Delta Smart Manufacturing

Delta Smart Manufacturing integrates Delta's software and hardware products of the OT and IT layer. This integrated solution upgrades production lines, digitizes production progress, and controls product quality for stable and seamless operation.

Managers can precisely control production status, factory information, and energy consumption data across plants, enabling real-time remote scheduling and decision-making. By applying AI and big data analytics, Delta Smart Manufacturing gives clients the edge in managing rapidly changing market demands and the manufacturing digitization wave.

Enterprise | Management | Control | OT

War Room | Mobile / Alarm | Cloud Platform | Data Analytics | Energy Analytics

Digital Twin

DIATwin
Digital Twin

Manufacturing Operation DIAWorks

- Manufacturing Execution DIAMES
- Equipment Management DIAEMS
- Alarm Management DIAAMS
- Statistical Process Control DIASPC
- Smart Visualization DIASVP

Automation Integration DIAAuto

- Equipment Automation Program DIAEAP
  - EAS for Electronics Assembly
  - IMM for Injection Molding Manufacturing
  - PMM for Precision Machining Manufacturing
- Equipment Standard Communication and Control Application Software
  - DIASECS for Semiconductor
  - DIACFX for Electronics Assembly

Intra-Plant Logistics DIATrans

Warehouse Management
DIAWMS

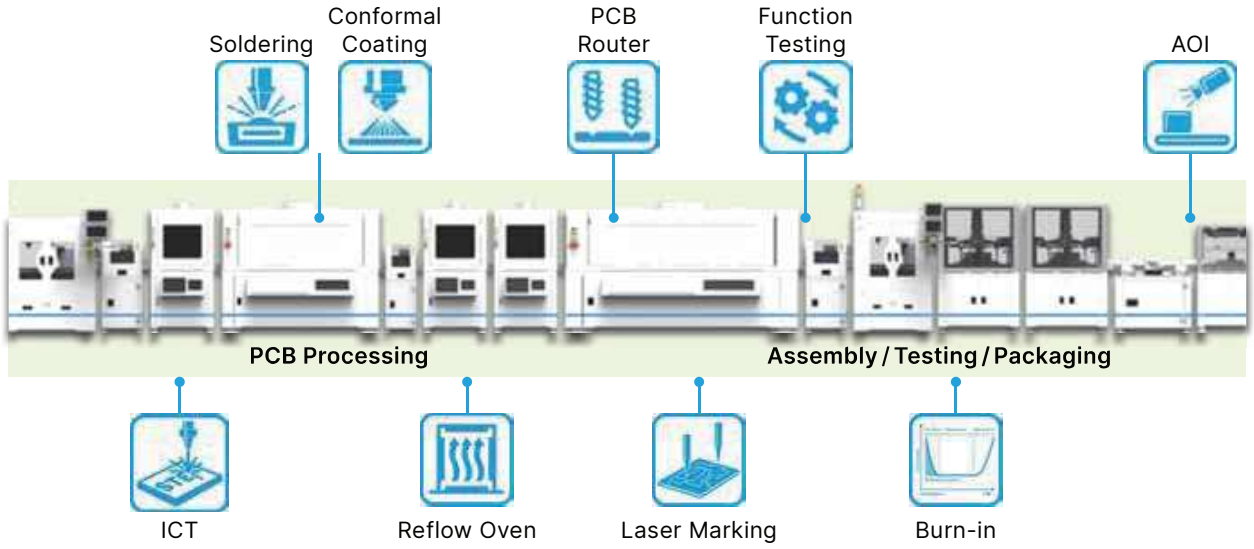
Material Control
DIAMCS

Smart SCADA

VTScada | DIAView
SCADA System

DIAEnergie
Industrial Energy Management System (IEMS)

Equipment Predictive Maintenance (PdM AI)



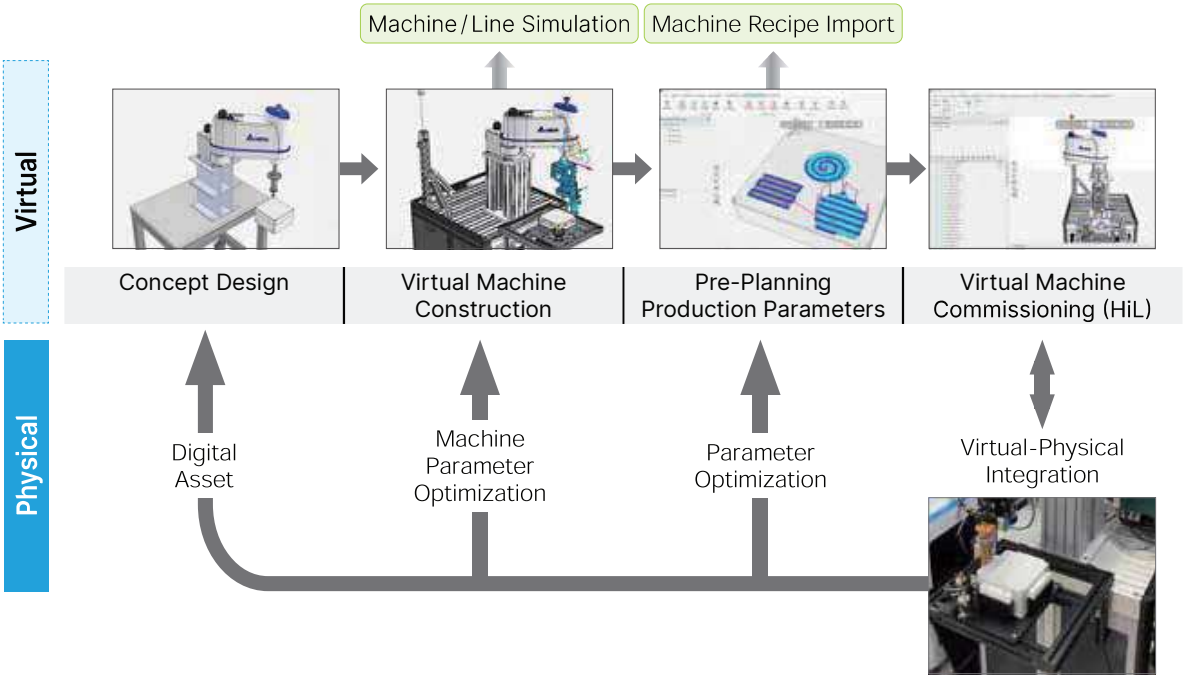
Digital Twin

Virtual Machine Development Platform New

DIATwin

DIATwin is a smart design tool for efficient machine development. Using 3D visualization and parameter optimization modules, the development process is digitized. High-fidelity simulation and a ready-made model library enable DIATwin to enhance development efficiency

Digital Twin Solution for Automated Machine Development



System Functions

Virtual-Physical Integration

- Programming support for PLC / PC-Based controllers and Delta Industrial Robots
- Switches between virtual and physical
- Achieves Hardware in Loop (HiL)

Easy Operation

- Built-in component / Machine Layout Library
- Increases efficiency for equipment manufacturers
- Simplifies development through algorithms and models in the industry module toolkit

High Flexibility

- Add-ons for industry modules
- Follows FMI standards, supports reusable/planned simulation models

High-Fidelity Simulation

- Precise virtual and physical simulation of Delta products, including robots, servo drives, PLCs, sensors, vision cameras, and more

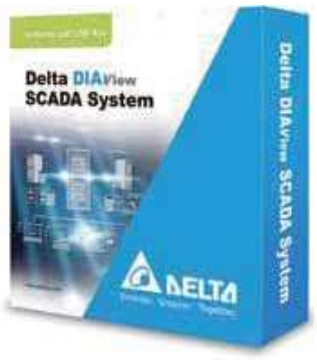
Applications

Electronics assembly, Shoe manufacturing, Hardware processing and handling; Other equipment manufacturers and factory automation applications

