Automation for a Changing World

Delta Industrial Automation

2020 Full Range / **Catalogue**

ΛELTA

Smarter. Greener. Together.

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 was founded in 1971. Delta offers energy efficient power products, switching power supplies with efficiency over 90%, telecom power with up to 98%, and PV inverters with up to 98.8% efficiency. We have also developed the world's first server power supply certified as 80 Plus Titanium. We regularly invest 6% to 7% of our annual sales revenues in R&D and have worldwide R&D facilities in China, Europe, India, Japan, Singapore, and the U.S.

Delta is a frequent recipient of international awards and related recognition for innovation, design, energy management and corporate social responsibility. Since 2011, Delta has been selected each year for the prestigious Dow Jones Sustainability™ World Index (DJSI World Index). In 2019, we were also included in the DJSI Emerging Markets Index for the 7th consecutive year. In 2016-2017, Delta was ranked by CDP (formerly the Climate Disclosure Project) at the Climate Change Leadership Level.

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 IIoT and data collection, as well as manufacturing management and monitoring 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 "Automation for a Changing World".

Delta IABG Milestones

1995
AC Motor Drive

1999
Small PLC

2003
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
Flow Switch

Laser Displacement

Barcode Scanner

Area Sensor

IABG Profile

- Mission: To elevate the living environment through advanced automation technology with value-added innovation
- Headquarters in Taoyuan, Taiwan
- Founded in 1995
- Manufacturing and R&D technology centers in Taiwan (Taoyuan, Chungli, Taichung, Tainan), China (Shanghai, Wujiang), and India (Hosur)
- Number of employees: 7,200 (R&D 1,205)

2004	2006	2008	2009	2010	
Human Machine Interface	Time/Counter/ Tachometer	Industrial Power Supply	Pressure Sensor	Active Front End Unit	Motion Control Card

2012			2014	
High Performance Mid-range PLC	Controller with Human Machine Interface	Machine Vision System	Programmable Automation Controller	Power Meter

2016					
Articulated Robots	Compact Modular Mid-range PLC	IIoT Cloud-based Platform	IIoT Industrial Cloud Routers	Industrial PCs	Planetary Gearboxes
		DIACloud			

2018	2019~2020	
Motion Controller Based on CODESYS	Servo Press	Delta Extended Motion Controller

NELTA

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Power Quality Solution

AC Servo Drives and Motor

Actuator

Gearbox

Delta Extended Motion Controller **New**

PC-Based Motion Controller

CNC Solution

Robot Controller

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Programmable Logic Controller

Human Machine Interface

Text Panel HMI

Touch Panel HMI with Built-in PLC

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Industrial Ethernet & IIoT Solution

ΔELTA

Industrial Fieldbus Solution

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Equipment IoT Solution

Factory Energy Management

High Performance / Standard / Basic Compact Drive New
MH300 / MS300 / ME300

Compact-designed Powerful Multifunction Drives

Optimized Space Utilization

- Compact design with up to 60% size reduction compared to existing models

Outstanding Drive Performance

- Support both induction and permanent magnet motors
- MH300 Series: supports open-loop / closed-loop control
- MS300 / ME300 Series: Supports close-loop control

Strong System Support

- High speed models: support up to 1500 Hz (MS300) / 2000 Hz (MH300) output frequency under open-loop control
- Built-in PLC with 2k steps (MS300); 5k steps (MH300) program capacity
- Built-in braking choppers for the entire series
- Various communications: MH300 / MS300: EtherCAT, PROFIBUS DP, DeviceNet, Modbus TCP, EtherNet/IP, CANopen
  ME300: RS-485 (Modubs)
- ME300 built-in pump parameters and support multi-pump functions

High Safety, Stability and Reliability

- Support STO (SIL2/PLd) safety function and safety measures for sudden power outages
- Enhanced 100% PCBs conformal coating; compliant with IEC 60721-3-3 class 3C3
- Extended key components lifetime

Easy to Install, Easy to Use

- A user-friendly and removable 5-digital LED keypad for the MS300 series; LCD keypad equipped with quick setting wheel dial for the MH300 series
- Macro function, quick parameter setting and duplication
- Built-in USB port for monitoring (MH300 / MS300)

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	3.7 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
MH300 MS300	**Standard Moldel** 0~599 Hz	115V/1-phase												
		230V/1-phase												
		230V/3-phase												
		460V/3-phase												
	High Speed Model >599 Hz					230V/1-phase								
						230V/3-phase								
						460V/3-phase								
ME300	**Standard Moldel** 0~599 Hz	115V/1-phase												
		230V/1-phase												
		230V/3-phase												
		460V/3-phase												

Applications

MH300: Machine tools, textile machines, woodworking machines, rubber & plastics machines and cranes
MS300: Machine tools, textile machines, woodworking machines, packaging machines, electronics, fans, pumps
ME300: Food & Beverage, woodworking machines, packaging machines, conveyor, fans, single/multi-pumps and air compressors

Sensorless Vector Control Compact Drive
VFD-E / VFD-EL

Small Size with Multifunctions

- Optional extension modules for more flexible applications
  (High speed fieldbus, braking modules, I/O cards and PG cards for VFD-E Series)
- Modular fan design for easy maintenance and replacement
- Built-in EMC filter for 230 V single-phase and 460 V three-phase models to effectively minimize the electromagnetic interference
- Built-in RFI Switch for noise suppression (all models)
- Built-in PLC with 500 steps program capacity (VFD-E Series)
- Supports common DC-BUS; the regenerative braking power is shared by parallel connected AC motor drives to enhance the stability of the DC-BUS voltage
- Side-by-side installation and DIN-rail mounting
- Built-in PID feedback control, special functions for constant pressure pump
- Built-in RS-485 (Modbus), baud rate up to 38,400 bps
- VFD-E Series provides two models for selection: CANopen model with built-in CANopen communication protocol, and the fanless plate model with no cooling fins

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

Applications

Food packaging machines, textile machines, presses, conveyors

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Economy Vector Control Drive
C200

High Speed Frequency Output

- Supports both induction and permanent magnet motors
- Built-in PLC with 5k steps program capacity
- High-speed frequency output (V/F control mode) up to 2,000 Hz
- Flange mount design (Frame A) and removable panel to facilitate installation process
- Built-in pulse input terminal with encoder for closed-loop control
- Built-in CANopen and RS-485 (Modbus) communication

CE c(UL)us EAC

Power Range	0.4 kW 0.5 HP	0.75 kW 1 HP	1.5 kW 2 HP	2.2 kW 3 HP	3.7 kW 5 HP	4 kW 5 HP	5.5 kW 7.5 HP	7.5 kW 10 HP
C200	230 V / 1-phase							
	230 V / 3-phase							
		460V / 3-phase						

Applications
Food packaging machines, conveyor equipment, textile machines, woodworking machines, fans and water pumps

Vector Control Drive New
C2000 Plus
For General Drive Controls

- Heavy Duty overload capability: 150% / 60 sec. and 180% / 3 sec., suitable for constant torque applications

- Supports both induction and permanent magnet motors

- Field-oriented vector control

- P2P control

- Wide power range (up to 560 kW for 460 V models)

- User-friendly Start Wizard

- Display in 9 languages: English, Spanish, Portuguese, French, Russian, Turkish, German, Italian, Traditional / Simplified Chinese

- Built-in PLC with 10k steps program capacity

- Enhanced protections and adaptation with PCB coating, compliant with 3C3 standard

- Modular design for easy maintenance and extension

- Built-in Modbus and optional communication cards: EtherCAT New, PROFINET New, EtherNet/IP, PROFIBUS DP, DeviceNet, Modbus TCP, CANopen

$C \in$ $_c(U_L)_{us}$ EAC

Power Range	0.75 ~ 3.7 kW 1 ~ 5 HP	5.5 ~ 18.5 kW 7.5 ~ 25 HP	22 ~ 37 kW 30 ~ 50 HP	45 ~ 90 kW 60 ~ 125 HP	110 ~ 185 kW 150 ~ 250 HP	220 ~ 560 kW 300 ~ 750 HP	630 kW 850 HP
C2000 Plus	230 V / 3-phase						
	460 V / 3-phase						
	575 V / 3-phase						
		690 V / 3-phase					

Applications

Machine tools, extruders, calender machines, paper machines, compressors, wire drawing machines, packaging machines

ΔELTA
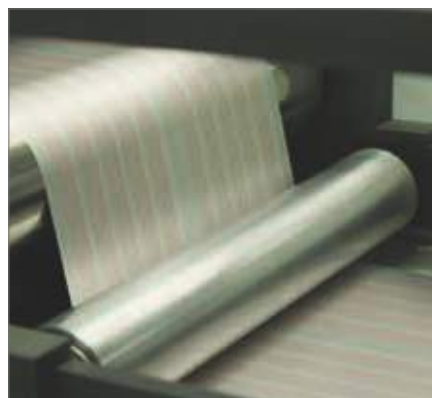
Fan / Pump Vector Control Drive
CP2000

Excellent for Large Power Fans and Pumps Applications

- Built-in BACnet and RS-485 (Modbus) communication protocols

- Enhanced conformal coating on PCBs for superior durability in critical environments

- Fire mode and Bypass mode: continuous pressure output to extract smoke when a fire accident or other emergencies occur

- 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

- Built-in LCD keypad for easy operation, and the TPEditor software allows user-defined home page editing

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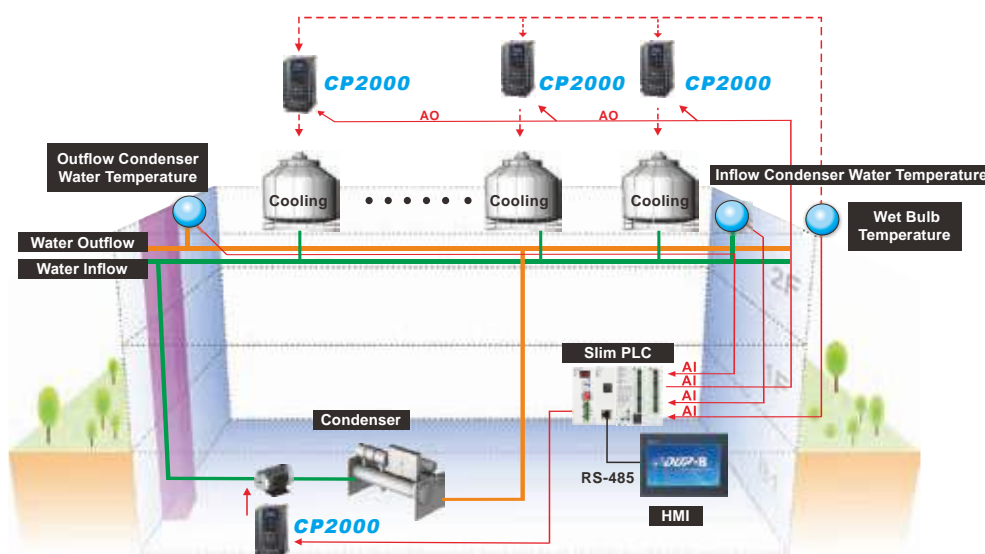
Power Range	0.75 ~ 3.7 kW 1 ~ 5 HP	5.5 ~ 18.5 kW 7.5 ~ 25 HP	22 ~ 37 kW 30 ~ 50 HP	45 ~ 90 kW 60 ~ 125 HP	110 ~ 185 kW 150 ~ 250 HP	220 ~ 450 kW 300 ~ 600 HP	560 ~ 630 kW 715 ~ 850 HP
CP2000	230 V / 3-phase						
	460 V / 3-phase						
	575 V / 3-phase						
			690 V / 3-phase				

Applications

Factory automation, HVAC, fans and pumps

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IP55 Fan / Pump Drive New
CFP2000

For HVAC, Fans and Pumps Applications

- 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 the 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

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

Fans

Chiller

Water Supply & Water Treatment

DELTA

Heavy Duty Vector Control Drive
CH2000

Excellent Large Overload Capability for Impact Loading Applications

- Fast response to impact loads
- Super Heavy Duty (SHD) setting for high overload capability: 150% of rated current for 60 secs and 200% of rated current for 3 secs
- Large starting torque: over 200% at 0.5 Hz, and 200% at 0 Hz in FOC+PG mode
- Supports both induction and permanent magnet motors
- Various crane functions for high operation performance
- Modular design for easy installation and maintenance
- Built-in PLC with 10k steps program capacity
- Built-in Modbus communication
- Optional communication cards: PROFIBUS DP, DeviceNet, Modbus TCP, EtherNet/IP, EtherCAT and CANopen

Advanced Crane Functions

Forward
- Current
- Frequency

Dwell function
Stabilizes torque output to prevent slipping

Brake Engagement

Brake Release

Brake Engagement

Forward
- Current
- Frequency

Reverse
- Current
- Frequency

Brake delay
Ensures torque output before brake release

Reverse
- Current
- Frequency
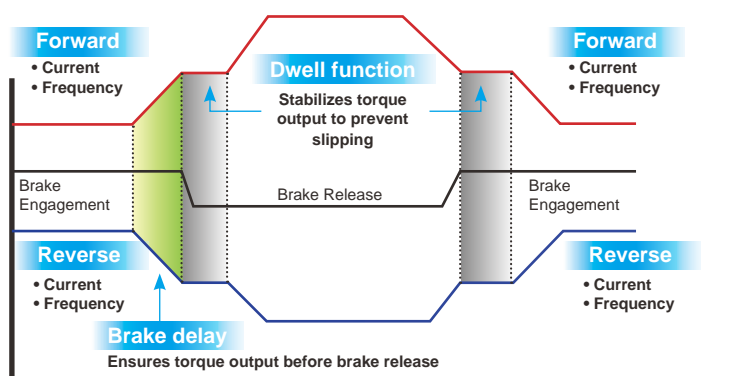
▲ Mechanical Brake Control

8 independent brake control settings for different criteria; high flexibility to meet complex application needs and to ensure operation safety

▲ Advanced Crane Time Sequence

Brake delay and dwell function for smooth operation

— Forward Output Frequency
— Mechanical Brake Action
— Reverse Output Frequency
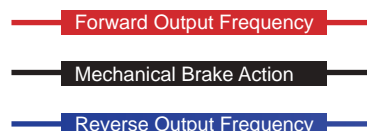
Light Load Acceleration

