



for a greener tomorrow



**MITSUBISHI
ELECTRIC**

Changes for the Better

FACTORY AUTOMATION

Your competitiveness from the production site

**“Modernize”
and
“Optimize”**









Presented by Mitsubishi Electric

MIGRATION

Migration of equipment systems presented by Mitsubishi Electric!

“Modernize”
and
“Optimize”

<p>Mitsubishi Electric PLCs</p> <p>MELSEC iQ-R series</p>  <p>MELSEC L series</p>  <ul style="list-style-type: none">Meeting various needsHigh speed and large capacityNumerous actual achievements	<p>Mitsubishi Electric micro PLCs</p> <p>MELSEC iQ-F series</p>  <ul style="list-style-type: none">Compact and convenientHigh cost performanceAbundant built-in functions	<p>Mitsubishi Electric graphic operation terminals</p> <p>GOT2000 Graphic Operation Terminal</p>  <ul style="list-style-type: none">High-speed drawing, operation and communicationExtensive lineupInnovating the production site	<p>Mitsubishi Electric inverters</p>  <ul style="list-style-type: none">Energy savingLong life spanEasy maintenance	<p>Mitsubishi Electric industrial robots</p> <p>MELFA FR series</p>  <ul style="list-style-type: none">Production efficiencyImproved reliabilityHigh added value
---	---	---	--	--

Migration Recommendations

The features of migration proposed by Mitsubishi Electric

Latest products and abundant migration **know-how**

Elaborate support

Mitsubishi Electric aims for

“stable operation”
“improved productivity and improved quality”
“higher added value”
 to the customer!

Mitsubishi Electric AC servos
MITSUBISHI SERVO AMPLIFIERS & MOTORS
MELSERVO



High response and high accuracy

High-speed network

Multiple functions

Mitsubishi Electric low-voltage distribution control equipment

World Super **WS-V** Series



High reliability

Reduction of maintenance work

Network expansion

Presented by Mitsubishi Electric

These are the migration of equipment systems!

Changing the control

PLCs

Micro PLCs

Changing the display

Graphic operation terminals

Changing the drive control

Inverters

Industrial robots

AC servos

Changing the power distribution

Low-voltage distribution control equipment

Changing the factory

Latest solutions

High reliability

Support

Production discontinuance of major FA products



Migration of equipment systems
presented by Mitsubishi Electric

Various concerns in your factory...

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

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

We would like to use the existing equipment for the time being.

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

We would like to expand automated production.



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.

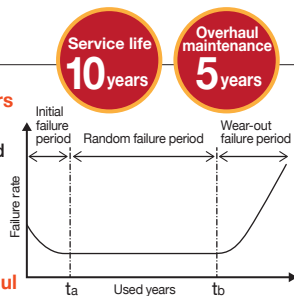
Replacing a unit whose service life is expired

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.

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

- 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.



Hop!

In the existing facility

- [Stable operation]
- [Extension of equipment service life]
- [Preventive maintenance]

Migration check

- 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

We would like to reduce the stop time caused by failures.

We may not cope with failures of equipment whose production is of special equipment.

The productivity can not be improved because the performance of the existing equipment has reached the limit.

We would like to acquire and analyze data quickly.

There is much wasteful time in the maintenance work because the existing equipment are manufactured by many companies.

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

We are not sure whether we can replace and migrate the FA equipment by ourselves.

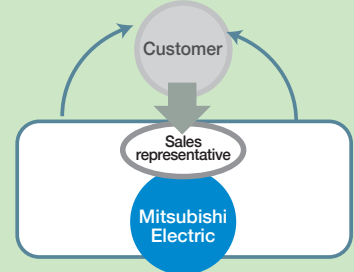
Before

After
Turn the page.



Migration by Mitsubishi Electric

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



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

Step!

In addition,

- [Productivity improvement]
- [Quality improvement]
- [Promotion of energy saving]

How about introducing new equipment of high productivity that is easy to use?

- High-speed, high-accuracy control
- Smart wiring
- High-speed, large-capacity communication
- Networking
- Standardizing the maintenance tool
- Utilizing the GOT
- Quick recovery from machine alarms
- Supporting and implementing energy saving

Jump!

Furthermore,

- [Visualization]
- [Automation]
- [Safety and security measures]

How about introducing new equipment assuring quick response, safety and security?

- 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)

Migrations
by Mitsubishi
Electric

Migration of equipment systems
presented by Mitsubishi Electric

Can be resolved by migration!

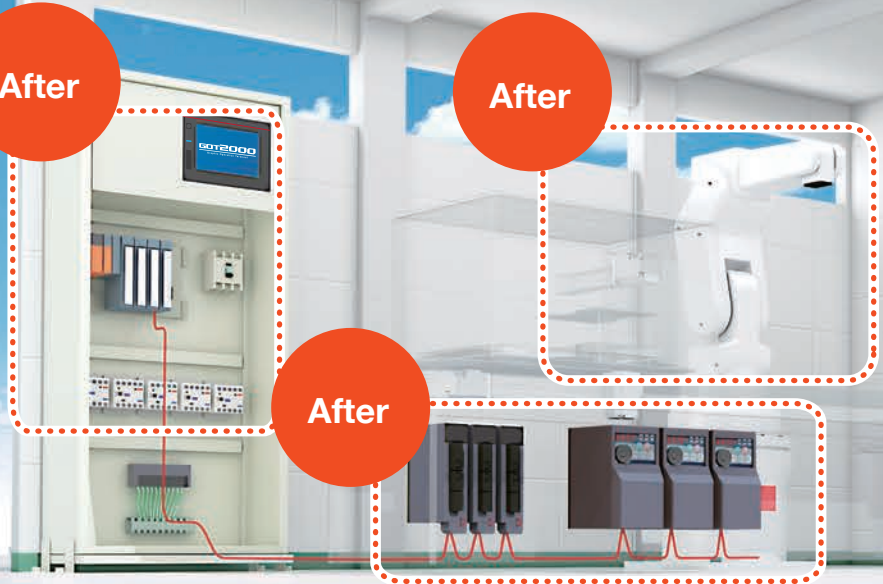
Migration requires
only small cost!

Energy-saving and
environment friendly
equipment!

After

After

After



Mitsubishi Electric's 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.

Mitsubishi Electric's drive equipment

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 Electric PLCs

MELSEC iQ-R
series



MELSEC L
series



Mitsubishi Electric micro PLCs

MELSEC iQ-F
series



Mitsubishi Electric
graphic operation terminals

GOT2000
Graphic Operation Terminal



Mitsubishi Electric
AC servos

MITSUBISHI SERVO AMPLIFIERS & MOTORS
MELSERVO



Mitsubishi Electric
inverters



CC-Link I^{ET}SN



After

Data can be acquired and analyzed quickly!

The performance of the equipment is improved, and the productivity is improved!

Automated production expanded, and the efficiency improved.

The FA equipment were replaced and migrated easily!

The productivity and quality are improved using the existing equipment!

