

FA Remote Solutions

e-Factory



GLOBAL IMPACT OF MITSUBISHI ELECTRIC



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

Changes for the Better

"Changes for the Better" represents the Mitsubishi Electric Group's attitude to "always strive to achieve something better", as we continue to change and grow. Each one of us shares a strong will and passion to continuously aim for change, reinforcing our commitment to creating "an even better tomorrow".

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

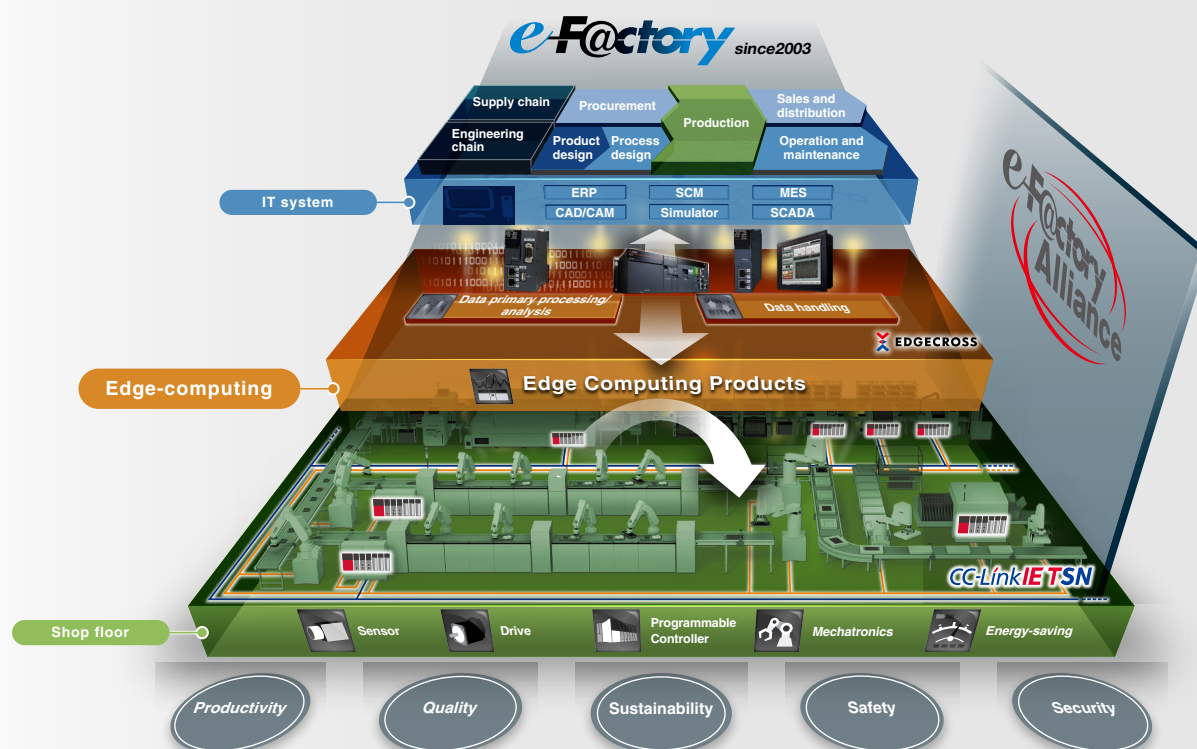
Maximizing productivity and efficiency with cutting-edge automation technology.

Our advances in AI and IoT are adding new value to society in diverse areas from automation to information systems. The creation of game-changing solutions is helping to transform the world, which is why we are honored to be recognized in the 2019 "Forbes Digital 100" as one of world's most influential digital corporations.





The “e-F@ctory” FA-IT integrated solution proposes ways of utilizing FA and IT technologies that reduce the total cost of development, production, and maintenance activities, continuously support customer kaizen activities, and promote monozukuri that is one step ahead.



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Accelerating the shift to remote monozukuri and diversifying work styles in the FA remote solutions provide this support.

Technological innovation is accelerating the diversification of work styles, and the manufacturing industry is no exception. As it becomes the norm to address monitoring, maintenance, service, and development requirements anywhere, anytime, tangible benefits include less production downtime and reduced travel costs.

Mitsubishi Electric's FA remote solutions facilitate the diversification of work styles and contribute to improving the competitiveness of all companies involved in monozukuri.

Remote Monitoring

Value

Check factory KPI and other data **anytime**

Remote operation of shop floor HMI (GOT)



Collection and visualization of shop floor data



Remote Maintenance

Value

Immediately address problems without needing to go to the shop floor.

Remote operation of onsite PLCs, cameras, etc.

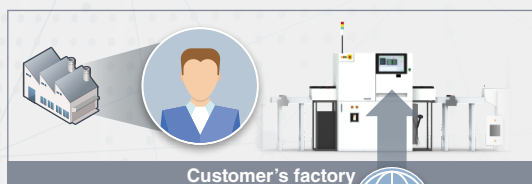


Remote Service

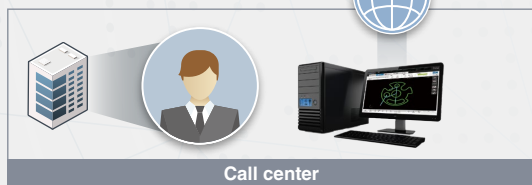
Value

Experts respond immediately, even in the case of equipment issues

Secure remote functions added to equipment



Customer's factory



Call center

Remote Development

Value

Working from home, smoothly coordinate with partner companies as if in the **same environment as the shop floor**

Provide a place for collaborative work




■ Safety Precautions

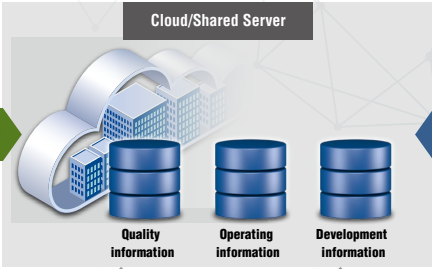
When using remote operation functions, ensure the safety of the shop floor in order to handle unexpected situations such as communication delays or interruptions.



Remote Monitoring
Centralized KPI monitoring of multiple locations



GENESIS64™



Remote Development
Development while smoothly coordinating from anywhere



Remote Monitoring
Monitoring of shop floor status



GOT Mobile


Remote Maintenance
Remote maintenance of devices



GX Works3



Remote Service
Experts respond immediately



Case 1	Want to easily check equipment status from a remote location	P.7
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Case 4	Want to monitor factory energy use from a remote location	P.10
Case 5	Want to perform centralized monitoring of multiple locations	P.11

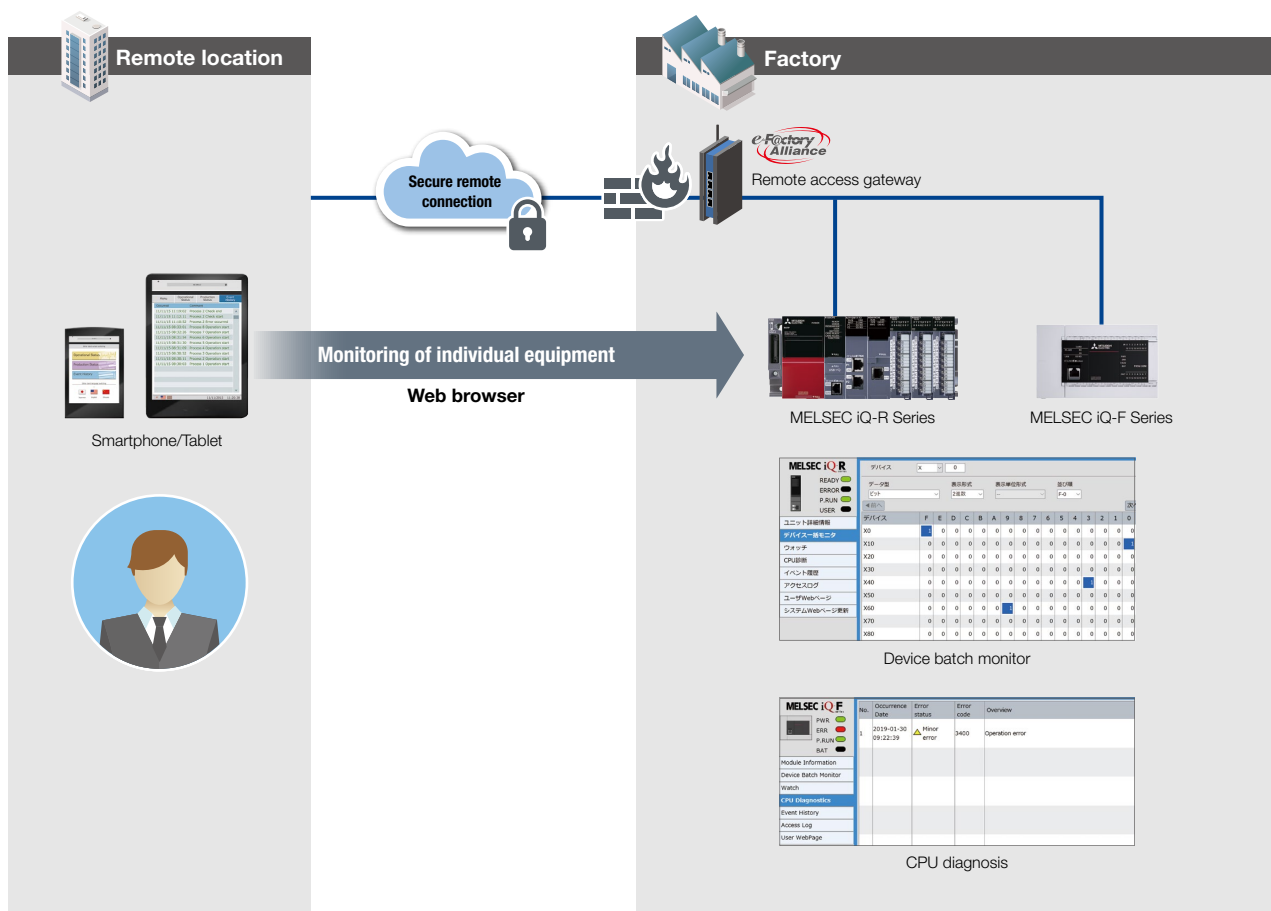
Case 6	Want to be able to smoothly handle issues and start-up production lines even without engineers on the shop floor	P.12
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Case 9	Want to streamline the development of large-scale programs such as PLCs	P.15



Remote Solutions

Solution

* Using the Ewon/Secomea remote solution, users can easily and safely construct a remote access environment.



■ Even without a special-purpose tool, users can view equipment status via a smartphone or tablet web browser, and then respond appropriately based on facts and data.

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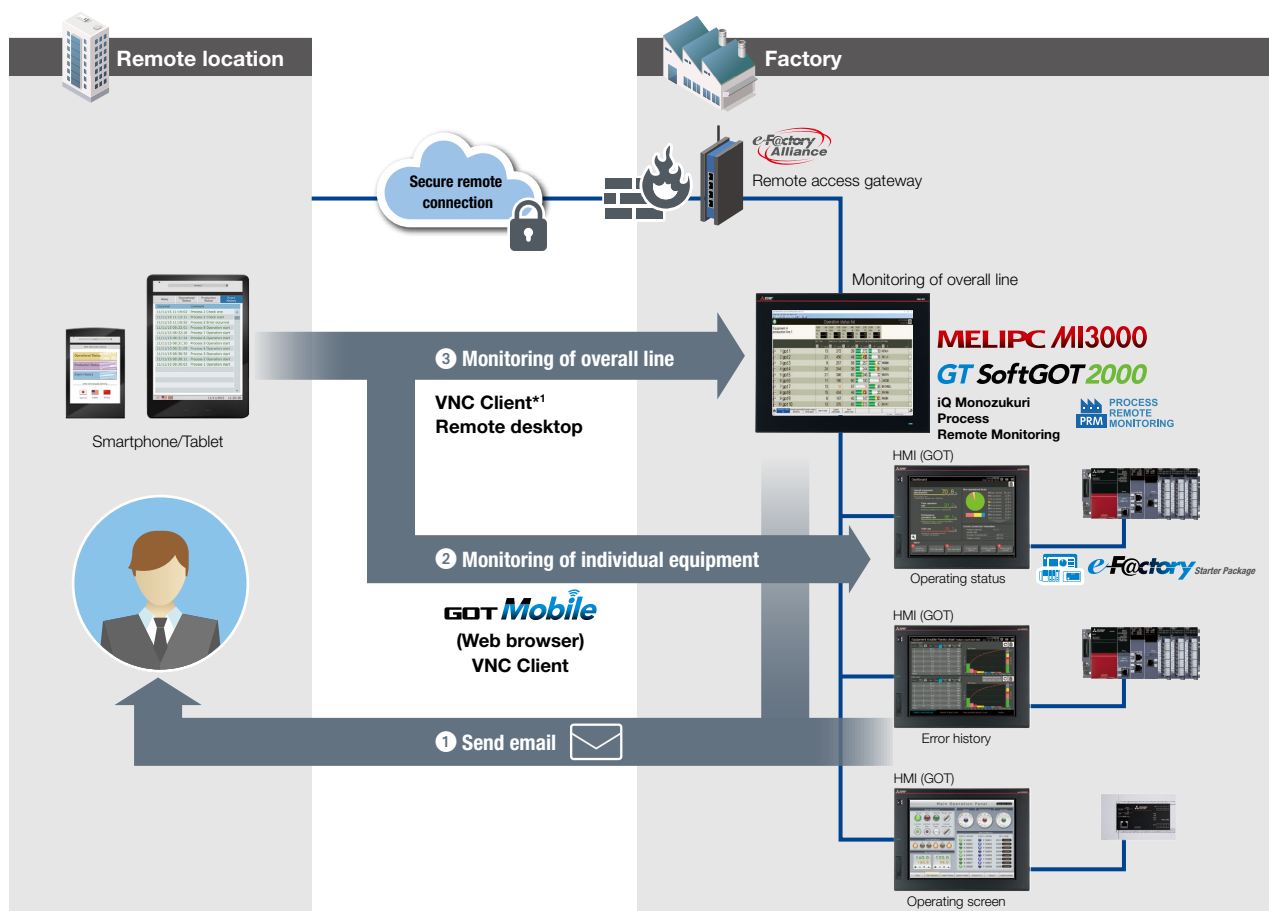


Want to grasp the operating status of production equipment and the overall production line from a remote location

Solution

- (1) Notify user of error with the email transmission function of the GOT2000 Series.
- (2) Utilizing the GOT Mobile function, users can review/monitor the operating status of equipment visualized with e-F@ctory Starter Package, etc. on a web browser.
- (3) Introduced iQ Monozukuri Process Remote Monitoring to MI3000 (preinstalled on GT SoftGOT2000) for monitoring of entire line. Moreover, enabled remote monitoring of overall line from VNC Client.