SCADA System

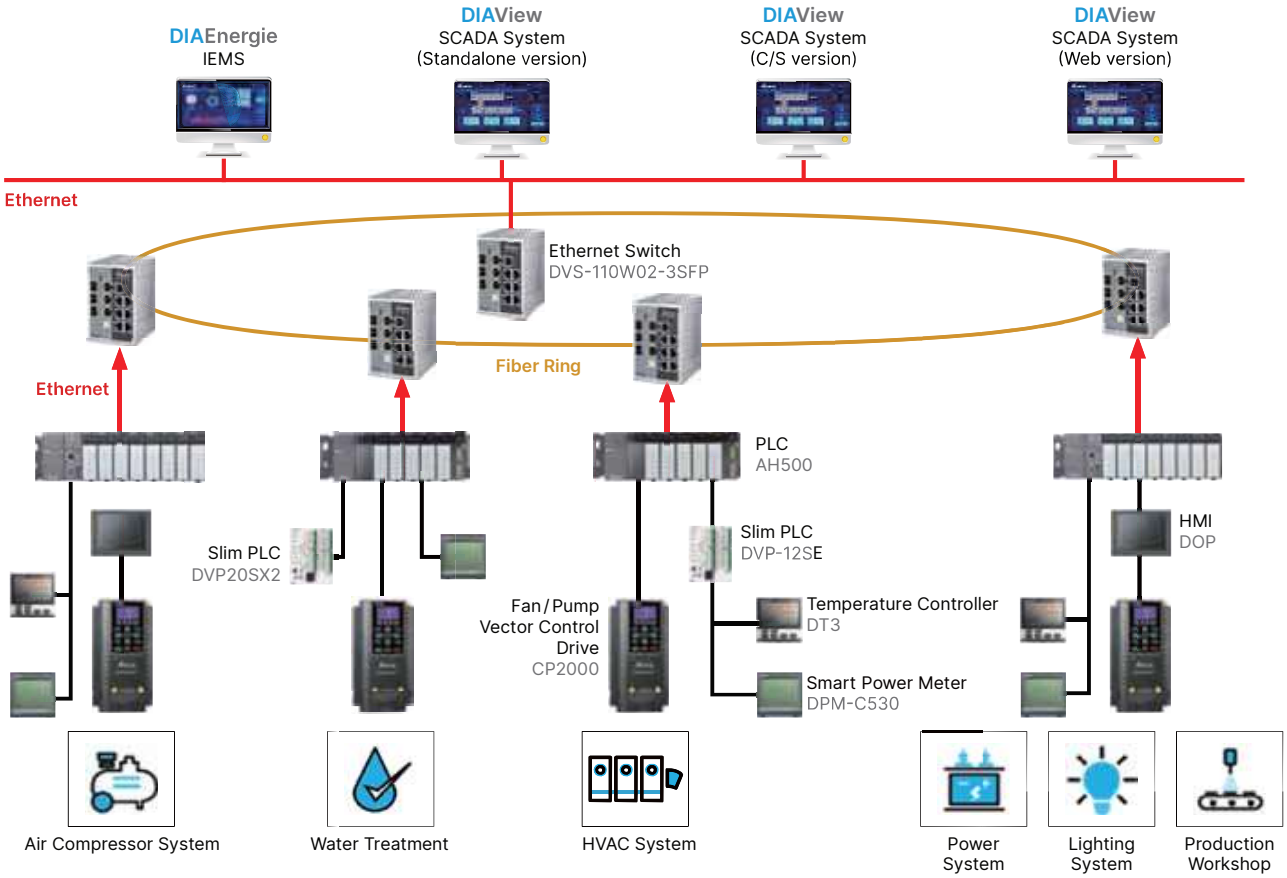
DIAView

Remote Monitoring for Smart Factory Management



- Seamless integration with Delta PLCs and I/O modules, supporting various industrial communication protocols and equipment drivers
- Web-Based CSS/HTML5 platform and WPF technology for intuitive & vivid displays and easy-to-navigate interfaces
- Variables Library and batch parameter editing for flexibility and high efficiency
- Diverse real-time data visualization: curve/pie/bar charts and reports
- Real-time and historical data analysis tools
- Efficient anomaly alarms and management
- Easy-to-learn VBScript language
- Reliable user authority management for different authorization levels

System Structure



Applications

Smart manufacturing and smart machines, HVAC, Water treatment, Electronics manufacturing

Smart SCADA

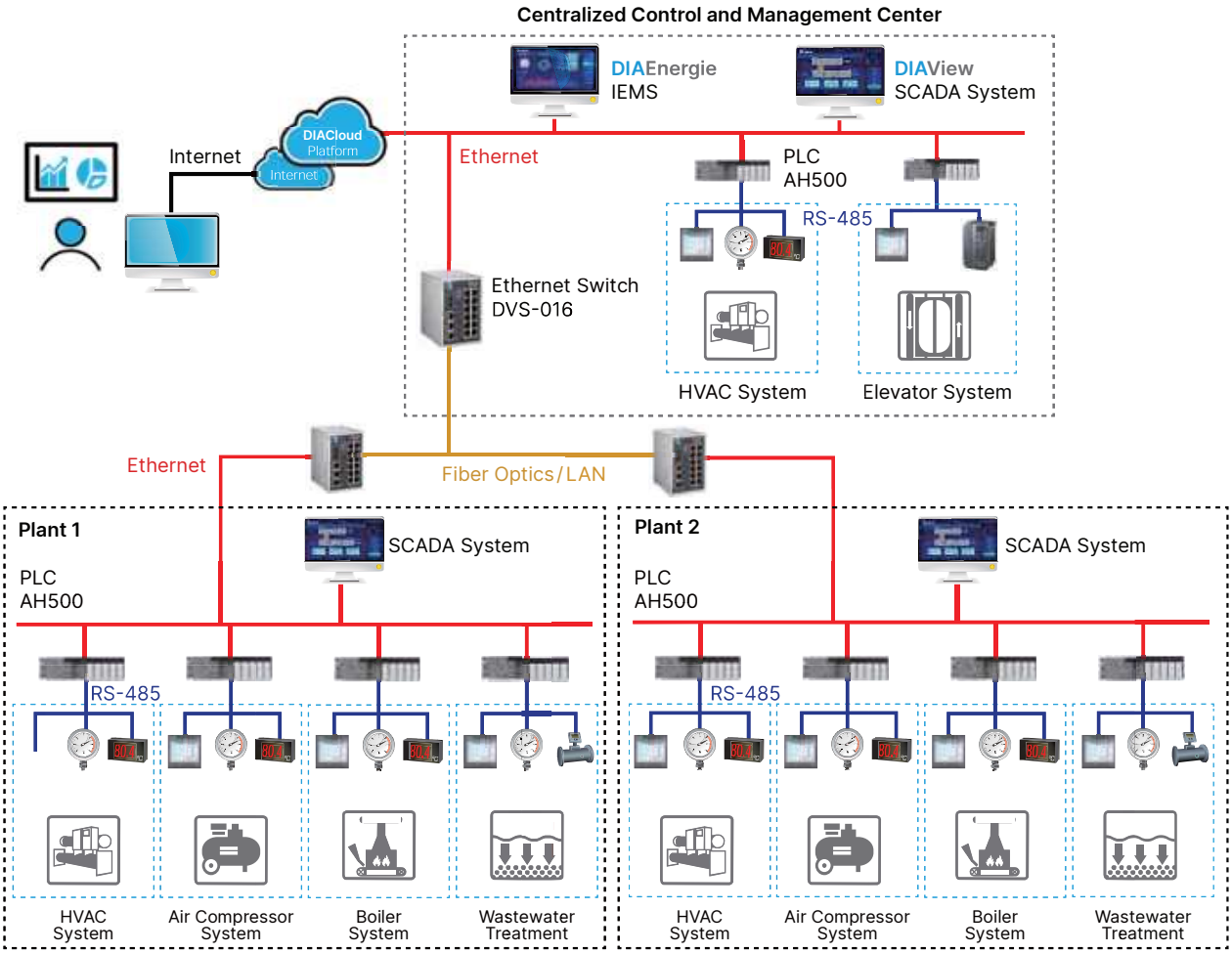
Industrial Energy Management System

DIAEnergie

Innovative Solution for Smart Energy Saving

- Remote monitoring and visualization of critical power data
- Data analytics by areas and user authorization levels
- Monitoring and analysis for energy performance goals
- Real-time alarms for anomalies
- Power consumption analysis for efficient electricity usage and cost savings
- Demand management and forecasts to avoid exceeding the electricity consumption threshold
- User-defined tools for report output and a variety of data analyses

System Structure



Applications

Energy saving, Environment control, Power monitoring and analysis, Facility management control

Data Integration Platform New

inData+

inData+ is a one-stop platform for digital transformation. By inData+ central server, subsystem data is managed, allocated, and integrated

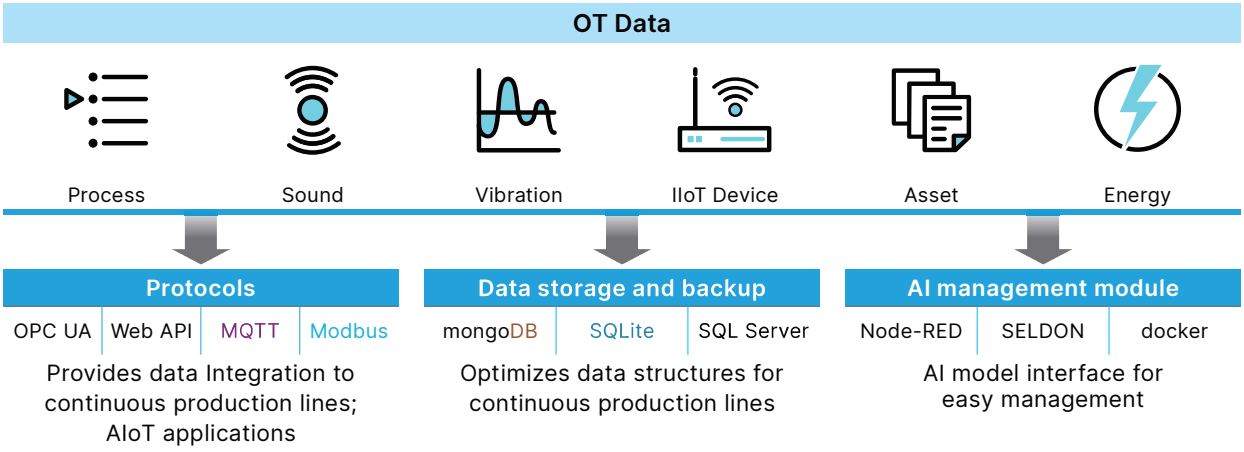
Flexible and diverse data integration

- Provides mainstream protocols for OT and IT integration (OPC DA / OPC UA / Modbus / ODBC / MQTT / Web API)

Rapid deployment and management of AI models

- Collects process information (temperature, pressure, flow) and equipment inspection data (vibration information, inspection reports)
- Provides additional features for AI model learning

System Structure



Applications

Petrochemical industry, Steel industry, and Fiber / textile industry; Other continuous production lines

Petrochemical

Steel

Fiber / Textile

Smart SCADA

Predictive Maintenance AI New

PdM AI

PdM AI is a robust solution for continuous processing industries, offering three core functions: real-time monitoring with OA, health / RUL prediction, and anomaly detection