Required Check Time

Confirmed as light load and accelerates

Target speed

Check current level

Checking light load status

— Output Frequency
— Output Current
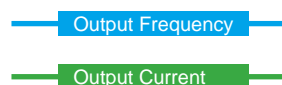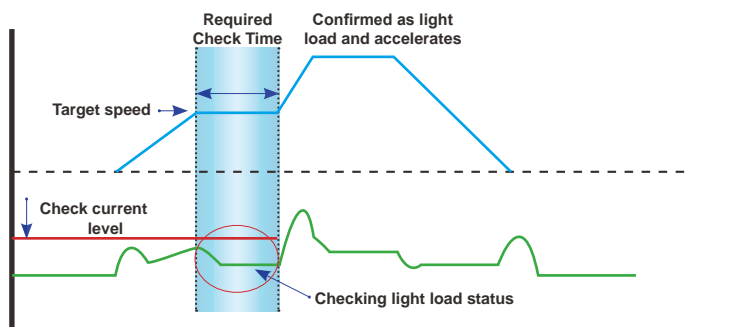
Applications

Machine tools, punching machines, cranes and hoists

CE c(UL)us EAC

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

Textile Vector Control Drive
CT2000

Highly Flexible Flange Mount and Wall Mount Drive

- Fanless design with highly effective heat sink to prevent fiber and dust from clogging or entering the drive, solving overheating problems[1]
- Flange-mount installation to enhance system safety and stability, providing excellent heat dissipation performance[1]
- Support external fan connection (optional)[1]
- Wall-mount 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 and RS-485 (Modbus) communication protocol
- Optional communication cards

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

Flange Mount

Wall Mount

Power Range	11 kW	15 kW	18.5 kW	22 kW	30 kW	37 kW	45 kW	55 kW	75 kW	90 kW
CT2000	460 V / 3-phase									

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 New
MSI

High Power Density & High Efficiency

- Built with the latest materials & magnetic reluctance technology
- Ultra-high efficiency: rated load / partial load
- 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

Applications

Fans, pumps, compressors

Power Range		0.75 kW	1.1 kW	1.5 kW	2.2 kW	3 kW	4 kW	5.5 kW	7.5 kW	11 kW	15 kW	18.5 kW	22 kW	30 kW	37 kW
MSI	Standard Model	380 V / 3-phase													
	High-speed Model							380 V / 3-phase							

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
- Power range 2.2~75 kW
- 4 relay output and 2 multi-function digital signal output terminals (MO)
- 2 analog signal inputs (AI) and 2 analog signal outputs (AO)
- 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

CE EHC c(UL)us TÜVRheinland CERTIFIED (EN81-1+A3, EN81-20)
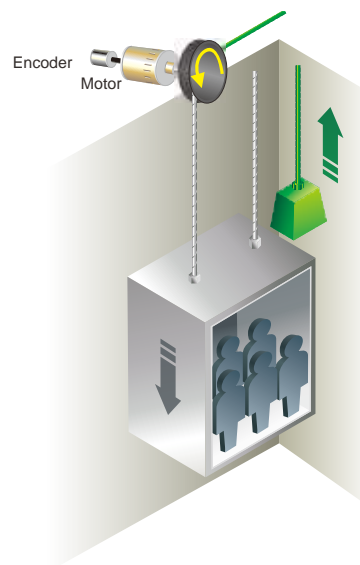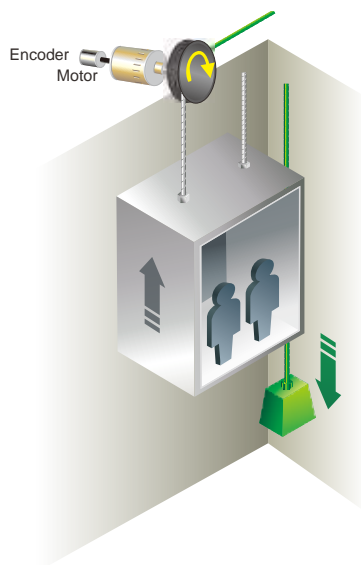
Power Range	2.2 kW 3 HP	3.7 kW 5 HP	4 kW * 5 HP	5.5 kW 7.5 HP	7.5 kW 10 HP	11 kW 15 HP	15 kW 20 HP	18.5 kW 25 HP	22 kW 30 HP	30 kW 40 HP	37 kW 50 HP	45 kW 60 HP	55 kW 75 HP	75 kW 100 HP
ED	230V/1-phase													
			230V/3-phase											
			460V/3-phase											

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

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Compact Elevator Drive New
MH300-L

New Compact Design with Open Loop Control

Size Reduction 40%

- Supports asynchronous motors with open loop control
- Precise control of S curve performs smooth start and stop for a comfortable ride
- Compact design and user-friendly operation interface
- EPS/ARD and sequence control functions for elevator applications
- Built-in 5-digit 16-segment LCD digital keypad
- Built-in USB connection port
- Built-in EMC filter (optional)
- Built-in brake chopper
- 7 digital inputs (extension up to 10) and 1 relay output (extension up to 3)
- Integrated Safe Torque Off (STO) SIL2

AC Motor Drive · Contactor 2

Traditional

Cost and space saving

Emergency Stop · Controller · Contactor 1

Integrated STO SIL2

Elevator Drive **MH300-L**
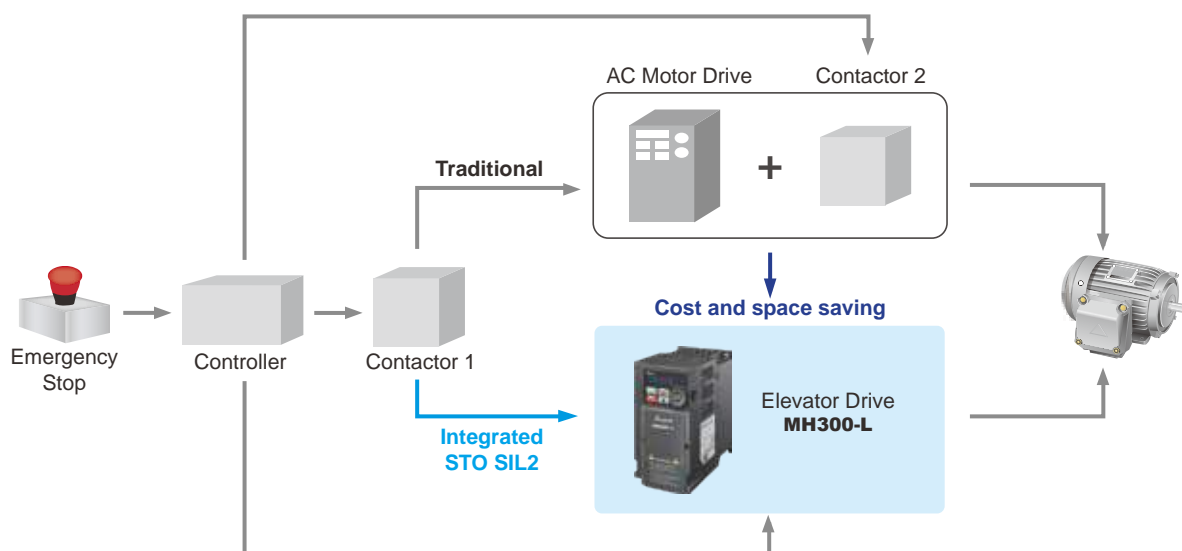
Power Range	2.2 kW 3 HP	3.7 kW 5 HP	5.5 kW 7.5 HP	7.5 kW 10 HP	11 kW 15 HP	15 kW 20 HP
MH300-L	230V/3-phase					
	460V/3-phase					

Door Control Drive
VFD-DD

Door Control Solution

- **Compact Design**
- **Distance Control Mode**
- **Speed Control Mode**
- **Multi-step Speed Control Mode**

5.5 mm

- **Safety Switch**
- **Removable Terminal Blocks**
- **Built-in Digital Keypad**

- Simplified elevator door control system
- Supports induction and permanent magnet motors
- Easy installation with dedicated inputs/outputs
- Various protection functions ensure passenger safety
- Auto-tuning of door width

- Auto-positioning when power is applied
- Smooth door re-open/re-close curve
- Demo mode
- Supports elevator door obstruction detection

Optional Motors

ECMD-B91207MN
ECMD-B91207MS
ECMD-B91608MS
ECMD-B81610MS

Applications

Elevator doors

Power Range	0.1 kW 0.125 HP	0.2 kW 0.25 HP	0.4 kW 0.5 HP
VFD-DD	115 V/1-phase		
		230 V/1-phase	

Integrated Elevator Drive New
IED-S

Integrated Drive and Control to Save Installation Space

Control

- Highly efficient group control function, capable of controlling multiple elevators without additional control cards
- Various operation modes: demo mode, attendant service mode and time-based mode
- Single/Double-door elevator applications
- Max. 64 floors

Design

- 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

Drive

- Support induction and permanent magnet motors
- Emergency Power Supply (EPS) function
- Dual safety protection functions: torque output check before releasing mechanical brake

Tune

- 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

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

CE c(UL)us

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	18.5 kW 25 HP	22 kW 30 HP	30 kW 40 HP	37 kW 50 HP	45 kW 60 HP	55 kW 75 HP	75 kW 100 HP
IED-S	230 V/1-phase												
			230 V/3-phase										
			460 V/3-phase										

ΔNELTA

Motor Control

- Induction motor closed-loop control
- Permanent-magnet motor closed-loop control

Versatile I/O Terminals

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

Encoders

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

Direct Landing

- Automatically calculates the speed curve from start to stop by distance for efficient ride

Motor Auto-tuning with Load

- Ability to perform auto-tuning with load when elevator structure is complete
- Measures motor parameter precisely with load
- Measures magnetic declination precisely with load
- Reliable and saves manpower

Certifications with Compliance

- CE, UL certifications
- Supports Safe Torque Off (STO) SIL2
- Safety circuit certificate for electronic components
- Certificate for self-monitoring subsystem

LCD Digital Keypad

- Multiple lines display allows intuitive operation
- Monitors user-defined physical quantities
- Rapid parameter duplication shortens tuning time
- Built-in real-time clock (RTM) to display time
- Multiple languages: Chinese (TC / SC), English, and more

Slim and Compact Design

- Slim design with a min. thickness of 146 mm

One Drive for All Control Needs

IED-S

13
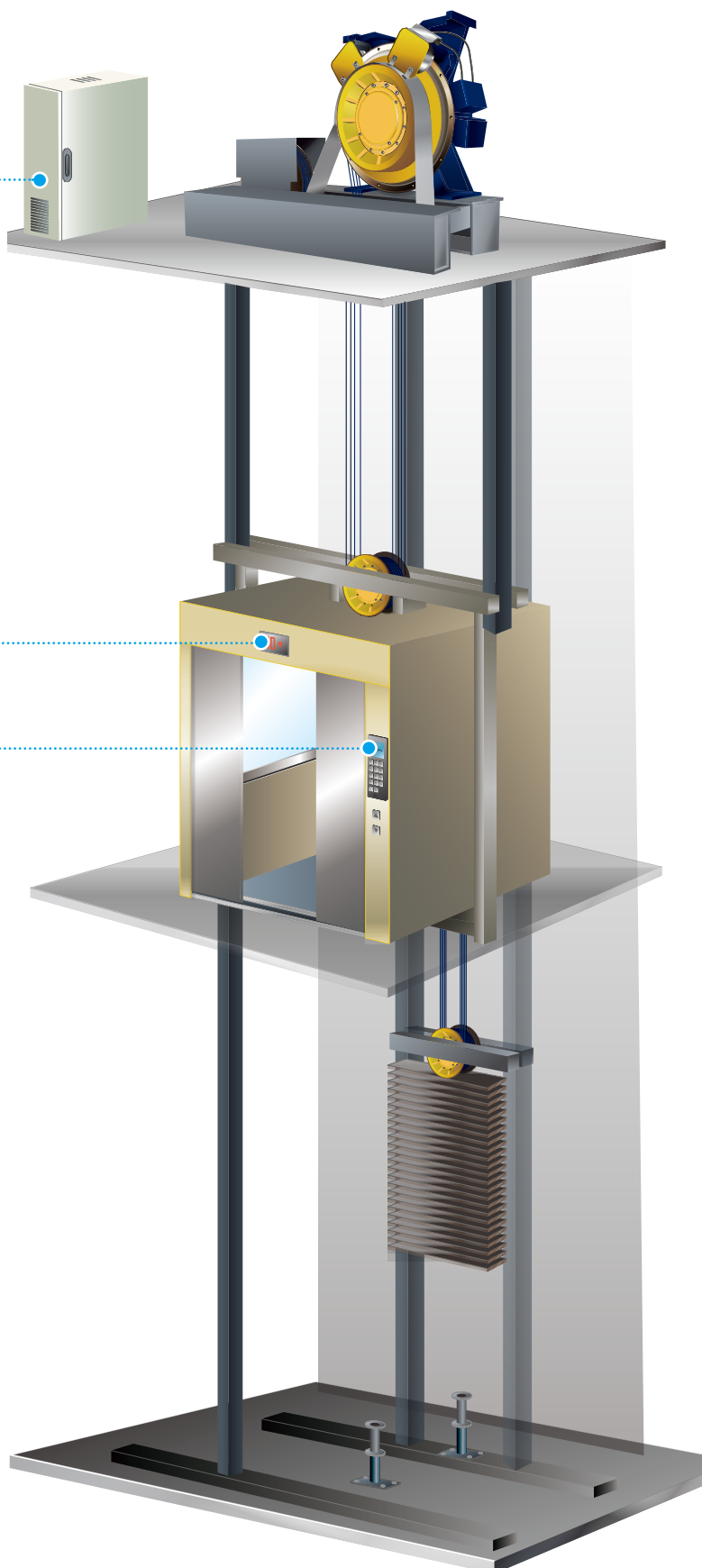
Hall Call / Car Call Display Boards

- **EA-FM02MVN02**

- **EA-FM02MBT01**
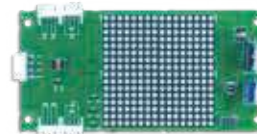
Car top Board

- **EA-CT01**

Command Board

- **EA-CP16**

[Optional]
External Digital Keypad

- **KPC-CC01**

- Control settings
- Drive settings
- Parameter copy

ΛELTA

Hybrid Energy Saving System
HES

Energy Saving for Injection Molding Machine

- **Energy savings:** Ensures high productivity and precision with 40% less energy consumption than variable pump hydraulic systems; 60% less energy consumption than traditional quantitative pump hydraulic systems

