MITSUBISHI ELECTRIC

Changes for the Better

iQ Platform
C Controller/C Intelligent Function Module
Applications Pre-installed Model

e-F@ctory

• RD55UP06-V-BZ11/-BZ13/-BZ15 • RD55UP12-V-BZ11/-BZ13/-BZ15 NEW

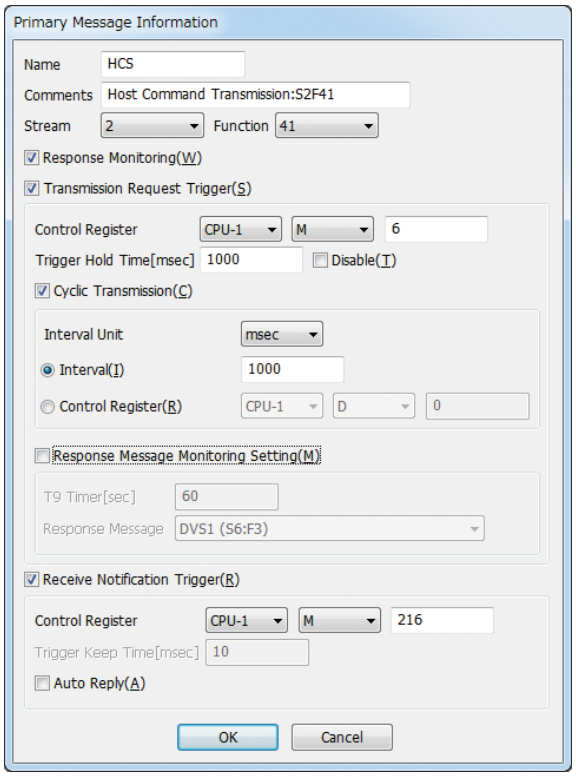
SECS/GEM Communication Software

Realizing SECS*1/GEM communication without a computer nor program

■ Implementation of communication without programming

Various types of communication functions can be added to the programmable controller by just configuring the handshake of data devices and trigger relay. Communication logs and programmable controller logs can be output also. The huge device process data can be reported without a gateway computer and SECS/GEM communications with the existing equipment is possible.

Communication types supported:
SECS-I (SEMI E4), HSMS (SEMI E37)
SECS-II (SEMI E5), GEM (SEMI E30)



SECS/GEM communication software

■ Reduction of installation and running costs

Earlier start-up of a new production line is possible by distributing setting data to equipment manufacturers. Even if the SECS/GEM communication specifications are changed, only setting change is necessary, reducing development processes and time.

■ Reduction of implementation costs for "SECS ready" equipment

Utilizing the correlation between the C Controller and "SECS/GEM communication software", SECS-based communication interfaces can be implemented easily throughout the fab.
In addition to cost reduction of gateway computers, issues when introducing a computer system into the fab environment especially when clean room operations are used can be eliminated.
The C Controller + "SECS/GEM communication software" solution utilizes the direct link from the MES*2 system to the factory floor provided by the MELSEC solution with the programmable controller. Specific SECS/GEM level functionality is realized and flexible to changes in the SECS/GEM communication specification without having to update hardware and software modules within the control system.

*1. SECS: SEMI Equipment Communications Standard
*2. MES: Manufacturing Execution Systems