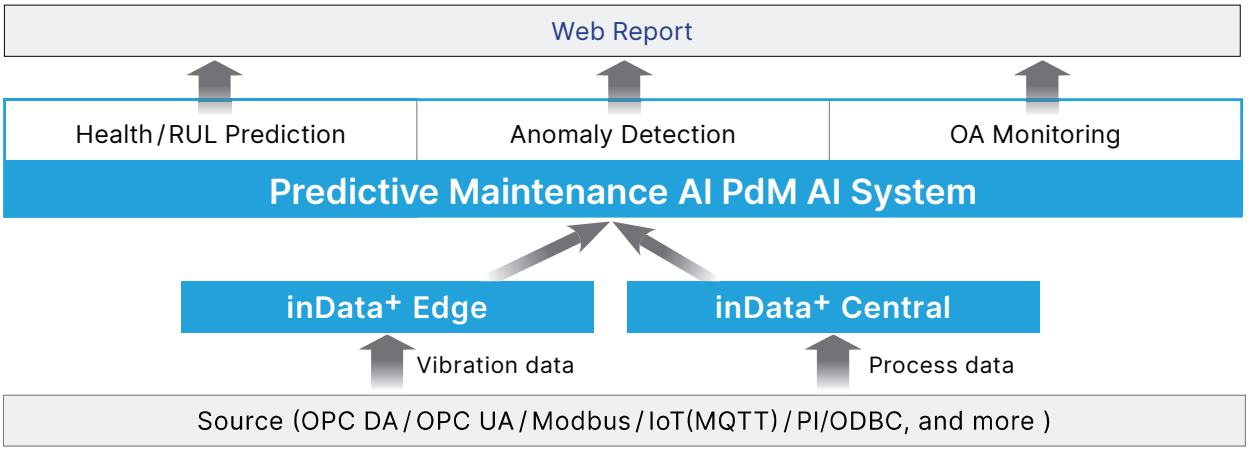
Anomaly detection and alarms

- Real-time monitoring
- Immediate alert notification
- Historical data analysis & trends
- User-configurable alert thresholds

Failure root cause analysis

- Accumulation of experiences
- Cost reduction due to lower professional personnel turnover
- Effective anomaly management strategies
- Continuous improvement

System Structure



Applications

Petrochemical, Steel, Fiber / Textile industry, Other continuous production lines

Petrochemical

Steel

Fiber / Textile

Data Mining Module Miner+

New

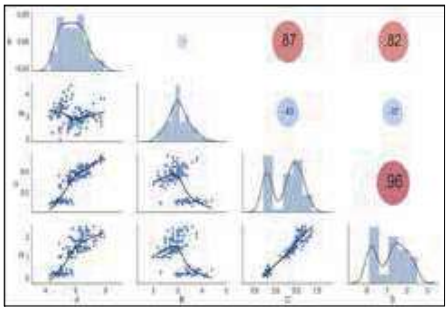
Miner+ empowers data intelligence in process improvement, equipment inspection, production, and quality control. With a user-friendly interface and seamless integration with inData+, users can extract data insights from the production process

User-friendly data analysis capabilities

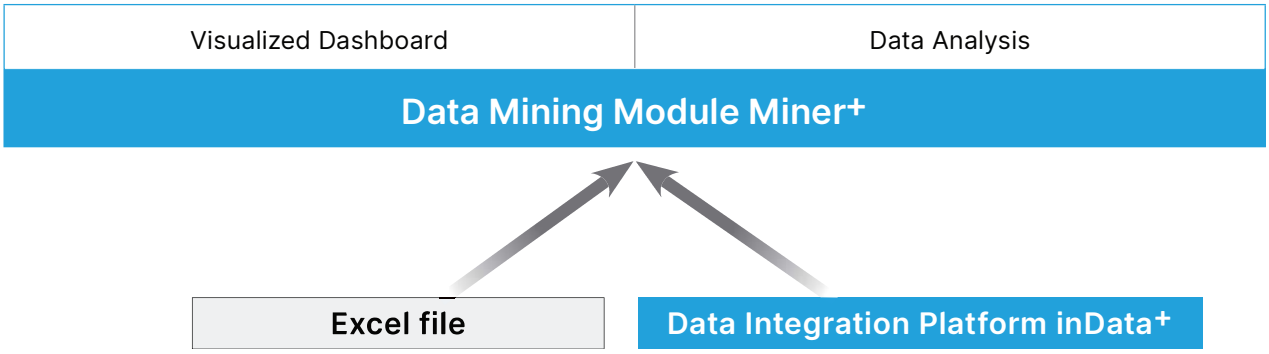
- Provides data intelligence for process improvement, equipment inspection, production, and quality control
- Factor analysis considers time delays in continuous production

Visualized dashboard

- Enables users to integrate data sources from the inData+ Data Integration Platform to achieve process improvement, equipment operation tracking, and process status monitoring



System Structure



Applications

Petrochemical, Steel, Fiber / Textile industry, Other continuous production lines

Petrochemical

Steel

Fiber / Textile

Smart SCADA

Spectrum Analysis System New

SPAS+

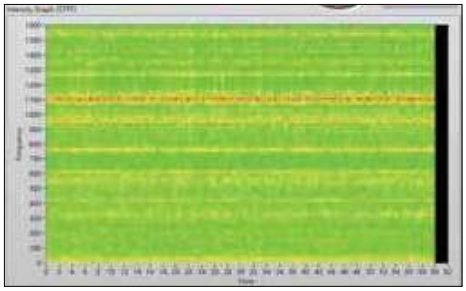
SPAS+ is an advanced vibration signal analysis tool designed for time-domain, frequency-domain, and time-frequency signals. It allows custom filtering, including high-pass, low-pass, and band-pass filters, for precise capturing of target frequencies. The unique defect frequency database offers automatic fault annotation, enabling users to quickly identify issues. SPAS+ supports database expansion to ensure the latest vibration data and effectively manages and analyzes vibration data to enhance equipment health monitoring efficiency

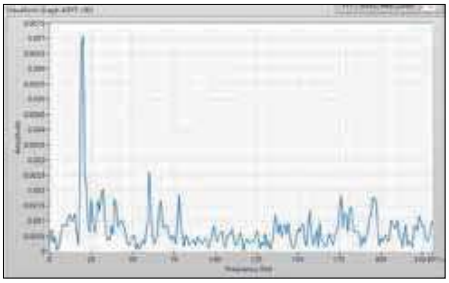
Integration with PdM AI system

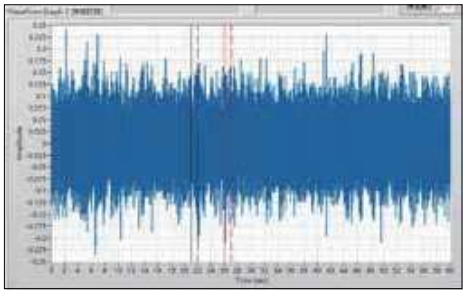
- Real-time data synchronization
- PdM case study & insights
- Remote diagnostics and troubleshooting

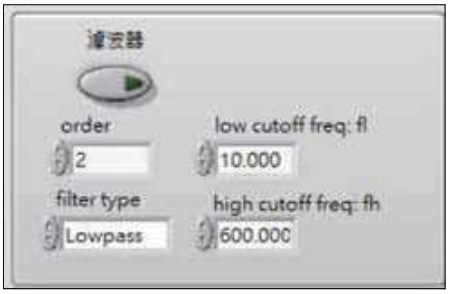
Replaces traditional spectrum analysis

- User-friendly interface
- Historical data analysis and trend identification
- Customizable reporting and alarms
- Interactive data visualization & config tools









Applications

Petrochemical, Steel, Fiber / Textile industry, Other continuous production lines

Petrochemical

Steel

Fiber/Textile

Manufacturing Execution System

DIAMES

DIAMES is the core of the smart factory, coordinating upper-level planning and management systems withequipment control in the lower-level workshop. Through data transmission of production activities, from order to completion, DIAMES optimizes manufacturing process management. It is the key to factory digital transformation

Complete product traceability and process monitoring to achieve lean production

- Systematically establishes standard production processes and operating specifications, conducts real-time checks
- Utilizes management reports and data visualization platforms to achieve transparency of production information, assisting managers in grasping real-time production status
- Collects production data such as personnel, machinery, materials, methods, environment, and measurements throughout the manufacturing process; meticulously recording product histories

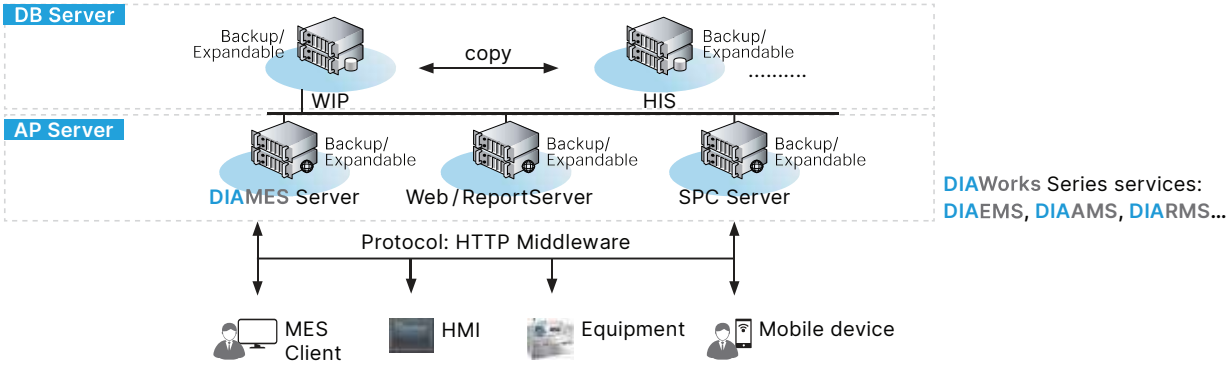
Complies with ISA-95; An integrated manufacturing operations management system for different industries

- With production management at its core, DIAMES integrates quality, equipment, material storage and logistics management to enhance efficiency
- Provides work-in-progress (WIP) management items, including serial number tracking, batch tracking, lot tracking, and carrier tracking
- Comprehensive process quality inspection and flexible sampling rules; Efficient quality management with statistical process control
- Tailors industry-specific solutions to address key challenges

