

# MR-J3

## Servo and Motion Control

**Simple, easy, dynamic**  
Ultimate positioning control



**IMPROVED COMMUNICATION** 

Industry leading performance gives faster production cycles and reduced material wastage

**INTELLIGENT DESIGN** 

Reduced component size means more flexibility for installation and reduced enclosure sizes

**SIMPLER OPERATION** 

Many built in functions have automatic setup, reducing both installation time and installation mistakes

# MR-J3, how all servo systems should be



Example of conveyor belt control.

The MR-J3 servo-amplifier series has been designed to be the easiest servo system to install, configure and use. Thoughtful design has been applied to all three areas of hardware, firmware and software.

## Hardware that is not hard work

All aspects of servo use and operation have been reviewed for the design of the MR-J3. This has allowed the MR-J3's design to be simplified to reduce wiring time and errors by utilizing a "plug and play" style approach.

### ■ Fast USB connection

The new USB programming port allows quicker connection to the MR-J3 amplifier and quicker communication speeds, in some cases up to 20 times faster, than existing solutions. This means users can spend more time on the issues that matter and not waiting for downloads.



Fast USB connection can mean configuration and monitoring speed increases by to 20 fold

### ■ Reduced component size

The reduced component size is critically important to machine designers who are often called upon to squeeze all of the control solutions they need into the smallest deliverable package. The MR-J3 series boasts an intelligent design that has reduced amplifier sizes by over 40 % and motor lengths by almost a quarter. This means machine designers don't have to make as many compromises to get the right motor and deliver the right power in the right place.



Plug and play concepts minimise wiring errors and speed up installation

## Firmware that delivers performance

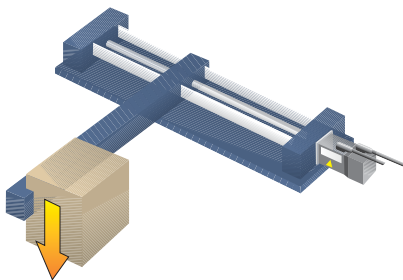
The MR-J3 is designed to make installation and commissioning as easy as possible. Many features can be set-up automatically to operate at optimum performance.

### ■ Adaptive filtering

Mitsubishi has been instrumental in making design breakthroughs in high performance servo design. The realtime auto-tuning adaptive filter was one such major breakthrough. For the MR-J3, there is a new innovative enhancement of the Adaptive Filter II (patent applied for). This advanced control feature means greater suppression of vibration at high gain settings as well as increasing the frequency range by almost 4.5 kHz.

### ■ Advanced suppression of mechanical vibration

The MR-J3 has an automatic feature that enables the amplifier to minimize the effects of a vibrating load.



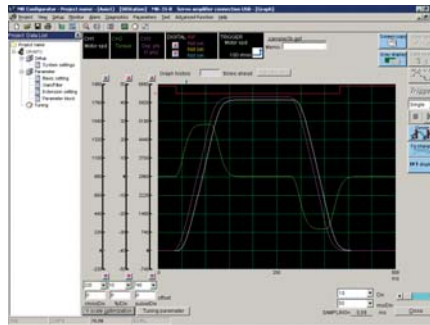
An example of a system configuration with extreme load vibration, higher performance and higher system response is easily achieved.

With this auto-tuning switched on, eliminating excess vibration, higher performance and higher system response is easily achieved.

## Software that makes life easy

The MR-J3 series can be set-up and configured using the MR-Configurator software. This allows users to view and configure a simple set-up screen to configure amplifiers in simple, easy steps.

In addition, there are extensive diagnostics screens such as a "three channel oscilloscope" and a "history function" that allow the servo systems performance to be analysed for problems and optimized.



Online diagnostics allow speed/position/torque values to be monitored simultaneously as well as reviewing general settings and mechanical characteristics.

On-line diagnostics allow speed/position/torque values to be monitored simultaneously as well as reviewing general settings and mechanical characteristics.

## Advanced features

The MR-J3 series delivers easy to use hardware with high performance, for example:

### ■ Increased motor speed

MR-J3 motors are leading the market with speeds of 6000rpm that still deliver high torque capabilities. This makes it easier for designers to select the motors they need to meet tough performance criteria.