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

Mitsubishi Electric's 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 Electric industrial robots

MELFA FR
SERIES



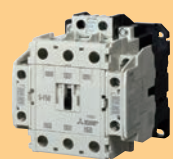
Mitsubishi Electric low-voltage distribution control equipment



World Super
WS-V
Series



SS
Super-S Series



MS-T
series

Mitsubishi Electric PLCs

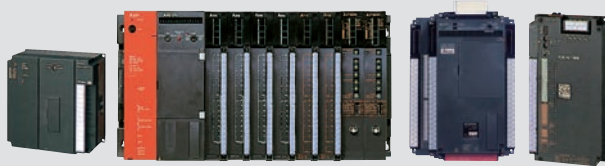
First,

How is the current status of the existing PLC?

MELSEC-A (large type)
Discontinued
September 2008

MELSEC-A (small type)
Discontinued
September 2014

Mitsubishi Electric PLCs



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 supports migration with various tools and accumulated know-how.

Mitsubishi Electric offers various tools for replacement with latest models.

Mitsubishi Electric

A to Q migration catalogs and case examples

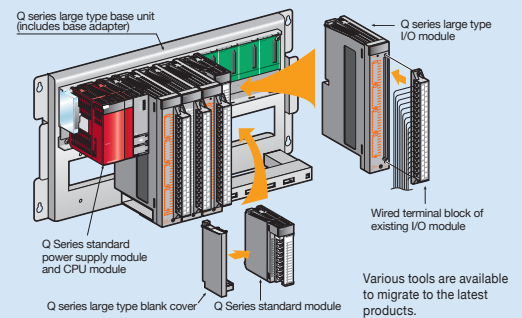
- MELSEC-A Series (large type) Transition Guide
- MELSEC A Series (small type) Transition Guide
- MELSEC-A Series Transition Examples



For example

A to Q hardware replacement!

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

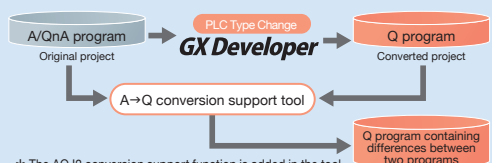


For example

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.



* The AOJ2 conversion support function is added in the tool (Ver. 1.09 or later).

Migrate



Partner manufacturers

A/AnS to iQ-R/Q migration tool catalogs

- Migration tool catalogs



Mitsubishi Electric Engineering Co., Ltd.



Remarkably shorten time required for wiring when replacing A/AnS series with iQ-R or Q series.

Mitsubishi Electric System & Service Co., Ltd.

* Refer to "Introduction of partner manufacturers" on pages 28 to 29.

Mitsubishi Electric

To customers who use Q series

Q series (discontinued or to be discontinued) can be replaced to iQ-R series.

Transition guide and replacement procedure from Q series to iQ-R series

- MELSEC-Q Series to MELSEC iQ-R Series Migration Guide
- Alternative model lists and project conversion procedure for the replacement of MELSEC-Q series models with MELSEC iQ-R series models



* For details of replacement models, visit Mitsubishi Electric FA website.

Migrate to the latest Mitsubishi Electric PLCs!!

Mitsubishi Electric PLCs
MELSEC iQ-R series



MELSEC Q series



MELSEC L series



Benefits of migration

3 years 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 Electric Micro PLCs

First,

How is the current status of the existing PLC?

FX1S/FX1N/FX1NC
Discontinued
December 2015

FX2N/FX2NC
Discontinued
September 2012

Mitsubishi Electric micro PLCs



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

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!

Micro PLCs are downsized compared to legacy models, and can fit into the existing space. Programs can be replaced with FX-20P-E-FKIT for F series or with GX Works2 and GX Works3 for FX series.

Mitsubishi Electric offers various tools for replacement with latest models.

Migration catalog

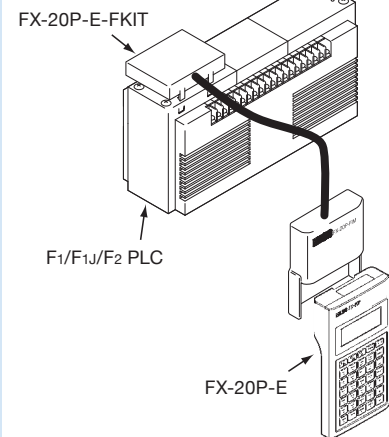
- FX Migration Guide



For example

F (F1, F1J, F2) series replacement!

The combination "FX-20P-E + FX-20P-E-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-E + FX-20P-E-FKIT". After existing programs are transferred to the FX series, they can be corrected and debugged using GX Works2.

FX-20P-E
Discontinued
December 2012

* Contact your local dealer.

Migrate



- Migration Guide from FX2N/FX2NC to FX3

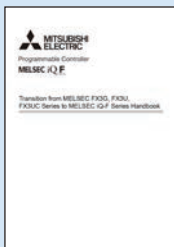


- Migration Guide from FX1N/FX1NC to FX3



MELSEC iQ-F series migration material

- Transition from MELSEC FX3s, FX3u, FX3uc Series to MELSEC iQ-F Series Handbook



For example

Legacy FX series replacement!

FX series programs can be replaced with FX3 series programs using PC type change function of GX Works2.

Programming software

GX Works2



Migrate to the latest Mitsubishi Electric PLCs!!

Mitsubishi Electric micro PLCs

MELSEC iQ-F series



MELSEC-F
FX3 series



Benefits of migration

3 years warranty!

Easy connection with multiple communication ports!

Expansion boards enable expansion at low cost!

Convenient built-in functions enable system configuration at low cost!

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

Improve efficiency with various convenient instructions!

Enhanced program security function!

High-function and compact extension modules are available!

Mitsubishi Electric graphic operation terminals

First,

How is the current status of the existing GOT?

GOT-A900
Discontinued
March 2009

GOT-F900
Discontinued
March 2011

Mitsubishi Electric graphic operation terminals



GOT-A900 series



GOT1000 series

Concerns about the existing equipment

The product is getting old and is not well maintained.

Screen data 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 GOT2000 series products?

Mitsubishi Electric can eliminate these concerns!

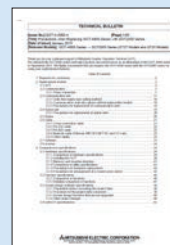
GOT series has same panel-cut dimensions when the screen size is the same. Screen data can easily be replaced using GT Works3. GOT with the latest functions can reduce loads on the PLC, and can back up data.

Mitsubishi Electric offers various tools for replacement with latest models.

Migration documents

Documents for migrating GOT-A900 series

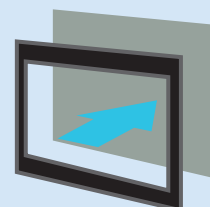
- Precautions when Replacing GOT-A900 Series with GOT2000 Series



For example

Migration tool

Optional attachment is available for replacing GOT-900, 1000 series with different screen size.

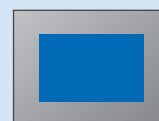


For example

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 Schneider Electric Japan Holdings Ltd.

