at a maximum of 1MHz high-speed pulse.
 ◎1-axis control



FX_{2N}-1PG-E

Servo Amplifier

From the industry's top level high-speed, high-accuracy servos to one-touch servos and 2-axis models

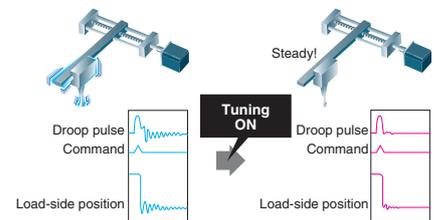
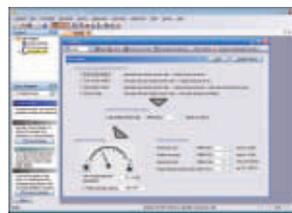
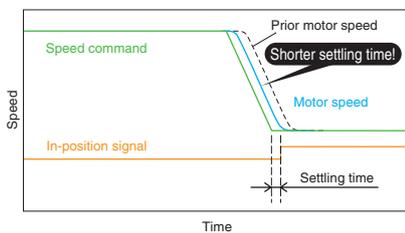
In addition to the high-end MELSERVO-J3 series, a variety of models to match various applications is available.

The Mitsubishi servo amplifiers support motors from rotary servo motors to linear servo motors and direct drive motors, and greatly enhance system performance.

Industry leading level of speed and accuracy with easy and useful functions MELSERVO-J3 Series

2.1kHz* speed frequency response is achieved. Compatible servo motors are equipped with a high-resolution absolute encoder of 262,144p/rev (18-bit) as standard.

This high-end MELSERVO amplifier model greatly reduces the positioning time with the fast motor speed and high-speed frequency response. Precise adjustments can be completed with a variety of advanced functions. * Available only with MR-J3-A/B(-RJ006)/BSafety.



2.1kHz* frequency response speed Industry-leading level

Speed frequency response is increased to 2.1kHz, achieving the industry leading level of control performance. The increased speed frequency is effective for shortening the tact time and satisfies high-end machine needs.

* Available only with MR-J3-A/B(-RJ006)/BSafety.

Real-time auto-tuning

All gain settings including position and speed loop gains can be automatically adjusted by setting the responsiveness. Furthermore, the response level can be set in up to 32 scales.

Advanced vibration suppression control Industry's first

An optimal filter is automatically set with the auto-tuning function for suppressing 100Hz or lower frequency vibration that occurs when a driving part stops. This function is effective in suppressing vibration at the end of an arm and in reducing residual vibration in a machine.

MR-J3-□A

General-purpose interface compatible

Pulse train and analog input, etc., are provided as a standard for the command interface. The control mode can be switched accordingly for position, speed or torque control.



Command interface	Pulse train/Analog/RS-422 multi-drop
Control mode	Position/Speed/Torque
Power specifications	1-phase 100VAC/3-phase 200VAC/3-phase 400VAC
Capacity range	100W to 55kW

MR-J3-□B



SSCNET III compatible

A complete synchronous system for SSCNET III can be configured using 0.44ms cycle high-speed serial communication between the controller and the servo amplifier.



Command interface	SSCNET III
Control mode	Position
Power specifications	1-phase 100VAC/3-phase 200VAC/3-phase 400VAC
Capacity range	100W to 55kW

MR-J3-□BSafety



SSCNET III compatible/Drive safety compatible/
Fully closed loop control

STO (Safe torque off) function is provided as a safety function. SS1 function is also supported by using the optional module MR-J3-D05. Fully closed loop control is also supported.



Command interface	SSCNET III
Control mode	Position/Fully closed loop control
Power specifications	1-phase 100VAC/3-phase 200VAC/3-phase 400VAC
Capacity range	100W to 55kW

MR-J3-□B-RJ004



SSCNET III compatible/Linear servo compatible

This model supports high-accuracy operation of linear servo motors. A fully closed loop control system using position feedback signals from a load-side encoder such as a linear encoder can be configured.



Command interface	SSCNET III
Control mode	Position/Fully closed loop control
Power specifications	3-phase 200VAC/3-phase 400VAC
Capacity range	200W to 22kW

MR-J3-□B-RJ080W



SSCNET III compatible/Direct drive motor compatible

Setup is so easy while keeping industry leading level of fast and accurate operation. The performance of the direct drive motor can be utilized to the fullest by using the advanced control functions and the tuning functions.



Command interface	SSCNET III
Control mode	Position
Power specifications	3-phase 200VAC
Capacity range	200W to 5kW

MR-J3-□T

CC-Link compatible/Built-in positioning function

The built-in positioning function sets position and speed data in the point tables in the servo amplifier. Positioning operation can be started using start signals from a host controller.



Command interface	CC-Link/DIO/RS-422 multi-drop pulse train
Control mode	Position/Speed/Positioning
Power specifications	1-phase 100VAC/3-phase 200VAC/3-phase 400VAC
Capacity range	100W to 22kW

Space-saving, reduced-wiring and energy-conservative 2-axis servo amplifier

MELSERVO-J3W Series



MR-J3W-□B

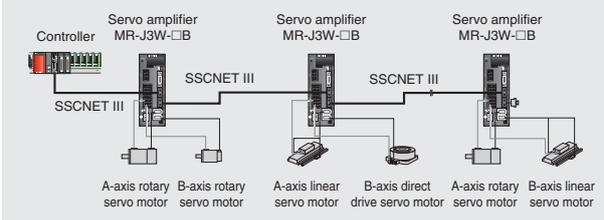
SSCNET III compatible/integrated 2-axis

One unit of the servo amplifier operates any combination of two rotary/linear servo motors or direct drive motors. Mounting space can be reduced approximately 17% to 25% as compared to that of 2 units of MR-J3 series servo amplifiers.



- Two servo motors are operated by a common power supply. Thus, the regenerative energy can be used effectively depending on the operation conditions.
- Wiring can be reduced by using common SSCNET III cables, control circuit power supply cables and main circuit power supply cables for the two axes.

Example of system configuration



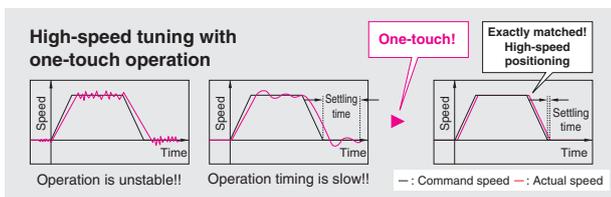
Command interface	SSCNET III
Control mode	Position
Power specifications	3-phase 200VAC
Capacity range	200W x 2 axes, 400W x 2 axes, 750W x 2 axes, 1kW x 2 axes

"One-touch servo" small body, easy operation and high functionality

MELSERVO-JN Series

MR-JN-□A

General-purpose interface compatible/
built-in positioning function



[Easy to use!] No personal computer is required for servo tuning. Servo is adjusted just by pressing the button on the front of the servo amplifier. The "tough drive function" allows operation to continue without stopping the system even if the load or the power fluctuates temporarily or if the machine resonance frequency changes.

[Easy to incorporate!] Optimal models can be selected by using a dedicated software. 200W or larger servo amplifier has an integrated regenerative resistor as a standard, reducing wiring and spaces.

[Easy to set up!] Setup the servo amplifier easily by using the display panel and buttons on the front of the servo amplifier.

[Easy to maintain!] The separated power supplies for main and control circuits enable easy maintenance. The fan-less style eliminates the need to replace the fan.