Application example

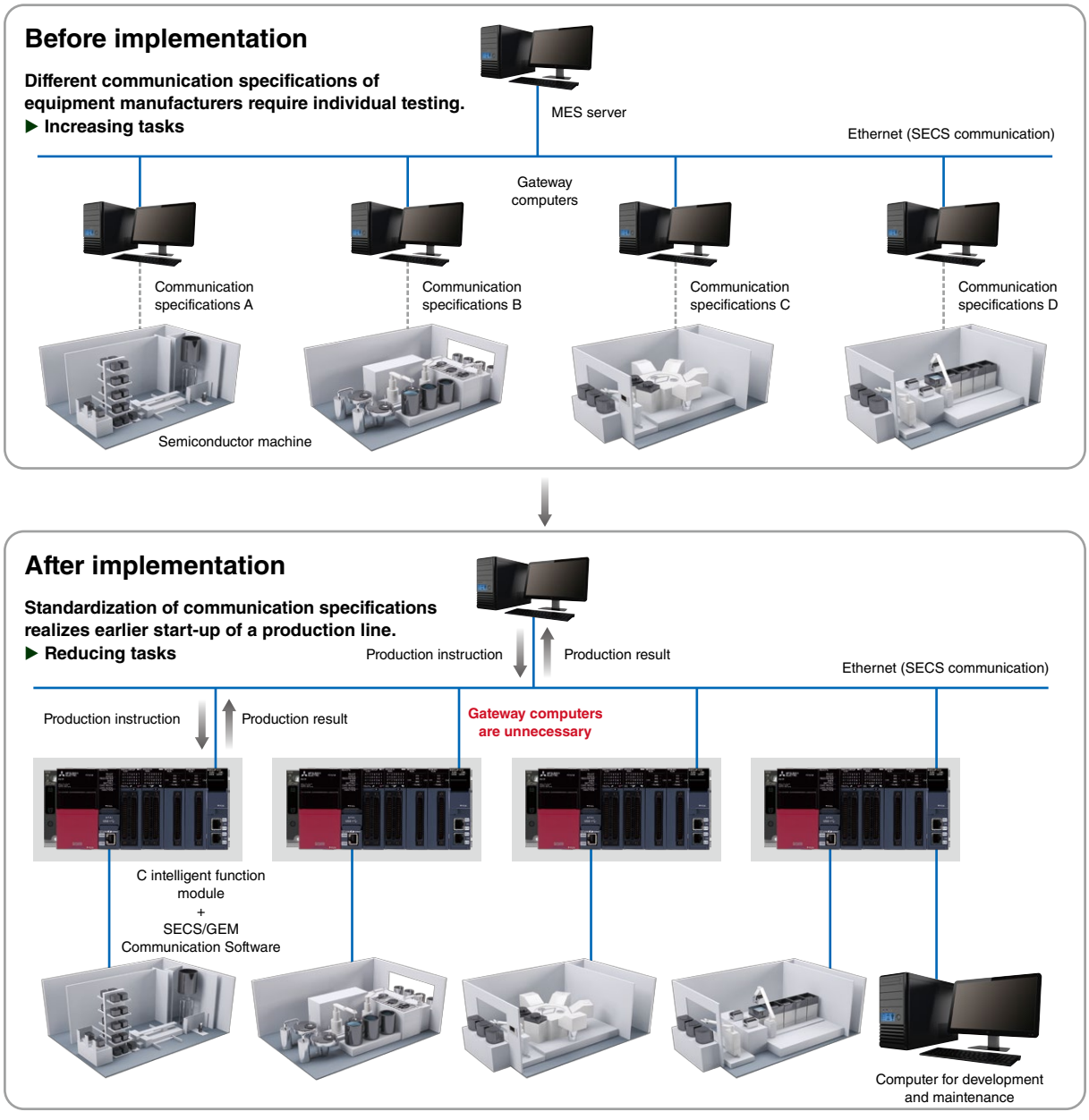
Reduce total implementation costs for SECS communication interfaces

■ Common issues

- Determining communication specifications with equipment manufacturers is cumbersome
- Difficult to start a new production line in a short time due to a time-consuming communication testing
- Difficult to change communication specifications after starting of a production line
- High maintenance costs associated with aging parts of computers such as disk drive, cooling fan, and UPS
- OS maintenance and virus security measures are necessary

■ Merits

- Standardization of communication specifications is realized by providing setting files to equipment manufacturers
- Early start-up of SECS communication is realized by providing setting files to equipment manufacturers
- Only setting change is necessary when SECS communication specifications are changed after implementation
- Maintenance cost can be reduced as the system does not require gateway computers
- Long-term stable operation is realized with use of highly reliable VxWorks® embedded C Controller



• R12CCPU-V-BZ19/-BZ1B

Data Collection Software

Shop floor data management/analysis/utilization optimizes manufacturing

Data Mining System

(Data Collection Software + Data Analysis Tool)

■ Low cost implementation of data mining system

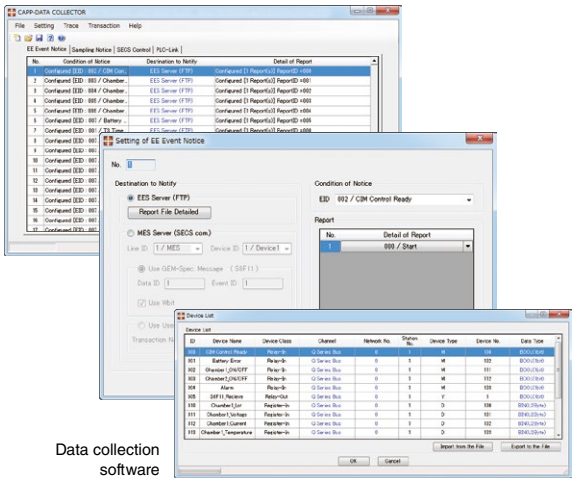
This product enables direct collection of data necessary for analysis and has features and functions that simplify analysis in upper analysis system.

■ Collecting data without programming

This product is able to retrieve data from desired information at desired timing with desired format. Data such as equipment data and communication data between a host*1 and equipment can be monitored and automatically collected just by configuration.