* Using the Ewon/Secomea remote solution, users can easily and safely construct a remote access environment.



* When connecting with VNC Client, the computer (MI3000) installed with SoftGOT2000 requires VNC server software.

Benefits

- User notices errors quickly due to email notifications therefore can response more swiftly.
- Even when traveling, user can grasp equipment/overall line status from a web browser or VNC Client on a smartphone, tablet, etc., and take the appropriate response.

Product

GOT2000 Series

P.20

e-F@ctory Starter Package

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MELIPC Series

P.23

e-F@ctory Alliance HMS Ewon Cosy Series

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e-F@ctory Alliance Secomea SiteManager Series

P.31

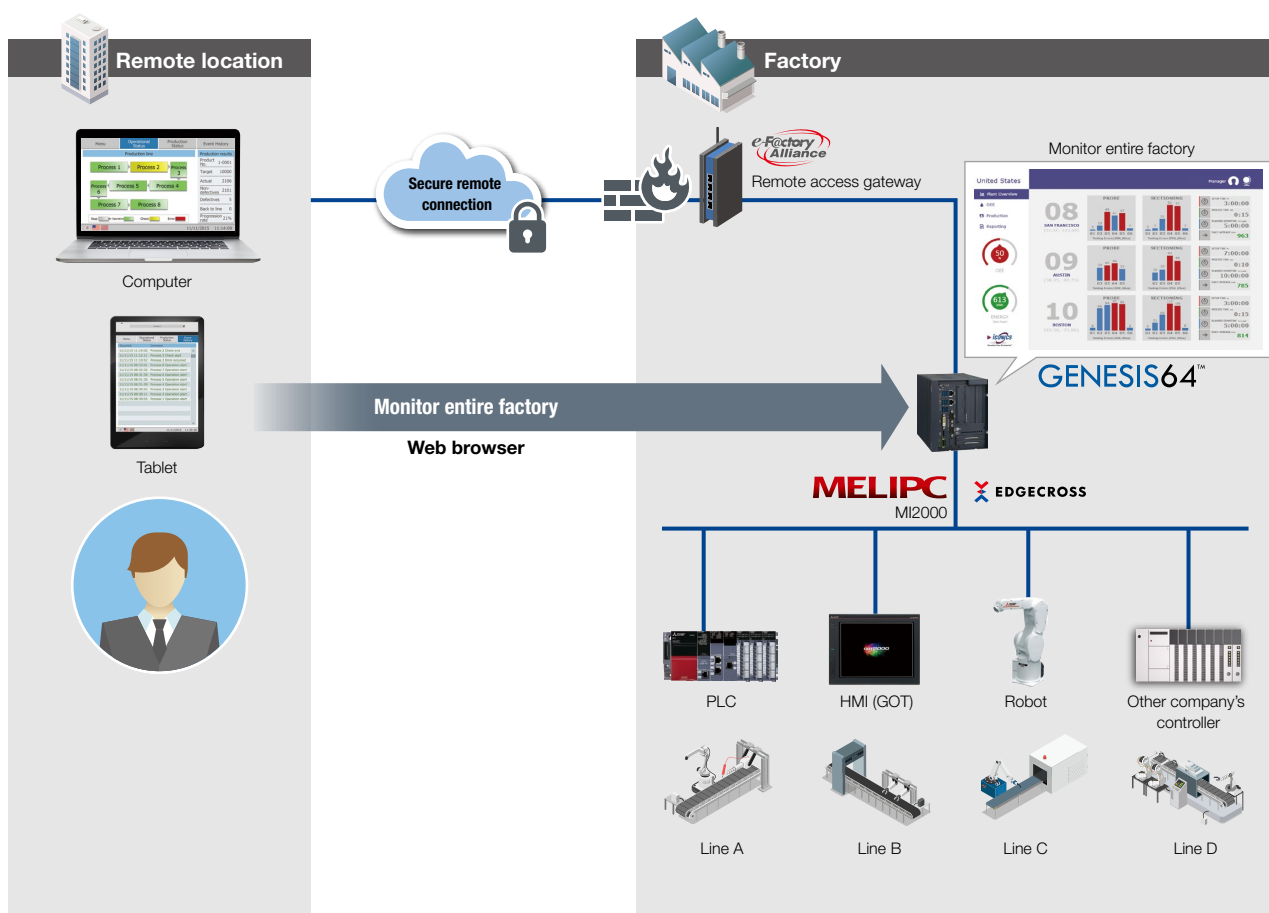


Want to monitor operating status of overall factory from a remote location

Solution

Introduce GENESIS64™ to production shop floors and monitor operating status on a web browser.

* Using the Ewon/Secomea remote solution, users can easily and safely construct a remote access environment.



Benefits

- Able to check production status on a graphical screen from a remote location just as if the user was on the shop floor.

Product

MELIPC Series

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GENESIS64™

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e-Factory Alliance HMS Ewon Cosy Series

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e-Factory Alliance Secomea SiteManager Series

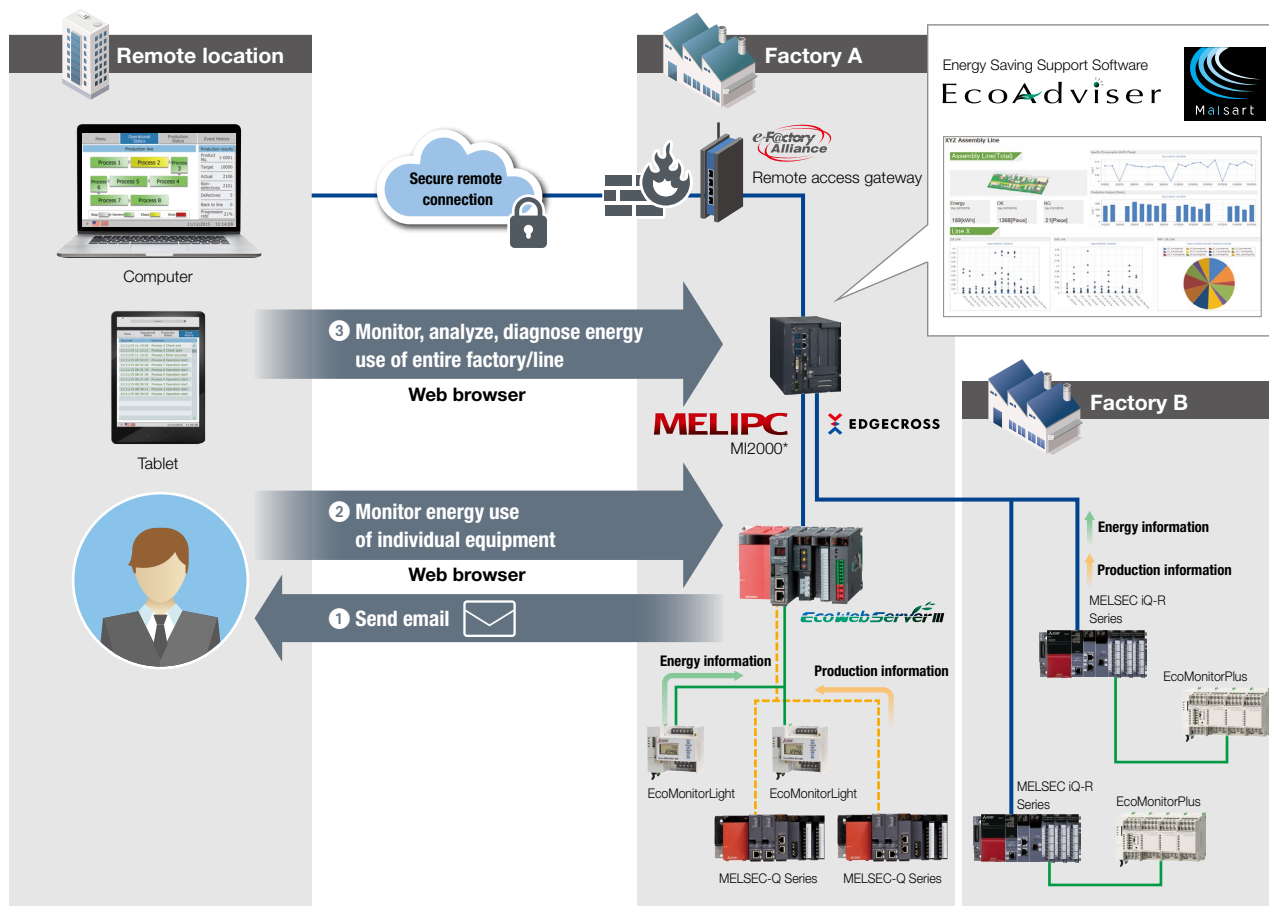
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Want to monitor factory energy use from a remote location

Solution

- (1) Email notifications from EcoWebServerIII alert users of equipment errors and exceeded demand target values.
- (2) Energy/Demand-related information can be reviewed from a remote location on a web browser.
- (3) The “EcoAdviser” Energy Saving Support Software analyzes energy use of the entire factory/line and provides the user with diagnostic results.

* Using the Ewon/Secomea remote solution, users can easily and safely construct a remote access environment.



* Can be used on general-purpose computers (Windows® 10).

Benefits

- By detecting equipment errors and exceeded demand target values through email notifications, customers can respond swiftly.
- Improve efficiency by checking factors that cause energy loss using AI diagnosis from anywhere.

Product

MELIPC Series

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EcoAdviser

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EcoWebServerIII

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e-Factory Alliance HMS Ewon Cosy Series

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e-Factory Alliance Secomea SiteManager Series

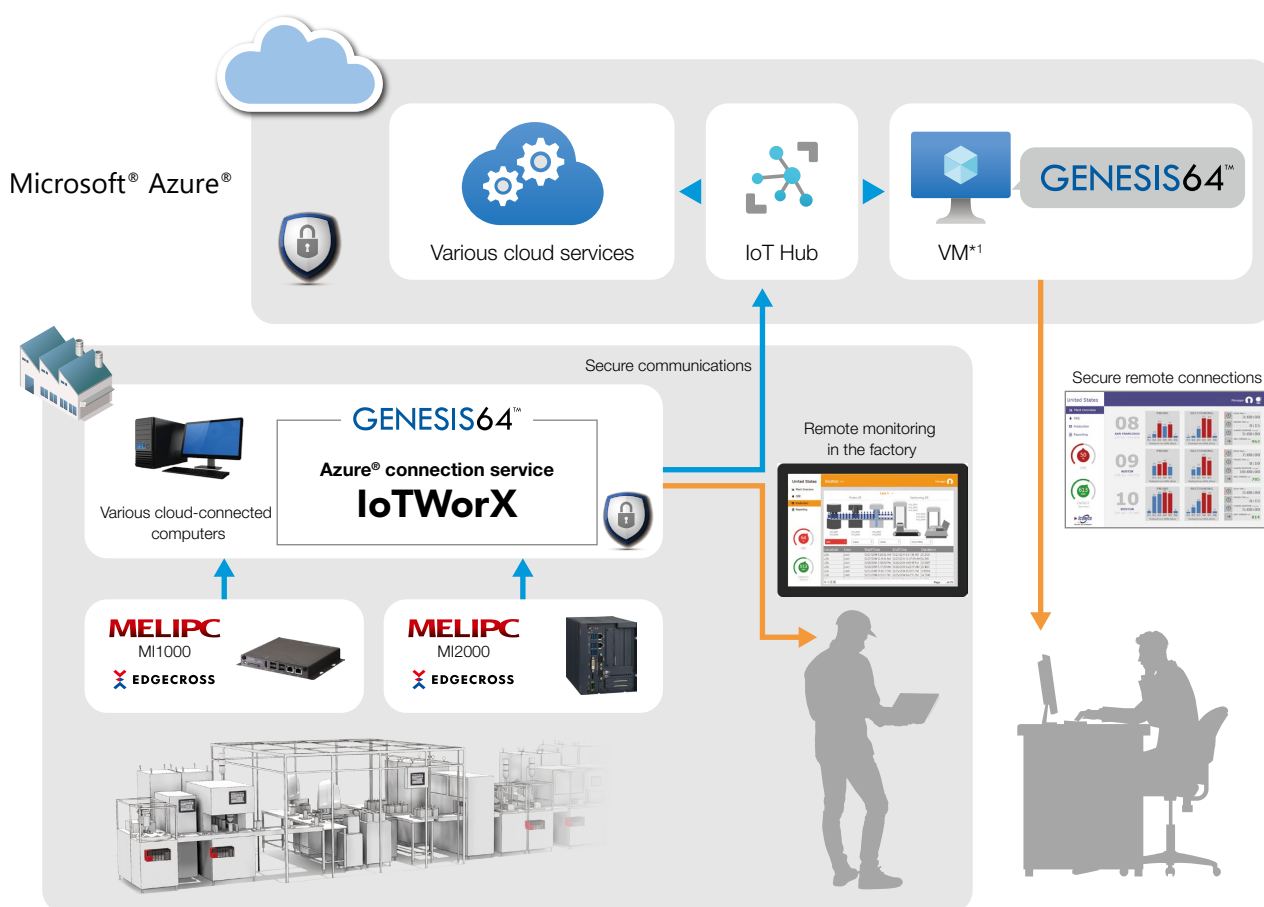
P.31

Want to perform centralized monitoring of multiple locations

Solution

Gather information related to equipment operation and quality on factory computers and SCADA GENESIS64™ of cloud VM*1 and share via the web.

Cloud coordination from Edgexcross is carried out via secure communication from GENESIS64™ to Microsoft® Azure®.



*1 VM: Virtual machine. This use case uses Microsoft® Azure® Virtual Machines.

Benefits

- Monitor operating status and quality information for each factory not only from within a factory, but also on any device in an environment with an internet connection.
- Flexibly respond to future global expansion.