Command interface	Pulse train
Control mode	Position/Speed/Torque/Positioning
Power specifications	1-phase 100VAC, 1-phase 200VAC
Capacity range	100W to 400W

User-friendly servo with easy operation

MR-E Super Series

MR-E-□A/AG-QW003-KH003

General purpose interface compatible

Pulse train interface or analog input interface can be selected according to your application. Signal interface is available in source or sink.



Source interface

	MR-E-A-QW003	MR-E-AG-QW003
Command Interface	Pulse train	Analog input
Control mode	Position/Speed *1	Speed/Torque
Power specifications	3-phase 200VAC, 1-phase 230VAC	
Capacity range	100W to 2kW	

Sink interface

	MR-E-A-KH003	MR-E-AG-KH003
Command Interface	Pulse train	Analog input
Control mode	Position/Speed *1	Speed/Torque
Power specifications	3-phase 200VAC, 1-phase 230VAC	
Capacity range	100W to 2kW	

*1: Internal speed only

Servo Motor

From rotary to linear servo and direct drive motors

The rotary servo motor is available in capacities from 50W to 55kW.

The linear servo motor and the direct drive motor respond to new needs for driving control by providing high rigidity, performance and flexibility in system configurations unique to a direct drive. These motors also offer easy maintenance and cleanliness.

A wide range of capacities and series for various system applications

Rotary Servo Motor

HF series



HF-KN/HF-KP

Small capacity, low inertia. Perfect for general-purpose industrial machines.

[Examples of use] ●Inserters
●Mounters ●Bonders ●PCB drilling machines ●In-circuit testers ●Label printers ●Knitting and embroidery machines ●Ultra-compact robots and robot hand sections



HF-MP

Small capacity, ultra-low inertia. Perfect for high-throughput operations.

[Examples of use] ●Inserters
●Mounters ●Bonders ●PCB drilling machines ●In-circuit testers ●Label printers ●Knitting and embroidery machines ●Ultra-compact robots and robot hand sections



HF-SN/HF-SP

Medium capacity, medium inertia. Suitable for machines having large load inertia.

[Examples of use] ●Material handling systems ●Dedicated machines
●Robots ●Loaders and unloaders
●Winders, tension units ●Turrets
●X-Y tables



HF-JP

Medium to large capacity, low inertia. Perfect for high-throughput positioning or high acceleration/deceleration operations.

[Example of use] ●Food packaging machines ●Printers ●Injection molding machines ●Large press machines

HC series



HC-LP

Medium to large capacity, low inertia. Perfect for general-purpose industrial machines.

[Examples of use] ●Roll feeders
●Loaders and unloaders
●High-throughput material handling systems



HC-RP

Medium capacity, ultra-low inertia. Perfect for high-frequency operation.

[Examples of use] ●Roll feeders
●Loaders and unloaders
●High-throughput material handling systems



HC-UP

Medium capacity, flat type. Perfect for applications with limited mounting space.

[Examples of use] ●Robots
●Conveyors ●Winders ●Tension machines ●Food processing machines



HA-LP

Medium to large capacity, low inertia. Suitable for large capacity fields of large systems.

[Examples of use] ●Injection molding machines ●Semiconductor manufacturing devices ●Large material handling systems ●Press machines

●: Available

Series	Rated speed	Maximum speed (r/min)	Capacity range (kW)	Applicable servo amplifier	Encoder resolution (p/rev)	With electromagnetic brake	With Reducer	IP rating*1
HF-KP	3000	6000	0.05 0.75kW	MR-J3/J3W	262144	●	●	IP65
HF-MP	3000	6000	0.05 0.75kW	MR-J3/J3W	262144	●	●	IP65
HF-SP	1000	1500	0.5 4.2kW	MR-J3/J3W	262144	●	—	IP67
	2000	3000	0.5 7kW	MR-J3/J3W	262144	●	●	IP67
HC-LP	2000	3000	0.5 3kW	MR-J3/J3W	262144	●	—	IP65
HC-RP	3000	4500	1 5kW	MR-J3	262144	●	●	IP65
HC-UP	2000	3000/2500	0.75 5kW	MR-J3/J3W	262144	●	—	IP65
HF-JP	3000	6000/5000	0.5 9kW	MR-J3/J3W	262144	●	—	IP67
	1500	3000	11 15kW	MR-J3	262144	●	—	IP67
HA-LP	1000	1200	6 37kW	MR-J3	262144	●*2	—	IP44
	1500	2000	7 50kW	MR-J3	262144	●*2	—	IP44
	2000	2000	5 55kW	MR-J3	262144	●*2	—	IP44
HF-KN	3000	4500	0.05 0.75kW	MR-JN/MR-E-Super	131072	●	—	IP65
HF-SN	2000	3000	0.5 2kW	MR-E-Super	131072	●	—	IP67

*1: The shaft-through portion is excluded. *2: Some models are not supported.

Suitable for linear motion systems requiring high speed and accuracy

Linear Servo Motor

- Supporting maximum speed of 2m/s and maximum thrust of 150N to 18000N. Small size and high thrust are achieved by increasing the winding density and by optimizing core and magnet geometries using electromagnetic field analysis.
- High accuracy tandem synchronous control is achieved by using a motion controller and a SSCNET III compatible linear servo amplifier.
- Diverse product lines include core type with magnetic attraction counter-force in addition to core, coreless, liquid-cooling core types.



LM-H2 series

Core type suitable for space-saving. The magnetic attraction force contributes to high rigidity.



LM-F series

Core type compact linear servo motor. The integrated liquid-cooling system doubles the continuous thrust. The magnetic attraction force contributes to high rigidity.



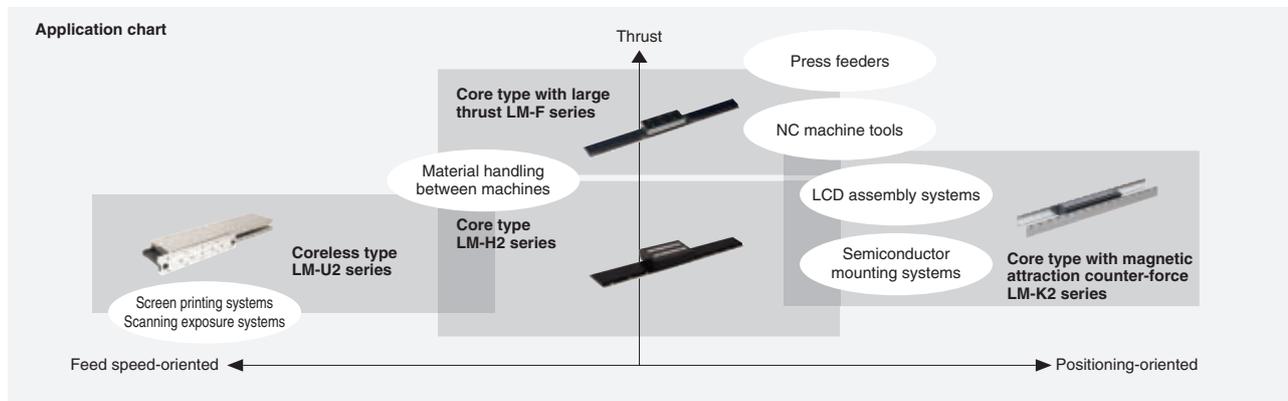
LM-U2 series

Coreless type without cogging resulting in small speed fluctuation. The structure with no magnetic attraction force extends life of the linear guides.



LM-K2 series

Core type with magnetic attraction counter-force. The magnetic attraction counter-force structure extends life of the linear guides and contributes to lowering audible noise.