### ■ Increased encoder resolution

All MR-J3 encoders are 18 bit which delivers an industry leading 262,144 pulses/rev. This means smoother and higher accuracy operation.

### ■ Improved motor IP ratings

All MR-J3 motors over 1kW are IP67\* rated as standard. This means MR-J3 systems can be used in difficult applications or where "wash-down" is required, for example in the food industry.

Note\*: Excludes the motor shaft.

## Increased response speed

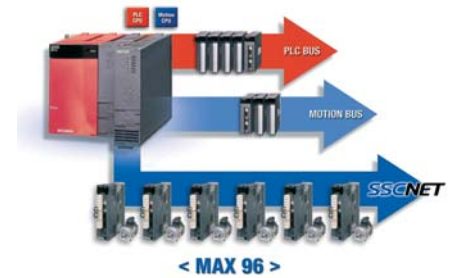
The MR-J3's speed-frequency response has increased over 30 % over existing models to 900 Hz. This increased response speed means quicker operation and greater accuracy for users.

### ■ Advanced networking

MR-J3 uses the dedicated motion network, SSCNET III. With this high speed bus network (transfer rates up to 50 MB/s), cycle times of 0.44 ms are possible as the system is based on electrical noise immune fibre optic network cables. The use of SSCNET III means users have higher speed communication, greater reliability and reduced cabling errors.

### ■ Flexible control solutions

SSCNET III can be cost effectively implemented for 2 to 96 axes using a range of PLC based controllers. Special function control cards are available for FX3U and Q series PLCs as well as dedicated motion control CPUs for System Q.



# Specifications ///

Common specifications MR-J3-A/B		10A 10B	20A 20B	40A 40B	60A 60B	70A 70B	100A 100B	200A 200B	350A 350B	500A 500B	700A 700B	
Power supply	Voltage / frequency <sup>①</sup>	3-phase 200 – 230 V AC, 50 / 60 Hz; 1-phase 200 – 230 V AC, 50 / 60 Hz; 1-phase 200 – 240 V AC, 50 / 60 Hz					3-phase 200 – 230 V AC, 50 / 60 Hz					
		3-phase 200 – 230 V AC, 50 / 60 Hz; 1-phase 230 V AC, 50 / 60 Hz										
Permissible voltage fluctuation	A type	3-phase 200 – 230 V AC: 170 – 253 V AC, 1-phase 200 – 230 V AC: 170 – 253 V AC					3-phase 170 – 253 V AC					
	B type	3-phase 200 – 230 V AC: 170 – 253 V AC, 1-phase 230 V AC: 207 – 253 V AC										
Permissible frequency fluctuation		± 5 % maximum										
Control circuit voltage / frequency		1-phase 170 – 253 V AC, 50 / 60 Hz (± 5 % max.)										
Control circuit power supply		30							45			
Interface power supply		24 V DC ±10 % (required current capacity: 300 mA)										
		24 V DC ±10 % (required current capacity: 150 mA)										
Control system		Sinusoidal PWM control / current control system										
Dynamic brake		Built-in										
Protective functions		Overcurrent shutdown, regeneration overvoltage shutdown, overload shutdown (electronic thermal), servo-motor overheat protection, encoder fault protection, regeneration fault protection, undervoltage / sudden power outage protection, overspeed protection, excess error protection.										
Structure		Self-cooling, open (IP00)					Fan-cooling, open (IP00)					
Environment	Ambient temperature	Operation: 0 – 55 °C (no freezing). Storage: -20 – 65 °C (no freezing)										
	Ambient humidity	Operation: 90 % RH max. (no condensation). Storage: 90 % RH max. (no condensation)										
	Elevation	1000 m or less above sea level										
	Oscillation	5.9 m/s <sup>2</sup> (0.6 G) max.										
Weight [kg]		0.8	0.8	1.0	1.0	1.4	1.4	2.3	2.3	4.6	6.2	

<sup>①</sup> Rated output capacity and rated rotation speed of the servo motor used in combination with the servo amplifier are as indicated when using the power voltage and frequency listed. Output and speed cannot be guaranteed when the power supply voltage is less than specified.

Note: See technical catalogue or manual for specific model details.

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