Digitized Automation for a Changing World

Delta Industrial Automation

2024 Full Range **Catalogue**

www.deltaww.com

ΔELTA

Delta Profile

Corporate Mission -
To provide innovative, clean, and energy-efficient solutions for a better tomorrow.

Delta, founded in 1971, is a global provider of power and thermal management solutions. Its mission statement, "To provide innovative, clean and energy-efficient solutions for a better tomorrow," focuses on addressing key environmental issues such as global climate change. As an energy-saving solutions provider with core competencies in power electronics and automation, Delta's business categories include Power Electronics, Mobility, Automation, and Infrastructure.

Delta offers some of the most energy efficient power products in the industry, including switching power supplies with efficiency over 90%, telecom power with up to 98%, and PV inverters with up to 99.2% efficiency. We have also developed the world's first server power supply certified as 80 Plus Titanium.

Headquartered in Taiwan, we regularly invest over 8% of our annual sales revenues in R&D and have worldwide R&D facilities in China, Europe, Japan, Singapore, Thailand, and the U.S.

Delta is a frequent recipient of international awards and related recognition for innovation, design, and continuous dedication to ESG. Since 2011, Delta has been listed on the DJSI World Index of Dow Jones Sustainability™ Indices for 13 consecutive years. Delta has also won CDP with double A List for 3 times for its substantial contribution to climate change and water security issues and named Supplier Engagement Leader for its continuous development of a sustainable value chain for 7 consecutive years.

In response to the challenge of climate change, Delta will remain committed to the research and development of innovative, energy-saving products, solutions and services that contributing substantially to the sustainable development of mankind.

About Delta Industrial Automation (IABG)

Since the debut of our AC motor drive in 1995, Delta continues to develop our industrial automation business, providing superior quality, reliability and precision. Our range of complete smart manufacturing solutions covers equipment automation, automated production line design and integration, equipment IoT and data collection, as well as manufacturing management / monitoring and preventive maintenance to maximize productivity and stabilize production. Delta applies AI and big data analysis to optimize production processes and implement digitalization for equipment, production lines and energy usage. With automation products, software, and system solutions integrated into an all-in-one digitalized smart manufacturing model of factory, processes, and equipment, Delta provides numerous production models, including customized, small volume and wide variety, and mass production for customers on a global scale.

With robust R&D capability and abundant industry experience, Delta offers industrial automation products and solutions that find application in a broad range of industries, including electronics, components, photoelectric panels and food & beverages. We are dedicated to providing innovative and reliable smart, green manufacturing solutions for global customers, keeping our promise of "Digitized Automation for a Changing World".

IABG Profile

To elevate the living environment through advanced automation technology with value-added innovations

Headquarters

Taoyuan, Taiwan

Founded

1995

R&D technology centers

- Taiwan (Taipei, Taoyuan, Chungli, Taichung, Tainan)
- China (Beijing, Dalian, Xi'an, Nanjing, Wujiang, Wuhan, Dongguan)
- USA (Conklin, Rochester, Charlotte)
- Canada   - Slovakia
- United Kingdom   - Thailand
- Germany   - India
- Netherlands   - Japan

Plants

- Taiwan (Taoyuan, Chungli, Taichung)
- China (Wujiang, Dongguan)
- India (Krishnagiri)
- Thailand (Bangpoo)
- USA (Conklin, Rochester)

Milestones

1995
- AC Motor Drive

1999
- Small PLC

2003
- Optical Incremental Encoder
- Temperature Controller
- AC Servo Drive and Motor

2004
- Human Machine Interface

2006
- Time / Counter / Tachometer

2008
- Industrial Power Supply

2009
- Pressure Sensor

2010
- Motion Control Card
- Active Front End Unit

2011
- CNC Controller
- Hybrid Energy Saving System
- Integrated Elevator Drive

2012
- High Performance Mid-Range PLC
- Controller with Human Machine Interface
- Machine Vision System
- Unmanaged Industrial Ethernet Switch

2014
- Smart Power Meter
- PC-Based Motion Controller

2024
- Digital Twin
- Data Integration Platform + AI

2023
- e-Bike Mid Drive Motor

2022
- Machine Vision Platform

2021
- Industrial Camera
- Smart Screw Driver
- Smart Machine Box for Injection Molding

2020
- Smart Equipment
- Manufacturing Management & Visualization
- VTScada SCADA System

2019
- Electric Servo Press
- e-Scooter Integrated Side-Mounted Powertrain

2018
- Motion Controller

2017
- Laser Displacement
- Area Sensor
- Barcode Scanner

2016
- Industrial PC
- IIoT Cloud-Based Platform
- Manufacturing Execution System (MES)
- Planetary Gearbox
- IIoT Industrial Cloud Router
- Articulated Robot

2015
- Smart Sensor
- Linear Stage
- SCADA System
- Industrial Energy Management System
- SCARA Robot
- Robot Controller with Servo Drive Integrated

DELTA

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01 Drive

AC Motor Drive

Fluid Machinery Solution

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Textile

ΔELTA

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Low Voltage Powertrain System

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Linear Motion

Encoder

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04 Motion Control

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11 Smart Equipment

Automated Smart Equipment

- **Electronics Assembly**
- **Semiconductor**
- **Passive Component**

12 Software Systems

Smart Machine Suite DIAStudio

Digital Twin

Smart SCADA

Manufacturing Management Platform DIAWorks

Automation Integration Platform DIAAuto

Edge Server Box

Intra-Plant Logistics Platform DIATrans

Global Operations

NELTA

Compact Drive

Compact Multi-Drive New
MX300

Bilateral Installation & Compact Size

- Modular structure saves cabinet space
- Controls up to 6 inverter modules, 15 axes
- Plug-in installation for fast setup
- Supports Modbus and CANopen, connects and controls up to 15 axes
- Regenerative power on a common DC bus ensures energy efficiency
- Max. 200% starting torque, 150% 60 sec. overload capacity

Saves cabinet space + wiring + accessories = cost efficiency

- Multi-drive saves cabinet space and cables
- Unifies screw hole location between modules for simple installation

Regenerative power on a common DC bus ensures energy efficiency

- Axes are in a common DC bus configuration

Single Drive

582 mm

Power Cable + Motor Cable × **48**

Saves Wiring by **43%**

MX300
(Supports 3-axis module)

245 mm

Saves Space by **58%**

Power Cable + Motor Cable × **27**

Consume Energy

Regenerative Energy

Regenerative Energy
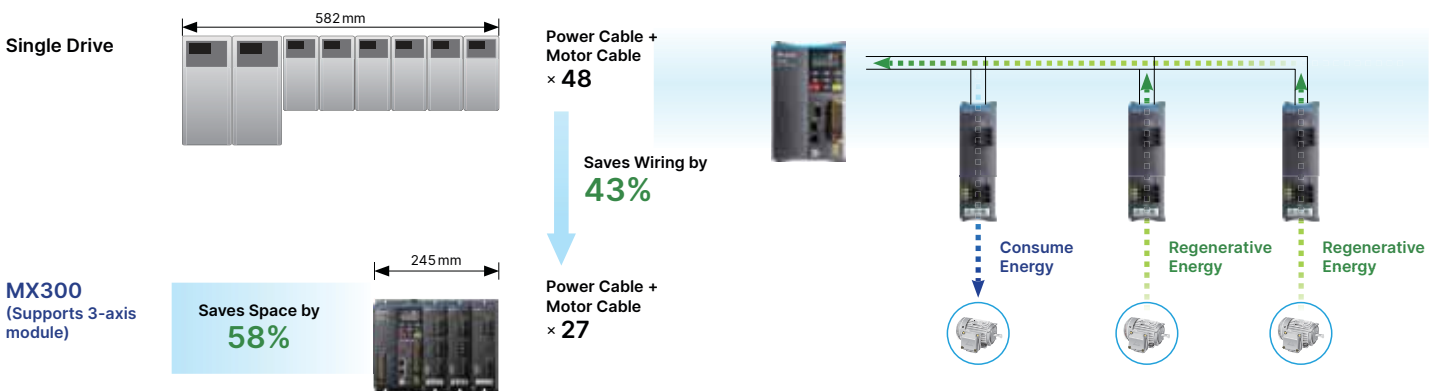
Note: Two 3.7 kW drives with six 0.75 kW drives as an example

Power Range	0.4 kW	0.75 kW	1.5 kW	2.2 kW	3.7 kW	5.5 kW	7.5 kW	11 kW	15 kW	18.5 kW	22 kW
MX300				230 V 1-Phase Rectifier (Under Development)							
	230 V 1-Axis Inverter (Under Development)										
	230 V 2-Axis Inverter (Under Development)										
							460 V 3-Phase Rectifier				
	460 V 1-Axis Inverter										
	460 V 2-Axis Inverter										
	460 V 3-Axis Inverter			(Under Development)							

Applications

Open-loop control applications with multiple low-power axes, such as glass edging machine, woodworking machine, car wash machine, and more

High Performance Compact Drive
MH300

Transmission & Tension Control Solutions

Outstanding Drive Performance

- Supports induction and PM motors with optional PG cards for highly precise speed and position control
- Provides powerful torque output at low frequency (0.5 Hz / 200% without PG vector control; 0 Hz / 200% with PG vector control) for stable heavy duty operation at low speed and high torque

Strong System Support

- Built-in PLC with 5k steps; system programming function saves costs
- Highly safe and reliable with Safe Torque Off (STO) SIL 2 / PL d
- All models can be connected through common DC bus
- Built-in Modbus and CANopen communication; optional communication card: EtherNet/IP, Modbus TCP, EtherCAT, DeviceNet, PROFIBUS DP, and PROFINET

Flexible Expansion

- Built-in two 33 kHz high-speed pulse input terminals (MI6 & 7) and one output terminal (DFM)
- Built-in two accessory card slots for PG card, I/O expansion card, communication card, or 24 V power card at the same time

Tension Control

Closed-loop tension, speed control

Tension Lever

Deceleration Box

Tension Feedback

Tension Command

Closed-loop tension, torque control

Tension Sensor

Deceleration Box

Tension Feedback

Tension Command

Open-loop tension, torque control

Deceleration Box

Tension Command
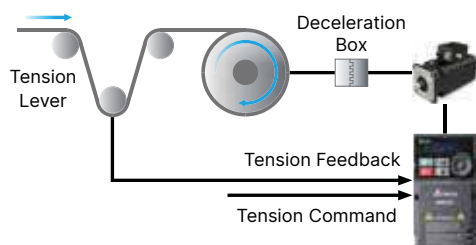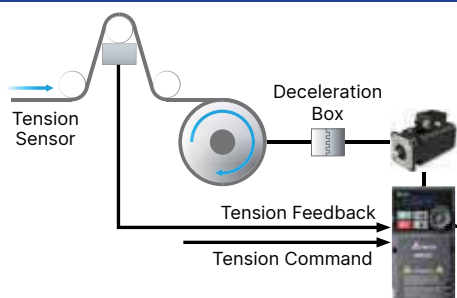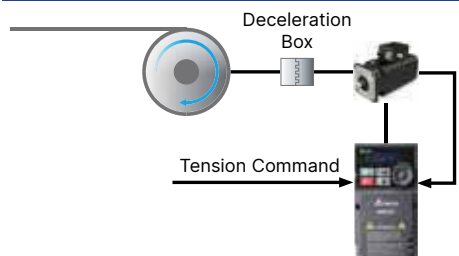
Steady linear velocity control

Encoder

Deceleration Box

Linear Velocity Feedback

Linear Velocity Command
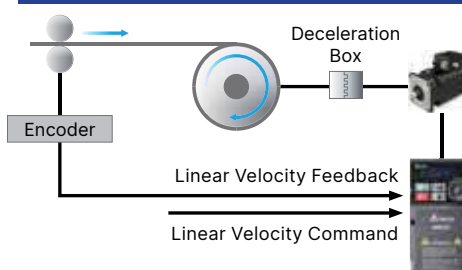
Applications

Machine tools, s machinery, Woodworking machinery, Rubber and plastic machinery, Winding / unwinding applications

SEMI F47

Power Range	0.2 kW 0.25 HP	0.4 kW 0.5 HP	0.75 kW 1 HP	1.5 kW 2 HP	2.2 kW 3 HP	3 kW 4 HP	3.7/4 kW 5 HP	5.5 kW 7.5 HP	7.5 kW 10 HP	11 kW 15 HP	15 kW 20 HP	18.5 kW 25 HP	22 kW 30 HP	30 kW 40 HP	37 kW 50 HP	45 kW 60 HP	55 kW 75 HP	75 kW 100 HP
MH300	115 V / 1-phase																	
	230 V / 1-phase																	
	230 V / 3-phase						230 V / 3-phase											
		460 V / 3-phase																

DELTA

Compact Drive

Compact Drive
MS300

Built-in PLC, Various Communication Protocols and Wide Power Range

- Overload capacity up to 150% / 60 secs and 200% / 3 secs for various constant torque loads
- Supports IM / IPM / SPM motors
- Supports Delta's MSI motors for an IE5 energy-efficient system (please refer to the product description of the motor series)
- High torque at low speed (up to 200% at 0.5 Hz with vector control) for stable operation of heavy-duty equipment
- Integrated PLC function (2k steps)
- Highly safe and reliable with Safe Torque Off (STO) SIL2 / PL d
- Built-in EMC filter(optional)
- Pull-out keypad
- 24 V power supply card(optional) for unexpected shutdowns
- USB charging on PC is available for parameter setting and update (no need for power supply from main circuit)
- Built-in Modbus and optional communication cards: CANopen, DeviceNet, EtherNet/IP, EtherCAT, PROFIBUS DP, Modbus TCP, and PROFITNET
- High-speed model up to 1,500 Hz

Plate-Mount Design

- Customers can design their own cooling system, applicable to water / oil / air cooling and others
- It can be used for applications with large on-site flecking and easy to block cooling fans, or textile and vacuum pump equipment with independent cooling plates at the customer's site

CE* UL CERTIFIED EAC TÜV Rheinland CERTIFIED   SEMI F47*   * Supports Finless Type

Power Range		0.2 kW 0.25 HP	0.4 kW 0.5 HP	0.75 kW 1 HP	1.5 kW 2 HP	2.2 kW 3 HP	3 kW 4 HP	3.7 kW 5 HP	5.5 kW 7.5 HP	7.5 kW 10 HP	11 kW 15 HP	15 kW 20 HP	18.5 kW 25 HP	22 kW 30 HP
MS300	Standard 0~599 Hz	115 V / 1-phase												
		230 V / 1-phase												
		230 V / 3-phase												
				460 V / 3-phase										
	High-speed 0~1,500 Hz				230 V / 1-phase									
					230 V / 3-phase									
					460 V / 3-phase									
	Plate-mount 0~599 Hz			460 V / 3-phase										

Applications

Machine tools, Air compressors, Textiles machines, Woodworking machines, Packaging machines, Electronics, Fans and pumps

Basic Compact Drive
ME300

Compact Design for Basic Applications

- Overload capacity up to 150% / 60 secs and 200% / 3 secs for various constant torque loads
- Supports IM/IPM/SPM motors
- High torque of 200% at low speed 3 Hz
- Built-in braking chopper
- Pulse / PWM input as frequency command
- Built-in EMC filter(optional) and Safe Torque Off (STO) SIL2/PL d(optional)
- Built-in sleep mode, water leak inspection, and multi-pump (in parallel) alternative operation function
- PCB with 100% conformal coating; compliant with IEC 60721-3-3 Class 3C3
- Built-in Modbus protocol
- Macro function for quick parameter setting for pumps, conveyor systems, and more
- Supports pull-out operation panel(optional)

Pumping Functions

- Sleep mode and water leakage detection: Enters / Maintains sleep status at constant voltage to avoid frequent start and stop (parameter configuration required)
- Lack-of-water detection: Decelerates and stops operation for no water supply to avoid pump damage due to dry-run operation

Multi-pump Control

- Alternate operation: Multiple pumps alternately operate at regular intervals (hourly, daily, or weekly) for easy maintenance and pump lifespan extension
- Constant pressure mode: Maintains constant water output pressure and adjusts the number of pumps per requirements for water supply and energy efficiency

Alternate Operation

ME300 Master 1	ME300 Slave 1	ME300 Slave 2	ME300 Slave 3
O	S	S	S
S	O	S	S
S	S	O	S
S	S	S	O
Setting Time	Setting Time	Setting Time	Setting Time

ME300 Status
- O Operating
- S Standby

Constant Pressure Mode

ME300 Master 1	ME300 Slave 1	ME300 Slave 2	ME300 Slave 3	Water Usage
O	S	S	S	🏠
O	O	S	S	🏠🏠🏠
O	O	O	S	🏠🏠🏠🏠
O	O	O	O	🏠🏠

CE UL CERTIFIED EAC TÜVRheinland CERTIFIED ⚠ ⊕ KC SEMI F47
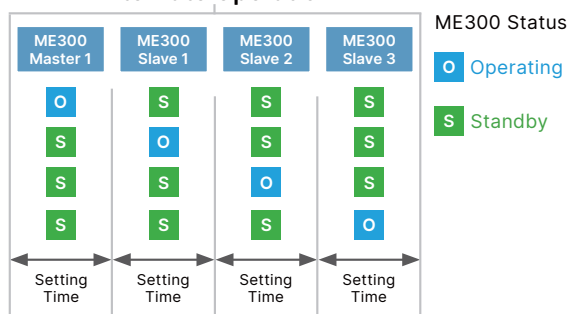
Power Range		0.1 kW 0.125 HP	0.2 kW 0.25 HP	0.4 kW 0.5 HP	0.75 kW 1 HP	1.5 kW 2 HP	2.2 kW 3 HP	3 kW 4 HP	3.7 kW 5 HP	5.5 kW 7.5 HP	7.5 kW 10 HP
ME300	Standard 0 ~ 599 Hz	115 V / 1-phase									
		230 V / 1-phase									
		230 V / 3-phase									
		460 V / 3-phase									

Applications

Logistics, Food packaging machines, Woodworking machines, Fans and pumps, Electronics, Conveyance equipment

 DELTA

Compact Drive

High Protection Compact Drive (IP66 Model)
MS300 IP66 / NEMA 4X

Durable Operation under Harsh Conditions

- Protection against humidity and dust in industrial environments
- Main switch[optional] for fast installation, no need for an electric control cabinet to save cost
- Built-in braking chopper
- Integrated PLC function (2k steps)
- Highly safe and reliable with Safe Torque Off (STO) SIL2 / PL d
- Built-in EMC filter[optional]
- Standard keypad
- Built-in Modbus; optional communication cards: CANopen, DeviceNet, EtherNet/IP, EtherCAT, PROFIBUS DP, Modbus TCP, and PROFINET* for multiple applications and communication needs

* Contact Delta for more details.

IP66 / NEMA 4X Rated Protection Against Water and Dust

SPM
(Surface Permanent Magnet Motor)

IPM
(Interior Permanent Magnet Motor)

IM
(Induction Motor)

CE UL CERTIFIED EAC TÜVRheinland CERTIFIED ⬦ ⬦ SEMI F47

Power Range		0.4 kW 0.5 HP	0.75 kW 1 HP	1.5 kW 2 HP	2.2 kW 3 HP	3.7 kW 5 HP	5.5 kW 7.5 HP	7.5 kW 10 HP	11 kW 15 HP	15 kW 20 HP	18.5 kW 25 HP	22 kW 30 HP
MS300	IP66 / NEMA 4X	230 V / 1-phase										
		230 V / 3-phase										
		460 V / 3-phase										

Applications

For humid or dusty environments in various industries such as food & beverages, pumps, and more

Sensorless Vector Control Compact Drive
VFD-E

- Built-in EMC filter for 230 V single-phase and 460 V three-phase models to effectively minimize electromagnetic interference
- Standard Modbus protocol via RS-485 and optional fieldbus cards (including PROFIBUS, DeviceNet and CANopen)
- Optional extension modules for more flexible applications, such as PG (Encoder) card, I/O card and Relay card
- Built-in PLC with 500 steps program capacity

Applications

Vacuum compressor, Conveyor and transportation, Fan / pump equipment, Paper / textile, Food processing, Woodworking, Machining tool / metal processing

Sensorless Vector Control Compact Drive
VFD-EL

- 6 sets of Digital Input,1 set of Relay, 1 set of Analog Input, 1 set of Analog Output
- Built-in EMI filter for 230 V single-phase and 460 V three-phase models to effectively minimize the electromagnetic interference
- Supports side-by-side installation and DIN-rail mounting
- Built-in constant pump pressure control and PID control

Applications

Edge banding, Logistics conveyor, Material handing

Sensorless Vector Control Economical
VFD-EL-W

- 4 sets of Digital Input, 1 set of Relay, 1 set of Analog Input, 1 set of SG+/SG-
- Supports side-by-side installation
- KC Certification (EL-W-1)

Applications

Edge banding, Logistics conveyor, Food packing, Material handling

Canopen Communication Compact Drive
VFD-EL-C

- Built-in CANopen(Ci402) & RS-485(Modbus)
- CANopen remote I/O (6DI + 4DO)
- Dual RJ45 port, CANopen no Hub required
- CE certification

Applications

Photovoltaic production line, Food packing, Spray painting, Logistics, Woodworking

ΔELTA

Compact Drive

Category	Item	VFD-EL	VFD-EL-W	VFD-EL-C
Terminal	Digital input	6	4	6
	Digital output			4
	Relay	1	1	
	Analog input	1	1	
	Analog output	1		
	RJ45 port	1	1	2
	SG+ / SG- terminals		●	
	DC_BUS terminals	●		
Communication	Modbus RS485	●	●	●
	CANopen Ci402			●
Others	EMI filter	●		
	Installation	wall-mounted, DIN-rail	wall-mounted	wall-mounted
	Frequency control knob	●	●	

CE UL CERTIFIED [*] [o] [**]

Power Range	0.2 kW 0.25 HP	0.4 kW 0.5 HP	0.75 kW 1 HP	1.5 kW 2 HP	2.2 kW 3 HP	3.7 kW 5 HP	5.5 kW 7.5 HP	7.5 kW 10 HP	11 kW 15 HP	15 kW 20 HP	18.5 kW 25 HP	22 kW 30 HP
VFD-E 115 V/1-phase	■	■	■									
230 V/1-phase	■	■	■	■	■	■						
230 V/3-phase	■	■	■	■	■	■	■	■	■	■	■	
460 V/3-phase		■	■	■	■	■	■	■	■	■	■	■
VFD-EL 115 V/1-phase	■	■	■									
230 V/1-phase	■	■	■	■	■	■						
230 V/3-phase	■	■	■	■	■	■	■					
460 V/3-phase		■	■	■	■	■	■					
VFD-EL-W 230 V/1-phase	■	■	■	■	■	■						
460 V/3-phase		■	■	■	4.0 kW							
VFD-EL-C 230 V/1-phase	■	■	■	■	■	■						
460 V/3-phase		■	■	■	4.0 kW							

Standard Drive

High Performance Vector Control Drive
C2000 Plus

Best Choice for General Drive Controls

- Heavy duty overload capability: 150% / 60 secs and 180% / 3 secs, suitable for constant torque applications
- Supports induction / PM / SynRM motors
- Field-oriented vector control
- P2P control
- Wide power range (up to 560 kW for 460 V models)
- User-friendly Start Wizard
- Display in 9 languages: English, Spanish, Portuguese, French, Russian, Turkish, German, Italian, and Traditional / Simplified Chinese
- Built-in PLC with 10k steps program capacity
- Enhanced protections and adaptation with PCB coating, compliant with Class 3C3
- Modular design for easy maintenance and extension
- Built-in Modbus and optional communication cards: EtherCAT, PROFINET, EtherNet/IP, PROFIBUS DP, DeviceNet, Modbus TCP, and CANopen

Single-Point Positioning

Positions the motor at a specific point (within a single rotation) for precise stop upon request
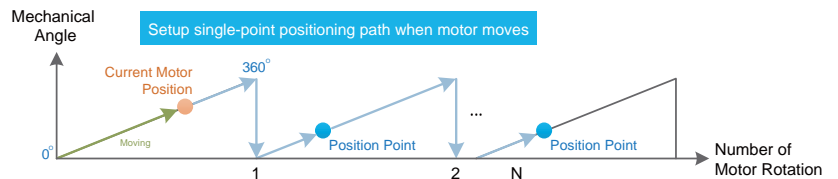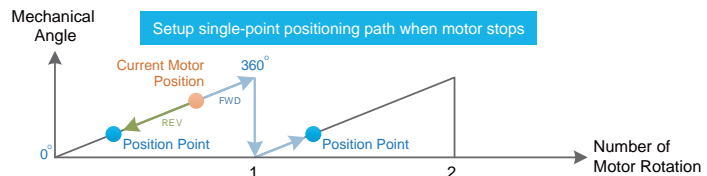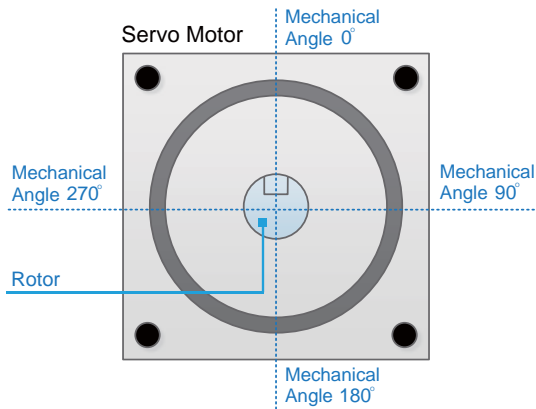
Power Range	0.75~3.7 kW 1~5 HP	5.5~18.5 kW 7.5~25 HP	22~37 kW 30~50 HP	45~90 kW 60~125 HP	110~185 kW 150~250 HP	220~560 kW 300~750 HP	630 kW 850 HP
C2000 Plus	230 V / 3-phase						
	460 V / 3-phase						
	575 V / 3-phase						
		690 V / 3-phase					

* The default of 575V & 690V models are light duty

Applications

Machine tools, Extruders, Calender machines, Paper machines, Compressors, Wire drawing machines, Packaging machines

Standard Drive

Heavy Duty Vector Control Drive
CH2000

Excellent High Overload Capability for Impact Loading Applications

- Fast response to impact loads
- Super Heavy Duty (SHD) setting for high overload capability: 150% / 60 secs, and 200% / 3 secs
- Large starting torque: Over 200% at 0.5 Hz / 200% at 0 Hz in FOC + PG mode
- Supports both induction and permanent magnet motors
- Various crane functions for high performance: Real-time anti-sway, anti-crab, torque proving, and shaft-synchro
- Modular design for easy installation and maintenance
- Built-in PLC with 10k steps program capacity
- Built-in braking unit (up to 75 kW)
- Built-in Modbus communication
- Optional communication cards: PROFIBUS DP, DeviceNet, Modbus TCP, EtherNet/IP, EtherCAT and CANopen

Real-Time Anti-Sway
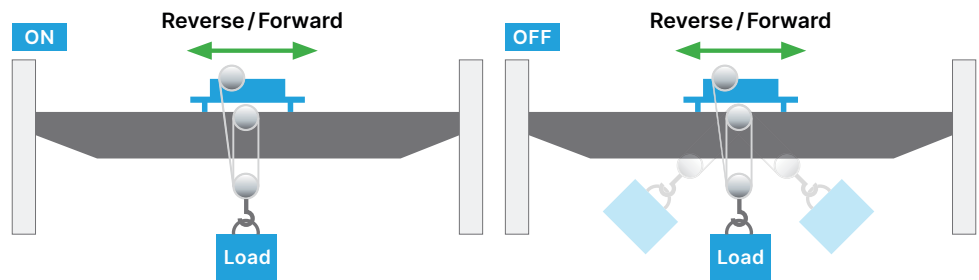
Advanced Crane Functions

D-to-D Link* (Modbus)
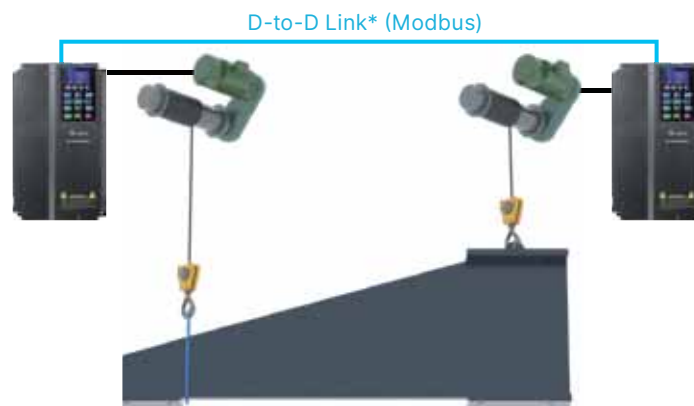
*Device-to-device link

CE   SEMI F47

Power Range	0.75 ~ 3.7 kW 1 ~ 5 HP	5.5 ~ 18.5 kW 7.5 ~ 25 HP	22 ~ 37 kW 30 ~ 50 HP	45 ~ 75 kW 60 ~ 100 HP	90 ~ 220 kW 125 ~ 300 HP	280 ~ 450 kW 375 ~ 600 HP
CH2000	230 V / 3-phase					
	460 V / 3-phase					

Applications

Machine tools, Punching machines, Cranes and hoists

High-Speed Fluid

High Frequency Motor Drive
C2000-HS

Prime Product for High-Speed Fluid Applications

- Supports all kinds of high speed motors, including IM(induction motor), SPM (surface permanent magnet motor),IPM (Interior permanent magnet motor)

- Max. operating frequency up to 1,500 Hz

- 120% of rated current: 1 minute for every 5 minutes, 160% of rated current: 3 seconds for every 30 seconds

- Direct drive mechanism: reduced system footprint, higher efficiency and lower cost

- With FOC sensorless control, the speed control precision reaches 1:100

- Maintains high motor drive efficiency of up to 98% while running at a high carrier frequency

- All series built-in DC reactor to suppress harmonics distortion and compliant with EN61000-3-12

- Certifications: GB/T12668-2, UL508c, CE

Structure

High Frequency
Motor Drive

Output Reactor   Impeller   Radial bearing   Radial bearing

Axial bearing

Position Sensor

Electromagnet

Magnetic
Bearing
Controller

Maglev Control
Signal
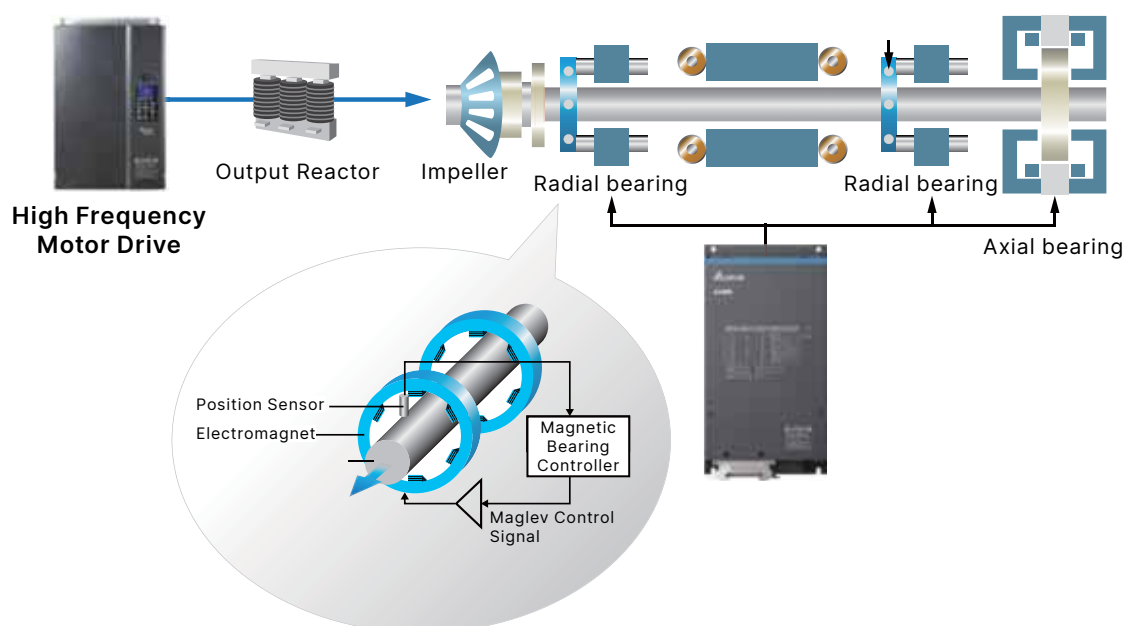
Power Range	30 kW 40 HP	37 kW 50 HP	45 kW 60 HP	55 kW 75 HP	75 kW 100 HP	90 kW 125 HP	110 kW 150 HP	160 kW 215 HP	220 kW 300 HP	355 kW 475 HP
C2000-HS	460 V / 3-phase									

Applications

Maglev chiller, Maglev and air bearing, Air compressor and turbo blower, Micro turbine generator, Fly-wheel energy storage

High-Speed Fluid

High Performance Liquid Cooled Drive `New`
C2000-R

Optimized Liquid Cooling Design, Compact Size

- Compact design saves space: Special heat dissipation design greatly reduces the volume compared with air-cooled drives

- Outstanding control technology for precise operation: Built-in motor ID parameters for sensorless control with stable output speed and optimized dynamic response; With FOC sensorless control, the speed control precision reaches 1:100

- Low harmonic distortion design reduces the impact on the power grid and peripheral equipment: All rating built-in DC reactors; Reduces harmonic distortion; Compliant with EN61000-3-12

- High EMC level, less additional accessory requirements: No external filter is required to meet C3 level requirement

- Anti-condensation function without an external controller: Built-in water temperature control function, effectively prevents condensation without an external controller

Structure

Motor drive
Liquid Cooled Motor Drive
C2000-R

Output reactor

DC+
DC-

Maglev Motor / Bearing
MSH

High-speed motor

Impeller Sensor ring Radial bearing Sensor ring Radial bearing Axial bearing

Magnetic bearing drive

Active Power Filter
APF3000

Magnetic Bearing Controller
AMBD
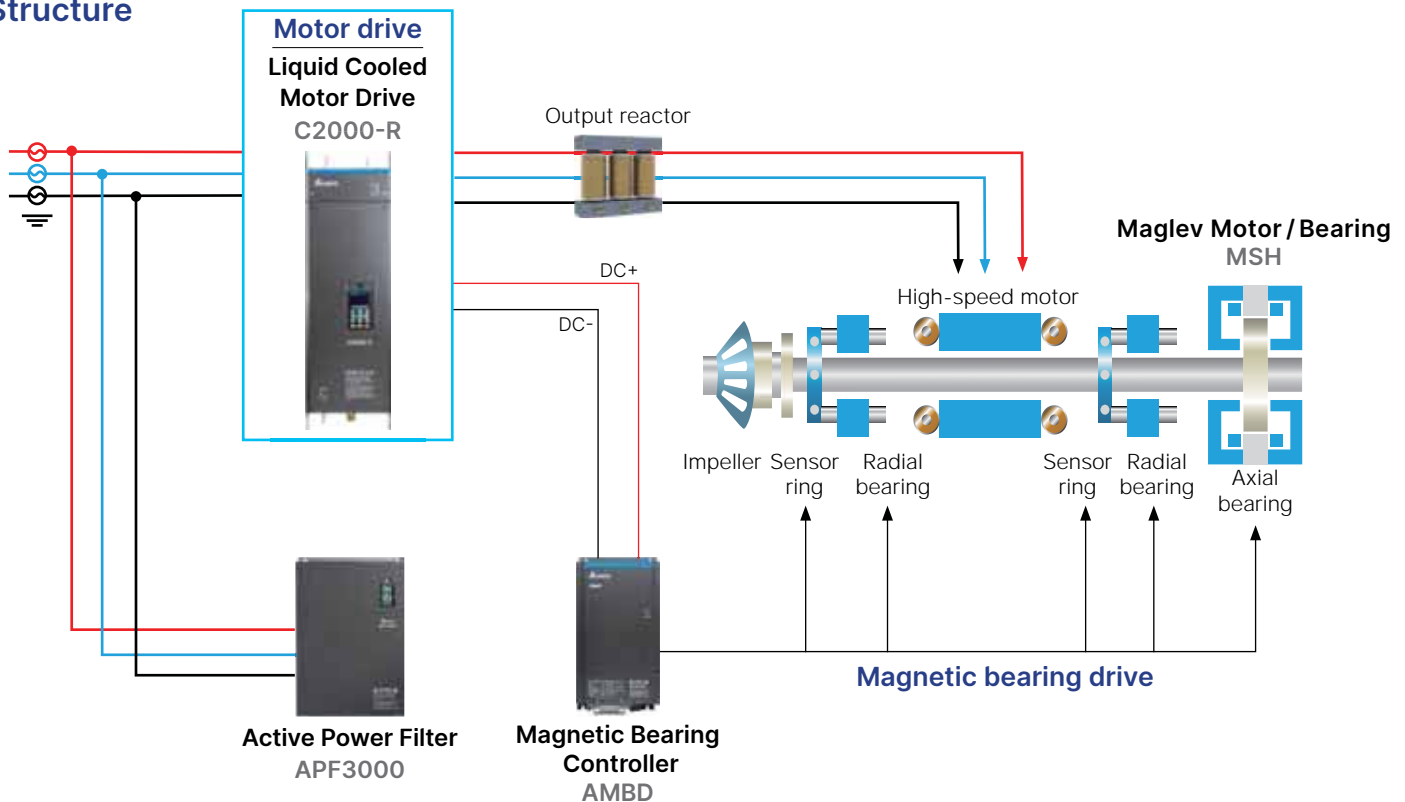
Power Range	132 kW 175 HP	160 kW 215 HP	250 kW 335 HP	450 kW 600 HP	185 kW 250 HP	220 kW 300 HP	280 kW 375 HP	315 kW 420 HP	355 kW 475 HP
C2000-R	380 V ~ 460 V / 3-phase								

Applications

Chiller units for HVAC systems, Tunnel boring machine, Mining crusher

Active Magnetic Bearing Drive
AMBD

New Generation Fluid Magnetic Solution

- Wide input voltage range: Wide DC power input to apply with the current terminals of 230 / 460 V inverters
- Lower implementation costs: Leverages Delta's inverter feature of power regeneration from deceleration, no need for UPS
- Magnetic bearing 5-axis control: Independent front and rear radial bearing control to reduce vibration and enhance magnetic suspension control accuracy. Independent axial position control to detect shaft elongation and avoid collisions caused by excessive temperature
- High control accuracy: Compliant with the ISO 14839-2 Zone A standard. The bearing vibration displacement is less than 30% of the maximum vibration displacement
- Supports external temperature sensors: Available for 6 sets of motor and magnetic bearing temperature protection
- Peak power up to 3 kW: Suitable for magnetic bearing motors up to 500 kW to perform magnetic suspension control

Magnetic bearing construction avoids traditional friction loss and maintenance issues and is the best choice for high flow, pressure and efficiency in high speed fluid applications. Compared with traditional centrifugal ice machines, it can save energy by more than 30%

Ball Bearing	High-Speed Magnetic Bearing
Needs a gearbox	w/o gearbox
	Reduce size
• High-speed impossible. The limit rotation speed is about 8,000 rpm • High speed (7,000~8,000 rpm) needs to be equipped with oil or water cooling equipment, and mechanical system needs a gearbox	• Advantage: Low friction coefficient, smaller rotor inertia, longer life than traditional bearings, high system rigidity, anti-compressor surge shock • Disadvantage: Parameter adjustment, higher price, extra sensors installation

Peak Power Range		1.5 kW	3.0 kW
VFD-DD	Input Voltage	250~600 V_{DC}	
	Rated Output Voltage	6 Arms	10 Arms

Applications

Magnetic bearing chillers, Magnetic bearing turbo blowers, Micro gas turbines, Flywheel energy storage systems

Fans and Pumps

Open-Loop Variable-Torque Standard Drive `New`
VP3000

High Efficiency, Stability, and Lower Harmonics
Next-Generation Standard Drive for the Fluid Industry

- Controls various high-efficiency motors: IM, PM, and SynRM
- Effective harmonic suppression to extend system life: The lowest harmonics can reach THDi Min. 35%, better than EN 61000-3-12 standard
- The volume of the slim type appearance design is 23% smaller, compared to the previous generation
- Predictive Maintenance (PdM): Monitors key components service life for stable equipment operation
- Built-in EMC filter C2, C3
- Enhances the corrosion resistance capacity: The PCB coating complies with IEC 60721-3-3 class 3C3
- Built-in PLC 20k steps, with drive and controller integrated
- Built-in multi-pump function: Alternate operation, constant pressure mode, and pump redundancy

Effective Harmonic Suppression

- Adopts lower harmonic technology to effectively suppress harmonics without an extra reactor*
- The lowest harmonics can reach THDi min. 35%, much better than EN 61000-3-12 standard (THDi < 48%)

Motor drive without DC choke
THDi 107%
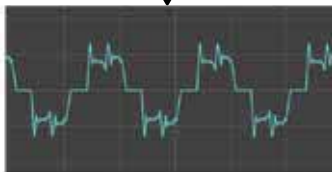
VP3000 with low harmonic technology
THDi 35%

Predictive Maintenance (PdM)

- Early maintenance notification for power module, capacitor, and cooling fan to allow replacement before end of service life and prevent sudden downtime

Advanced equipment or
machine parts renewal
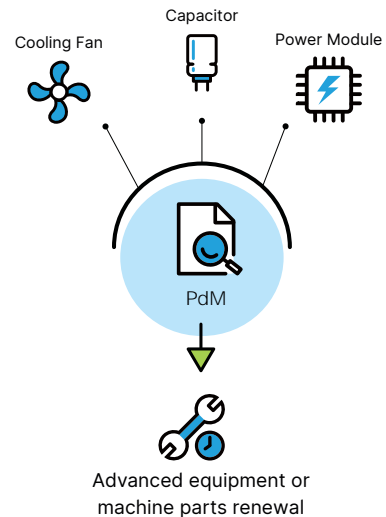
*Available in lower harmonic models. For details, please refer to Model Name Explanation.