- **Low Oil Temperature:** Oil temperature decreased by 5ºC to 10ºC, saving costs on oil cooler

- **Reduce Oil Usage:** 50% to 60% oil usage savings and a 50% smaller oil tank

- **High Duplication Accuracy:** Precise flow and pressure control featuring duplication of products with less than 0.09% difference

- **Long Holding Pressure:** Keeps mold halves securely closed for a longer period for thick plastic products formation

- **Fast Frequency Response:** High-speed frequency response up to 50 ms with permanent magnet servo motor (PMSM)

- **Suitable for Harsh Environments:** Resolver is resistant to vibrations and shocks, oil and dust

- **Easy to Refurbish Old Machines:** Analog command 0 ~ 10 V and linear correction (3 points), no need to replace the computer

- **Flow Convergence:** Saves cost on tubes; enlarged flow capacity enhances energy-saving performance

Power Consumption Curve of the Injection Molding Process

Traditional injection molding machine with fixed displacement pump

Hybrid Energy Saving System (HES)

Extreme low power consumption at the pressure holding phase

Almost no power consumption at the cooling phase
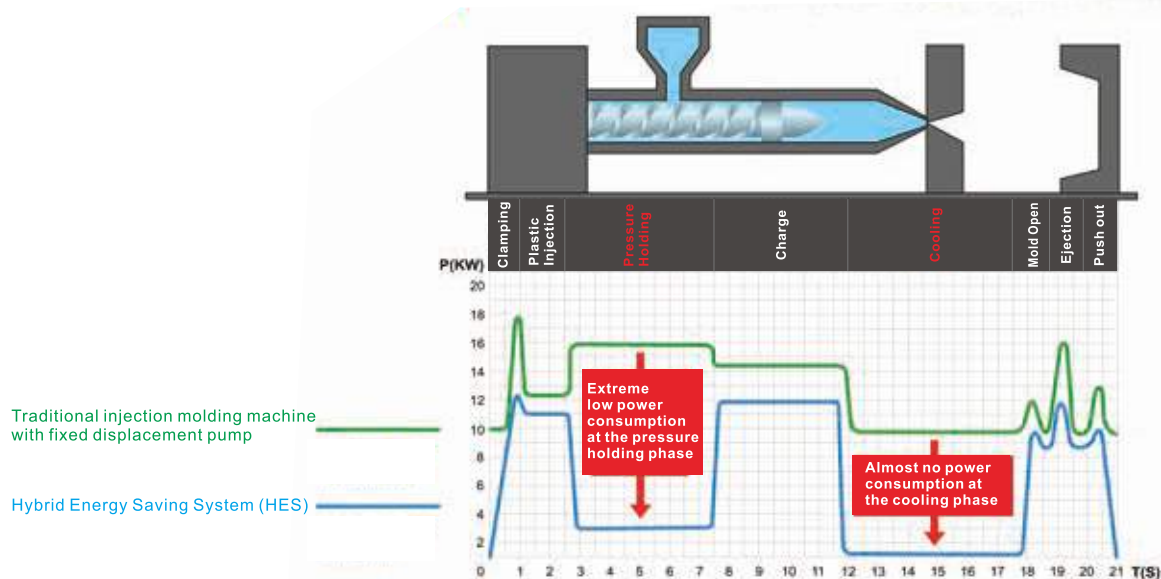
Power Range	50 L / min	63 L / min	80 L / min	100 L / min	125 L / min	160 L / min	200 L / min	250 L / min	320 L / min
HES	230 V/3-phase								
	460 V/3-phase								

Applications

Injection molding machines, bottle blowing machines, pipe bending machines, bending machines and other hydraulic equipment

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
- Lessens 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%.

REG2000	Power consumed
Converts regenerative energy into reusable electricity	Regenerative energy

Lessen Break Resistor

Dissipates regenerative energy as heat

Lights

Drive

Inverter

Mains

Regenerative Energy

HVAC

Regenerative Energy → Reusable Power

Drive

Mains

Braking Unit

Regenerative Energy

HOT

Regenerative Energy → Heat

CE SEMI F47
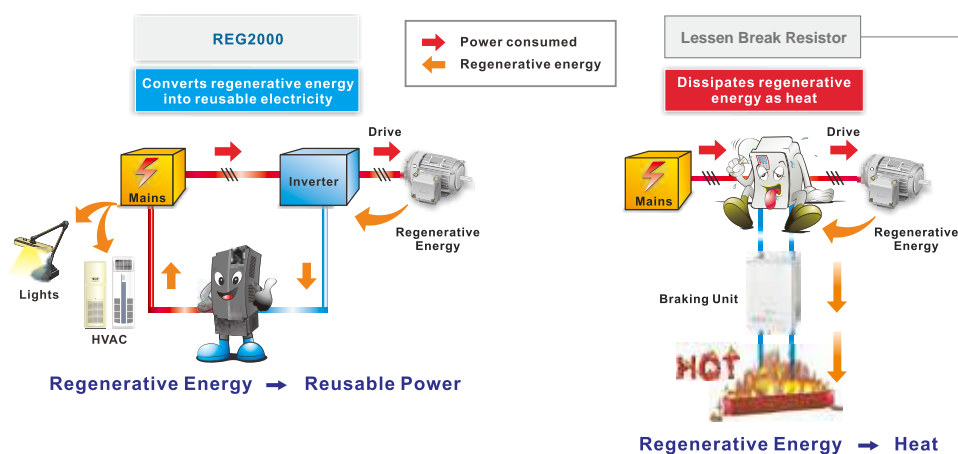
Power Range	7.5 kW	11 kW	15 kW	18.5 kW	22 kW	30 kW	37 kW	45 kW	55 kW
REG2000	230 V / 3-phase								
	460 V / 3-phase								

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

Escalator	Elevator	Winding / Unwinding Equipment	Cranes & Hoists	Centrifuge Equipment	Press	Industrial Laundry	Machine Tool
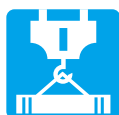
NELTA

Active Front End
AFE2000

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

- More than 95% power regeneration efficiency

- Improves power factor to more than 99% with input current THD ≤5% at full load

- Realize 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

- Supports all kinds of fieldbus for real-time power status monitoring and control*

PROFIBUS CANopen DeviceNet Modbus TCP EtherNet/IP

EAC

*Available from Delta upon request

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

Applications

Large-inertia loads applications: centrifuge equipment, dewatering machines and roving machines

4-quadrant loads 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

Static Var Generator
SVG2000

Comprehensive Reactive Power Compensation to Improve Power Efficiency

- Compensates both leading and lagging reactive current and improves power factor to 0.99

- Adopts special Delta power supply modules to provide a wide range application from 220 V ~ 480 V and 525 V ~ 690 V

- Modular design of fan, power, drive, control and reactor modules

- 7" touch screen TFT LCE expression in 65,536 colors

Capacity	300 k VAR	500 k VAR
SVG2000	220 V ~ 480 V / 3-phase	
	525 V ~ 690 V / 3-phase	

Applications

A new solution to replace traditional phase-leading capacitors, applicable to the power distribution systems of industry, infrastructure, commercial buildings and homes

Active Power Filter
APF2000

For Power Quality Improvement

- Filters the 2nd to 50th order harmonics with efficiency of more than 90%, compliant with IEEE519 standard

- Full response speed faster than 20 ms

- Selection to compensate either harmonic wave or reactive power, or both at the same time

- Modular design of fan, power, drive control and reactor modules

- 7" 65,536 colors TFT LCD touch screen

- Compact design: the 300 A model only measured 600 W x 800 D x 2,200 H (mm)

- Parallel connection of multiple units to expand total capacity

- Built-in RS-485 communication; provides various communication and fieldbus card options

PROFI BUS®   **CANopen (DS301)**   **DeviceNet**   **Modbus TCP**

Concept

An active power filter is a large power electrical device that monitors the three-phase current in real time and provides an equally opposite phase to relevant devices to filter out the harmonics. It is connected in parallel to the grid and uses a current transformer to inspect the 3-phase current waveform and to obtain the required compensation data of harmonic current and reactive power. The active power filter will then inject an equally opposite current input to the power system for harmonic filtering. In addition, the active power filter can also create a phase that complements the leading and lagging reactive current. It effectively improves the power factor of the grid and provides compensation to the reactive power.

Grid current   Compensating current   Load current
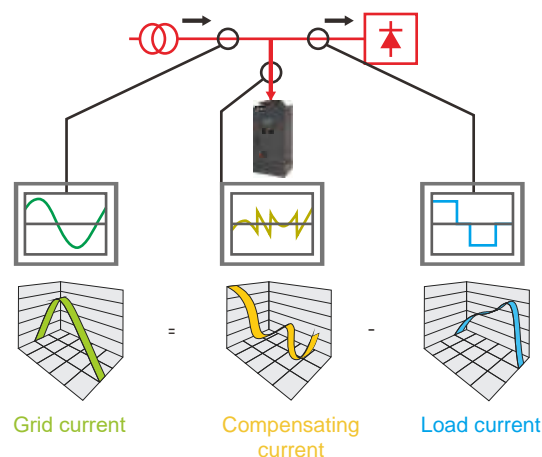
Capacity	50 A	100 A	200 A	300 A
APF2000	200 V ~ 480 V / 3-phase			

Applications

Metallurgy and petrochemicals industries:
Rectifier, converter, rolling mill, electric arc furnace, medium frequency furnace and inverter

Chemical and electrolysis industries:
Rectifier, calcium carbide furnace, electric soldering and inverter

Mechanical industries:
Rectifier, rolling mill, inverter, electric arc equipment

Metal, paper, plastic processing and textile industries:
Rectifier, rolling mill, inverter, electric arc furnace and electric furnace

Transportation industries:
The rectifier and the inverter of electric vehicles, electric motorcycles and metro systems

Automobile manufacturing industries:
Soldering equipment, car painting equipment, battery charger and inverter

Telecommunication, medical and construction industries:
Server station, EPS, UPE, converter, charger and inverter

ΔELTA

AC Servo Drive & Motor New
ASDA-A3

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

3.1 kHz Bandwidth and Shorter Synchronization Cycle

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

Response Bandwidth

Synchronization Cycle
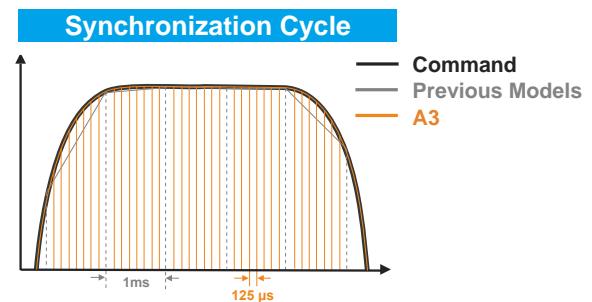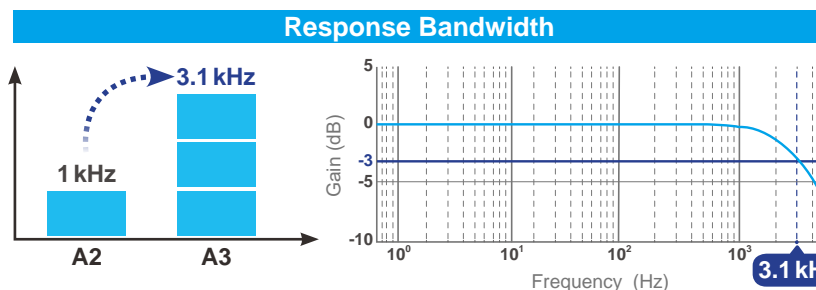
24-bit Absolute Type Encoder

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

16,777,216 pulses
for one single turn
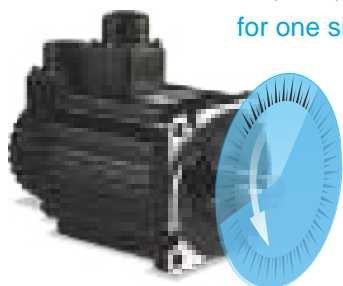
46,603 pulses for one degree
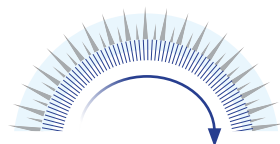
Advanced Motion Control Functions

- 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, position, speed, superimposition, blending, on-the-fly change motion commands and E-CAM functions are available

Low Frequency Vibration Suppression Function

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

Without Vibration Suppression

Delta Vibration Suppression

Stable
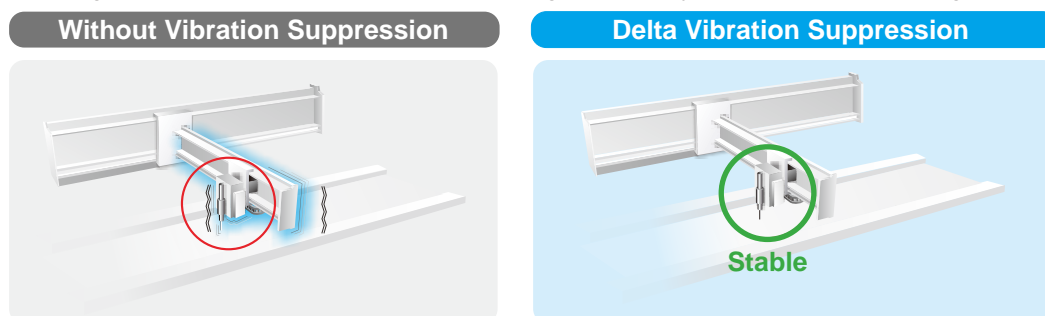
Auto-Tuning Function

- Optimize machine performance with less tuning effort and simple setup procedures via panel keypad or software