Product

MELIPC Series

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GENESIS64™

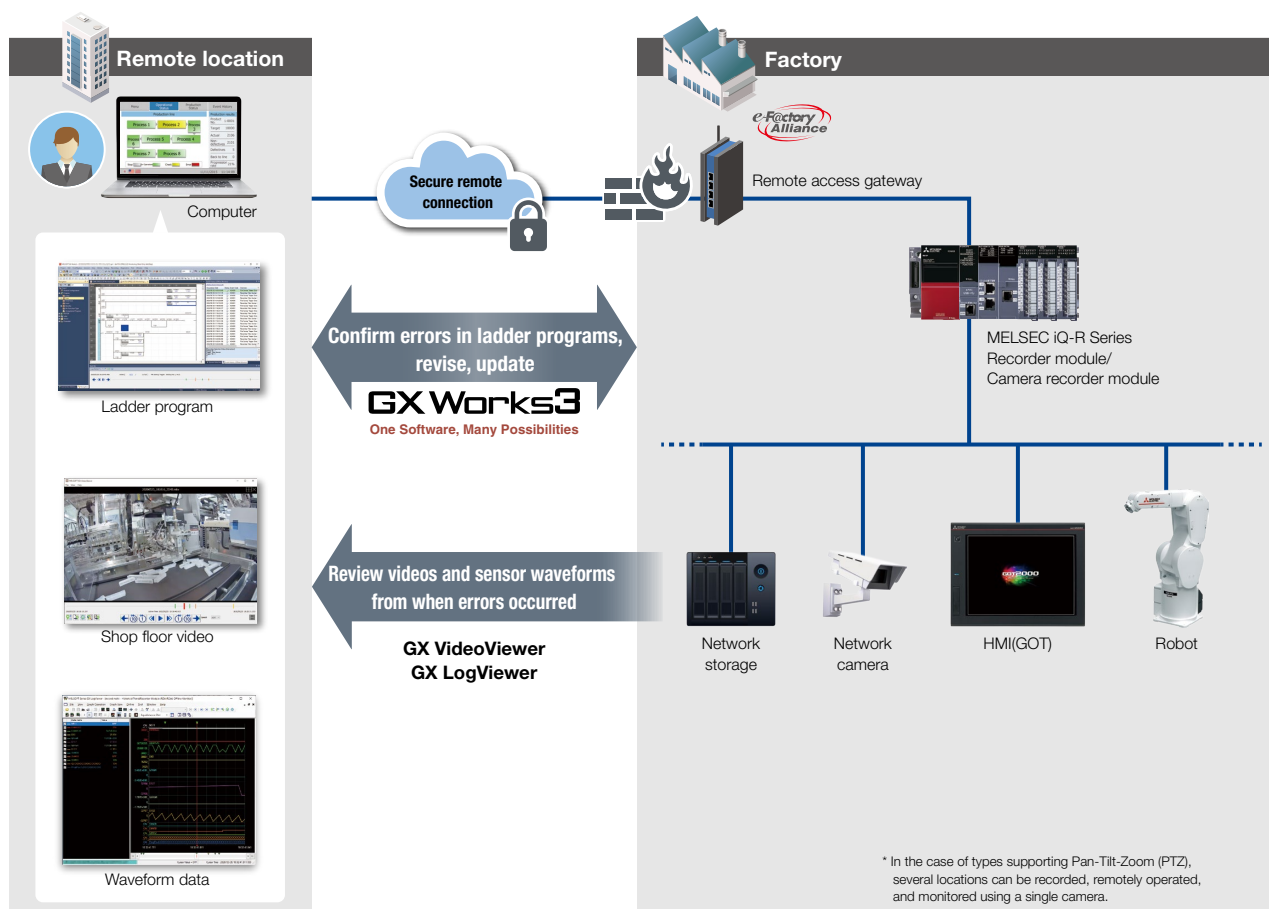
P.24

Want to be able to smoothly handle issues and start-up production lines even without engineers on the shop floor

Solution

- (1) Completely record equipment operating data and video when errors occur on a system recorder.
- (2) Use a log marker from a remote location to synchronize and display waveform data, programs, and video, and share analysis content.

* Remote environments are built easily and securely with Ewon/Secomea remote solutions.



Benefits

- Downtime is reduced as equipment designers and maintenance personnel can immediately begin remote surveys and make accurate decisions based on data.
- Travel costs are reduced when a problem can be resolved simply by giving instructions from a remote location.
- Related personnel can view the operating data and videos of equipment in real time and share knowledge to solve problems smoothly.

Product

MELSEC iQ-R Series Recorder module

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MELSOFT GX Works3

P.27

HMS Ewon Cosy Series

P.30

Secomea SiteManager Series

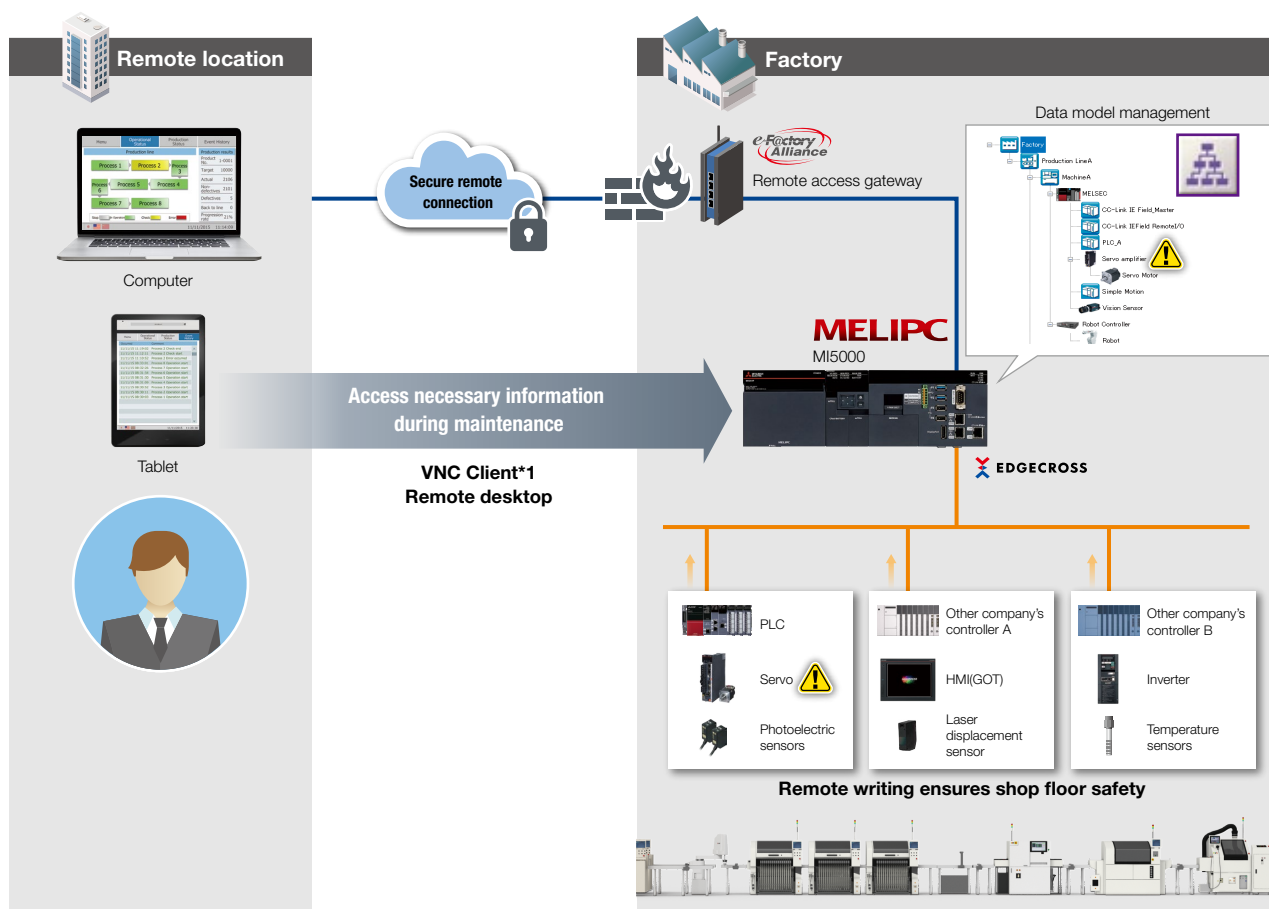
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Want to be able to immediately access device configuration and other relevant information for equipment requiring maintenance from a remote location

Solution

- (1) Pre-register factory/line/equipment configuration and related information (device manual program) in Edgecross data model management.
- (2) From a remote location, Edgecross data model management enables the user to drill down to the intended equipment, ascertain the current status, and carry out maintenance.

* Remote environments are built easily and securely using Ewon/Secomea remote solutions



*1 When connecting with VNC Client, the computer (MI5000) installed with Edgecross requires VNC server software.

Benefits

- The equipment configuration is provided in a tree structure so the relationship between equipment can be intuitively understood.
- Necessary information can be understood immediately, enabling swift and accurate maintenance to be performed.

Product

MELIPC Series

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HMS Ewon Cosy Series

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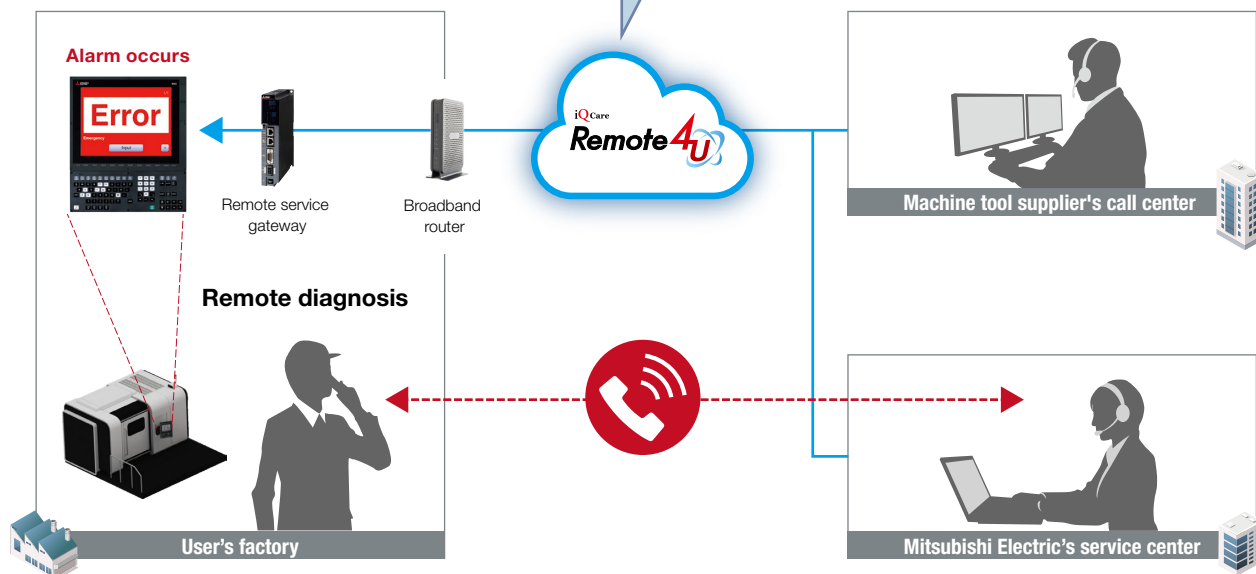
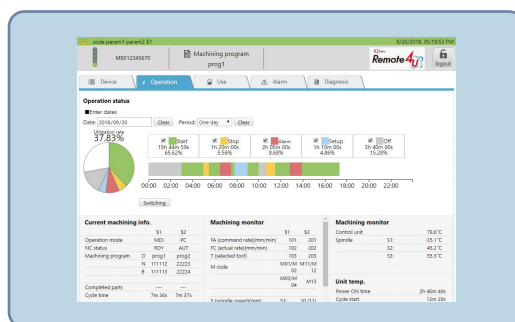
Secomea SiteManager Series

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Want to propose remote services to users for machine tools

Solution

- (1) Through the iQ Care Remote4U platform, added a remote service function to machines equipped with Mitsubishi Electric's computerized numerical controllers (CNC).
- (2) Through a cloud server provided by Mitsubishi Electric, enabled remote access from the machine manufacturer's call center or our service center.



* Please contact your nearest Mitsubishi Electric overseas office regarding which regions offer this service.

Benefits

- Able to monitor operating information for machines equipped with Mitsubishi Electric CNC in real-time.
- Remote diagnosis of CNCs on users' machines improves maintainability and reduces machine downtime.

Product

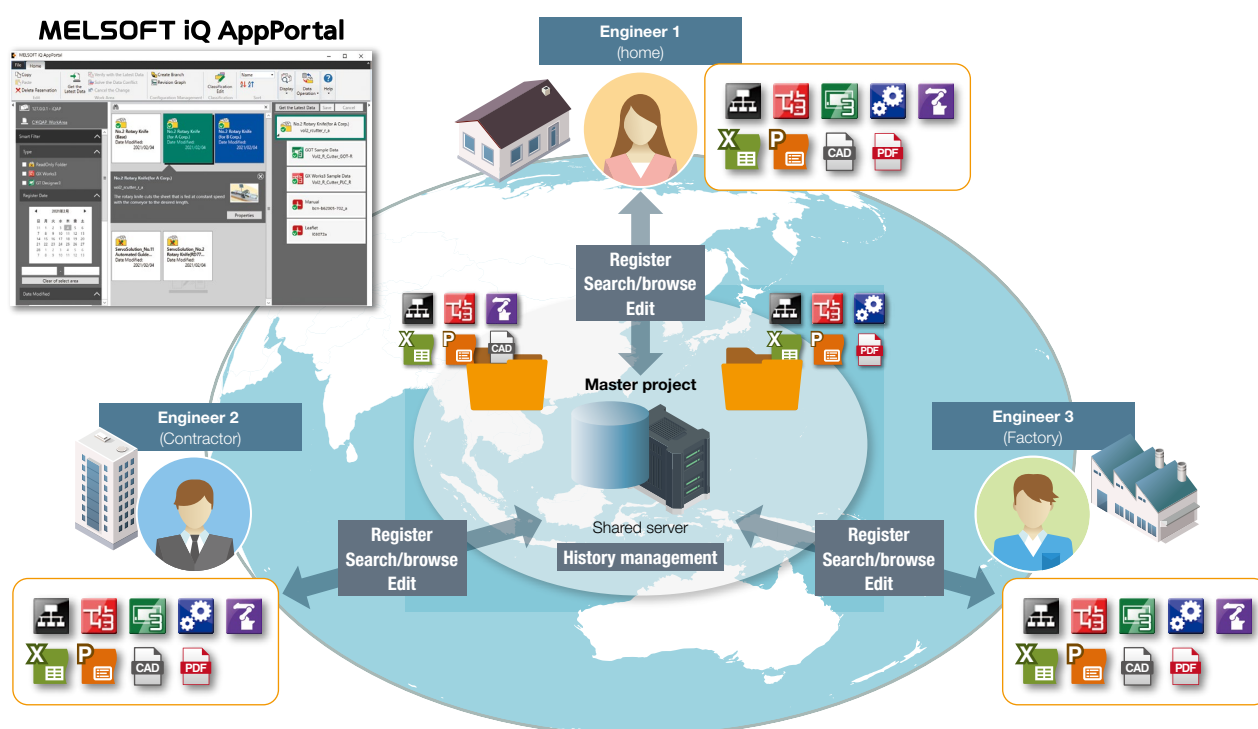
CNC Remote Service

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Want to streamline the development of large-scale programs such as PLCs

Solution

Use MELSOFT iQ AppPortal for centralized management of programs, documents and materials related to device design on the company server. Each person in charge refers to the same materials and programs in every scene while simultaneously continuing development.



