MITSUBISHI ELECTRIC

Changes for the Better

for a greener tomorrow eco Changes

Mitsubishi Integrated Solution e-F@ctory

A solution for advanced factories of the future

e-F@ctory

GLOBAL IMPACT OF MITSUBISHI ELECTRIC

Through Mitsubishi Electric's vision, "Changes for the Better" are possible for a brighter future.

Changes for the Better

We bring together the best minds to create the best technologies. At Mitsubishi Electric, we understand that technology is the driving force of change in our lives. By bringing greater comfort to daily life, maximizing the efficiency of businesses and keeping things running across society, we integrate technology and innovation to bring changes for the better.

Mitsubishi Electric is involved in many areas including the following

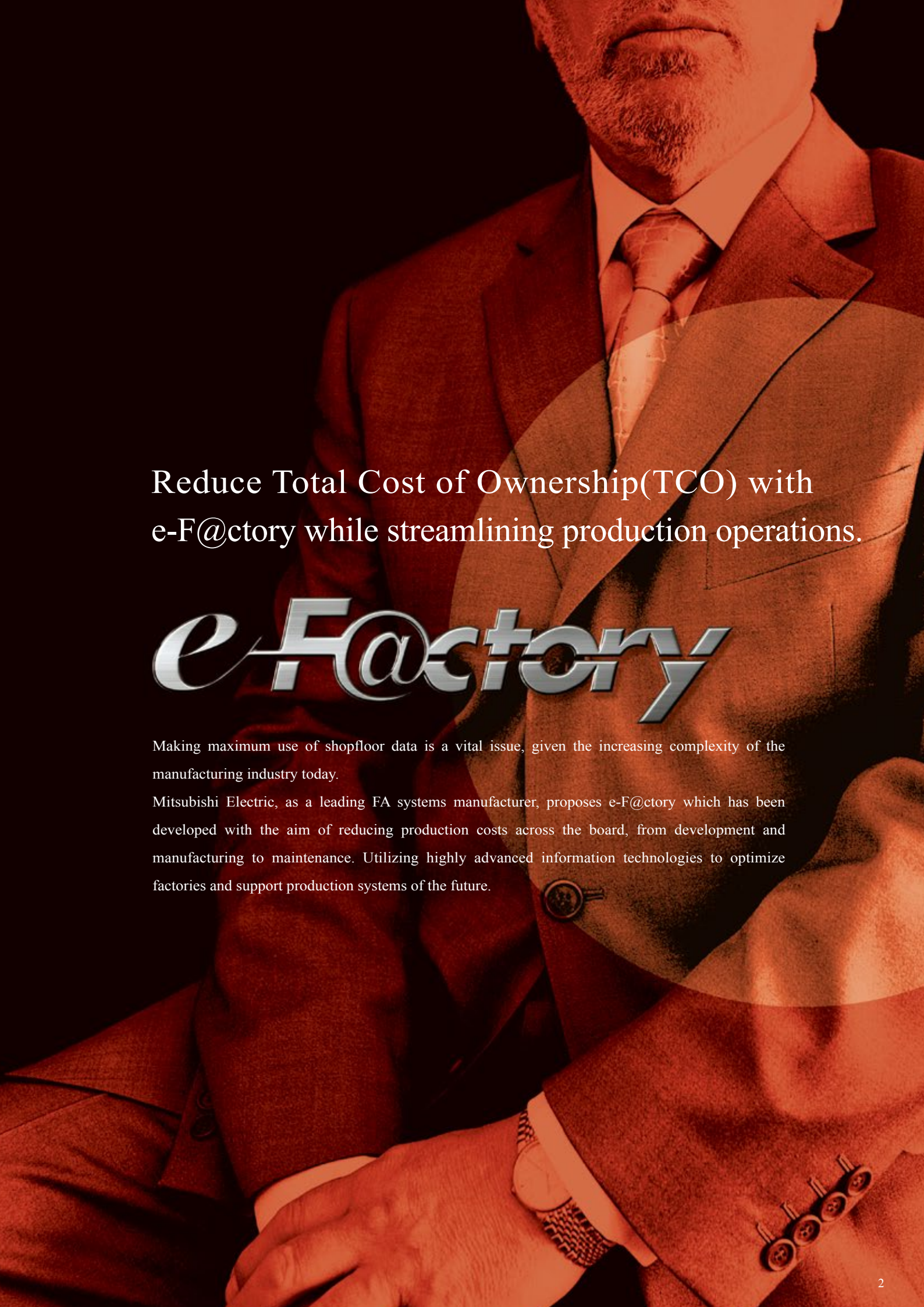
Energy and Electric Systems
A wide range of power and electrical products from generators to large-scale displays.

Electronic Devices
A wide portfolio of cutting-edge semiconductor devices for systems and products.

Home Appliance
Dependable consumer products like air conditioners and home entertainment systems.

Information and Communication Systems
Commercial and consumer-centric equipment, products and systems.

Industrial Automation Systems
Maximizing productivity and efficiency with cutting-edge automation technology.



Reduce Total Cost of Ownership(TCO) with e-F@ctory while streamlining production operations.

e-F@ctory

Making maximum use of shopfloor data is a vital issue, given the increasing complexity of the manufacturing industry today.

Mitsubishi Electric, as a leading FA systems manufacturer, proposes e-F@ctory which has been developed with the aim of reducing production costs across the board, from development and manufacturing to maintenance. Utilizing highly advanced information technologies to optimize factories and support production systems of the future.

Think of those issues and the trouble involved…

Does your factor have the ability to "visualize, analyze and improve" them?

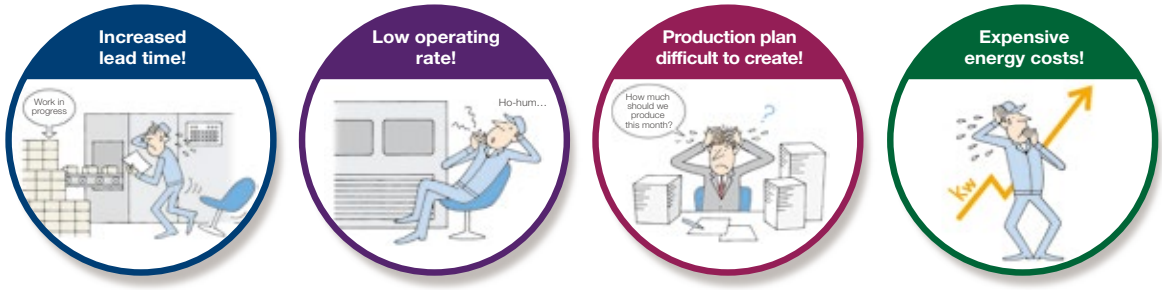
Does your factory face various issues and problems?

"Invisible problems" happen all the time on the shop floor. The keywords for resolving them in the manufacturing business are "visualize, analyze, and improve."

The first step in resolving a problem is to change from being "invisible" to "visible" by visualizing, analyzing and improving production information.

It becomes possible to "see (read)" factory information in real time, doing so onsite or from a remote location.

Before



After

e-F@ctory is the so
the manufac

Reduced lead-time

Improved operating rate

Cost re

ctory

lution to issues facing
turing industry

Energy saving

Quality improvement

duction

The steps toward creating an e-F@ctory effectively results in fa

An “e-F@ctory-based plant” incorporates a system that is capable of addressing various issues by collecting shop floor data such as production performance, operating performance and quality information from production equipment and devices “directly” and in “real time,” and directly interfacing with enterprise database’s.
In other words, the e-F@ctory platform substantially improves quality, work schedules, and productivity, by having significant vertical data integration from shop floor to enterprise.

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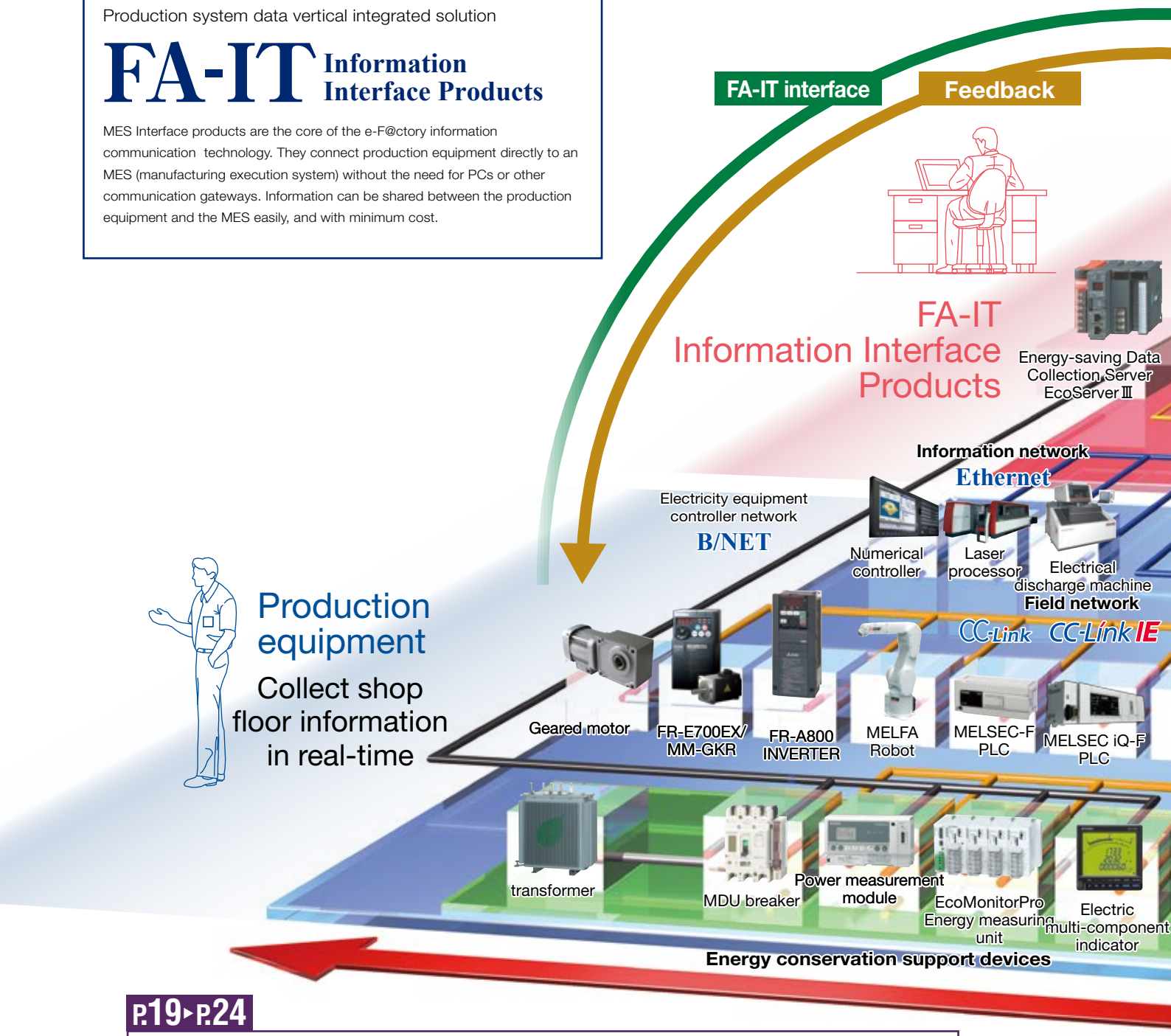
Production system data vertical integrated solution

FA-IT Information Interface Products

MES Interface products are the core of the e-F@ctory information communication technology. They connect production equipment directly to an MES (manufacturing execution system) without the need for PCs or other communication gateways. Information can be shared between the production equipment and the MES easily, and with minimum cost.



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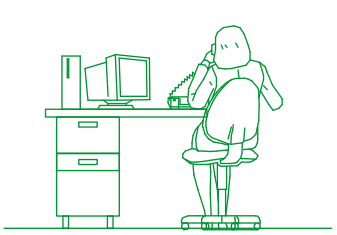
Shop floor optimizing solution

iQ Platform

Increased production data, short production cycles, sudden changes in production volume-if these issues are not addressed, the time it takes from the development of equipment components to commencing the production line will become longer, and it will be become difficult to maintain stable quality. iQ Platform addresses such issues from the TCO* perspective.

*TCO:Total Cost of Ownership

ctory-wide optimization.



e-F@ctory Alliance

IT System
Diagnosis/
Analysis

ERP
MES
Production planning, cost management, stock management, progress management, schedule management, quality control, etc.

Information network
Ethernet

MES Interface
GOT2000 (HMI)
MELQIC data collection analyzer
Numerical controller
High-speed Data Logger
C Controller

MES Interface products

Controller network
CC-Link IE

Energy measuring module
MELSEC iQ-R PLC
MELSEC-Q PLC
MELSEC-QS Safety PLC
MELSEC iQ-R Motion CPU
MELSEC-L PLC

Safety field network
Wireless network
Servo network
SSCNETIII/H
CC-Link Safety

CC-Link
CC-Link IE
Partner product
MR-J4-GF AC Servo
Safety remote I/O module
MR-J4-B AC Servo
INVERTER+ IPM motor
AnyWireASLINK mapping sensor

iQSS
Sensor Solution

Information link

iQ Platform

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Flexible response to the diverse needs
with abundant energy saving support devices

e&ecoF@ctory
Energy saving solution

Energy saving solution offers an aggressive energy conservation plan, which achieves not only the reduction of costs through energy saving but also close management for every production equipment or line and the reduction of production life cycle cost.