Compact Size Design

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

ASDA-A3
200 W

ASDA-A2
200 W

Servo motor shorter in length

ASDA-A2

ASDA-A3

20%

20%
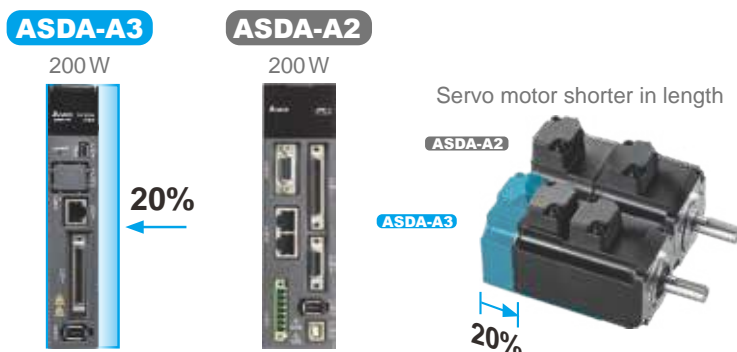
機種選擇

	Type	PT Mode Pulse Train	PR Mode	RS-485	CANopen	DMCNET	EtherCAT	Analog Voltage Control	Full-closed Loop Control	E-CAM	STO
A3	**L**	O	O	O				O	O	O	
	M	O	O	O	O			O	O	O	O
	F		O			O			O	O	
	E		O				O		O	O	O

Applications

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

DELTA

AC Servo Drive & Motor New

ASDA-B3

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

Various Models Available

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

High Response Bandwidth and Shorter Synchronization Cycle

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

Response Bandwidth

3.1 kHz
B3
1 kHz
A2
0.5 kHz
B2

Increased Productivity

40%
B2
B3

Synchronization Cycle

Command
Previous Models
B3
1ms
125 µs
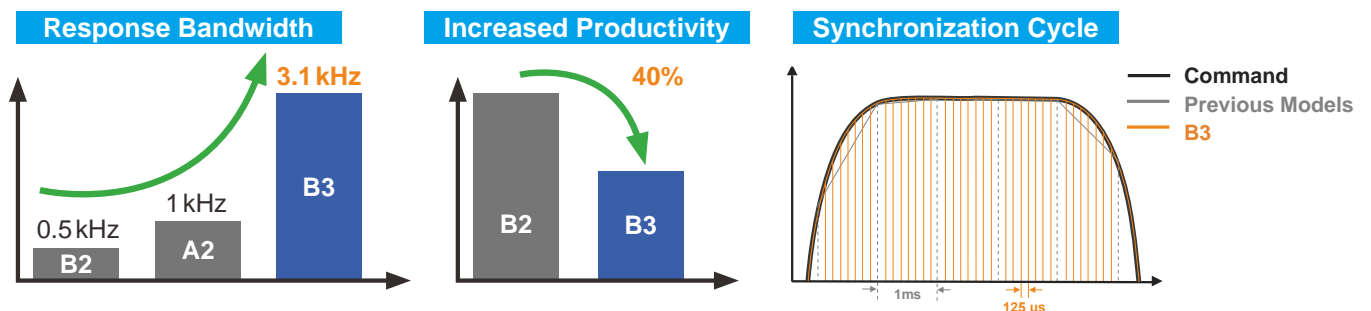
Increased Speed and Torque

- Motor speed increased to 6,000 rpm

- Torque overload ratio increased to 3.5 times and the time required for acceleration and deceleration is shortened

- Significantly increases productivity and efficiency

High Resolution Encoder

- 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 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

Analog Feedback PID Control

- Supports analog signal input

- Achieves real-time and precise PID control with the analog signals from the external sensor for improved production yield and processing performance
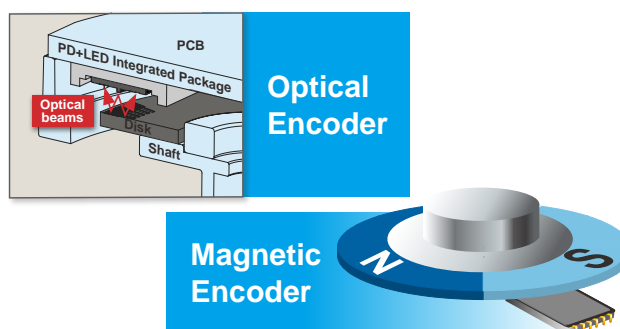
Axis Synchronization Function

- Easy gantry control with the EtherCAT high-speed inter-axis data exchange

Applications

Machine tools, electronics assembly equipment, tool magazines and turrets, industrial robots, packaging machines, labeling machines, semi-conductor equipment, textiles equipment, diamond cutting machines
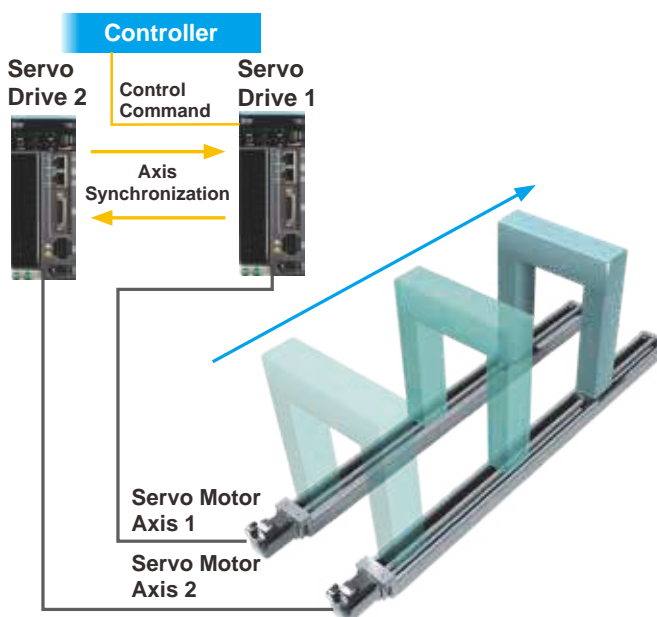
AC Servo Drive & Motor
ASDA-A2

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 applications; max. 720 points for E-CAM ooutline

- High-speed Capture and Compare function for position latch and detection; max. 800 records stored in the memory

- Built-in gantry control algorithm

High Precision, High Performance Servo Motors

- Supports incremental type and absolute type encoders

- Incremental type 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 ensure the accuracy of positioning
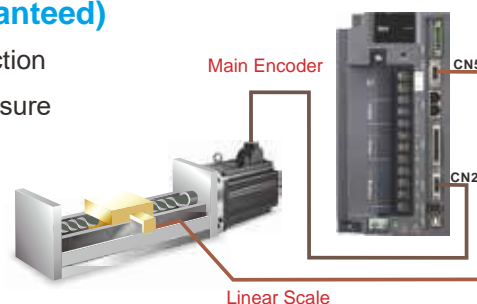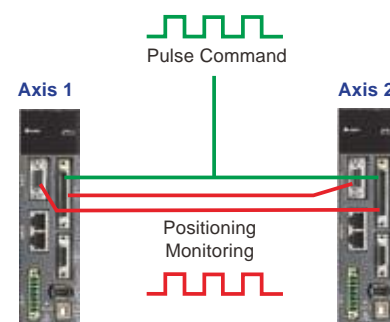
Versatile PR mode

- 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

A command is executed only when the previous command is completed

The second command is executed after the delay time or during the deceleration period

Insertion changes the command executed at the moment it is inserted
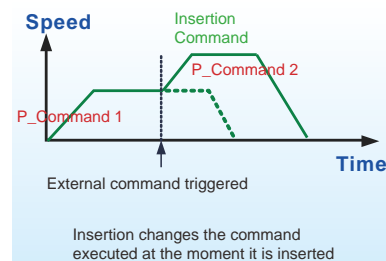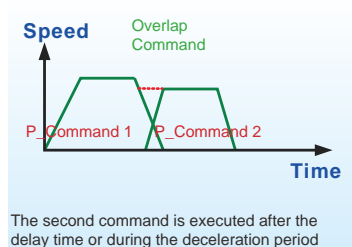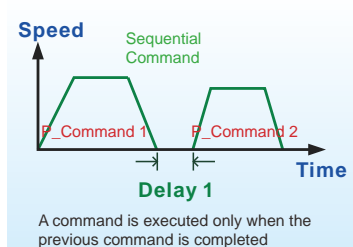
Basic Features

- Input voltage: 200 V$_{AC}$ ~ 230 V$_{AC}$, 0.1 kW ~ 15 kW, 1-phase / 3-phase, or 3-phase
- Input voltage: 400 V$_{AC}$, 0.4 kW ~ 15 kW, 3-phase
- Up to 1 kHz 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]	CANpen	DMCNET	Analog Voltage Control	Pulse Input Port
Standard Model	L	O	O	X	O	X	X	X	X	O	O
	U	O	O	O	O	O	X	X	X	O	O
Network Model	E	X	X	O	O	X	O	X	X	X	X
	F	O	O	X	O	X	X	X	O	X	X
	M	O	O	X	O	O	X	O	X	O	O

*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, labeling machines, feeding machines, TFT LCD cutting machines, IC packaging machines, injection processing equipment, lathes, electric discharge machines (EDM), woodworking machines, wire cutting machines, printing machines, textile equipment

Food Packaging Machine
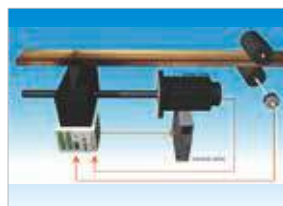
Wire Cutting Machine
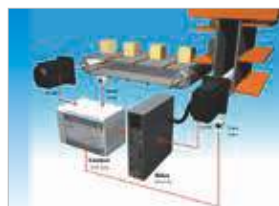
Feeding Machine

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: 400 V 400 W ~ 7.5 kW, 220 V 100 W ~ 3 kW
- 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 type and incremental type ECMA Series motors

EtherCAT controllers

Third party controllers

Delta PC-Based Motion Controller
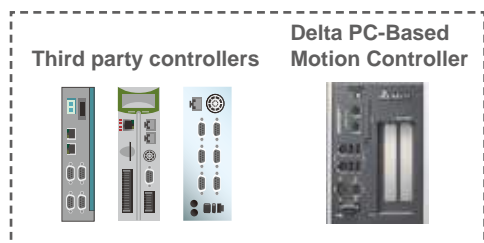
Applications

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. 250 µs
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

Servo Status Display /
Operation Panel /
Charge LED

External Encoder

Extension DI Port

Safe Torque Off
(STO) I/O

Digital I/O

Motor Encoder

EtherCAT Status LED

EtherCAT Port

USB Port
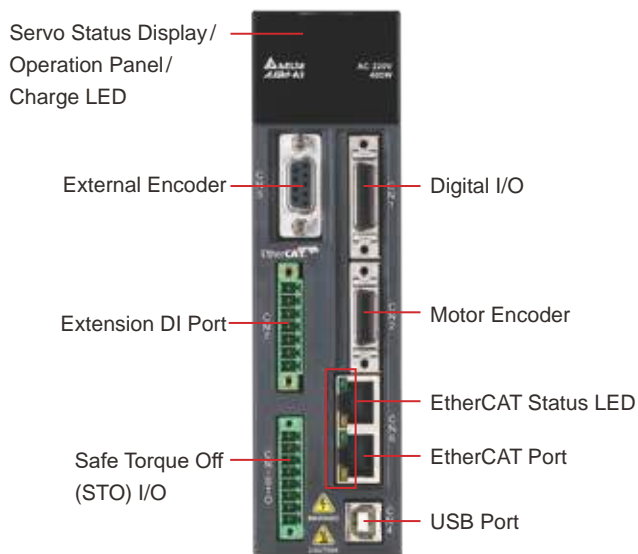
Accessories for ASDA A2-E

Part Number	ASD-CNSC0026
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: 0.1 kW ~ 3 kW

- Input voltage: $200\,V_{AC} \sim 230\,V_{AC}$, 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 (400 W and above models), saving wiring and cost

Applications

CE · c(UL)us · GOLDEN PIN DESIGN MARK

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

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

Charge LED

LED Display

Operation Button
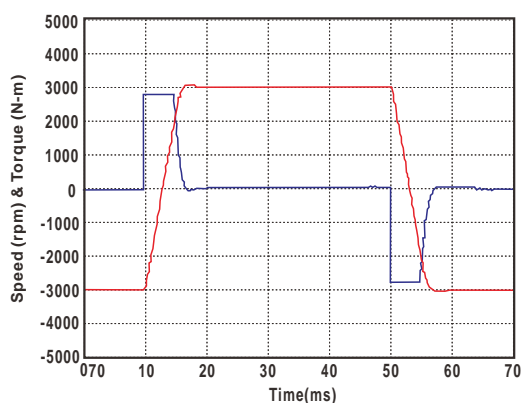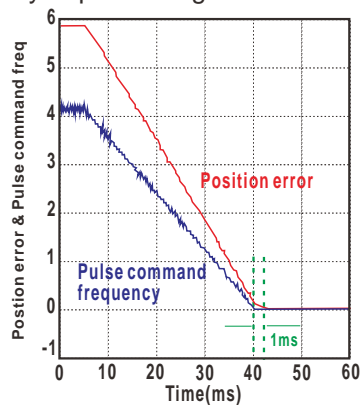
- Three auto notch filters to suppress mechanical resonance efficiently

Exact!
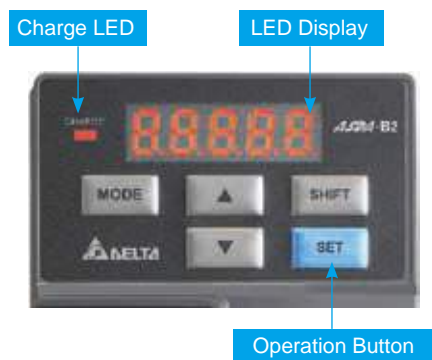
- Built-in regenerative resistor (400 W and above models), simplifying wiring and minimizing space

Separated power supply for main circuit and control circuit

Built-in regenerative resistor

CH1
CH2
Supports two analog outputs

NELTA
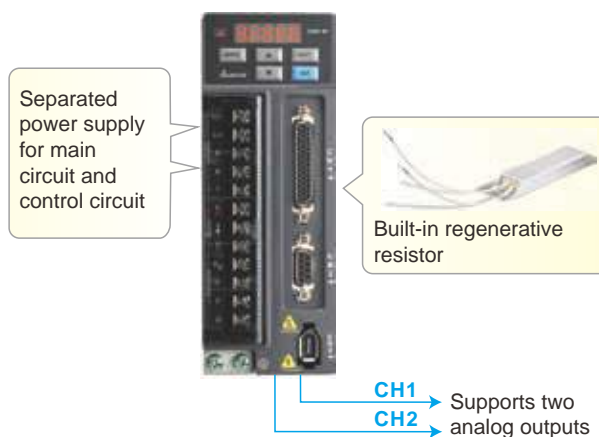
AC Servo Drive & Motor
ASDA-M

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 control accuracy
- 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