■ Supports various analysis tools

Supports various analysis tools that are necessary for data mining.*2



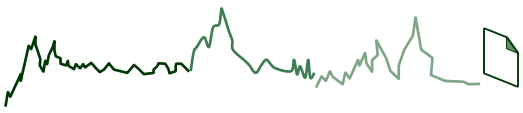
Data collection software

Data analysis without data collection software

No time axis in retrieved data

▶ **Retrieve data from search by time. Unnecessary data is included.**

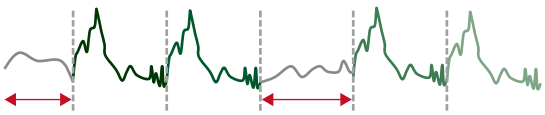
FTP server



Time-consuming to retrieve necessary data

▶ **Filter retrieved data to get desired data. (Work cycle)**

Alarm

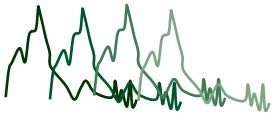


Unused data Unused data

Time-consuming to process data for necessary data that used in data analysis

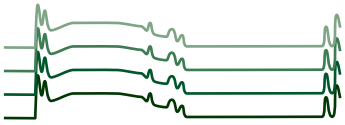
▶ **Data analysis tool is used to analyze various equipment conditions**

Found faulty product



"Data collection software" requires only few simple settings to retrieve data.

Data can be displayed in many layers and can be extracted in the same condition for comparison. Deviation data can be monitored with guard band.



*1. Host communication protocol types supported: SECS-I (SEMI E4), HSMS (SEMI E37), SECS-II (SEMI E5), GEM (SEMI E30)
*2. Data analysis tools are separately required.

Application example

Detect abnormality of manufacturing equipment utilizing collected sensor data.

■ Common issues

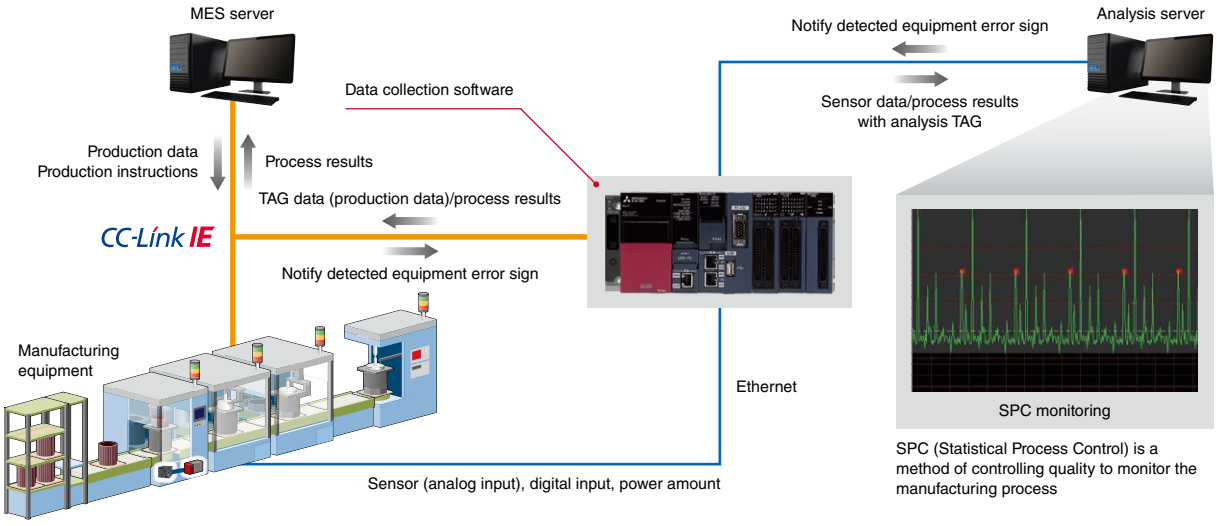
- Production stop due to a sudden equipment failure results in a substantial loss
- Periodical check requires a significant maintenance cost

■ Merits

- Monitor a sign of equipment error by statistically monitoring trend deviation of collected sensor data
- Collect FFT converted*1 results of huge volume of analog data such as sound and vibrations

■ Additional merits

- Equipment maintenance is realized just before an error occurs in equipment
- Periodical parts replacement can be reduced, realizing cost reduction
- Implementation is easy as modification of the existing equipment is unnecessary



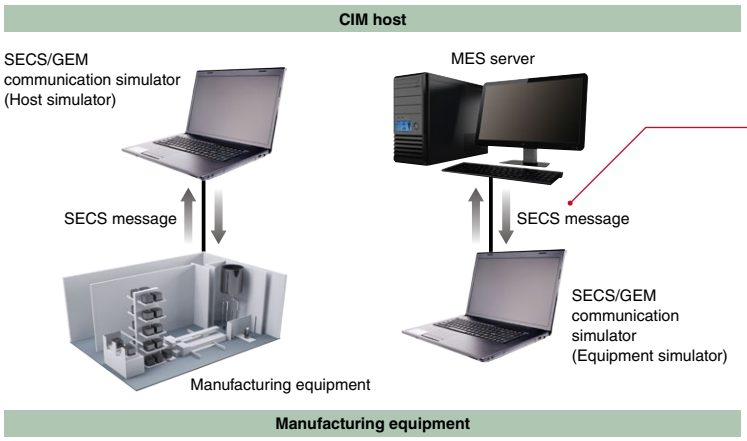
SPC (Statistical Process Control) is a method of controlling quality to monitor the manufacturing process

