



Digitized Automation for a Changing World

Delta Smart Manufacturing



Delta Smart Manufacturing

Manufacturing Operation DIAWorks

Manufacturing Execution System	
DIA MES	2
Statistical Process Control System	
DIA SPC	3
Alarm Management System	
DIA AMS	4
Equipment Management System	
DIA EMS	5
Smart Visualization System	
DIA SVP	6

Manufacturing Operation DIAAuto

Equipment Automation Program New	
DIA EAP+	7
Equipment Automation Program New	
DIA EAP-EAS	8
Equipment Automation Program for Injection Molding Manufacturing Applications New	
DIA EAP-IMM	9
Equipment Automation Program for Precision Machining Manufacturing Applications New	
DIA EAP-PMM	10
Semiconductor Equipment Communication and Control Software	
DIA SECS	11
Electronics Assembly Equipment Standard Communication and Control Application Software New	
DIA CFX	12

Manufacturing Operation DIATrans

Equipment Management System	
DIA WMS	13
Material Control System	
DIA MCS	14

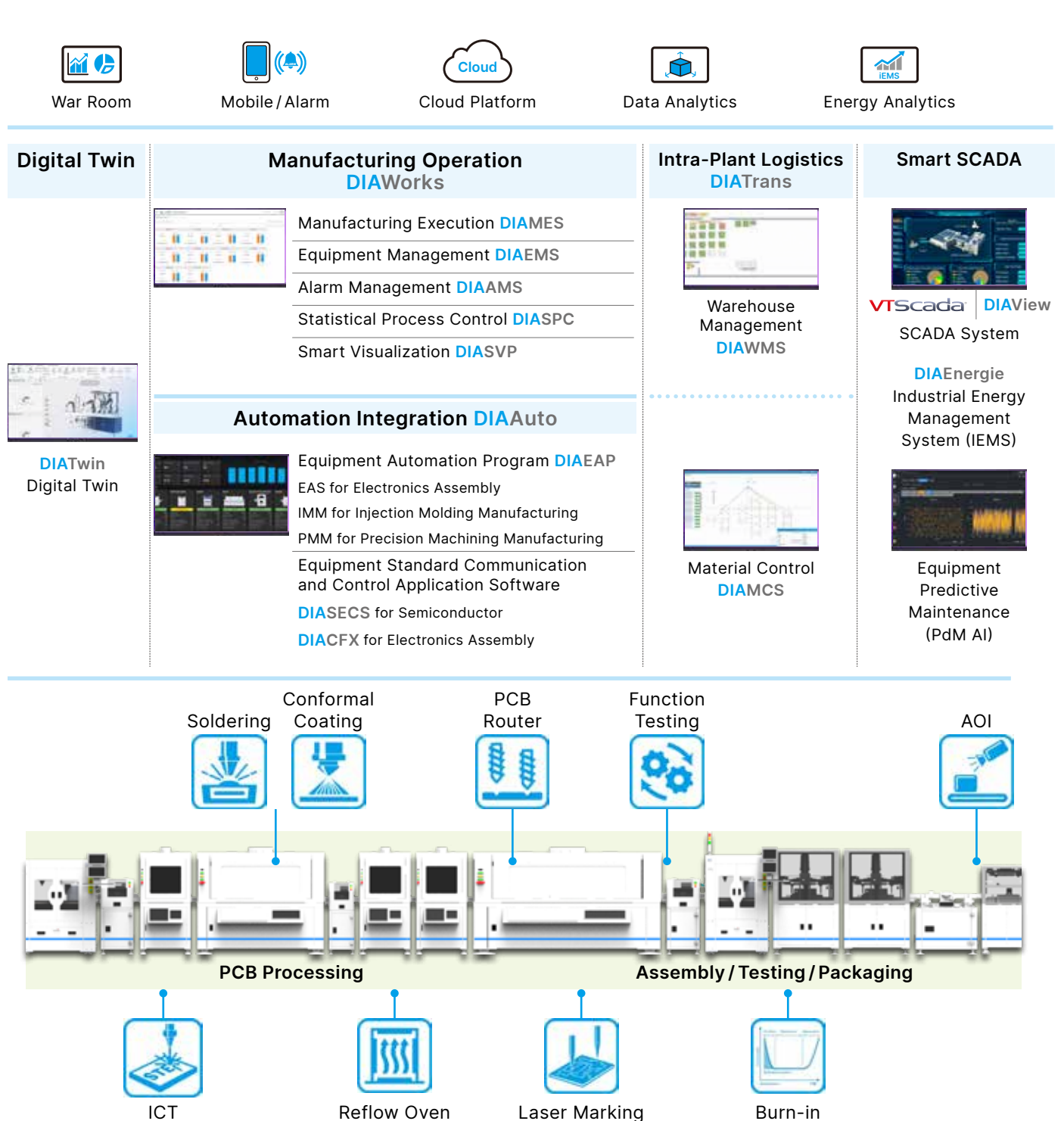
Digital Twin

Virtual Machine Development Platform New	
DIA Twin	15

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.



Manufacturing Operation **DIAMWorks**

Manufacturing Execution System

DIAMES

DIAMES is the core of the smart factory, coordinating upper-level planning and management systems with equipment 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

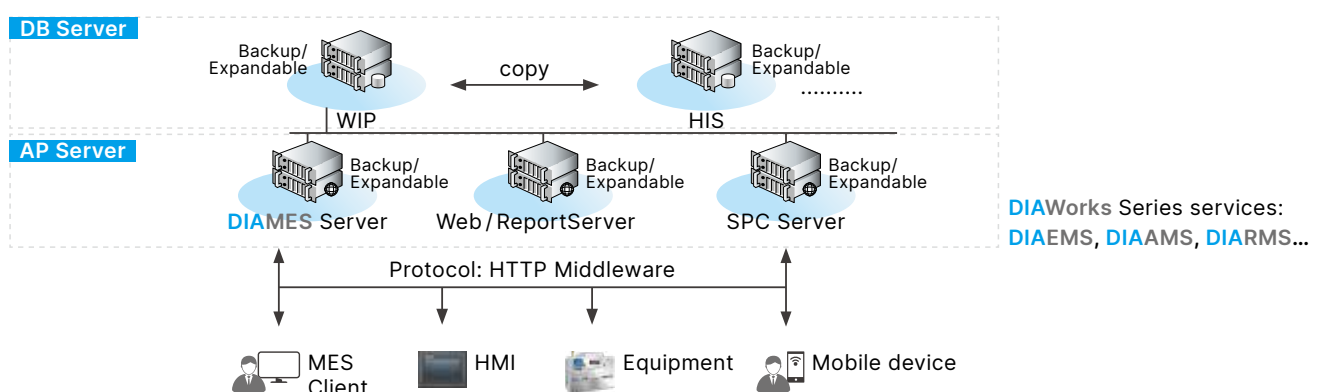
Complies with ISA-95; An integrated manufacturing operations management system for different industries