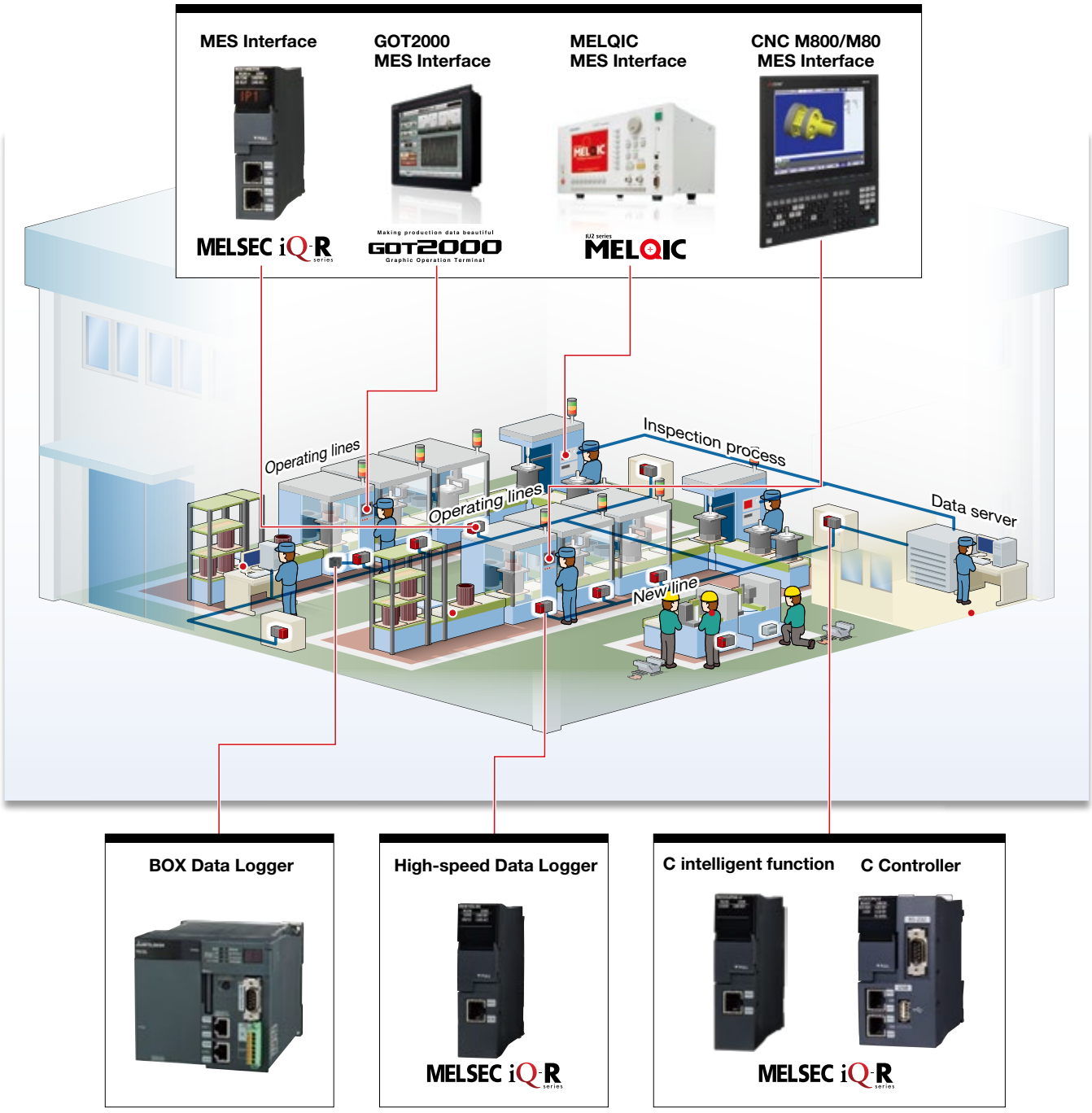
Mitsubishi Electric's advanced FA and IT data communication technologies will draw out the full potential of your plant.

FA-IT Information Interface Products

Flexible to changes, operating rate increase, lead-time reduction, quality improvement, cost reduction - the issues of the manufacturing industry need to be addressed by utilizing all available shop floor data.

FA-IT information interface products are innovative products that embody the e-F@ctory system. They connect production equipment directly to an MES (manufacturing execution system),and further on to a higher IT system.

FA-IT information interface products create a seamless flow of information between production equipment and information systems in response to diverse needs in manufacturing plants.



The MES Interface is the information link between production equipment and the manufacturing execution system (MES).

High-speed Data Logger

The High-speed Data Logger collects data from each measuring device directly without requiring dedicated logging equipment.

The Box Data Logger can be connected to a network while existing equipment is running, and collect data thereafter.

The C Language Controller can control, process information and higher-level communications using C/C++ programming.

From higher-level information systems to facilities management systems, optimize FA-IT information-sharing products factory-wide.

A broad lineup of MES Interface products provides direct connections between production equipment and an MES with minimum fuss and at minimum cost.

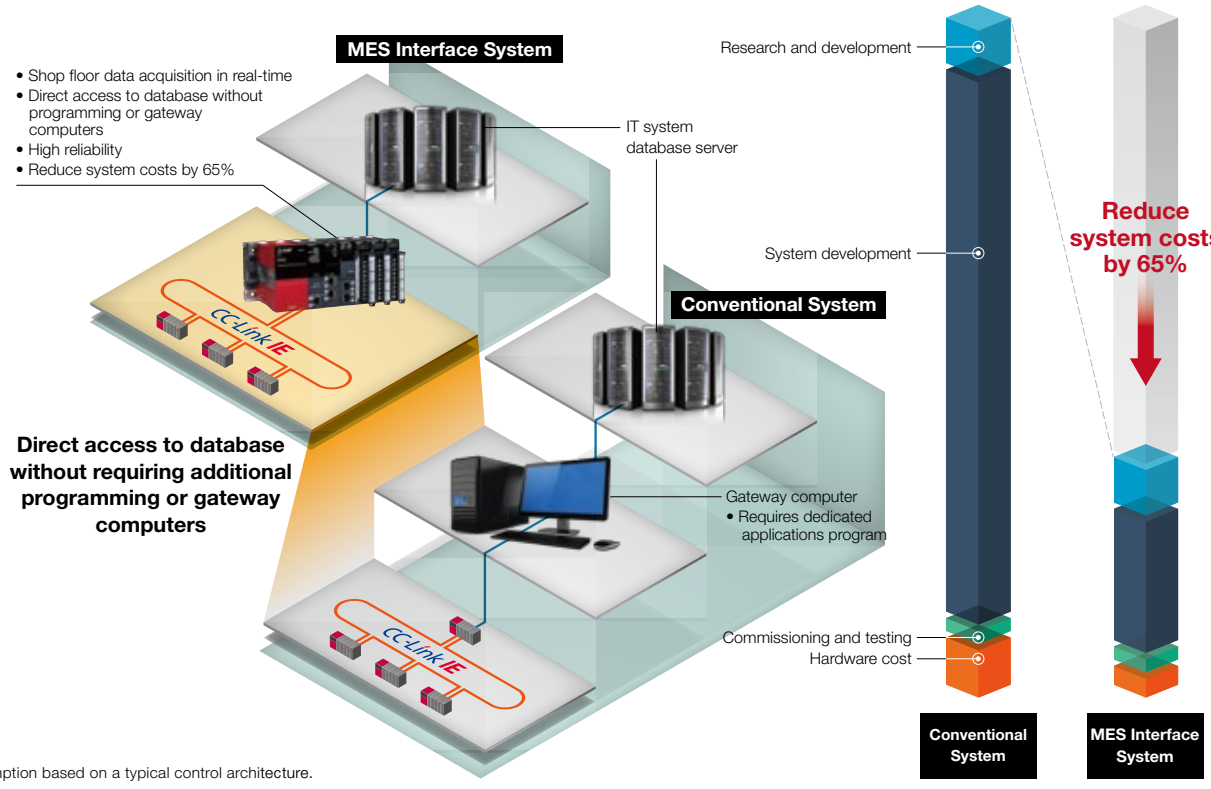
MES Interface products enable production equipment and the MES database to be connected directly without requiring a communications gateway (e.g., computer).
Information collected on the MELSEC PLC is processed by the PLC MES interface.
Information from existing equipment and the controllers of each company is processed by the GOT2000 MES Interface function.
Information acquired and analyzed by MELQIC is processed by the MELQIC MES Interface board.
Information sharing between production and inspection equipment and the MES is easy, realizing reduced cost.

Information collected from the shop floor sent directly to the database

The conditions regarding event data generation can be monitored on the MES interface side and when the conditions are established, work results and other data are sent to the IT system database.
The MES interface can also be used to retrieve data, such as work instructions, from the database.

System configuration costs reduced by 65%*1

MES Interface modules enable direct connectivity between IT database servers and programmable controllers on the shop floor, eliminating the need for gateway computers or specified programs. Being much more reliable than computers, the MES Interface saves on maintenance costs typical of computers.

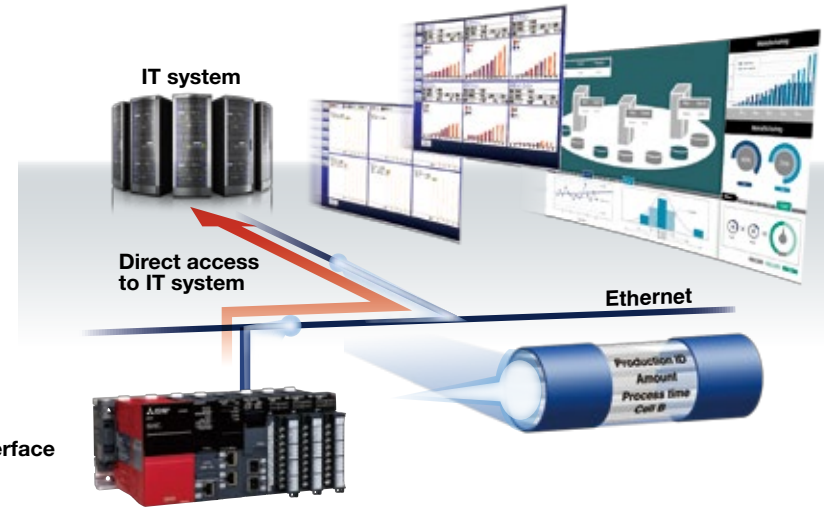


*1. Assumption based on a typical control architecture.

The various functions of FA-IT information interface products strongly support the informatization of production equipment.

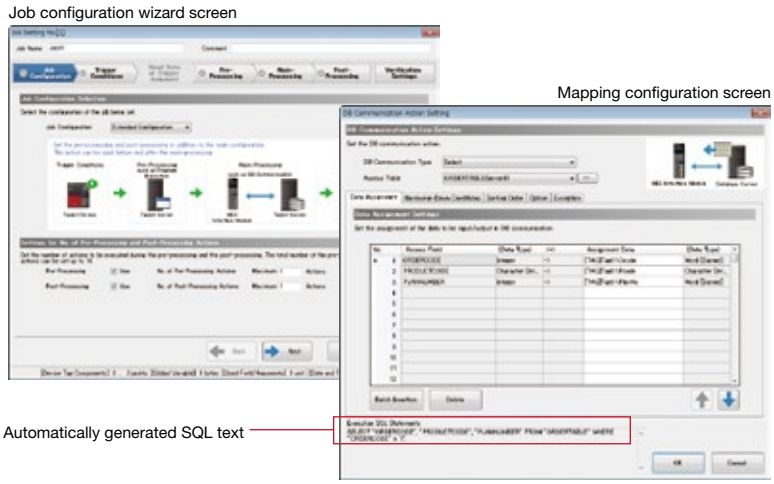
Supporting functions that ensure data reliability

- Information with timestamps is temporarily saved to a SD or CF card during communication faults or when no response is received from the server.
  The data is automatically resent when the problem is resolved, therefore securing data continuity.
- SNTP enables time synchronization between the information system and production equipment.
- Log acquisition is possible during communication faults.



Program-free easy configuration (Easy to Use)

With the special-purpose configuration tool, it is possible to configure only the necessary items in the correct order utilizing a simple wizard-style setup process. SQL text is automatically generated based on configurations, therefore eliminating the need to create a program for data communication.



The incorporation of MES Template Package allows assessment and examination of investment effect and performance using a test line, for easy application to the entire plant upon verification of effectiveness.

MES Template Package offers templates of all general functions of the MES system to provide easy production management, traceability, and preparation of Gantt charts.
It will also facilitate the future transition of data to a large-scale database system.

Excel® macros	Extracts data from the sample database and displays Excel® macros traceability information and Gantt charts
Sample database	Database tables and sample data for production management, traceability, and Gantt charts
MES Interface project	Delivers production management data to the PLC and sends collected performance data to the sample database

* The MES template package can be downloaded from the Mitsubishi Electric FA website: www.MitsubishiElectric.co.jp/fa

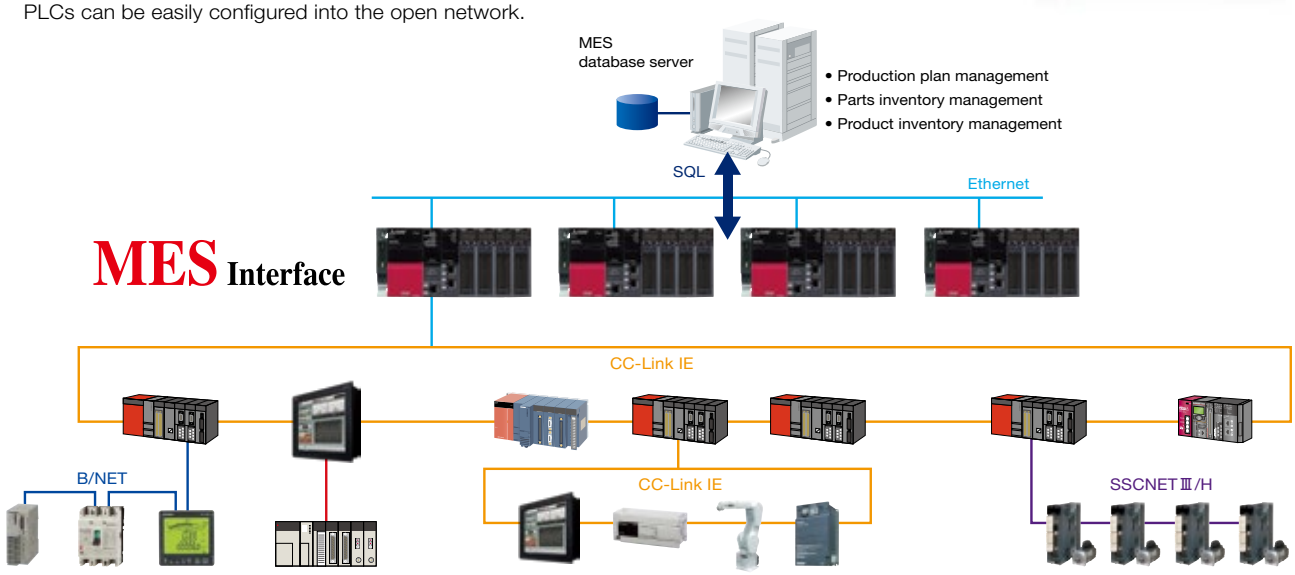
MELSEC iQ-R/MELSEC-Q PLC MES Interface

MELSEC iQ-R series

MELSEC Q series

PLCs are connected directly to the MES without the use of gateway PCs or communication programs.

