



Digitized Automation for a Changing World

Delta Industrial Automation

2023 Full Range Catalogue



About Delta



Bruce Cheng
Founder and Honorary Chairman



Yancey Hai
Chairman

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, 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 10 consecutive years. In 2020, Delta was also recognized by CDP with two "A" leadership level ratings 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

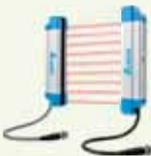
In response to the challenge of climate change, Delta will remain committed to the research and development of innovative, energy-saving products, solutions and services that contribute substantially to the sustainable development of mankind.

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".

Delta IABG Milestones

1995		1999		2003		
AC Motor Drive 	Small PLC 	AC Servo Drive and Motor 	Temperature Controller 	Optical Incremental Encoder 		
2011						
CNC Controller 	Hybrid Energy Saving System 	Integrated Elevator Drive 	Unmanaged Industrial Ethernet Switch 			
2015						
Smart Sensor 	Linear Stage 	Robot Controller with Servo Drive Integrated 	SCARA Robot 	Industrial Energy Management System 	SCADA System 	
2017		2018		2019		
Flow Switch 	Laser Displacement 	Barcode Scanner 	Area Sensor 	Motion Controller Based on CODESYS 	Servo Press 	Extended Motion Controller 

IABG Profile

Mission

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

Founded

1995

Headquarters

Taoyuan, Taiwan

Number of employees

7,500 (R&D 1,389)



R&D technology centers

- Taiwan (Taipei, Taoyuan, Chungli, Taichung, Tainan)
- China (Shanghai, Wujiang, Dongguan, Wuhan, Dalian)
- India
- United Kingdom
- Netherlands
- Thailand
- Canada
- Japan

Plants

- Taiwan (Taoyuan, Chungli, Pingjhen, Taichung, Tainan)
- China (Shanghai, Wujiang, Dongguan)
- India (Hosur, Krishnagiri)
- Thailand

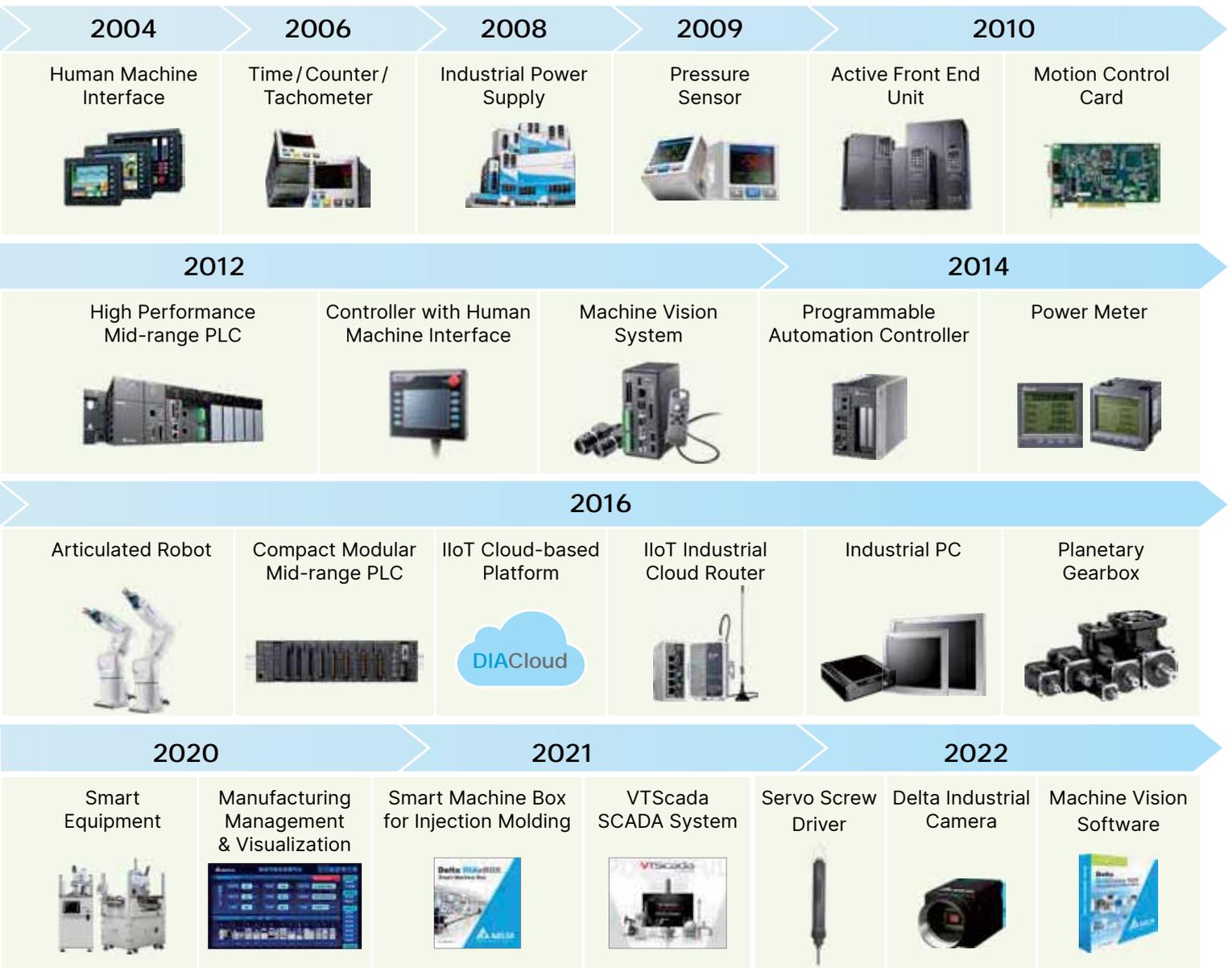


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High Performance Vector Control Drive New

C2000 Plus

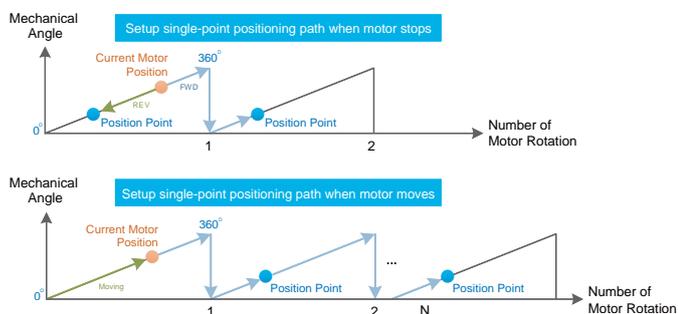
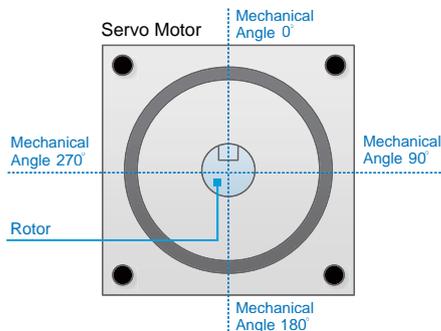
Best Choice for General Drive Controls

- 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 560kW for 460V 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	230V/3-phase						
	460V/3-phase						
	575V/3-phase						
	690V/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

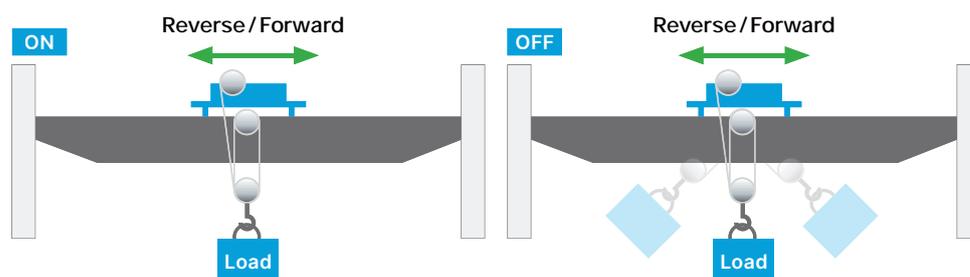
Heavy Duty Vector Control Drive CH2000

Excellent High Overload Capability for Impact Loading Applications

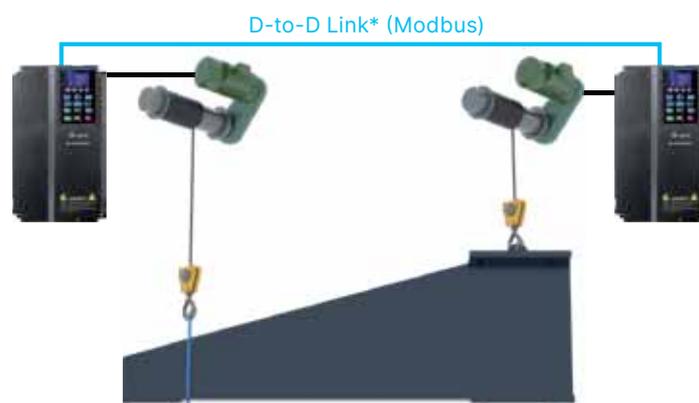
- Fast response to impact loads
- Super Heavy Duty (SHD) setting for high overload capability:
150%/60secs, and 200%/3secs
- Large starting torque: Over 200% at 0.5Hz/200% at 0Hz in FOC+PG mode
- Supports both induction and permanent magnet motors
- Various crane functions for high performance:
Real-time 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 75kW)
- Built-in Modbus communication
- Optional communication cards: PROFIBUS DP, DeviceNet, Modbus TCP, EtherNet/IP, EtherCAT and CANopen



Real-Time Anti-Sway



Advanced Crane Functions



*Device-to-device link



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	230V/3-phase					
	460V/3-phase					

Applications

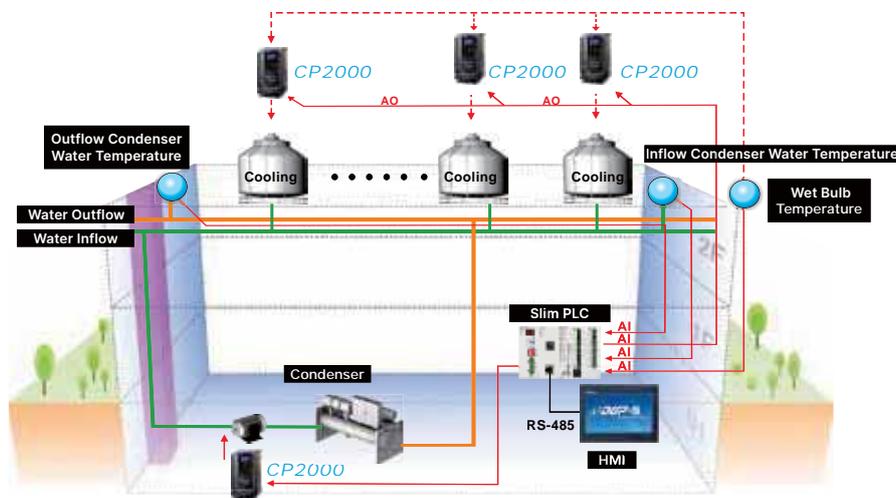
Machine tools, punching machines, cranes and hoists

Fan / Pump Vector Control Drive CP2000

Excellent for Large Power Fans and Pumps Applications



- Supports induction / 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.15)
- 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



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	230V / 3-phase						
	460V / 3-phase						
	575V / 3-phase						
	690V / 3-phase						

Applications

Factory automation, HVAC, fans and pumps

IP55 Fan / Pump Drive CFP2000

For HVAC and Fans / Pumps Applications

- Supports induction/PM/SynRM motors
- IP55 and IP41 enclosure 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

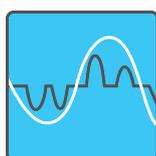


Built-in EMC Filter



- EN61800-3 C2 & C1

Built-in DC Choke



- Suppress harmonics, THDi < 48%
- EN61000-3-12

Protection Class



- IP41 Dust Resistant Type (standard)



- IP41 Water Resistant Type^(optional)



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	220V/3-phase				
	380 to 480V/3-phase				
	600V/3-phase				

Applications

HVAC, fans & pumps, water supply / water treatment systems

High Performance Compact Drive MH300

Transmission & Tension Control Solutions

Outstanding Drive Performance

- Overload capacity up to 150%/60 secs and 200%/3 secs, suitable for constant torque applications
- Supports induction and PM motors with optional PG cards for highly precise speed and position control
- Provides powerful torque output at low frequency (0.5Hz/200% without PG vector control; 0Hz/200% with PG vector control) for stable heavy duty operation at low speed and high torque
- Built-in tension control function for constant tension
- Speed, torque and position control



Strong System Support

- Built-in PLC with 5k steps; system programming function saves costs
- Built-in STO (SIL2/PL d) safety function and measures for sudden power outages
- 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*
- Optional models with built-in filter
- Optional 24 V power supply card to reduce unexpected downtime

* Please contact Delta for purchase.

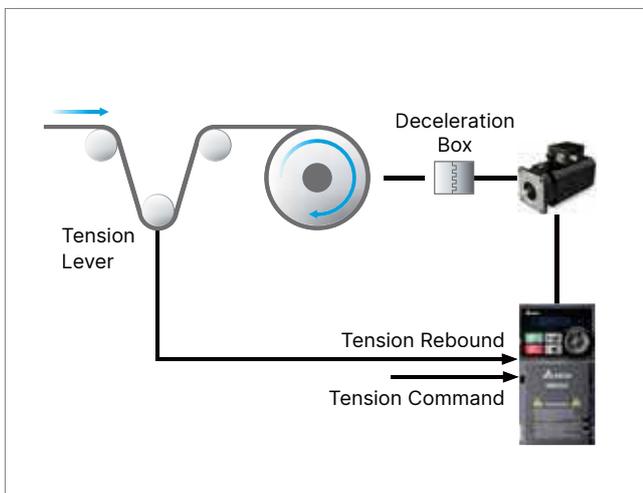
Flexible Expansion

- Built-in two 33kHz 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
- Expandable to 3 DI and 3 DO, including 6 ports in total
- Expandable to 2 or 3 relays

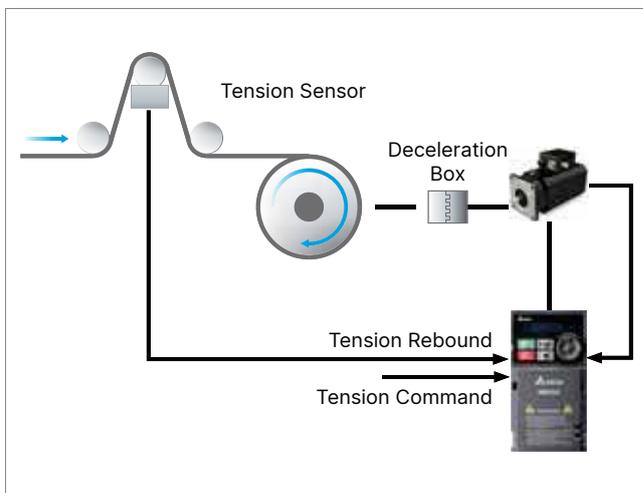
Tension Control

- Built-in roll diameter calculation by linear speed, material thickness, and distance meter
- Two PID parameters: Linearly adjustable to control tension at startup, of small/large rolls, and at high/low linear speed
- Tension taper calculation: Automatically adjusts tension per the winding roll diameter to avoid wrinkles or deformation
- Friction and inertia compensation for torque control: Automatically compensates friction and inertia during winding/unwinding for constant tension
- Automatic roll change merely using external signal without machine shutdown

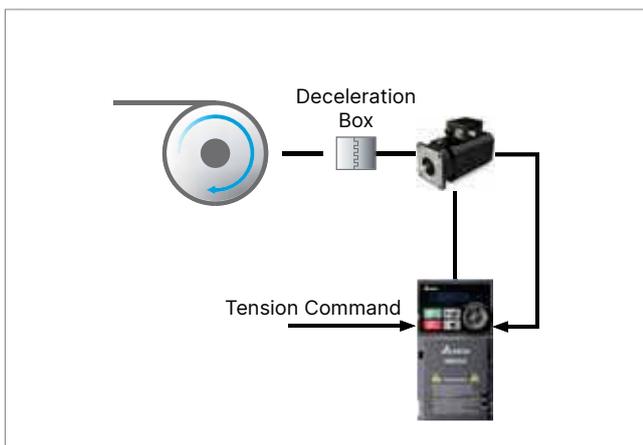
• Closed-loop tension, speed control



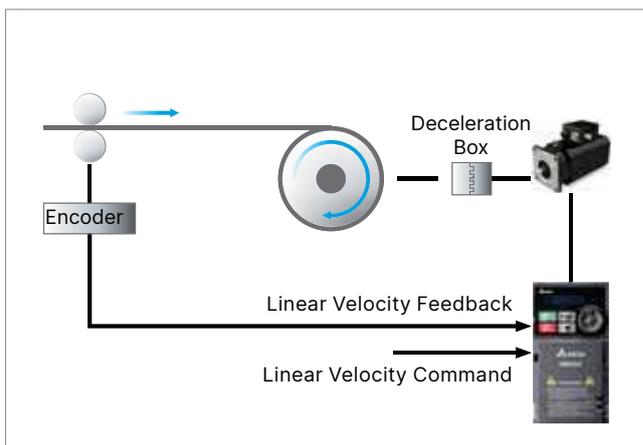
• Closed-loop tension, torque control



• Open-loop tension, torque control



• Steady linear velocity control



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	115V/1-phase																		
	230V/1-phase																		
	230V/3-phase																		
	460V/3-phase																		

Applications

Machine tools, textile machinery, woodworking machinery, rubber and plastic machinery, winding/unwinding applications

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 p.15)
- High torque at low speed (up to 200% at 0.5Hz 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 1,500Hz



* Under development

Optimized Space Utilization

- Compact design improves space utilization
- Seamless and parallel installation for flexible deployment and high efficiency



Power Range		0.2kW 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						New							
	High-speed 0 ~ 1500 Hz	230 V / 1-phase													
		230 V / 3-phase													
460 V / 3-phase															

Applications

Machine tools, air compressors, textile machines, woodworking machines, packaging machines, electronics, fans, pumps

Basic Compact Drive ME300

Compact and Low Power Range 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)



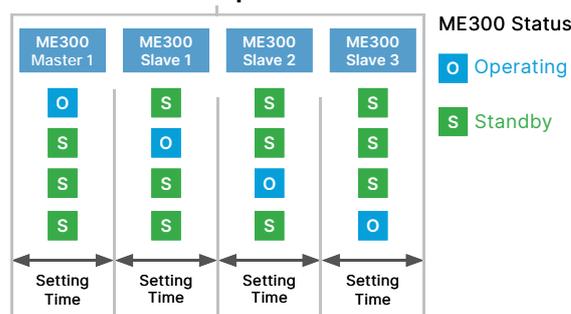
Pumping Functions

- 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

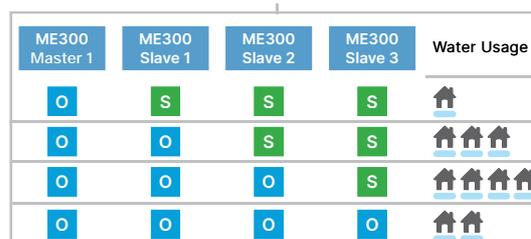
Multi-pump Control

- 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



Constant Pressure Mode



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							New			

Applications

Logistics, food packaging machines, woodworking machines, packaging machines, fans & pumps, electronics, conveyance equipment

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



Power Range		0.1kW 0.125 HP	0.2kW 0.25 HP	0.4kW 0.5 HP	0.75kW 1 HP	1.5kW 2 HP	2.2kW 3 HP	3.7kW 5 HP	5.5kW 7.5 HP	7.5kW 10 HP	11kW 15 HP	15kW 20 HP	18.5kW 25 HP	22kW 30 HP
MS300	IP66 / NEMA 4X	230V / 1-phase												
		230V / 3-phase												
		460V / 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 230V single-phase and 460V 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



Sensorless Vector Control Compact Drive VFD-EL

- Built-in EMI filter for 230V single-phase and 460V three-phase models to effectively minimize the electromagnetic interference
- Intensified air channel, built-in constant pump pressure control and PID control
- Supports side-by-side installation and DIN-rail mounting



Sensorless Vector Control Compact Drive VFD-EL-W

- Built-in RS-485 (Modbus)
- Built-in constant pump pressure control and PID control
- 150%/60secs overload capability



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												
	460 V/3-phase												
VFD-EL-W	230 V/1-phase												
	460 V/3-phase						4.0 kW						

Applications

Conveyors, fans, pumps, woodworking machines, food packaging machines, textile machines

Integrated Elevator Drive ^{New} IED-S

Integrated Drive and Control Saves Space

Compact Design

- Suitable for limited installation spaces
- Modular design of fans and capacitors for easy replacement and maintenance
- Built-in 5-digit 7-segment LED display

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

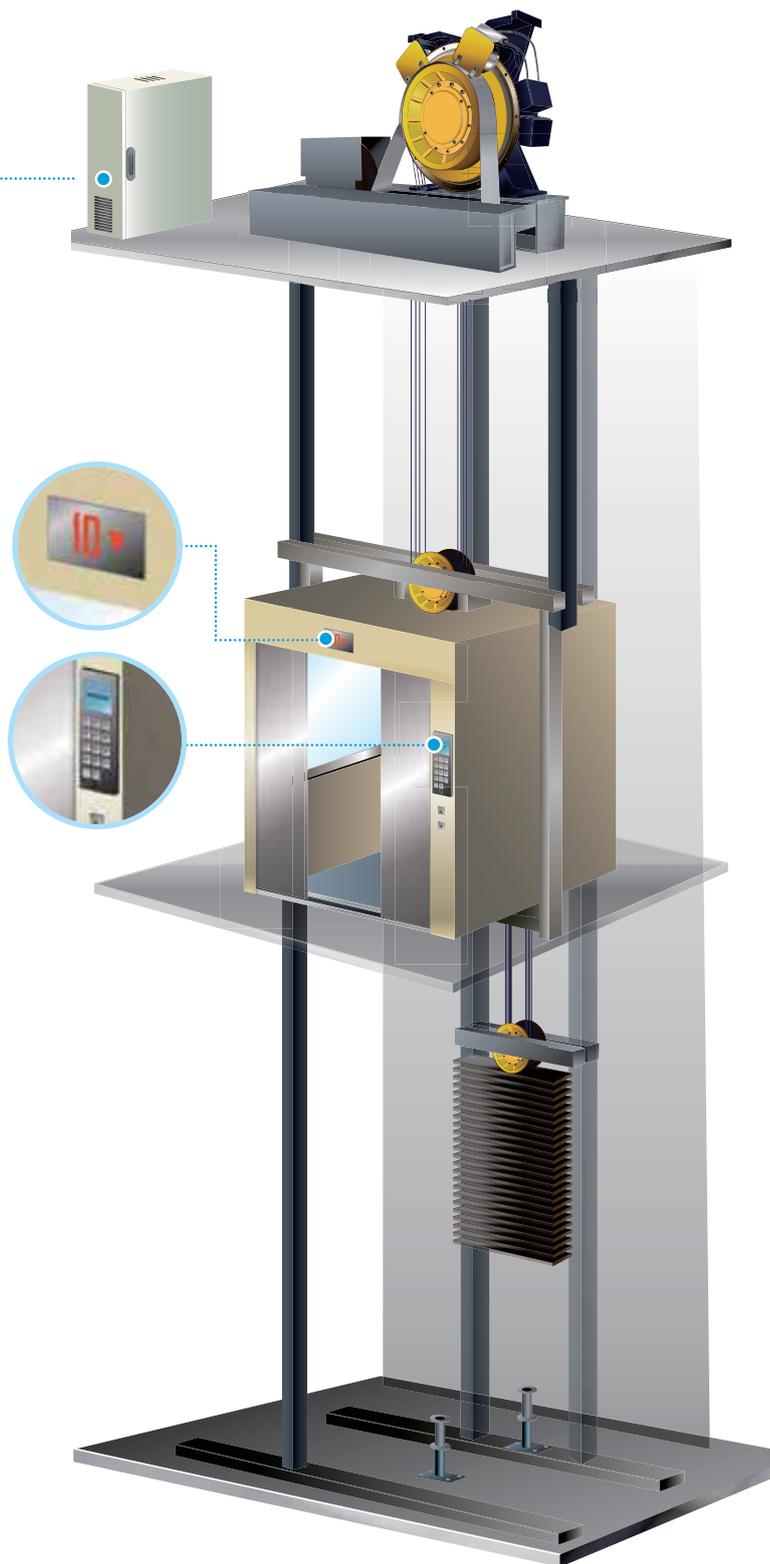
- Power regeneration function available when installed with Delta's Active Front End (AFE2000 Series) or Power Regenerative Unit (REG2000 Series)
- Lighting and air circulation scheduling for elevator cars
- Standby mode to save energy

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

Drive

- Supports induction and permanent-magnet motors
- Emergency power supply (EPS) mode
- Supports versatile encoder types

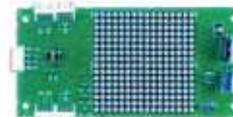


Hall Call / Car Call Display Boards

- EA-FM02MVN02

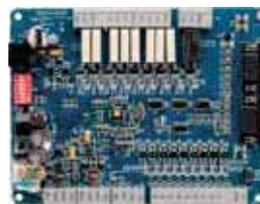


- EA-FM02MBT01



Car top Board

- EA-CT01



Command Board

- EA-CP16



(Optional) External Digital Keypad

- KPC-CC01



- Control settings
- Drive settings
- Parameter duplication

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	230V/3-phase										
	460V/3-phase										



Applications

Commercial, residential building, villa and freight elevators, as well as MR and MRL elevators

Elevator Drive

VFD-ED

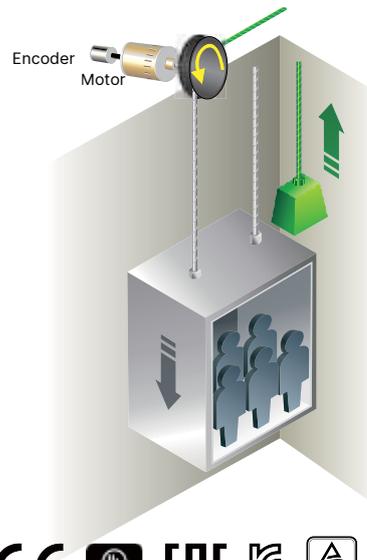
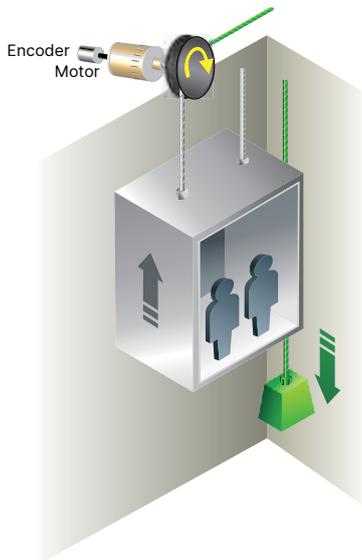
Excellent Time Sequence Control for Smooth Rides

- 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



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	230V/1-phase													
	230V/3-phase													
	460V/3-phase													

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

Applications

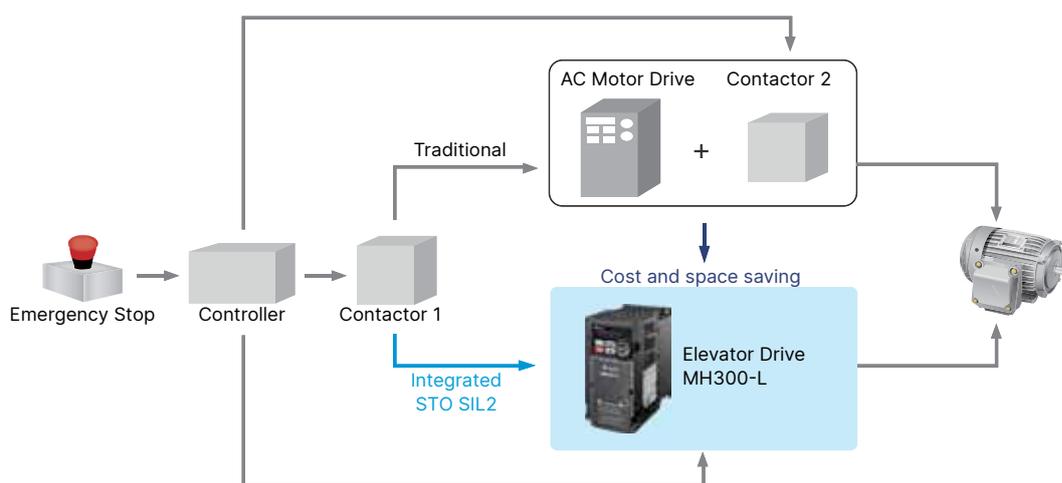
Commercial, residential building, villa and freight elevators, as well as MR and MRL elevators

Compact Elevator Drive MH300-L

Compact Design with Open-loop Control for Precise Time Sequence



- 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					
	460V / 3-phase					



Applications

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

Hybrid Injection Molding Solution New

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
 - **Control Unit for Injection Molding Machine CSJ:**
Connects all the components in the system to reduce system complexity and achieves seamless integration
- Up to 75% energy-saving for holding and cooling processes
- Compatible with dedicated production monitoring and management software (DIAeBOX) for real-time production data collection, handling and monitoring



Delta Hybrid 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 control of motor
- Easy adjustment
- Multiple protections
- Multi-pump control for confluence/flow diversion
- User-friendly software for machine commissioning
- Diagnoses of component health



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



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

Control Unit for Injection Molding Machine CSJ

- 12" full-color display for operation via both keyboard and touchscreen
- Dedicated PLC programming for secondary development
- Adopts Delta's superior drive technology, tuning capability, and monitoring interface
- Supports CANopen and Modbus for connection to other equipment
- Supports high-speed pulses for servo rotary tables
- Integrated as an all-in-one injection molding machine solution with one-stop-shop service



Digital Input/Output	32/32, 40/40	Analog Input	4 (0~10V)
Relay Output	12	Analog Output	4 (-10~10V/0~10V)
Temperature Feedback	8	High-speed Pulse Input/Output	2/2
Temperature Sensing Cable	K, J, E	Communication	RS485, CANopen, Ethernet

Motor-Mounted Pump Drive New

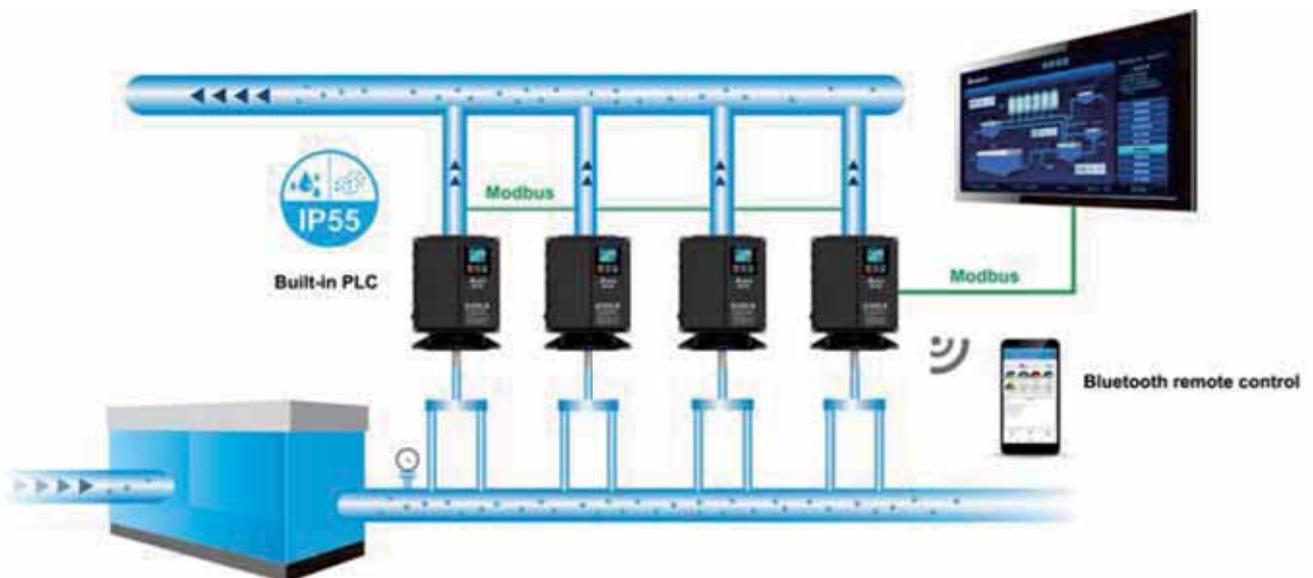
MPD

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 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	11M ~ 22 kW 15 ~ 30 HP
MPD	460V/3-phase	Estimated Launch in Q3, 2022

Applications

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

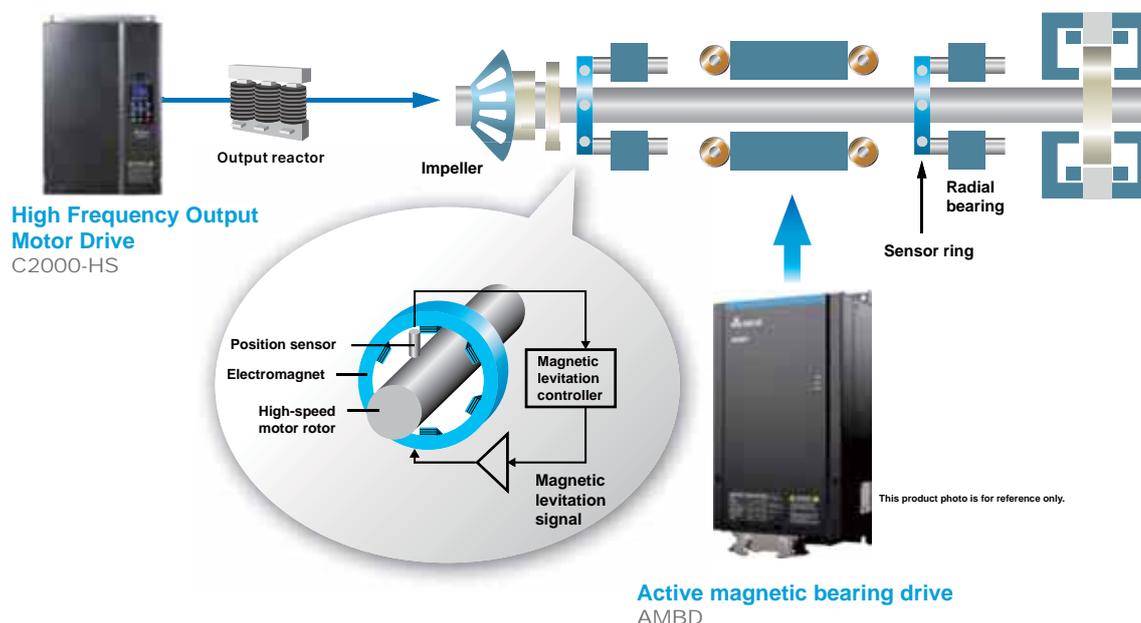
Active Magnetic Bearing Drive New AMBD

Excellent Functions for High-Speed Operation

- Wide DC voltage input with DC terminals
- Built-in DEB function to recover DC bus with system inertia and avoid mechanical damages due to mains power failure, no need for any UPS
- Independent front and rear radial control to reduce bearing shaking and improve suspension control accuracy
- Independent axial position control to detect the elongation of a shaft to avoid collisions due to high shaft temperature
- High control accuracy meets ISO standards; the bearing sways less than 30% of the maximum motion range
- Temperature protection with 6 motors and magnetic bearings, applicable to PTC: PT100/PT1000; the protection levels can be adjusted by parameters
- Peak power up to 3kW, applicable to magnetic levitation control of high-speed motors of up to 500kW
- Output frequency up to 1,500Hz if used with the High-frequency Motor Drive C2000-HS Series
- Reduces current ripples of the high-speed motor and restrains the temperature rise of the motor rotor with an output reactor



Structure



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

Chillers, turbo blowers, micro gas turbines, flywheel energy storage

Textile Vector Control Drive CT2000

Highly Flexible Flange Mount and Wall Mount Methods

- Fanless design with highly effective heat sink to prevent fiber and dust from clogging or entering the drive, solving overheating problems^(*1)
- Flange-mounting installation to enhance system safety and stability, providing excellent heat dissipation performance^(*1)
- Supports external fan connection^{(optional)(*1)}
- Wall-mounting installation model with an enlarged fan^(*2)
- Deceleration Energy Backup (DEB) function for smooth motor deceleration control
- Supports induction and permanent magnet motors
- Common DC BUS design
- Built-in PLC with 10k steps program capacity RS-485, supports Modbus communication
- Optional communication cards available upon request



Flange-Mounting Types



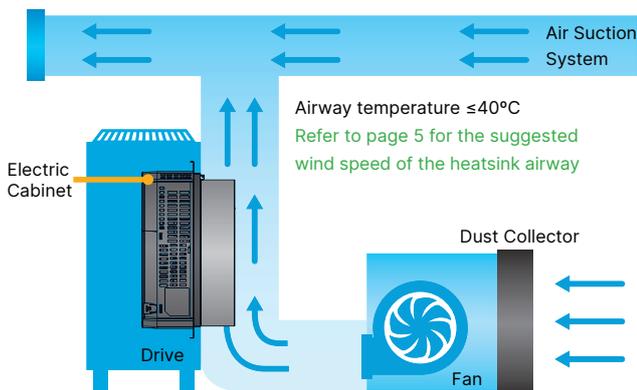
Wall-Mounting Types

*1: For model names ending with code A or B
*2: For model names ending with code C

Flange-Mounting Types

Flange-mounting installation for fanless models. This design avoids fiber or dust clumping in the fan or entering the drive and prevents overheating problems. This model is suitable for an application environment that has sufficient space for an airway for the drive.

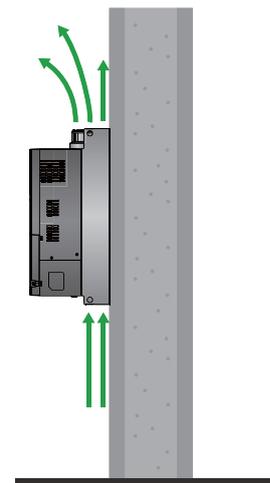
Available for models with names ending in A or B



Wall-Mounting Types

Larger fan design for wall-mounting installation to fulfill other textile application needs.

Larger fan is available for models with names ending in C



Applications

Textile machines and all textile applications that require flange-mount or wall-mount installation

* Flange-mount: Please refer to the CT2000 user manual for airway design requirements before installation

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
- Super Premium 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 enclosure 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

Matches with Standard Compact Drive MS300 Series for Fan and Pump Applications

Standard Compact Drive MS300

* Refer to page 7 for MS300.



Synchronous Reluctance Motor (Standard) MSI

- Overload capacity up to 120% / 60 secs



Matches with Fan/Pump Vector Control Drive CP2000 Series for Compressor Applications

Fan/Pump Vector Control Drive CP2000

* Refer to page 3 for CP2000.



Synchronous Reluctance Motor (Models of SF 1.2) MSI

- Up to 120% operational capacity



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
1500 rpm Standard MSI + MS300 Series	380V / 3-phase																
3000 rpm Standard MSI + MS300 Series	380V / 3-phase																
MSI SF 1.2 + CP2000 Series	380V / 3-phase																

* Applicable system voltage is 380 V.

Applications

Fans, pumps, compressors, industrial machinery

Active Front End AFE2000

The Best Energy Saving Device with Power Factor Compensation and Power Regeneration

- More than 95% power regeneration efficiency
- Improves power factor to more than 99% with input current THD $\leq 5\%$ at full load
- Realizes 4-quadrant operation with variable frequencies and speed control when applied with AC motor drives
- Maintains constant DC bus voltage or current when the mains voltage is unstable
- Built-in RS-485 (Modbus) communication



Power Range	7.5 kW 10HP	15 kW 20HP	22 kW 30HP	37 kW 50HP	45 kW 60HP	75 kW 100HP
AFE2000	230V 3-phase					
	460V 3-phase					

Applications

- **Large-inertia load applications:** Centrifuge equipment, dewatering machines and roving machines
- **4-quadrant load applications:** Elevators, cranes and pumpjacks (oil extraction machines)
- **Quick braking applications:** Machine tools, bag making machines, auto storage and retrieval systems, and lathes
- **Long energy feedback time applications:** Wind power, water power, steel printing and paper making machinery (winding equipment)
- **Power quality improvement:** Semiconductor and panel industries

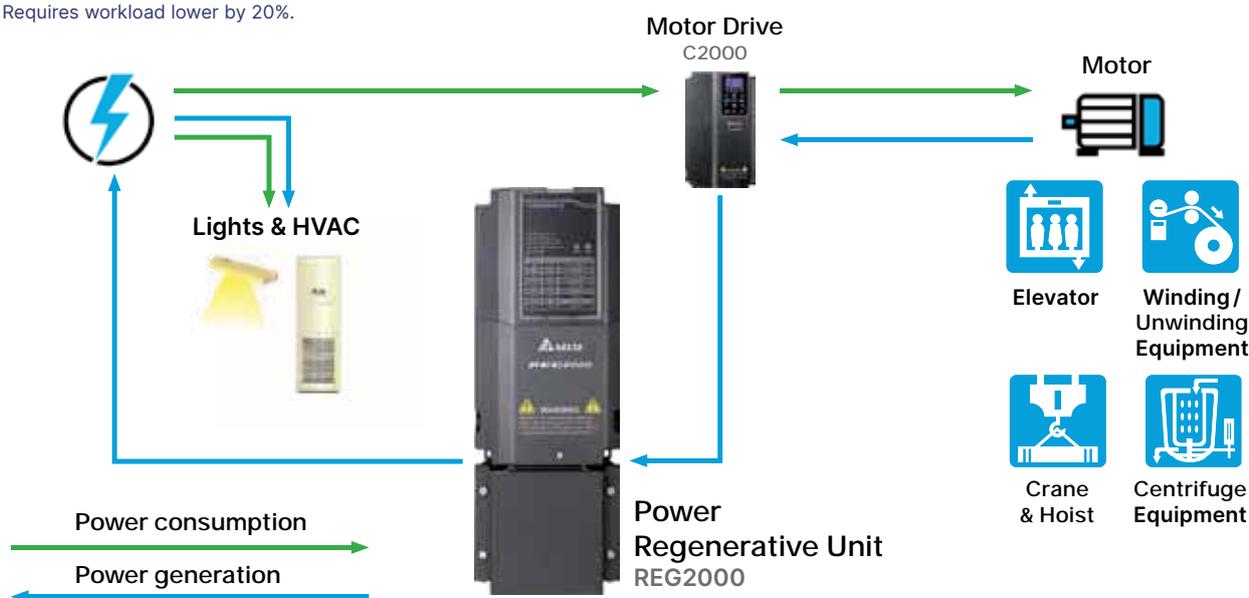
Power Regenerative Unit REG2000

Replaces Traditional Brake Resistor and Features Power Regeneration

- Compact design with a built-in reactor for easy installation
- No need for parameter setting, suitable for general applications and installation to existing systems
- Outstanding energy-saving performance with more than 95% power regeneration efficiency
- Replaces traditional brake resistors to reduce the generation of heat
- Compatible with the drives and servo drives that have DC terminals
- Supports 4 parallel connections* for large power applications
- Improves motor braking capability up to 150% from 125% of braking resistors
- Built-in RS-485 (Modbus) communication and real-time monitoring of energy-saving performance and cost



* Requires workload lower by 20%.