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

Product Line-up

750 W	1.5 kW
100 W ~ 750 W	0.75 kW ~ 1.5 kW

USB connection port for direct connection to personal computers or notebooks

HMC Series
Controller with Human Machine Interface

ASDA-M Series Servo System

Real Time I/O
(18 Inputs/9 Outputs)

Z-Axis   Y-Axis   X-Axis

ASDA-A2 Series Servo Drives

DMCNET High-Speed Motion Control

DMCNET communication protocol

32 DI / 32 DO or 16 DI / 16 DO

4-Channel 16-bit D/A or 4-Channel 16-bit 4 A/D

4-Channel Pulse Interface

Real Time, Reliable and High-Speed Motion Control Network

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

Advanced Gantry Control

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

ASDA-M

Same DSP, Real-time, Excellent Synchronous Control

Data of Position, Speed and Torque

Axis 1 ↔ Axis 2

Data exchanges once every 62.5 µs

Gantry Control

Axis 1

Axis 2
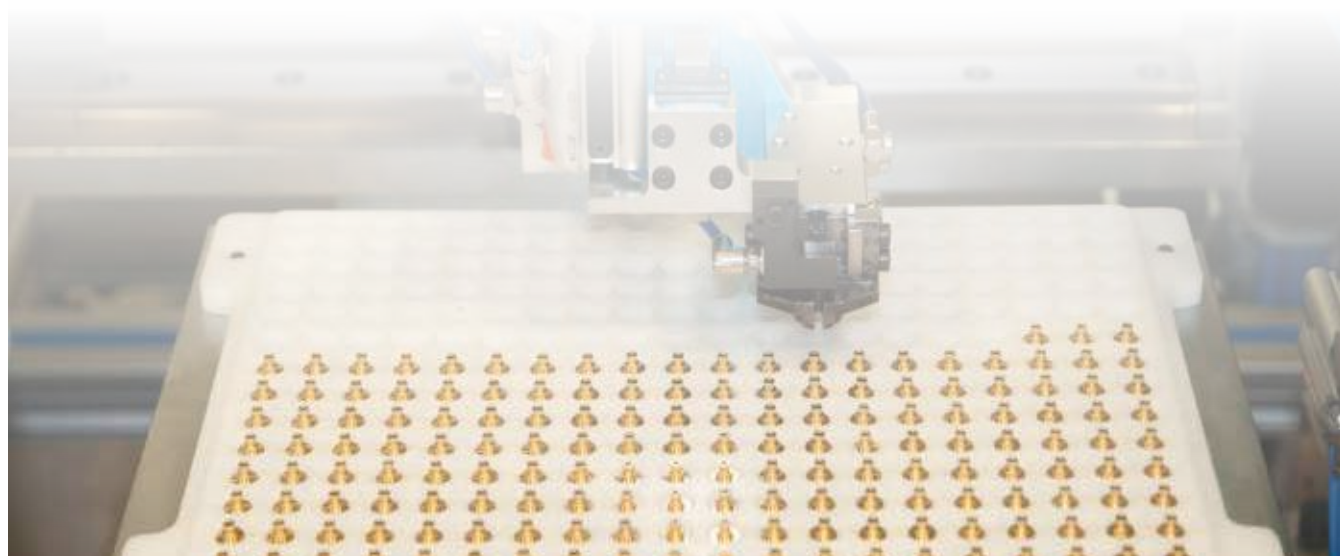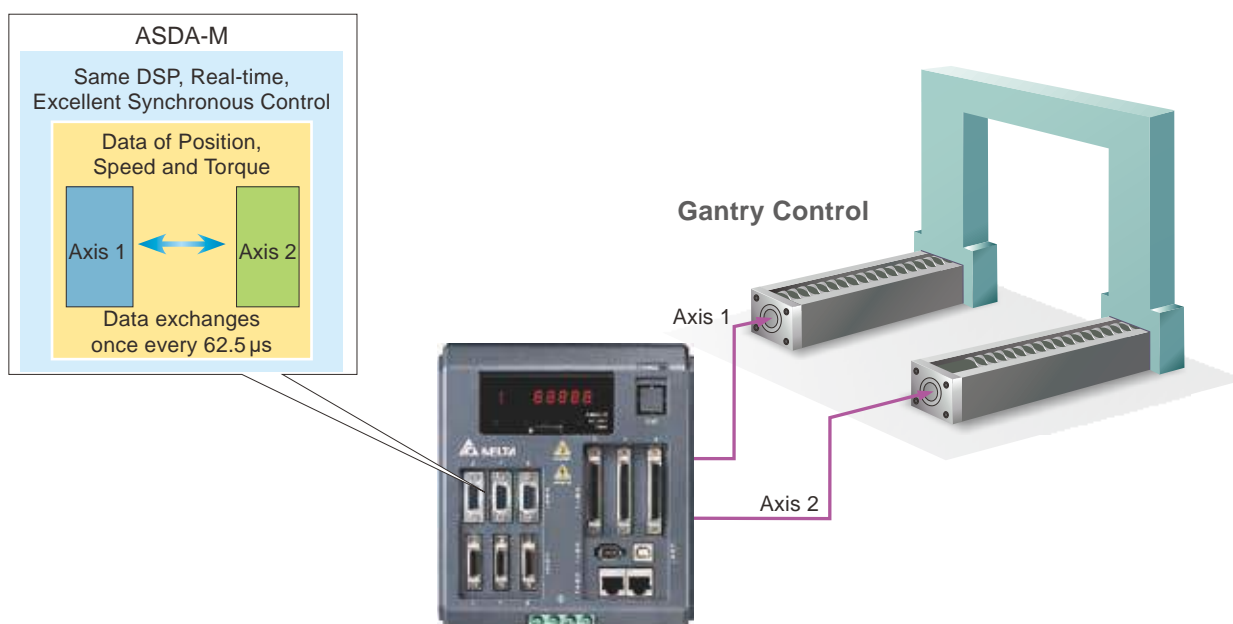
Spindle Motor Drive
ASDA-S

Ensuring 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
- 200 V models and 400 V models are available for selection
- Capable of connecting to CNC controllers via DMCNET high-speed serial communiction

Delta's CNC Controller NC300 Series

Spindle Axis ASDA-S Series

DMCNET
High-Speed Serial
Communication

Feeding Axis ASDA-A2 Series
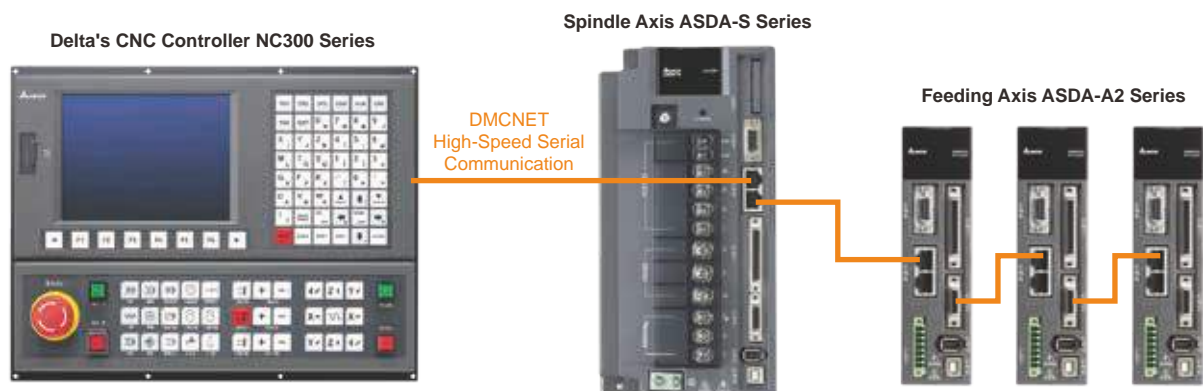
IPM Spindle Motor
ECMS

Power range: 3.7 kW / 6.7 kW

- Encoder type: Incremental 20-bit
- Max. torque: 14.72 N-m / 26.65 N-m
- Speed range: 6000 r/min ~ 12000 r/min
- Optional accessories: Coolant through spindle
- IP rating: IP54

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

Thrust (N)

Model	Continuous Thrust	Maximum Thrust
ECML-S1606	21	87
ECML-S1608	29	116
ECML-S2003	33	133
ECML-S2004	44	177
ECML-S2005	55	221
ECML-S2504	64	258
ECML-S2506	97	387
ECML-S2508	131	525
ECML-S3204	87	350
ECML-S3206	140	561
ECML-S3208	187	748
ECML-S3505	276	1190
ECML-S3506	352	1380
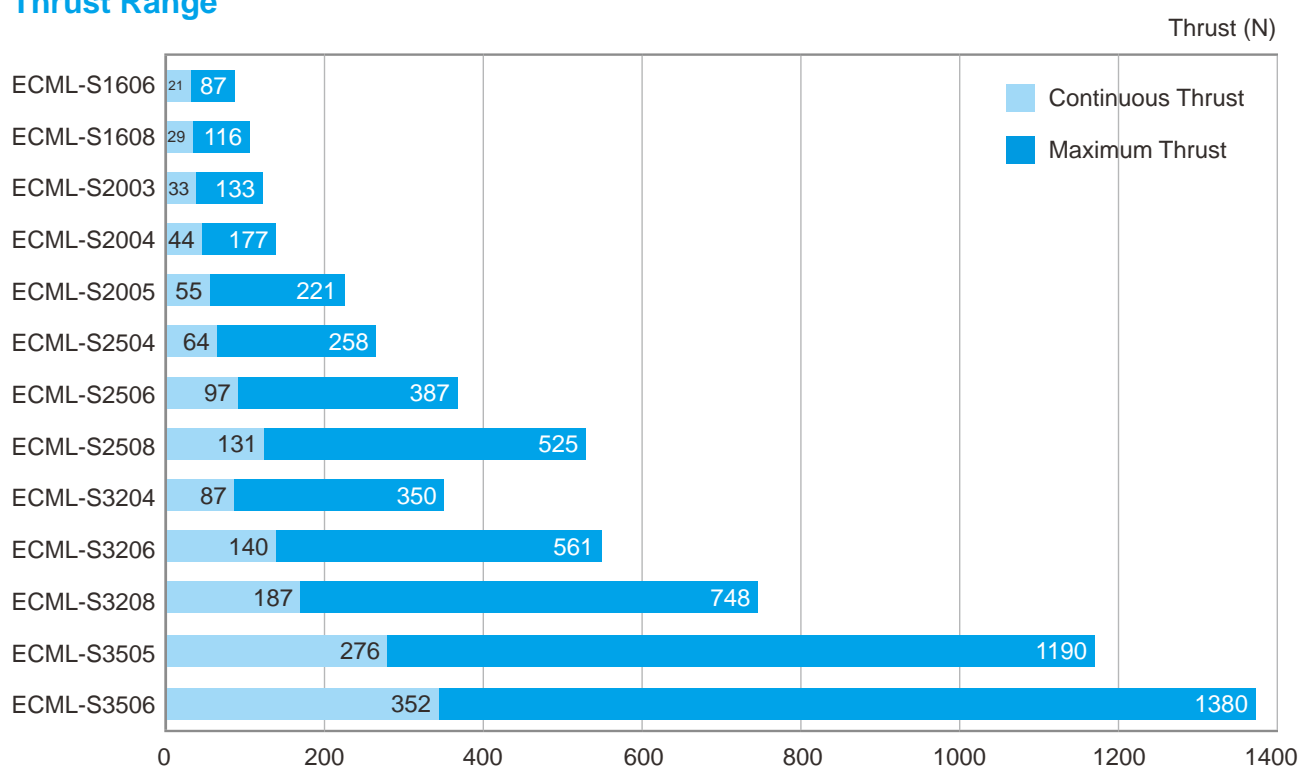
Magnetic Shaft Length (Unit: mm)

Shaft Diameter	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

NELTA

U-shaped Ironless Linear Motor New
ECM-PU

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

Thrust Range

Thrust (N)

Model	Continuous Thrust	Maximum Thrust
ECM-PU211	65	
ECM-PU212	130	
ECM-PU381	63	259
ECM-PU382	127	517
ECM-PU383	220	914
ECM-PU384	293	1218
ECM-PU432	214	873
ECM-PU433	321	1309
ECM-PU434	450	1870
ECM-PU435	562	2338

0　200　400　600　800　1000　1200　1400　1600　1800　2000　2200　2400
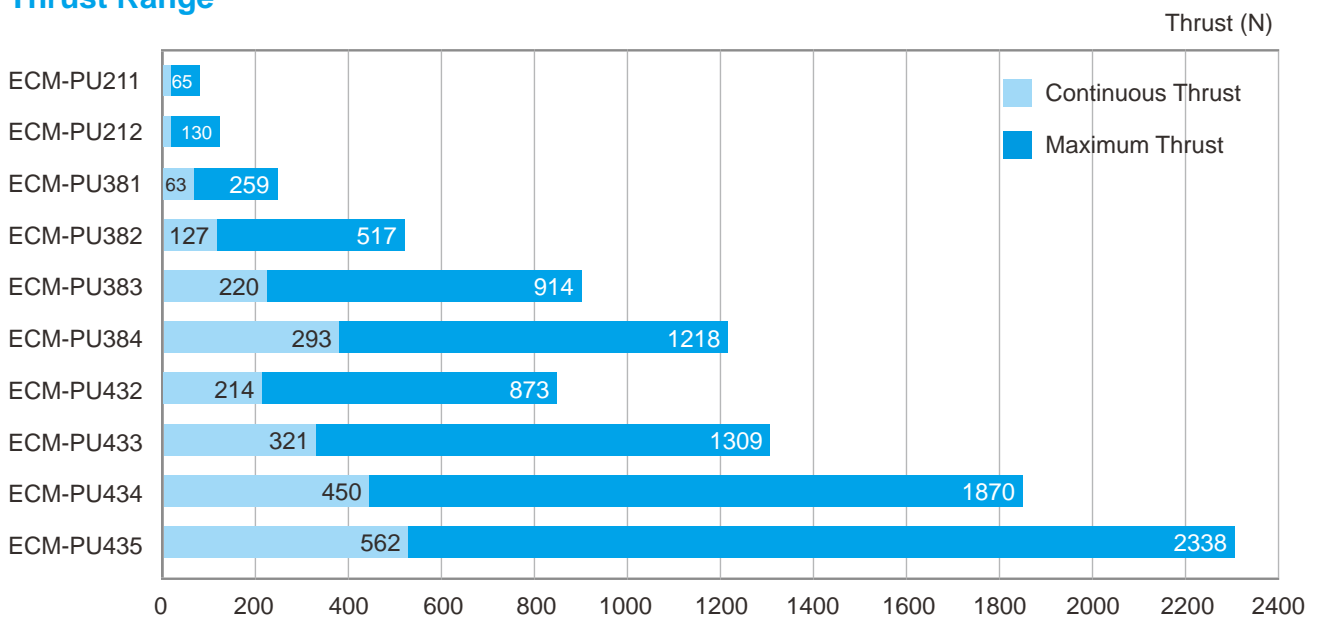
Magnetic Shaft Length (Unit: mm)