- Comprehensive plant information, including production, equipment, quality, and energy data, are collected and managed via a seamless network.
- Even the most detailed equipment-level information can be collected via an extensive field network.
- Machine tools and equipment that utilize third-party PLCs can be easily configured into the open network.

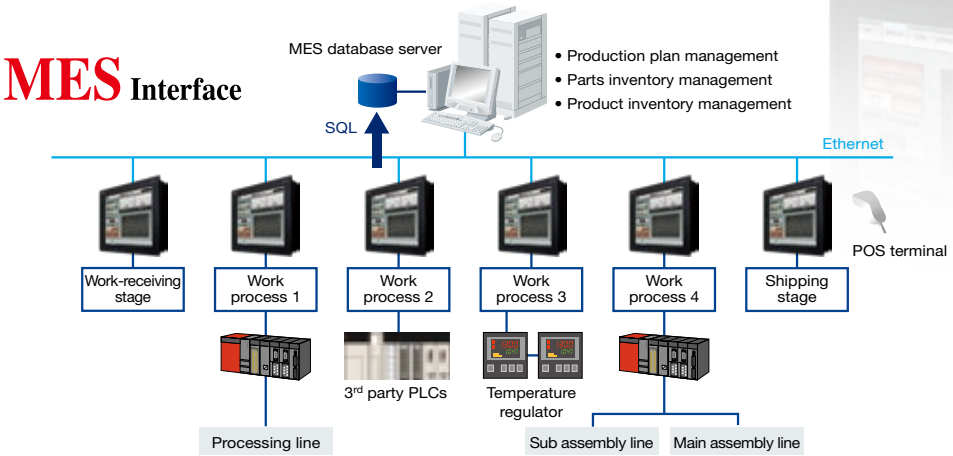


GOT2000 HMI MES Interface function

GOT2000 Graphic Operation Terminal

The GOT2000 HMI collects and sends data from connected FA products to the MES.

- Collects data from existing equipment and other equipment that utilize third-party PLCs.
- Supports operators' tasks by providing access to a barcode reader, document viewer, or other such tools.
- Equipped with substantial information management functions characteristic of a display unit (HMI).
  - Displays logging data (logging function + display of historical trend graph/historical trend list)
  - Management of alarm history, such as equipment alarms and production history
  - Management of worker operational history

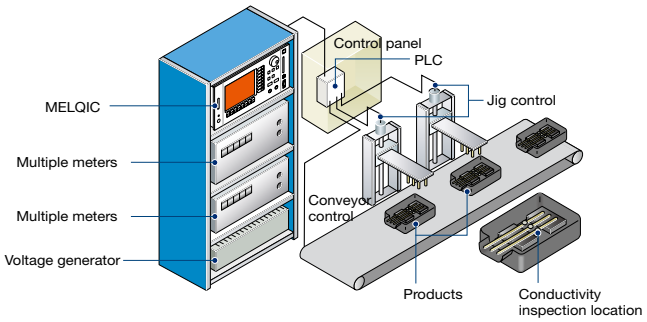


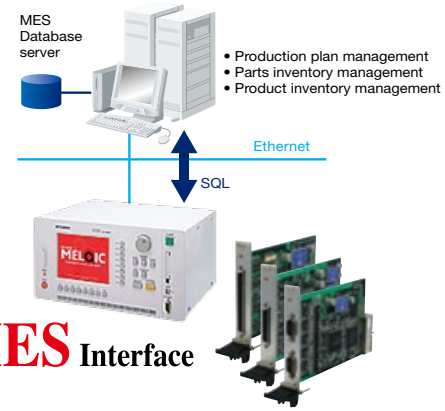
Data collection analyzer MELQIC MES Interface function

Collecting production and inspection information from the shop floor in real-time.

IU2 series
MELQIC

- Informatization of inspection data using highly reliable hardware
  By being HDD-free and equipped with a real-time OS, long-term stable use as an FA device is possible, and various communications such as MES Interface, CC-Link, CAN and GP-IB are supported
- The adoption of VISIO allows high functionality with easy programming
  Multi-channel sampling maximum 10MHz/data analysis FFT, digital filter, peak detection, rise/fall detection, etc.
  High-speed logging (maximum 1ms interval, maximum 90 channels)/ built-in computer card slot (maximum 16GB)

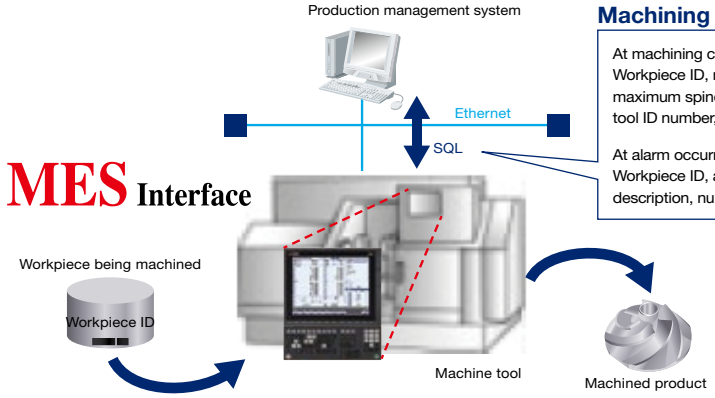




M800/M80 Series computerized numerical controller MES interface function

CNC sends machining information and operation status of machine tools to MES.

- Enhances traceability and supports visualization of the entire factory.
- When machining is complete or an alarm occurs, the information collected by the CNC is sent from the built-in MES interface to the database.
- Achieves visualization of operation status, which simplifies the creation of production plans and production management, as well as the visualization of machining results and alarm occurrence status so that a higher standard of quality control can be realized.



Machining information

At machining completion
Workpiece ID, machining start/finish time, maximum spindle load, power consumption, tool ID number, tool offset, etc.

At alarm occurrence
Workpiece ID, alarm occurrence time, alarm description, number of tool used, tool offset, etc.

MELSEC iQ-R/MELSEC-Q
High-speed Data Logger

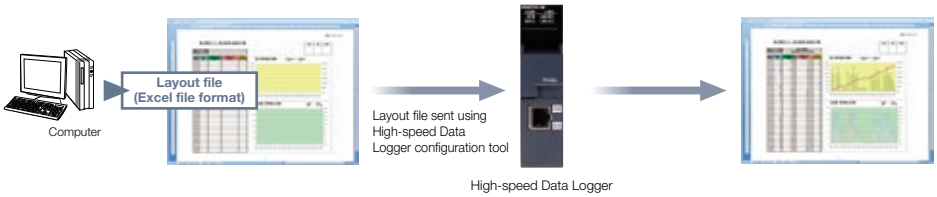
PLC data logging possible with simple configuration.

Various measurement data are directly collected by the data logger to provide high-speed, easy, and low-cost data logging solutions with greater precision than conventional modules. Because there is no need to install PCs or dedicated devices on the shop floor, using the data logger contributes to minimizing system costs and improving system reliability.

- An Assistant Wizard helps set up the appropriate logging method for the intended use, and the Viewer Utility generates trend graphs to facilitate data monitoring and analyses.
- Since no PC or protocol converter is needed to collect data, initial costs can be kept extremely low.
- Realize logging data management on the upper server by forwarding to an FTP server/Windows shared folder.

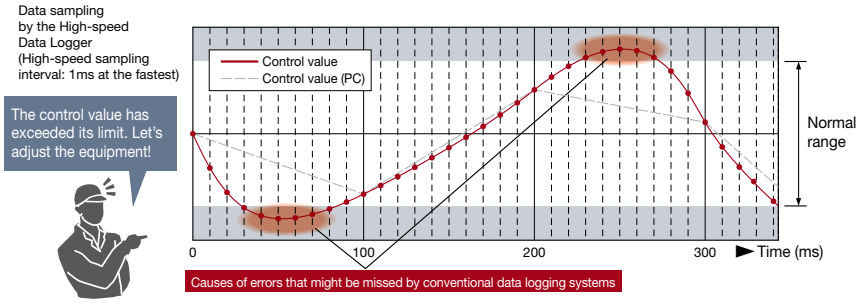
* Forwarding to a Windows shared folder is only possible when using the MELSEC iQ-R High-speed Data Logger

Automatic creation of graphical materials to suit the application, such as daily reports, ledgers and reports!



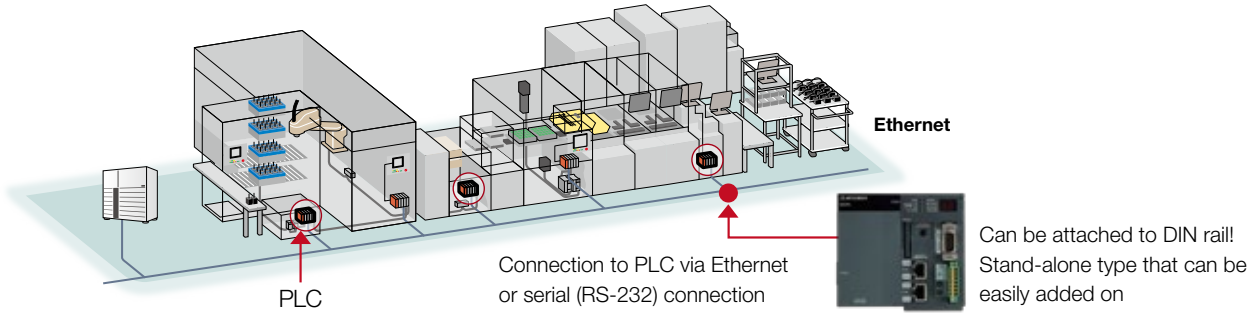
Data is recorded in synchronization with sequence scanning! (High-speed Data Logger)

The High-speed Data Sampling Function synchronizes the data logging task with sequence scanning, which is the smallest time unit of control, to ensure high-speed, high-precision data logging.
The sampled data can be used not only to analyze machine performance, but also to identify the cause of errors when they occur, because the data logger records even the smallest change in control values.



Connect to existing equipment system while its running and begin collecting equipment data immediately (Box Data Logger)

Module can be attached to the DIN rail and easily connected to equipment via Ethernet or RS-232 serial port afterwards.
Data logging for PLCs of other companies is also possible.



[High-speed Data Logger / BOX Data Logger: Shared functions]

- High-speed, high-accuracy data logging
- Assistance in the form of a wizard makes it easy to set the appropriate logging method for the purpose. In addition, display of trend graphs by the display utility provides a simple expression of monitoring data analysis results
- Because no computer or protocol converter is necessary for data collection, initial costs are significantly reduced
- The use of CF cards enables data logging over an extended period. In addition, sending saved log files to the server makes it possible to log data in excess of the capacity of the CF cards
- Setting Excel file templates for layout, graphs, formulas, etc. in advance makes it possible to save data as ledgers or reports
- GX Log Viewer is used as the display and analysis tool, enabling display and analysis of high volumes of collected data using easy-to-understand operations
- Device data essential for detailed checks, etc. can be read from a recipe file (CSV format) and written to the PLC CPU at the specified timing

MELSEC iQ-R/MELSEC-Q PLC C controller

Control, information processing and upper-level communication processing are possible with partner software products and a C/C++ language program.

• Utilization of partner software products

CIMSNIPER (Nippon Denno Co., Ltd.)

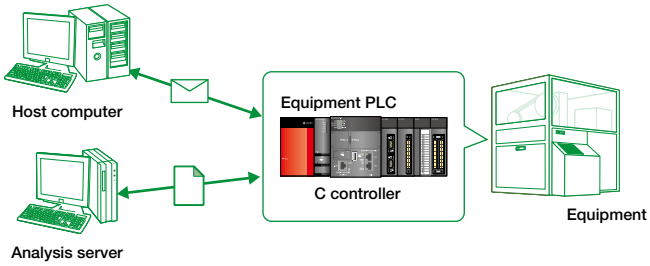
Realize low-cost data mining

CIMSNIPER enables direct collection of target data and possesses features and functions enabling upper-level data analysis to be performed with minimal man-hours.

Program-free collection possible

A product offering the information you want, when you want it, and in the format you want it in. Through configuration only, the monitoring of equipment information and host-to-host communication*, as well as automatic collection of data, are possible.

* Host-to-host communication-supporting protocols: SECS-I, HSMS, GEM, FTP
• Please consult with us regarding special protocols.



Various analysis tools supported

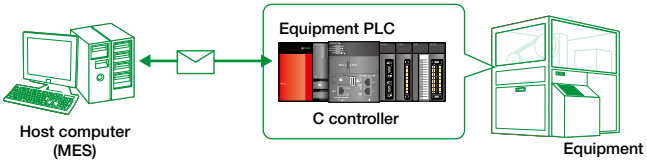
Various types of analysis tools required for data mining are supported.

* Analysis tools must be prepared separately.

CIMOPERATOR® (Nippon Denno Co., Ltd.)

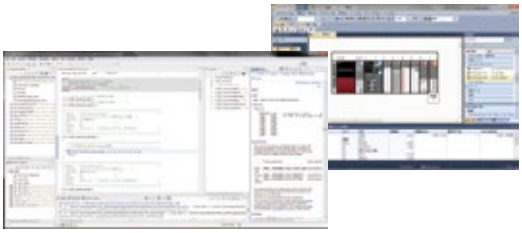
Various communications possible program-free

Simply by configuring a data device-trigger relay handshake, various communication functions can be added to the PLC. Various communication logs and PLC logs can also be output.
A large volume of equipment processing data can be reported without the use of a gateway computer and existing equipment can be brought online.