$C \epsilon$ UL CERTIFIED   SEMI F47

Power Range	0.75~3.7 kW 1~5 HP	5.5~18.5 kW 7.5~25 HP	22~37 kW 30~50 HP	45~90 kW 60~125 HP	110~185 kW 150~250 HP	220~450 kW 300~600 HP	560~630 kW 715~850 HP
VP3000	460 V / 3-phase						

Applications

HVAC, Chiller, Air compressors, Tunnel ventilation, Water supply and treatment

Fan / Pump Vector Control Drive
CP2000

Excellent for Large Power
Fans and Pumps Applications

- Supports IM / PM / SynRM motors
- Built-in Modbus and BACnet MS/TP communication
- Enhanced PCB (Printed Circuit Board) conformal coating improves drive durability; compliant with Class 3C3
- Fire mode and Bypass mode: Continuous pressure output to extract smoke when a fire accident or other emergency occurs
- Fast and easy installation with quick settings for self-defined parameter groups and parameter duplication
- Various modes for fans / pumps applications:
  PID control, sleep/wake up functions, flying start and frequency-hopping functions
- Supports Delta's MSI motors for an IE5 energy-efficient system (please refer to p.17)
- Built-in LCD keypad for easy operation, and the TPEditor software allows user-defined home page editing
- Synchronous multi-pump control of up to 8 motors, and fixed amount / fixed time circulation control (optional relay expansion cards available)
- Built-in PLC with 10k steps program capacity and real-time clock (RTC)
- Optional communication cards: PROFIBUS DP, DeviceNet, Modbus TCP, EtherNet/IP, CANopen, PROFINET and BACnet IP

Structure
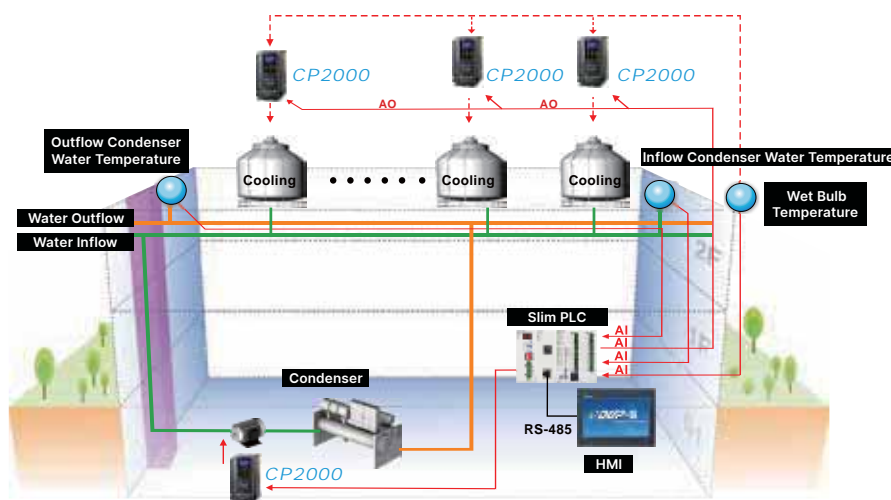
Power Range	0.75~3.7 kW 1~5 HP	5.5~18.5 kW 7.5~25 HP	22~37 kW 30~50 HP	45~90 kW 60~125 HP	110~185 kW 150~250 HP	220~450 kW 300~600 HP	560~630 kW 715~850 HP
CP2000	230 V / 3-phase						
	460 V / 3-phase						
		575 V / 3-phase					
			690 V / 3-phase				

Applications

Factory automation, HVAC, Fans and pumps

14

CE UL CERTIFIED EHC [symbol] [symbol] [symbol] KC SEMI F47

[DELTA logo]

Fans and Pumps

IP55 Fan / Pump Drive
CFP2000

For HVAC and Fans / Pumps Applications

- Supports induction / PM / SynRM motors
- IP55 and IP41 protections
- Built-in main switch for the IP55 models(optional)
- Built-in Safe Torque Off (STO) SIL2
- Built-in EMC filter; compliant with IEC 61800-3 C2 / C1
- Built-in DC reactor effectively reduces harmonic distortion; compliant with IEC 61000-3-12
- Enhanced PCB (Printed Circuit Board) conformal coating improves drive durability; compliant with Class 3C3
- 2 sets of PID controllers
- Built-in PLC with 10k steps program capacity and real-time clock (RTC)
- Built-in Modbus and BACnet MS/TP communication
- Optional communication cards:
  PROFIBUS DP, DeviceNet, Modbus TCP, EtherNet/IP, CANopen, PROFINET and BACnet IP
- Built-in Quick Start and industry recipes to simplify installation and setup
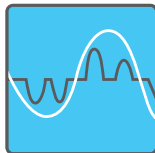
Built-in EMC Filter	Built-in DC Choke	Protection Class	
• EN61800-3 C2 & C1	• Suppress harmonics, THDi < 48% • EN61000-3-12	• IP41 Dust Resistant Type (standard)	• IP55 Waterproof Type(optional)
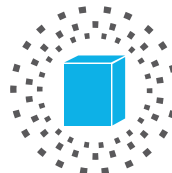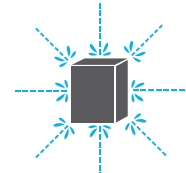
CE UL CERTIFIED EHC ◬ ◉ SEMI F47

Power Range	0.75 ~ 5.5 kW 1 ~ 7.5 HP	11 ~ 22 kW 15 ~ 30 HP	30 ~ 37 kW 40 ~ 50 HP	45 ~ 55 kW 60 ~ 75 HP	75 ~ 90 kW 100 ~ 125 HP
CFP2000	220 V / 3-phase				
	380 to 480 V / 3-phase				
	600 V / 3-phase				

Applications

HVAC, Fans and pumps, Water supply and treatment

Motor-Mounted Pump Drive
MPD

Highly Efficient Pumping Solution

- Adopts an efficient IE5 motor for energy efficiency, compliant with EN61800-9-2 IES2

- IP55-rated protection level

- Built-in PLC with 14k steps program capacity and RTC for flexible operation

- Suitable for water pumps requiring constant pressure and variable frequency; built-in multi-pump control of up to 8 pumps

- Smart pumping: Multi-pump redundancy, flow estimation, cavitation protection

- Pumping protection: Dry pump, high/low water pressure

- Optional EMI for EN61800-3 C1/C2 compliance

- Delta's optional dedicated pumping application with bluetooth connection for monitoring and adjustment

Structure
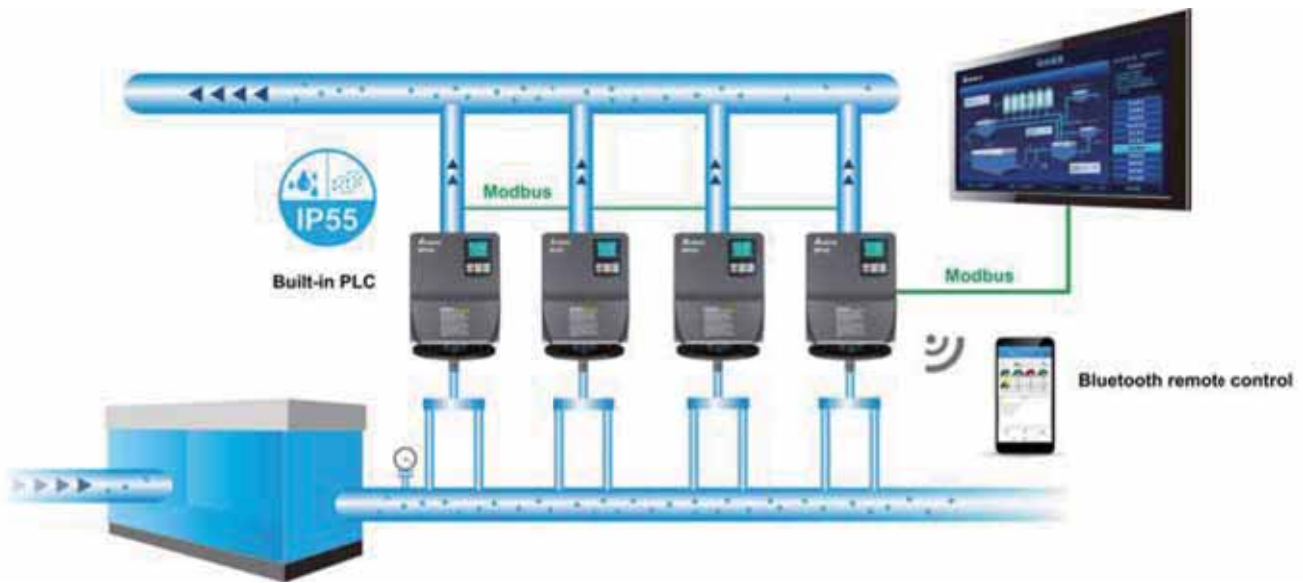
Power Range	0.75 ~ 7.5 kW 1 ~ 10 HP	11 ~ 22 kW 15 ~ 30 HP
MPD	460 V / 3-phase	Estimated Launch in Q4, 2024

Applications

Industrial/commercial water supply systems, Water supply systems in residential areas, Water pumps for pressurization and transportation

Motors

PMa Synchronous Reluctance Motor
MSI

High Power Density and High Efficiency

- Built with the latest materials and magnetic reluctance technology
- Ultra-high efficiency: Rated load / partial load
- High efficiency IE4 without rare earth elements (NdFeB)
- Lightweight design, small size, and high power density
- Low noise and vibration
- Easy replacement for a corresponding motor frame size
- IP55 protection
- Flexible installation: Flange mounting / foot mounting

High Efficiency and Energy-Saving Systems:

- **Quick Settings:** Enter MSI motor codes for Delta's motor drive to automatically identify and load the motor parameters
- **Space-saving:** 1~2 frames smaller than induction motors with the same power range

Fan and Pump Applications

**Standard
Compact Drive
MS300**

**PMa Synchronous Reluctance Motor
(Standard)
MSI**

- Overload capacity up to 120% / 60 secs

IE5 IE4

Compressor Applications

**Fan / Pump Vector
Control Drive
CP2000**

Power Range (kW)	0.75	1.1	1.5	2.2	3	4	5.5	7.5	11	15	18.5	22	30	37	45	55	75
1,500 rpm Standard MSI + MS300 Series	380 V / 3-phase																
3,000 rpm Standard MSI + MS300 Series	380 V / 3-phase																

* Applicable system voltage is 380 V.

Applications

Fans and pumps, Compressors, Industrial machinery

Injection Molding Solution

Hybrid Injection Molding Solution

**High Energy Efficiency, Precise Control and User-friendly Design
for Optimized Injection Molding Processes**

- Perfect combination of industrial know-how and advanced
  key components for high performance and energy-saving
  injection molding solutions:

  - **Hybrid Energy Saving System HES-C:**
    Precise pressure and flow control for each process to ensure
    highly accurate injection for stable and consistent products and quality

  - **Synchronous Torque Motor MST:**
    Replaces hydraulic motors or gearboxes; simultaneously
    performs mold opening and material feeding to shorten
    production cycle and increase productivity

  - **Hybrid Servo Drive VFD-VJ:**
    Built-in pressure control algorithm

- Compatible with production monitoring and management software (**DIA**EAP-IMM) for real-time production data
  collection, handling and monitoring

Delta Hybrid Injection Molding Solution

Ethernet

**Production Monitoring and
Management Software for
Injection Molding Machine
DIA**EAP-IMM

**Hybrid Energy
Saving System
HES-C**

**Door Control
Drive
VFD-DD**

**Synchronous
Torque Motor
MST**
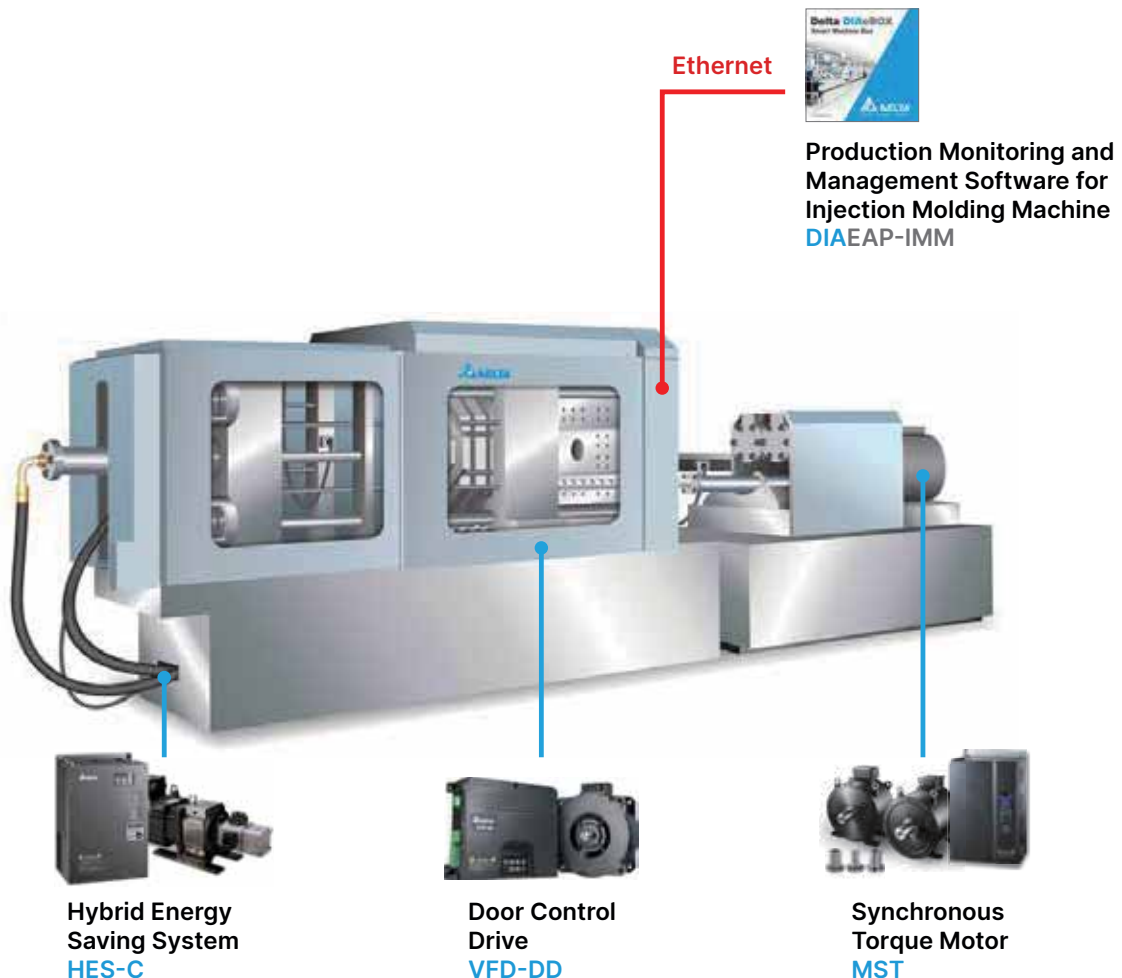
Injection Molding Solution

Hybrid Energy Saving System
HES-C

- Significant energy efficiency
- High overload capability
- Three sets of PID pressure control
- S-Curve for pressure / smooth flow control
- Field-weakening motor control
- Easy commissioning
- Multiple protections
- Multi-pump control for confluence / flow diversion
- User-friendly software for machine commissioning
- Diagnoses of component health

CE

Flow Range (L/min)	63	80	100	125	160	200	250	320
HES-C 230V								
HES-C 460V								

Synchronous Torque Motor
MST

- High torque at low speed and stable operation: Precise control of feeding position
- Direct drive, no energy loss during transmission
- Fast acceleration / deceleration response and zero-speed holding function to avoid screw rotation during injection
- High efficiency, low noise
- Long service life, easy maintenance (No oil lines, belts, or gearboxes)
- Direct oil cooling in oil tanks, no need to install additional water tanks
- Shortens molding cycle and improves production efficiency

CE

Power Range (kW)	15	22	30	55	75	132	160	220	280
MST 460V									

Hybrid Servo Drive
VFD-VJ

- Built-in pressure control algorithm
- Multi-pump convergent flow control
- PG card and communication card on control board
- Supports CANopen communication
- Built-in brake unit
- Protection of insufficient pump oil
- Supports IPM motor parameter auto-tuning
- 4 k ~ 10 kHz adjustable carrier frequency

CE

Power Range (kW)	11	15	18.5	22	30	37	45	55	75
VFD-VJ 230V									
VFD-VJ 460V									

Full Electric / Hybrid Injection Molding Solution New
IAS

**Flexible Deployment, Full Electric
Controller, High Speed and Precision,
Energy Saving**

An integrated system platform with Delta automation control solutions

- Supports various types of injection molding machines, such as single-color, multi-color, horizontal, vertical, and two-plate machines
- High-speed IPC controller with high response, precise control
- Supports different machine types, such as electric, oil and hybrid
- Barrel synchronous temperature rise function
- User-defined function to change machine operating flow quickly
- Hydraulic Energy Saving System HES-C provides precise pressure and flow control for each process to ensure accurate injection, enhancing stability and quality
- ASDA-H3 high power modular multi-axis servo drive provides common DC bus design to improve energy efficiency and reduce space

Secondary development platform DIAStudio

- Provides users an interface and process control integrated development environment
- Provides complete examples and source code for easy secondary development
- Reserves the flexibility for customized development
- Online debugging, editing, and monitoring tool

Structure

PC-Based
Motion Controller
AX-8

Temperature
Controller
DTM

Precision Tube Temperature Control

All-Electric Injection
Molding Machine
Control Panel
NC-MOT

Hydraulic Energy
Saving System
HES-C

High-Power Multi-Axis
AC Servo System
ASDA-H3

20
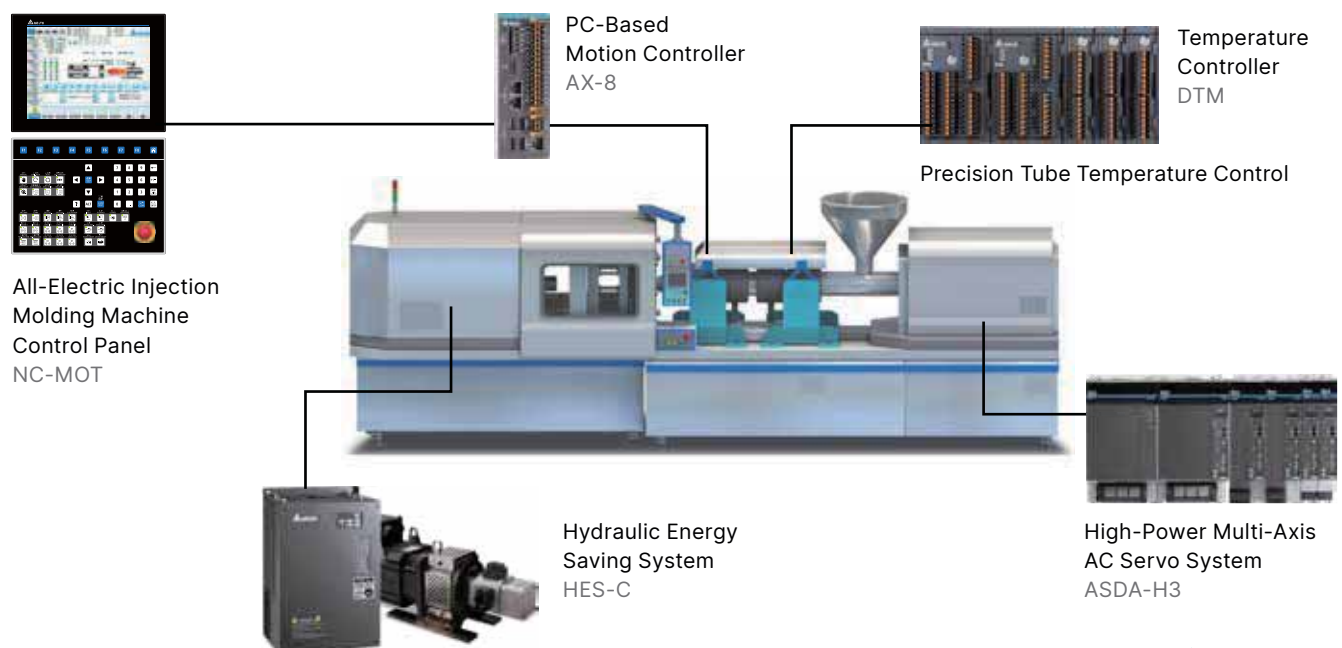
Injection Molding Solution

Intelligent Injection Molding Monitoring Solution
DIAEAP-IMM

The Best IIoT Solution for Machine Tools

- Injection controller data collection
- Real-time production monitoring:
  Manufacturing information visualization, Data digitization,
  Mobile device interface, Remote production management
- Efficient e-Forms: Daily quality daily report,
  OEE report, Production history, Trend charts, and more
- Optimizes production efficiency: Big data analytics
  Parameter optimization, Reduce inefficiency
- Integration of systems:
  Integrates different brands of injection molding machines and ERP/MES

DIAEAP-IMM

- Web server base structure
- User interface for injection molding machine industry
- Tags monitoring and work order status notification

Equipment manager

Parameter Wizard

- Machine hour overview
- Product information
- Mold lifespan
- Parameters monitoring
- Production record

Quality manager

Injection Molding Wizard

- Quality overview
- Fault analysis
- Virtual inspection

Production manager

Reporting

- OEE, Activation, Production, Working hours analysis
- Production history
- Mobile device interface
- Remote production management
- Production trend report

Optimizes Manufacturing Efficiency

- Production experience can be recorded and accumulated, improving equipment parameters and manufacturing processes
- Edge computing and real-time analysis of injection molding machine, ensuring quick response, higher installation efficiency

Logistics

Telescopic Belt Conveyor Intergrated Drive
LTC

Integrated Double VFDs, PLC and 24 V$_{DC}$ Power Supply

- Built-in PLC 14k steps logic controller to achieve integrated drive control
- Integrated 35 W 24 V$_{DC}$ power supply
- 21 DI (17 user-defined DI & 4 internal defined DI), support NPN/PNP mode switching
- 13 DO (8 User-defined DO & 5 Internal defined DO), high reliability relays support 220 V$_{AC}$ and 24 V$_{DC}$, with 1 DO supporting 380 V$_{AC}$ load)
- Large capacitance and common bus design: No need for optional brake and resistor, reduces installation costs
- Regenerative energy, intelligent soft brake

Solution Architecture

- DWS System:
  Dimension Weight Scanning System
- Oil solenoid valve:
  Reduces the pitch angle of the telescopic belt conveyor
- Hydraulic motor:
  Increases the pitch angle of the telescopic belt conveyor
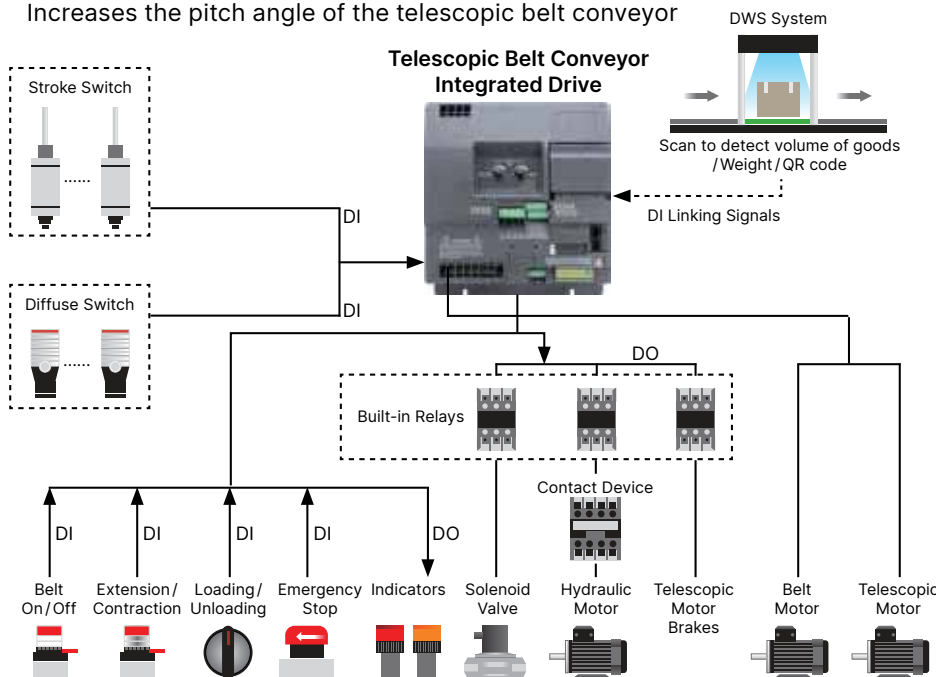
Compact Size
Reduces control cabinet size by 60%

Integrated Drive
Integrates motor drives and PLC

Easy Installation
Simple wiring for installation

Fast Tuning
Simple parameters setting

Easy Maintenance
Quick replacement

Optimal Costs
Reduces the number of parts in the control cabinet

Power Range

380 ~ 480 V$_{AC}$ / 3-phase

Model	VFD2207LTC43A		VFD4015LTC43A	
Inverter Unit	VFD1	VFD2	VFD1	VFD2
Applicable Motor Power (kW)	2.2	0.75	4.0	1.5
Applicable Motor Power (HP)	3.0	1.0	5.5	2.0
Frame Size	A			

ΔNELTA

Conveying Equipment

Distributed Electric Control Cabinet Drive
VFD-EL-D

Highly Integrated Peripheral Electrical Components, Energy and Cost Effective

- EL-DL/EL-DS models: 5DI/3DO, EL-DA models, 10DI/6DO
- Supports Modbus/CANopen
- Supports IM/IPM/SPM motor
- High overload capacity: 200% for 3 seconds, 180% for 10 seconds, and 150% for 60 seconds
- EL-DL/EL-DS: one channel of 24 V/250 mA power supply;
  EL-DA: two channels of 24 V/250 mA independent power supply
- Sufficient I/Os to reduce external switching power supplies and intermediate relays
- The PUD1 keypad can be pulled out to serve as a replacement for conventional buttons and indicator lights
- One-button parameter copy via keypad PUD1
- Ultra-high air volume DC fan

DC Series

DA Series   DS Series   DL Series

Power Range	2.2 kW 3 HP	4.0 kW 5 HP	5.5 kW 7.5 HP
VFD-EL-D		460 V/3-phase	

Applications

Matrix line belt conveyor   Turning belt conveyor   DWS front-end belt conveyor   Climbing belt conveyor

Applications

- Electric distribution panel
- Industrial control situations requiring more digital input/output terminals and complex system wiring

Elevator and Door Control

Integrated Elevator Drive
IED-S

Space-Efficient Integrated Drive and Control

Versatile I/O Terminals

- 25 digital input ports
- 8 relay output ports
- 5 high-voltage input ports

Encoders

- Incremental
- Sin/Cos
- SICK HIPERFACE
- HEIDENHAIN EnDat 2.1

Control

- Highly efficient group control of up to 8 elevators without additional control cards
- Various operation modes: Demo, attendant service, and time-Based
- Single/double-door elevator applications
- Max. 63 floors

Efficiency

- Direct stop: Multi-speed control to provide a comfortable ride with higher efficiency
- Peak hours operation: Improves peak hours operation efficiency
- Full-load bypass operation: Arrives at designated floor without stopping

Auto-Adjustment

- Auto-learning hoistway and auto floor height detection
- Auto-tuning motor parameters without load disconnection
- PC software monitors motor operation status

Energy Saving

- Lighting and air circulation scheduling for elevator cars
- Standby mode to save energy

Certifications Compliant

- CE, UL certifications
- Supports Safe Torque Off (STO) SIL2
- Safety circuit certificate for electronic components
- Certificate for self-monitoring subsystem
- Compliance with CN elevator verification, meets EN81-20/50

Power Range

Power Range	5.5 kW 7.5 HP	7.5 kW 10 HP	11 kW 15 HP	15 kW 20 HP	18.5 kW 25 HP	22 kW 30 HP	30 kW 40 HP	37 kW 50 HP	45 kW 60 HP	55 kW 75 HP	75 kW 100 HP
IED-S	230 V/3-phase										
	460 V/3-phase										

Applications

Commercial and residential building, Freight elevators, MR and MRL elevators

ΔELTA

Elevator and Door Control

Advanced Elevator Drive New
EB3000

Safe, Smart and Comfortable

- Built-in STO (SIL3), complies with EN81-20/50
- Optional models with built-in filter, complies with EN12015, EN12016
- Built-in brake transistor
- Built-in CANlift CiA 417 and DCP 3/4
- Flexible UPS configuration
- Supports various encoders: Endat2.2, SSI, BiSS-C, and more
- Direct docking mode to decrease creeping and travel time
- Data logger with 6 trigger modes
- Bluetooth connection for remote control via the app

Structure

Controller

CANlift CiA 417, CAN bus

DCP 3/4, Modbus

Multi-function I/O

Modbus

APP

LCD Keypad

VFD Explorer Lite
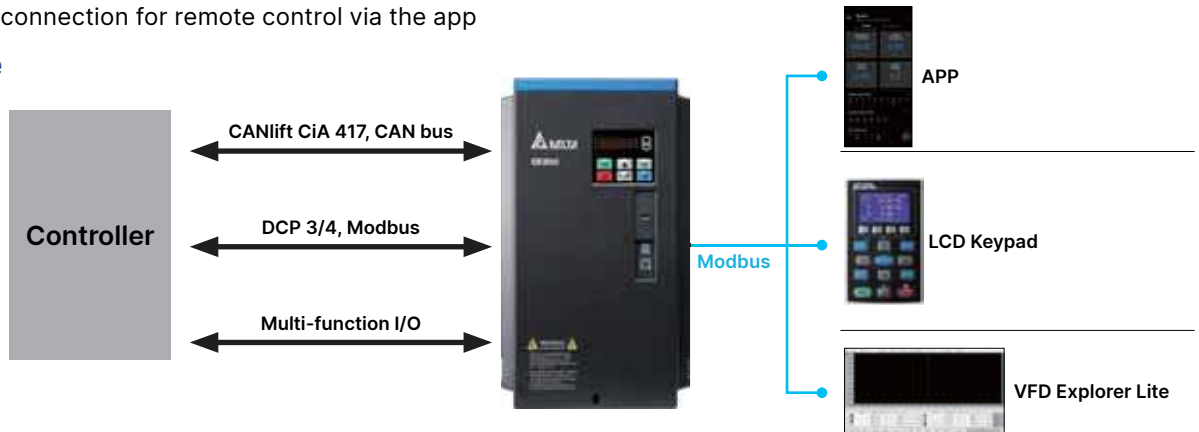
Machine Room
Drive on the Rooftop

Machine Room-less
Drive Inside the Hoistway Hall

Machine Room-less
Drive Inside the Hoistway

Power Range	2.2 ~ 3.7 kW 3 ~ 5 HP	4 ~ 18.5 kW 5 ~ 25 HP
EB3000	230 V / 1-phase	460 V / 3-phase

CE   UL CERTIFIED   (STO SIL 3)   (EN81-20, EN81-50)   RoHS   EAC

Applications

MR and MRL elevators, New installation or replacement cases

25

Elevator Drive
VFD-ED

Excellent Time Sequence Control for Smooth Rides

- Supports induction and permanent magnet motors
- Precise control of S curve performs smooth start and stop for a comfortable ride
- Optional PG feedback cards (Incremental / SinCos / SICK HIPERFACE / HEIDENHAIN)
- Highly precise field-oriented vector control
- Automatic torque compensation function to prevent elevators from slipping or vibrating
- Emergency operation enabled with UPS or battery when a power outage occurs
- Wall-mount or embedded installation
- Built-in LED digital keypad
- Built-in plentiful IO terminals for various elevator applications
- 1 CANopen and 2 RS-485 (Modbus)

Emergency Operation

- Supports single phase 230 V_{AC} uninterrupted power system (UPS)
- Automatically determines the light load operation direction when a power outage occurs

(EN81-1+A3, EN81-20)

Power Range	2.2 kW 3 HP	3.7 kW 5 HP	4 kW * 5 HP	5.5 kW 7.5 HP	7.5 kW 10 HP	11 kW 15 HP	15 kW 20 HP	18.5 kW 25 HP	22 kW 30 HP	30 kW 40 HP	37 kW 50 HP	45 kW 60 HP	55 kW 75 HP	75 kW 100 HP
ED	230 V / 1-phase													
			230 V / 3-phase											
			460 V / 3-phase											

*Min. power range of the 460 V model: 4 kW

Applications

Commercial and residential building, Freight elevators, MR and MRL elevators

Elevator and Door Control

Compact Elevator Drive
MH300-L

Compact Design with Open-Loop Control for Precise Time Sequence

Size Reduction **40%**

- Supports asynchronous motors with open-loop control
- Precise control of S curve performs smooth start and stop for a comfortable ride
- Compact design and user-friendly operation
- Emergency Power Supply (EPS) / Automatic Rescue Device (ARD) and sequence control functions for elevator applications
- Built-in 5-digit 16-segment LCD digital keypad
- Built-in EMC filter(optional) complies with EN 12015 / EN 12016 standards for lift applications
- Built-in brake chopper to enhance braking capability
- 7 digital inputs (extension up to 10) and 1 relay output (extension up to 3)
- Integrated Safe Torque Off (STO) SIL2
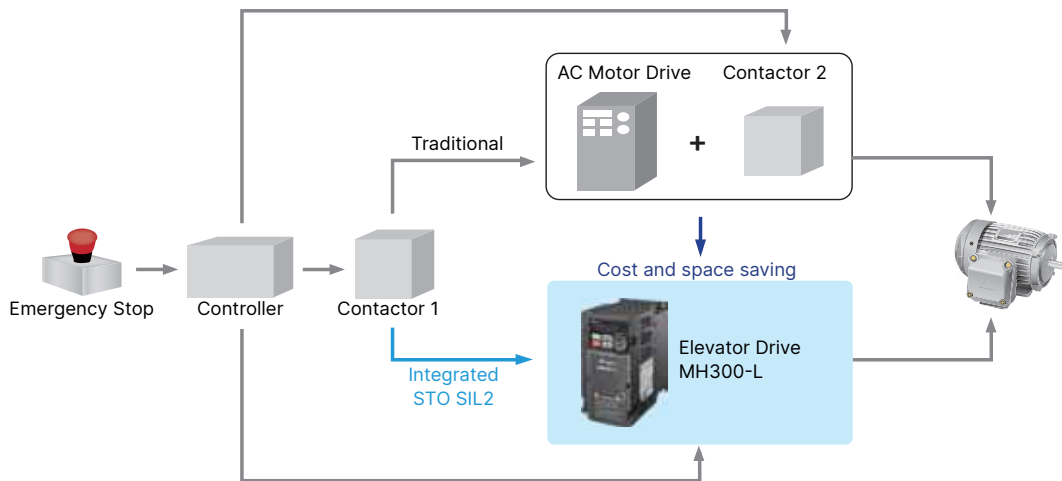
Power Range	2.2 kW 3 HP	3.7 kW 5 HP	5.5 kW 7.5 HP	7.5 kW 10 HP	11 kW 15 HP	15 kW 20 HP
MH300-L	230V / 3-phase					
		460 V / 3-phase				

Applications

Low floor residential building, IM open-loop elevators of villas

Textile Vector Control Drive
CT2000

Plate Mount, Flange Mount, Wall Mount

- Deceleration Energy Backup (DEB) function for smooth motor deceleration control
- Supports both asynchronous and synchronous motors
- Common DC BUS design
- Built-in 10K steps PLC programming capability and RS-485 with MODBUS communication
- Optional communication cards are available upon request
- SEMI F47, CE, UL Certifications [*1]

*1: Finless Drive does not have SEMI F47 or UL certification

Plate-Mounting Type

In response to different textile environments, liquid cooling is sometimes used to reduce the impact of harsh environments on air-cooled heat dissipation. Plate-mount design can be applied to the liquid cooling plate for heat dissipation, suitable for customer's requirements.

*Available for models with names ending in A
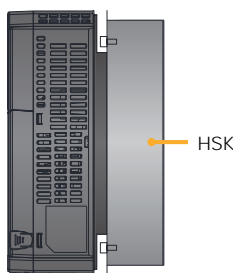
Flange-Mounting Type

Flange-mount installation for the fanless model. Prevents overheating problem caused by fiber or dust clogging the fan or entering the drive. Suitable for spaces with cooling ducts.

*Available for models with names ending in B
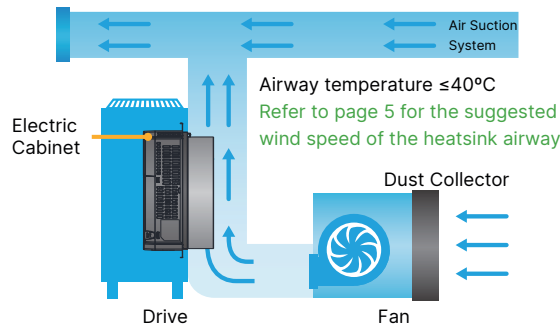
Wall-Mounting Type

Large fan design for wall-mount installation, fulfills general textile applications.

*Available for models with names ending in C

HSK

Air Suction System

Electric Cabinet

Airway temperature ≤40°C
Refer to page 5 for the suggested wind speed of the heatsink airway

Dust Collector

Drive   Fan
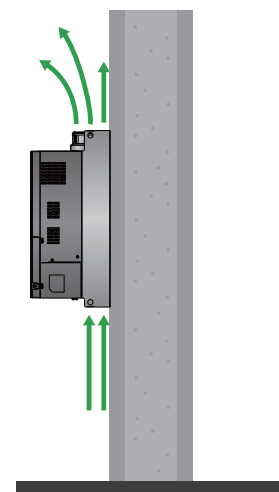
CE UL CERTIFIED * SEMI F47 * * Available for Flange-mounting and Wall- mounting types

460V (kW)	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90
460V (HP)	7.5	10	15	20	25	30	40	50	60	75	100	125
Plate-Mounting Type	A		B			C			D			
Flange-Mounting Type			B			C			D			
Wall-Mounting Type			B			C			D			

Applications

For applications requiring flange mount, wall mount and finless installation, such as textile machines, the flange-mount heat dissipation duct design must meet CT2000 specifications

ΔELTA

Low Voltage Powertrain System

e-Scooter Integrated Side-Mounted Powertrain `New`

High Efficiency and High Reliability.
Drive, Motor & Gearbox in ONE Unit

Highly Integrated

- **Easy wiring:**
  A typical design often separates the drive and motor, while Delta's all-in-one powertrain integrates the drive, motor, and gearbox into a single unit which greatly reduces wiring (e.g., three-phase power supply, encoder)
- **Simplified assembly:**
  The all-in-one design optimizes the assembly process and time as well as offers convenience for maintenance

Modular Standard Platform

- Features a flexible design with diverse combinations of drive, motor, and gearbox for different performance and voltage specifications

Waterproof & Dustproof

- IP67 rated. Capable of operating in <1m water depth for 30 minutes, providing outstanding protection to withstand harsh environments

Flexible Underseat Storage

- Integrates the drive into the powertrain. Compared with traditional designs with the drive installed under the seat, Delta's powertrain enhances space utilization by around 10%
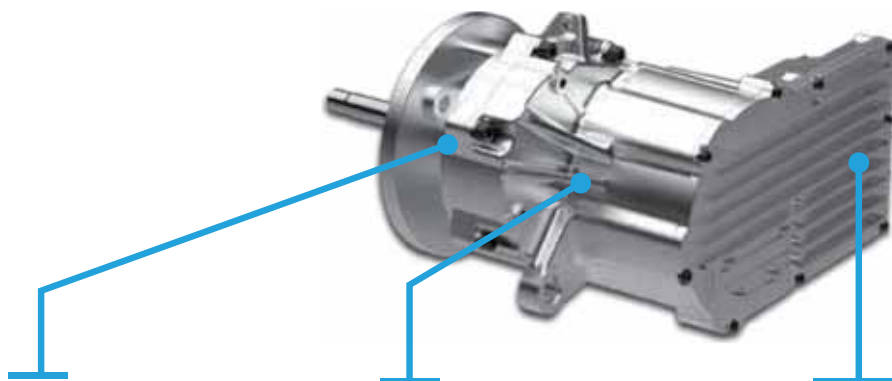
Gearbox
High efficiency, low noise

Motor
Magnetic components with flexible design for different e-scooter performance requirements

Drive
Built-in VCU*, directly receives digital/analog output from e-scooters
*VCU (Vehicle Control Unit)

Applications

Delivery service, Commuting

e-Bike Mid Drive Motor `New`
EBPH

Compact Size, High Performance Output

Compact Size
- Leverages Delta's patented transmission technology to minimize the size, blending the Mid Drive Motor into a sleek and compact e-bike

High-Performance Power Output
- Maintaining high-performance power output despite a more compact motor size marks a significant breakthrough. This offers riders enhanced power assistance

Comprehensive Eco-System
- Featuring high system integration capabilities, the drive can integrate with manufacturers in the market, such as for battery and display dashboards for a total solution

Pedal Sensor
High sampling of torque and cadence as feedback for the control unit

Patented Transmission
Delta's unique gear technology ensures efficient power delivery

Motor Control
The control unit ensures a comfortable riding experience and reliability

High Torque Motor
High torque performance up to 120 rpm pedaling satisfies different riding conditions

Cover & Shell
Concise concentric cylinder design for easy installation and protection requirements
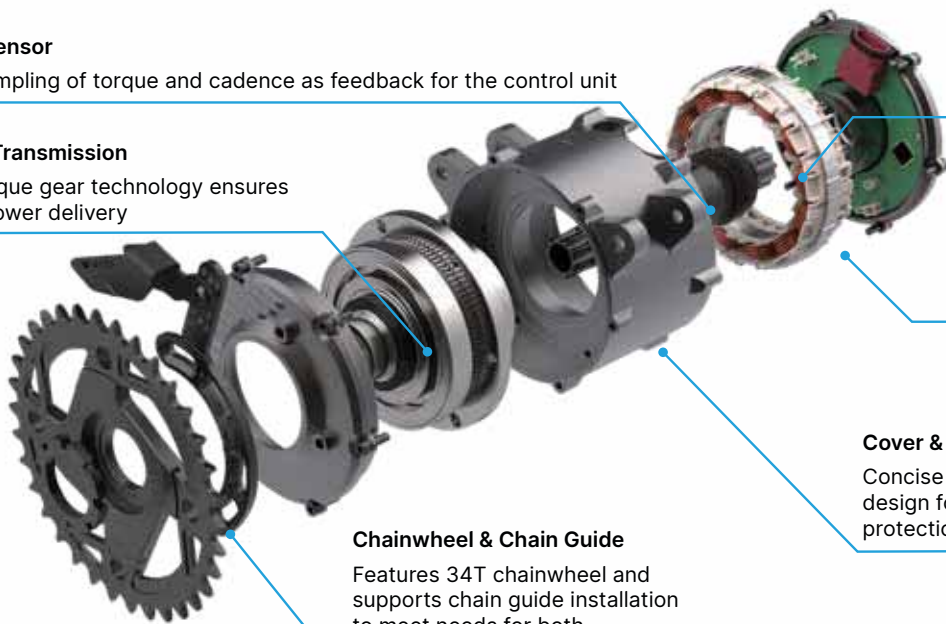
Chainwheel & Chain Guide
Features 34T chainwheel and supports chain guide installation to meet needs for both e-Trekking and e-Mountain Bikes

Europe: CE Marking
Americas: NRTL Marking

Applications

e-Mountain bike, e-Trekking bike, e-Cargo bike

DELTA

Low Voltage Powertrain System

Low Voltage Electric Vehicle Drive `New`
BTD

Highly Efficient and Reliable with Outstanding Performance

The Drive BTD Series ensures a safe and comfortable riding experience. It also features a high compatibility and compact size, while providing advanced control of the LSV (Low Speed Vehicle) motor. The BTD drive offers customers a highly cost-effective combination of power, performance, and functionality.

The BTD drive is designed for golf cars, utility vehicles and Light-On-Road applications such as electric 3-wheelers. It is also suitable for material handling vehicles in the logistics industry such as warehouse trucks.

Outstanding Drive Performance

- Overload capacity up to 300% / 120 sec
- Supports IM/PMSM and Hub motors
- FOC control

High Compatibility

- Built-in CAN communication
- Built-in digital rotor position encoder interface

Robust Safety and Protection

- Output overcurrent protection
- HV/LV protection
- Overheat, Overload protection
- Locked rotor protection, battery low-voltage warning, seat warning
- Emergency stop output

Features and Functions

- Parking, rolling, wheel speed functions
- Emergency reversal
- Motor parameters auto-tuning
- SRO Mode / HPD Mode

International Certifications

- IP65 Rated per IEC60529
- UL recognized per UL583
- EMC: Designed to the requirements of EN 12895:2000 | IEC 61000-6-2:2016 | IEC 61000-4-2

Regulatory compliance of the complete vehicle system with the controller installed is the responsibility of the vehicle OEM.