Highly stable system architecture; Flexible secondary development; Easy maintenance

- Network redundancy automatically switches to the backup server during data blockage to prevent data loss
- A multi-layered architecture offers various templates and components. Allows for the flexible combination of functionalities based on business logic requirements, effectively controlling system impacts

System Architecture



Applications

Electronics assembly, Electronic components, Flat panel displays and materials, Solar cell, Semiconductor, Home appliances, Printed circuit board, Metal processing, Automotive parts, Food processing, and other industries

Manufacturing Management Platform DIAWorks

Statistical Process Control System

DIASPC

DIASPC collects real-time measurement data in the manufacturing process, applies statistical methods and control rules to provide early warning of abnormal trends, monitors the manufacturing process, and stabilizes the manufacturing process for improved product quality. Complies with the IATF16949 international standard

Alarms notify and ensure the stability of the process capability

- Various variable, attributed data, and control rules effectively monitor process capability and prevent anomalies
- Quickly finds stratifications and provides anomaly analysis
- 3 real-time monitoring tools for anomaly quality events, including Alarm board, E-mail, and Plant-wide dashboard platform

PDCA management cycle used to continuously optimize production quality

- Users can import the excel file to build the basic setting data and measurement data quickly
- Tracks and manages the quality status anomaly, provides Out of Control Action Plan (OCAP)
- Provides version history tracking for control limit and specification limit versions
- Flexible export format for users to quickly create certificate of analysis reports and quality assurance certificates

Provides a variety of charts and reports for analysis and control

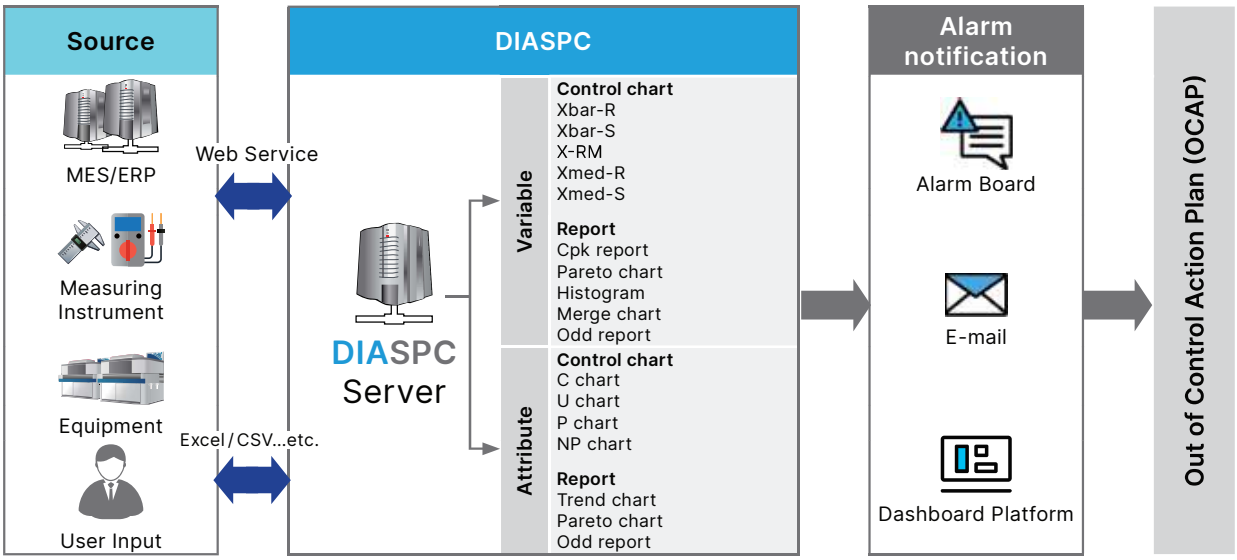

Control Chart


Histogram


Pareto Chart


CPK Report

System Architecture



Alarm Management System

DIAAMS

DIAAMS integrates anomaly alarms of various information systems, equipment and facilities, and immediately warns the responsible units, so that users at all levels can deal with anomalies quickly

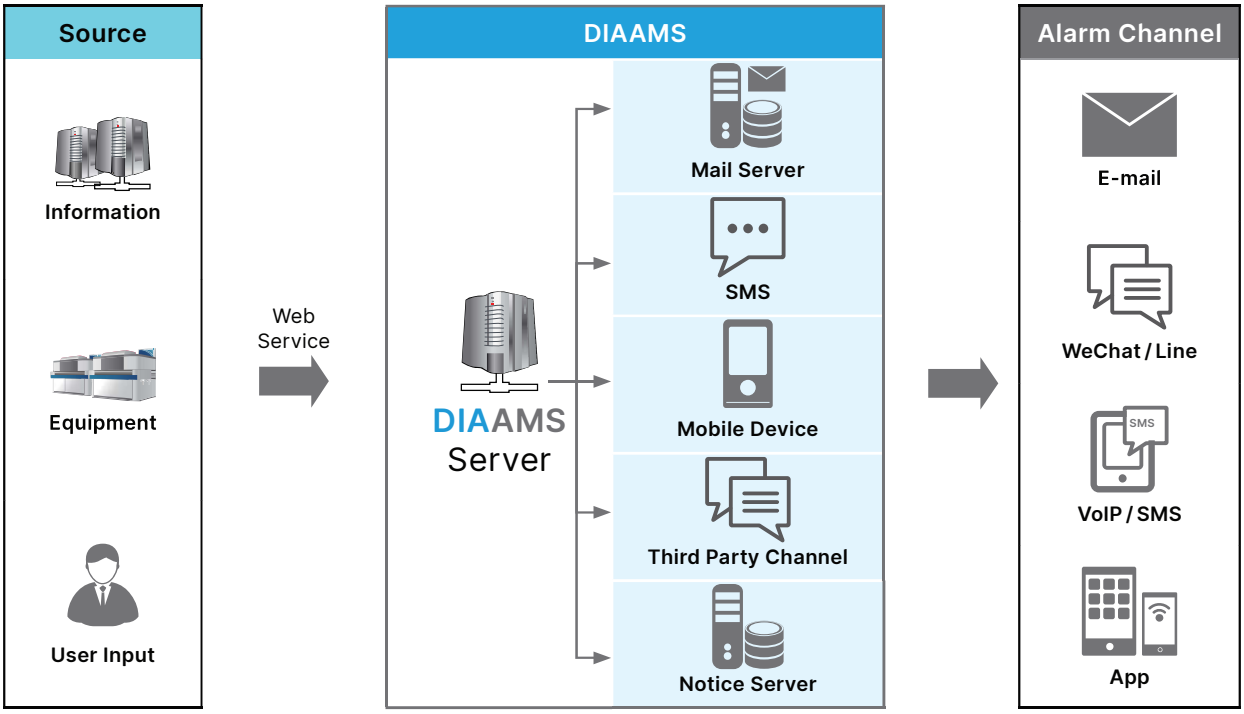
Effective alarm ensures immediate action

- Supports multiple alarm channels, including email, SMS, VoIP, WeChat, Line and app notifications
- Provides multi-level alarm settings, if first level users don't respond immediately, the system automatically reports to second-level users
- Web-Based server requires no installation, allows remote alarm setup

Flexible alarm condition setting reduces maintenance cost

- Prevents repeated invalid alarms that disturb users
- Quickly batch-sets alarm source screening rules for the correct sending path
- Provides a standard interface, quickly integrates with other systems.

System Architecture



System Functions

Alarm Classification

Alarm classification and summary based on plant area and other systems

Multiple Level Setting

Sets the alarm sending path; Multi-level sending settings

Alarm Management

Various alarm managing actions interrupt or end the event according to each condition

Alarm Reports

Provides a variety of report records to query the alarm status and analysis

Manufacturing Management Platform DIAWorks

Equipment Management System

DIAEMS

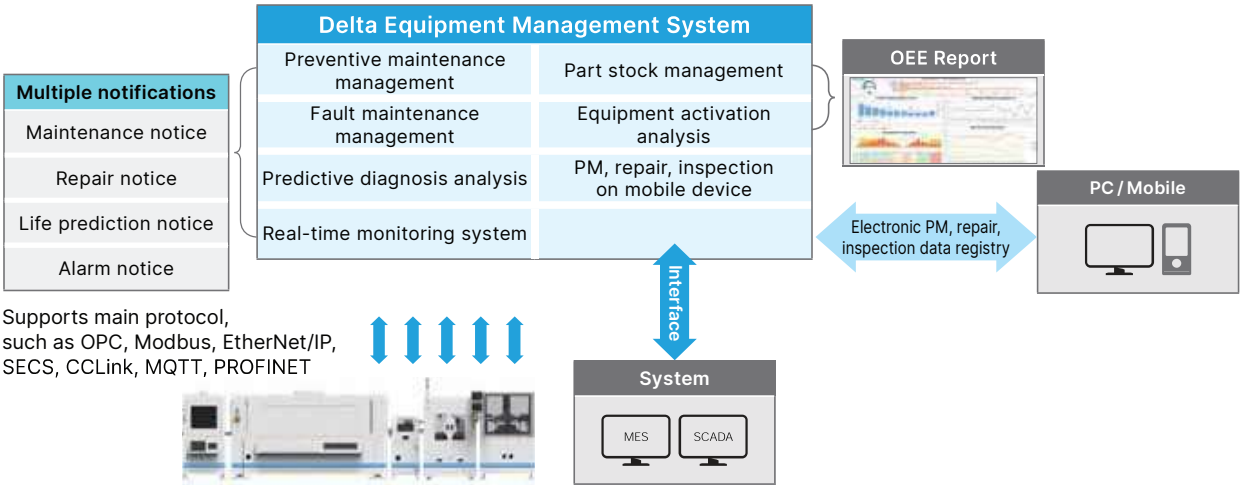
DIAAMS integrates anomaly alarms of various information systems, equipment and facilities, and immediately warns the responsible units, so that users at all levels can deal with anomalies quickly

