MITSUBISHI ELECTRIC

Changes for the Better

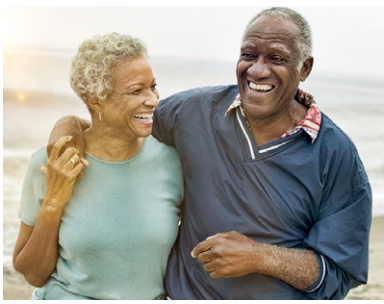
Automating the World

FACTORY AUTOMATION

Industrial Computer MELIPC Series

MELIPC

EDGECROSS



Our Factory Automation business is focused on "Automating the World" to make it a better, more sustainable environment supporting manufacturing and society, celebrating diversity and contributing towards an active and fulfilling role.

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.

SUSTAINABLE DEVELOPMENT GOALS

The Mitsubishi Electric Group is actively solving social issues, such as decarbonization and labor shortages, by providing production sites with energy-saving equipment and solutions that utilize automation systems, thereby helping towards a sustainable society.

Committed to ever higher customer satisfaction

Mitsubishi Electric is a global leader in the research, manufacturing and marketing of electrical and electronic equipment used in areas such as communications, consumer electronics, industrial technology, energy and transportation. Within this, the industrial automation business has grown significantly since the first induction motor was manufactured over 90 years ago and has closely followed the automation industry in the world. Mitsubishi Electric industrial automation boasts a wide-range of product areas such as production control, drives, and mechatronics, power distribution products that are used in various industries. Mitsubishi Electric offers TCO reduction solution by e-F@ctory with a wide range of FA products and accumulated production technology.

Industrial computer opens up new possibilities of manufacturing

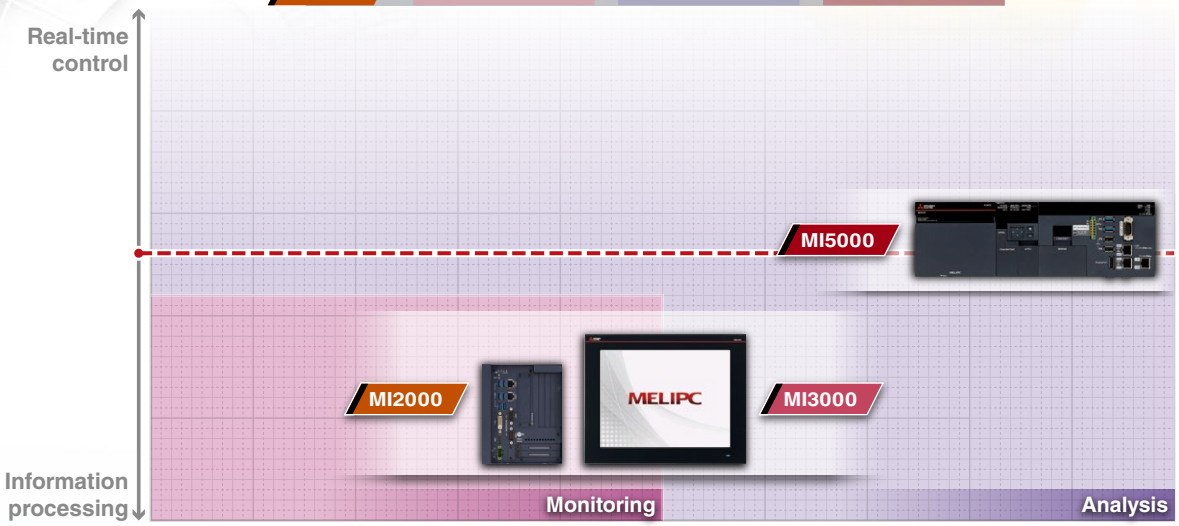
Industrial computer has been developed maximizing highly reliable device control technology accumulated through development of the MELSEC Series programmable controller. Mitsubishi Electric industrial computer MELIPC Series offers new values for Edge computing, IT system coordination, and device control with its robust features and flexibility utilizing general purpose applications.

INDEX

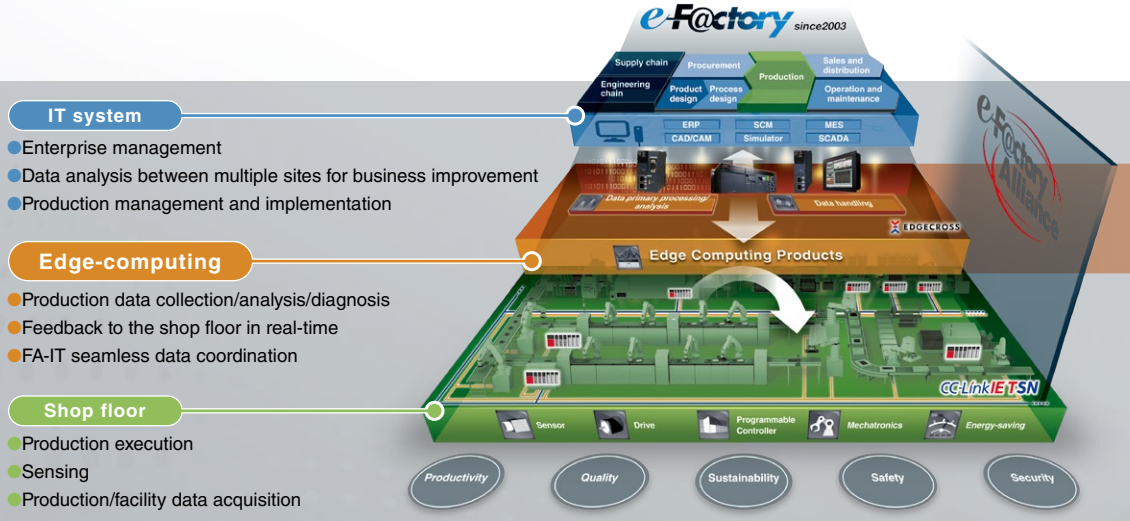
MELIPC

The MELIPC realizes “real-time control” for device control and “Edge computing” enabling data collection/analysis in the middle level between the IT system and shop floor. A wide range of products from a high-end model supporting CC-Link IE Field Network capable of high performance processing and high-speed communications to simple and compact range models are available. The MELIPC corresponds with requirements such as real-time control, preventative maintenance, and quality improvement on the shop floor, contributing to productivity enhancement through utilization of production data.

	Monitoring	Analysis	Control
MI5000	●*1	●	●
MI3000	●	●	—
MI2000	●*1	●	—



*1. Connect an external monitoring screen for monitoring.



IT system
- Enterprise management
- Data analysis between multiple sites for business improvement
- Production management and implementation

Edge-computing
- Production data collection/analysis/diagnosis
- Feedback to the shop floor in real-time
- FA-IT seamless data coordination

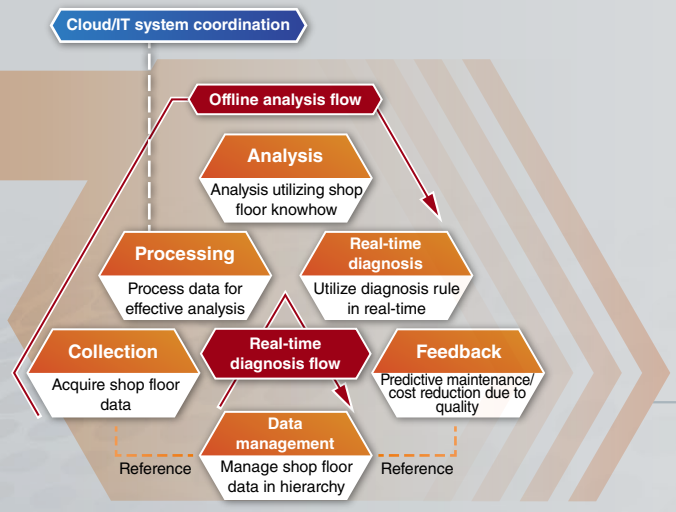
Shop floor
- Production execution
- Sensing
- Production/facility data acquisition

e-F@ctory is the Mitsubishi Electric solution for improving the performance of any manufacturing enterprise by enhancing productivity, and reducing the maintenance and operations costs together with seamless information flow throughout the plant by using a combination of factory automation and IT technologies.

Real-time control application

- **MELIPC MI5000**

One module realizes device control and information processing which were previously managed with a combination of computer and dedicated device for example. Equipped with real-time OS VxWorks®, the MELIPC realizes real-time control which cannot be achieved with general industrial computers, contributing to high-accuracy device control and information processing at high speed.



Data utilization flow

Edge computing application

- **MELIPC MI5000/MI3000/MI2000**
- **MELSOFT MaiLab**

Real-time utilization of production data and coordination with IT system are necessary to realize e-F@ctory. “Edge computing” enabling information processing between the shop floor and IT system is required.

EDGECROSS

Utilization of open software platform “Edgecross*1” which realizes FA-IT coordination in the edge computing level enhances Edge computing and e-F@ctory.

*1. Edgecross is a product of Edgecross Consortium.

MI5000

DESIGN AWARD 2019

Microsoft Azure Certified

EDGECROSS

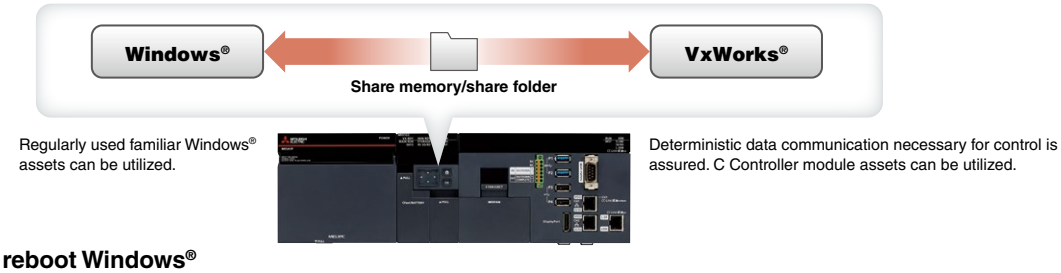
Edgecross Basic Software Data Collector pre-installed

Windows® and VxWorks® pre-installed

The module can run two operating systems at the same time, VxWorks® with deterministic performance for device control and data collection and Windows® for displaying analysis results of collected data, allowing superior processing according to OS. This feature allows one module to realize device control and information processing which were previously managed using a computer and dedicated device, reducing system configuration cost and space for devices.

• Easy data passing between OSs

Passing data between OSs is easy via share memory and share folder.



• Individually reboot Windows®

Even if Windows® freezes, restarting Windows® is possible while VxWorks® is running.

