

FA Integrated Solution  
e-F@ctory

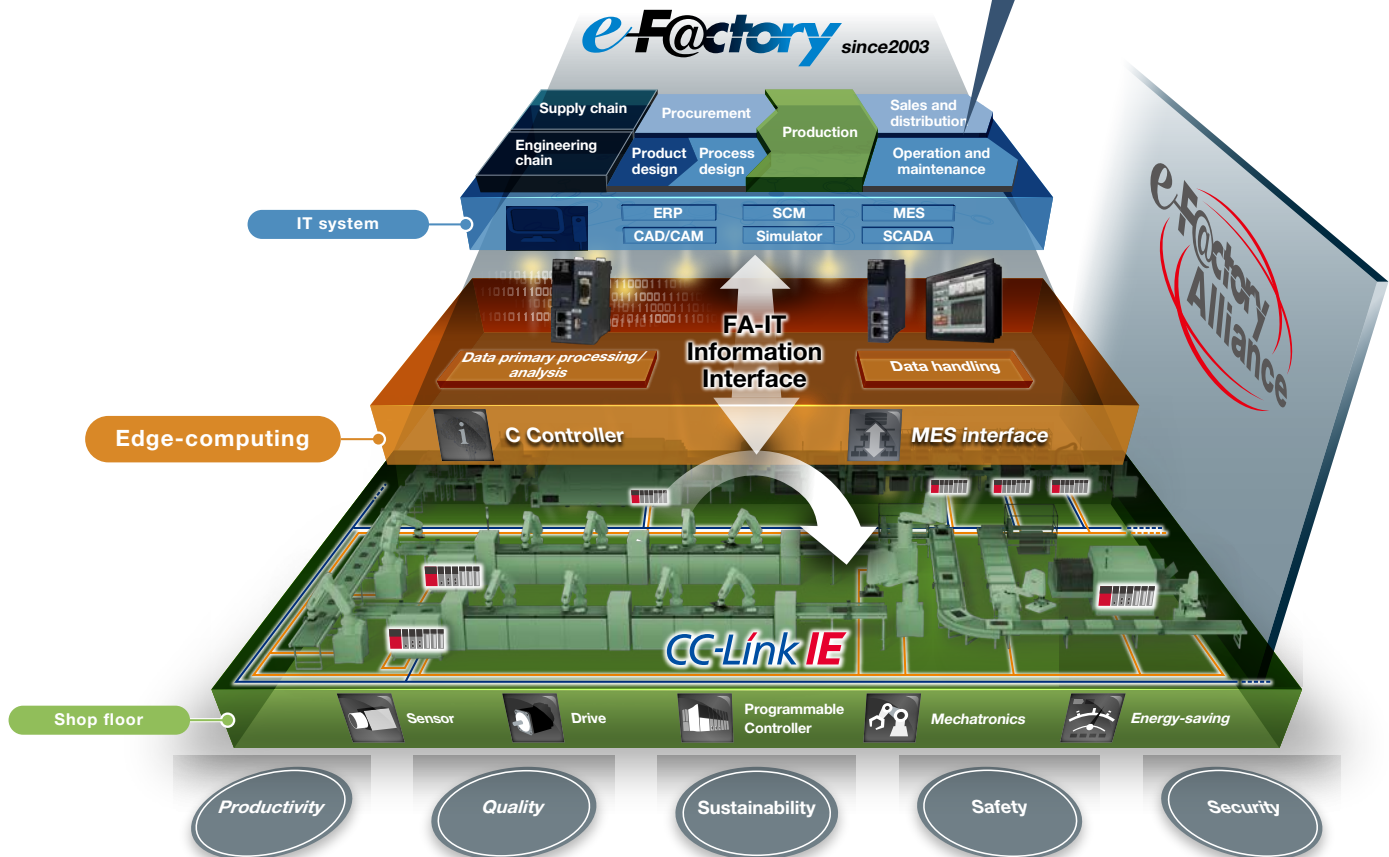
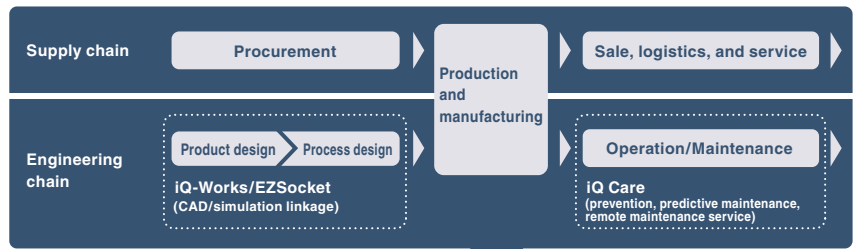
This solution solves customers' issues and concerns by enabling visualization and analysis that lead to improvements and increase availability at production sites.

\*1 Visualize, analyze, and improve

Utilizing our FA and IT technologies and collaborating with e-F@ctory Alliance partners, we reduce the total cost across the entire supply chain and engineering chain, and support the improvement initiatives and one-step-ahead manufacturing of our customers.



FA integrated solutions reduce total cost



Overall production information is captured in addition to energy information, enabling the realization of efficient production and energy use (energy savings).

# To realize **e-F@ctory**<sup>®</sup>

## **iQ Platform** iQ Platform

e-F@ctory is a FA integrated solution based on the concept of reducing total cost across the board, from development and production to maintenance. It supports the future of manufacturing by optimizing factory operations utilizing advanced technologies and information. The foundation of e-F@ctory is the FA integrated platform, iQ Platform. iQ Platform integrates and links the controllers and HMI that control production systems, engineering environments and networks. It contributes to cost reductions throughout all phases of manufacturing, from design to launch, operation, and maintenance. Mitsubishi Electric optimizes its customers' systems with leading technologies and solutions that will continue to support the future of manufacturing.

### Controllers and HMI Improves productivity and product quality

- ①Significantly improves total system performance through the high-speed performance of MELSEC Series system buses
- ②Equipped with dedicated FB and label memory necessary for program standardization
- ③Equipped with a robust integrated security function

### Engineering environment Achieves efficient development, operation, and maintenance

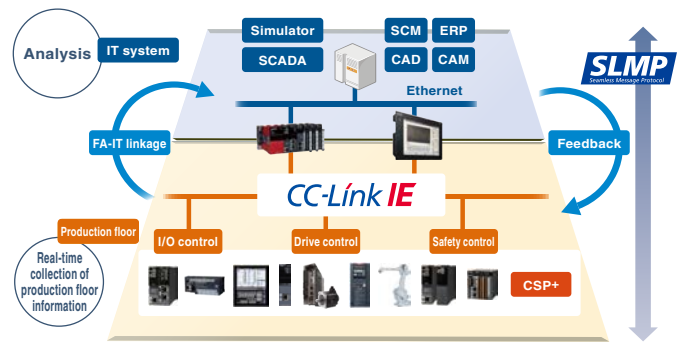
- ①Detect and generate large-scale network configuration diagrams from the actual machine
- ②Mutual parameter reflection between MELSOFT Navigator and individual engineering software programs
- ③Automatically follows changes to system label devices commonly owned by each controller and HMI

### Networks Reduce loss with high accuracy and production speed

- ①Utilizing CC-Link IE, 1 Gbps high-speed communication retrieval with no loss
- ②Seamless communication between each device using SLMP

## **CC-Link IE** CC-Link IE

Integration of all functions required in control applications such as a high-speed, large-volume, enhanced diagnosis function, and the unification of general I/O control/motion functions and a safety communication function. Also achieves improved productivity, quality and energy savings through the utilization of IT, real-time collection of data from the production floor-necessary for reducing TCO-as well as seamless integration with IT systems. By linking each component with CC-Link IE, the customer's overall system is optimized, and TCO can be reduced across all phases, from development to production and maintenance.



**CSP+**: A device profile enabling configuration and monitoring regardless of device type  
**SLMP**: A common protocol realizing seamless data communication between networks



### Delivering networks made in Japan to the world -CC-Link Partner Association

CC-Link is an open field network made in Japan. The CC-Link Partner Association (CLPA) is expanding its global activities to promote CC-Link. These activities, including exhibitions in and outside Japan, are coming to fruition. CC-Link is now certified as a standard by the ISO and the IEC, international standardization management organizations. CC-Link is growing to become a genuine world-standard network. Moreover, supporting the need to optimize entire systems, the CLPA has introduced CC-Link IE, an integrated network based on the Ethernet that enables the expansion of seamless communications from upstream information systems to production sites. As one of the board companies of the CLPA, Mitsubishi Electric is cooperating with CLPA partners in and outside Japan to actively promote CC-Link.

\*Ethernet is a trademark of Xerox Corporation.

FA Integrated Solution  
e-F@ctory

# Mitsubishi Electric Nagoya Works realizes significant improvement in productivity, quality, energy-efficiency, safety, and security through the introduction of e-F@ctory.

Mitsubishi Electric's Nagoya Works has some e-F@ctory model factories within the premises of the Works, enabling the actual effects of improving productivity and equipment operating ratio to be examined. Please see for yourself how e-F@ctory is being used Mitsubishi Electric factories.



## Example of operation management/energy conservation/work support system introduction: Nagoya Works, E4 Building: Programmable controller manufacturing factory

### Aim of introduction

- Stabilization of operating ratio by reducing the installation of incorrect parts
- Reduction of time taken for failure analysis
- Alleviation of burden on experienced operators who provide guidance
- Safety countermeasures for operators who perform loading/unloading work

### Examples of introduction

- Introduction of a surface-mounting operation management system utilizing C-language controllers
- Introduction of a work instruction system based on HMI screens
- Introduction of an energy conservation system for AC/lighting using programmable controllers
- Introduction of a vertical conveyance system using safety programmable controllers

### Results of introduction

30% reduction in energy cost	50% reduction in quality loss
30% increase in productivity	65% reduction in man-hours required for new employee training



## Example of quality control on assembly line: Nagoya Works, W3 Building: Servo motor manufacturing factory

### Aim of introduction

- Response to varying demand and high-mix, variable production
- Improvement of equipment operating ratio and quality

### Examples of introduction

- Direct collection of information inside equipment from the MES interface (programmable controller)
- Strengthen information management through direct connection of equipment with the manufacturing execution system (MES) and conducting various improvement activities

### Results of introduction

50% reduction in lead-time	40% reduction in processing time
50% reduction in quality loss	65% reduction in system construction time
50% reduction in manufacturing process duration	<small>* Figures have been calculated based on a computer-free, program-free state.</small>



## Example of productivity improvement through AI robot introduction: Nagoya Works, Kani Factory: Magnetic Motor Starters manufacturing factory

### Aim of introduction

- Improve operating ratio of lines with a high number of processes
- Support high-mix, low-volume, high-cycle production
- Reduce equipment installation area

### Examples of introduction

- Introduction of a robot production system that fuses people and machines
- Uniform management of quality and equipment information by utilizing e-F@ctory
- Collection and management (traceability) of product data (barcodes) and quality (inspection) data for each machine
- Utilization of robot intelligent technologies (assembly/inspection using force sensors)

### Results of introduction

30% increase in productivity	55% decrease in number of processes
85% decrease in installation rate	60% increase in operating ratio



## Example of productivity improvement of shaft processing line through introduction of e-F@ctory: Nagoya Works, Shinshiro factory: 3-phase motor manufacturing factory

### Aim of introduction

- Improve line balance by reducing grinding time of bottleneck processes

### Examples of introduction

- Manage production information through introduction of e-F@ctory  
Automatic work instructions to the processing lines based on information from the upper production management server  
Expand unmanned operation through planned set-up changeover and improve productivity
- A grinder-free system utilizing a C-language controller  
Automatically calculating the offset value of the lathe from the automatically calculated outer-diameter dimensions and achieving stable finishing on the lathe  
Significant reduction of cycle time through the abolishment of the shaft rotor grinding process

### Results of introduction

15% reduction in processing time	30% increase in productivity
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**3-year warranty**

# Product warranty extended to 3 years



[Applicable models] Programmable Controller /Indicator

## Programmable Controller MELSEC Series



- iQ-R Series
- Q Series
- L Series
- iQ-F Series
- F Series

## Human Machine Interface



- GOT2000 Series
- GOT1000 Series

\*Our product warranty is valid for 3 years after the date of customer purchase or the date of delivery to your designated location (within 42 months of manufacturing and with up to a six month circulation period after shipping from our manufacturer). Additionally, the coverage of this warranty will be determined by our company internal regulations.

## FA Products Mobile Showroom

# The latest product for our customers



The Mobile Showroom is equipped with our latest line-up of Mitsubishi FA products, and is available across the entire country to introduce our products to customers. Even without our customers coming to meet us or securing a meeting room, we can quickly hold an exhibition in a single corner of a customer's parking lot. By all means, if you are interested, please let us know. We are available anywhere throughout the country.

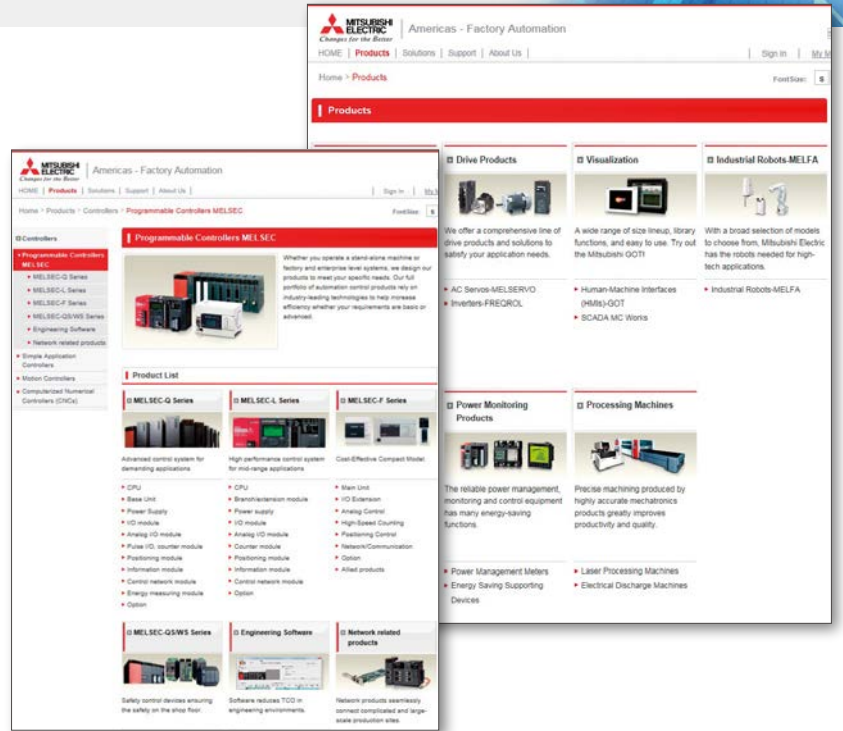


Mobile Showroom for Robot products

WEB

# Easier to see, easier to use, and easier to understand!

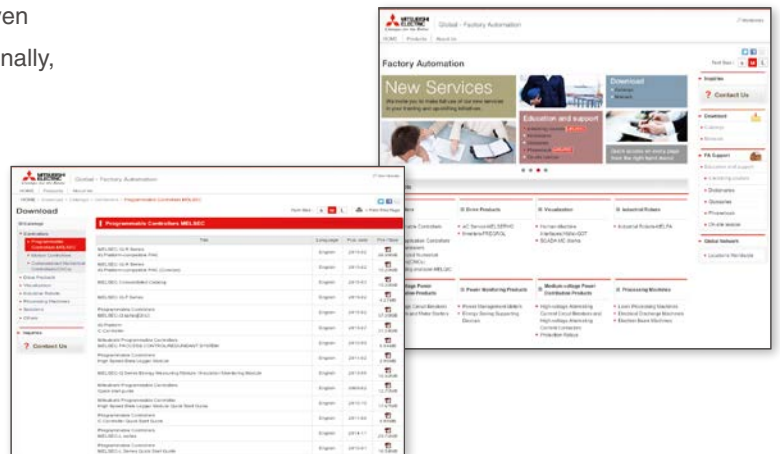
In addition to our Mitsubishi electrical products we provide a variety of useful information regarding partner company's products and services, and now each of our services is even easier to use.



Download

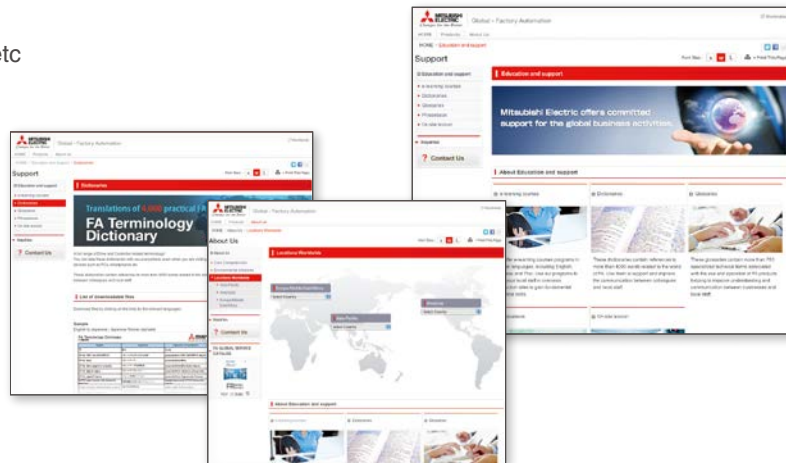
## Refine conditions for a significant power-up in search functions

Our downloadable catalogs and manuals, etc. are made even easier to use with the refining and search functions. Additionally, you can quickly download even large amounts of data.



## Global business support

In addition to support sites and Japanese language contacts in all over the world, phrase books, glossaries, etc are available in every language.

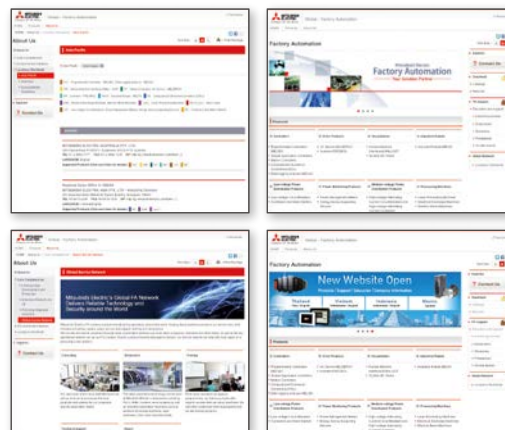


### Global

## Throughout the world, Mitsubishi Electric FA Information can be easily accessed.

From the “Worldwide” link on the upper right of the page, you can easily access the global FA site.

On the global page, in addition to products that can be purchased globally, you can also check-out various regional services, such as regional product information and international language catalogs and manuals. By all means, please make use of these services when expanding your business overseas.



**FA  
e-Learning**

Learn at your own pace  
whenever and wherever.



In the office, out of the office, and in your own home — You can attend the Mitsubishi FA Equipment Usage e-Learning sessions for free from anywhere.

**e-Learning tools**

e-Learning is available with many language.