Systemizes equipment management, simplifies workflow and increases efficiency

- PM / Repair / Inspection fast mode, simplifies the process and reduces workload
- Part stock management, reduces inventory, simplifies tracing workload
- Real time analytics of utilization and anomaly statistics

Integrates different equipment from OT to IT, offers predictive diagnosis

- Integrates spec data import with simplified interface
- Flexible mechanism to intelligently create PM and repair work orders
- Extends equipment lifespan and prevents loss from anomalies with predictive diagnosis



System Functions

Predictive Diagnosis	Preventive Maintenance	Malfunction Repair	Part Stock	Equipment Utilization
Service life prediction, anomaly diagnosis and analysis	PM work reminders and execution records	Creates repair work orders	Manages part in/out-stock and inventory, controls the usage and stock	Real-time utilization and status report

Applications

Bare printed circuit board	Copper clad laminate, Circuit board
Computers, electronics and optical products manufacturing	Computer, Monitor, Disk array, PCBA
Electronic parts and components manufacturing	LEC, Passive element, Automobile electronics
Semiconductors manufacturing	Wafer, Packaging, Testing, Driver IC
Motor vehicles and parts manufacturing	Vehicles, Tire, Wheel rim, Car lights, Stamping part, Wire bundle
Food manufacturing	Beverages, Dairy products, Pastry, bread & food packaging material
Other	Building automation, Building energy management

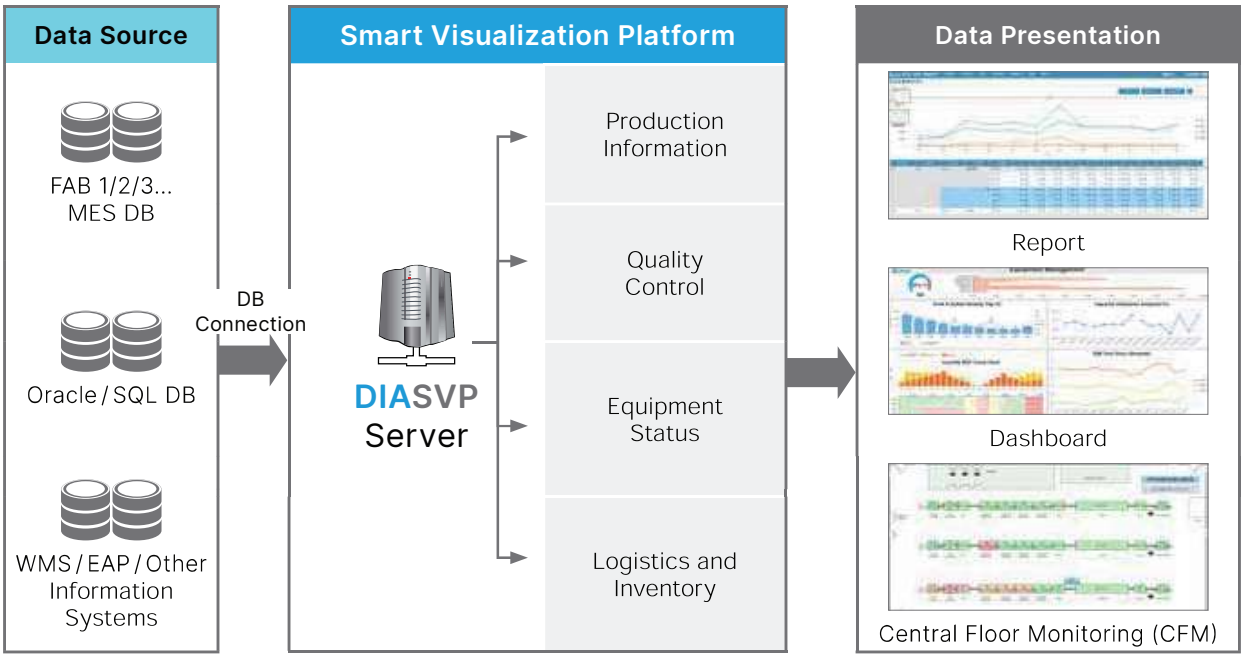
Smart Visualization System

DIASVP

DIASVP provides a centralized factory production information visualization management platform. It integrates big data analytics to enable remote monitoring and decision-making

Simple configuration for rapid report development and swift deployment

- Lightweight development of a web platform, supporting cloud platform microservices deployment and maintenance
- Generates reports, dashboards, and Central Floor Monitoring (CFM) through simple configuration settings
- Supports multi data sources, such as SQL Select, Procedure and Customized program class; Able to attach external computing modules (SPC, EMS, and more)
- Flexible presentation of report content, supporting various charts, tables, pivot tables, and more
- Report configuration wizard guides users to quickly complete setup
- Updated data push notifications and scheduled sending tools, enabling real-time monitoring of factory status



The Central Floor Monitoring (CFM) provides a clear overview of production progress and resource utilization

- Graphic editing of the factory layout module, allows for setting background color, outline color, and flashing functionality to highlight important messages; a visualization of the location and status of production resources
- Nine-grid design for machine images, allowing flexible configuration to display important production data for each machine.
- Visualizing storage space utilization and inventory data
- Real-time push data updates, eliminates repetitive system transmissions and quickly presenting information
- Easy monitoring with a single CFM server which connects to multiple plants or heterogeneous systems

Automation Integration Platform DIAAuto

Equipment Automation Program New

DIAEAP+

Integrates diverse specifications and protocols, leveraging edge computing to achieve smart manufacturing. Enables effective production management.

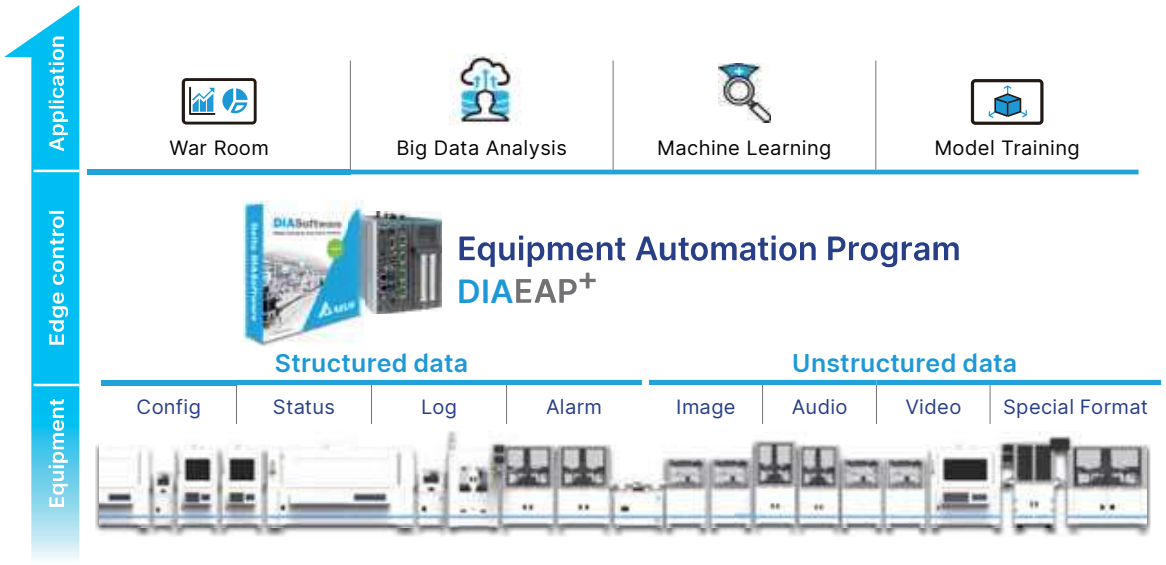
Simple web UI design, low-code development platform, rapid deployment

- Edge computing mechanism, better response time, decreases the loading of the management system
- Supports standard communication protocols, such as OPC UA, Modbus, IPC-CFX, SECS, and others
- Modulization system design, reduces project cost and decreases repetitive work
- Full data lifecycle consulting service, including requirement analysis, specification formulation, system development, and go production
- Standard assistance tool, Factory Automation Suite, ensures smooth deployment

Applications tailored to each industry

- Industry key parameter analysis, deep integration of production procedure
- Designs industry-specific modules for rapid deployment
- Monitoring visualization provides real-time device status for quick troubleshooting
- Independent operation to control equipment and production flow, ensuring seamless production despite anomalies in upper-level systems

System Architecture



System Functions

Production Monitoring	Centralized Monitoring	Data Intelligence	Issue Tracking	AI Services

Applications

Printed circuit boards, Electronics assembly, Electronic components

Equipment Automation Program

New

DIAEAP-EAS

Integrates diverse specifications and protocols, leveraging edge computing to achieve IIoT for enhanced production line efficiency.