CC-Link IE Field Network realizes highly accurate device control

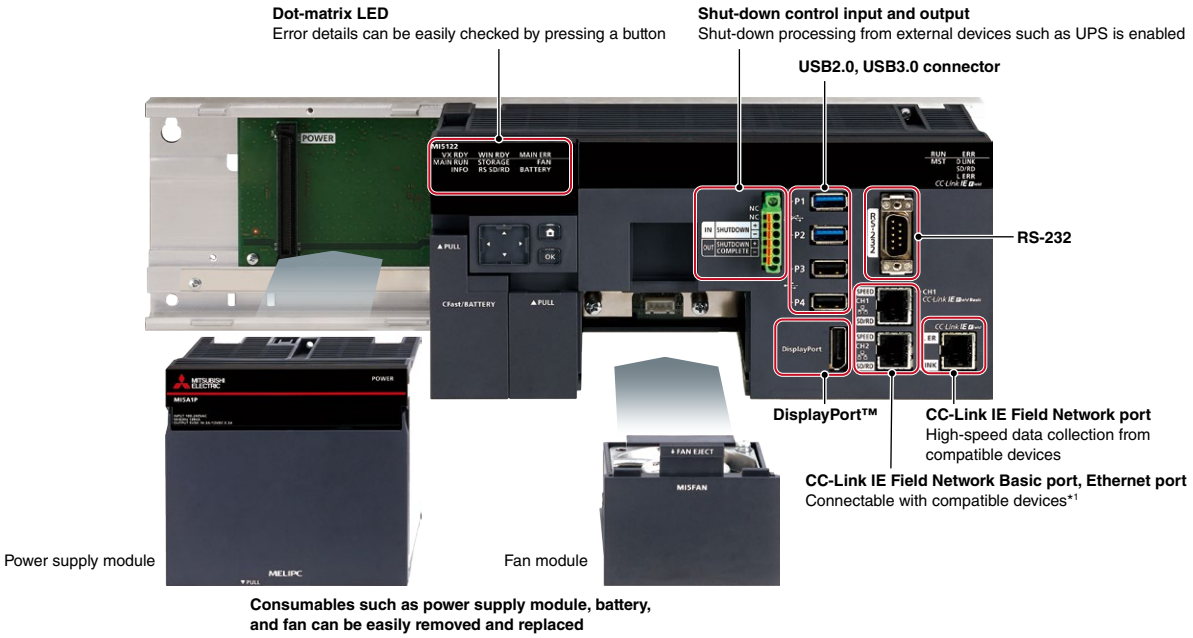
Control data and production data of devices can be communicated at 1 ms via CC-Link IE Field Network, realizing highly accurate device control and high-speed production data collection. The module is equipped with CC-Link IE Field Network port and CC-Link IE Field Network Basic port which enable easy connection with compatible products just by setting.

Easier programming

Using Windows® and VxWorks® API, high-speed data communications between OSs and access to various devices are easily realized and programming is also easy. In addition, the module uses same functions as the C Controller such as CCPU functions and MD functions, program assets of the C Controller can be utilized.

Hardware features

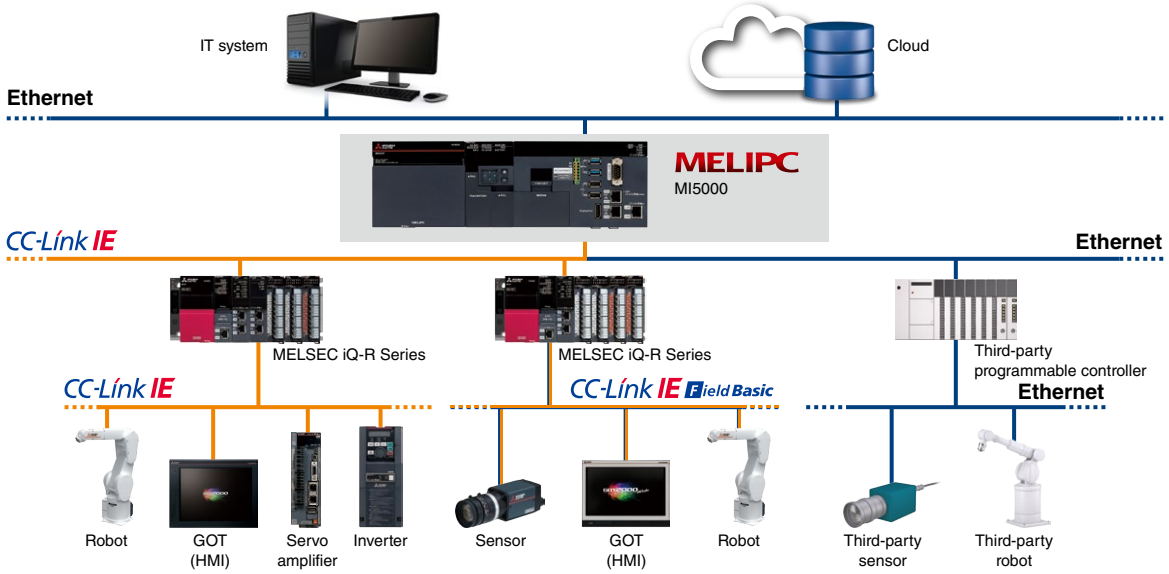
Inheriting highly robust features of the MELSEC programmable controllers, the module can continuously operate in various environments for a long term. In addition, consumable items are easily removed and replaced, making maintenance easy.



*1. CC-Link IE Field Network Basic supports CH1 only.

System configuration

Utilization of pre-installed software enables easier collection of Mitsubishi Electric factory automation devices data. In addition, installing additional software allows easier collection of third-party products data. The module is equipped with CC-Link IE Field Network port and CC-Link IE Field Network Basic port, enabling easy connection with compatible products just by setting.



MI3000

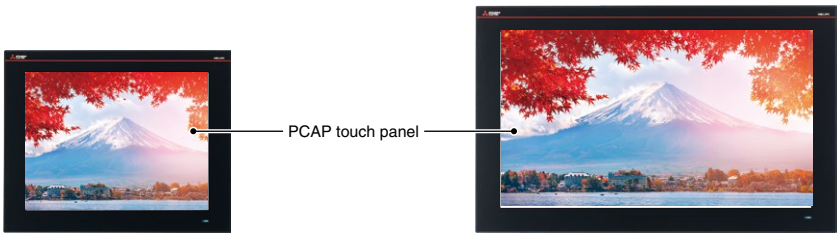
Microsoft Azure Certified

EDGECROSS

Edgecross Basic Software
Data Collector
GT SoftGOT2000 pre-installed

Beautiful, stunning, large screen monitor offers easy-to-view display and user-friendly operation

Large screen and high resolution LCD panel is equipped as standard for data display and touch operation. Light-touch operation is realized with a PCAP touch panel that is widely used for smartphones and tablet devices. The touch panel with high transmittance offers clear and high visibility display.

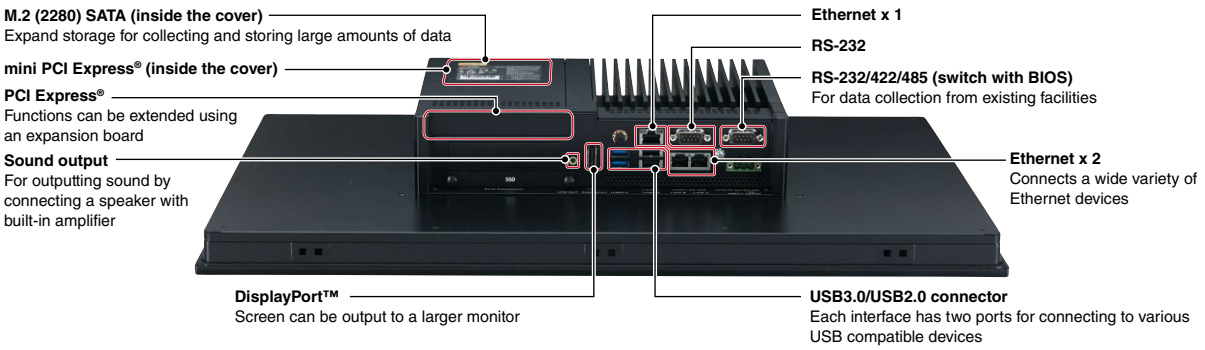


MI3315G-W
15" XGA: 1024 x 768 dots

MI3321G-W
21.5" widescreen, Full HD: 1920 x 1080 dots

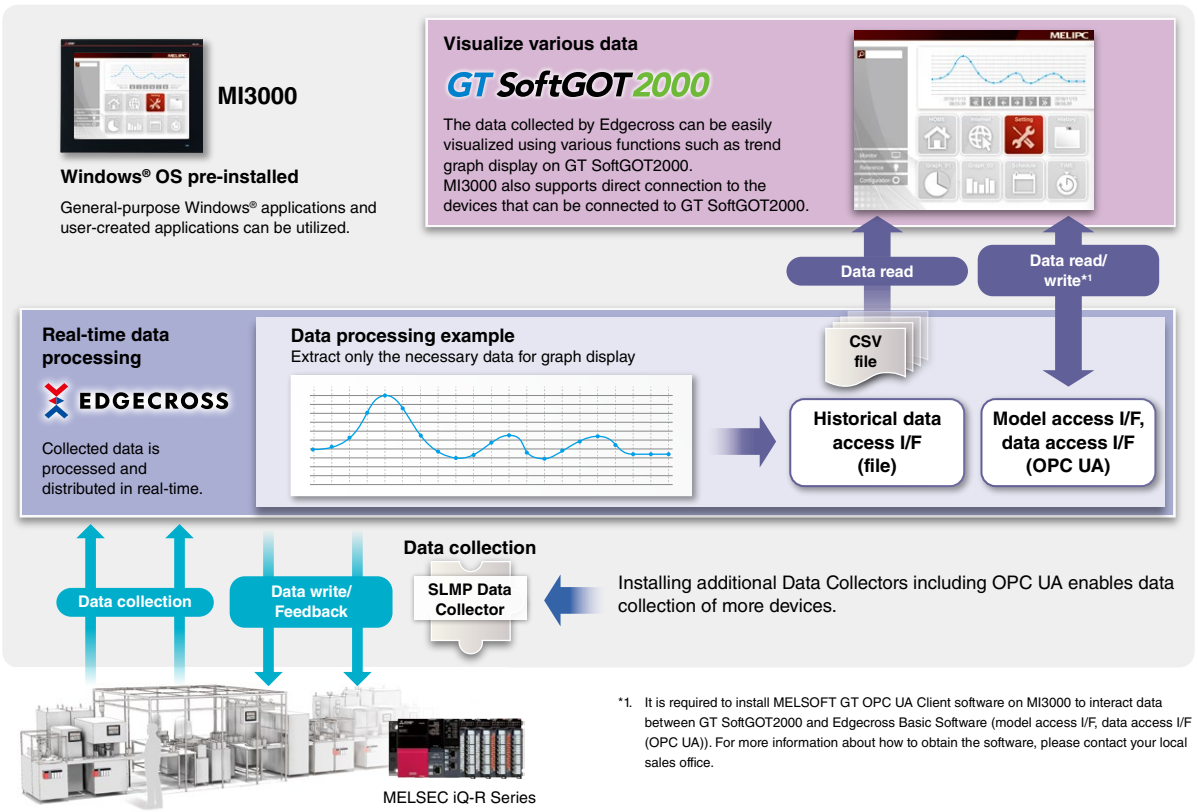
System expansion according to needs

Equipped with various interfaces, systems can be configured according to the customers' needs.



Equipped with all necessary functions to visualize factories in one body

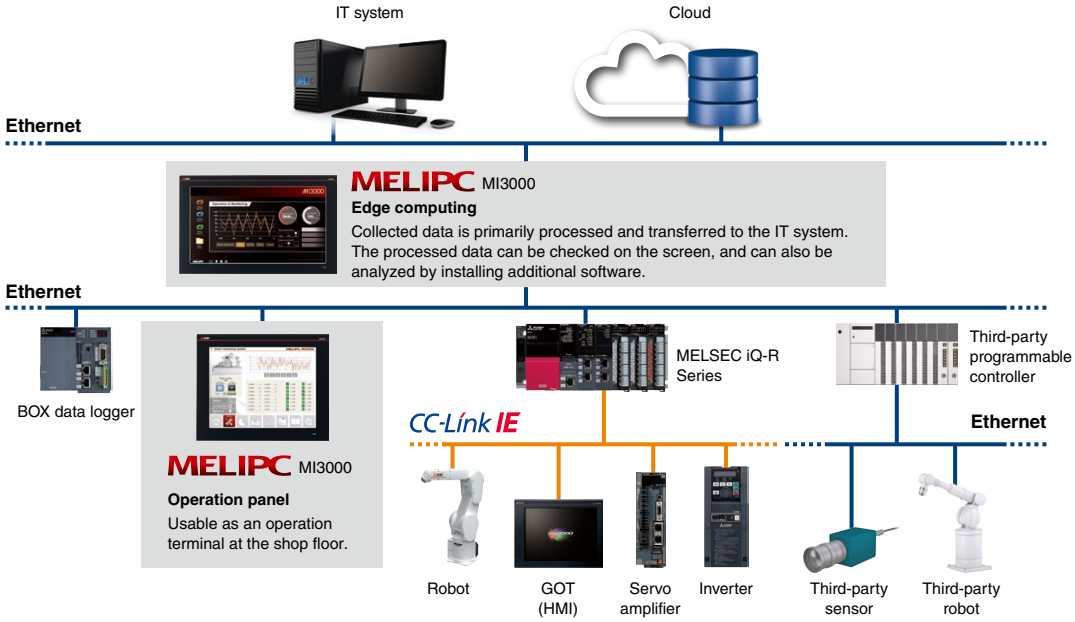
Edgecross Basic Software, SLMP Data Collector, and GT SoftGOT2000 are pre-installed on MI3000. The data collected by Edgecross using SLMP Data Collector and the data collected by GT SoftGOT2000 can be monitored on the GT SoftGOT2000 screen. Since Windows® OS is pre-installed, Windows® applications can be utilized. One MI3000 can easily realize visualization of shop floors and execution of various applications.