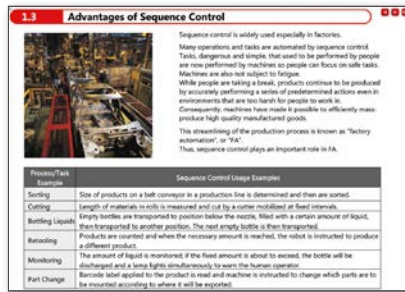
Languages: English, Chinese, Korean, Thai, Indonesian, Vietnamese, Malay, Portuguese (South American), Spanish (Central and South American), Turkish, Hindi.

<http://www.MitsubishiElectric.co.jp/fa/glosup/e-learning/index.html>

**e-Learning**

1

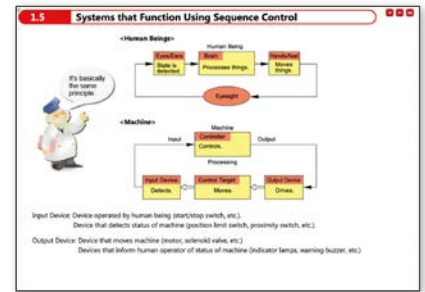
All courses  
are free of  
charge



2

Learning at your  
own pace,  
whenever and  
wherever.

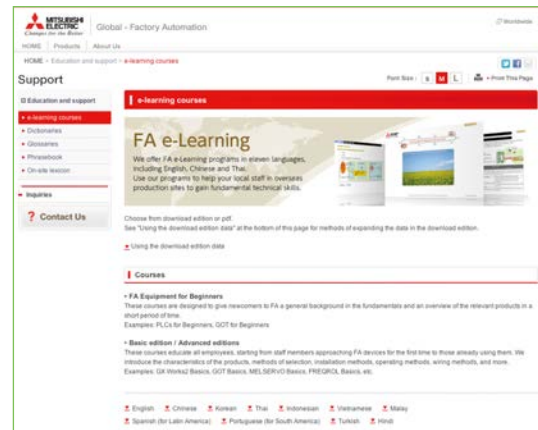
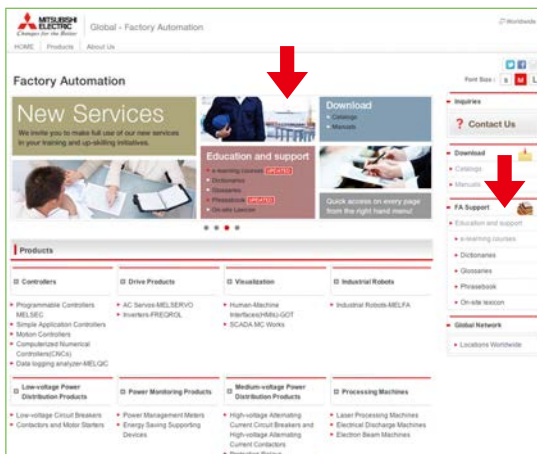
- You can learn whenever & wherever.
- You can repeat lessons as needed.
- You can quickly and easily check your learning progress.



3

Effective  
multi-media  
learning

- You can understand deeply with animations and videos.
- You can operate programming software with simulator.



● Access directly from the following URL.  
<http://www.mitsubishielectric.com/fa/assist/e-learning/index.html>





We would like to improve the productivity and quality without changing the existing equipment.

We cannot afford large cost required for new equipment or modifying the existing equipment.

We would like to save energy, and be environmentally friendly.

We do not have enough workers engaged in examination for improvements and migration.

We would like to acquire and analyze data quickly.

We would like to preventive maintenance.



# Equipment System Migration in 3 Steps

Mitsubishi Electric will propose a variety of products and functions based on various keywords to eliminate concerns of customers.

**Step 1** [Stable operation] [Extension of equipment service life] [Preventive maintenance]

- Selecting the proper latest model
- Downsizing and space saving
- Replacing existing products manufactured by other companies with Mitsubishi products
- Improving the maintainability
- Utilizing the software assets and resources
- Improving the operability
- Step-by-step migration
- Preventive maintenance realized by migration

**Step 2** [Productivity improvement]

- High-speed, high-accuracy control
- Smart wiring
- High-speed, large-capacity communication
- Networking

**Control equipment** Not only various functions, high speed, large capacity and extensive networking but also top class reliability are proved by long-term actual achievements.

**Drive equipment**

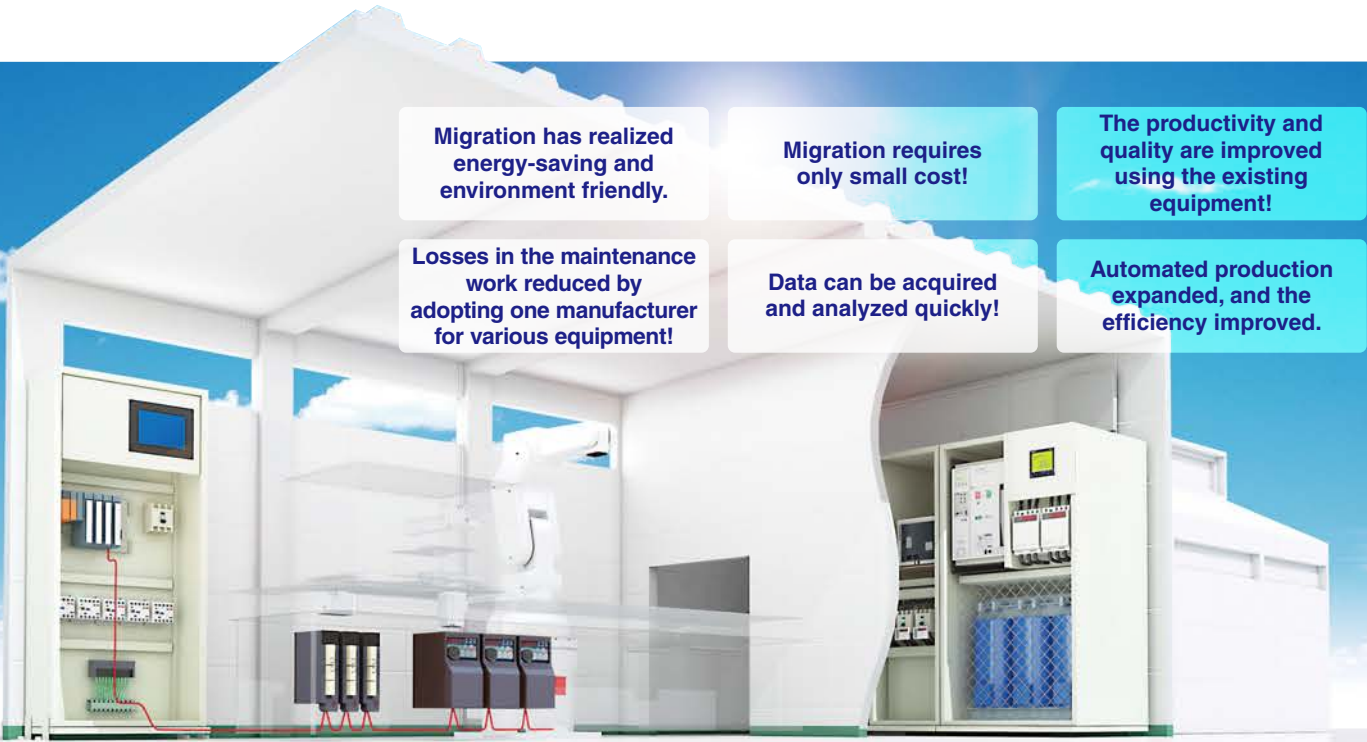
**Mitsubishi PLCs**  
**MELSEC iQ-R series**

**Mitsubishi micro PLCs**  
**MELSEC iQ-F series** **MELSEC-F**

**MELSEC Q series** **MELSEC L series**

**Mitsubishi graphic operation terminals**  
**GOT2000**  
Graphic Operation Terminal

**Mitsubishi inverters**  
**Mitsubishi AC servos** **FREQROL**  
**MELSERVO**  
  
  
SERVO SYSTEM CONTROLLER NETWORK



Migration has realized energy-saving and environment friendly.

Migration requires only small cost!

The productivity and quality are improved using the existing equipment!

Losses in the maintenance work reduced by adopting one manufacturer for various equipment!

Data can be acquired and analyzed quickly!

Automated production expanded, and the efficiency improved.

**Preventive maintenance and product life** Preventive maintenance of equipment and devices is required to use FA equipment for a long time.

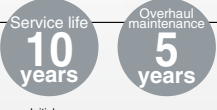
There are two concepts of preventive maintenance.

**Daily maintenance and inspection** (Visual inspection)  
 ●Indicator lamps (in the equipment main body, devices and units)  
 ●Equipment mounting status  
 ●Cable connection status

**Periodic maintenance and inspection** (Visual inspection)  
 ●Maintenance of electrical equipment  
 ●Ambient environment  
 ●Checking stored programs

**Product life**

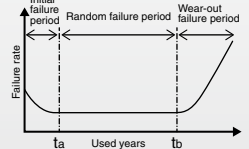
●Mitsubishi Electric recommends 10 years as the service life of FA equipment.



●Mitsubishi Electric recommends overhaul maintenance of FA equipment in 5 years since the start of operation.

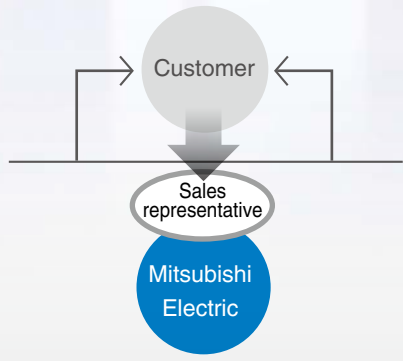
**Replacing a unit whose service life is expired**

Even if a unit is operating normally, the failure rate is high because each part is worn out and damages (related to the power ON time, surge, etc.) are accumulated.



- Maintenance of units (to prevent short-circuit by removing dust and adhering substances)
- Replacement of parts requiring periodic replacement (such as fuses, batteries and memory cards)
- Overhaul of units incorporating parts having limited service life\*

\*Aluminum electrolytic capacitors, fuses, relays, etc.



Mitsubishi Electric will support migration of equipment for the customer in cooperation with the sales representative.

**[Quality improvement] [Promotion of energy saving]**

- Standardizing the maintenance tool
- Utilizing the GOT
- Quick recovery from machine alarms
- Supporting and implementing energy saving

Mitsubishi Electric's motor control technology is advancing everyday. Mitsubishi drive equipment contribute to the realization of not only high functions and high performance but also energy saving.

**Mitsubishi industrial robots**

**MELFA**



**Step 3 [Visualization] [Automation] [Safety and security measures]**

- Acquiring, judging and analyzing data
- Image recognition inspection
- Automating inspections and judgments
- Safety control equipment
- Automation and labor saving by robots
- Duplicating the CPU
- Constructing the MES (manufacturing execution system)

**Distribution control equipment**

Mitsubishi Electric supports stable supply of electric power with its wide variety of products in the distribution control field, and proposes aggressive energy saving achieved by migration.

**Mitsubishi low-voltage distribution control equipment**



**World Super WS-V Series**



**SS Super-S Series**



**MS-T series**

# Mitsubishi PLCs

How is the current status of the existing PLC?

## Mitsubishi PLCs



**MELSEC-A (large type)**  
Discontinued September 2008



**MELSEC-A (small type)**  
Discontinued September 2014

A/QnA (large type), A2C, AnS (small type), AOJ2(H)

### [Concerns about the existing equipment]

The equipment is working fine, but is getting old.

We would like to upgrade but the performance has reached the limit.

Components from different brands are installed in the equipment which is making maintenance troublesome.

### [Concerns for migrating]

Need to keep the equipment running.

Don't know to which product to migrate to.

Can't read out the existing programs.

Mitsubishi Electric can eliminate these concerns!

Mitsubishi Electric offers various tools for replacement with latest models.

## Mitsubishi Electric

### A to Q migration catalogs and case examples

- MELSEC-A Series (large type) Transition Guide
- MELSEC A Series (small type) Transition Guide
- MELSEC-A Series Transition Examples

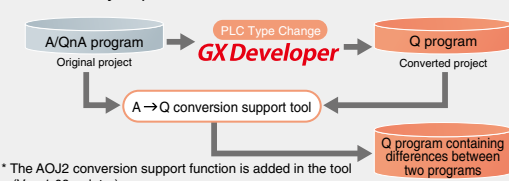


**For example** A to Q hardware replacement!

The hardware can be replaced without changing the size and location.

**For example** A to Q program replacement!

Existing programs can be automatically converted into Q programs using "PLC Type Change" in GX Developer (also included with GX Works2). By converting both an existing program and a converted program into "Q program containing differences between two programs" using the A to Q conversion support tool (which can be downloaded free of charge), the correction efficiency is considerably improved.



# Migrate to the latest Mitsubishi PLCs!!

Mitsubishi supports migration with various tools and accumulated know-how.

Mitsubishi PLCs

## MELSEC iQ-R series



▶ P.10

## MELSEC Q series



▶ P.88

## MELSEC L series




▶ P.118



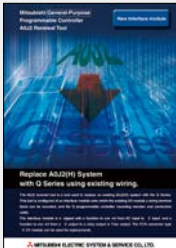
**Partner manufacturers**

**A to Q migration tool catalogs**

- Migration tool catalogs



Mitsubishi Electric Engineering Co., Ltd.

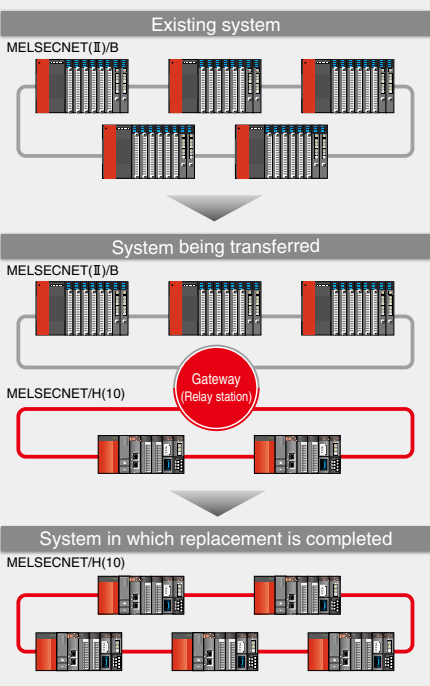


Mitsubishi Electric System & Service Co., Ltd.

Tools to easily migrate from A series to Q series available.

For example Network replacement!

Mitsubishi data link system "MELSECNET" can be replaced in various methods.



### [Benefits of migration]

- 3 year warranty!
- Easy connection with multiple communication ports!
- High speed and large capacity CPU!
- Improve efficiency with various convenient instructions!
- Abundant lineup enables selection of product suitable for the required specifications.
- The control panel can be downsized.
- Enhanced program security function!

# Mitsubishi Micro PLCs

How is the current status of the existing PLC?

Mitsubishi micro PLCs



F1, F1J, F2, FX1, FX2, FX2C,  
FX0, FX0S, FX0N, FX1S, FX1N, FX1NC,  
FX2N, FX2NC

**FX1S/FX1N/FX1NC**  
To be discontinued  
December 2015

**FX2N/FX2NC**  
Discontinued  
September 2012

## [Concerns about the existing equipment]

The equipment is working fine, but is getting old.

We would like to upgrade but the performance has reached the limit.

Components from different brands are installed in the equipment which is making maintenance troublesome.

## [Concerns for migrating]

Need to keep the equipment running.

Don't know to which product to migrate to.

Can't read out the existing programs.

Mitsubishi Electric can eliminate these concerns!

Mitsubishi Electric offers various tools for replacement with latest models.

## Migration catalog

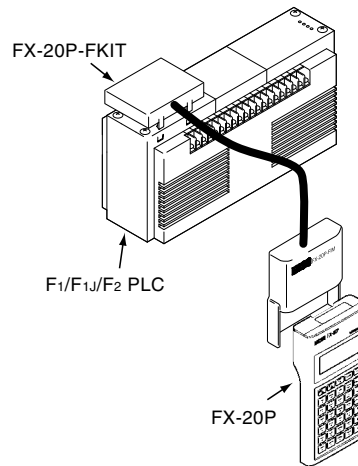
● FX Migration Guide



For example

F (F1, F1J, F2) series replacement!

The combination "FX-20P + FX-20P-FKIT" is available.



The F (F1, F1J, F2) series can be replaced by the FX series while reading out existing programs using the combination "FX-20P + FX-20P-FKIT". After existing programs are transferred to the FX series, they can be corrected and debugged using GX Works2.

**FX-20P**  
Discontinued  
December 2012

\* Contact your local dealer.

# Migrate to the latest Mitsubishi PLCs!!

Micro PLCs are downsized compared to legacy models, and can fit into the existing space. Programs can be replaced with FX-20P-FKIT for F series or with GX Works2 for FX series.

Mitsubishi micro PLCs

## MELSEC iQ-F series



▶P.48



Mitsubishi micro PLCs

## MELSEC-F FX3 series



▶P.134

●Migration Guide from FX2N/FX2NC to FX3

●Migration Guide from FX1N/FX1NC to FX3



For example

Legacy FX series replacement!

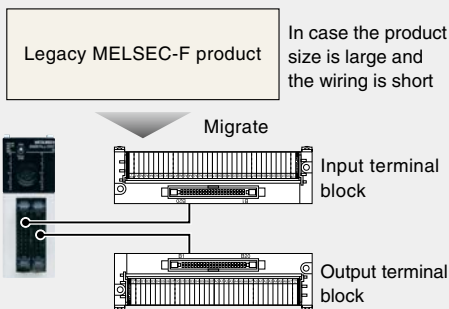
Legacy FX series program can be transferred to the latest product by using PC type change function of GX Works2.

Programming software  
**GX Works2**



For example

Replacing wiring!



Large size legacy product can be replaced easily with connector type FX series PLC and terminal block product of partner vendors.

(Connector type requires 24 V DC power supply)

### [Benefits of migration]

<b>3 year warranty!</b>	<b>Easy connection with multiple communication ports!</b>
<b>Expansion boards enable expansion at low cost!</b>	<b>Convenient built-in functions enable system configuration at low cost!</b>
<b>Abundant lineup enables selection of product suitable for the required specifications.</b>	<b>Improve efficiency with various convenient instructions!</b>
<b>Enhanced program security function!</b>	<b>High-function and compact extension modules are available!</b>

# Mitsubishi graphic operation terminals

## How is the current status of the existing GOT?

Mitsubishi graphic operation terminals



GOT-A900 series



GOT-F900 series



### [Concerns about the existing equipment]

The product is getting old and is not well maintained.

Screen datas are not backed up.

Components from different brands are installed in the equipment which is making maintenance troublesome.

### [Concerns for migrating]

Do we have to drill holes to replace?

Can the screen data be replaced?

Can we replace other brand HMI with GOT1000 or GOT2000 series products?

Mitsubishi Electric can eliminate these concerns!