Series	Maximum speed (m/s)	Magnetic attraction force (N)	Continuous thrust (N) / Maximum thrust (N)	Applicable servo amplifier	IP rating
LM-H2	2	500 to 7000	960 / 2400	MR-J3-B-RJ004/J3W	IP00
LM-U2	2	0	800 / 3200	MR-J3-B-RJ004/J3W	IP00
LM-F	2	4500 to 45000	1800 (Natural cooling) / 3000 (Natural cooling) / 6000 (Liquid cooling) / 18000 (Natural cooling) / 18000 (Liquid cooling)	MR-J3-B-RJ004	IP00
LM-K2	2	0	120 / 2400 / 300 / 6000	MR-J3-B-RJ004/J3W	IP00

For compact and simplified machine driving part with high-accuracy control

Direct Drive Motor



TM-RFM series

- Industry leading level of compact size and thinness contributes to compact construction and a low center of gravity for enhanced machine stability.
- High torque intensity is achieved with the latest technologies of magnetic designs and windings. The minimal torque ripple enables extremely smooth rotation.
- The motor is equipped with a high-resolution 20-bit absolute encoder, enabling higher accuracy systems.
- The hollow shaft with diameter of 20mm to 104mm allows cables and air tubing to pass through.

[Examples of use] ● Index table for machine tools ● Rotary axis for material handling robots ● Painting and vapor deposition systems ● LCD/semiconductor spin-type washing units ● LCD/semiconductor testing systems (XYθ tables) ● Rotary axis for polishing systems

Series	Motor outer diameter (mm)	Rated speed (r/min)	Maximum speed (r/min)	Rated torque (N-m) / Maximum torque (N-m)	Applicable servo amplifier	IP rating ^{*1}
TM-RFM	Ø130	200	500	2.6 / 6	MR-J3-B-RJ080W/J3W	IP42
	Ø180	200	500	6 / 18	MR-J3-B-RJ080W/J3W	IP42
	Ø230	200	500	12 / 36	MR-J3-B-RJ080W/J3W	IP42
	Ø330	100	200	40 / 120 / 240 / 720	MR-J3-B-RJ080W/J3W	IP42

*1: Connectors and gap between rotor and stator are excluded.

Network (SSCNET III)

A new-generation network opening the future of servos

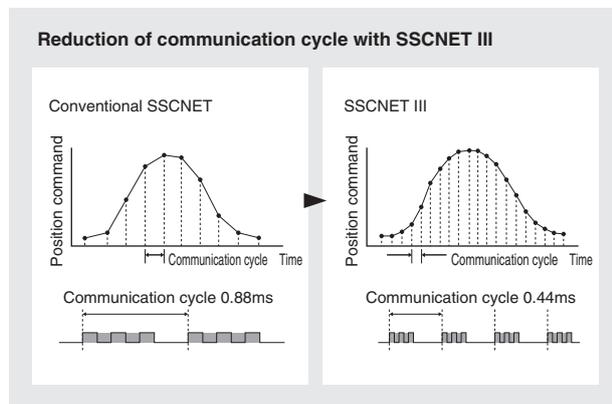
SSCNET III is a high-speed, high-performance servo system controller network employing fiber optic cable.

Machine performance can be substantially improved by using SSCNET III with the MR-J3 which achieves high speed (maximum of 6,000r/min with HF-KP servo motor) and high accuracy (encoder resolution of 262,144p/rev).



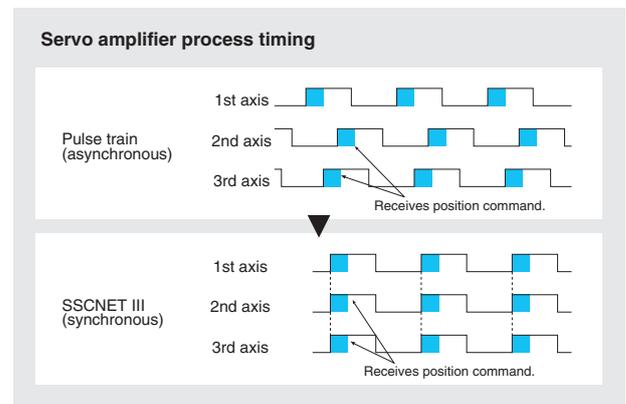
Improve communication speed and command communication cycle.

The communication speed is 50Mbps full duplex (equivalent to 100Mbps one way). The high-speed serial communication with cycle times as fast as 0.44ms improves synchronous, speed and position controls of the servo system.



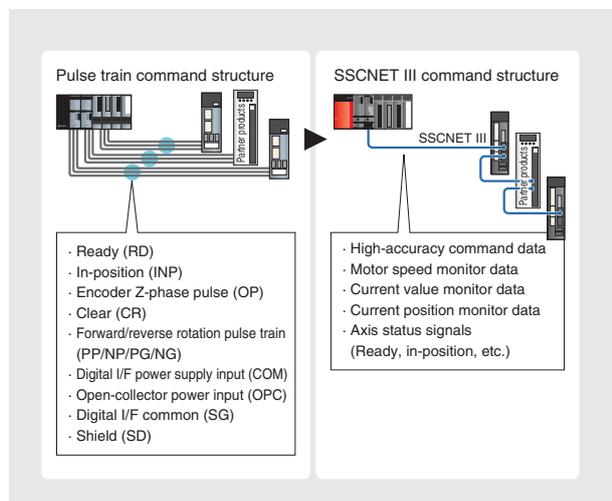
Create high-performance system with synchronous communication.

Synchronous start or high-precision interpolation is difficult with conventional pulse train commands which operate asynchronously. With SSCNET III which enables complete synchronous communication, a high performance can be attained with systems requiring accurate synchronization.



Reduce wiring.

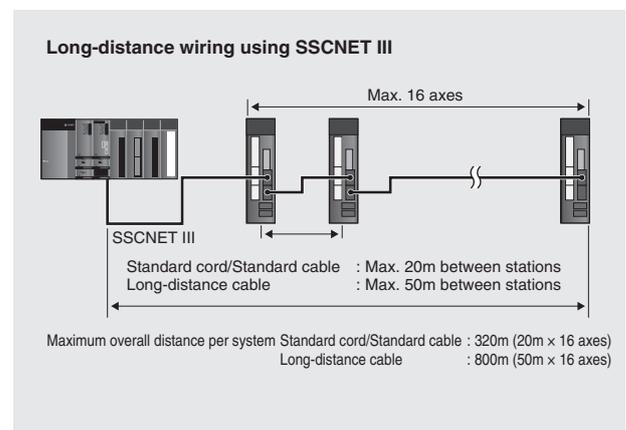
By using SSCNET III, wiring can be reduced as compared to the conventional pulse train command.



Extend wiring distances.

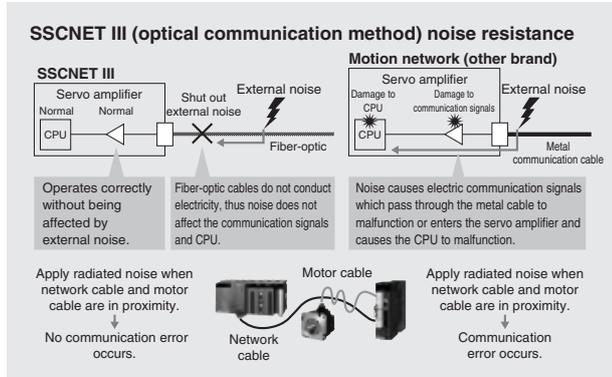
Long-distance wiring up to 800m* per system is possible, increasing the freedom of system design. The power supply cable between the servo amplifier and motor can be shortened by dispersing the controller and servo amplifier.

* 50m x 16 axes when long-distance cables are used.



Improve noise immunity.