• Program development using C/C++ language

- Preinstall real-time OS (VxWorks)
- Software development can be performed in an integrated development environment (CW Workbench)
- Prepare a special-purpose tool to perform configuration/diagnosis on the various units



Series	Model	Features
iQ-R Series	R12CCPU-V Standard model	High-speed control utilizing newly developed high-speed system bus realizes significantly shorter tact time
	RD55UP06-V C intelligent function module NEW	Ability to link each CPU enables operation as an intelligent function module, making C and C++ program processing possible Original intelligent function module can be developed for communication/data processing and information processing
Q Series	Q12DCCPU-V Standard model	Installation of RTOS (VxWorks) enables high-speed I/O control Optimized by replacing microcomputer-control system
	Q24DHCCPU-V High-end model	Installation of high-speed CPU and RTOS (VxWorks) enables optimization by replacing personal computer-based control system
	Q24DHCCPU-VG Model with display function	VGA port added to high-end model and middleware installed to support GUI output
	Q24DHCCPU-LS Model supporting general-purpose OS	Supports general-purpose OS such as Linux and T-Kernel Makes effective use of software assets

■ MES Interface Functions

Functions	Description
DB record input/output function	Function to perform the reading/writing of database data for upper-level information system.
Device memory input/output function	Function to perform the reading/writing of device memory data for CPU module.
Trigger condition monitoring function	Function to monitor values such as time and device tag elements, and start a job when trigger conditions change from false to true (condition establishment).
Data calculation/processing function	Function to perform addition, subtraction, multiplication and division, remainder and character string operations.
Program execution function	Function to execute programs on the server from MES Interface.
Database buffering	Function for buffering transmission data to the database and resending after a normal state is recovered in the case of data interface trouble, such as lost network between MES Interface and database or when the database has crashed.

■ MES Interface Specifications

Functions		RD81MES96	QJ71MES96
Peripheral device connection port	Ethernet	2CH(1000BASE-T/100BASE-TX/10BASE-T)	1CH(100BASE-TX/10BASE-T)
Database interface	Database type*1	Oracle database, Microsoft SQL Server, Microsoft Access	Oracle database, Microsoft SQL Server, Microsoft Access, etc.
Job	Configurable number	Max. 64 points/project	
	Trigger buffering count	192	128
	Trigger condition (combinable number)	2 conditions/job	
Action	Configurable number	Max. 1,920 actions/project Max. 30 actions/job (20 main processing actions + 10 pre/post-processing actions)	Max. 640 actions/project Max. 10 actions/job
	Type	SELECT, INSERT, UPDATE, DELETE, Multi-SELECT, STORED PROCEDURE	
	Number of DB communication action fields	Max. 65,536 fields/project	Max. 8,192 fields/project
	Number of calculations possible	Max. 20/calculation action	
Program execution	Configurable number	Max. 10/job (maximum of 10 including pre/post-processing)	Max. 2/job (1 each before executing the first action and after executing the last action)
Device tag	Access destination device	iQ-R Series (own station, other stations), Q Series (other stations), L Series (other stations)	iQ-R Series (other stations), Q Series (own station, other stations), L Series (other stations), A Series (other stations)
	Access interval	Shortest sequence scan (up to 8K points)	Shortest 100ms (up to 96 points)
	Number of tags	64 tags/project	
	Number of elements	1,024 points/tag 65,536 points/project	256 points/tag 4,096 points/project
DB buffer	Buffer size during communication fault*1	2,048MB	512MB

*1. Refer to the manual for details.

MELSEC iQ-R series MES Interface module

Product name	Model	Description
MES Interface module NEW	RD81MES96	MES Interface Function execution module
SD memory card	NZ1MEM-2GBSD	2GB
	NZ1MEM-4GBSD	4GB
	NZ1MEM-8GBSD	8GB
	NZ1MEM-16GBSD	16GB

MELSEC iQ-R series MES Interface Support Tool

Product name	Model	Description
MES Interface Support Tool NEW (MX MESInterface-R)	SW1DND-RMESIF-J	MELSEC iQ-R series MES Interface Function Configuration Tool, etc.

MELSEC-Q series MES Interface module

Product name	Model	Description
MES Interface module	QJ71MES96	MES Interface Function execution module
CompactFlash card	GT05-MEM-128MC	128MB
	GT05-MEM-256MC	256MB
	QD81MEM-512MBC	512MB
	QD81MEM-1GBC	1GB

MELSEC-Q series MES Interface Support Tool

Product name	Model	Description
MES Interface Support Tool (MX MESInterface)	SW1DND-MESIF-J	MELSEC-Q series MES Interface Function Configuration Tool, etc.

MES Interface M800/M80 Series CNC

Product name	Model	Description
MITSUBISHI CNC M800/M80	FCA850U/ FCA830U/ FCA850H-□□/ FCA830H-□□/ FCA80H-□□/ FCA80P-□□	M800/M80 Series control unit

GOT2000 MES Interface functions

Product name	Model	Description
GOT2000	GT27□□-□□□□ GT25□□-□□□□	GOT2000 series module
MES Interface function license	GT25-MESIFKEY-□	MES Interface function license
SD memory card	NZ1MEM-2GBSD NZ1MEM-4GBSD NZ1MEM-8GBSD NZ1MEM-16GBSD	Supports SD memory card

GOT2000 MES Interface configuration tool

Product name	Model	Description
Screen creation software GT Works3	SW1DND-GTWK3-J	Sets MES Interface actions, Tool for configuring DB connection service, etc.

MELQIC MES Interface functions

Product name	Model	Description
Data collection analyzer	IU2-4M10HA(-E) IU2-5M10(-E) IU2-5M10L IU2-3M10 IU2-3M10L	IU2 series MELQIC module
MES Interface board	IU2-1EMES	MES Interface function executing board
CompactFlash card	–	Required. 128 Mbytes or more

MELQIC MES Interface Support Tool

Product name	Model	Description
MES Interface Support Tool (IU MES Interface)	SW1DNC-IUMIF	MES Interface Function Configuration Tool, etc.

■ High-speed Data Logger / BOX Data Logger: Functions

Item		Description
High-speed data collection function		Function for collecting by synchronizing with PLC scanning (only for High-speed Data Logger)
Logging function		Function for collection and recording of data and event data.
	Data logging function	Function for recording data continuously or when triggered.
	Event logging function	Function for recording sequence of occurrence of recorded events as a time history.
FTP server function		Function for reading and deletion of saved High-speed Data Logger module files from PC FTP client software.
File forwarding function		Function for forwarding saved files to the computer FTP server or Windows shared folder (Windows shared folder only possible when used with MELSEC iQ-R High-speed Data Logger)
e-mail sending function		Function for sending notification of events and saved files in e-mail.
Excel file saving function		Function for saving of collected data in Excel file format. (Report function)
CSV file saving function		Function for saving of collected data in CSV file format.
Time synchronization function		Function for synchronization of time data with data collection times. Function for synchronization with SNTP server in the network or PLC CPU (internal clock in the case of GOT and MELQIC).

■ High-speed Data Logger / BOX Data Logger: Specifications

Item			MELSEC iQ-R High-speed Data Logger	MELSEC-Q High-speed Data Logger	BOX Data Logger
Device type			Base unit-mounted type		Standalone type
Data collection	Data collection interval	High-speed data collection	Synchronized with sequence scanning time 0.5 - 0.9ms, 1 - 32,767ms (during trigger logging) 2 - 32,767ms (during continuous logging)	Synchronized with sequence scanning time 1-32,767 milliseconds (Triggered logging) 3-32,767 milliseconds (During continuous logging)	–
		General-purpose data collection	0.1-0.9 seconds, 1-32,767 seconds, time interval specification (Hour, minute and second specification)		
	Number of data collected	High-speed data collection	Total number of data: Maximum 32,768 (Per setting: 1024) Total number of devices: Maximum 32,768 (Per setting 4096)	Total number of data: Maximum 8,192 (Per setting: 256) Total number of devices: Maximum 8,192 (Per setting 256)	–
		General-purpose data collection	Total number of data: Maximum 65,536 (Per setting: 1,024); Total number of devices: Maximum of 262,144 (Per setting: 4,096)	Total number of data: Maximum 16,384 (Per setting: 256); Total number of devices: Maximum of 262,144 (Per setting: 4,096)	
	Format for data output (CSV files)		Format for bits and decimals: Number of decimal places 0-14; Format for exponents: Number of decimal places 0-14, hexadecimal format, character strings, numerical strings The following designations can be made for trigger logging (output only one line after trigger) ·Time/cumulative time Decimal format: 0 - 4 decimals after the decimal point ·Count/cumulative count Decimal format: 0 decimals after the decimal point	Format for bits and decimals: Number of decimal places 0-14; Format for exponents: Number of decimal places 0-14, hexadecimal format, character strings, numerical strings	
	Scaling		Four arithmetic operations: Computations combining (×,÷) and (+,−)		
	Targets for data collection		MELSEC iQ-R/Q/L Series PLCs	MELSEC-Q/L Series PLCs	MELSEC-Q/L/A/F Series PLC, Omron/Siemens/Rockwell PLCs
	Data logging	Number of settings	Maximum of 64		
		Logging types	Continuous logging, triggered logging		
		File format	CSV file (File extension: CSV), ·Unicode text file (extension: TXT) Binary file (File extension: BIN)	CSV file (File extension: CSV), Binary file (File extension: BIN)	
Event logging	Number of settings		Maximum of 64		
	Number of events		Maximum of 256 for each event logging setting	Maximum of 64 for each event logging setting	
	File format		CSV file (File extension: CSV); ·Unicode text file (extension: TXT) Binary file (File extension: BIN)	CSV file (File extension: CSV); Binary file (File extension: BIN)	
	Event conditions		Data conditions: Bit ON/OFF, data ⇔ Comparison of constants, data ⇔ Data comparison, data modification; Frequency of establishment of conditions: Three conditions; Sequence for establishment of conditions (Sequence and time conditions): Up to four conditions		
Report	Number of settings		Maximum of 64		
	File format		Excel format (File extension :XLS)		
	Output data type		Data in data logging files, time of generation, current value data		
	Number of output data		64 layouts, total of 65,535 cells for each report setting		
e-mail sending function	Use		Notification of occurrence of event, sending of saved files		
	Attached files		Mail for sending of saved files, without event notification mail: Saved files (CSV, Binary, Excel) to a maximum of 512 KB		
	Delivery addresses		Maximum of 16 groups		
	Mail client operation confirmation software		Microsoft Outlook 2013	Mixrosoft Outlook Express 6.0, Microsoft Windows Mail 6.0	
FTP server	Use		Reading and deletion of saved files, writing, reading and deletion of recipe files		
	FTP client operation confirmation software		Microsoft Internet Explorer 8.0/9.0/10.0/11.0		Windows Internet Explorer 7.0/8.0/9.0/10.0
	Number of sessions		10		
FTP client	Use		Transfer of stored files		
	FTP server operation confirmation software		Microsoft Internet Information Service		
Windows shared folder	Operation confirmation operation system		Microsoft Windows 7	Starter Home Premium Professional Ultimate Enterprise	–
			Microsoft Windows 8 Microsoft Windows 8.1	(Unbranded) Pro Enterprise	
Recipe	Number of data		Maximum 256 data		
	Number of records		Maximum 256 records		
	Recipe files		CSV files (File extension: CSV); Maximum of 256 files		
	Modes of execution		Dedicated instructions (Rudder program), setting tool		
Compatible memory cards			SD cards (Maximum of 16GB)	CF cards (Maximum of 8GB)	
External dimensions			27.8(W)x106(H)x110(D)mm	98(H)×27.4(W)×90(D)mm	98(H)×110.8(W)×145.5(D)mm

MELSEC iQ-R series High-speed Data Logger module

Product name	Model name	Description
High-speed Data Logger module NEW	RD81DL96	High-speed Data Logger module *Requires an SD card
SD card	NZ1MEM-2GBSD	2GB
	NZ1MEM-4GBSD	4GB
	NZ1MEM-8GBSD	8GB
	NZ1MEM-16GBSD	16GB

MELSEC iQ-R series High-speed Data Logger module Configuration Tool

Product name	Model name	Description
Tool for MELSEC iQ-R High-speed Data Logger Tool for module NEW	SW1DNN-RDLUTL-J	High-speed Data Logger module logging setting tool

MELSEC-Q series High-speed Data Logger module

Product name	Model name	Description
High-speed Data Logger module	QD81DL96	High-speed Data Logger module *Requires compact flash card.
Compact flash card	QD81MEM-512MBC	512MB
	QD81MEM-1GBC	1GB
	QD81MEM-2GBC	2GB
	QD81MEM-4GBC	4GB
	QD81MEM-8GBC	8GB

MELSEC-Q series High-speed Data Logger module Configuration Tool

Product name	Model name	Description
High-speed Data Logger module Tool for module	SW1DNN-DLUTL-J	MELSEC-Q High-speed Data Logger module logging setting tool

BOX Data Logger

Product name	Model name	Description
BOX Data Logger	NZ2DL	BOX Data Logger *Requires compact flash card.
Compact flash card	QD81MEM-512MBC	512MB
	QD81MEM-1GBC	1GB
	QD81MEM-2GBC	2GB
	QD81MEM-4GBC	4GB
	QD81MEM-8GBC	8GB

BOX Data Logger Configuration Tool

Product name	Model name	Description
BOX Data Logger setting tool	SW1DNN-NLUTL-J	BOX Data Logger logging setting tool

BOX Data Logger Setting Tool

Product name	Model name	Description
GX LogViewer	SW1DNN-VIEWER-J	Collected data display and analysis tool

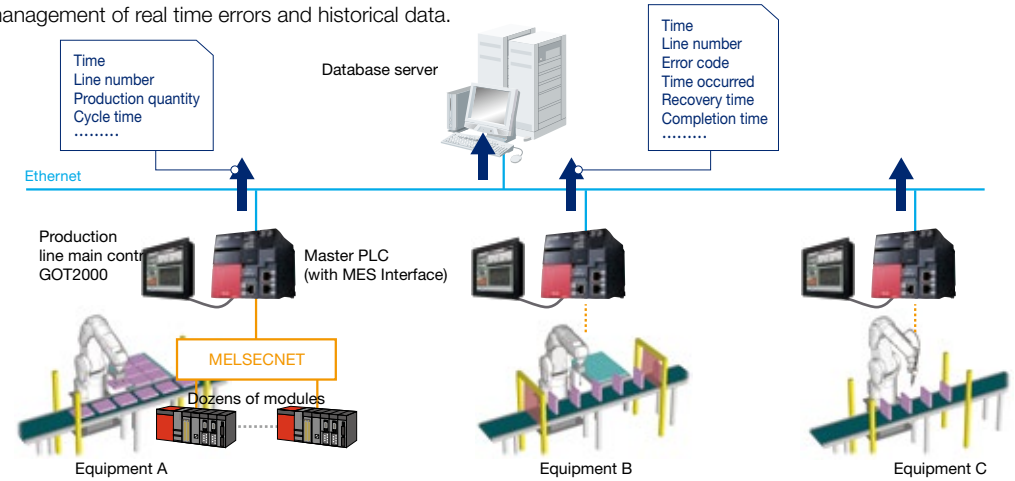
Application example Production management system

Manages operational performance data(production volume, cycle time, etc.).