## Mitsubishi Electric offers various tools for replacement with latest models.

### Migration documents

● Technical Bulletin for replacement of GOT-A900 with GOT1000



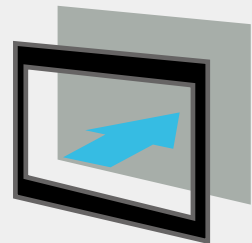
● Technical Bulletin for replacement of GOT-1000 with GOT2000



For example

### Migration tool

Optional attachment is available for replacing GOT-900 to GOT1000 series with different screen size.



For example

Replacing of a Mitsubishi legacy product or other brand HMI!



Screen data created in the GOT-A800 series SW3NIW-A8GOTP



Screen data created in the GP-PRO/PB-III series manufactured by Digital Electronics Corporation



## Migrate to the latest Mitsubishi Graphic Operation Terminals!!

GOT series has same panel-cut dimensions when the screen size is the same. Screen data can easily be replaced using GT Works3. GOT with the latest functions can reduce loads on the PLC, and can back up data.

Mitsubishi Graphic Operation Terminals

# GOT2000

Graphic Operation Terminal



▶ P.566

Documents for migrating GOT-F900 series

- GOT-F900 Migration Guide
- Replacement Guide



For example

### GT Works3+plus

comes with the following software to convert screen data from GOT-900 series to GOT1000, GOT2000 series.



GT Designer2 classic

GT Designer3

GT Works3 comes with GT Converter2 to convert screen data of legacy models and other brand HMI to GOT1000/GOT2000 series.

Screen design software

### GT Works3 GT Works3+plus GT Converter2



Mitsubishi Graphic Operation Terminals

GOT2000 series  
GOT1000 series



### [Benefits of migration]

3 year warranty!

Front side USB port enables easy maintenance\*

\* Excluding some models

Can be connected to various networks!

Easy connection with multiple communication ports!

Decentralize control to GOT to assure stable operation!

Improves visibility with brilliant color LCD!

Abundant lineup enables selection of product suitable for the required specifications.

Logging function to improve quality!

## GOT Mobile

Monitor your worksite anytime, anywhere.

Check the equipment status using a web browser.





# Mitsubishi inverters

How is the current status of the existing inverter?

Mitsubishi inverters



A700

A500

F500



E500



S500

## [Concerns about the existing equipment]

Replacement of service life limited components may be needed soon.

Need to manage and control many units.

Need to improve energy efficiency.

## [Concerns for migrating]

Are there compatible products to the existing obsolete products?

How can we replace the parameters?

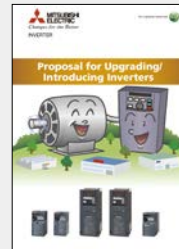
We are using coil type motor, eddy current joint type motor (AS), direct current (DC) motor, and have difficulty in daily and preventive maintenances.

Mitsubishi Electric can eliminate these concerns!

Mitsubishi Electric offers various tools for replacement with latest models.

### Migration documents

- Inverter migration proposal



For example

### Convenient compatibility

- Parameters can be converted easily using the convert function of "FR Configurator2" (optional) parameter setting software.



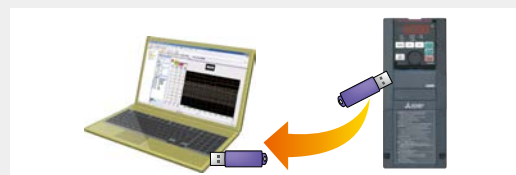
- The mounting compatibility with conventional models is secured.
- Mitsubishi Electric offers the (optional) mounting compatibility attachment though the compatibility may be different in some models.



### Advantages of migration to the 800 series

- In the FR-A800 and F800 series, the trace function can store the operation status (such as the output frequency) just before activation of the protection function in the RAM built in the inverter. The stored data (trace data) can be copied to the USB memory. Troubleshooting can be performed easily even in distant places when the trace data is captured by the software (FR Configurator2) set up in the inverter.

The trace data stored in the built-in RAM is erased when the power is turned OFF or the inverter is reset.



# Migrate to the latest Mitsubishi inverters!!

Abundant tools and documents to support migration are available. Parameters can be converted easily using FR Configurator2. Mitsubishi inverters with the latest functions considerably improves energy saving and ease of maintenance!

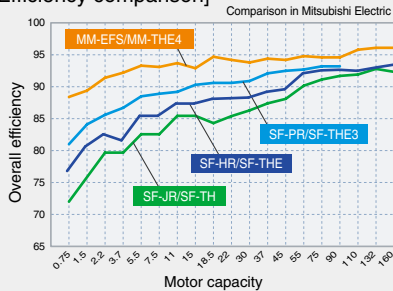
## Energy saving

Replace with high-efficiency IPM motor (MM-EFS series)



- The FREQROL-F800 series is compatible with the IPM motor.
- Replacement is easy due to frame number being the same as that of the standard three-phase motor.

### [Efficiency comparison]



- IPM motor with permanent magnet is more efficient than the high-performance energy-saving motors.
- Efficiency level meets "IE4 (super premium efficiency)" of international standard IEC 60034-30. (As of March 2013)

## Improved ease of maintenance

Latest series use long service-life components and most advanced life diagnosis which improves ease of maintenance.

- Approximate life of limited service life components

Part name	Approximate service life	Service life specified by JEMA
Cooling fan	10 years	2 to 3 years
Capacitor for smoothing main circuit	10 years	5 years
Smoothing capacitor on PC Board	10 years	5 years

- Deterioration degree of main circuit capacitors, control circuit capacitors and rush current suppression circuits can be monitored.
- Self-diagnosis function sounds alarm for components having limited service life to prevent failures.

It is economical to use Mitsubishi inverters for drive when Mitsubishi PLCs are used for control. CC-Link and RS-485 communication enable precise control of multiple inverters.



## [Benefits of migration]

- Improved ease of maintenance with long service life components.
- Easy control with abundant network connections!
- Life diagnosis function notifies remaining service life of components!
- "Close contact" installation design saves installation space (E700 and D700).
- Easy operation with M dial
- Easy wiring (A800, F800, E700SC and D700).
- Abundant lineup enables selection of product suitable for the required specifications!
- Parameters can be copied using the USB memory (A800 and F800).
- The magnet motor is also available (A800 and F800).
- Easy replacement of cooling fan

# Mitsubishi industrial robots

How is the current status of the existing robot?

Mitsubishi industrial robots



## [Concerns about the existing equipment]

Want to improve productivity of the equipment.

Maintenance is hard due to increased failures.

Want to visualize all standalone robots.

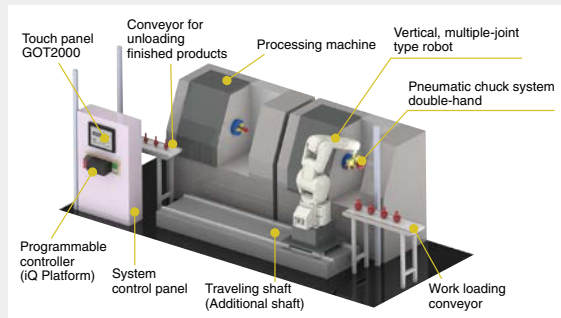
Mitsubishi Electric can eliminate these concerns!

It contributes to productivity, the improvement in reliability, and total cost reduction.

For example

### Loading/Unloading of parts to a processing machine

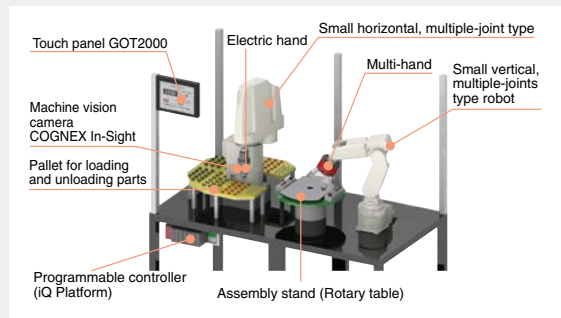
(A lathe, a machining center, a press machine, and a make-up machine, etc.)



For example

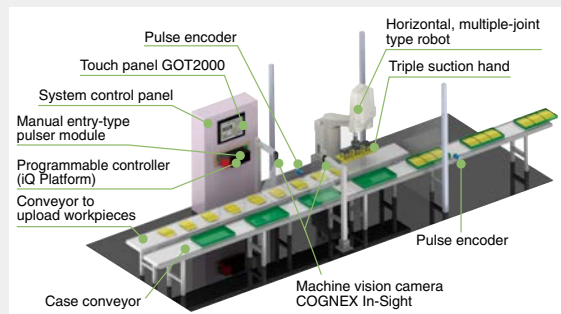
### Assembly of electric components

(switch)



For example

### Conveyor alignment for packed food products



# Migrate to the latest Mitsubishi robots!!



RH-F series

RV-F series



**iQ Platform**

SQ series supports iQ Platform and enables higher speed control.



▶P.636

## [Benefits of migration]

High-speed control improves tact time!	Robot CPU in iQ Platform saves wiring
Multiple robots can be controlled together.	Robot can be controlled using PLC language!
Downsized robot saves installation space.	Improved operability with easy connection of GOT

### Points for the employment of robots

A vertical, multiple-joint type robot realizes high-speed loading and unloading of parts to a processing machine. (Oil mist proof) Additional traveling shaft improves the operating rate of a robot and efficiently utilizes the facility.

#### Advantages

- Improvement of environmental resistance
- Smooth hand-over of products with various processing machines
- Higher operating rate of robot
- Shorter cycle time

### Points for the employment of robots

High-speed parts kitting with a horizontal, multiple-joint type robot, fine assembly with a vertical, multiple-joint type robot, and the ability to handle a variety of workpieces with a high-functioning hand (a multi-hand and an electric hand)

#### Advantages

- High-speed kitting
- Capable of handling a wide variety of workpieces using only a small space
- No need to change hands to switch a kind of work
- Complicated assembly process
- Reduction of cycle time

### Points for the employment of robots

High-speed vision-tracking of horizontal, multiple-joint type robot realizes non-stopping alignment process. It also processes simultaneous tracking for multiple conveyors.

#### Advantages

- High-speed tracking
- No need of alignment device
- Reduction of cycle time
- Stable quality due to automated process

# Mitsubishi AC servos

How is the current status of the existing AC servo?

Mitsubishi AC servos



MR-A, MR-J, MR-J2, MR-J2S, MR-H, MR-SA/SB/SC/SD, MR-SO, MR-VA/VC



## [Concerns about the existing equipment]

AC servos is not tuned correctly and generates large noise.

Takes time to complete positioning.

Motor seems to be okay but the amplifier is a concern.

## [Concerns for migrating]

Are there compatible products to the existing obsolete products?

Can the hardware be replaced easily?

How can we replace the parameters?

Mitsubishi Electric can eliminate these concerns!

Various tools are available to migrate to the latest products.

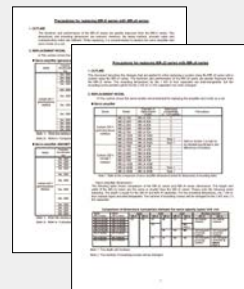
## Mitsubishi Electric

### Replacement support documents

●MR-J2-Super series migration catalog



●Cautions on replacement of the MR-J/MR-H series



●Migration Guide from MR-J2 Super/J2M series to MR-J4 series

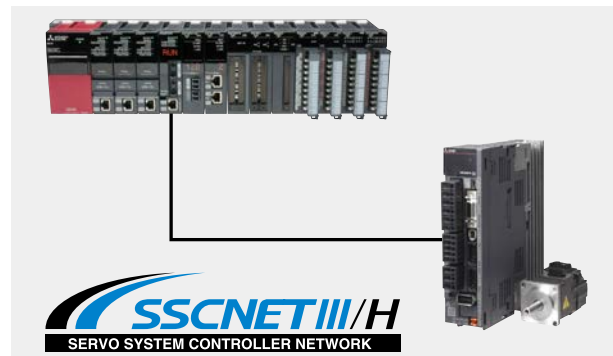


●New Product Newsletter for MR-J2S-B SSCNET conversion unit



## MR-J4-B is recommended for replacing legacy Mitsubishi products and other manufacturers products.

- SSCNET III/H enables a simple system with less wiring.
- MR Configurator2 enables easy adjustment, monitor display, parameter setting, etc.

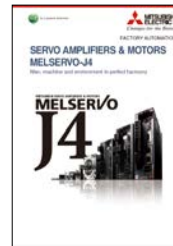


## Migrate to the latest Mitsubishi AC servos!!

Abundant tools to support easy migration are available. In multi-axis control, combining the motion controller contributes to function upgrade and space saving!



MITSUBISHI SERVO AMPLIFIERS & MOTORS  
**MELSERVO-J4**  
 ▶P.270  
 0.05kW to 22kW



### Partner manufacturer

● Migration tools available from Mitsubishi Electric System & Service Co. Ltd.

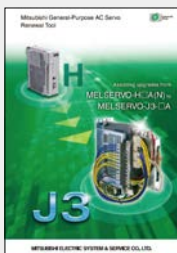
For replacing MR-J series



For replacing MR-J2S series



For replacing MR-H series



For replacing MR-SA series



For example

In case of MR-J2S series



Servo can be replaced with MR-J3A type using the migration tool.

### [Benefits of migration]

Easy servo adjustment to fit the equipment!

Easy wiring with SSCNET III/H or SSCNET III.

High-response control improves tact time!

Easy setting of electronic gear.

Smooth operation due to reduced cogging torque

Easy tuning function

Abundant lineup enables selection of product suitable for the required specifications!

Space saving design allows close contact installation

# Mitsubishi low-voltage distribution control equipment

How is the current status of the existing low-voltage distribution control equipment?

## Low-voltage circuit breakers



No-fuse circuit breaker NF225-SS series      No-fuse circuit breaker NF2000 series

Need to replace the breaker because the current capacity has changed.

Concerned about aging products malfunctioning.

Need to replace the large obsolete products to save space.

## Electromagnetic switches



Electromagnetic contactors MS-K series

Concerned about aging products malfunctioning.

Want to save space by migrating to the latest products.

## Power management measuring unit



Mechanical measuring unit

Concerned about aging products malfunctioning.

Need to reduce measuring work.

Mitsubishi Electric can eliminate these concerns!

Migrate to the latest Mitsubishi low-voltage distribution control equipment!!



No-fuse circuit breakers



Low-voltage air circuit breakers



Downsized products allows panel space saving.  
Functions can be upgraded just by replacing.  
Can prevent unnecessary operations of the earth-leakage circuit breaker by high function IC.



Electromagnetic contactors MS-T series

Terminal cover installed for added safety.  
Downsized products allows panel space saving.



Electronic multi-measuring instruments ME96SS series



LCD improves visibility.  
Easy data collection with communication function.  
Various options facilitate setting changes for the display and output devices (electronic measuring instrument).

Migrations by Mitsubishi Electric

## Furthermore, Mitsubishi's migration can:

Energy measuring unit  
EcoMonitorLight

MDU breaker\*

No-fuse circuit breaker/  
earth-leakage circuit  
breaker equipped with  
leakage current indication\*

Single-circuit measuring unit, display unit, and setting unit integrated into a single measuring unit.

Allows easy and low cost energy "visualization". Built-in MODBUS® communication allows system upgrade.



In addition to circuit breaker function, this product continuously monitors the electric circuit information (power amount, load current, leakage current, etc.) and enables centralized monitoring through communication.



These products monitors leakage current data and investigate causes of electric leakage.



\* These equipment are not sold in the USA.

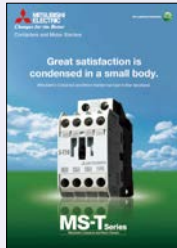
### Product catalogs

- Mitsubishi WS-V Series Molded Case Circuit Breakers and Earth-leakage Circuit Breakers
- Mitsubishi WS-AE Series Low Voltage Air Circuit Breakers



### Product catalogs

- Mitsubishi MS-T Series Electromagnetic switches



### Product catalogs

- Mitsubishi Super-S Series Electronic Multi-measuring Instrument ME96SS



Mitsubishi FA products can "visualize" power management equipment and of production equipment.

Directly connected to Q series PLC.



Electric power measuring unit [QE84WH]  
PLC measures power information up to 4 channels which enables standard data control and state monitoring in each production equipment.

Insulation monitoring unit [QE821LG]  
PLC continuously monitors the insulation status and supports preventive maintenance of the production equipment.



## [ Benefits of migration ]

### Low-voltage circuit breakers

Downsized to save panel space.

New circuit breaking technology allows higher performance.

Contribute to energy saving and preventive maintenance through monitoring of the electric circuit information using the MDU breaker and others.

### Electromagnetic switches

Safe and easy wiring with CAN terminal.

Detachable arc cover makes inspection easy.

Save energy with low power consumption coil.

### Electronic multi-measuring instrument

Wide viewing angle LCD improves visibility.

Set data transceiver allows easy setting and management.

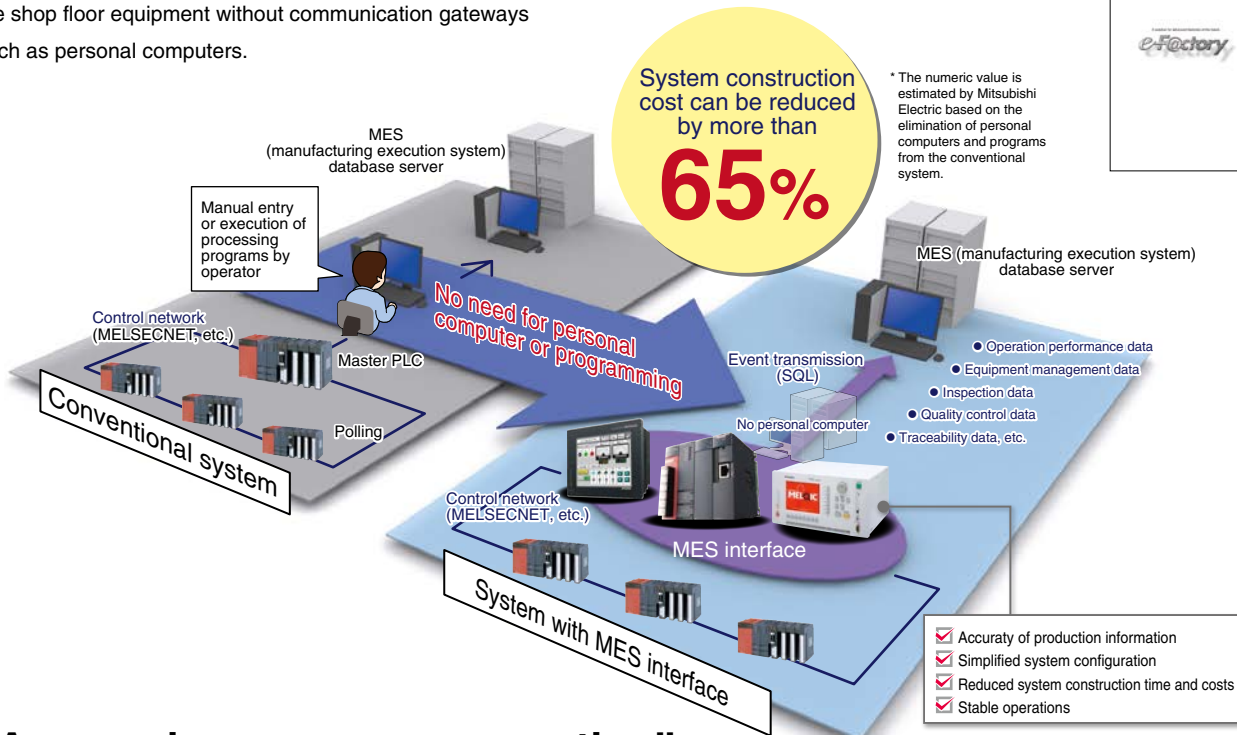


# The production capability of your factory

The MES interface is the key to realize the visual platform “e-F@ctory”.