- 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

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



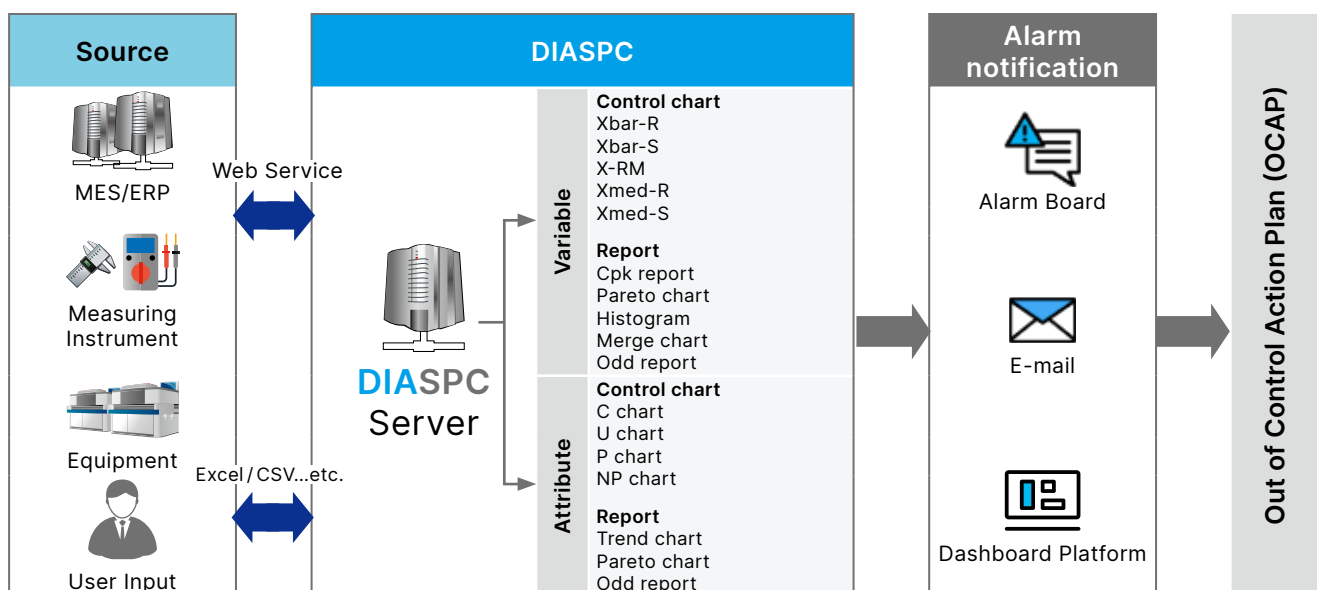
Control Chart

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

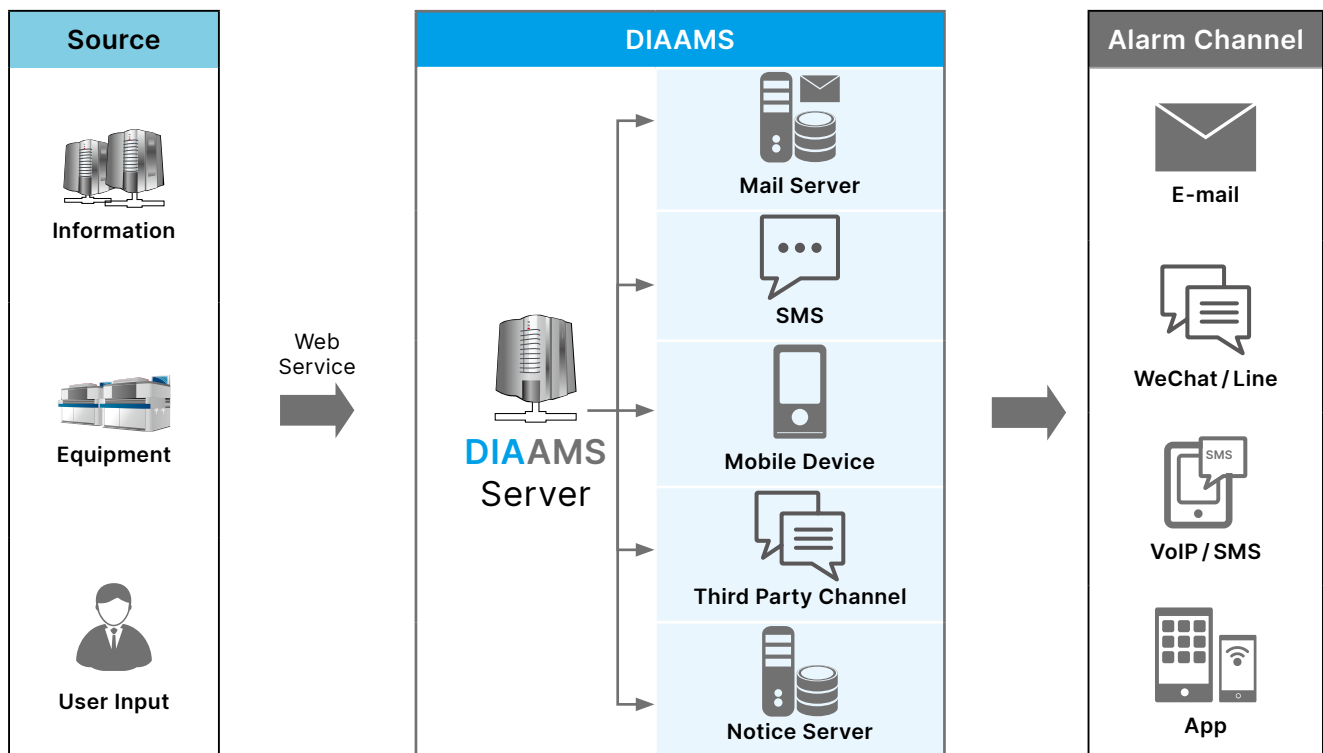
Effective alarm ensures immediate action