This system provides a means of efficiently managing production process status(production quantity, cycle time) and checking the error history of different aspects of the line. Device data is easily collected from various controllers via the controller network and communicated directly to a database server via MES Interface.

[Installation effects]

- Efficiently manage production performances.
- Effectively realize quick recovery and intelligent preventative maintenance measures by proper management of real time errors and historical data.



(Example: Printer cartridge manufacturing line)

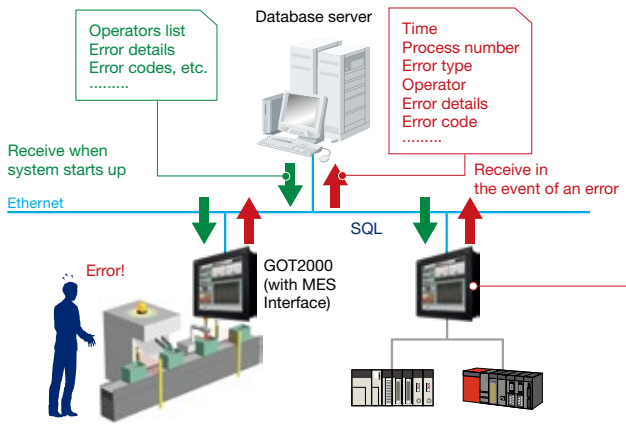
Application example Alarm information management system

Collects error information and in case of an error, information can be input/sent from HMI.

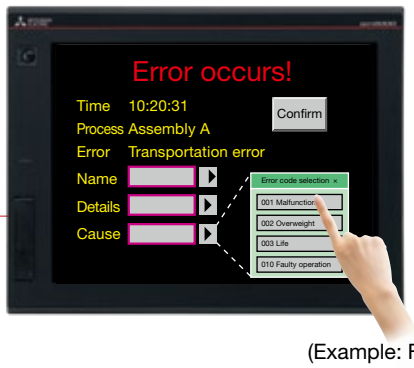
By having an alarm management system incorporated into the production line,various detailed information such as process, error description, cause, etc., can be efficiently collected and managed.This system read a recipe information such as operator, error description, etc. when it starts up and detailed information in the event of an error can be input and sent from HMI.

[Installation effects]

- Automated alarm management provides accurate and fast analysis of errors.
- Equipment maintenance procedures are improved substantially by managing detailed information within the server.



- Input screen is automatically displayed once an error occurs.
- Detailed error information is multiple-choice entry (achieve uniformity in the entry)
- Specific information are retrieved from the database and displayed on screen.



(Example: Food processing line)

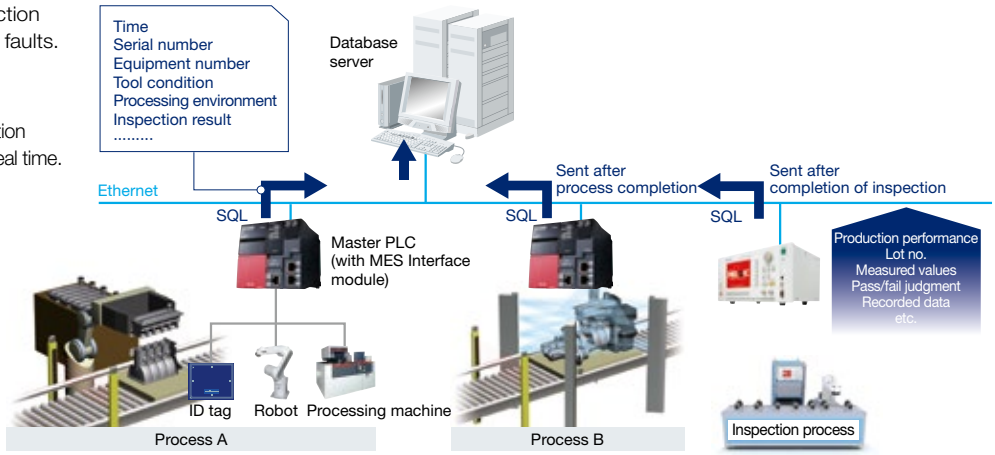
Application example Traceability system

Ensuring accumulative collection of production process data such as process number, operation history, and quality directly from the shop floor.

Critical data such as equipment number, operation history, and quality data are collected from each individual process or machining point and fed directly to the database server. The serial number of each machining process (engine), processing history, and inspection history are sent to the database after completion.

[Installation effects]

- Traceability data can be used to respond promptly to production down situations and quality faults.
- Trends in operation status and quality information are closely monitored, highlighting production quality variances effectively in real time.



(Example: Automotive engine machining line)

Application example Ingredient ratio management system

Allows management of ingredient ratio data by PC, to ensure smooth changes in ingredient ratios per product.

The ingredient ratio data for each product is managed as a recipe file by a personal computer.
Using the FTP server function, the recipe files are stored on the SD card of the High-speed Data Logger Module.
When changing products on the production line, a dedicated command retrieves the relevant recipe file needed for production.

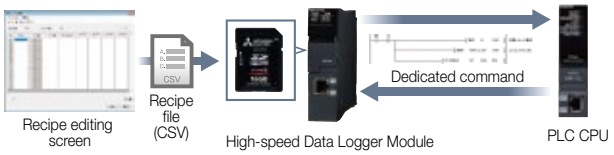
[Installation effects]

- Shortens the time needed to change products.
- Prevents human errors when setting parameters for product changes.

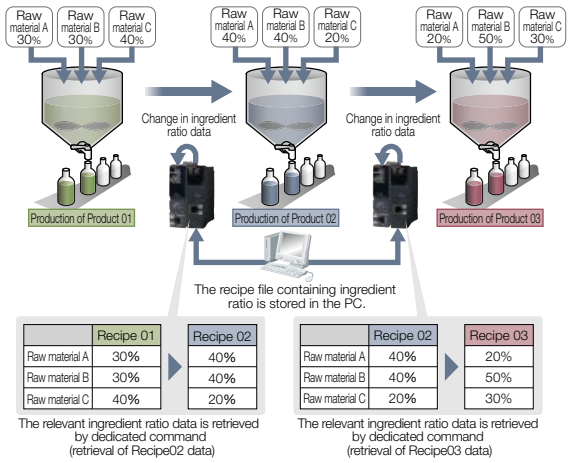
❶ Create a recipe file.
Recipe files can be created easily by using the High-Speed Data Logger module setting tool.

❷ Store the recipe file using FTP or other tool.
Store the recipe file in the SD card of the High-Speed Data Logger.

❸ Writing the device value
The device value is read from the recipe file in the SD card and sent to the PLC CPU.



❹ Rewriting the recipe file
The device value from the PLC CPU is written to the recipe file in the SD card.



	Recipe 01	Recipe 02
Raw material A	30%	40%
Raw material B	30%	40%
Raw material C	40%	20%

The relevant ingredient ratio data is retrieved by dedicated command (retrieval of Recipe02 data)

	Recipe 02	Recipe 03
Raw material A	40%	20%
Raw material B	40%	50%
Raw material C	20%	30%

The relevant ingredient ratio data is retrieved by dedicated command (retrieval of Recipe03 data)

Reduce Total Cost of Ownership (TCO) with iQ Platform

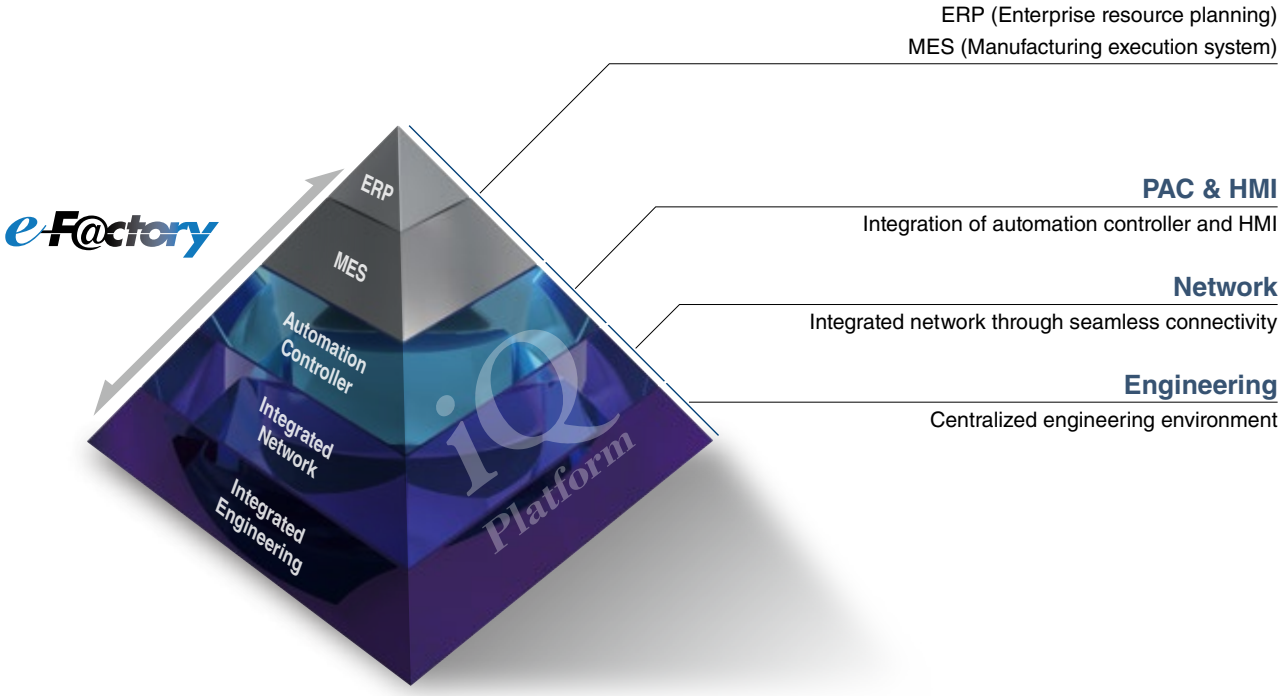
Mitsubishi Electric not only offers vertical integration with its MES Interfaces, but also offers horizontal hardware integration of all its automation products on the shop floor.

This is achieved and designed around the iQ Platform, which is a consolidated automation platform bringing all aspects of automation onto one main programmable automation controller.

The design highlights the integration of controllers, CNCs, Robots, HMIs, engineering environment, and networking, hence resulting in reduced TCO.

iQ Platform for maximum return on investment

Minimize TCO, Seamless integration, Maximize productivity, Transparent communications: these are common items that highlight the benefits of the iQ Platform and e-F@ctory. The iQ Platform minimizes TCO at all phases of the automation life cycle by improving development times, enhancing productivity, reducing maintenance costs, and making information more easily accessible across the plant. Together with e-F@ctory, offering various best-in-class solutions through its e-F@ctory alliance program, the capabilities of the manufacturing enterprise is enhanced even further realizing the next level for future intelligent manufacturing plants.



Further reduce TCO while securing your manufacturing assets

Automation Controller

Improve productivity and product quality

1. High-speed system bus realizing improved system performance
2. On-screen multi-touch control enabling smooth GOT (HMI) operations

Integrated Network

Best-in-class integrated network optimizing production capabilities

1. CC-Link IE supporting 1 Gbps high-speed communication
2. Seamless connectivity within all levels of manufacturing with SLMP

Centralized Engineering

Integrated engineering environment with system level features

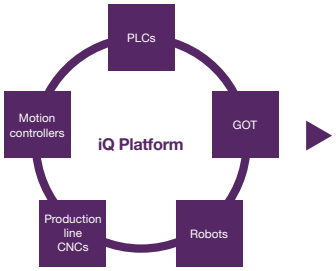
1. Automatic generation of system configuration
2. Share parameters across multiple engineering software via MELSOFT Navigator
3. Changes to system labels are reflected between PAC and HMI

iQ Platform controller and HMI achieve multiple CPU high-speed

The effective coordination of high-speed communication between multiple CPUs provides even higher speed control.

The iQ platform consists of a ultra high speed multi CPU main base unit, realizing high speed communication across the backplane between high-speed and high-capacity PLC CPUs, and high-speed and high-precision motion controllers. Compatibility of sequence control and drive control has improved drastically, and complicated machine control can be performed high-speed and easily.

By adding the GOT1000 range of high function HMIs, the iQ platform provides a true integrated automation platform from all aspects of the application. Production line CNCs and robots are also supported.



Realizing the factory of the future with high end controllers.

Development cost reduction	Production cost reduction	Maintenance cost reduction
■Reduction in equipment design time ■Reduction in commissioning time	■Shorter cycle and operation times ■Integration with higher information systems	■Utilization of MELSEC-Q series ■Reduced down time

Cutting edge technology with flexibility in application needs.