BTDH2 Series

BTDS1 Series

Servo System - AC Servo Motor and Drive

AC Servo Drive & Motor New
ASDA-W3

Seamless Multi-Axis Control
New Chapter for Servo Tech

200 V Dual-Axis 0.1 ~ 1.5 kW
Rated Current 0.9 A ~ 8.3 A

200 V Single-Axis 2 ~ 3 kW
Rated Current 13.4 A ~ 19.4 A

Modular Design

- Power, drive, and control modules are mounted on the backplane
- No dissipating space needed between modules
- Every drive module can drive two motors[*]

[*] 2 kW and 3 kW drive module can only control one motor

Simple Wiring

- Saves installation time and cost
- Power modules supplies power via backplane, reducing power wiring
- High speed backplane communication protocol. No network wiring is required between modules
- Organizes cables easily, keeping panels tidy

ASDA-W3

Fieldbus

35%↓

382 mm

Single Drive Structure

Fieldbus

Single Drive | Single Drive | Single Drive | Single Drive | Single Drive | Single Drive | Single Drive | Single Drive | Single Drive | Single Drive | Single Drive

40 mm Dissipation

590 mm

Built-in Motion Control - Supports Multiple Sets of Gantry Motion

- High performance control module coupled with high speed backplane communication. Under the speed of 16 kHz, capable of controlling the host and slave motor
- Flexible selection of master axis and follows by designated slave axis, achieving multi-gantry control
- Host controller delivers master axis motion command

Delta Host Controller

Servo Motor Axis 4

Servo Motor Axis 3
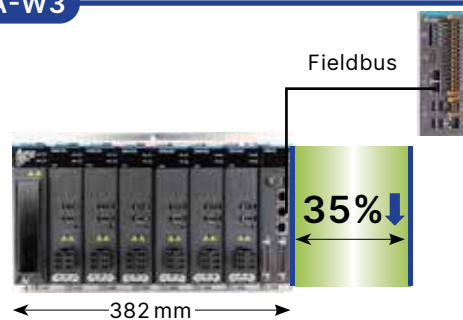
Servo Motor Axis 2
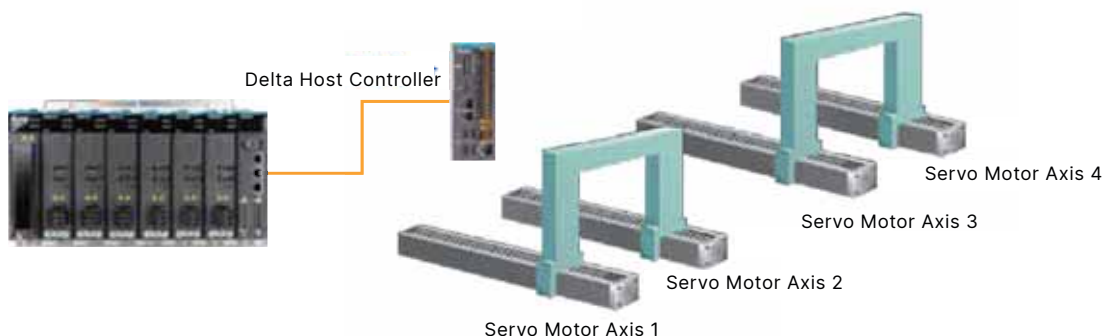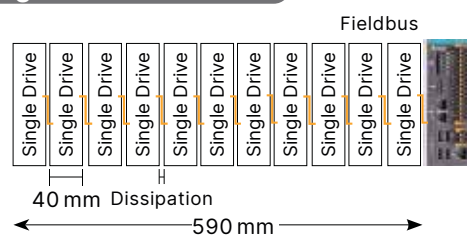
Servo Motor Axis 1

Applications

Semiconductors, Electrics & electronics, New energy (lithium batteries), Woodworking, Packaging, Logistics

NELTA

Servo System - AC Servo Motor and Drive

AC Servo Drive & Motor `New`
ASDA-H3

3.1 kHz High Response Bandwidth
27-bit High Resolution Absolute Encoder
PR Mode for Advanced Motion Command Planning

400 V Single-Axis 4.5 ~ 155 kW │ Rated Current 13 ~ 300 A
400 V Dual-Axis 0.75 ~ 20 kW │ Rated Current 3.1 ~ 40 A

Space-Saving

- ASDA-H3 (Single-Axis 7.5 kW × 6)

42%↓

- ASDA-A3 (7.5 kW)

125 mm

273 mm

Dissipation Dissipation Dissipation Dissipation Dissipation

755 mm

1 mm for dissipation
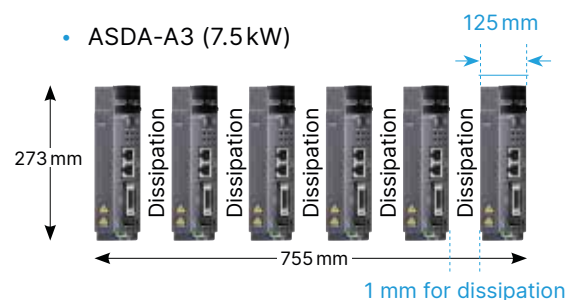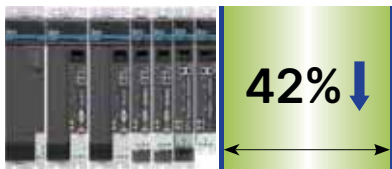
Single-Axis / Dual-Axis Drive Module

Single-Axis

Servo Motor
PM Motor

Dual-Axis

Servo Motor / Linear Motor

Third Party PM
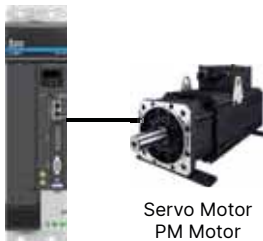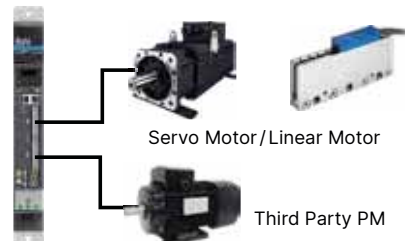
High Energy Efficiency

Common DC bus transfers the regenerative energy into power

Motor Operation / Acceleration
Consume Energy

DC Bus

Braking Resistor

Regenerative Energy
Motor Deceleration

Energy Storage Module

R
S
T

Utility
Power

R
S
T

Consume Energy

Power Regenerative Unit
REG2000
Active Front End
AFE2000
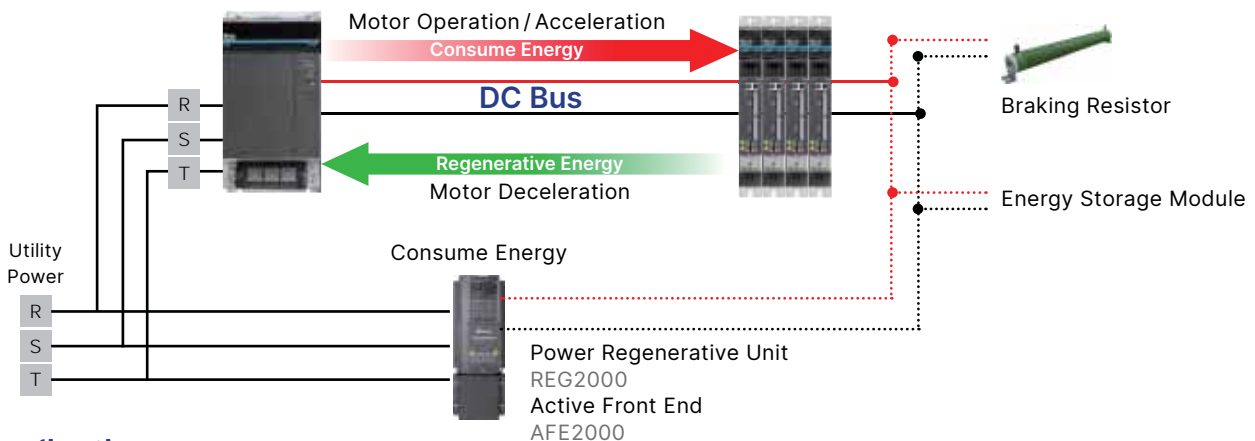
Applications

Metal processing, Rubber & plastics, Multi-wire cutting, Carton cutting

AC Servo Drive & Motor
ASDA-A3

24-bit Absolute Encoder / 3.1 kHz Bandwidth Advanced Motion Control Functions Supports Functional Safety (only 400 V model)

200 V: 0.1 ~ 15 kW | 400 V: 0.4 ~ 15 kW

3.1 kHz Bandwidth and Shorter Synchronization Cycle

- Response bandwidth increased by 3.1 times (compared to the ASDA-A2 Series), providing higher speed for commands
- Higher responsiveness and shorter settling time increases productivity
- The synchronization cycle of the ASDA-A3 Series is 125 µs, which is 8 times faster than that of the ASDA-A2 Series

Response Bandwidth

Synchronization Cycle

24-bit Absolute Encoder

16,777,216 pulses for one single turn

46,603 pulses for one degree
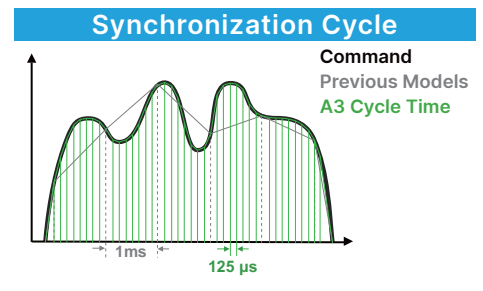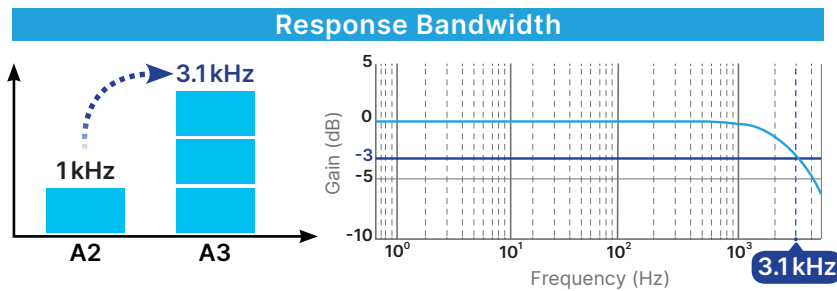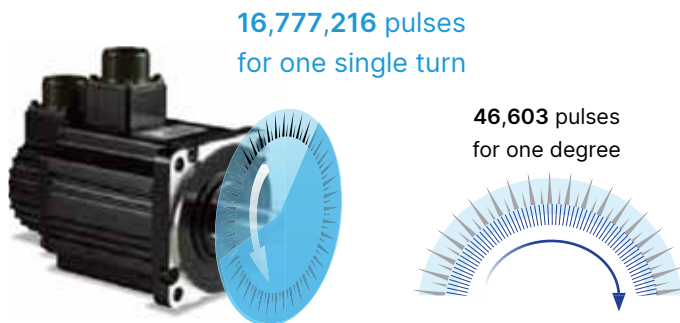
Advanced Motion Control Functions
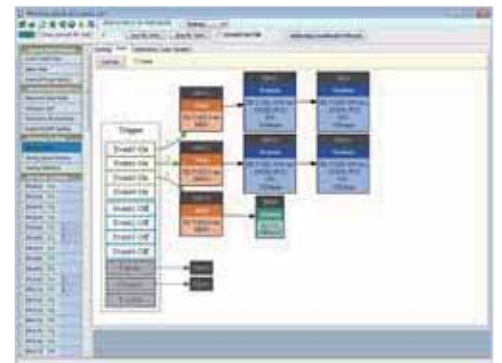
Model Types

Type		Linear Motor	PT Mode Pulse Train	PR Mode	RS-485	CANopen	DMCNET	EtherCAT	Analog Voltage Control	Full-Closed Loop Control	E-CAM	STO
A3	L	√	√	√	√	-	-	-	√	√	-	-
	M	√	√	√	√	√	-	-	√	√	√	√
	F	√	-	√	-	-	√	-	-	√	√	-
	E	√	-	√	-	-	-	√	-	√	√	√

Applications

Machine tools, Electronics assembly or detection equipment, Industrial robots, Packaging machines, Labeling machines, Semiconductor processing equipment, Textiles equipment

Servo System - AC Servo Motor and Drive

AC Servo Drive & Motor
ASDA-B3

24-bit Absolute Encoder / 3.1 kHz Bandwidth
Advanced Motion Control Functions

200 V: 0.1 ~ 3 kW │ 400 V: 1 ~ 7.5 kW

Model Types

Type		PT Mode Pulse Train	PR Mode	RS-485	Analog Voltage Control	CANopen	DMCNET	EtherCAT	PROFINET	STO	Dynamic Brake
B3	L	√	√	√	√	-	-	-	-	-	-
	M	-	√	-	√	√	-	-	-	-	-
	F	-	√	-	√	-	√	-	-	-	-
	E	-	√	-	√	-	-	√	-	-	-
B3A	L	√	√	√	√	-	-	-	-	√	√
	M	√	√	√	√	√	-	-	-	√	√
	F	√	√	-	√	-	√	-	-	√	√
	E	√	√	-	√	-	-	√	-	√	√
	P	-	√	-	-	-	-	-	√	√	√

High Response Bandwidth and Shorter Synchronization Cycle

- Higher responsiveness: From 0.5 kHz of the ASDA-B2 Series to 3.1 kHz of the ASDA-B3 Series
- Increased productivity: Settling time decreased by 40%
- The synchronization cycle of the ASDA-B3 Series is 125 μs, which is 8 times faster than that of the ASDA-A2 Series

Analog Feedback PID Control

- Supports analog signal input
- Achieves real-time and precise PID control with the analog signals from the external sensor, which enhances production yields and processing performance
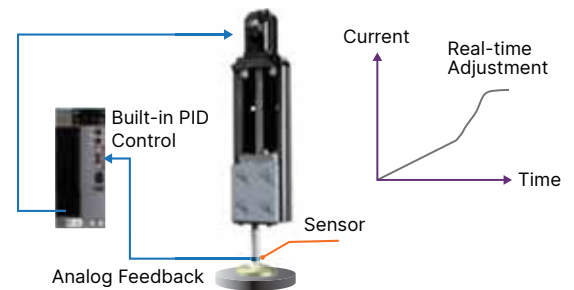
High Resolution Encoder

- B3 series drivers support absolute type motors
- 24-bit optical encoder: The encoder is lighter and thinner with the reflective sensor technology; the exclusive optical sensor compensation function enhances product reliability
- 17-bit magnetic encoder: The magnetic induction technology enhances the capability to prevent vibration and increases the oil resistant level
- Battery-less absolute encoder: Reduces maintenance efforts, avoids abnormal failures caused by battery exhaustion, and prevents the complicated process of lithium battery transportation
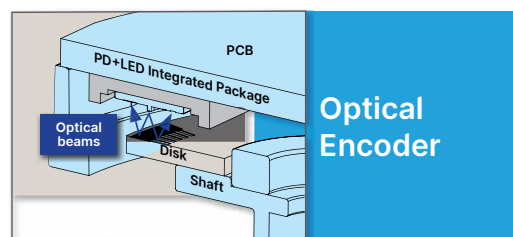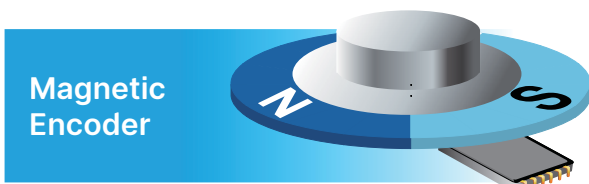
Applications

Machine tools, Electronics assembly equipment, Tool magazines and turrets, Industrial robots, Packaging machines, Labeling machines, Semiconductor equipment, Textiles equipment, Diamond cutting machines

AC Servo Drive & Motor
ASDA-M

Three-in-One Intelligent Servo System Integrating Motion Controller and Servo Drive

Outstanding Motion Control

- 3-axis synchronous servo module with higher performance
- Built-in motion control and PLC functions
- Multi-axis synchronous interpolation and built-in motion control require high synchronous control accuracy
- Advanced synchronous gantry control
- Versatile PR mode for various continuous motion movements

New PC Software Functions

- ASDA-Soft provides built-in contour analysis function
- EzASD provides PLC programming and motion commands editing environment

High Precision, High Performance Servo Motors

- Supports incremental and absolute encoders
- Incremental encoder provides up to 1,280,000 p/rev resolution for high-precision positioning

Real-Time, Reliable and High-Speed Motion Control Network

- Supports DMCNET and CANopen communication protocols
- Builds an integrated system configuration by DMCNET with the aid of Delta's Controller with Human Machine Interface (HMC)
- Supports DMCNET extension digital input and output modules

Advanced Gantry Control

- Real-time data exchange among 3 axes greatly increases the efficiency and performance of gantry control
- Simultaneously performs precise motion control and drive for each axis in rigid or general mechanical systems whether the loading on multiple axes is equal or not
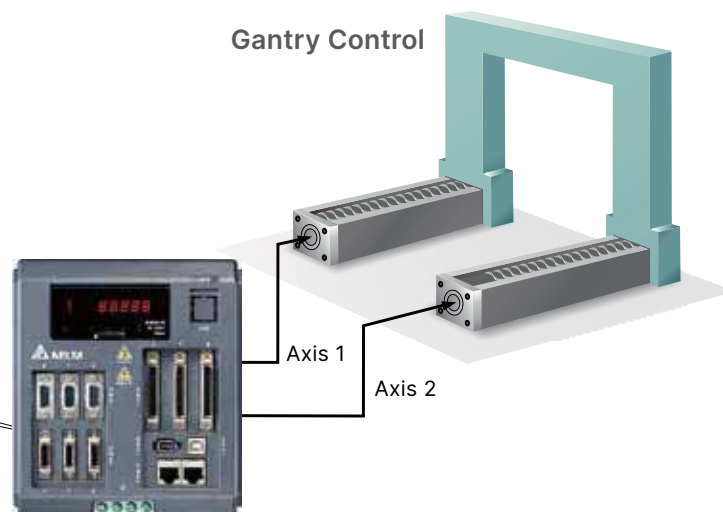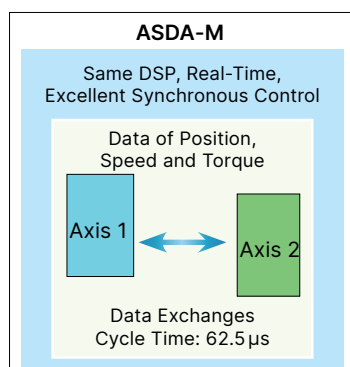
ASDA-M

Same DSP, Real-Time, Excellent Synchronous Control

Data of Position, Speed and Torque

Axis 1

Axis 2

Data Exchanges
Cycle Time: 62.5 μs

Gantry Control

Axis 1

Axis 2

Applications

Machine tools, Electronics assembly equipment, Tool magazines and turrets, Industrial robots, Packaging machines, Labeling machines, Semiconductor equipment, Textiles equipment, Diamond cutting machines

DELTA

Linear Motion

Linear Pocket Actuator `New`
LPL

- Integrates linear motors, linear encoders, and rails in one unit. Lightweight and easy to install
- The rated thrust is 5 N and 1,000 N
- Low thrust and short travel; the acceleration is up to 10 G
- Fine force analysis; the minimum is within 0.1 N
- Excellent force repeatability; the minimum thrust is within ±1% (with Delta's servo drives)
- The whole series includes optical linear encoders with a 0.5 μm resolution

Direct Driven Structure
Linear motor driven features high speed, high precision, lightweight and with no backlash or abrasion

Precise Force Control
Integrated one-unit design for less deviations; Capable of achieving high precision force control with Delta's servo drives

Soft Landing
Capable of slow contact and precise pressing control with the soft landing features of Delta's servo drives to avoid component damage

Lightweight
Small size to save space. Capable of side-by-side installation. Suitable for precise pressing and fast pick and place z-axis applications, such as electronic components, lens, and wafer production

LPL Series features soft-landing on the secondary platform with Delta Servo Drive ASDA-A3 Series to avoid damaging the processing parts

Operating Route

A
1. Position Mode   4. Position Mode
B
2. Speed Mode
C
3. Torsion Mode

Position-Thrust Curves

Position (PUU)   Thrust (%)

High-speed movement   High-speed movement
C
B
Soft Landing
A
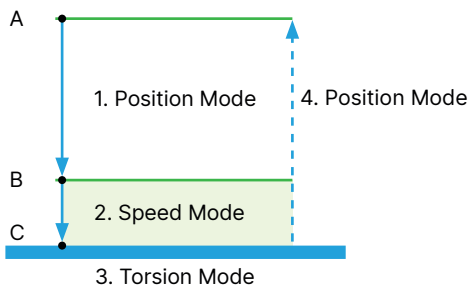
1   2   3   4   Time (ms)
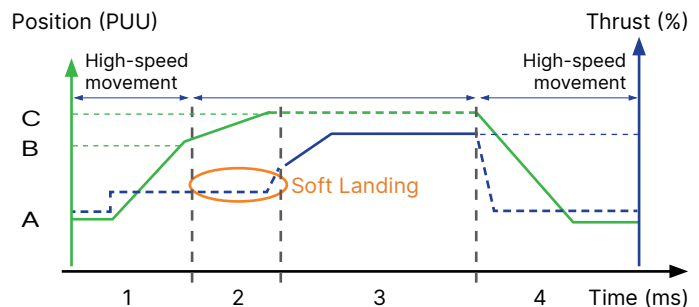
Movement Types	Movement Status	Benefits
1. Position Mode (A→B)	Falls to the default position in high speed	High-speed movements; Reduces processing hours
2. Speed Mode (B→C)	Falls in low speed and gently presses the contact platform (The process is called soft landing)	Gentle contacts; Avoids damaging the processing parts
3. Torque Mode (C)	Compresses to the default value and retains the pressure for torsion output	Stable torsion; Fulfills production requirements
4. Position Mode (C→A)	Quickly pulls back	High-speed movements; Reduces processing hours

Advantages of Soft Landing

- Linear motor module structure features high speed, high precision, and stability for more precise and timely soft landing
- Breaks down different movement modes to optimize production efficiency and quality yield
- Suitable for precise pressing and assembly applications, such as lens, wafers, electronic components, and other production with easy to damage parts

Applications

Electronics assembly equipment, Semiconductor packaging and testing, Micro Z-axis applications such as lenses assembly

U-Shaped Ironless Linear Motor
ECM-PU

- Simple design for easy mounting on equipment
- Suitable for continuous motions
- No cogging force, low thrust ripple
- Excellent dynamic response
- No backlash
- Built-in temperature sensors and Hall devices
- Large air gap for quick installation
- Long and non-restricted distance

Thrust Range

Thrust (N)
- Continuous Thrust
- Maximum Thrust

Model	Continuous	Maximum
ECM-PU221	3.2	16.8
ECM-PU222	6.3	33.5
ECM-PU211	13	65
ECM-PU212	27	130
ECM-PU22H2	38.5	200
ECM-PU22H3	57.8	300
ECM-PU22H4	77	400
ECM-PU381	51	258
ECM-PU382	102	515
ECM-PU383	130	885
ECM-PU384	167	1,184
ECM-PU432	169	891
ECM-PU433	286	1,274
ECM-PU434	321	1,955
ECM-PU435	377	2,420
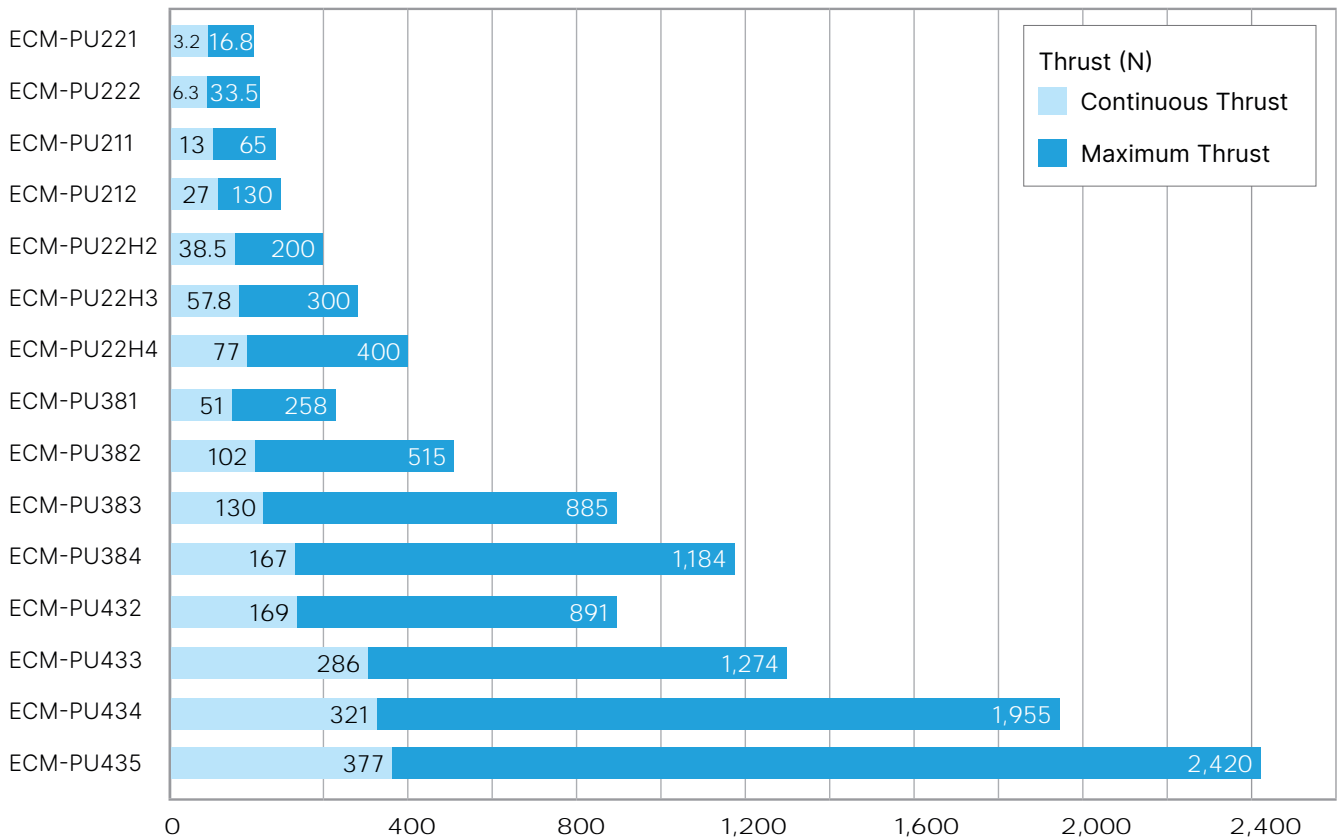
Magnetic Track Length (Unit: mm)

Model Name	Length	Gap
ECM-PU21	135, 270	135
ECM-PU38	156, 312	156
ECM-PU43	156, 312	156

Applications

Electronics equipment, Semiconductor equipment

Linear Motion

Flat Iron-Core Linear Motor
ECM-PF

- Simple design for easy mounting on equipment
- Intense unit thrust
- Suitable for point-to-point motion
- Excellent dynamic response
- No backlash
- Built-in temperature sensors and Hall devices
- Large air gap for quick installation
- Long and non-restricted distance

Thrust Range

Model	Continuous Thrust	Maximum Thrust
ECM-PF501	56	206
ECM-PF502	124	413
ECM-PF503	165	553
ECM-PF504	220	736
ECM-PF651	89	330
ECM-PF652	160	660
ECM-PF653	238	884
ECM-PF654	317	1,177
ECM-PF801	125	377
ECM-PF802	248	760
ECM-PF803	329	1,070
ECM-PF804	500	1,431
ECM-PFC81	240	753
ECM-PFC82	400	1,520
ECM-PFC83	657	2,140
ECM-PFC84	1,000	2,862

Thrust (N): Continuous Thrust, Maximum Thrust
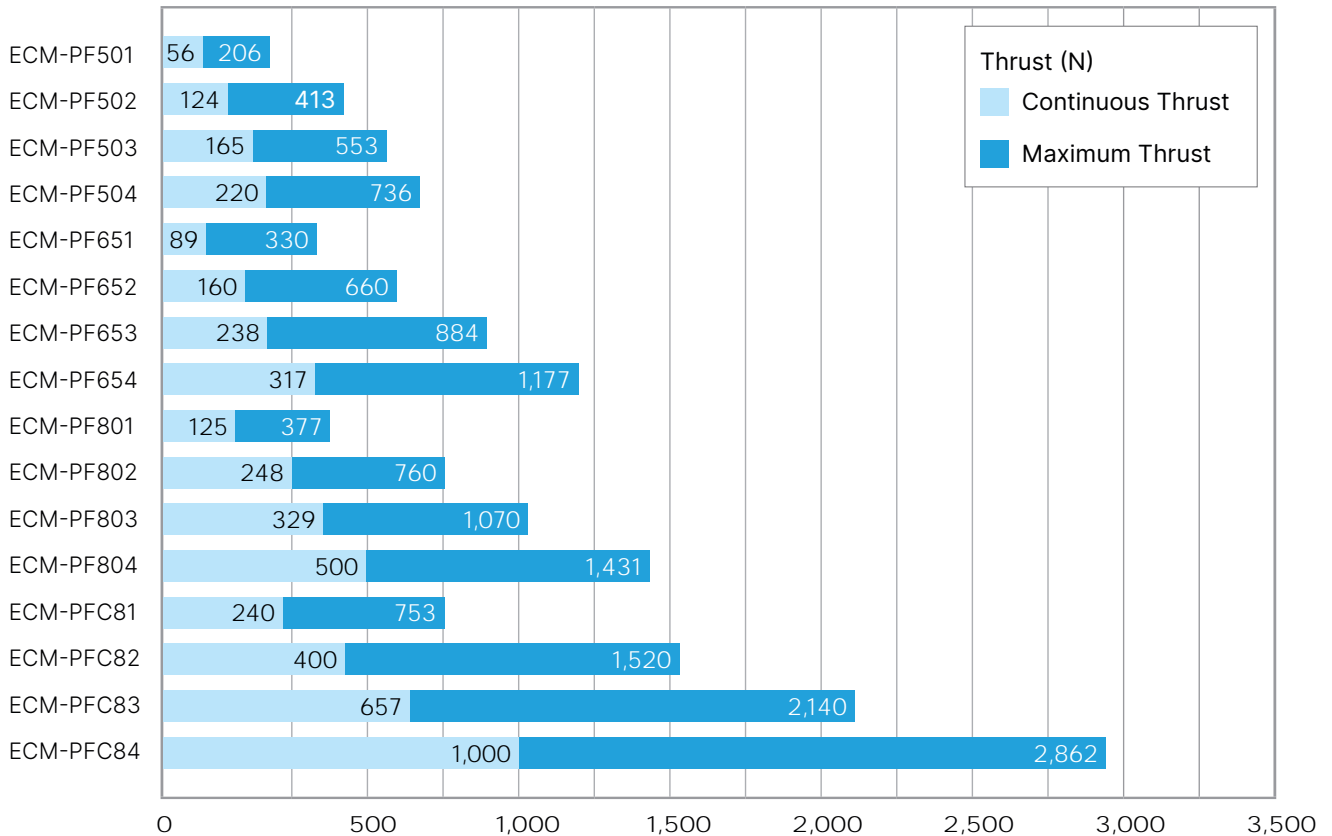
Magnetic Track Length (Unit: mm)

Model Name	Length	Gap
ECM-PF80	128, 320	192
ECM-PFC8	128, 320	192

Applications

Machine tools, Laser processing, Semiconductor equipment

Encoder

Optical Linear Encoder New
MSR-LEH

- High precision, high immunity to dirt, missing pulse detection, and unintended collision prevention (with Delta Servo Drive)
- 4 nm high resolution, suitable for various high-speed and precision applications. Commonly used for linear motor position feedback or installed outside rotary motors for extra precision
- Reflective optical inspection design with smaller encoder read heads
- Includes communication and pulse-output types for different requirements of the servo drives
- Employs LED indicators at the encoder read heads, clearly shows the current installation status
- Satisfies high-resolution (4 nm) and high-speed (10 m/s) working environments
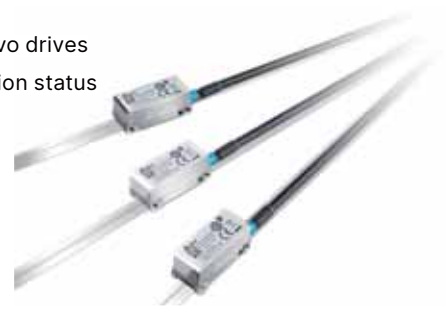
Reflective Optical Sensor

- Precise optical ray tracing simulation
- One-chip integration of light source and detector
- Achieves high-precision measurement with higher installation tolerance

Optical Simulation

Side view

LED Source

Reflection Pattern

Top view

Detector Array (Green)

Reflection Pattern (Brown)

LED Source (White)

One-Chip Integration

Detector Array

Optical ruler

Scale pattern
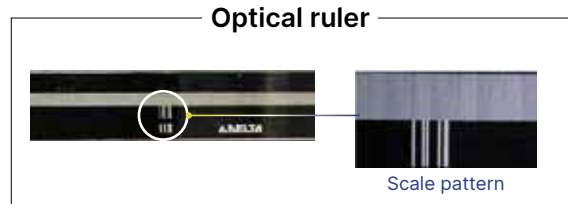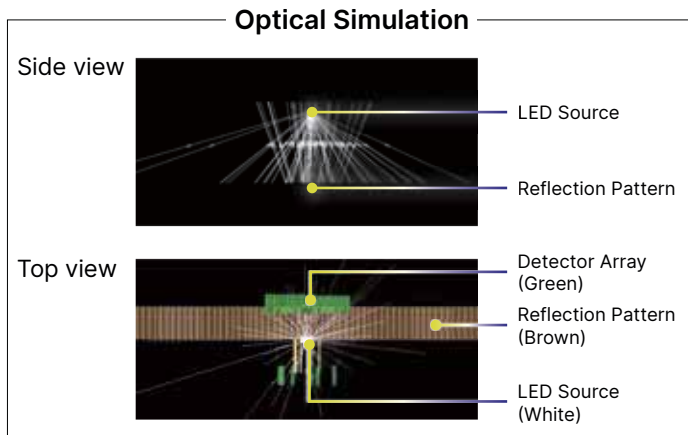
High Immunity to Dirt

Patterned array design enhances dirt immunity, such as to light cutting oil stains and dirt particles

Surface	Clean	Fingerprint	Cutting Oil	Marker Pen
Image				
Contaminant Width	-	11 mm	4 mm	1 mm
Signal Quality (%)	100	58	43	79
Signal Distortion	NO	NO Contaminants lower the signal quality, but Delta's built-in array algorithm ensures signal reconstruction		

Superior Precision Measurement

- Inspection of linear motor modules with Delta Optical Scale using Laser Interferometry
- General applications: A common stage requires 2 μm repeatability
- Advanced applications: Requires 1 μm repeatability
- The Delta Linear Motion Module* solution meets the requirements
- **Repeatability up to 0.128 μm**

* Linear motion module includes Delta linear motor, Delta optical linear encoder, and air-bearing stage

Unit	(+) μm	(-) μm	(Bidir) μm
Repeatability	0.105	0.073	**0.128**

Air-Bearing Stage

Optical Linear Encoder

U-Shaped Linear Motor

Applications

Electronics assembly equipment, Semiconductor packaging and testing, Camera lens module assembly machine
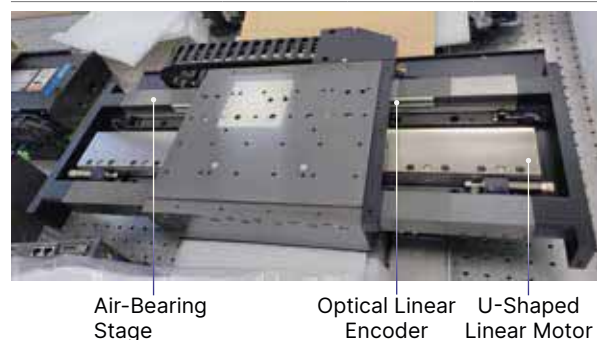
Encoder

Rotary Encoder
ES / EH / HS / HH

Incremental

- Configurable resolution (magnetic)
- Wide input voltage: 5 ~ 30 V$_{DC}$
- Resolution: 100 ~ 4,096 PPR
- Output form: open collector, line driver, push-pull
- HS / ES outer diameter of solid shaft: 37 mm / 50 mm
- EH outer diameter of hollow shaft: 37 mm / 50 mm

Solid Mandrel
ES5 / ES3 (Optical)
HS5 / HS3 (Magnetic)

Hollow Mandrel
EH5 / EH3 (Optical)
HH5 / HH3 (Magnetic) $^{coming soon}$
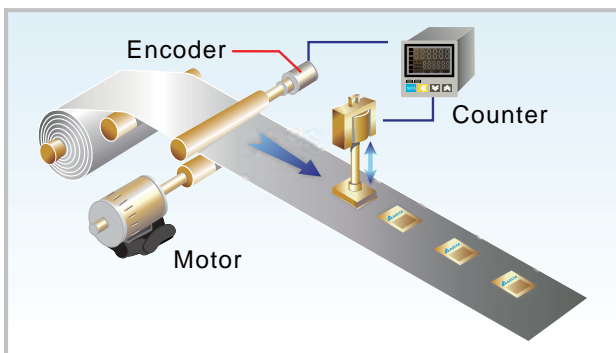
Label Printing Machine
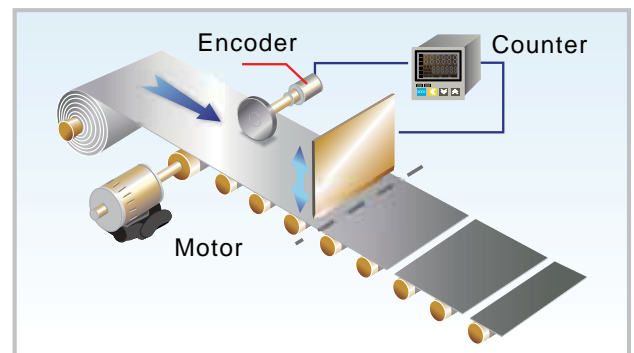
Cutting Machine
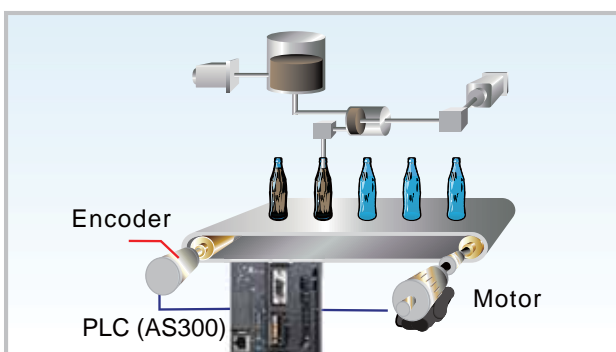
Bottling Machine
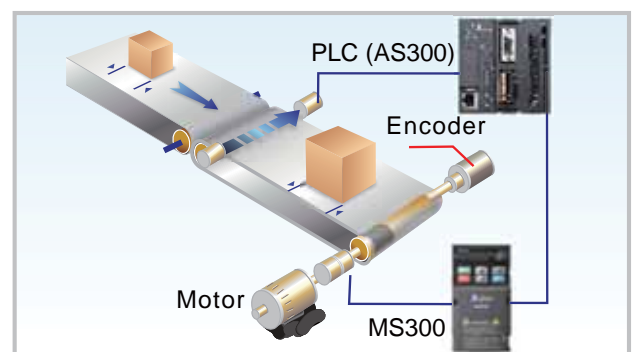
Testing / Inspection Machine

Applications

Label printing machines, Testing / inspection machines, Elevators, Bottling machines, Cutting machines, Elevator doors

Planetary Gearbox

High Precision Planetary Gearbox
PS

- **Supports All Series of Delta Servo Motors**
- **Provides Concentric and Right-Angle Models**
- **High Precision**
  - Backlash for concentric 1-stage gearbox is under 3 arcmin
  - Backlash for right angle 1-stage gearbox is under 4 arcmin
- **High Input Speed**
  - Input speed allows for 5,000 rpm
- **High Torque**
  - Helical gear design offers higher output torque in comparison with spur gearbox

- **High Efficiency**
  - Efficiency for 1-stage model exceeds 97%
  - Efficiency for 2-stage model exceeds 94%
- **Low Noise**
  - Under 65 dB
- **Lifetime Lubrication**
  - IP65-rated sealed design avoids leakage problems and requires no maintenance during the product's lifetime

Precision Planetary Gearbox
PA

- **Supports All Series of Delta Servo Motors**
- **Provides Concentric Models**
- **High Rigidity and High Torque**
  - Employs uncaged needle roller bearings with a set design
  - Includes ring teeth, gearbox, and helical gears for high rigidity and output torque
- **High Precision**
  - Backlash for 1-stage gearbox is under 8 arcmin
  - Backlash for 2-stage gearbox is under 12 arcmin

- **High Efficiency**
  - Efficiency for 1-stage model exceeds 95%
  - Efficiency for 2-stage model exceeds 92%
- **Low Noise**
  - Uses helical gears capable of meshing to ensure smooth and quiet operation
- **Lifetime Lubrication**
  - IP65-rated sealed design avoids leakage problems and requires no maintenance during the product's lifetime

ΔELTA

AX Series Motion Solution

Standalone Motion Controller
AX-8

Supports EtherCAT and DIADesigner-AX Programming Software as a High-Performance Motion Control Solution for Various Industrial Applications

- Intel x86 CPU with fanless and compact design
- Provides low-voltage detection and data overwriting functions
- Supports EtherCAT, Modbus, and OPC UA protocols
- Supports 8 high-speed digital local inputs / outputs
- Synchronous servo control of up to 64 axes / 1ms
- Built-in security IC system for enhanced software and hardware security
- IEC 61131-3 compliant software provides a standardized programming and controller development platform

AX-8 Series

Max. 100m between two stations

ASDA-A2   **ASDA-A2**   **R1-EC Remote Modules**

Max. 64 axes / 1ms
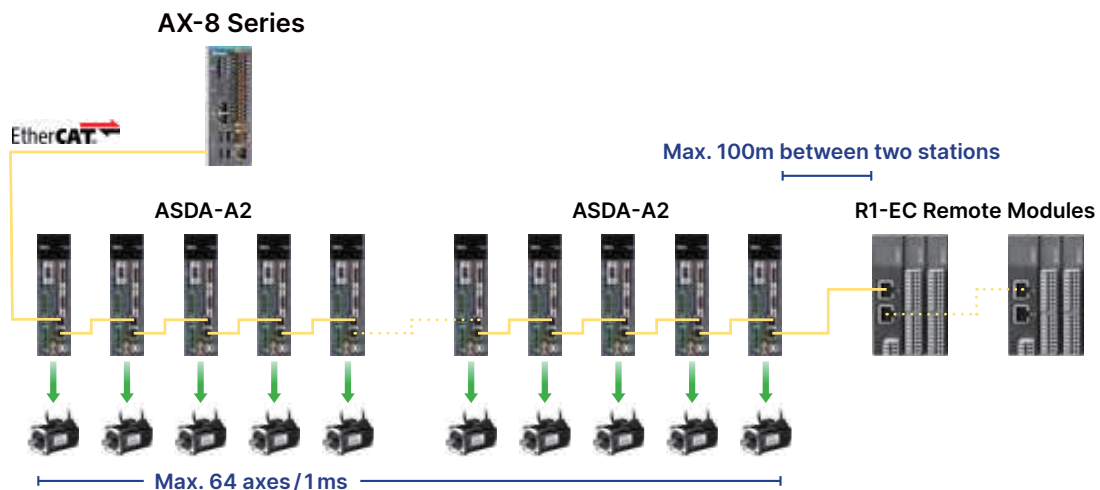
Standalone Motion Controller
AX-C New

Supports EtherCAT and DIADesigner-AX Software as a Compact Motion Control Solution for General OEM Applications

- Supports EtherCAT, Modbus, PROFONET and OPC UA protocols
- Built in 4 sets of 200 kHz high speed input / 4 axes of 200 kHz pulse output
- Synchronous servo control of up to 12 axes / 1ms
- IEC 61131-3 compliant software provides a standardized programming and controller development platform

Applications

Electronic products assembly line, Electronics, Lithium battery, Logistics, Woodworking, Packaging, Printing

High-End IIoT Motion Controller
AX-5 `New`

Provides a Real-Time EtherCAT I/O System and IIoT Capability for Advanced Motion Applications with DIADesigner-AX Programming Software

- Utilizes quad core processor to ensure both motion and data exchange performance
- AX-5 Series CPUs support up to 8 / 12 / 16 / 32 / 64-axis EtherCAT motion control ability
- High performance: Min. execution time of basic instruction is 1 ns; min sync. time of AX-5 reaches up to 0.5 ms for 16 axes
- Supports new generation AX-5 series ultra slim power / digital / analog / temperature I/O modules (max. quantity: 4,096) and 100 MHz EtherCAT system I/O bus
- Built-in EtherCAT, CANopen, PROFINET, Modbus, EtherNet/IP, OPC UA, MQTT, and FTP protocols
- Onboard USB Type A interface supports 3rd party Wi-Fi and Bluetooth dongles
- IEC 61131-3 compliant software provides a standardized programming and controller development platform, offering motion instructions such as position, velocity, torque, multi-axis interpolation, E-gear, E-CAM, and more

AX-5 CPU   #1 · · · #N

EtherCAT

AX-5 Remote I/O   AX-5 Remote I/O   EtherCAT Slaves
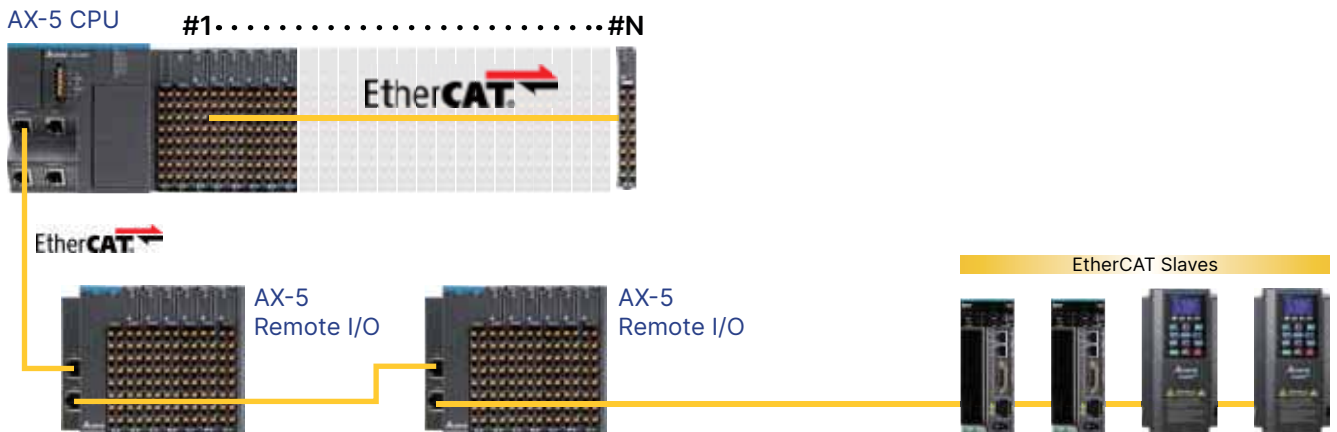
PLC-Based Motion Controller
AX-3

Provides a Flexible Motion Solution for Various Applications with DIADesigner-AX Software and EtherCAT Communication

- AX-308E / AX-316E / AX-332E CPUs support up to 8 / 16 / 32-axis EtherCAT motion control ability (min. sync time of AX-332E: 0.5 ms for 16 axes)
- AX-304EL / AX-364EL CPUs support 4 / 64-axis EtherCAT point-to-point control ability
- Supports PLC AS series' power, DIO, AIO and temperature expansion modules (max. 32 modules)
- High performance: Min. execution time of basic instruction is 0.5 ns (AX-332E)
- IEC 61131-3 compliant software provides a standardized programming and controller development platform, offering motion instructions such as position, velocity, torque, multi-axis interpolation, E-gear, E-CAM, and more
- Built-in 6 ~ 16 DI, 6 ~ 8 DO, incremental encoder (× 1 ~ 2), SSI absolute encoder, RS-232 / RS-485, Ethernet and EtherCAT ports
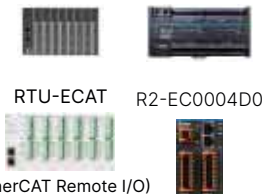
AX Series Motion Solution

Motion Controller Programming Software
DIADesigner-AX

DIADesigner-AX is a Programming Platform Compliant with IEC 61131-3 for Delta's PC-Based Motion Controller AX Series. It Provides a Large Number of Application Commands and a Useful Motion Library. It Has Multiple Built-in Languages and Enables Easy and Highly Efficient Development with its User-Friendly Interface

- **Standardized Programming**
  IEC 61131-3 compliant software provides a standardized programming and controller development platform