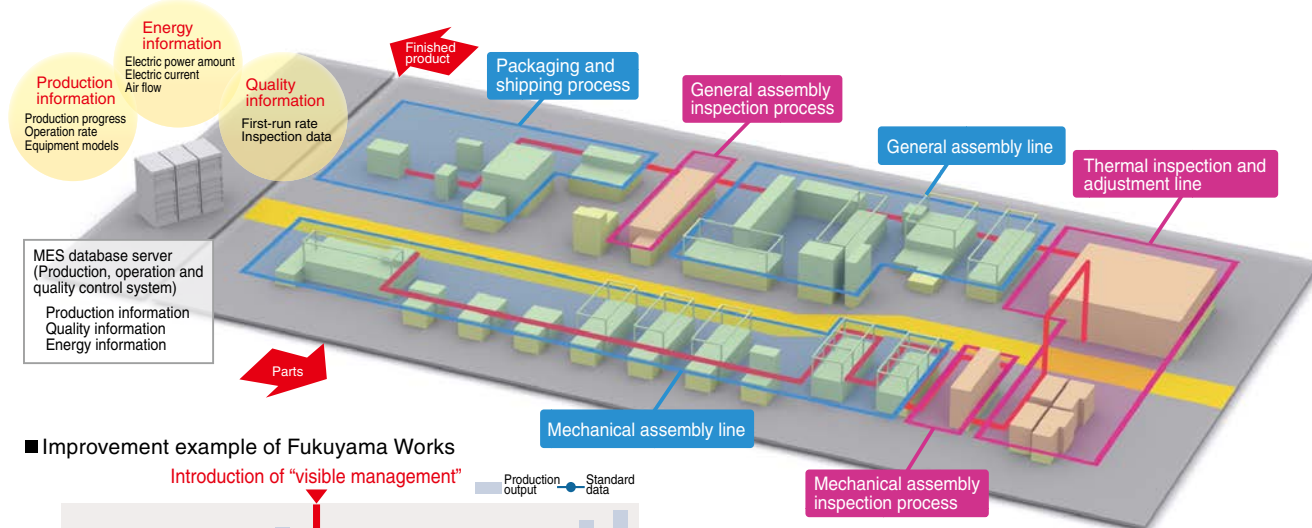
A broad lineup of MES interface products of Mitsubishi Electric enables direct connection between the MES (manufacturing execution system) database and the shop floor equipment without communication gateways such as personal computers.

Mitsubishi FA Integrated Solution e-F@ctory

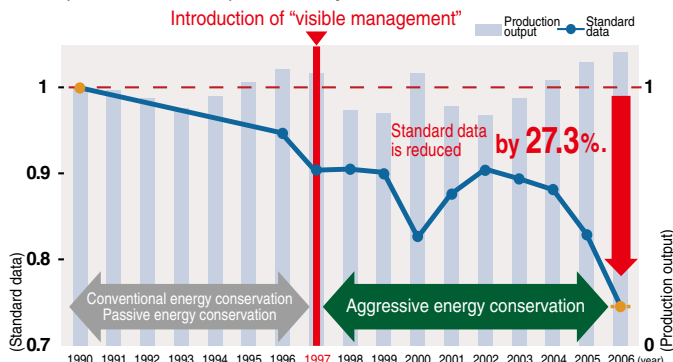


## “Aggressive energy conservation”

Mitsubishi Electric’s Fukuyama Works adopted “visible management”, and is now implement “aggressive energy conservation” efforts. Fukuyama Works has realized an economical and ecological “eco factory”, and uses its eco expertise to engage in the energy conservation business.



Improvement example of Fukuyama Works



**Reduction by 27.3% in standard data**  
\* Performance in 2006 compared to 1990

**Reduction of approximately 23 million yen in basic power cost**  
\* Performance in 2006 compared to 1990

**Reduction of approximately 100 million yen in basic power cost**  
\* Performance in 2006 compared to 1990

# Mitsubishi Electric's simple, convenient and compact EcoWebServerIII is advanced to support visible management of energy.

● Mitsubishi Energy-saving Data Collection Server EcoWebServerIII



## ● What is EcoWebServer?

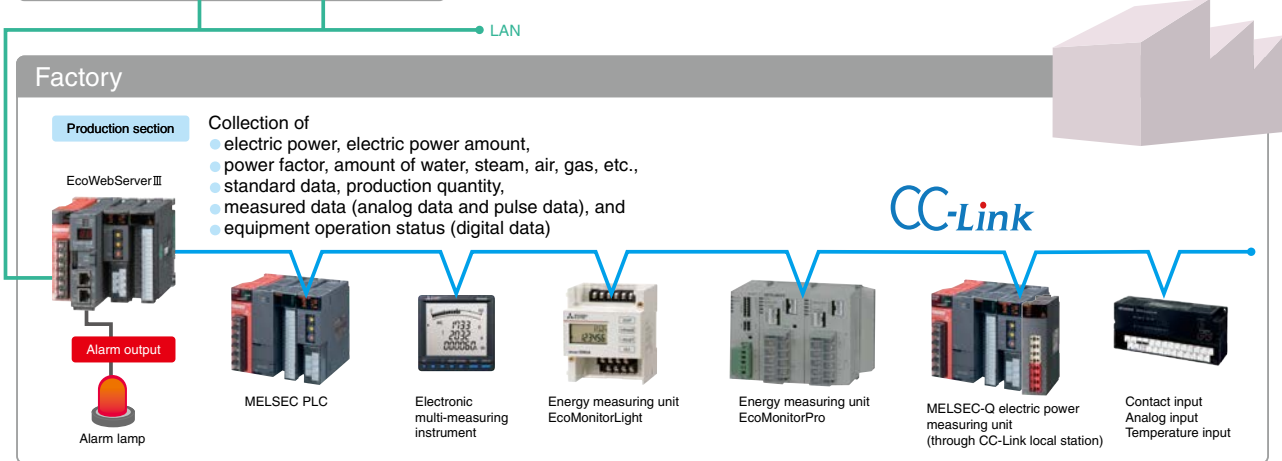
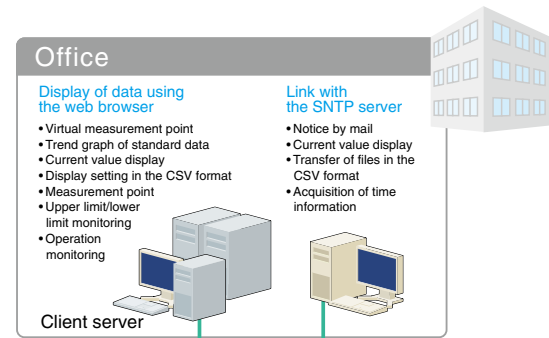
EcoWebServer is an all-in-one type data collection server having excellent functions essential in energy-saving management of alarm units and machines.

Two types selectable



CC-Link connection type

B-NET connection type



Control Field

Drive Field

Distribution Field

Reliable Support

Production discontinuance

## Remain available! Inherited functions

The setting software is provided as an accessory. There is no necessity to create programs.

**Simple setting  
Simple extension**

The newly adopted universal design makes graphs easier to see.

**Graph display**

Virtual measurement and production quantity are incorporated in the standard data control.

**Calculation function**

The measured data are processed and saved easily.

**CSV format  
Compatible with FTP**

## Powered up! Improved performance

The daily data saving period has been extended from 2 months to 6 months. Extended saving period

**Extended saving period**

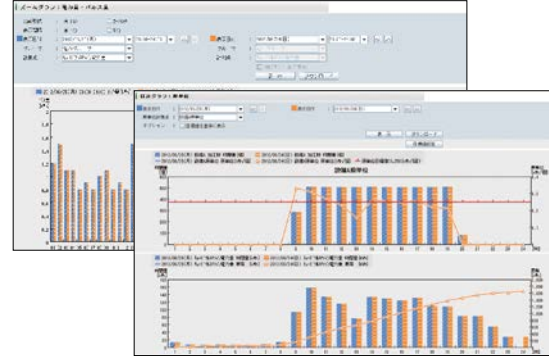
The number of virtual measurement points and standard data measurement points have been increased.

**Enhanced calculation function**

The zoom data collection period has been reduced.

**1 minute minimum**

Various graph displays are available to construct the "mechanism to let workers be aware" of status changes.



## New functions added! Additional functions

Alarm outputs have been enabled to enhance the monitoring function.

**Up to 16 contact outputs**

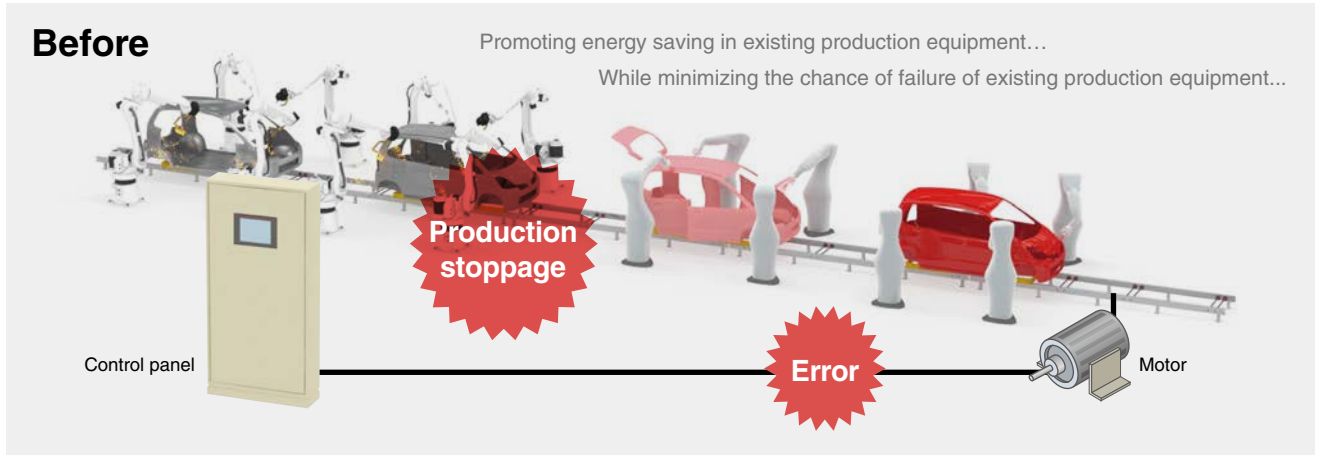
The temperature and humidity data are collected for each section and application.

**Multiple comparison**

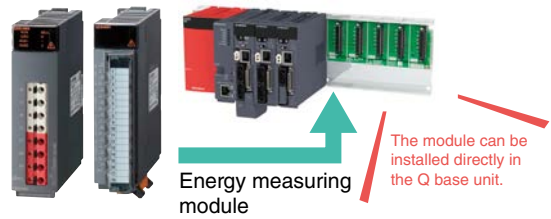
The energy loss in the equipment has been made visible.

**Equipment monitoring**

# Power measurement and insulation monitoring together with PLC migration realize energy saving and preventive maintenance!

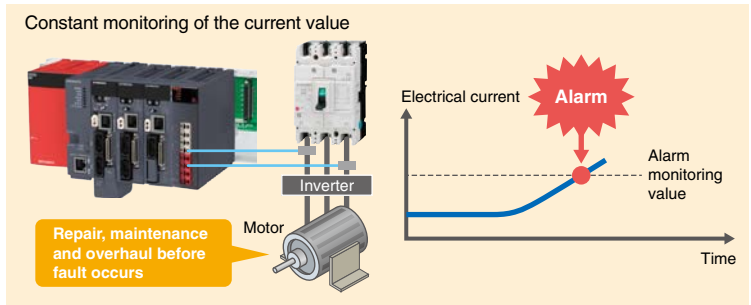


## Energy Measuring Module Installation Example

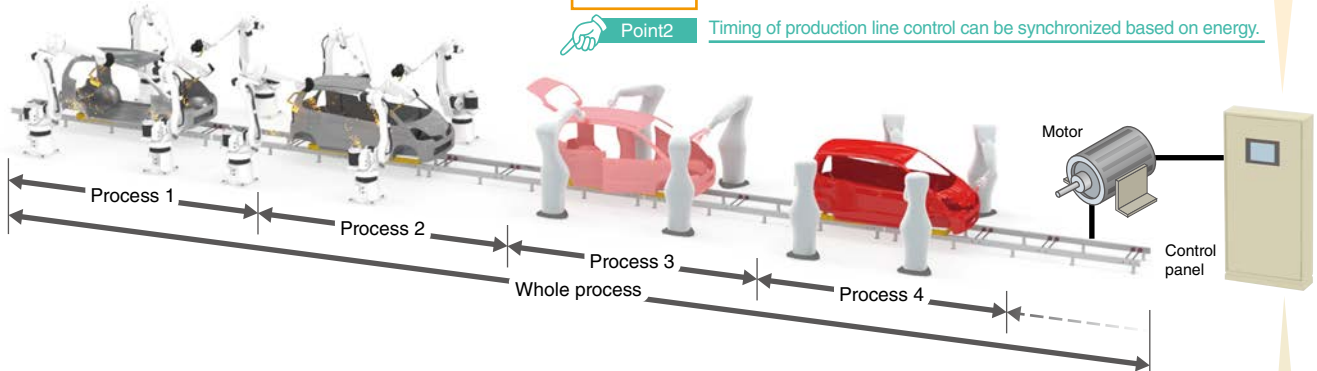


- Specific energy consumption can be managed in detail according to individual items or processes to assist in reducing the power consumption of production equipment and realize energy savings.
- Constantly measuring current (or power) consumption can help prevent serious faults and equipment failure, ultimately resulting in reduced production losses.

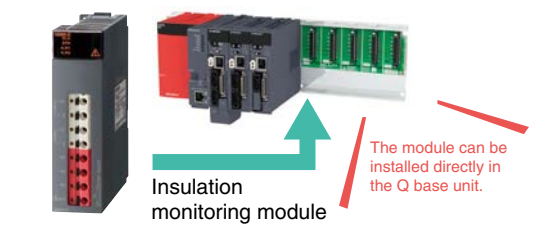
**Preventive Maintenance** Point1 Constant measurement of the electrical current  
Preventive maintenance measures are taken before equipment stoppage.



**Energy Saving** Point2 Item or process, synchronizing the control timing  
Timing of production line control can be synchronized based on energy.

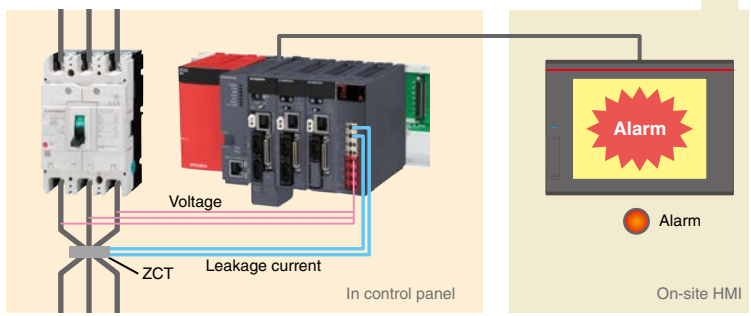


## Insulation Monitoring Module Installation Example



- Maintenance man-hours can be reduced by improving the efficiency of periodic inspection work.
- The resistive-component leakage current (Ior) can be measured so that a leakage current caused by insulation deterioration can be identified.

**Preventive Maintenance** Point3 Constant measurement of the Leakage current value, and constant monitoring for insulation deterioration for each unit/load  
Prevention of sudden failure of machines and lines / Detection of insulation deterioration (earth leakage) at early stage



Control Field

Drive Field

Distribution Field

Reliable Support

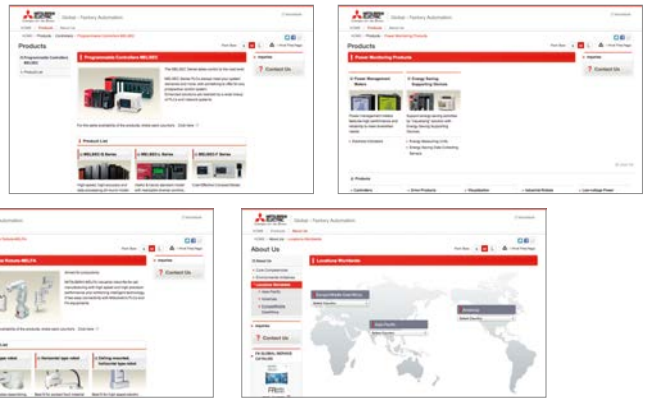
Production discontinuance

# Global web site



## Easily accessibility to the FA information of Mitsubishi Electric all over the world!

From "Worldwide" provided at the upper right corner of the top page, you can easily access to the FA web sites all over the world. On the pages for each country, you can check not only products purchasable all over the world but also the information on products developed specially for the region, catalogs and manuals in each language and various regional services. Please utilize "Worldwide" for expanding your business overseas.

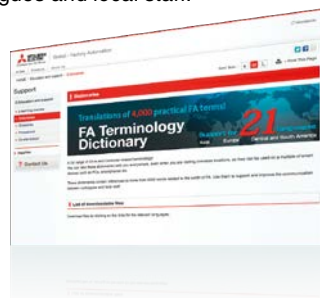


Global FA web site [www.MitsubishiElectric.com/fa](http://www.MitsubishiElectric.com/fa)

# Business support

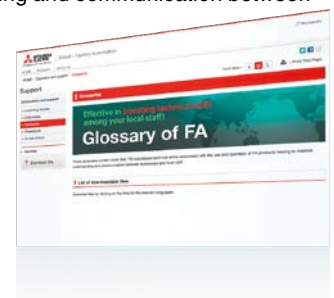
### ◆ Dictionaries

These dictionaries contain references to more than 4000 words related to the world of FA. Use them to support and improve the communication between colleagues and local staff.



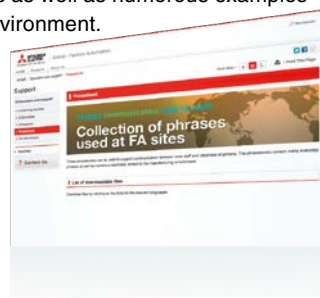
### ◆ Glossaries

These glossaries contain more than 750 specialized technical terms associated with the use and operation of FA products helping to improve understanding and communication between businesses and local staff.