Benefits

- Monitor rework by preventing accidental overwriting of the latest files edited by other people.
- Ascertain changed locations and latest version based on history management to secure quality.

Product

MELSOFT iQ AppPortal

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Product Introduction



MELSEC iQ-R/iQ-F Series CPU module

With today's tough cost competition, improving the production line operating ratio is essential.

The MELSEC iQ-R Series features a variety of maintenance functions for preventive maintenance that contribute to avoiding unforeseen trouble and enable early recovery, thereby ultimately improving the operating ratio. This, in turn, contributes to reducing downtime, improving productivity, and maintaining the quality standard of the products being manufactured.

MELSEC iQ-F Series is used to enhance functions and services that improve when IoT is incorporated. MELSEC iQ-F Series finds solutions to the various "issues" faced by production shop floors, such as improving productivity, strengthening security, and coordinating IoT.



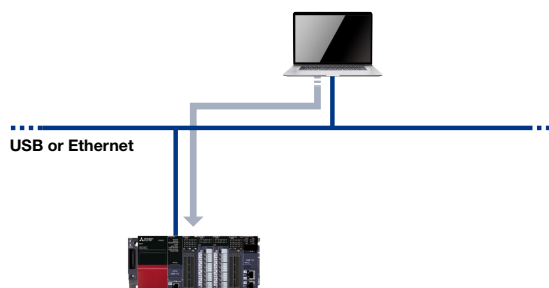
Web Server Function

By accessing the web server from a web browser of a computer, tablet, etc., it is possible to write and read data of devices belonging to the CPU unit, batch monitor device data, perform device tests, etc. Moreover, by setting access authority for each user, it is possible to limit the pages each user can view/write to.



Data Logging Function

By installing a CPU unit logging setting tool on a computer in a remote location, the CPU unit can be accessed via EZ Socket in order to read, write, or delete logging settings.

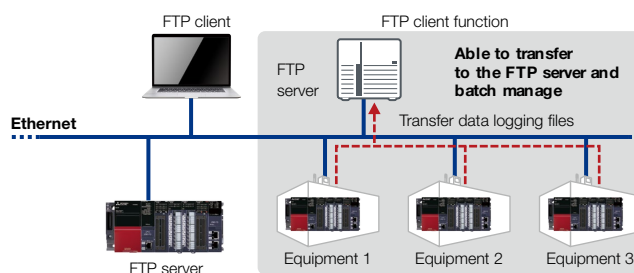


FTP Server/Client Function

By installing general-purpose FTP client software on a computer at a remote site, a user can access the CPU's FTP server from the FTP client software. It is also possible to automatically transfer logging files to the FTP server. (FTP client function)

	iQ-R	iQ-F	
		FX5U/FX5UC	FX5UJ
Web server function	△	●	△
Data logging function	●	●	●
FTP server	●	●	●
FTP client function	△	●	—

●: Supported △: Partially supported —: Not supported
(Please see the catalog for details.)



MELSEC iQ-R Series Recorder module

MELSEC iQ-R Recorder Module is a dedicated logging module for Mitsubishi Electric's "System Recorder" post-maintenance solution, which significantly reduces machine downtime through "complete recording" and "easy analysis" of system operating status during error occurrence.

Data from before/after certain preset triggers can be scanned every time and collected with timestamps. When setting recording, there's no need to worry about the target for data collection, and swift recovery is supported.



System Recorder Using Recorder Unit (post-maintenance solution)

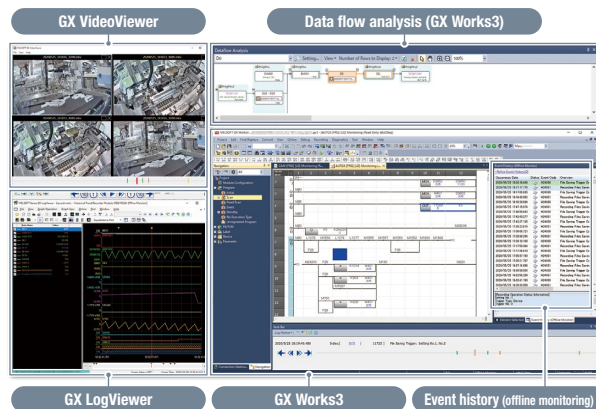
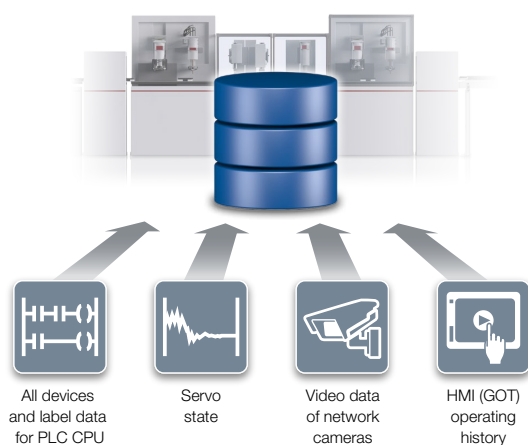
Significantly reduces machine downtime with "complete recording" and "easy analysis" of system operating status during error

Complete recording

- Complete recording of all data required for error analysis
- Complete system recording
- Complete prolonged recording

Easy analysis

- Display all data on the same timeline
- Expresses influencing factors in straightforward terms
- High-productivity programs also offer speedy solutions



Complete recording

When problems arise for equipment with multiple devices, it is necessary to find out the facts before and after such an occurrence (when, where, and what happened) in order to recover normal operation.

The Recorder Unit records control data of multiple equipment/devices so that the circumstances both before and after the problem occurs can be reproduced offline anytime. In addition, the Recorder Unit records all workpiece conditions and operation history.



Want to record video and data

Recording function (MELSEC iQ-R Series)

- **All device/label logging per sequence scan**
Recorder Unit exhaustively records changes in all devices/labels
- **All labels/FB logging of the PLC**
Unconsciously records all device addresses/system configurations
- **Event history**
Records device/label operations from external devices
- **General-purpose network camera video**
Records visual information such as work behavior and user's behavior

Also want to record drive system conditions

MELSERVO-J5 Series/MELSEC iQ-R Series Motion module

- **All device/label logging per sequence scan**
Timestamped and accurate recording of motion control data that operates faster than a PLC scan

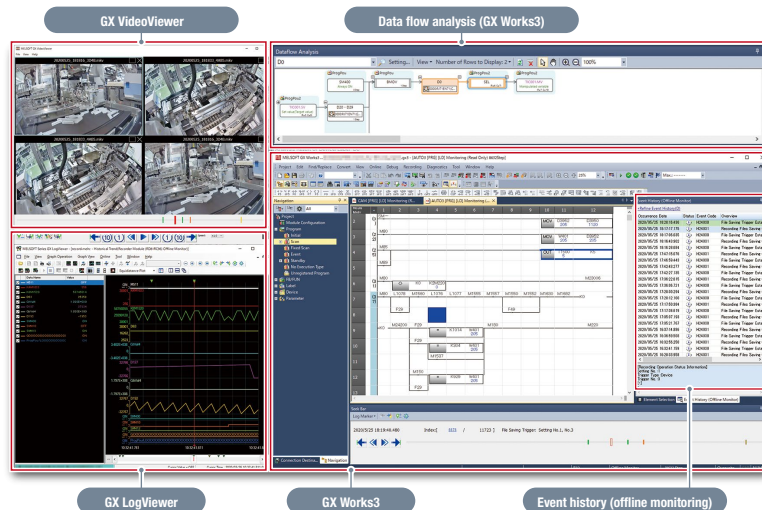
Also want to record users' operations

GOT2000 Series

- **Records HMI (GOT) operation history and alarm history**
Records operation history of shop floor workers and alarm information for connected devices

Easy analysis

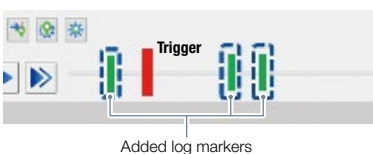
The data collected through complete recording (recording file) can be reproduced offline together with program operation transition. Moreover, by confirming data together with camera video footage, this function enables marking of potentially problematic points (time of error occurrence) from the video. The reviewer can share the equipment conditions at the marked time with shop floor workers, maintenance personnel and designers, thus smoothly communicating to ensure everyone has the same understanding of the error occurrence status from vast amounts of video data and, ultimately, easily identifying the cause of the error.



- GX VideoViewer***
Review video when problem occurs
* For information on obtaining the sample screen, please contact your local Mitsubishi Electric sales office or representative.
- Data flow analysis (GX Works3)**
Extracts problematic and influencing data
- GX LogViewer**
Analyzes data changes
- GX Works3**
Displays data changes and program relationships offline
- Event history (offline monitoring)**
Review event history during offline monitoring

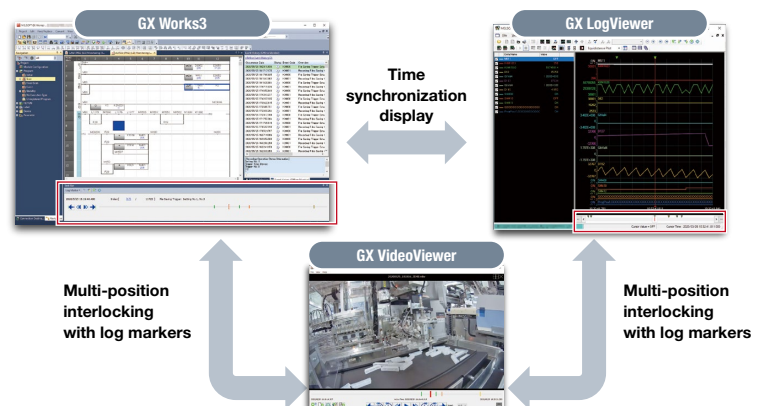
Conceptual Image of Function

- 1 Use the "Add Marking" button to add log markers to points requiring attention



- 2 Share points requiring attention between tools

- GX Works3** Circuit monitor toolbar
- GX LogViewer** Top of waveform display graph
- GX VideoViewer** Video display seek bar



GOT2000 Series

For the GOT2000 Series, we have prepared three HMI stationary models: GT27, GT25, and GT21. We have also prepared GT SoftGOT2000 as the HMI software for operating GOTs on a computer.

GT27 is a high-end model supporting all HMI GOT functions. GT25 is a mid-range model balancing high functionality and low cost. GT21 is a low-range model incorporating the basic functions of HMI GOT in a compact form.

GT SoftGOT2000 enables HMI GOT functions to be used on a computer, enabling information of FA devices connected to the computer via a network to be monitored and operated.

* A separate license (GT27-SGTKEY-U) is required when using GT SoftGOT2000.

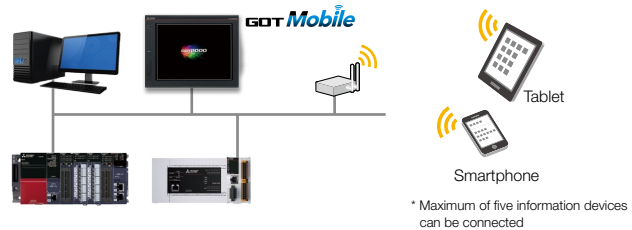


GOT Mobile Function - See the shop floor from a remote location

Compatible GOT : **GT27** **GT25**

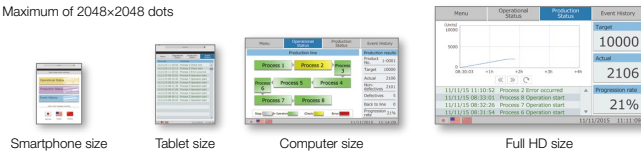
Users can monitor and operate connected shop floor devices from information devices such as computers or tablets in a remote location via the GOT on the shop floor.

* A separate license (GT25-WEBSKEY) is required. For details, see GOT Mobile Function Application Examples L[NA]08464ENG.



Freely create screens for each information device

* Maximum of 2048x2048 dots



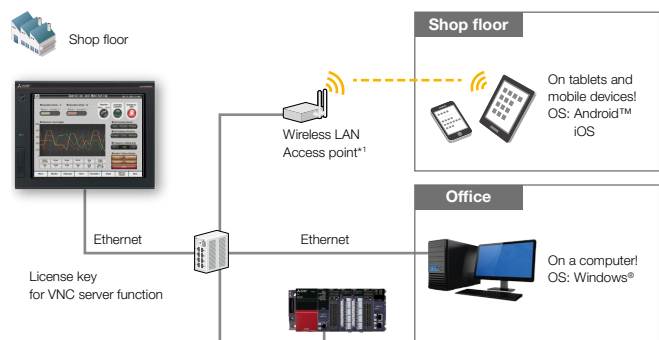
VNC® Server Function - Remote control of GOT from a computer or tablet

Compatible GOT : **GT27** **GT25** **GT21**

Users can display and operate the same functions as GOT on a computer or tablet. (Also supports system application screens such as PLC program monitor.) Because the shop floor GOT screens are displayed and monitored "as is," there's no need to prepare screens for remote monitoring and maintenance.

* A separate license (GT25-VNCSKEY) is required to use the VNC server function.

* GT21 model only supported for the GT21 Wide model.



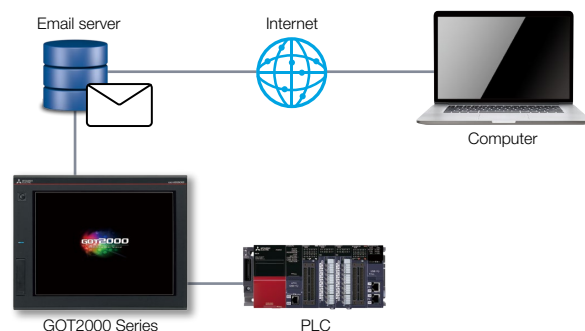
*1 A separate access point is not required if a wireless LAN communication unit is equipped on GOT. (Access point supported on GT Works3 Ver.1.144A and later)

E-mail Sending Function - Email notification of equipment alarms and recovery information

Compatible GOT : **GT27** **GT25** **SoftGOT**

The GOT email function sends users emails regarding equipment alarms and recovery information. These emails can be received at a remote location via the Internet.