Shaft Diameter	Length	Gap
ECM-PU21	135, 270	135
ECM-PU38	156, 312	156
ECM-PU43	156, 312	156

Flat Iron-Core Linear Motor 🔴New
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

Thrust (N)

Continuous Thrust
Maximum Thrust

Model	Continuous Thrust	Maximum Thrust
ECM-PFS01	121	363
ECM-PFS02	242	726
ECM-PFS03	368	1088
ECM-PFS04	490	1451
ECM-PFC81	247	728
ECM-PFC82	493	1454
ECM-PFC83	749	2181
ECM-PFC84	999	2908

0 200 400 600 800 1000 1200 1400 1600 1800 2000 2200 2400 2600 2800 3000
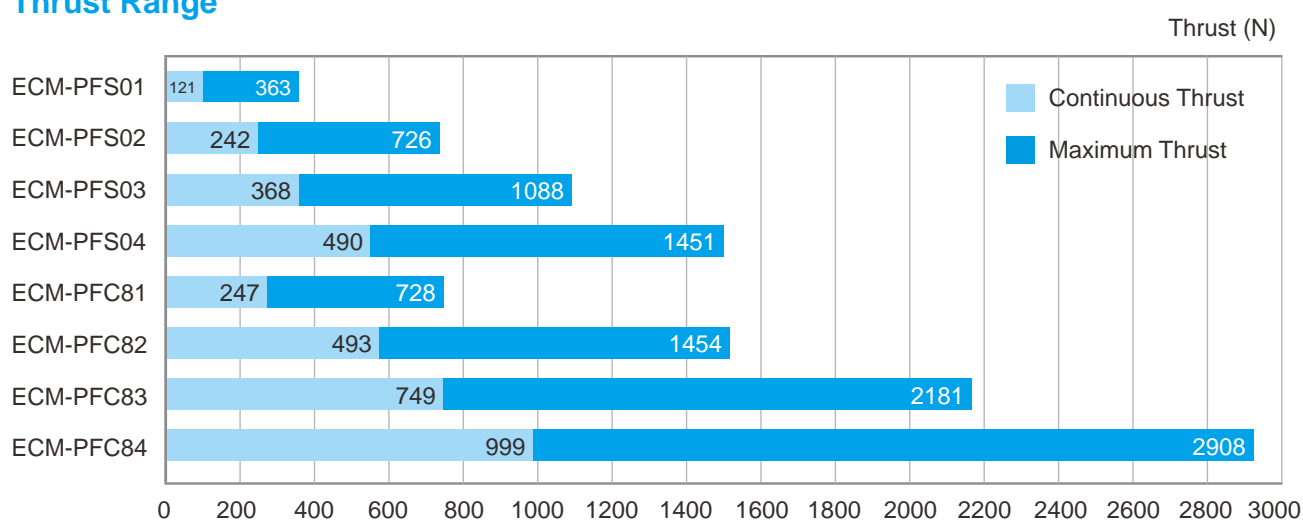
Magnetic Shaft Length (Unit: mm)

Shaft Diameter	Length	Gap
ECM-PF80	128, 320	135
ECM-PFC8	128, 320	156

ΔELTA

Linear Stage
LU

High Precision Steel Ballscrew Driven Stage
Position Repeatability of ±3um

- 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

- Conventional actuator
- LU actuator

20 msec

Following error 0.005 mm
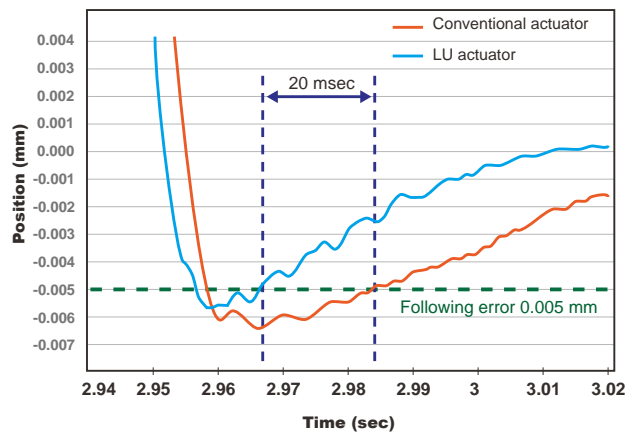
Test condition
- Without load
- Motor speed: 3,000 rpm
- Acceleration time: 50 ms

Thrust Range

Thrust (N)

	Continuous Thrust	Maximum Thrust
LU-46 (400W / Lead 10)	718	2160
LU-46 (400W / Lead 20)	359	1080
LU-33 (100W / Lead 5)	362	1086
LU-33 (100W / Lead 10)	181	543
LU-26 (100W / Lead 2)	905	2714
LU-26 (100W / Lead 6)	302	905
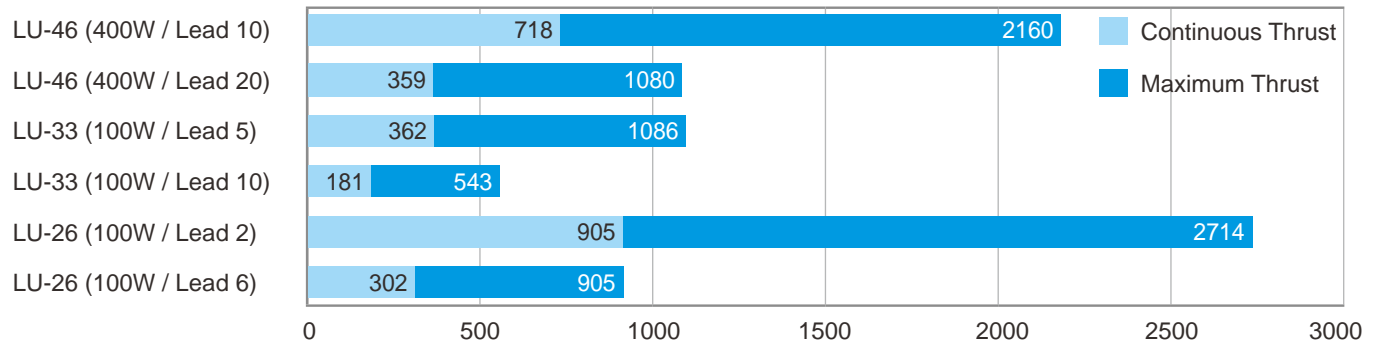
Linear Stage
LA-S

High Speed, High Precision Linear Motor Driven Stage
Position Repeatability of ±1um

- **Direct drive with zero backlash**
  Directly driven by Delta's linear motor without backlash and alignment issues

- **High speed and high precision**
  - Provide high-precision and high-stability motion operation:
    high speed capability of up to 4m/s
  - Integrate with linear motor and optical linear encoder for direct drive
    and preventing 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

Motor Coil Assembly   Motor Magnetic Way

Optical Readhead   Linear Guideway

Scale

Thrust Range

Thrust (N)

	Continuous Thrust	Maximum Thrust
LA-S4	44	177
LA-S5	55	221
LA-S6	64	257
LA-S7	96	386
LA-S8	131	525
LA-SA	138	555
LA-SB	185	740

0   100   200   300   400   500   600   700   800

ΔELTA
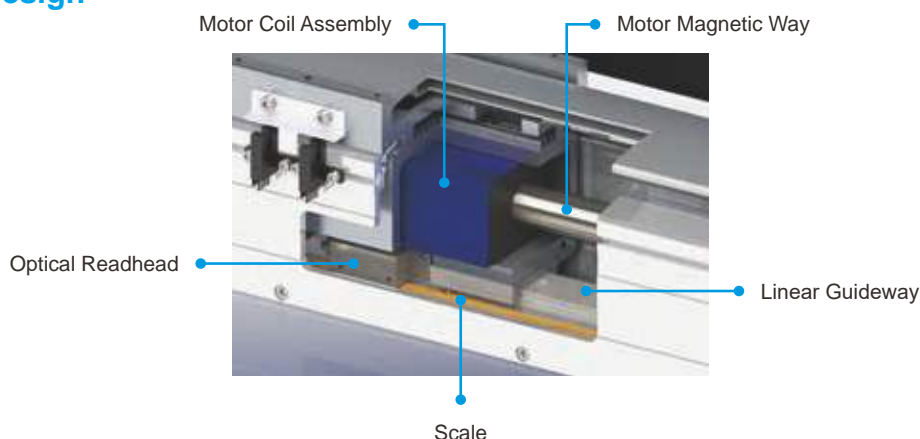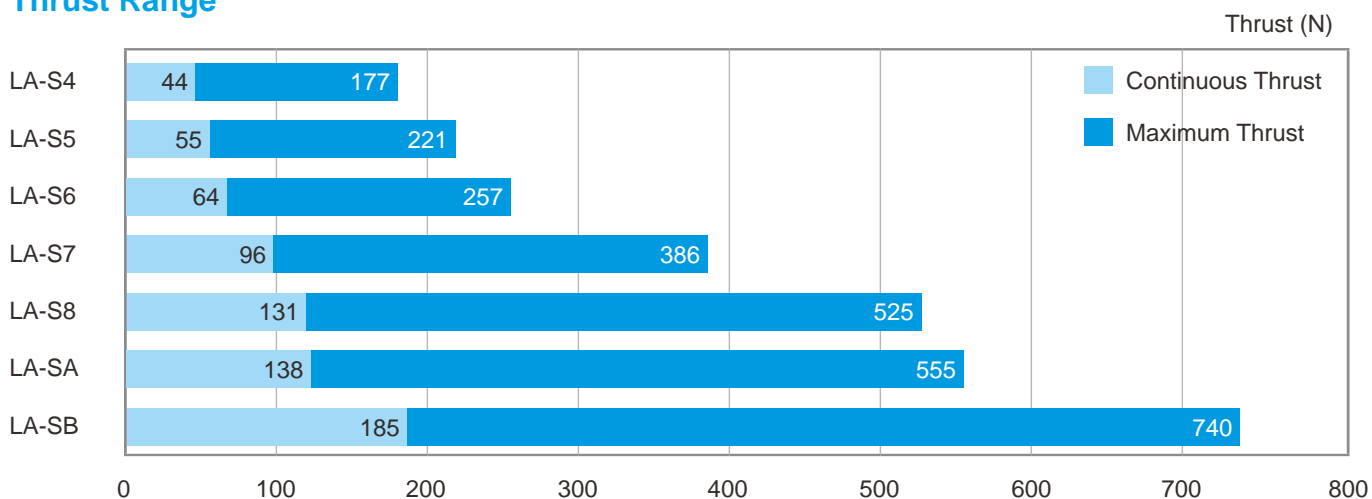
High Precision Planetary Gearbox
PS

- **Supports all series of Delta servo motors**

- **Provide 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**

- **Provide concentric models**

- **High rigidity and high torque**
  - Employ uncaged needle roller bearings with a set design
  - including 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**
  - Use 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

Delta Extended Motion Controller New
DXMC

The DXMC Series is an advanced synchronous multi-axis motion controller with max. 32 real axes and 64 virtual axes control. It provides tension control, rotary cut, flying shear and E-CAM function modules with user-friendly program editing for a wide range of industry applications, including packaging machines, printing machines, winding machines and industrial robots. In addition, the DXMC Series features optional Multiprog PLC or Delta Motion Kernel to provide a flexible and customized motion control platform for machine upgrades and smart equipment

Standard Type
DXMC-S

- Max. 32 servo axes control (execution cycle: 1 ms)
- Supports EtherCAT, Modbus TCP and Non-protocol communication
- Built-in 16 DI / 16 DO terminals and RS-485 serial port
- Supports A / B / Z and SSI encoder signal input
- Various robot modules to control multiple robots simultaneously
- Function blocks available: tension control, rotary cut, flying shear, E-CAM
- IEC-61131-3 compliant PLC programming and advanced robot languages

Synchronous multi-axis motion control, built-in 16 DI / 16 DO terminals, EtherCAT bus, simple wiring

Panel Type
DXMC-P

- Motion controller integrated with HMI
- Max. 8 servo axes control (execution cycle: 2 ms)
- Supports EtherCAT, Modbus TCP, and Non-protocol communication
- Built in RS-232 / RS-422 / RS-485 COM ports
- IEC-61131-3 compliant PLC programming and advanced robot languages

Built-in 7" & 10" LED monitor for display and operation

NELTA

Motion Control Function Blocks – Delta Motion Kernel

E-CAM
Multiple Engagement Timing and Shearing Mode Settings

- E-CAM function and shearing action start simultaneously to ensure the phase is not offset due to position deviation

Rotary Cut and Flying Shear
Rotary Cut

- Sets up cutting length, tool quantity, sync. zone data with application parameters to build up rotary cut CAM table
- Feeding axis and rotary axis rotate with the same speed ratio in sync. zone (same speed in general)
- Users are able to adjust rotary speed in sync zone on-line to fix the deviation between theory and reality, no need to build up a new table
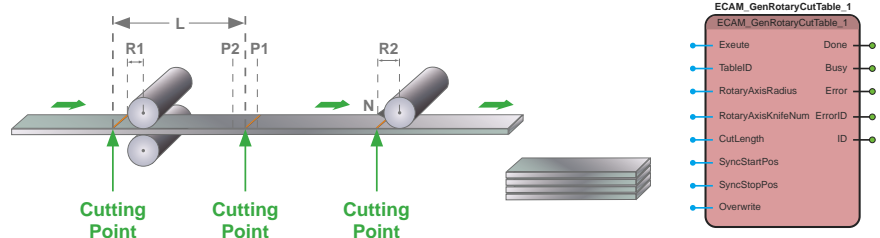
Flying Shear