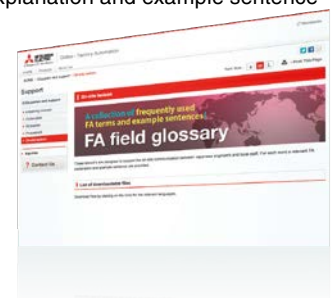
### ◆ Phrasebook

These phrasebooks can be used to support communication between local staff and Japanese engineers. The phrasebooks contain many everyday phrases as well as numerous examples related to the manufacturing environment.



### ◆ On-site lexicon

These lexicon's are designed to support the on-site communication between Japanese engineers and local staff. For each word a relevant FA explanation and example sentence are provided.

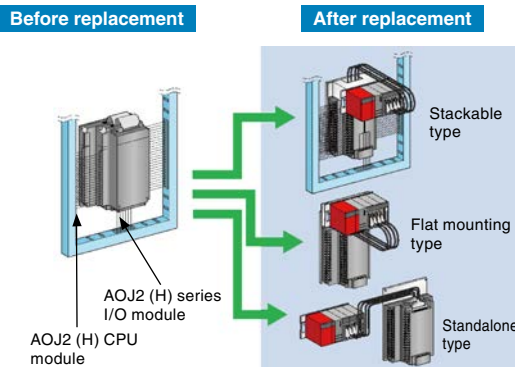




# Mitsubishi Electric System & Service Co., Ltd.

## AOJ2 migration tool

This migration tool is used to replace the MELSEC-AOJ2 with the Q series.  
 It consists of the interface module (to which the wired terminal block of the existing I/O module can be directly mounted), Q series PLC mounting members and connection cables.  
 Either of three types of installation methods can be selected in accordance with the installation space.  
 This migration tool utilizes the existing wiring to reduce wiring mistakes and work time.



• Catalog



## AC servo migration tool

This migration tool is used to replace the MR-J2Super series with the MR-J4 series.  
 Because the existing mounting dimensions and cables are compatible, replacement can be performed in a short time.  
 This migration tool is available also for step-by step migration consisting of primary replacement (in which only the amplifier is replaced) and secondary replacement (in which the motor is replaced). It utilizes your assets effectively.



### Applicable models

- MR-J2S-[ ]A (0.1 to 22 kW)
- MR-J2S-[ ]B (0.1 to 22 kW)

• Catalog



## FA integrated network cables

Mitsubishi Electric System & Service Co., Ltd. offers various network cables and wiring equipment for the controller network "CC-Link IE Control", field network "CC-Link IE Field" and motion network "SSCNET III/H" to correspond with various applications.



CC-Link IE Control

Optical fiber cable for controller network "CC-Link IE Control"

Connection terminal for controller network "CC-Link IE Control"



CC-Link IE Field

Ethernet cable for field network "CC-Link IE Field"

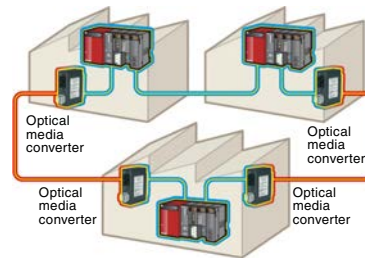
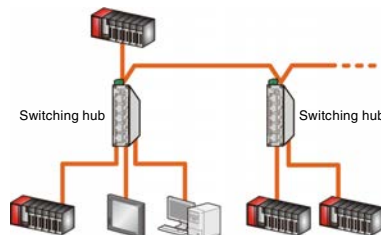
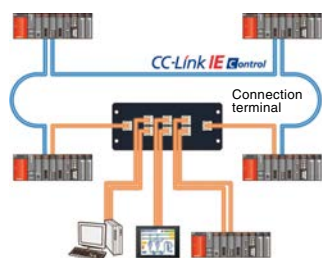
Industrial switching hub for field network "CC-Link IE Field"



SSCNET III/H

Optical fiber cable for motion network "SSCNET III/H"

Optical media converter for controller network "CC-Link IE Control"



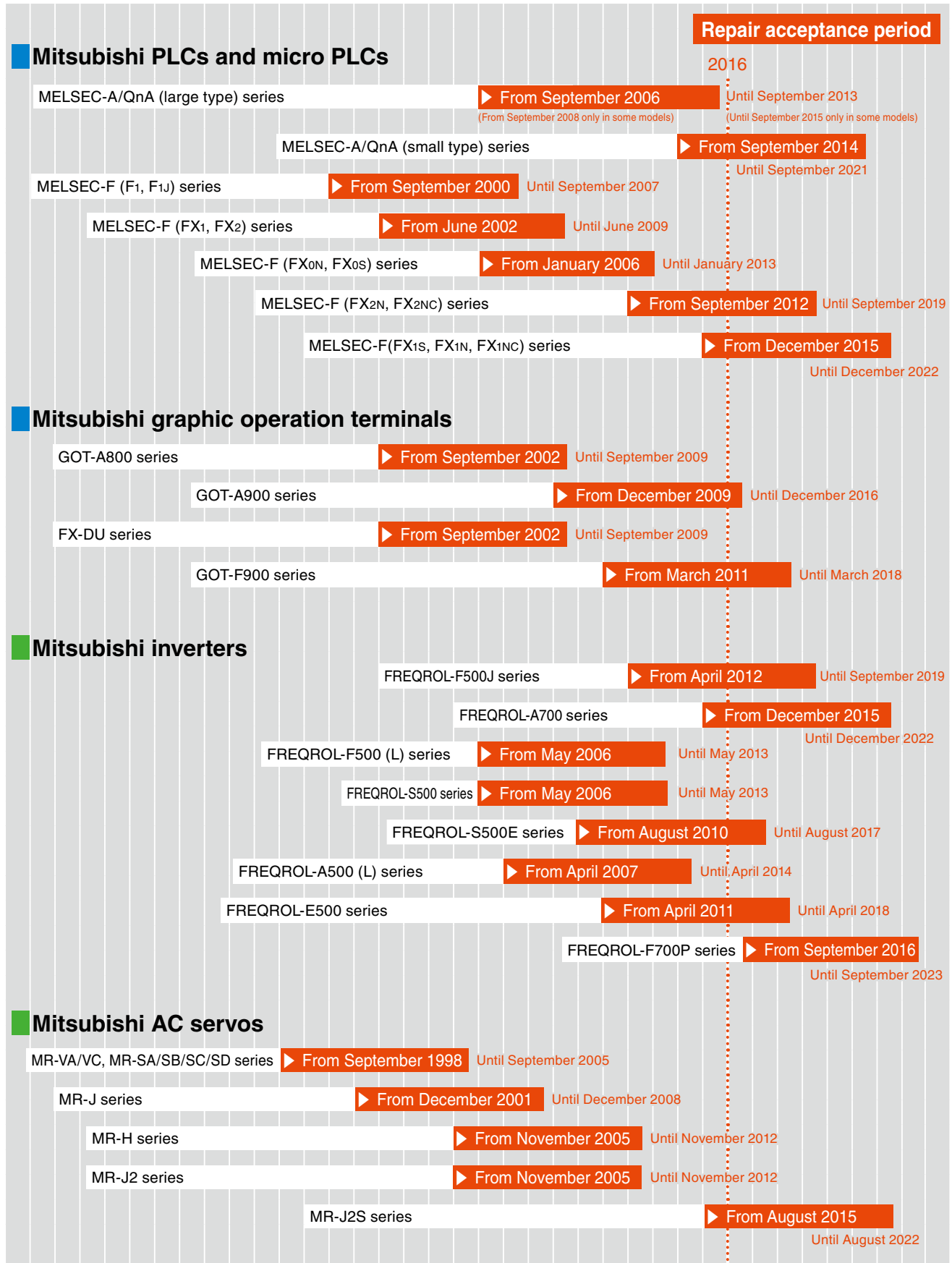
## Mitsubishi AC servo cable for MELSERVO-J4/J3/JN series

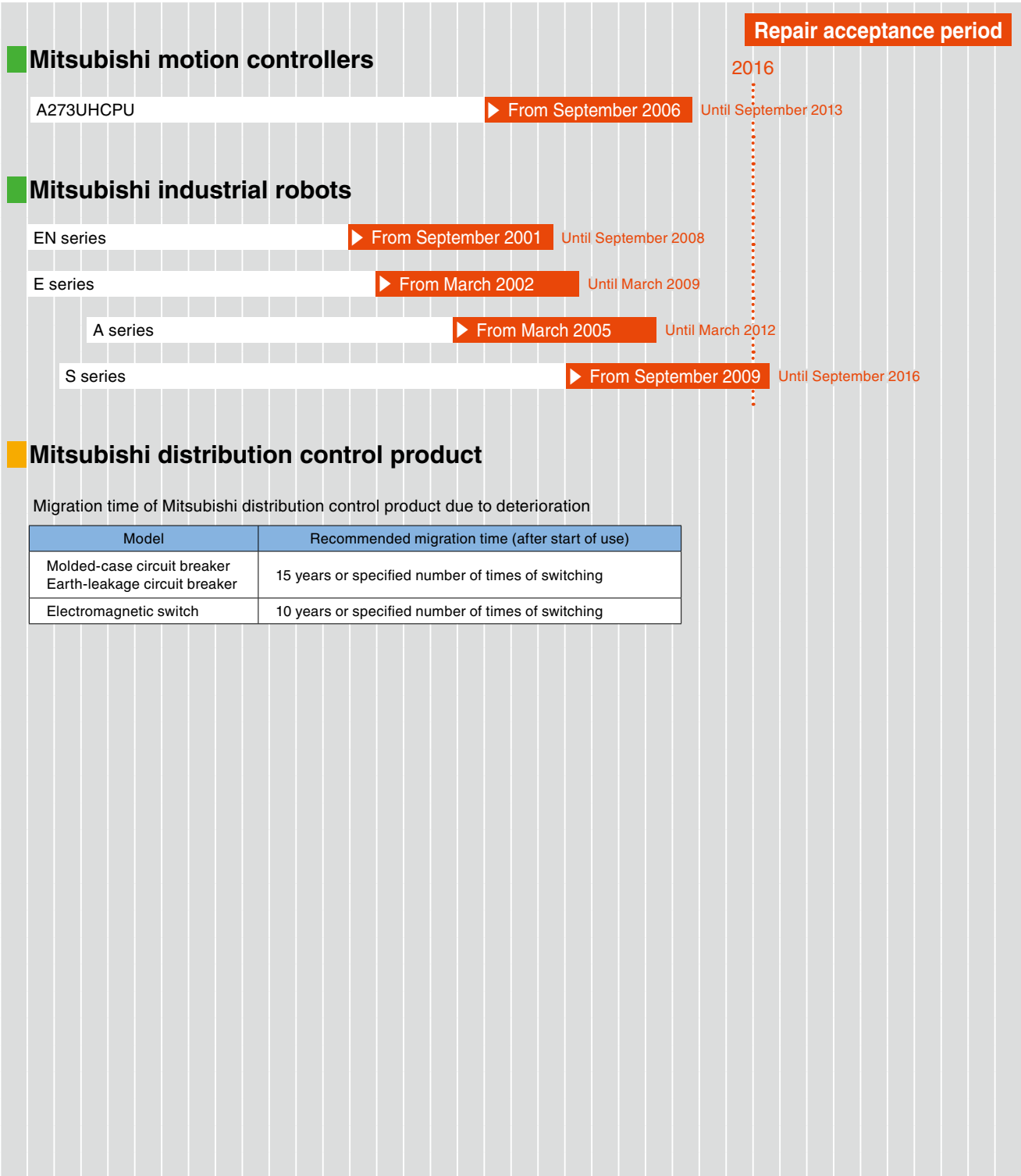
- This cable enables relay connection, and is available in a case in which the AC servo should be separated from the machine side during transportation or installation, a case in which a highly flexible part should be adopted partially in the AC servo, and other cases.
- Mitsubishi Electric System & Service Co., Ltd. produces cables (increment:1 m) for Mitsubishi MR-J4/J3/JN series servo encoders, power supplies and electromagnetic brakes.

\* Mitsubishi Electric System & Service Co., Ltd. produces cables other than cables of standard length sold by Mitsubishi Electric Corporation.



Below is the repair acceptance period of major models and series in which production of the main unit are already discontinued. Production may be discontinued even in other models and series not shown below, and production may be discontinued before the date shown below or may be continued in some models and series shown below. Refer to the Mitsubishi Electric's website or contact Mitsubishi Electric sales representatives for further information.





**⚠ Safety precautions**

- To properly use the products described in this document, make sure to read the relevant manuals before use.
- These products have been manufactured as general-purpose products for general industrial purposes, and have not been designed or manufactured to be incorporated in equipment or system used in situations that can affect or endanger human life.
- When considering using these products for special purposes such as equipment or system for nuclear power, electric power, aerospace, medical care or riding mobile object, contact the contact point in charge of sales in Mitsubishi Electric.
- These products have been manufactured under strict quality control. However, it is strongly advised to install a backup or failsafe function in the system when using these products in facilities where a failure of these products may cause a serious accident or loss.

**Trademarks and registered trademarks**

- MODBUS is a registered trademark of Schneider Electric SA.
- Ethernet is a trademark of Xerox Corporation.
- All other company names and product names described in this document are trademarks or registered trademarks of their representative companies.



**Production/  
Development**

# We Strive to Respond to Customers Needs in All Aspects of Our Production and Development Processes and Quality

**Production** We manufacture products that satisfy our customers needs, with leading-edge production lines and technologies.

In cooperation with our network of factories and overseas production bases, our mother factory in Nagoya, Japan, has developed systems and solutions, such as e-F@ctory, that are designed to optimize and strengthen manufacturing and production processes. This is demonstrated through the total “visualization” of the factory operations from ensuring the highest level of productivity and machine optimization to energy management applied throughout the total plant operation.



Nagoya Works



Shinshiro Factory



Kani Factory

Nagoya Works (Nagoya, Aichi)

As the core factory of our FA business, Nagoya Works creates an extensive lineup and network of FA products. Its goal is to contribute to production throughout the world and become the No.1 FA supplier to our customers.



Fukuyama Works (Fukuyama, Hiroshima)

Fukuyama Works utilizes its world-class power distribution and control technology to manufacture protective, measurement and control equipment. It also produces a wide range of ecological and economical energy-saving products.



Nakatsugawa Works (Nakatsugawa, Gifu)

Nakatsugawa Works contributes to the future of lifestyles and the planet through environmentally conscious systems. It manufactures ventilators and industrial fans that create comfortable environments while saving energy.



Power Distribution Systems Center (Marugame, Kagawa)

The Power Distribution Systems Center specializes in vacuum circuit breakers and other electrical distribution equipment for factories, office buildings, public facilities, power plants, and railway substations, in addition to control and monitoring systems.



Mitsubishi Electric FA Industrial Products Corporation (Fukuoka, Fukuoka)

This site provides solutions to various needs in the area of geared motors, and hoists, which serve as driving sources for a broad range of equipment, from transport to food production.



Mitsubishi Electric India Pvt. Ltd.

We manufacture inverters, power distribution control devices, PLC and HMI, and we are building a manufacturing, sales, and service system that is responsive to the needs of the Indian market.



Mitsubishi Electric Automation (Thailand) Co., Ltd.

Founded as a production base for three-phase induction motors, but it now manufactures electric energy meter and die-cast parts, mainly for domestic use in Thailand.



Mitsubishi Electric Automation Manufacturing (Changshu) Co., Ltd.

Manufacturing servo, NC, and other drive control equipment. Production is local to meet the growing demand in China.



Mitsubishi Electric Low Voltage Equipmet (Xiamen) Co., Ltd.

Manufacturing low voltage power distribution and control equipment. The company is responding to the expansion of our customers' production facilities in China.



Mitsubishi Electric Dalian Industrial Products Co., Ltd.

Founded as a production base for breakers, this site also manufactures inverters and electrical discharge machines today. It intends to further upgrade its production processes as a strategic overseas production base.

## Development We identify new customer needs promptly and accelerate our R&D cycle to respond to those needs.

### Core Development Processes

To develop products in response to diversifying needs, two core development centers have been created integrating the related departments of FA and Industrial Automation Machinery. These state-of-the-art centers maximise the technology synergies to produce world-class products.



FA Development Center (within Nagoya Works)

The FA Development Center pursues solutions for our customers' diverse and advanced needs in the areas of control technology, networking, HMI, complex software, drives etc.



Industrial Automation Development Center (within Nagoya Works)

The state-of-the-art development environment is capable of responding to trends for more compact features, higher precision, and higher speeds. The design, processing technology and service domains have been brought together to strengthen Mitsubishi Electric's total development power.

### Comprehensive strength

To promote the development of competitive products and create technologies for the future we foster world-leading R&D activities whilst utilizing our network of overseas and domestic research institutes.



Advanced Technology R&D Center (Amagasaki, Hyogo)

As an advanced technology base for all of Mitsubishi Electric's business areas, the R&D Center has many responsibilities: from the development of common infrastructure technologies and new products to the research and development of potential new businesses for the future.



Information and Technology R&D Center (Kamakura, Kanagawa)

The R&D Center plays an important role in creating new businesses and innovating existing ones through basic research and development in the areas of information, communications, and optical and electromagnetic technologies.

### Development at the global level

We develop products that satisfy the needs of our overseas customers, propose new global-scale FA business plans, adopt cutting-edge technologies from overseas and promote other development activities, all from a global perspective.



European Development Center (Düsseldorf, Germany)

In addition to investigating and researching cutting-edge technologies, the European Development Center develops products for the European market, in the languages of the European countries, as well as working to obtain various EU standards and certifications.



North American Development Center (Chicago, Boston) USA

As a planning and development base for new products and new business creation in North America, the North American Development Center aims to incubate new FA businesses and investigate advanced technologies.



China Design (Dalian, China)

Based on close cooperation between sales departments and our mother factory, we are expanding our product lineup and developing new specifications for the Chinese market.



Indian Development Center (Pune, India)

The company develops for the Indian market. Also, as a development base for the global market, it partners with other development bases to develop common technologies for FA equipment.

## Quality

In response to our customers' trust and confidence, we constantly review and reinforce our quality management system.



Anechoic room

Manufacturing servo, NC, and other drive control equipment. Production is local to meet the growing demand in China.



LSI evaluation facility

Manufacturing low voltage power distribution and control equipment. The company is responding to the expansion of our customers' production facilities in China.