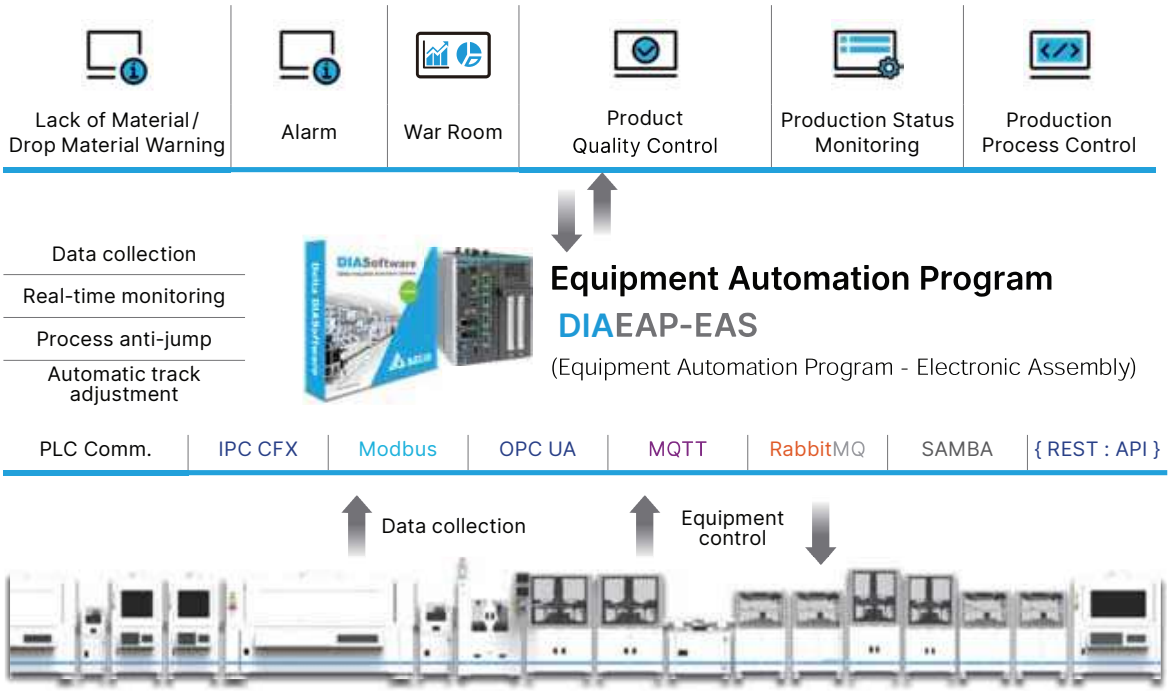
Equipment IIoT for electronics assembly

- Fast implementation of standard communication protocol
- Supports diverse protocols, such as Modbus, IPC CFX, and more
- Standard modular design lowers implementation costs, minimizes refitting, and enables rapid deployment

Low-volume large-variey production, reduces stoptime, eradicates anomalies

- Supports simplifying recipe management processes to enhance production efficiency
- Proactive alerts, adjusting production UPH, precise data presentation, optimizing production scheduling
- Monitoring boards and modular applications specifically designed for electronics assembly

System Architecture



System Functions

Production Monitoring | **Parameter Management** | **Production Data Collection** | **Issue Track** | **WIP Management**

Automation Integration Platform DIAAuto

Equipment Automation Program for Injection Molding Manufacturing Applications New

DIAEAP-IMM

Integrates diverse specifications and protocols, leveraging edge computing to achieve IIoT for enhanced production line efficiency.

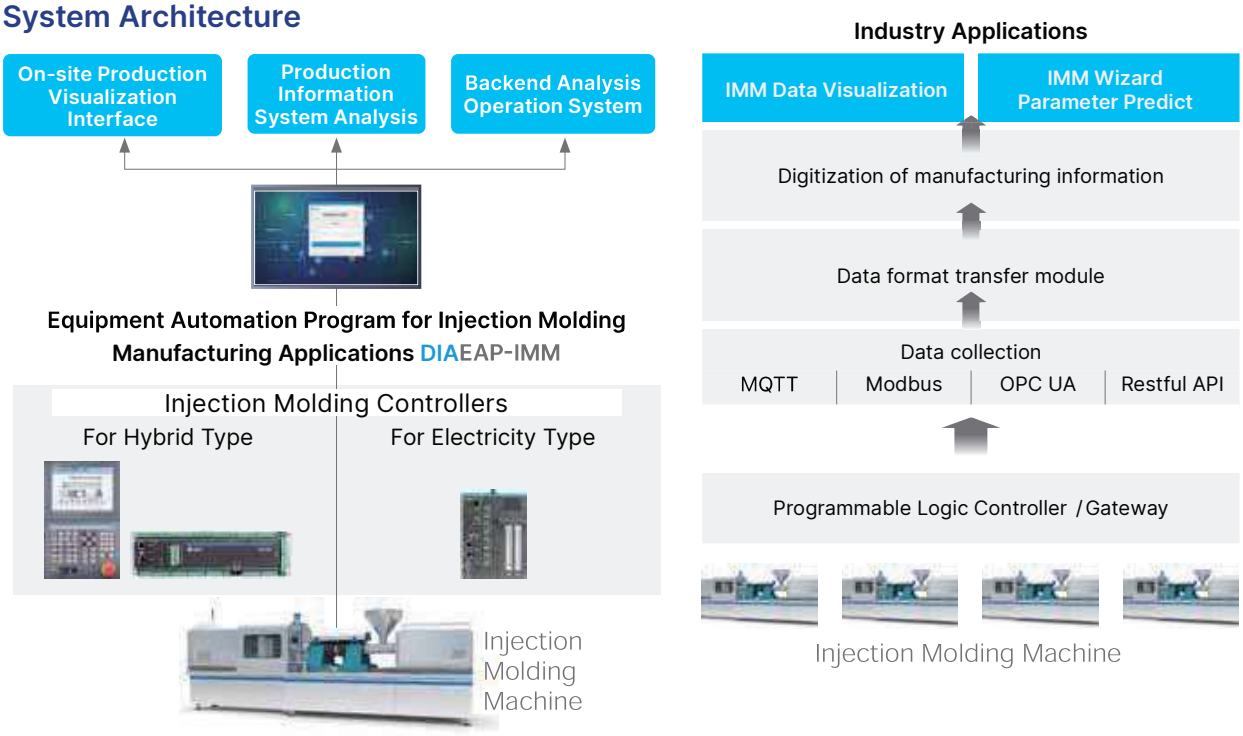
Injection molding know-how and equipment IIoT

- Deep industry knowledge, quickly builds injection molding machine networking interface
- Supports multiple communication protocols, such as MQTT, Modbus TCP/IP, OPC UA, WebSocket, Restful WebAPI
- Standard modular design supports centralized and decentralized system architecture, reducing costs, manpower; Rapid deployment

Data analysis and visualization, process optimization, cost saving

- Data analytics, reports and trend charts
- Injection Wizard
- Records and accumulates the production experience, and optimizes the processes continuously
- Edge computing tech enables fast response and lower implementation costs

System Architecture



System Functions

Equipment Automation Program for Precision Machining Manufacturing Applications

New

DIAEAP-PMM

Integrates diverse specifications and protocols, leveraging edge computing to achieve IIoT for enhanced production line efficiency.

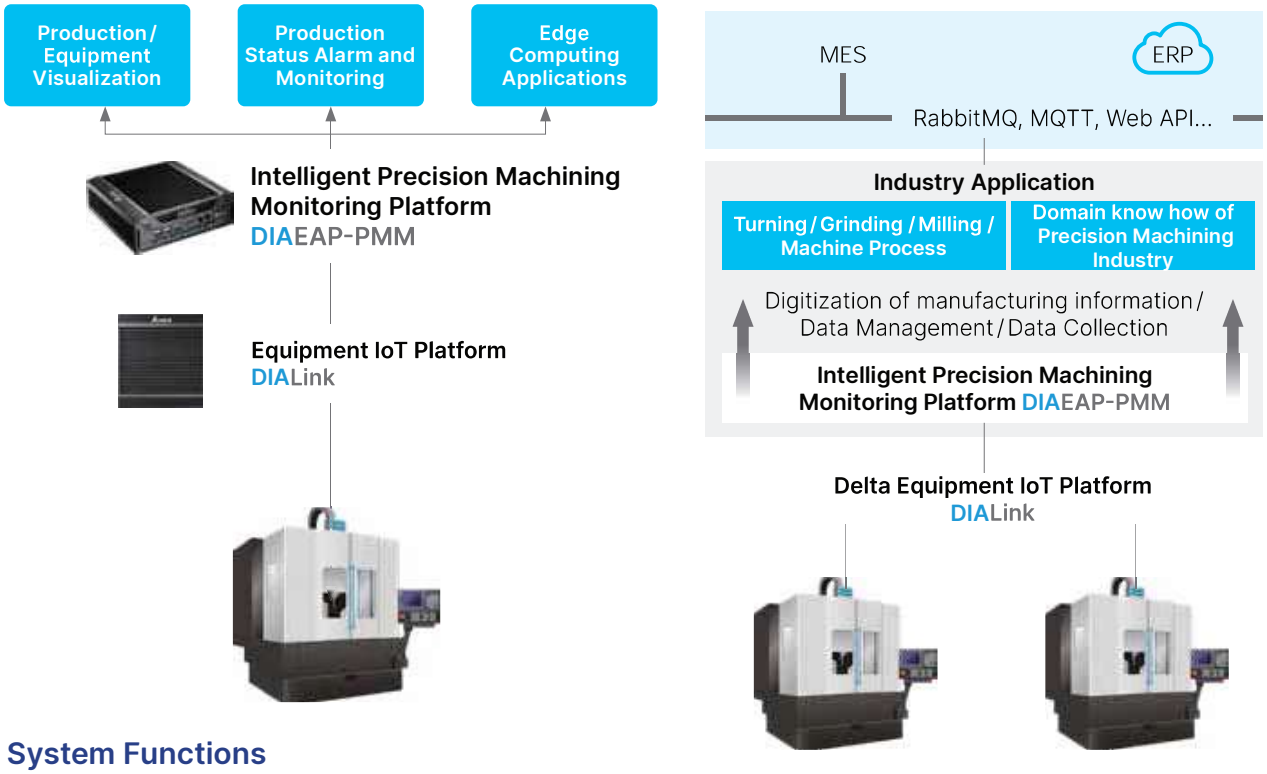
Precision machining manufacturing know-how

- CNC machine data collection and precision machining applications
- Tool, spindle and servo axis monitoring
- Alarm setting, compensation parameter monitoring and response

Turning / grinding / milling / precision machining production process optimization

- Equipment operation, production indicators, work orders, and tools monitoring to enhance efficiency
- Monitors value setting / OOC (Out of Control limit), improves the product quality
- Visualization of manufacturing information, production inspections, reduces manpower and cost

System Architecture



System Functions

Automation Integration Platform DIAAuto

Semiconductor Equipment Standard Communication and Control Application Software

DIASECS

DIASECS transforms equipment into GEM-compliant machines and simplifies the task of equipment-to-host communication implementation. It offers highly-automated configuration tool setting to quickly import SECS/GEM standards, and is applicable to semiconductors, printed circuit boards, photovoltaics, LEDs, displays, and other electronic components.