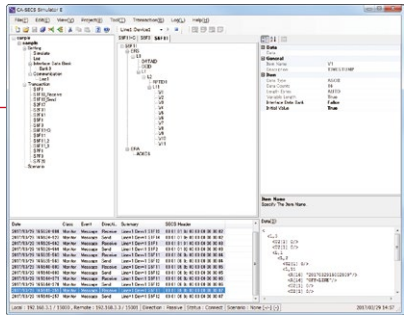
*1. A conversion program needs to be created using a programmable controller or C Controller for FFT conversion.

• SW1DNC-SECSSIM-E

SECS/GEM Communication Simulator

Enabling simulations of semiconductor communication standard SECS communication





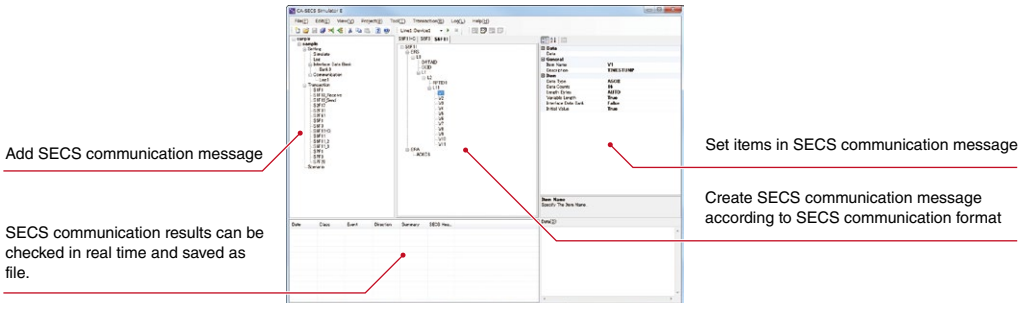
SECS messages can be set on GUI screen interactively referring to the communication specifications, allowing immediate use as a host or manufacturing equipment simulator.

■ SECS communication simulation is possible

SECS/GEM communication simulator is Windows® application software enabling simulations of semiconductor communication standard SECS communication. Utilizing either as a host or equipment simulator and for debugging check and on-site testing, necessary works for enabling SECS/GEM communication can be smoothly done, reducing overall development cost.

■ Features

- SECS communication format can be easily created/set with GUI operation on tree view that is suitable for SECS message in SGML format
- Acting as a host simulator, communication functions of manufacturing equipment can be simulated prior to the delivery of manufacturing equipment
- This simulator can be used to debug SECS communication functions of manufacturing equipment and CIM host
- This tool can be used for on-site testing when enabling SECS communication with the existing equipment



Utilizing as an equipment simulator, communication functions of CIM host can be checked prior to the delivery of manufacturing equipment.

Product List

Model	Pre-installed software	Outline
RD55UP06-V-BZ11	SECS/GEM communication software for NON-GEM	Supports SECS-Ⅰ (SEMI E4), HSMS (SEMI E37), and SECS-Ⅱ (SEMI E5).
RD55UP12-V-BZ11 NEW		
RD55UP06-V-BZ13	SECS/GEM communication software for GEM	Supports SECS-Ⅰ (SEMI E4), HSMS (SEMI E37), SECS-Ⅱ (SEMI E5), and GEM (SEMI E30). (Does not support Trace data collection, Limits monitoring, Process program management, and Document file output.)
RD55UP12-V-BZ13 NEW		
RD55UP06-V-BZ15	SECS/GEM communication software for GEM ADVANCED	Supports SECS-Ⅰ (SEMI E4), HSMS (SEMI E37), SECS-Ⅱ (SEMI E5), and GEM (SEMI E30). (Supports Trace data collection, Limits monitoring, Process program management, and Document file output.)
RD55UP12-V-BZ15 NEW		
R12CCPU-V-BZ19	Data collection software	Equipped with Simple MES functionality.
R12CCPU-V-BZ1B	Data collection software Light	Not equipped with Simple MES functionality.
SW1DNC-SECSSIM-E	SECS/GEM communication simulator	Windows® application that enables SECS communication.

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- Before using the products for special purposes such as nuclear power, electric power, aerospace, medicine or passenger-carrying vehicles, consult with Mitsubishi Electric.
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