* Email transmission requires an email server.



FA Transparent Function – Smooth debugging realized

Compatible GOT : **GT27** **GT25** **GT21**

Connects the USB interface on the front of a GOT with a computer to enable programming, start-up, and adjustment of FA devices via the GOT. Eliminates the need for cumbersome work such as opening panels and messing with cables. Moreover, users can open programming/setup software of FA devices and perform adjustment work from a remote location via the shop floor GOT using a computer connected to the shop floor GOT via Ethernet. In addition to Ethernet, it is also possible to connect shop floor GOT and FA devices via CC-Link IE and CPU.

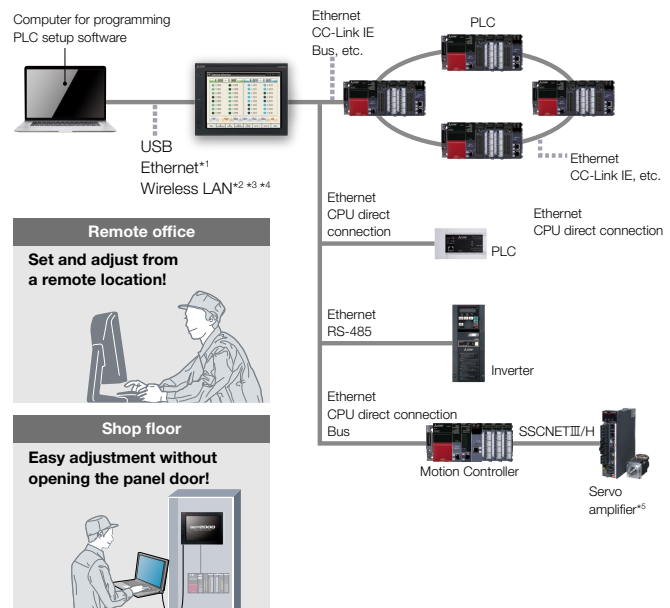
*1 GT2505, GT25 Handy, and GT21 cannot be used when GOT is connected to devices via Ethernet.

*2 GT2505, GT25 Handy, GT21 are not supported.

*3 A wireless LAN communication unit (GT25-WLAN) must be installed on the GOT main unit.

*4 For more information on the countries in which wireless LAN communication units are available, see GOT2000 catalog L(NA)08270ENG.

*5 GT21 does not have access to Mitsubishi Electric servo amplifiers.

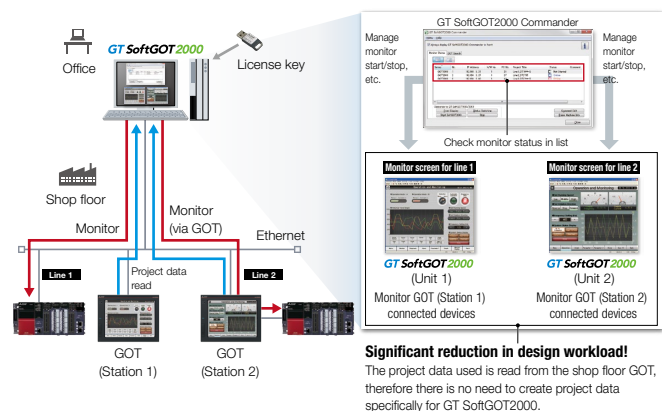


SoftGOT-GOT link function – Collaboration between shop floor GOT and office SoftGOT

Compatible GOT : **GT27** **GT25** **SoftGOT**

GT SoftGOT2000 reads project data of the shop floor GOT via Ethernet and uses the data to monitor connected devices. Separate screens can be displayed for GT SoftGOT2000 and GOT. Additionally, screen display on the computer side is performed by GT SoftGOT2000, therefore there is no need for GOT to perform processing.

* A separate license (GT27-SGTKEY-U) is required when using GT SoftGOT2000.

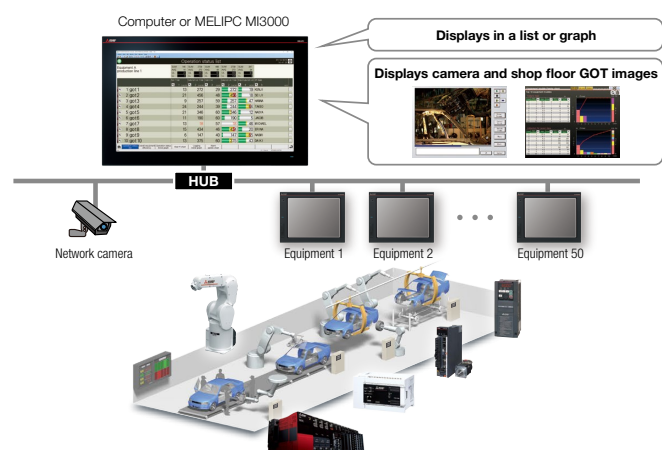


iQ Monozukuri Process Remote Monitoring – Easy remote monitoring of multiple equipment units

Compatible GOT : **GT27** **GT25** **SoftGOT**

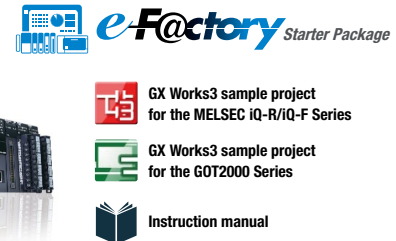
This is an application package that easily achieves IoT of the production shop floor and enables the collection, visualization, and batch management of information from multiple equipment. Via the shop floor GOT, information relating to production operating status, the operating log of individual equipment, alarms, etc., is all collected on GT SoftGOT2000 to easily achieve visualization of data. Analysis of the visualized data supports improvement of production shop floor processes and increases productivity.

* Up to five GOT can be managed with one license. To manage information of 50 GOT units, please purchase a product with 10 licenses.



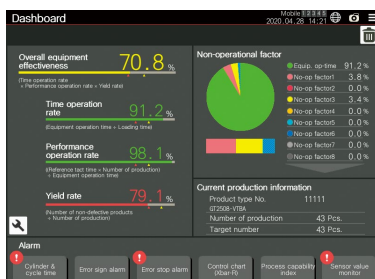
e-F@ctory Starter Package

The e-F@ctory Starter Package consists of sample projects for the PLC MELSEC iQ-R/iQ-F Series and HMI GOT2000 Series. By providing programs for visualization, easy analysis, etc., in sample project form, this product single-handedly integrates IoT on the production shop floor with basic settings such as device allocation and parameter settings. The e-F@ctory Starter Package helps to provide solutions to various issues that may occur when introducing IoT systems such as investigation period and budget.



Visualization of overall equipment efficiency **iQ-R** **iQ-F**

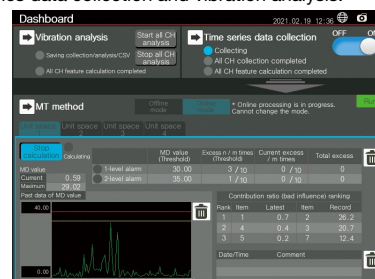
A general display of equipment production/operating status, including overall equipment efficiency and production volume.



* The sample screen shown above is from the MELSEC iQ-R Series.

Detection of irregularities using the MT method **iQ-R** **iQ-F**

Expresses degree of divergence between regular data and input data in numerical form and detects errors. The iQ-R Series also includes a function to input feature quantity derived from time series data collection and vibration analysis.



* The sample screen shown above is from the MELSEC iQ-R Series.

Error detection by monitoring cylinder operation time **iQ-R** **iQ-F**

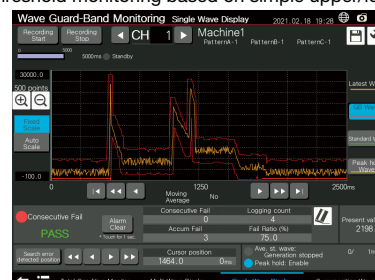
Measures and monitors cylinder conditions, operations, and equipment operating cycles to identify any sign of errors.



* The sample screen shown above is from the MELSEC iQ-R Series.

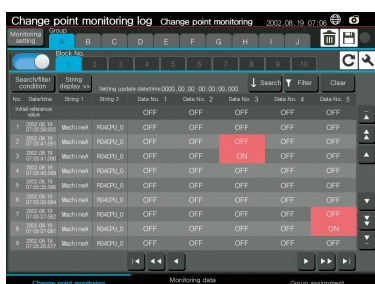
Error detection by monitoring analog waveform status **iQ-R**

Uses thresholds to monitor the shape of the waveform. Guard band monitoring makes it possible to monitor the waveform status of analog waveform data such as electrical current and temperature. Accordingly, it is possible to detect abnormal waveform fluctuation that was difficult to detect with threshold monitoring based on simple upper/lower limits.



Management of equipment/process changes **iQ-R**

Users can manage change points according to the 4M and 5M+1E perspectives used in quality management, and then use this information for cause analysis when a problem arises.



Error detection by frequency analysis of vibration waveform **iQ-R**

Uses vibration analysis (FFT) to express vibration created by equipment, devices, and products in numerical form and visualize the status. Detection of abnormal vibration makes it possible to perform preventive maintenance on equipment and increase productivity.



MELIPC Series

Mitsubishi Electric's industrial-use PC MELIPC Series makes it possible to build systems with edge computing utilizing IoT at a high degree of freedom due to its robust features specifically for FA use and adoption of general-purpose applications. The lineup consists of four product types to suit various data utilization scenarios depending on the application; from a high-end model supporting a high-performance processor and CC-Link IE field network capable of high-speed communication to a simple and compact low-range model.



Pre-installed with Edgecross – an open software platform suited to data utilization

MELIPC Series comes preinstalled with Edgecross* – a software platform in the edge computing area – meaning that users can build a real-time remote monitoring system by combination with Edgecross-compatible software, etc.

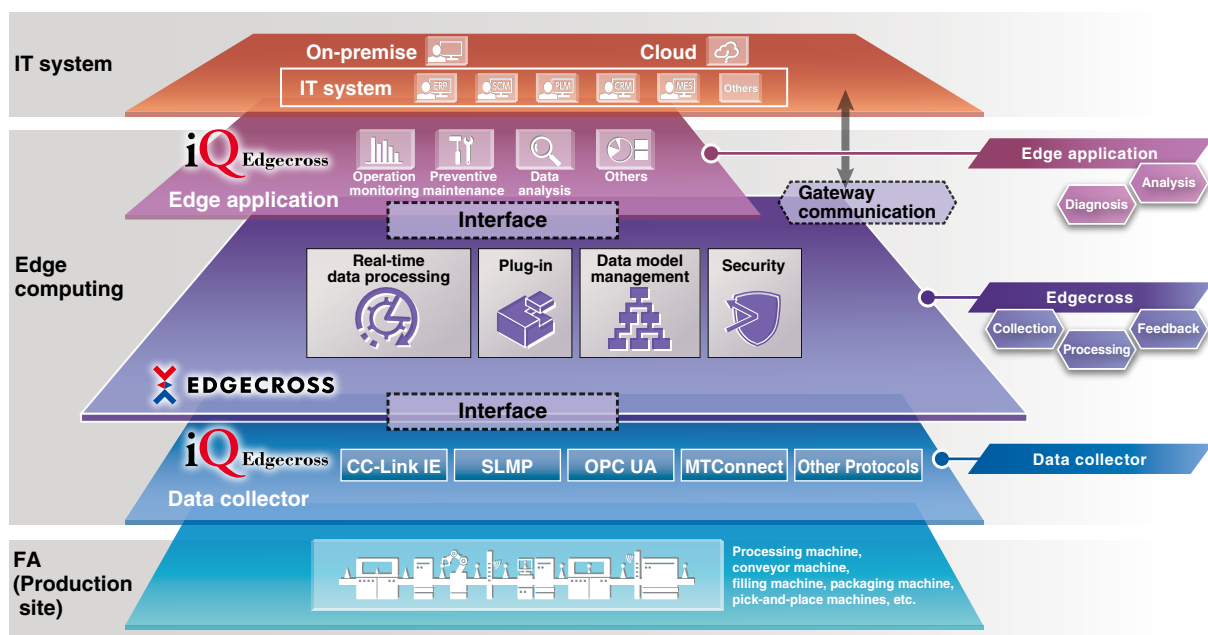
* An open software platform provided by the Edgecross Consortium, a general incorporated association.
<https://www.edgecross.org/en/solution/feature.html>

Data model management

A function that expresses the equipment, devices, and lines of a production shop floor in an abstract way to perform hierarchical management. It offers a GUI to intuitively perform settings and operations with the same feel as Windows® Explorer. Rather than the conventional approach of managing each piece of equipment individually, by managing all data relating to production equipment for the entire factory, it is possible to consolidate factory management and maintenance.

Data collection from every kind of equipment

By selecting a data collector compatible with Edgecross and suited to the communication method of a specific piece of equipment, the necessary data for remote monitoring and maintenance can be collected.



GENESIS64™

GENESIS64™ offers a highly functional monitoring control system supporting the various business needs of manufacturing, production processes, and administrative offices. This product proposes solutions that suit the many diversified needs related to monitoring and control, such as streamlining of monitoring activities, wide-area monitoring, and remote monitoring.



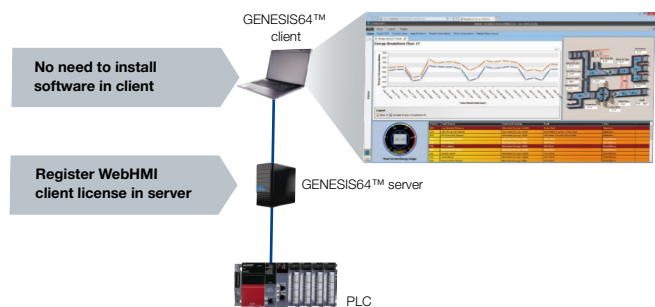
Email functions and push notifications

- AlertWorX is a standard function of GENESIS64™ that links with alarms and notifies users of alarm information via email or SMS.
- The optional function, AlarmWorX64 Multimedia (MMX), sends emails to a customer's computer, tablet, or mobile device notifying them of information relating to alarm occurrences. Moreover, settings can be adjusted to automatically switch recipients depending on the alarm type, such as either the operator group or engineer group, or operators for the relevant shift, depending on the time the alarm occurs.
- A push notification function has been newly added to help swiftly alert customers on the shop floor or in an office of alarm occurrences.