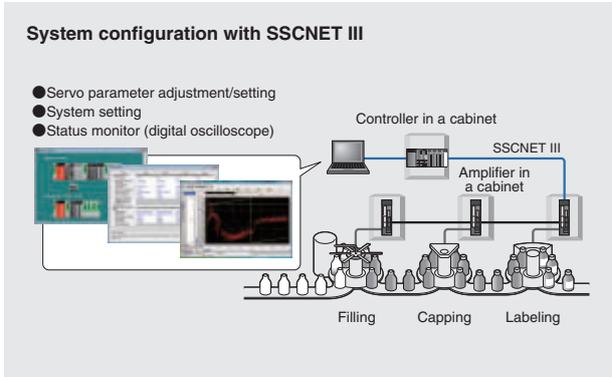
Immunity against noise from power cables or external devices can be improved by adopting fiber-optic cables. Fast and highly reliable communication allows high speed and accuracy drive and enables multi-axis, large-scale systems to be configured.



Simplify central control and reduce adjustment time.

Large amounts of data can be exchanged in real-time between the controller and the servo amplifiers. Speed on each axis, etc., can be monitored on the controller side, and the servo amplifier parameters can be adjusted* when the motion controller is used.

* Using "MR Configurator2" with a personal computer connected to the controller.



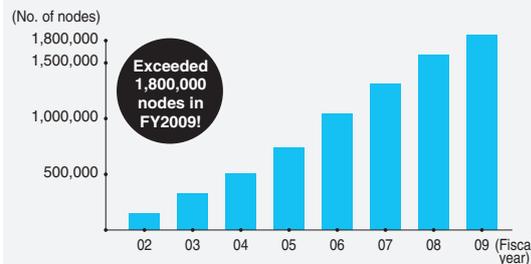
The SSCNET Partner Association (SNP) acting to spread SSCNET throughout the world.



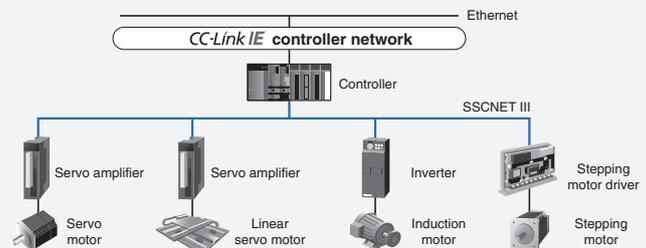
The SSCNET Partner Association (SNP) carries activities to introduce the advanced servo system controller network "SSCNET III" and compatible products to many users. In cooperation with partner corporations, SNP widely promotes the performance attainable with "SSCNET III" and aims to make "SSCNET III" a more global servo system controller network.



Transition of number of SSCNET nodes introduced



"SSCNET III" increases the freedom of system configurations with the Mitsubishi servo as well as the variety of SSCNET compatible partner products including stepping motors and direct drive motors.



Main membership benefits

- Access to the latest trends and information on motion network SSCNET and Mitsubishi Electric FA businesses
- Participation in partner meetings in Japan and overseas
- Expanding business opportunities
- Introduction of member products and SSCNET compatible products to various tools and media

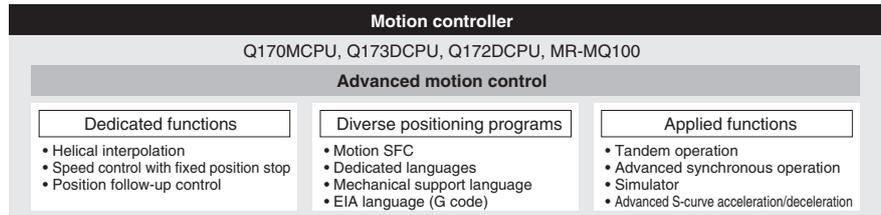
* SNP membership requires no joining fees or annual dues.

Product Selection Guide

Differences of motion controller, simple motion module and positioning module

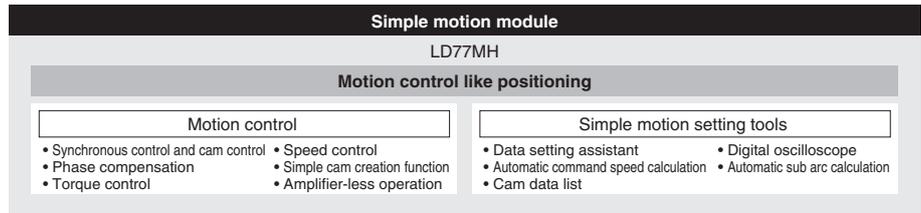
What is a motion controller?

This controller executes advanced motion control such as synchronous operation, position tracking, tandem operation and advanced S-curve acceleration/deceleration by using a variety of positioning programs.



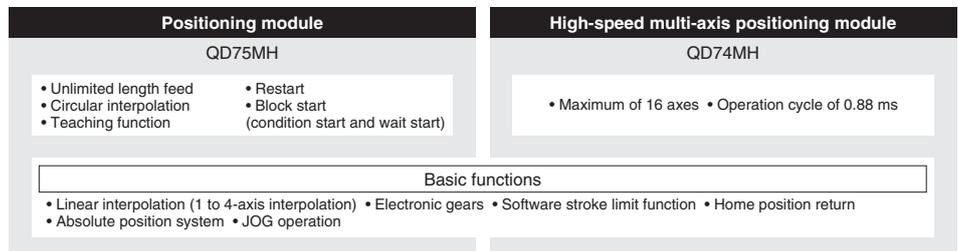
What is a simple motion module?

Various control systems including synchronous, cam and torque controls which used to be enabled only by a motion controller are now made possible by this motion module with operations similar to the positioning module.



What is a positioning module?

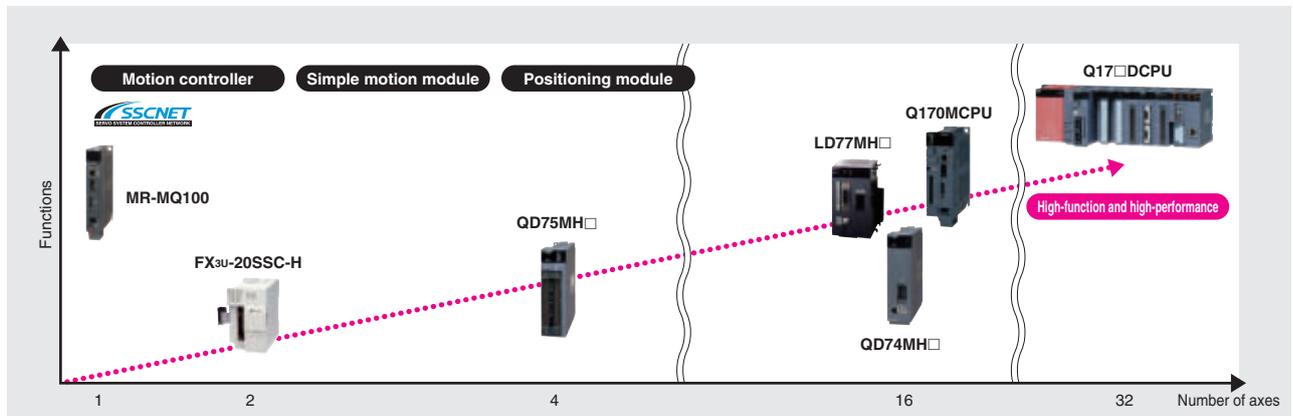
This module easily performs linear interpolation and independent positioning just by writing positioning data to the buffer memory using a sequence program.