- 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

Equipment Management System

DIAEMS

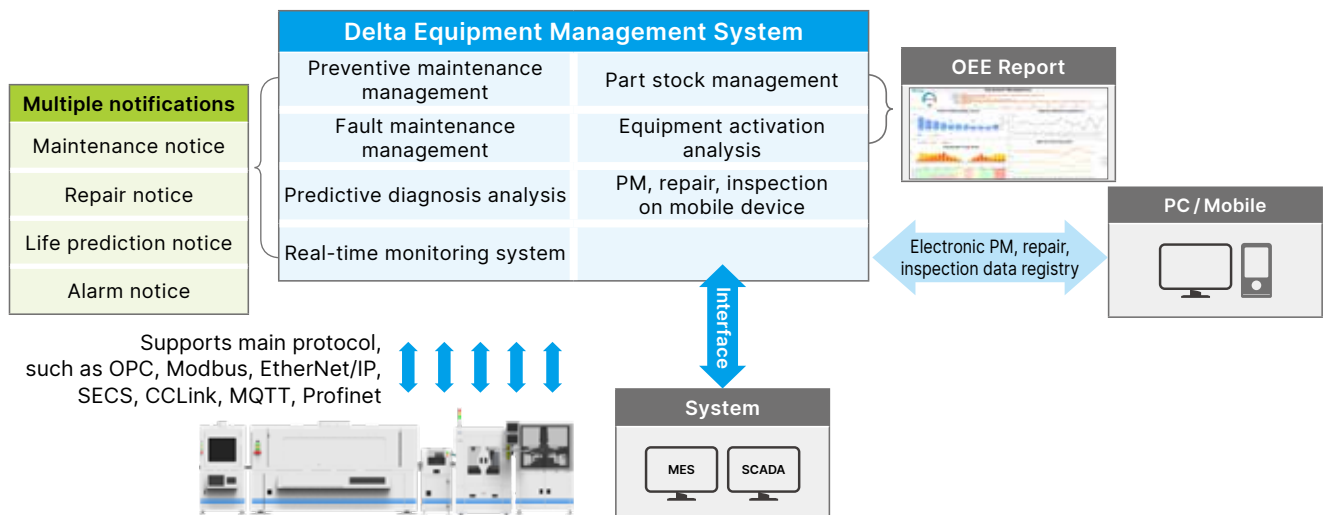
DIAEMS integrates anomaly alarms of various information systems, equipment and facilities, and immediately warns the responsible units, so that users at all levels can deal with anomalies quickly