*1. It is required to install MELSOFT GT OPC UA Client software on MI3000 to interact data between GT SoftGOT2000 and Edgecross Basic Software (model access I/F, data access I/F (OPC UA)). For more information about how to obtain the software, please contact your local sales office.

System configuration

Utilization of pre-installed Edgecross Basic Software and SLMP Data Collector enables real-time monitoring of shop floor data and realizes coordination with IT systems. With GT SoftGOT2000, data collected by Edgecross and factory automation products can be easily monitored. MI3000 is useful for a wide range of applications.



MI2000

Microsoft Azure Certified

EDGECROSS

Edgecross Basic Software
Data Collector pre-installed

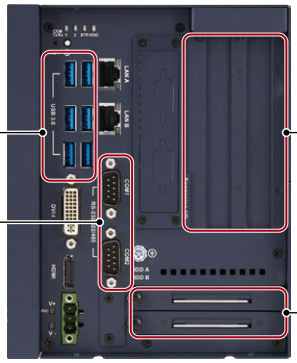
Data analysis/diagnosis/monitoring

Intel® Core™ i3 CPU realizes simple analysis/diagnosis/monitoring of collected data, contributing to quality improvement.

Flexible system expansion

Equipped with 2.5-inch HDD/SSD slot and PCI Express®/PCI slot, a large volume of data can be stored and functions can be extended. Fitting the CC-Link IE Field Network interface board to the PCI Express® slot allows the module to operate as a CC-Link IE Field Network master station or local station.

Various expandable interfaces easily realize coordination with the existing system and FA devices.



USB3.0 connector
Various USB compatible devices can be connected to 6 ports

RS232/RS422/RS485
For data collection from existing facilities

PCI Express®/PCI slot
Functions can be extended using an expansion board

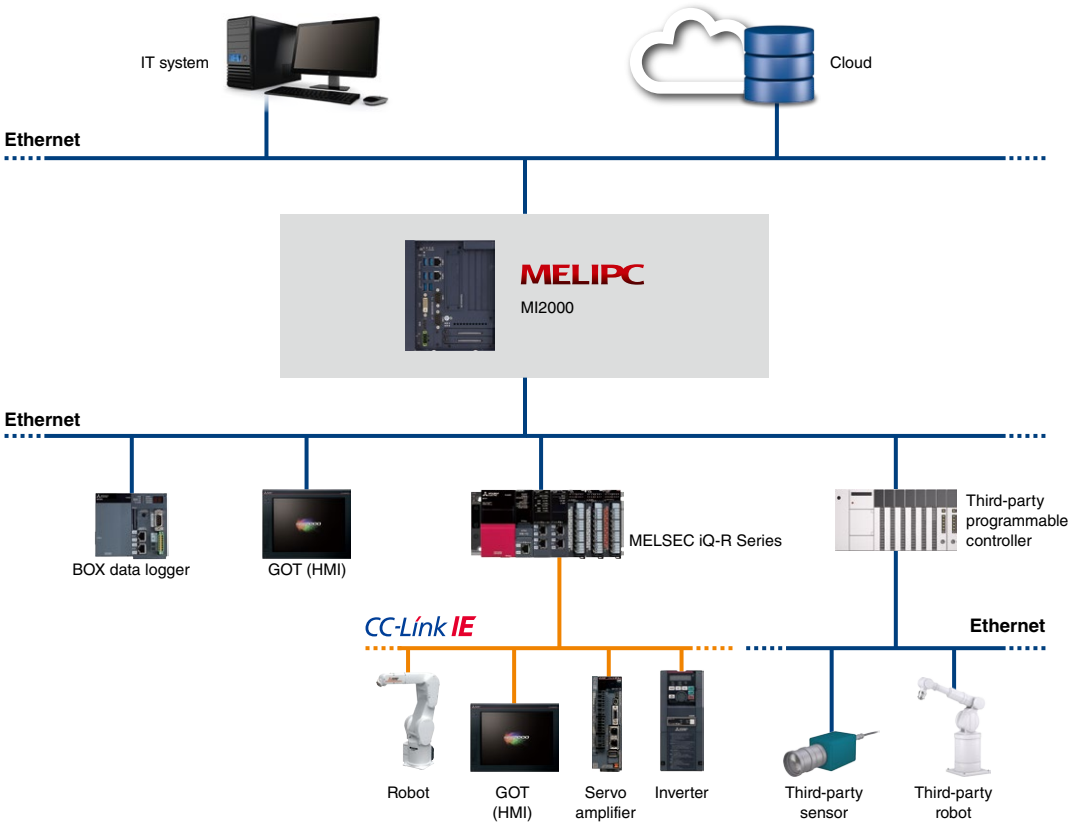
Serial ATA HDD/SSD slot
2.5 inch HDD/SSD can be connected
For collection/storage of large-volume data

Fan-less hardware design reduces maintenance

MI2000 has a fan-less structure. Maintenance such as replacement and cleaning is not required.

System configuration

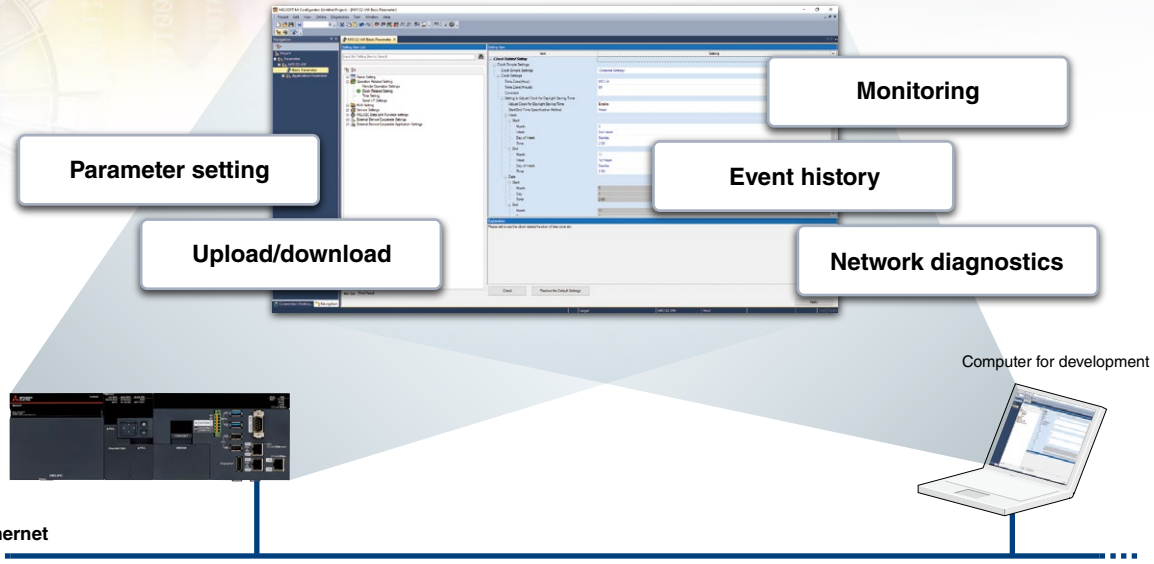
Utilization of pre-installed software enables easier collection of Mitsubishi Electric factory automation devices data. In addition, installing additional software allows easier collection of third-party products data. Primary processing of collected data can reduce the data amount to be transferred to the IT system, preventing data delay and such.



Setting/monitoring tool for MELIPC MI5000

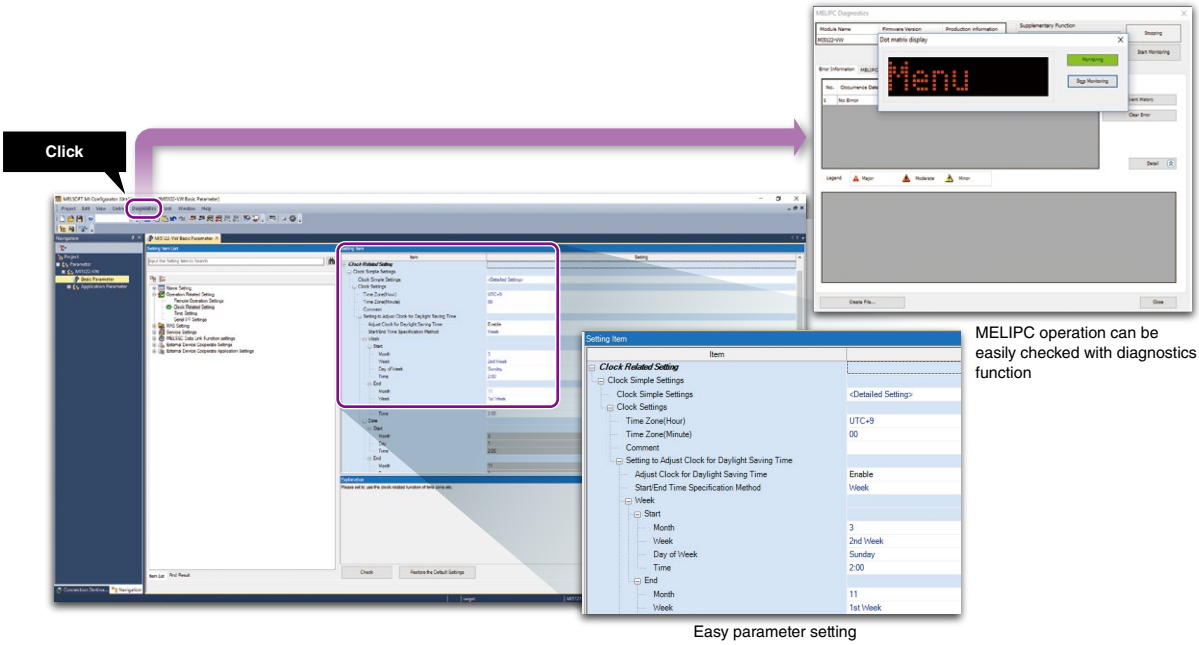
MI Configurator

MI5000 / MI3000 / MI2000



Easier setting and monitoring

MI Configurator is software consists of various features such as parameter setting/diagnostics/monitoring/testing of MELIPC. Parameter items are categorized by purposes, allowing to display necessary setting items preferentially. Target parameters can be easily found, reducing implementation cost.