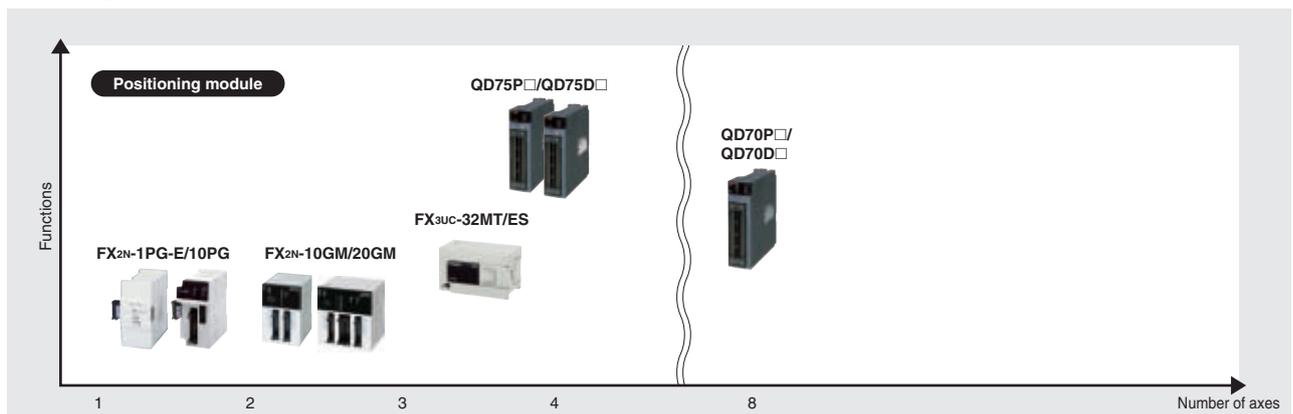
Comparison of controller functions

Select an optimum controller from a diverse product line to match the required system functions, performance and tact time.

Controller modules connectable to SSCNET III compatible servo amplifier



Positioning modules capable of pulse train connection



Positioning Functions

■ Motion controller
 ■ Simple motion module
 ■ Positioning module
 ■ PLC MELSEC FX series

Model	Number of axes	Function										Compatible servo amplifier									
		Absolute position	Absolute position unlimited length feed	Manual pulse generator	S-curve acceleration/deceleration	Interpolation	Circular interpolation	Electronic gears	Positioning program	Synchronous control	Pulse train output	SSCNET III	Response speed	Wiring performance	MR-J3-B	MR-J3-A	MR-J3W-B	MR-J3-RJ004 (linear servo motor)	MR-J3-RJ006 (fully closed loop control)	MR-J3-B-RJ080W (direct drive motor)	MR-JN
Q172DCPU	8	Automatic	○	○	○	4	○	○	Motion SFC, mechanical support language, G code	○	○	○	0.44ms or longer	◎	○	○	○	○	○	○	○
Q173DCPU	32	Automatic	○	○	○	4	○	○	Motion SFC, mechanical support language, G code	○	○	○	0.44ms or longer	◎	○	○	○	○	○	○	○
Q170MCPU	16	Automatic	○	○	○	4	○	○	Motion SFC, mechanical support language	○	○	○	0.44ms or longer	◎	○	○	○	○	○	○	○
MR-MQ100	1	Automatic	○	○	○	○	○	○	Motion SFC, mechanical support language	○	○	○	0.44ms	◎	○	○	○	○	○	○	○
LD77MH4	4	Automatic	○	○	○	4	○	○	Point table method	○	○	○	0.88ms or longer	◎	○	○	○	○	○	○	○
LD77MH16	16	Automatic	○	○	○	4	○	○	Point table method	○	○	○	0.88ms or longer	◎	○	○	○	○	○	○	○
QD75MH1	1	Automatic	○	○	○	○	○	○	Point table method	○	○	○	1.77ms or longer	◎	○	○	○	○	○	○	○
QD75MH2	2	Automatic	○	○	○	2	○	○	Point table method	○	○	○	1.77ms or longer	◎	○	○	○	○	○	○	○
QD75MH4	4	Automatic	○	○	○	4	○	○	Point table method	○	○	○	1.77ms or longer	◎	○	○	○	○	○	○	○
QD74MH8	8	Automatic	○	○	○	4	○	○	Point table method	○	○	○	0.88ms or longer	◎	○	○	○	○	○	○	○
QD74MH16	16	Automatic	○	○	○	4	○	○	Point table method	○	○	○	0.88ms or longer	◎	○	○	○	○	○	○	○
FX _{3U} -20SSC-H	2	Automatic	○	○	○	2	○	○	Sequence program, Point table method	○	○	○	1.77ms or longer	◎	○	○	○	○	○	○	○
QD75P1	1	Simple	○	○	○	○	○	○	Point table method	○	○	○	3.55ms or longer	◎	○	○	○	○	○	○	○
QD75P2	2	Simple	○	○	○	2	○	○	Point table method	○	○	○	3.55ms or longer	◎	○	○	○	○	○	○	○
QD75P4	4	Simple	○	○	○	4	○	○	Point table method	○	○	○	3.55ms or longer	◎	○	○	○	○	○	○	○
QD75D1	1	Simple	○	○	○	○	○	○	Point table method	Differential	○	○	3.55ms or longer	◎	○	○	○	○	○	○	○
QD75D2	2	Simple	○	○	○	2	○	○	Point table method	Differential	○	○	3.55ms or longer	◎	○	○	○	○	○	○	○
QD75D4	4	Simple	○	○	○	4	○	○	Point table method	Differential	○	○	3.55ms or longer	◎	○	○	○	○	○	○	○
QD70P4	4	○	○	○	○	○	○	○	Point table method	○	○	○	0.1ms or longer	◎	○	○	○	○	○	○	○
QD70P8	8	○	○	○	○	○	○	○	Point table method	○	○	○	0.1ms or longer	◎	○	○	○	○	○	○	○
FX _{3U} -32MT/ES	3	Simple	○	○	○	○	○	○	Sequence program	○	○	○	1ms or longer	◎	○	○	○	○	○	○	○
FX _{2N} -1PG-E	1	Simple	○	○	○	○	○	○	Sequence program	○	○	○	10ms or longer ¹⁾	◎	○	○	○	○	○	○	○
FX _{2N} -10PG	1	Simple	○	○	○	○	○	○	Sequence program, Point table method	Differential	○	○	1ms or longer	◎	○	○	○	○	○	○	○
FX _{2N} -10GM	1	Automatic	○	○	○	○	○	○	Point table method, Positioning dedicated language	○	○	○	10ms or longer	◎	○	○	○	○	○	○	○
FX _{2N} -20GM	2	Automatic	○	○	○	2	○	○	Positioning dedicated language	○	○	○	20ms or longer	◎	○	○	○	○	○	○	○

*1: First time 500ms, 2nd and following time: 10ms

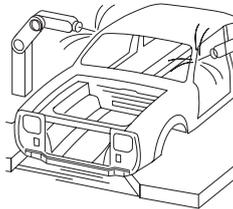
Operating System Software Packages for Motion Controller

Conveyor assembly use

Motion SFC compatible SV13

Dedicated language

- Electronic component assembly
- Insetters
- Feeders
- Molders
- Conveying equipment
- Paint applicators
- Chip mounters
- Wafer slicers
- Loaders/unloaders
- Bonding machines
- X-Y tables



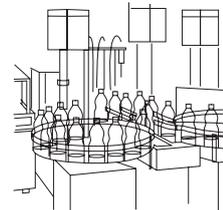
- Circular interpolation
- Constant speed control
- Fixed-pitch feed
- Speed control with fixed position stop
- Speed switching
- Speed control
- Speed/position switching
- Linear interpolation (1 to 4 axes)
- Teaching