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



Service life prediction, anomaly diagnosis and analysis

Preventive Maintenance



PM work reminders and execution records

Malfunction Repair



Creates repair work orders

Part Stock



Manages part in/out-stock and inventory, controls the usage and stock

Equipment Utilization



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

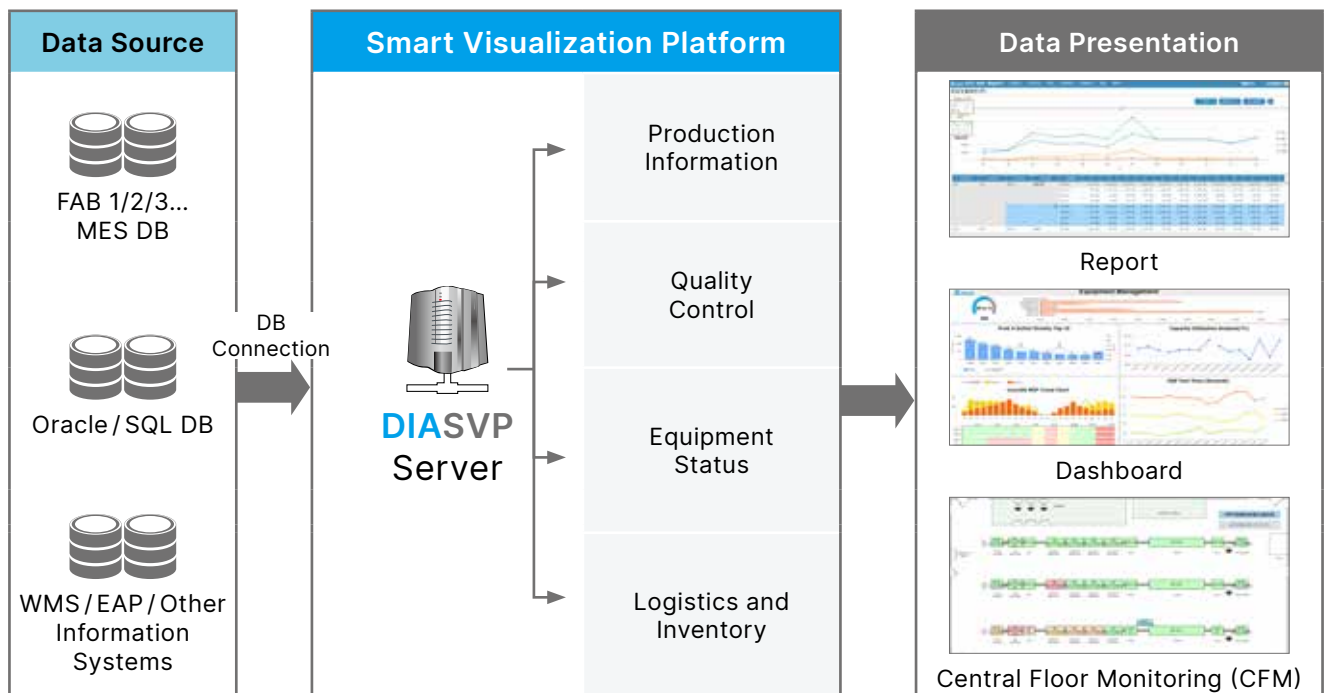
Smart Visualization System

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



Manufacturing Operation **DIA**Auto

Equipment Automation Program **DIAEAP+**

New

DIAEAP+

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

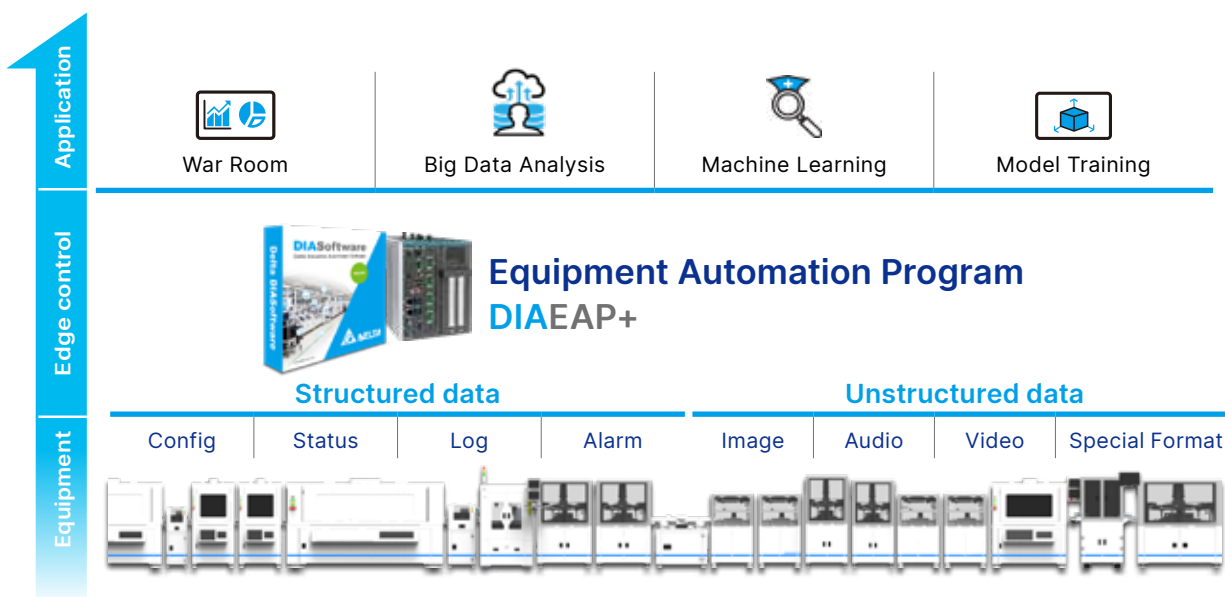
Simple web UI design, low-code development platform, rapid deployment

- 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.

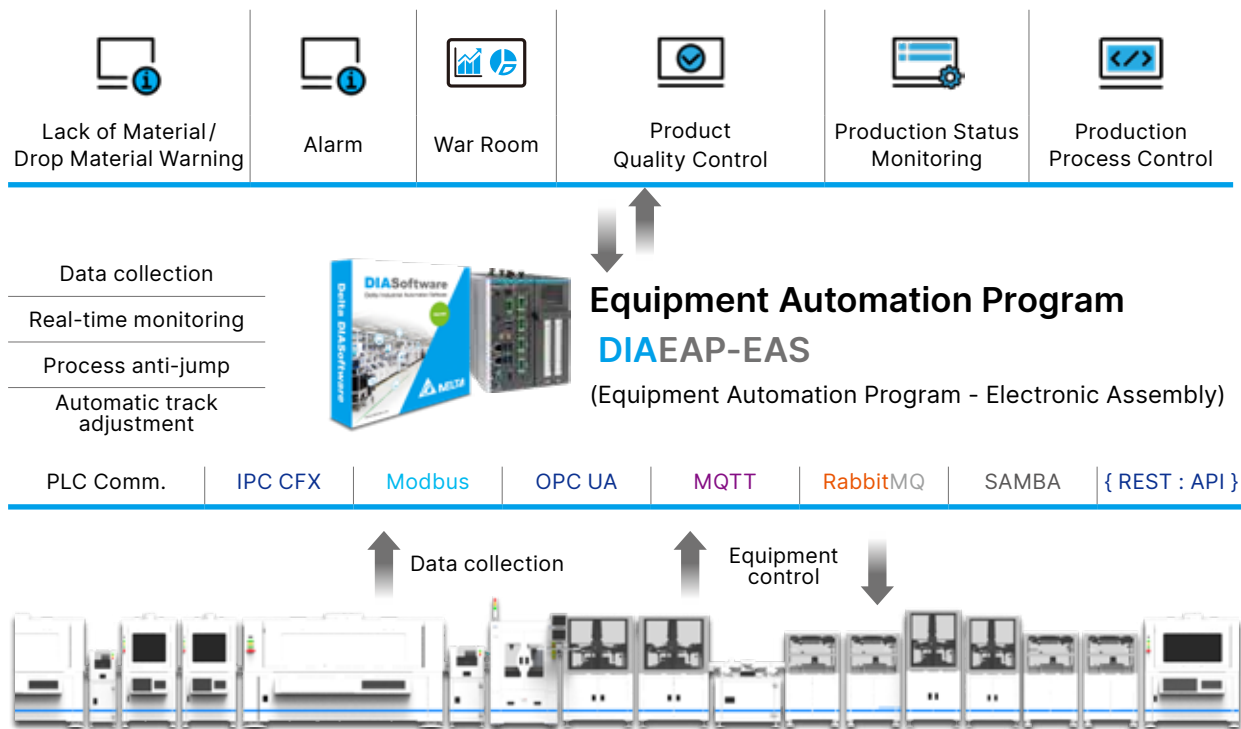
Equipment IIoT for electronics assembly

- 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



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.