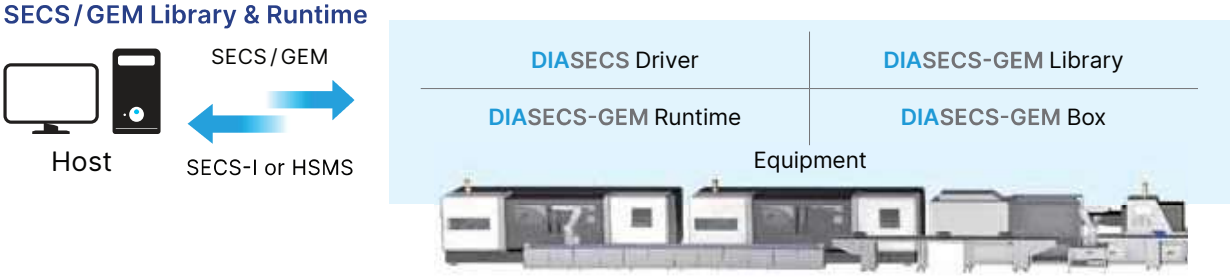
Complies with SEMI standards, high performance, easy to use

- Fully complies with SEMI standard
- Communication rate can reach 300 transactions per second
- User friendly API, provides simulator for functional verification and stress testing, quickly imports SECS/GEM

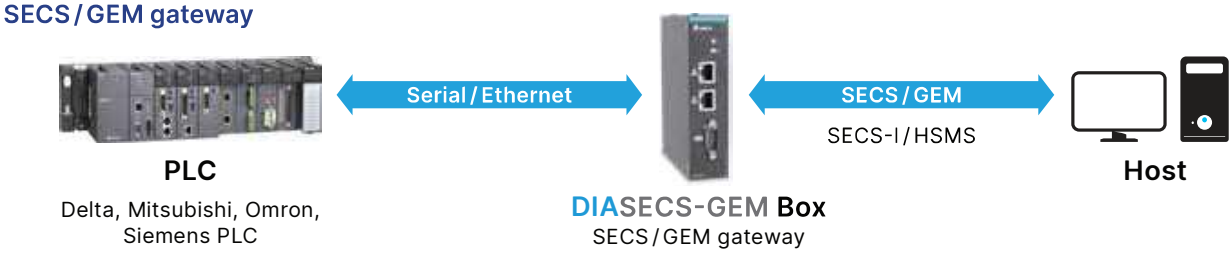
High integration, user-friendly, issue tracking

- Highly automated integration of SECS/GEM specifications, supports most PLC communication protocols
- Quickly completes parameter configuration and settings for quick start
- Provides complete SECS event log to track anomaly effectively

SECS/GEM Library & Runtime

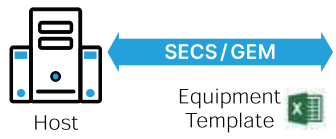


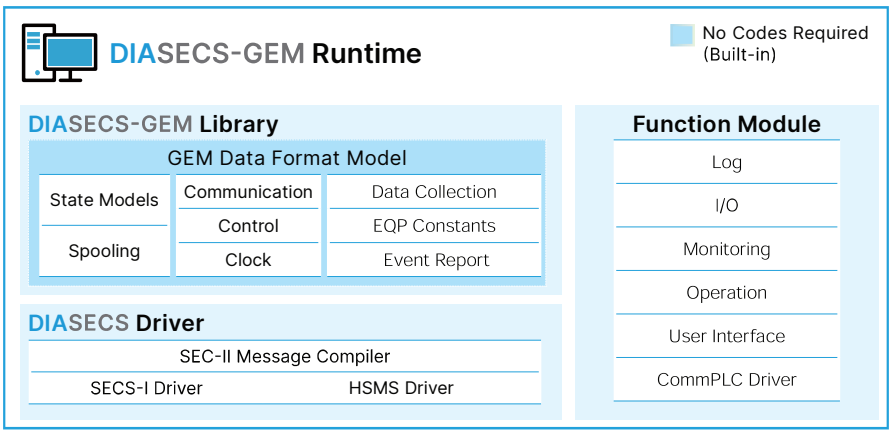
SECS/GEM gateway



Software Architecture

DIASECS-GEM RunTime





Electronics Assembly Equipment Standard Communication and Control Application Software DIACFX

New

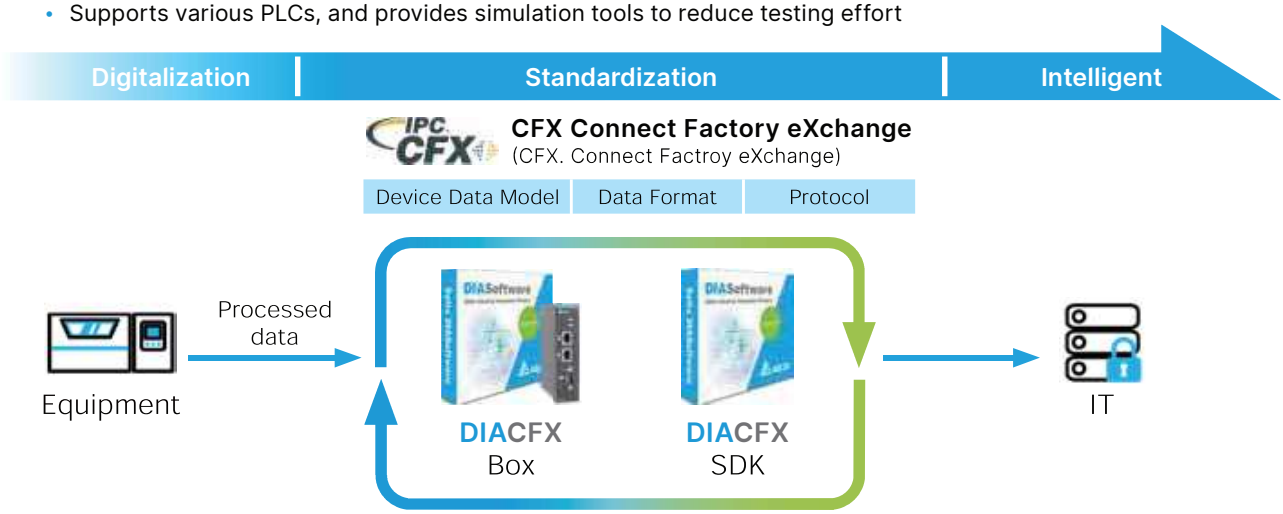
DIACFX is designed for electronics assembly equipment, standardizing the communication protocol and data model. It helps machine makers quickly implement the IPC-2591, Connected Factory Exchange (CFX) standard. DIACFX solves the problem of high customization costs, and closes the gap between OT and IT. Applications include the electronics assembly industry, such as SMT and assembly equipment.

Complies with IPC-2591, CFX Standard

- Reduces high customization costs, accelerates data integration

Supports PC and PLC-Based equipment

- For PC-Based equipment, programmers only need to input the parameters defined by SDK, which will standardize the data model and protocol to comply with IPC CFX
- For PLC-Based equipment, programmers only need to write the data with their familiar PLC registers. The DIACFX Box supports plug and play, fulfilling easy connection
- Supports various PLCs, and provides simulation tools to reduce testing effort



Target User	Assembly Equipment Manufacturers	
Equipment Type	DIACFX SDK	DIACFX Box
	PC based	PLC based
	Programming C#	Programming PLC
Standard	IPC CFX 1.6 Standard	
Protocol	AMQP 1.0	
Web UI	-	Supports
Compiler Version	Support .Net Framework Ver. 4.6.2 above, Net core Ver 3.1 above	-
OS	Windows 7, Windows 8, Window 10, Window 11, Windows Server 2003 above, Linux	-
Programmable	C#	Low-code tools
Compatible PLC	-	Delta, Fanuc, Siemens, Mitsubishi, Omron, and more
Simulation Tools	✓	

Edge Server Box

Equipment IoT Platform

DIALink

Equipment Monitoring and Data Acquisition

Features

- Supports connection to CNCs / PLCs and various equipment brands
- Real-time data access / visualization / storage
- Cloud computing via OPC UA / MQTT
- Edge computing with M2M connection