Migrate



Documents for migrating GOT1000 series

- TECHNICAL BULLETIN



- GT10 – GT21 Models
- GT11 – GT27, GT25 Models
- GT14 – GT2505 Model
- GT16, GT15 – GT27, 25 Models

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 GOT2000 series.

Screen design software

GT Works3
GT Works3+plus
GT Converter2



Mitsubishi Electric
Graphic Operation Terminals

GOT2000 series



Migrate to the latest Mitsubishi Electric Graphic Operation Terminals!!

Mitsubishi Electric Graphic Operation Terminals

GOT2000

Graphic Operation Terminal



Benefits of migration

3 years 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 Electric inverters

First,

How is the current status of the existing inverter?

Mitsubishi Electric inverters



A700, F700P, A500, F500, E500, S500, V500

Concerns about the existing equipment

Replacement of service life limited components may be needed soon.

Need to manage and control many units.

Need 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!

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

Mitsubishi Electric offers various tools for replacement with latest models.

Migration documents

- Inverter migration proposal



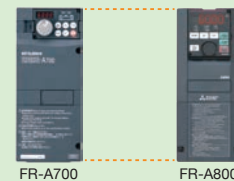
For example

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, F800 and E800 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



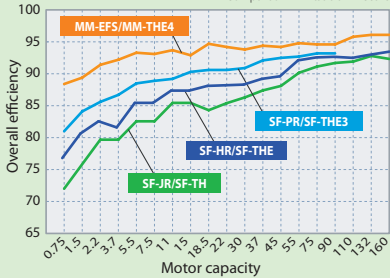
Energy saving

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] Comparison in Mitsubishi Electric



- 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.

* Excerpts from "Periodic check of the transistorized inverter" of JEMA (Japan Electrical Manufacturer's Association).

Migrate to the latest Mitsubishi Electric inverters!!

Mitsubishi Electric inverters



A800



F800



E800



D700



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 (E800 and D700).

Easy operation with M dial

Easy wiring (A800, F800, E800 and D700).

CC-Link IE TSN communication function (A-800-GN, E-800-E, E800-SCE)

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

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

Mitsubishi Electric industrial robots

First,

How is the current status of the existing robot?

Mitsubishi Electric industrial robots



P series M series E series EN series
A series S series SD/SQ series F series

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!

iQ Platform

FR series supports iQ Platform and enables higher speed control.

Next-generation automation with MELFA Smart Plus*!

MELFA Smart Plus

* An option using AI for extending function

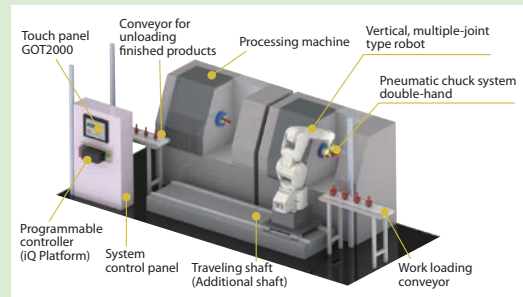


It contributes to productivity, the improvement in reliability, and total cost reduction.

For example

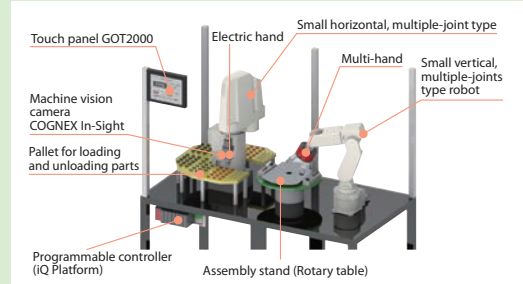
Loading/Unloading of parts to a processing machine

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



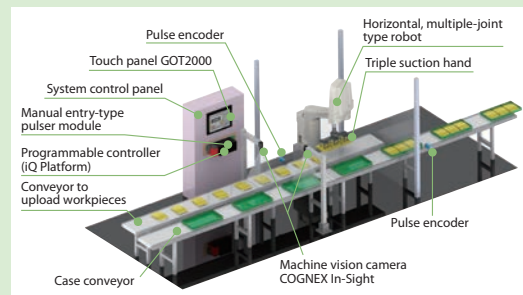
For example

Assembly of electric components (switch)



For example

Conveyor alignment for packed food products



Migrate to the latest Mitsubishi Electric robots!!

Mitsubishi Electric industrial robots

MELFA FR
SERIES



RH-FR series RV-FR series

Extended function option

MELFA Smart Plus



MELFA Smart Plus



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

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!

Functional expansion such as AI with MELFA Smart Plus

Improved operability with easy connection of GOT

Mitsubishi Electric AC servos

First,

How is the current status of the existing AC servo?

⚠️
MR-J2S
Discontinued
August 2015.

⚠️
MR-J3/MR-J3W
Discontinued
May 2019.

Mitsubishi Electric AC servos



MR-A, MR-J, MR-J2, MR-J2S, MR-J3/MR-J3W, 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!

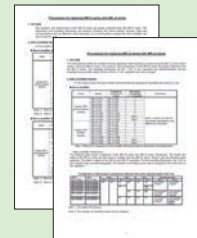
Abundant tools to support easy migration are available. In multi-axis control, combining the motion controller contributes to function upgrade and space saving!

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



- Migration Guide from MELSERVO-J3/J3W to MELSERVO-J4



Partner manufacturers

Mitsubishi Electric Engineering Co., Ltd. or Mitsubishi Electric System & Service Co., Ltd. provide useful migration tools.

- SCNET → SSCNET III/H Conversion Unit



- SSCNET III/H → SSCNET Conversion Unit



Migrate



MR-J4-B is recommended for replacing legacy Mitsubishi Electric 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.

For example

In case of MR-J2S series



Servo can be replaced with MR-J4 type using the migration tool.

Mitsubishi Electric

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

For replacing MR-J2S series



* Refer to "Introduction of partner manufacturers" on pages 29.

Migrate to the latest Mitsubishi Electric AC servos!!



MITSUBISHI ELECTRIC SERVO SYSTEM
MELSERVO-J5



MITSUBISHI SERVO AMPLIFIERS & MOTORS
MELSERVO-J4
0.05 kW to 220 kW



Benefits of migration

Easy servo adjustment to fit the equipment!

Easy wiring with CC-Link IE TSN or SSCNET III/H.

High-response control improves tact time!

Advanced predictive maintenance function shortens downtime.

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 Electric low-voltage distribution control

First,

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.

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



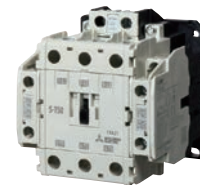
No-fuse circuit breakers



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

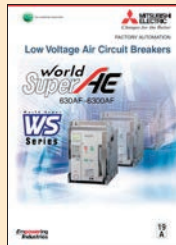
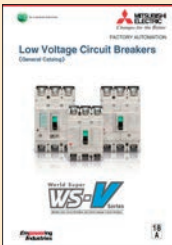


LCD improves visibility.
Easy data collection with communication function.
Various options facilitate setting changes for the display and output devices. (electronic measuring instrument)

equipment

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



Furthermore, Mitsubishi's migration can:

Energy measuring unit EcoMonitorLight

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.