Power Range	7.5 kW	11 kW	15 kW	18.5 kW	22 kW	30 kW	37 kW	45 kW	55 kW
REG2000	230V / 3-phase								
	460V / 3-phase								

Applications

- **Large-inertia load applications:** Centrifuge equipment, industrial laundries, heavy duty conveyors, roving machines, gantry machine tools and more
- **4-quadrant load applications:** Elevators, cranes and hoists, pumpjacks and more
- **Quick braking applications:** Machine tools, bag making machines, auto storage and retrieval systems, presses and more
- **Long-term energy feedback applications:** Printing machines, escalators, winding /unwinding machines and more

AC Servo Drive & Motor New

ASDA-A3

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

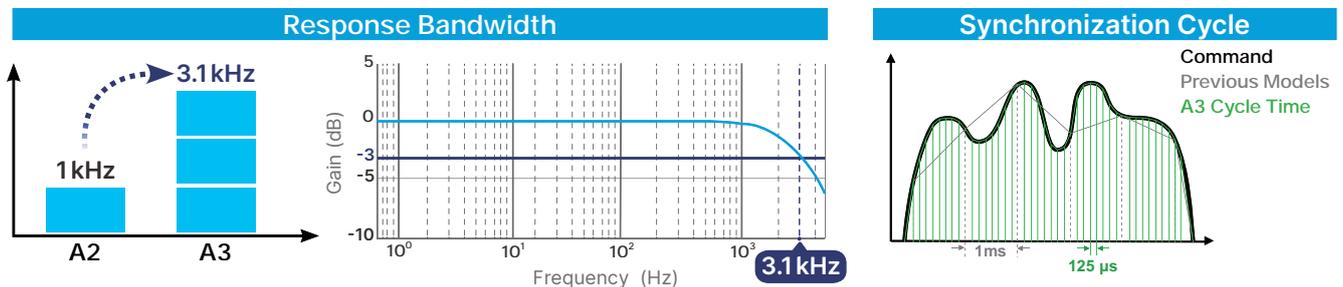
200V: 0.1 ~ 15 kW

400V: 0.4 ~ 15 kW



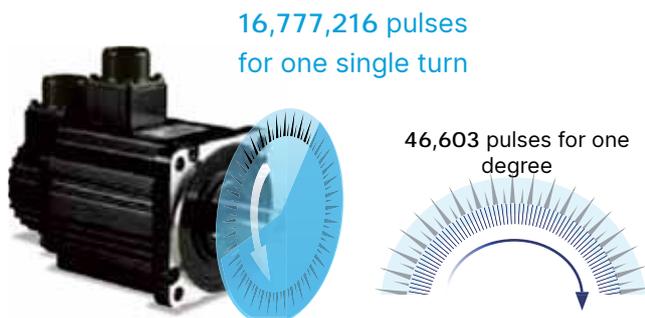
3.1 kHz Bandwidth and Shorter Synchronization Cycle

- 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 μ s, which is 8 times faster than that of the ASDA-A2 Series



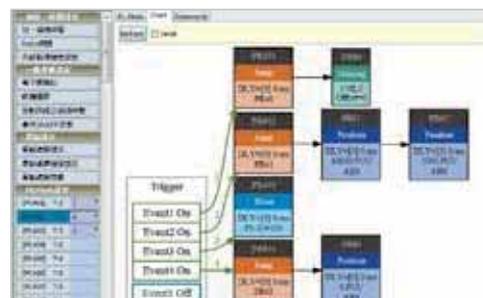
24-bit Absolute Encoder

- Positioning precision enhanced by the 16,777,216 pulses/turn encoder
- Reduced speed variance at low speed to ensure a smooth process and enhance machine efficiency
- Absolute encoder helps to keep the motor's position when the power is off



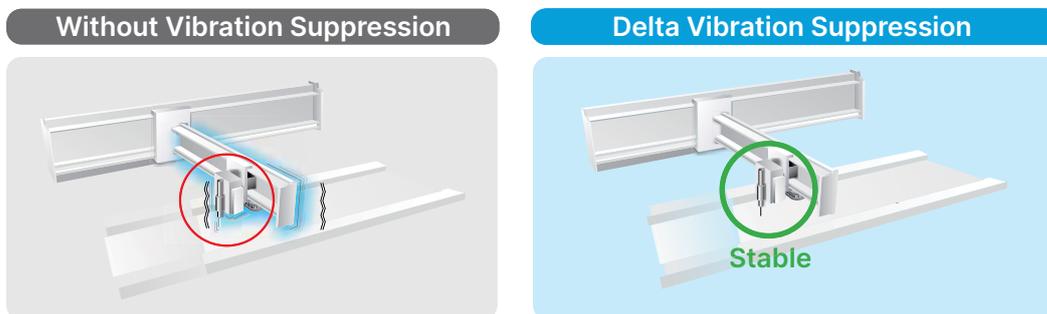
Advanced Motion Control Functions

- 99 sophisticated motion commands and segments allowed
- Graphical user interface offers simple setup and programming
- Arithmetic operation and condition jump commands are added
- General motion functions: homing, positioning, speed, superimposition, blending, on-the-fly motion change commands and E-CAM functions are available



Low Frequency Vibration Suppression

- Keeps the machining process stable when mechanisms with higher elasticity such as a belt or a swing arm are applied



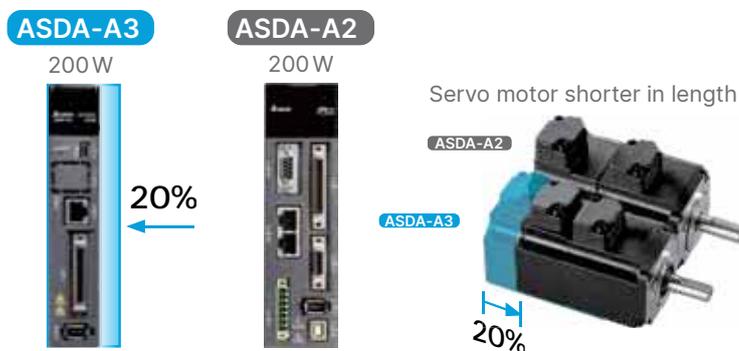
Auto-Tuning

- Optimizes machine performance with less tuning effort
- Simple setup procedures via panel keypad or software



Compact Size

- ASDA-A3 is 20% smaller than the ASDA-A2 in dimensions, requiring less installation space



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, electronic assembly or detection equipment, industrial robots, packaging machines, labeling machines, semiconductor processing equipment and textile equipment

AC Servo Drive & Motor New

ASDA-B3

24-bit Absolute Encoder / 3.1 kHz Bandwidth

Advanced Motion Control Functions

200V: 0.1 ~ 3kW

400V: 1 ~ 7.5kW

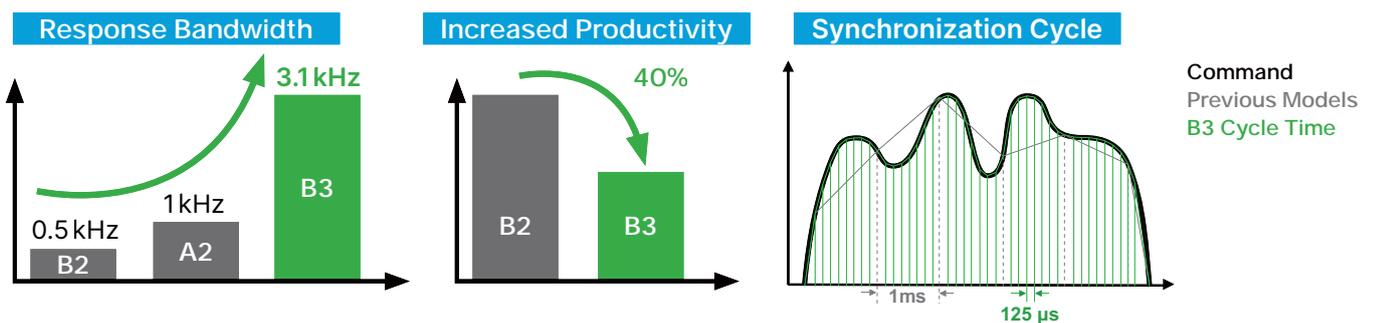


Model Types

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

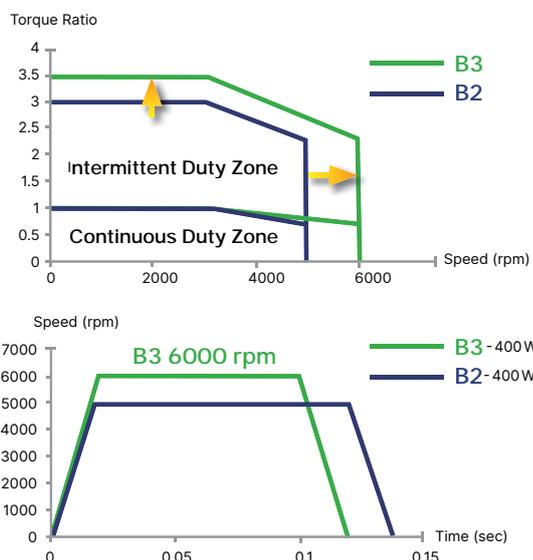
High Response Bandwidth and Shorter Synchronization Cycle

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



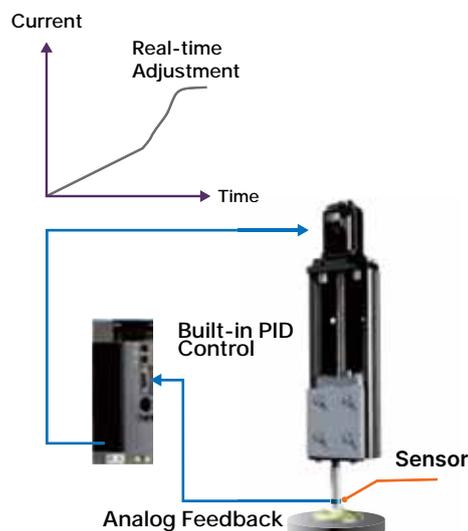
Increased Speed and Torque

- Motor speed increased up to 6,000 rpm
- Torque overload ratio increased to 3.5 times
- Enhances productivity and efficiency with shortened acceleration/deceleration time



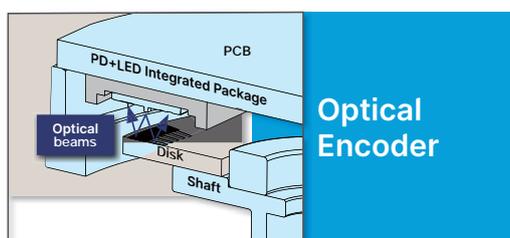
Analog Feedback PID Control

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



High Resolution Encoder

- B3 series drivers support absolute type motors.
- High resolution for more precise positioning
- The incremental encoder can retain the single-turn absolute position without the need to execute homing after cycling the power
- After the absolute encoder is powered off, the number of turns and the position are retained
- 24-bit optical encoder: the encoder is lighter and thinner with the reflective sensor technology; the exclusive optical sensor compensation function improves product reliability
- 17-bit magnetic encoder: the magnetic induction technology improves the capability to prevent vibration and increases the oil resistant level



Applications

Machine tools, electronics assembly equipment, tool magazines and turrets, industrial robots, packaging machines, labeling machines, semi-conductor equipment, textiles equipment, diamond cutting machines

AC Servo Drive & Motor

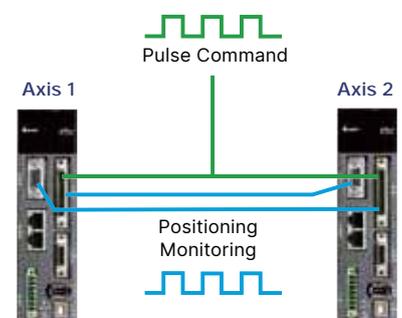
ASDA-A2

Implements 20-bit (1,280,000 p/rev) superior resolution encoder as a standard; Built-in motion control functions



Built-in Motion Control Functions

- Electronic Cam (E-CAM) function for mark tracing, positioning, synchronous control and more applications; max. 720 points for E-CAM outline
- High-speed Capture and Compare function for position latching and detection; max. 800 records stored in the memory
- Built-in gantry control algorithm

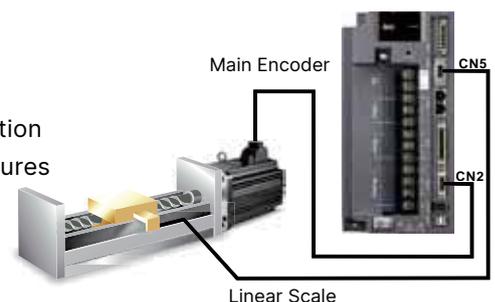


High Precision, High Performance Servo Motors

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

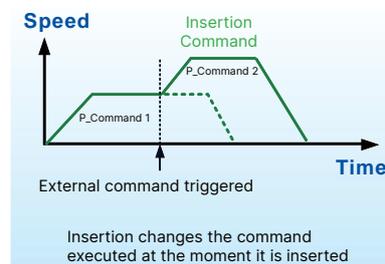
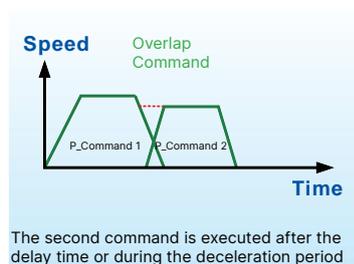
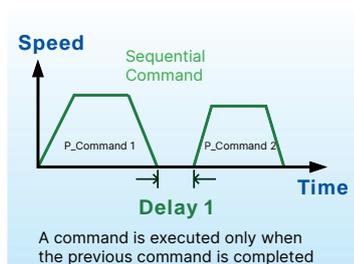
Full-Closed Loop Control (Accuracy of Positioning Guaranteed)

- Direct signal transmission through CN5 port to perform full-closed function
- Reduces the effect of backlash and flexibility from the machine and ensures the accuracy of positioning



Versatile PR mode

- 64 procedures can be applied for various and multiple points continuous motion movements
- 35 homing modes/jump mode/parameter editing mode/speed mode/position mode



Basic Features

- Input voltage: 200 V_{AC} ~ 230 V_{AC}, 0.1kW ~ 15kW, 1-phase/3-phase
- Input voltage: 400 V_{AC}, 0.4 kW ~ 15kW, 3-phase
- Up to 1kHz bandwidth for high speed and high precision applications
- CANopen, DMCNET, EtherCAT communication protocols
- ASDA-A2-E model is equipped with Safe Torque Off function (STO), compliant with IEC31800-5-2

	Type	RS-485 (CN3)	Full Closed-loop Control (CN5) ^{*1}	Extension Port for Digital Input (CN7)	PR Parameters ^{*2}	E-CAM ^{*3}	EtherCAT ^{*4}	CANopen	DMCNET	Analog Voltage Control	Pulse Input Port
Standard	L	√	√	-	√	-	-	-	-	√	√
	U	√	√	√	√	√	-	-	-	√	√
Network	E	-	-	√	√	-	√	-	-	-	-
	F	√	√	-	√	-	-	-	√	-	-
	M	√	√	-	√	√	-	√	-	√	√

*1. In PR mode, only ASDA-A2-F supports full-closed control function.

*2. PR parameters can be read and written through communication by DMCNET only.

*3. E-CAM function can only be used in PR mode.

*4. For information about ASDA-A2-E EtherCAT interface servo drive, please refer to the ASDA A2-E brochure.

Applications

Food packaging machines, filling and bottling equipment, high-speed labeling machines, feeding machines, TFT LCD cutting machines, IC packaging machines, injection processing equipment, lathes, electric discharge machines (EDM), woodworking machines, gantry machines, wire cutting machines, printing machines, textile equipment



Food Packaging Machine



Wire Cutting Machine



Feeding Machine



High-speed Labeling Machine

AC Servo Drive EtherCAT[®]

ASDA-A2-E

Supports EtherCAT High-Speed Communication

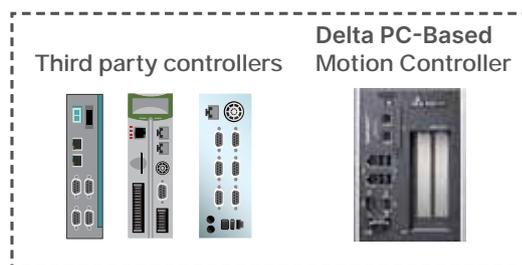
Delta's ASDA-A2-E Series supports EtherCAT communication, and complies with IEC61158 and IEC61800-7 to enable fast, real-time and precise performance in high-end applications. It also supports a CoE device profile based on CiA402, and all command types of EtherCAT.



In addition to the EtherCAT communication function, the ASDA-A2-E Series features:

- Wide power range: 400V 400W~7.5kW, 220V 100W~3kW
- Integrated Safe Torque Off (STO), compliant with IEC61508, SIL2; IEC62061, SILCL2; ISO13849-1, Cat. 3 PL=d
- Short cycle time, ideal for high-speed synchronous multi-axis control
- Touch Probe function can be enabled with two dedicated Digital Inputs (DI) on CN7 or an external encoder
- Supports absolute and incremental ECMA Series motors

EtherCAT controllers



Applications



Printing Machine



Metal Working Machine



Food Packaging

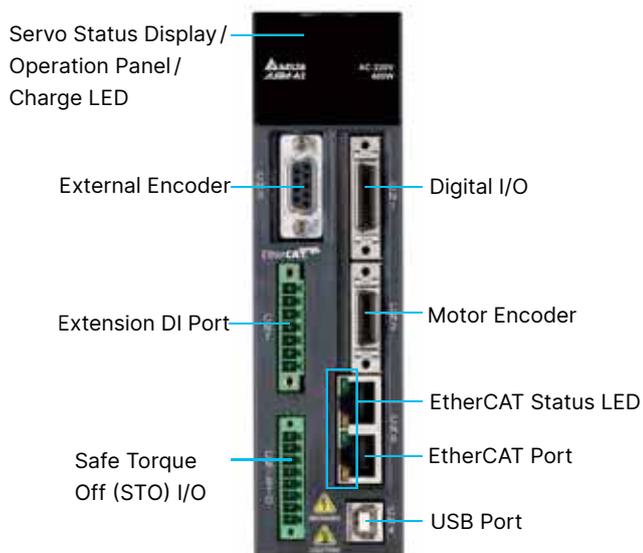


Woodworking Machine

Communication Specifications

Physical Layer	IEEE802.3u (100 BASE-TX)
EtherCAT Commands (Data Link Layer)	APRD, FPRD, BRD, LRD, APWR, FPWR, BWR, LWR, ARMW, FRMW, APRW, FPRW, BRW, LRW
Device Profile (CiA402)	Homing Mode, Profile Position Mode, Profile Velocity Mode, Profile Torque Mode, Interpolated Position Mode, Cyclic Syn. Position Mode, Cyclic Syn. Velocity Mode, Cyclic Syn. Torque Mode, Touch Probe Function, Torque Limit Function
Process Data Size	Tx: 8 Object (max. 32 bytes) Rx: 8 Object (max. 32 bytes), supports Dynamic Mapping
Bus Clock	DC cycle with min. 250µs
LED Indicator	EtherCAT Link/Activity Indicator (L/A) x 2 EtherCAT RUN Indicator (RUN) x 1 EtherCAT ERROR Indicator (ERR) x 1

Part Names and Functions



Accessories

Part Number	ASD-CN5C0026
Description	CN1 connector
Part Number	ASD-CNFS0808
Description	Pack of connectors used for STO Wiring connectors (8 pcs/pack)



AC Servo Drive & Motor

ASDA-B2

Implements 17-bit (160,000 p/rev) high resolution encoder as a standard



Power Range: 0.1kW ~ 3kW

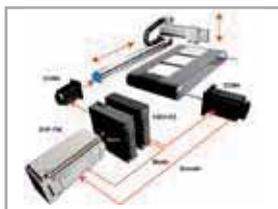
- Input voltage: 200 V_{AC} ~ 230 V_{AC}, 1-phase / 3-phase, or 3-phase
- Fulfills high precision positioning control requirements of general applications:
 - Built-in Position, Speed and Torque modes (Speed and Torque modes can be controlled via internal parameters or external voltage)
 - Command sources: pulse input (up to 4 Mpps) and analog voltage
 - Three notch filters optimize the operation of the mechanical system automatically
 - Friction compensation and motor protection functions are available to reinforce the system
 - Separated power supply for main circuit and control circuit, easy to maintain
 - Built-in regenerative resistor featured as standard (400W and above models), saving wiring and costs



Applications



Bar Feeder



Transporting and Conveying Equipment



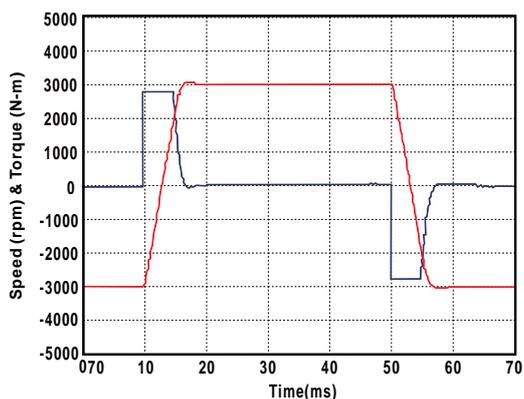
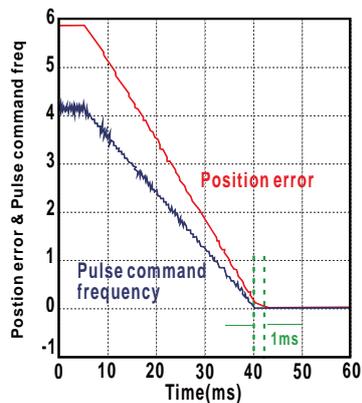
Electric Discharge Machines (EDM)



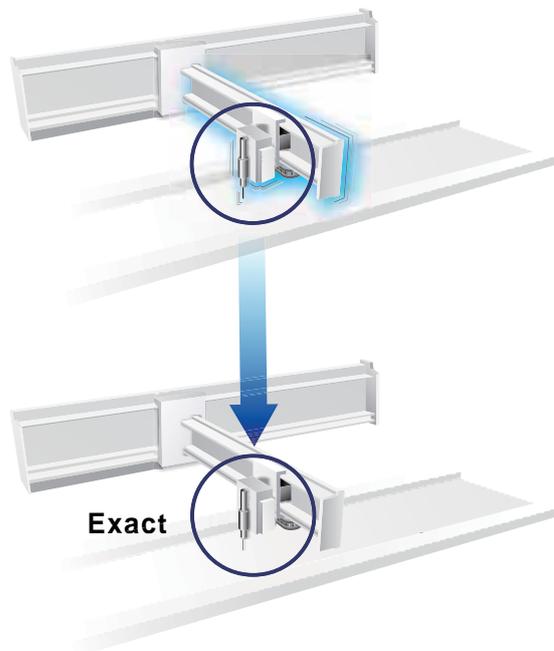
Cutting Machine

High Accuracy for Positioning

- ASDA-B2 Series feature an incremental encoder with 17-bit resolution (160,000 p/rev) which can eliminate unstable commands at low speed, smooth the motor operation and enhance the accuracy of positioning



- Three auto notch filters to suppress mechanical resonance efficiently

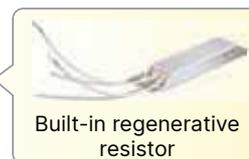


Easy-to-Use and Cost-Saving

- Same power and encoder cables as the ASDA-B Series
- User-friendly digital keypad, ideal for parameter settings and monitoring
- Built-in regenerative resistor (400W and above models), simplifying wiring and minimizing space



Separated power supply for main circuit and control circuit



Built-in regenerative resistor

CH1
CH2 → Supports two analog outputs

AC Servo Drive & Motor

ASDA-M

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

Impeccable 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 commands, ideal for applications that require high synchronous accuracy
- Advanced synchronous gantry control
- Versatile PR mode for various continuous motion movements

New PC Software Functions

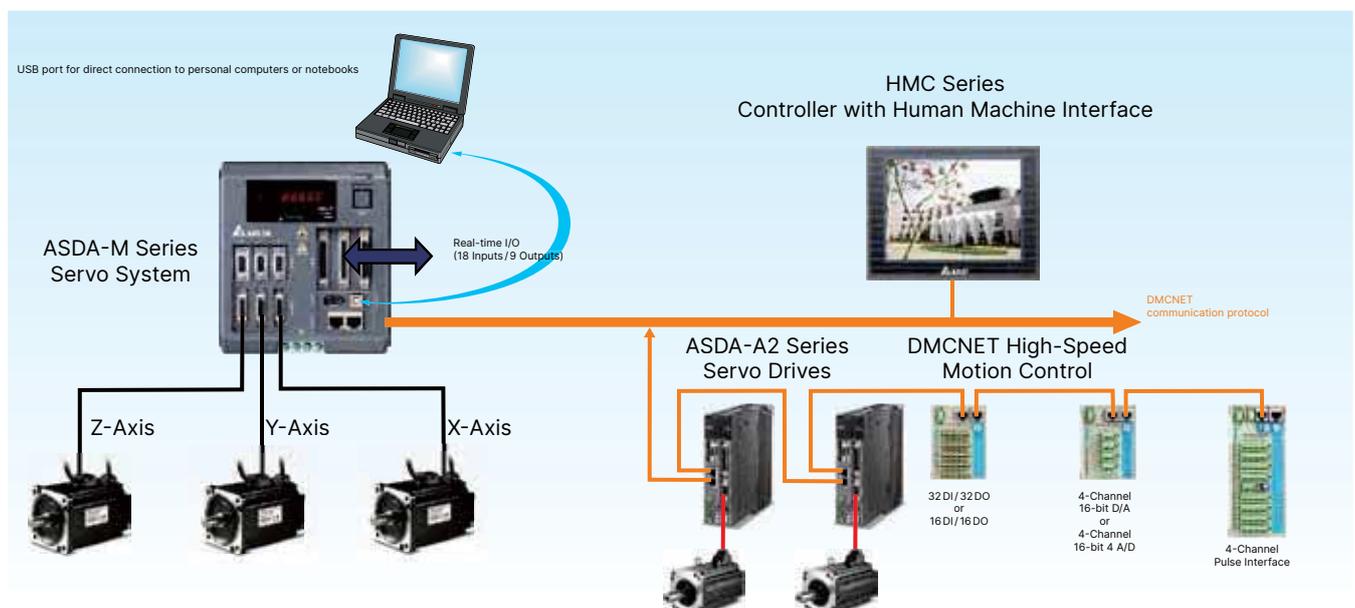
- ASDA-Soft provides built-in contour analysis function
- EzASD provides PLC programming and motion commands editing environment

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



Product Line-up

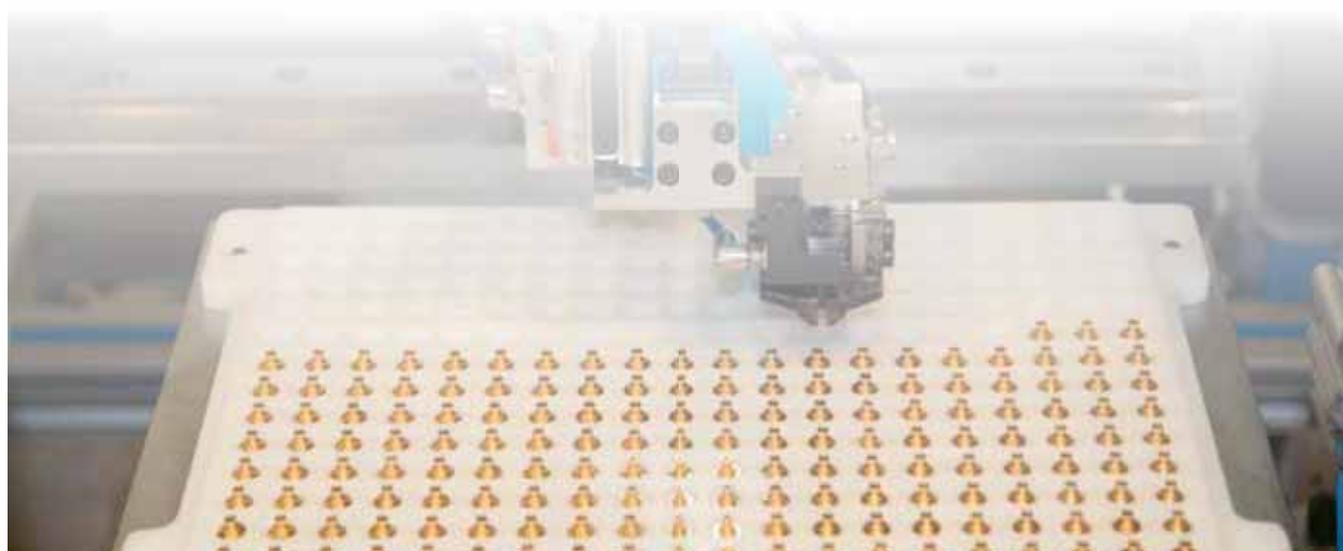
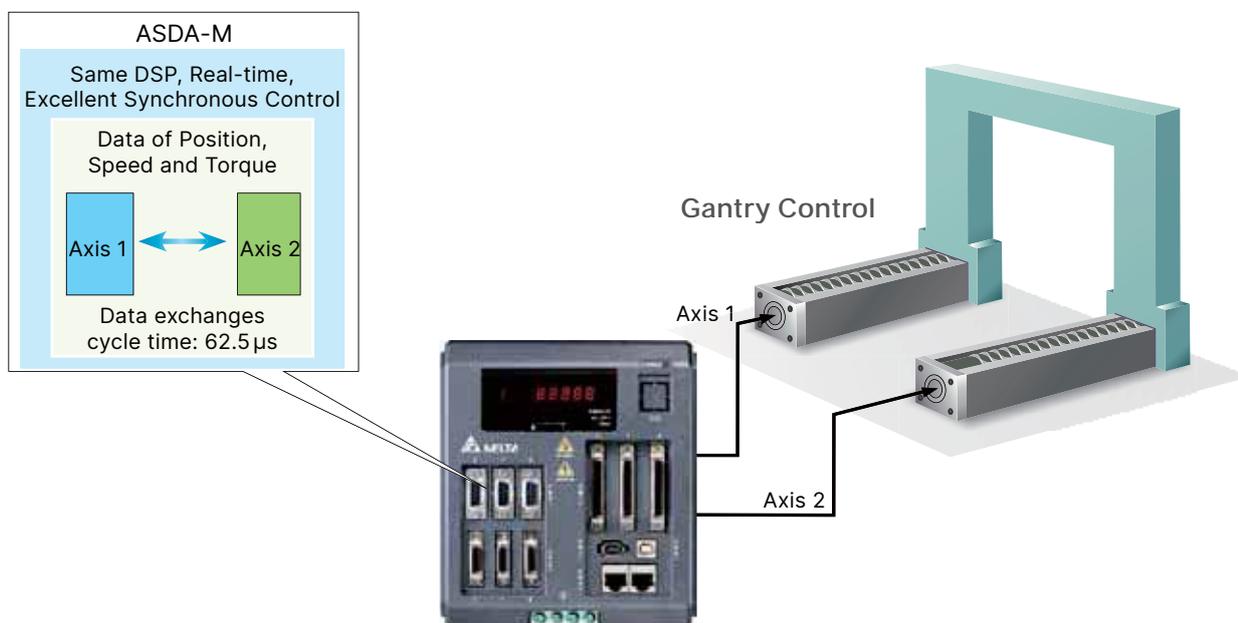


Real-Time, Reliable and High-Speed Motion Control Network

- 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

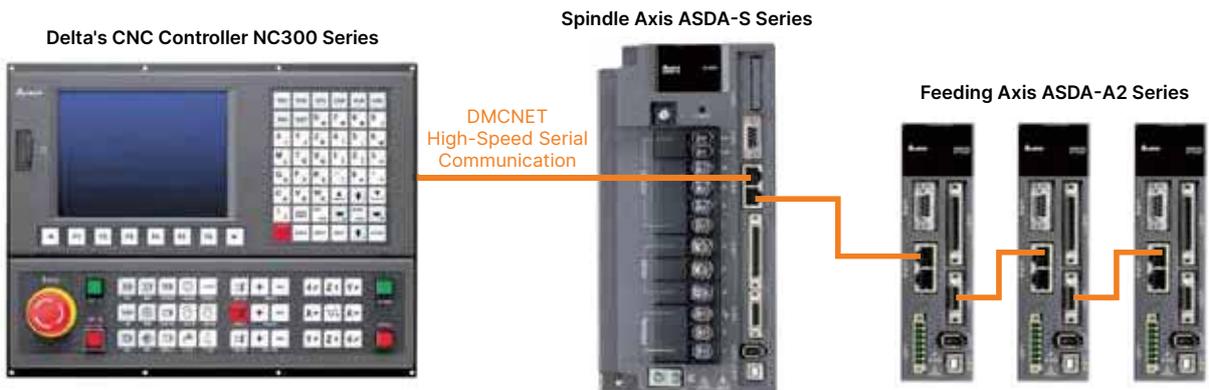


Spindle Motor Drive ASDA-S

Ensures Premium Surface Finish Quality for the CNC Industry

Power range: 3 kW ~ 15 kW

- Supports Delta permanent magnet spindle motors and other induction motors
- Provides high-performance servo vector control as in the ASDA-A2 Series
- Supports pulse encoder signals (ABZ phase) via CN5 port, no external converter card required
- Built-in induction motor parameter measuring and estimating function
- Offers V/F control for induction motors without encoders
- Equipped with analog speed and resolution switching function
- Supports analog voltage, position pulse and DMCNET motion commands
- 200V and 400V models are available for selection
- Capable of connecting to CNC controllers via DMCNET high-speed serial communication

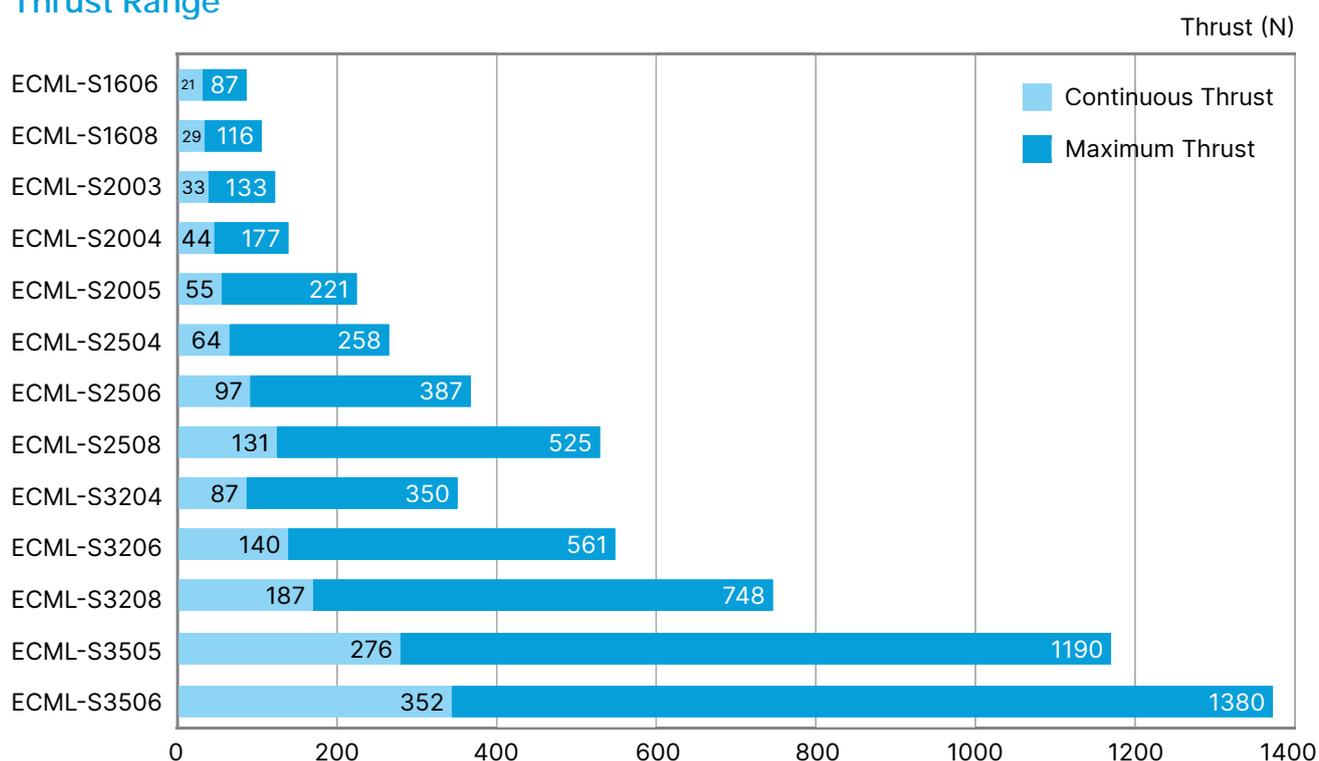


Linear Shaft Motor ECML-S

- Simple design for easy mounting on equipment
- Direct driving mechanism, easy to replace ballscrew mechanism
- No cogging forces, low thrust ripple
- Excellent dynamic response
- No backlash
- Built-in temperature sensor and hall sensor units
- Large air gap for easy installation
- Installation holes on both sides in the coil assembly for easy mounting



Thrust Range



Magnetic Shaft Length (Unit: mm)

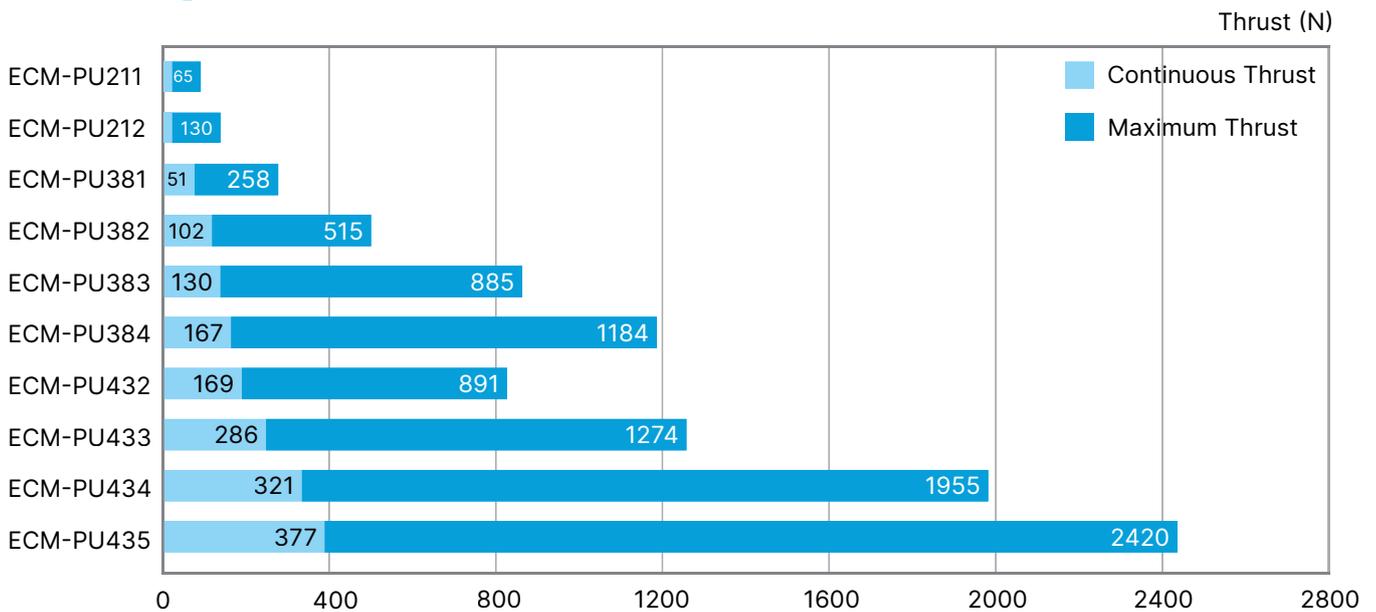
Model Name	Minimum Length	Maximum Length	Gap
ECML-SM16	250	1,240	30
ECML-SM20	250	1,270	60
ECML-SM25	330	1,650	60
ECML-SM32	450	2,790	60
ECML-SM35	810	2,790	60

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



Magnetic Track Length (Unit: mm)

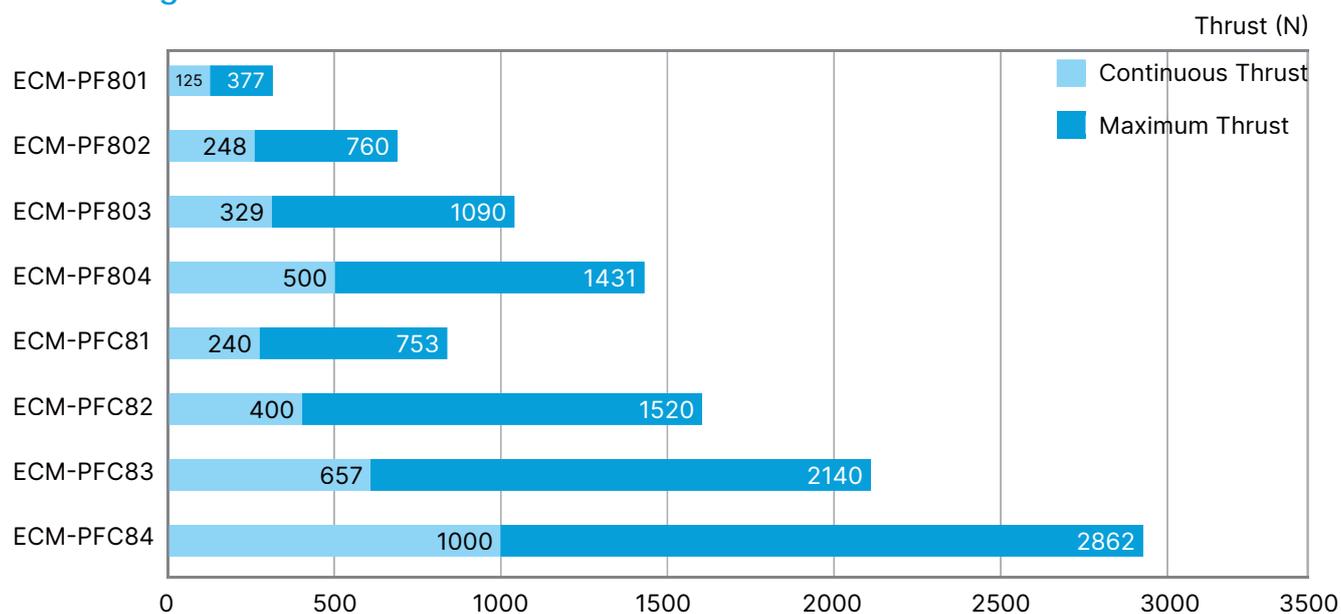
Model Name	Length	Gap
ECM-PU21	135, 270	135
ECM-PU38	156, 312	156
ECM-PU43	156, 312	156