- Suitable for motion control of cutting or filling machines
- Sets up cutting length, wait position, flying zone, sync. zone, and feedback zone data with application parameters to build up flying shear CAM table
- Master axis and slave axis rotate with the same speed ratio in sync. zone (same speed in general) and cut the workpiece in sync. zone
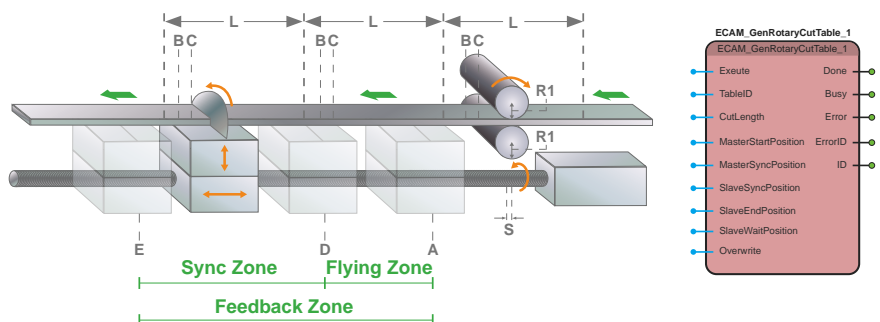
Tension Control

- Speed Mode for quicker response
- Dancer Mode: Feedforward input to accelerate response
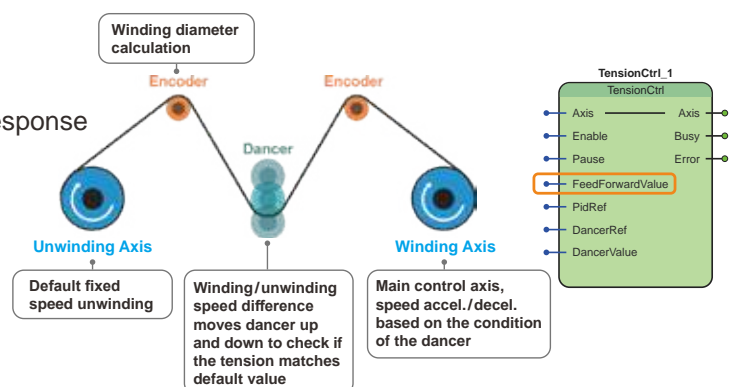
PC-Based Motion Controller
MH1 / MH2 New / AX-8 New / MP1

Supports DMCNET / EtherCAT fieldbus for various motion control applications

Host PAC MH1 **Host PAC MH2 / AX-8** **Panel PAC MP1**

- **Energy Efficiency and Robust Hardware**
  - The MH1/MH2/AX-8 Series: cable less, fan-less and low-power consumption design supports stable operation; built-in CFast card, SD card, SSD and M.2 SSD slots provide fast and stable data transmission
  - The MP1 Series: equipped with a 10.1-inch touchscreen for more flexible operation

- **Multiple Peripheral Interfaces for Communication**
  Equipped with USB ports, serial COM ports, Gbps Ehternet ports and PCI/PCIe extension slots

- **Supports Master and Slave Modules**
  With built-in DMCNET and EtherCAT protocols, Delta provides complete servo drive and module products for users to select based on the electrical control unit space and precision requirements. Users are able to build up a highly efficient and extensible PC-based motion control solution

- **High Security**
  Customizable IC device for programming security and confidential protection

- **OS and Software Support**
  The PACs support Windows 7/10 OS. Users can choose to program with the built-in Dynamic-link library (DLL), or development tools SoftHMI and SoftPLC (eg. IMP) for UI development, single axis and multi-axis motion control. Integrated with equipment IoT, CAM and visual inspection functions, Delta's PACs fulfill more customized requirements

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
- PP/PT/PVT
- Compare Trigger
- Motion Buffer
- Gantry control (EtherCAT)
- E-CAM (EtherCAT)

- **Speed Curve Tracing**
  Speed curve tracing function to trace current motion speed and adjust 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

- **DMCNET/EtherCAT Automation Software**
  The EzDMC/EcNavi development software includes a DMCNET/EtherCAT master controller and slave devices for data communication, functional identification, programming and debugging, providing a fast and easy way for first-timers to understand the solution

- **Motion Control Platform Based on CODESYS**
  Based on CODESYS, the PC-Based Motion Controller AX-8 Series saves development time and cost

DELTA

Applications

Electronics Production: PCB machines, Automated Optical Inspection (AOI) machines, semi-conductor machines, LED machines, TFT inspection machines, glue-dispensing machines, SMT pick-and-place machines, winding machines, optical lens processing machines, glass grinding machines, lens assembly machines, TAP machines

Woodworking: CNC drilling machines, woodwork cutting machines, board slitting machines, mortise & tenon machine, solid wood door machine

Other: Aluminum curtain walls, flame cutting, ion cutting, stone processing, pipe bending

EtherCAT Modules Supported

- **Gateway Type E-BUS Remote Power Couplers**
  R1-EC5500D0
  Connect to digital I/O, analog I/O and pulse I/O extension modules

With E-BUS power module

- **16 Digital Input Remote Modules**
  R1-EC6002D0 / R1-EC6022D0
  Provides digital IN signals remote control for EtherCAT master

- **4-Channel Analog Input Remote Module**
  R1-EC8124D0
  Provides analog IN signals remote control for EtherCAT master

- **MPG Module**
  R1-EC5614D0
  Receives Manual Pulse Generator (MPG) signals remotely for EtherCAT master

- **1-Channel Pulse Remote Module**
  R1-EC5621D0
  Connects to digital I/O, analog I/O, pulse I/O and MPG signal extension modules with EtherCAT master

- **16 Digital Output Remote Modules**
  R1-EC7062D0 / R1-EC70A2D0 / R1-EC70E2D0 / R1-EC70F2D0
  Provides digital OUT signals remote control for EtherCAT master

- **4-Channel Analog Output Remote Module**
  R1-EC9144D0
  Provides analog OUT signals remote control for EtherCAT master

Delta High-Speed Motion Control System
DMCNET

Delta's Motion Control NETwork (DMCNET) is a high speed,
real-time communication system

- Up to 12 axes servo control with-in 1ms simultaneously; with 3-axis helical and linear interpolation divided into 4 groups, or 2-axis linear and arc interpolation divided into 6 groups
- Supports 64-bit dual-precision floating point, allowing high-precision system calculations and flexible operation
- Supports absolute commands, incremental 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 command, offering fast communication and motion control for various applications

The DMCNET is equipped with the high-speed and reliable one-wire DMCNET communication protocol for diverse motion control applications. Adapted for customer's needs, Delta's PCI motion control cards are available in three series:

- 12-axis PCI-DMC-A02
- 6-axis PCI-DMC-F02 with digital I/O interfaces
- PCI-DMC-B01/PCI-DMC-B02/PIC-DMC-B03 with pulse compare & capture functions

All series are able to connect to multiple servo systems, such as the advanced ASDA-A3-F Series, high performance ASDA-A2-F Series, and standard ASDA-B2-F & ASDA-B3-F Series, as well as ASDA-A2R Series with linear motors. The DMCNET establishes a total motion control solution enabling lower system cost and superior performance to increase end-product value and competitiveness

DMCNET System Configuration
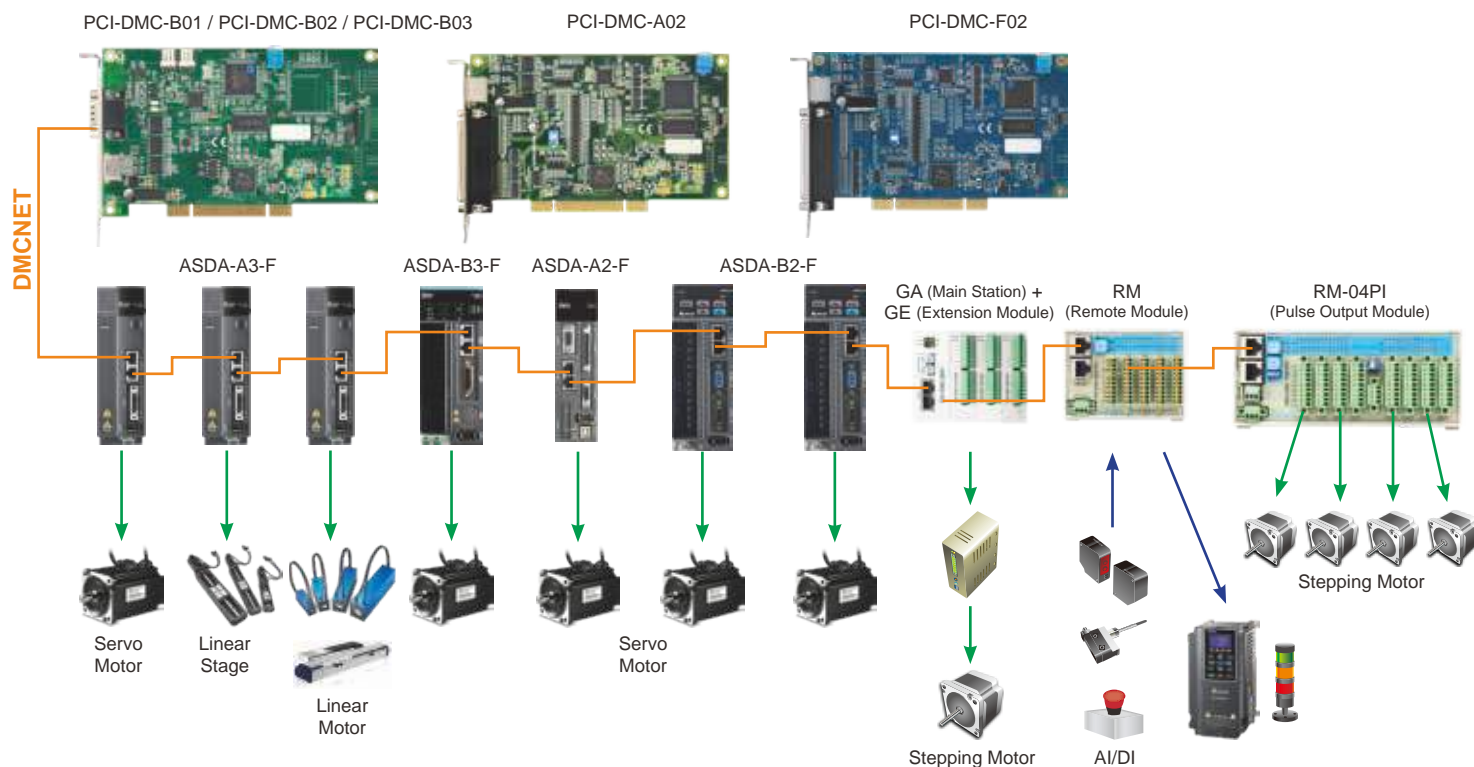
PCI-DMC-B01 / PCI-DMC-B02 / PCI-DMC-B03   PCI-DMC-A02   PCI-DMC-F02

DMCNET

ASDA-A3-F   ASDA-B3-F   ASDA-A2-F   ASDA-B2-F   GA (Main Station) + GE (Extension Module)   RM (Remote Module)   RM-04PI (Pulse Output Module)

Servo Motor   Linear Stage   Linear Motor   Servo Motor   Stepping Motor   AI/DI   Stepping Motor

Applications

Integrated electronics applications, glue dispensing machines, woodworking machines, pipe bending machines, stone processing machines, aluminum curtain walls, flame cutting machines, ion cutting machines

ΔNELTA

IPC Motion Platform (IMP1.5)

A Simple and Fast Setup Development Platform for Realizing Unsurpassed Motion Control

High-speed, flexible and scalable development platform which combines powerful motion control functions and integrates Delta's HMI editing and PLC logic programming software tools to achieve complex and precise motion control based on customers' requirements

- **Power Motion Control Core:** Upgrades Delta's PAC or PC with a motion control card to become a high-speed communication motion controller with HMI and PLC functions
- **Simple Secondary Development Platform:** Combines with Delta's standard HMI editor DOPSoft and PLC editor WPLSoft in one platform to simplify programming and IMP project development
- **Scalable Communication for Expandable Network:** Through PCI extension slots, three DMCNET communication networks with up to 36 stations can be established; it is able to control 36 axes of servo motors simultaneously without connecting to any remote modules
- **Industry-Oriented Controller:** Provides Soft Numeric Control (SNC) and Motion Program Macro (MPM) to adjust and modify self-defined motion paths and commands according to application requirement changes
- **Standard Communication Interfaces:** Built-in Modbus and Modbus TCP gateways enable convenient data transmission between machines

HMI Editor   PLC Editor

IPC Motion Platform

DMCNET Motion Control Card

VGA Display

Host PAC MH1

Panel PAC MP1

ASDA-A3-F, ASDA-A2-F, ASDA-B3-F or ASDA-B2-F

DMCNET   Max. 36 Axes

GA (Main Station) + GE (Extension Module)   RM (Remote Module)   RM-04PI (Pulse Output Module)