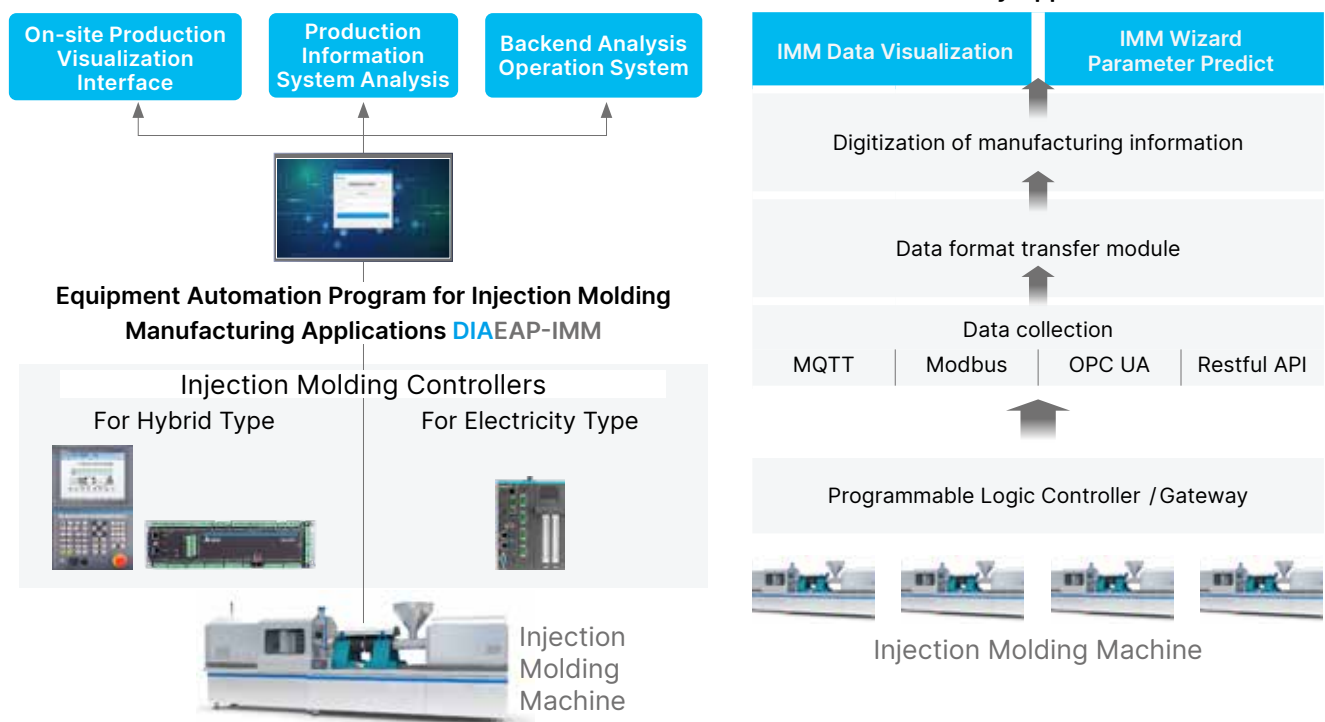
Injection molding know-how and equipment IIOT

- 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

Production Monitoring



Parameter Management



Production Data Collection



Issue Tracking



WIP Management



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.

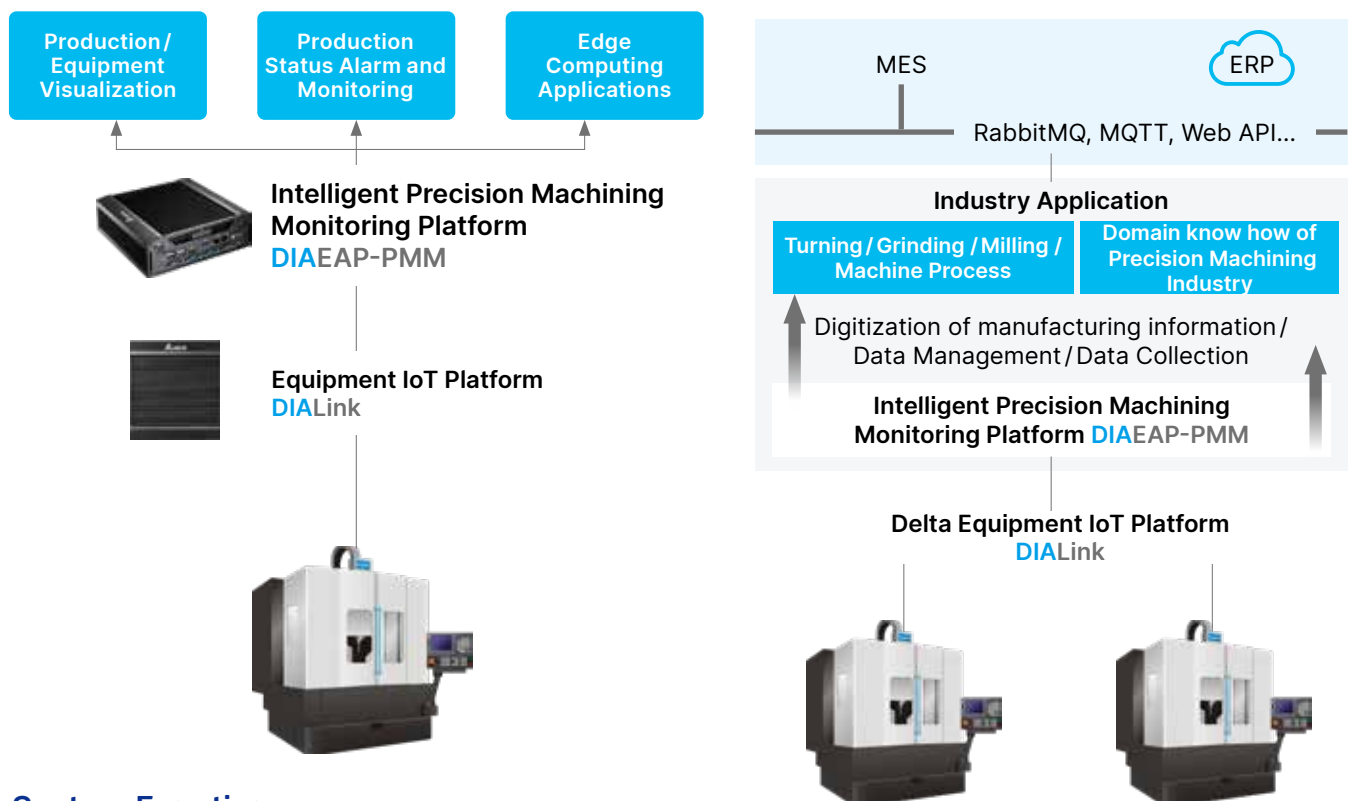
Precision machining manufacturing know-how

- 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

Production Monitoring



Parameter Management



Production Data Collection



Issue Tracking



WIP Management



Semiconductor Equipment Communication and Control 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.