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



Magnetic Track Length (Unit: mm)

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

Linear Stage

LU

High Precision Steel Ballscrew Driven Stage Position Repeatability of $\pm 3\mu\text{m}$

- Non-coupling mechanism design
- Compact size for space saving
- High rigidity and high accuracy
- Fast response
- Low inertia ratio



Features

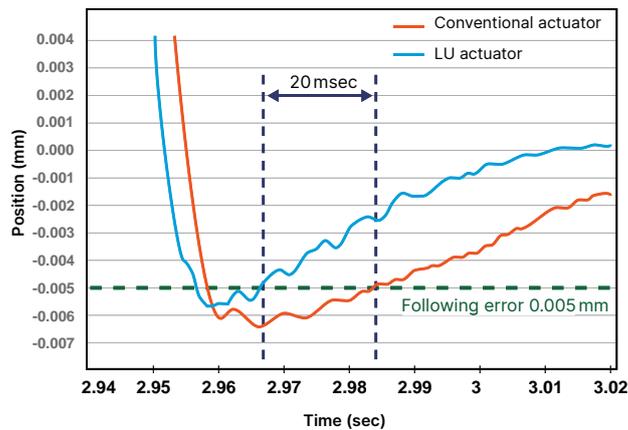


Delta LU Series
(without coupling)



Conventional Linear
Stage (with coupling)

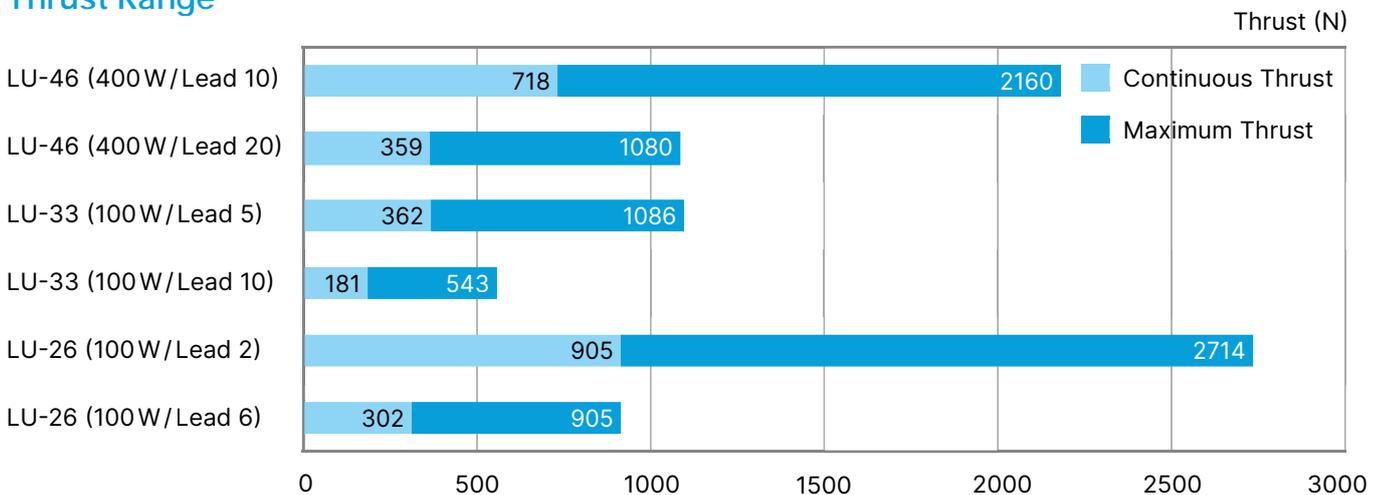
Measured Data by Laser Interferometer



Test condition

- Without load
- Motor speed: 3,000 rpm
- Acceleration time: 50 ms

Thrust Range



Linear Stage

LA-S

High Speed, High Precision Linear Motor Driven Stage Position Repeatability of $\pm 1 \mu\text{m}$



Direct drive with zero backlash

- Directly driven by Delta's linear motor without backlash and alignment issues

High speed and high precision

- Provides high-precision and high-stability motion operation:
high speed capability of up to 4m/s
- Integrates with linear motor and optical linear encoder for direct drive and prevents backlash and accumulated offsets caused by changing machines

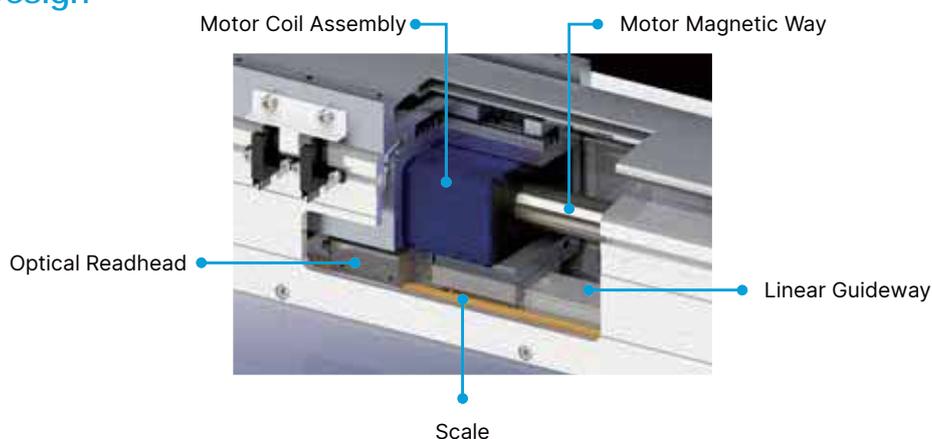
Cog-free design with low thrust ripple

- Use an ironless forcer for zero cogging and low thrust ripple to perform smooth motion, even at low speed

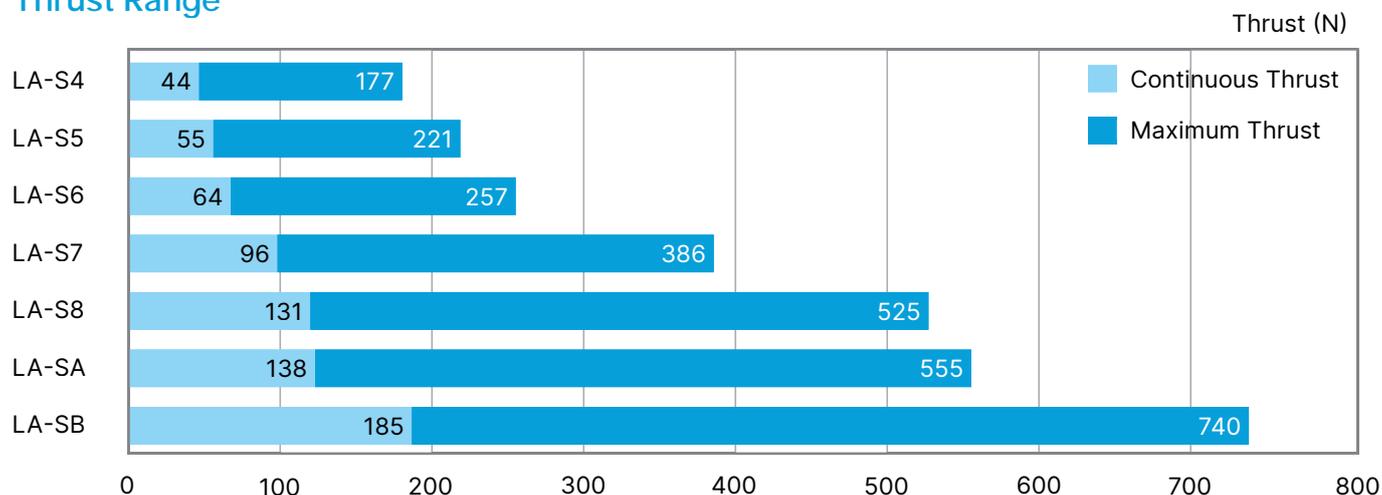
Long travel distance with multiple sliders

- Good performance on long travel distances (up to 1.5m) for various positioning applications
- Single-axis platform supports more than 2 linear motors, creating multiple sliders within one stage unit for efficient space savings and independent operation

Mechanism Design



Thrust Range



Smart Servo Screwdriver System ^{New}

Servo 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



Servo Screwdriver 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

- Control 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
- Analyze defects causes such as stripping, tilted screws to continually optimize quality
- Ensures to implementing the correct screwdriver and processes in operation to prevent resource waste and enhance yield rate



Operation and User Interface

Tightening Status Monitoring

- Troubleshoots anomalies such as tilted, stripped and missing screws, as well as abnormal torque/angle

Parameter Settings

- Built-in parameter sets for faster implementation and easier operation
- Configurable parameters include: angles, torques, speeds, cycle time, number of screws, unscrewing times, and screwing order
- Multiple tightening strategies: standard 4-step tightening, pre-positioning, strengthened tightening
- Applies corresponding parameters with a scanner to reduce human errors

Integration with a PLC

- Anomalies alerts
- Receives orders from the PLC to adjust parameters
- Stores and uploads tightening records

Intuitive Parameter Configuration

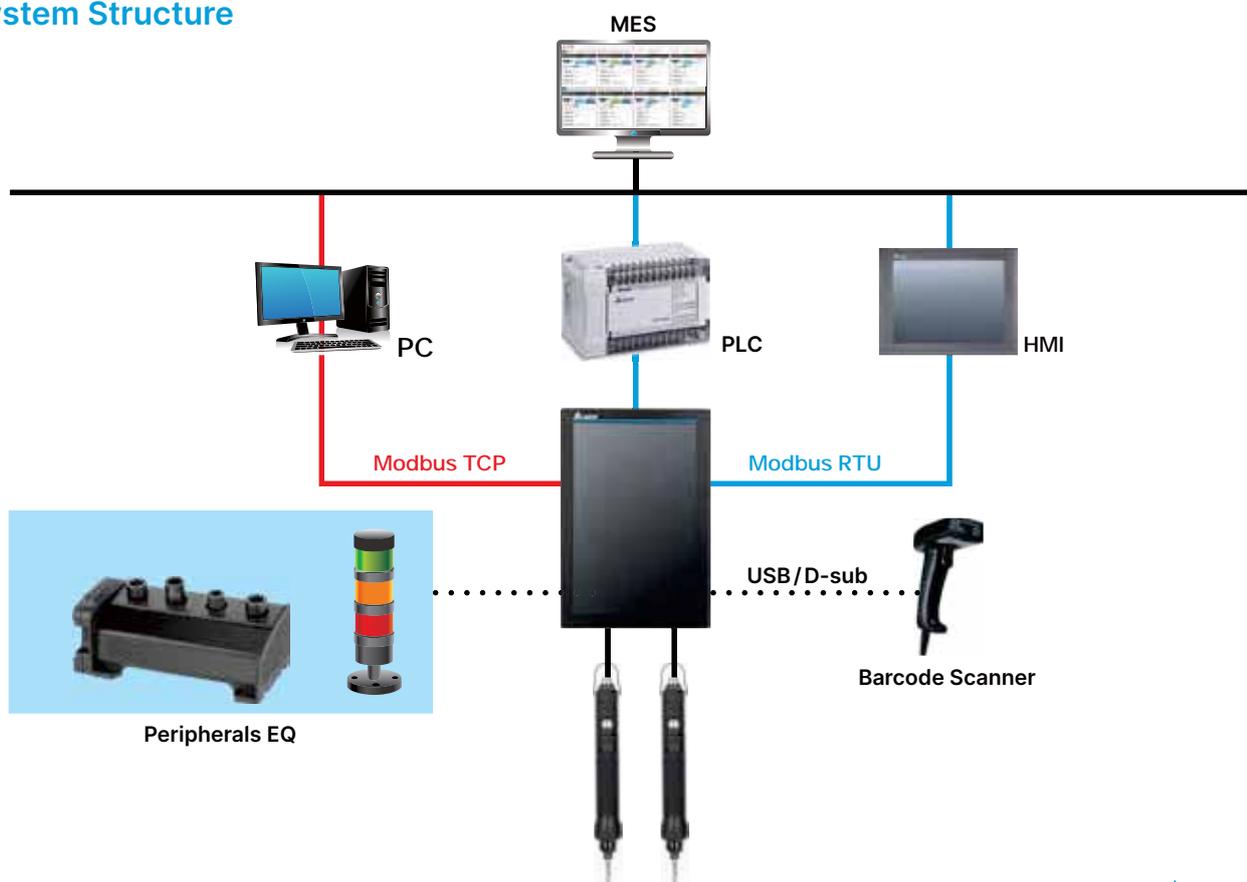
- User-friendly parameter configuration interface

Dual-spindle Operation with One Controller

- The controller for dual-axis allows two screwdrivers to operate simultaneously for higher productivity
- Switches between dual-axis synchronization and separate operation to satisfy different needs



System Structure



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 65dB
- **Lifetime lubrication**
Protective class IP65 sealed design avoids leakage problems and requires no maintenance during the product's lifetime

Precision Planetary Gearbox PA



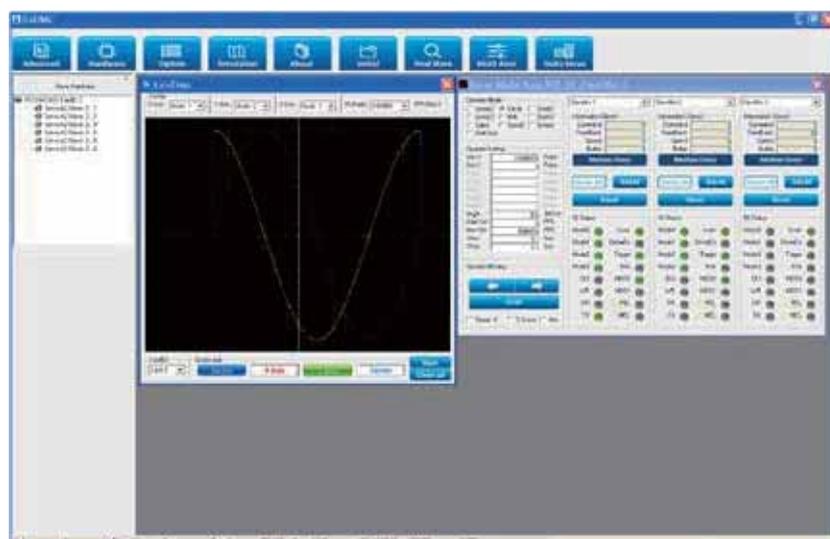
- **Supports all series of Delta servo motors**
- **Provides concentric models**
- **High rigidity and high torque**
 - Employs uncaged needle roller bearings with a set design
 - Includes ring teeth, gearbox and helical gears for high rigidity and output torque
- **High precision**
 - Backlash for 1-stage 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**
 - Protective class IP65 sealed design avoids leakage problems and requires no maintenance during the product's lifetime

PC-Based Motion Controller

MH2 / MP1

Supports EtherCAT / DMCNET 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, SSD and M.2 SSD slots provide fast and stable data transmission
 - The MP1 Series: equipped with a 15" touchscreen for more flexible operation
- Multiple Peripheral Interfaces for Communication**
 Built-in USB ports, serial COM ports, Gbps Ethernet ports
- Supports Master and Slave Modules**
 Built-in EtherCAT / DMCNET fieldbus for servo system and motion control module connection (up to 64 axes/100 stations via EtherCAT; up to 12 axes/12 stations via DMCNET)
- 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



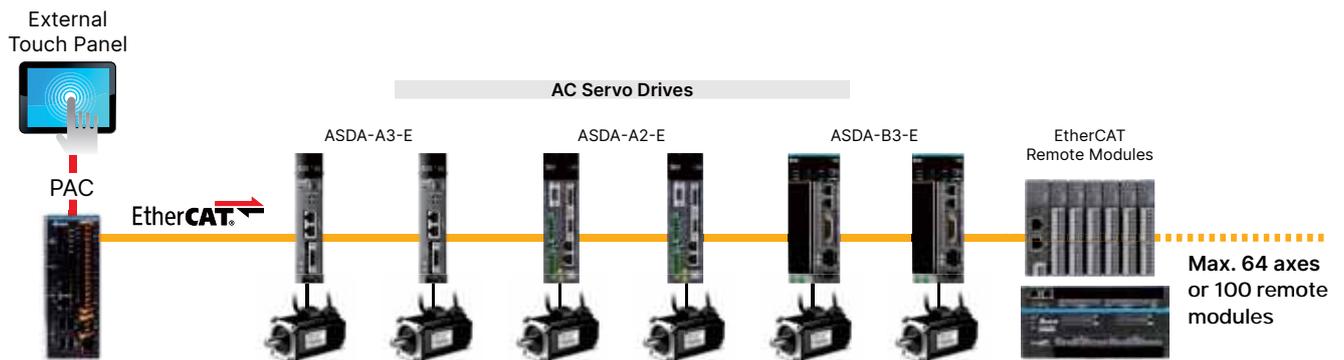
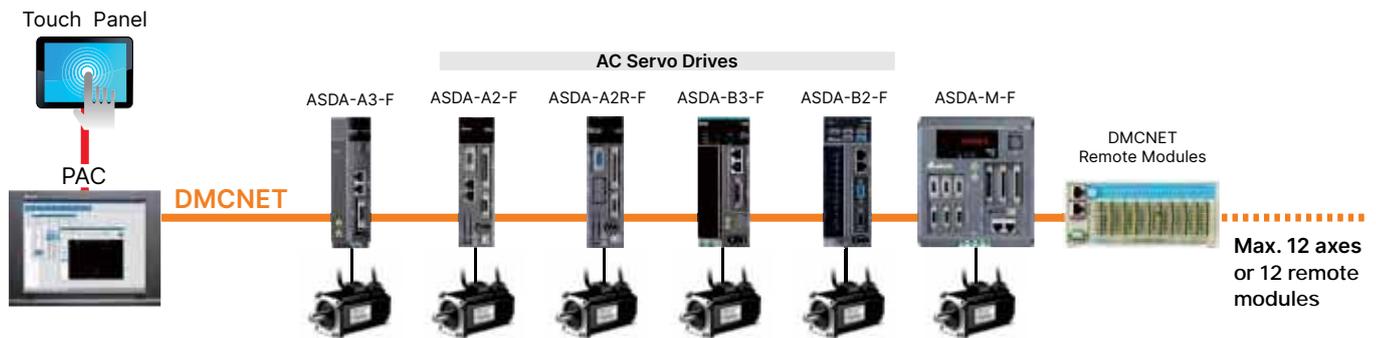
Motion Control Functions

- Point-to-point position control
- Multi-axis linear interpolation
- Single-axis two-speed motion
- Circular interpolation
- Helical interpolation
- Backlash compensation
- Helix deviation compensation
- JOG
- CSP/CSV/CST
- PP/PT/PVT
- Compare Trigger
- Motion Buffer (EtherCAT)
- Gantry Control (EtherCAT)
- E-CAM (EtherCAT)

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

MH2 / MP1

EtherCAT Modules Supported



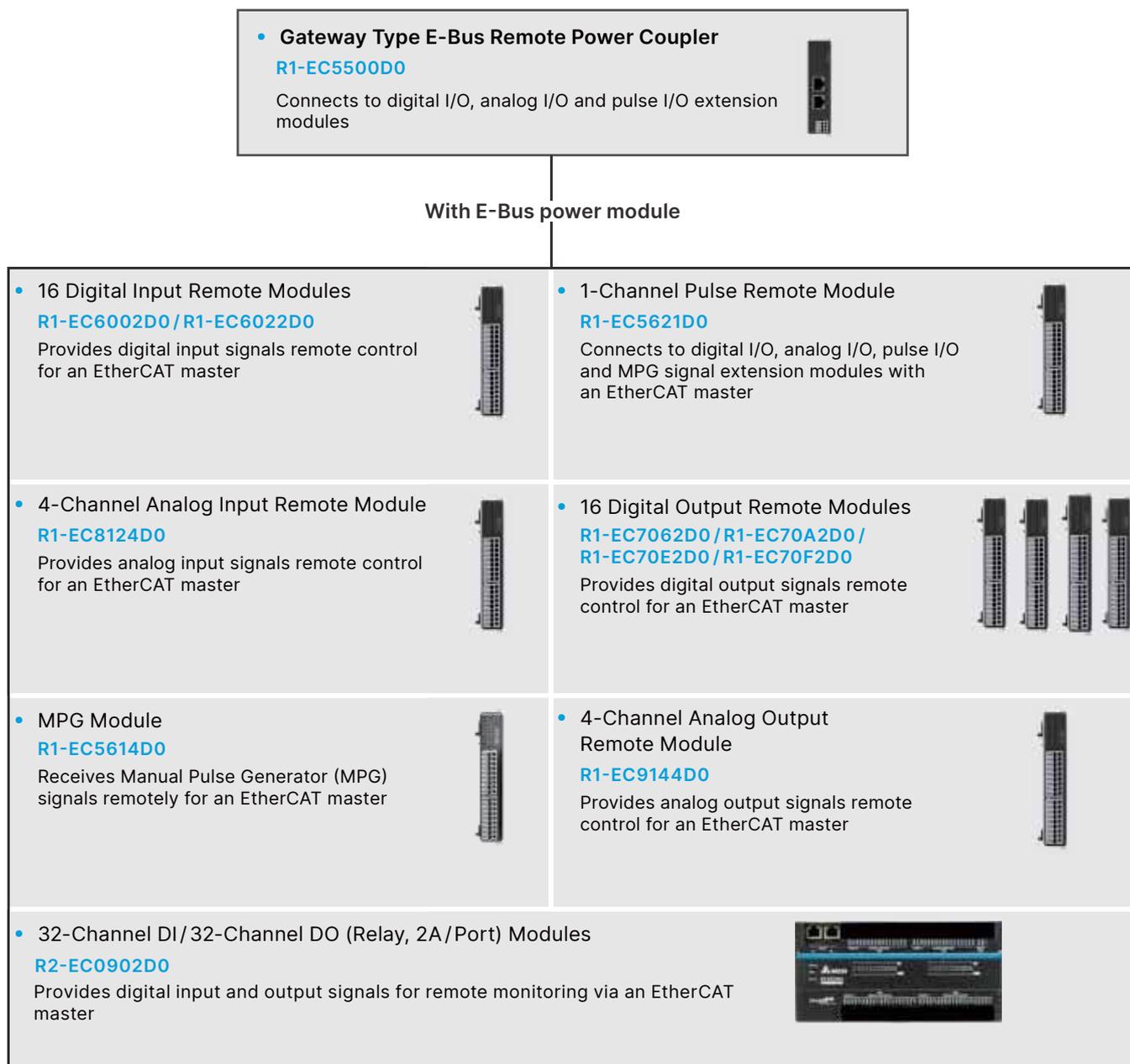
Applications

- **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, electronic assembly, consumer electronics, winding machines, glue-dispensing machines
- **Woodworking:**
CNC drilling machines, woodworking machines, board slitting machines
- **Other:**
Aluminum & stone processing equipment



MH2 / MP1

EtherCAT Modules Supported



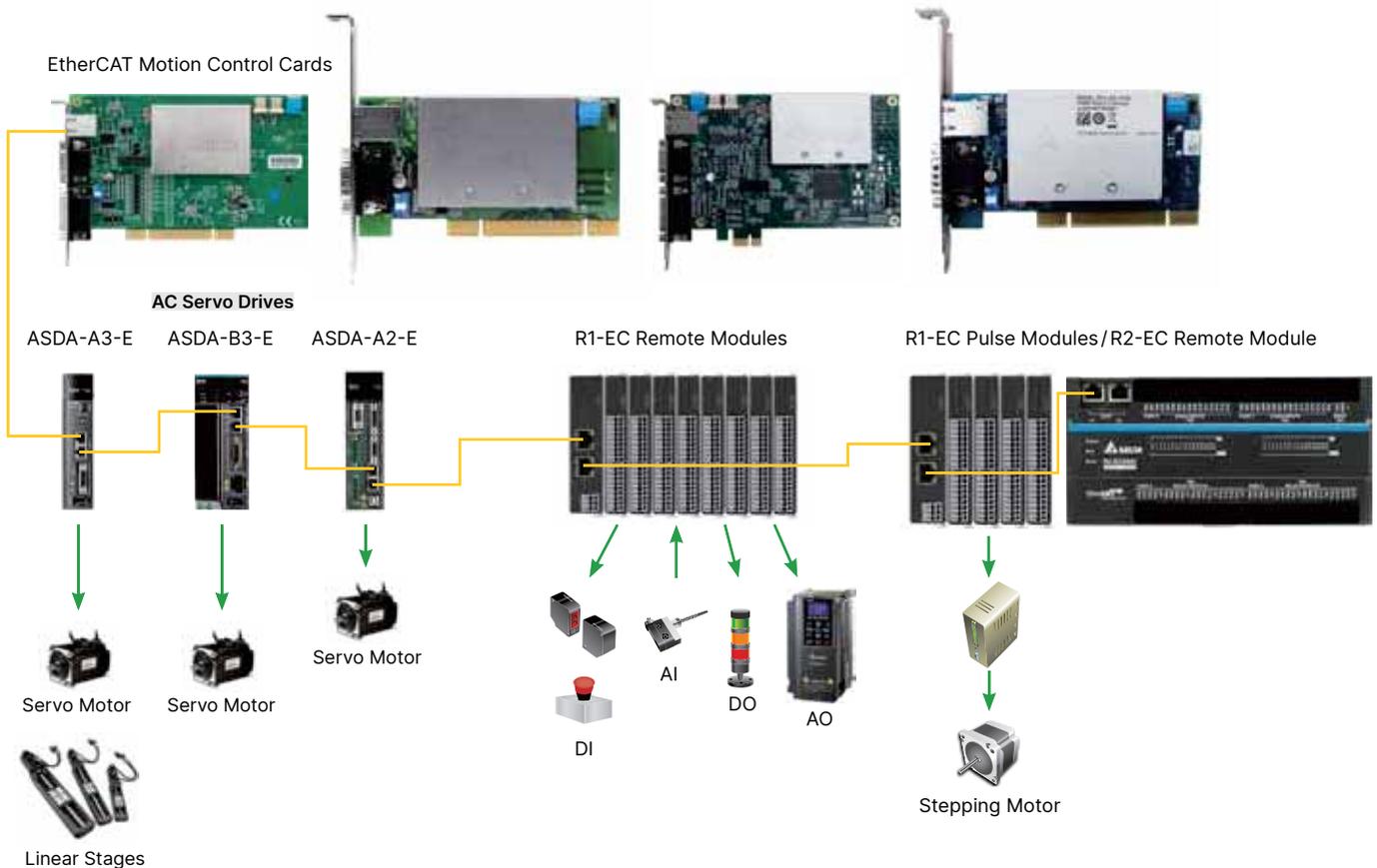
EtherCAT High-Speed Motion Control System

EtherCAT (Ethernet Control Automation Technology) is an open Ethernet-based fieldbus system that provides high-efficiency and high-performance synchronization quality for automation control. Delta's EtherCAT motion control cards feature:



- 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 1ms 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



Applications

Automated optical inspection machines, GPU testing machines, electronic assembly, consumer electronics assembly, automotive production lines, semiconductor equipment, IC testing and packaging machines

High-Speed Motion Control System DMCNET

Delta's Motion Control NETWORK (DMCNET) is a high-speed and real-time communication system that features:

- Up to 12-axis simultaneous servo control within 1 ms; could be divided into 4 groups of 3-axis helical/linear interpolation or 6 groups of 2-axis linear/arc interpolation
- Supports 64-bit double-precision floating point for highly precise calculation and flexible operation
- Supports incremental and absolute commands and T-curve/S-curve velocity profiles
- Built-in 35 homing modes
- Built-in position, speed and torque control modes; able to receive real-time servo information/parameters or change control modes via communication protocol, offering fast communication and motion control for various applications



Three series of PCI motion control cards are available for Delta's DMCNET single-wire communication protocol:

- 12-axis motion control card with digital I/O interfaces: PCI-DMC-A02
- 6-axis motion control card with digital I/O interfaces: PCI-DMC-F02
- Motion control cards with pulse comparison & capture functions: PCI-DMC-B01, PCI-DMC-B02, PIC-DMC-B03

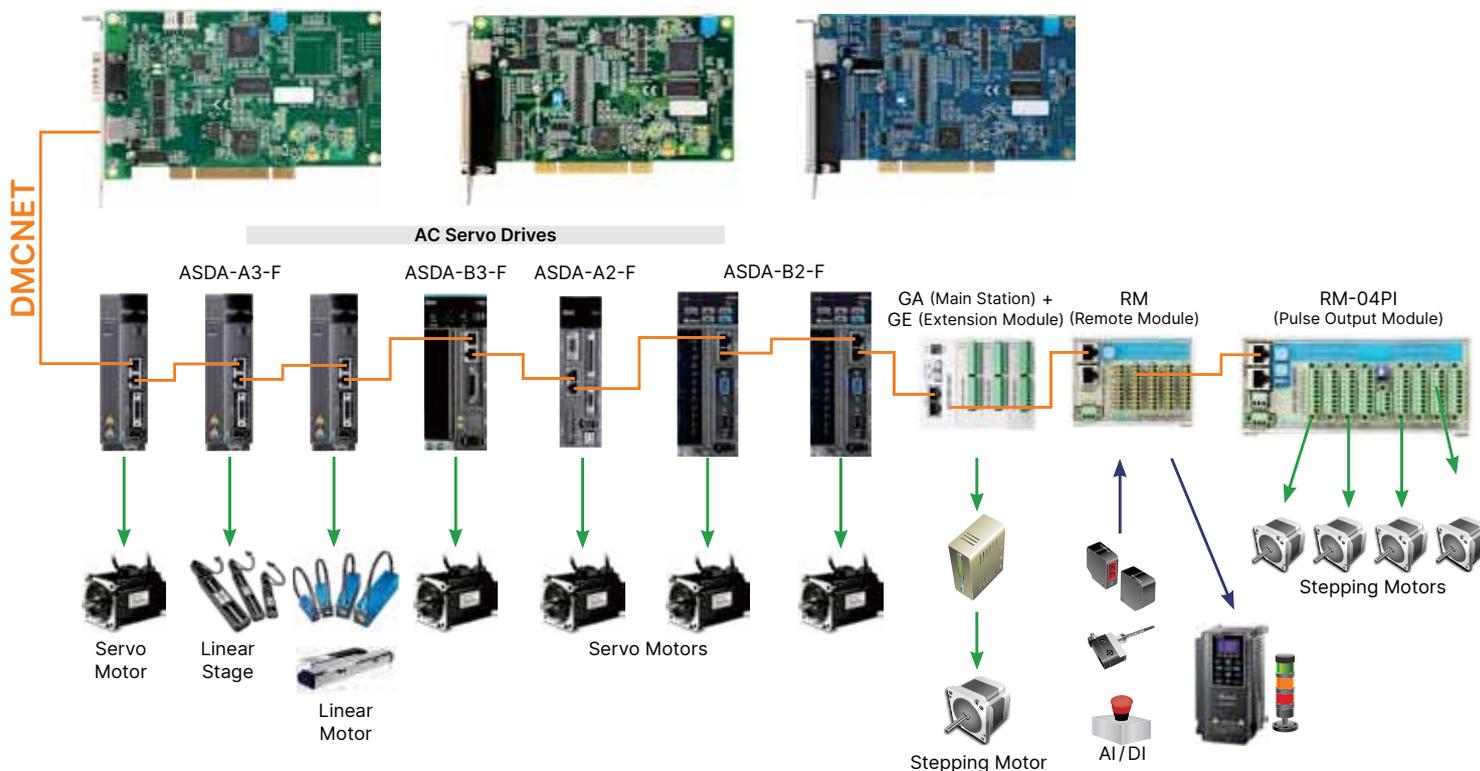
All series are able to connect to multiple servo systems, such as the ASDA-A3-F, ASDA-B3-F, ASDA-A2-F, ASDA-B2-F Series, or the ASDA-A2R Series with linear motors per user's requirements for high performance

DMCNET System Configuration

PCI-DMC-B01/PCI-DMC-B02/PCI-DMC-B03

PCI-DMC-A02

PCI-DMC-F02



Applications

Automated optical inspection machines, GPU testing machines, electronic assembly, consumer electronics assembly, automotive production lines, semiconductor equipment, IC testing and packaging machines

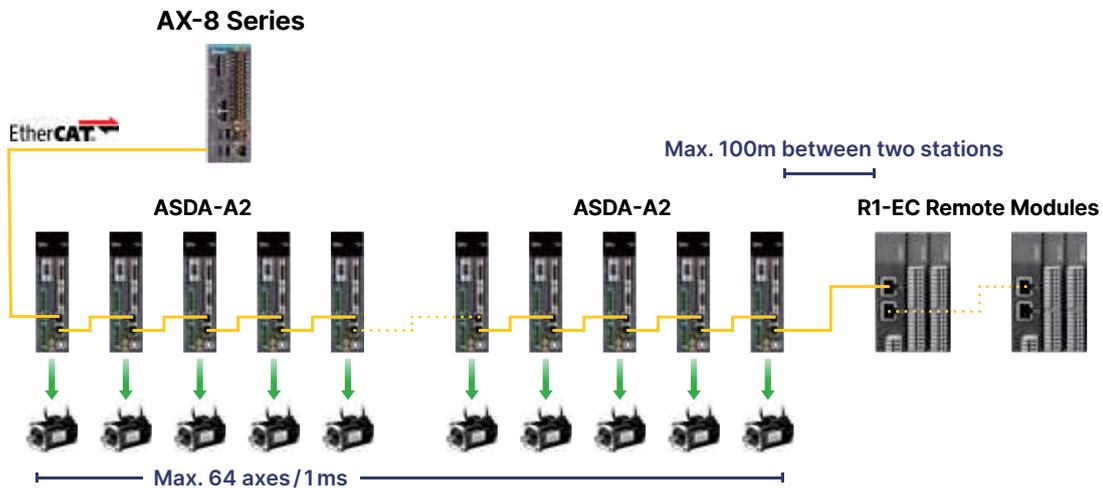
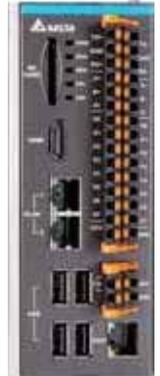
CODESYS Motion Solution

PC-Based Motion Controller

AX-8 Series

Supports EtherCAT and CODESYS-based programming software as a comprehensive and integrated motion control solution for various industrial applications

- Intel x86 CPU with fanless and compact design
- Provides low-voltage detection and data overwriting functions for PACs
- 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 CODESYS software provides a standardized programming and controller development platform



PLC-Based Motion Controller

AX-3 Series New

Provides a real-time and flexible motion solution for various applications with CODESYS-based program and EtherCAT communication

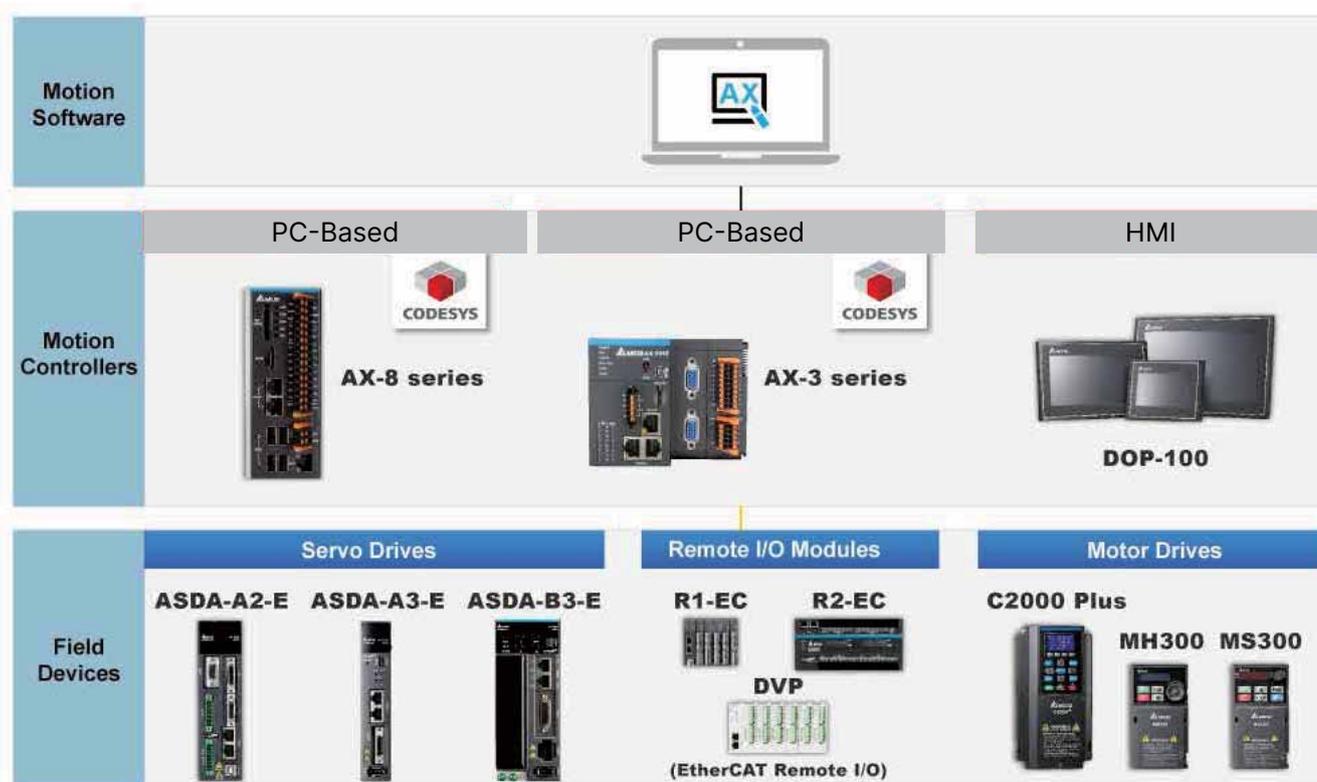
- AX-308E/AX-316E/AX-332E CPU support up to 8/16/32-axis EtherCAT motion control ability and the min sync. time of AX-332E reaches up to 0.5 ms for 16 axes
- AX-304EL/AX-364EL CPU support 4/64-axis EtherCAT point-to-point control ability, which provides robust functions and higher values
- Supports PLC AS series' power, DIO, AIO and temperature expansion modules (Max. 32 modules)
- High performance: min. execution time of basic instruction is 5 ns
- Provides common 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 (x1~2), SSI absolute encoder, RS-232/RS-485, Ethernet and EtherCAT ports



Software - DIADesinger-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



Open CNC Solution NC30EB

Open-structured CNC Control System for Customization and Flexibility



Solution 1: Standard

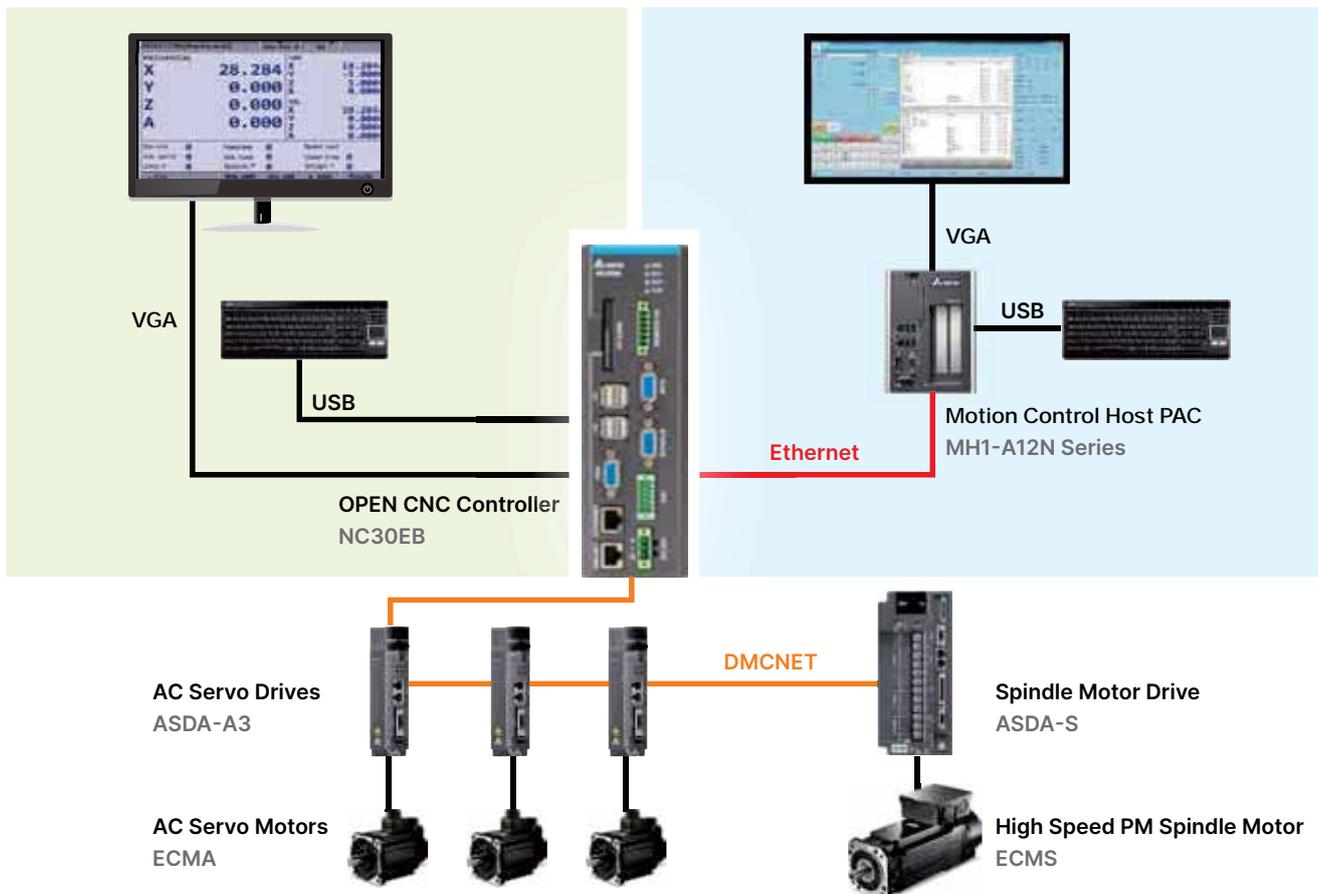
VGA output for external display with Delta's standard interface

- Provides new operating interface using the DOPSOFT software to program customized functions for flexible operation
- Bilingual CNC operation interface (Chinese, English)
- Embedded control system provides high efficiency
- Allows easy customization with accessories including a monitor and a keyboard
- Supports DMCNET communication for easy wiring and excellent synchronous multi-axis control

Solution 2: Function-Oriented

Match with panels or other products based on applications

- API platform and template are provided for users to self-define the HMI functions
- Easy integration with third party software via IPC
- Reduces additional hardware cost for customers to focus more on software upgrades and better integration for higher operation performance



Applications

Customized CNC systems, woodworking machines, lathes, grinding machines, glass cutting machines, soldering machines, rim engraving, milling machines, industrial robots