MELIPC operation can be easily checked with diagnostics function

Easy parameter setting

Faster troubleshooting

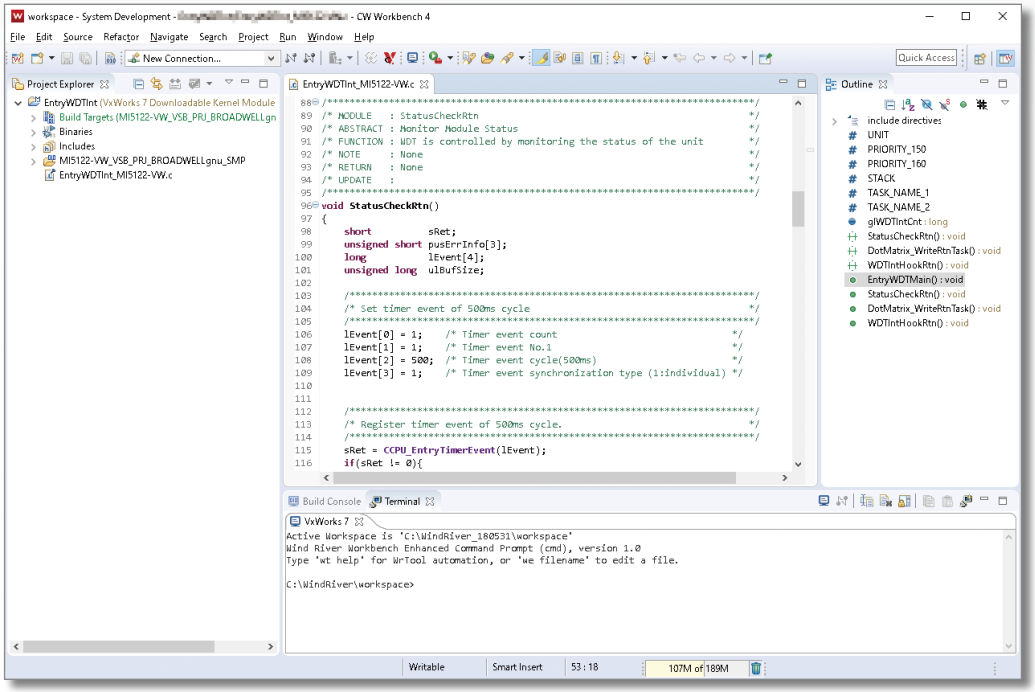
Error information are logged in the event history at an error occurrence. Error causes and countermeasures can be checked with event history, thereby helping to reduce troubleshooting time.

Note: MI Configurator is pre-installed on MI5000. For updating of MI Configurator to the latest version and installation in other computers, please contact your local Mitsubishi Electric sales office or representative.

Engineering software for MELIPC MI5000

CW Workbench 4

MI5000 / MI3000 / MI2000



Easily develop real-time control program

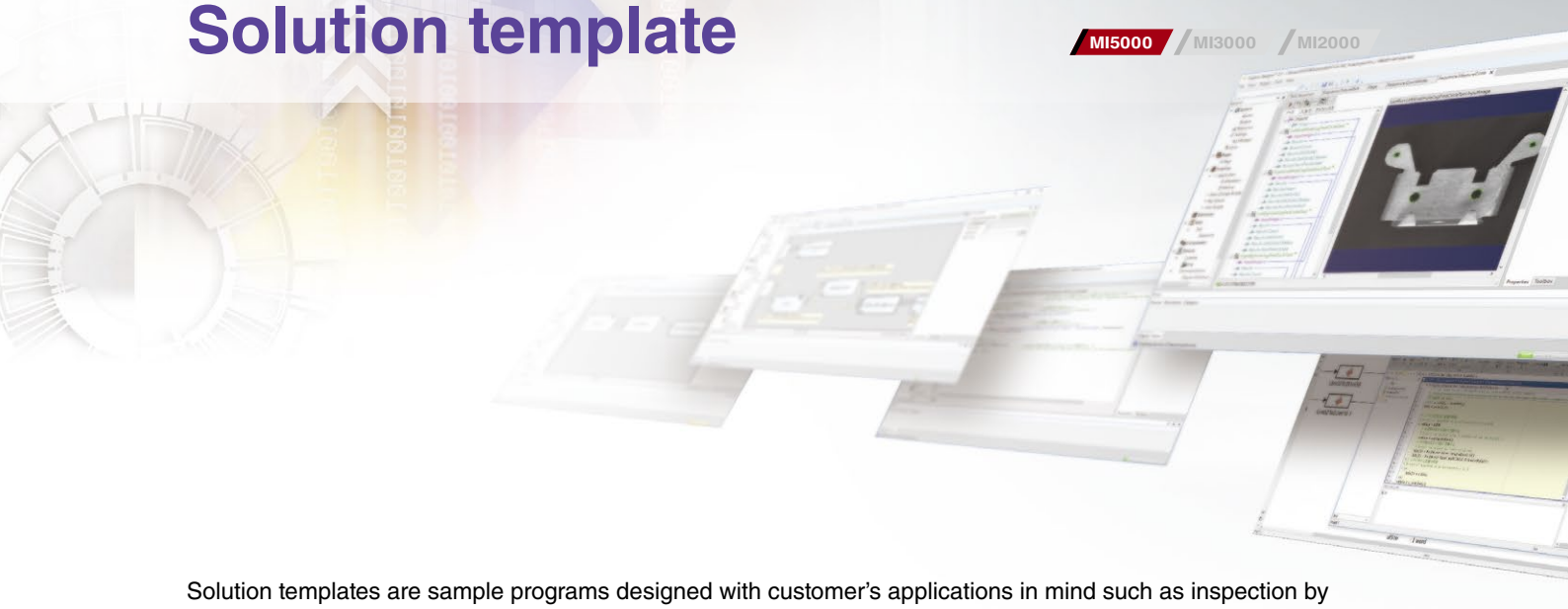
Development environment for a full-fledged real-time OS which is normally expensive can be implemented at a lower cost. Main functions include such as programming, compiling, source code debugging, allowing easier programming of VxWorks® user application. API such as CCPU function and MD function which realizes high-speed data communication between OSs and easier access to various connected devices is provided, making real-time control programming easy.

Multiple language functionality available with plug-in tool

Functionality of Eclipse based CW Workbench 4 can be expanded to support multiple languages, source code management, etc. with third-party plug-in tools.

Solution template

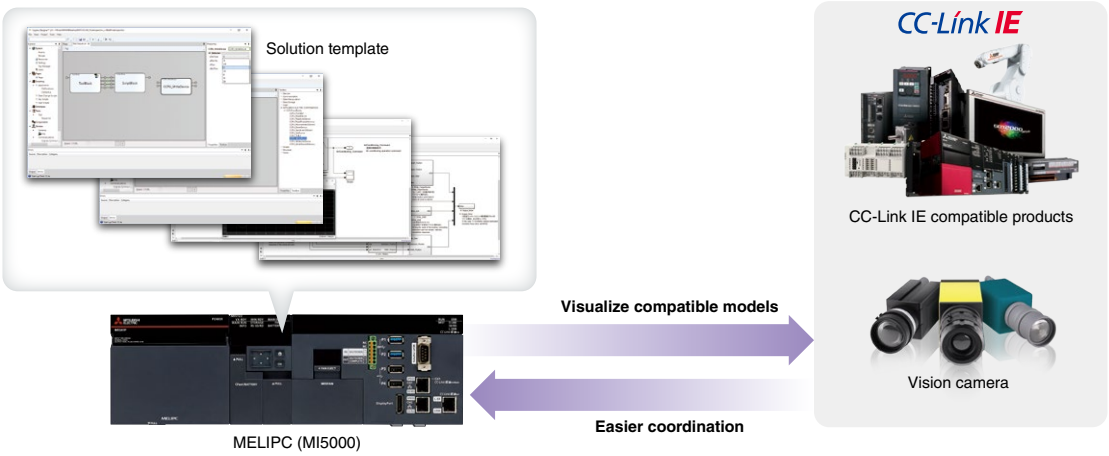
MI5000 / MI3000 / MI2000



Solution templates are sample programs designed with customer's applications in mind such as inspection by image processing and monitoring/control by model-based development. Multiple solution templates are available for selection according to the application. Using the template as a system development base enables MELIPC application development easier.

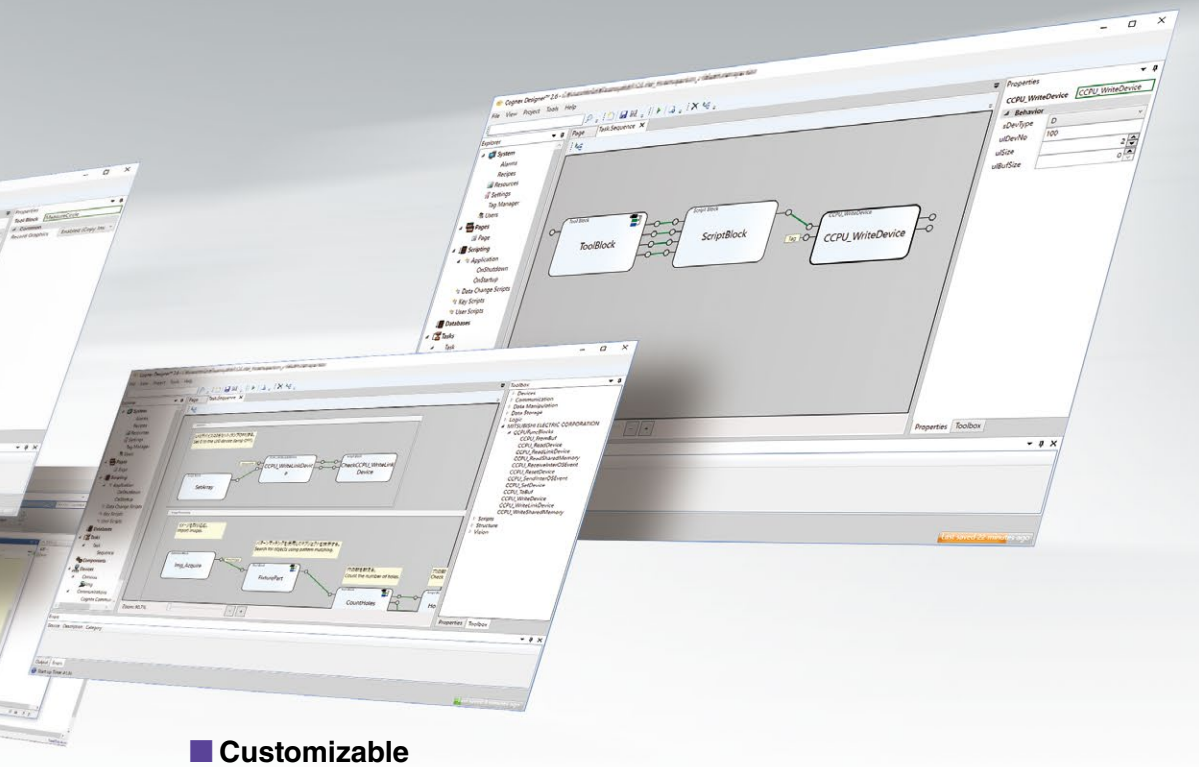
Specifically presents compatible devices and software

Combination and connection method of compatible devices and software are presented in solution templates, making it easy to select connectable devices, thereby reducing development time.



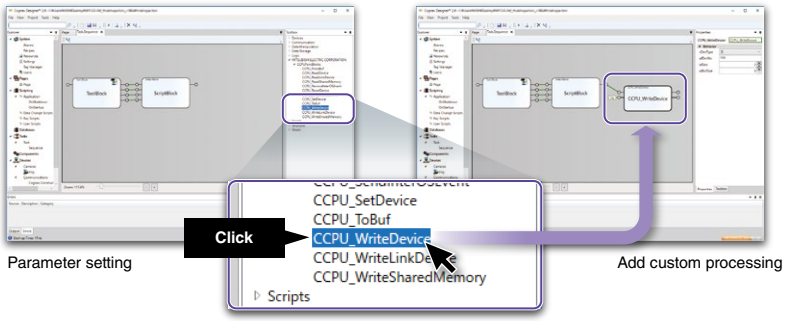
Plug-in for coordination with MELIPC

Solution templates offer a plug-in for coordination between MELIPC and compatible devices/software, realizing easier access to compatible devices/software.