- **Unified Integrated Software**
  Programs all of Delta's automation products on a single platform to shorten development time and costs

- **Open and Modular Platform**
  Allows secondary development for customized functionalities and components with users' industry know-how

- **Single PLC / Motion Platform**
  CODESYS runtime supports Windows, VxWork, and Linux operating systems to program PC-Based or PLC-Based controllers

- **Supports EtherCAT High-Speed Fieldbus**
  Highly efficient, precise and instant motion control enhances productivity

- **Tag Sharing Between HMI and Controllers Based on CODESYS**
  Easy and simple variable sharing saves editing time and labor

- **Supports Diverse Industry Applications**
  Suitable for industrial robots, woodworking, printing, and packaging applications

Motion Software			
	Standalone	**PLC-Based**	**HMI**
Motion Controllers	AX-8 Series AX-C Series	AX-3 Series AX-5 Series	DOP-100
	Servo Drives	**Remote I/O Modules**	**Motor Drives**
Field Devices	ASDA-A2-E ASDA-A3-E ASDA-B3-E	R1-EC R2-EC RTU-ECAT R2-EC0004D0 (EtherCAT Remote I/O)	C2000 Plus MH300 MS300

PLC-Based Motion Solution

Compact Modular Motion Controller
AS500

The Optimal Solution for OEM Equipment

EtherCAT Motion Control System

- Provides a variety of controller options
  Standard controller: 16-axis │ Point-to-point controller: 32-axis and 64-axis
- AS516E CPU supports up to 16 axes Delta EtherCAT servo drives (min. sync time: 1 ms / 16 axes)
- Supports AS power, DIO, AIO, temperature and load cell expansion modules (max. 32 modules)
- 1GHz processor provides high operation performance
- Provides various motion commands: position, velocity, torque, multi-axis interpolation, E-gear, E-CAM, G-code, and more
- Built-in 16 DI & 8 DO, incremental encoder × 2, SSI absolute encoder, RS-232 / 485, Ethernet, CANopen DS301, and EtherCAT interfaces
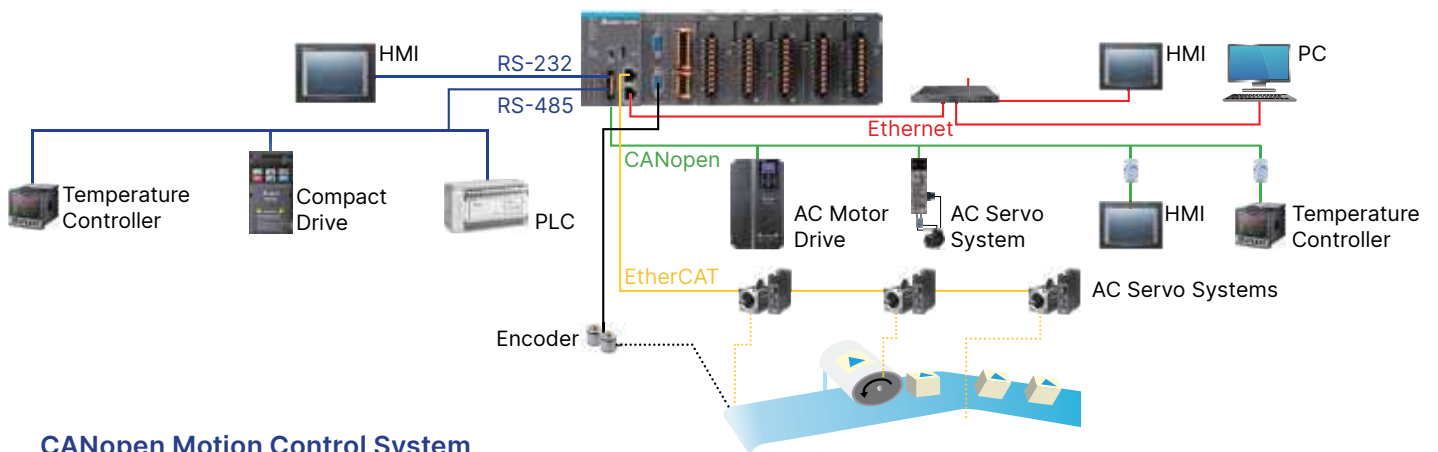
CANopen Motion Control System

- AS524C CPU supports up to 24 axes Delta CANopen servo drives (min. sync time: 2 ms / 4 axes)
- Supports AS power, DIO, AIO, temperature and load cell expansion modules (max. 32 modules)
- 1GHz processor provides high operation performance
- Provides various motion commands: position, velocity, torque, multi-axis interpolation, E-gear, E-CAM, G-code, and more
- Built-in 16 DI & 8 DO, 2 incremental encoders, SSI absolute encoder, RS-232 / 485, Ethernet × 2, CANopen DS301, and CANopen motion interfaces
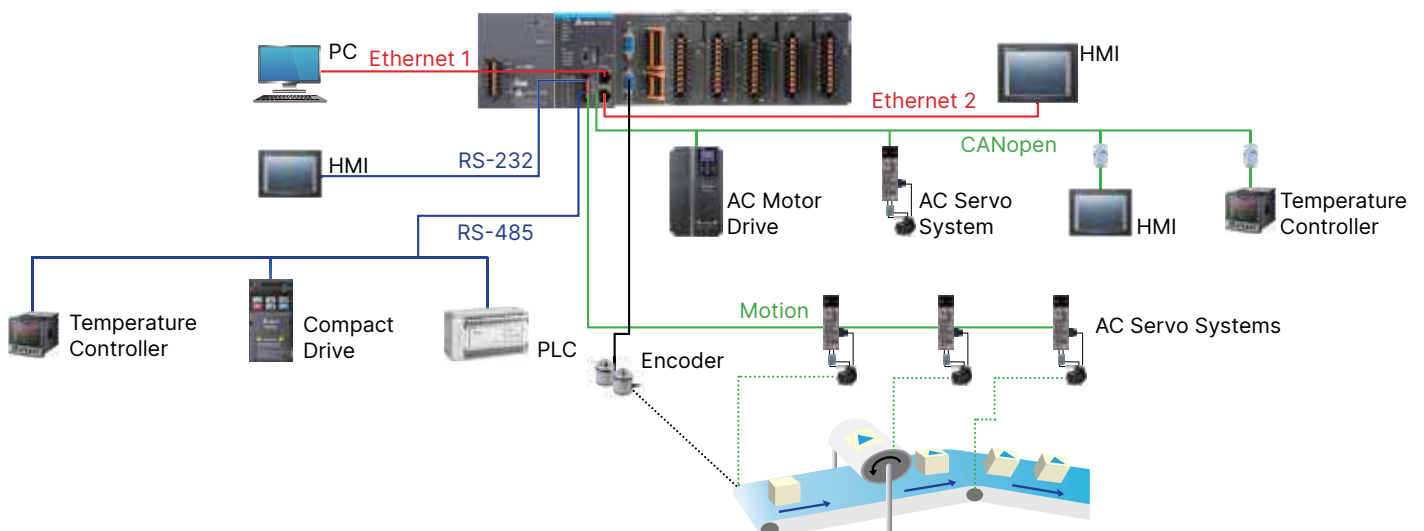
PLC-Based Motion Solution

Multi-Axis Motion Controller
DVP-15MC / 50MC

High Speed, High Precision, and High Performance Motion Control

DVP-15MC DVP-50MC

EtherCAT Motion Controller
- Standard: 6 and 32 axes
- Point-to-point: 4 and 16 axes

CANopen Motion Controller
- Standard: 6 and 32 axes

Perfect Controllers for EtherCAT / CANopen Motion Solutions
- Built-in 16 / 24 I/O points; max. 480 I/O points
- Program capacity: 20M bytes
- Built-in Ethernet, RS-232 and RS-485 ports, and supports standard Modbus ASCII / RTU protocol
- e-CAM function (2,048 points) for rotary / flying shears
- Supports DVS-S Series modules (left-side and right-side modules) for multiple options

- Flexible industrial networking applications (DeviceNet Master / Slave, CANopen Master / Slave modules)
- Provides standard communication cables, terminal resistors, distribution boxes, and more accessories for easy wiring and connection

System Configuration (CANopen Motion)
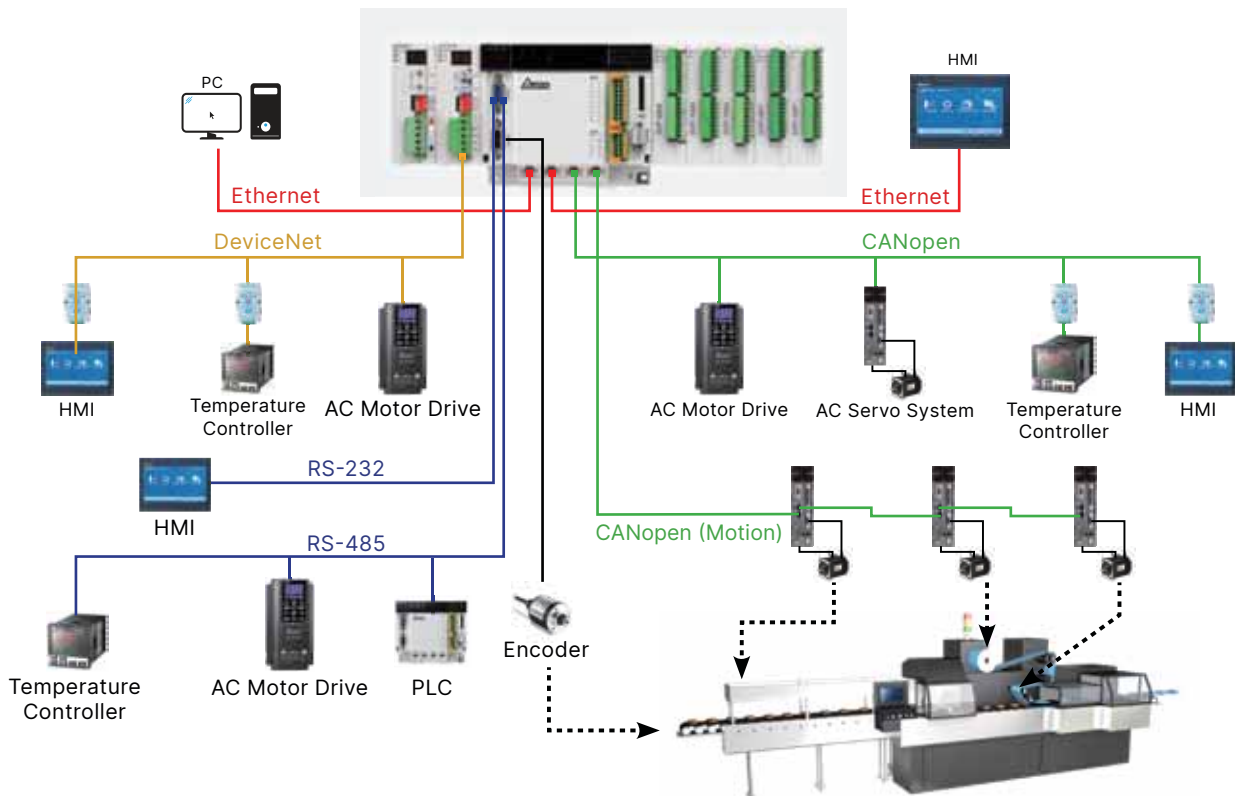
Applications
High-speed cutting machine, Digital board cutting machine, CNC lathe

PC-Based Motion Solution

Standalone Motion Controller
MH2

Supports EtherCAT Fieldbus for Various Motion Control Applications

- **Energy Efficiency and Robust Hardware**
  The MH2 Series: cable-less, fan-less, and low-power consumption design supports
  stable operation; built-in SD card and M.2 SSD slots provide fast and stable data transmission

- **Multiple Peripheral Interfaces for Communication**
  Built-in USB ports, serial COM ports, GBps Ethernet ports

- **Supports Master and Slave Modules**
  Built-in EtherCAT fieldbus for servo system and motion control module connection
  (up to 64 axes / 100 stations via EtherCAT)

- **High Security**
  Dedicated IC for programming security and confidential information protection

- **OS and Software Support**
  The MH2 Series is built in with Windows 10 IoT and DLL for flexible usage and software development
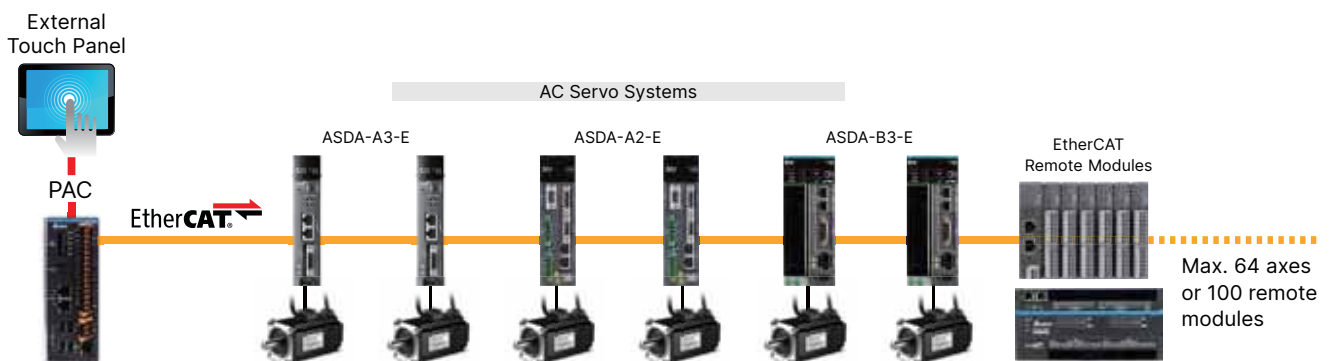
- **Speed Curve Tracing**

  Speed curve tracing function traces current motion speed and
  adjusts commands

- **Simulation Scope**

  Captures figures of motion commands or real motion tracks with
  X / Y-axis monitor to simulate motion commands or
  monitor motion tracks

- **Verification Software for EtherCAT**

  The EcNavi software enables verification for data communication,
  functional identification, programming and debugging, providing
  a fast and easy way for first-timers to understand the solution
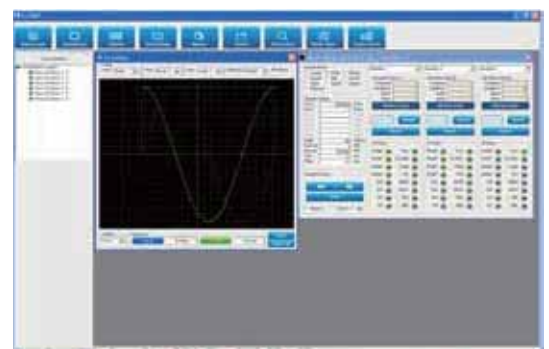
Applications

- **Electronics Production:**
  Automated Optical Inspection (AOI) machines, LED machines, TFT/OLED inspection machines, PCB machines,
  Semiconductor machines, TAP machines, GPU testing machines, IC testers, Optical lens processing machines,
  Lens assembly machines, Laser dicing machines, Electronics assembly, Consumer electronics, Winding machines,
  Glue dispensing machines

- **Woodworking:** CNC drilling machines, Woodworking machines, Board slitting machines

- **Others:** Aluminum & stone processing equipment

PC-Based Motion Solution

Remote I/O Module
R1-EC

Rugged and Compact Gateway Type E-Bus Slave Modules for High Precision and Demanding Industry Applications
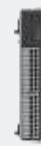
- **Gateway Type E-Bus Remote Power Coupler**
  R1-EC5500D0

  Connects to digital I/O, analog I/O, and pulse I/O extension modules

With E-Bus power module

16 Digital Input Remote Modules
R1-EC6002D1 / R1-EC6022D1
Provides digital input signals remote control for an EtherCAT master

1-Channel Pulse Remote Module
R1-EC5621D1
Connects to digital I/O, analog I/O, pulse I/O, and MPG signal extension modules with an EtherCAT master

4-Channel Analog Input Remote Module
R1-EC8124D1
Provides analog input signals remote control for an EtherCAT master

16 Digital Output Remote Modules
R1-EC7062D1 / R1-EC70A2D1 / R1-EC70E2D1 / R1-EC70F2D1
Provides digital output signals remote control for an EtherCAT master

MPG Module
R1-EC5614D1
Receives Manual Pulse Generator (MPG) signals remotely for an EtherCAT master

4-Channel Analog Output Remote Module
R1-EC9144D1
Provides analog output signals remote control for an EtherCAT master

Remote I/O Module
R2-EC

High-performance remote I/O bus system

- 32-Channel DI / 32-Channel DO (Relay, 2A / Port) Modules
  R2-EC0902D0
  Provides digital input and output signals for remote monitoring via an EtherCAT master

- 16-Channel DI / 16-Channel DO Modules
  R2-EC0004D0 New
  Provides digital input and output signals for remote monitoring via an EtherCAT master

- 32-Channel DI Modules
  R2-EC1004D0 New
  Provides digital input signals for remote monitoring via an EtherCAT master

- 32-Channel DO Modules
  R2-EC2004D0 New
  Provides digital output signals for remote monitoring via an EtherCAT master
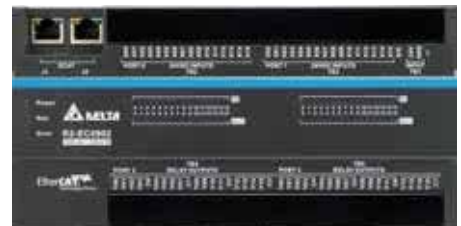
EtherCAT High-Speed Motion Control System

EtherCAT (Ethernet Control Automation Technology) is an Open Ethernet-Based Fieldbus System that Provides High-Efficiency and High-Performance Synchronization Quality for Automation Control

- PCI-L221 series and PCIE-L221 series motion control cards provide complete functions for EtherCAT masters and support device descriptions in XML format (EtherCAT Slave Information ESI file), allowing quick identification of ESI files and information from different slaves and offering the capability of real-time connection via EtherCAT for high-level integration

- High-speed motion control of up to 64 slave stations, including 32 servo axes within 1 ms cycle time

- Communication cycle time can be adjusted to 2 ms, 1 ms or 0.5 ms for different needs

- Motion control functions: 35 homing modes, point-to-point position control, 2-axis/3-axis interpolation, multi-axis synchronization, continuous motion control, gantry control, speed control, torque control, and more

EtherCAT System Configuration

EtherCAT Motion Control Cards

ASDA-A3-E   ASDA-B3-E   ASDA-A2-E   R1-EC Remote Modules   R1-EC Pulse Modules/R2-EC Remote Module

Servo Motor   Servo Motor   Servo Motor

DI   AI   DO   AO

Stepping Motor

Linear Stages
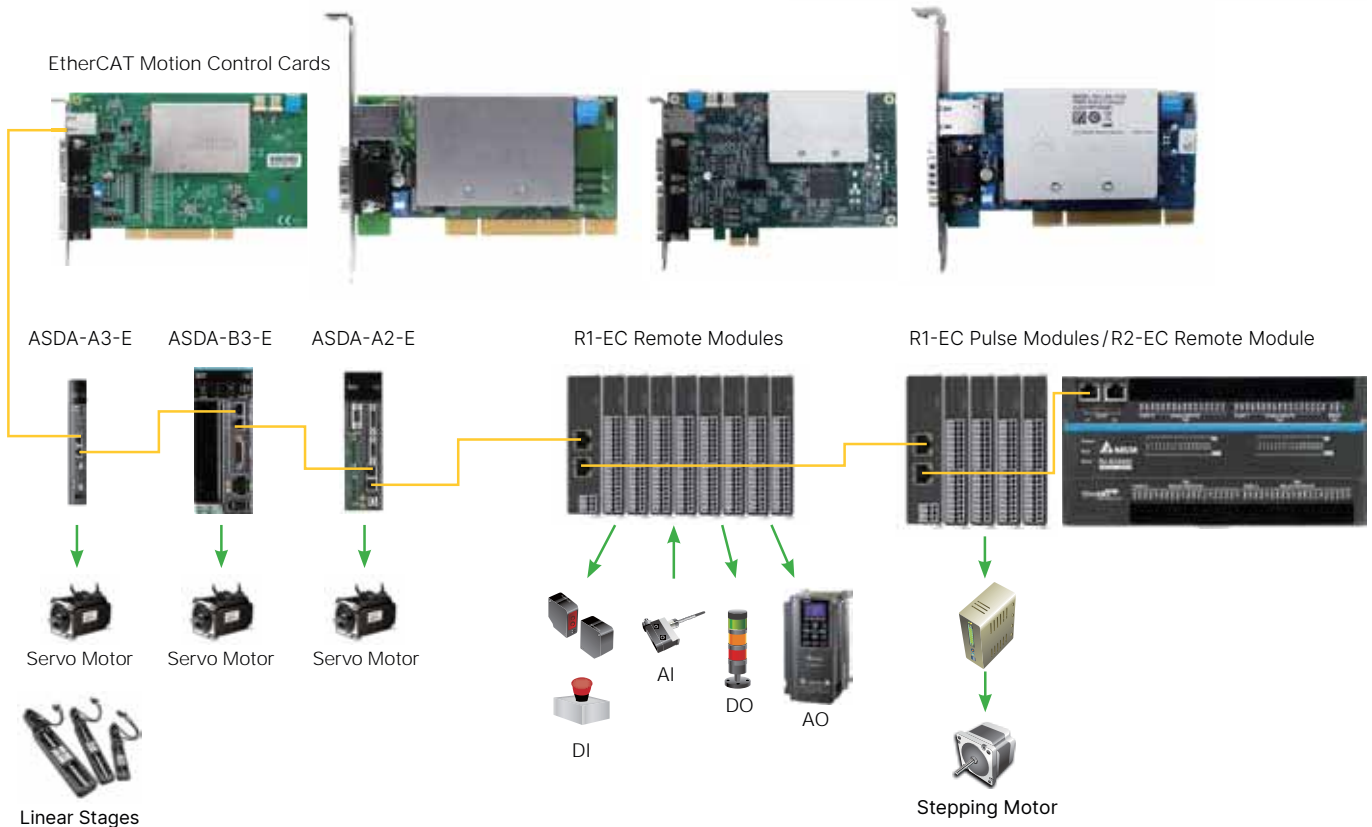
Applications

Automated optical inspection machines, GPU testing machines, Electronics assembly, Consumer electronics assembly, Automotive production lines, Semiconductor equipment, IC testing and packaging machines

∆NELTA

CNC Solution

Open CNC Solution
NC50E

Open-Structured CNC Control System for Customization and Flexibility

Standard

HDMI output for external display with Delta programmable operation interface

- Fully customized operation interface according to application requirements by DOPSoft screen editor
- Supports large touch screen size panel
- Supports screen, keyboard, and mouse operation
- Customizable dialog programming function
- User interface localization design
- EtherCAT high speed motion control field bus

Function-Oriented

High-end solution design through PC-Based environment for specific field application

- Provides specific API for C programming interface to remotely connect to CNC controller
- Functional packages such as CAD/CAM can be integrated through C programming to enhance the high-end solutions
- Reduces additional hardware cost for customers to focus more on software upgrades and better integration for higher operation performance

System Configuration

VGA

USB

OPEN CNC Controller
NC50E

VGA

USB

Industrial PC
DIAVH-IPC00

Ethernet

AC Servo Drives
ASDA-A3

EtherCAT

Spindle Motor Drive
ASDA-S

AC Servo Motors
ECMA

High Speed PM Spindle Motor
ECMS
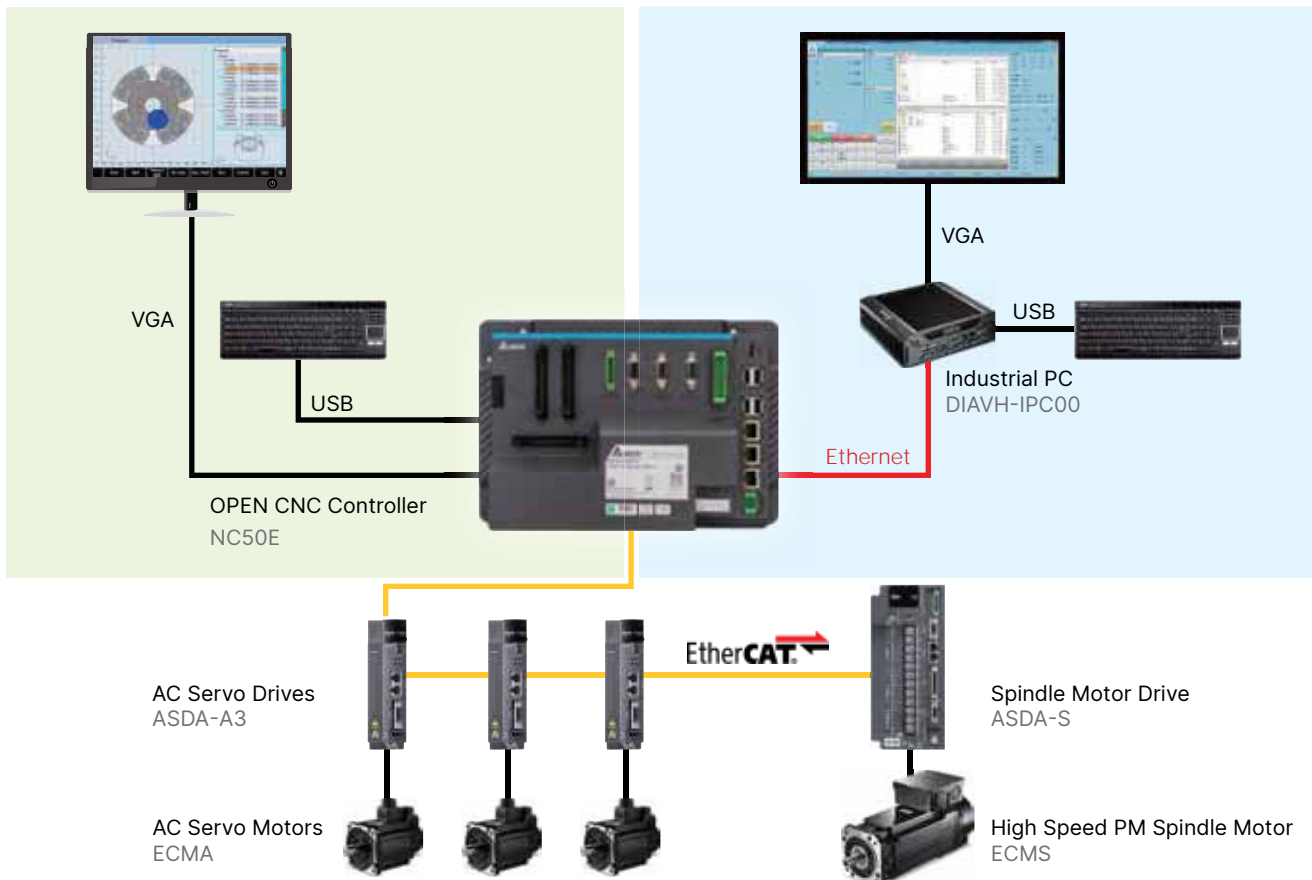
Applications

Customized CNC systems, Woodworking machines, Lathes, Grinding machines, Glass cutting machines, Soldering machines, Rim engraving, Milling machines, Industrial robots

CNC Solution

Integrated Total Solution for the CNC Machine Tools Industry

New Architecture Customized Interface

- The new multi-core processor hardware architecture greatly upgrades computing capacity
- The flexible interface editing function easily makes an exclusive controller meet customer needs

EtherCAT Field Bus

- Integrates Delta EtherCAT servo drive system and I/O modules to form a complete CNC solution, with cable lengths up to 1,000 m

Multi-Axis / Multi-Paths / Multi-Configuration

- Maximum 4 paths, 24 feed axes, and 8 spindles
- Simultaneously controls up to 16 feed axes and 5 axes interpolation in a single path
- Achieves multi-paths control of machining and loading & unloading at the same time

High Speed, High Precision

- 4,000 blocks look-ahead and 4,000 bps processing capability
- Fine machining is achieved by 1 nm command resolution

Integration Capability

- Built-in dual Ethernet port to satisfy intranet and extranet applications
- Integrates the intelligent platform through CNC API library

Industry Features

- Integrates industry-specific CAD/CAM software to simplify complicated operations and reduce training resources

System Configuration

CNCSoft Software

MPG

Remote Module
R1-EC

Remote Module
R2-EC

AC Servo Drives
ASDA-A3

Spindle Motor Drive
ASDA-S

AC Servo Motors
ECMA

High Speed PM Spindle Motor
ECMS
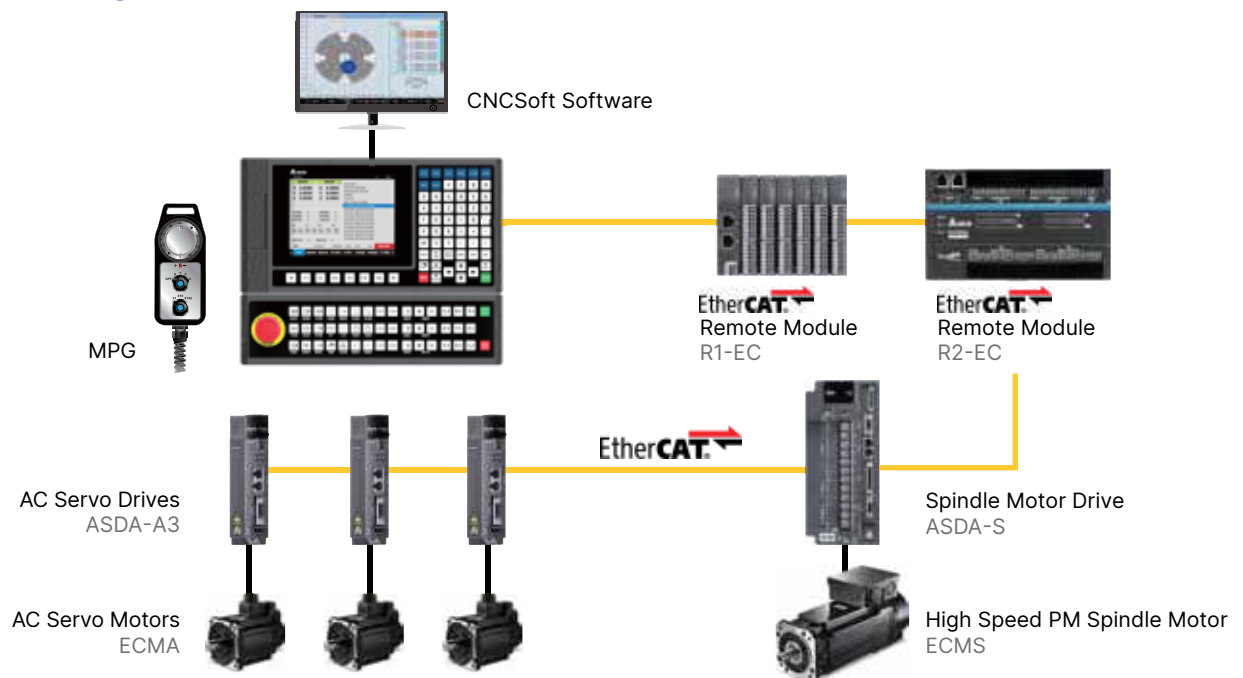
Applications

CNC machining centers, High-speed tapping machines, Engraving machines, CNC gantry control machines, CNC woodworking machines

ANELTA

CNC Solution

Intelligent CAD/CAM Solution `New`

Integrates Domain Know-How and Different Customer Needs to Provide Optimal Industry Solutions with Delta Motion Controllers, Achieving Software-Hardware Integration and Outstanding Performance

- Simplified user interface with intuitive, guided operation saves manpower and machining time
- One-button design is equipped with patterns identification, tool selection, and know-how integration. Generates optimal machining programs
- 3D machining preview and interference simulation detection ensure safe and smooth machinery

Model Design (CAD)

- Built-in multiple workpieces and feature templates. Supports DXF file import for rapid 3D model design
- Provides feature self-drawing function, enabling users to draw any contour lines
- Automatically identifies multiple features after importing a STEP file, which saves project design time

General Feature Template

DXF File Import
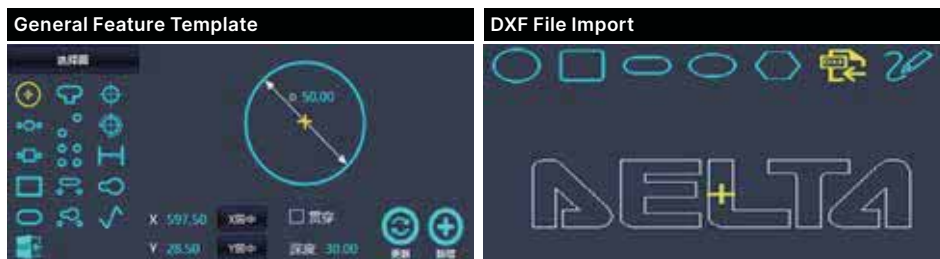
Auto Generation of NC Path (CAM)

- For different machining needs, generates optimal NC path accordingly

Toolpath Generation
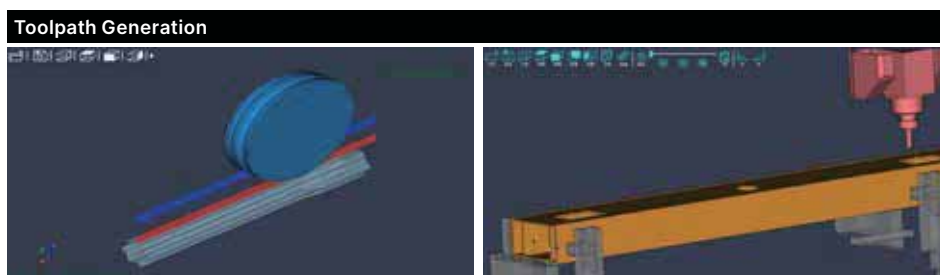
Simulation

- 3D display of machining process to check results in advance
- Interference detection prevents collision, ensuring operation safety
- Coupled with Delta motion controllers to achieve real-time machining simulation

3D Machining Preview

Interference Simulation Detection
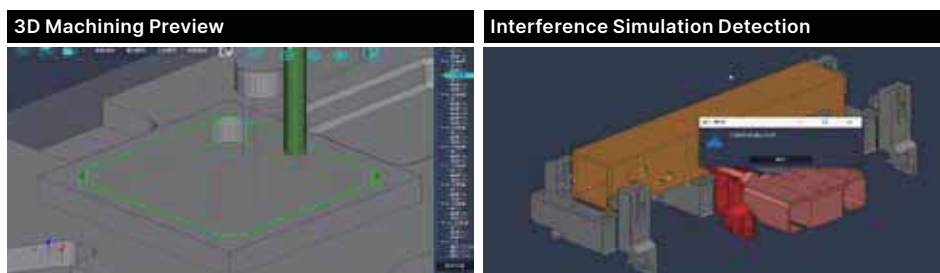
Robot Controller

Robot Controller with Servo Drive Integrated
ASDA-MS

An Innovative and Comprehensive Development Platform for Robot Control

Complete Robot Solution

- Integrated servo drive and controller in one single unit for real-time control with high flexibility and reliability
- Various communication protocols
- Built-in diverse robot control modules
- Up to 10-axis motion control: 4-axis robot + 6 external axes
- Supports 5 kinds of programming languages with IEC 61131-3 and the PLCopen motion function block
- Offers DRL Languages for robot application programming
- Supports G-code programming

User-Friendly Robot Software

- IEC61131-3 PLC programming
- DRL programming
- Multiple robot motion settings
- Intelligent robot system calibration
- Real-time monitoring oscilloscope
- Applicable for different types of robots such as SCARA robots, articulated robots, DELTA robots and more

System Configuration

Users

PAD

Robot Software on PC

Handheld Type HMI
DOP-H

Ethernet

DELTA Robot

Articulated Robot
DRV

SCARA Robot
DRS

Extension Axes

AC Servo Drive
ASDA-MS

AC Servo Drive
ASDA-A2-F

AC Servo Drive
ASDA-M

DMCNET

AC Servo Motor
ECMA

AC Servo Motor
ECMA
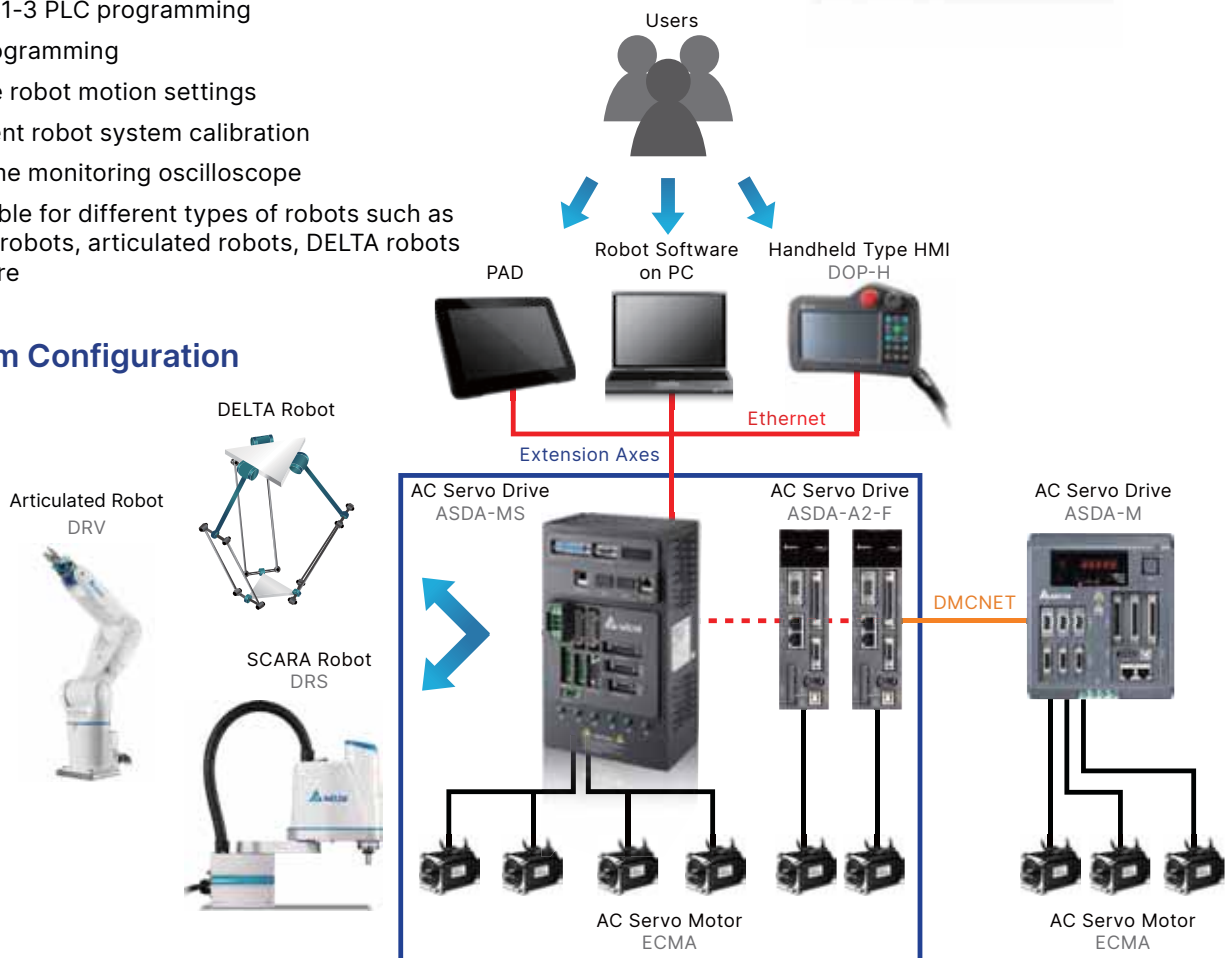
Applications

Industries: Consumer electronics, Electrical / electronics, Rubber and plastics, Packaging, Metal fabrication
Tasks: Insertion, Screw driving, Assembly, Glue dispensing, Soldering, Loading / unloading, Stacking, Inspection

Programmable Logic Controller

Hot Swappable Mid-Range PLC
AH

An Excellent Controller for High-Level Applications

- 32-bit dual-core multitasking processor (RTOS)
- Excellent program execution speed (LD: 0.02 µs)
- Max. I/O:
  - DIO: Max. 4,352 points
  - AIO: Max. 544 channels
  - RIO: >100,000 points
- Program capacity: Max. 1M steps (4 MB)
- Data register (D+L): 512k words
- CPU built-in with fully isolated RS-232 / 422 / 485, Mini-USB, Ethernet and SDHC card slot
- Abundant selection of extension modules: DIO, AIO, temperature measurement, network, pulse-train, and EtherCAT motion control

System Architecture

① Sync. optical fiber　② Ext. cable for backplane　③ EtherNet/IP ring topology (DLR)　④ Star topology EtherNet/IP / Modbus TCP
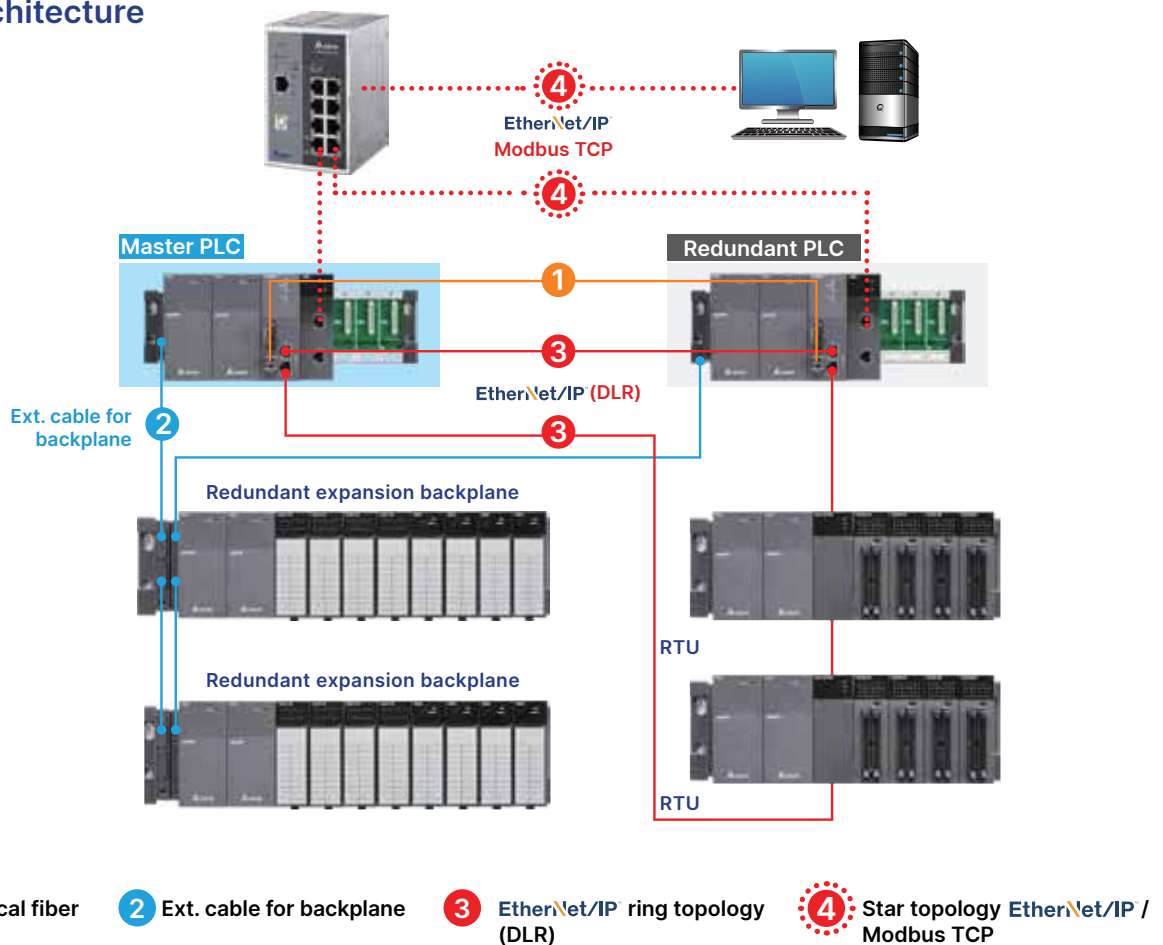
Applications

Logistics / Warehouse, High-end industrial machines, System applications (Water / Waste water, HVAC, Traffic)

High-End IIoT PLC
AX-5 `New`

Scalable, Fast, and Versatile | Multiple Protocols Integrated | IIoT-Ready

CPU

An all-in-one CPU provides an EtherCAT I/O system with IIoT capability for advanced motion applications with DIADesigner-AX software platform

- Utilizes quad core processor to ensure both motion and data exchange performance
- Supports up to 8 / 12 / 16 / 32 / 64-axis EtherCAT motion control ability
- High performance: min. basic instruction execution time: 1 ns; min sync. time: 0.5 ms for 16 axes
- Supports new generation AX-5 series ultra slim (12 mm) power / digital / analog / temperature I/O modules (max. 4,096) and 100 MHz EtherCAT system I/O bus
- Built-in EtherCAT, CANopen, PROFINET, Modbus, EtherNet/IP, OPC UA, MQTT, and FTP protocols
- Onboard USB Type A interface supports 3rd party Wi-Fi and Bluetooth dongles
- IEC 61131-3 compliant software provides a standardized programming and controller development platform, offering motion instructions such as position, velocity, torque, multi-axis interpolation, E-gear, E-CAM, and more