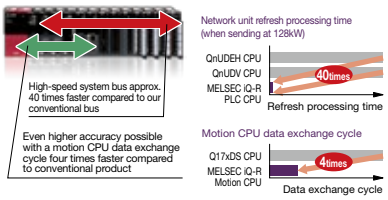
iQ Platform PLC

Achieve ultra high speeds of nano order and large data hardling functionality

■ Reduced operation times with higher processing performance

Basic command processing time (LD command) of 9.5ns is realized.

■ Cycle time reduced significantly using newly developed high-speed system bus



■ Easy handling of large-volume data

Possible to process large, complex programs.

◎ Program size

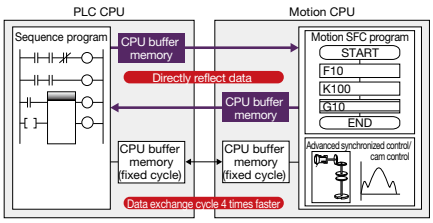
R04CPU	R08CPU	R16CPU	R32CPU	R120CPU
40K Step	80K Step	160K Step	320K Step	1200K Step

iQ Platform motion controller

Multi-CPU configuration enables high-speed motion control

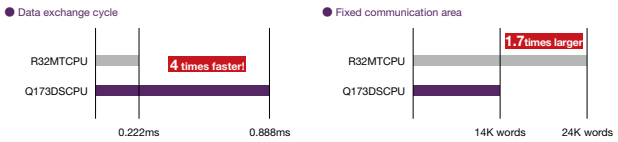
■ CPU buffer memory with 2M words (motion CPU) as standard equipment.

Convenient for forwarding large volumes of data between CPUs and immediately reflecting data updates.



■ In regards to the CPU buffer memory (fixed cycle communication area), 24K words (4 CPU total) is forwarded between CPUs every 0.222ms

Also effective for transmitting/receiving highly synchronized data between CPUs.



communication.

iQ Platform production line CNCs

Production line CNCs well suited for the automotive industry.

■ Multiple CPU high speed communication

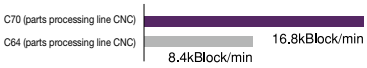
Cycle/operation time is reduced by multiple CPU high speed data exchange.
Existing modules can also be utilized.

High-speed data communication between PLC CPUs and CNC CPUs

■ High-performance CNC CPU

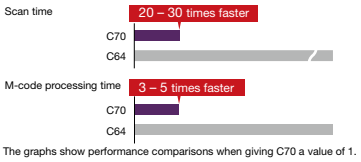
CNC CPU performance is also increased by double. High speed communications from the NC control processing to sequence control and host communications.

2 times greater block processing capacity!



■ Cycle time is greatly reduced

Scan time and M-code processing time substantially reduced resulting in shorter operation times on the shop floor.



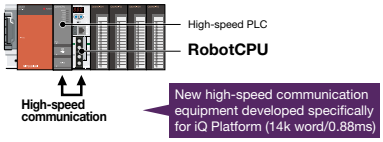
The graphs show performance comparisons when giving C70 a value of 1.

iQ Platform robot controller

Robots and PLCs are directly connected by iQ Automation.

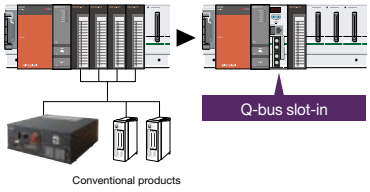
■ Control performance is greatly enhanced

I/O processing time is greatly reduced by high speed communication between PLC and robot.



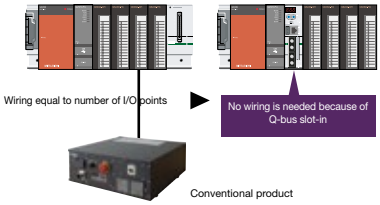
■ System cost is also reduced

Peripheral devices can be reduced by the expansion of I/O points with 1024 words between PLC and robot.



■ Reduced wiring connections

Less wiring is realized by the direct connection with PLC. Construction time and costs are substantially reduced.

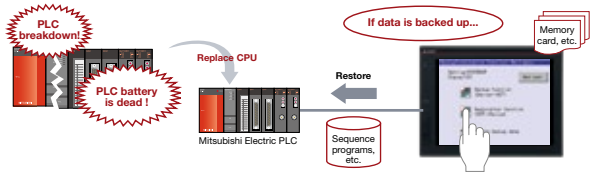


iQ Platform HMI

Streamline shop floors applying the renowned compatibility of iQ Platform-compliant products

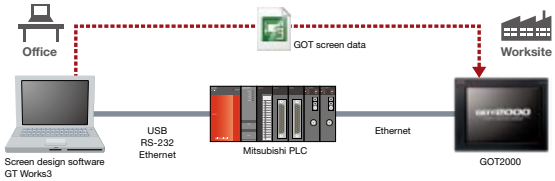
■ Reliable back-up/restore function in case something goes wrong

Various data, such as that for PLC CPU sequence programs and parameters, is backed up on the SD memory card of the GOT.



■ FA transparent function for easy repair onsite

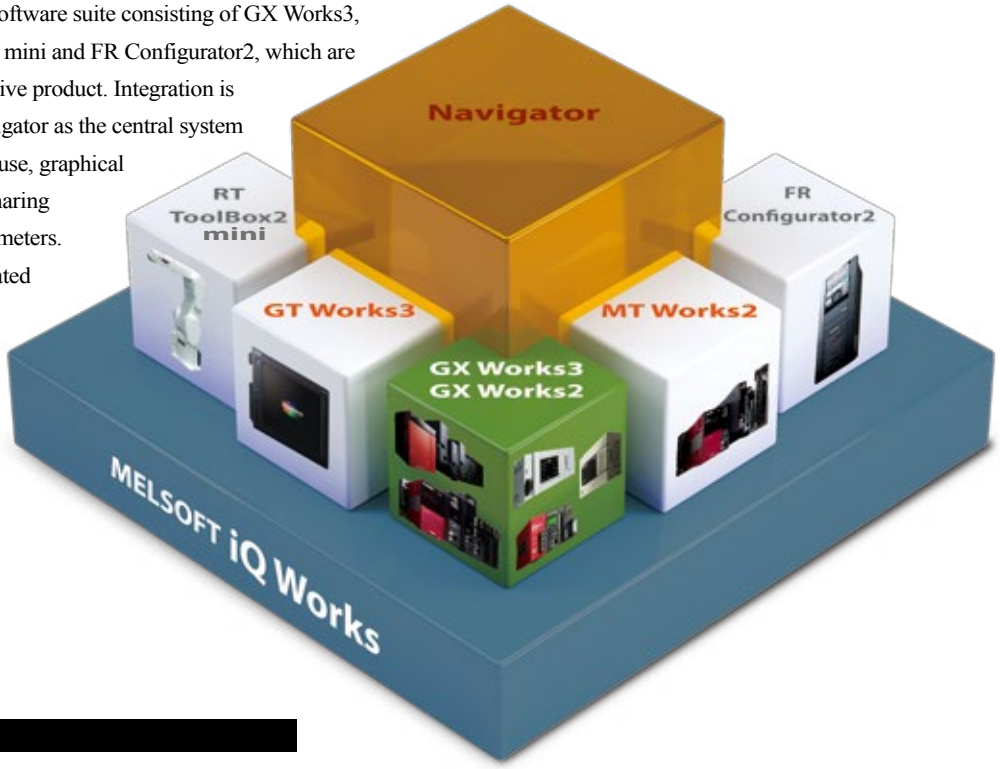
It is possible to connect a computer to the GOT, and via the GOT, prepare FA equipment programming, and start or adjust work.



Programmable controller engineering software

MELSOFT iQ Works

MELSOFT iQ Works is an integrated software suite consisting of GX Works3, MT Works2, GT Works3,RT ToolBox2 mini and FR Configurator2, which are programming software for each respective product. Integration is further enhanced with MELSOFT Navigator as the central system configuration incorporating an easy-to-use, graphical user interface with additional project-sharing features such as system labels and parameters. The advantages of this powerful integrated software suite are that system design is made much easier with a substantial reduction in repetitious tasks, cutting down on errors while helping to reduce the overall TCO.



System management software

MELSOFT Navigator

System level graphic-based configuration tool that simplifies the system design by providing a visual representation of the system. System management features such as system-wide parameterization, labels and block reading of project data are also included.

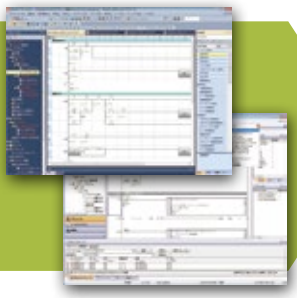
Programmable controller engineering software

MELSOFT GX Works3

Latest generation of software available for the MELSEC iQ-R and iQ-F Series control systems. Includes a graphic-based system configuration, integrated motion control setup, multiple language support, in addition to extensive diagnosis and troubleshooting functions.

MELSOFT GX Works2

Incorporating backward compatibility of programs created with GX Developer, GX Works2 further improves its functionality resulting in reduced engineering costs.



HMI/GOT screen design software

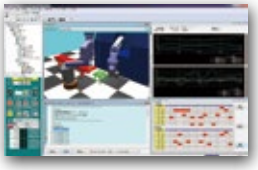
MELSOFT GT Works3

The GOT (Graphic Operation Terminal) screen creation software is designed with three main features; Simplicity, Graphics Design, and Easy-Usability, further helping to create graphic screens in fewer steps.

Robot engineering software

MELSOFT RT ToolBox2 mini

Supports various steps from programming, to commissioning, evaluation, and maintenance. In addition, improved preventative maintenance is realized through the use of an integrated 3D robot simulator.



Motion controller engineering software

MELSOFT MT Works2

The motion control design and maintenance software includes intuitive graphic based programming together with a digital oscilloscope simulator.

Inverter setup software

MELSOFT FR Configurator2

Simplifies the setup and maintenance of AC inverters. Parameters can be registered easily and distributed to multiple inverters when replacing, and activation of the PLC function all from one setup screen.

Seamless connectivity within all levels of automation

The backbone of e-F@ctory, leveraging connectivity between the shop floor and IT

Extensive visualization with advanced data connectivity

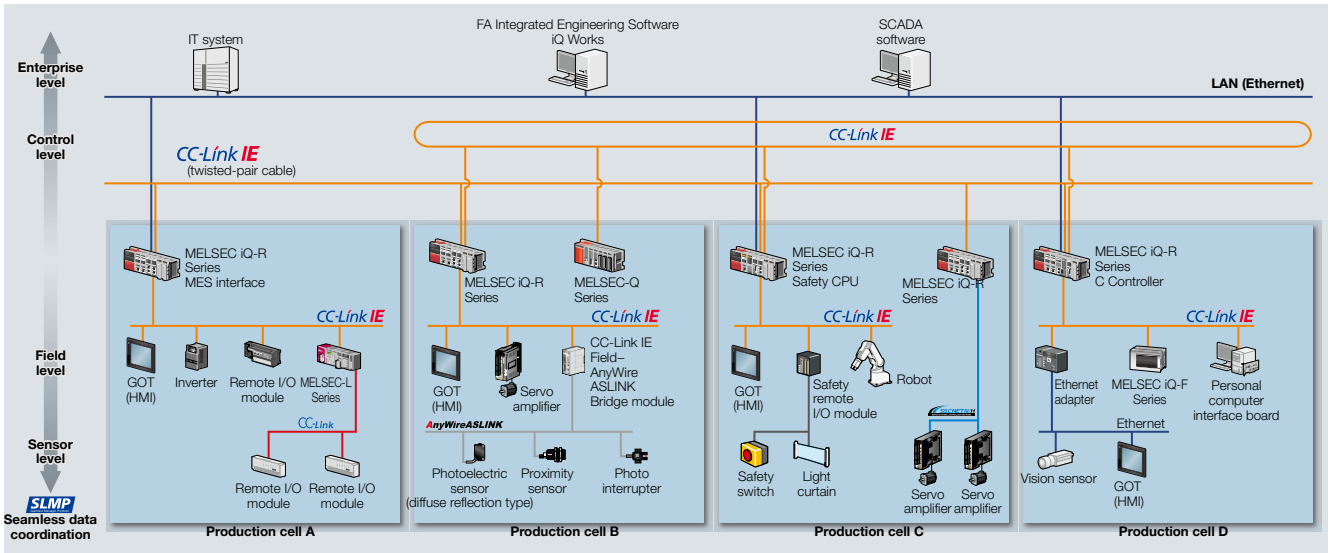
Big Data analytics requires deterministic data collection, which can be realized by incorporating two key features: SLMP*1 that enables seamless connectivity between devices in the IT layer and on the shop floor; and a high-speed, large-capacity 1 Gbps communications network that enables the handling of large-data, such as production, quality and control data between different production processes.

General, motion and safety control integrated into one network

CC-Link IE incorporates generic distributed control, synchronous motion control, and safety control enabling safety communications across multiple safety devices, all on the same network. The topology is quite versatile, based on twisted-pair cables, which enables flexibility in system configuration while helping to keep installation cost low.

Comprehensive diagnosis realizing higher reliability

Disruptions to the control system are kept to a minimum via comprehensive diagnostics functions, high communications integrity owing to the noiseresistant characteristics of the optical cable, and communication re-routing capabilities made possible as the result of using a ring topology. Also, network errors can be rectified quickly by visualizing the network system image using the engineering software*2, and remotely from a GOT (HMI) directly on the machine or production line.



A plant with increased "visualization" is also a plant with increased "energy saving".