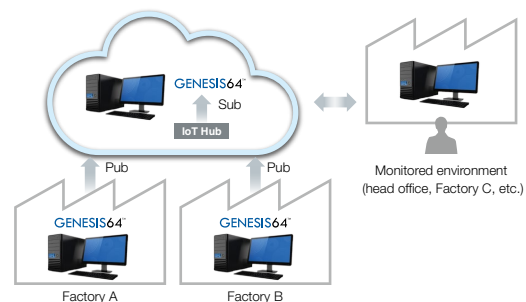
WebHMI Web monitoring

The GENESIS64™ server takes on the role of the web server, and it is possible to monitor and edit projects from the web client (computer for GENESIS64™ client). Most GENESIS64™ functions can be used via various web browsers. Moreover, WebHMI can be used without installing software on the client computer, therefore minimizing burden when expanding clients.



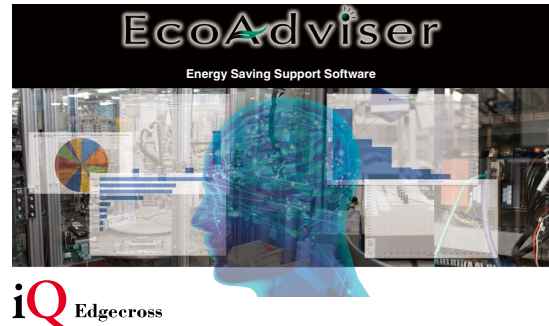
IoT communication function for IoTWorX cloud

Thanks to compatibility with IoT Hub - the familiar general-purpose service of Microsoft® Azure® - data held by GENESIS64™ in each location can be integrated on the cloud to enable wide-area monitoring.



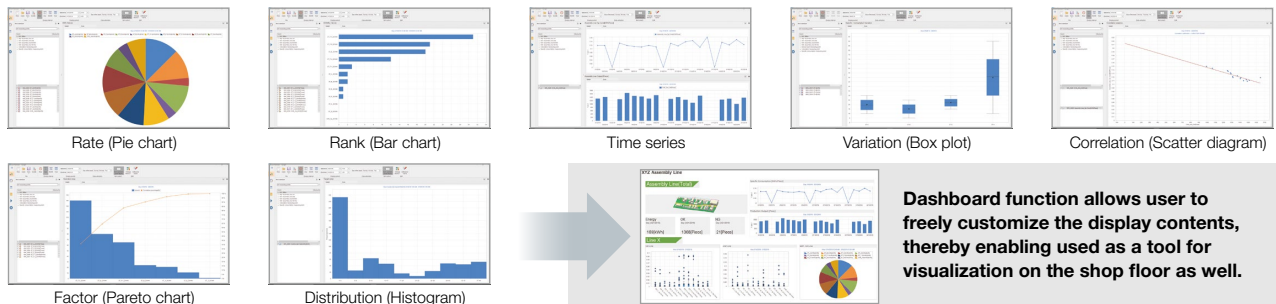
EcoAdviser

This software uses energy data and production information collected from EcoWebServerIII or Edgexcross-compatible products to create graphs and dashboard screens. In addition, Mitsubishi Electric's Maisart AI technology is installed to provide total support for energy-saving activities ranging from understanding the current situation to extracting energy loss, diagnosing factors, and verifying the effectiveness of energy-saving measures.



Understanding the Current Situation - Rich graph display facilitates speedy comprehension of current energy use

Can create seven types of graphs to suit the purpose of current status comprehension, consumption unit management, or applied analysis.



Loss Extraction - Utilizing AI and Mitsubishi Electric's unique know-how for automatic extraction of production equipment energy loss

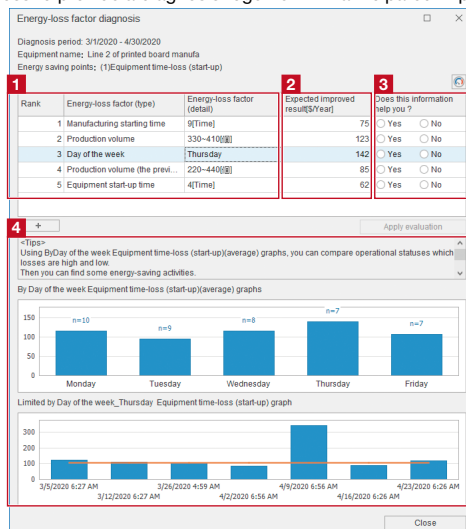
Focusing on the five major perspectives of energy-savings derived from Mitsubishi Electric's know-how accumulated over many years, EcoAdviser utilizes AI to automatically extracts energy loss from electrical energy and production volume.

- Energy loss can be extracted simply by selecting the diagnosis period
- Ranking-type display in order of equipment with high energy loss
- Displays daily energy loss for each of the five major perspectives of energy-savings and highlights places where loss is higher than usual



Factor Diagnosis - Utilizing AI to diagnose factors causing energy loss

Utilizes AI to assess date/time information, production information, etc. and rank items with high correlation as factors causing energy loss to provide a diagnosis together with anticipated improvement results.



Point 1

Ranking display of factors most likely to cause energy loss

- Default factors include equipment start-up time, production start time, day of the week, production volume, etc.
- Collected arbitrary data can also be added as factors (production model type, temperature, humidity, etc.)

Point 2

Displays improvement effect in monetary terms if measure is implemented (rough estimate)

Point 3

Learns selected effectiveness and reflects in factor diagnosis from next time onwards

Point 4

For each selected factor, presents information that can be more noticeable in shop floor improvements

- Advice
- Energy loss by factor
- Energy loss by one factor limitation

Effect Verification - Easy visualization of improvements after implementation of energy-saving measures

Simply by selecting the period before/after the measure was implemented, users can confirm the improvement in energy loss in terms of electrical energy consumption and cost.

By revising energy-saving measures while verifying effects, energy-saving initiatives can be rolled out with good continuity.

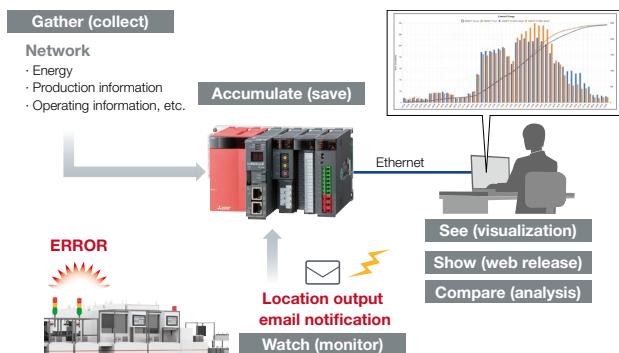
EcoWebServerIII

EcoWebServerIII is a product that facilitates data analysis needed to achieve energy-savings simply by setting the collection of measurement data of measurement instruments connected to a field network (CC-Link or MODBUS®). EcoWebServerIII can also convert the data into graph format utilizing a web browser and display current values.



Function required for energy-savings provided as a standard feature

Equipped with functions necessary to collect, save, visualize, etc. measurement data without programs or ladders, thereby simplifying the construction of energy monitoring systems.



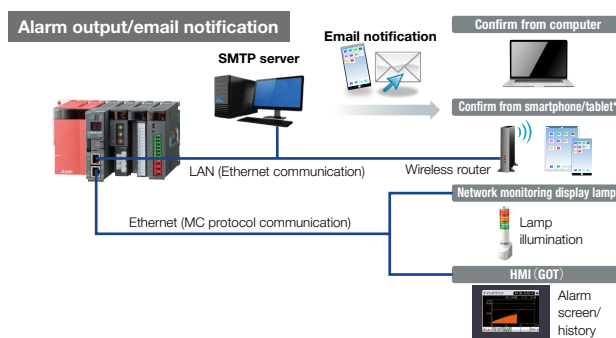
Converts measurement data to graph format on a web browser

- Featuring built-in applications specifically for energy savings (graph creation function, etc.), EcoWebServerIII contributes to factory energy-saving measures.
- With a HTTP server function, EcoWebServerIII sends the data it collects to the Intranet via Ethernet. Users can confirm energy consumption in real-time from any kind of device.



Detection of exceeded target values and equipment errors by alarm output and email notification

- When targets are exceeded or an equipment error occurs, users are notified by alarm output and email notification, allowing them to instantly notice the change in conditions. This accelerates the PDCA cycle from the time of problem occurrence until a measure is implemented, thus increasing productivity.
- Also supports smartphones/tablets, enabling users to confirm alarm content and emails while on the shop floor.



* For details, please consult with your network administrator (or the relevant department).

Full lineup of measurement instruments to suit various purposes and applications

EcoMonitorPlus



- Layered expansion to suit the purpose with a building-block approach
- Basic unit lineup includes a control unit equipped with an energy-saving automatic control function.
- Optional units support saving of measurement data (in CSV file format) to SD memory cards and various communications.

EcoMonitorLight



- With a built-in LCD display, settings, measurement, and display necessary for energy measurement can all be performed on a single unit.
- In the same way as EcoMonitorPlus, optional units support saving of measurement data to SD memory cards and various communication.

Eco Monitor Plus

MELSEC iQ-R Series Energy Measuring Module



- One module can measure various items including electrical energy, reactive power, current, and voltage.
- By synchronizing with production information and control programs, users can manage energy consumption in detailed consumption units by individual model type and/or process. This contributes to energy savings on the production line and higher productivity.

Eco Monitor Light

MDU Breaker (MDU: Measuring Display Unit)



- Consolidates a breaker, VT/CT for measurement, and measurement display unit into one and supports energy savings by saving space, and reducing installation work and wiring.
- The measurement display unit is available in a variety of installation styles, including main body installation, built-in display, stand-alone built-in display unit, and panel installation (photo shows main body installation).
- Supports a wide variety of networks (CC-Link, MODBUS®, electrical energy pulse output).

MELSOFT GX Works3

GX Works3 is simple, user-friendly new-generation engineering software featuring structured programming and a variety of new functions and technologies designed for use with the control systems of MELSEC iQ-R and MELSEC iQ-F Series products.



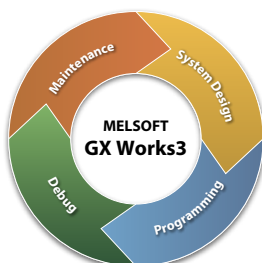
GX Works3
One Software. Many Possibilities.

Intuitive engineering software covering the product development cycle

- Graphic-based configuration realizing easier programming
- Integrated motion-control system configuration
- Complies with IEC 61131-3

Simple point and click programming architecture

- Straightforward graphic based system configuration design
- MELSOFT library enables efficient programming through “Module Label/FB”
- Extensive version control features



Tab view multiple editors

Conveniently work on multiple editors without having to switch software screens.

Module label/FB

Automatically generate module function blocks simply by selecting one and placing it directly into the ladder editor.

Simple motion setting tool

Simple motion setting tool
Easily configure the simple motion module with this convenient integrated tool.

Navigation window

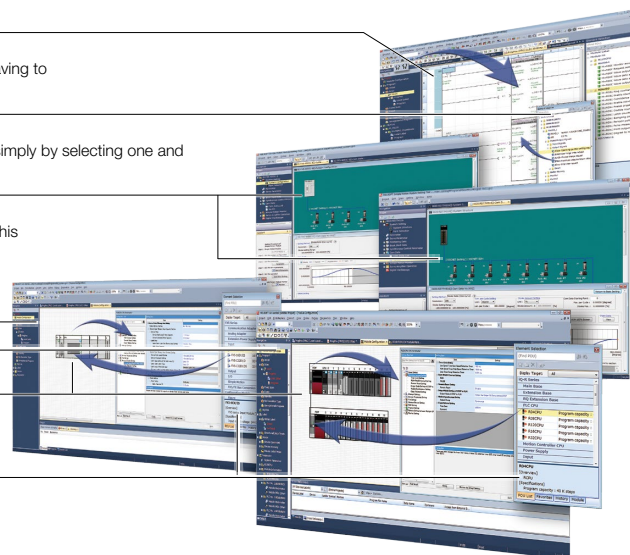
Navigation window
Easily access project components
Organize program file list.

Module configuration

Module configuration
Easily parameterize each module directly from the configuration editor.

Module list

Simply drag & drop modules directly into the module configuration.



Global realization by multi-language support

- Users can easily change the language of menus and messages in GX Works3 (multiple languages supported in a single package).
- No difference in functions between displayed languages, thereby allowing smooth introduction to production bases around the world.

Simultaneous editing function enables efficient program editing

- Several people can create and simultaneously edit local projects from a single master project shared on the company network or cloud.
- Enables concurrent program design without the need to wait for upstream process program editing to be completed.

MELSOFT iQ AppPortal

iQ AppPortal is a software to batch manage MELSOFT product project files, design drawings, documents, etc. by individual purpose.

Files can be registered using an easy drag-and-drop operation.

By easily leaving editing history after registration, users can also view editing history and retrieve past data with ease.

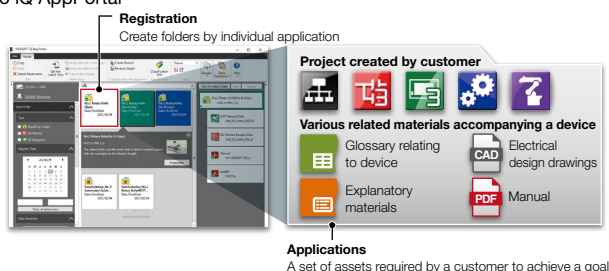
Moreover, the branch creation function and revision graph help to reduce the workload of diversion development/management by making it instantly apparent when data has been diverted, when it began being diverted, the diversion source, and diversion destination.



Registration

Batch management by individual application

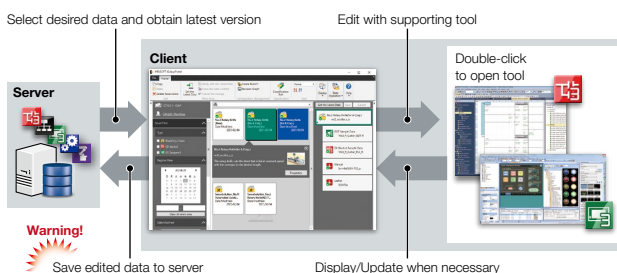
Assets can be registered easily by dragging and dropping from Explorer to iQ AppPortal



Utilization

Prevents overwriting of content edited by other users

When a user tries to overwrite a file edited by someone else, a warning is issued upon upload to the server. This feature prevents users unintentionally overwriting another user's edited content.