Coupler

I/O Module

100 MHz EtherCAT I/O system

AX-5 CPU   #1 · #N

EtherCAT

100 MHz

AX-5 Remote I/O

EtherCAT

AX-5 Remote I/O

EtherCAT Slaves
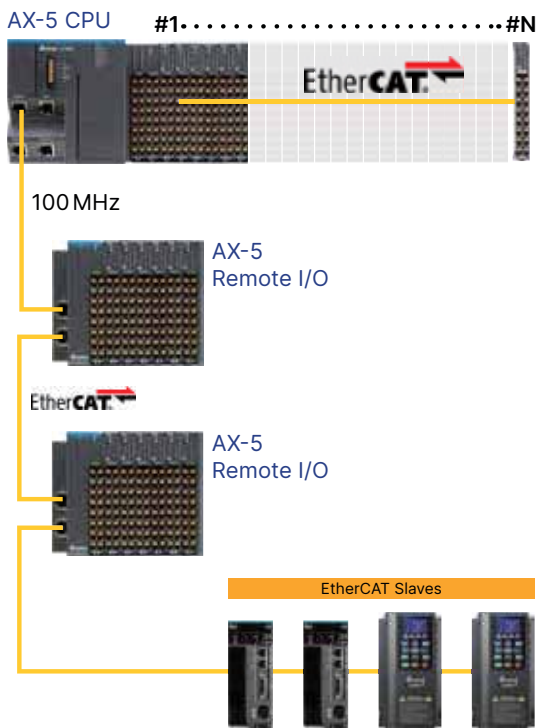
High performance all-in-one CPU

- Arm Cortex Quadcore Processor: Multi-tasking to ensure both motion and data exchange performance
- Supports multiple protocols

EtherCAT	**OPC UA**
EtherNet/IP	**Modbus**
MQTT	CANopen
FTP	PROFINET®

Reduces product, engineering, and service costs by a fully integrated development platform

Full Ethernet system supports data exchange, motion control, I/O	Integration and scalability	IIoT connectivity	Suitable for machine makers

Applications

Lithium Battery, Woodworking, Textiles, Logistics / Warehouse, High-end industrial machines

Δ NELTA

Programmable Logic Controller

Compact Modular AX Series PLC
AX-3

Combines Flexibility and User-Friendliness to Achieve High-Performance

Provides a flexible motion control solution for various applications with DIADesigner-AX platform and EtherCAT communication

- Provides multiple controller solutions
  - EtherCAT motion controllers
    - AX-308E / AX-316E / AX-332E CPUs support up to 8 / 16 / 32-axis EtherCAT motion control ability (min. sync time of AX-332E: 0.5 ms for 16 axes)
    - AX-304EL / AX-364EL CPUs support 4 / 64-axis EtherCAT point-to-point control ability
  - Logic controllers
    - AX-300N / AX-324N CPUs built-in 0 / 24 DIO points
- Supports AS power, DIO, AIO and temperature expansion modules (max. 32 modules)
- High performance, min. execution time: 5 ns
- IEC 61131-3 compliant software provides a standardized programming and controller development platform, offering motion instructions such as position, velocity, torque, multi-axis interpolation, E-gear, E-CAM, and more
- Built-in 16 DI and 8 DO, incremental encoder × 2, SSI absolute encoder, RS-232/485, Ethernet and EtherCAT interfaces

System Architecture
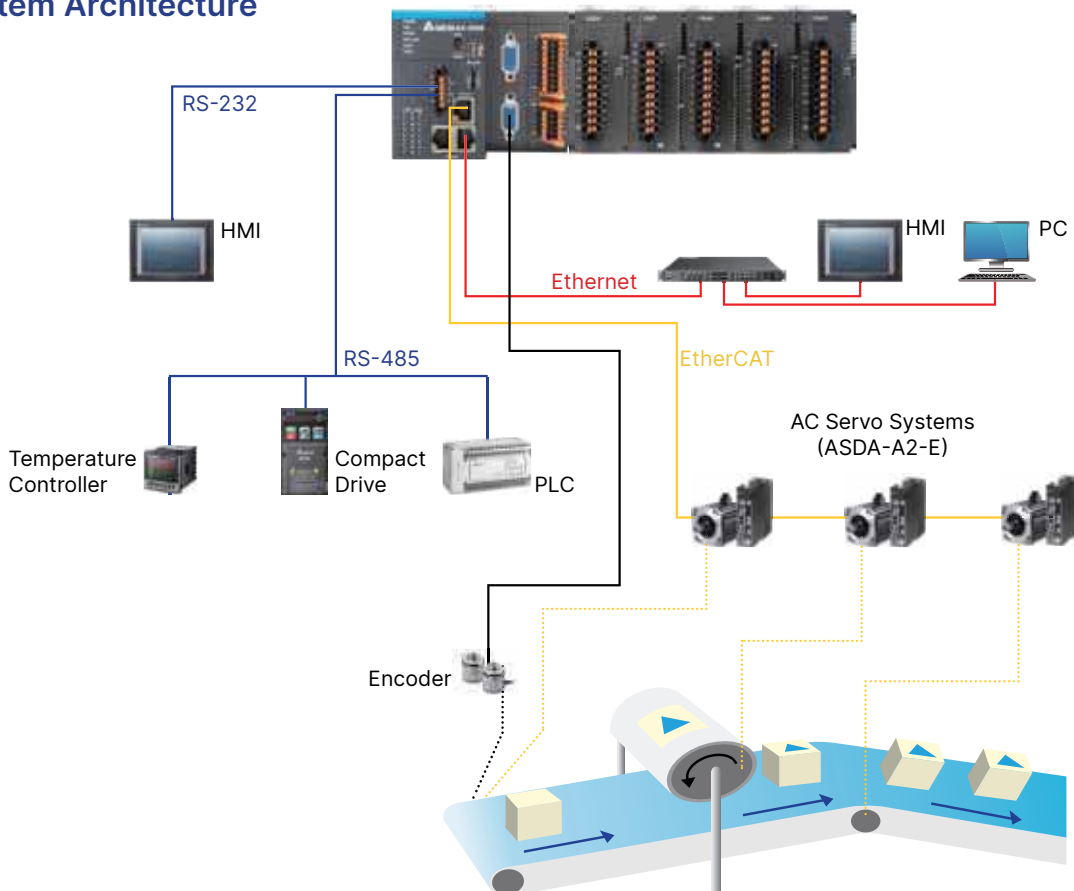
Applications

Woodworking, Packaging, Printing, Textiles, and Pharmaceutical machines

Compact Modular Mid-Range PLC
AS

Flexible, Smart, Friendly - An Ideal Option for Upgrading Multitasking Equipment for Automated Equipment Control

- Max. I/O: 1,024 points
- Max. program capacity: 128k steps
- Data register: 60k words
- Max. extension ability: 32 modules
- 32-bit SoC (System on Chip) CPU for high-performance and high-speed computing
- CPU with built-in RS-485 port × 2, mini USB port, Ethernet port, micro SD card slot and CANopen port (*1)
- Max. 8 axes control via CANopen motion network / max. 6 axes control via pulse control (200 kHz)
- Robust rackless design and patented DIN rail clips for easy plug-in / plug-out module installation and replacement
- Various modules for selection: digital I/O, analog I/O, load cell, temperature, serial communication and industrial bus
- PLC programming software (ISPSoft) for program editing, hardware and network configuration, system diagnosis and axis positioning control

Note 1: AS300 CPUs don't support built-in CANopen port

Advanced CPU Performance

High-speed execution: up to 40k steps / ms
(Condition: 40% LD instruction / 60% MOV instruction)

LD instruction	0.025 μs
MOV instruction	0.15 μs
Floating point operation instruction	1.6 μs
Trigonometric operation instruction	3.5 μs

Positioning Control - High-Speed Pulse

- AS transistor CPU: Up to 6 axes (or 12 channels) 200 kHz
- AS324MT-A differential CPU: 2 axes 4 MHz + 4 axes 200 kHz
- Positioning planning table for fast positioning planning and path simulation
- Choose any given 2 axes for linear and arc interpolation

AC Servo Drive
ASDA Series

Positioning Control - Delta's CANopen Control

- The AS CPU supports up to 8 Delta servo drives and 8 AC motor drives (AS-FCOPM function card is needed for AS300)
- Fast positioning configuration in one initialization instruction, a CANopen data exchange table not required
- Axis control by instructions for easy maintenance and high PLC program readability

CANopen DS301

Supports up to 8 servo drives,
8 AC motor drives, and 7 AS RIO stations
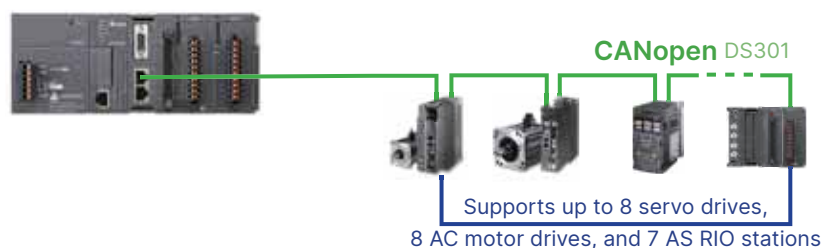
Applications

High-end equipment for Electronics Manufacturing, Machinery processing, Food packaging and other industries

ΔELTA

Programmable Logic Controller

The 3rd Generation Standard / EtherCAT / AIO Brick PLC
DVP-ES3 / ES3-TEC New / EX3 New

Ideal for Upgrading Multitasking Equipment

The 3rd generation brick PLCs fulfill the market demand for value-added machines with a user-friendly programming interface, built-in analog I/O, multiple communication ports, and expanded program capacity.

Compared with the previous generation, the 3rd generation aligns with market demands for versatile PLCs.

- Max. basic instruction execution speed: 0.25 μs (adopts the compact AS Series PLC)
- Program capacity: 64k steps
- Max. 256 points for the total of inputs and outputs (max. 8 AIO extension modules)
- Built-in 2 × RS-485, AIO (EX3 only), micro SD card
- Supports EtherCAT* (ES3-TEC only), EtherNet/IP Scanner / Adapter, Modbus TCP, CANopen DS301 (ES3 and EX3 only)

*Only supports Delta servo drives (ASDA-A2-E, ASDA-A3-E and ASDA-B3-E) and Delta AC motor drives (C2000 and CH2000 series)

System Architecture

DVP-ES3-TEC

EtherCAT — Delta Servo Drive — Delta AC Motor Drive — Delta RIO

DVP-ES3

CANopen — Delta Servo Drive — Delta AC Motor Drive — Delta RIO

DVP-EX3

Ethernet — HMI — PPC + SCADA — 4G Router — Ethernet Switch

Serial — HMI — Delta AC Motor Drive — Delta RIO — Smart Power Meter — Other 3rd-party Device
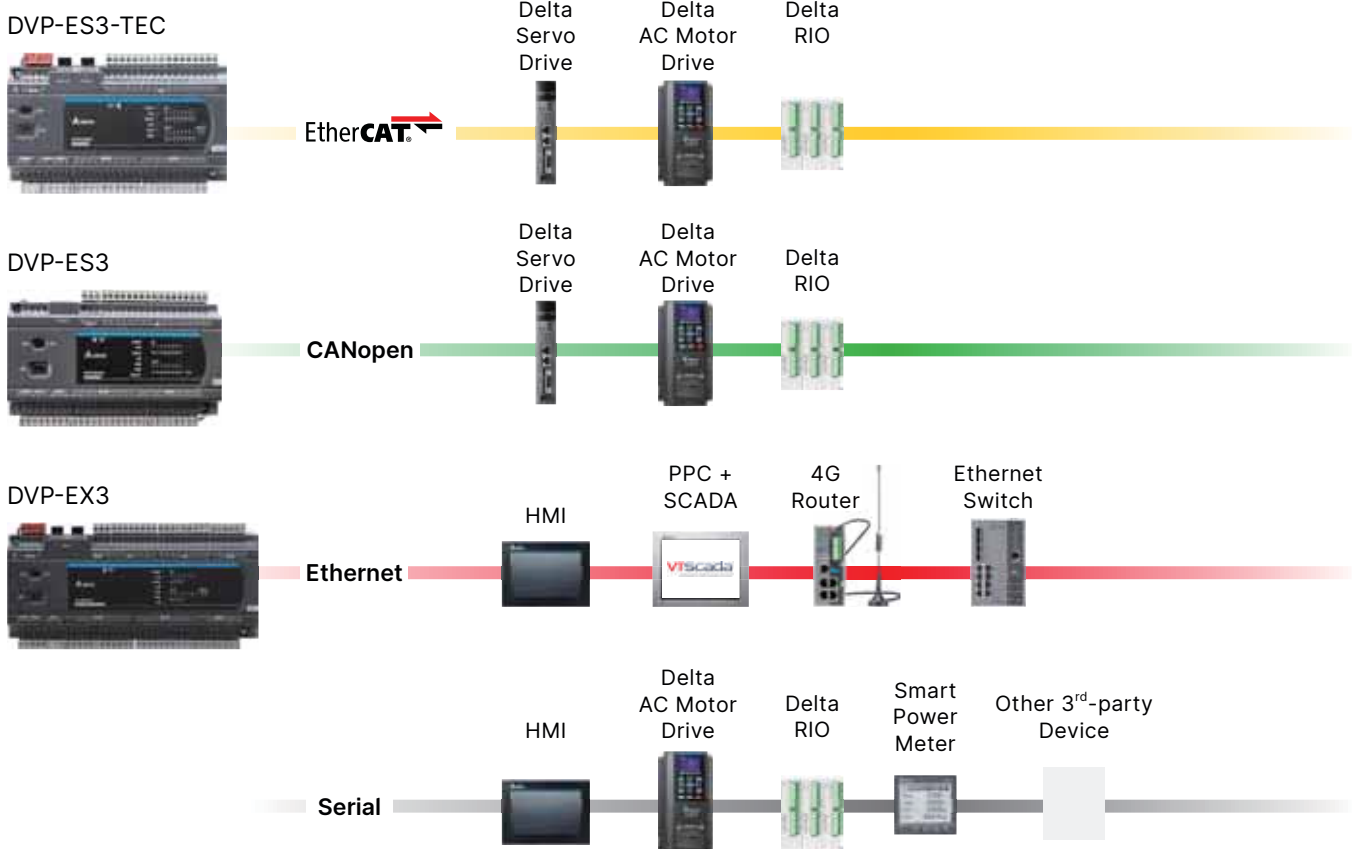
Applications

Machinery, Packaging, Textiles, HVAC, and Data collection

Standard / Analog Brick PLC
DVP-ES2 / EX2

Provides Comprehensive Functions for General Applications

Features integrated communication and high efficiency for various control systems

- DVP-ES2 Series:
  - 16 / 20 / 24 / 32 / 40 / 60 / 80 I/O points for a variety of applications
  - No battery required; RTC function operates for at least one week after power off (hardware version 2.0 or above)
  - DVP32ES2-C model with built-in CANopen (Baud: 1Mbps)
- DVP-EX2 Series:
  - Built-in 12-bit 4 analog inputs / 2 analog outputs, can be matched with 14-bit analog I/O extension modules
  - Analog I/O and temperature model DVP30EX2 Series features built-in PID auto tuning and complete analog control functions
- Program capacity: 16k steps
- Data register: 10k words
- Max. basic instruction execution speed: 0.35 μs
- High efficiency: 1k steps of programs can be processed within 1ms
- Max. 100 kHz pulse control; motion control instructions (mark / masking and instant frequency changing) available for multi-axis applications
- Up to 4-level password protection ensures program security and safeguards intellectual property

Applications

HVAC, Molding injection machine, Large-scale warehouse management, Packaging machine, Precise textile machine, Logistics system

Network Type Advanced Slim PLC
DVP-SE

Provides versatile communication functions for advanced applications

- Program capacity: 16k steps
- Data register: 12k words
- Max. basic instruction execution speed: 0.64 μs
- Built-in Ethernet, supports Modbus TCP, EtherNet/IP (Adapter)
- IP Filter function protects systems against malware and network threats
- No battery required; RTC function operates for 15 days after power off
- Supports DVP-S Series left-side and right-side modules (DVP26SE only supports right-side modules)

Applications

Remote device monitoring, Production line monitoring, Building automation, Printing machine, Container filler (recipe application)

Programmable Logic Controller

The 3rd Generation Standard / AIO Slim PLC
DVP-SV3 / SX3 New

Recommended for Compact Machine Upgrading

- Max. basic instruction execution speed: 0.025 μs (adopts AS Series PLC)
- Program capacity: 64k steps
- SV3: up to 256 inputs and 252 outputs ; SX3: up to 248 inputs and 246 outputs (both sides allow up to 8 extension modules)
- Built-in 2 × RS-485, AIO (SX3 only), micro SD card
- Supports EtherNet / IP Scanner / Adapter, Modbus TCP, CANopen DS301

System Structure

Control Room

PLC
AH5X1-EN
(EIP Scanner / Adapter)

PLC
AS300
(EIP Scanner / Adapter)

**PLC
DVP-EX3
(EIP Scanner / Adapter)**

HMI

PLC
DVP-SE
(EIP Adapter)

**PLC
DVP-SV3/SX3
(EIP Scanner / Adapter)**

**PLC
DVP-ES3
(EIP Scanner / Adapter)**

Eterhnet Switch
DVS

Motor Drive
M300
(EIP Drive)

Motor Drive
C2000
(EIP Drive)

PLC
AH-RTU
(EIP Adapter)

PLC
AH10EN-5A
(EIP Scanner / Adapter)
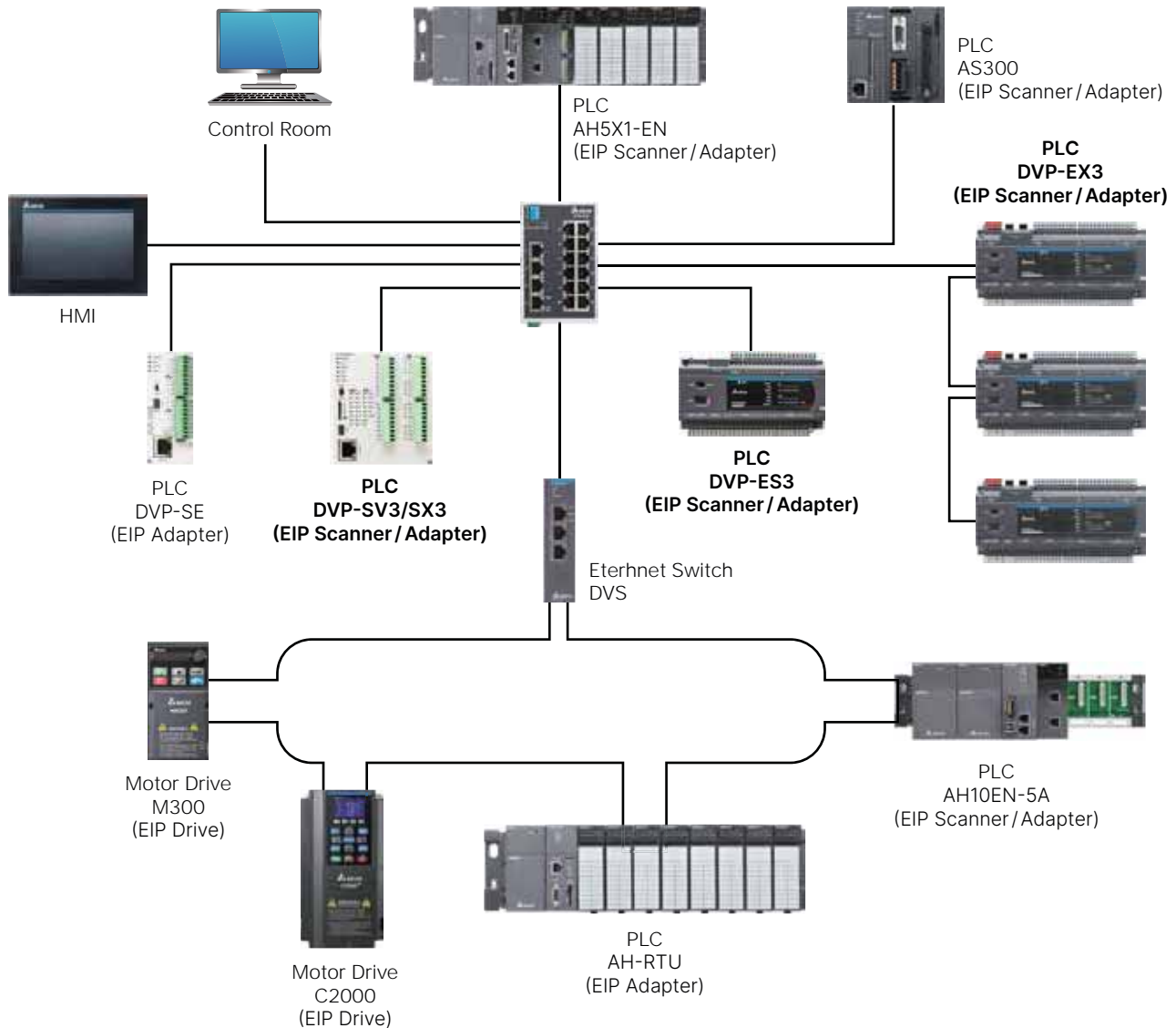
Applications

Positioning control, Material cutting machines (high-speed servo control), Crane main hoists, Material clips (controlled by servos), Optoelectronics equipment, Semiconductors, Textiles, and HVAC

High Performance Slim PLC
DVP-SV2

Top Choice for Slim Type PLC

High-end model of DVP-S Series with larger program capacities and data registers for more demanding and complex applications

Excellent Motion Control

- High-speed pulse output: 4 axes of 200 kHz pulse output
- Supports max. 4 high-speed counters (200 kHz)
- Various motion control instructions to achieve high-speed and high-precision positioning control for labeling machines, packaging machines, printing machines, and more
- Linear / arc interpolation motion control
- Provides up to 16 external interrupt pointers

Full Program Protection

- Auto backup to prevent program and data loss even when the battery runs out
- Secondary backup function saves an extra copy of programs and data to enhance program safety
- Up to 4-level password protection ensures program security and intellectual property

Scalability

- Supports DVP-S Series left-side and right-side modules
- Ethernet communication instructions (ETHRW) available

High-Speed Modules (Left-Side)

Network Modules

- **DeviceNet Master**
  DVPDNET-SL

- **CANopen Master**
  DVPCOPM-SL

- **RS-485 Serial Communication Module**
  DVPSCM12-SL

- **BACnet MS / TP Slave Serial Communication Module**
  DVPSCM52-SL

- **Ethernet**
  DVPEN01-SL

Left-Side Positioning Module

- **2-Axis Positioning**
  DVPDNET-SL

Analog Input / Output Modules

- **Analog Input**
  DVP04AD-SL

- **Analog Output**
  DVP04DA-SL

Load Cell Modules

DVP201LC-SL
DVP211LC-SL
DVP202LC-SL

Applications

2-Axis servo positioning control, Material cutting machine (high-speed servo control), Crane main hoist, Material clips (controlled by servo), Optoelectronics equipment, Semiconductor, Textiles, Energy saving and Building automation

ΔELTA

Programmable Logic Controller

Standard Slim PLC
DVP-SS2

Economic and Compact Type

- Max. I/O: 480 points
- Program capacity: 8k steps
- Data register: 5k words
- Max. basic instruction execution speed: 0.35 µs
- Built-in RS-232 and RS-485 ports (Master/Slave)

- Supports standard Modbus ASCII/RTU protocol and PLC Link function
- Motion control functions:
  - 4 points of 10 kHz pulse output
  - 8 points of high-speed counters: 20 kHz / 4 points, 10 kHz / 4 points

Advanced Slim PLC
DVP-SA2

Advanced Type for High-Speed Modules (Left-Side)

- Program capacity: 16k steps
- Data register: 10k words
- Max. basic instruction execution speed: 0.35 µs
- Built-in 1 RS-232 and 2 RS-485 ports (Master / Slave)
- Supports standard Modbus ASCII / RTU protocol and PLC Link
- No battery required; RTC operates for 15 days after power off

- Supports DVP-S Series left-side and right-side modules
- Motion control functions:
  - 4 points of high-speed pulse output: 100 kHz / 2 points, 10 kHz / 2 points
  - 8 points of high-speed pulse input: 100 kHz / 2 points, 10 kHz / 6 points, 1 set of A / B phase 50 kHz
  - Supports 2-axis linear and arc interpolation

Analog I/O Slim PLC
DVP-SX2

Analog Type with Highly Efficient PID Control

- Program capacity: 16k steps
- Data register: 10k words
- Max. basic instruction execution speed: 0.35 µs
- Built-in 4 analog inputs / 2 analog outputs
- Supports standard Modbus ASCII/RTU protocol and PLC Link function
- No battery required; RTC operates for at least one week after power off (hardware version 2.0 or above)

- Supports DVP-S Series modules (left-side and right-side modules)
- Motion control functions:
  - 4 points of high-speed pulse output: 100 kHz / 2 points, 10 kHz / 2 points
  - 8 points of high-speed pulse input: 100 kHz / 2 points, 10 kHz / 6 points
  - Supports 2-axis linear and arc interpolation

Human Machine Interface

DOP-100

Connect Your Work, Step into the Cloud

Advanced Multimedia Type HMI

12-inch | DOP-112MX

- 12" 24-bit colors TFT / Display resolution: 1,024 × 768 pixels
- Dual core 1GHz CPU / 1GB RAM / 8 GB ROM
- 2 built-in Ethernet ports and supports SD cards
- Serial Communication Port × 4 (D-Sub × 2)
- Supports analog / IP camera multilingual input
- Mini USB client / USB host
- Supports FTP / Email / VNC / Web monitor

15-inch | DOP-115MX

- 15" 24-bit colors TFT / Display resolution: 1,024 × 768 pixels
- Dual core 1GHz CPU / 1GB RAM / 8 GB ROM
- 2 built-in Ethernet ports and supports SD cards
- Serial Communication Port × 4 (D-Sub × 2)
- Supports analog / IP camera multilingual input
- Mini USB client / USB host
- Supports FTP / Email / VNC / Web monitor

Advanced Type HMI

4.3-inch | DOP-103WQ

- 4.3" 16-bit TFT / Display resolution: 480 × 272 pixels
- Cortex-A8 800 MHz CPU / 512 MB RAM / 256 MB ROM
- Built-in Ethernet port × 1
- Serial Communication Port × 2 (D-Sub × 1)
- Multilingual input
- USB host for peripheral device connection
- Supports FTP / Email / VNC / Web monitor

Human Machine Interface

Advanced Type HMI

7-inch | DOP-107WV

- 7" 16-bit TFT / Display resolution: 800 × 480 pixels
- Cortex-A8 800 MHz CPU / 512 MB RAM / 256 MB ROM
- Built-in Ethernet port × 1
- Serial Communication Port × 3 (D-Sub × 2)
- Multilingual input
- USB host for peripheral device connection
- Supports FTP / Email / VNC / Web monitor

10.1-inch | DOP-110WS

- 10.1" 16-bit TFT / Display resolution: 1,024 × 600 pixels
- Cortex-A8 800 MHz CPU / 512 MB RAM / 256 MB ROM
- Built-in Ethernet port × 1 and supports SD cards
- Serial Communication Port × 3 (D-Sub × 2)
- Multilingual input
- USB host for peripheral device connection
- Supports FTP / Email / VNC / Web monitor
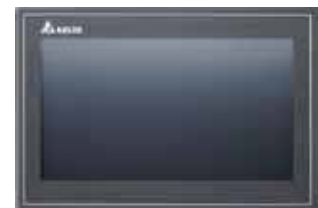
12-inch | DOP-112WX

- 12" 24-bit TFT / Display resolution: 1,024 × 768 pixels
- Dual core 1 GHz CPU / 1 GB RAM / 8 GB ROM
- Built-in Ethernet port × 2 and supports SD cards
- Serial Communication Port × 4 (D-Sub × 2)
- Multilingual input
- Mini USB client / USB host for peripheral device connection
- Supports FTP / Email / VNC / Web monitor

15-inch | DOP-115WX

- 15" 24-bit TFT / Display resolution: 1,024 × 768 pixels
- Dual core 1 GHz CPU / 1 GB RAM / 8 GB ROM
- Built-in Ethernet port × 2 and supports SD cards
- Serial Communication Port × 4 (D-Sub × 2)
- Multilingual input
- Mini USB client / USB host for peripheral device connection
- Supports FTP / Email / VNC / Web monitor

Standard Premium Type HMI

7-inch | DOP-107PV `New`

- 7" 24-bit TFT / Display resolution: 800 × 480 pixels
- Cortex-A8 800 MHz CPU / 256 MB RAM / 256 MB ROM
- Built-in Ethernet port × 1
- Serial Communication Port × 3 (D-Sub × 2)
- USB host for peripheral device connection
- Supports FTP / MAIL / VNC / Web Monitor
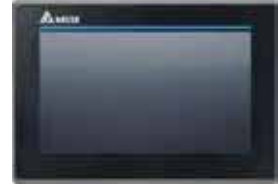
Standard Ethernet Type HMI

7-inch | DOP-107IV

- 7" 16-bit TFT / Display resolution: 800 × 480 pixels
- Cortex-A8 800 MHz CPU / 256 MB RAM / 256 MB ROM
- Built-in Ethernet port × 1 and supports SD cards
- Serial Communication Port × 3 (D-Sub × 3)
- USB host for peripheral device connection
- Supports FTP / Email / VNC / Web monitor

7-inch | DOP-107EV

- 7" 16-bit TFT / Display resolution: 800 × 480 pixels
- Cortex-A8 800 MHz CPU / 256 MB RAM / 256 MB ROM
- Built-in Ethernet port × 1
- Serial Communication Port × 3 (D-Sub × 2)
- USB host for peripheral device connection
- Supports FTP / Email / VNC / Web monitor

7-inch | DOP-107EG

- 7" 16-bit TFT / Display resolution: 800 × 600 pixels
- Cortex-A8 800 MHz CPU / 256 MB RAM / 256 MB ROM
- Built-in Ethernet port × 1 and supports SD cards
- Serial Communication Port × 3 (D-Sub × 2)
- USB host for peripheral device connection
- Supports FTP / Email / VNC / Web monitor

ΔNELTA

Human Machine Interface

Standard Ethernet Type HMI

8-inch | DOP-108IG

- 8" 16-bit TFT / Display resolution: 800 × 600 pixels
- Cortex-A8 800 MHz CPU / 256 MB RAM / 256 MB ROM
- Built-in Ethernet port × 1 and supports SD cards
- Serial Communication Port × 3 (D-Sub × 3)
- USB host for peripheral device connection
- Supports FTP / Email / VNC / Web monitor

10.1-inch | DOP-110IS

- 10.1" 16-bit TFT / Display resolution: 1,024 × 600 pixels
- Cortex-A8 800 MHz CPU / 256 MB RAM / 256 MB ROM
- Built-in Ethernet port × 1 and supports SD cards
- Serial Communication Port × 3 (D-Sub × 3)
- USB host for peripheral device connection
- Supports FTP / Email / VNC / Web monitor
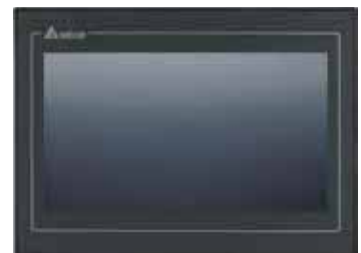
10.4-inch | DOP-110IG

- 10.4" 16-bit TFT / Display resolution: 800 × 600 pixels
- Cortex-A8 800 MHz CPU / 256 MB RAM / 256 MB ROM
- Built-in Ethernet port × 1 and supports SD cards
- Serial Communication Port × 3 (D-Sub × 3)
- USB host for peripheral device connection
- Supports FTP / Email / VNC / Web monitor

Standard Type HMI

5.6-inch | DOP-105CQ

- 5.6" 16-bit TFT / Display resolution: 320 × 234 pixels
- Cortex-A8 800 MHz CPU / 256 MB RAM / 256 MB ROM
- Serial Communication Port × 3 (D-Sub × 2)
- USB host for peripheral device connection

7-inch | DOP-107CV

- 7" 16-bit TFT / Display resolution: 800 × 480 pixels
- Cortex-A8 800 MHz CPU / 256 MB RAM / 256 MB ROM
- Serial Communication Port × 3 (D-Sub × 2)
- USB host for peripheral device connection

10.1-inch | DOP-110CS

- 10.1" 16-bit TFT / Display resolution: 1,024 × 600 pixels
- Cortex-A8 800 MHz CPU / 256 MB RAM / 256 MB ROM
- Serial Communication Port × 3 (D-Sub × 2)
- USB host for peripheral device connection

10.4-inch | DOP-110CG

- 10.4" 16-bit TFT / Display resolution: 800 × 600 pixels
- Cortex-A8 800 MHz CPU / 256 MB RAM / 256 MB ROM
- Serial Communication Port × 3 (D-Sub × 2)
- USB host for peripheral device connection

Handheld HMI

7-inch | DOP-107H

- 7" 16-bit TFT, 16:9
- Display Resolution: 800 × 480 pixels
- Supports SD/SDHC cards
- Built-in emergency stop switch
- Built-in enable switch (rear side)
- Serial communication models support RS-485 / RS-422
- Ethernet communication models support Ethernet port × 1
- Optional MPG (Manual Pulse Generator)
- Compact and lightweight design: 750 g
- Integrated style cables available (5 m / 10 m)

Touch / Text Panel Human Machine Interface

Basic Ethernet Type HMI

4.3-inch | DOP-103DQ `New`

- 4.3" 16-bit TFT / Display resolution: 480 × 272 pixels
- Cortex-A8 800 MHz CPU / 512 MB RAM / 256 MB ROM
- Built-in Ethernet port × 1
- Serial Communication Port × 2 (D-Sub × 1)
- USB host for peripheral device connection
- Supports FTP / Email / VNC / Web monitor

7-inch | DOP-107DV

- 7" 16-bit TFT / Display resolution: 800 × 480 pixels
- Cortex-A8 800 MHz CPU / 256 MB RAM / 256 MB ROM
- Built-in Ethernet port × 1
- Serial Communication Port × 2 (D-Sub × 1)
- USB host for peripheral device connection
- Supports FTP / Email / VNC / Web monitor

Basic Type HMI

4.3-inch | DOP-103SQ `New`

- 4.3" 16-bit TFT / Display resolution: 480 × 272 pixels
- Cortex-A8 800 MHz CPU / 256 MB RAM / 256 MB ROM
- Serial Communication Port × 2 (D-Sub × 1)
- USB host for peripheral device connection

4.3-inch | DOP-103BQ

- 4.3" 16-bit TFT / Display resolution: 480 × 272 pixels
- Cortex-A8 800 MHz CPU / 256 MB RAM / 256 MB ROM
- Serial Communication Port × 2 (D-Sub × 1)
- USB host for peripheral device connection

7-inch | DOP-107BV

- 7" 16-bit TFT / Display resolution: 800 × 480 pixels
- Cortex-A8 800 MHz CPU / 256 MB RAM / 256 MB ROM
- Serial Communication Port × 2 (D-Sub × 1)
- USB host for peripheral device connection

TP

4-Line Text Panel HMI
TP04G-AL-C / TP04G-AL2

- 4.1" STN-LCD
- User-defined function keys available
- RS-232 / RS-422 / RS-485 ports (TP04G-AL2)
- Password protection function
- User-defined boot screen
- Built-in real-time clock (RTC)

TP04G-BL-C

- 4.1" STN-LCD
- 0 ~ 9 numeric keys and user-defined function available
- Built-in RS-232 and RS-422 / RS-485 ports
- Modbus ASCII / RTU modes
- Password protection function
- User-defined boot screen
- Built-in real-time clock (RTC)

8-Line Text Panel HMI
TP08G-BT2

- 3.8" STN-LCD
- Resolution: 240 × 128 dots
- Built-in 1,024k bytes flash memory
- 24 user-defined function keys
- Built-in RS-232 and RS-422 / RS-485 ports
- Recipes and macro functions

7-Inch Touch Panel HMI with Built-in PLC
TP70P

- Adopts the CPU of the DVP-SS2 Series PLC: program capacity: 4k steps / D device: 5k words
- Provides 2 sets of 10 kHz high-speed pulse input
- 7" TFT-LCD touch screen
- Built-in USB port for program upload / download
- Built-in RS-485 port × 2
- Modbus ASCII / RTU modes
- Built-in real-time clock (RTC)
- Digital and analog I/O terminals available

4-Line Text Panel HMI with Built-in PLC
TP04P

- Adopts the CPU of the DVP-SS2 Series PLC: program capacity: 8k steps / D device: 5k words
- Provides 2 sets of 10 kHz high-speed pulse input
- 4.1" STN-LCD
- Provides 0 ~ 9 numeric keys with user-defined functions
- Built-in USB port for program upload / download
- Built-in RS-485 port × 2
- Modbus ASCII/RTU modes
- User-defined boot screen
- Built-in real-time clock (RTC)
- Digital and analog I/O terminals

Applications

High-end electronics manufacturing equipment, Machining, Food packaging

ΔELTΛ

Industrial PC

DIAVH / IPC / PPC

Stable and High-Performance Integration Platform

- Standard fanless industrial computers for easy DIN-rail mounting
- System expansion with PCI/PCIe slots for machine vision, web monitoring and motion control applications
- Multiple sizes of Panel PC available (10"/12"/15"/17"/19"/21")
- High/Low-temperature resistance and IP65-rated front panel (dustproof & waterproof), suitable for applications in harsh industrial environments
- Intel Core i3/i5/i7 and Celeron J1900 processor with fanless design and low power consumption for high efficiency and excellent performance
- One-click startup (power-on)
- Built-in Windows 10 (Pro/IoT version) with 64/128/256/512G SSD
- Compatible with SCADA and IEMS software platforms

SCADA System
DIAView

Industrial Panel PC
DIAVH-PPC15

Industrial PC
IPC-E200

Ethernet

Industrial PC
DIAVH-IPC

Managed Industrial
Ethernet Switch
DVS-110W02-3SFP

Modbus

Modbus

PLC
AS300
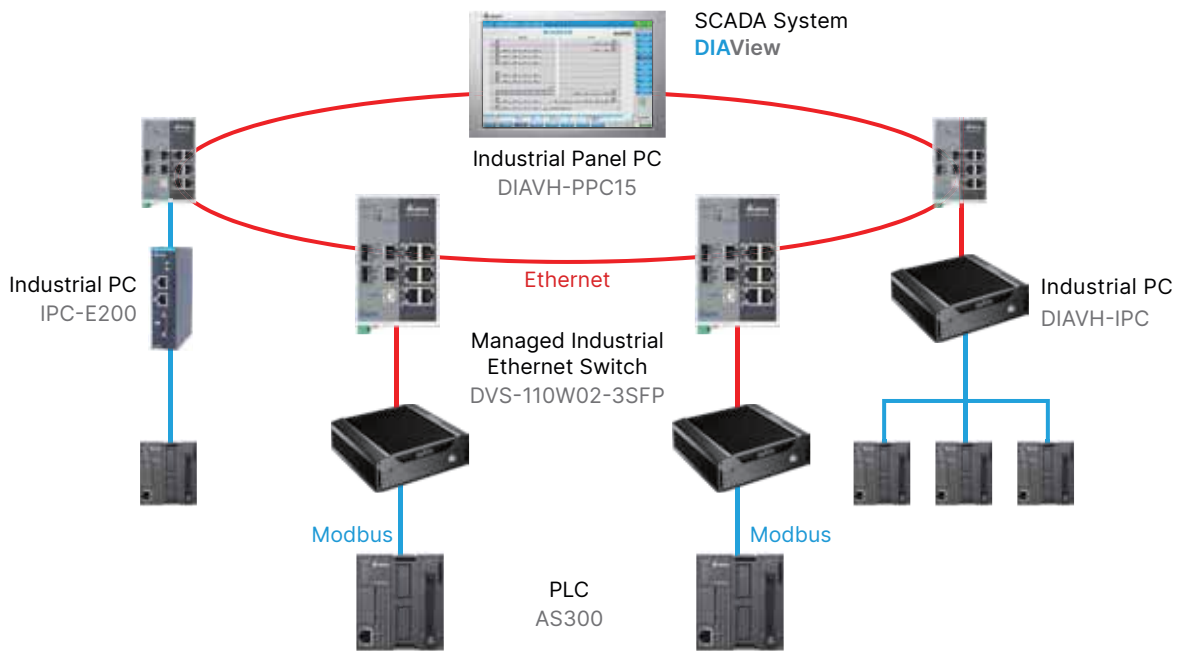
| Facility Control & Management System | Equipment Management System | Production Process Control System | Production Quality Management System |

Plugin Program
Manufacturing Process

Flux
Spraying

Wave
Soldering

Semi-Finished
Product Testing

Damp Proof
Coating

Damp Proof
Membrane Furnace
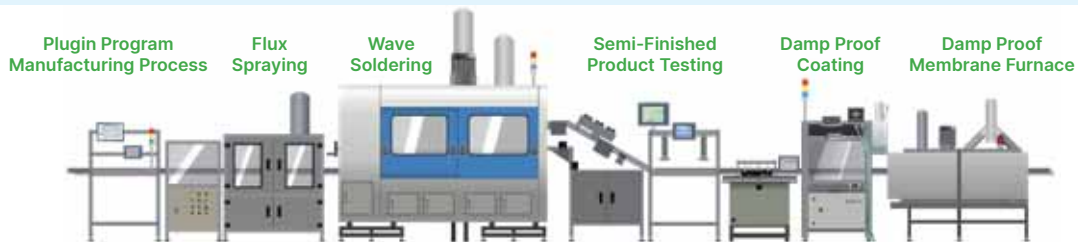
Applications

Equipment for electronics manufacturing, Machinery equipment, HVAC, Water treatment, Facility management and monitoring control

Industrial Ethernet & IIoT Solution

State-of-the-Art Industrial Networking for Smart Manufacturing

Layer 3 Managed Switch
DVS-G928W01

- 28-Port full GbE (10 GbE optional), modular design for flexible configuration
- Layer 3 routing functions (RIP & VRRP) allow multiple subnets in a large network to exchange data and information across a network address
- Complete L2 network management functions: Q-in-Q VLAN, QoS, LACP, IGMP and SNMP v1/v2c/v3
- IPv6 address suitable for large network and neighbor discovery
- EtherNet/IP and Modbus TCP protocols that facilitate the remote management by SCADA and other industrial devices
- Adopts high-end proprietary redundancy technologies ONE RING & ONE CHAIN for quick self-recovery within 30 ms from network disconnection
- Enhanced network security with IEEE 802.1X, TACACS+, SSH, HTTPS and SNMP v3
- IEEE 1588v2 PTP (Precision Time Protocol) for precise time synchronization and calibration for network equipment
- Loopback-detection to avoid broadcast storms by automatically shutting down the ports over a switching loop
- Cable diagnostic to auto-detect the twisted-pair cabling quality and report cabling issues regularly
- Auto alarm notifications by emails, relay, Syslog and SNMP trap
- Compatible with various industrial protocols, including EtherNet/IP, PROFINET, CC-LINK IE and DNP 3.0
- $100 \sim 240\ V_{AC}$ and $125 \sim 370\ V_{DC}$ wide-range redundant power input
- IP30 metal case, -40ºC~85ºC operating temperature
- Electrical substation: IEC 61850-3, IEEE 1613
- Rail traffic: EN 50121-4
- Certification: UL 61010, IEC 60950-1, CE, FCC, CCC and RCM

Modules

DVS-G900-8GE
8 10/100/1000Base-T RJ45

DVS-G900-8GF
8 100/1000Base-SFP

DVS-G900-6GM12
6 10/100/1000Base-T M12

DVS-G900-4GF
4 100/1000Base-SFP

ΔELTA

Industrial Ethernet & IIoT Solution

Managed Switch

DVS-G116

- 12-Port GbE + 4-Port GbE SFP, designed for backbone networks in IIoT applications; full Gigabit Ethernet configuration
- Complete L2 network management functions: Q-in-Q VLAN, QoS, LACP, IGMP and SNMP v1 / v2c / v3
- IPv6 address for large network and neighbor discovery
- Modbus TCP and EtherNet/IP protocols that facilitate remote management by SCADA and other industrial devices
- Optimizes network redundancy by adopting high-end proprietary redundancy technologies ONE RING & ONE CHAIN for quick self-recovery within 10ms from network disconnection
- Enhanced network security with IEEE 802.1X, TACACS+, SSH, HTTPS and SNMP v3
- Loopback-detection to avoid broadcast storms by automatically shutting down the ports over a switching loop
- DDM diagnosis function by SFP fiber module
- Auto alarm notifications by emails, DI, relay, syslog and SNMP trap
- Compatible with various industrial protocols, including EtherNet/IP, PROFINET, CC-LINK IE and DNP 3.0
- IP40 metal case, -40ºC ~ 75ºC wide operating temperature
- Certification: UL 61010, IEC 62368-1, CE, FCC and RCM