Customizable

Contents of solution templates can be customized by modifying and adding processing according to applications.
Customizing solution templates according to requirements can reduce tasks for implementation.



Lineup

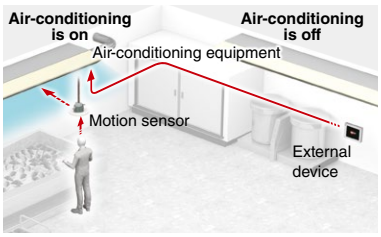
• Image processing support function

Function to support creation of vision processing application*1

Sample	Outline
Hole dimensions check	Check the work hole position and dimensions
Wire harness incorrect wiring detection	Check whether the wire shape and color order connected to the harness is correct or not
Delivered product check	Check letters printed on the carton
Electronic parts check	Check whether the number of pins connected to the IC is correct or not

• Model-based development support function*2

Sample	Outline
Automated warehouse	Entering and dispatching of products from warehouse
Tension test	Realize equivalent function as tension test machine
Air-conditioning management	Perform air-conditioning control and cost calculation

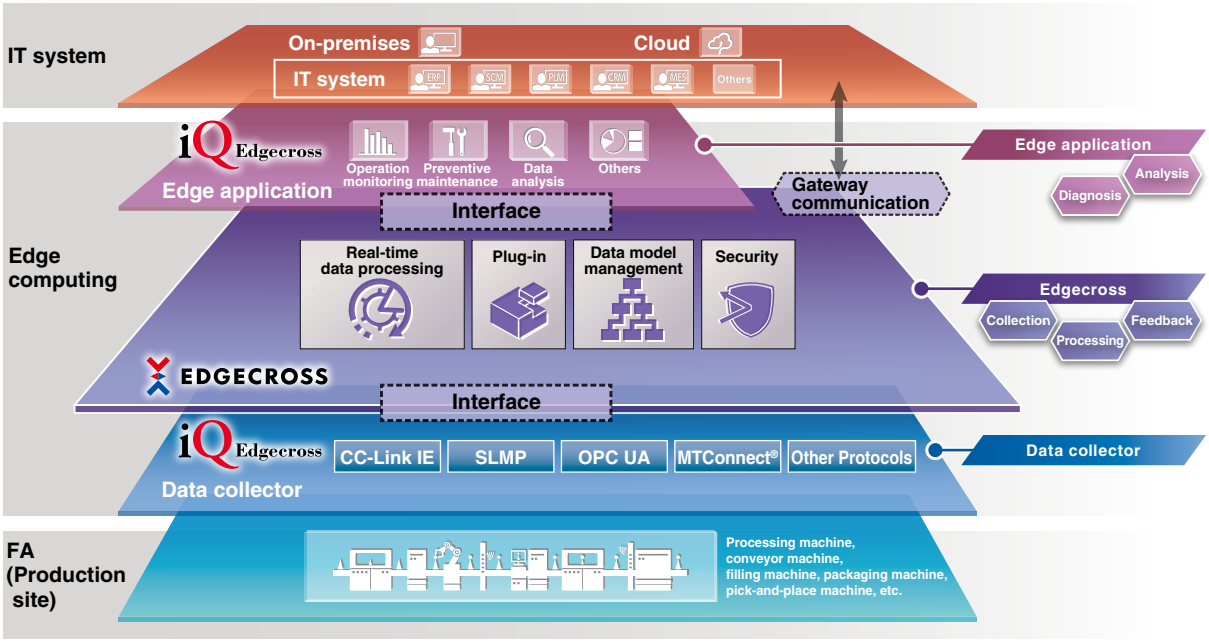


*1. COGNEX image processing software "Cognex Designer" is used.
*2. MathWorks multiple domain simulation "Simulink®" is used.

Note: For details on how to obtain solution templates, please contact your local Mitsubishi Electric sales office or representative.

iQ Edgecross

Utilization of open software platform “Edgecross” which realizes FA-IT coordination in the edge computing level enhances Mitsubishi Electric edge computing and e-F@ctory, contributing to manufacturing improvement.



iQ Edgecross | “iQ Edgecross” is Mitsubishi Electric edge-computing software supporting open software platform “Edgecross”

Edge application

Software that performs various processing for data utilization on the shop floor using functions provided by Edgecross in the edge computing level. A wide range of software according to applications is available.

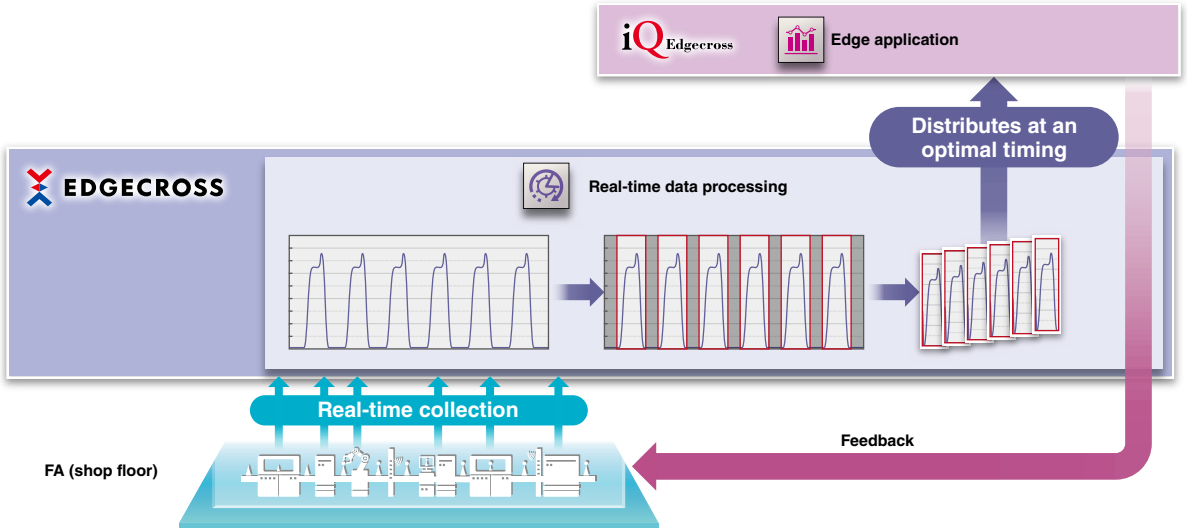
Data collector

A software component that collects data on the shop floor through each network. Data collectors supporting different protocols are available, enabling data collection from various devices. CC-Link IE Field Network Data Collector enables accurate shop floor data collection at high speed.

Edgecross

Real-time data processing

Real-time data continuously collected on the shop floor is processed and distributed to Edge applications for processing, then returned to the shop floor machines. Waveforms per action cycle for example are extracted so that Edge applications can handle easily, then the grouped waveforms are distributed to Edge applications. Finally, the diagnosis results by Edge applications are fed back to the shop floor machines.



Data model management

Data model management is a function to manage devices, machines, and production lines on the shop floor as abstract models in a hierarchical structure, allowing graphic-based setting and operations similar to Windows® explorer. Centralized management and maintenance of the entire factory is realized by managing all data in the whole production facilities previously managed individually.

Gateway communications

Gateway communications allow effective data coordination with IT system including Cloud. Protocols (MQTT, etc.) highly compatible with IT system is supported, realizing seamless data coordination with IT system.

Reference: Edgecross Consortium
URL: https://www.edgecross.org/en/

Mitsubishi Electric Data Science Tool

MELSOFT MaiLab

iQ Edgecross

MI5000 / MI3000 / MI2000

Mitsubishi Electric's Data Science Tool MELSOFT MaiLab is a data science tool that further improves manufacturing by replacing “human experience and intuition” with digital technology and enabling it to be easily incorporated into control systems.

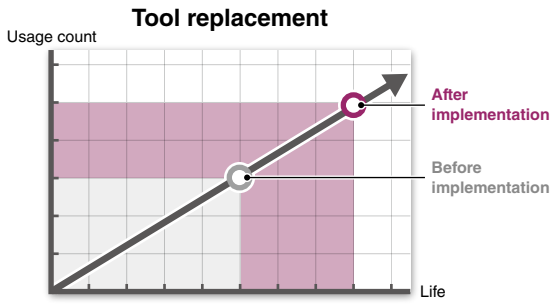
Maisart

Maisart: Mitsubishi Electric's AI creates the State-of-the-ART in technology
Mitsubishi Electric's brand of AI technology aiming to make all devices smarter

Issue Relying on the experience and intuition of skilled workers

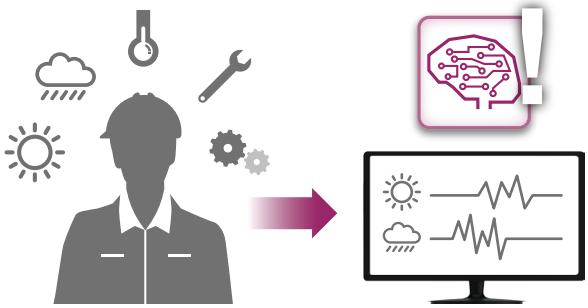
Cost reduction

Can we replace machine tools at the optimum timing by monitoring consumable condition?



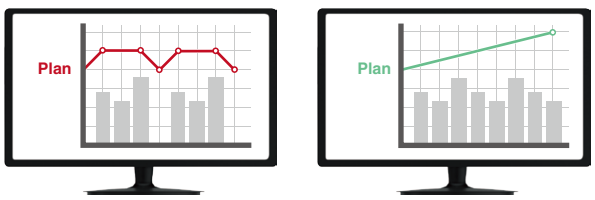
Skill succession and workforce saving

Can AI be used to pass on the knowhow of skilled workers to unskilled workers?



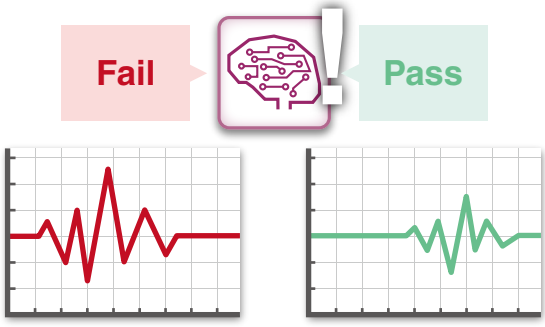
Productivity improvement

Can we perform maintenance before sudden failures by monitoring equipment condition?