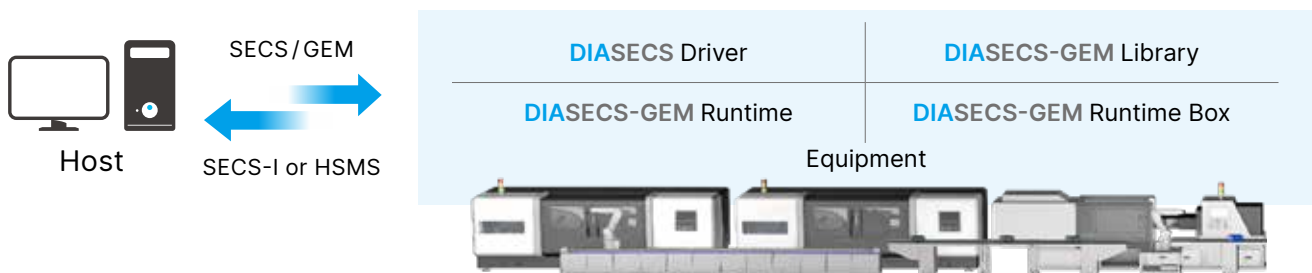
Complies with SEMI standards, high performance, easy to use

- 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

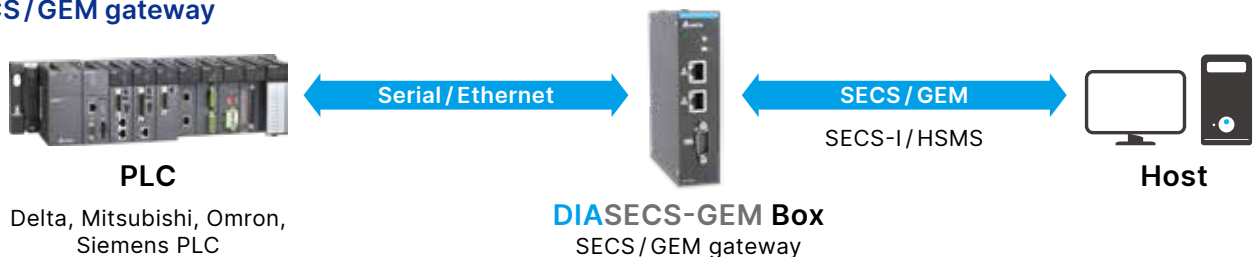
High integration, user-friendly, issue tracking

- 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

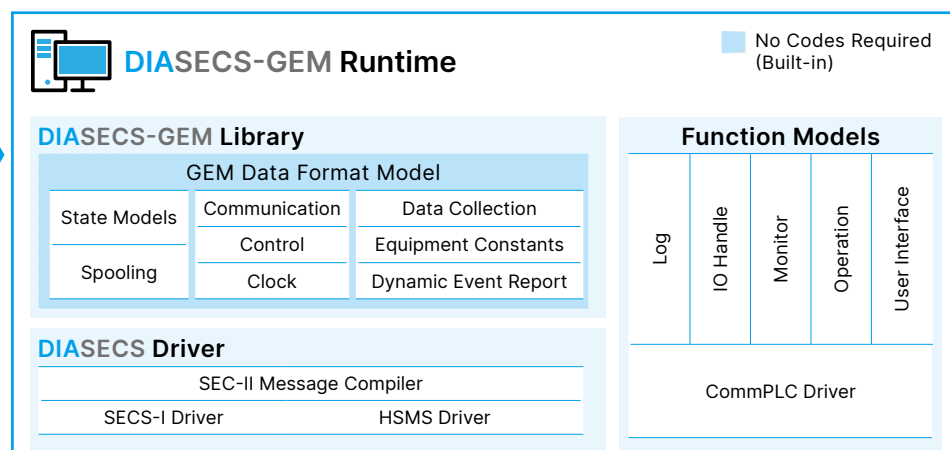
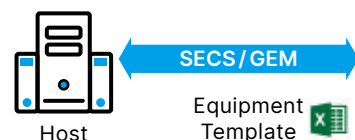


SECS / GEM gateway



Software Architecture

DIASECS-GEM RunTime



Electronics Assembly Equipment Standard Communication and Control Application Software

New

DIACFX

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	✓	

Manufacturing Operation **DIA**Trans

Equipment Management System

DIAWMS

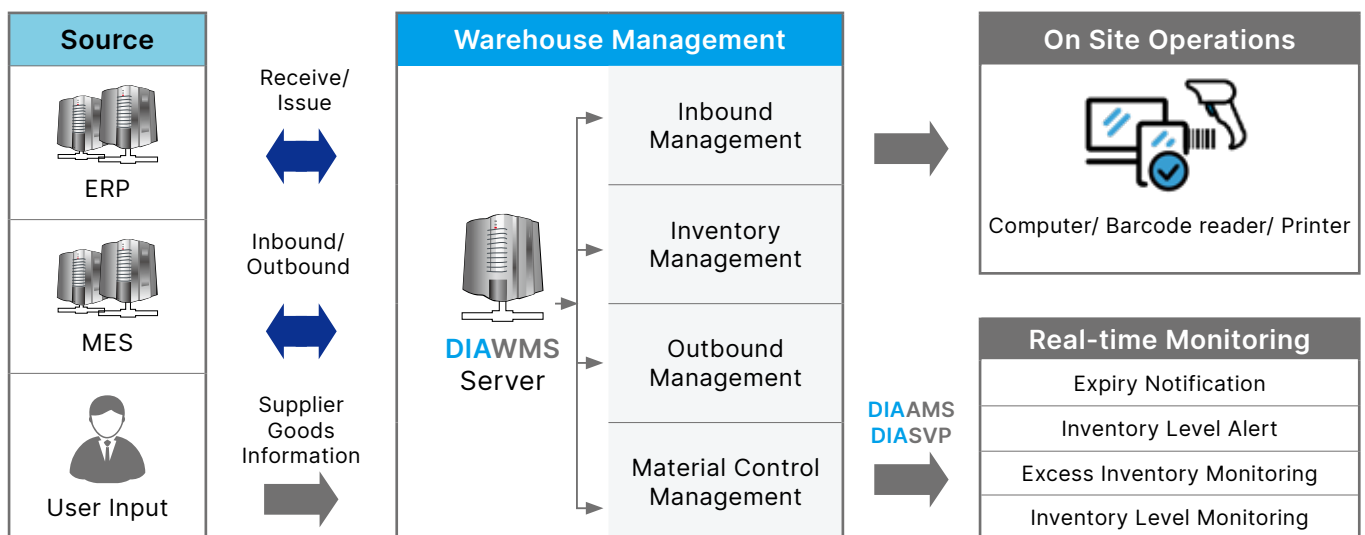
DIAWMS integrates inbound / outbound operations with warehouse management. It improves resource management and monitors material status, reducing inventory costs, and effectively improving inventory turnover and operational efficiency.