MDU breaker*

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.



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

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

* These equipment are not sold in the USA.



Mitsubishi Electric 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

BC and spring clamp terminals allows safe and easy wiring.

Detachable arc cover makes inspection easy.

Save energy with low power consumption coil.

Electronic multi-measuring instrument

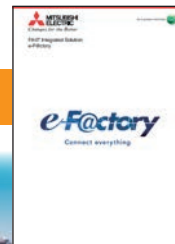
Wide viewing angle LCD improves visibility.

Set data transceiver allows easy setting and management.

Latest solutions from Mitsubishi Electric Maximizing that will change your factory

By introducing e-F@ctory, in Nagoya Works of Mitsubishi Electric, productivity, quality, energy-saving effect and safety are greatly improved and security are realized. In Fukuyama Works of Mitsubishi Electric, energy-saving by controlling of demand data is realized.

FA-IT Integrated Solution
e-F@ctory



Case of e-F@ctory by Mitsubishi Electric (Nagoya Works)*

Improving Productivity with Operations Management/ Energy-savings/Work Support Systems

Issues

- Stabilization of operating rate by reducing incorrect part implementation
- Shorten time required to analyze failure causes
- Alleviate burden on experienced operators who give instructions
- Safety measures for operators who perform loading/unloading work

Solutions

- Introduction of a system using a C controller for managing surface implementation
- Introduction of a screw-fastening support system using a display screen
- Introduction of a system for managing energy savings of air-conditioning and lighting using MC Works64 and a PLC
- Introduction of a vertical conveyance system using a safety PLC



MC Works⁶⁴



Benefits

Energy cost
Approx. 30% reduction

Poor quality
Approx. 50% reduction

Productivity
Approx. 30% improvement

Man-hours required to train
new employees
Approx. 65% reduction

Improving Quality on the Assembly Line

Issues

- Support fluctuating demand and high-mix, varying volume production
- Improve equipment operating rate and quality

Solutions

- Directly collect various information from equipment with a Manufacturing Execution System (MES) interface (PLC)
- Directly connect equipment and a MES to strengthen information management and carry out various improvement activities



Benefits

Lead-time
Approx. 50% reduction

Machining time
Approx. 40% reduction

Poor quality
Approx. 50% reduction

System build tim
Approx. 65% reduction

Manufacturing timeframe
Approx. 50% reduction

Case of e-F@ctory by Mitsubishi Electric (Fukuyama Works)*

Energy-saving in offices

Issues

- Management and control of General Administration Building power demand

Solutions

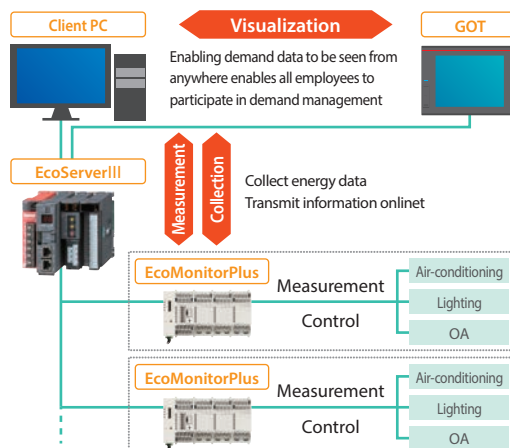
- Real-time measurement, collection and visualization of power consumption
- Automatic online adjustment of air-conditioning

Benefits

General Administration Building
24%
less energy consumption

Fukuyama Works overall
Approx. 100 million
yen annual reduction in costs

(base year: 1996, FY2010 results)



* Investigated by Mitsubishi Electric

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

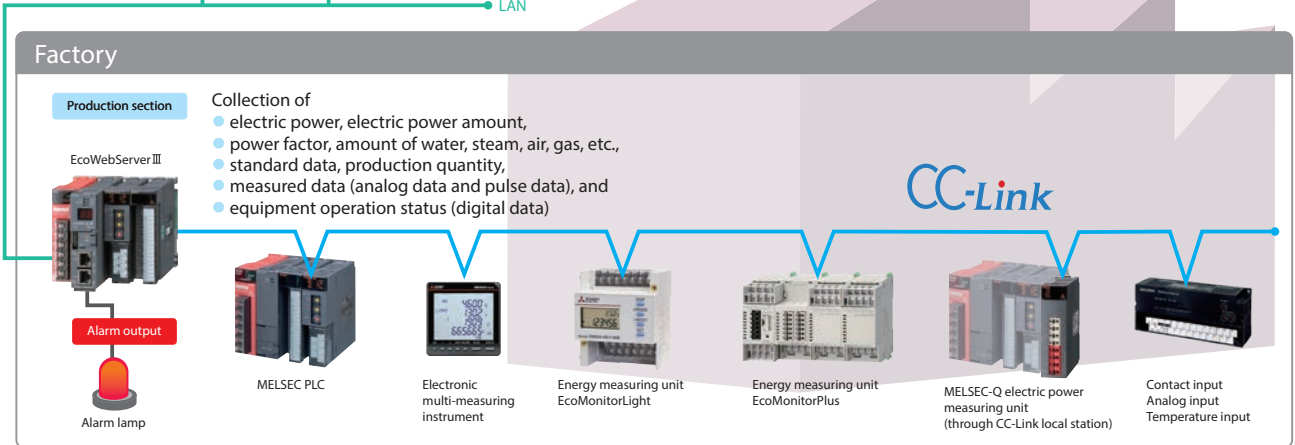
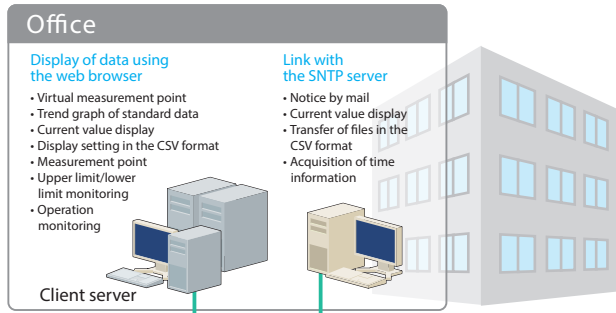
• Mitsubishi Energy-saving Data Collection Server EcoWebServerIII



TWO types selectable

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.



Inherited functions

Remain available!