Simultaneous editing function enables efficient program editing

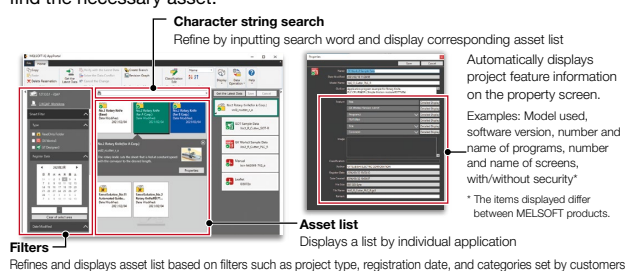
Users can easily create new applications based on existing ones. By managing as a new folder, users can also develop similar applications in parallel.

Moreover, a revision graph allows users to instantly see when and from which application the new application was created as a branch, thus making diversion development/management easy.

Viewing/Vearching

Review asset information without opening a project

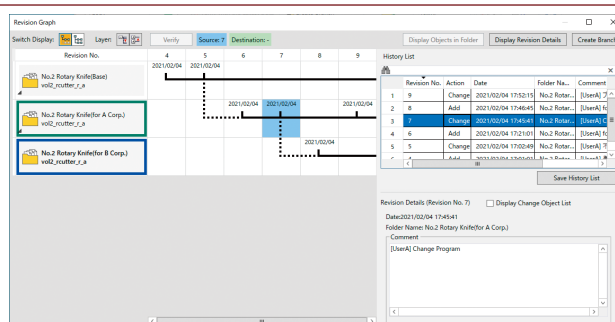
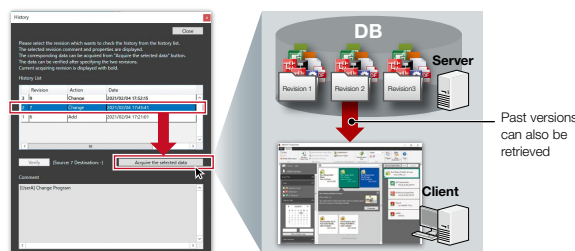
Using filters and character string searches, users can quickly and easily find the necessary asset.



History management

Detailed evaluation of change history and retrieval of past files

Users can save the history of the changed asset along with comments. It is also possible to retrieve past versions of files from the history log, thereby making it easy to manage history with reference to past file names, etc.



CNC Remote Service (for Machine Tool Manufacturers & Users)

Users can confirm operating information of machines equipped with Mitsubishi Electric computerized numerical controllers (CNCs).
It is possible to remotely diagnose the CNC of a user's machines, thus improving maintainability and helping to reduce machine downtime.

* Please contact your nearest Mitsubishi Electric overseas office regarding which regions offer this service.

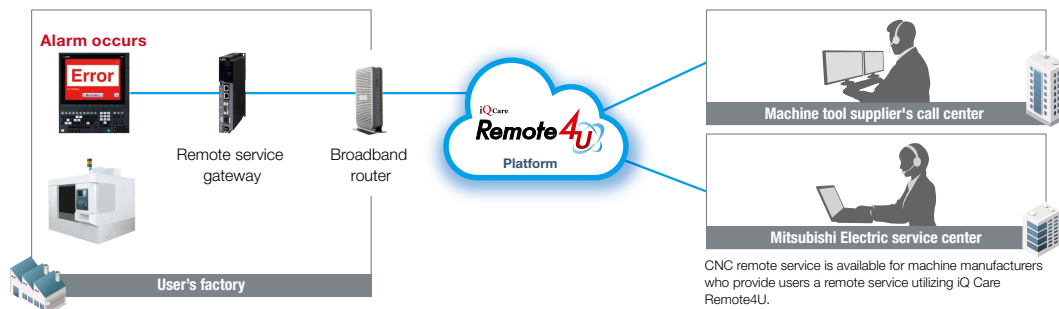


CNC Remote Service (for Machine Tool Manufacturers)

Simply by purchasing a platform license, users can take advantage of our remote service for machine tools equipped with Mitsubishi Electric CNCs. Mitsubishi Electric prepares the cloud server, thus reducing the cost involved in introducing and maintaining the remote service. Moreover, by introducing this remote service, machine manufacturers can improve the efficiency of their service work.

iQ Care Remote4U Platform

Machine remote service can be easily introduced by leveraging the iQ Care Remote4U platform



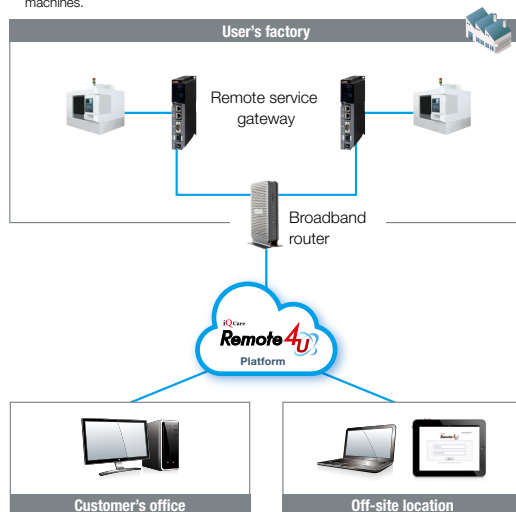
CNC Remote Service (for Users)

Dashboard function*1

Dashboard function contributes to production process improvement and running cost reduction

Users can monitor operating information for machines equipped with Mitsubishi Electric CNCs in real-time.

*1 Different from the dashboard function of Mitsubishi Electric EDMs and laser processing machines.

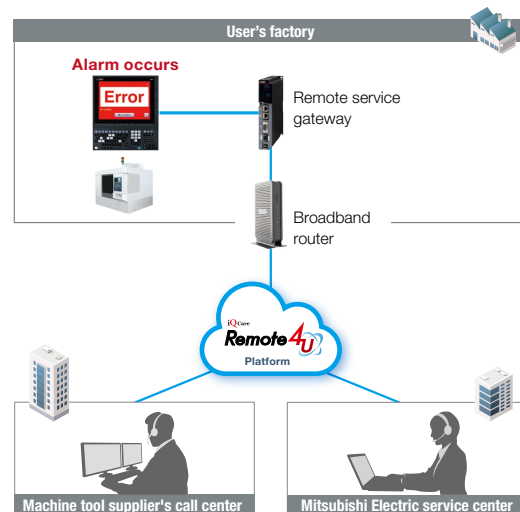


Users can access from the web browser of a commercially sold computer, smartphone, or tablet without having to install dedicated software (must enter an ID and password).

Remote diagnosis function

Improving maintainability with a remote diagnosis function

Mitsubishi Electric can remotely support its CNCs installed in customers' machines from its service center.



Remote diagnosis of machines is also possible if there is a contract with a machine manufacturer who holds a license for the iQ Care Remote4U platform.

HMS Ewon Cosy Series

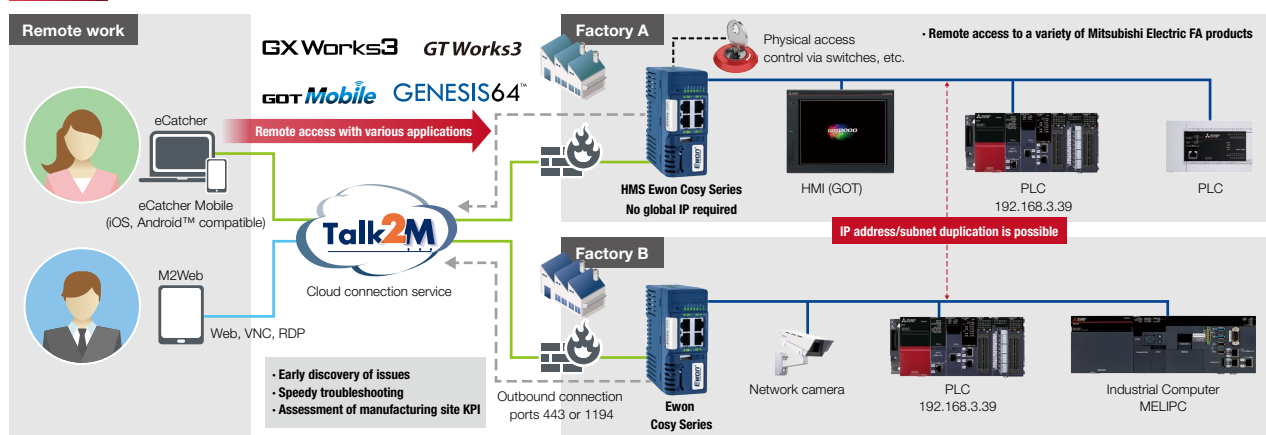
With the Cosy Series (remote access gateway) and Talk2M (cloud connection service), users can access Mitsubishi Electric FA devices from anywhere in the world and safely perform troubleshooting of equipment and devices, thus reducing support cost and downtime.

A secure connection is achieved through measures such as exclusive outbound connection, two-layer authentication, connection audit tracing, and access control using physical external key switches. Additionally, HMS Ewon Cosy Series has obtained ISO27001 and ISECOM STAR security certification. In addition to SiteManager's main unit being designed with a robust aluminum housing, SiteManager Embedded (embedded software) can be used to make industrial computers such as MELIPC, etc. function as a gateway.

Access is possible not only from a computer using eCatche (client software), but also remotely from an iOS or Android™ device installed with eCatcher Mobile on a browser of MELSEC or GOT. Moreover, assuming installation on a control panel, Ewon Cosy has been designed with specifications suited to industrial use, such as 24 VDC input, industrial EMC support, wide operating temperature range, and DIN rail mounting.



Conceptual image of remote access



Reasons why the Ewon Cosy Series is the manufacturers' choice

Ranked most reliable service in the North American market for six consecutive years 	Easy setup that only an FA manufacturer can provide 	Overwhelming number of VPN servers for connection anywhere in the world 	Highly secure performance with VPN connection 	Highly experienced, enriched manufacturer support 	Robust product specifications suited to industrial environments
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Product data

Remote access gateway Cosy				
Internet connection	Wired LAN	Wi-Fi	3G*1	4G/LTE*1
Product model	EC61330	EC6133C	EC6133D	EC6133F
Common specifications	RJ45 x 4 (10/100Mbps), USB x 1, DI x 2/DO x 1, Rating: 12-24 VDC, Operating temperature range: -25 to 70°C, DIN rail mounting			

*1 Antennas for 3G/4G models sold separately.

Free cloud service*2 Talk2M Free +	
Number of registered devices	Unlimited
Number of registered users	Unlimited
Number of concurrent views	5
Number of concurrent connections	1
Monthly data volume	3GB

*2 Talk2M Pro is also available for a fee.



Flexy Series - Industrial IoT gateway for host models also included in the lineup

In addition to the Cosy remote access, this solution also facilitates smooth IIoT transition by collecting data from a remote manufacturing site and connecting individual cloud services with OPC UA, MQTT, etc.

Secomea SiteManager Series

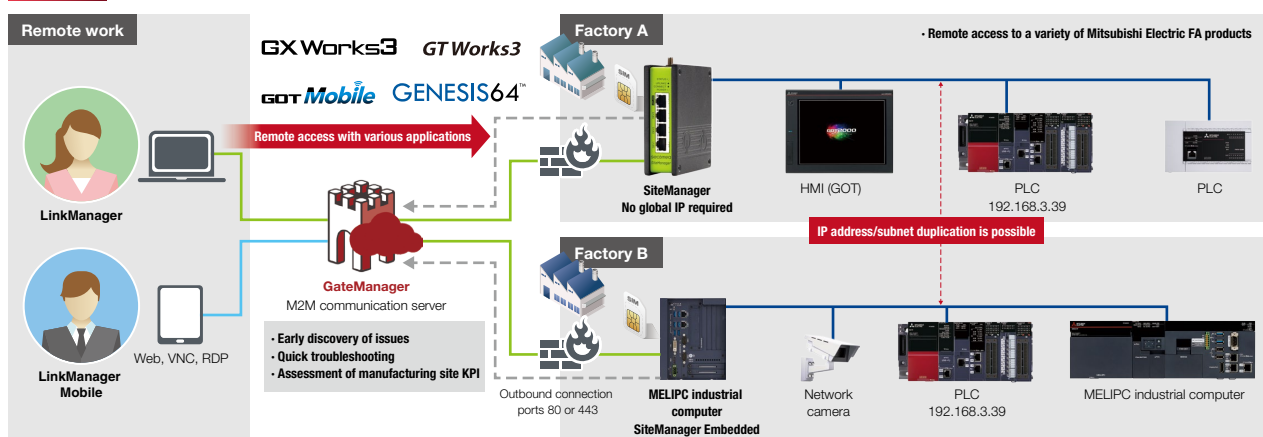
With SiteManager (remote access gateway), GateManager (relay M2M communication server), and LinkManager (client software), it is possible to access Mitsubishi Electric FA devices to monitor and perform maintenance on machinery and equipment at a manufacturing site, thus reducing business trip/transportation costs, and enabling quicker response.

A secure connection is achieved through measures such as exclusive outbound connection, encryption using SSL/TSL, multi-factor authentication using certificates, SMS, etc., access authority using an individual device, audit log, etc. The Secomea solution has obtained security certification from ProtectEM GmbH (a German third-party organization) and conforms to Industry 4.0. In addition to SiteManager's main unit being designed with a robust aluminum housing, SiteManager Embedded (embedded software) can be used to make industrial computers such as MELIPC, etc. function as a gateway.

secomea
SiteManager

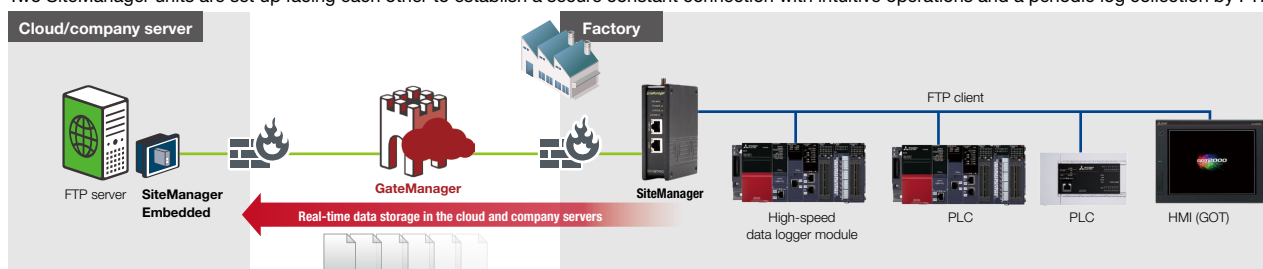


Conceptual image of remote access



Constant connection option "LogTunnel" use case

Two SiteManager units are set up facing each other to establish a secure constant connection with intuitive operations and a periodic log collection by FTP.



