Nexplant MESplus MC

Machine
Control

Latest equipment automation and communication standard

Today's factory automation system environment is rapidly changing and Nexplant MESplus MC is the most effective application for the equipment automation development in manufacturing factory.

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What is **MC**(Machine Control)?

When the concept of equipment automation first appeared, it was recognized as the automation of the production line. However, in recent years, the meaning of equipment automation has been greatly expanded, and it has been recognized as the automation of manufacturing-related management and manufacturing processes. MC(Machine Control) aims to utilize standardized and optimized application to increase facility efficiency.

In order to effectively cope with the IoT paradigm, it is required to collect and utilize the production equipment data in a stable manner. Therefore, it is necessary to secure a system that supports not only the equipment operation management system, but also the existing equipment and the interface with new equipment.
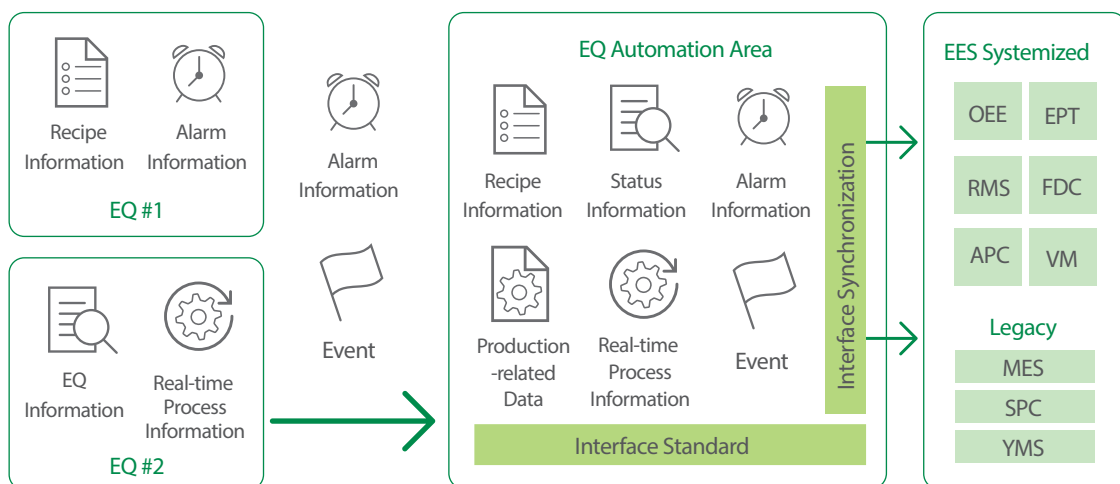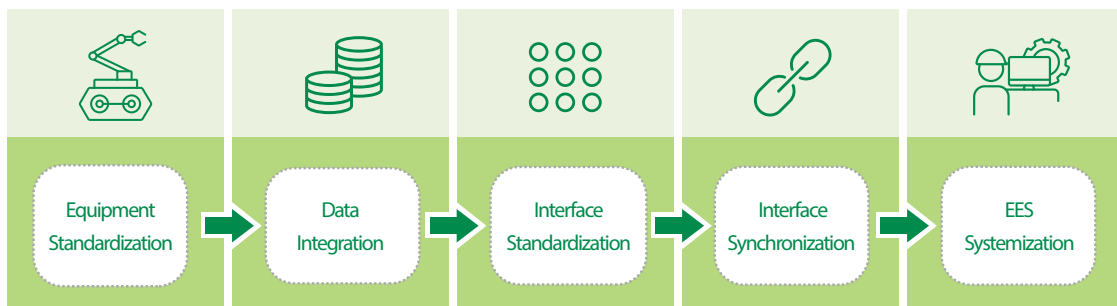
- OEE (Overall Equipment Effectiveness)
- FDC(Fault Detection Classification)
- SPC(Statistical Process Control)
- EPT(Equipment Performance Tracking)
- APC(Advanced Parameter Control)
- YMS(Yield Management System)
- RMS(recipe Management System)
- VM(Virtual Metrology)

Nexplant MESplus MC

MC is an equipment automation application for factory automation on the manufacturing floor.
It quickly collects and processes large amounts of equipment data to provide the data needed to implement production management systems (MES) and equipment engineering systems (EES). It is especially optimized for equipment automation for high-tech industries such as Semiconductors, FPD (LCD, PDP, OLED, Solar Cell, etc.), Electronics and Battery.