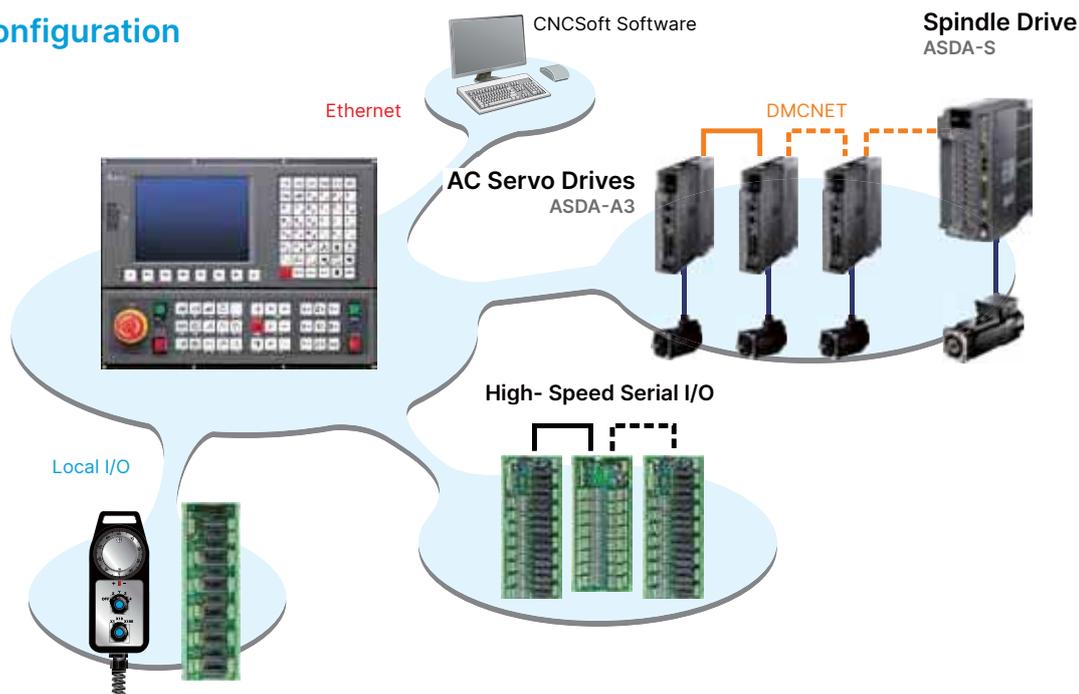
CNC Solution

Integrated Total Solution for the CNC Machine Tools Industry



- Built-in 32-bit high-speed and multi-task processing dual CPU to construct a real-time and multi-functional control center
- High-quality digital data transmission when matched with Delta's high-speed servo and spindle systems
- Auto-gain tuning allows automatic servo system parameter settings to achieve easy and real-time optimum control
- Provides new operating interface using the DOPSOFT software to program customized functions for flexible operation
- Built-in high-resolution encoder with an accuracy of 0.1um to enhance control and accuracy
- Capable of connecting serial digital I/O modules to greatly improve the extension capacity

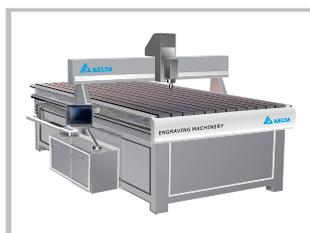
System Configuration



Applications



CNC Machining Center /
High-speed Tapping Machine



Engraving Machine



CNC Gantry Control Machine



CNC Woodworking Machine

Robot Controller with Servo Drive Integrated ASDA-MS

An Innovative and Comprehensive
Development Platform for Robot Control

Complete Robot Solution

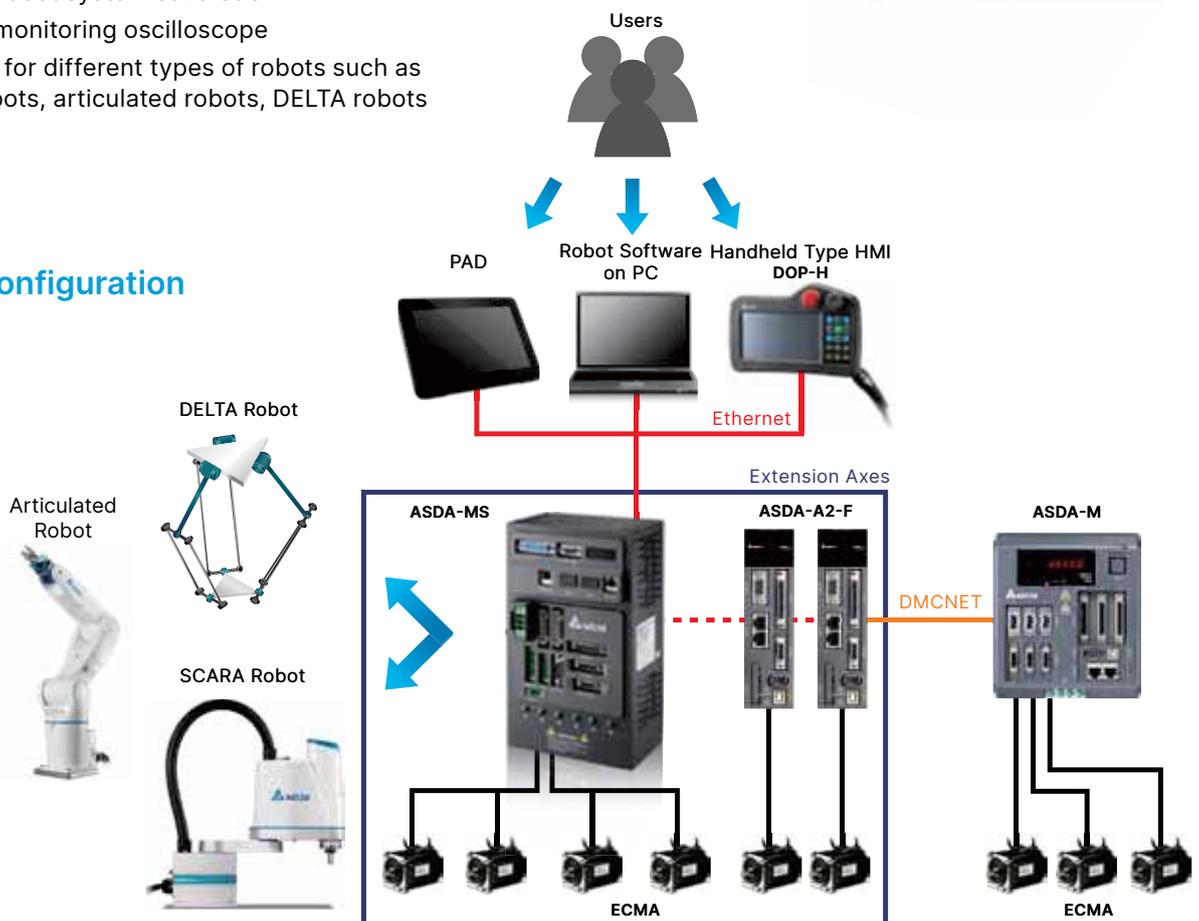
- Integrated servo drive and controller in one single unit for real-time motion control with high flexibility and reliability
- Various communication protocols
- Built-in with diverse robot control modules
- Up to 10-axis motion control: 4-axis robot + 6 external axes
- Supports 5 kinds of programming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

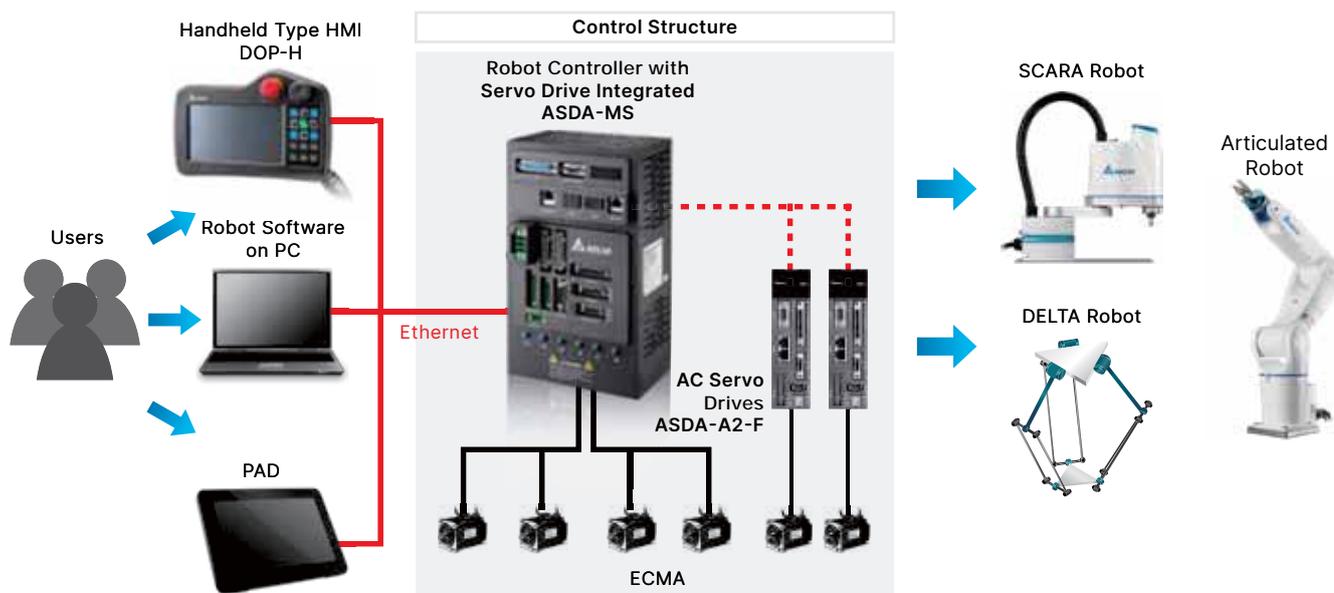


System Configuration



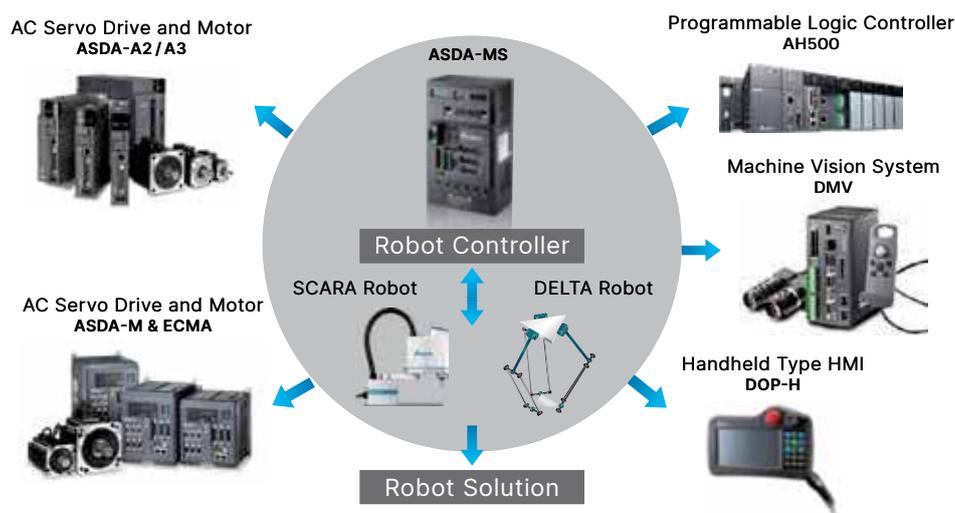
All-in-One Robot Controller

- Integrates motion controller, robot controller and 4 servo drives into one single unit to speed up data transmission, enhance system control performance and dynamically compensate non-linear terms that affect robot motion during robot moving processes, meeting the requirements of high speed and high precision for robot or motion control applications
- Provides a variety of tools for implementing required functions and supports different types of robots and products such as Delta's linear motion products, 4-axis SCARA robots, DELTA robots, and the 2 axes extension via DMCNET for 6-axis articulated robots to meet diverse requirements with flexibility and reliability



Comprehensive Development Platform

- Provides a comprehensive development platform for customers to design their specific applications, enhancing value-added secondary development and efficiency of various manufacturing techniques
- Integrates with Delta's industrial automation products and related robot peripheral devices to create a complete robotic automation solution, meeting the requirements for both robot and robot workstation applications



Applications

Industries: Consumer electronics, electrical / electronics, rubber and plastics, packaging, metal fabrication

Tasks: Insertion, screw driving, assembly, glue dispensing, soldering, loading / unloading, stacking, inspection

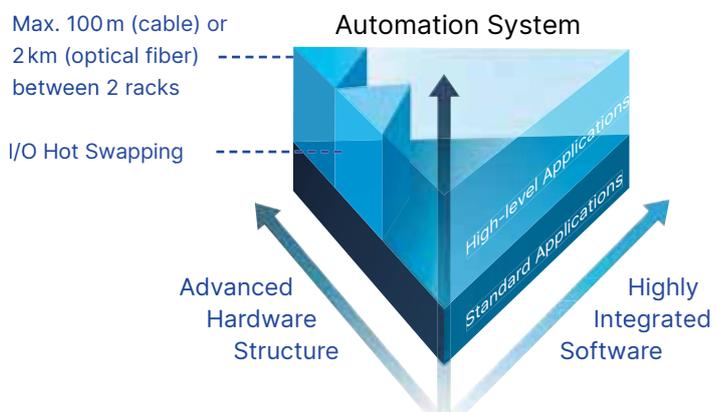
Hot Swappable Mid-range PLC AH

The Smart Solution for High-end Machinery and System Integration



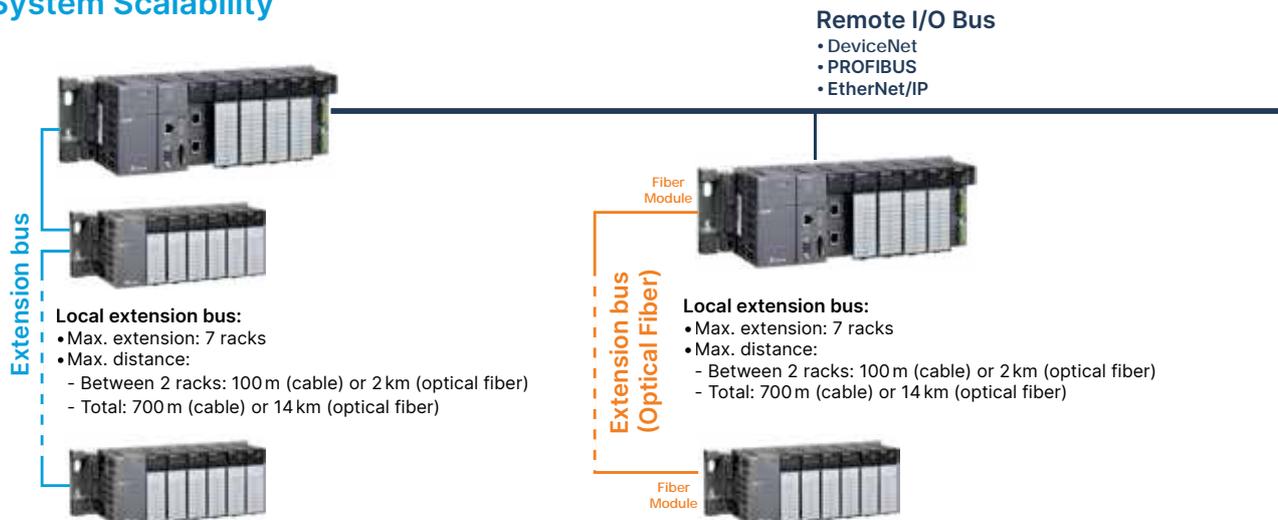
- 32-bit dual-core multitasking processor
- Excellent program execution speed (LD: 20ns)
- Max. I/O:
 - DIO: Max. 4,352 points
 - AIO: Max. 544 channels
 - RIO: Max. 125,440 digital points/3,920 analog channels
- Program capacity: max. 1M steps (4 MB)
- Data register (D+L): 512k words
- CPU with built-in fully isolated RS-232/422/485 ports, mini USB port, Ethernet port and SDHC card slot (compatible with the memory cards on the market)
- Various modules for selection: digital I/O modules, analog I/O modules, temperature modules, network modules, pulse-train modules, and DMCNET motion control modules

Modularized Hardware Structure and Highly Integrated Software



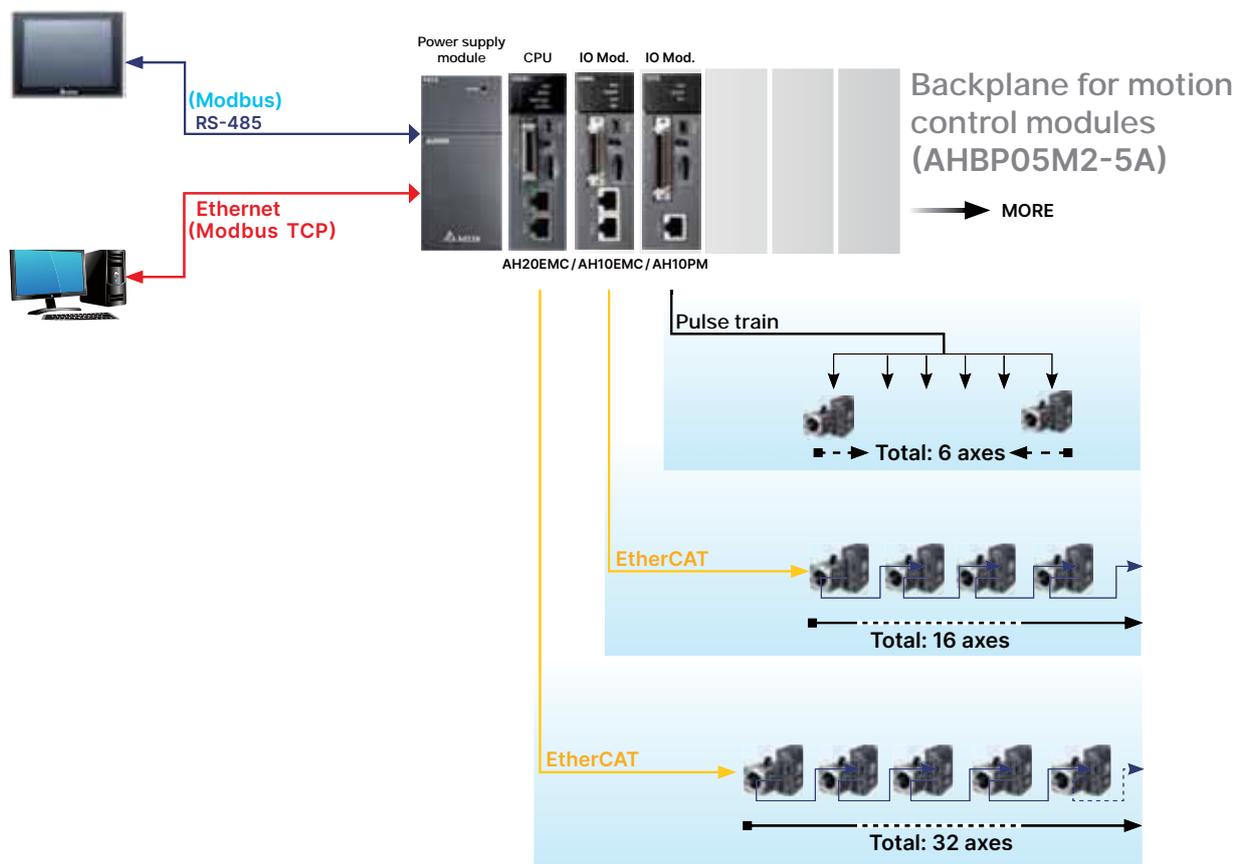
- Highly integrated programming software ISPSOft: Graphical interface with 5 programming languages
- Enhanced flexibility: Max. 100m (cable) or 2 km (optical fiber) between 2 local extension racks
- Redundant system and hot-swapping function ensure non-stop system operation for improved maintainability

System Scalability



Motion Control Structure

Example: AH20EMC



Applications

- **High-end industrial equipment:**

Textile machines, packaging machines, injection and molding machines, electronics equipment, printing machines, paper making machines, warehousing management systems, and logistics management systems

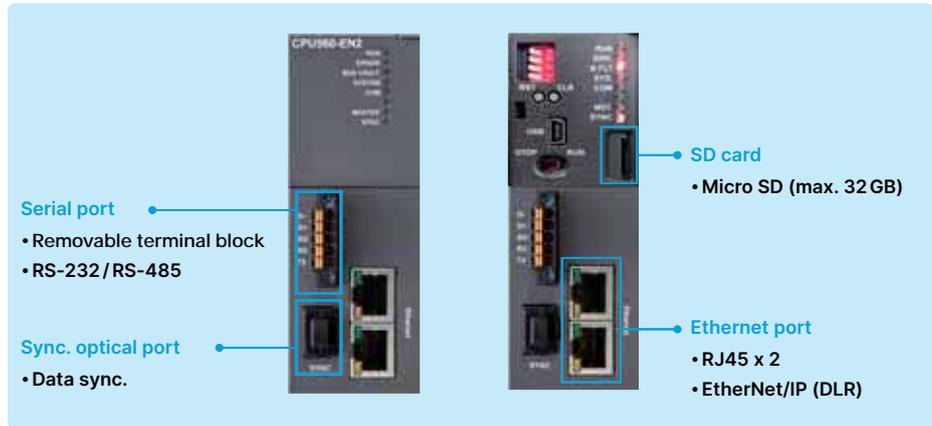
- **System integration applications:**

Water treatment, HVAC systems, traffic monitoring systems

Redundant CPU

The redundant CPU of the AH Series adopts a reliable redundancy structure, and integrates synchronous modules, Ethernet ports and serial communication interfaces for a more competitive control solution.

AHCPU560-EN2



Redundant Backplane

The redundant backplane of the AH Series provides redundant power supply and communication interfaces for a complete control solution.

Redundant main backplane: AHBP04MR1-5A (4-slot)



Redundant expansion backplane: AHBP06ER1-5A (6-slot) and AHBP08ER1-5A (8-slot)



Redundant System

Full Redundancy Structure

Redundant CPU	Redundant Main Backplane	Redundant Power	Redundant Ext. Ports	Ring Topology
---------------	--------------------------	-----------------	----------------------	---------------

Modules

Main Backplane	Expansion Backplane	RTU rack
<ul style="list-style-type: none"> Ethernet module: AH10EN-5A (V3) Serial module: AH10SCM-5A (V3) 	<ul style="list-style-type: none"> DIO AIO (includes temperature modules) Serial modules: AH10SCM-5A and AH15SCM-5A 	<ul style="list-style-type: none"> DIO AIO (includes temperature modules)

Tasks

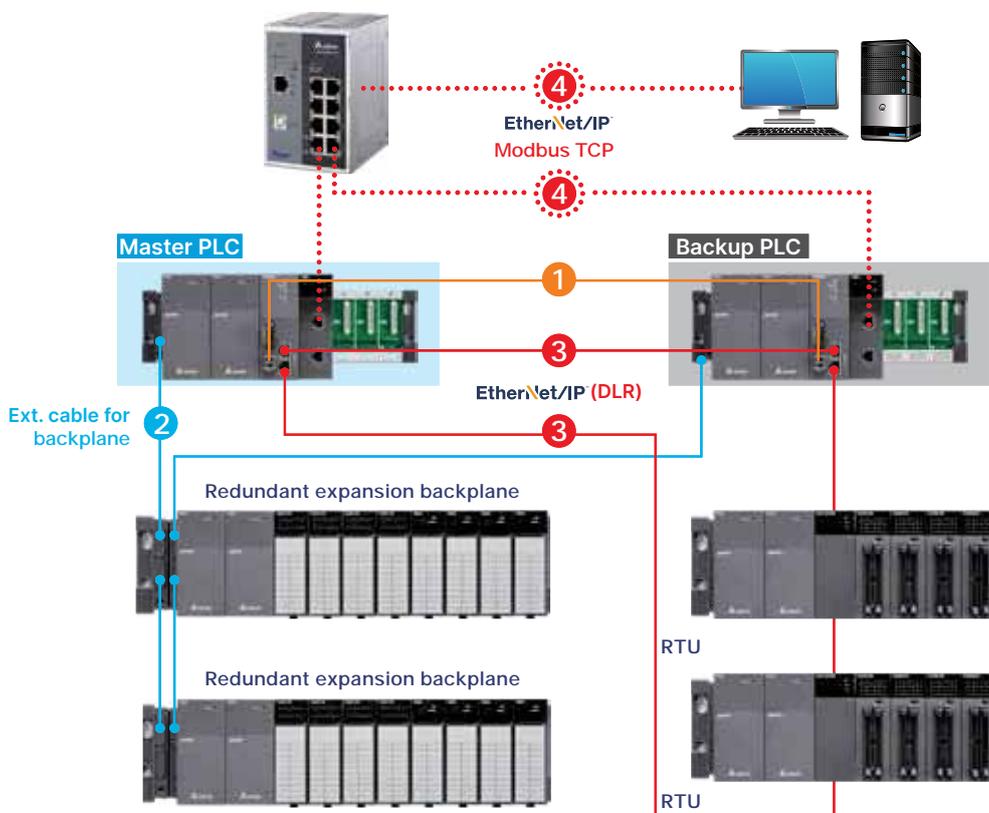
Cyclic	Timer Interrupt
--------	-----------------

CPU built-in sync. module

CPU switch-over time: 20 ms

RTU nodes for expansion backplanes

Standard backplanes available (under some conditions)



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

Compact Modular Mid-range PLC AS

Flexible, Smart, Friendly - The Best Choice for Automated Equipment Control

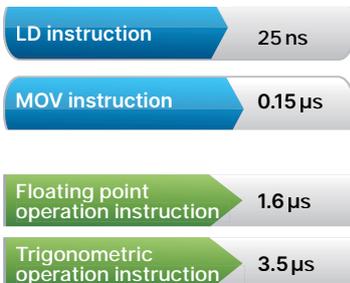


- Max. I/O: 1,024 points
- Max. Program capacity: 128k steps
- Data register: 60k words
- Max. extension ability: 32 modules
- 32-bit SoC (System on Chip) CPU for high-performance and high-speed computing
- CPU with built-in RS-485 port x 2, mini USB port, Ethernet port, micro SD card slot and CANopen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

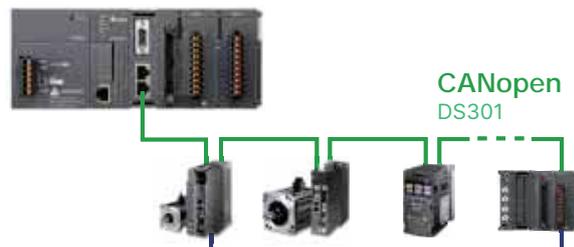
Advanced CPU Performance

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



Positioning Control - Delta's CANopen Control

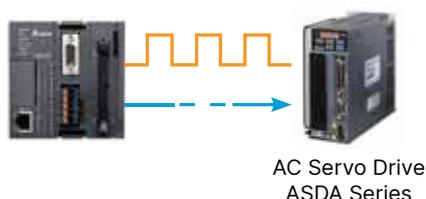
- AS CPU supports up to 8 Delta servo drives and 8 AC motor drives (AS-FCOPM function card is needed for AS300)
- Fast positioning configuration in one initialization instruction without building a CANopen data exchange table
- Axis control by instructions for easy maintenance and high PLC program readability



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

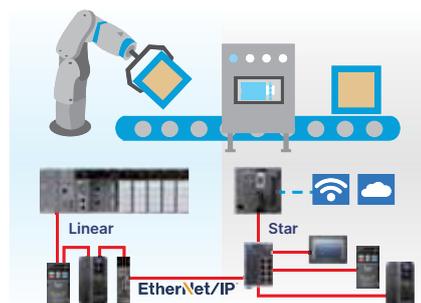
Positioning Control - High-speed Pulse

- 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



Flexible Network System Configuration

- Supports star, linear network topology for fast expansion and management on production lines
- Compatible with IT network; no independent network or IT technician required
- Matches with Delta's industrial Ethernet solutions to construct IoT for more automation applications and industrial upgrades



New Programming Software

Various, Convenient Software Wizards for Effortless Planning

Positioning Planning Table



- 2D simulation

Intuitive 2D track simulation for real-time path planning, no complicated calculation required

- Path list

Multiple combination for positioning modes and tracks; fast path planning via table-structured planning



- Axis parameter setting

Intuitive configuration interface for easy axis parameter setting

Complete Diagnosis Tools for Quick and Effective System Monitoring

Data Logger / Tracer

- Real-time monitoring:

High-speed tracer for fast sampling within 1 scanning cycle

- Stable logging:

Long-time data logger saves up to 32,768 data records, able to be transferred to SD cards

- Precise data capture:

Supports a variety of sampling intervals, trigger modes, software settings, and hardware executions

- Convenient comparison:

Multiple data logs in various data formats can be recorded at the same time

- Efficient data analysis:

Supports trend display, scaling, arrangement, merge and measurement

- Real-time
- Stable
- Precise



Applications

High-end equipment for electronics manufacturing, machinery processing, food packaging and other industries

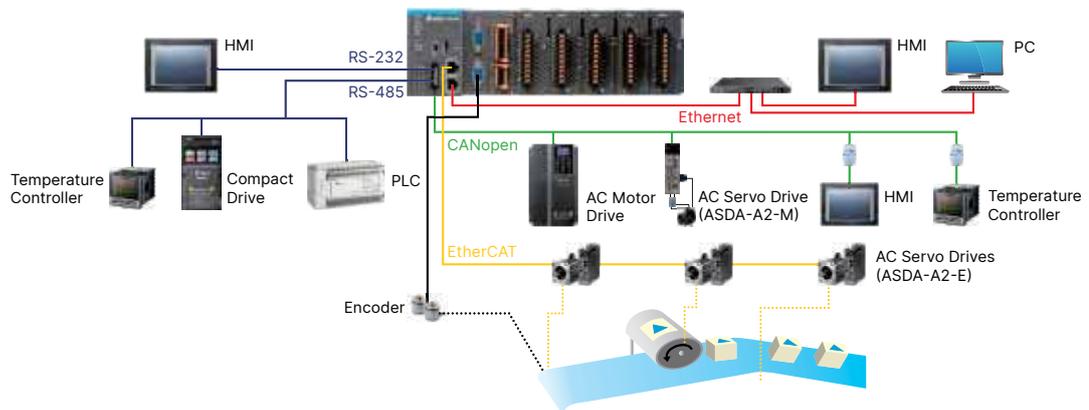
Compact Modular Motion Controller AS500

The Best Solution for OEM Equipment



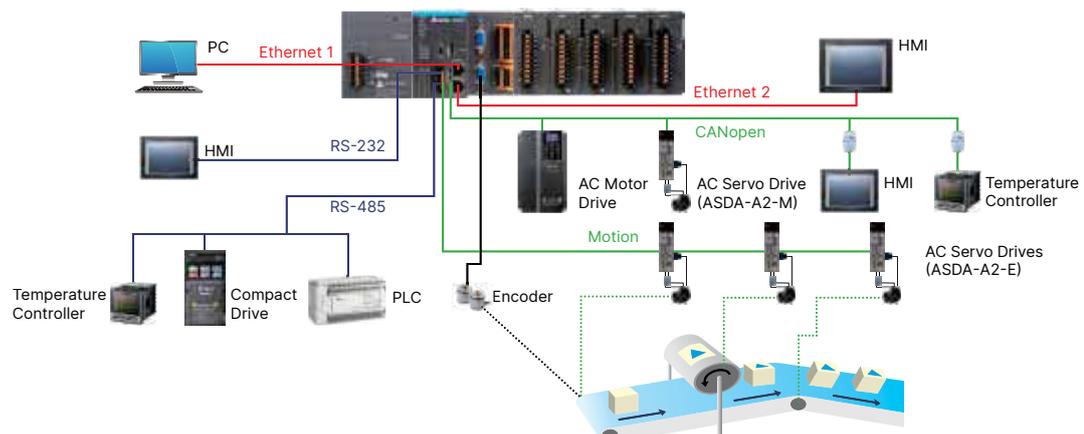
EtherCAT Motion Control System

- 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: 1ms/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 x 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 x 2, CANopen DS301 and CANopen motion interfaces



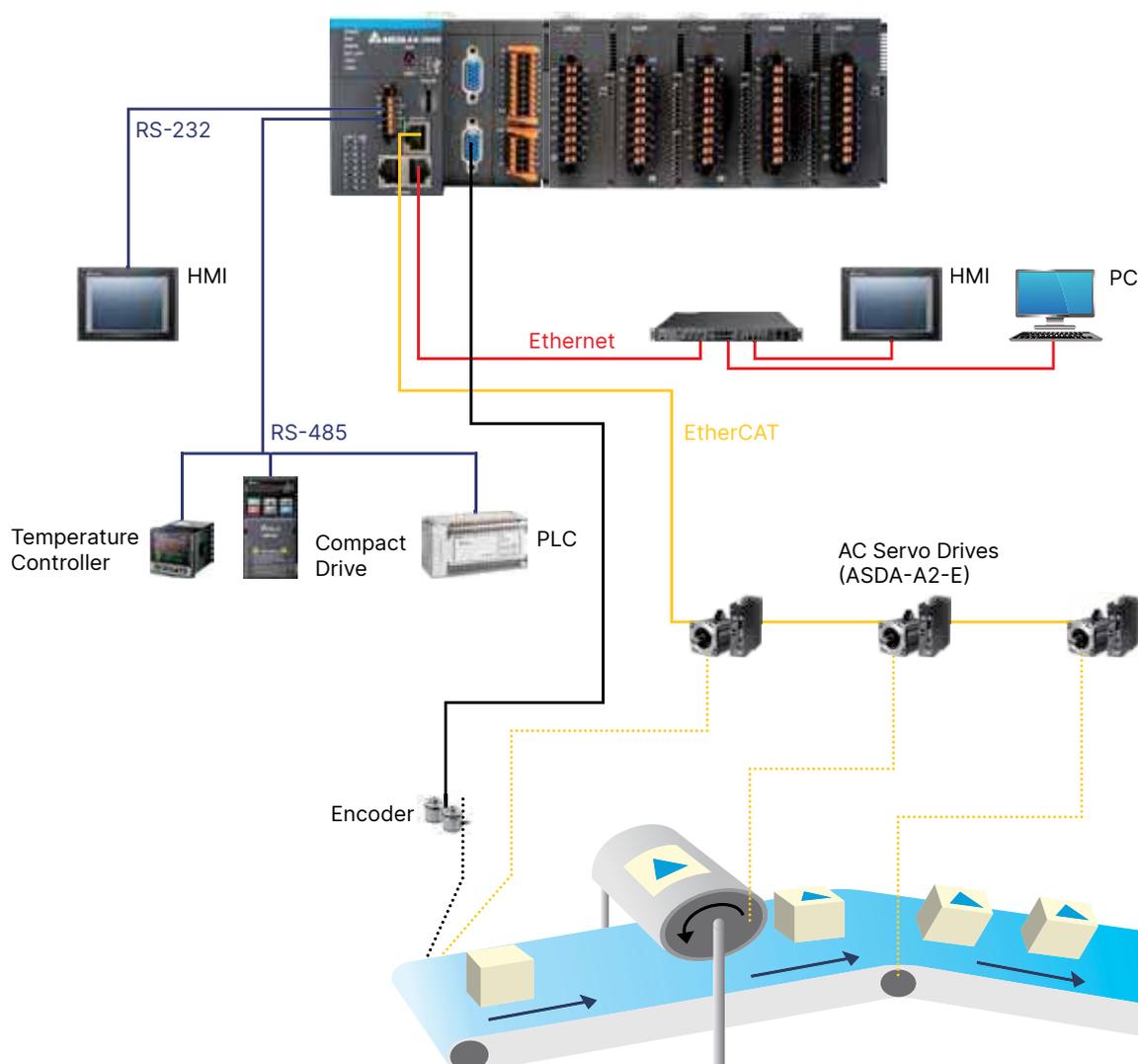
Compact Modular CODESYS Controller AX-3 ^{New}

Perfect Integration of High Performance,
Flexibility and User-friendliness



CODESYS EtherCAT Control System

- Provides multiple controller solutions
 - EtherCAT motion controllers
 - AX-308E CPU supports up to 8 EtherCAT axes (min. sync time: 2 ms/8 axes)
 - AX-304EL/AX-364EL CPUs support up to 4/64 EtherCAT axes (Point-to-Point mode)
 - Logical 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. command execution time: 5 ns
- Provides various motion commands: position, velocity, torque, multi-axis interpolation, E-gear, E-CAM, and more
- Built-in 16 DI & 8 DO, 2 incremental encoders, SSI absolute encoder, RS-232/485, Ethernet and EtherCAT interfaces

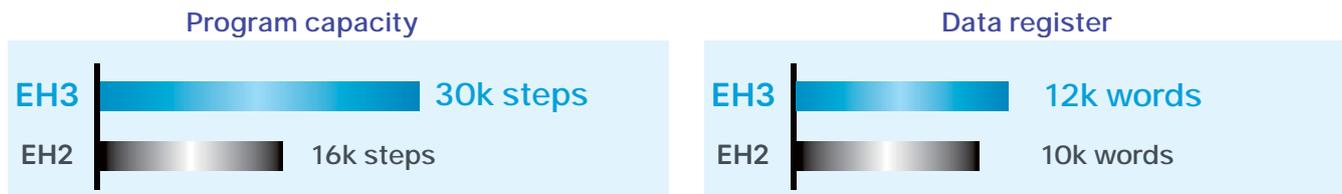


High Performance PLC

DVP-EH3

Excellent for OEM Monitoring Solutions

High-end model of Delta's DVP-E Series PLC with large program capacity and data registers for demanding and complex applications



Excellent Motion Control

- High-speed pulse output: max. 4 axes of 200 kHz pulse output (DVP40/48/64/80EH00T3)
- Supports max. 4 hardware 200 kHz high-speed counters
- Various motion control instructions to achieve high-speed and high-precision positioning control for labeling machines, packaging machines, printing machines and more applications
- Linear / arc interpolation motion control functions
- Up to 16 external interrupt pointers



Complete Program Protection

- Auto backup function prevents 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 protects your source programs and intellectual property

Function Cards

- RS-232/RS-422 Communication (COM3 Port, DVP-EH3 Series PLC only)



- Ethernet Communication



- Analog Input/Output



Standard PLC

DVP-ES3 New

The Most High-end DVP Series PLC –
The Best Choice for Advanced Machines



Outstanding Operation Performance

- Adopts the high performance processor of the Compact Modular Mid-range PLC AS Series
- Min. execution time of basic instruction: 25 ns

Excellent Motion Control

- High speed counter: 200 kHz x 4 (A/B phase) or 200 kHz x 8 (single phase)
- High speed pulse out: 200kHz x 4 (pulse + direction) or 200kHz x 8 (pulse)
- 2-axis interpolation (linear and arc)
- Table structured position control function
- 8 axes CANopen point-to-point motion control (with Delta servo drives only)

Built-in More Communication Interfaces

- Supports USB for programming
- RS-485 x2: Modbus RTU/ASCII
- Ethernet:
 - Modbus TCP: 16/16 connections (Server/Client)
 - EtherNet/IP: 16/16 connections (TCP/CIP)
- CANopen: DS301

Higher Specifications

- Program capacity: 64k steps
- Data capacity: 64k words
- Built-in 32/48/64/80 DIO points
- Supports micro SD cards

Program Capacity



Data Register



Execution Speed



Modules

- Digital I/O Modules

Input Point Extension

DVP08XM211N
DVP16XM211N



Output Point Extension

DVP08XN211R/T
DVP16XN211R/T
DVP24XN200R/T



Input / Output Point Extension

DVP08XP211R/T
DVP16XP211R/T
DVP24XP200R/T
DVP32XP200R/T



- Analog I/O Modules

Input Point Extension

DVP04AD-E2



Output Point Extension

DVP04DA-E2
DVP02DA-E2



Input / Output Point Extension

DVP06XA-E2



- Temperature Modules

DVP04PT-E2



DVP06PT-E2



DVP04TC-E2



- Resolver Module

DVP10RC-E2



- DVP-ES2 Series Extension Module + Cable

DVPAEXT01-E2



Standard PLC / Analog I/O PLC DVP-ES2 / EX2

Comprehensive Functions for General Applications

Standard PLCs with integrated communication and highly efficient processing capabilities for your control systems

- Standard PLC 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)
- Analog I/O PLC 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. execution speed of basic instructions: 0.35 μ s
- Highly efficient processing ability: 1k steps of programs can be processed within 1ms
- Max. 100kHz pulse control; specific motion control instructions (mark/masking and instant frequency changing) available for multi-axis applications
- Up to 4-level password protection ensures program confidentiality and intellectual property



Network Type Advanced Slim PLC DVP-SE

Complete network communication functions for advanced industrial applications

- Program capacity: 16k steps
- Data register: 12k words
- Max. execution speed of basic instructions: 0.64 μ s
- Built-in Ethernet and supports Modbus TCP and EtherNet/IP (Adapter mode)
- IP Filter function as firewall for first line protection against malware and network threats
- No battery required; RTC function operates for 15 days after power off
- Supports DVP-S Series modules (left-side and right-side) (DVP26SE only supports right-side modules)



High Performance Slim PLC DVP-SV2

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

Complete Program Protection

- Auto backup function 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 confidentiality and intellectual property

Scalability

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

High-speed Modules (Left-side)

Network Modules	Analog Input / Output Modules
<ul style="list-style-type: none"> • DeviceNet Master DVDPNET-SL 	<ul style="list-style-type: none"> • CANopen Master DVPCOPM-SL 
<ul style="list-style-type: none"> • Ethernet DVPEN01-SL 	<ul style="list-style-type: none"> • Analog Input DVP04AD-SL • Analog Output DVP04DA-SL 
<ul style="list-style-type: none"> • RS-422/RS-485 Serial Communication Module DVPSCM12-SL 	<ul style="list-style-type: none"> • PROFIBUS DP Slave DVPPF02-SL • BACnet MS/TP Slave Serial Communication Module DVPSCM52-SL  
	<h3>Load Cell Modules</h3> <ul style="list-style-type: none"> DVP01LC-SL DVP02LC-SL DVP201LC-SL DVP211LC-SL DVP202LC-SL 

Standard Slim PLC DVP-SS2

Economic and Compact Type

- Max. I/O: 480 points
- Program capacity: 8k steps
- Data register: 5k words
- Max. execution speed of basic instructions: 0.35 μ s
- 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 10kHz pulse output
 - 8 points of high-speed counters: 20kHz/4 points, 10kHz/4 points



Advanced Slim PLC DVP-SA2

Advanced Type for High-speed Modules (Left-side)

- Program capacity: 16k steps
- Data register: 10k words
- Max. execution speed of basic instructions: 0.35 μ s
- Built-in 1 RS-232 and 2 RS-485 ports (Master/Slave)
- Supports standard Modbus ASCII/RTU protocol and PLC Link function
- No battery required; RTC function operates for 15 days after power off
- Supports DVP-S Series modules (left-side and right-side modules)
- Motion control functions:
 - 4 points of high-speed pulse output: 100kHz/2 points, 10kHz/2 points
 - 8 points of high-speed pulse input: 100kHz/2 points, 10kHz/6 points, 1 set of A/B phase 50kHz
 - Supports 2-axis linear and arc interpolation