<p>The setting software is provided as an accessory. There is no necessity to create programs.</p> <p>Simple setting Simple extension</p>	<p>The newly adopted universal design makes graphs easier to see.</p> <p>Graph display</p>	<p>Virtual measurement and production quantity are incorporated in the standard data control.</p> <p>Calculation function</p>	<p>The measured data are processed and saved easily.</p> <p>CSV format Compatible with FTP</p>
---	---	--	--

Improved performance

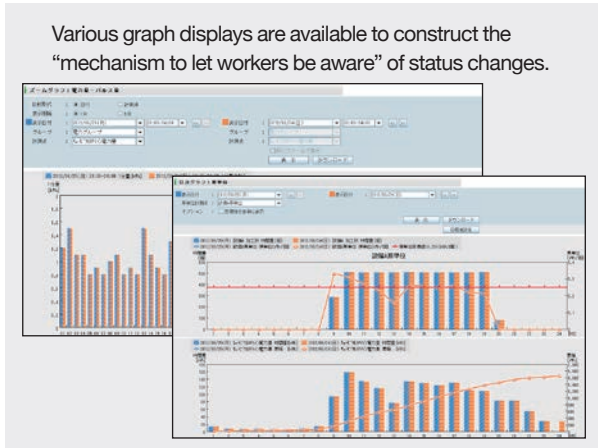
Powered up!

<p>The daily data saving period has been extended from 2 months to 6 months. Extended saving period</p> <p>Extended saving period</p>	<p>The number of virtual measurement points and standard data measurement points have been increased.</p> <p>Enhanced calculation function</p>	<p>The zoom data collection period has been reduced.</p> <p>1 minute minimum</p>
--	---	---

Additional functions

New functions added!

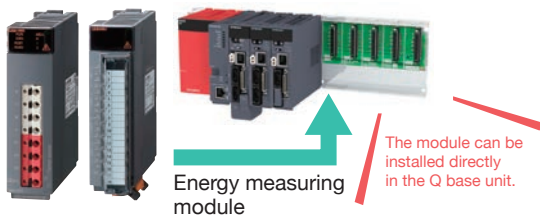
<p>Alarm outputs have been enabled to enhance the monitoring function.</p> <p>Up to 16 contact outputs</p>	<p>The temperature and humidity data are collected for each section and application.</p> <p>Multiple comparison</p>	<p>The energy loss in the equipment has been made visible.</p> <p>Equipment monitoring</p>
---	--	---



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



Energy Measuring Module Installation Example

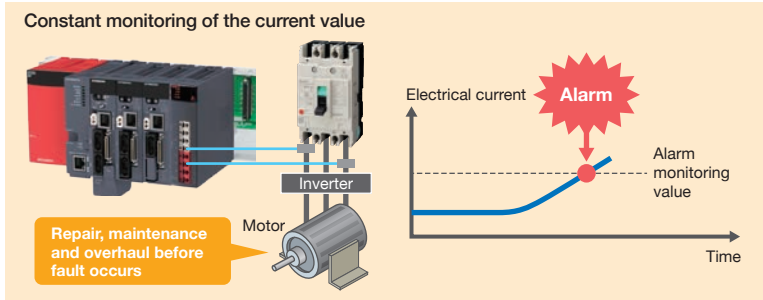


- Specific energy consumption can be managed in detail according to individual items or processes to assist in reducing the power consumption of production equipment and realize energy savings.
- Constantly measuring current (or power) consumption can help prevent serious faults and equipment failure,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

Preventive Maintenance
Point1

Constant measurement of the electrical current

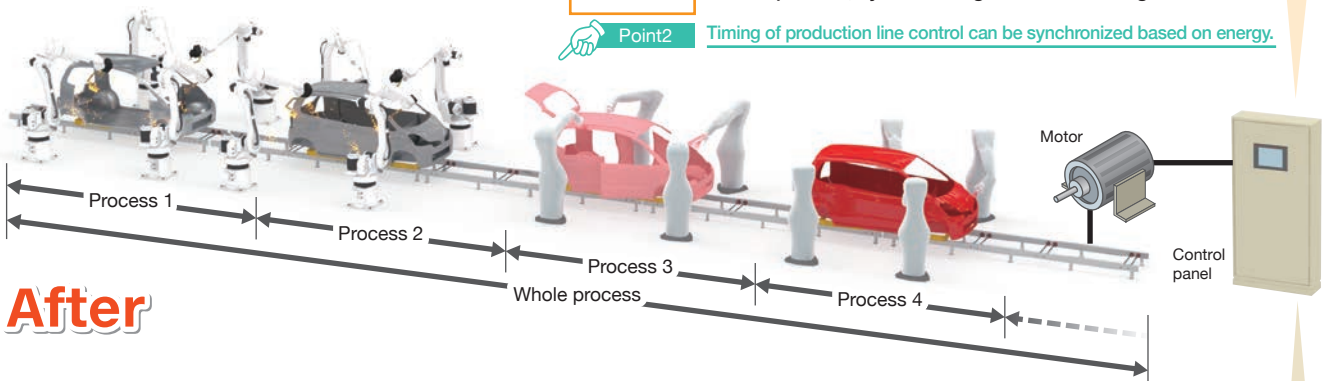
Preventive maintenance measures are taken before equipment stoppage.



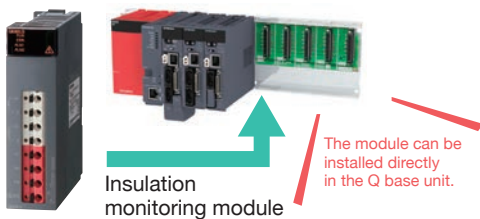
Energy Saving
Point2

Item or process, synchronizing the control timing

Timing of production line control can be synchronized based on energy.



Insulation Monitoring Module Installation Example

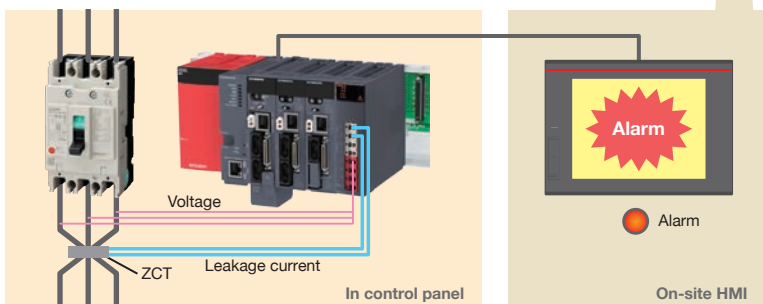


- Maintenance man-hours can be reduced by improving the efficiency of periodic inspection work.
- The resistive-component leakage current (Ior) can be measured so that a leakage current caused by insulation deterioration can be identified.

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



Global web site



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

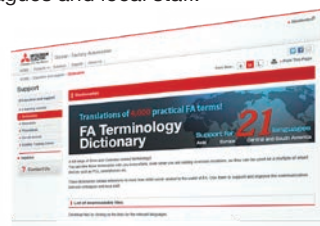
From “Worldwide” provided at the upper right corner of the top page, you can easily access to the FA web sites all over the world. On the pages for each country, you can check not only products purchasable all over the world but also the information on products developed specially for the region, catalogs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



Education and support

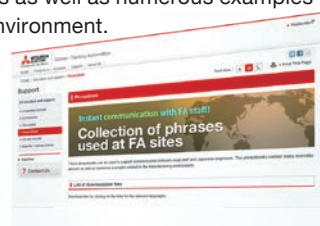
◆ Dictionaries

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.