DVS-G112

- 8-Port GbE + 4-Port GbE SFP, designed for backbone networks in IIoT applications; full Gigabit Ethernet configuration
- Complete L2 network management functions: Q-in-Q VLAN, QoS, LACP, IGMP & SNMP v1 / v2c / v3
- IPv6 address for large network and neighbor discovery
- Modbus TCP and EtherNet/IP protocols that facilitate remote management by SCADA and other industrial devices
- Optimizes network redundancy by adopting high-end proprietary redundancy technologies ONE RING & ONE CHAIN for quick self-recovery within 10ms from network disconnection
- Enhanced network security with IEEE 802.1X, TACACS+, SSH, HTTPS and SNMP v3
- Loopback-detection to avoid broadcast storms by automatically shutting down the ports over a switching loop
- DDM diagnosis function by SFP fiber module
- Auto alarm notifications by emails, DI, relay, syslog and SNMP trap
- Compatible with various industrial protocols, including EtherNet/IP, PROFINET, CC-LINK IE and DNP 3.0
- IP40 metal case, -40ºC ~ 75ºC wide operating temperature
- Certification: UL 61010, IEC 62368-1, CE, FCC and RCM

DVS-G106

- 4-Port GbE + 2-Port GbE SFP, designed for backbone networks in IIoT applications; full Gigabit Ethernet configuration
- Complete L2 network management functions: Q-in-Q VLAN, QoS, LACP, IGMP and SNMP v1 / v2c / v3
- IPv6 address for large network and neighbor discovery
- Modbus TCP and EtherNet/IP protocols that facilitate remote management by SCADA and other industrial devices
- Optimizes network redundancy by adopting high-end proprietary redundancy technologies ONE RING & ONE CHAIN for quick self-recovery within 10 ms from network disconnection
- Enhanced network security with IEEE 802.1X, TACACS+, SSH, HTTPS and SNMP v3
- Loopback-detection to avoid broadcast storms by automatically shutting down the ports over a switching loop
- DDM diagnosis by SFP fiber module
- Auto alarm notifications by emails, DI, relay, syslog and SNMP trap
- Compatible with various industrial protocols, including EtherNet/IP, PROFINET, CC-LINK IE and DNP 3.0
- IP40 metal case, -40ºC ~ 75ºC wide operating temperature
- Certification: UL 61010, IEC 62368-1, CE, FCC and RCM

DVS-103

- 3-Port 10/100Base-T(X) Ethernet switch for EtherNet/IP DLR specifically
- Supports EtherNet/IP protocol
- DLR (device-level ring) technology, self-healing recovery time < 3 ms (less than 50 nodes)
- Design with DI and DO for auto alarms
- IP40 metal case, -20ºC ~ 70ºC operating temperature
- Certification: UL 61010, IEC 62368-1, CE, FCC and RCM

PoE+ Managed Switch
DVS-G512

- 8-Port GbE + 4-Port 100/1000Base-SFP, full Gigabit
- 8 10/100/1000Base-T PoE (PSE) ports, each provides 30 W power supply to meet IEEE 802.3at and IEEE 802.3af standards
- Complete L2 network management functions: VLAN, QoS, LACP, IGMP and SNMP v1/v2c/v3
- IPv6 address for large network and neighbor discovery
- Advanced PoE management and intelligent powered device (PD) class detection
- IEC 62439-2 MRP media redundancy protocol; IEEE 1588v2 PTP precision time protocol
- DDM diagnosis function by SFP fiber module
- Auto alarm notifications by emails, relay, syslog and SNMP trap
- IP30 metal case, -40ºC ~ 70ºC operating temperature
- Certification: CE, FCC and RCM

Industrial Ethernet & IIoT Solution

Unmanaged Switch

DVS-G008W01

- 8-Port GbE
- Transparent transmission of VLAN tagged packets
- Auto alarm notifications by relay output for power failure
- Power supply: 12 ~ 48 V$_{DC}$ or 10 ~ 24 V$_{AC}$, supports redundant dual inputs
- IP30 metal case, -40ºC ~ 75ºC operating temperature
- Certification: UL 61010, EN 62368-1, CE, FCC and RCM

DVS-005 / 008 / 016

- 5 / 8 / 16-Port FE; supports long-distance transmission via fiber optics
- IEEE 802.1p based QoS for packet forwarding precedence
- Built-in broadcast storm protection
- Transparent transmission of VLAN tagged packets
- Auto alarm notification by relay output for link-down and power failure
- Power supply: 12 ~ 48 V$_{DC}$, supports redundant dual inputs
- IP40 metal case, -40ºC ~ 75ºC operating temperature
- Certification: UL 508, IEC 61131-2, CE, FCC and RCM

DVS-G005I00C

- 5-Port GbE
- Jumbo frame size: up to 10k Bytes
- Power supply: 12 ~ 48 V$_{DC}$, supports redundant dual inputs
- IP40 PC case, -20ºC ~ 70ºC operating temperature
- Certification: UL 61010, IEC 62368-1, CE, FCC and RCM

DVS-008W00-M12

- 8-Port 10/100Base-T(X) M12, ensures robust and tight connection
- Strong 5g resistance to extreme vibration environments
- IP67 metal housing to prevent water and dust ingress
- Transparent transmission of VLAN tagged packets
- Power supply: 12 ~ 48 V$_{DC}$, supports redundant dual inputs
- -40ºC ~75ºC wide operating temperature
- Certification: UL 61010, EN 62368-1, CE, FCC and RCM

PoE+ Unmanaged Switch
DVS-G406W01-2GF

- 4-Port GbE + 2-Port 100/1000Base-SFP, full Gigabit
- 4 10/100/1000Base-T PoE (PSE) ports, each provides 30 W power supply to meet IEEE 802.3at and IEEE 802.3af standards
- Jumbo frame size: up to 9,216 Bytes
- Auto alarm notifications by relay output for power failure
- IP30 metal case, -40ºC ~ 70ºC operating temperature
- Certification: CE, FCC and RCM

PoE+ Splitter
DVS-G401

- 1-Port GbE for PoE+ data / power input and 1-Port GbE for data output
- All ports compliant with IEEE 802.3at and IEEE 802.3af standards, each provides 30 W power supply
- Intelligent PoE input overvoltage protection
- Power output up to 27 W
- IP30 metal case, -20ºC ~ 70ºC operating temperature
- Certification: CE, FCC and RCM

PoE+ Injector
DVS-G402

- 2-Port GbE for PoE+ data / power output and 2-Port GbE for data input
- All ports compliant with IEEE 802.3at and IEEE 802.3af standards, each provides 30 W power supply
- Intelligent PoE output overvoltage protection
- Built-in 12 V_{DC} power booster for flexible PoE deployment
- IP30 metal case, -20ºC ~ 70ºC operating temperature
- Certification: CE, FCC and RCM

Industrial Ethernet & IIoT Solution

Ethernet-to-Fiber Media Converter
DVS-G002I00-TF

- 1-Port 100/1000Base-T to 100/1000Base-SFP
- Jumbo frame size: up to 10k Bytes
- Supports Link Fault Pass-Through (LFP)
- Power supply: 12 ~ 48 V_{DC}, supports redundant dual inputs
- IP40 PC case, -20ºC ~ 70ºC operating temperature
- Certification: UL 61010, IEC 62368-1, CE, FCC and RCM

SFP Fiber Transceiver
LCP-GbE

- 1-Port GbE, compliant with IEEE 802.3z
- Full duplex operation
- DDM diagnosis monitors transmission quality
- Hot-plugging duplex LC connectors for maximum flexibility
- Metal case, -40ºC ~ 85ºC operating temperature

LCP-1FE

- 1-Port FE, compliant with IEEE 802.3u
- Full duplex operation
- DDM diagnosis monitors transmission quality
- Hot-plugging duplex LC connectors for maximum flexibility
- Metal case, -40ºC ~ 85ºC operating temperature

High-Gain Antenna
DVW-ANT

- Supports IEEE 802.11 b/g/n or IEEE 802.11 a/b/g/n
- 2.4 & 5 GHz dual-band omni-directional 5.5 & 8dBi, or 2.4 GHz omni-directional 7 dBi
- Powerful magnetic base with 3-meter extension cord and RP-SMA (male) connector
- IP65 waterproof and UV resistant design, suitable for applications under all kinds of weather conditions
- -30ºC ~ 60ºC operating temperature

Industrial 4G/WAN Cloud Router
DX-3021L9

- 4-Port FE LAN + 1-Port FE WAN + 1-Port RS-232 + 1-Port RS-485
- Universal 4G LTE-FDD and LTE-TDD frequency bands, compatible with WCDMA/GSM/GPRS/EDGE 3G/2G networks
- Supports **DIACloud** Cloud Management Platform, no ISP public IP address required
- Supports Modbus TCP, Modbus ASCII/RTU, Mitsubishi MC and Siemens TCP protocols
- Dual SIM dual standby technology, seamless switch among ISP systems for continuous network connection
- Built-in DI/DO for alarm settings and triggering
- Firmware upgrade and automatic configuration via USB flash drives; allows remote access to the USB flash drives via FTP
- USB port compatible with 3rd party Wi-Fi USB adapter to add WLAN interface as Wi-Fi client (only Realtek RTL8192EU driver supported)
- Internet connection via cellular network or broadband interfaces; allows self-defined internet connectivity priority
- Firewalls: SPI, DoS attacks, IP/MAC filter
- IP30 metal case, -20ºC~70ºC operating temperature
- Certification: NCC, CE, FCC and UL

IEEE 802.11 WLAN
DVW-W01I2-E1

- Comprehensive transmission interface: 1-Port GbE + 1-Port RS-232 + 1-Port RS-485
- Compliant with IEEE 802.11ac wireless technology for up to 866 Mbps data transmission rate
- Proprietary ONE ROAMING high-end fast roaming technology with seamless switch (< 150 ms) among APs
- Multiple wireless modes: AP, Client, repeater
- Supports serial device servers and Modbus gateways
- Wireless QoS (IEEE 802.11e, WMM) for video packet transmission precedence
- Enhanced wireless security: WPA-PSK/WPA2-PSK (TKIP/AES)
- Modbus TCP protocol that facilitates remote management by SCADA and other industrial devices
- Auto alarm notification by emails, DI and relay
- IP40 metal case, -10ºC~60ºC operating temperature
- Certification: UL 61010, IEC 62368-1, CE, FCC, RCM, SRRC and NCC

Communication Module

High-Speed and Stable Industrial Network Solutions

Master Module

Ethernet | DVPEN01-SL

- Modbus TCP connections:
  Client: 32 | Server: 16
- Smart data exchange
- RTU mapping
- Simple firewall
- Email alarm

Ethernet | RTU-EN01

- Modbus TCP slave protocol
- Able to connect 8 DVP-S Series analog I/O modules
- Able to connect digital I/O modules (256 points)
- RS-485 port supports max. 32 Modbus slaves
- Smart PLC if-then function
- Smart monitor function

CANopen | DVPCOPM-SL

- CANopen protocol
- Able to connect max. 110 slaves
- Various PDO and high-speed SDO transmission
- Supports NMT slave, Heartbeat, Emergency, and more protocols

CANopen | RTU-CN01

- CANopen protocol
- Able to connect 8 DVP-S series analog I/O modules
- Able to connect DVP-S series digital I/O modules (256 points)

EtherCAT | RTU-ECAT

- EtherCAT protocol
- Able to connect 8 DVP-S series analog I/O modules
- Able to connect DVP-S series digital I/O modules (256 points)

DeviceNet | DVPDNET-SL

- For DVP-EH3-L, DVP-MC, DVP-SA2, SE, SV2, SX2 Series only
- Supports DeviceNet protocol
- Connectable to 63 slaves
- Max. baud rate: 500k bps
- Max. network length: 500m
- RTU mapping

RS-485 | DVPSCM12-SL

- Standard Modbus communication and user-defined RS-485 communication protocols
- 2 sets of independent RS-485 communication interfaces
- Isolated power and communication provide strong noise immunity;
  built-in 120 Ω terminal resistor switch and removable terminal
- Data transmission settings via software, no programming required
- Applicable for PLC communication ports for program uploading/downloading and monitoring

RS-485 | RTU-485

- Modbus protocol
- Able to connect 8 DVP-S Series analog I/O modules
- Able to connect digital I/O modules (256 points)
- Max. baud rate: 115.2 Kbps

Master Module

BACnet MS/TP | DVPSCM52-SL

- BACnet MS/TP slave, standard Modbus and user-defined RS-422/485 communication protocols
- Compatible with major brand software and DDC; remote I/O and converter function available when connected to a PLC with I/O point extension
- Isolated power and communication provide strong noise immunity
- Compatible with high-speed communication modules on the left (PLC needed)

USB Converter

USB » CAN | IFD6530

- A USB/RS-485 communication converter for AC motor drive C2000 series
- Offers 9V power supply
- Supports AC motor drive VFD series keypad (KPC-CC01) for parameter storage and editing in TPEditor software
- Supports baud rate 75~115,200 bps

USB » RS-485 | IFD6500

- A USB/RS-485 communication converter
- Supports baud rate 75~115,200 bps
- No external power supply required
- Auto-detects data flow direction
- Plug and play USB device

USB » CAN | IFD6503

- Extracts CAN messages (standard and extended frames), decodes and displays following DeviceNet and CANopen protocols
- Filters by preset conditions
- CAN messages (1 sent manually, and max. 8 sent automatically)
- Max. 1 Mbps
- Plug and play USB device

Modbus Serial Converter

RS-422/485 | IFD8510-A

- Automatically configures communication format and transmission
- Switch-less and fully-isolated design
- Communication baud rate: up to 115,200bps

RS-232 « » RS-422/485 | IFD8500-A

- RS-232 to RS-422/485 isolated converter
- Auto transmission speed adjustment

Modbus Serial Converter

EtherNet/IP, Modbus TCP » Modbus | IFD9506

- Isolation in RS-485 channel (incl. power supply)
- EtherNet/IP and Modbus TCP protocols
- Smart monitor function
- Supports webpage setup and on-line monitoring
- Serial virtual COM available
- Alarm notifications through email

Smart Sensor

Laser Displacement
LD-E

- 25 ~ 700 mm detection range
- Support Digital I/O / Analog 4 ~ 20 mA / Modbus RS-485 communication
- 5 ~ 800 μm repeatibility
- Panel buttons enable quick parameter setting and support seven-segment display
- IP67 protection, suitable for various environments
- Compact size (25 × 44 × 24 mm) for easy installation

Area Sensor
AS-B General Model

Area Protection (Standard Type)

- Detects finger-sized, hand-sized, and arm-sized objects
- Detection height: 160 mm ~ 1,920 mm
- Lighting angle < 5°, reduces external stray light impact
- Simultaneously conducts light beam scanning, voltage and channel diagnosis in each scanning cycle
- Transmitter and receiver alignment indicators
- Ball-impact tested to avoid damage to the cover

Object Measurement (Communication Type)

- Full Functionalities: includes AS-B Standard Type features and supports RS-485 connection
- Proactive Protection: supports interlock and restart functions
- Supports fixed / floating blanking setting for presence check
- Proactively uploads channel status or combination data to the control system for immediate reaction
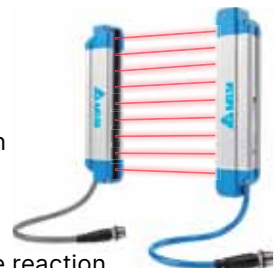
AS-E Compact Model

Area Protection (Standard Type)

- Ø30 mm (hand-sized) detection capability
- Detection height: 140 mm ~ 540 mm
- Lighting angle < 5°
- Simultaneously conducts light beam scanning, voltage and channel diagnosis in each scanning cycle
- PIN supports both NPN or PNP output

Object Measurement (Communication Type)

- Ultra Slim: 15 × 17 mm; detection height: 560 mm
- Full Functionalities: includes AS-E Standard Type features and supports RS-485 connection
- Active upload function can be controlled via input PIN
- Proactively uploads channel status, combination data or channel energy value to the control system for immediate reaction
- Low Energy Alert indicates smudge, misalignment, or replacement needed

Temperature Controller

Pulse Heat Pressing Temperature Controller `New`
DTH

High-Speed, High-Precision Temperature Control

The DTH series is equipped with fast and stable temperature measurement capabilities and provides precise temperature control through PID control and DC pulse output. Supports efficient computing and data analysis with built-in algorithms and large storage capacity. It is an excellent tool for pulse heat pressing and ensures high processing speed, stable yield, and lower consumption of soldering materials.

- DC pulse output ensures stable temperature control
- 500 Hz high-speed sampling for precise temperature control
- PID auto-tuning complete in 10 seconds
- User-friendly interface
- Detailed records for easy tracking
- Supports remote monitoring to realize smart manufacturing

Applications

Flexible flat cable (FFC) bonding, PCB wire bonding, Conducting wire bonding, Plastic heat pressing, Solar panels conducting wire bonding, Type C / USB cable bonding
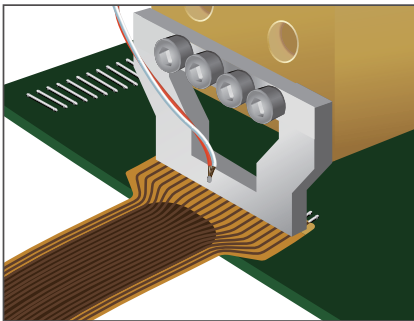
Flexible flat cable (FFC) bonding
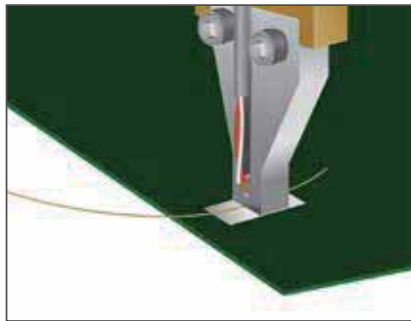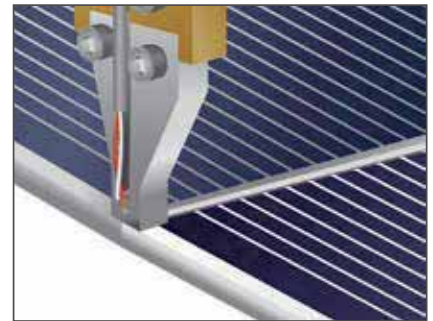
PCB wire bonding

Solar panels conducting wire bonding
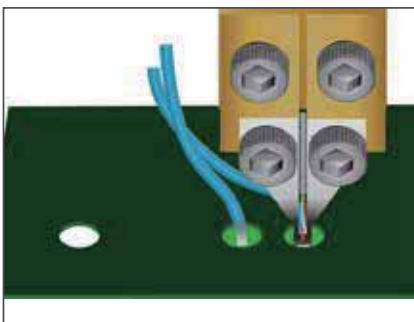
Conducting wire bonding
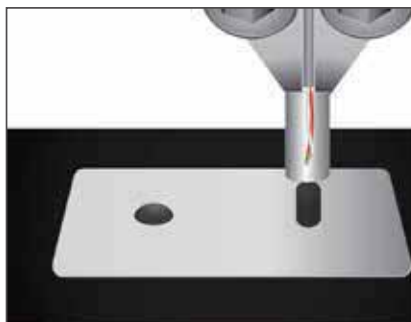
Plastic heat pressing
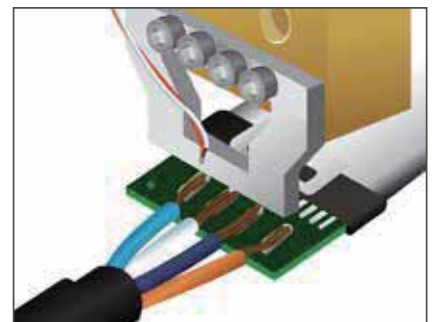
Type C / USB cable bonding

Temperature Controller

Multi-Loop Modular Temperature Controller `New`
DTN

Thin-Type Design and Multi-Point Temperature Control

- Thin-type design saves horizontal mounting space
- Supports Ethernet communication for stable and real-time multi-loop parameter control
- Modular design allows easy replacement and extension up to 64 PID control loops for flexible applications

Thin-Type Design Saves Horizontal Mounting Space

- Reduces width by 65 % compared to the DTE Series
- Saves horizontal mounting space and overcomes cabinet size limitation

DTE Width 110 mm

Width reduction by 65 %

DTN Width 38 mm
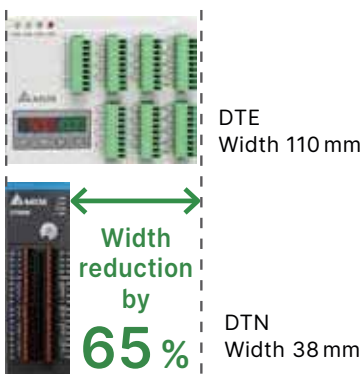
Fast Module Connection via RS-485 Communication

- Max. Baud rate: 115,200 bps
- Supports Modbus RTU / ASCII
- Offers external switches for communication protocol and address set up, easy to install and maintain

Delta HMI

Master

RS-485

DTN Group 1   DTN Group 2   DTN Group 3
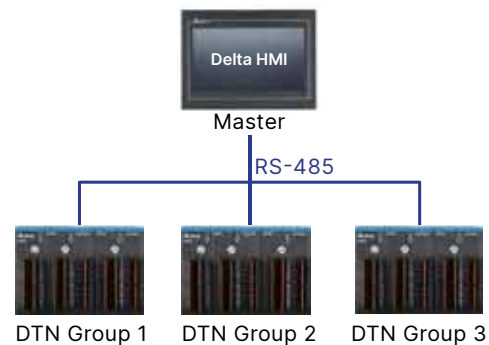
Various Extension Modules for Flexible Applications

- The DTN Series consists of measurement, I/O extension, and Ethernet modules.
- One measurement module provides an up to 8-point control loop, and a host group controls up to 64 points
- The second output and alarm point can be easily set as any address in the I/O extension module for convenient on-site wiring and various applications
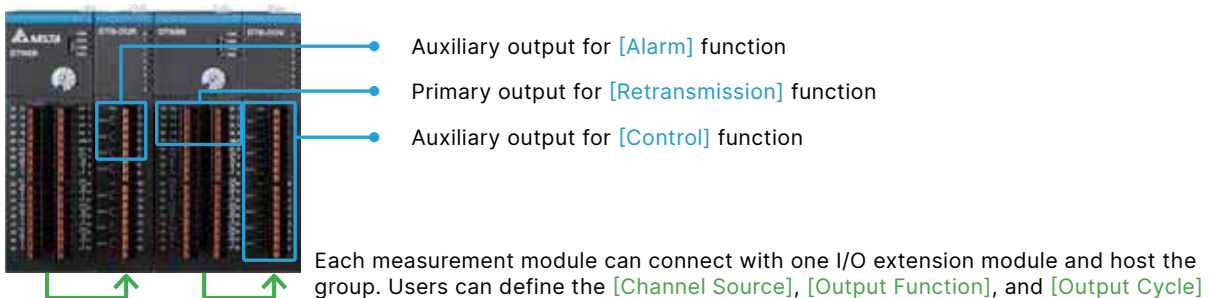
Auxiliary output for [Alarm] function

Primary output for [Retransmission] function

Auxiliary output for [Control] function

Each measurement module can connect with one I/O extension module and host the group. Users can define the [Channel Source], [Output Function], and [Output Cycle]

Applications

Rubber and plastics, Semiconductor, Solar energy, Glass manufacturing, and more

Advanced Multi-Loop Modular Temperature Controller
DTM

Quick Start and a User-Friendly Interface

- Modular design for easy wiring
- Various extension modules for various applications
- Data collection by CPU for higher data exchange efficiency
- Supports RS-485 and Ethernet communication, and multi-point temperature control (max. 64-CH control loops for a DTM group)
- User-defined communication addresses
- Complete isolation between channels

Data Collection by Host

- The DTM host collects data from all extension modules at any time and uploads to the master controller immediately for higher communication efficiency
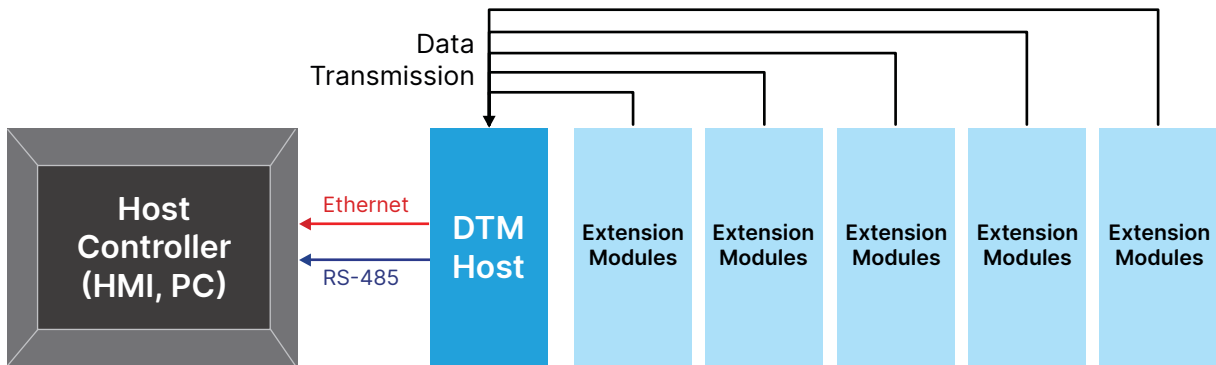
The host sends all data from the DTM group to the host controller.

RS-485 and Ethernet introduction

- Ethernet: supports Ethernet / IP communication
- RS-485
  - Max. Baud rate 115,200 bps
  - Supports ASCII and RTU
  - Offers external switches communication protocols, address setup, and easy installation and maintenance
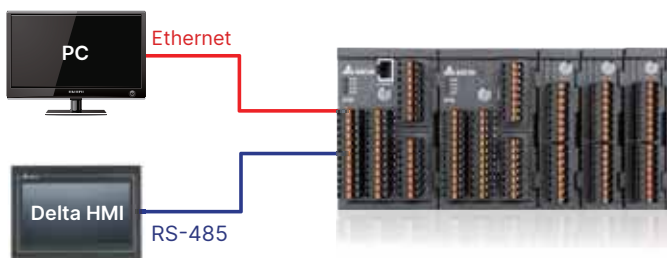
Applications

Rubber and plastics, Semiconductor, Solar energy, Glass manufacturing, and more

Temperature Controller

Advanced Intelligent Temperature Controller
DT3

High Speed, High Precision, High Performance - Multifunction Temperature Controller

- Power supply: 80 ~ 260 V_{AC} 50 / 60 Hz, 24 V_{AC} ± 10% 50 / 60 Hz, 24 V_{DC} ± 10%
- Thermocouple: K, J, T, E, N, R, S, B, L, U, TXK
- Platinum resistance sensor: Pt100, JPt100
- Resistance temperature detector: Cu50, Ni120
- Sensor input sampling rate: 0.1 second
- Control output: relay, 4 ~ 20 mA current, voltage pulse, 0 ~ 10 V voltage
- Control mode: ON/OFF, PID, PID program, manual, self-tuning, fuzzy control
- Modbus communication: optional
- Dual control output for heating and cooling control
- Heater burnout alarm
- PID program control provides 16 patterns with 16 steps each
- IP66 ingress protection rating on front panel and CE, UL certification

Remote Control

- Temperature settings via analog output of host controller

Hotplate

Output control   Temperature signal input

0 ~ 20 mA, 4 ~ 20 mA   Analog signal mA/V
0 ~ 5 V, 0 ~ 10 V

Remote control via analog signal or communication protocols
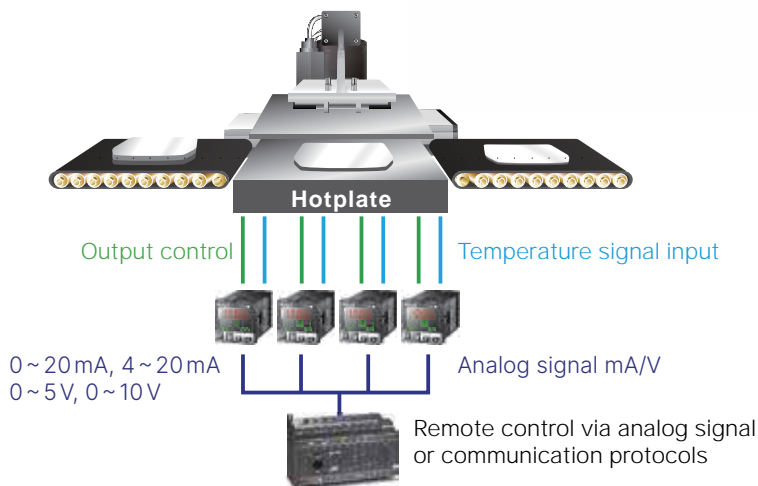
Various Control Modes

- Auto-tuning
- Fuzzy
- Manual
- ON / OFF
- PID process control
- Self-tuning

When disturbance occurs

PID control

Default value

Fuzzy PID control

The Fuzzy mode effectively reduces temperature fluctuation

PID control   Fuzzy PID control
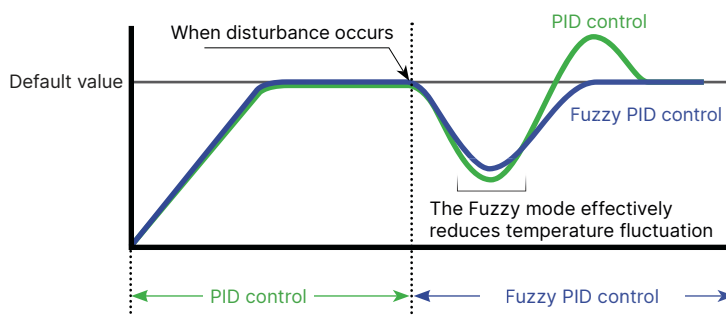
Applications

Solar panel manufacturing, Food & beverages packaging, Pharmaceuticals, Semiconductor, Rubber and plastics, High-tech electronics industries, HVAC

Intelligent Temperature Controller
DTK

- Power input: 100 ~ 240 V_{AC}, 50 / 60 Hz
- Thermocouple: K, J, T, E, N, R, S, B, L, U, TXK
- Platinum resistance: Pt100, JPt100
- RTD: Cu50, Ni120
- Output: Relay, current 4 ~ 20 mA, pulse voltage
- Control mode: ON / OFF, PID, manual
- Modbus communication[(optional)]
- 1 set of alarm output (2 sets of alarm outputs are optional), 9 alarm modes
- IP66 ingress protection rating on front panel
- Panel size options: 48 × 48, 48 × 96, 72 × 72, 96 × 96 (mm)

Standard Temperature Controller
DTA

- Power input: 100 ~ 240 V_{AC}, 50 / 60 Hz
- Thermocouple: K, J, T, E, N, R, S, B, L, U, TXK
- Platinum resistance: Pt100, JPt100
- RTD: Cu50
- Output: Relay, current, pulse voltage
- Control mode: ON / OFF, PID, manual
- Modbus communication[(optional)]
- 2 sets of alarm outputs, 13 alarm modes
- Dimensions: 48 × 48, 48 × 96, 72 × 72, 96 × 48, 96 × 96 (mm)
- IP65 protection

Advanced Temperature Controller
DTB

- Power input: 100 ~ 240 V_{AC}, 50 / 60 Hz, 24 V_{DC} ± 10%
- Thermocouple: K, J, T, E, N, R, S, B, L, U, TXK
- Platinum resistance: Pt100, JPt100
- Analog input: 0 ~ 5 V, 0 ~ 10 V, 0 ~ 20 mA, 4 ~ 20 mA, 0 ~ 50 mA
- Output: Relay, current 4 ~ 20 mA, pulse voltage, analog voltage 0 ~ 10 V
- Control mode: ON / OFF, PID, manual, PID process control
- Built-in Modbus communication
- 2 sets of alarm outputs, 18 alarm modes
- Dimensions: 48 × 24, 48 × 48, 48 × 96, 96 × 96 (mm)
- IP65 protection

DELTA

Temperature Controller

Modular Temperature Controller
DTC

- Power input: 24 V_{DC} ± 10%
- Thermocouple: K, J, T, E, N, R, S, B, L, U, TXK
- Platinum resistance: Pt100, JPt100
- Analog input: 0 ~ 5 V, 0 ~ 10 V, 0 ~ 20 mA, 4 ~ 20 mA, 0 ~ 50 mA
- Output: Relay, current 4 ~ 20 mA, pulse voltage, analog voltage 0 ~ 10 V
- Control mode: ON/OFF, PID, manual, PID process control
- Built-in Modbus communication
- 2 sets of alarm outputs, 13 alarm modes

Multi-Channel Modular Temperature Controller
DTE

- Power input: 24 V_{DC} ± 10%
- Thermocouple: K, J, T, E, N, R, S, B, L, U, TXK (supports max. 8 sets of inputs)
- Platinum resistance: Pt100, JPt100 (supports max. 6 sets of inputs)
- RTD: Cu50, Ni120
- Output: Relay, current 4 ~ 20 mA, pulse voltage, analog voltage 0 ~ 10 V
- Control mode: ON/OFF, PID, manual, PID process control
- Built-in Modbus communication
- 2 sets of alarm outputs, 13 alarm modes

Valve Controller
DTV

- Power input: 100 ~ 240 V_{AC}, 50/60 Hz, 24 V_{DC} ± 10%
- Thermocouple: K, J, T, E, N, R, S, B, L, U, TXK
- Platinum resistance: Pt100, JPt100
- Analog input: 0 ~ 5 V, 0 ~ 10 V, 0 ~ 20 mA, 4 ~ 20 mA, 0 ~ 50 mA
- Output: Relay
- Control mode: ON/OFF, PID, manual, PID process control
- Built-in Modbus communication
- 2 sets of alarm outputs, 17 alarm modes
- Dimensions: 48 × 96, 96 × 96 (mm)
- IP65 protection

Pressure Sensor

Standard Multifunction Pressure Sensor
DPA

High-Precision Pressure Sensor with Comprehensive Functions

- Measurement range:
  DPA01: -100 kPa ~ 100 kPa
  DPA10: -100 kPa ~ 1,000 kPa
- Tri-color display
- Simple code display
- Various unit conversions
- Various output modes
- RS-485 communication and analog output
- 10 sets of outputs for response time setup
- Safety control function
- Energy-saving mode

Basic Multifunction Pressure Sensor
DPB

Miniature Pressure Sensor for Easy Integration and Cost Savings

- Measurement range:
  DPB01: -100 kPa ~ 100 kPa
  DPB10: -100 kPa ~ 1,000 kPa
- Various unit conversions
- 10 sets of outputs for response time setup
- Various output modes
- Tri-color display
- Fast zeroing / reset
- Safety control function
- Simple code display

Applications

Machine making, Solar energy, Food packaging, Semiconductor, Electronics, Assembly automation

DELTA

Timer / Counter / Tachometer

Timer / Counter / Tachometer
CTA

All-in-One Device

- Power input: 100～240 V_{AC}, 50/60 Hz, 24 V_{DC} ±10%
- Simultaneous counting and timing in the mixed mode
- 6-digit LCD display
- Max. counting speed: 10 Kpps
- NPN or PNP input
- Pre-scale function
- Counting modes: 1-stage, 2-stage, batch, total, dual
- Modbus communication[(optional)]

Labeling Machine
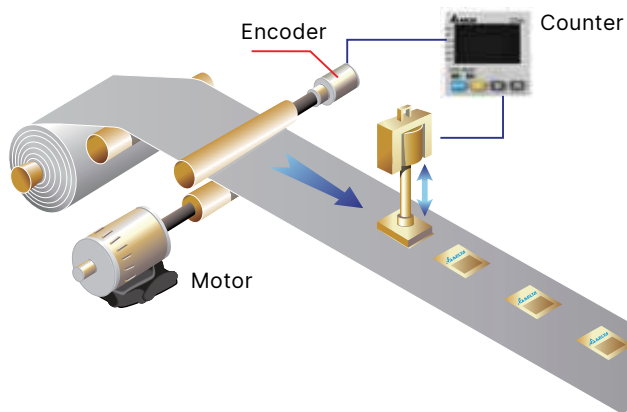
Fixed Length Cutting Machine
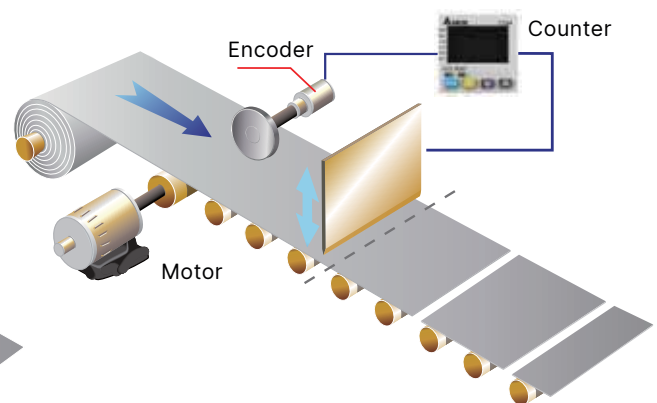
Applications

Food packaging machines, Labeling machines, Fixed length cutting machines, Logistics, Electronics

Smart Power Meter

DPM

Highly Accurate, Reliable Power Monitoring Solution

The DPM Series precisely measures parameters of electrical energy and power quality including power factors, harmonics, and current / voltage unbalance. This series also features a variety of communication protocols for easy integration with critical power systems and monitoring functions to provide power data, off-limit alarms, and history logs

- Precise measurement of bidirectional energy and electrical parameters; compliant with the IEC 62053-22 standard
- Supports Modbus communication for easy integration with system software
- Various models for selection based on installation types and function levels to fulfill different requirements and purposes in energy management

Panel Mounting Type
DPM-C

- Suitable for applications in general power systems
- Large LCD displays power data in real time
- A variety of communication protocols for easy integration
- Various power monitoring functions for different applications

Applications

Distribution boards, electrical rooms, factory / building energy management systems

DIN Rail Mounting Type
DPM-D

- Easy installation and integration for various equipment
- Applicable to general energy management systems
- Multiple functions of energy measurement for different applications

Applications

High power-consuming equipment, electrical equipment cabinets, enclosures

Multi-Loop Type
DPM-M

- Multiple and selective circuit monitoring reduces large-scale power meter use
- Suitable for large-scale applications to save power circuit costs
- AC / DC measurement

Applications

Shopping malls, Dormitories, Telecommunication systems

Machine Vision

3D ToF Mini Camera `New` * Suitable for indoor/outdoor applications
DMV-TM

Sharp Eyes that Let Robots See Their Working Space

The 3D ToF Mini Camera DMV-T Mini is designed for AGV / AMR integration. Compact and lightweight, the DMV-T Mini can be integrated in AGVs/AMRs in various sizes. With the ToF technology, the DMV-T Mini is suitable for environments with various lighting conditions and provides quality images and accurate 3D depth information. It also supports a wider field of view, global shutter, and capturing moving images over a large area.

Combined as an integrated solution, the DMV-TM and machine vision platform DIAVision help AGVs / AMRs accomplish precise navigation and 24/7 operation.

- Integrate lighting, imaging and processing in a compact design
- 3D ToF depth sensing along with ambient light immunity, and 2D color imaging
- DIAVision Machine Vision Platform for value-added vision application software customization

Camera Specifications

Dimensions (mm)	99.5 × 33 × 37.5 (L × W × H)	**RGB Shutter**	Global Shutter
Working Distance (m)	0.15 ~ 4	**Power Supply**	PoE: IEEE 802.3bt DC: 24 V ± 10%
FOV	105° × 78°	**Protocol**	GigE
ToF Resolution	640 × 480 (0.3M)	**Power Consumption**	Average 8 W
RGB Resolution	1440 × 1080 (1.6 M)	**IP Rating**	IP65
Frame Rate (fps)	30	**Certification**	UL, CE

Applications

AGV / AMR navigation and collision avoidance

3D ToF Smart Camera `New`
DMV-T

* Suitable for indoor applications only

Sharp Eyes that Let Robots See Their Working Space

The 3D ToF Smart Camera DMV-T integrates imaging, sensing and computing functions in a compact design. The DMV-T processes the image data in real time with a built-in dual-core CPU and provides quality images and accurate 3D depth information in various lightings.

Combined as an integrated solution, the DMV-T and the machine vision platform **DIAVision** achieve precise measurement, recognition, and positioning for various applications such as object detection and robot vision.

- 60 fps frame rate
- 640 × 480 video resolution
- 6 m of working range
- ARM Dual Cortex-A53 & Xillnx FPGA
- Supports GenICam interface and PoE power supply
- IP67 Protection and IEC-certified vibration resistance

Camera Specifications

Sensor	Sony IMX556	OS	Linux
Resolution (Pixel)	640 × 480, 0.3 M	Interface	10/100/1000 Mbps Ethernet, GigE Vision 2.0 Compliant
Frame Rate (fps)	60	Power Supply	PoE: IEEE 802.3bt / 24 V_{DC} ±10%
LD Wavelength (nm)	850	Dimensions (mm)	72 × 70 × 70 (L × H × W)
FOV	67° × 51°	Weight	500 g
Recommend Working Range (m)	6	Certification	IP66, IP67, CE, KC, UL
Distance Resolution (mm)	1	Temperature	Storage: -40°C to 85°C
CPU	Dual Cortex-A53 1.2 GHz	Eye Safety	Class I

Applications

This integrated solution combining the DMV-TM and **DIAVision** is ideal for warehousing and logistics to optimize storage, handling and dispatch of goods, reduce sorting errors, and enhance throughput.

Reduces sorting errors via high-precision object measurement and identification

Enhances pick-and-place and transport efficiency by fast detection and precise positioning

Ensures smooth AGV/AMR operation via obstacle and collision avoidance

Machine Vision

Industrial Camera
DMV-C

High Speed, High Performance and High Stability

- Supports exposure time and white balance settings
- Gamma correction, LUT, Gain
- Software trigger, external I/O trigger and continuous capture
- User-defined ROI and mirror output
- GigE Vision 2.0 compliant
- 64 MB image cache memory
- CE, KC, UL and RoHS certified

DMV-CC / CX
- CMOS sensor
- Resolution: 0.4 M ~ 5 M
- Global shutter

DMV-CL
- CMOS sensor
- Resolution: 0.4 M ~ 20 M
- Global shutter, Rolling shutter

Camera Specifications

Model	Sensor Model	Resolution (W × H)	Optical Size (inch)	Shutter	Exposure Time	Pixel Size (um)	FPS	Mono/ Color	Pixel Format	GPIO
DMV-CC400GM290	IMX287	720 × 540				6.9	290	Mono		
DMV-CC400GC290								Color		
DMV-CC1M6GM075	IMX273	1440 × 1080	1/2.9				75	Mono		
DMV-CC1M6GC075								Color		
DMV-CC3M2GM036	IMX265	2048 × 1536	1/1.8	Global		3.45	36	Mono	Mono (12,10,8) Bayer (12,10,8)	
DMV-CC3M2GC036								Color		
DMV-CX5M0GM023	IMX264	2448 × 2048	2/3				23	Mono		Isolated Input × 1
DMV-CX5M0GC023					20 µs ~ 1s			Color		
DMV-CL5M0GM023	IMX335	2592 × 1944	1/2.8			2		Mono		Isolated Output × 2
DMV-CL5M0GC023								Color		
DMV-CL6M3GM016	IMX178	3072 × 2048	1/1.8			2.4	16	Mono	Mono (10,8) Bayer (10,8)	
DMV-CL6M3GC016				Rolling				Color		
DMV-CL12MGM008	IMX226	4000 × 3000	1/1.7			1.85	8	Mono	Mono (12,10,8) Bayer (12,10,8)	
DMV-CL12MGC008								Color		
DMV-CL20MGM005	IMX183	5472 × 3648	1			2.4	5	Mono		
DMV-CL20MGC005								Color		

Applications

Inline inspection, Vision-guided robot applications, Logistics, Food & beverages packaging, Electronics, Printing

Machine Vision System
DMV3000G

**Smart Machine Vision System with a
User-Friendly Interface**

- Supports 2 color / monochrome GigE industrial cameras for simultaneous multi-task detection
- Smart and easy setup allows quick inspection project building
- Enhanced inspection speed to increase production efficiency and save cost
- Multiple built-in image inspection tools, saving program development and editing time
- Ethernet, RS-232, RS-485 interfaces for data output
- Compliant with high industrial standards; higher stability than home edition PC-based systems
- Built-in communication system connected by PLC, no need for extra programming
- Supports lens distortion correction (including camera tilt correction) and grid calibration for greater detection accuracy

Camera Specifications

Resolution	Level	Frame Rate	Pixel Dimensions (Horizontal / Vertical)	Sensor Size (inch) (Horizontal / Vertical)	Pixel Size (μm)	Lens Mount
0.4 M	Mono / Color	290	720 × 540	1 / 2.9	6.9	C-mount
1.6 M	Mono / Color	75	1440 × 1080	1 / 2.9	3.45	C-mount
3.2 M	Mono / Color	36	2048 × 1536	1 / 1.8	3.45	C-mount

Applications

Inspection for mobile phone lens quality, Disposable coffee filters, Logistics, Food & beverages packaging, Electronics, Printing, Motion control, Paper cup inspection, and other automated production

AELTA

Machine Vision

Machine Vision System
DMV1000G

Basic and Easy-to-Use Machine Vision System

- User-friendly interface for quick system setup
- A flowchart project editor saves development time
- Built-in multi-functional developing tools save users from complex programming
- Offers versatile digital I/O terminals
- Compact and light, saves wiring and space
- Exceptional hardware supports high-speed processing
- Supports GigE interface industrial camera
- Complete product line-up including lighting and lenses
- Compatible with Ethernet and RS-232/485 communication interfaces for quick system integration
- Supports Micro SD cards
- Compliant with high industrial standards; higher stability than PC-Based systems

Camera Specifications

Resolution	Level	Frame Rate	Pixel Dimensions (Horizontal/Vertical)	Sensor Size (inch) (Horizontal/Vertical) (mm)	Pixel Size (µm)	Lens Mount
0.3 M	Mono	120 fps	640 × 480	1/2.9" (4.4 × 3.3)	6.9	C-mount
0.8 M	Mono	60 fps	1024 × 768	1/2.9" (3.5 × 2.6)	3.45	C-mount

Applications

Food & beverages packaging, Electronics, Printing machines, Pharmaceuticals, Vision Guided Robotic System (VGRS), Robot/automated production lines

Machine Vision Platform New

DIAVision

DIAVision enables developers to complete vision application design, development and integration on one single platform. Offering high compatibility with industrial standards and a wide range of built-in Vision Functions, **DIAVision** features high flexibility for value-added vision application software customization.