Analog I/O Slim PLC DVP-SX2

Analog Type with Highly Efficient PID Control Function

- Program capacity: 16k steps
- Data register: 10k words
- Max. execution speed of basic instructions: 0.35 μ s
- Built-in 4 analog inputs/2 analog outputs
- Supports standard Modbus ASCII/RTU protocol and PLC Link function
- No battery required; RTC function 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: 100kHz/2 points, 10kHz/2 points
 - 8 points of high-speed pulse input: 100kHz/2 points, 10kHz/6 points
 - Supports 2-axis linear and arc interpolation



Multi-axis Motion Controller

DVP-10MC / 15MC / 50MC

High Speed, High Precision, and High Performance Motion Control

Provides a variety of controller options

EtherCAT motion controller

- Standard: 6 and 24 axes
- Point-to-point: 4 and 16 axes

CANopen motion controller

- Standard: 6 and 24 axes



DVP-10MC



DVP-15MC

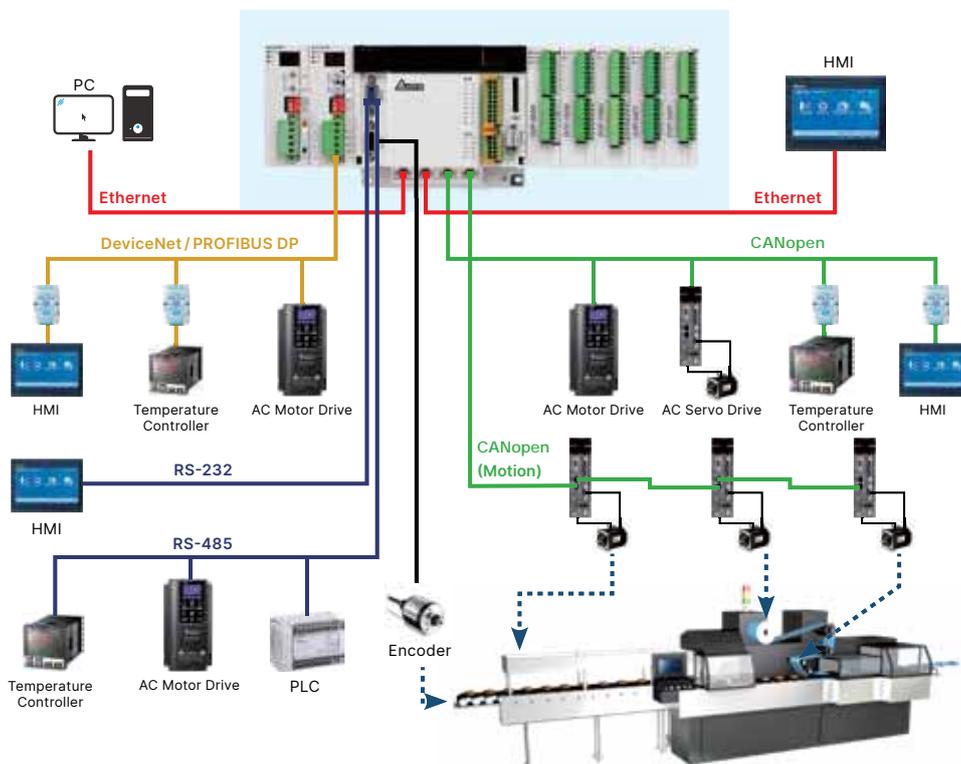


DVP-50MC

Perfect Controllers for EtherCAT / CANopen Motion Solutions

- Built-in 16 / 24 I/O points; max. 480 I/O points
- Program capacity:
 - DVP10MC: Ladder 16k steps/Motion 1Mbytes
 - DVP15MC/50MC: 20M bytes
- Built-in Ethernet, RS-232 and RS-485 ports, and support 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 and PROFIBUS DP Slave modules)
- Provides standard communication cables, terminal resistors, distribution boxes and more accessories for easy wiring and connection

System Configuration (CANopen Motion)



General Motion Controller

DVP-PM

Standard Motion Controller

DVP10PM00M

- Built-in 24 I/O points, extension up to 256 I/O points
- Program capacity: 64k steps
- Data register: 10k words
- Execution speed LD: 0.1375 μ s, MOV: 2.1 μ s
- Built-in RS-232 and RS-485 ports
- 2/3/4/5/6 axes linear interpolation motion control
- Highly accurate PWM 200 kHz output, resolution 0.3%
- 8 groups of high-speed captures (mark correction, frequency measurement), comparative output, Mark/Mask function (for bag making)
- Supports standard Modbus ASCII/RTU protocol
- Motion control functions:
 - High-speed pulse output: built-in 6 sets of A/B phase pulse outputs
 - 6 sets of high-speed counters and hardware digital filter for counting
 - Single-axis motion control function (supports MPG, single-speed and two-speed positioning)
 - Electronic gear function



Advanced Motion Controller

DVP20PM00M / D / DT

- Built-in 16 I/O points, extension up to 512 I/O points
- Program capacity: 64k steps
- Data register: 10k words
- Built-in RS-232 and RS-485 ports
- Compatible with G-code / M-Code
- 3-axis linear/arc/helical interpolation
- Supports electronic cam (2,048 points) function for flying shear and rotary cut applications
- All models can be applied as motion controllers or extension modules
- Supports standard Modbus ASCII/RTU protocol
- Motion control functions:
 - Built-in A/B phase differential signal outputs: 2 sets (DVP20PM00D) / 3 sets (DVP20PM00M) with differential output frequency of max. 500kHz
 - Supports MPG inputs
 - Single-axis motion control function (supports MPG, single-speed and two-speed positioning)
 - Electronic gear function



Human Machine Interface

DOP-100

Connect Your Work, Step into the Cloud

Advanced Multimedia Type HMI

12-inch Advanced Multimedia HMI

DOP-112MX

- 12" 24-bit colors TFT/Display resolution: 1,024 x 768 pixels
- Dual core 1GHz CPU/1 GB RAM/8 GB ROM
- 2 built-in Ethernet ports and supports SD cards
- 2 sets of COM ports/2 extension COM ports, supports up to 4 RS-485
- Supports analog/IP camera functions & multilingual input
- Mini USB client/USB host
- Supports FTP/Email/VNC/Web monitor



15-inch Advanced Multimedia HMI

DOP-115MX

- 15" 24-bit colors TFT/Display resolution: 1,024 x 768 pixels
- Dual core 1GHz CPU/1 GB RAM/8 GB ROM
- 2 built-in Ethernet ports and supports SD cards
- 2 sets of COM ports/2 extension COM ports, supports up to 4 RS-485
- Supports analog/IP camera functions & multilingual input
- Mini USB client/USB host
- Supports FTP/Email/VNC/Web monitor



Advanced Type HMI

4.3-inch Advanced HMI

DOP-103WQ

- 4.3" 65,536 colors TFT/Display resolution: 480 x 272
- Cortex-A8 800MHz CPU/512 MB RAM/256 MB ROM
- Built-in Ethernet
- 1 COM port/1 extension COM port
- Multilingual input
- USB host
- Supports FTP/Email/VNC/Web monitor



7-inch Advanced HMI DOP-107WV

- 7" 65,536 colors TFT/Display resolution: 800 x 480
- Cortex-A8 800MHz CPU/512 MB RAM/256 MB ROM
- Built-in Ethernet
- 2 sets of COM ports/1 extension COM port
- Multilingual input
- USB host
- Supports FTP/Email/VNC/Web monitor



10-inch Advanced HMI DOP-110WS

- 10.1" 65,536 colors TFT/Display resolution: 1,024 x 600
- Cortex-A8 800MHz CPU/512 MB RAM/256 MB ROM
- Built-in Ethernet and supports SD cards
- 2 sets of COM ports/1 extension COM port
- USB host
- Supports FTP/Email/VNC/Web monitor



12-inch Advanced HMI DOP-112WX

- 12" 24-bit colors TFT/Display resolution: 1,024 x 768 pixels
- Dual core 1GHz CPU/1 GB RAM/8 GB ROM
- 2 built-in Ethernet ports and supports SD cards
- 2 sets of COM ports/2 extension COM ports, supports up to 4 RS-485
- Multilingual input
- Mini USB client/USB host
- Supports FTP/Email/VNC/Web monitor



Advanced Type HMI

15-inch Advanced HMI DOP-115WX

- 15" 24-bit colors TFT/Display resolution: 1,024 x 768 pixels
- Dual core 1GHz CPU/1 GB RAM/8 GB ROM
- 2 built-in Ethernet ports and supports SD cards
- 2 sets of COM ports/2 extension COM ports, supports up to 4 RS-485
- Multilingual input
- Mini USB client/USB host
- Supports FTP/Email/VNC/Web monitor



Standard Ethernet Type HMI

7-inch Standard Ethernet HMI DOP-107IV

- 7" 65,536 colors TFT/Display resolution: 800 x 480 pixels
- Cortex-A8 800MHz CPU/256 MB RAM/256 MB ROM
- Built-in Ethernet and supports SD cards
- 3 sets of COM ports/1 extension COM port
- USB host
- Supports FTP/Email/VNC/Web monitor



8-inch Standard Ethernet HMI DOP-108IG

- 8" 65,536 colors TFT/Display resolution: 800 x 600 pixels
- Cortex-A8 800MHz CPU/256 MB RAM/256 MB ROM
- Built-in Ethernet and supports SD cards
- 3 sets of COM ports/1 extension COM port
- USB host
- Supports FTP/Email/VNC/Web monitor



10-inch Standard Ethernet HMI DOP-110IG

- 10" 65,536 colors TFT/Display resolution: 800 x 600 pixels
- Cortex-A8 800MHz CPU/256 MB RAM/256 MB ROM
- Built-in Ethernet and supports SD cards
- 3 sets of COM ports/1 extension COM port
- USB host
- Supports FTP/Email/VNC/Web monitor



10-inch Standard Ethernet HMI DOP-110IS

- 10" 65,536 colors TFT/Display resolution: 1,024 x 600 pixels
- Cortex-A8 800MHz CPU/256 MB RAM/256 MB ROM
- Built-in Ethernet and supports SD cards
- 3 sets of COM ports/1 extension COM port
- USB host
- Supports FTP/Email/VNC/Web monitor



7-inch Standard Ethernet HMI DOP-107EV

- 7" 65,536 colors TFT/Display resolution: 800 x 480
- Cortex-A8 800MHz CPU/256 MB RAM/256 MB ROM
- Built-in Ethernet
- 2 sets of COM ports/1 extension COM port
- USB host
- Supports FTP/Email/VNC/Web monitor



7-inch Standard Ethernet HMI DOP-107EG

- 7" 65,536 colors TFT/Display resolution: 800 x 600
- Cortex-A8 800MHz CPU/256 MB RAM/256 MB ROM
- Built-in Ethernet and supports SD cards
- 2 sets of COM ports/1 extension COM port
- USB host
- Supports FTP/Email/VNC/Web monitor



Standard Type HMI

5-inch Standard HMI

DOP-105CQ

- 5.6" 65,536 colors TFT/Display resolution: 320 x 234 pixels
- Cortex-A8 800MHz CPU/256 MB RAM/256 MB ROM
- 2 sets of COM ports/1 extension COM port
- USB host



7-inch Standard HMI

DOP-107CV

- 7" 65,536 colors TFT/Display resolution: 800 x 480
- Cortex-A8 800MHz CPU/256 MB RAM/256 MB ROM
- 2 sets of COM ports/1 extension COM port
- USB host & USB client



10-inch Standard HMI

DOP-110CS

- 10.1" 65,536 colors TFT/Display resolution: 1,024 x 600
- Cortex-A8 800MHz CPU/256 MB RAM/256 MB ROM
- 2 sets of COM ports/1 extension COM port
- USB host



10-inch Standard HMI

DOP-110CG

- 10.4" 65,536 colors TFT/Display resolution: 800 x 600 pixels
- Cortex-A8 800MHz CPU/256 MB RAM/256 MB ROM
- 2 sets of COM ports/1 extension COM port
- USB host



Basic Ethernet Type HMI

7-inch Basic Ethernet HMI

DOP-107DV

- 7" 65,536 colors TFT/Display resolution: 800 x 480 pixels
- Cortex-A8 800MHz CPU/256 MB RAM/256 MB ROM
- Built-in Ethernet
- 1 set of COM ports/1 extension COM port
- USB host
- Supports FTP/Email/VNC/Web monitor



Basic Type HMI

4.3-inch Basic HMI

DOP-103BQ

- 4.3" 65,536 colors TFT/Display resolution: 480 x 272
- Cortex-A8 800MHz CPU/256 MB RAM/256 MB ROM
- 1 COM port/1 extension COM port
- USB host



7-inch Basic HMI

DOP-107BV

- 7" 65,536 colors TFT/Display resolution: 800 x 480
- Cortex-A8 800MHz CPU/256 MB RAM/256 MB ROM
- 1 COM port/1 extension COM port
- USB host



Handheld HMI

7-inch Widescreen Handheld HMI

DOP-H07

- 7" 16:9 widescreen, 65,536 colors TFT
- Display Resolution: 800 x 480 pixels
- Supports 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 one Ethernet port
- Optional MPG (Manual Pulse Generator)
- Compact and lightweight design: 750 g
- Integrated style cables available (5m/10m)



Touch / Text Panel Human Machine Interface 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)

Dimensions	4.1" (101.8 × 35.24 mm)
Resolution	192 × 64
Display Color	Monochrome
Flash Memory	256k Bytes
Function Key	10 function keys
Password	Available
Recipe Function	N/A
RTC	Available
Serial COM Port	RS-232 & RS-422 / 485
Editing Software	TPEditor

4-Line Text Panel HMI 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)

Dimensions	4.1" (101.8 × 35.24 mm)
Resolution	192 × 64
Display Color	Monochrome
Flash Memory	256k Bytes
Function Key	17 function keys
Password	Available
Recipe Function	N/A
RTC	Available
Serial COM Port	RS-232 & RS-422 / 485
Editing Software	TPEditor

8-Line Text Panel HMI TP08G-BT2

- 3.8" STN-LCD
- Resolution: 240x128 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

Dimensions	3.8" (83x41mm)
Resolution	240 × 128
Display Color	Monochrome
Flash Memory	1 MB
Function Key	24 function keys
Password	Available
Recipe Function	Available
RTC	Available
Serial COM Port	RS-232 & RS-422 / 485
Editing Software	TPEditor

Applications

High-end equipment for the electronics manufacturing, machining, food packaging and other industries

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 10kHz high-speed pulse input
- 7" TFT-LCD
- Touch screen
- Built-in USB port for program upload/download
- Built-in RS-485 port x 2
- Modbus ASCII/RTU modes
- Built-in real-time clock (RTC)
- Digital and analog I/O terminals available

Dimensions	7" (154 × 85 mm)
Resolution	800 × 480
Display Color	65,535 colors
Flash Memory	64 MB
Function Key	N/A
Password	Available
Recipe Function	N/A
RTC	Available
Serial COM Port	2 sets of RS-485
Editing Software	TPEditor

4-Line Text Panel HMI with Built-in PLC TPO4P

- Adopts the CPU of the DVP-SS2 Series PLC: program capacity: 8k steps/D device: 5k words
- Provides 2 sets of 10kHz 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 x 2
- Modbus ASCII/RTU modes
- User-defined boot screen
- Built-in real-time clock (RTC)
- Digital and analog I/O terminals

Dimensions	4.1" (101.8 × 35.24 mm)
Resolution	192 × 64
Display Color	Monochrome
Flash Memory	1 MB
Function Key	17 function keys
Password	Available
Recipe Function	N/A
RTC	Available
Serial COM Port	2 sets for RS-485
Editing Software	TPEditor



SCADA System

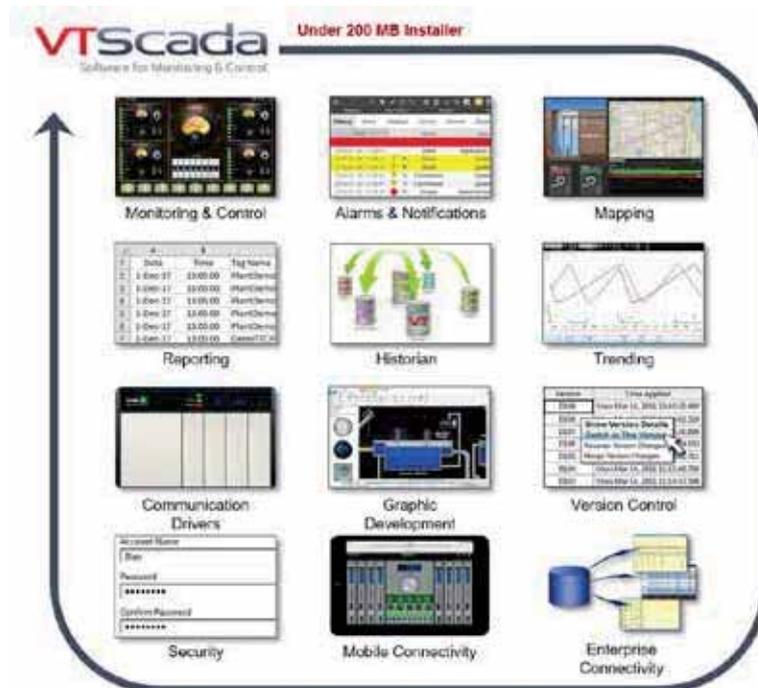
VTScada

VTScada is a flexible and scalable SCADA software, that provides an intuitive interface for real-time monitoring in various industries. It allows users to monitor hundreds to multi-million I/Os. Supporting more than 100 drivers, the software provides a reliable interface with high customizability and comprehensive functions for industrial monitoring applications.



Fully Integrated Architecture (Standard & Optional)

- Complete SCADA functions available with one-time installation



Applications



Water & Wastewater Treatment



Oil & Gas | Chemicals



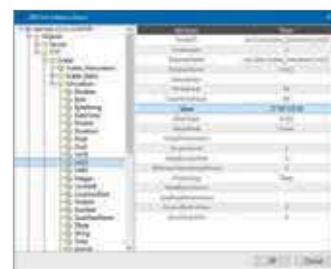
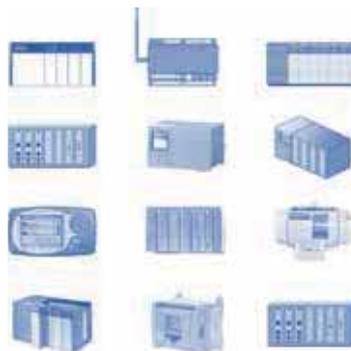
Electronics Manufacturing



Food & Beverage

Device Driver Library (Standard)

- More than 100 industry standard and proprietary protocols
- Integrated device driver library allows users to connect to any combination of hardware



OPC UA Client Configuration Driver

The VTScada Historian (Standard)

- Built-in historical database, requiring no additional costs

Redundancy across the System (Requires Multiple Licenses)

- Automatic failover for polling and logging
- A smarter way for Thin Client server hot backup failover
- Synchronized historian and alarm database



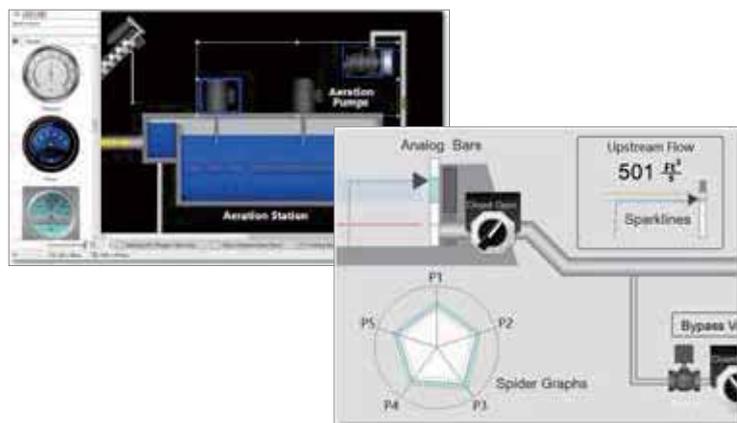
VTScada Thin Clients (Optional)

- Supports HTML5 browsers on mobile devices and PCs



VTScada Idea Studio (Standard in Development Runtime License)

- User-friendly drag-and-drop interface for screen development
- Applies configured changes without rebooting the whole system
- Provides 200+ widgets, 4,000+ graphics and 3D pipe elements to design customized, vivid monitoring display



SCADA System

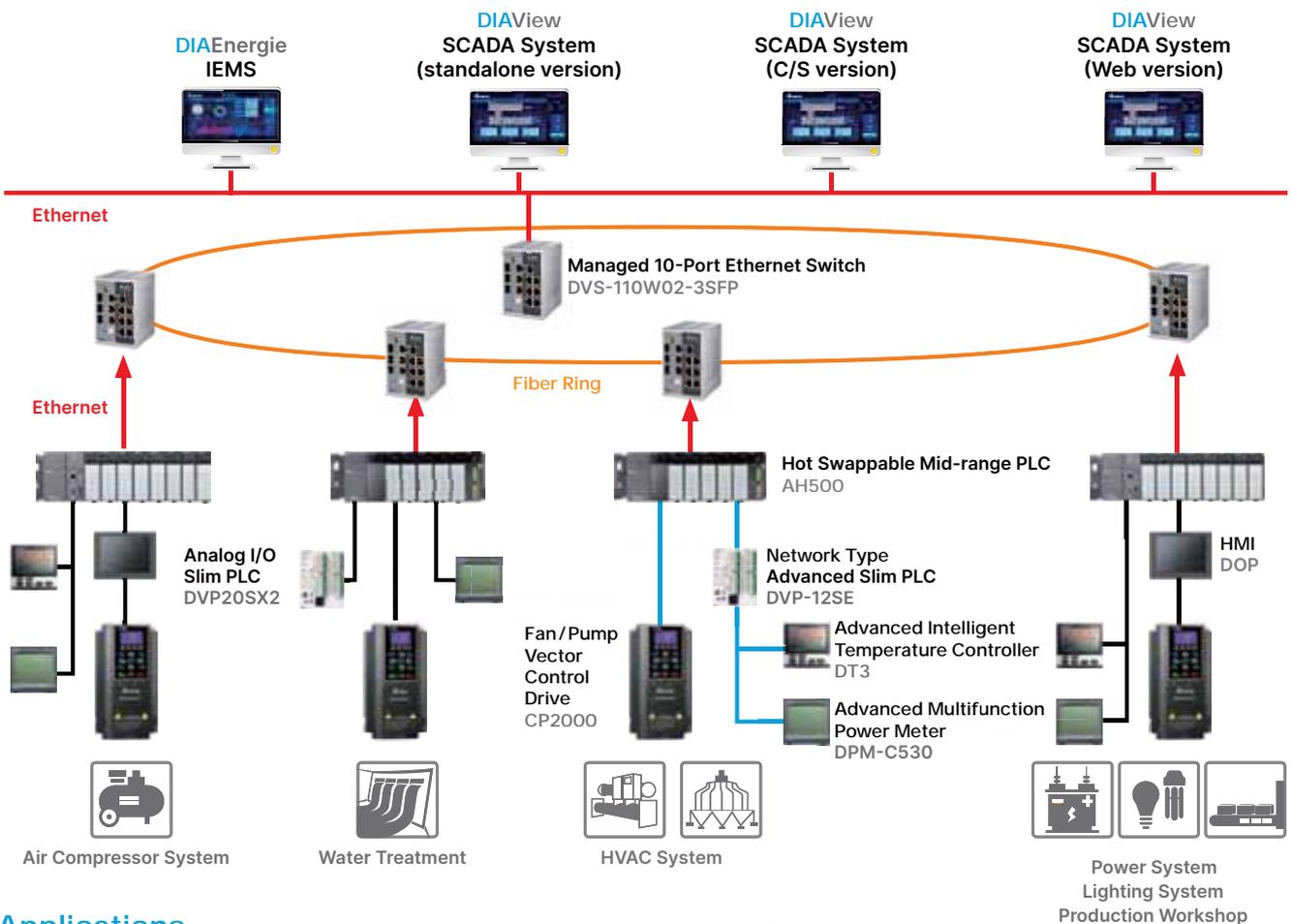
DIAView

Remote Monitoring for Smart Factory Management

- Seamless integration with Delta's PLC products 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
- Diversity of real-time data visualization: S-curve/pie/bar charts and reports
- Diversified 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 and Applications



Applications

Smart manufacturing and smart machines, HVAC, water treatment, electronics manufacturing

Success Stories

Wood Edge Sealing Machine Monitoring

Customer Needs

The customer requested integrating both new and old equipment for network connection, and collecting production data and equipment status in real time for recording, analysis and visualization.

Solution

- Optimizes efficiency with equipment automation and automatic recipe/process data import via barcode scanning
- Multi-language (Chinese and English) function enables quick duplication and highly efficient secondary development
- Approaches to the task: Data input/output/monitoring, reference tables for function configuration, diverse processing (dispersant, pre-milling, pre-heating, head and tail cutting, finishing, and more)
- Main functions: Recipe settings (imports/exports Excel and CSV, and imports recipe items via barcode scanning) and alarm interface

Benefits

- Automated wood edge grinding saves labor cost
- Real-time monitoring of equipment operation and processes provide high accuracy
- Smart and highly automated, it suits industry-specific equipment



Photoelectric Sensor PS-R

- Different sensing range adjustment (Trimmer or TEACH)
- M3 mounting hole, easy to install
- Electrical circuit protection
- IP67 and CE certification



PS-F / PS-L

- Slim and small, easy to install
- Electrical circuit protection
- IP67 and CE certification
- Electrical circuit protection



PS-M

- Standard size (M18) for mounting
- Sensing range adjustment (TEACH)
- M3 mounting hole, easy to install
- Electrical circuit protection
- IP67 and CE certification



Inductive Proximity Sensor ISE ^{New}

- Nickel coated brass/stainless steel
- Presence/absence detection of magnetic substance
- IP67
- CE certification
- Reverse voltage protect (RVP)



Laser Displacement LD-N (Standard Type)

- Aluminum case, robust structure
- Slim and small, easy to install
- High precision, sampling time setting available
- IP67 and CE certification



Laser Displacement LD-E (Long-range Type)

- 100~500 mm detection range
- 7 types of display settings
- DIO, AIO, and RS-485 communication interface
- 70~800 μm repeatability
- IP67-rated protection
- Compact size of 25 x 44 x 24 mm for easy installation



Area Sensor AS-B (Standard)

- Aluminum case, robust structure
- No dead zone
- Effective aperture angle: less than 2.5 degrees
- IP67 and CE certification

* Note: TX cable (grey) and CX cable (black)



AS-B (Communication)

- Aluminum case, robust structure
- Fixed/floating mask
- Interlock/restart functions
- Measurement function
- Auto data upload
- Customized periodic optical axis intervals for fixed scanning

* Note 1: TX cable (grey) and CX cable (blue)

Note 2: Successfully applied to package detection, measurement and deviation inspection in logistics industries.



AS-E

- Aluminum case, robust structure
- Compact design: 17 x 15 mm
- Sensing distance: 3 m



Applications

Electronics, warehousing / logistics, wood and steel processing, textiles, food and beverages, machine making, protection and more

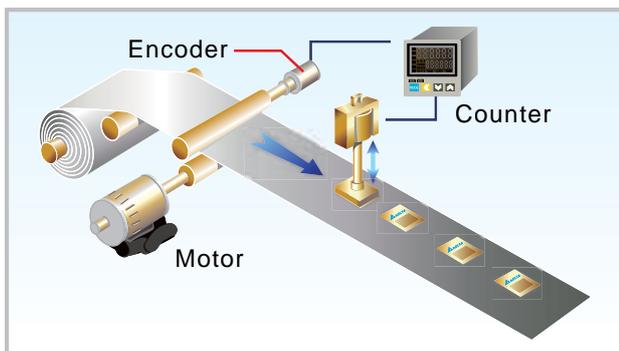


Rotary Encoder

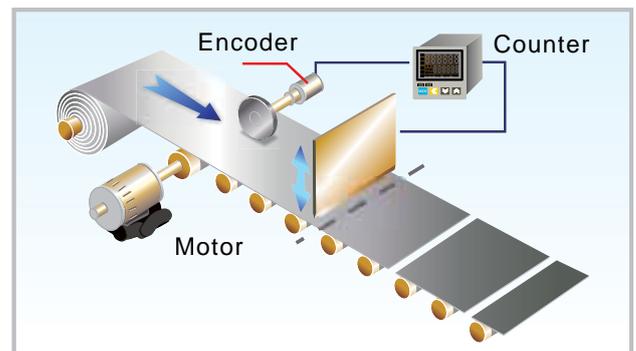
ES/EH/HS/HH

Incremental

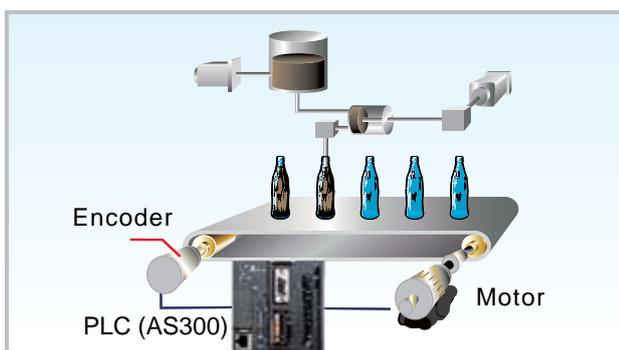
- Configurable resolution (magnetic)
- Wide input voltage: 5 ~ 30 V_{DC}
- Resolution: 100 ~ 4,096 PPR
- Output form: open collector, line driver, push-pull
- HS/ES outer diameter of solid shaft: 37 mm/50 mm
- EH outer diameter of hollow shaft: 37 mm/50 mm



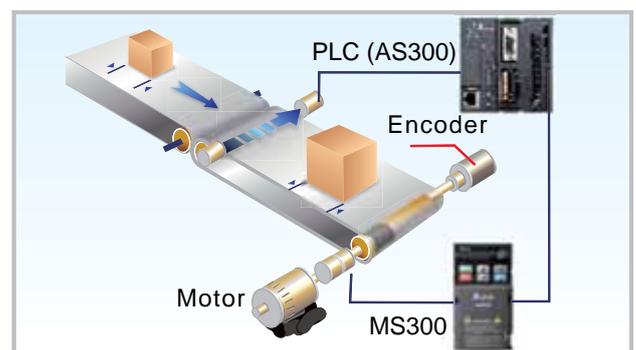
Label Printing Machine



Cutting Machine



Bottling Machine



Testing/Inspection Machine

Applications

Label printing machines, testing/inspection machines, elevators, bottling machines, cutting machines, elevator doors

Handheld Barcode Scanner

DAH1000S / DAH2000H

Wide Target Range, Fast and Reliable Capturing

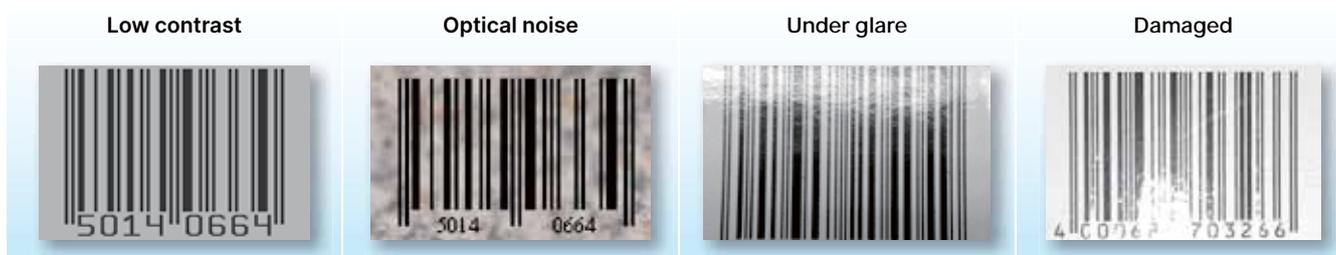
The DAH Series adopts a high-end decoding algorithm to read barcodes quickly, and can easily and stably identify 1D and 2D barcodes within the range of 5 to 25 cm. It caters to various industrial barcode scanning application requirements.

- High-speed code capturing without precise aiming
- Quick and precise barcode reading under low contrast, optical noise, uneven exposure or damaged conditions
- Easy commands for users to set up:
 - Manual adjustment of illumination under various environment conditions
 - Single or multiple trigger modes
 - Barcode type selection based on user's demands
 - User-definable data export of scanned codes for flexible usage
- Robust design: drop impact resistance at 1m high
- No detachable components, saving maintenance costs

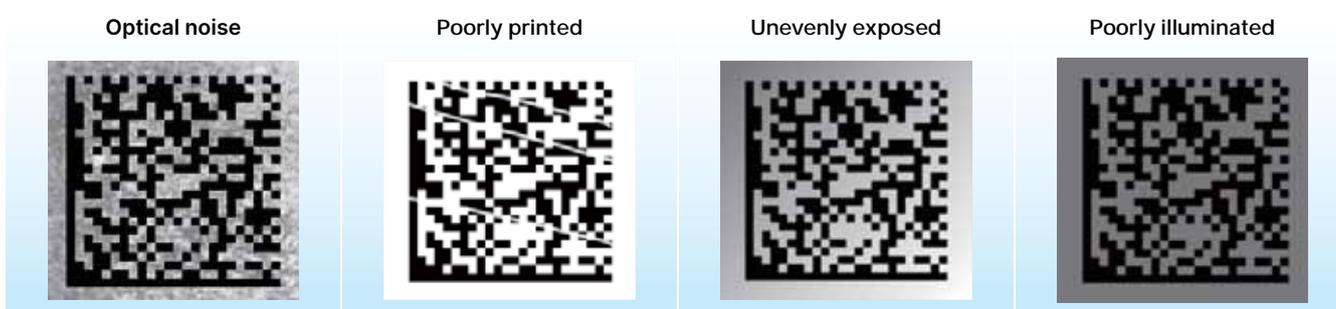


Advanced Decode Algorithm for Excellent Reading Performance

1D Barcodes



2D Barcodes



Applications

Food and beverage packaging machines, electrical machines, printing machines, pharmaceutical machinery, automated product lines

Fixed-mount Barcode Scanner

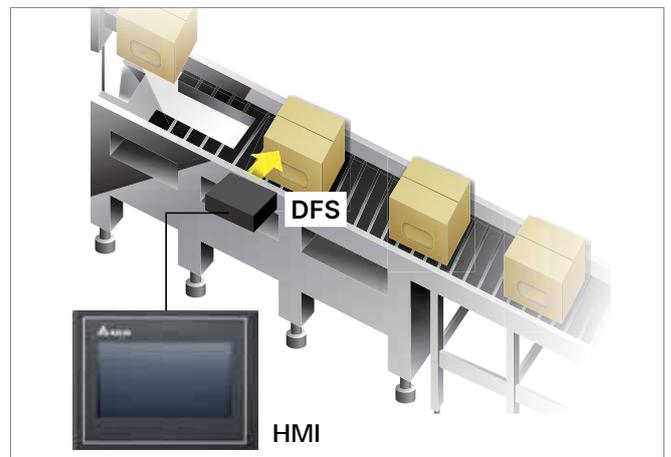
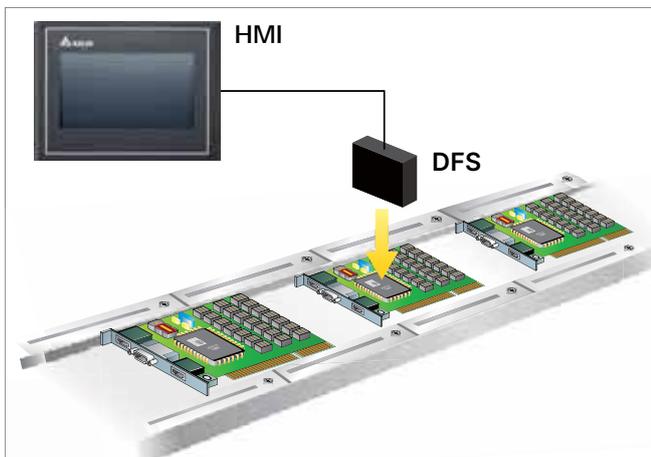
DFS131/DFS150

The DFS Series adopts built-in LED indicators and a CMOS sensor to ensure effective auto barcode detection under any lighting conditions when objects are passed through a scanning area. It is applicable to industrial conveyors and can easily complete scanning through the operating route during manual handling for fully automatic barcode scanning. In addition, the DFS Series supports various installations for independent and embedded applications as a flexible and highly efficient barcode scanner.

- Flexible design, suitable for independent, embedded applications and various installations
- Built-in LED indicators and a CMOS sensor ensures valid reading under any lighting conditions
- Effective auto detection of barcodes attached to products or components
- Seamless integration with conveyors for fully automatic barcode reading



System Structure



Applications



Retail



Logistics



Manufacturing



Medical Service

Vision Sensor

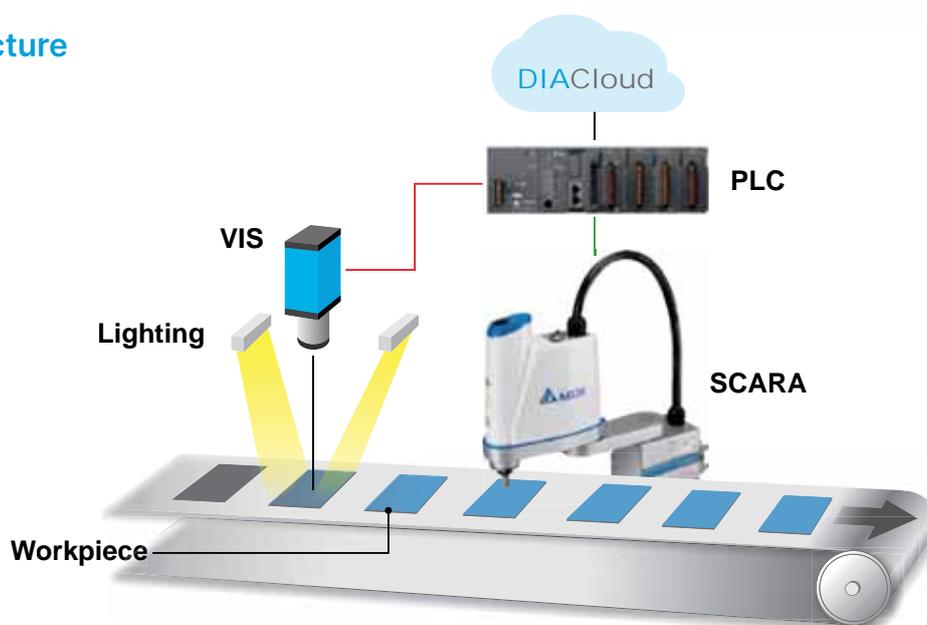
VIS

The VIS Series is built with a CMOS sensor and LED lighting for sensing under poor illumination. Users can set up programs easily in the full-window interface for object inspection and multi-barcode reading applications. The VIS Series can be implemented on production lines for fully automated inspection and high production efficiency.

- Advanced embedded system for high-speed inspections
- Compact size for flexible installation
- User-friendly interface that supports program setup via browsers for simple and rapid device adjustment
- Built-in LED lighting, no need for an additional lighting device



System Structure



Applications

Automated quality inspection for packaging, electronics manufacturing and product assembly



Barcode Reading



Quality Assurance



Object Inspection

Multi-Loop Modular Temperature Controller

DTM

Quick Start and User-friendly Interface for Settings

- Modular design for easy wiring
- Various extension modules for a wide range of applications
- Data collection by CPU for higher data exchange efficiency
- Supports RS-485 and Ethernet communication, and multi-point temperature control (64 points with host group / > 1,000 points with RS-485 or Ethernet)
- User-defined communication addresses
- Complete isolation between channels



Module Introduction

CPUs

RS-485 Type

DTMR08 / DTMR04



- Communication: RS-485
- Supports up to 7 measurement modules + 8 I/O modules
- Temperature control points: 4 or 8
- Dimensions: 7 (W) × 11.3 (H) × 8 (D) cm

Ethernet Type

DTME08 / DTME04



- Communication: RS-485 + Ethernet
- Supports up to 7 measurement modules + 8 I/O modules
- Temperature control points: 4 or 8
- Dimensions: 7 (W) × 11.3 (H) × 8 (D) cm

Measurement Extension Modules

DTMN08 / DTMN04 / DTMN02(-V,-R,-C,-L)



- Communication: N/A
- Temperature control points: 4 or 8
- Dimensions: 7 (W) × 11.3 (H) × 8 (D) cm

* The output extension cassette is not included for all measurement modules.

I/O Extension Modules

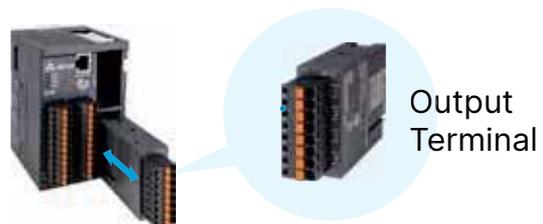


- Model/Channels
 - DTM-DOV/8CH, 0~12V pulse voltage
 - DTM-DOR/8CH, 2A relay contact
 - DTM-DOC/8CH, 4~20mA output
 - DTM-DOL/8CH, 0~10V output
 - DTM-CT030/8CH, current transformer (CT)(optional)
- Dimensions: 3 (W) × 11.3 (H) × 8 (D) cm

Output Extension Cassettes

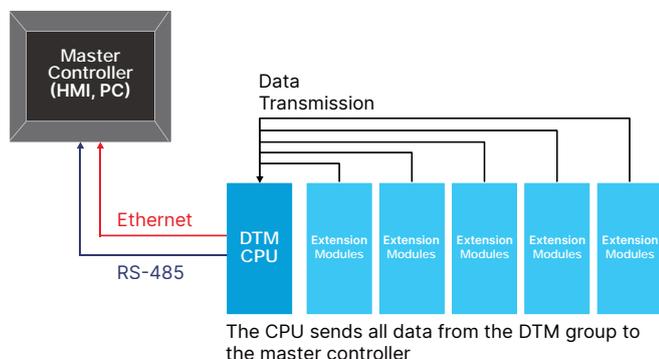
- Model/Channels
 - DTM-BDV/4CH, 0~12V pulse voltage
 - DTM-BDR/4CH, 2A relay contact
 - DTM-BDC/4CH, 4~20mA output
 - DTM-BDL/4CH, 0~10V output
- Dimensions: 2.5 (W) × 4.8 (H) × 7.7 (D) cm

* Please refer to the picture on the right for installation



Data Collection by CPU

The DTM CPU collects data from all extension modules and uploads to the host controller immediately for higher communication efficiency



User-Defined Communication Address

Flexible operation interface; allows user-defined communication addresses and easy access to parameters for higher communication efficiency

User-defined functions:
Only CUP IDs are available for data collection

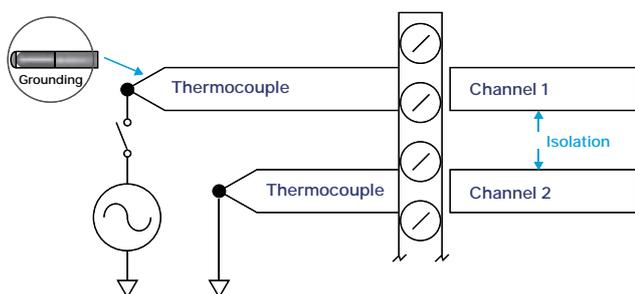
Create parameter groups:
Collects and manages parameter groups by creating parameters in corresponding group addresses



*Please download the software from Delta's website. The interface could be updated in new versions. Delta reserves the right to make modifications at any time without prior notice.