Benefits

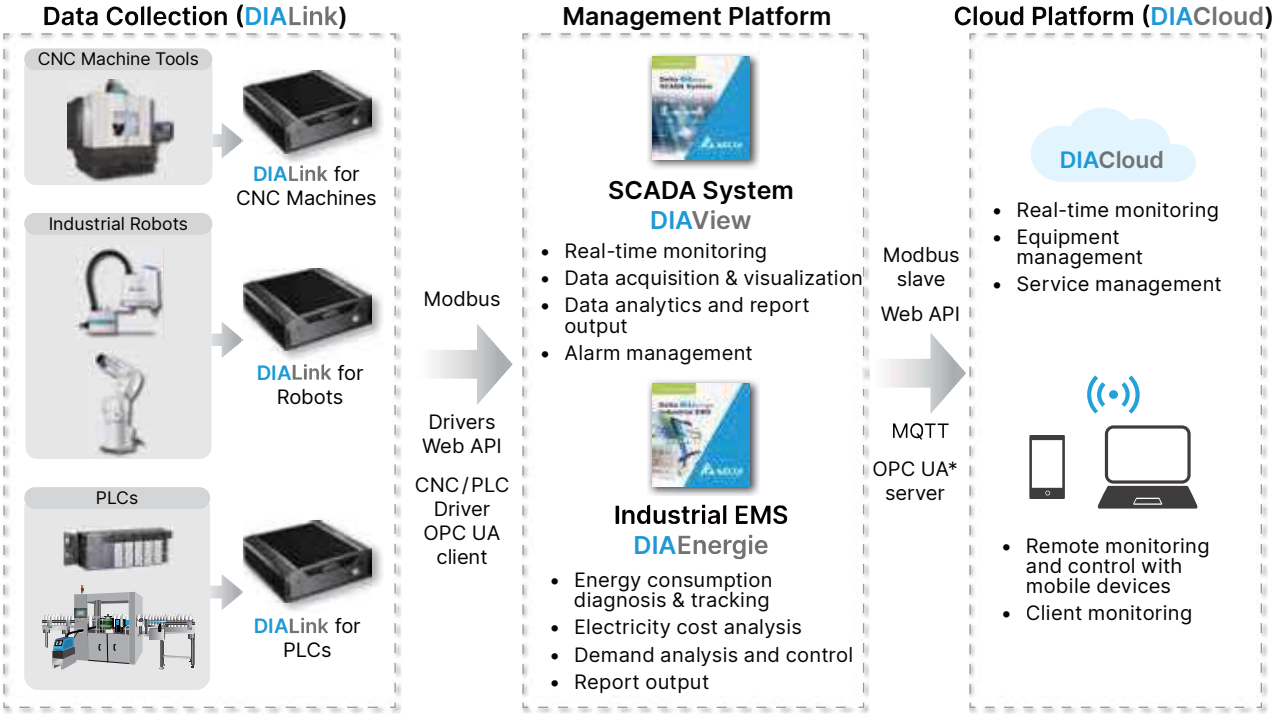
- Equipment data digitization and management
- Customizable / user-defined real-time data visualization
- Machine anomaly and idle time monitoring
- Analysis of overall equipment effectiveness (OEE)

Applications

- Real-time equipment data collection
- Data analytics for management
- Remote monitoring and control

Rapid, Seamless and Secure Data Transfer

- Supports Modbus slaves, JSON, MQTT data formats
- Open web API for development



* Option module

Applications

Electric vehicle assembly, Hardware manufacturing, Electronics and appliances assembly, Industrial robots

Warehouse Management System

DIAWMS

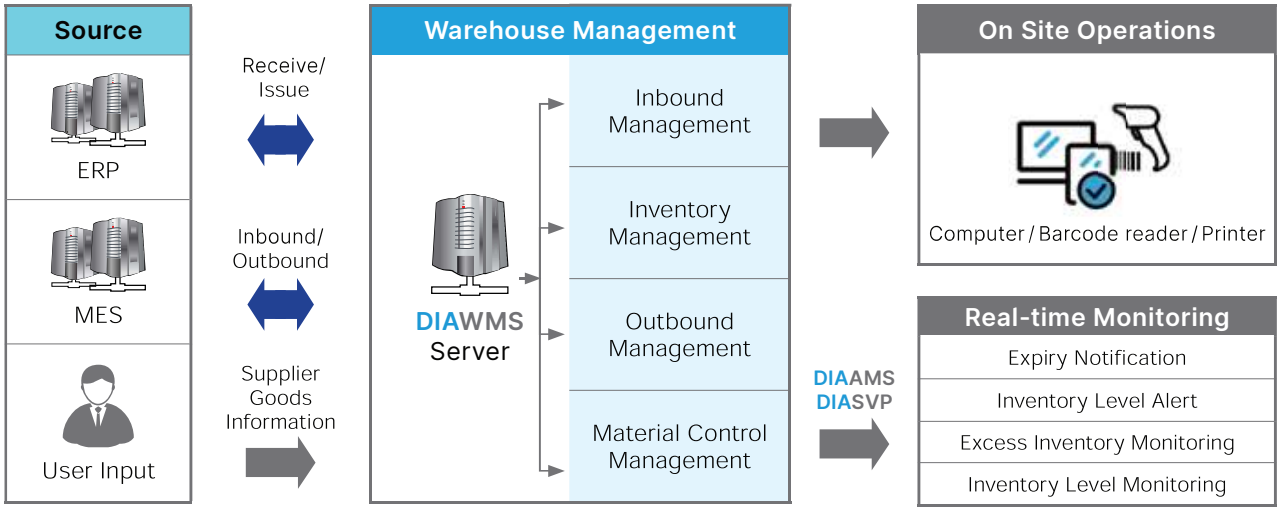
DIAWMS integrates inbound / outbound operations with warehouse management. It improves resource management and monitors material status, reducing inventory costs, and effectively improving inventory turnover and operational efficiency.

Systemizes dynamic management, increasing inventory transparency

- Ensures inventory data accuracy in picking, taking stock, and allocation; implements safety inventory, excess monitoring, and FIFO
- Provides the tracing of material destinations and querying important information
- Offers exception management such as material unpacked, packed, merging/batching, material control disabling, expiration date extension, allowing flexible adaptation to various requirements
- Merges multiple work orders into a pick list according to production schedules, enhancing preparation efficiency

System integration to achieve automated warehousing and intelligent logistics

- Provides standard interfaces for the integration of commands and equipment, optimizing real-time scheduling of production resources
- Supports smartphones, tablets, PDAs, and other mobile devices, allowing real-time connection to the system on site



System functions

Goods Receiving

Attaches barcode for quality control of received materials; permits entry to the warehouse

Inbound

Provides the designated bin to facilitate inbound operations

Inventory Management

Monitors the inventory expiration date to reduce waste and boost turnover

Picking Strategy

Flexible picking strategy to enhance workflow efficiency

Outbound / Goods Issuing

Schedules and picks materials according to the shipping order

Dashboards / Reports

Provides dashboards and reports to analyze the current status of inventory

Intra-Plant Logistics Platform DIATrans

Material Control System

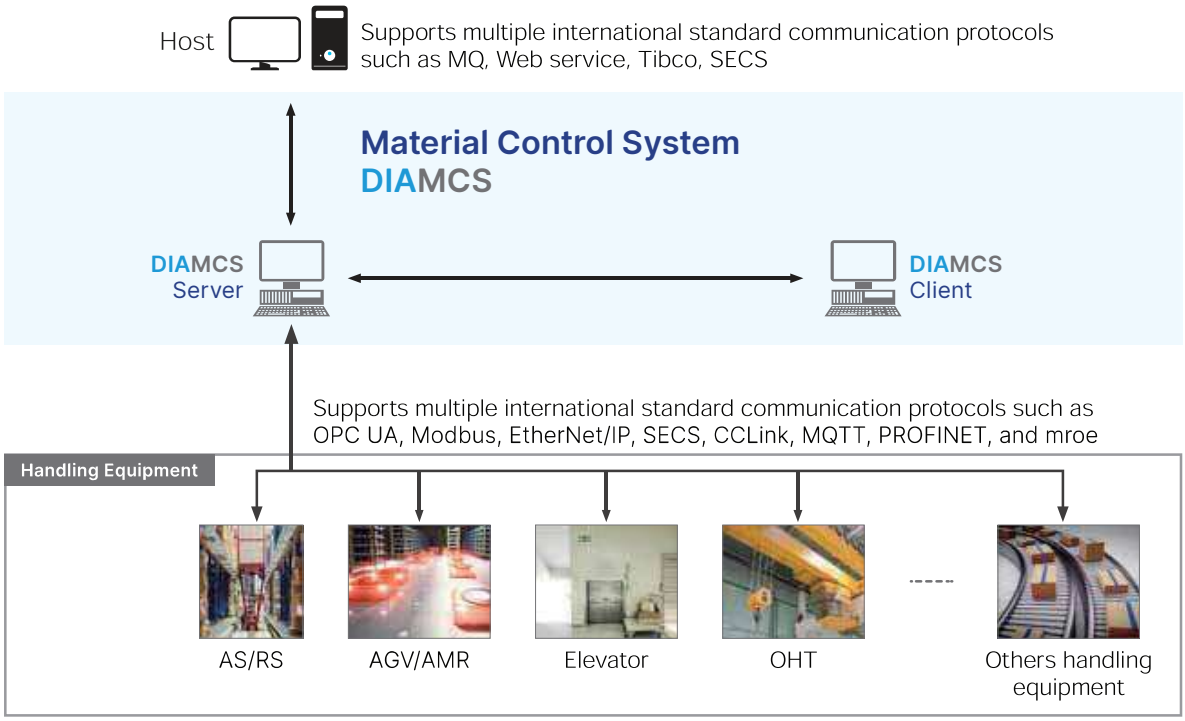
DIAMCS

DIAMCS provides system integration of factory material control equipment and warehouse equipment. It enhances transportation efficiency and real-time production scheduling.

Optimal transportation routes for equipment efficiency and bin balance

- Manages material handling and warehouse equipment; plans optimal routes for enhanced bin balance
- Provides a monitoring dashboard for warehouse, query histories handling records; Easy material control and tracking
- Offers statistical analysis of equipment efficiency and utilization rates, reducing ineffective material handling
- Supports multiple international standard communication protocols such as OPC UA, Modbus, EtherNet/IP, SECS, CCLink, MQTT, PROFINET, and more
- Accepts dispatch and warehouse orders from management systems to control handling equipment; Provides real-time handling report

System Architecture



System Functions

Dispatch Orders

Dispatches orders for all storage locations / Material handling orders

Topology

Provides real-time command execution to monitor status on site

Optimal Route

Optimizes / plans dispatch routes

Statistical Analysis

Statistical analysis of material control efficiency

Dispatch Monitoring

Real-time tracking of the path of conveyed materials