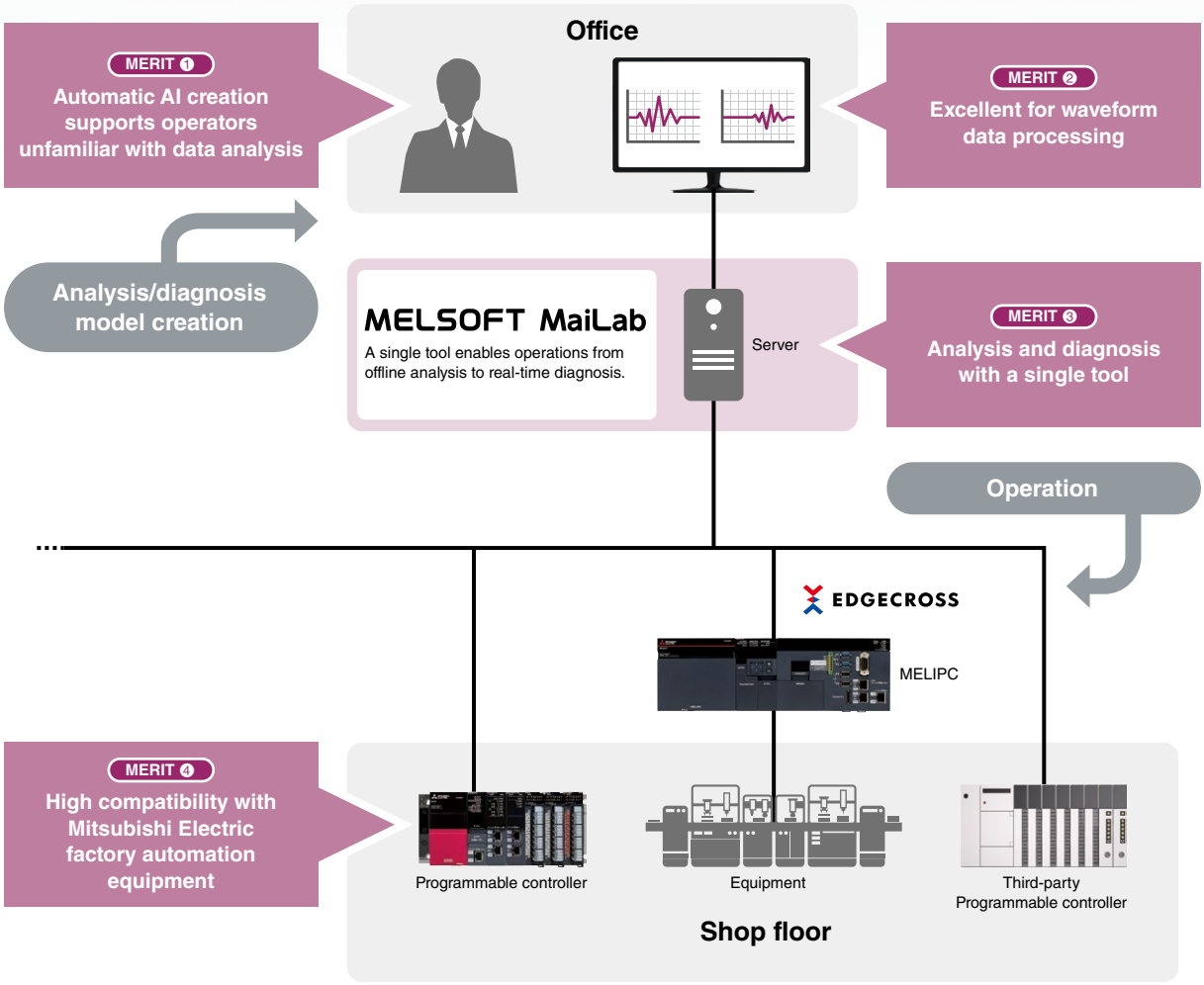


Quality improvement

Can manufacturing quality be verified without relying on operators?



Solution Replace human experience with digital technology. Utilize data.



Plus Mitsubishi Electric also offers services such as data analysis by our data scientists on behalf of customers and training on basic knowledge for data analysis.

Easy analysis/diagnosis in 4 steps

MELSOFT MaiLab is a tool that enables easy data analysis in 4 basic steps.

Data collection

Data collection

Examine what data should be collected and how they should be collected.

Data

Offline analysis

STEP 01 Data set creation

First, import data to be analyzed into MELSOFT MaiLab to register.
A group of registered data is called a "data set".
The data set can be shown in various kinds of graphs, so that it can also be easily checked by human eyes before performing diagnosis using AI.

Office

STEP 02 AI creation

Perform learning with a data set.
A model that enables diagnosis of unknown data is called an "AI".
When "What you want to do (purpose)" is selected, data patterns and rules are automatically derived, and MELSOFT MaiLab creates the "AI".

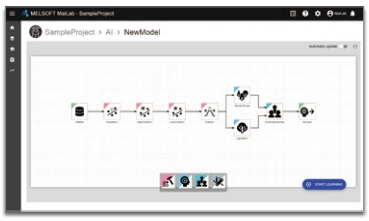
Data accumulation

Production site

Real-time diagnosis

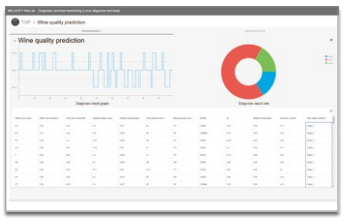
STEP 03 Task creation

Settings for performing diagnosis of unknown data are called a “task”.
MELSOFT MaiLab will define the data input/output methods and threshold values to judge the pass or fail. The accuracy is displayed as a score, which serves as a guideline for judgment.



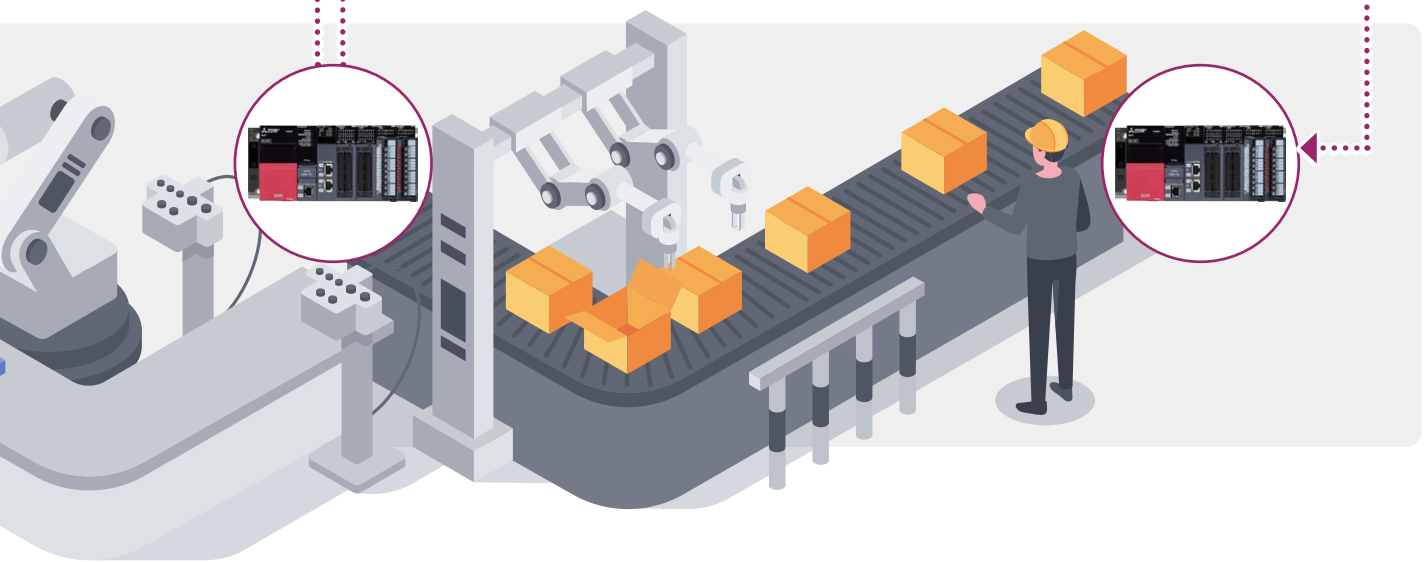
STEP 04 Task execution and monitoring

Execute tasks and monitor the diagnosis status of unknown data.
Deployment to equipment can be easily performed with just a click. Data flow and pass or fail judgment status can be confirmed on a graphical display via the learning server.



Data collection

Feedback



Product specifications

General specifications

MELIPC MI5000

Item	MI5000					
Operating ambient temperature (°C)	0…55					
Storage ambient temperature*1 (°C)	–25…75					
Operating ambient humidity (% RH)	5…95, non-condensing					
Storage ambient humidity*1 (% RH)						
Vibration resistance	Compliant with JIS B 3502 and IEC 61131-2	-	Frequency	Constant acceleration	Half amplitude	Sweep count
		Under intermittent vibration	5…8.4 Hz	-	3.5 mm	10 times each in directions X, Y, Z
			8.4…150 Hz	9.8 m/s²	-	
		Under continuous vibration	5…8.4 Hz	-	1.75 mm	-
			8.4…150 Hz	4.9 m/s²	-	
Shock resistance	Compliant with JIS B 3502 and IEC 61131-2 (147 m/s², 3 times each in directions X, Y, Z)					
Operating atmosphere	No corrosive gases, no flammable gases, no excessive conductive dust					
Operating altitude*2 (m)	0…2000*3					
Installation location	Inside the control panel*4					
Overvoltage category*5	≤ Ⅱ					
Pollution degree*6	≤ 2					

MELIPC MI3000

Item	MI3000	
Operating ambient temperature (°C)	0…55	
Storage ambient temperature (°C)	–20…60	
Operating ambient humidity (% RH)	10…90, non-condensing	
Storage ambient humidity (% RH)		
Vibration resistance	Random vibration	Compliant with IEC 60068-2-64, 5…500Hz, one hour in direction X, Y, Z each
		3 Grms
Shock resistance	Compliant with IEC 60068-2-27, 10 G, half sine wave, 11 msec	
Operating atmosphere	No greasy fumes, no corrosive gases, no flammable gases, no excessive conductive dust, no direct sunlight (as well as at storage)	
Operating altitude*2 (m)	-*7	
Installation location	Inside the control panel	
Overvoltage category*5	≤ Ⅱ	
Pollution degree*6	≤ 2	

MELIPC MI2000

Item	MI2000	
Operating ambient temperature (°C)	0…55*8	
Storage ambient temperature (°C)	–40…75	
Operating ambient humidity (% RH)	10…90, non-condensing	
Storage ambient humidity (% RH)		
Vibration resistance	Random vibration	Compliant with IEC60068-2-64, 5…500 Hz, 1 oct/min, one hour in direction X, Y, Z each
		4 Grms (1.5 Grms when HDD is used)
Shock resistance	Compliant with IEC 60068-2-27, 50 G, half sine wave, 11 msec	
Operating atmosphere	No corrosive gases, no flammable gases, no excessive conductive dust	
Operating altitude*2 (m)	-*7	
Operating location	Stable location where product is less affected by electric field and magnetic field	
Overvoltage category*5	≤ Ⅱ	
Pollution degree*6	≤ 2	

*1. The storage ambient temperature of the fan is –25 to 70°C, and the storage ambient humidity is 20 to 95 % RH.
*2. Do not use nor store the product under pressure higher than the atmospheric pressure of altitude 0 m. Doing so may cause malfunction.
*3. When used at an altitude higher than 2000 m, the upper limits of the permissible voltage and the operating ambient temperature become lower.
*4. When installing a ventilation fan in the control panel, situate in order that this does not interfere with the exhaust flow from the product fan.
*5. This indicates the section of the power supply to which the equipment is assumed to be connected between the public electrical power distribution network and the machinery within premises. Category Ⅱ applies to equipment for which electrical power is supplied from fixed facilities. The surge voltage withstand level for up to the rated voltage of 300 V is 2500 V.
*6. This index indicates the degree to which conductive material is generated in terms of the environment in which the equipment is used. Pollution level 2 is when only non-conductive pollution occurs. A temporary conductivity caused by condensing must be expected occasionally.
*7. No limitations to altitude. When used at a high altitude, the upper limits of the permissible voltage and the operating ambient temperature become lower. Please check performance before use at the customer side.
*8. Safety certificate: 0 to 45°C.