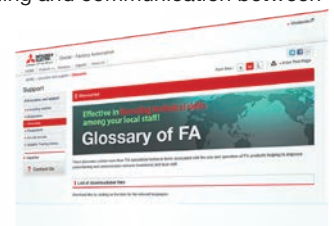
◆ Phrasebook

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.



◆ 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.



◆ 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.



◆ FA e-Learning

This site supports 17 languages (English, Chinese, Korean, Thai, Indonesian, Vietnamese, Malay, Myanmar, Spanish [for Latin America], Portuguese [for South America], Russian, Polish, Czech, Slovakian, Hungarian, Hindi and Turkish) will support other languages. (coming soon) Please utilize this site for improving basic skills of local workers in overseas production sites.



◆ Satellite Training Series

Supports learning with DVD instruction and textbook in your local language.

Available in six languages: English, Japanese, Chinese (simplified), Indonesian, Thai and Vietnamese



Supported languages

	FA e-Learning	Dictionaries	Glossaries	Phrasebook	On-site lexicon	Satellite Training Series
English	●	●	●	●	●	●
Japanese	●	●	●	●	●	●
Chinese [Simplified]	●	●	●	●	●	●
Chinese [Traditional]		●	●	●		
Korean	●	●	●	●		
Thai	●	●	●	●		●
Indonesian	●	●	●	●		●
Vietnamese	●	●	●	●		●
Malay	●			●		
Myanmar	●			●		
Tagalog [Filipino]				●		
Spanish		●				
Spanish [for Latin America]	●	●	●	●		
Portuguese		●				
Portuguese [for South America]	●	●	●	●		
German		●				
Italian		●				
French		●				
Russian	●	●		●		
Polish	●	●		●		
Czech	●	●		●		
Slovakian	●	●		●		
Hungarian	●	●		●		
Turkish	●	●	●	●		
Hindi	●			●		

3-years guarantee

3-years guarantee has started.

[Subjected models] PLCs and graphic operation terminals

PLCs MELSEC series	Micro PLCs MELSEC series	Motion controllers	Graphic operation terminals
 <ul style="list-style-type: none"> ● iQ-R series ● Q series ● QnU series ● L series 	 <ul style="list-style-type: none"> ● iQ-F series ● FX3 series 	 <ul style="list-style-type: none"> ● iQ-R series ● Q series ● L series 	 <ul style="list-style-type: none"> ● GOT 2000 series ● GOT 1000 series

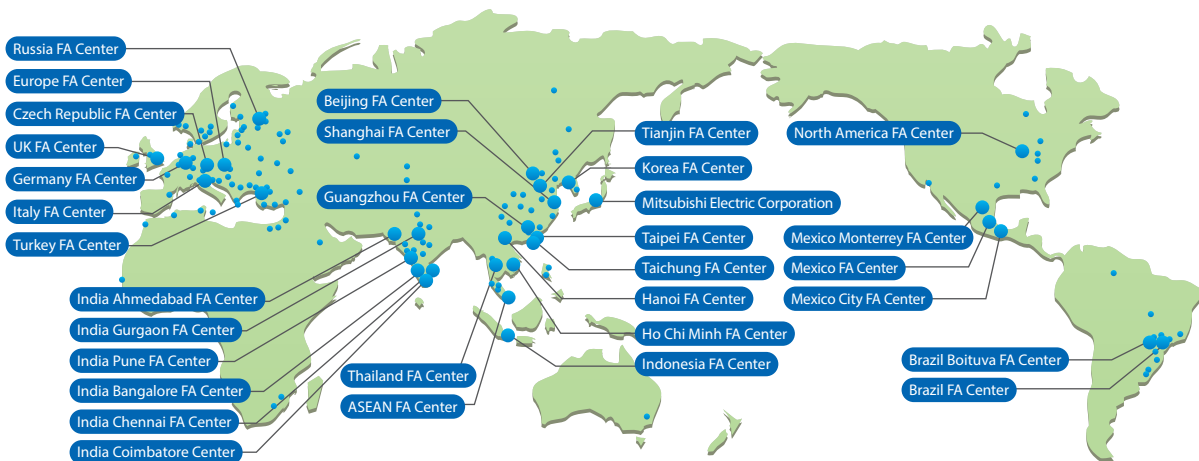
* The free guarantee period of a product shall be 3 years after the purchase or after it is delivered to the specified place (within 42 months after manufacturing under consideration that the circulation period after shipment from Mitsubishi Electric's factory is 6 months maximum). The free guarantee policy shall be specified by Mitsubishi Electric.

Training school

Mitsubishi Electric offers training from basic operation to application programming in local language using actual products. In addition, Mitsubishi Electric offers individual menus and training visits basing on requests from customers.



Global FA Centers



Service menu	Service menu							
	Japanese	Showroom	Training	Field service (Field investigation and dispatch of engineers)	Technical consultation	Failure inspection	Repair	Spare part sales
Operation								
FA Center (key service operation)	○	○	○	○	○	○	○	△
Overseas sales office /representative	△	△	—	—	○	○	—	○

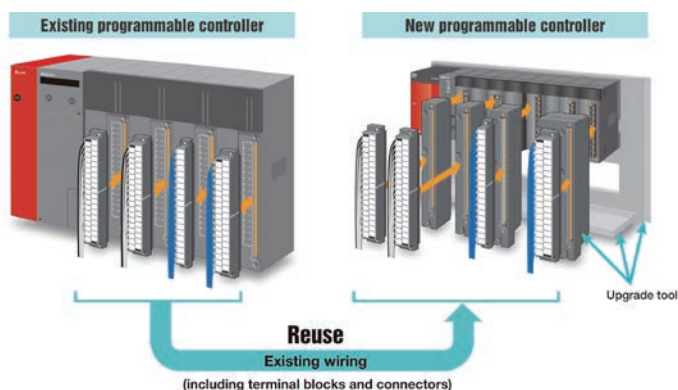
* The contents of services may vary depending on the operation. Please contact the nearest sales offices or your sales representative for more information.

MITSUBISHI ELECTRIC ENGINEERING CO., LTD.

Mitsubishi Electric Engineering Co., Ltd. designs and sells peripheral components of Mitsubishi PLCs including PLC upgrade support equipment, wiring saving equipment and man-hour saving equipment.

PLC migration (upgrade) tools

Migration (upgrade) tools for replacing the A/AnS series with the iQ-R/Q series are provided. Please use selection tools.