Complete Isolation Between Channels

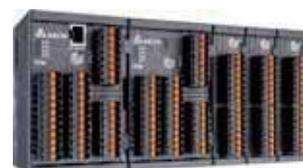
- Complete isolation between channels prevents electricity leakage of the heating device and damage to the electric circuit of the thermocouple input channels
- 8 sets of input channels are completely isolated to ensure a stable measurement signal and avoid interference



Multi-Point Temperature Control via RS-485 and Ethernet

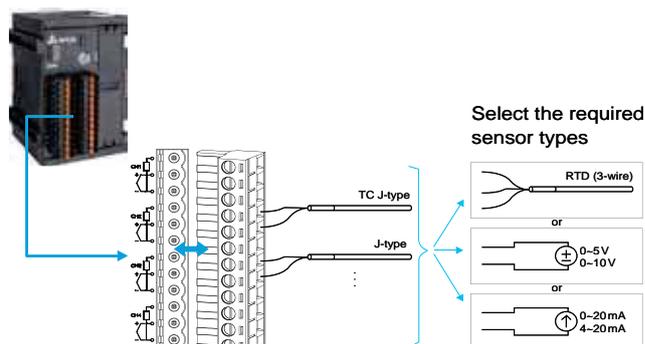
1. Multi-point control

- 1 CPU controls up to 8 points;
1 CPU group controls up to 64 points
- DTM CPU provides 8 sets of sensor inputs to control 8 points simultaneously
- 1 CPU supports up to 7 measurement modules and 8 I/O modules as a group



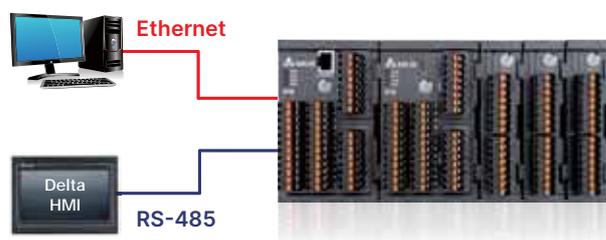
2. Various input channels

- A single channel supports analog voltage, analog current, thermocouple and platinum RTD input
- Allows users to select the sensor type for each channel separately



3. RS-485 and Ethernet introduction

- Ethernet/IP communication
- RS-485:
 - Max. Baud rate 115,200 bps
 - Supports ASCII and RTU
 - Offers external switches for communication protocol and address setup, easy to install and maintain



Advanced Intelligent Temperature Controller

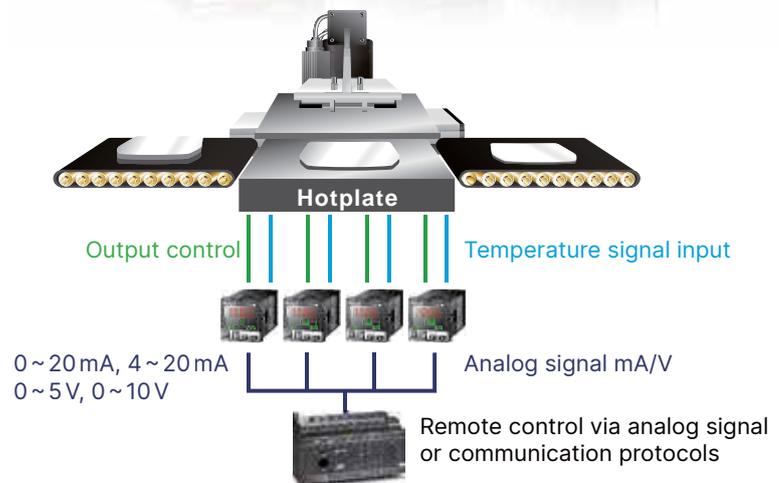
DT3

High Speed, High Precision, High Performance
Multifunction Temperature Controller



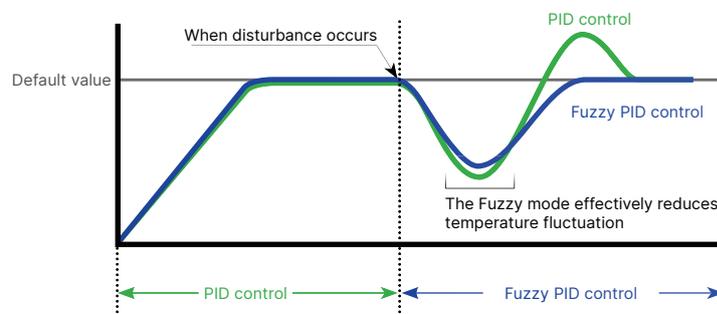
Remote Control

Temperature settings via
analog output of host controller



Various Control Modes

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



Applications

Solar panel manufacturing, food and beverage packaging, pharmaceuticals, semiconductors, rubber and plastics, high-tech electronics industries, HVAC

User-defined Function Keys

- Control modes selection
- Alarm clearing
- Controller ON/OFF
- PID activation
- Menu setting & saving
- Process control ON/OFF



Large Tri-color LCD Display



Heater Disconnection Detection

Measurable up to 100A

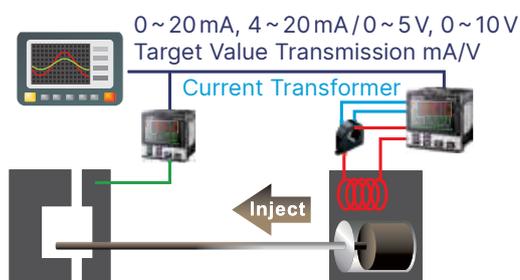


Point-to-Point Control (Proportional Output mA)

Sets the target value by point-to-point control

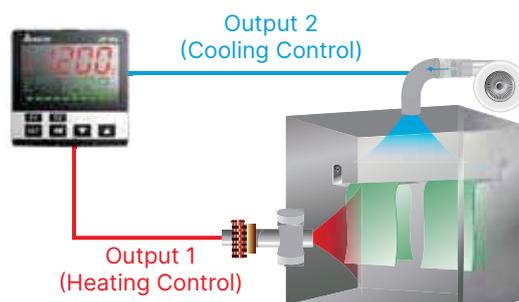


Retransmission Output



Dual-output Control

- Two outputs for rapid heating/cooling to achieve a designated temperature
- AT function is used to automatically calculate two PID parameters, one for heating and the other for cooling



Temperature Sensor Input

- Thermocouple:
K, J, T, E, N, R, S, B, L, U, TXK
- Platinum Resistance Thermometer:
Pt100, JPt100, Cu50, Ni120
- Analog Input:
0 ~ 5 V, 0 ~ 10 V, 0 ~ 20 mA, 4 ~ 20 mA, 0 ~ 50 mA

Power Output

Relay/Current 4 ~ 20 mA/pulse voltage/
Analog voltage 0 ~ 10 V

Power Input

AC 100 ~ 240 V, 50 / 60 Hz, AC/DC 24 V ± 10%

Intelligent Temperature Controller DTK

- Power input: AC 100~240V, 50/60Hz
- Thermocouple: K, J, T, E, N, R, S, B, L, U, TXK
- Platinum resistance: Pt100, JPt100
- RTD: Cu50, Ni120
- Output: Relay, current 4~20mA, 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
- Certification: CE, UL



Standard Temperature Controller DTA

- Power input: AC 100~240V, 50/60Hz
- Thermocouple: K, J, T, E, N, R, S, B, L, U, TXK
- Platinum resistance: Pt100, JPt100
- RTD: Cu50
- Analog input: N/A
- Output: Relay, current, pulse voltage
- Control mode: ON-OFF, PID, manual
- Modbus communication^(optional)
- 2 sets of alarm outputs, 12 alarm modes
- Dimensions: 48x48, 48x96, 72x72, 96x48, 96x96 (mm)
- IP66 protection
- Certifications: CE, UL



Advanced Temperature Controller DTB

- Power input: AC 100~240V, 50/60Hz, DC 24V ± 10%
- Thermocouple: K, J, T, E, N, R, S, B, L, U, TXK
- Platinum resistance: Pt100, JPt100
- Analog input: 0~5V, 0~10V, 0~20mA, 4~20mA, 0~50mA
- Output: Relay, current 4~20mA, pulse voltage, analog voltage 0~10V
- Control mode: ON-OFF, PID, manual, PID process control
- Built-in Modbus communication
- 2 sets of alarm outputs, 18 alarm modes
- Dimensions: 48x24, 48x48, 48x96, 96x96 (mm)
- IP66 protection
- Certifications: CE, UL



Modular Temperature Controller DTC

- Power input: DC 24V \pm 10%
- Thermocouple: K, J, T, E, N, R, S, B, L, U, TXK
- Platinum resistance: Pt100, JPt100
- Analog input: 0~5V, 0~10V, 0~20mA, 4~20mA, 0~50mA
- Output: Relay, current 4~20mA, pulse voltage, analog voltage 0~10V
- Control mode: ON-OFF, PID, manual, PID process control
- Built-in Modbus communication
- 2 sets of alarm outputs, 18 alarm modes
- Certifications: CE, UL



Valve Controller DTV

- Power input: AC 100~240V, 50/60Hz, DC 24V \pm 10%
- Thermocouple: K, J, T, E, N, R, S, B, L, U, TXK
- Platinum resistance: Pt100, JPt100
- Analog input: 0~5V, 0~10V, 0~20mA, 4~20mA, 0~50mA
- Output: Relay, current 4~20mA, pulse voltage, analog voltage 0~10V
- Control mode: ON-OFF, PID, manual, PID process control
- Built-in Modbus communication
- 2 sets of alarm outputs, 17 alarm modes
- Dimensions: 48x96, 96x96 (mm)
- IP66 protection
- Certifications: CE, UL



Multi-Channel Modular Temperature Controller DTE

- Power input: DC 24V \pm 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
- Analog input: N/A
- Output: Relay, current 4~20mA, pulse voltage, analog voltage 0~10V
- Control mode: ON-OFF, PID, manual, PID process control
- Built-in Modbus communication
- 2 sets of alarm outputs, 18 alarm modes
- Certifications: CE, UL



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
- Response time setup for 10 sets of outputs
- 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
- Response time setup for 10 sets of outputs
- Various output modes
- Tri-color display
- Fast zeroing/reset
- Safety control function
- Simple code display



Applications

Machine making, solar energy, food packaging, semiconductors, electronics, assembly automation



Flow Switch

DFM

High-precision and Multiple Air Flow Range

- Flow range: 2 ~ 200L/min., 0.5 ~ 50L/min.
- Bidirectional flow measurement, unaffected by fluid direction
- Embedded Laminar Flow Element (LFE), no extra straight pipes needed for stabilizing air flow
- Easy installation and maintenance
- High-quality LCD display
- Supports analog outputs



Applications

Food and beverage packaging, electronics manufacturing, rubber and plastic welding, Laser Beam Machining (LBM), air compressors (in factories and others), and nitrogen generators

Timer/Counter/Tachometer

CTA

All-in-One Device

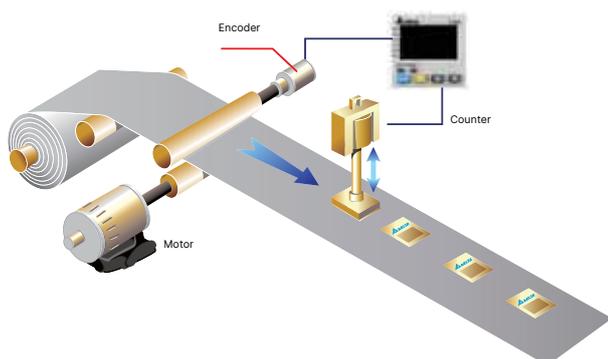
- Power input: AC 100 ~ 240V, 50/60Hz, DC 24V ± 10%
- Simultaneous counting and timing in the mixed mode
- 6-digit LCD display
- Max. counting speed: 10Kpps
- NPN or PNP input signals
- Pre-scale function
- Counting modes: 1-stage, 2-stage, batch, total, dual
- Modbus communication ^(optional)



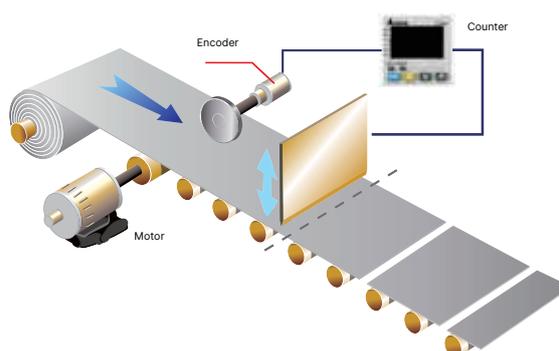
Applications

Food packaging machines, label printing machines, fixed length cutting machines, logistics, electronics

Label Printing Machine



Fixed Length Cutting Machine



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 IEC 62053-22
- Supports Modbus protocol for communication. 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 Series

- 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 Series

- 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 Series

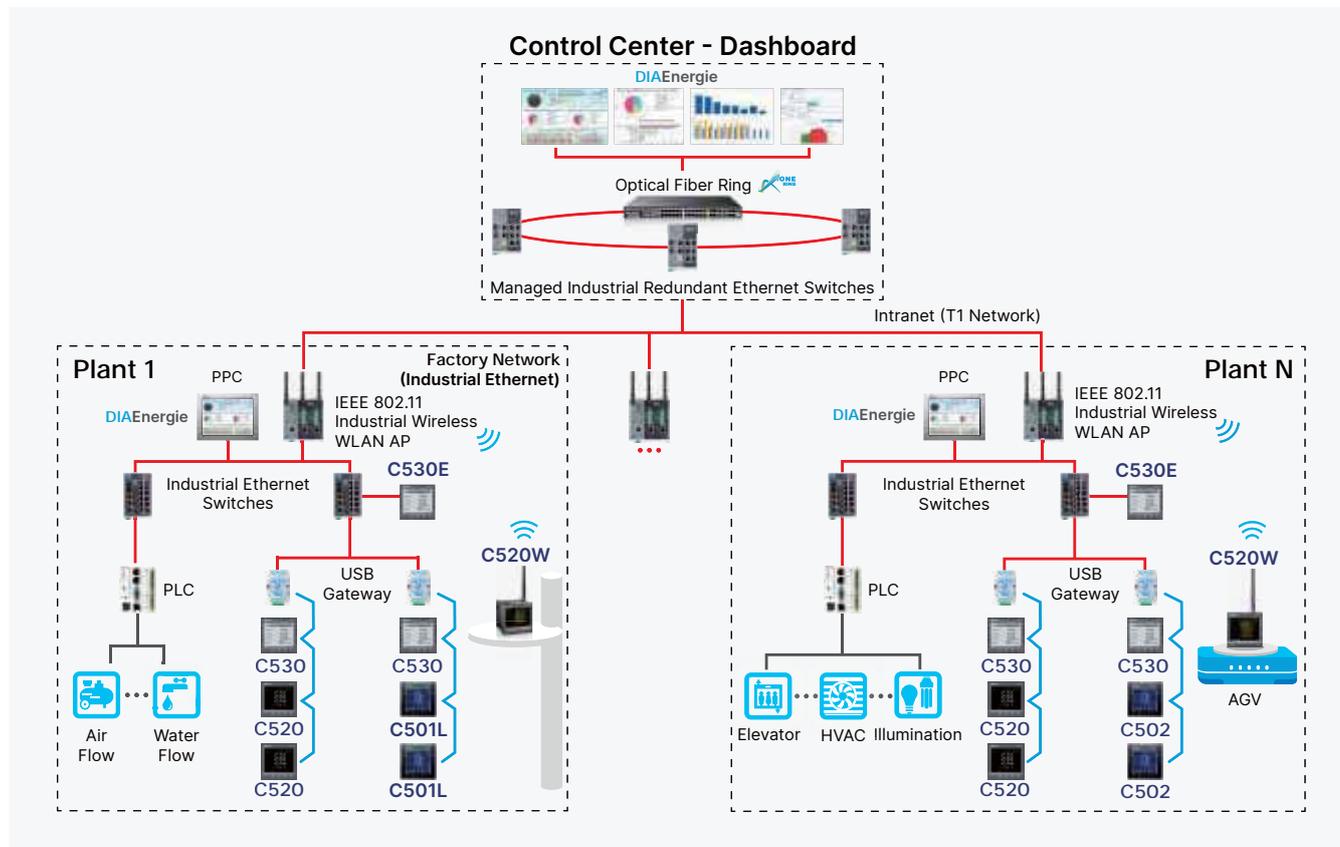
- Multiple and selective circuit monitoring reduces the use of power meters in large-scale areas
- Suitable for applications with a great many power circuits to save cost
- AC/DC measurement

Applications

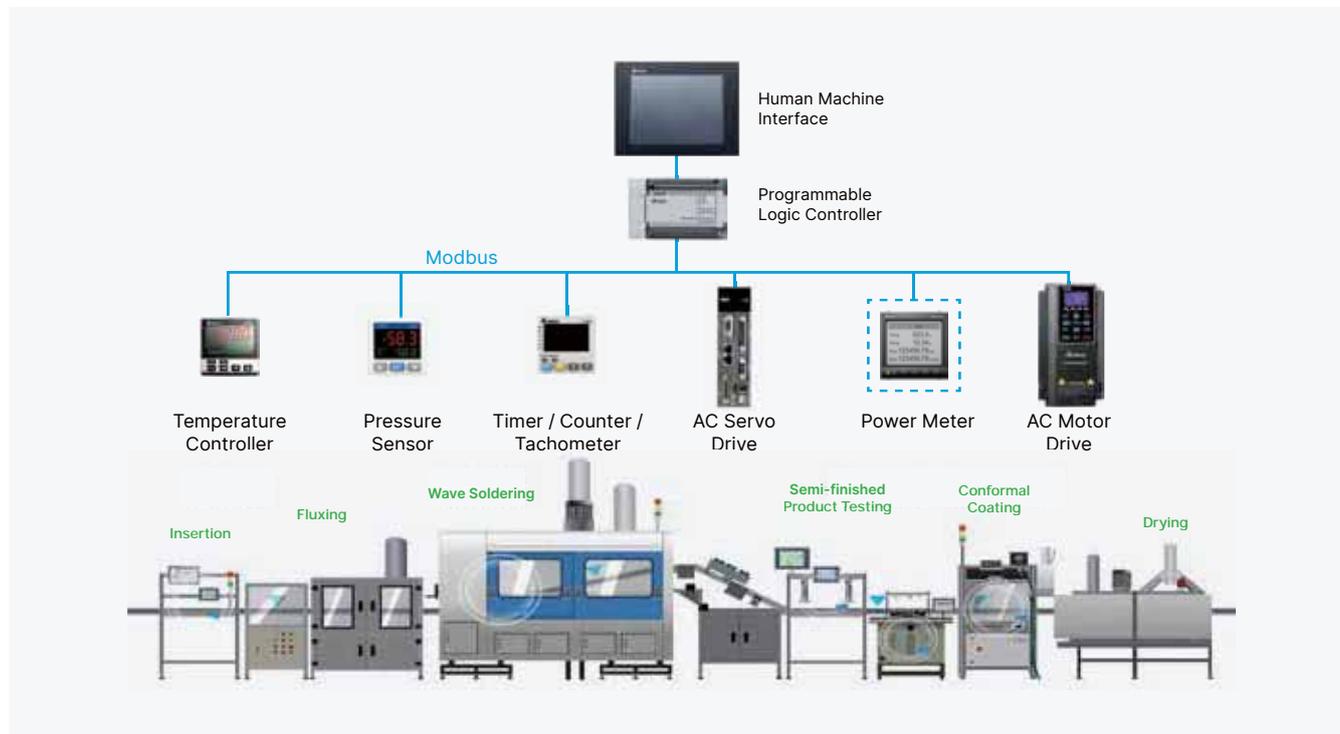
Shopping malls, dormitories, telecommunication systems



Cross-Factory Energy Management and Integrated Applications



Factory Automation - Energy Consumption Analysis of Production Lines



Machine Vision System

DMV3000G

Smart Machine Vision System with a User-friendly Interface

- Supports two 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



Camera Specifications

Resolution	Level	Frame Rate	Pixel Dimensions (Horizontal/Vertical)	Sensor Size (mm) (Horizontal/Vertical)	Pixel Size	Lens Mount
0.3 M	Mono/Color	180 fps	640 × 480	1/3.6" (3 × 2.3)	4.8 μm	C mount
2 M	Mono/Color	50 fps	1,600 × 1,200	1/1.8" (7.5 × 5.6)	4.7 μm	C mount

Applications

Inspection for mobile phone lens quality, disposable coffee filters, and others on automation production lines in logistics, food and beverage packaging, electronics, printing industries, motion control guidance, paper cup inspection



Machine Vision System

DMV1000G

Basic and Easy-to-use Machine Vision System

- User-friendly operation interface for quick system setup
- Flowchart programming interface 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
- Hardware specification meets high-speed processing requirements and offers exceptional performance better than competing products
- Supports GigE interface industrial camera
- Complete product line-up including lighting and lenses
- Compatible with Ethernet and RS-232 / 485 communication interfaces for a quick link up with external devices
- 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 (mm) (Horizontal / Vertical)	Pixel Size	Lens Mount
0.3 M	Mono	120 fps	640 × 480	1/2.9" (4.4 × 3.3)	6.9 μm	C mount
0.8 M	Mono	60 fps	1024 × 768	1/2.9" (3.5 × 2.6)	3.45 μm	C mount

Applications

Food and beverage packaging, electrical / electronics, printing machines, pharmaceuticals, Vision Guided Robotic System (VGRS), robot / automated production lines

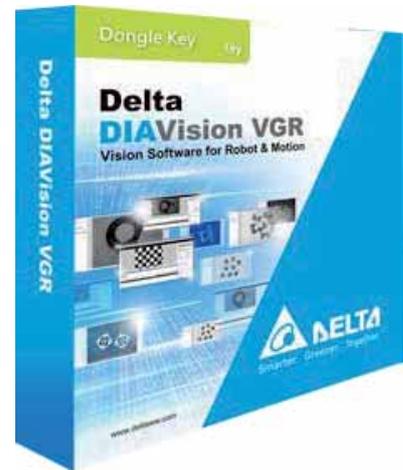


Machine Vision Software New

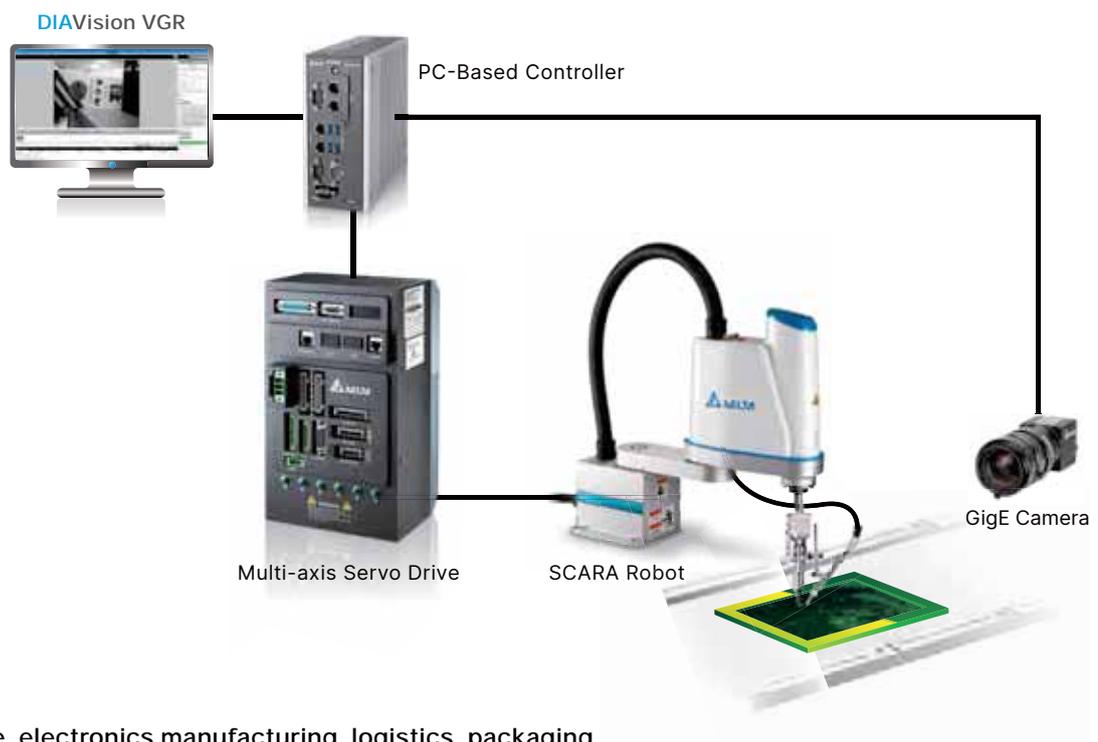
DIASion VGR

Easily achieve high-efficiency inspection requirements

- **Intuitive and user-friendly interface:** flexible program commands, for easy setup and operation
- **Dynamic multi-project flowchart:** simple process control to reduce manual errors
- **Automatic robot positioning algorithm:** prevents XY tolerance from getting larger when angles change
- **GigE camera interface:** supports GigE cameras with resolution from 0.3M to 12M
- **Flexible platform:** easy for multi-process programming and expansion based on user's requirements



System Configurations



Applications

Food & beverage, electronics manufacturing, logistics, packaging



Delta Industrial Camera New

DMV-C

High-speed, High Performance & High Stability

- Auto exposure time, gain, white balance
- Gamma correction and LUT
- Software trigger, external I/O trigger and continuous capture
- User-defined ROI and mirror output
- GigE Vision 2.0 compliant
- 64 MB frame buffer for reliable transmission
- CE, KC and RoHS certified



DMV-CC (Standard Type)

- CMOS sensor
- Resolution: 0.4 M ~ 5 M
- Global shutter

DMV-CL (Basic Type)

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

Model	Sensor Model	Resolution (H×W)	Optical Size (inch)	Shutter	Exposure Time	Pixel Size (μm)	FPS	Mono/Color	Pixel Format	GPIO
DMV-CC400GM290	IMX287	720×540	1/2.9	Global	20 us~1s	6.9	290	Mono	Mono (12,10,8) Bayer (12,10,8)	Isolated Input × 1 Isolated Output × 2
DMV-CC400GC290								Color		
DMV-CL400GM120	IMX297						120	Mono	Mono (10,8) Bayer (10,8)	
DMV-CL400GC120								Color		
DMV-CC1M6GM075	IMX273	1,440×1,080	1/2.8			75	Mono	Mono (12,10,8) Bayer (12,10,8)		
DMV-CC1M6GC075							Color			
DMV-CL1M6GM060	IMX296					60	Mono	Mono (10,8) Bayer (10,8)		
DMV-CL1M6GC060							Color			
DMV-CC2M1GM055	SNAPPY 2M	1,920×1,080	1/1.8			55	Mono	Mono (12,10,8) Bayer (12,10,8)		
DMV-CC2M1GC055							Color			
DMV-CC5M0GM023	SNAPPY 5M	2,560×1,936	1/2.8			23	Mono			
DMV-CC5M0GC023							Color			
DMV-CL5M0GM023	IMX335	2,592×1,944	1/1.8	16	Mono					
DMV-CL5M0GC023					Color					
DMV-CL6M3GM016	IMX178	3,072×2,048	1/1.7	8	Mono					
DMV-CL6M3GC016					Color					
DMV-CL12MGM008	IMX226	4,000×3,000	1	5	Mono					
DMV-CL12MGC008					Color					
DMV-CL20MGM005	IMX183	5,472×3,648	1	5	Mono					
DMV-CL20MGC005					Color					

Industrial Power Supply

DIN Rail Models

CliQ, CliQ II, CliQ III, CliQ M, CliQ VA, Lyte, Lyte II, Sync

CliQ	Model Name	Output Voltage (V)	Output Power (W)
	DRP012V015W1AZ	12	15
	DRP012V030W1AZ		30
	DRP012V060W1AA		60
	DRP012V100W1AA		100
	DRP-24V48W1AZ	24	48
	DRP024V060W1AZ		60
	DRP024V060W1AA		60
	DRP024V120W1AA		120
	DRP024V240W1AA		240
	DRP024V480W1AA		480

CliQ II	Model Name	Output Voltage (V)	Output Power (W)
	DRP024V060W1BN	24 1-Phase	60
	DRP024V060W1NZ		60
	DRP-24V100W1NN		91.2
	DRP024V120W1BN		120
	DRP024V240W1BN		240
	DRP024V480W1BN		480
	DRP-24V120W2BN	24 2-Phase	120
	DRP-24V240W2BN		240
	DRP024V060W3BN	24 3-Phase	60
	DRP024V120W3BN		120
	DRP024V240W3BN		240
	DRP024V480W3BN		480
	DRP024V960W3BN		960
	DRP048V060W1BN		48
	DRP048V120W1BN	120	
	DRP048V240W1BN	240	
	DRP048V480W1BN	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

Lyte	Model Name	Output Voltage (V)	Output Power (W)
	DRL-12V75W1AA	12	75
	DRL-24V75W1AA	24	75
	DRL-24V480W1AA		480
	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-48V120W1EN	48	120
	DRL-48V240W1EN		240

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 Chrome, Modules, DVP

Chrome	Model Name	Output Voltage (V)	Output Power (W)
	DRC-5V10W1AZ	5	7.5
	DRC-12V10W1AZ	12	10
	DRC-12V30W1AZ		25.2
	DRC-12V60W1AZ		54
	DRC-12V60W1CZ	54	
	DRC-12V100W1AZ	72	
	DRC-24V10W1AZ	24	10
	DRC-24V10W1HZ		10
	DRC-24V30W1AZ		30
	DRC-24V60W1AZ		60
	DRC-24V100W1AZ		91.2

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

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

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

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

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

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.



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
	PMT-15V50W2BA	51	
	PMT-15V75W2BA	75	
	PMT-15V100W2BA	105	
	PMT-15V150W2BA	150	
	PMT-15V150W2CA	150	
	PMT-24V35W2BA	24	
	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
	PMT-30V50W2BA	57	
	PMT-30V75W2BA	75	
	PMT-30V100W2BA	105	
	PMT-30V150W2BA	150	
	PMT-30V150W2CA	150	
	PMT-36V35W2BA	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
	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	
	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-05V035W1AA		35
	PMC-05V050W1AA		50
	PMC-12V035W1AA	12	35
	PMC-12V050W1AA		50
	PMC-12V060W1NA		60
	PMC-12V100W1AA		100
	PMC-12V150W1BA		150
	PMC-12V600W1BA		600
	PMC-24V035W1AA		24
	PMC-24V050W1AA	50	
	PMC-24V075W1AA	75	
	PMC-24V100W1AA	100	
	PMC-24V150W1AA	150	
	PMC-24V150W2AA	150	
	PMC-24V150W1BA	150	
	PMC-24V300W1BA	300	
	PMC-24V600W1BA	600	
	PMC-24V600W1RW	600	
	PMC-DSPV100W1A	24/5	
	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-24V200WCGB	24	201.6
	PMF-24V240WCGB		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
	PMR-5V320WDAA	300	
	PMR-5V320WDGA	300	
	PMR-5V320WDBA	300	
	PMR-5V320WDCA	300	



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, PJJ

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
	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 _i : 24 V _{SB} : 5	300
	PJH-24V300WBBA	V _i : 24 V _{SB} : 12	300
	PJH-36V300WBBA	V _i : 36 V _{SB} : 5	300
	PJH-36V300WBBA	V _i : 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)}
	PJT-12V100WBBA		100 ^{B)}
	PJT-15V40WBAA		15 V
	PJT-15V65WBAA	63	
	PJT-15V100WBAA	100	
	PJT-15V100WBBA	80 ^{A)}	
	PJT-15V100WBBA	100 ^{B)}	
	PJT-18V40WBAA	18 V	
	PJT-18V65WBAA		65
	PJT-18V100WBAA		100
	PJT-18V100WBBA		80 ^{A)}
	PJT-18V100WBBA		100 ^{B)}
	PJT-24V40WBAA		24 V
	PJT-24V65WBAA	65	
	PJT-24V100WBAA	100	
PJT-24V100WBBA	80 ^{A)}		
PJT-24V100WBBA	100 ^{B)}		
PJT-27V150WBNA	V _i : 27 V V _{SB} : 12 V	150	

A) Convection
B) Forced Cooling

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

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

Applicable Series



Building Automation

- Escalators & Elevators
- CCTV Surveillance
- HVAC Control

CliQ III, Lyte, Lyte II, Chrome, Sync, PMT2, PMC, PMU, PJT, PJ, PJJ



Machine Automation

- Robotic Arms
- Injection Molding Machines

CliQ, CliQ II, CliQ III, CliQ M, CliQ VA, Lyte, Lyte II, Chrome, Sync, PMT2, PMC, PMF, PMU, PJT, PJ, PJB



Renewable Energy

- Wind Turbines
- Solar Tracker Systems

CliQ, CliQ II, CliQ III, CliQ M, CliQ VA, Lyte, Lyte II, PMC



Process Automation

- Petrochemicals Plants
- Wastewater Treatment
- Oil Refinery

CliQ, CliQ II, CliQ III, CliQ M, CliQ VA, Lyte, Lyte II, Chrome, Sync, PMT2, PMC, PMF, PMU



Test & Measurement

- Spectrum Analyzers
- AC Power Sources
- Oscillators

Chrome, Sync, PMT2, PMC, PJT, PJ, PJB



Factory Automation

- Packaging Machines
- Wave Soldering Machines
- Conveyor Systems

CliQ, CliQ II, CliQ III, CliQ M, CliQ VA, Lyte, Lyte II, Chrome, Sync, PMT2, PMC, PMF, PMU, PJT, PJ, PJB



LED Lighting

- Stage Lighting
- Digital Signage Solutions

PMT, PMC, PMF, PMR, PJJ



Food & Beverage

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

PMT2, PMC, PMF, PJT, PJ, PJB, PJJ, PJJ

Industrial Ethernet & IIoT Solution

State-of-the-art Industrial Networking for Smart Industry

Layer 3 Managed Switch DVS-G928W01

- 28-Port full GbE (10GbE optional), modular design for flexible configuration
- Layer 3 routing functions (RIP & VRRP) allows 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, SNMP v1/v2c/v3
- IPv6 address suitable for large network and neighboring node 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 30ms 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 & SNMP trap
- Compatible with various industrial protocols, including EtherNet/IP, PROFINET, CC-LINK IE and DNP 3.0
- 100~240 V_{AC} and 125~370 V_{DC} wide-range redundant power input
- IP30 metal case, -40°C~85°C 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



Managed Switch DVS-328



- 24-Port FE + 4-Port GbE Combo SFP, designed for backbone network transmission at control centers
- Complete L2 network management functions: Q-in-Q VLAN, QoS, LACP, IGMP & SNMP v1/v2c/v3
- IPv6 address for large network and neighboring node discovery
- Modbus TCP and EtherNet/IP protocols that facilitate remote management by SCADA and other industrial devices
- Adopts high-end proprietary redundancy technologies ONE RING & ONE CHAIN for quick self-recovery within 20ms 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
- Cable diagnostic to automatically detect twisted-pair cable quality and periodically report issues
- Auto alarm notifications by emails, DI, relay, syslog & SNMP trap
- Compatible with various industrial protocols, including EtherNet/IP, PROFINET, CC-LINK IE and DNP 3.0
- 85 ~ 264 V_{AC} and 88 ~ 370 V_{DC} wide-range redundant power input
- IP40 metal case, -40°C ~ 70°C operating temperature
- Certification: UL 60950-1, IEC 60950-1, CCC, CE, FCC and RCM

DVS-G116



- 12-Port GbE + 4-Port GbE SFP, designed for backbone networks in IIoT application. 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 neighboring node discovery
- Modbus TCP and EtherNet/IP protocols that facilitate remote management by SCADA and other industrial devices
- Delta network redundancy technology continues to evolve and optimize all the time; adopts 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 & SNMP trap
- Compatible with various industrial protocols, including EtherNet/IP, PROFINET, CC-LINK IE and DNP 3.0
- IP40 metal case, -40°C ~ 75°C 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 neighboring node discovery
- Modbus TCP and EtherNet/IP protocols that facilitate remote management by SCADA and other industrial devices
- Delta network redundancy technology continues to evolve and optimize all the time; adopts 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 & SNMP trap
- Compatible with various industrial protocols, including EtherNet/IP, PROFINET, CC-LINK IE and DNP 3.0
- IP40 metal case, -40°C ~75°C 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 & SNMP v1/v2c/v3
- IPv6 address for large network and neighboring node discovery
- Modbus TCP and EtherNet/IP protocols that facilitate remote management by SCADA and other industrial devices
- Delta network redundancy technology continues to evolve and optimize all the time; adopts 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 & SNMP trap
- Compatible with various industrial protocols, including EtherNet/IP, PROFINET, CC-LINK IE and DNP 3.0
- IP40 metal case, -40°C ~75°C wide operating temperature
- Certification: UL 61010, IEC 62368-1, CE, FCC and RCM



DVS-110

- 7-Port FE + 3-Port GbE Combo SFP, designed for backbone networks
- Complete L2 network management functions: VLAN, QoS, LACP, IGMP & SNMP v1/v2c/v3
- IPv6 address for large network and neighboring node discovery
- Modbus TCP and EtherNet/IP protocols that facilitate remote management by SCADA and other industrial devices
- Adopts high-end proprietary redundancy technologies ONE RING & ONE CHAIN for quick self-recovery within 20ms from network disconnection
- 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 & SNMP trap
- IP40 metal case, -40°C ~ 75°C operating temperature
- Certification: UL 508, IEC 61131-2, CE, FCC and RCM



DVS-109

- 8-Port FE + 1-Port GbE, Gigabit uplink port elevating transmission bandwidth
- Complete L2 network management functions: VLAN, QoS, LACP, IGMP & SNMP v1/v2c/v3
- IPv6 address for large network and neighboring node discovery
- Modbus TCP and EtherNet/IP protocols that facilitate remote management by SCADA and other industrial devices
- Adopts high-end proprietary redundancy technologies ONE RING & ONE CHAIN for quick self-recovery within 20ms from network disconnection
- Loopback-detection to avoid broadcast storms by automatically shutting down the ports over a switching loop
- Auto alarm notifications by emails, DI, relay, syslog & SNMP trap
- IP40 metal case, -40°C ~ 75°C operating temperature
- Certification: UL 508, IEC 61131-2, CE, FCC and RCM



DVS-108

- 6-Port FE + 2-Port GbE Combo SFP, designed for backbone network
- Complete L2 network management functions: VLAN, QoS, LACP, IGMP & SNMP v1/v2c/v3
- IPv6 address for large network and neighboring node discovery
- Modbus TCP and EtherNet/IP protocols that facilitate remote management by SCADA and other industrial devices
- Adopts high-end proprietary redundancy technologies ONE RING & ONE CHAIN for quick self-recovery within 20ms from network disconnection
- 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 & SNMP trap
- IP40 metal case, -40°C ~ 75°C operating temperature
- Certification: UL 508, IEC 61131-2, CE, FCC and RCM



DVS-103

- 3-Port 10/100Base-T(X) Ethernet switch for EtherNet/IP DLR specifically
- EtherNet/IP protocol
- DLR (device-level ring) technology, self-healing recovery time < 3 ms (less than 50 nodes)
- Design with DI and DO to automate alarms
- IP40 metal case, -20°C~70°C 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 30W power supply to meet IEEE 802.3at and IEEE 802.3af standards
- Complete L2 network management functions: VLAN, QoS, LACP, IGMP & SNMP v1/v2c/v3
- IPv6 address for large network and neighboring node 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 & SNMP trap
- IP30 metal case, -40°C~70°C operating temperature
- Certification: CE, FCC and RCM



Unmanaged Switch

DVS-G008W01

- 8-Port GbE
- Transparent transmission of VLAN tagged packets
- Auto alarm notifications by relay output for power failure
- 12~48 V_{DC} redundant terminal block power input with 10~24 V_{AC}
- IP30 metal case, -40°C~75°C operating temperature
- Certification: UL 61010, EN 62368-1, CE, FCC and RCM



DVS-G005I00A

- 5-Port GbE
- IEEE 802.1p based QoS for packet forwarding precedence
- Built-in broadcast storm protection
- Transparent transmission of VLAN tagged packets
- Jumbo packet transmission: up to 9,216 Bytes
- IEEE Green Ethernet for power savings
- IP40 metal case, -10°C~60°C operating temperature
- Certification: UL 508, IEC 61131-2, 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
- With a terminal block for 12 ~ 48 V_{DC} redundant power input
- IP40 metal case, -40°C ~ 75°C operating temperature
- Certification: UL 508, IEC 61131-2, CE, FCC and RCM



DVS-G005I00C

- 5-Port GbE
- Jumbo frame size up to 10k Bytes
- With a terminal block for 12 ~ 48 V_{DC} redundant power input
- IP40 PC case, -20°C ~ 70°C 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-rated waterproof and dustproof metal housing to prevent penetrating water and micro dust ingress
- Transparent transmission of VLAN tagged packets
- 12 ~ 48 V_{DC} redundant power input
- -40°C ~ 75°C wide operating temperature
- Certification: UL 61010, EN 62368-1, CE, FCC and RCM



PoE+ Unmanaged Switch

DVS-G408W01

- 8-Port GbE, 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
- Jumbo packet transmission: up to 9,216 Bytes
- Auto alarm notification by relay output for power failure
- IP30 metal case, -40°C ~ 70°C operating temperature
- Certification: CE, FCC and RCM



DVS-G406W01-2GF

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



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)
- With a terminal block for 12 ~ 48 V_{DC} redundant power input
- IP40 PC case, -20°C ~ 70°C 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 function to monitor transmission quality
- Hot-plugging duplex LC connectors for maximum flexibility
- Metal case, -40°C ~ 85°C operating temperature



LCP-1FE

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



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 30W power supply
- Intelligent PoE input overvoltage protection
- Power output up to 27W
- IP30 metal case, -20°C ~ 70°C 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 30W power supply
- Intelligent PoE output overvoltage protection
- Built-in 12V_{DC} power booster for flexible PoE deployment
- IP30 metal case, -20°C ~ 70°C operating temperature
- Certification: CE, FCC and RCM



IEEE 802.11 WLAN DVW-W02W2-E2

- Complete transmission interface: 2-Port GbE + 2-Port RS-232/422/485
- Compliant with IEEE 802.11n wireless technology for up to 450 Mbps data transmission rate
- IEEE 802.11r fast roaming with seamless switch (< 50ms) among APs
- Multiple wireless modes: AP, Client CPE, WDS P-T-P, WDS P-T-MP and repeater
- Supports serial device servers and Modbus gateways
- Wireless QoS (IEEE 802.11e, WMM) for video packet transmission precedence
- Enhanced wireless security: 64/128-bit WEP, WPA/WPA2, WPA-PSK/WPA2-PSK (TKIP/AES) and 802.1X Authentication
- Modbus TCP protocol that facilitates the remote management by SCADA and other industrial devices
- Auto alarm notification by emails, DI, relay, Syslog and SNMP trap
- IP40 metal case, -40°C ~ 75°C operating temperature
- Certification: UL 508, IEC 61131-2, CE, FCC, RCM, BSMI, SRRC and NCC