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

Material Control System

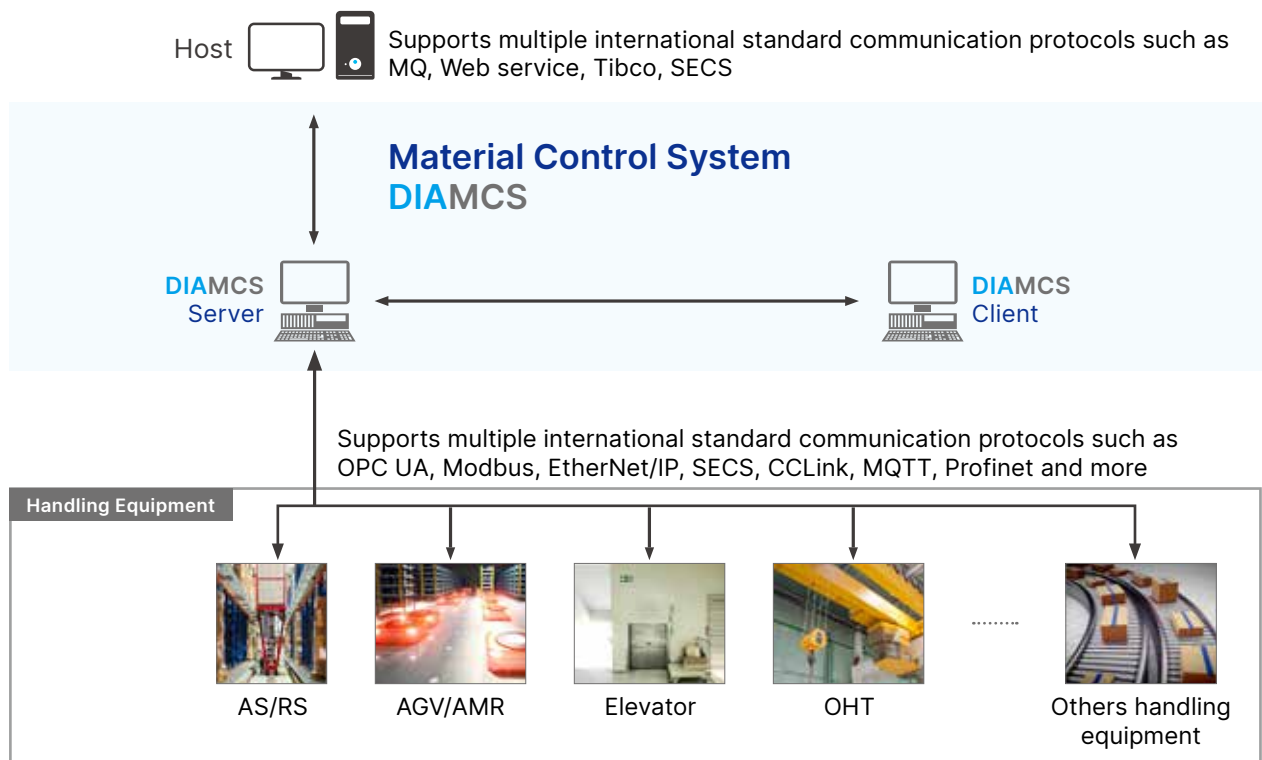
DIAMCS

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	Topology	Optimal Route	Statistical Analysis	Dispatch Monitoring
Dispatches orders for all storage locations / Material handling orders	Provides real-time command execution to monitor status on site	Optimizes / plans dispatch routes	Statistical analysis of material control efficiency	Real-time tracking of the path of conveyed materials