Automatic machinery use

Motion SFC compatible SV22

Mechanical support language

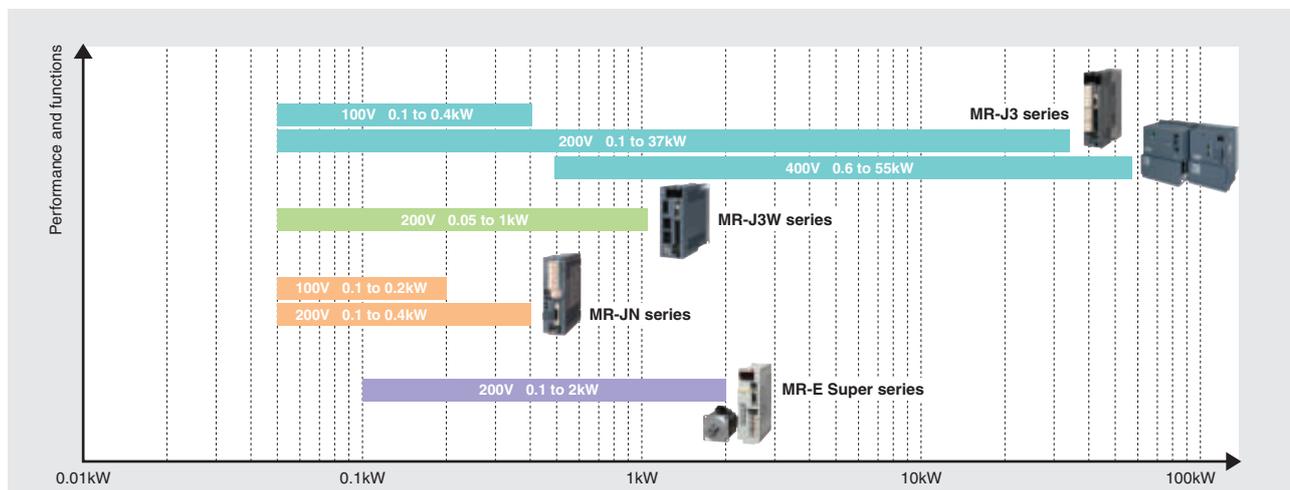
- Press feeders
- Food processing
- Food packaging
- Winding machines
- Spinning machines
- Weaving machines
- Knitting machines
- Printing machines
- Binding machines
- Tire molding machines
- Paper manufacturing machines



- Synchronous control
- Electronic shaft
- Electronic clutch
- Electronic cam
- Drawing control

Servo Amplifier Lines

A diverse product line of servo amplifiers is available including the easy-to-use one-touch servo MR-JN series to the industry's top level high-end servo MR-J3 series.



Fully supporting all your needs from model selection, system design, startup to maintenance with diverse software

MELSOFT is FA integrated engineering software that demonstrate their abilities in various FA scenes including "designing", "debugging and startup" and "operation and maintenance" to facilitate all aspects from specification review to daily data collection.

MELSOFT offers an extensive software collection to efficiently support quick operation and maintenance of an optimal servo system.



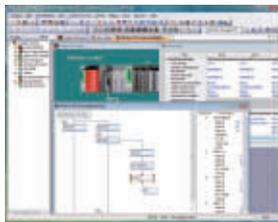
Reduce total cost of ownership of motion systems.

iQ Platform compatible motion controller engineering software **MELSOFT MT Works2**



This motion controller engineering software for iQ Platform provides comprehensive supports for motion CPU design and maintenance.

Intuitive settings and programming functions on a graphical screen, and useful functions such as a digital oscilloscope and simulator contribute to lowering total cost of ownership of motion system.



Workspace control

Display the entire project including created programs and parameters in a tree.



Intuitive system settings

Set servo amplifiers and modules graphically and easily, and check the settings in a glance.



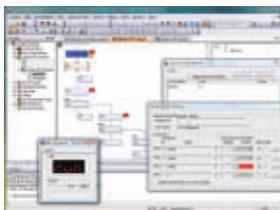
Mechanical system program editing

Just drag and drop mechanical modules as an image of your machine, and set parameters. Complicated synchronous control can be achieved.



Motion SFC program editing

Describe machine operation procedures with a flow chart style.



Motion simulator

Simulate the motion SFC program debugging mode and the digital oscilloscope function on your personal computer without an actual machine.



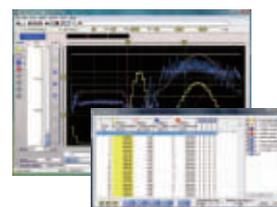
Various test operation functions

Perform basic startup in the test mode without a program.



Powerful monitor functions

Monitor the motion SFC program and the motion controller operations, and perform batch error monitor.

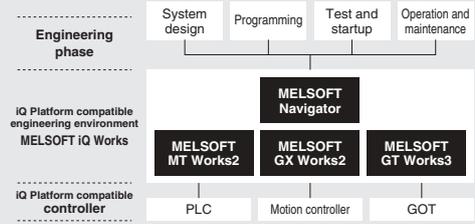


Digital oscilloscope

Data synchronized with the motion controller's operation cycle is collected and displayed as a waveform. Check the operation during startup and adjustment, and find out causes of problems easily.

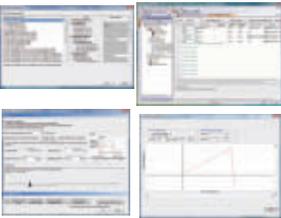
Integrated engineering for seamless collaboration among FA devices

"MELSOFT iQ Works" is an integrated engineering environment developed based on the FA integration concept "iQ Platform" proposed early on by Mitsubishi Electric. Seamless collaboration among FA devices from PLC, motion controller to HMI reduces total cost of ownership of engineering drastically.



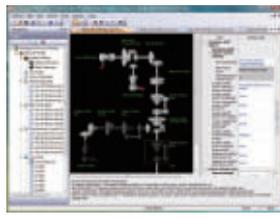
Easily set simple motions.

PLC engineering software **MELSOFT GX Works2**



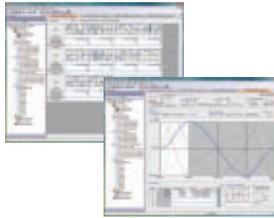
Positioning data setting

Set positioning data easily with the data setting assistant function.



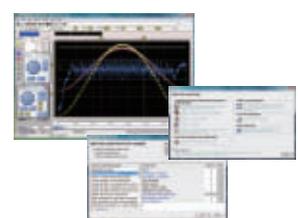
Synchronous control setting

Easily set synchronous control in which machine components such as gears, shaft, reduction gears or cam are interchanged by software just by setting parameters.



Cam data setting

Set cam data with a high degree of freedom easily. Cam data can also be displayed as thumbnails.



Digital oscilloscope function

Collect data from a simple motion synchronized with the control cycle and display it as waveforms. Startups are performed efficiently.

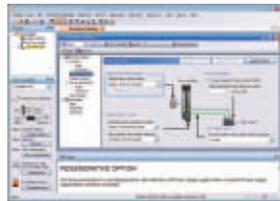
Easily set up servos.

Servo setup software **MR Configurator2**



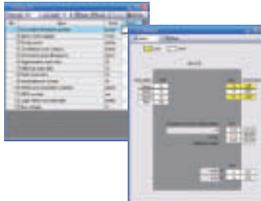
Servo assistant function

Easily setup servo amplifier including parameter setting, test operation and servo adjustment just by following guidance displays.