- Cross-platform - **DIAVision** can operate on Linux and Windows systems
- Web-Based design enables **DIAVision** to run on / with various hardware systems / software
- Compatible with multiple industrial standards and devices, such as GigE industrial cameras, robotic arms, industrial controllers, and more
- Design with abundant graphical components via easy drag-and-drop on the screen
- 100+ built-in Vision Functions, and allows integration of other vision algorithms
- Vision Functions flow and UI designs can be stored and reused for new application development without much effort
- All the assets on **DIAVision** are protected by specific mechanisms to prevent leakage of software design secrets
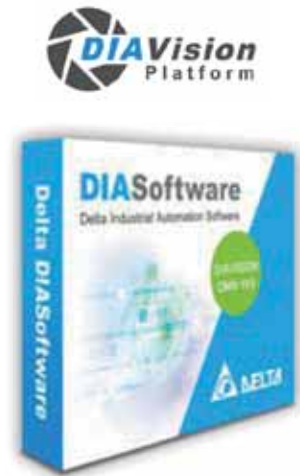
A Friendly Graphical Editor, WYSIWYG
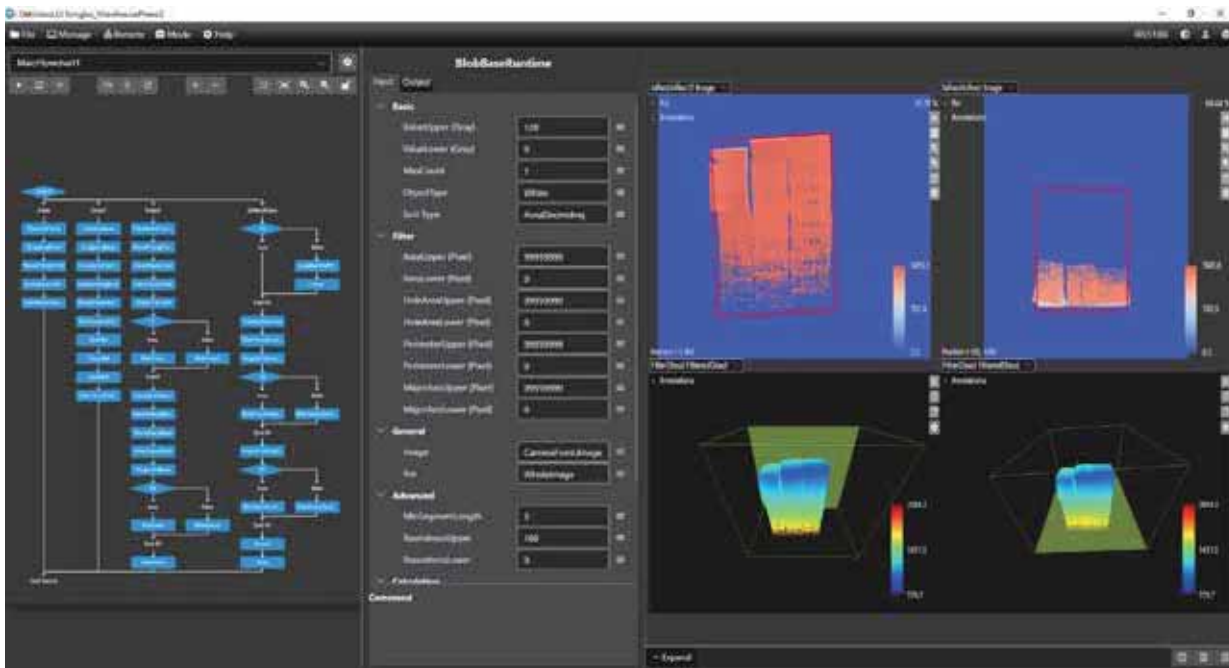
Design   Configure   Image

Industrial Power Supply

DIN Rail Models
Force-GT, LYTE, LYTE II, CliQ III, CliQ M, CliQ VA, CHROME II, SYNC

Force-GT	Model Name	Output Voltage (V)	Output Power (W)
	DRF-12V120W1GBA	12 1-Phase	120
	DRF-12V120W1GTA		120
	DRF-12V240W1GBA		240
	DRF-12V240W1GTA		240
	DRF-24V120W1GBA	24 1-Phase	120
	DRF-24V120W1GTA		120
	DRF-24V240W1GBA		240
	DRF-24V240W1GTA		240
	DRF-24V480W1GBA		480
	DRF-24V480W1GTA		480
	DRF-48V120W1GBA	48 1-Phase	120
	DRF-48V120W1GTA		120
	DRF-48V240W1GBA		240
	DRF-48V240W1GTA		240
	DRF-48V480W1GBA		480
	DRF-48V480W1GTA		480
	DRF-24V120W3GBA	24 3-Phase	120
	DRF-24V120W3GTA		120
	DRF-24V240W3GBA		240
	DRF-24V240W3GTA		240
	DRF-24V480W3GBA		480
	DRF-24V480W3GTA		480
	DRF-24V960W3GBA		960

LYTE	Model Name	Output Voltage (V)	Output Power (W)
	DRL-12V75W1AA	12	75
	DRL-24V75W1AA	24	75
	DRL-48V75W1AA	48	75.36

LYTE II	Model Name	Output Voltage (V)	Output Power (W)
	DRL-12V120W1EN	12	120
	DRL-12V240W1EN		240
	DRL-24V120W1EN	24	120
	DRL-24V240W1EN		240
	DRL-24V480W1EN		480
	DRL-48V120W1EN	48	120
	DRL-48V240W1EN		240
	DRL-48V480W1EN		480

CliQ III	Model Name	Output Voltage (V)	Output Power (W)
	DRP-24V120W1CAN	24	120
	DRP-24V240W1CAN		240
	DRP-24V480W1CAN		480

CliQ M	Model Name	Output Voltage (V)	Output Power (W)
	DRM-24V80W1PN	24	81.6
	DRM-24V120W1PN		120
	DRM-24V240W1PN		240
	DRM-24V480W1PN		480
	DRM-24V960W1PN		960
	DRM-24V480W1SN		480
	DRM-24V480W3PN	24 3-Phase	480
	DRM-24V960W3PN		960

CliQ VA	Model Name	Output Voltage (V)	Output Power (W)
	DRV-24V120W1PN	24	120
	DRV-24V240W1PN		240
	DRV-24V480W1PN		480

CHROME II	Model Name	Output Voltage (V)	Output Power (W)
	DRC-12V030W1RZ	12	24
	DRC-12V060W1RZ		54
	DRC-12V100W1RZ		85.2
	DRC-24V030W1RZ	24	36
	DRC-24V060W1RZ		60
	DRC-24V100W1RZ		91.92
	DRC-48V060W1RZ	48	60
	DRC-48V100W1RZ		92.16

SYNC	Model Name	Output Voltage (V)	Output Power (W)
	DRS-5V30W1NZ	5	15
	DRS-5V50W1AZ		30
	DRS-5V50W1NZ		25
	DRS-12V50W1NZ	12	48
	DRS-24V30W1AZ	24	30
	DRS-24V30W1NZ		30
	DRS-24V50W1NZ		50
	DRS-24V100W1AZ		96
	DRS-24V100W1NZ		91.2

DIN Rail Models
Modules, DVP

Redundancy Module	Model Name	Output Voltage (V)	Output Current (A)
	DRR-20N		20
		24	
	DRR-40N		40

Buffer Module	Model Name	Output Voltage (V)	Output Current (A)
	DRB-24V020ABN		20
		24	
	DRB-24V040ABN		40

DVP	Model Name	Output Voltage (V)	Output Power (W)
	DVP-PS01		24
	DVP-PS02	24	48
	DVP-PS03		120

DC-UPS Module	Model Name	Output Voltage (V)	Output Current (A)
	DRU-24V40ABN		40
	DRU-24V10ACZ		10
	DRU-24V10AMN	24	10
	DRU-24V20AMN		20
	DRU-24V40AMN		40

Battery Module (without battery)	Model Name	Input/Output Voltage (V)	Capacity (A)
	DRN-24V7AAEN	24	40

Industrial Power Supply CliQ M Series Sets for Uninterruptible Systems

Delta integrates its Industrial Power Supply CliQ M Series with the new DC-UPS and battery modules for uninterruptible systems. The integration is set to reduce production downtime during power failures.

Power Supply — DC-UPS Module — Battery Module — Equipment
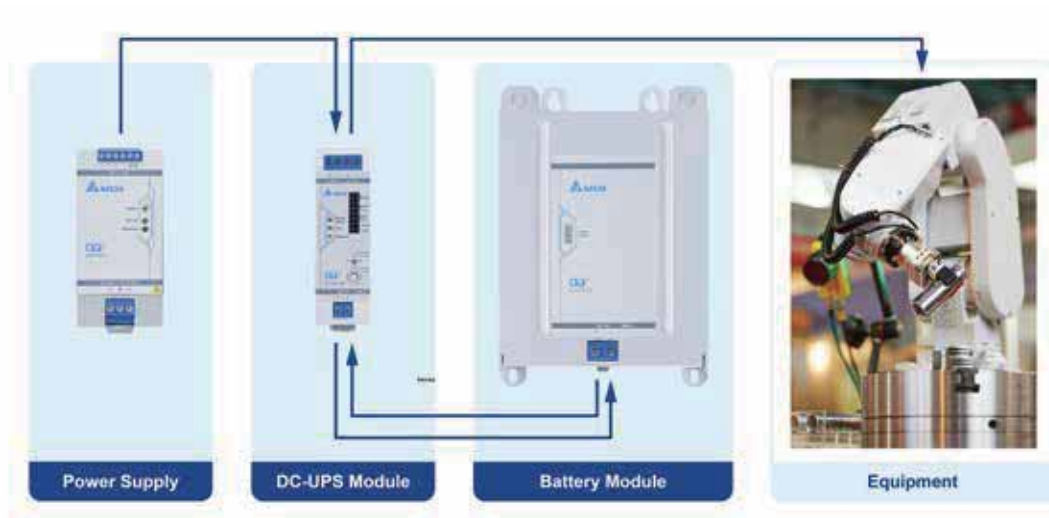
Industrial Power Supply

Panel Mount Models
PMT2, PMC, PMF, PMR, PMU

PMT2	Model Name	Output Voltage (V)	Output Power (W)
	PMT-12V35W2BA	12	36
	PMT-12V50W2BA		50.4
	PMT-12V75W2BA		72
	PMT-12V100W2BA		102
	PMT-12V150W2BA		150
	PMT-12V150W2CA		150
	PMT-12V200W2BM		204
	PMT-12V200W2BR		204
	PMT-12V350W2BM		348
	PMT-12V350W2BR		348
	PMT-15V35W2BA	15	36
	PMT-15V50W2BA		51
	PMT-15V75W2BA		75
	PMT-15V100W2BA		105
	PMT-15V150W2BA		150
	PMT-15V150W2CA		150
	PMT-24V35W2BA	24	36
	PMT-24V50W2BA		52.8
	PMT-24V75W2BA		76.8
	PMT-24V100W2BA		108
	PMT-24V150W2BA		150
	PMT-24V150W2CA		150
	PMT-24V200W2BM		211.2
	PMT-24V200W2BR		211.2
	PMT-24V350W2BM		350.4
	PMT-24V350W2BR		350.4
	PMT-30V35W2BA	30	36
	PMT-30V50W2BA		57
	PMT-30V75W2BA		75
	PMT-30V100W2BA		105
	PMT-30V150W2BA		150
	PMT-30V150W2CA		150
	PMT-36V35W2BA	36	36
	PMT-36V50W2BA		52.2
	PMT-36V75W2BA		75.6
	PMT-36V100W2BA		100.8
	PMT-36V150W2BA		154.8
	PMT-36V150W2CA		154.8
	PMT-36V200W2BM		212.4
	PMT-36V150W2BR		212.4
	PMT-36V350W2BM		349.2
	PMT-36V350W2BR		349.2
	PMT-48V35W2BA	48	38.4
	PMT-48V50W2BA		52.8
	PMT-48V75W2BA		76.8
	PMT-48V100W2BA		110.4
	PMT-48V150W2BA		158.4
	PMT-48V150W2CA		158.4
	PMT-48V200W2BM		211.2
	PMT-48V200W2BR		211.2
	PMT-48V350W2BM		350.4
	PMT-48V350W2BR		350.4
	PMT-D1V75W2BA	12 / 5	73
	PMT-D1V75W2CA	12 / 5	73
	PMT-D2V75W2BA	24 / 5	75.4
	PMT-D2V75W2CA	24 / 5	75.4

PMC	Model Name	Output Voltage (V)	Output Power (W)
	PMC-05V015W1AA	5	15
	PMC-12V150W1BA	12	150
	PMC-12V600W1BA		600
	PMC-24V150W1BA	24	150
	PMC-24V300W1BA		300
	PMC-24V600W1BA		600
	PMC-24V600W1RW		600
	PMC-DSPV100W1A	24 / 5	100
	PMC-48V150W1BA	48	150
	PMC-48V600W1BA		600

PMF	Model Name	Output Voltage (V)	Output Power (W)
	PMF-4V320WCGB	4.2	231
	PMF-5V320WCGB	5	275
	PMF-24V240WCGB	24	240
	PMF-24V320WCGB		320

PMR	Model Name	Output Voltage (V)	Output Power (W)
	PMR-4V320WCAA	4.2	252
	PMR-4V320WDAA		252
	PMR-4V320WDGA		252
	PMR-4V320WDBA		252
	PMR-4V320WDCA		252
	PMR-5V320WCAA	5	300
	PMR-5V320WDAA		300
	PMR-5V320WDGA		300
	PMR-5V320WDBA		300
	PMR-5V320WDCA		300
	PMR-12V150W1AT	12	150
	PMR-12V240W1AT		240
	PMR-12V320W1AT		320.4
	PMR-12V600W1BT		600
	PMR-24V150W1AT	24	150
	PMR-24V240W1AT		240
	PMR-24V320W1AT		321.6
	PMR-24V600W1BT		600
	PMR-36V150W1AT	36	150
	PMR-36V240W1AT		241.2
	PMR-36V320W1AT		320.4
	PMR-36V600W1BT		600
	PMR-48V150W1AT	48	150
	PMR-48V240W1AT		240
	PMR-48V320W1AT		321.6
	PMR-48V600W1BT		600

PMU	Model Name	Output Voltage (V)	Output Power (W)
	PMU-13V155WCBA	13.8	151
	PMU-13V155WCCA		151
	PMU-27V155WCBA	27.6	151
	PMU-27V155WCCA		151

Open Frame Models
PJ, PJB, PJH, PJT, PJU, PJL

PJ	Model Name	Output Voltage (V)	Output Power (W)
	PJ-5V15WBNA	5	15
	PJ-12V15WBNA	12	15.6
	PJ-12V30WBNA		30
	PJ-12V50WBNA		51.6
	PJ-12V100WBNA		102
	PJ-12V150WBNA		150
	PJ-24V30WBNA	24	31.2
	PJ-24V50WBNA		50.4
	PJ-24V100WBNA		103.2
	PJ-24V150WBNA		150
	PJ-48V50WBNA	48	52.8

PJB	Model Name	Output Voltage (V)	Output Power (W)
	PJB-24V100WBNA	24	103.2
	PJB-24V150WBNA		151.2
	PJB-24V240WBNA		240
	PJB-24V300WBNA		300

PJH	Model Name	Output Voltage (V)	Output Power (W)
	PJH-24V300WBBA	V_1: 24 V_{SB}: 5	300
	PJH-24V300WBCA	V_1: 24 V_{SB}: 12	300
	PJH-36V300WBBA	V_1: 36 V_{SB}: 5	300
	PJH-36V300WBCA	V_1: 36 V_{SB}: 12	300

PJT	Model Name	Output Voltage (V)	Output Power (W)
	PJT-12V40WBAA	12 V	40
	PJT-12V65WBAA		60
	PJT-12V100WBAA		100
	PJT-12V100WBBA		80 [A] 100 [B]
	PJT-15V40WBAA	15 V	40
	PJT-15V65WBAA		63
	PJT-15V100WBAA		100
	PJT-15V100WBBA		80 [A] 100 [B]
	PJT-18V40WBAA	18 V	40
	PJT-18V65WBAA		65
	PJT-18V100WBAA		100
	PJT-18V100WBBA		80 [A] 100 [B]
	PJT-24V40WBAA	24 V	40
	PJT-24V65WBAA		65
	PJT-24V100WBAA		100
	PJT-24V100WBBA		80 [A] 100 [B]
	PJT-27V150WBNA	V1: 27 V VSB: 12 V	150

A) Convection
B) Forced Cooling

PJU	Model Name	Output Voltage (V)	Output Power (W)
	PJU-13V60WCAA	V_1: 13.8	60
	PJU-13V60WCBA	B^+: 13.6	60
	PJU-27V60WCAA	V_1: 27.6	60
	PJU-27V60WCBA	B^+: 12.4	60

PJL	Model Name	Output Voltage (V)	Output Power (W)
	PJL-48V200WBBA	48	200
	PJL-48V400WBBA		400

Applicable Series

Building Automation
- Escalators & Elevators
- CCTV Surveillance
- HVAC Control

CliQ III, LYTE, LYTE II, CHROME II, SYNC, PMT2, PMC, PMU, PJT, PJ, PJU

Machine Automation
- Robotic Arms
- Injection Molding Machines

Force-GT, CliQ III, CliQ M, CliQ VA, LYTE, LYTE II, CHROME II, SYNC, PMT2, PMC, PMF, PMU, PJT, PJ, PJB

Renewable Energy
- Wind Turbines
- Solar Tracker Systems

Force-GT, CliQ III, CliQ M, CliQ VA

Process Automation
- Petrochemicals Plants
- Wastewater Treatment
- Oil Refinery

Force-GT, CliQ III, CliQ M, CliQ VA, LYTE, LYTE II, CHROME II, SYNC, PMT2, PMC, PMF, PMU

Test & Measurement
- Spectrum Analyzers
- AC Power Sources
- Oscillators

CHROME II, SYNC, PMT2, PMC, PJT, PJ, PJB

Factory Automation
- Packaging Machines
- Wave Soldering Machines
- Conveyor Systems

Force-GT, CliQ III, CliQ M, CliQ VA, LYTE, LYTE II, CHROME II, SYNC, PMT2, PMC, PMF, PMU, PJT, PJ, PJB

LED Lighting
- Stage Lighting
- Digital Signage Solutions

PMC, PMF, PMR, PJL

Household Appliance
- Coffee Machines
- Vending Machines
- Self-service Kiosks (SSKs)

CHROME II, PMT2, PMR, PJH

NELTA

Robot

Articulated Robot
DRV

**Automation for
Smart Manufacturing**

	DRV70L	DRV90	DRVA1/A4L7	DRVA41/A4LC New
Max. Working Range	710 mm	900 mm	1,111/1,411 mm	1,183/1,419 mm
Max. Payload	7 kg	7 kg	7 kg	12 kg
IP Rating	IP40, IP65	IP40, IP65	IP65	IP54 (wrist IP65)

Hollow-Wrist Design

- No Hollow Design

  Tangled wire/cords
  lead to equipment
  interference

- Hollow Design

  Enhanced
  reliability of
  extension
  wire/cords

High Flexibility/
Multiple Installations

- Max. working range:
  710 mm ~ 1,411 mm enhances
  manufacturing flexibility

- Desk-mount/wall-mount/
  ceiling-mount installation
  fulfills various application
  needs

Simple and User-Friendly Operation Interface

- **DRAStudio** Robotic Automation
  Studio software system

- Intuitive user interface

  - Real-time equipment data
  - Dynamic-link library
  - Self-defined user I/O
  - Optimized parameters

  - Complete tuning
    function
  - Easy backup with
    one click

System Configuration

Ethernet

Extensions: up to 8 stations
DMCNET (Applies Servo Drives ASDA-A2 Series: Max. 4 axes of control + 4 Digital I/O)

PC

Indicator Lights   Push Buttons

Machine Vision System
DMV3000G

RS-232/485

Robot Controller
DCV

AC Servo Drives + AC Servo Motors
ASDA-A2 + ECMA

Digital I/O
Modules

Ext. Axes

Ext. Encoder

Indicator Lights
Push Buttons

Teaching Pendant
DTV

Safety

Safety
Fencing

Area Sensor
AS

Articulated
Robot
DRV

Applications

Pick-and-place, Load/unload, Assembly, Insertion, Inspection, Screw-driving

SCARA Robot
DRS

High Repeatability, High Precision, Outstanding Linearity and Verticality

Max. Working Range: 800 / 1,000 mm
Max. Payload: 22 kg

Max. Working Range: 300 ~ 800 mm
Max. Payload: 3 / 6 / 12 kg

DRS80 / A0LM **New**	DRS40 / 60 / 80L Series			
	Standard Model		**Special Model**	
	Arm Length	Payload		
	• 300 ~ 600 mm	• 3 kg • 10 kg	• Number of Axis: 3 axis / 5 axis / ceiling mounted	
	• 500 ~ 700 mm	• 6 kg • 12 kg	• Arm length: 600 mm	
	• 600 ~ 800 mm			

- Cycle time: 0.42 s / 0.45 s (2 kg)
- Repeatability:
  ±0.025 mm (J1 + J2)
  ±0.01 mm (J3)
  ±0.01° (R axis)

Optimizes Operational Efficiency

- Safe operation, enhances operational stability
- Outstanding dynamic display for operational efficiency and intelligent control
- Smart temperature control, real-time control of working environment

Intuitive Teaching Methods with Versatile Control Approaches

PAD   HMI   Teaching Pendant   PC

On-the-Fly & Conveyor Tracking

- Easy and flexible conveyor tracking
- User-friendly template guidance
- On-the-fly function provides outstanding positioning to shorten cycle time and enhance productivity
- Integrates with Delta's IA products for a total solution

Sensor-Less Compliance Control Function

- Compensates for the deviation between workpieces and insertion holes
- Fast and precise smooth insertion
- Enhances assembly and production performance
- Insertion performance may differ depending on workpiece hardness
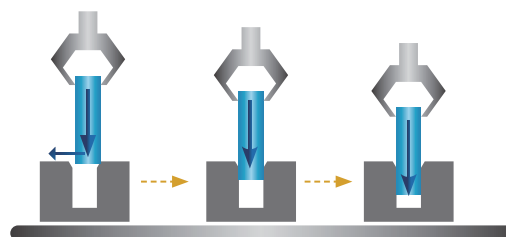
Real-Time Information Monitoring and Collection

- Robot machine data monitoring and analysis
- Oversees real-time machine operation data
- On-site production information acquisition

Equipment IoT Platform
DIALink

Arch Motion Control

- Route optimization
- Saves motion time
- Quick and easy setting
- Optimizes arch route setting, fast operational speed
- Prevents crash when near the top or edge of robot route planning

General
Arch Motion
P2   P3
Optimized
Arch Motion
h1 h2   Obstacle   h3
P1   P4

DELTA
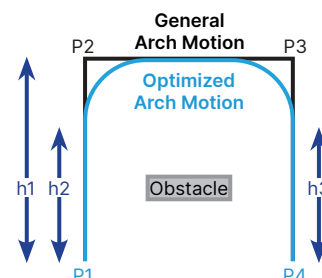
Robot

Robotic Simulation Platform
DRASimuCAD

One Software Provides Workstation Design, Simulation and Operation Path Generation, Saving Setup Time and Boosting Introduction Efficiency

- Simulates the actual workflow and operation environment, allowing real 3D models to be imported to pre-assess the rationality of the robot and peripheral equipment settings
- Pre-inspects robot abnormalities, detects collision and operation range limitations, saving teaching time and reducing errors when introducing the robot into applications
- Auto-generates path simulation and creates robot project for fast workflow design and programming to enhance efficiency

Modeling (CAD)

- Complete 3D CAD design capabilities
- Built-in Parasolid and ACIS Dual-Core for mainstream CAD formats support, resolving the splitting image issue when importing/exporting image files
- Built-in robot, tool and application device library for easy drag and drop; preset actions links for fast simulation system establishment
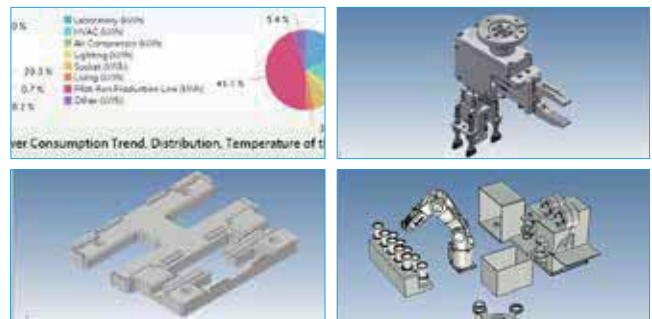
Virtual Robot Simulation

- Collision Detection
  - Predicts any collision under operation
  - Pre-inspects the operation range settings to eliminate repeated modification
- Offline Programming
  - Direct robot programming in robot language (RL)
  - Same interface with DRAStudio, allowing teaching points, setting coordinate system (user frame / tool frame) and creating a robot project
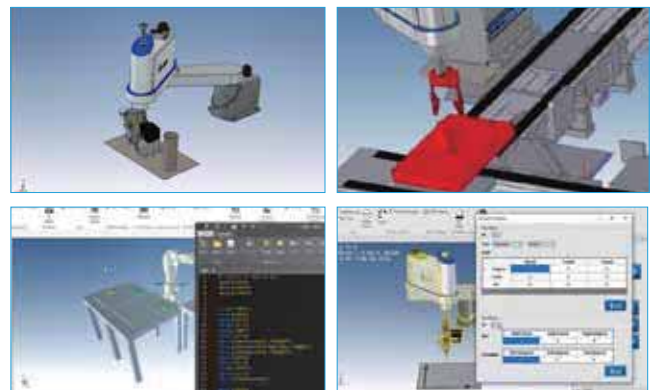
Path Generating (CAM)

- Auto-generates processing path and is combined with visual features for fast simulation

Applications

Conveyor belt dynamic processing simulation, Deburring, Sole gluing, Remote TCP

Smart Screwdriving System

Transducerized Smart Screwdriver
ECM-SD3

» **High-resolution position feedback encoder**

» **High precision torque sensor signals directly fed to the full closed-loop control**

» **Low cogging torque of the AC servo motor**

• Indicator light signals screwing status

• Front LED light eliminates shading during operation

• Easily mounted on robots and equipment with a coupling

Smart Screwdriving Controller
ASD-SD3

» **Dual-spindle control for higher efficiency**

» **Enables dual-spindle synchronization and separate operation**

• 10.1 inch large screen displays the results of both drivers at a time

• Large memory capacity stores more than 20,000 results

System Features

• Controls two screwdrivers with just one controller

• Stores up to 500 sets of model configurations and 500 screw parameters

• Manufacturing data can be retained at a local machine or uploaded to a manufacturing execution system

• Provides multiple control modes, including torque, angle and seating points control

• Sets two screwdrivers to operate synchronously or at different intervals to meet different needs

• Analyzes defects causes such as stripping, or tilted screws to continually optimize quality

• Ensures implementing the correct screwdriver and processes in operation to prevent resource waste and enhance yield rate

System Structure

MES

PC

PLC

HMI

Modbus TCP

Modbus RTU

USB / D-sub

Peripherals EQ

Barcode Scanner
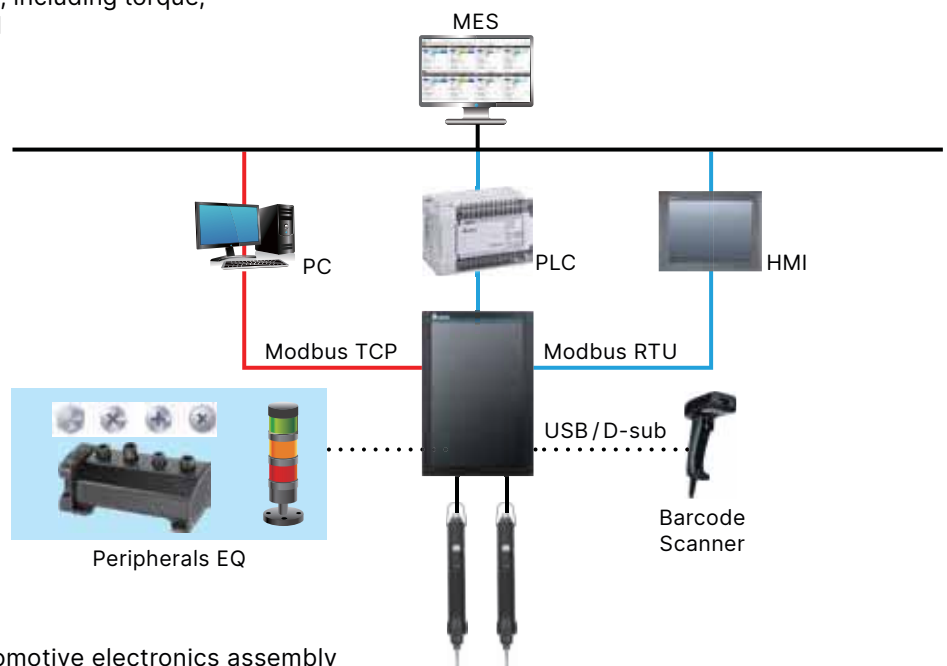
Applications

Electronic product assembly, Automotive electronics assembly

Manufacturing Equipment

Electric Servo Press
AM-ESP S / AM-ESP E / AM-ASP F

Features flexible speed control of the stroke and downforce based on process requirements, meeting the rapid, flexible, and mixed-line production demands of the electronics manufacturing industry. It can enhance processing quality, reduce errors and losses caused by poor pressing, and thereby save unnecessary costs for customers. In addition, the electric cylinder servo press saves material costs without the need for traditional press components such as flywheels, pneumatic cylinders, press motors, and clutches, saving material costs and reducing pollution. This accomplishes high efficiency and energy saving for diversified markets

Standard Type   Cylinder Type   Cylinder Type

	S Series	E Series	F Series
Force	500~5,000 kgf	100~5,000 kgf	100~5,000 kgf
Stroke	100 / 250 mm	100 / 200 / 300 / 400 mm	100 / 200 / 300 / 400 mm
Features	Adopts a cast base with integral design, and combined with Delta components, it possesses high dynamic load capacity.	Satisfies industry demands, compact size, user-friendly interface, hassle-free implementation	Provides a high-rigidity structure, autonomous I/O control, and analysis of statistical data
Advantages	Features rapid mold change capabilities to accommodate small-volume large variety. It also includes the recording of process data during operations for statistical analysis and integrates mechanisms relevant to MES (Manufacturing Execution System) usage.		

Multiple Control Modes: Control for Swift Determination of Quality

Various control modes for specific pressing positions and forces to control the pressing stroke, minimize defects and enhance production efficiency

• Position Mode / Force Position Mode

• Force Mode / Force Distance Mode

• Distance Mode / Multiple Modes

In addition, incorporating dynamic frame mode (geometric constraints) enables real-time monitoring and recording. This facilitates monitoring processes, confirming details, and ensuring quality control

DIAServoPress Software for High Efficiency [Optional]

• Real-time monitoring on pressing status

• Real-time display of pressing curves and status, sensor values, and statistics

• Production visualization (productivity, yield rates, and more) to enhance management efficiency

Remote Control for Fast Execution

• Data upload to the manufacturing execution system (MES) via the built-in Ethernet communication for efficient and remote management, recording and analysis

Applications

Vehicle charging devices, Metal parts, Electronic & electrical appliance components, Industrial robots

Automated Smart Equipment

For equipment requirements in industries such as electronics assembly, semiconductor, and passive components, corresponding to odd-form insertion, AOI, and CMC winding in production line processes, Delta provides high-efficiency, high-precision, and highly reliable product solutions.

Features and Advantages

- Highly stable equipment operation, leading to enhanced product yield
- Real-time monitoring and alarms
- Reduces labor costs and production expenses

- Supports MES connectivity, real-time uploading of production information
- Save on material and equipment energy consumption
- Achieves rapid line changeovers

Delta Smart Equipment				
Industry Solution Pack	Electronics Assembly		Main Process Equipment	Odd-Form Insertion	
	Semiconductor			AOI	
	Passive Component			CMC Winding	

Smart Equipment List

Electronics Assembly

- Auto Insertion
- Router
- Labeling
- Screw Driving
- Glue Dispensing
- Conveyor Integrated Glue Dispensing

- AOI
- Appearance Inspection
- Transfer
- Board Inverter
- Lift Carrier
- Feeding
- Soldering

- Stringing & Bending
- Auto Packing Line
- AS/RS

Semiconductor

- Wafer Sorter
- Wafer Edge Grinding
- Wafer Edge Profile Measurement
- Pinhole Inspection

Passive Component

- Winding
- Power Inductor Winding
- Six-Sided Inspection
- Substrate Inspection
- 7″ Taping & Labeling
- 13″ Reel Tape Labeling
- Testing & Packing

Smart Machine Suite

DIAStudio iD

Save Time and Bring Convenience to Your Design

DIAStudio is an integrated engineering platform designed for machinery system development.

To simplify and reduce the time required, tasks such as product selection (Delta's HMIs, PLCs, servo drives and motors, AC motor drives), PLC programming, parameter setting, machine commissioning, and HMI integration can all be executed smoothly on one platform with DIAStudio key tools.

iD **DIAStudio**
Smart Machine Suite

DIASelector Product Selection

- Provides a desktop (Windows), web, and app-Based (Android & iOS) mechanism for quick product selection

DIADesigner Programming and Configuration

- Provides an integrated environment of controllers and terminal equipment for project management, IEC61131-3 programming and parameter setting, adjusting and monitoring, allowing users to quickly implement complex industry applications

DIADesigner-AX Motion Controller Programming

- Supports Delta's new generation motion controller (AX series) based on IEC 61131-3 programming with a large number of built-in application commands and a powerful motion control library

DIAScreen HMI Programming

- Provides wizards for configuration, communication, user interface design, and variable tag sharing with DIADesigner and DIADesigner-AX

Applications

Automated equipment: Electronics manufacturing, Labeling, Food packaging, and Textiles machines

DIASelector **Product Selection**

Quick & Smart Selection Tool

Easy product selection with specifications, patterns and key words to select Delta's controllers, servo drives, motor drives, sensors, and HMIs for various automation projects.

- Desktop (Windows), Web, and Android / iOS versions are available
- Smart selection wizard for efficient product selection
- Integrated product information and up-to-date data
- Data sharing with EPLAN
- Collaborate and share on cloud, work across team

Product Selection / Search / Filter

Product Comparison
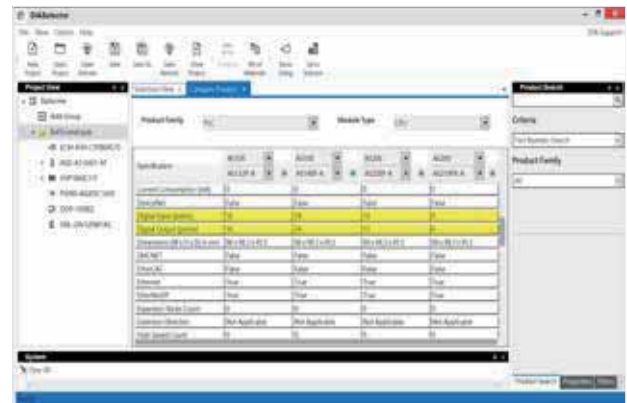
Smart Wizard

Servo Sizing

Friendly model selection by application scenarios for 8 servo types

Other Features

- Product information (catalogs / manuals) for download
- Compatible accessories recommendations
- BOM list generation based on projects and sharing by email

Smart Machine Suite

DIADesigner PLC Programming and Configuration

Integrated Development & Engineering Software

Provides a programming environment for machine system developers to enhance system configuration and development efficiency.

- Manages multiple products in one project:
  - PLCs / AC servo drives / AC motor drives
- Project management interfaces:
  - Basic view for beginners
  - Advanced view for advanced users
- Programming:
  - Compliant with IEC 61131-3 standards
  - LD, ST, SFC, CFC

- Intuitive network and hardware configuration
- Commission: Oscilloscope / Parameter / Servo Tuning
- Data management
- One wire communication
- Library manager
- **DIACloud** communication

User-oriented Project Management

Basic designer view:
Wizard Design for operation guidance

Advanced designer view:
Complete functions via menus

Supports IEC61131-3 Standard Programming Language

Ladder Logic

ST Structure Text

Sequence Function Chart

Intuitive Topology Configuration

Commissioning Tool
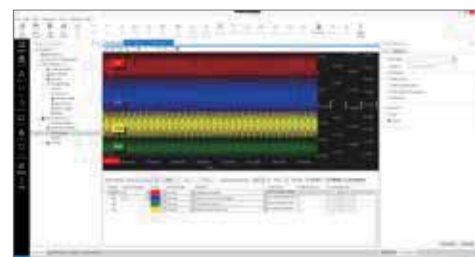
DIADesigner-AX Motion Controller Programming

Motion Development & Engineering Software

DIADesigner-AX is the IEC 61131-3 programming tool for Delta's new generation motion controller. It offers built-in commands and a powerful motion control function library. Multilingual function and a user-friendly interface create an efficient development environment.

- IEC 61131-3 programming tool for Delta's new-generation motion cotroller AX Series
- Built-in commands and a powerful motion control function library
- Open and modular platform allows secondary development of customized functionalities and components by users from different industries
- Motion control programming based on standard PLC open motion control
- Easy tag sharing between **DIAScreen** and AX Series Controllers

Electronic Cam

- Provides E-Cam synchronous control function
- Graphic interface for programming E-Cam curves
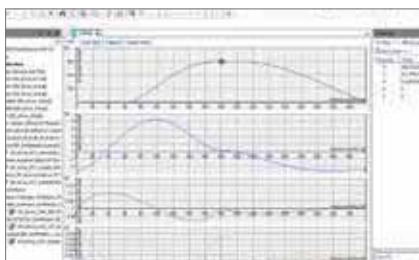
Multi-Axis Function Block

- Motion control using IEC 61131-3 function blocks

DIAScreen HMI Programming

Intuitive Visualization Software

User-friendly HMI programming software for DOP-100 and TP Series

- Abundant elements and smooth animation
- Advanced alarms
- User authority management
- Integrates HMI and text panel software functions and user interface for consistent UX
- Tag sharing between projects on **DIADesigner** and **DIADesigner-AX**

Tag Sharing

Compatible with HMIs and text panels

Interface unity

DOP Series

TP Series
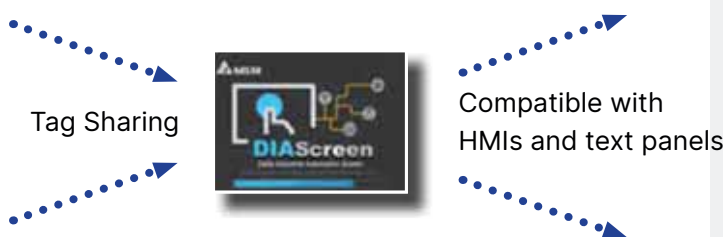
Delta Smart Manufacturing

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

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

Management

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)

Control

OT

Soldering | Conformal Coating | PCB Router | Function Testing | AOI

PCB Processing | **Assembly / Testing / Packaging**

ICT | Reflow Oven | Laser Marking | Burn-in

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

| Machine / Line Simulation | Machine Recipe Import |

Virtual

| Concept Design | Virtual Machine Construction | Pre-Planning Production Parameters | Virtual Machine Commissioning (HiL) |

Physical

Digital Asset — Machine Parameter Optimization — Parameter Optimization — Virtual-Physical Integration
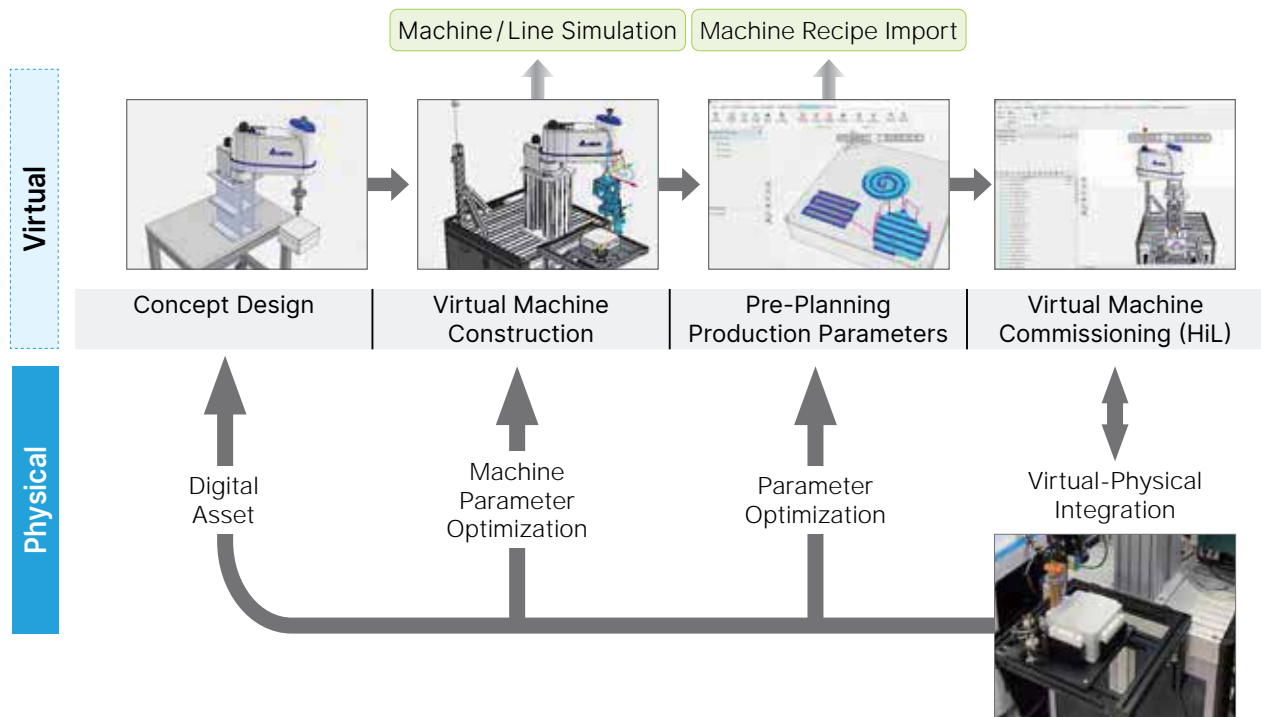
System Functions

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

Smart SCADA

SCADA System
VTScada

Remote Real-time Monitoring for Factories

- Integrated architecture with one-time installation
- Diverse Driver Library with 100+ industry standard and proprietary protocols
- Built-in Historian database, no extra cost or configuration
- Achieves IEC-62443-4-1-ML 2 cybersecurity certification
- VTScada Thin Clients enables remote access from anywhere
- Instant-built intuitive screen with 200+ widgets, 4000+ graphics, and 3D pipes