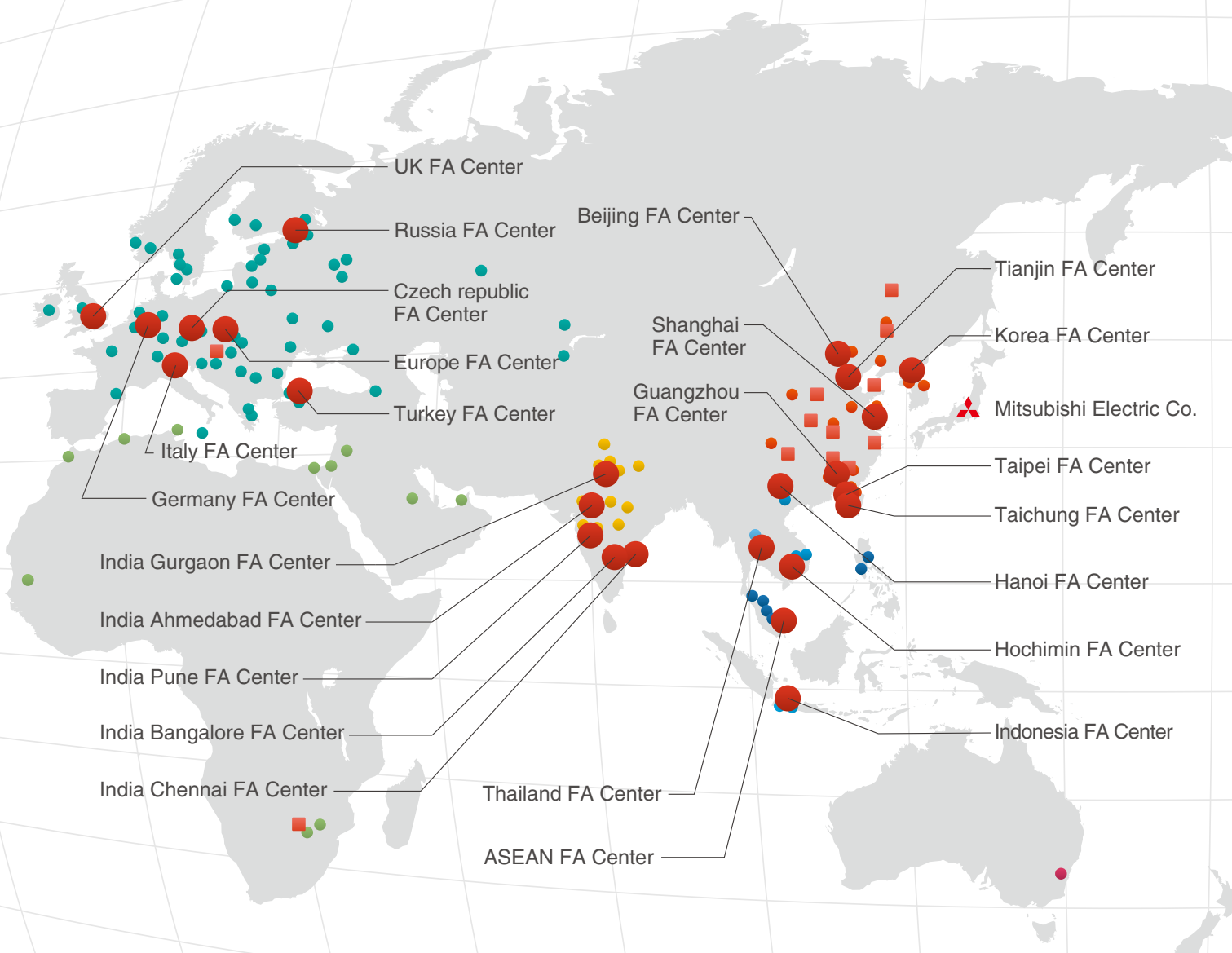


Inspecting machining equipment performance

We exhaustively inspect the drive control and machining performance of machining equipment, testing to ensure continuing precision machining after delivery.

**GLOBAL NETWORK**

**Our Global Network Delivers  
Reliable Technologies and  
Security All Over the World**



**GLOBALIN**



# China Main Land

## Shanghai FA Center

PLC HMI SV INV RB CNC LVS MC

Mitsubishi Electric Automation (China) Ltd.

Shanghai FA Center

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HP <http://www.meach.cn> LANGUAGE Chinese, Japanese, English

\* Japanese engineers are stationed in the FA Center.



## Beijing FA Center

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## Tianjin FA Center

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Tianjin FA Center

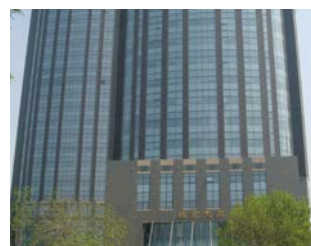
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\* Japanese engineers are stationed in the FA Center.



\* Robot: 华南地区受付窓口

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LANGUAGE Chinese

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## MITSUBISHI ELECTRIC GUANGZHOU

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## MITSUBISHI ELECTRIC FUZHOU

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LANGUAGE Chinese

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# China Main Land

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LANGUAGE Chinese

### ● Mitsubishi Electric Automation (HONG KONG) Ltd.

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20th Floor, Cityplaza One, 1111 King's Road, Taikoo Shing,  
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LANGUAGE Chinese, English

\* Please contact Shanghai FA Center for Japanese support.

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LANGUAGE Chinese

# Korea

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LANGUAGE Korean, Japanese

\* Japanese engineers are stationed in the FA Center.



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LANGUAGE Korean, Japanese

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LANGUAGE Korean, Japanese

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LANGUAGE Korean, English, Japanese

# Taiwan

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LANGUAGE Chinese, Japanese, English

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LANGUAGE Chinese, English, Japanese

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LANGUAGE Chinese, Japanese

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LANGUAGE Chinese

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#### (AUTOMATION DIVISION)

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#### 士林電機股份有限公司

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### FAPRO ENTERPRISE CO., Ltd.

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LANGUAGE Chinese

### TWO-WAY TRADING CORPORATION

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HP <http://www.two-way.com.tw> LANGUAGE Chinese

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Room 3, 11F, No.37, Sec. 2, Sanmin Road, Banqiao District,  
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HP <http://www.han-way.com.tw> LANGUAGE Chinese

### FACON Engineering Co., Ltd.

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PLC SV

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TEL +886-2-8221-3180 FAX +886-2-8221-3183

HP <http://www.facon.com.cn> LANGUAGE Chinese

### EVERTAK TECHNOLOGY CO.,Ltd.

#### 日遠科技股份有限公司

PLC HMI SV INV

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TEL +886-3-4617999 FAX +886-3-4617688

HP <http://www.evertak.com.tw> LANGUAGE Chinese



# ASEAN

## ASEAN FA Center

PLC HMI SV INV RB CNC LVS

### Mitsubishi Electric Asia Pte. Ltd.

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 +65-6470-2413 (CNC)  
 +65-6470-2462 (LVS)

FAX +65-6476-7439

HP <http://www.mitsubishielectric.com.sg>

LANGUAGE Chinese, Malay, English, Japanese



### Regional Sales Office in ASEAN

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 307 Alexandra Road, Mitsubishi Electric Building, Singapore 159943

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LANGUAGE English, Chinese, Japanese

### Distributors

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HP <http://sg.pumasautomation.com/index.php/en/>

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TDS Technology (S) Pte. Ltd. (PLC HMI SV INV RB)

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TEL +65-6366-1661 FAX +65-6362-1661

HP <http://www.tdstech.com>

LANGUAGE English, Chinese

FA-Tech Robotic & Controls Pte. Ltd. (PLC HMI SV INV RB)

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LANGUAGE Malay, English, Chinese

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LANGUAGE Malay, English, Chinese

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LANGUAGE Malay, English, Chinese

Flexible Automation System Sdn. Bhd.

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LANGUAGE Malay, English, Chinese

Flexible Automation System Sdn. Bhd.

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LANGUAGE Malay, English, Chinese

Flexible Automation System Sdn. Bhd.

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LANGUAGE Malay, English, Chinese

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- PT. Autoteknindo Sumber Makmur** PLC HMI SV INV  
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- PT. Noble Electrindo** PLC HMI SV INV RB  
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 LANGUAGE Indonesian, English
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 LANGUAGE Indonesian, English, Japanese
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 LANGUAGE Indonesian, English
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 LANGUAGE Indonesian, English
- PT. Abadi Bangun Bersama** PLC HMI SV INV  
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 LANGUAGE Indonesian, English
- PT. Setsuyo Astec - Surabaya Office** PLC HMI SV INV  
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 LANGUAGE Indonesian, English
- PT. Sahabat Indonesia** LVS MC  
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 LANGUAGE Indonesian, English

Indonesia

# Vietnam

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LANGUAGE Vietnamese, English, Japanese

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LANGUAGE Vietnamese, English



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LANGUAGE Vietnamese, English, Japanese

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LANGUAGE Vietnamese, English, Japanese

## Distributors

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HP <http://www.sagiangvn.com>

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### SA GIANG TRADING CO., Ltd. Hanoi office

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### NARASAKI SANGYO CO., LTD.

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### DUY HUNG TECHCOM CO., LTD.

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TEL +84-4-3540-9046 FAX +84-4-3540-9049

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LANGUAGE Vietnamese, English

### DUY HUNG TECHCOM CO., LTD. HCM Branch

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LANGUAGE Vietnamese, English

# Thailand

## Thailand FA Center

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### Sales Offices

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#### Mitsubishi Electric Factory Automation

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LANGUAGE Thai, English

#### Mitsubishi Electric Automation (Thailand) Co., Ltd. IM\*

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\* This IM (Induction Motor) is different from the one sold in Japan. For further information, please contact MITSUBISHI ELECTRIC AUTOMATION (THAILAND) CO., LTD.

\* Induction Motor

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LANGUAGE Thai, English

# India

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LANGUAGE Japanese, English, Hindi, Marathi

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LANGUAGE Japanese, English, Hindi

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### Mitsubishi Electric India Pvt. Ltd. Bangalore Branch

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LANGUAGE Kannad, Hindi, English



# India

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LANGUAGE Tamil, Hindi, English



## India Ahmedabad FA Center

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LANGUAGE Marathi, Hindi, English, Japanese

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LANGUAGE Hindi, English, Japanese

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LANGUAGE Kannad, Hindi, English

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LANGUAGE Tamil, Hindi, English

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LANGUAGE Gujarati, Hindi, English

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LANGUAGE Gujarati, Hindi, English

### Mitsubishi Electric India Pvt. Ltd.

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LANGUAGE Marathi, Hindi, English

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LANGUAGE Telugu, Hindi, English

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LANGUAGE Malayalam, Tamil, Hindi, English

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LANGUAGE Hindi, English

### Mitsubishi Electric India Pvt. Ltd.

Nagpur Branch

Plot No.8, NIIT Layout, Ravindra Nagar, Ring Road, Nagpur,  
Maharashtra, India

TEL +91-712-2284020

HP <http://www.mitsubishielectric.in>

LANGUAGE Marathi, Hindi, English

### Mitsubishi Electric India Pvt. Ltd.

Indore Branch

110 1st Floor, Shagun Commercial Complex, Plot No.7/PU-4,  
Scheme No.54, Vijay Nagar, Indore - 452010, Madhya Pradesh, India

TEL +91-731-6050013

HP <http://www.mitsubishielectric.in>

LANGUAGE Hindi, English

# Oceania

## Sales Offices

### AUSTRALIA

MITSUBISHI ELECTRIC AUSTRALIA PTY. LTD.

348 Victoria Road, P.O. Box 11, Rydalmere, N.S.W 2116, Australia

TEL +61-2-9684-7777

FAX +61-2-9684-7245

HP <http://www.mitsubishielectric.com.au>

LANGUAGE English

# Americas / Mexico

## North America FA Center

PLC HMI SV INV RB CNC LVS MC

### Mitsubishi Electric Automation, Inc.

500 Corporate Woods Parkway, Vernon Hills, IL 60061, U.S.A.

TEL +1-847-478-2100, +1-847-478-2500 **CNC**

FAX +1-847-478-2253, +1-847-478-2650 **CNC**, +1-847-478-2396 **LVS MC**

HP <https://us.mitsubishielectric.com/fa/en> **LANGUAGE** English, Japanese

\* Japanese engineers are stationed in the FA Center.

### TEL Technical Consulting

(Support hours: 7:00 to 19:00 (CST))

TEL 1-800-950-7781

TEL +1-847-478-2469 **PLC HMI**

**LANGUAGE** English

+1-847-478-2334 **SV INV RB LVS MC**

**LANGUAGE** Japanese



## Regional Sales Office in America

### Mitsubishi Electric Automation, Inc. **PLC HMI SV INV RB CNC LVS MC**

500 Corporate Woods Parkway, Vernon Hills, IL 60061, U.S.A.

TEL +1-847-478-2100(Rep), +1-847-478-2500 **CNC** FAX +1-847-478-2253, +1-847-478-2650 **CNC**, +1-847-478-2396 **LVS MC**

HP <https://us.mitsubishielectric.com/fa/en> **LANGUAGE** English, Spanish, Japanese

## Sales Offices

### ● CANADIAN REGION

#### Mitsubishi Electric Automation, Inc. Canadian Region

**PLC HMI SV INV RB CNC LVS MC**

4299 14th Avenue, Markham, Ontario L3R 0J2, Canada

TEL +1-905-754-3805

FAX +1-905-475-7935

HP <https://us.mitsubishielectric.com/fa/en>

**LANGUAGE** English

### ● SOUTH OHIO

#### Mitsubishi Electric Automation, Inc. Central Region

##### Branch Office (Cincinnati office - South Ohio)

**PLC HMI SV INV LVS MC**

World Park 5 10166 International Blvd. Cincinnati, Ohio 45246, U.S.A.

TEL +1-513-785-0530

HP <https://us.mitsubishielectric.com/fa/en>

**LANGUAGE** English

### ● NORTH OHIO

#### Mitsubishi Electric Automation, Inc. Central Region

##### Branch Office (Sidney office - North Ohio)

**PLC HMI SV INV LVS MC**

670 Vandermark Rd Sidney, Ohio 45365, U.S.A

TEL +1-937-492-3058 FAX +1-937-492-3058

HP <https://us.mitsubishielectric.com/fa/en>

**LANGUAGE** English, Japanese

### ● MICHIGAN

#### Mitsubishi Electric Automation, Inc. Central Region

##### Branch Office (Northville - Michigan)

**PLC HMI SV INV LVS MC**

15603 Centennial Drive, Northville, MI 48168, U.S.A.

TEL +1-734-453-6200 FAX +1-734-455-4299

HP <https://us.mitsubishielectric.com/fa/en>

**LANGUAGE** English

### ● EASTERN REGION

#### Mitsubishi Electric Automation, Inc. Eastern Region

##### Headquarters **PLC HMI SV INV RB CNC LVS MC**

1845 Satellite Boulevard Suite 450, Duluth, GA 30097, U.S.A.

TEL +1-678-258-4500 FAX +1-847-876-6684

HP <https://us.mitsubishielectric.com/fa/en>

**LANGUAGE** English

### ● WESTERN REGION

#### Mitsubishi Electric Automation, Inc. Western Region

##### Headquarters **PLC HMI SV INV RB CNC LVS MC**

5900-B Katella Ave, Cypress, CA 90630, U.S.A

TEL +1-714-699-2626

FAX +1-714-699-2620

HP <https://us.mitsubishielectric.com/fa/en>

**LANGUAGE** English

#### Mitsubishi Electric Automation, Inc. Western Region

##### Branch Office-California **PLC HMI SV INV LVS MC**

48511 Warm Springs Blvd, Suite 209 Fremont, CA 94539, U.S.A.

TEL +1-510-344-8020

HP <https://us.mitsubishielectric.com/fa/en>

**LANGUAGE** English, Japanese

### ● TEXAS

#### Mitsubishi Electric Automation, Inc. Western Region

##### Grapevine - Texas **PLC HMI SV INV RB CNC LVS MC**

1000 Nolen Drive, Suite 200, Grapevine, TX 76051, U.S.A.

TEL +1-817-416-9767, +1-817-251-7468 **CNC**

FAX +1-817-416-5000

HP <https://us.mitsubishielectric.com/fa/en>

**LANGUAGE** English, Spanish

## Mexico FA Center

PLC HMI SV INV

### Mitsubishi Electric Automation, Inc. Mexico Branch

Mariano Escobedo #69, Col. Zona Industrial, Tlalnepanitla Edo. México, C.P. 54030

TEL +52-55-3067-7500

HP <https://mx.mitsubishielectric.com/fa/en>

**LANGUAGE** Spanish, English, Japanese

\* Japanese engineers are stationed in the FA Center.



## Sales Offices

### ● Mitsubishi Electric Automation, Inc.

#### Mexico Branch **PLC HMI SV INV RB CNC LVS MC**

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TEL +52-55-3067-7511(Rep)

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**LANGUAGE** English, Spanish, Japanese

### ● Mitsubishi Electric Automation, Inc.

#### Monterrey Office **PLC HMI SV INV RB CNC LVS MC**

Plaza Mirage, AV. Gonzalitos 460 Sur, Local 28, Col. San Jeronimo, Monterrey, Nuevo Leon, C.P. 64640, Mexico

TEL +52-55-3067-7521

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**LANGUAGE** English, Spanish

# Brazil

## Brazil FA Center

PLC HMI SV INV RB LVS MC

### Mitsubishi Electric do Brasil Comércio e Serviços Ltda.

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HP [http://www.mitsubishielectric.com/fa/br\\_pt/](http://www.mitsubishielectric.com/fa/br_pt/)

LANGUAGE Portuguese, English, Japanese



## Brazil Votorantim FA Center

CNC

### MELCO CNC do Brasil Comercio e Servicos S.A.

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LANGUAGE Portuguese, English, Japanese



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HP [http://www.mitsubishielectric.com/fa/br\\_pt/](http://www.mitsubishielectric.com/fa/br_pt/)

LANGUAGE Portuguese, English, Japanese

### MELCO CNC do Brasil Comercio e Servicos S.A.

CNC

Avenida Gisele Constantino, 1578, Parque Bela Vista - Votorantim-SP, Brazil

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LANGUAGE Portuguese, English, Japanese

## Distributors

### ARTCOM COM. E DISTRIBUICAO DE MAQ. E EQUIPAMENTOS INDUSTRIAIS LTDA.

PLC HMI SV INV

Av. Getulio Vargas, 943, Bairro Niteroi, CEP 92480-000, Canoas - RS, Brasil

TEL +55-51-3031-7677

HP <http://www.artcom-rs.com.br/>

LANGUAGE Portuguese

### Automotion Ind. Com. Imp. e Exp. Ltda.

PLC HMI SV INV

Acesso Jose Sartorelli, KM 2.1 - CEP 18550-000, Boituva - SP, Brazil

TEL +55-15-3363-9900 FAX +55-15-3363-9911

HP <http://www.automotion.com.br/>

LANGUAGE Portuguese, English

### CETEM Automacao Industrial LTDA.

PLC HMI SV INV

Rua Candido Benicio, 1381, Bairro Praca Seca, CEP 21321-802, Rio de Janeiro - RJ, Brasil

TEL +55-21-3350-8833

HP <http://www.cetemrj.com.br/>

LANGUAGE Portuguese, English

### CIM Automacao LTDA.

PLC HMI SV INV RB

Rua Minas Gerais, 409, Diadema - CEP 09941-760, Sao Paulo - SP, Brasil

TEL +55-11-3389-1118 FAX +55-11-3389-1110

HP <http://www.cimautomacao.com.br/>

LANGUAGE Portuguese, English

### LARATEC COM DE FERRAMENTAS LTDA.

PLC HMI SV INV

Rua Albano Reis, 1058, Bom Retiro, CEP 80520-530, Curitiba - PR, Brasil

TEL +55-41-3022-1666

HP <http://www.laratec.com.br>

LANGUAGE Portuguese

### MPA Automacao LTDA.

PLC HMI SV INV

Av. ENG. EURICO VIANA - SETOR LESTE, Bairro VILA NOVA, CEP 74740-170, GOIANIA - GO, Brasil

TEL +55-62-3541-0015

HP <http://www.mpaautomacao.com.br>

LANGUAGE Portuguese

### RGO COMERCIO MANUTENCAO E IMP DE EQUIP ELETRONICOS LTDA.

PLC HMI INV

Rua Sergio Cardoso, 72, Jardim Paraíso, CEP 13211-374, Jundiaí - SP, Brasil

TEL +55-11-3963-6020

HP <http://www.rgoeletronica.com.br>

LANGUAGE Portuguese

### SEMATEX AUTOMACAO INDUSTRIAL LTDA.

PLC HMI SV INV

Rua Buenos Aires, 459 - Sala 101, Ponta Aguda, CEP 89051-050, Blumenau - SC, Brasil

TEL +55-47-3323-8000

HP <http://www.sematex.com.br/>

LANGUAGE Portuguese

### SUNXTRONIC DA AMAZ IMP E EXP LTDA.

PLC HMI SV INV RB

Rua Jose Paranagua, 470C - Centro, CEP 69005-130, Manaus - AM, Brasil

TEL +55-92-3233-5497 FAX +55-92-3233-9723

HP <http://www.sunxtronic.com.br/>

LANGUAGE Portuguese, English

# Europe

## Europe FA Center

PLC HMI SV INV RB CNC LVS MC

### Mitsubishi Electric Europe B.V. Polish Branch

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FAX +48-12-630-47-01

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LANGUAGE Polish, English, Japanese

\* Japanese engineers are stationed in the FA Center.