Performance specifications

■ MELIPC MI5000

Item	MI5122-VW	
	Windows® section	VxWorks® section
Hardware		
MPU	Intel® Core™ i7-5700EQ 2.60G Hz (Quad Core)	
Main memory*1 (byte)	12G	1G
Internal storage capacity (byte)	45G	4G
Extended storage interface	CFast™ card x 1*2	-
Software		
OS	Windows® 10 IoT Enterprise 2016 LTSB (64bit)	VxWorks®7.0
Programming language	Language supporting above OS	C/C++
Format of dedicated APIs	Standard DLL	C/C++ format
Display interface		
Interface	DisplayPort™ x 1	-
Resolution	Max. 3840 x 2160*3	-
Extended slot		
PCI Express®	-	
mini PCI Express®	-	
PCI	-	
RS-232		
Number of channels	1*4	
Transmission rate (bps)	9600…115200	
RS-422		
Number of channels	-	
Transmission rate (bps)	-	
RS-485		
Number of channels	-	
Transmission rate (bps)	-	
USB		
USB3.0	2	
USB2.0	2	
I/O terminal		
OS shutdown request input	●	
OS shutdown completed notification output	●	
Power supply (AC input)		
Rated input voltage	100…240 V AC	
Input voltage variable range (V AC)	85…264	
Input frequency	50/60Hz ± 5%	
Maximum input apparent power (VA)	139	
Others		
External dimensions (H x W x D, mm)	106 x 362 x 119	
Weight (kg)	2.7	

*1. Shared memory is 0.25 GB.
*2. Maximum capacity of option product is 64 GB.
*3. Maximum resolution at 60 Hz.
*4. Can be allocated to the Windows® section or VxWorks® section through parameter settings.

Performance specifications

■ MELIPC MI3000

Item	MI3000	
	MI3321G-W	MI3315G-W
Hardware		
MPU	Intel® Core™ i3-6100U 2.30GHz (Dual Core)	
Main memory (byte)	8G	
Internal storage capacity (byte)	64G	
Extended storage interface	M.2 (2280) SATA SSD x 1	
Software		
OS	Windows® 10 IoT Enterprise 2016 LTSB (64 bit)	
Programming language	Language supporting above OS	
Format of dedicated APIs	-	
Display specifications		
Display device*1*2	TFT color LCD	
Screen size	21.5" widescreen	15"
Resolution (dot)	Full HD: 1920 x 1080	XGA: 1024 x 768
Display colors	16.77 million	
Backlight specification	LED backlight (not replaceable)	
Life	50,000 hours	
Touch panel		
Type	PCAP (Projected Capacitive)	
Simultaneous press	Max. 10 keys*3	
Transmittance	90% ± 3%	
Display interface (for external monitor output)		
Interface	DisplayPort™ x 1	
Resolution*4	Max. 3840 x 2160	
Extended slot		
PCI Express®	x1 slot (half size) x 1	
mini PCI Express®	Full size x 2	
PCI	-	
RS-232		
Number of channels	2 (RS-422/485 can also be used for one of the two channels)*5	
Transmission rate (bps)	300…115200	
RS-422		
Number of channels	1 (RS-232/485 can also be used)*5	
Transmission rate (bps)	300…115200	
RS-485		
Number of channels	1 (RS-232/422 can also be used)*5	
Transmission rate (bps)	300…115200	
USB		
USB3.0	2	
USB2.0	2	
Sound output (ø3.5 mini-jack (3-prong))		
Interface	Audio Line-Out	
Number of ports	1	
I/O terminal		
OS shutdown request input	-	
OS shutdown completed notification output	-	
Power supply (DC input)		
Rated input voltage (V DC)	24	
Input voltage variable range (V DC)	19.2…28.8	
Input frequency (Hz)	-	
Maximum input apparent power (VA)	-	
Others		
POWER LED	2 colors (blue and orange)	
Environmental protective structure	IP66 (front face)	
External dimensions (H x W x D, mm)	349.8 x 558.4 x 88.8	307.3 x 383.2 x 86
Panel cutting dimensions (H x W, mm)	341.8 x 550.3	298.5 x 374.5
Weight (kg)	9.8	7.0

*1. As a characteristic of liquid crystal display panels, bright dots (always lit) and dark dots (never lit) may appear on the panel. Since liquid crystal display panels comprise a great number of display elements, the appearance of bright and dark dots cannot be reduced to zero. Individual differences in liquid crystal display panels may cause differences in color, uneven brightness and flickering. Note that these phenomena are characteristics of liquid crystal display panels and it does not mean the products are defective or damaged.

*2. Flickering may occur due to vibration, shock, or the display colors.

*3. Multiple touch keys cannot be pressed simultaneously while GT SoftGOT2000 is used.

*4. Maximum resolution at 60 Hz.

*5. The interface can be switched between RS-232, RS-422, and RS-485 with the BIOS.

■ MELIPC MI2000

Item	MI2000 MI2012-W(-CL)
Hardware	
MPU	Intel® Core™ i3-6102E 1.90G Hz (Dual Core)
Main memory (byte)	8G
Internal storage capacity (byte)	64G
Extended storage interface	2.5"SATA SSD/HDD x 2 CFast™ card x 1*1
Software	
OS	Windows® 10 IoT Enterprise 2016 LTSB (64bit)
Programming language	Language supporting above OS
Format of dedicated APIs	-
Display interface	
Interface	HDMI v1.4 x 1, DVI-I x 1
Resolution*2	Max. 1920 x 1080
Extended slot	
PCI Express®	x1, x2, x4, x8, x16 (half-size) x 1
mini PCI Express®	Full-size x 2
PCI	Half-size x 1
RS-232	
Number of channels	2 (RS-422/485 can also be used)
Transmission rate (bps)	9600…115200
RS-422	
Number of channels	2 (RS-232/485 can also be used)
Transmission rate (bps)	75…115200
RS-485	
Number of channels	2 (RS-232/422 can also be used)
Transmission rate (bps)	75…115200
USB	
USB3.0	6
USB2.0	-
I/O terminal	
OS shutdown request input	-
OS shutdown completed notification output	-
Power supply (AC input)	
Rated input voltage	AC adapter (input voltage: 100…240 V AC, output voltage: 24 V DC)*3
Input voltage variable range (V AC)	90…264
Input frequency (Hz)	47…63
Maximum input apparent power (VA)	170
Others	
External dimensions (H x W x D, mm)	177 x 142 x 238
Weight (kg)	3.9 (excluding AC adapter)

*1. Maximum capacity of option product is 64 GB.
*2. Maximum resolution at 60 Hz.
*3. A power supply cable included with MI2012-W is exclusively for 100 V AC in Japan. When using with other than 100 V AC or abroad, please purchase MI2012-W-CL and use an appropriate cable complying with the power supply used and the safety standard of the area.

Field network specifications

■ MELIPC

Item	MI5000		MI3000	MI2000
	Windows® section	VxWorks® section		
Ethernet				
Interface	10BASE-T/100BASE-TX/1000BASE-T			
Number of channels	1 (CH2)	1 (CH1)	3	2
CC-Link IE Field Network				
Station type	Master/local station		-	-
Transmission speed (bps)	1G		-	-
Max. number of connectable stations	120*1		-	-
Number of ports	1		-	-
Communications cable	Ethernet cable (Category 5e or higher, double shielded/ STP) straight cable		-	-
Network topology	Line type and star type*2		-	-
Overall cable distance (m)	Line type: 12,000 Star type: Depends on the system configuration		-	-
Max. station-to-station distance (m)	100		-	-
CC-Link IE Field Network Basic				
Station type	Master station		-	-
Number of remote stations on 1 network*3	64 (16 x 4 groups)		-	-
Number of ports	1		-	-
Network topology	Star type		-	-

*1. Up to 120 device stations can be connected.
*2. For star type connections, use a switching hub that supports CC-Link IE Field Network synchronized communications.
*3. Maximum number of remote stations managed by the master station. Changes depending on numbers of occupied remote stations. However, configure so the total number of occupied remote stations does not exceed the total number of connected devices.

Pre-installed software list

■ Edge application

Item	MI5000	MI3000	MI2000
GT SoftGOT2000	-	●	-

■ Edgecross

Item	MI5000	MI3000	MI2000
Edgecross Basic Software	●	●	●

■ Data collector

Item	MI5000	MI3000	MI2000
CC-Link IE Field Network Data Collector (MELIPC MI5122-VW)	●	-	-
SLMP Data Collector	●	●	●

■ Engineering software

Item	MI5000	MI3000	MI2000
MELSOFT MI Configurator	●	-	-

iQ-Edgecross compatible software list

■ Edge application

Item	MI5000	MI3000	MI2000
MELSOFT MaiLab	●	●	●
GT SoftGOT2000	●	● Pre-installed	●
GENESIS64™	●	●	●

■ Data collector

Item	MI5000	MI3000	MI2000
CC-Link IE Field Network Data Collector (MELIPC MI5122-VW)	●	-	-
CC-Link IE TSN Data Collector	●	●	●
CC-Link IE Field Network Data Collector *4	-	●	●
CC-Link IE Controller Network Data Collector *4	-	●	●
SLMP Data Collector	●	●	●
OPC UA Data Collector	●	●	●
MTConnect® Data Collector	●	●	●

*4. The network interface board by Mitsubishi Electric is required separately. For further details, please refer to the option list on page 28.

Operating environment

■ MELSOFT MaiLab

Item	Specifications	
	Required	Recommended
Learning operating environment		
Personal computer	Personal computer, industrial PC, server	
CPU	Equivalent to Intel® Core™ i3 or higher	Equivalent to Intel® Core™ i7 or higher*1
Memory	4 GB or more	16 GB or more*1
OS	English version, Japanese version, or Simplified Chinese version	
	64 bits	
	Windows® 10 (Pro, Enterprise, IoT Enterprise) Windows Server® 2019 (Datacenter, Standard, Essentials) Windows Server® 2016 (Datacenter, Standard, Essentials)	
Available storage capacity	16 GB or more	64 GB or more*1
Collection/diagnosis operating environment		
Personal computer	Personal computer, industrial PC, server	
CPU	Equivalent to Intel® Core™ i3 or higher	Equivalent to Intel® Core™ i7 or higher*1
Memory	4 GB or more	8 GB or more*1
OS	English version, Japanese version, or Simplified Chinese version	
	64 bits	
	Windows® 10 (Pro, Enterprise, IoT Enterprise) Windows Server® 2019 (Datacenter, Standard, Essentials) Windows Server® 2016 (Datacenter, Standard, Essentials)	
Available storage capacity	16 GB or more	32 GB or more*1

*1. Required for performing not only a method with a small amount of calculation processing such as multiple regression analysis but also a method with a large amount of calculation processing such as deep learning.

Product list

MELIPC

Type	Model	Outline
MELIPC MI5000	MI5122-VW	Edgecross Basic Software, CC-Link IE Field Network Data Collector (MELIPC MI5122-VW), SLMP Data Collector, MI Configurator pre-installed
MELIPC MI3000	MI3321G-W	TFT color LCD, 21.5" widescreen, Full HD, Panel color Black Edgecross Basic Software, SLMP Data Collector, GT SoftGOT2000 pre-installed
	MI3315G-W	TFT color LCD, 15" XGA, Panel color Black Edgecross Basic Software, SLMP Data Collector, GT SoftGOT2000 pre-installed
MELIPC MI2000	MI2012-W	Edgecross Basic Software, SLMP Data Collector pre-installed
	MI2012-W-CL	Edgecross Basic Software, SLMP Data Collector pre-installed power supply cable is not included

Option

Type	Model	Outline
Power supply module	MI5A1P	Replacement module for MI5000
Fan unit	MI5FAN	Replacement module for MI5000
Battery	FX3U-32BL	For MI5000, for preserving clock data*1
CFast™ card	NZ1MEM-16GBCFT	For MI2000/MI5000 expansion storage 16GB
	NZ1MEM-32GBCFT	For MI2000/MI5000 expansion storage 32GB
	NZ1MEM-64GBCFT	For MI2000/MI5000 expansion storage 64GB
CC-Link IE Field Network interface board	Q81BD-J71GF11-T2	Master/local station, PCI Express® slot*2
	Q80BD-J71GF11-T2	Master/local station, PCI/PCI-X® slot*2
CC-Link IE Controller Network interface board	Q81BD-J71GP21-SX	Control/normal station, PCI Express® slot*3
	Q81BD-J71GP21S-SX	Control/normal station, PCI Express® slot, with external power supply input terminals*3
	Q80BD-J71GP21-SX	Control/normal station, PCI/PCI-X® slot*3
	Q80BD-J71GP21S-SX	Control/normal station, PCI/PCI-X® slot, with external power supply input terminals*3

*1. Same battery as the MELSEC iQ-F/F Series
*2. Required when using CC-Link IE Field Network Data Collector.
*3. Required when using CC-Link IE Controller Network Data Collector.