DVW-W01I2-E1

- Complete 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 (< 150ms) 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, -10°C ~ 60°C operating temperature
- Certification: UL 61010, IEC 62368-1, CE, FCC, RCM, SRRC and NCC



High-gain Antenna DVW-ANT

- Supports IEEE 802.11 b/g/n or IEEE 802.11 a/b/g/n
- 2.4 & 5GHz dual-band omni-directional 5.5 & 8dBi, or 2.4GHz omni-directional 7dBi
- 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
- -30°C ~ 60°C 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
- 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 could be acceptable 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, -20°C ~ 70°C operating temperature
- Certification: NCC, CE, FCC and UL



Industrial 3G Cloud Router DX-2100RW

- 1-Port FE + 1-Port RS-232 + 1-Port RS-485
- UMTS/HSPA+: 800/850, 900, AWS1700, 1900, 2100MHz
- GSM/GPRS/EDGE: 850, 900, 1800, 1900MHz
- Supports DIACloud Cloud Management Platform, no ISP public IP address required
- Modbus TCP and Modbus ASCII/RTU protocols
- Firewalls: Stateful Packet Inspection (SPI), Denial of Service (DoS) attacks, NAT, port triggering, port mapping, IP address filtering, MAC address filtering, URL filtering
- IP30 metal case, -20°C ~ 70°C operating temperature
- Certification: CE, FCC and UL



Industrial Ethernet Cloud Router DX-2300LN

- 4-Port FE LAN + 1-Port FE WAN + 1-Port RS-232 + 1-Port RS-485
- Supports DIACloud Cloud Management Platform, no ISP public IP address required
- Modbus TCP and Modbus ASCII/RTU protocols
- Firewalls: Stateful Packet Inspection (SPI), Denial of Service (DoS) attacks, NAT, port triggering, port mapping, IP address filtering, MAC address filtering, URL filtering
- IP30 metal case, -20°C ~ 70°C operating temperature
- Certification: CE, FCC and UL



Industrial 3G/WAN Cloud Router DX-3001H9

- 4-Port FE LAN + 1-Port FE WAN + 1-Port RS-232 + 1-Port RS-485
- UMTS/HSPA+: 800/850, 900, AWS1700, 1900, 2100 MHz
- GSM/GPRS/EDGE: 850, 900, 1800, 1900 MHz
- Supports DIACloud Cloud Management Platform, no ISP public IP address required
- Modbus TCP, Modbus ASCII/RTU protocols
- Dual SIM redundancy design: seamless switch among ISP systems for continuous network connection
- IP30 metal case, -20°C ~ 70°C operating temperature
- Certification: CE, FCC and UL



Industrial 3G/WAN VPN Router DX-3001H9-V

- 4-Port FE LAN + 1-Port FE WAN + 1-Port RS-232 + 1-Port RS-485
- UMTS/HSPA+: 800/850, 900, AWS1700, 1900, 2100 MHz
- Supports GSM/GPRS/EDGE: 850, 900, 1800, 1900 MHz
- IPSec, OpenVPN, PPTP, L2TP and GRE VPN protocols; IPSec with CA certificate supports L2TP over IPSec
- Dual SIM redundancy design: seamless switch among ISP systems for continuous network connection
- Built-in RTC
- Flexible connection method over WAN port, e.g. static IP, DHCP client and more
- Firewalls: Stateful Packet Inspection (SPI), Denial of Service (DoS) attacks, NAT, port triggering, port mapping, IP address filtering, MAC address filtering, URL filtering
- IP30 metal case, -20°C ~ 70°C operating temperature
- Certification: CE, FCC and UL

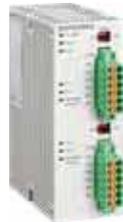


Communication Module

High-speed and Stable Industrial Network Solutions

BACnet MS/TP Slave Module DVPSCM52-SL

- BACnet MS/TP slave, standard Modbus and user-defined RS-422/485 communication protocols
- Compatible with software and DDC of major brands on the market; remote I/O and converter function available when connected with a PLC with I/O point extension
- Isolated power and communication provide strong noise immunity; built-in 120 ohm terminal resistor switch and feed-through terminals with spring plugs
- Data transmission settings via software, no complex programming required



RS-422 / 485 Master Module DVPSCM12-SL

- Standard Modbus communication and user-defined RS-422/485 communication protocols
- Two sets of independent RS-422/485 communication interfaces
- Isolated power and communication provide strong noise immunity; built-in 120 ohm terminal resistor switch and feed-through terminals with spring plugs
- Data transmission settings via software, no complex programming required
- Applied as PLC communication ports for program uploading/downloading and monitoring



Ethernet Master Module DVPEN01-SL

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



CANopen Master Module DVPCOPM-SL

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



PROFIBUS DP Slave Module DVPPF02-SL

- PROFIBUS DP slave protocol
- Supports GSD files identification and cyclic data transmission
- Data transmission: up to 100 words IN/OUT data mapping



DeviceNet Master Module DVPDNET-SL

- DeviceNet protocol
- Able to connect max. 63 slaves
- Supports EDS files identification and cyclic data transmission
- Max. network connection distance: 500 m
- RTU mapping



Ethernet Remote I/O Communication Module RTU-EN01

- Modbus TCP slave protocol
- Able to connect 8 DVP-S Series analog I/O modules
- Able to connect digital I/O (256 points) modules
- RS-485 port supports max. 32 Modbus slaves
- Smart PLC if-then function
- Smart monitor function
- Supports webpage setup and on-line monitoring
- Serial virtual COM available



PROFIBUS DP Remote I/O Communication Module RTU-PD01

- PROFIBUS DP slave protocol
- Auto-detects baud rate, max. baud rate: 12 Mbps
- Supports GSD files for identification and cyclic data transmission
- Able to connect 8 DVP-S Series analog I/O modules
- Able to connect digital I/O (256 points)
- RS-485 port supports max. 16 Modbus slaves



DeviceNet Remote I/O Communication Module RTU-DNET

- DeviceNet protocol
- Supports EDS files for identification and cyclic data transmission
- Able to connect 8 DVP-S Series analog I/O modules
- Able to connect digital I/O (256 points)
- RS-485 port supports max. 8 Modbus slaves



RS-485 Remote I/O Communication Module RTU-485

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



CANopen Remote I/O Communication Module 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 Remote I/O Communication Module 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)



DVP Series Slave Modules (Right-side)

DVPCP02-H2	DVPPF01-S	DVPPF02-H2	DVPDT01-S	DVPDT02-H2
				
CANopen Slave Module Supports DVP-EH2/3 Series	PROFIBUS Slave Module Supports DVP-S Series	PROFIBUS Slave Module Supports DVP-EH2/3 Series	DeviceNet Slave Module Supports DVP-S Series	DeviceNet Slave Module Supports DVP-EH2/3 Series

Converter

Impedance to Noise with a Range of Fieldbus Converters



Applications

Intelligent transportation systems, water treatment, building automation, factory automation, monitoring and control systems

USB Converter

	<p>UC-PRG020-12A USB » RS-232</p>	<ul style="list-style-type: none"> • Delta programming cables • RS-232 port provides mini-DIN and DB9 connectors • A portable hot-plugging USB device, no power supply required
	<p>IFD6500 USB » RS-485</p>	<ul style="list-style-type: none"> • Lightweight design for easy portability • Auto-detection of data flow direction • A portable USB device • Supports Win XP, Win7 32/64-bit
	<p>IFD6503 USB » CAN</p>	<ul style="list-style-type: none"> • Extracts CAN messages (incl. standard and extended frames), decodes and displays following DeviceNet and CANopen protocols • Filters by set conditions • CAN messages (1 sent manually, and max. 8 sent automatically) • Max. 1Mbps • A portable USB device
	<p>IFD6530 USB » RS-485</p>	<ul style="list-style-type: none"> • Lightweight design for easy portability • Auto-detection of data flow direction • Supports KPC-CC01 keypad in conducting parameters and page editing • Supports Win XP, Win7 32/64-bit • A portable USB device

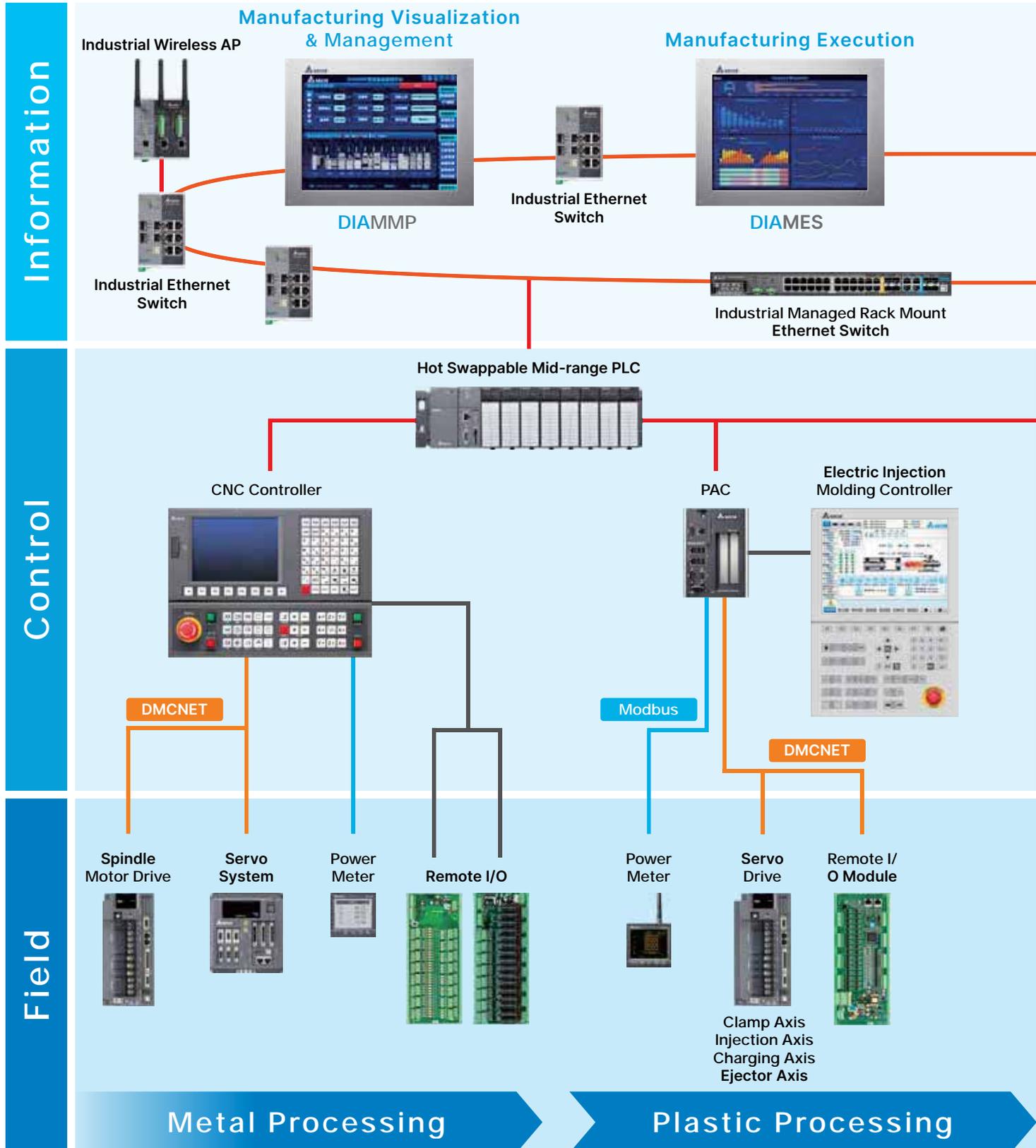
Modbus Serial Converter

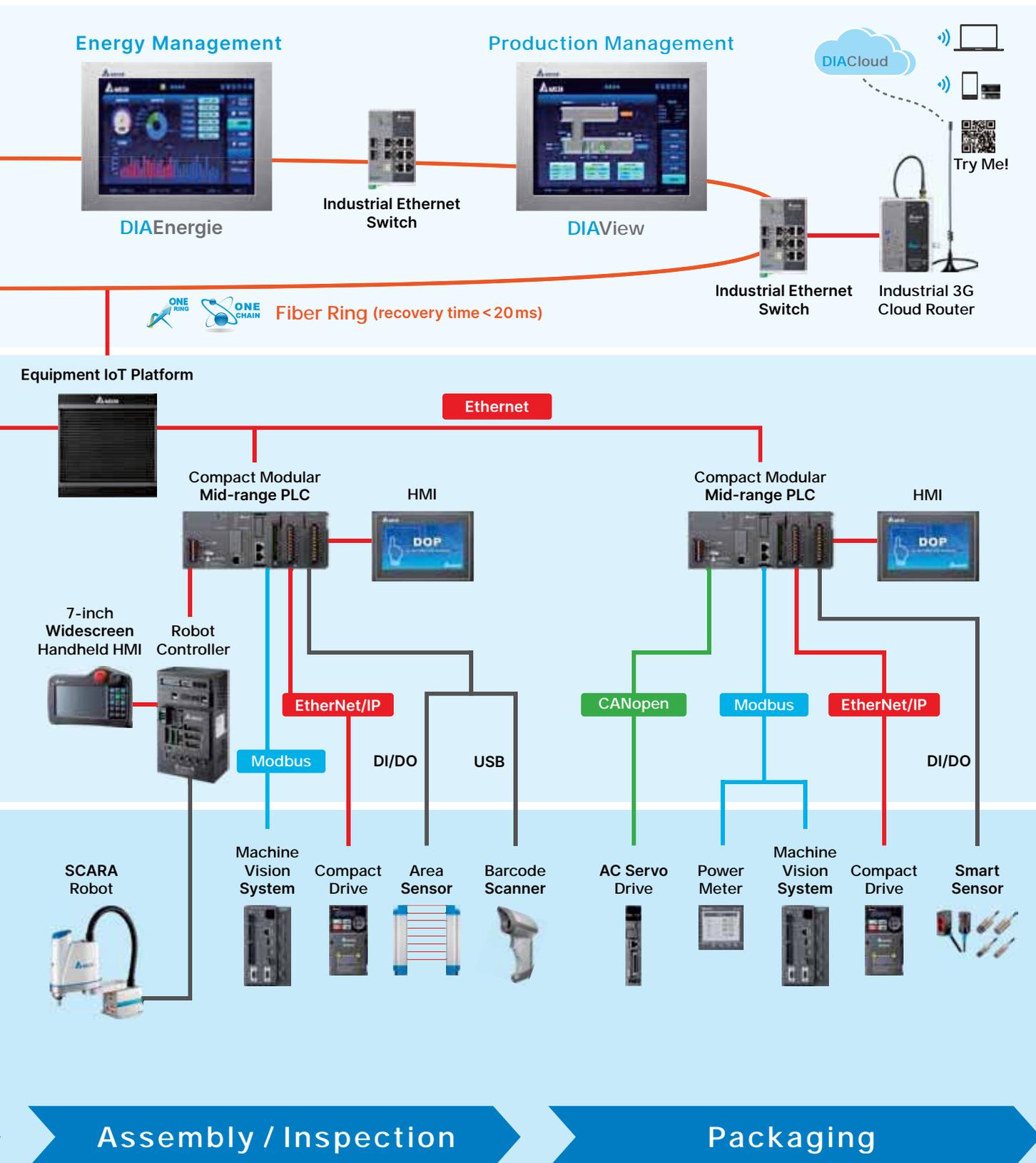
	IFD8500A RS-232 « » RS-485	<ul style="list-style-type: none"> • RS-232 to RS-422 / 485 isolated converter • Auto transmission speed adjustment
	IFD8510A RS-422 / 485	<ul style="list-style-type: none"> • RS-422 / 485 isolated regenerator • RS-422 / 485 transmission distance extended to 1.2 km • Able to connect to 32 RS-485 devices • Auto transmission speed adjustment and data flow direction control
	IFD8520 RS-232 « » RS-485	<ul style="list-style-type: none"> • RS-232 to RS-422 / 485 addressable isolated converter • Connects RS-232 to RS-422 / 485 by setting up Modbus address
	IFD8540 Bluetooth « » RS-485 / 232	<ul style="list-style-type: none"> • Bluetooth to RS-485 / 232 isolated converter • Supports Bluetooth GATT and Mesh mode • With external antenna

Industrial Network Converter

	IFD9502 DeviceNet » Modbus	<ul style="list-style-type: none"> • DeviceNet protocol • Able to connect Delta industrial automation products • Isolation in RS-485 channel (incl. power supply) • Full compatibility test passed
	IFD9503 CANopen » Modbus	<ul style="list-style-type: none"> • CANopen protocol • Able to connect all Delta industrial automation products • Isolation in RS-485 channel (incl. power supply) • Full compatibility test passed
	IFD9506 EtherNet/IP, Modbus TCP » Modbus	<ul style="list-style-type: none"> • 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 notification through email

Industrial Automation Solutions



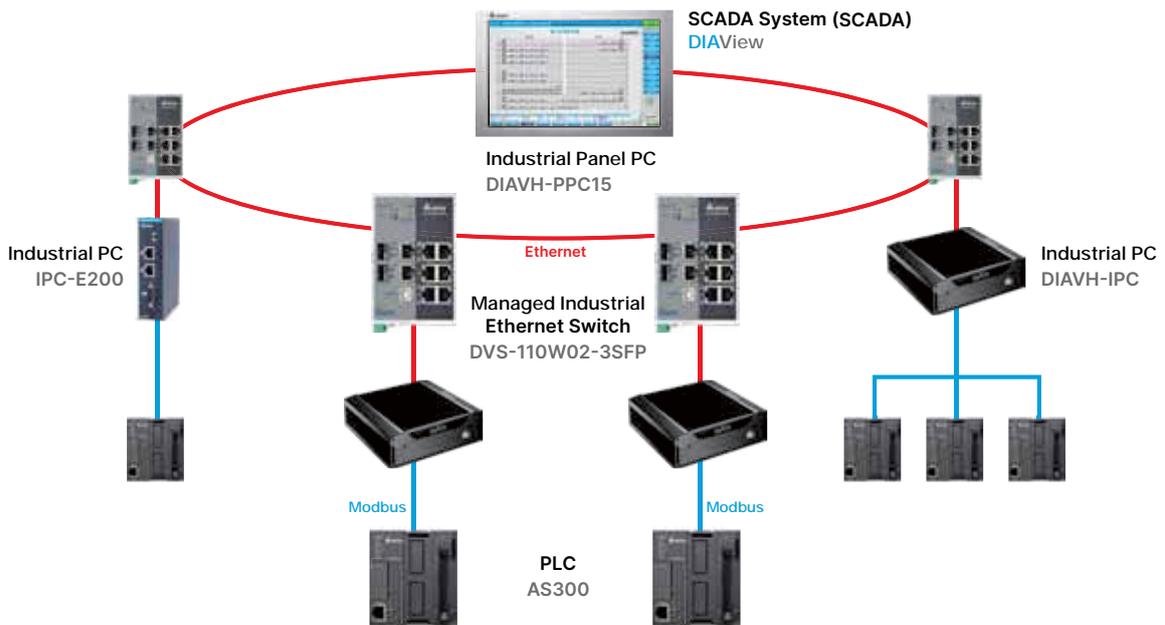


Industrial PC

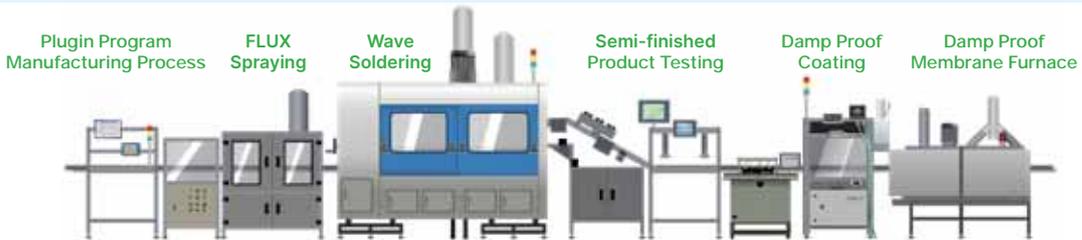
DIAPH/IPC

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



Facility Control & Management System	Equipment Management System	Production Process Control System	Production Quality Management System
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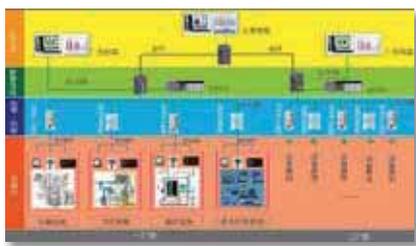


Applications

Equipment for electronics manufacturing, machinery equipment, HVAC, water treatment, facility management and monitoring control

Factory Digitalization

- Factory data acquisition, process control and management
- Distributed system for data computing, storage, and analytics



Factory Digitalization



Factory Equipment Monitoring

Logistic Applications: Transportation and Stereoscopic Warehouse

- Locations of material storage are saved in the database
- Material loading/unloading/sorting via barcode scanning for space and costs saving and high efficiency



Warehousing System



Warehouse Monitoring

Inspection & Monitoring of Electronic Equipment

- Implementation of inspection and equipment group control via PLCs, DIAView and inspection equipment
- Daily production recording, qualified/unqualified product identification, and data inquiries



Electronic Inspection Equipment



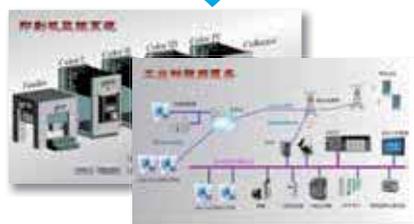
Inspection and Monitoring of Electronic Equipment

Equipment Monitoring System

- Achieves real-time remote monitoring of machine operating status
- Allows device suppliers to remotely lock/unlock devices for flexible management



Total Configuration of Equipment Monitoring

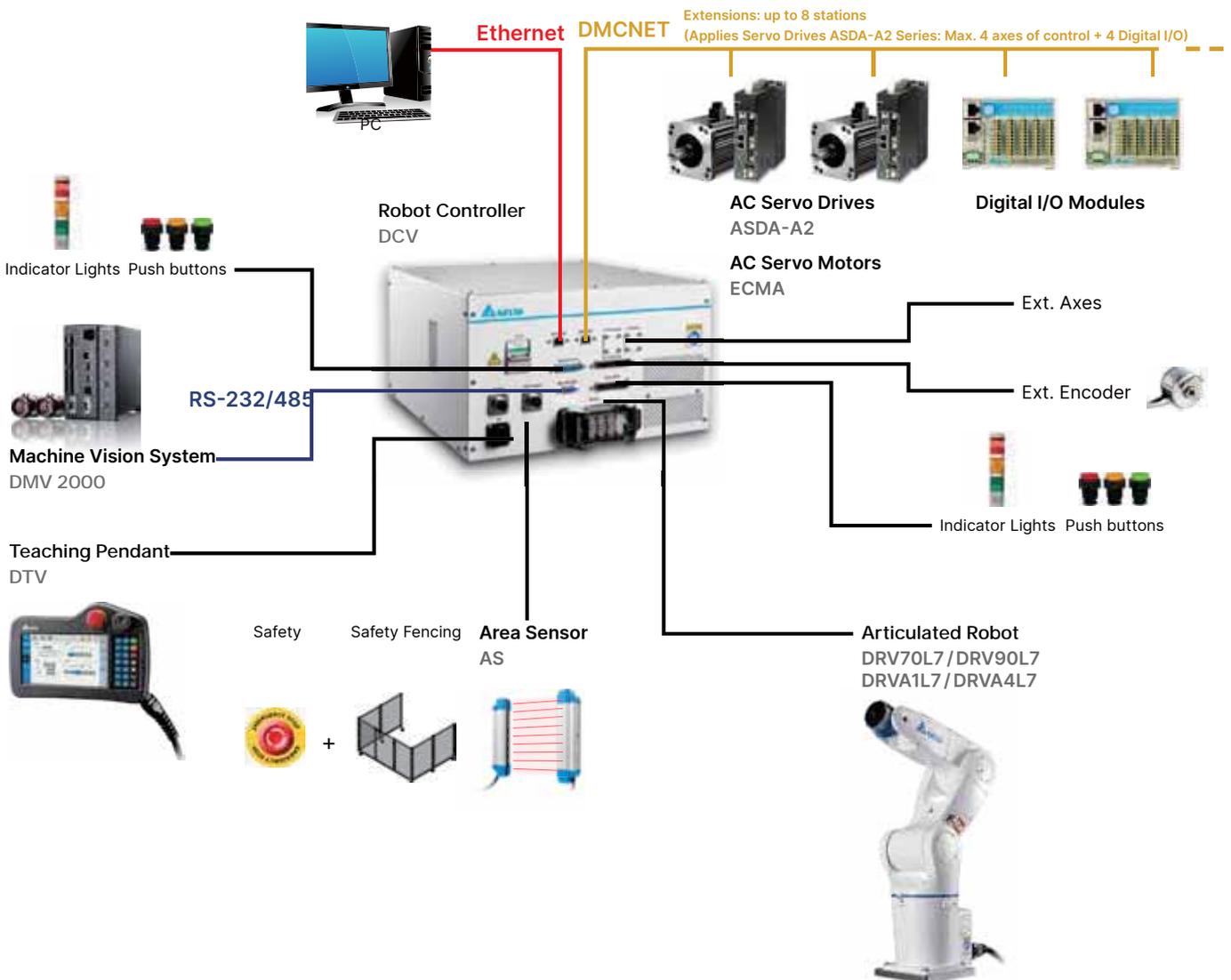


Equipment Remote Monitoring

Articulated Robot DRV

Automation for Smart Manufacturing

- High precision, high speed
- Built-in 3 solenoid valves for quick integration and application
- Hollow design of the robot wrist (the 6th axis) for wiring and tool placement
- High integration and efficiency
 - Matched with key devices for production automation
 - Quick integration with peripheral components for workstation applications



Product Specifications					
Model	DRV70L7	DRV90L7	DRVA1L7	DRVA4L7	
Number of Axes	6				
Max. Working Range	710 mm	900 mm	1,111 mm	1,411 mm	
Max. Payload	7 kg				
Motion Range (Max. Speed)	J1	±170° (450°/sec)	±170° (370°/sec)	±170°(240°/sec)	±170°(200°/sec)
	J2	+133°/-105° (340°/sec)	+135°/-105° (260°/sec)	+135°/-105 (220°/sec)	+135°/-105 (165°/sec)
	J3	+65°/-205° (510°/sec)	+65°/-205° (410°/sec)	+60°/-205 (295°/sec)	+60°/-205 (220°/sec)
	J4	±190° (550°/sec)		±190° (465°/sec)	
	J5	±120° (550°/sec)		±120° (480°/sec)	
	J6	±360° (820°/sec)		±360° (705°/sec)	
Repeatability	±0.02 mm	±0.03 mm	±0.04 mm	±0.05 mm	
Standard Cycle Time*1	0.32 sec	0.35 sec	0.48 sec	0.54 sec	
Installation	Desk-mount/Wall-mount/Ceiling-mount		Desk-mount/Wall-mount		
Built-in Wires	One 12Pos. connector for sensor connections and two ø6 pneumatic tubings (one is for three built-in solenoids, the other is for extension purpose)				
IP rating*2	IP40(Standard)/IP65 (Optional)		IP65 (Standard)		
Environment	Temperature	0°C ~ 40°C			
	Humidity	20 ~ 85%RH			
	Vibration	0.5G			
Weight	37 kg	39 kg	76 kg	82 kg	
Controller Series	Robot Controller DCV Series				

*1. When carrying a payload of 1kg and reciprocating 25mm in vertical and 300mm in horizontal directions under an operating temperature of 25°C and within a humidity of 45%~65% RH (non-condensing)

*2. Please contact regional sales when environment conditions are not within the above specifications

• **High Flexibility/Multiple Installations**

- Max. working range: 710 mm ~ 1,411mm enhances manufacturing flexibility
- Desk-mount / wall-mount / ceiling-mount installation fulfills various application needs



• **Hollow-wrist Design**

No Hollow Design
Tangled wire/cords lead to equipment interference



Hollow Design
Enhanced reliability of extension wire/cords



• **Simple and User-Friendly Operation Interface**



DRASudio Robotic Automation Studio software system



Intuitive user interface

- Real-time equipment data
- Dynamic-link library
- Self-defined user IO
- Optimized parameters
- Complete tuning function
- Easy backup with one click



Simple and graphic programming

Applications



Pick-and-Place



Load /Unload



Assembly



Insertion



Inspection



Screw-driving

SCARA Robot

DRS

High Repeatability, High Precision, Excellent Linearity and Verticality



Product Specifications							
Model		DRS30L3 SS1BN002	DRS40L3 SS1BN002	DRS60L3 SS1BN002	DRS50L6 SS1BN002	DRS60L6 SS1BN002	DRS70L6 SS1BN002
Number of Axes		4	4	4	4	4	4
Arm Length (X+Y)		300 mm	400 mm	600 mm	500 mm	600 mm	700 mm
Rated / Max. Payload		1 kg / 3 kg	1 kg / 3 kg	1 kg / 3 kg	2 kg / 6 kg	2 kg / 6 kg	2 kg / 6 kg
Motion Range	J1	±130°	±130°	±114°	±133°	±133°	±133°
	J2	±145°	±146.6°	±148°	±153°	±153°	±153°
	J3	150 mm	150 mm	150 mm	200 mm / 300 mm	200 mm / 300 mm	200 mm / 300 mm
	J4	±360°	±360°	±360°	±360°	±360°	±360°
	J5	-	-	-	-	-	-
	J6	-	-	-	-	-	-
Maximum Speed	J1 + J2	4,058 mm/s	4,710 mm/s	4,050 mm/s	4,400 mm/s	5,000 mm/s	5,500 mm/s
	J3	1,250 mm/s	1,250 mm/s	1,250 mm/s	1,100 mm/s	1,100 mm/s	1,100 mm/s
	J4	1,875°/s	1,875°/s	1,875°/s	2,000°/s (600°/s ***)	2,000°/s (600°/s ***)	2,000°/s (600°/s ***)
	J5	-	-	-	-	-	-
	J6	-	-	-	-	-	-
Standard Cycle Time*		0.392 s *	0.42 s *	0.92 s *	0.39 s *	0.39 s *	0.40 s *
Allowable Inertia Moment	Rated	0.0091 kg-m ²	0.0091 kg-m ²	0.0091 kg-m ²	0.01 kg-m ² (0.07 kg-m ² ***)	0.01 kg-m ² (0.07 kg-m ² ***)	0.01 kg-m ² (0.07 kg-m ² ***)
	Max.	0.075 kg-m ²	0.075 kg-m ²	0.075 kg-m ²	0.01 kg-m ² (0.07 kg-m ² ***)	0.01 kg-m ² (0.07 kg-m ² ***)	0.01 kg-m ² (0.07 kg-m ² ***)
Repeatability		±0.010 mm	±0.010 mm	±0.015 mm	±0.015 mm	±0.015 mm	±0.015 mm

* When carrying a payload of 1kg and reciprocating 25mm in vertical and 300mm in horizontal directions under an operating temperature of 25°C and within a humidity of 45% ~ 65% RH (non-condensing).

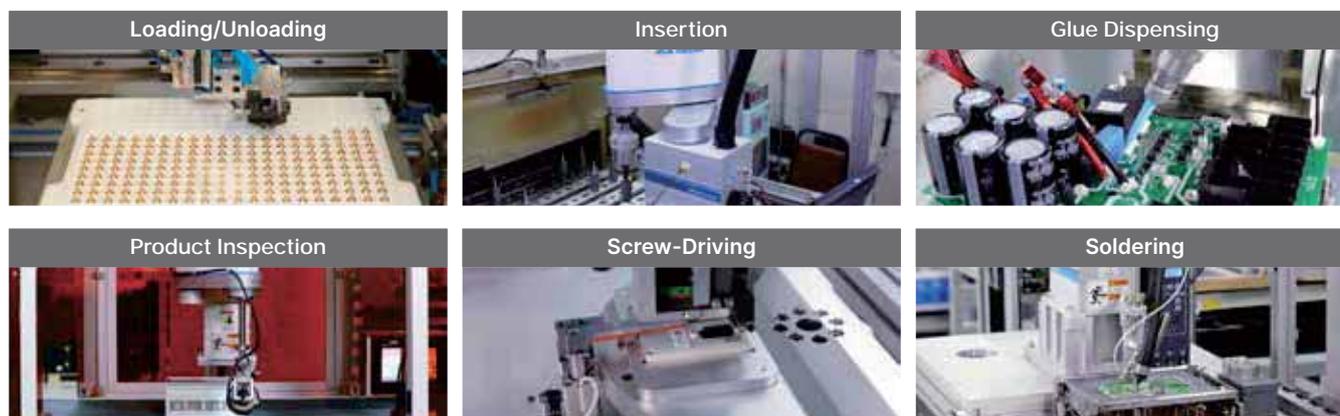
** When carrying a payload of 2kg and reciprocating 25mm in vertical and 300mm in horizontal directions under an operating temperature of 25°C and within a humidity of 45% ~ 65% RH (non-condensing).

*** High-inertia models

Applications

- **Industries:** Electrical / electronics, consumer electronics, rubber and plastic, metal fabrication, food and beverages
- **Processes:** Loading / unloading, pick-and-place, assembly, packaging, insertion, dispensing, soldering, labelling, inspection and screw-driving

SCARA Robot Applications



Product Specifications

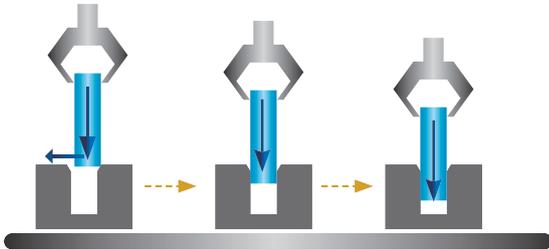
Model	DRS60LC SS1BN002	DRS70LC SS1BN002	DRS80LC SS1BN002	DRS60H6 SS1BN002	DRS60L3 SS1BN502	DRS60L6 SS1BN302
Number of Axes	4	4	4	4	5	3
Arm Length (X+Y)	600 mm	700 mm	800 mm	600 mm	600 mm	600 mm
Rated / Max. Payload	5 kg / 12 kg	5 kg / 12 kg	5 kg / 12 kg	2 kg / 6 kg	1 kg / 3 kg	2 kg / 6 kg
Motion Range	J1	±132°	±132°	±132°	±130°	±133°
	J2	±152.5°	±152.5°	±152.5°	±150°	±153°
	J3	200 mm / 420 mm	200 mm / 420 mm	200 mm / 420 mm	200 mm	200 mm
	J4	±360°	±360°	±360°	±360°	±360°
	J5	-	-	-	-	±360°
	J6	-	-	-	-	-
Maximum Speed	J1 + J2	7,100 mm/s	7,700 mm/s	8,300 mm/s	5,000 mm/s	5,500 mm/s
	J3	118 mm/s	1,180 mm/s	1,180 mm/s	1,100 mm/s	1,100 mm/s
	J4	1,025°/s	1,025°/s	1,025°/s	2,000°/s	2,000°/s
	J5	-	-	-	-	600°/s
	J6	-	-	-	-	-
Standard Cycle Time*	0.43 s **	0.45 s **	0.47 s **	0.39 s *	0.45 s *	0.39 s *
Allowable Inertia Moment	Rated	0.02 kg*m ²	0.02 kg*m ²	0.02 kg*m ²	0.01 kg*m ²	0.01 kg*m ²
	Max.	0.25 kg*m ²	0.25 kg*m ²	0.25 kg*m ²	0.023 kg*m ²	0.023 kg*m ²
Repeatability	±0.025 mm	±0.025 mm	±0.025 mm	±0.015 mm	±0.015 mm	±0.015 mm

* When carrying a payload of 1kg and reciprocating 25 mm in vertical and 300 mm in horizontal directions under an operating temperature of 25°C and within a humidity of 45% ~ 65% RH (non-condensing).

** When carrying a payload of 2kg and reciprocating 25 mm in vertical and 300 mm in horizontal directions under an operating temperature of 25°C and within a humidity of 45% ~ 65% RH (non-condensing).

- **Sensor-less Compliance Control Function**

- Compensates for the deviation between workpieces and insertion holes
- Fast and precise smooth insertion
- Improves assembly and production performance



- Insertion performance may differ depending on workpiece hardness

- **On-the-Fly & Conveyor Tracking**

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



- **Real-time Information Monitoring and Collection**

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



Equipment Data Acquisition Platform
DIALink



Overall Equipment Effectiveness Platform
DIAOEE

- **Intuitive Teaching Methods with Versatile Control Approaches**



PAD

HMI

Teaching Pendant

PC



Position Adjustment
(left/right)

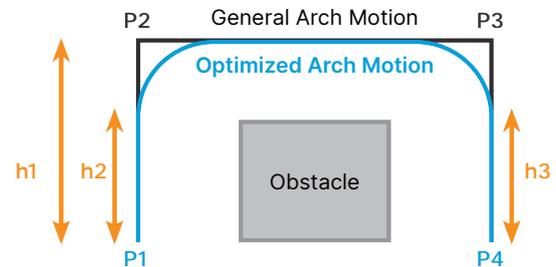


Position Adjustment
(forward/backward)

Positions are directly taught and controlled by hand, and recorded by SCARA.

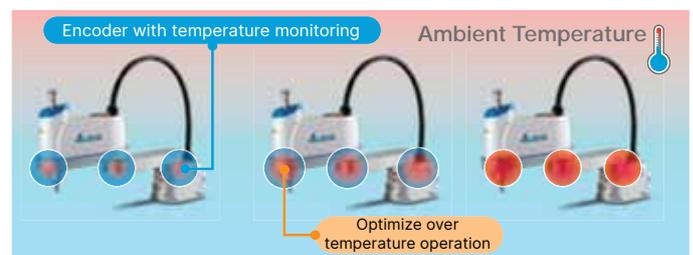
- **Arch Motion Control**

- 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



- **Optimizes Operational Efficiency**

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



Normal Mode

Adjustment Mode

Overload Mode

Screw Driving Robot

RS-AFS

One-Station Total Solution

- Robot + Screw Driver + Teaching Pendant

Easy to Use

- High integration
- Simple screwing parameter setup

Real-time monitoring

- Screw driving status
- Force monitoring
- Torque control



Applications

Consumer Electronics, automotive parts assembly
(Torque: 0.5 ~ 43 kgf-cm | Screw size: M1.2 ~ M5)

Benefits

Precise torque control
Products & screws not damaged

Model		RS-AFS 60LA01	RS-AFS 60LA02	RS-AFS 60LA04	RS-AFS 60LA05	RS-AFS 60LA06	RS-AFS 60LB01	RS-AFS 60LB02	RS-AFS 60LB04	RS-AFS 60LB05	RS-AFS 60LB06	
Number of Axes		3					4					
Arm Length (1 + 2 axis)		600mm										
Max. Speed	J1+J2	5,000mm/sec										
	J3	1,100mm/sec										
	J4	N.A.					600% _s					
	J1	±133°					±133°					
Range of Motion	J2	±153°					±153°					
	J3	200mm					200mm					
	J4	N.A.					±105°					
	J1+J2	±0.015mm					±0.015mm					
Repeatability	J3	±0.01mm					±0.01mm					
	J4	N.A.					±0.01mm					
	Net Weight		20kg									
Torque (kgf/cm)		0.5~1.8	1.5~9.0	1.5~9.0	6.0~25.0	10.0~43.0	0.5~1.8	1.5~9.0	1.5~9.0	6.0~25.0	10.0~43.0	
Torque (N/m)		0.05~0.17	0.15~0.88	0.15~0.88	0.58~2.45	0.98~4.20	0.05~0.17	0.15~0.88	0.15~0.88	0.58~2.45	0.98~4.20	
Max. Speed (rpm)		2,000	2,000	2,000	1,200	1,000	2,000	2,000	2,000	1,200	1,000	
Dimensions (LxWxH, mm)		250×57×63	250×57×63	250×57×63	318×57×63	318×57×63	250×57×63	250×57×63	250×57×63	318×57×63	318×57×63	
Weight (kg)		1	1.2	1.2	1.7	1.7	1	1.2	1.2	1.7	1.7	
Screw Size	Metric Size	M1.2~M2	M2~M3	M2~M3	M2.5~M4	M3~M5	M1.2~M2	M2~M3	M2~M3	M2.5~M4	M3~M5	
	Screwdriver Bit	Ø4	Ø5	Hex 1/4"	Hex 1/4"	Hex 1/4"	Ø4	Ø5	Hex 1/4"	Hex 1/4"	Hex 1/4"	
Ambient Temperature		5°C~40°C										
Storage Temperature		-20°C~55°C										
Humidity		0~90% RH (non-condensing)										

Robotic Simulation Platform

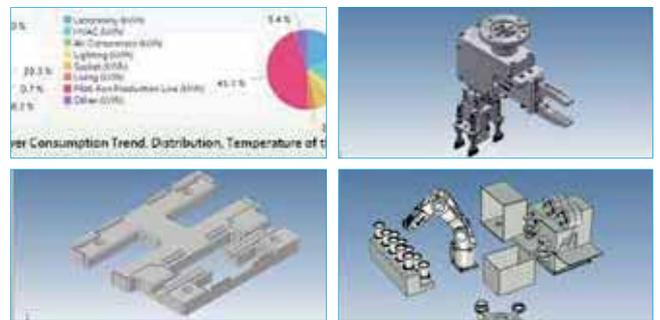
DRASimuCAD

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 improve efficiency

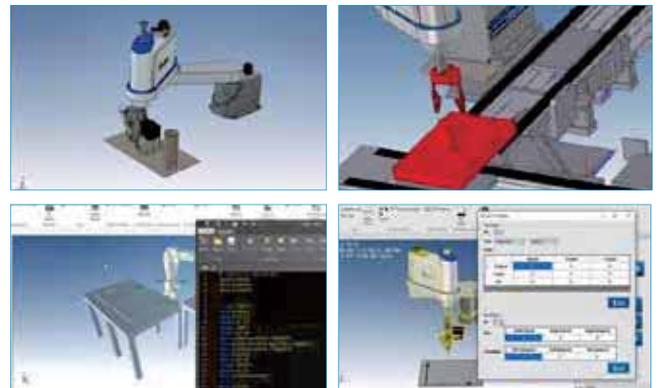
Modeling (CAD)

- 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 DRASstudio, allowing teaching points, setting coordinate system (user frame/tool frame) and creating 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



Servo Press

ESP-S / ESP-E

In modern industries, diversification, short lead time, multiple functions and customization are demanded for manufacturing in all fields. Since 2000, Delta has been working on the development of servo presses for the processing of fans, motors, network appliances, automobiles, electronics assembly, and more.

All of the key components are designed and manufactured by Delta for seamless integration, stable operation, high production efficiency as a one-stop-shop service. When connected with equipment management platforms, the electric servo press supports data exchange for monitoring in real time and flexible changeover on smart automated production lines. It helps customers increase yield rates and competitiveness.