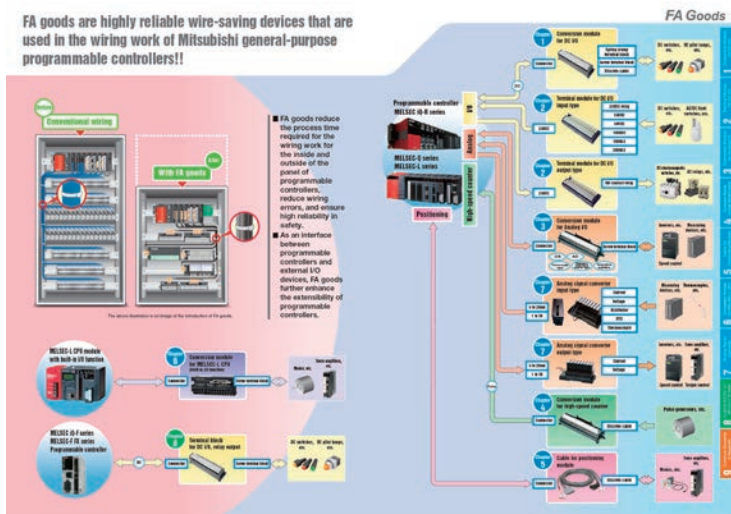


● Migration tool catalogs

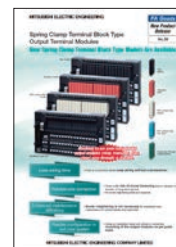


FA merchandise (FA goods)

Wiring saving equipment and man-hour saving equipment support the wiring of the PLCs. These equipment reduce man-hours for wiring inside and outside the panel and wiring mistakes, and realize safety backed up by high reliability.



● Catalogs



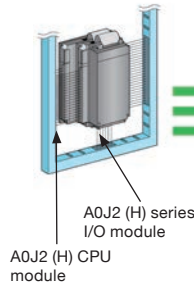
For the acquisition of Upgrade Tool and FA merchandise (FA goods), please contact your local Mitsubishi Electric sales office or sales representative.

Mitsubishi Electric System & Service Co., Ltd.

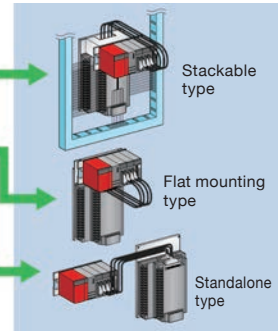
A0J2 migration tool

This migration tool is used to replace the MELSEC-A0J2 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.

Before replacement



After replacement

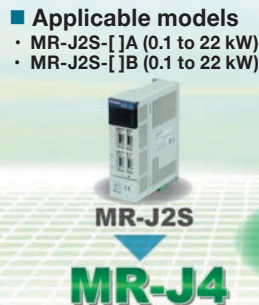


● Migration tool catalog



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-[JA (0.1 to 22 kW)
 - MR-J2S-[JB (0.1 to 22 kW)

● Migration tool 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"

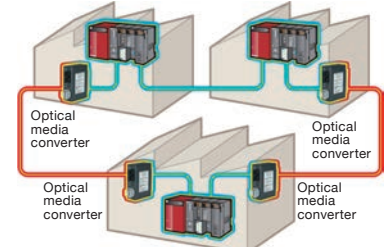
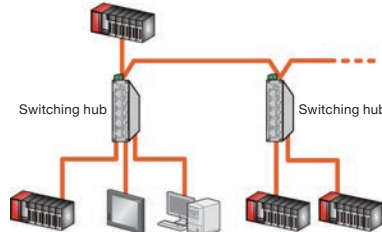
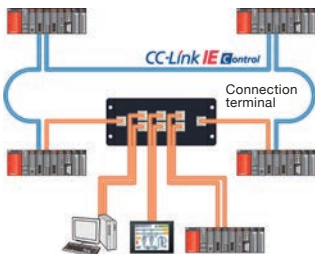


SSCNET III/H

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



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



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

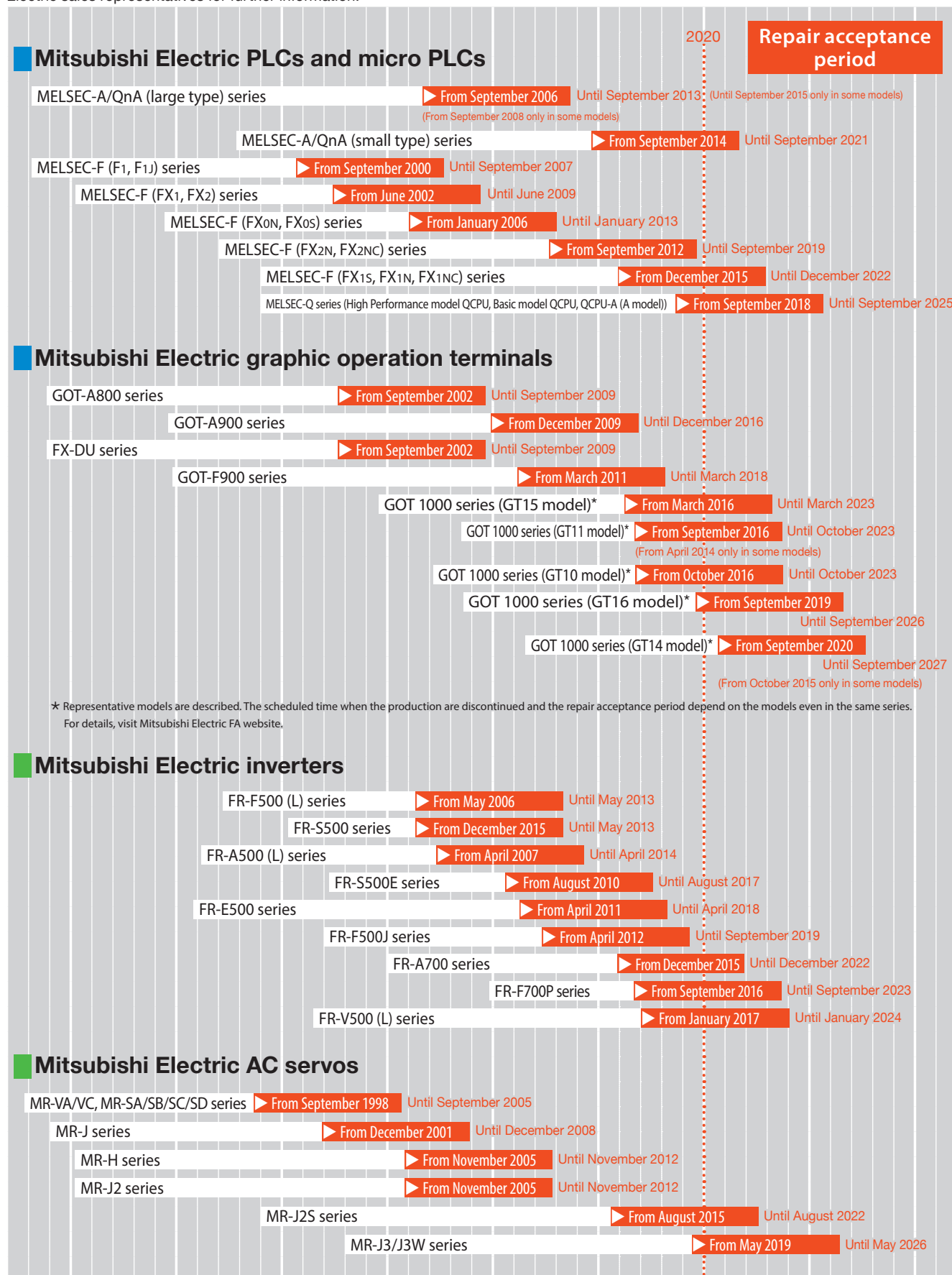
- This cable enables relay connection, and is available in a case in which the AC servo should be separated from the machine side during transportation or installation, a case in which a highly flexible part should be adopted partially in the AC servo, and other cases.
- Mitsubishi Electric System & 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.