Engineering software

Type	Model	Outline
CW Workbench 4	SW1DND-CWW4-E	For MI5000, C/C++ development environment (product with license)
	SW1DND-CWW4-EZ	For MI5000, C/C++ development environment (additional license product)
	SW1DND-CWW4-EVZ	For MI5000, C/C++ development environment (update license product)
MELSOFT GT Works3	SW1DND-GTWK3-EC	For MI3000, software to design GT SoftGOT2000 screens (English version, site license product*4)

*4. Anyone can use the product as long as that person belongs to the business office (including overseas offices) of the corporation that purchased the product, or to the same public vocational training facility or other educational institution as the corporation.

iQ Edgecross

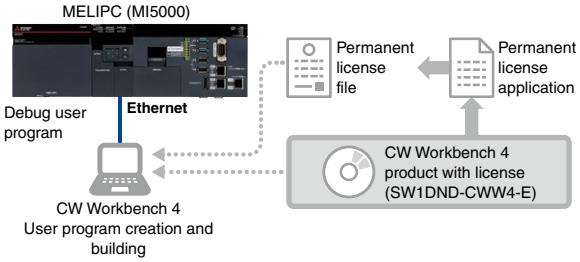
Type	Model	Outline
MELSOFT MaiLab	SW1DND-MAILAB-MQ12	Data science tool for MI5000/3000 (basic license, new)
	SW1DNN-MAILABRE-MQ12	Data science tool for MI5000/3000 (basic license, renewal)
	SW1DNN-MAILABAN-MQ12	Data science tool for MI5000/3000 (additional user license, new/renewal)
	SW1DND-MAILABPR-M	Data science tool for MI5000/3000 (additional diagnosis license, 1 license)
	SW1DND-MAILABPR-MA5	Data science tool for MI5000/3000 (additional diagnosis license, 5 licenses)
	SW1DND-MAILABPR-MA10	Data science tool for MI5000/3000 (additional diagnosis license, 10 licenses)

CW Workbench 4 license

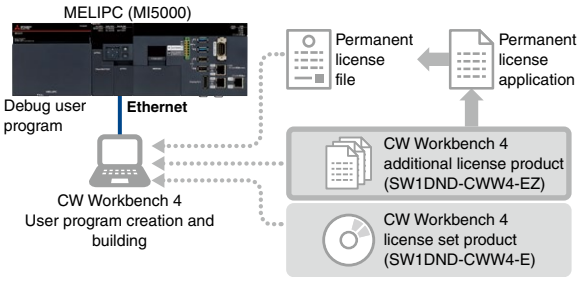
When purchasing a new license

Purchase one permanent license for each computer using CW Workbench 4. To install CW Workbench 4 in more than two computers, purchase additional permanent licenses for required number of computers.

CW Workbench 4 Product with license



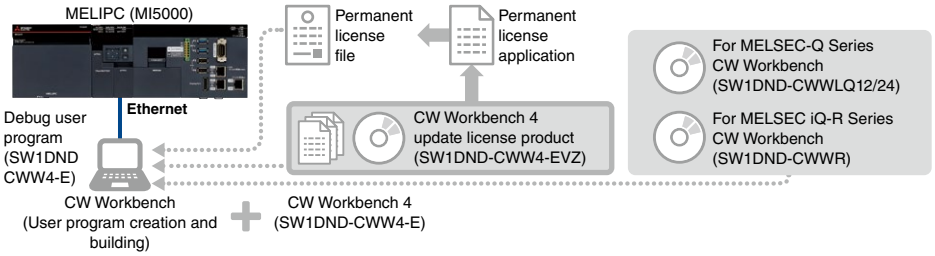
Additional license product



When CW Workbench is already used

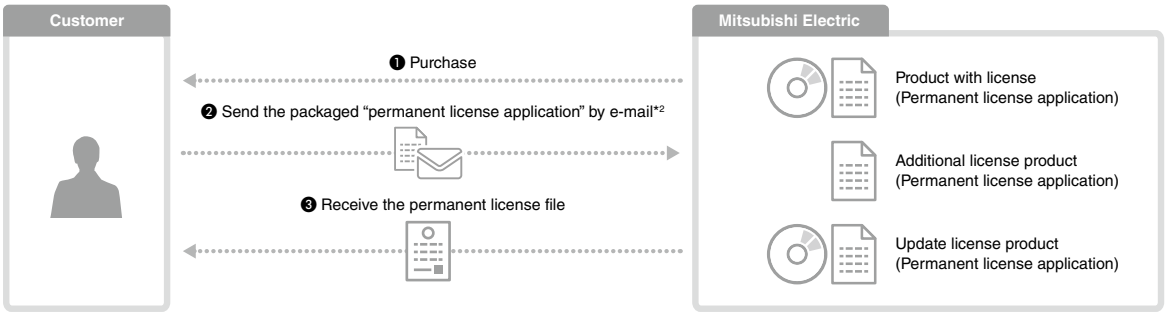
When already using CW Workbench for MELSEC iQ-R/Q Series C controller module, purchase an update license product of CW Workbench 4. *1

CW Workbench 4 Update license product



*1. Install CW Workbench (SW1DND-CWWLQ12/24•SW1DND-CWWR) and CW Workbench 4 (SW1DND-CWW4) in a separate folder. Also, CW Workbench and CW Workbench 4 cannot be started at the same time.

Product purchasing information



*2. A temporary license can be used until the permanent license is received (approximately 1 month).

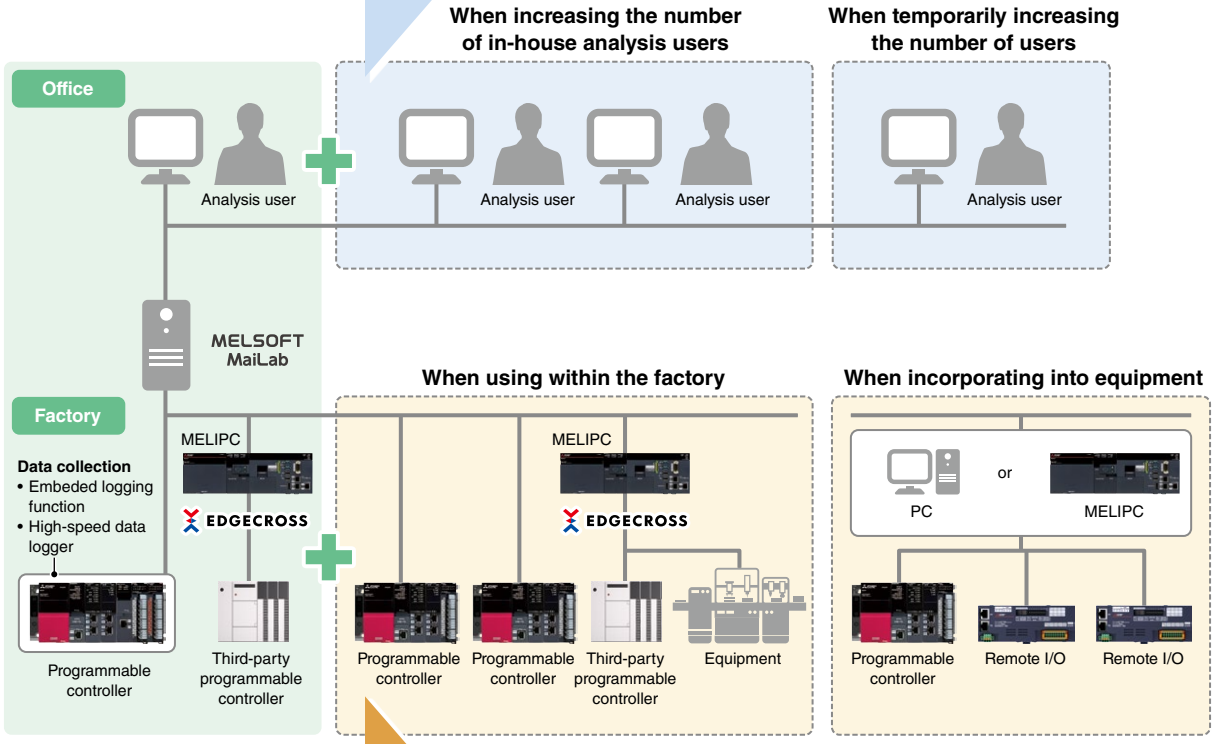
MELSOFT MaiLab license

Data collection and diagnosis can be started in MELSOFT MaiLab with just a basic license. In addition, systems can be freely configured according to the scale of facilities, increases in the number of analysis users, etc.

Additional user license — Annual renewal

●Flexibly respond to increases or decreases in the number of analysis users

Analysis users can be added.
Licenses for the analysis users that you want to add can be granted by linking them to the basic license.
Even temporary increases in personnel can be flexibly handled.



Additional diagnosis licenses — One-time purchase

●For factory expansion or incorporation into mass-production products

Equipment and facilities subject to diagnosis can be expanded.
There are no renewal costs when adding equipment within the factory, or when incorporating data diagnosis systems into mass-production equipment.

Extensive global support coverage providing expert help whenever needed

Global FA centers

EMEA

Europe FA Center
MITSUBISHI ELECTRIC EUROPE B.V. Polish Branch
Tel: +48-12-347-65-00

Germany FA Center
MITSUBISHI ELECTRIC EUROPE B.V. German Branch
Tel: +49-2102-486-0 / Fax: +49-2102-486-7780

UK FA Center
MITSUBISHI ELECTRIC EUROPE B.V. UK Branch
Tel: +44-1707-27-8780 / Fax: +44-1707-27-8695

Czech Republic FA Center
MITSUBISHI ELECTRIC EUROPE B.V. Czech Branch
Tel: +420-734-402-587

Italy FA Center
MITSUBISHI ELECTRIC EUROPE B.V. Italian Branch
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Shanghai FA Center
MITSUBISHI ELECTRIC AUTOMATION (CHINA) LTD. Shanghai FA Center
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Tianjin FA Center
MITSUBISHI ELECTRIC AUTOMATION (CHINA) LTD. Tianjin FA Center
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Taipei FA Center
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India Coimbatore FA Center
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India Gurgaon FA Center
MITSUBISHI ELECTRIC INDIA PVT. LTD. Gurgaon Head Office
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India Pune FA Center
MITSUBISHI ELECTRIC INDIA PVT. LTD. Pune Branch
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USA

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Mexico

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Mexico FA Center
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Mexico Monterrey FA Center
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Tel: +52-55-3067-7599

Brazil

Brazil FA Center
MITSUBISHI ELECTRIC DO BRASIL COMERCIO E SERVICOS LTDA.
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- Overview of available factory automation products
- Library of downloadable literature
- Support tools such as online e-learning courses, terminology dictionary, etc.
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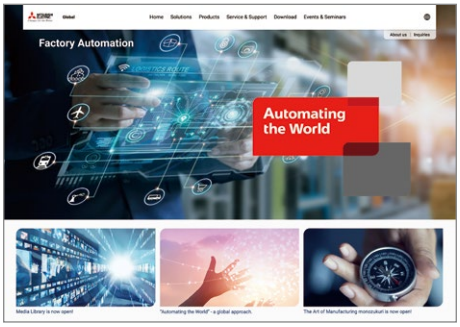

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Reference: Edgecross Consortium
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