Precise Force & Position Control

Applies servo motors to drive low-backlash ballscrew and tool holder for high repeatability and precision

- Press force: 100 ~ 5,000 kgf
- Integral casting and used with Delta's servo motors for high dynamic load capacity
- Fast control mode switching and precise control of press force, position, time required, and settings

Multiple Control Modes: Real-time Control and Monitoring

Reduces defect rates and elevates forming efficiency for specific products

- Position Mode
- Force Mode
- Distance Mode
- Force Distance Mode
- Force Position Mode
- Multiple Mode

Comprehensive PC-Based 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

Standard ESP-S



- Robust design
- High repeatability/Seamless hardware & software integration for high efficiency

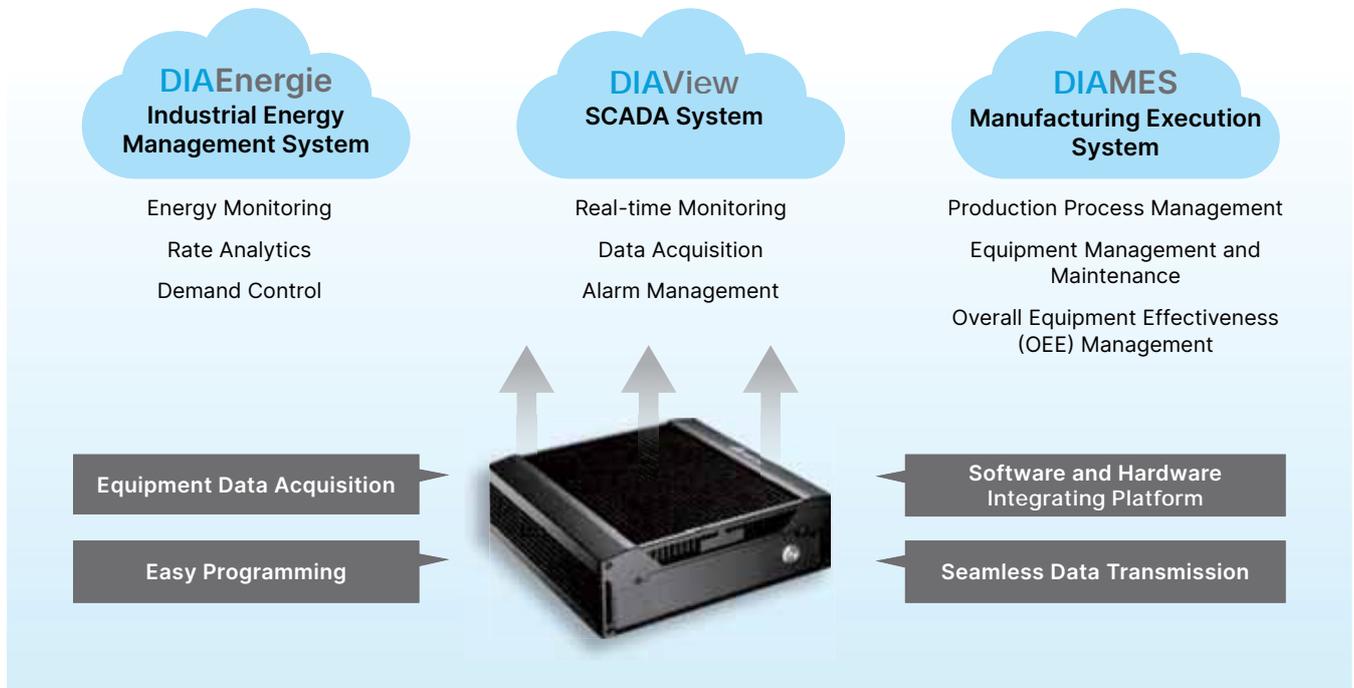
Cylinder ESP-E



- Accurate press & flexible control
- Multiple processes adaptable to changeovers
- High repeatability & multiple strokes

Equipment IoT Platform

DIALink



Equipment Monitoring and Data Acquisition

Features

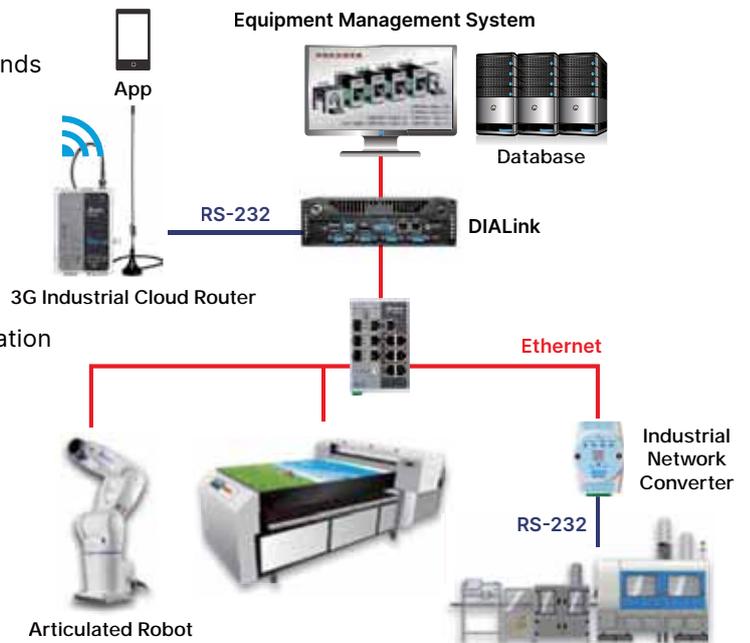
- Supports connection to CNCs/PLCs and various brands of equipment
- Data accessing/visualization/storage in real time
- Cloud computing via OPC UA/MQTT
- Edge computing with M2M connection

Benefits

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

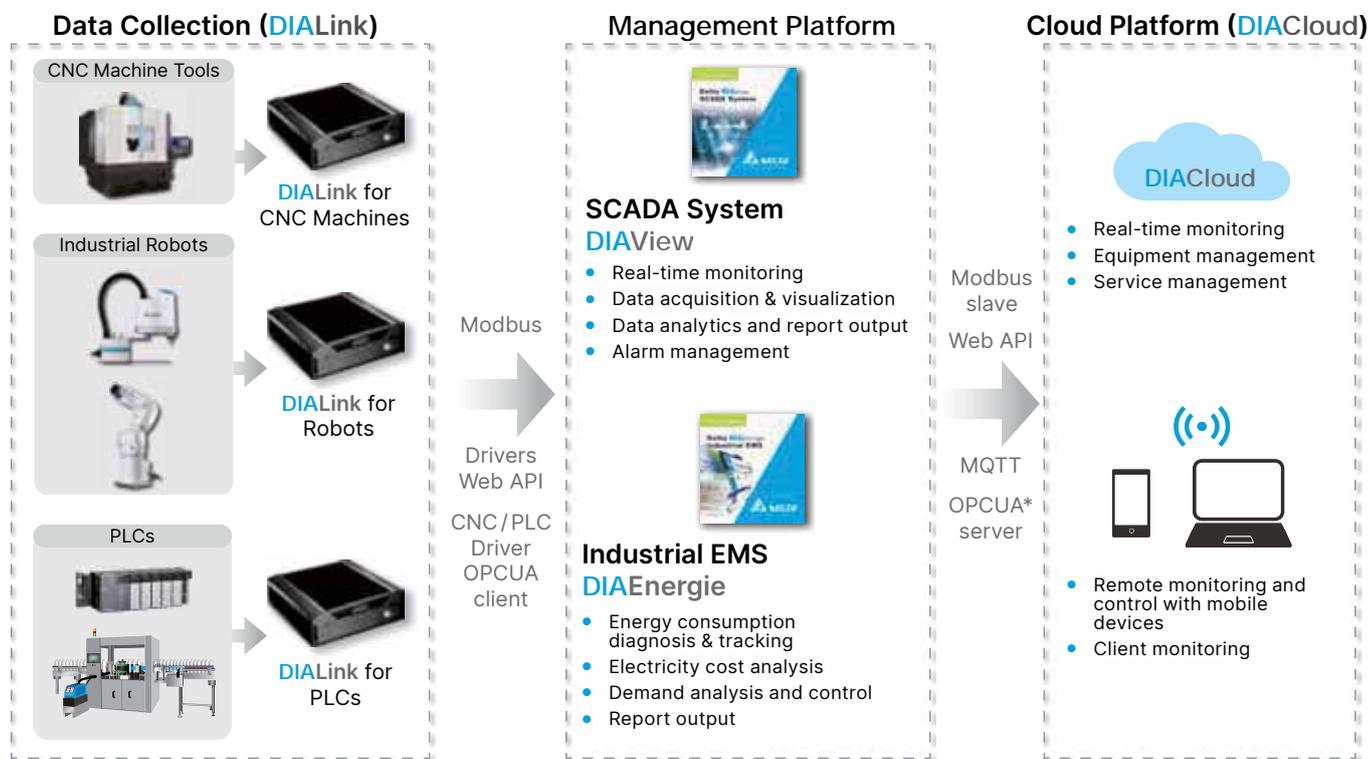
Applications

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



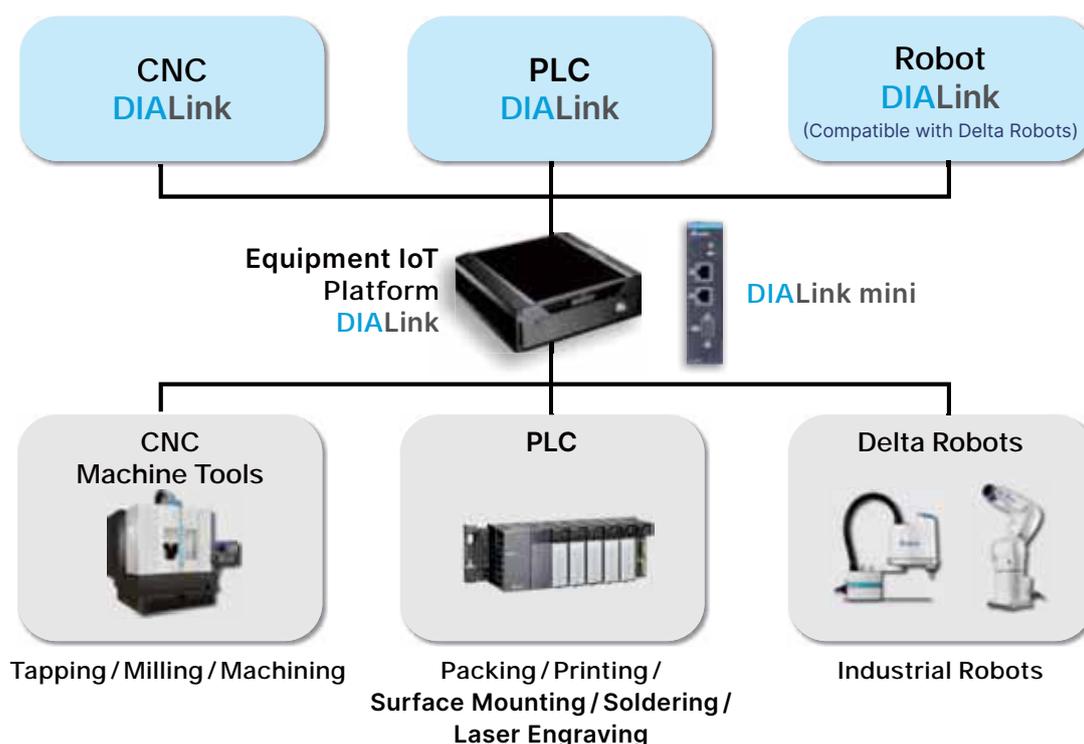
Rapid, Seamless and Secure Data Transfer

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



* Option module

DIALink for CNC Machines / PLCs / Robots



Statistical Process Control System New

DIASPC

DIASPC collects various measurement data in the manufacturing process in real time, applies statistical methods and control rules, provides early warning of abnormal trends and monitors the manufacturing process in real time, stabilizes the manufacturing process to improve product quality, and complies with the IATF16949 international standard.

Alarms notify and ensure the stability of the process capability

- Various variable and attributed data, and control rules, effectively monitor the process capability to prevent abnormalities.
- Quickly find the stratifications that affect the quality, and we provide abnormality analysis of each stratification.
- There are 3 monitoring tools for users including Alarm Board, personalized monitoring dashboard, and plant-wide warning dashboard, to control abnormal quality events in real time.

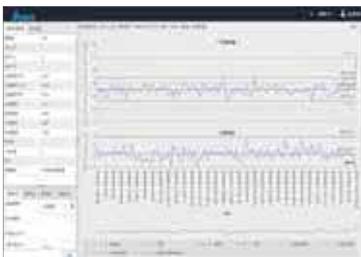
PDCA management cycle used to continuously optimize production quality

- Users can import the excel file to build the basic setting data and measurement data quickly.
- Track and manage the processing status of abnormal quality, and provide an Out of Control Action Plan (OCAP) mechanism.
- Provides version control for control limit and specification limit, and control plan update management is more efficient.
- Flexible export format for users to quickly create certificate of analysis reports and quality assurance certificates.

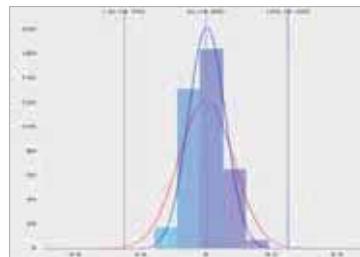
Reduces system maintenance costs

- The installation-free web server architecture is convenient for remote devices to open with a browser, reducing the maintenance costs of the information department.
- Provides standard interfaces to accelerate the integration of heterogeneous systems

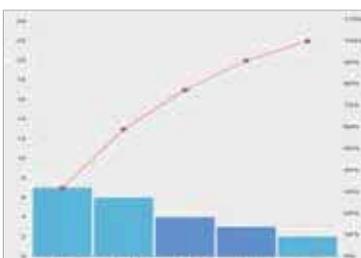
Provides a variety of charts and reports for the user to analyze and control.



Control Chart



Histogram

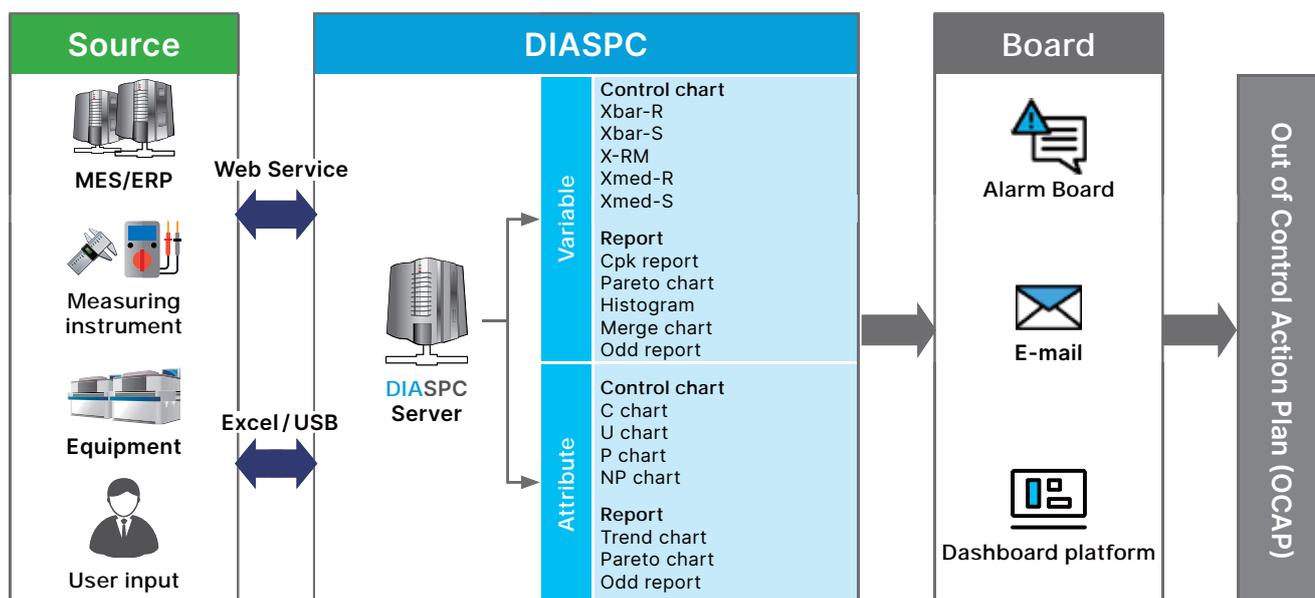


Pareto Chart



CPK Report

System Operation Process



Provides cloud version based on SaaS service

- The installation-free web server architecture is convenient for remote devices to open with a browser, reducing the maintenance costs of the information department.
- Provides standard interfaces to accelerate the integration of heterogeneous systems

	Servo	Cloud
Users	<ul style="list-style-type: none"> ● Volumes of data/Real-time monitor ● Specific IT department ● Large-scale 	<ul style="list-style-type: none"> ● Less data/Small-scale ● Non real-time ● Report tool
Price	High	Low
Implementation time	Slow	Fast
Cost	High	Low
Integration time	Longer	Less
Training	On Site	E-learning
Customize function	Provided	Not Provided

System functions

<p>Various control charts</p> 	<p>Multiple reports</p> 	<p>Alarm mail and dashboard</p> 	<p>Scheduling report sending</p> 	<p>Measurement Systems Analysis (GRR)</p> 
Users can choose a chart to monitor according to the factory management	Analysis tool to find the abnormal data	Abnormal occurrence, to provide users with a quick grasp of relevant information	Select the chart and report and flexibly set the sending schedule	Evaluate the credibility of the measurement and establish a reliable and accurate system

Alarm Management System New

DIAAMS

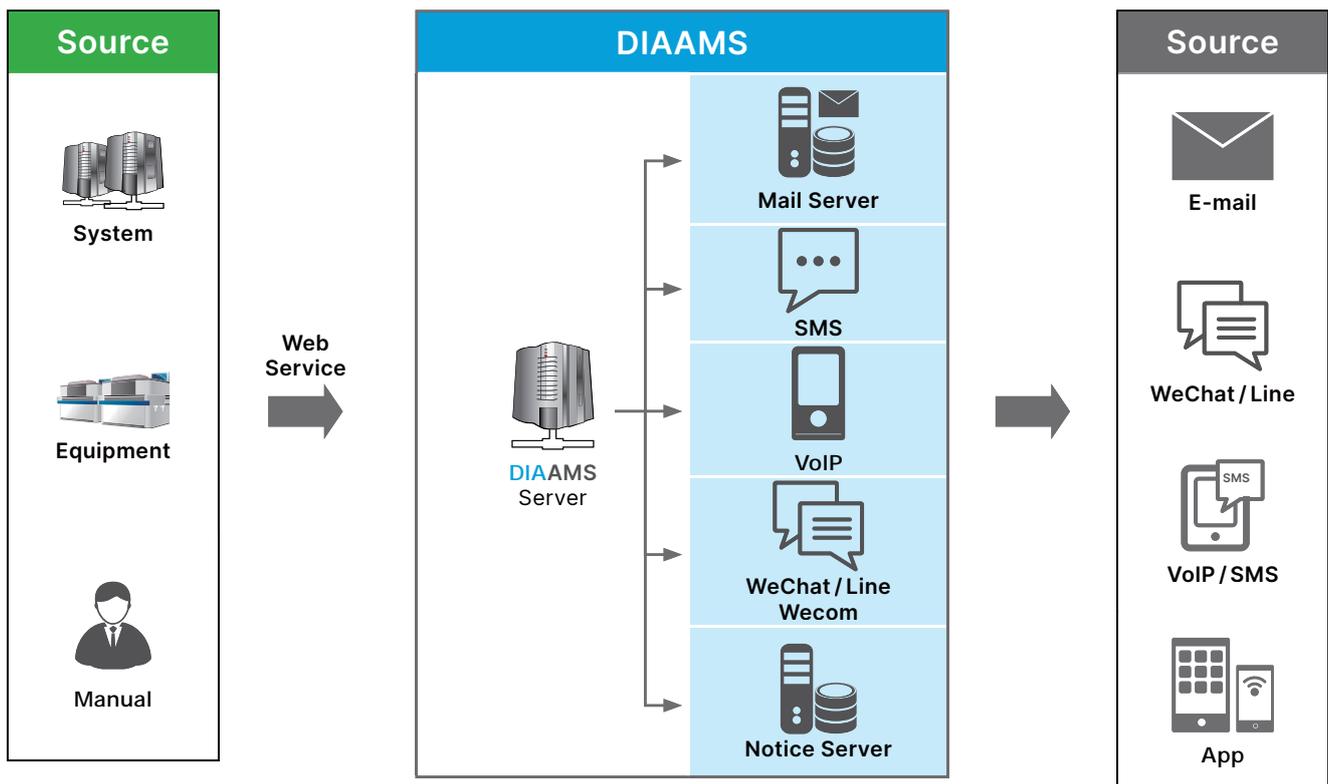
An enterprise-level alarm management platform collects abnormal alarms of various information systems, equipment and facilities, and immediately warns the power and responsible units, so that users at all levels can grasp abnormal conditions in real time and deal with them quickly.

Effectively sends warnings to ensure immediate disposal by the responsible units

- Supports multiple sending devices, including email, SMS, VoIP, Wechat, Line and app.
- Provides multi-level sending settings, if first level users don't respond immediately, the system automatically reports to the second-level users.
- Web-based, users can remotely access the system with browsers such as Google Chrome and Edge.

Flexible alarm condition setting and reduces maintenance cost

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



System functions

Alarm classification setting



Alarm classification and summary based on plant area and other systems

Multiple level setting



Set the alarm sending path, and multi-level sending settings

Alarm Management



It can confirm and interrupt or end the event according to special circumstances

Alarm Reports



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

Equipment Management System New

DIAEMS

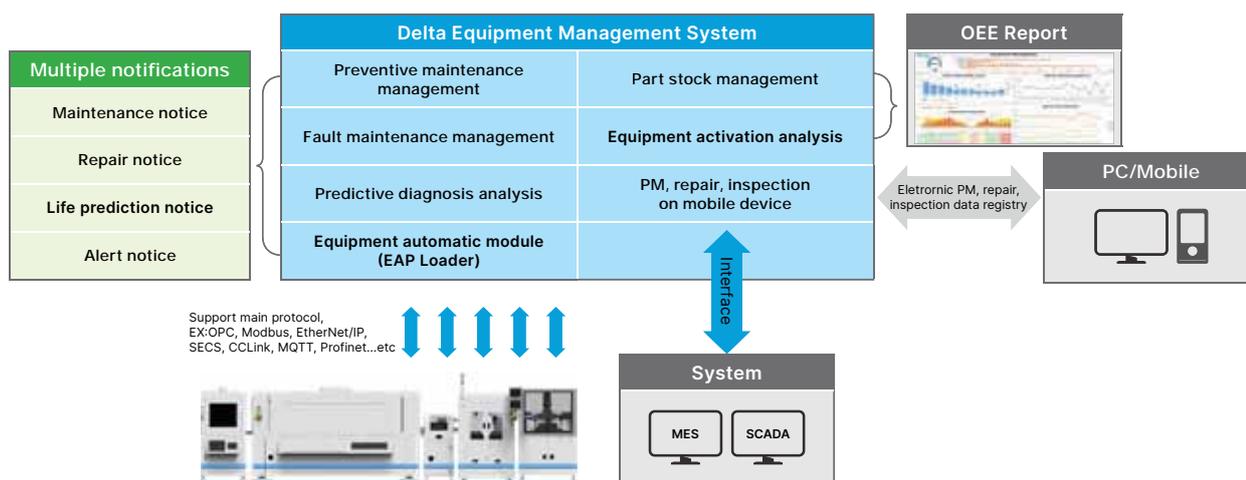
DIAEMS systemizes equipment PM and repair; efficiently upgrades equipment activation and equipment abnormality analysis; decreases human resource management loading and increases efficiency; integrates IT and OT technology to interface with different types of equipment; unifies specifications and communications; simplifies management rules; and implements the equipment management cycle

Systemizes equipment management, simplifies the flow and increases efficiency

- PM/Repair/Inspection quick flow mode, simplifies the process, and decreases human resource loading.
- Park stock management, decreases the inventory, and part trace loading.
- Real time monitoring, analysis of equipment activation and abnormal statistics.

With IT and OT, integrates communication specifications and interfaces with different types of equipment, predictive diagnosis

- Unifies the data specification import, simplifies the interface with other types of equipment.
- Flexible mechanism to intelligently create PM and repair work orders with specification settings.
- Increases the equipment service life and decreases the loss from sudden abnormalities with predictive diagnosis.



System functions

Predictive diagnosis	Preventive maintenance	Malfunction repair	Part stock	Equipment activation
Modeling prediction, predict service life, diagnose or analyze abnormalities	PM work reminders and execution records	Malfunction reason and management records, intelligently create repair work order	Manage part in/out-stock and inventory, control the usage and stock	Real time collection of equipment product information and analyze the activation and status to a report

Applications

Bare Printed Circuit Board	Copper clad laminate, circuit board
Computers, Electronic and Optical Products Manufacturing	Computer, Monitor, Disk array, PCBA
Electronic Parts and Components Manufacturing	LEC, Passive element, Automobile electronics
Semi-conductors Manufacturing	Wafer, Encapsulation, Test, Driver IC
Motor Vehicles and Parts Manufacturing	Motor vehicles, Tire, Wheel rim, Car lamp, Stamping part, Wire bundle
Food Manufacturing	Beverages, Dairy products, Pastry, Bread, Food packaging material
Other	Building automation, Building energy management

Semiconductor Equipment Communication and Control Software New

DIASECS

DIASECS is a solution that transforms your equipment controller into a full GEM compliant machine. It can also ease the task of equipment-to-host communication implementation. Configuration tool setting and a high level of automation helps customers quickly import SECS/GEM standards into equipment. SECS/GEM have adopted these standards for semiconductors, printed circuit boards, photovoltaics (PV), LEDs, displays, and other electronic components.

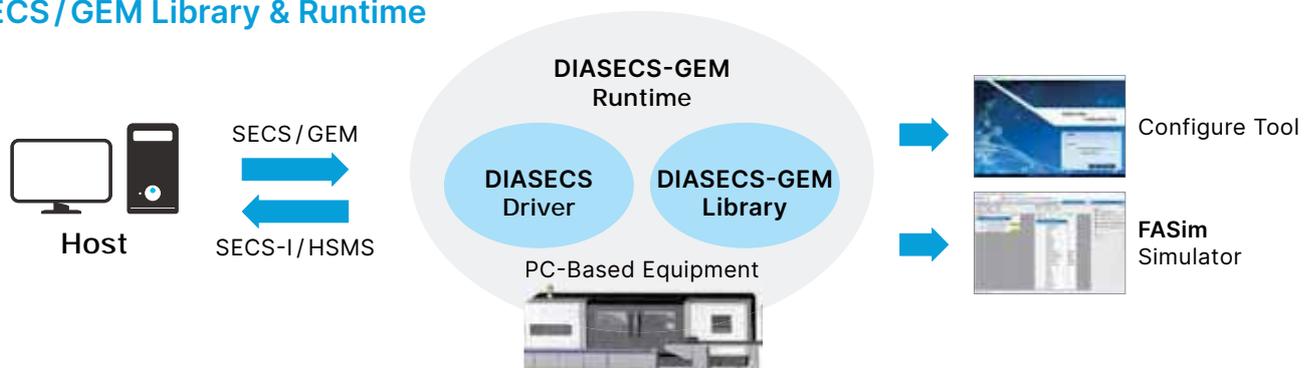
Complies with SEMI standards, high performance, easy to use

- Fully complies with SEMI standard
- Communication rate can reach 300 times per second of message transmission
- 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 out of the box
- Quickly complete parameter configuration and settings for quick start
- Record raw data and SML log at the same time, analysis is more accurate and easy to use

SECS/GEM Library & Runtime



SECS/GEM gateway



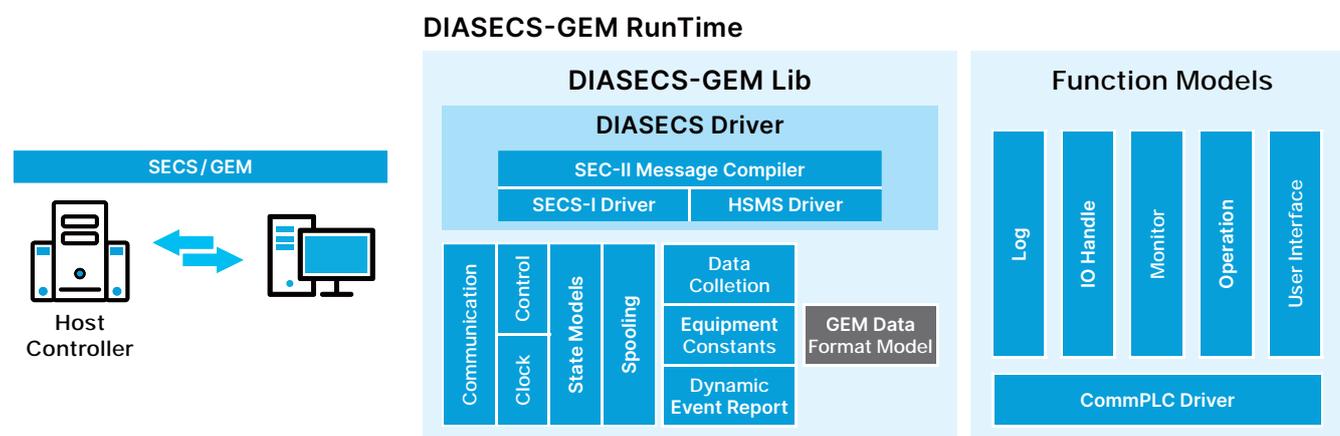
Applications

Semi-conductors Manufacturing:	Wafer, Encapsulation, Test, Driver IC
Bare Printed Circuit Board:	Copper clad laminate, Circuit board
Electronic Parts and Components Manufacturing:	LEC, Passive element, Automobile electronics
Flat Panel Display:	Display, Solar cell

DIASECS-GEM Family - SECS / GEM Semiconductor Equipment Communication Standard

	DIASECS-Driver	DIASECS-GEM Library	DIASECS-GEM Run Time	DIASECS BOX
Application Side	Host & EQP Side	Host & EQP Side	EQP Side	
SEMI Standard	SEMI E4/E5/E37	SEMI E4/E5/E37/ E30/E82/E88/E39/ E40/E90/E94/E87/ E116	SEMI E4/E5/E37/E30	
Communication Capability	>300 Trx/secs			
Compile/Disassemble Message	-	Support		
GEM	-	GEM200/GEM300	GEM200	
Simulation Tools	Provide			
Configuration Tools	-	Provide		
Log Level	Control Message/Hex/SML		Control Message/Hex/SML/ Transaction Data/Trace Data	
Programmable	DLL/ActiveX/C#		No-Code (Configuration)	
Compatible PLC	-	--	Delta/Mitsubishi/Omron/Siemens/ Rockwell/ABB etc.	
Real-Time Display (UI)	-	Variable	Log & Variable	

Software architecture



Industrial Energy Management System

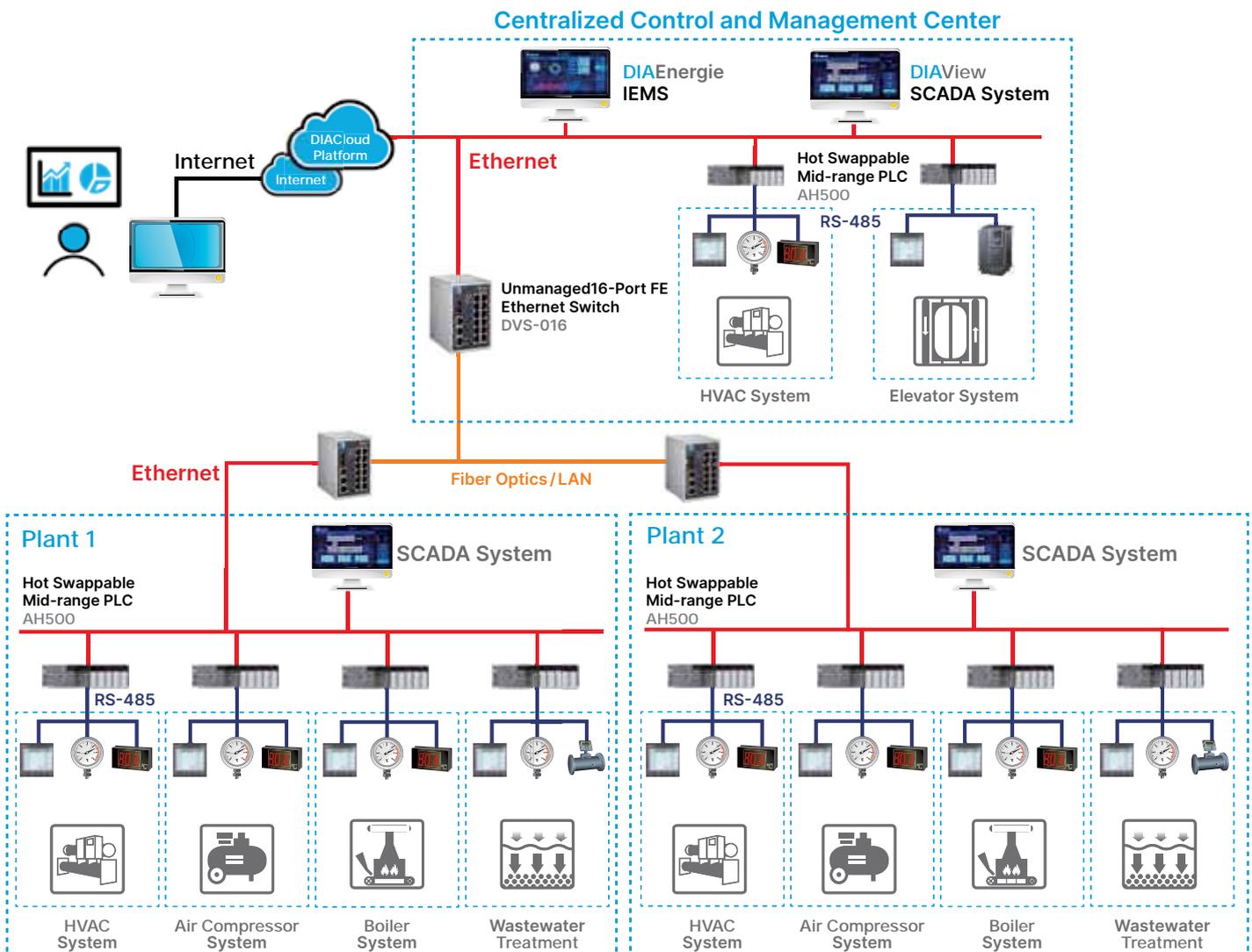
DIAEnergie

Innovative Solution for Smart Energy Saving

- Visualization and remote monitoring of critical power consumption
- Data analytics by areas and visualization per user authorization levels
- Monitoring and analysis to meet energy performance strategy goals
- Real-time alarms for anomalies
- Power consumption measurement and analysis to achieve efficient electricity usage and cost savings
- Demand management and forecasts to avoid exceeding the electricity consumption threshold
- User-definable tools for report output and a variety of types of data analysis



System Structure and Applications



Global Operations

ASIA (Taiwan)



Taoyuan Technology Center (Green Building)



Taoyuan Plant 1



Tainan Plant (Diamond-rated Green Building)

ASIA (China)

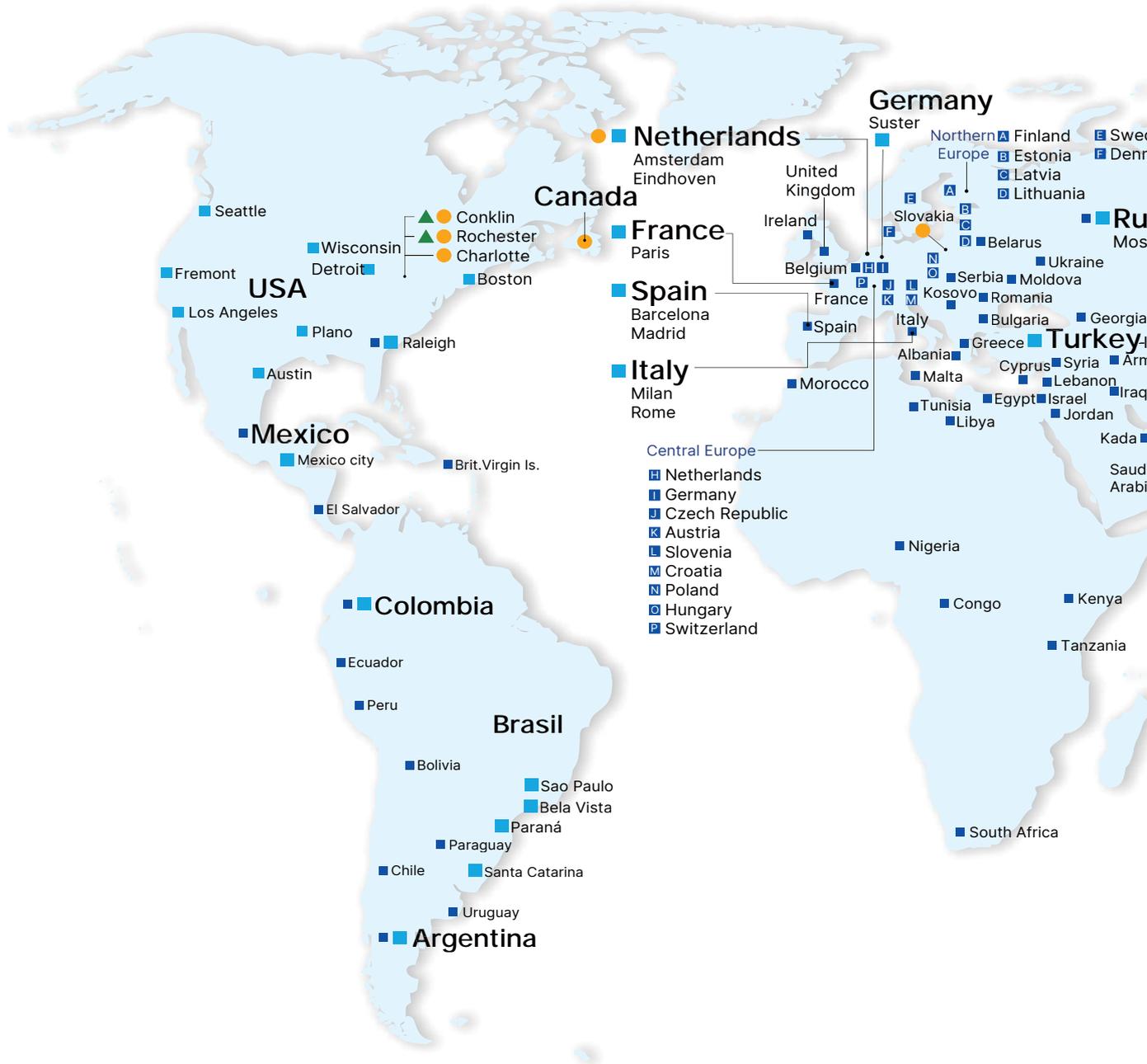


Wujiang Plant 3



Shanghai Office

▲ 10 Factories



ASIA (Japan)



Tokyo Office

ASIA (India)



Rudrapur Plant
(Green Building)

EUROPE



Amsterdam, the Netherlands

AMERICA

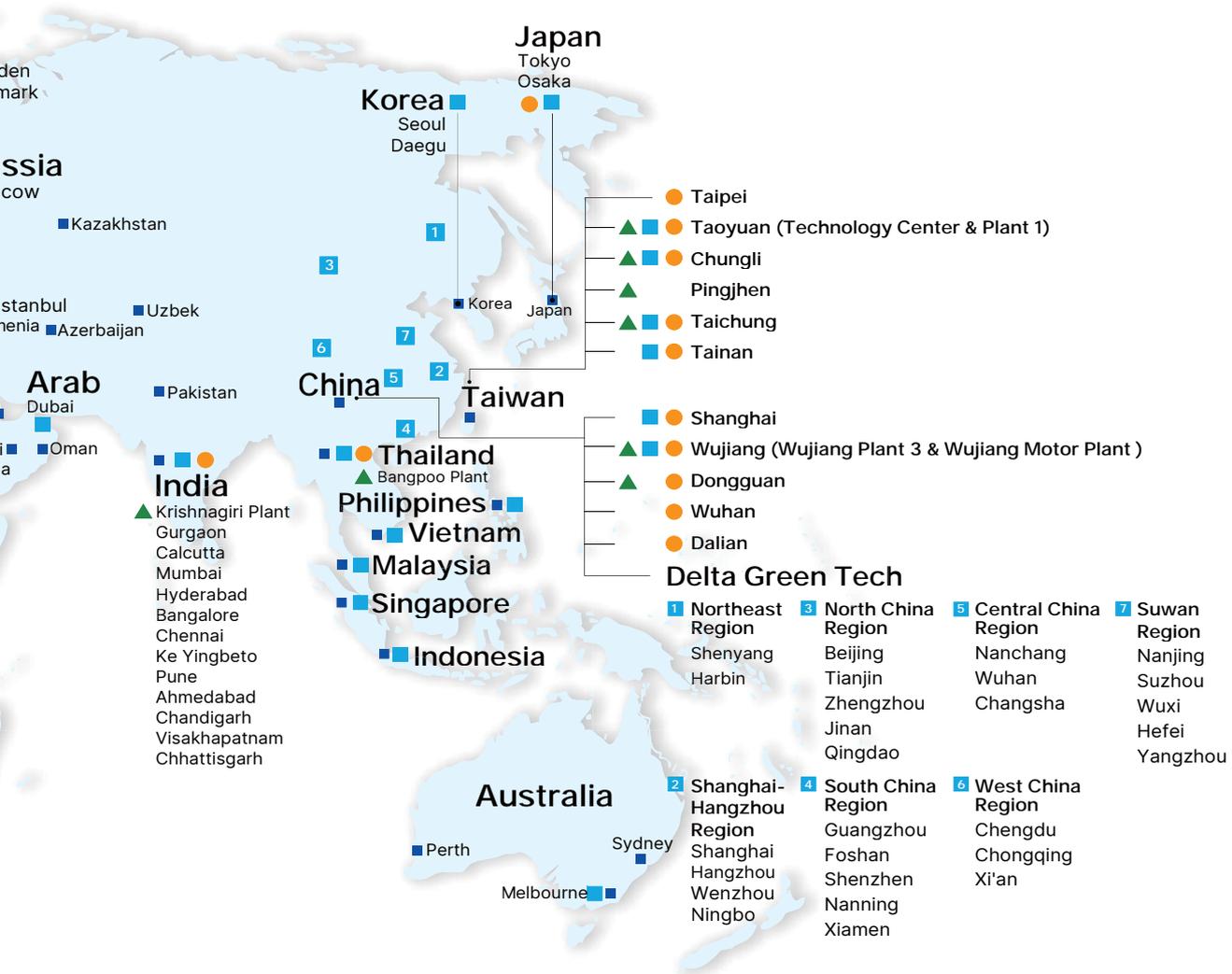


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