Production discontinuance of major FA products

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.

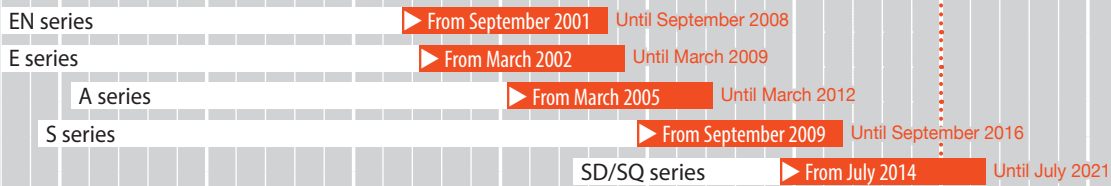


Mitsubishi Electric servo system controllers



Repair acceptance period

Mitsubishi Electric industrial robots



* Representative models are described. The scheduled time when the production are discontinued and the repair acceptance period depend on the models even in the same series. For details, visit Mitsubishi Electric FA website.

Mitsubishi Electric distribution control product

Migration time of Mitsubishi distribution control product due to deterioration

Model	Recommended migration time (after start of use)
Molded-case circuit breaker Earth-leakage circuit breaker	15 years or specified number of times of switching
Electromagnetic switch	10 years or specified number of times of switching

⚠ 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

- The company names, system names and product names mentioned in this document are either registered trademarks or trademarks of their respective companies.
- In some cases, trademark symbols such as "™" or "®" are not specified in this document.

Global Partner. Local Friend.

Points of contact

Japan (Tokyo)	FA Global Solution Technical Department	(TEL:+81-3-3218-6422)	India (Chennai)	MITSUBISHI ELECTRIC INDIA PVT. LTD. Chennai Branch	(TEL:+91-44-4554-8772)
Japan (Tokyo)	Asian Business Development Department	(TEL:+81-3-3218-6284)	India (Ahmedabad)	MITSUBISHI ELECTRIC INDIA PVT. LTD. Ahmedabad Branch	(TEL:+91-79-6512-0063)
China (Shanghai)	Mitsubishi Electric Automation (China) Ltd.	(TEL:+86-21-2322-3030)	India (Coimbatore)	MITSUBISHI ELECTRIC INDIA PVT. LTD. Coimbatore Branch	(TEL:+91-422-4385606)
China (Beijing)	Mitsubishi Electric Automation (China) Ltd. Beijing Branch	(TEL:+86-10-6518-8830)	North America	MITSUBISHI ELECTRIC AUTOMATION, INC.	(TEL:+1-847-478-2100)
China (Tianjin)	Mitsubishi Electric Automation (China) Ltd. Tianjin Branch	(TEL:+86-22-2813-1015)	Mexico	MITSUBISHI ELECTRIC AUTOMATION, INC. Queretaro Office	(TEL:+52-442-153-6014)
China (Guangzhou)	Mitsubishi Electric Automation (China) Ltd. Guangzhou Branch	(TEL:+86-20-8923-6730)	Mexico(City)	MITSUBISHI ELECTRIC AUTOMATION, INC. Mexico Branch	(TEL:+52-55-3067-7511)
Taiwan (Taichung)	Mitsubishi Electric Taiwan Co., Ltd.	(TEL:+886-4-2359-0688)	Mexico(Monterrey)	MITSUBISHI ELECTRIC AUTOMATION, INC. Monterrey Office	(TEL:+52-55-3067-7521)
Taiwan (Taipei)	Setsuyo Enterprise Co., Ltd.	(TEL:+886-2-2299-9917)	Brazil	MITSUBISHI ELECTRIC DO BRASIL COMÉRCIO E SERVIÇOS LTDA.	(TEL:+55-11-4689-3000)
Korea	Mitsubishi Electric Automation Korea Co., Ltd.	(TEL:+82-2-3660-9629)	Brazil (Votorantim)	Mitsubishi Electric do Brasil Comércio e Serviços Ltda. Votorantim Office	(TEL:+55-15-3023-9000)
ASEAN	MITSUBISHI ELECTRIC ASIA PTE. LTD.	(TEL:+65-6470-2480)	Europe	MITSUBISHI ELECTRIC EUROPE B.V. Polish Branch	(TEL:+48-12-347-65-00)
Thailand	MITSUBISHI ELECTRIC FACTORY AUTOMATION (THAILAND) CO.,LTD.	(TEL:+66-2682-6522)	Germany	MITSUBISHI ELECTRIC EUROPE B.V. German Branch	(TEL:+49-2102-486-0)
Indonesia	PT. MITSUBISHI ELECTRIC INDONESIA	(TEL:+62-21-2961-7797)	UK	MITSUBISHI ELECTRIC EUROPE B.V. UK Branch	(TEL:+44-1707-27-8780)
Vietnam (Hanoi)	MITSUBISHI ELECTRIC VIETNAM COMPANY LIMITED Hanoi Branch	(TEL:+84-24-3937-8075)	Czech Republic	MITSUBISHI ELECTRIC EUROPE B.V. Czech Branch	(TEL:+420-255-719-200)
Vietnam (Ho Chi Minh)	MITSUBISHI ELECTRIC VIETNAM COMPANY LIMITED	(TEL:+84-28-3910-5945)	Italy	MITSUBISHI ELECTRIC EUROPE B.V. Italian Branch	(TEL:+39-039-60531)
India (Pune)	MITSUBISHI ELECTRIC INDIA PVT. LTD. Pune Branch	(TEL:+91-20-2710-2000)	Russia	MITSUBISHI ELECTRIC (RUSSIA) LLC St.Petersburg Branch	(TEL:+7-812-633-3497)
India (Gurgaon)	MITSUBISHI ELECTRIC INDIA PVT. LTD. Gurgaon Head Office	(TEL:+91-124-463-0300)	Turkey	MITSUBISHI ELECTRIC TÜRKİYE ELEKTRİK ÜRÜNLERİ A.Ş. Ümraniye Branch	(TEL:+90-216-526-3990)
India (Bengaluru)	MITSUBISHI ELECTRIC INDIA PVT. LTD. Bengaluru Branch	(TEL:+91-80-4020-1600)			

MITSUBISHI ELECTRIC CORPORATION

HEAD OFFICE: TOKYO BLDG., 2-7-3, MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN
www.MitsubishiElectric.com