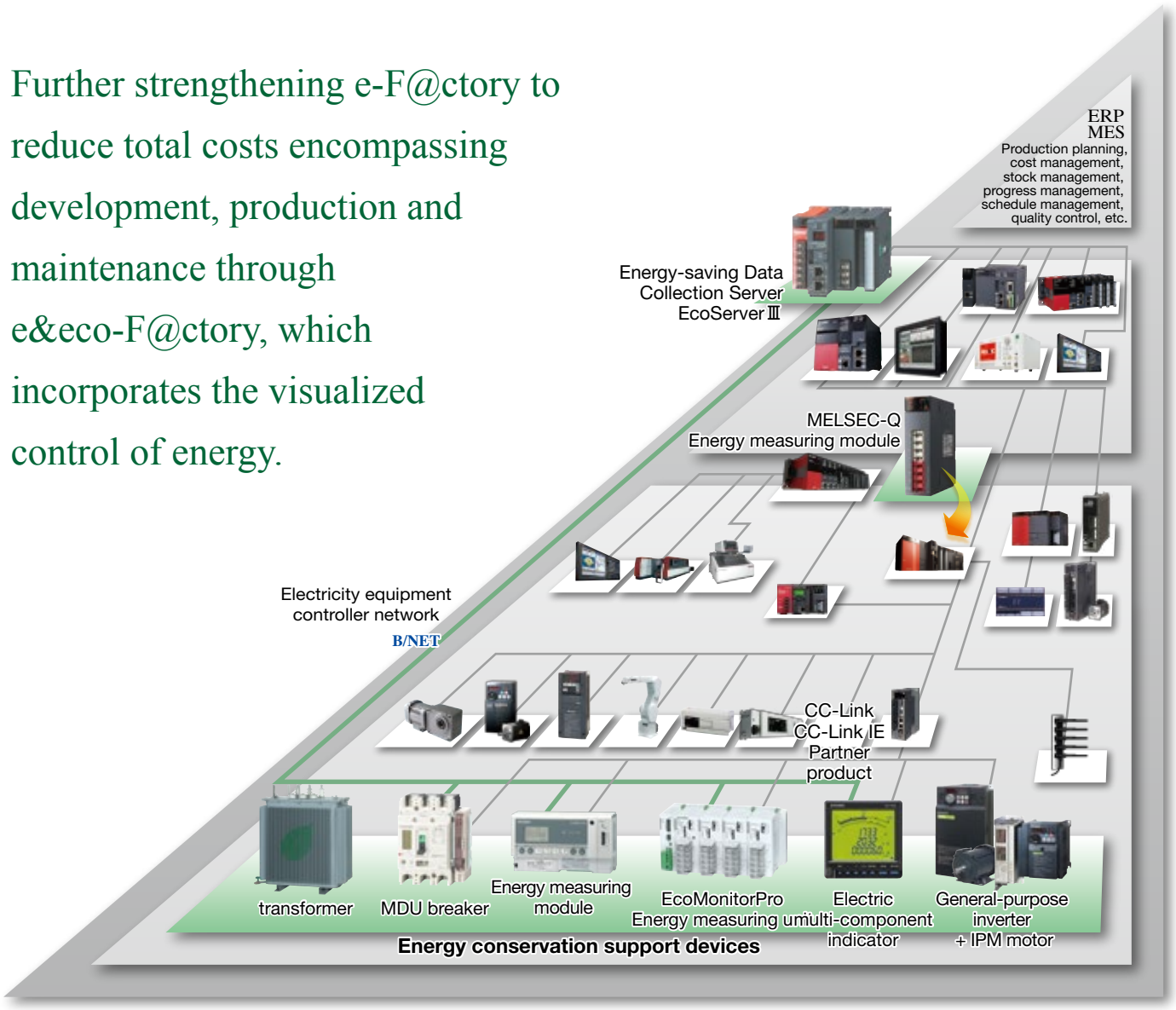
Energy Saving

In the plant where severe cost management is required, an even greater effort for energy reduction is essential. Energy-saving solution of e-F@ctory offers an "aggressive energy conservation", which not only reduces the costs through energy saving but also assesses it totally to pump into new investment.

e&eco-F@ctory proposes precise management of every production equipment or production line and energy conservation plan based on the life cycle cost of production.

Factory energy optimization with e&eco-F@ctory.

Further strengthening e-F@ctory to reduce total costs encompassing development, production and maintenance through e&eco-F@ctory, which incorporates the visualized control of energy.



Measure Energy Usage

Visualize Energy Usage

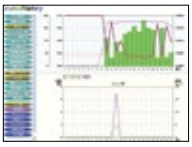
Reduce Energy Usage

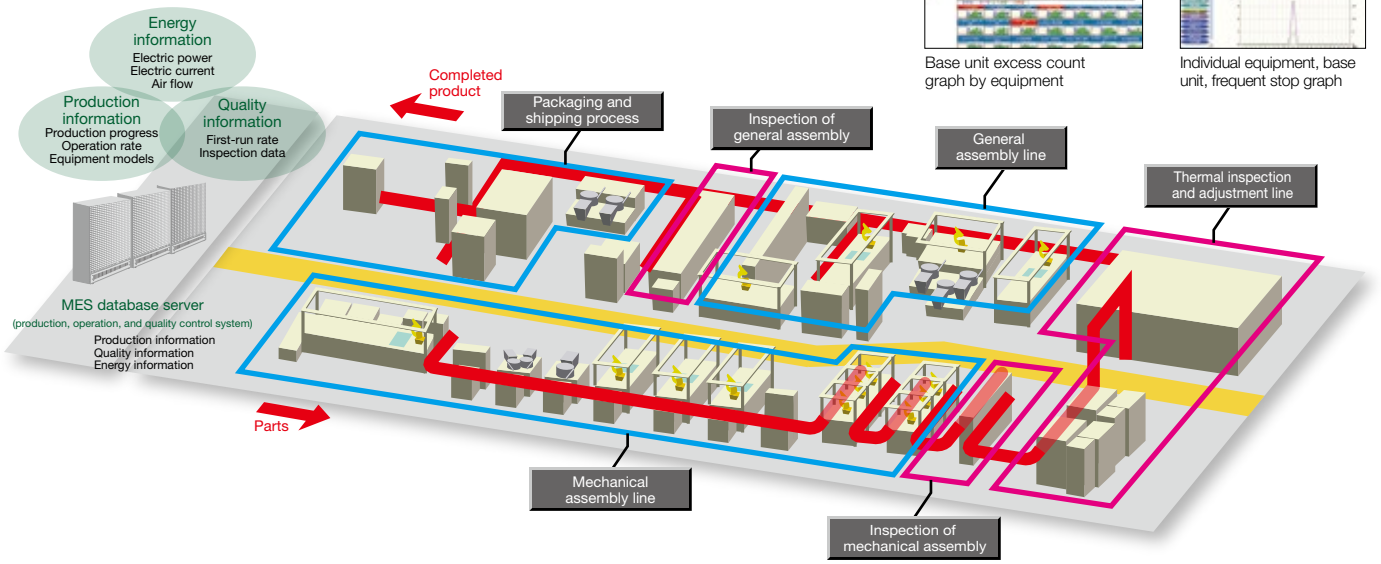
Manage Energy Usage

Fukuyama Works makes aggressive energy conservation efforts through "visible management."

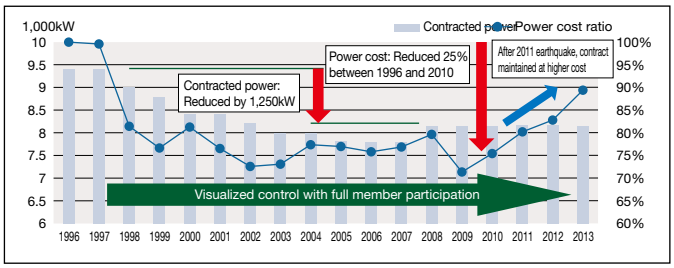
Mitsubishi Electric's Fukuyama Works (Fukuyama City, Hiroshima Prefecture) adopted "visible management" in 1997, and now practices aggressive energy conservation efforts.
It has realized an economical and ecological eco-factory, and uses its eco expertise to engage in the energy conservation business.
Under its policy of "visible energy conservation," it visualizes all aspects of energy usage in the factory as it implements factory-wide energy conservation activities. The knowledge it gains through these activities is incorporated in the development of energy-saving products.


Base unit excess count graph by equipment


Individual equipment, base unit, frequent stop graph



■ Energy-savings results of Fukuyama Works



Reduction effect

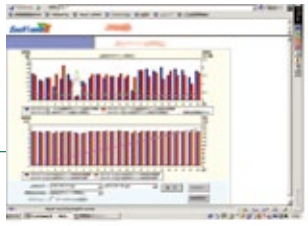
- Reduction in contracted power
  1,250kW/year
  systems* Comparison of FY1996 and FY2015
- Power cost
  Reduced 25% (approx. 100 million yen less)
  Comparison of FY1996 and FY2010

System for standard data management in each work process

System improvement

Support for reducing standard electric energy data

- System improvements are made by measuring the power usage and production output of each work process and managing standard data based on those measurements.
- "Visible management" is realized by using Intranet Web-based PCs.

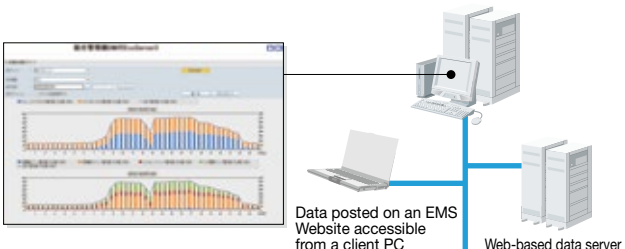

Screen example

Web-based energy conservation support system

Management and monitoring systems

Visible support of energy conservation activities

The Eco Server I Web-based data server makes accumulated data available on the Web via the Intranet in an easy understanding manner, to promote greater energy conservation efforts.


Data posted on an EMS Website accessible from a client PC
Web-based data server

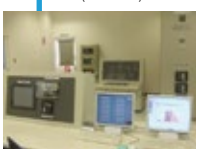
Electric energy management system

Management and monitoring systems

Total support of energy and labor saving efforts in the factory

Electricity, gas, temperature, and other energy-related data in the factory is recorded and monitored in detail through a B/NET network of power distribution and control equipment.

LAN(Ethernet)



Slots directly into the PLC for simple measurement of diverse energy information!

■ PLC MELSEC-Q power measuring module

Meets Energy-Saving Measurement needs
I want to monitor the power used by each place of equipment, for detailed energy-saving monitoring.

Meets Short-Term Measurement needs
I want a fast measurement cycle to measure short-term loads.

Meets Quality Control needs
I want to detect power supply irregularities in manufacturing equipment to control product quality.

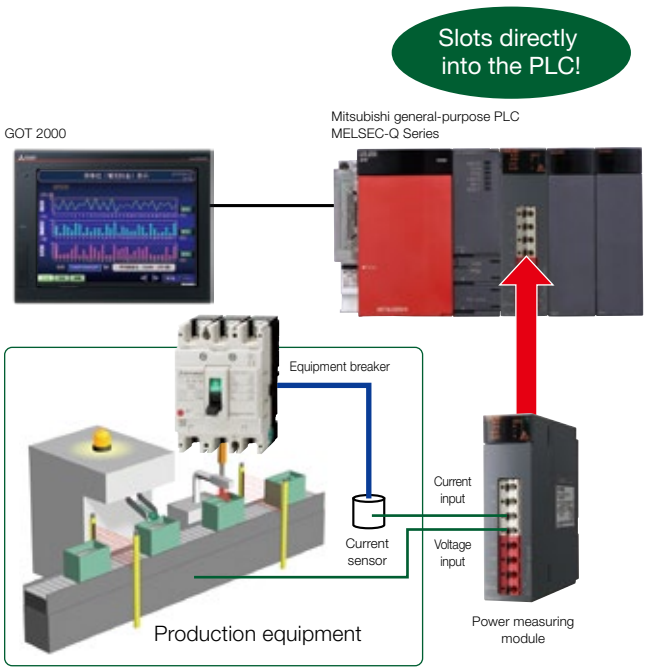
Meets Preventive Maintenance needs
I want to detect power and current used by manufacturing equipment and prevent sudden failures.

Meets Simple Installation needs
I want simple and smooth installation, with no program for power measurement.

MELSEC Q series

Key e&eco-F@ctory products, integrating production and quality data and energy data.

New power measurement units join the MELSEC-Q lineup, which continues to revolutionize the site of production. Enabling simple measurement of parameters including current, voltage, power, power factor, and active power, the units integrate production and quality data and energy data, assisting in increasing productivity, saving energy, and implementing preventive maintenance.
And because they can be directly slotted into PLCs, they save space, reduce wiring, and lower costs.
A range of possibilities are now available, including measurement of the energy used by each piece of production equipment, preventive maintenance of equipment based on real time measurements, and the use of measurements as quality management indicators linked to manufacturing data.



Slots directly into the PLC

The power measuring module is directly attached to the PLC, so there is no need to install any other instruments or connect wiring. There is no need for any major system construction either, so it also saves space.

Measure energy consumption simply

Read the signal from the current sensor on the device breaker, to measure energy consumed by the device. It's easy to grasp power consumption for each PLC unit and manage the standard data for each individual device.

Easy comparison of power consumption

Power can be measured only when a specific output signal is on. Power over a period can be measured at two points, to find the standby power consumed while idling or compare power consumed over a certain period.

Grasp the energy consumption status of a device

Record the maximum and minimum values of demand current, voltage, demand power and power factor for each device. Equalization of energy consumption is supported, to identify devices and times of high energy consumption.

Quickly catch abnormal device status

Set two measurement factors and monitor their upper and lower limit values. That makes it possible to quickly catch abnormal device status, and to find devices which are using large amounts of energy.