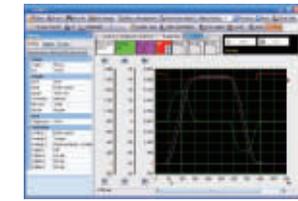
Parameter setting function

Set parameters by selecting from a drop-down list. The parameters can be listed or visually displayed.



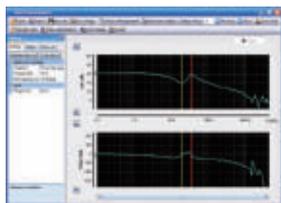
Monitor function

Monitor operation information in real time on the "Display all" window. Assigning input/output signals and monitoring ON/OFF status are also possible on the "I/O monitor" window.



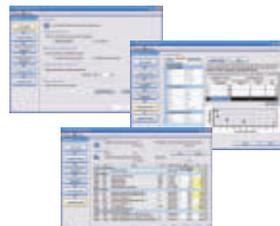
Graph function

Measure waveform of the 3ch analog and 4ch digital servo data. Startup and maintenance are performed efficiently.



Machine analyzer function

This function automatically inputs random torque to the servo motor and analyzes frequency characteristic (0.1kHz to 4.5kHz) of a machine system just by pressing the "Start" button.



Advanced gain search

Perform advanced servo adjustments to maximize the system performance with the ease of following a flow chart.

Select an optimum servo motor for system.

Capacity selection software



Select optimal servo amplifier, servo motor and optional regeneration unit just by entering machine's constants and operation patterns.

- Select from two operation patterns, position and speed control modes.
- Display feed rate and torque in the selection process graphically.

Production System

Homes of MELSERVO where the advanced FA technologies are incorporated

To guarantee the high quality and performance of MELSERVO, Mitsubishi Electric has built a cooperative system of three facilities - Shinshiro Factory, a branch factory of Nagoya Works; Mitsubishi Electric Dalian Industrial Products Co., Ltd., a manufacturing base; and Nagoya Works at the core. Mitsubishi Electric responds to customer needs throughout the world by uniting technologies and know-hows of these facilities.

Integrated manufacturing of servo amplifiers, motors, and other Mitsubishi servo system products.

Nagoya Works

Since its establishment as Mitsubishi Electric's first electric-motor mass-production factory in 1924, the Nagoya Works has continuously expanded the lines of FA and mechatronics products it handles. Today, the Nagoya Works develops and manufactures servo system products including not only servo amplifiers, servo motors, and motion controllers but also programmable controllers, networks, software, and solutions.

Number of employees	2,250	*As of 2010
Site area	306,000m ²	
Gross floor space	221,000m ²	(Excluding satellite factories)



Another Mitsubishi servo motor manufacturing facility.

Shinshiro Factory

Shinshiro Factory was established in 1974 as a branch factory of Nagoya Works. From its establishment, the factory has been supplying various types of servo motors, in which the newest mechatronics technologies and system technologies are integrated. Moreover, Shinshiro Factory has introduced e-F@ctory, the FA integrated solution, to the processing line for motor shafts, which include a lot of special components. Thus, the productivity of the production line has been improved, and the factory is now able to handle a variety of and a small lot of products in a short period of tact time.

Number of employees	110	*As of 2010
Site area	137,000m ²	
Gross floor space	40,000m ²	

AC servo manufacturing facility in China.

Mitsubishi Electric Dalian Industrial Products Co., Ltd.

Established in 1994 as Mitsubishi Electric's local manufacturing facility in Dalian, China, MDI manufactures high-quality AC servos, small-size circuit breakers, EDMs, inverters, and NCs mainly for distribution in the Chinese market.

Number of employees	660	*As of 2010
Site area	68,000m ²	
Gross floor space	43,957.7m ²	



e&eco-F@ctory implementation at the Nagoya Works

e&eco-F@ctory implementation at the Nagoya Works.

Here, we have linked production floor systems and equipment to information systems via MES. Mitsubishi Electric's e&eco-F@ctory solutions make production performance and energy consumption visible and are at work in the servo motor factory at the Nagoya Works where they are being used to boost capacity utilization and product quality, and reduce energy consumption. We use this facility as a model e&eco-F@ctory to which we welcome approximately 4,500 visitors a year.



Unique approach to guarantee MELSERVO quality

Manufacturing key parts in-house to maximize quality.

Encoders play an important role in servo systems. To guarantee the quality of the encoders, we manufacture these parts in our factory by incorporating our own technologies



Painstaking quality assurance through the application of cutting-edge testing equipment.



Ultrasonic Probing Devices



LSI testers



X-ray scanners



EMC center (large electromagnetic environment experiment room)



Equipment for highly accelerated life tests (HALT)

Mitsubishi Electric has assembled world-class R&D capabilities to offer the world a unique set of servo systems.

To spread advanced servo systems to the world as quickly as possible, Mitsubishi Electric has established FA-related development centers at its Nagoya Works, and in North America and Europe.

Furthermore, we have established strong connections between our Advanced Technology R&D Center, which pushes technology development beyond the limits of FA, and Information Technology R&D Center. We are moving forward with the development of new products that reflect the latest technological directions and customer input.

Japan (Nagoya Works)

Integrating product-development ability as a comprehensive FA supplier.

FA Development Center

One thousand engineers of controllers and drives, including people from our affiliated companies work here. We are advancing the synergy of Mitsubishi's FA products. Enhancing the compatibility among the products by sharing the development technologies each other. Moreover, engineers share and use technological data and development knowledge with overseas bases and partners, as well through high-speed network communication environments accessible twenty-four hours a day. In addition, planning, development, and prototyping stages are virtualized by information technology to reduce development period and to enhance development quality.



The advanced base for advantage of technology and development of industrial mechatronics products.

Mechatronics Development Center

The Mechatronics Development Center is the development base of mechatronics products. This development center has established advanced machining technology to achieve ultra-fine machining at the accuracy level as high as nanometer, improving development efficiency and reducing development time by seamlessly linking itself with relevant technological organizations. The Mechatronics Development Center is also utilized for joint development projects with our customers, leading creation of products corresponding to new ways of usage and new markets.



Japan (Mitsubishi Electric Corporation group)



Advanced Technology R&D Center

This is the base for the most advanced technology in relation to the whole business of Mitsubishi Electric Corporation, advancing development of common basic technologies and new products and forwarding research and development projects to initiate future business.



Information Technology R&D Center

Here, research and development of basic technology is advanced in the fields of information, communication, multimedia, and light and radio wave to activate creation of new business. Moreover, the Information Technology R&D Center is playing a role in finding a technology for a future top-runner business and in refreshing existing business with achievements of research and development in the field of information technology.

Overseas



Mitsubishi Electric Europe Development Center (EDC)

Since its establishment in 1996, EDC has been observing the latest FA market and technical trends in Europe by tying up with the European sales offices. We utilize the latest technologies into our new products to meet customer's requirement.