Digital Twin

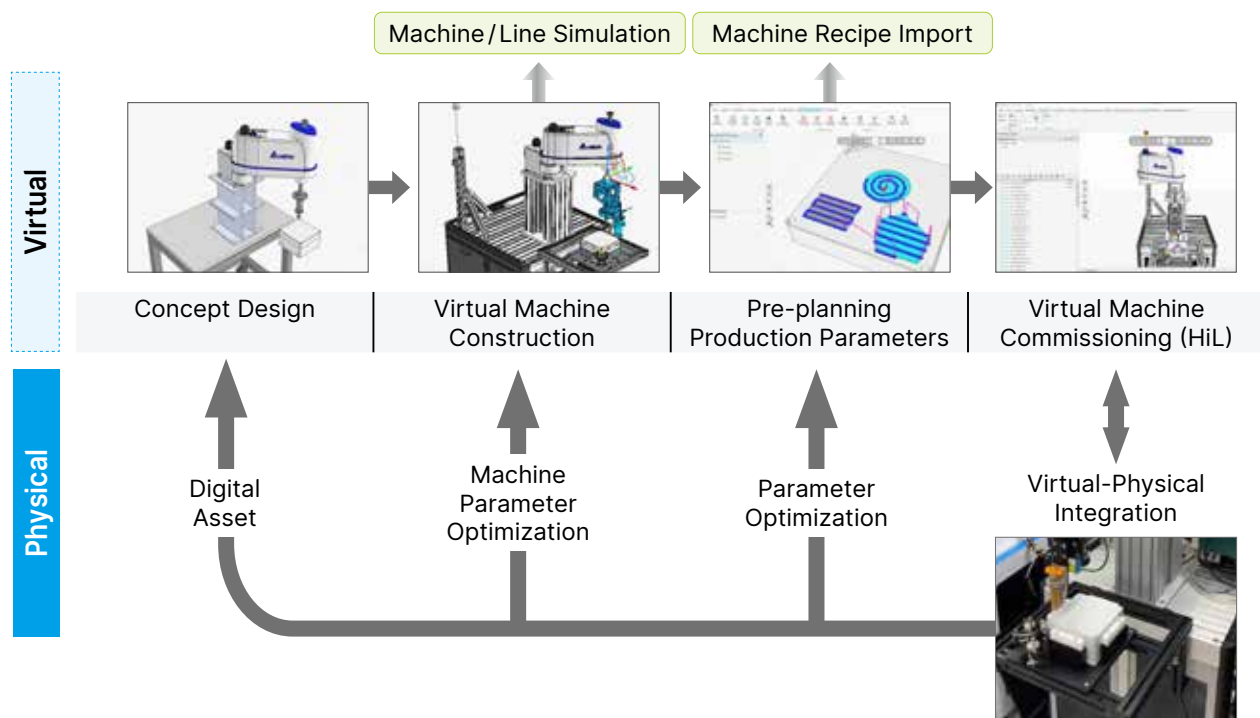
Virtual Machine Development Platform

New

DIA Twin

DIA Twin 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 DIA Twin 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



Smarter. Greener. Together.

Industrial Automation Headquarters

Taiwan: Delta Electronics, Inc.

Taoyuan Technology Center
No.18, Xinglong Rd., Taoyuan District,
Taoyuan City 33068, Taiwan
TEL: +886-3-362-6301 / FAX: +886-3-371-6301

Asia

China: Delta Electronics (Shanghai) Co., Ltd.

No.182 Minyu Rd., Pudong Shanghai, P.R.C.
Post code : 201209
TEL: +86-21-6872-3988 / FAX: +86-21-6872-3996
Customer Service: 400-820-9595

Japan: Delta Electronics (Japan), Inc.

Industrial Automation Sales Department
2-1-14 Shibadaimon, Minato-ku
Tokyo, Japan 105-0012
TEL: +81-3-5733-1155 / FAX: +81-3-5733-1255

Korea: Delta Electronics (Korea), Inc.

1511, 219, Gasan Digital 1-Ro., Geumcheon-gu,
Seoul, 08501 South Korea
TEL: +82-2-515-5305 / FAX: +82-2-515-5302

Singapore: Delta Energy Systems (Singapore) Pte Ltd.

4 Kaki Bukit Avenue 1, #05-04, Singapore 417939
TEL: +65-6747-5155 / FAX: +65-6744-9228

India: Delta Electronics (India) Pvt. Ltd.

Plot No.43, Sector 35, HSIIDC Gurgaon,
PIN 122001, Haryana, India
TEL: +91-124-4874900 / FAX: +91-124-4874945

Thailand: Delta Electronics (Thailand) PCL.

909 Soi 9, Moo 4, Bangpoo Industrial Estate (E.P.Z),
Pattana 1 Rd., T.Phraksa, A.Muang,
Samutprakarn 10280, Thailand
TEL: +66-2709-2800 / FAX: +66-2709-2827

Australia: Delta Electronics (Australia) Pty Ltd.

Unit 2, Building A, 18-24 Ricketts Road,
Mount Waverley, Victoria 3149 Australia
Mail: IA.au@deltaww.com
TEL: +61-1300-335-823 / +61-3-9543-3720

Americas

USA: Delta Electronics (Americas) Ltd.

5101 Davis Drive, Research Triangle Park, NC 27709, U.S.A.
TEL: +1-919-767-3813

Brazil: Delta Electronics Brazil Ltd.

Estrada Velha Rio-São Paulo, 5300 Eugênio de
Melo - São José dos Campos CEP: 12247-004 - SP - Brazil
TEL: +55-12-3932-2300 / FAX: +55-12-3932-237

Mexico: Delta Electronics International Mexico S.A. de C.V.

Gustavo Baz No. 309 Edificio E PB 103
Colonia La Loma, CP 54060
Tlalnepantla, Estado de México
TEL: +52-55-3603-9200

EMEA

EMEA Headquarters: Delta Electronics (Netherlands) B.V.

Sales: Sales.IA.EMEA@deltaww.com
Marketing: Marketing.IA.EMEA@deltaww.com
Technical Support: iatechnicalsupport@deltaww.com
Customer Support: Customer-Support@deltaww.com
Service: Service.IA.emea@deltaww.com
TEL: +31(0)40 800 3900

BENELUX: Delta Electronics (Netherlands) B.V.

Automotive Campus 260, 5708 JZ Helmond, The Netherlands
Mail: Sales.IA.Benelux@deltaww.com
TEL: +31(0)40 800 3900

DACH: Delta Electronics (Netherlands) B.V.

Coesterweg 45, D-59494 Soest, Germany
Mail: Sales.IA.DACH@deltaww.com
TEL: +49 2921 987 238

France: Delta Electronics (France) S.A.

ZI du bois Challand 2, 15 rue des Pyrénées,
Lisses, 91090 Evry Cedex, France
Mail: Sales.IA.FR@deltaww.com
TEL: +33(0)1 69 77 82 60

Iberia: Delta Electronics Solutions (Spain) S.L.U

Ctra. De Villaverde a Vallecas, 265 1º Dcha Ed.
Hormigueras - P.I. de Vallecas 28031 Madrid
TEL: +34(0)91 223 74 20
Carrer Llacuna 166, 08018 Barcelona, Spain
Mail: Sales.IA.Iberia@deltaww.com

Italy: Delta Electronics (Italy) S.r.l.

Via Meda 2-22060 Novedrate(CO)
Piazza Grazioli 18 00186 Roma Italy
Mail: Sales.IA.Italy@deltaww.com
TEL: +39 039 8900365

Turkey: Delta Greentech Elektronik San. Ltd. Sti. (Turkey)

Şerifali Mah. Hendem Cad. Kule Sok. No:16-A
34775 Ümraniye - İstanbul
Mail: Sales.IA.Turkey@deltaww.com
TEL: + 90 216 499 9910

MEA: Eltek Dubai (Eltek MEA DMCC)

OFFICE 2504, 25th Floor, Saba Tower 1,
Jumeirah Lakes Towers, Dubai, UAE
Mail: Sales.IA.MEA@deltaww.com
TEL: +971(0)4 2690148