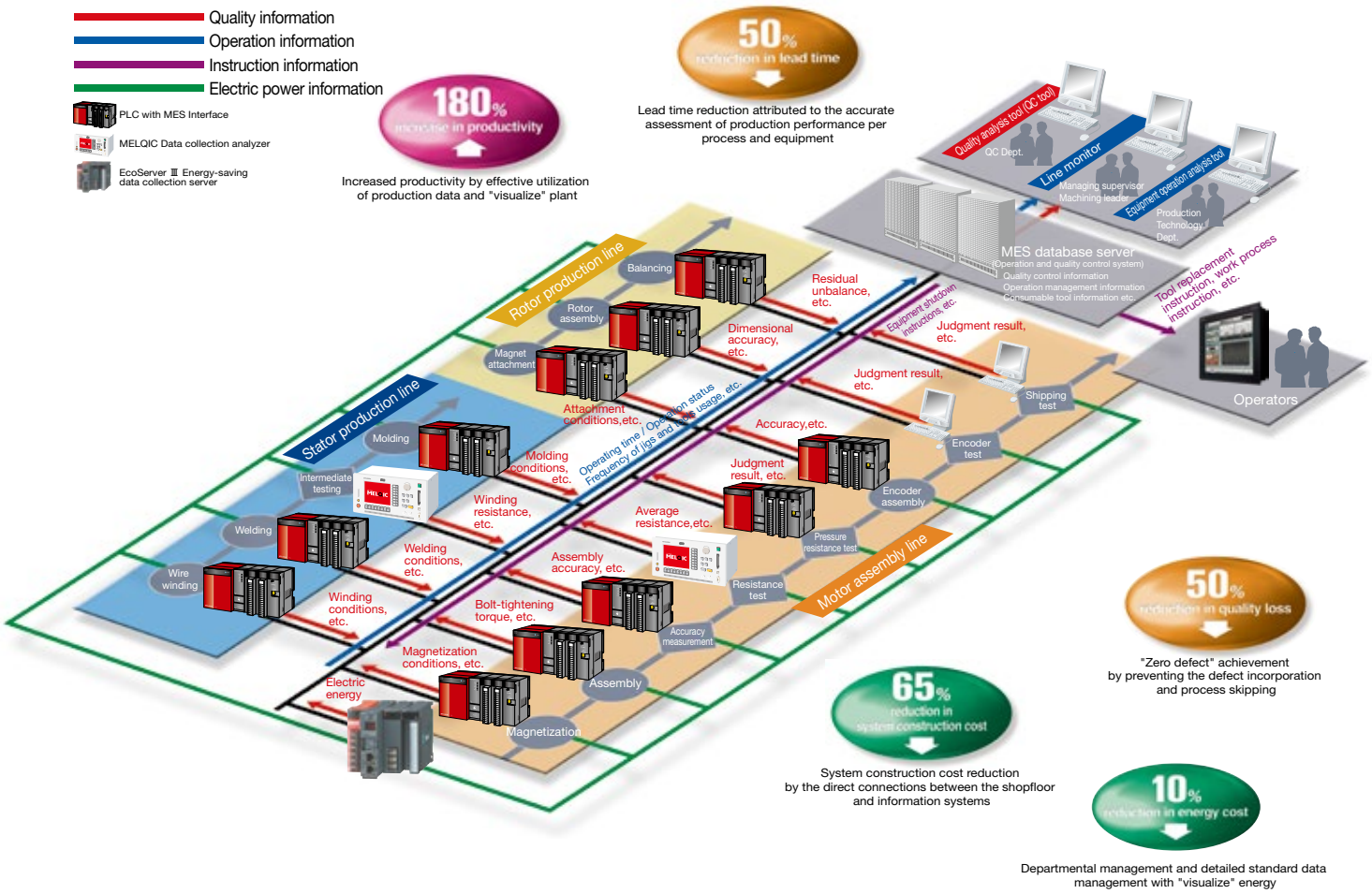
At Mitsubishi Electric's e-F@ctory Model Factory, significant improvements

Mitsubishi Electric has been running the "e-F@ctory Model Factory" within its Nagoya Works to verify productivity and equipment operating rates. On the premises, a production system comprised of the company's FA products that successfully integrate the information and solutions of partner manufacturers has been built.
This trial has produced numerous outstanding results, such as increasing productivity 180% and reducing system construction cost by 65%.*
Please confirm the concrete accomplishments of e-F@ctory for yourself at Mitsubishi Electric's model factory.

Assembly line quality control example: Servo motor plant (began operations in May 2005)

Real-time quality control ensures quality improvement.

The figure shows the latest example of an e-F@ctory plant. It pursues efficient operation management, real-time QC, quality control, and energy management, under the themes of " meticulousness " and " real time. "
With MES Interface modules at its core, the system effectively links control systems and devices to an information system.



RFID application example in an assembly test cell: Inverter/servo amplifier/power module plant (Began operations in March 2009)

The application of RFID to promote automation and management of individual equipment has led to significant quality improvement.

By using RFID tags to coordinate different work processes, it has become possible to keep a historical log of quality and other factors. Furthermore, a mechanism has been established to prevent defective items (human errors) from being carried over to the next work process.

in productivity and quality, as well as cost reductions, have been achieved

Example of introducing an operating management system: FA Systems Production Building (commenced operation in May 2014)

By pursuing higher productivity per square foot through visualization and analysis/improvement of operating status in real-time, productivity and quality have been improved.

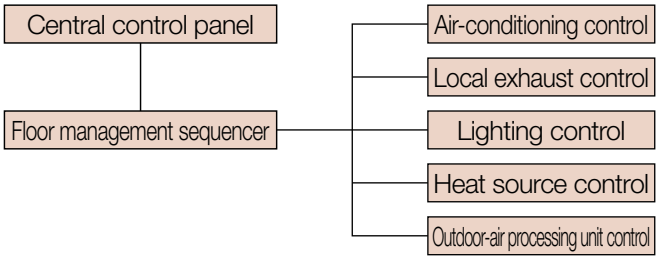
Operating rate, stop frequency, pick-up rate, no. of leftover parts, error frequency, etc.

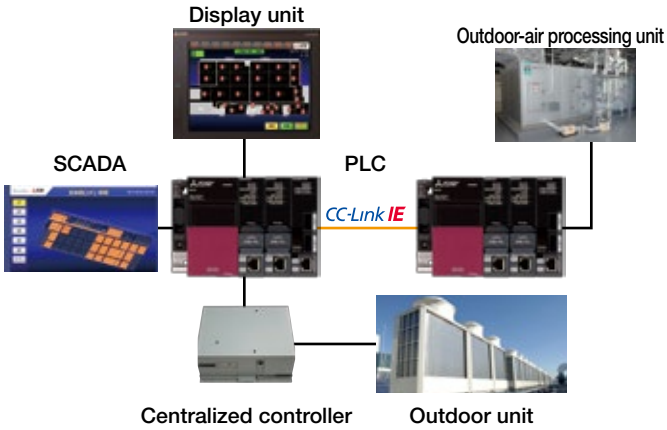
- Production information
- Operating information
- Quality information
- Error information

Example of introducing an air-conditioning and lighting energy-saving management system: FA Systems Production Building (commenced operation in May 2014)

Utilizing PLCs manufactured in-house, it is possible to monitor and control all information for the building, including that concerning air-conditioning, lighting and heat source devices. By forming a network of PLCs on each floor through CC-Link IE, real-time monitoring and operation through display units and MC Works (SCADA) have been achieved.

30% reduction
in energy cost





Example of introducing a robot assembly cell: Kani Factory electromagnetic switch production line (commenced operation in December 2012)

A high operating rate, high-quality, space-saving production system achieved through the fusion of people and equipment.

Realized the small lot/multi-cycle production demanded for electromagnetic switches by achieving both flexible production using cells and large-volume production using robots.

* All numerical values are trial calculated from the results of the e-F@ctory Model Factory at Mitsubishi Electric's Nagoya Works and based on a computer-free, program-free approach.

Collaborating with partners to ensure thorough shop floor optimization.

Partnership

In order to provide optimal solutions that match customers' needs, e-F@ctory is designed to enable collaboration with many partner manufacturers. Mitsubishi Electric is proud its highly evaluated products in the FA field. Together with the partners participating in the e-F@ctory Alliance FA partner program promoted by Mitsubishi Electric, the aim is “total cost reduction” for all aspects of customer development, production and maintenance.

Solutions are wide-ranging, including improving facility operation efficiency, shortening lead time, improving quality and reducing costs.

Firmly linking partner companies, e-F@ctory Alliance offers solutions for diversified needs.

The e-F@ctory Alliance is a FA manufacturer partnering program that strongly links the connection compatibility of Mitsubishi Electric FA equipment utilizing excellent software and machinery offered by partners, thereby enabling systems to be built by systems integration partners and the proposal of optimal solutions to customers.

Create entire production systems. Realize advanced systems integration.

Combining Mitsubishi Electric FA equipment and other products, systems integrators propose systems solutions for everything from shop floors to information systems.

Production line	Energy-saving	Instrument
Traceability	Production management	Preventive maintenance
Safety	Quality control	Renewal

etc

Develop applications software that further enhance connection compatibility of Mitsubishi Electric FA equipment.

Utilizing information-sharing products and technologies such as Mitsubishi Electric's EZSocket and SLMP, vendors develop and propose excellent application software and drivers that ensure the connection compatibility of Mitsubishi Electric FA equipment.

MES	SCADA	SCM
CAD/PLM	ERP	MRP
Data logger	FA simulator	APS

etc

Propose Mitsubishi Electric FA equipment and other machinery with superior compatibility. Realize improved systems construction and maintenance.

Manufacturers proposing peripheral equipment that is easy to connect with Mitsubishi Electric FA equipment and is easier to use.

Sensor	Actuator	Communication cable
Visualization system	RFID	Analyzer
Laser marker	Recorder	Relay terminal block

etc

Factory Automation Global website

Mitsubishi Electric Factory Automation provides a mix of services to support its customers worldwide. A consolidated global website is the main portal, offering a selection of support tools and a window to its local Mitsubishi Electric sales and support network.

■ **From here you can find:**

- Overview of available factory automation products
- Library of downloadable literature
- Support tools such as online e-learning courses, terminology dictionary, etc.
- Global sales and service network portal
- Latest news related to Mitsubishi Electric factory automation

Mitsubishi Electric Factory Automation Global website:

www.MitsubishiElectric.com/fa

Online e-learning

An extensive library of e-learning courses covering the factory automation product range has been prepared. Courses from beginner to advanced levels of difficulty are available in various languages.

■ **Beginner level**

Designed for newcomers to Mitsubishi Electric Factory Automation products gaining a background of the fundamentals and an overview of various products related to the course.

■ **Basic to Advanced levels**

These courses are designed to provide education at all levels. Various different features are explained with application examples providing an easy and informative resource for in-house company training.

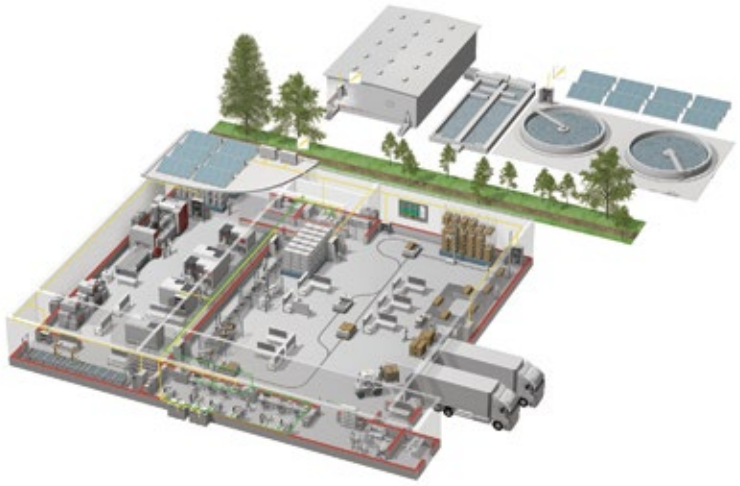
Precautions before use

This publication explains the typical features and functions of the products herein and does not provide restrictions or other information related to usage and module combinations. Before using the products, always read the product user manuals. Mitsubishi Electric will not be held liable for damage caused by factors found not to be the cause of Mitsubishi Electric; opportunity loss or lost profits caused by faults in Mitsubishi Electric products; damage, secondary damage, or accident compensation, whether foreseeable or not, caused by special factors; damage to products other than Mitsubishi Electric products; or any other duties.

⚠ **For safe use**

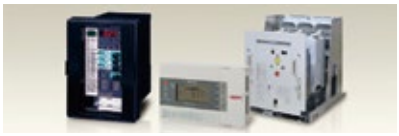
- To use the products given in this publication properly, always read the relevant manuals before beginning operation.
- The products have been manufactured as general-purpose parts for general industries, and are not designed or manufactured to be incorporated in a device or system used in purposes related to human life.
- Before using the products for special purposes such as nuclear power, electric power, aerospace, medicine or passenger-carrying vehicles, consult with Mitsubishi Electric.
- The products have been manufactured under strict quality control. However, when installing the products where major accidents or losses could occur if the products fail, install appropriate backup or fail-safe functions in the system.

YOUR SOLUTION PARTNER



Mitsubishi Electric offers a wide range of automation equipment from PLCs and HMIs to CNC and EDM machines.

Low voltage: MCCB, MCB, ACB



Medium voltage: VCB, VCC

Power monitoring, energy management

Compact and Modular Controllers

Inverters, Servos and Motors

Visualisation: HMIs

Numerical Control (NC)

Robots: SCARA, Articulated arm

Processing machines: EDM, Lasers, IDS

Transformers, Air conditioning, Photovoltaic systems

A NAME TO TRUST

Since its beginnings in 1870, some 45 companies use the Mitsubishi name, covering a spectrum of finance, commerce and industry.

The Mitsubishi brand name is recognized around the world as a symbol of premium quality.

Mitsubishi Electric Corporation is active in space development, transportation, semi-conductors, energy systems, communications and information processing, audio visual equipment and home electronics, building and energy management and automation systems, and has 237 factories and laboratories worldwide in over 121 countries.

This is why you can rely on Mitsubishi Electric automation solution - because we know first hand about the need for reliable, efficient, easy-to-use automation and control in our own factories.

As one of the world's leading companies with a global turnover of over 4 trillion Yen (over $40 billion), employing over 100,000 people, Mitsubishi Electric has the resource and the commitment to deliver the ultimate in service and support as well as the best products.

* Not all products are available in all countries.

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Mitsubishi Electric Corporation Nagoya Works is a factory certified for ISO 14001 (standards for environmental management systems) and ISO 9001 (standards for quality assurance management systems).

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