## Germany FA Center

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### Mitsubishi Electric Europe B.V. German Branch

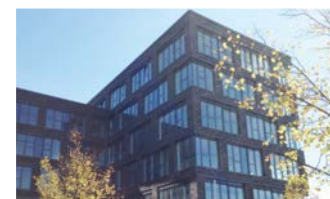
Mitsubishi-Electric-Platz 1, 40882 Ratingen, Germany

TEL +49-2102-486-0

FAX +49-2102-486-1120

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LANGUAGE German, English



## UK FA Center

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### Mitsubishi Electric Europe B.V. UK Branch

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FAX +44-1707-27-8695

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LANGUAGE English



## Czech Republic FA Center

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### Mitsubishi Electric Europe B.V. Czech Branch

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LANGUAGE Czech, English

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## Russia FA Center

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### Mitsubishi Electric (Russia) LLC St. Petersburg Branch

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FAX +7-812-633-3499

HP <https://ru3a.mitsubishielectric.com>

LANGUAGE Russian, English, Japanese



## Italy FA Center

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### Mitsubishi Electric Europe B.V. Italian Branch

Centro Direzionale Colleoni - Palazzo Sirio, Viale Colleoni 7, 20864 Agrate Brianza (MB), Italy

TEL +39-039-60531

FAX +39-039-6053312

HP <https://it3a.mitsubishielectric.com>

LANGUAGE Italian, French, English



EUROPE



## FA Center Satellite

## MITSUBISHI ELECTRIC Hungary FA Center Satellite

PLC HMI SV INV RB LVS MC

Ferto Utca 14, HU-1107 Budapest, Hungary

TEL +36-1-431-9726

FAX +36-1-431-9727

HP <https://hu3a.mitsubishielectric.com>

LANGUAGE Hungarian, English



## Regional Sales Office in Europe

## Mitsubishi Electric Europe B.V. - Factory Automation European Business Group

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FAX +49-2102-486-7170, +49-2102-486-9880 CNC

HP <https://eu3a.mitsubishielectric.com>

LANGUAGE German, English

## Sales Offices

## GERMANY

## Mitsubishi Electric Europe B.V.

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FAX +49-2102-486-1120, +49-2102-486-9880 CNC

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## Customer Technology Center North PLC HMI SV INV RB CNC LVS MC

Revierstraße 21, 44379 Dortmund, Germany

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FAX +49-231-967041-41

HP <https://de3a.mitsubishielectric.com> LANGUAGE German, English

## Customer Technology Center South-West PLC HMI SV INV RB CNC LVS MC

Kurze Straße 40, 70794 Filderstadt, Germany

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FAX +49-711-770598-79, +49-711-770598-141 CNC

HP <https://de3a.mitsubishielectric.com> LANGUAGE German, English

## Customer Technology Center South-East PLC HMI SV INV RB CNC LVS MC

Lilienthalstr. 2a, 85399 Hallbergmoos, Germany

TEL +49-811-99874-0

FAX +49-811-99874-10

HP <https://de3a.mitsubishielectric.com> LANGUAGE German, English

## UNITED KINGDOM

## Mitsubishi Electric Europe B.V.

UK Branch PLC HMI SV INV RB CNC LVS MC

Travellers Lane, UK-Hatfield, Hertfordshire, AL10 8XB, U.K.

TEL +44-1707-28-8780, +49-2102-486-0 CNC

FAX +44-1707-27-8695

HP <https://gb3a.mitsubishielectric.com> LANGUAGE English

## FRANCE

## Mitsubishi Electric Europe B.V.

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25, Boulevard des Bouvets, 92741 Nanterre Cedex, France

TEL +33-1-55-68-55-68, +33-1-41-02-83-13 CNC

FAX +33-1-55-68-57-57

HP <https://fr3a.mitsubishielectric.com> LANGUAGE French, English

## ITALY

## Mitsubishi Electric Europe B.V.

Italian Branch PLC HMI SV INV RB CNC LVS MC

Centro Direzionale Colleoni - Palazzo Sirio, Viale Colleoni 7, 20864 Agrate Brianza (MB), Italy

TEL +39-039-60531, +39-039-6053-342 CNC

FAX +39-039-6053-312

HP <https://it3a.mitsubishielectric.com>  
<http://mechatronics.mitsubishielectric.it/it/> CNC

LANGUAGE Italian, English

## SPAIN

## Mitsubishi Electric Europe B.V.

Spanish Branch PLC HMI SV INV RB CNC LVS MC

Carretera de Rubi, 76-80-Appdo. 420, 08190 Sant Cugat del Vallés (Barcelona), Spain

TEL +34-935-65-3131, +34-935-65-2236 CNC

FAX +34-935-89-1579

HP <https://es3a.mitsubishielectric.com> LANGUAGE English, Spanish, Portuguese

## IRELAND

## Mitsubishi Electric Europe B.V.

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Westgate Business Park, Ballymount, Dublin 24, Ireland

TEL +353-1-4198800

FAX +353-1-4198890

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## CZECH REPUBLIC

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TEL +420-251-551-470

FAX +420-251-551-471

HP <https://cz3a.mitsubishielectric.com> LANGUAGE Czech, English

## POLAND

## Mitsubishi Electric Europe B.V.

Polish Branch PLC HMI SV INV RB CNC LVS MC

ul. Krakowska 50, 32-083 Balice, Poland

TEL +48-12-347-65-00

FAX +48-12-630-47-01

HP <https://pl3a.mitsubishielectric.com> LANGUAGE Polish, English

## Office in Poznań PLC HMI SV INV RB CNC LVS MC

ul. Krzemowa 1, Złotniki k. Poznania 62-002 Suchy Las, Poland

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FAX +48-61-65-85-522

LANGUAGE Polish, English

## Office in Warsaw PLC HMI SV INV RB CNC LVS MC

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TEL +48-22-468-27-00

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LANGUAGE Polish, English

## Office in Wrocław PLC HMI SV INV RB CNC LVS MC

ul. Muchoborska 18, 54-424 Wrocław, Poland

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LANGUAGE Polish, English

## RUSSIA

## Mitsubishi Electric (Russia) LLC

St. Petersburg Branch PLC HMI SV INV RB CNC LVS MC

Piskarevsky pr. 2, bld 2, lit "Sch", BC "Benua", office 720; 195027 St. Petersburg, Russia

TEL +7-812-633-3497

FAX +7-812-633-3499

HP <https://ru3a.mitsubishielectric.com> LANGUAGE Russian, English, Japanese

## Mitsubishi Electric (Russia) LLC PLC HMI SV INV RB CNC LVS MC

52, bld. 1, Kosmodamianskaya emb., 115054 Moscow, Russia

TEL +7-495-721-2070

FAX +7-495-721-2071

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## SWEDEN

## Mitsubishi Electric Europe B.V.

(Scandinavia) PLC HMI SV INV RB CNC LVS MC

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TEL +46-8-625-10-00

FAX +46-46-39-70-18

HP <https://se3a.mitsubishielectric.com/fa/sv> LANGUAGE Swedish, English

## Netherlands

## Mitsubishi Electric Europe B.V.

Benelux Branch PLC HMI SV INV RB CNC LVS MC

Nijverheidsweg 23C, 3641 RP Mijdrecht

TEL +31-297250350

HP <https://nl3a.mitsubishielectric.com/fa/nl> LANGUAGE Dutch, English

## Slovakia

## Mitsubishi Electric Europe B.V.

Slovakian Branch PLC HMI SV INV RB LVS MC

Levická 7, 949 01 Nitra, Slovakia

TEL +421-917 624036

HP <https://sk3a.mitsubishielectric.com> LANGUAGE Slovakian, English

## Distributors

## ARMENIA

Industrial Technologies LLC PLC HMI SV INV LVS MC

Fourth str., 17, Microrajon, 2302 Razdan, Armenia

TEL +374-10-94-005-675

LANGUAGE Russian, English

## AUSTRIA

GEVA Elektronik-Handelsgesellschaft mbH PLC HMI SV INV RB

Wiener Str. 89, A-2500 Baden, Austria

TEL +43-2252-85552-0

FAX +43-2252-48860

HP <http://www.geva.at> LANGUAGE German, English

**BELARUS**


**Technikon Ltd.**   
177-9, Nezavisimosti pr. 220125 Minsk, Belarus  
TEL +375-17-393-1177 FAX +375-17-393-0081  
HP <http://www.technikon.by> LANGUAGE Belarussian, Russian, English

**BELGIUM**

**ESCO Drives**   
Kouterveld - Culliganlaan 3, BE-1831 Diegem, Belgium  
TEL +32-2-717-6460 FAX +32-2-717-6461  
HP <http://www.esco-da.be> LANGUAGE English, French, Dutch

**Koning & Hartman B.V., Industrial Solutions**   
Woluweilaan 31, BE-1800 Vilvoorde, Belgium  
TEL +32-2-257-02-40 FAX +32-2-257-02-49  
HP <http://www.koninghartman.be/nl>  
LANGUAGE German, English, Dutch, French

**BULGARIA**

**Akhnaton Ltd**   
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TEL +359-2-817-6000 FAX +359-2-817-69-99  
HP <http://www.akhnaton.biz> LANGUAGE Bulgarian, English

**CROATIA**

**INEA CR d.o.o.**   
Lošinska 4a, 10000 Zagreb, Croatia  
TEL +385-1-3694-001 FAX +385-1-3694-003  
HP <http://www.inea.hr> LANGUAGE Croatian, English

**CZECH REPUBLIC**

**AutoCont Control Systems, s.r.o.**   
Kafkova 1853/3, 702 00 Ostrava 2, Czech Republic  
TEL +420-59-5691-150 FAX +420-59-5691-199  
HP <http://www.autocontrol.cz> +420-59-5691-185  
LANGUAGE Czech, English


**DENMARK**


**Hans Følsgaard A/S**   
Theilgaardstr Torv 1, DK-4600 Køge, Denmark  
TEL +45-4320-8600 FAX +45-4396-8855  
HP <http://www.hf.net> LANGUAGE Danish, English, German

**FINLAND**

**Provendör Oy**   
Teljänkatu 8 A3, FIN-28130 Pori, Finland  
TEL +358-2-522-3300 FAX +358-2-522-3322  
HP <http://www.provendör.fi> LANGUAGE Finnish, English

**GREECE**

**Kalamarakis - Sapounas**   
Ionas & Neromilou str., 136 78 Chamomilos-Acharnes, Athens, Greece  
TEL +30-2102-406000 FAX +30-2102-406007  
LANGUAGE Greek, English

**UTEKO**   
5, M. Mavrogenous Str., 185 42 Piraeus, Greece  
TEL +30-211-1206-900 FAX +30-211-1206-999  
HP <http://www.uteko.gr> LANGUAGE Greek, English

**HUNGARY**

**Meltrade Automatika Kft.**   
Ferto Utca 14, HU-1107 Budapest, Hungary  
TEL +36-1-431-9726 FAX +36-1-431-9727  
HP <http://www.meltrade.hu> LANGUAGE Hungarian, English

**KAZAKHSTAN**

**"KAZPROMAVTOMATIKA"**   
Zhambyla str. 28, KZ-100012, Karaganda, Kazakhstan  
TEL +7-7212-50-11-50 FAX +7-7212-50-10-00  
HP <http://www.kpakz.com>  
LANGUAGE Kazakh, Russian, English

**KYRGYZSTAN**

**Bishkek Equipment Maintenance Centre ZTOTO**   
Zhukееva Budovkina str. 122, 720064 Bishkek, Kyrgyzstan  
TEL +996-312-56-6340 FAX +996-312-56-6340  
LANGUAGE Russian, English


**LITHUANIA**

**Rifas UAB**   
Tinklų g. 35R, LT-35115 Panevėžys, Lithuania  
TEL +370-45-582-728 FAX +370-45-582-729  
HP <http://www.rifas.lt> LANGUAGE Lithuanian, Russian, English


**MALTA**

**Alfatrade Ltd.**   
99, Paola Hill, MT-Paola PLA 1702, Malta  
TEL +356-21-697816 FAX +356-21-697817  
LANGUAGE English

**MOLDOVA**

**Intehsis srl**   
Boulevard Traian 23/1, MD-2060 Chisinau, Moldova  
TEL +373-22-66-4242 FAX +373-22-66-4280  
LANGUAGE Russian, English

**THE NETHERLANDS**

**Hiflex Automatiseringstechniek B.V.**   
Wolweverstraat 22, NL-2984 CD Ridderkerk, Netherlands  
TEL +31-180-46-60-04 FAX +31-180-44-23-55  
HP <http://www.hiflex.nl> LANGUAGE English, Dutch

**Intech Marine & Offshore B.V.**   
Sluisjesdijk 155, NL-3087 AG Rotterdam, Netherlands  
TEL +31-10-487-19-11 FAX +31-10-487-16-92  
LANGUAGE English, Dutch

**Koning & Hartman B.V.**   
Haarlerbergweg 21e-23e, NL-1101 CH, Amsterdam, Netherlands  
TEL +31-20-587-76-00 FAX +31-20-587-76-05  
HP <http://www.koninghartman.com> LANGUAGE German, English, Dutch


**ES Elektro B.V.**   
Steurweg 2, 4941 VR Raamsdonksveer, Netherlands  
TEL +31-765782800 FAX +31-765782800  
LANGUAGE Dutch, English


**NORWAY**

**Scanelec AS**   
Leirvikåsen 43B, NO-5179 Godvik, Norway  
TEL +47-55-506000 FAX +47-55-506001  
HP <http://www.scanelec.no> LANGUAGE Norwegian, English


**POLAND**

**MPL Techma Sp. z o.o.**   
al. Zwycięstwa 96/98, 81-451 Gdynia, Poland  
TEL +48-58-698-21-04 FAX +48-58-698-21-07  
LANGUAGE Polish


**PG SYSTEMS**   
ul. Rataja 12, 05-070 Sulejów, Poland  
TEL +48-22-499-57-26 FAX +48-22-499-57-27  
LANGUAGE Polish

**ELAUTEC S.C.**   
ul. Makuszyńskiego 22A, 31-752 Kraków, Poland  
TEL +48-12-413-00-77 FAX +48-12-638-31-89  
LANGUAGE Polish


**ROMANIA**

**Sirius Trading & Services srl**   
Aleea Lacul Morii Nr. 3, Sector 6, 060841 Bucuresti, Romania  
TEL +40-21-430-40-06 FAX +40-21-430-40-02  
HP <http://www.siriustrading.ro> LANGUAGE Romanian, English


**RUSSIA**


**Electrotechnical Systems Siberia Ltd.**   
62, office 450A, Sibiriyakov-Gvardel'tsev str., 630088, Novosibirsk, Russia  
TEL +7-383-3-150-150 FAX +7-383-3-150-150  
HP <http://www.es-electro.ru> LANGUAGE Russian, English

**STC Privodnaya Technika**   
42/13, Volgogradskiy Avenue, 109316, Moscow, Russia  
TEL +7-495-786-2100 FAX +7-495-786-2101  
HP <http://www.privod.ru> LANGUAGE Russian, English, German

**NC-TECH**   
213, B. Novodmitrovskaya str. 14/2, 127015 Moscow, Russia  
TEL +7-495-748-0191 FAX +7-495-748-0192  
HP <http://www.nc-tech.ru> LANGUAGE Russian, English


**Avtomatika Sever**   
Lva Tolstogo str. 7, office 311, 197376 St. Petersburg, Russia  
TEL +7-812-303-9648 FAX +7-812-718-3239  
HP <http://www.avtomatika.info> LANGUAGE Russian, English

**PTF ConSys**   
Vozrozhdeniya, 20A, 198188 St. Petersburg, Russia  
TEL +7-812-325-3653 FAX +7-812-334-0890  
HP <http://www.consys.ru> LANGUAGE Russian, English

**Techpribor**   
Dnepropetrovskaya str. 13, office 1, 236004 Kaliningrad, Russia  
TEL +7-4012-65-03-22 FAX +7-4012-65-38-33  
HP <http://www.techpribor-kaliningrad.ru> LANGUAGE Russian, English

**Intellectualny Dom**   
Kasliinskaya str.44, office 454084 Chelyabinsk, Russia  
TEL +7-351-790-55-16 FAX +7-351-790-93-32  
HP <http://www.idom.ru> LANGUAGE Russian, English

**RPS-Avtomatika**   
Nagibina str. 40a, office 105, 344018 Rostov-na-Donu, Russia  
TEL +7-863-226-35-72 FAX +7-863-231-23-52  
HP <http://www.rps-a.ru> LANGUAGE Russian, English

**Rivkora**   
11A, Babelya str., 620034, Ekaterinburg, Russia  
TEL +7-343-235-89-19 FAX +7-343-235-89-19  
HP <http://www.rivkora.ru> LANGUAGE Russian, English

**TDA-Electro**   
135A, Chaadaeva str., 440067, Penza, Russia  
TEL +7-8412-45-88-88 FAX +7-8412-90-00-33  
HP <http://www.tda-group.ru> LANGUAGE Russian, English

**SERBIA**

**INEA SR d.o.o.**   
Ul. Karadjordjeva 12/217, SER-113000 Smederevo, Serbia  
TEL +381-64-68-55-187  
HP <http://www.inea.rs> LANGUAGE Serbian, English

**SLOVAKIA**

**SIMAP SK, s.r.o.**   
Jána Derku 1671/1A, 911 01 Trenčín, Slovakia  
TEL +421-32-743-0472 FAX +421-32-743-7520  
HP <http://www.simap.sk> LANGUAGE Slovak, English


**SLOVENIA**

**INEA RBT d.o.o.**   
Stegne 11, SI-1000 Ljubljana, Slovenia  
TEL +386-1-5138-116 FAX +386-1-5138-170  
HP <http://www.inea-rbt.si> LANGUAGE Slovenian, English

\* English is available at each local distributors. If you require Japanese correspondence, please contact our Europe FA Center.