System Structure

HVAC	Electric Vehicles AC Charger	Energy Storage System	CCTV	Regenerative Energy	Plants Watering	Elevator	Production Management	Lighting	Access Control
BACNet/IP	OCPP	CANbus	TCP/IP	Modbus TCP					
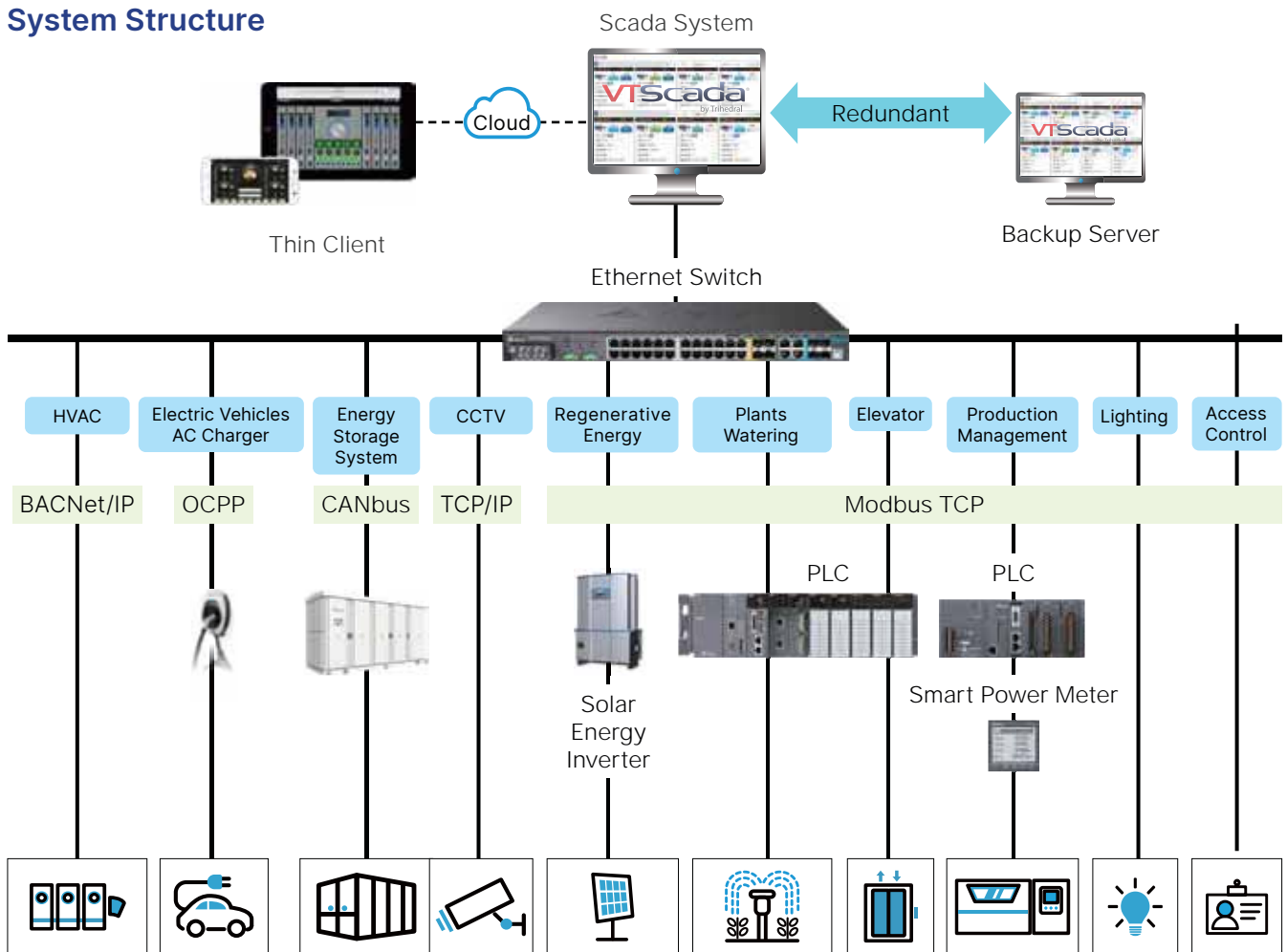
Applications

Water & wastewater treatment, Oil & gas, Chemicals, Electronics manufacturing, Food & beverages

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

DIAEnergie
IEMS

DIAView
SCADA System
(Standalone version)

DIAView
SCADA System
(C/S version)

DIAView
SCADA System
(Web version)

Ethernet

Ethernet Switch
DVS-110W02-3SFP

Fiber Ring

Ethernet

PLC
AH500

Slim PLC
DVP20SX2

Slim PLC
DVP-12SE

HMI
DOP

Fan / Pump
Vector Control
Drive
CP2000

Temperature Controller
DT3

Smart Power Meter
DPM-C530

Air Compressor System

Water Treatment

HVAC System

Power System

Lighting System

Production Workshop

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
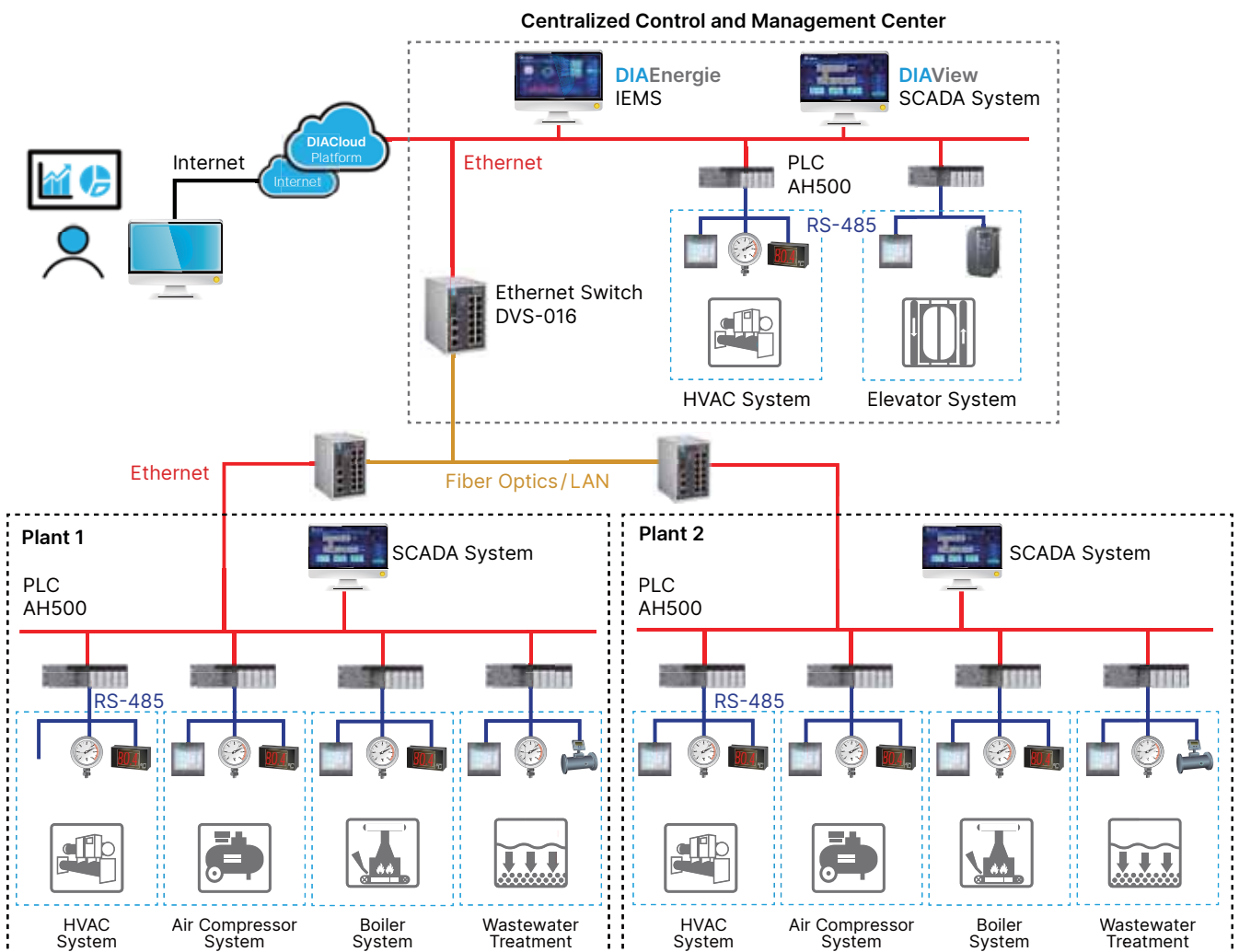
Applications

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

OT Data					
Process	Sound	Vibration	IIoT Device	Asset	Energy

Protocols				Data storage and backup			AI management module		
OPC UA	Web API	MQTT	Modbus	mongoDB	SQLite	SQL Server	Node-RED	SELDON	docker

Provides data Integration to continuous production lines; AIoT applications

Optimizes data structures for continuous production lines

AI model interface for easy management
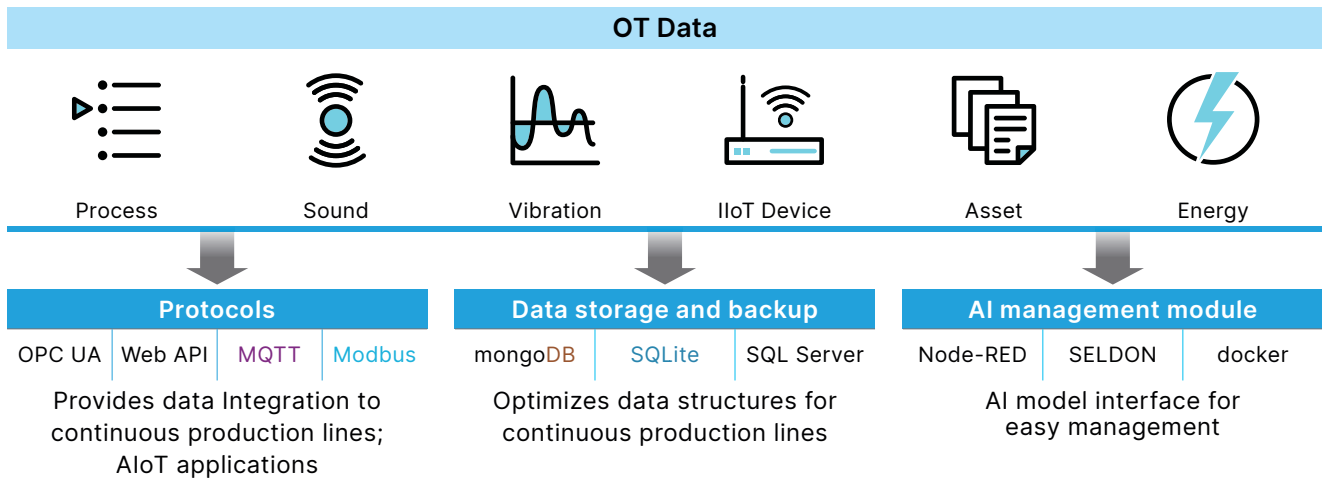
Applications

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
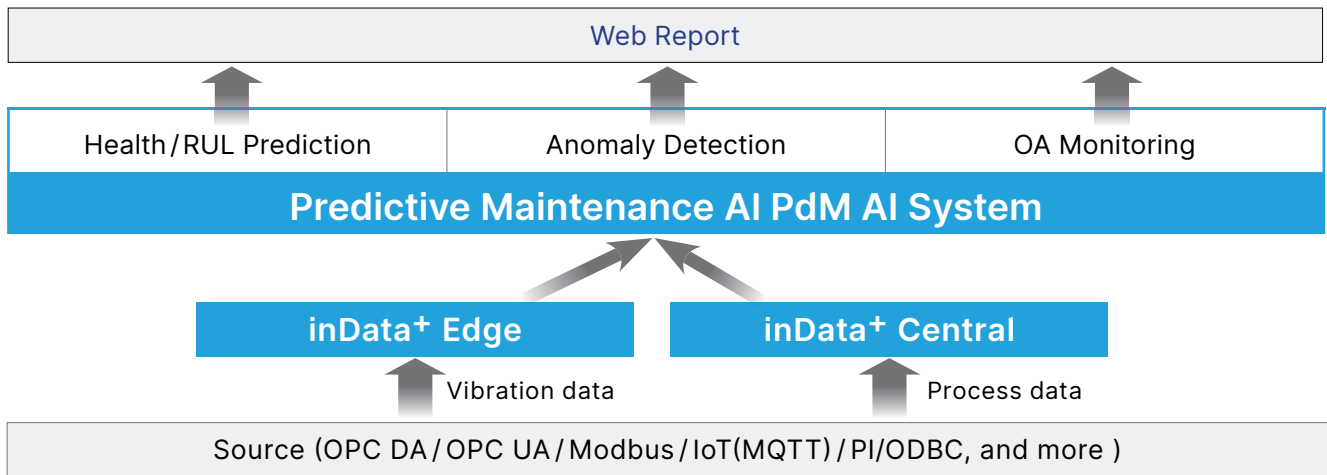
Web Report

Health / RUL Prediction	Anomaly Detection	OA Monitoring

Predictive Maintenance AI PdM AI System

inData⁺ Edge	inData⁺ Central

Vibration data   Process data

Source (OPC DA / OPC UA / Modbus / IoT(MQTT) / PI/ODBC, and more)

Applications

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

Petrochemical

Steel

Fiber / Textile

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Data Mining Module ^{New}
Miner$^+$

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
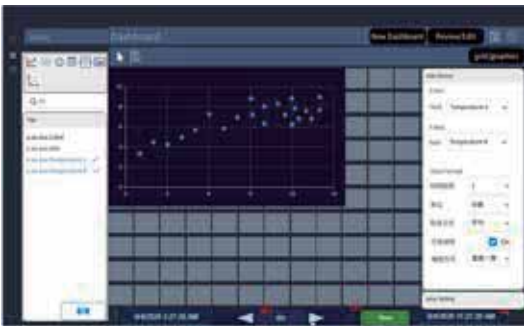
Visualized dashboard

- Enables users to integrate data sources from the inData$^+$ Data Integration Platform to achieve process improvement, equipment operation tracking, and process status monitoring
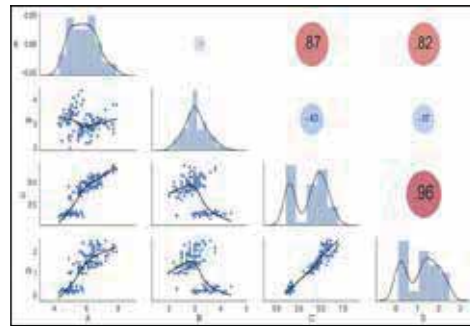
System Structure
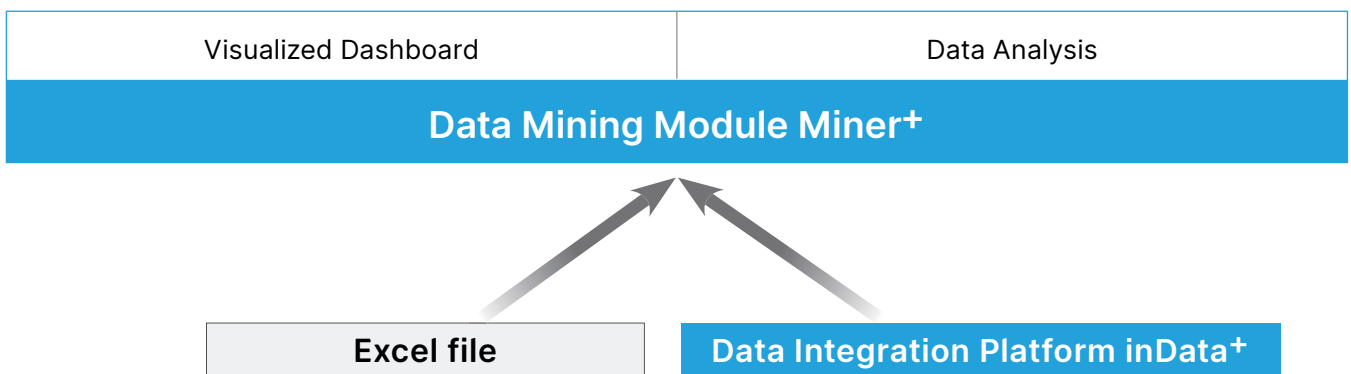
Visualized Dashboard	Data Analysis
Data Mining Module Miner$^+$	

| **Excel file** | **Data Integration Platform inData$^+$** |

Applications

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

Petrochemical

Steel

Fiber / Textile

DELTA

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
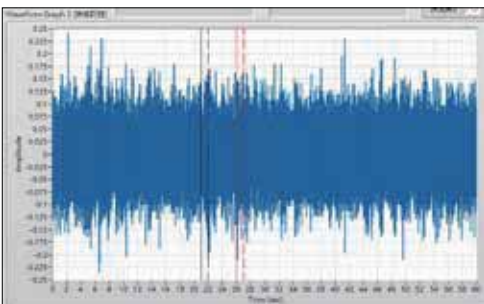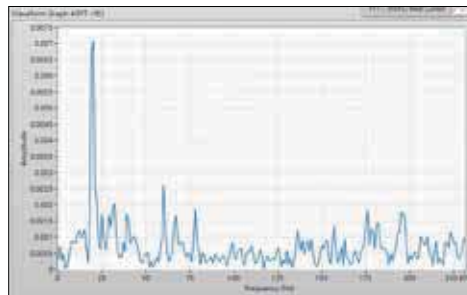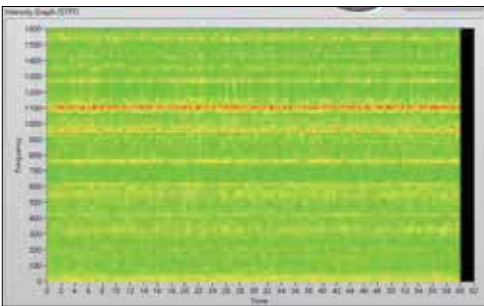
Applications

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

DIAWorks Series services: DIAEMS, DIAAMS, DIARMS...
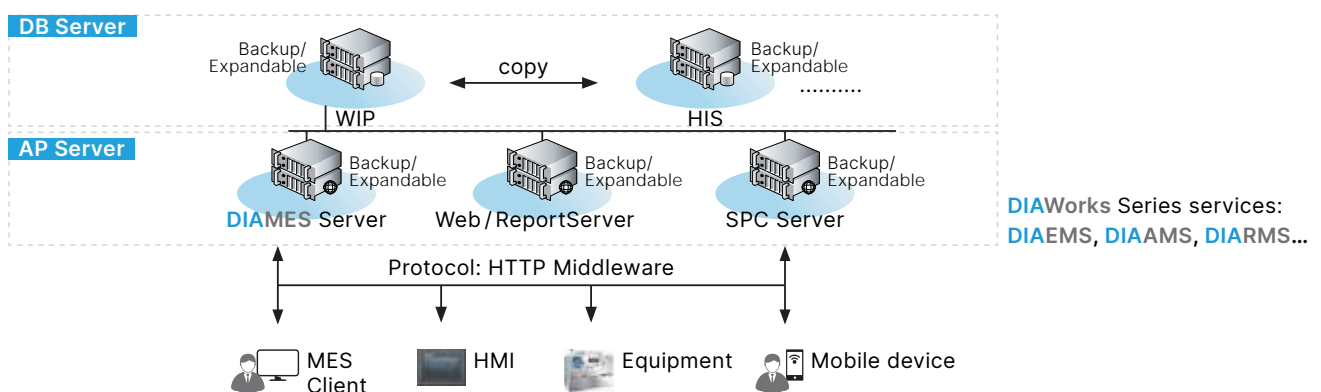
Applications

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
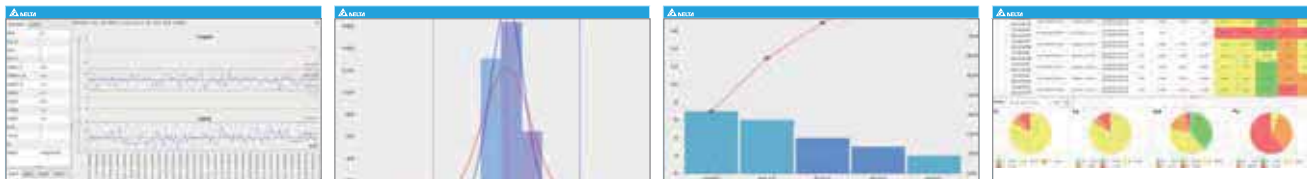
| Control Chart | Histogram | Pareto Chart | CPK Report |

System Architecture
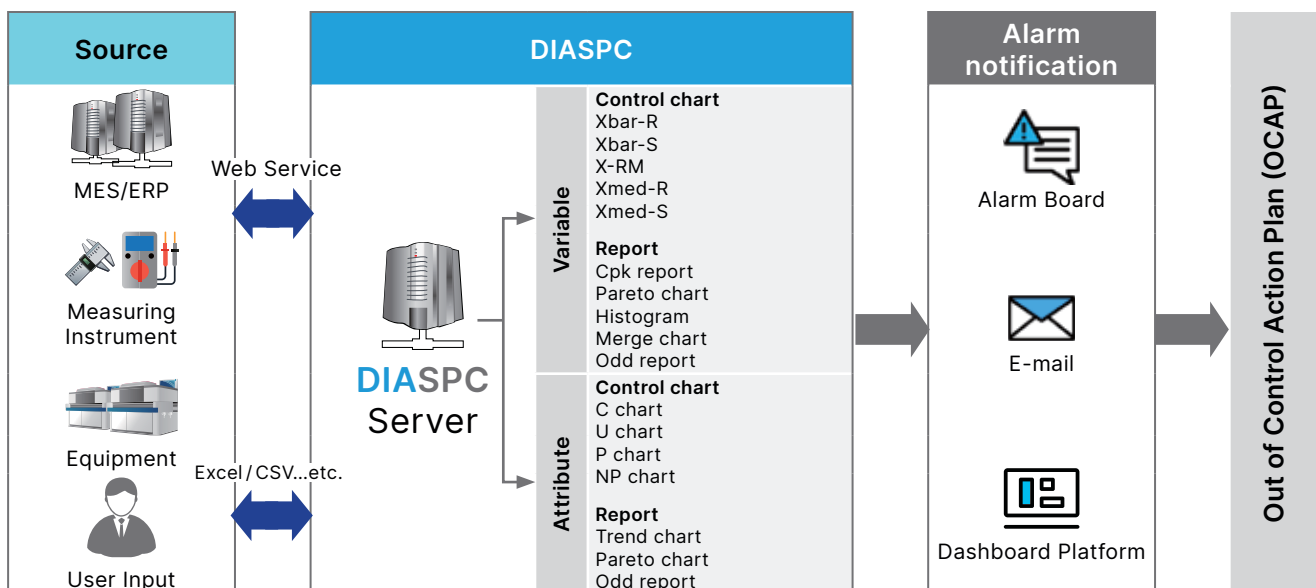
Alarm Management System

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

Source	DIAAMS	Alarm Channel
Information	Mail Server	E-mail
Equipment	SMS	WeChat / Line
User Input	Mobile Device	VoIP / SMS
	Third Party Channel	App
	Notice Server	

DIAAMS Server — Web Service
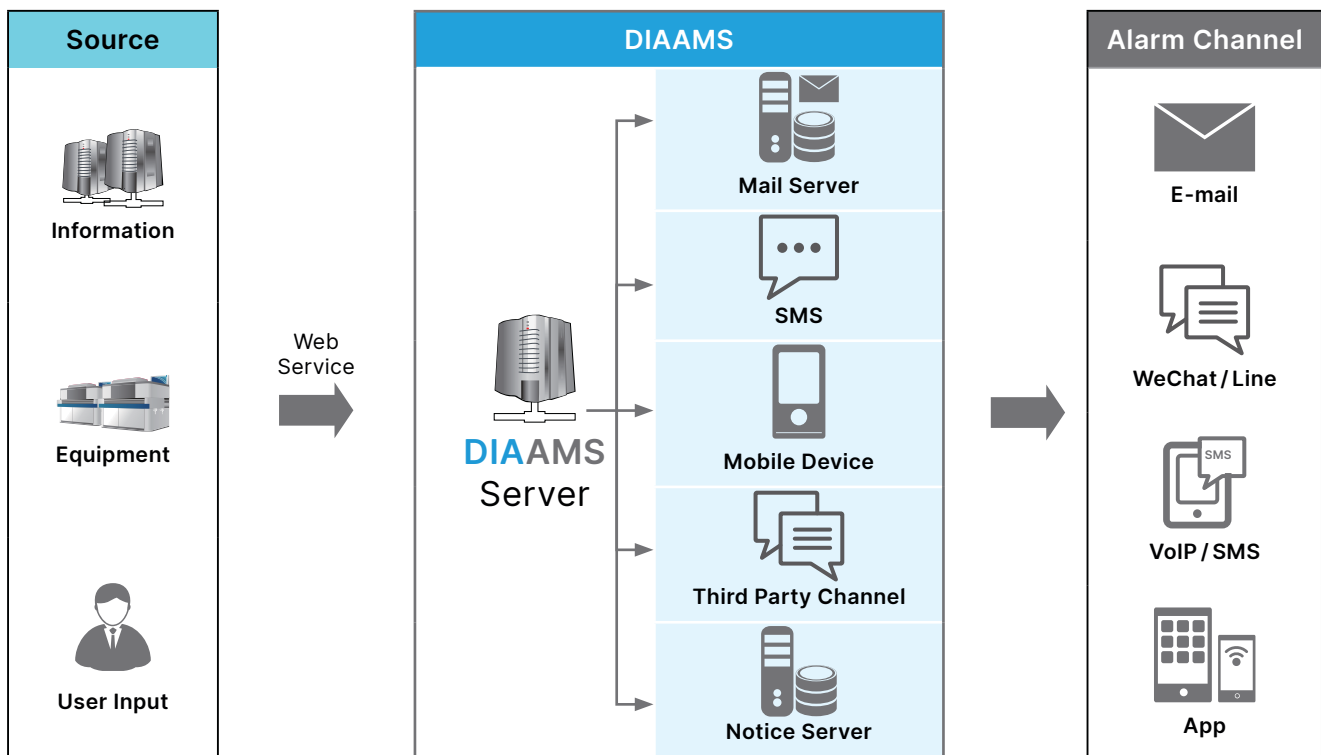
System Functions

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

Multiple notifications
- Maintenance notice
- Repair notice
- Life prediction notice
- Alarm notice

Delta Equipment Management System

Preventive maintenance management	Part stock management
Fault maintenance management	Equipment activation analysis
Predictive diagnosis analysis	PM, repair, inspection on mobile device
Real-time monitoring system	

OEE Report

PC / Mobile

Electronic PM, repair, inspection data registry

Interface

System

MES SCADA

Supports main protocol, such as OPC, Modbus, EtherNet/IP, SECS, CCLink, MQTT, PROFINET

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

Data Source

FAB 1/2/3...
MES DB

Oracle / SQL DB

WMS / EAP / Other
Information
Systems

DB
Connection

Smart Visualization Platform

DIASVP
Server

Production
Information

Quality
Control

Equipment
Status

Logistics and
Inventory

Data Presentation

Report

Dashboard

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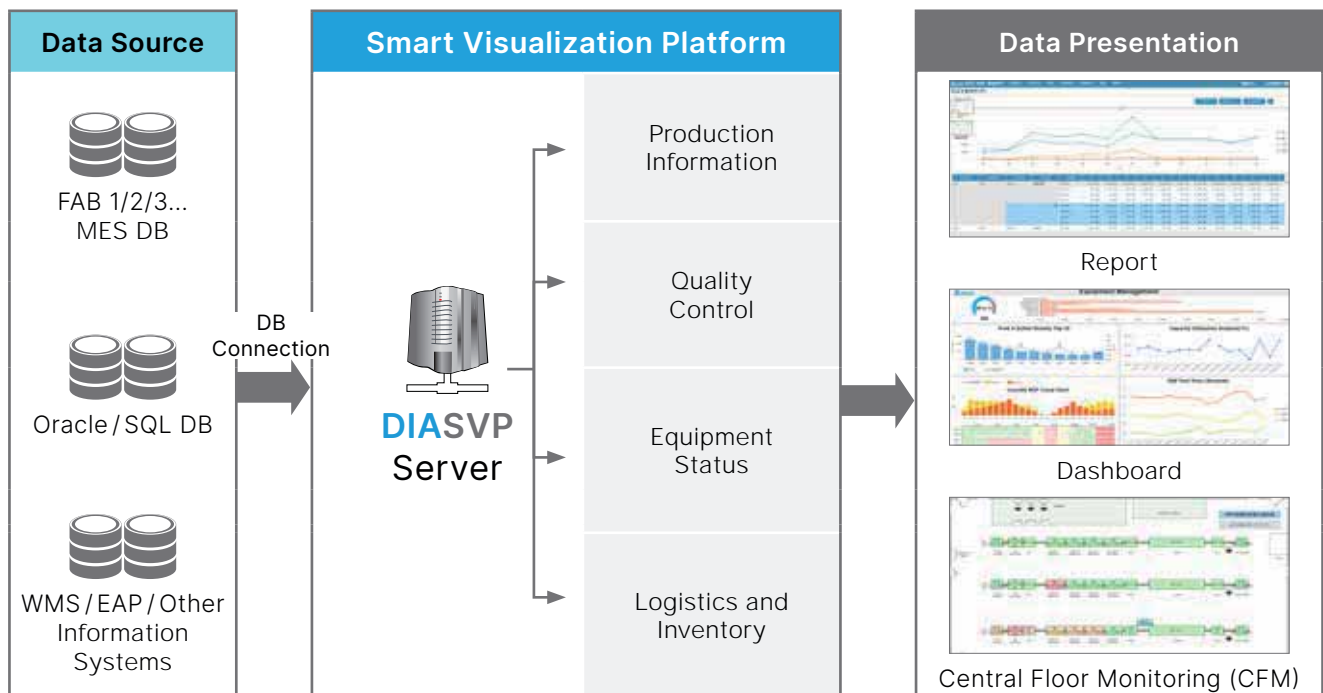
The Central Floor Monitoring (CFM) provides a clear overview of production progress and resource utilization

- 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

| Application | War Room | Big Data Analysis | Machine Learning | Model Training |

Equipment Automation Program
DIAEAP⁺

Structured data				Unstructured data			
Config	Status	Log	Alarm	Image	Audio	Video	Special Format
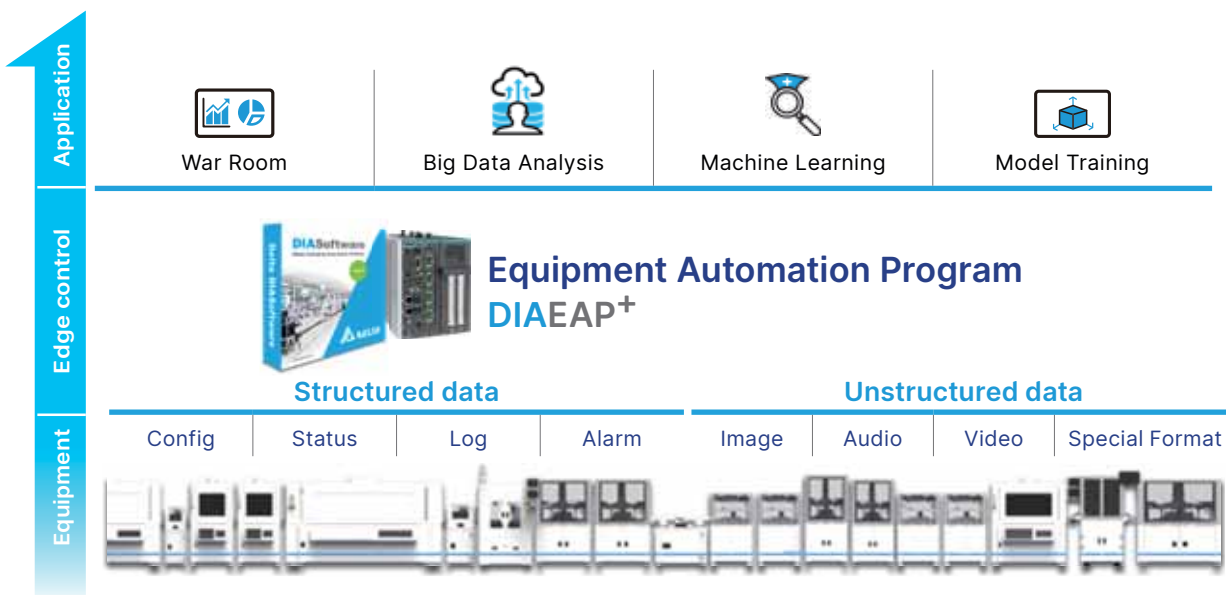
System Functions

| Production Monitoring | Centralized Monitoring | Data Intelligence | Issue Tracking | AI Services |

Applications

Printed circuit boards, Electronics assembly, Electronic components

Equipment Automation Program

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

Lack of Material/ Drop Material Warning	Alarm	War Room	Product Quality Control	Production Status Monitoring	Production Process Control

Data collection

Real-time monitoring

Process anti-jump

Automatic track adjustment

Equipment Automation Program

DIAEAP-EAS

(Equipment Automation Program - Electronic Assembly)

PLC Comm.	IPC CFX	Modbus	OPC UA	MQTT	RabbitMQ	SAMBA	{ REST : API }

Data collection

Equipment control

System Functions

Production Monitoring	Parameter Management	Production Data Collection	Issue Track	WIP Management

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DELTA

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

On-site Production Visualization Interface	Production Information System Analysis	Backend Analysis Operation System

Equipment Automation Program for Injection Molding Manufacturing Applications DIAEAP-IMM

Injection Molding Controllers
For Hybrid Type | For Electricity Type

Injection Molding Machine

Industry Applications

IMM Data Visualization	IMM Wizard Parameter Predict

Digitization of manufacturing information

Data format transfer module

Data collection

MQTT	Modbus	OPC UA	Restful API

Programmable Logic Controller / Gateway

Injection Molding Machine

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

Production / Equipment Visualization	Production Status Alarm and Monitoring	Edge Computing Applications

Intelligent Precision Machining Monitoring Platform DIAEAP-PMM

Equipment IoT Platform DIALink

MES   ERP

RabbitMQ, MQTT, Web API...

Industry Application

Turning / Grinding / Milling / Machine Process	Domain know how of Precision Machining Industry

Digitization of manufacturing information / Data Management / Data Collection

Intelligent Precision Machining Monitoring Platform DIAEAP-PMM

Delta Equipment IoT Platform DIALink

System Functions

Production Monitoring	Parameter Management	Production Data Collection	Issue Tracking	WIP Management

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

Host

SECS / GEM

SECS-I or HSMS

DIASECS Driver	DIASECS-GEM Library
DIASECS-GEM Runtime	DIASECS-GEM Box

Equipment

SECS / GEM gateway

PLC
Delta, Mitsubishi, Omron, Siemens PLC

Serial / Ethernet

DIASECS-GEM Box
SECS / GEM gateway

SECS / GEM
SECS-I / HSMS

Host
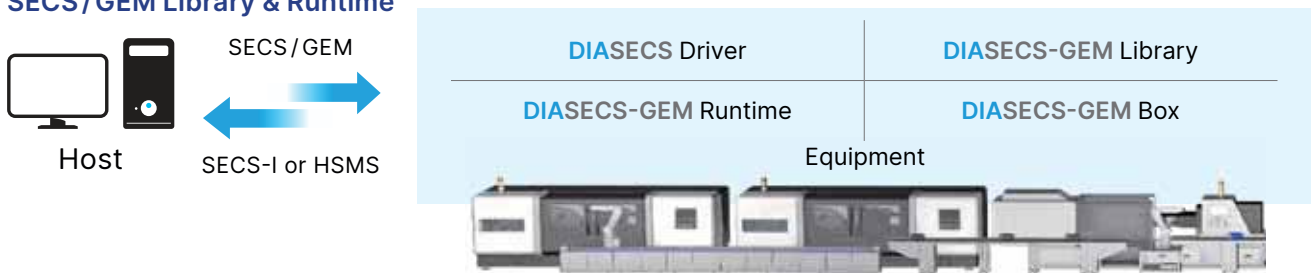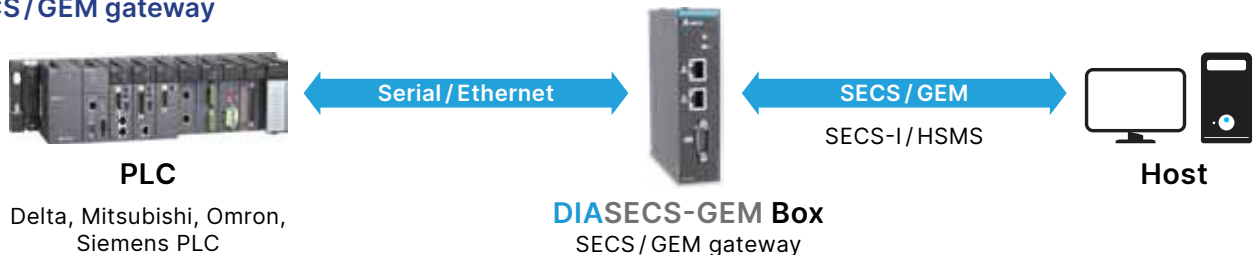
Software Architecture
DIASECS-GEM RunTime

Host

SECS / GEM

Equipment Template

DIASECS-GEM Runtime

No Codes Required (Built-in)

DIASECS-GEM Library

GEM Data Format Model		
State Models	Communication	Data Collection
	Control	EQP Constants
Spooling	Clock	Event Report

DIASECS Driver

SEC-II Message Compiler	
SECS-I Driver	HSMS Driver

Function Module

Log
I/O
Monitoring
Operation
User Interface
CommPLC Driver
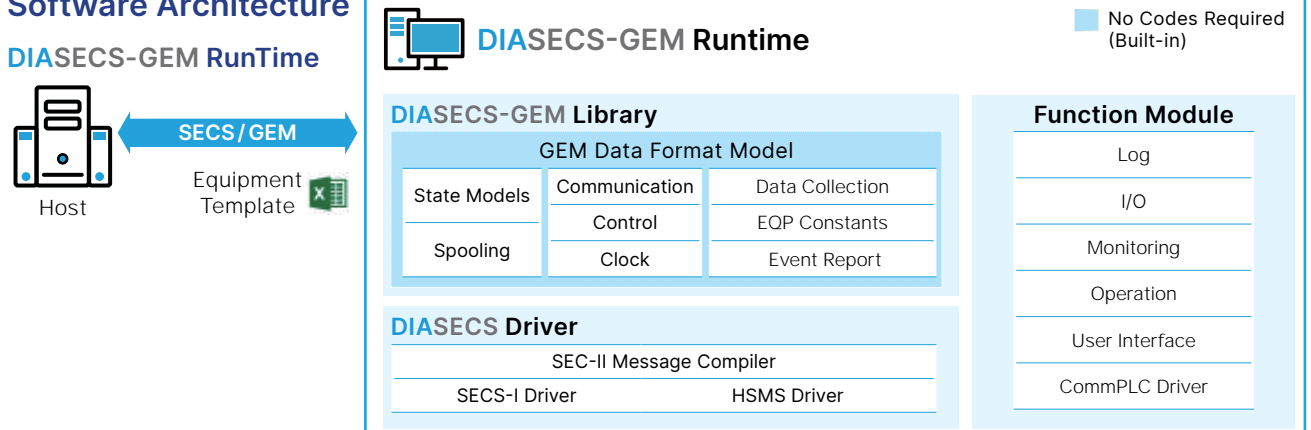
Electronics Assembly Equipment Standard New Communication and Control Application Software
DIACFX

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	
	DIACFX SDK	**DIACFX Box**
Equipment Type	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

Data Collection (DIALink)

CNC Machine Tools

DIALink for CNC Machines

Industrial Robots

DIALink for Robots

PLCs

DIALink for PLCs

Modbus

Drivers
Web API

CNC/PLC
Driver
OPC UA
client

Management Platform

SCADA System
DIAView
- Real-time monitoring
- Data acquisition & visualization
- Data analytics and report output
- Alarm management

Industrial EMS
DIAEnergie
- Energy consumption diagnosis & tracking
- Electricity cost analysis
- Demand analysis and control
- Report output

Modbus slave

Web API

MQTT

OPC UA* server

Cloud Platform (DIACloud)

DIACloud
- Real-time monitoring
- Equipment management
- Service management

- Remote monitoring and control with mobile devices
- Client monitoring

* Option module

Applications

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

Intra-Plant Logistics Platform DIATrans

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
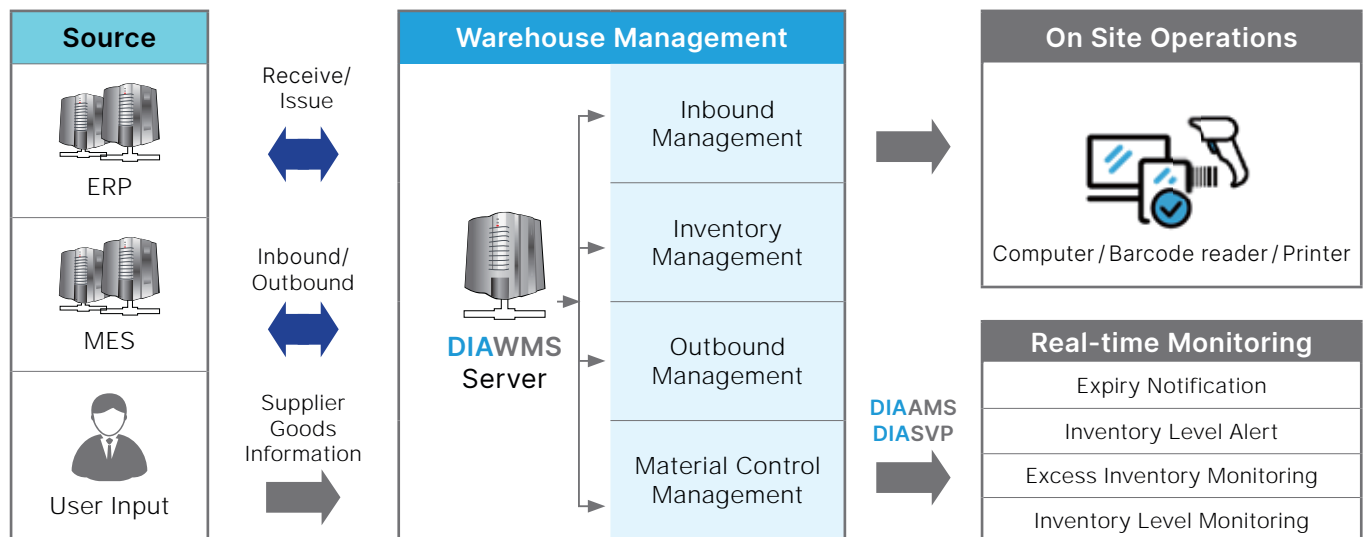
System functions

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

DELTA

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

Host — Supports multiple international standard communication protocols such as MQ, Web service, Tibco, SECS

Material Control System
DIAMCS

DIAMCS Server ⟷ **DIAMCS** Client

Supports multiple international standard communication protocols such as OPC UA, Modbus, EtherNet/IP, SECS, CCLink, MQTT, PROFINET, and mroe

Handling Equipment

| AS/RS | AGV/AMR | Elevator | OHT | ·········· | Others handling equipment |

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

Global Operations

ASIA (Taiwan)

Taoyuan
Technology Center
(Green Building)

Taoyuan Plant 1

Tainan Plant
(Diamond-rated Green Building)

ASIA (China)

Wujiang Plant 3

Shanghai Office

Canada

Seattle

Germany
Suster

Northern
Europe   A Finland
         B Estonia
         C Latvia
         D Lithuania

Netherlands
Amsterdam
Eindhoven

United
Kingdom

Ireland

Conklin
Rochester
Charlotte
Halifax

Wisconsin
Detroit

USA

Fremont
Los Angeles

Boston

Plano

Raleigh

Austin

Belgium
France
Spain
Italy
Albania
North Macedonia
Malta

France
Paris

Spain
Barcelona
Madrid

Portugal

Italy
Milan
Rome

Morocco

A
B
C
D Slovakia
Ukraine
N O
Serbia   Moldova
Romania
Bulgaria   Ge
Greece
Cyprus
Egypt Israel   Lebanon
Tunisia   Jordan
Libya

Turke

Mexico

Mexico city

Central Europe
H Netherlands
I Germany
J Czech Republic
K Austria
L Slovenia
M Croatia
N Poland
O Hungary
P Switzerland

Nigeria

Ghana

Congo

Keny

Tanzan

Colombia

Ecuador

Peru

Brasil

Bolivia

Sao Paulo
Bela Vista
Parana
Paraguay
Santa Catarina

Chile

Uruguay

Argentina

South Africa

▲ **9 Factories**   ■ **84 Branch Offices**

ASIA (Japan)
Tokyo Office

ASIA (India)
Rudrapur Plant
(Green Building)

EUROPE
Amsterdam, the Netherlands

AMERICA
Research Triangle Park, U.S.A.

Sweden
Denmark

Japan
Tokyo
Osaka

Korea
Seoul
Daegu

Kazakhstan

Tajikistan

ey-Istanbul
Armenia Azerbaijan Uzbek

Iraq

Qatar

Saudi
Arabia
Dubai

Pakistan

**United
Arab
Emirates**

India
Krishnagiri
Gurgaon
Calcutta
Mumbai
Hyderabad
Bangalore
Chennai
Ke Yingbeto
Pune
Ahmedabad
Chandigarh
Visakhapatnam
Chhattisgarh

Korea Japan

China

Taiwan

Bangpoo

Thailand

Philippines

Vietnam

Malaysia

Singapore

Indonesia

Taipei

Taoyuan (Technology Center & Plant 1)

Chungli

Taichung

Tainan

Beijing

Dalian

Xi'an

Nanjing

Shanghai

Wujiang (Wujiang Plant 3 & Wujiang Motor Plant)

Wuhan

Dongguan

Delta Green Tech

1 **Northeast Region**	3 **North China Region**	5 **Central China Region**	7 **Suwan Region**
Shenyang	Beijing	Nanchang	Nanjing
Harbin	Tianjin	Wuhan	Suzhou
	Zhengzhou	Changsha	Wuxi
	Jinan		Hefei
	Qingdao		Yangzhou

2 **Shanghai-Hangzhou Region**	4 **South China Region**	6 **West China Region**	8 **Western North Region**
Shanghai	Guangzhou	Chengdu	Xi'an
Hangzhou	Foshan	Chongqing	
Wenzhou	Shenzhen		
Ningbo	Nanning		
	Xiamen		

Australia
Perth
Sydney
Melbourne

● 23 **R&D Centers**   ■ 904 **Distributors**

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ΛELTA

Smarter. Greener. Together.

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