Mitsubishi Electric North American Development Center (NADC)

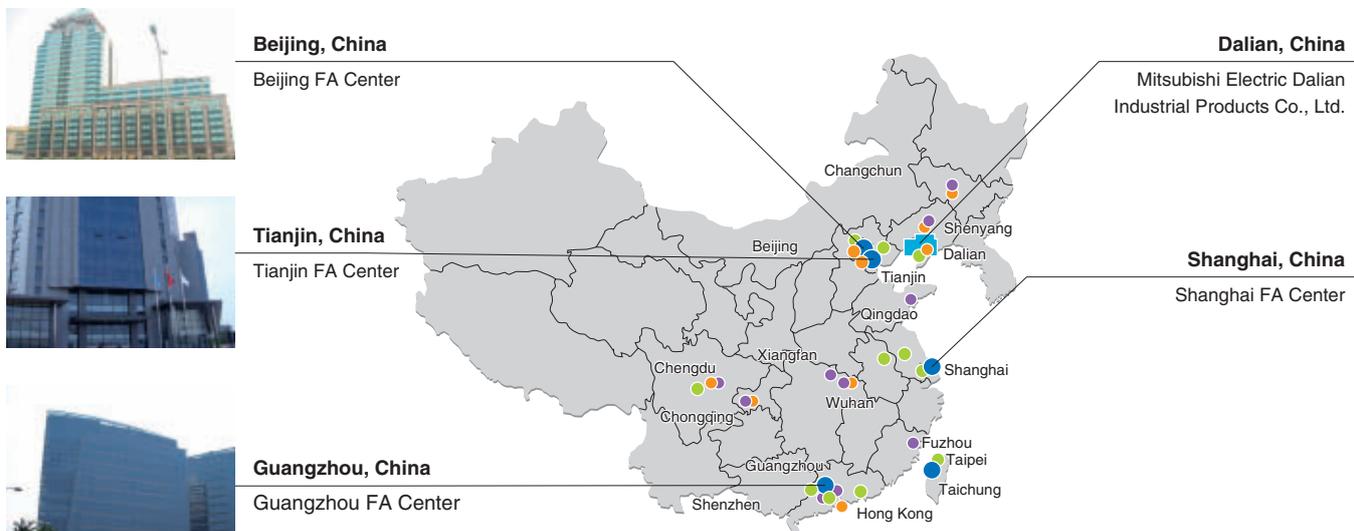
Since 1998, NADC has been making Research & Development as well as Marketing for our next-generation FA products in cooperation with our North American sales offices.

Global Support

- Global FA Center
- FA Center Satellite (China)
- Mechatronics Service Base (China)
- Mitsubishi Sales Offices
- Production Facility
- ◆ Development Center



China (including Hong Kong District)



Globally acknowledged Mitsubishi Electric servo systems

Our global network fully supports you.

Mitsubishi Electric servo systems are developed according to our internationally recognized quality assurance system. Mitsubishi Electric FA Centers support you by maximizing the performance and reliability of our servo systems throughout the world. We provide everything from technical consulting services to training and after-sales service.



Area	Overseas Operating Firms	FA Center		Bases providing our products	Countries (Regions)
		FA Center	Satellite		
Europe and Middle East	10	5	2	146	39
China	13	4	12	171	2
Asia	10	6	0	79	9
America	13	2	0	130	16
Others	1	0	0	3	3
Total	47	17	14	529	69

*As of 2010

Global all-around support

Across the globe, FA Centers provide customers with local assistance for purchasing Mitsubishi Electric products and with after-sales service.

To enable national branch offices and local representatives to work together in responding to local needs, we have developed a service network in 27 locations (including satellite offices) throughout the world.



Technical Consultations

Our expert engineers answer questions about Mitsubishi Electric FA products, offer advice on their use, and propose optimal systems and devices. They also provide consulting services on operations and applications that suit local needs.



Training

We provide practical training for equipment operations and programming using a variety of actual equipment. We support engineers in developing the skills needed on the site.



After-sales Service

With cutting edge information processing and communication technologies, we provide repairs, on-site engineering support and sales of replacement parts. We also have showrooms where you can experience the latest FA devices with our dedicated engineers.

Contact to FA Center

Shanghai FA Center	Mitsubishi Electric Automation (CHINA) Ltd. No.1386 Hongqiao Road, Mitsubishi Electric Automation Center 3F, Shanghai, China Tel: 86-21-2322-3030 Fax: 86-21-2322-3000	India FA Center	Mitsubishi Electric India Pvt. Ltd. India Factory Automation Centre 2nd Floor, DLF Building No.9B, DLF Cyber City Phase III, Gurgaon 122002, Haryana, India Tel: 91-124-4630300 Fax: 91-124-4630399
Beijing FA Center	Mitsubishi Electric Automation (CHINA) Ltd. Beijing Office 9F, Office Tower 1, Henderson Centre, 18 Jianguomennei Avenue, Dongcheng District, Beijing, China Tel: 86-10-6518-8830 Fax: 86-10-6518-3907	North American FA Center	Mitsubishi Electric Automation, Inc. 500 Corporate Woods Parkway, Vernon Hills, IL 60061, U.S.A Tel: 1-847-478-2100 Fax: 1-847-478-2253
Tianjin FA Center	Mitsubishi Electric Automation (CHINA) Ltd. Tianjin Office Unit 2003-2004B, Tianjin City Tower, No.35, You Yi Road, He Xi District, Tianjin Tel: 86-22-2813-1015 Fax: 86-22-2813-1017	Brazil FA Center	MELCO-TEC Representacao Comercial e Assessoria Tecnica Ltda. Av. Paulista, 1439, Cerqueira Cesar - Sao Paulo Brazil - CEP 01311-200 Tel: 55-11-3146-2200 Fax: 55-11-3146-2217
Guangzhou FA Center	Mitsubishi Electric Automation (CHINA) Ltd. Guangzhou Office Rm.1609, North Tower, The Hub Center, No.1068, Xin Gang East Road, Haizhu District, Guangzhou, China Tel: 86-20-8923-6730 Fax: 86-20-8923-6715	European FA Center	Mitsubishi Electric Europe B.V. Polish Branch ul. Krakowska 50, 32-083 Balice, Poland Tel: 48-12-630-4700 Fax: 48-12-630-4701
Taiwan FA Center	Setsuyo Enterprise Co., Ltd. 3F., No.105, Wugong 3rd, Wugu Dist, New Taipei City 24889, Taiwan, R.O.C Tel: 886-2-2299-9917 Fax: 886-2-2299-9963	German FA Center	Mitsubishi Electric Europe B.V. - German Branch Gothaer Strasse 8, D-40880 Ratingen, Germany Tel: 49-2102-486-0 Fax: 49-2102-486-1120
Korean FA Center	Mitsubishi Electric Automation Korea Co., Ltd. (Service) B1F, 2F, 1480-6, Gayang-Dong, Gangseo-Gu, Seoul, 157-200, Korea Tel: 82-2-3660-9630 Fax: 82-2-3663-0475	Czech Republic FA Center	Mitsubishi Electric Europe B.V. -o.s. Czech office Avenir Business Park, Radicka 714/113a, 158 00 Praha5, Czech Republic Tel: 420-251-551-470 Fax: 420-251-551-471
Thailand FA Center	Mitsubishi Electric Automation (Thailand) Co., Ltd. Bang-Chan Industrial Estate No.111, Soi Serithai 54, T.Kannayao, A.Kannayao, Bangkok10230, Thailand Tel: 66-2906-3238 Fax: 66-2906-3239	UK FA Center	Mitsubishi Electric Europe B.V. UK Branch Travellers Lane, Hatfield, Hertfordshire, AL10 8XB, UK. Tel: 44-1707-27-6100 Fax: 44-1707-27-8695
ASEAN FA Center	Mitsubishi Electric Asia Pte. Ltd. ASEAN Factory Automation Centre 307 Alexandra Road #05-01/02, Mitsubishi Electric Building, Singapore Tel: 65-6470-2480 Fax: 65-6476-7439	Russian FA Center	Mitsubishi Electric Europe B.V. Russian Branch St.Petersburg office Sverdlovskaya emb., bld "Sch", BC "Benua", office 720; 195027, St.Petersburg, Russia Tel: 7-812-633-3497 Fax: 7-812-633-3499

 **Safety Warning**

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



for a greener tomorrow

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.

mitsubishi electric corporation

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