## Distributors


## SWEDEN

**Euro Energy Components AB**   
 Järnvägsgatan 36, Box 10348, SE-434 24 Kungälv, Sweden  
 TEL +46-300-69-00-40 FAX +46-300-16475  
 HP <http://www.euroenergy.se> LANGUAGE Swedish, English

## SWITZERLAND


**Omni Ray AG**   
 Im Schörli 5, CH-8600 Dübendorf, Switzerland  
 TEL +41-44-802-28-80 FAX +41-44-802-28-28  
 HP <http://www.omniray.ch> LANGUAGE English, German, French

**Robotronic AG**   
 Schlachthofstrasse 8, CH-8406 Winterthur, Switzerland  
 TEL +41-52-267-0200 FAX +41-52-267-0201  
 HP <http://www.robotronic.ch> LANGUAGE English, German, French

**Trielec AG**   
 Mühlfentalstrasse 136, CH-8201 Schaffhausen, Switzerland  
 TEL +41-52-625-84-25 FAX +41-52-625-88-25  
 HP <http://www.trielec.ch> LANGUAGE German, English

## UKRAINE

**CSC Automation Ltd.**   
 M. Raskovoyi st. 4-b, 02660 Kiev, Ukraine  
 TEL +380-44-494-3344 FAX +380-44-494-3366  
 HP <http://www.kck.ua> LANGUAGE Ukrainian, Russian, English

**CSC Automation Ltd.**   
 Aptekarskiy lane 9-a, office 3, 61001 Kharkov, Ukraine  
 TEL +38-57-732-7774 FAX +38-57-731-8721  
 HP <http://www.kck.ua> LANGUAGE Russian, English

## Turkey

## Turkey FA Center



## Mitsubishi Electric Turkey A.Ş. Ümraniye Branch

Şerifali Mahallesi Nutuk Sokak No:5, TR-34775 Ümraniye / İstanbul, Turkey

TEL +90-216-969-2500  
 FAX +90-216-526-3995  
 HP <https://tr3a.mitsubishielectric.com>  
 LANGUAGE Turkish, English, Japanese

\* Japanese engineers are stationed in the FA Center.




## Sales Offices

## Mitsubishi Electric Turkey A.Ş.


**Ümraniye Branch**   
 Şerifali Mahallesi Nutuk Sokak No:5, TR-34775 Ümraniye / İstanbul, Turkey  
 TEL +90-216-526-3990 FAX +90-216-526-3995  
 HP <https://tr3a.mitsubishielectric.com> LANGUAGE Turkish, English, Japanese

## Distributors

## ETA ELEKTROTEKNIK SAN. TİC. LTD. ŞTİ.

  
 Yeşil Tepe Mah. Uluyol Cad. No:114 Erenler / Adapazarı / Sakarya  
 TEL +90-264-275-8104 FAX +90-264-275-7507  
 HP <http://etaelektroteknik.com>  
 LANGUAGE Turkish, English

## ESO ENDÜSTRİYEL ELEKT.SİST. OTOMASYON SAN.TİC.LTD.ŞTİ.

  
 İzmit Sanayi Sitesi 3.Cadde 202. Blok No:27 İzmit / Kocaeli  
 TEL +90-262-335-0716 FAX +90-262-335-1947  
 HP <http://www.esoendustriyel.com>  
 LANGUAGE Turkish, English


## GEOTEK ELEKTRİK ELEKTRONİK OTOMASYON SAN.VE TİC.LTD.ŞTİ.

  
 1443 Sk.No:3K Keremoğlu İş Merkezi P.K 35170 Yenisehir / İzmir  
 TEL +90-232-433-4780 FAX +90-232-433-4781  
 HP <http://www.geotekotomasyon.com/iletisim.html>  
 LANGUAGE Turkish, English

## BİRMAG MÜHENDİSLİK SAN.TİC.LTD.ŞTİ.

  
 Gazi Muhtarpaşa Bulvarı Mücahi Tler MH. 54 Nolu SK.  
 Güneydoğu İş Merkezi No:8/6 Şehitkamil / Gaziantep  
 TEL +90-342-215-0504 FAX +90-342-215-0599  
 HP <http://www.birmag.com> LANGUAGE Turkish, English

## GENFOTEK GENEL FABRİKA OTOMASYON TEKNOLOJİLERİ SAN. TİC. LTD.ŞTİ.

  
 Zafer Mah. Yeni San.Sitesi M-7 Blok No:21Çorlu / Tekirdağ  
 TEL +90-282-651-3486 FAX +90-282-651-3496  
 HP <http://www.genfotek.com>  
 LANGUAGE Turkish, English

## OPTİMAS ELK.MÜH.İNŞ.TUR.ORG.SAN.VE TİC.LTD.ŞTİ.

  
 Aykent San. Sitesi Hasan Basri Cad. No:10 Karatay / Konya  
 TEL +90-332-346-3083 FAX +90-332-346-3084  
 HP <http://www.optimas.com.tr>  
 LANGUAGE Turkish, English

\* If you need any information regarding countries or regions other than listed above, please contact Europe FA center.

# Middle East/Africa

## FA Center Satellite

### MITSUBISHI ELECTRIC EUROPE South Africa FA Center Satellite PLC HMI SV INV

20 Waterford Office Park Waterford Drive cnr of Witkoppen Road Fourways Johannesburg South Africa

**TEL** +27-11-658-8100

**HP** <https://za3a.mitsubishielectric.com>

**LANGUAGE** English

## Sales Offices

### Dubai Branch

Mitsubishi Electric Europe B.V. Dubai Branch PLC HMI SV INV RB LVS MC

Dubai Silicon Oasis, P.O.BOX 341241, Dubai, U.A.E.

**TEL** +971-4-3724716

**FAX** +971-4-3724721

**HP** <https://eu3a.mitsubishielectric.com>

**LANGUAGE** Arabic, English

## Distributors

### Middle East

#### EGYPT

Cairo Electrical Group LVS MC

9 Rostoum Str. Garden City 8th Floor, Apt. 37

P.O. Box 165-11516 Maglis El-Shaab, Cairo - Egypt

**TEL** +20-2-279-23-203

**FAX** +20-2-279-62-719

**LANGUAGE** Arabic, English, French

ELECTRO TECHNIQUE PLC HMI SV INV RB

8 Markaz Almaaloumat St., Sheraton, Cairo, Egypt

**TEL** +2-2-226-98-576

**FAX** +2-2-226-98-579

**LANGUAGE** Arabic, English

#### ISRAEL

Sherf Motion Technologies Ltd. HMI SV INV

Rehov Hamerkava 19, IL-58851 Holon, Israel

**TEL** +972-3-5595462

**FAX** +972-3-5560182

**HP** <http://www.sherfmotion.co.il>

**LANGUAGE** Hebrew, English

GIRIT CELADON LTD. PLC HMI

12 Haomanut Street, IL-42505 Netanya, Israel

**TEL** +972-9-8633980

**FAX** +972-3-7537802

**HP** <http://www.girit.co.il>

**LANGUAGE** Hebrew, English

ILAN&GAVISH Automation PLC HMI RB

24 Shenkar St., Kiryat Arie, IL-49001 Petah-Tikva, Israel

**TEL** +972-3-9221824

**FAX** +972-3-9240761

**HP** <http://www.ilan-gavish.co.il>

**LANGUAGE** Hebrew, English

#### LEBANON

CEG Liban - Comptoir d'Electricité Générale Liban PLC HMI SV INV LVS MC

Cebaco Center - Block A, Autostrade Dora, Beirut, Lebanon

**TEL** +961-1-240-445

**FAX** +961-1-240-193

**LANGUAGE** Arabic, English, French

#### SAUDI ARABIA

Center of Electrical Goods PLC HMI SV INV LVS MC

Al-Shuwayer Street Side way of Salahudin Al-Ayoubi Str.

(Known as Sitteen Str.) Behind Bank Al-Bilad, P.O. Box 15955,

Riyadh 11454, Saudi Arabia

**TEL** +966-11-477-0149

**FAX** +961-1-477-6043

**LANGUAGE** Arabic, English, French

The Integrated Control for Trading Est. (TIC) PLC HMI SV INV RB

Ash Shaikh Abdullah Al Anqari St., Al Wurud, Riyadh, Saudi Arabia

**TEL** +966-11 2051240

**FAX** +966-11 2051967

**LANGUAGE** Arabic, English

#### Other Middle East Arab Countries/Cyprus

Comptoir d'Electricité Générale - International -

S.A.L. (Off Shore) PLC HMI SV INV LVS MC

Cebaco Center - Block A, Autostrade Dora

P.O. Box 11-1314 Beirut, Beirut, Lebanon

**TEL** +961-1-240-430

**FAX** +961-1-240-438

**LANGUAGE** Arabic, French, English

### Africa

#### ALGERIA

MEC-CASA Complete Automation Solutions Algeria PLC HMI SV INV LVS MC

Cité Alghazel N° 01, 02000 Chlef, Algeria

**TEL** +213-27722867

**FAX** +213-27722867

**HP** <http://www.mec-casa.com>

**LANGUAGE** Arabic, French, English

#### MOROCCO

SCHIELE MAROC PLC HMI SV INV RB LVS MC

Km 7,2 Nouvelle Route de Rabat. Ain Sebaâ. 20600

Casablanca, Maroc

**TEL** +212-5-22-66-01-51/52/53/54

**FAX** +212-5-22-66-01-56

**HP** <http://www.schielemaroc.com>

**LANGUAGE** French, English

#### SENEGAL

Avangreen Senegal PLC HMI SV INV LVS MC

Rue B x Birago Diop nr. 27, Point E Dakar (Senegal)

**TEL** +221-33-825-74-20

**FAX** +221-33-825-74-30

**HP** <http://www.avangreen.com>

**LANGUAGE** French, English

#### SOUTH AFRICA

MOTIONTRONIX CNC

No. 5 Albatross Street, Rhodesfield, Kempton Park 1619, South Africa

**TEL** +27-11-394-8512

**FAX** +27-11-394-8513

**HP** <http://www.motiontronix.co.za>

**LANGUAGE** English

CBI-electric LVS MC

Private Bag 2016, 1600 Isando, South Africa

**TEL** +27-11-977-0770

**FAX** +27-11-977-0761

**HP** <http://www.cbi-electric.com>

**LANGUAGE** English

Adroit Technologies PLC HMI SV INV RB

20 Waterford Office Park, 189 Witkoppen Road, Fourways,

South Africa

**TEL** +27-11-658-8100

**FAX** +27-11-658-8101

**HP** <http://www.adroit.co.za>

**LANGUAGE** English

#### TUNISIA

MOTRA Electric PLC HMI SV INV RB LVS MC

3, Résidence Imen, Avenue des Martyrs Mourouj III,

2074 - El Mourouj III Ben Arous, Tunisia

**TEL** +216-71-474-599

**FAX** +216-71-474-671

**HP** <http://www.motra-electric.com>

**LANGUAGE** French, English

# Warranty

## Warranty Information

### 1. Gratis Warranty Term and Gratis Warranty Range

If any faults or defects (hereinafter "Failure") found to be the responsibility of Mitsubishi occur during use of the product within the gratis warranty term, the product shall be repaired at no cost via the sales representative. However, if repairs are required onsite, actual expenses to send an engineer will be borne by the customer. Mitsubishi shall not be held responsible for any re-commissioning, maintenance, or testing on-site that involves replacement of the failed module.

#### [Gratis Warranty Term]

The gratis warranty term of the product shall be between 12 months<sup>1</sup> and 36 months<sup>2</sup> after the date of purchase or delivery to a designated place.

Note that the product shall be distributed for a maximum period of 6 months after shipment, and the longest gratis warranty term after manufacturing shall be between 18 months<sup>1</sup> and 42 months<sup>2</sup>. In addition, the gratis warranty term of the product repaired shall not exceed the gratis warranty term before repairs.

#### [Gratis Warranty Range]

(1) The customer shall be responsible for the primary failure diagnosis unless otherwise specified.

If requested by the customer, Mitsubishi Electric Corporation or its representative firm may carry out the primary failure diagnosis at the customer's expense.

The primary failure diagnosis will, however, be free of charge should the cause of failure be attributable to Mitsubishi Electric Corporation.

(2) The warranty shall apply only to the product used under normal situations such as when the usage state, method and/or environment conform to the conditions / precautions stated in the instruction manual, the user's manual, the caution labels on the product, etc. The range shall be limited to normal use within the usage state, usage methods, usage environment, etc. which follow the conditions, precautions, etc. given in the instruction manual, user's manual, caution labels on the product, etc.

(3) Even within the gratis warranty term, repairs shall be charged in the following cases.

- ① Any failure occurring from inappropriate storage or handling of the product, carelessness or negligence of the customer. Failure caused by the customer's hardware or software design.
- ② Any failure caused by unapproved modifications, etc., to the product by the customer.
- ③ When the Mitsubishi product is assembled into the customer's device, any failure that could have been avoided if functions or structures, judged as necessary in the legal safety measures the customer's device is subject to or judged as necessary by industry standards, had been provided.
- ④ Any failure that could have been avoided if consumable parts designated in the user's manual etc. had been correctly serviced or replaced.
- ⑤ Replacement of consumable parts.
- ⑥ Any failure caused by external irresistible forces such as fires or abnormal voltages, and any failure caused by force majeure such as earthquakes, lightning, wind and water damage.
- ⑦ Any failure caused by reasons unpredictable by scientific technology standards at time of shipment from Mitsubishi.
- ⑧ Any other failure found not to be the responsibility of Mitsubishi or admitted not to be so by the customer.

### 2. Onerous repair term after discontinuation of production

(1) Mitsubishi shall accept onerous product repairs for 7 years (4 years for the safety controller) after production of the product is discontinued.

Discontinuation of production shall be notified with Mitsubishi Technical Bulletins, etc.

(2) Product supply (including repair parts) is not available after production is discontinued.

### 3. Overseas service

Overseas, repairs shall be accepted by Mitsubishi's local overseas FA Center. Note that the repair conditions at each FA Center may differ.

#### 4. Exclusion of loss in opportunity and secondary loss from warranty liability

Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation to damages caused by any cause found not to be the responsibility of Mitsubishi, loss in opportunity, lost profits incurred to the customer by failures of Mitsubishi products, special damages and secondary damages, whether foreseeable or not, compensation for accidents, and compensation for damages to products other than Mitsubishi products, replacement by the customer, maintenance of on-site equipment, start-up test run and other tasks.

#### 5. Changes in product specifications

The specifications given in the catalogs, manuals or technical documents are subject to change without prior notice.

#### 6. Product application

(1) In using the Mitsubishi product, the usage conditions shall be that the application will not lead to a major accident even if any problem or fault should occur in the product, and that backup and fail-safe functions are systematically provided outside of the device for any problem or fault.

(2) The Mitsubishi product has been designed and manufactured for applications in general industries, etc.

Thus, the product should not be used in applications that could affect the public, such as use in nuclear power plants or other power plants operated by respective power companies, and that require a special quality assurance system, such as use for railway companies or public sectors.

Also, the product should not be used in applications that could have significant impact on human life or property, such as use in aircraft, medical or railway services, incineration / fuel devices, manned transportation equipment, equipment for recreation / amusement, or safety devices.

However, Mitsubishi Electric Corporation may consider the possibility of using the product even in these fore-mentioned applications, if the customer acknowledges that the product has only limited application and that any special quality is not required.

(3) Depending on the product, because there shall be other terms defined that are not included in this context, please confirm when you place an order.

\*1: The products (Safety controller / Inverter / Low-voltage circuit breaker / Magnetic contactors and starters / Power management measuring devices) whose gratis warranty term is either 12 months after delivery or 18 months after manufacturing.

\*2: The products (Programmable controller (including C language controller) / Servo system controller / GOT / Energy-saving support device) whose gratis warranty term is either 36 months after delivery or 42 months after manufacturing.

\*3: The gratis warranty term of the industrial robot shall be for either 12 months after delivery or 2000 operating hours (possible operating hours of 8 hours per day × 250 days).

\*4: Oil mist environment for industrial robots

As a result of tests conducted using cutting oils shown in the table on the right, Mitsubishi confirms that the product satisfies IP (Ingress Protection) specifications. Using the product in an environment where any cutting oils other than those shown in the table on the right may cause the product to decrease in IP performance. Also, the warranty does not apply if a failure occurs in the product used in an atmosphere where any cutting oil other than those shown in the table on the right is used or where a robot is directly exposed to water, oil

or dust beyond IP specs limits. If the customer wants to use a type of cutting oil, other than the applicable oils confirmed, Mitsubishi is ready to conduct a verification test of the oil on the behalf of the customer. For the latest information about any types of cutting oils, other than those listed in the table on the right, which have been confirmed as applicable, visit the website "Mitsubishi FA Site" (URL<<http://www.mitsubishielectric.co.jp/fa>>).

\*5: Usage environment for Magnetic contactors and starters

Do not use the product in the following locations, as it may cause the product to malfunction or shorten its operation life.

- ① Where the ambient temperature exceeds the range of -5 to +40°C.
- ② Where the average daily temperature exceeds 35°C.
- ③ Where the altitude exceeds 1000m.
- ④ Where abnormal vibration or shock happens.
- ⑤ Where there is the excessive amount of dust.
- ⑥ Where hazardous gases such as explosive, corrosive and flammable gases are generated.
- ⑦ Where there is the excessive amount of moisture or oil mist.
- ⑧ Where there is too much snow and ice.
- ⑨ Where it is always wet.
- ⑩ Where it is directly exposed to sea breeze.

**Cutting oils for oil mist environmental test**

No.	Oil name	Manufacturer	Property	Operating condition
1	Castrol hysol X	Castrol	Water soluble	20 fold dilution
2	Castrol Syntilo 9954	Castrol	Water soluble	20 fold dilution
3	Yushiro oil CE	Yushiro Chemical Industry	Water-insoluble	—
4	Yushiroken E10	Yushiro Chemical Industry	Water soluble	20 fold dilution
5	Yushiroken synthetic 770TG	Yushiro Chemical Industry	Water soluble	20 fold dilution
6	Yushiroken FX90	Yushiro Chemical Industry	Water soluble	20 fold dilution
7	SUNCUT ES-50N	Nippon Grease	Water-insoluble	—
8	Searching cut SG555	Kyowa Oil Lubricants	Water-insoluble	—
9	Emul cut FA-800	Kyodo Yushi	Water soluble	—