Not only FTP, but all protocols including HTTP, OPC UA, and MQTT can be used, and traceability systems as well as SCADA system construction are supported.

Secomea SiteManager also offers constant connection at the same time as maintenance of FA devices through remote access using LinkManager.

Lineup

With various versions available to suit the user's environment and purpose of use, SiteManager Embedded software can be installed and used on industrial devices.



SiteManager Model number		Internet connection method		
		LAN	3G/4G	Wi-Fi
Number of device connections	5	1129	1139	1149
	10	1529	1539	1549
	25	3329	3339	3349
	100	3529	3539	3549



Unlike the SiteManager hardware product, SiteManager Embedded is a software gateway that can be installed in a MELIPC, etc. to function as a secure access gateway. It operates as a seamless service in the background on various OS. SiteManager Embedded is very light, and therefore uses minimal system resources.

CC-Link IE TSN

CC-Link IE TSN supports TCP/IP communications and applies it to industrial architectures through its support of TSN enabling real-time communications. With its flexible system architecture and extensive setup and troubleshooting features make CC-Link IE TSN ideal for building an IIoT infrastructure across the entire manufacturing enterprise.

What is Time-Sensitive Networking (TSN)?

TSN is the IEEE-defined standard technology that enables deterministic messaging on standard Ethernet. The technology ensures deterministic communications by utilizing the time synchronization method (IEEE 802.1AS) and time-sharing method (IEEE 802.1Qbv). With the addition of these standards to Ethernet technology, real-time control communication and non-real time information communication can be mixed, which is not possible with conventional Ethernet communications.

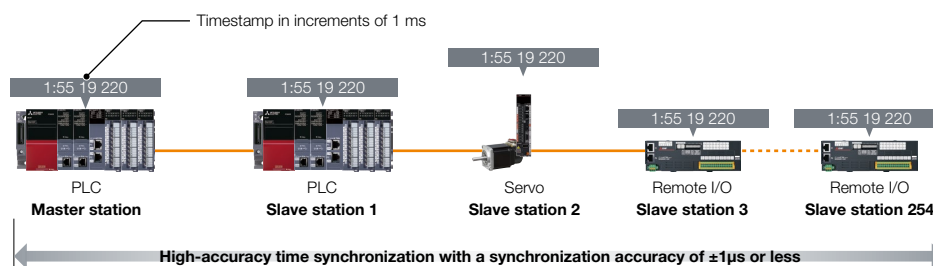


TSN technology enables the transfer of deterministic communication even when delivering the information communication data of IT systems on the same network. By increasing network bandwidth and giving priority to CC-Link IE TSN communications and TCP/IP communications, devices that use general Ethernet communications can be connected to the same network without affecting real-time control communication performance.



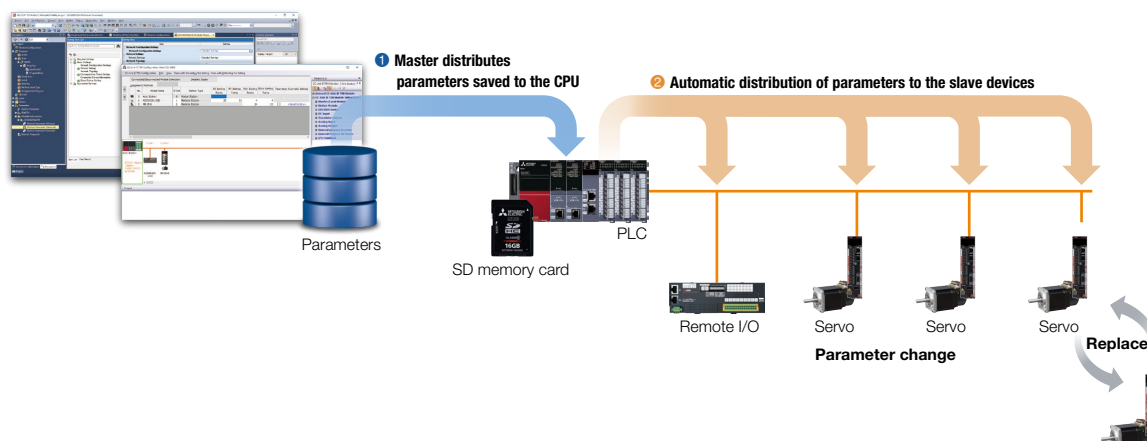
Time series analysis using high-accuracy time synchronization

Achieves high-accuracy time synchronization with a synchronization accuracy of $\pm 1\mu\text{s}$ or less and retains timestamp information in each connected station at increments of 1 ms. Error history can be displayed in time series, therefore enabling users to accurately analyze what happened and the cause of the problem from the exact time an error occurs.



Easy replacement of slave devices through automatic parameter distribution [Reducing start-up time]

When power is turned on or there is contingency, the master device automatically distributes parameters saved on the CPU unit to slave devices. As such, even when a slave device is replaced, there's no need to separately write parameters to it; making for smooth replacement.





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A PARTNERSHIP FOR SUCCESS



BEST IN CLASS

Mitsubishi Electric always strives to deliver open solutions. The e-F@ctory Alliance provides an open environment in which customers can select the best partner for their needs. In this increasingly competitive world, manufacturers want to gain as much advantage as possible. Utilizing 'best in class' suppliers is a must and being able to draw on an ecosystem of strong complimentary suppliers is a big plus.

That's the e-F@ctory Alliance benefit.



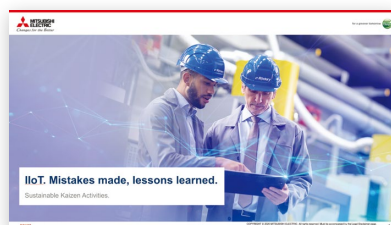
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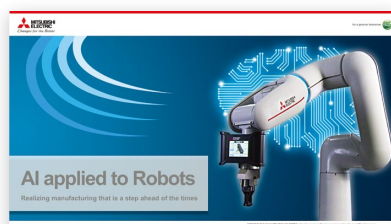
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Smart Manufacturing Kaizen Level



AI applied to Robots



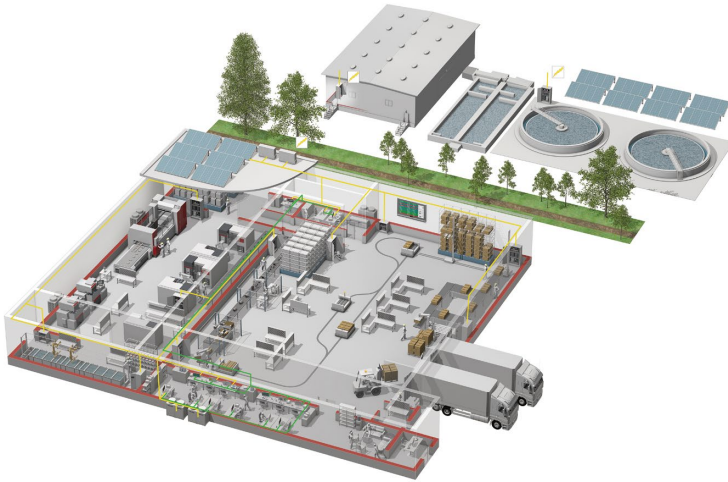
Latest Industry IoT trends for everybody



ARC White paper



YOUR SOLUTION PARTNER



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

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, established in 1921, 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 183 factories, laboratories and offices worldwide in over 140 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 146,000 people, Mitsubishi Electric has the resource and the commitment to deliver the ultimate in service and support as well as the best products.



Low voltage: MCCB, MCB, ACB



Medium voltage: VCB, VCC



Power monitoring, energy management



Compact and Modular Controllers



Inverters, Servos and Motors



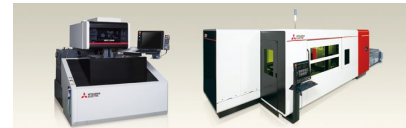
Visualization: HMIs



Numerical Control (NC)



Industrial / Collaborative Robots



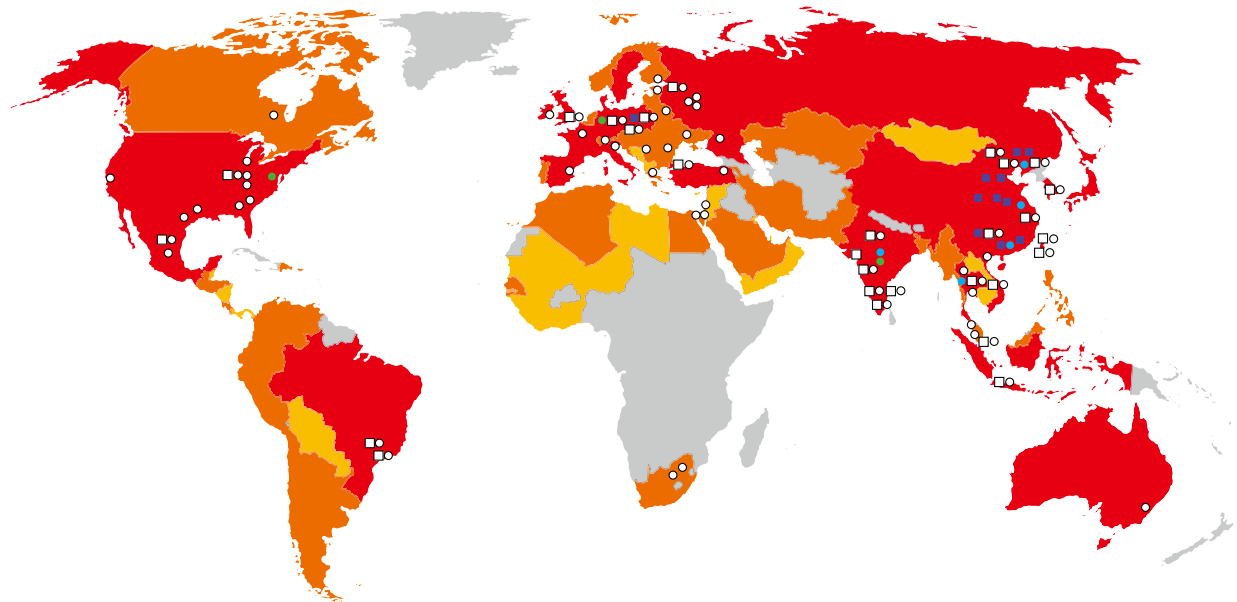
Processing machines: EDM, Lasers, IDS



Transformers, Air conditioning, Photovoltaic systems

* Not all products are available in all countries.

Global Partner. Local Friend.



- Sales office
- FA center
- FA center satellite
- Production center
- R&D center

Note: This is a map of our global sales and support coverage. It does not reflect any national borders.

- A region where there are direct Mitsubishi Electric FA offices (main/local and satellite).
- A region covered by primary sales partners (distributors) who have local sales offices.
- A region covered by our extended sales network which may or may not have local offices.

Country/ Region	Sales office	Tel/ Fax		
USA	MITSUBISHI ELECTRIC AUTOMATION, INC. 500 Corporate Woods Parkway, Vernon Hills, IL 60061, U.S.A.	Tel : +1-847-478-2100 Fax : +1-847-478-2253	Singapore	MITSUBISHI ELECTRIC ASIA PTE. LTD. 307, Alexandra Road, Mitsubishi Electric Building, Singapore 159943 Tel : +65-6473-2308 Fax : +65-6476-7439
Mexico	MITSUBISHI ELECTRIC AUTOMATION, INC. Mexico Branch Mariano Escobedo #69, Col. Zona Industrial, Tlalnepantla Edo, C.P.54030, Mexico	Tel : +52-55-3067-7511	Thailand	MITSUBISHI ELECTRIC FACTORY AUTOMATION (THAILAND) CO., LTD. 12th Floor, SV.City Building, Office Tower 1, No. 896/19 and 20 Rama 3 Road, Kwaeng Bangpongpan, Khet Yannawa, Bangkok 10120, Thailand Tel : +66-2682-6522 Fax : +66-2682-6020
Brazil	MITSUBISHI ELECTRIC DO BRASIL COMÉRCIO E SERVIÇOS LTDA. Avenida Adelino Cardana, 293, 21 andar, Bethaville, Barueri SP, Brazil	Tel : +55-11-4689-3000 Fax : +55-11-4689-3016	Vietnam	MITSUBISHI ELECTRIC VIETNAM COMPANY LIMITED Hanoi Branch 6-Floor, Detech Tower, 8 Ton That Thuyet Street, My Dinh 2 Ward, Nam Tu Liem District, Hanoi, Vietnam Tel : +84-4-3937-8075 Fax : +84-4-3937-8076
Germany	MITSUBISHI ELECTRIC EUROPE B.V. German Branch Mitsubishi-Electric-Platz 1, 40882 Ratingen, Germany	Tel : +49-2102-486-0 Fax : +49-2102-486-1120	Indonesia	PT. MITSUBISHI ELECTRIC INDONESIA Gedung Jaya 8th Floor, J.L. MH. Thamrin No.12, Jakarta Pusat 10340, Indonesia Tel : +62-21-3192-6461 Fax : +62-21-3192-3942
China	MITSUBISHI ELECTRIC AUTOMATION (CHINA) LTD. No.1386 Hongqiao Road, Mitsubishi Electric Automation Center, Shanghai, China	Tel : +86-21-2322-3030 Fax : +86-21-2322-3000	India	MITSUBISHI ELECTRIC INDIA PVT. LTD. Pune Branch Emerald House, EL -3, J Block, M.I.D.C Bhosari, Pune - 411026, Maharashtra, India Tel : +91-20-2710-2000 Fax : +91-20-2710-2100
Taiwan	SETSUYO ENTERPRISE CO., LTD. 6F, No.105, Wugong 3rd Road, Wugu District, New Taipei City 24889, Taiwan, R.O.C.	Tel : +886-2-2299-2499 Fax : +886-2-2299-2509	Australia	MITSUBISHI ELECTRIC AUSTRALIA PTY. LTD. 348 Victoria Road, P.O. Box 11, Rydalmere, N.S.W 2116, Australia Tel : +61-2-9684-7777 Fax : +61-2-9684-7245
Korea	MITSUBISHI ELECTRIC AUTOMATION KOREA CO., LTD. 7F-9F, Gangseo Hangang Xi-tower A, 401, Yangcheon-ro, Gangseo-Gu, Seoul 157-801, Korea	Tel : +82-2-3660-9629/ 9606/9607 Fax : +82-2-3664-0475		

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