Main Features

Various equipment protocols and industry standards supported

1
· Interface with equipment that support different protocols is possible
· Efficient application and cost reduction by minimizing equipment remodeling and replacement

Flexible data collection and processing

2
· Built-in function for data collection provided
· Various transformation and conversion functions supported for data processing

Verified performance and stability

3
· System management support through real-time monitoring
· Improved report and log-based error analysis capabilities
· Stable system implementation through Fail-Over
· Applied at many large manufacturing companies

Easy development and maintenance

4
· Modeling-type development environment supported
· Preventing of wrong input by user through refined GUI
· Various equipment and interface system simulator and log provided
· Development and maintenance possible through internet

Major Functions

Communication Modeler

⊕ SECS/GEM/HSMS Message Definition

- SECS/GEM/HSMS Log using Drag & Drop Message Library defined

- Copy & Paste of each Message

- Log Enable/Disable for each Message

- Various Object Properties defined eliminating additional Coding

- Standard SECS/GEM/HSMS Message Library definition

⊕ PLC Map Definition

- Freely define Bit and Word areas

- Quick Map definition function provided by using Copy & Paste

- Various Object Properties provided eliminating additional Coding

⊕ Equipment Transaction Definition

- Definition of SECS/GEM/HSMS Message Item & conditional expression based on item combination

- Various conditional expressions and priority functions provided

- Mapping Multi-message to one Transaction

⊕ Equipment Scenario Definition

- Readability (actual equipment process flow) provided

- Callback Function interface provided

- Effective locking supported for data integrity and convenient modification

Administrator & Simulator

⊕ Equipment Remote Control Management

- Monitoring and control of remote equipment over the internet, Multi-Fab (FAB) support

⊕ Virtual Test

- Easily create virtual devices using logs

- Configuring and testing various virtual scenarios supported

⊕ Test Log Definition

- Hex & SECS-II log provided

- Word data provided that is mapped in Bit Event

- Support and management of log file using development

⊕ EAP Communication Trend Analysis

- EAP communication trend analysis and statistical calculation

- Reporting using EAP Log Analyzer

Data Interface

⊕ Data Collection Defined

- Various information functions implemented in Development Kit

- User definition data collection structure defined

- Variable List & Item technique implementation

- Various Component Properties supported for collected data formatting

⊕ Data Definition Between Equipment and Upper System

- Consistent communication support with automation components by supporting standard data conversion component

- Data encoding & decoding

- Standard Callback Function Skeleton defined through Stub Generator

⊕ SECS & PLC Driver

- High-capacity high-speed communication

- Late component creation supported for easy user programming

Case Study

Case 1.
Productivity improvement by implementing equipment automation application

Challenge	Solution	Benefits
· Incidents caused and decreased productivity by manual operation · Equipment process status and status management needed · I/F needed for upper system utilization	· Integrated data collection from equipment through diverse communication protocols · Equipment control for incident prevention · Auto recovery in case of any error through solution integrated Auto Failover function	· Incident prevention through equipment control · Improved productivity with Automation support · Stable equipment data collection and system implementation

Case 2.
PCB production equipment automation & eCIM system implementation

Challenge	Solution	Benefits
· Lack of data analysis for quality and productivity improvement · Equipment Recipe management required · Implementation of integrated eCIM management system required · Data collection of outsourced production results needed	· Comprehensive data collection through communication module improvement · Recipe Management System (RMS) implemented · I/F support for interfacing with upper systems (ERP, MES) · Production process result collection system implemented by interfacing with outsourced network	· Prevention of production incidents and quality improvement through recipe management · Product tracking system (Lot Tracking) secured by using Master Data of upper system · Increase production efficiency by checking production results of outsourcing companies

Case 3.
Automation system implementation for full Automotive line

Challenge	Solution	Benefits
· Lot Tracking system of in-line equipment required · Fault detection system and quick action required	· PLC MAP standardization of full line · CIM implementation for measurement and inspection equipment · Interface with upper system (MES) provided · Automatic system failure detection & auto fail-over function provided	· Product tracking (Lot Tracking) & improved reliability by implementing Automation system · Reduced time for implementing new automation line by using standard PLC map · Securing stable data collection by shortening interface changes and fault response time

Major Benefits

- Maximize productivity at production line by precisely controlling equipment using planned information

- Reduced manufacturing cycle time & product defect rate by providing real-time production and quality related equipment data

- Reduced production costs by implementing unstaffed full-automation

- Reduced equipment down-time due to fault detection through real-time equipment monitoring

- Improved equipment utilization rate by managing equipment based on equipment failure analysis

- Reduced production lead time by quickly responding to changes in production line process

- Minimize loss of equipment data by configuring system redundancy through Fail-Over

- Early automation line implementation by providing convenient development & test environment

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