Max. 36 Stations

ASDA-A3-F   ASDA-A2-F   ASDA-B3-F   ASDA-B2-F   GA (Main Station) + GE (Extension Module)   RM (Remote Module)   RM-04PI (Pulse Output Module)
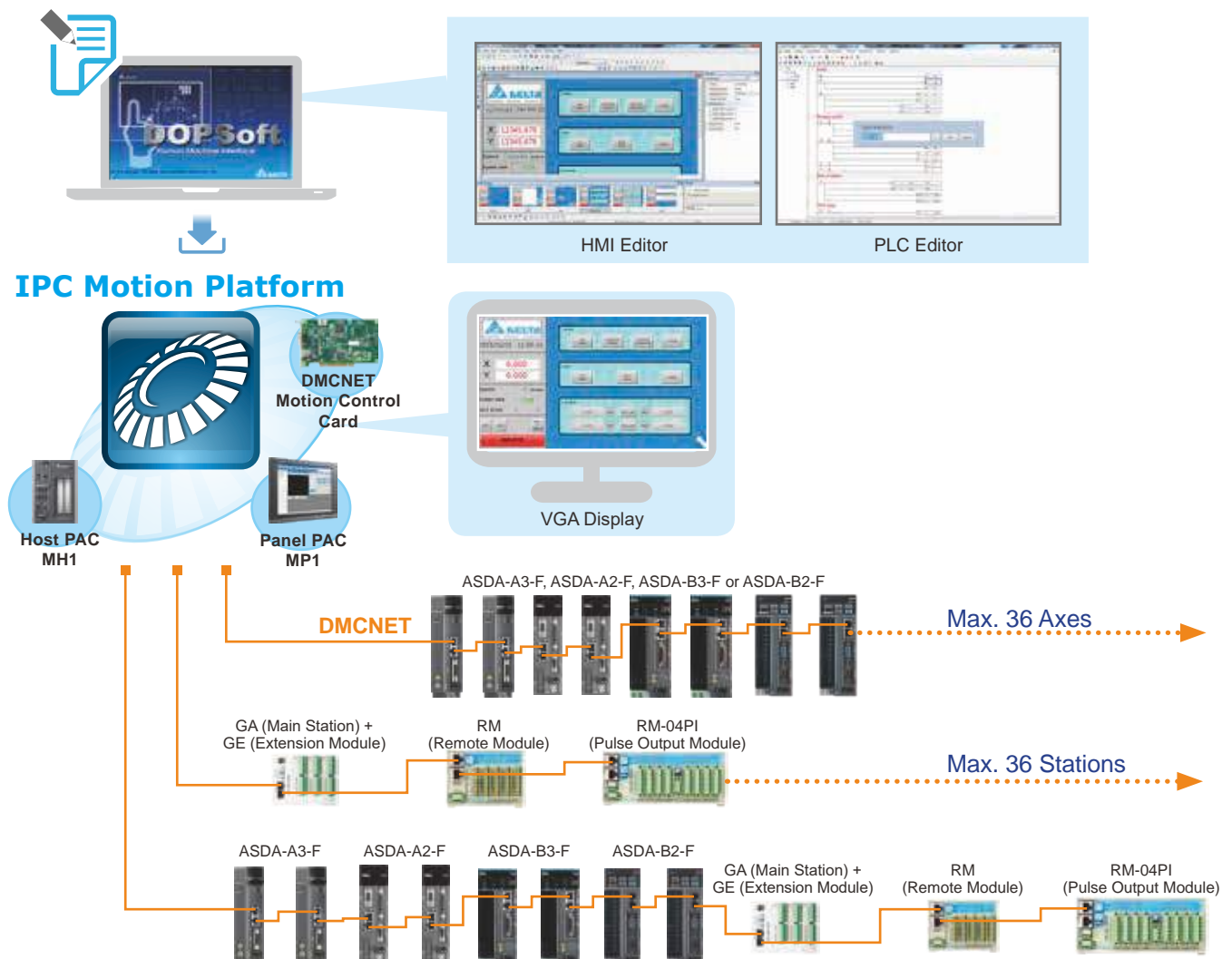
EtherCAT High-Speed Motion Control System

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-XXD0 and PCIE-L221-B1D0 motion control cards provide complete functions for EtherCAT masters and support device descriptions in XML format (EtherCAT Slave Information-ESI), allowing quick identification of ESI files 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 between stations: within 1 ms to 0.5 ms based on customer needs

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

EtherCAT System Configuration
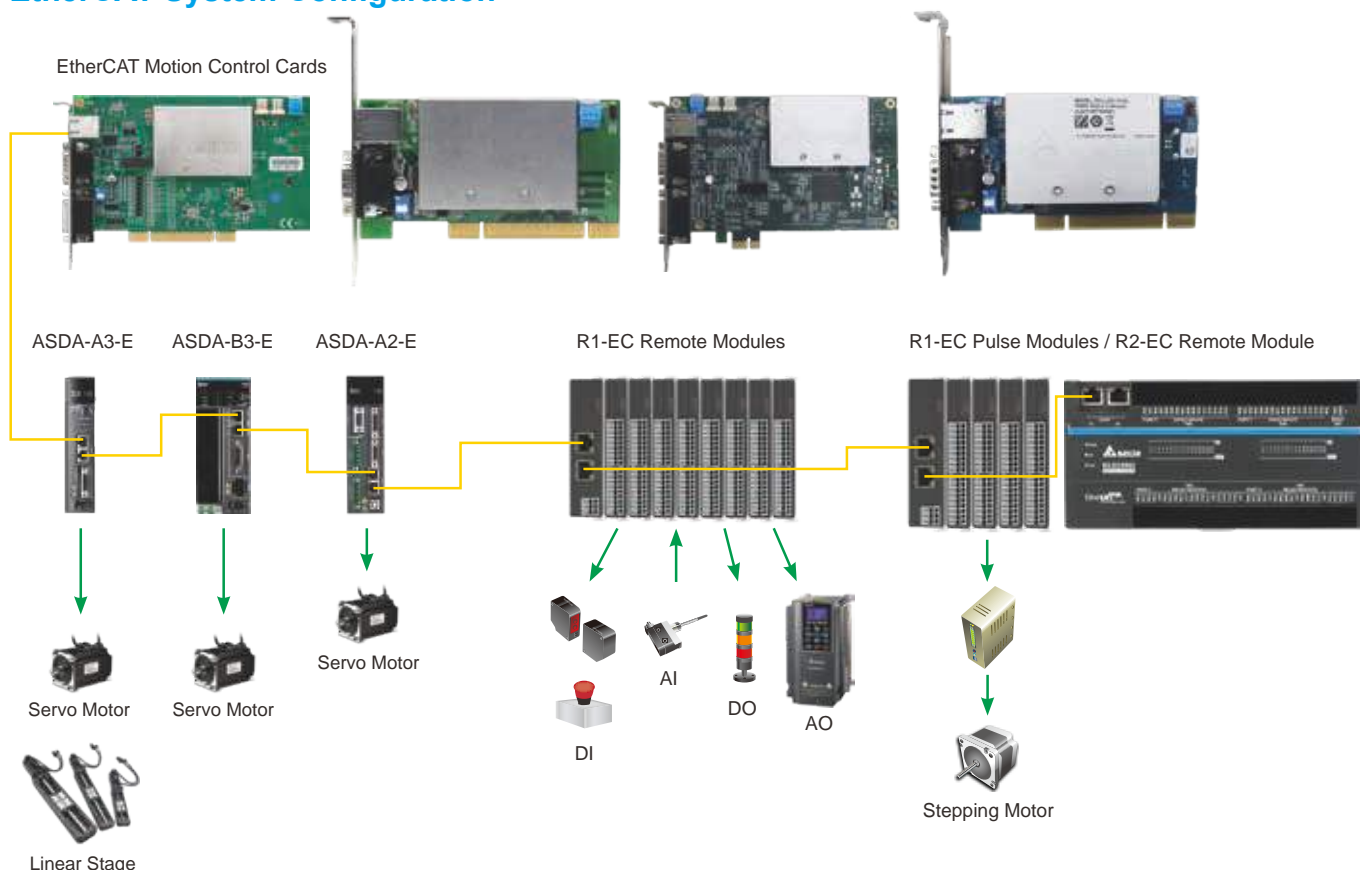
EtherCAT Motion Control Cards

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

Servo Motor

Servo Motor Servo Motor

Servo Motor

DI

AI

DO

AO

Stepping Motor

Linear Stage

Applications

Integrated electronics applications, glue dispensing machines, woodworking machines, pipe bending machines, stone processing machines, aluminum curtain walls, flame cutting machines, ion cutting machines

IPC Motion Platform (IMP1.5)

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High-speed, flexible and scalable development platform which combines powerful motion control functions and integrates Delta's HMI editor (DOPSoft) and PLC logic programming tools to achieve complex and precise motion control based on customers' requirements.

- **Motion Control Core:** Upgrades Delta's PAC or PC with a motion control card to become a high-speed communication motion controller with HMI and PLC functions

- **Simple Secondary Development Platform:** Combines with Delta's standard HMI editor DOPSoft and PLC editor WPLSoft in one platform to simplify programming and IMP project development

- **Scalable Communication for Expandable Network:** The EtherCAT fieldbus system with IMP is able to connect max. 100 stations and control max. 64 axes of servo motors

- **Industry-Oriented Controller:** Provides Soft Numeric Control (SNC) and Motion Program Macro (MPM) to adjust and modify self-defined motion paths and commands according to application requirement changes

- **Standard Communication Interfaces:** Built-in Modbus and Modbus TCP gateways enable convenient data transmission between machines

HMI Editor

PLC Editor

IPC Motion Platform

EtherCAT Motion Control Card

VGA Display

ASDA-A3-E   ASDA-A2-E   ASDA-B3-E

EtherCAT

Max. 32 Axes

R1-EC Remote Modules / R2-EC Remote Module

Max. 64 Stations
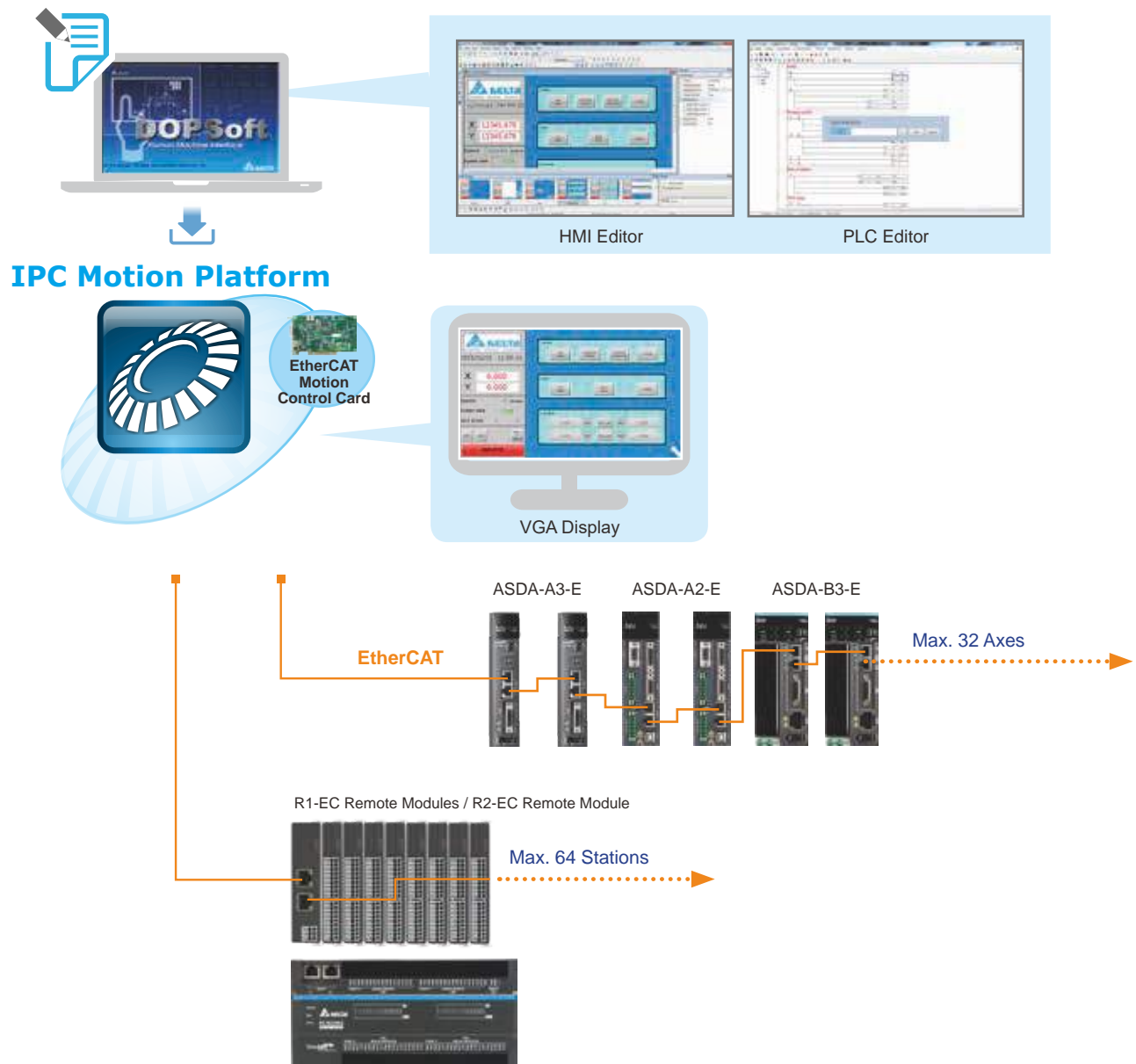
CODESYS SoftPLC Platform

CODESYS is an IEC 61131-3 compliant SoftPLC development system, supporting SoftHMI and PLC programming software to develop. Delta's PC-Based motion controller AX-8 Series based on CODESYS offers complete functionalities of a development tool, including:

- **Programming based on CODESYS:** Equipped in the PC-Based Motion Controller AX-8 Series for real-time motion commands via RTE real-time OS and EtherCAT communications

- **PLCopen Standard Motion Control:** Single and multi-axis motion control with standard PLCopen Motion POUs

- **E-CAM:** Synchronized E-CAM function and graphic CAM curve editing surface; each cam supports 32,767 points

- **Standard IEC 61131-3 Programming Languages:** Supports ST, LD, FBD, SFC standard programming languages

- **Debugging Mode:** Displays application data in simulation mode on SoftPLC, reading/writing/forced setting of variable values directly in the respective editor, monitoring specific selected values in watchlists and single step code execution

- **Servo Axes Control:** 64 axes / 1 ms synchronous servo control

Solution Configuration

Motion Software

HDMI

Download

PC-Based Host Motion Controller

AX-8

Motion Controller

Field Devices

AC Servo Drive

ASDA-A3-E
ASDA-A2-E
ASDA-B3-E

Remote I/O Module

R1-EC / R2-EC

AC Motor Drives

MS300   C2000
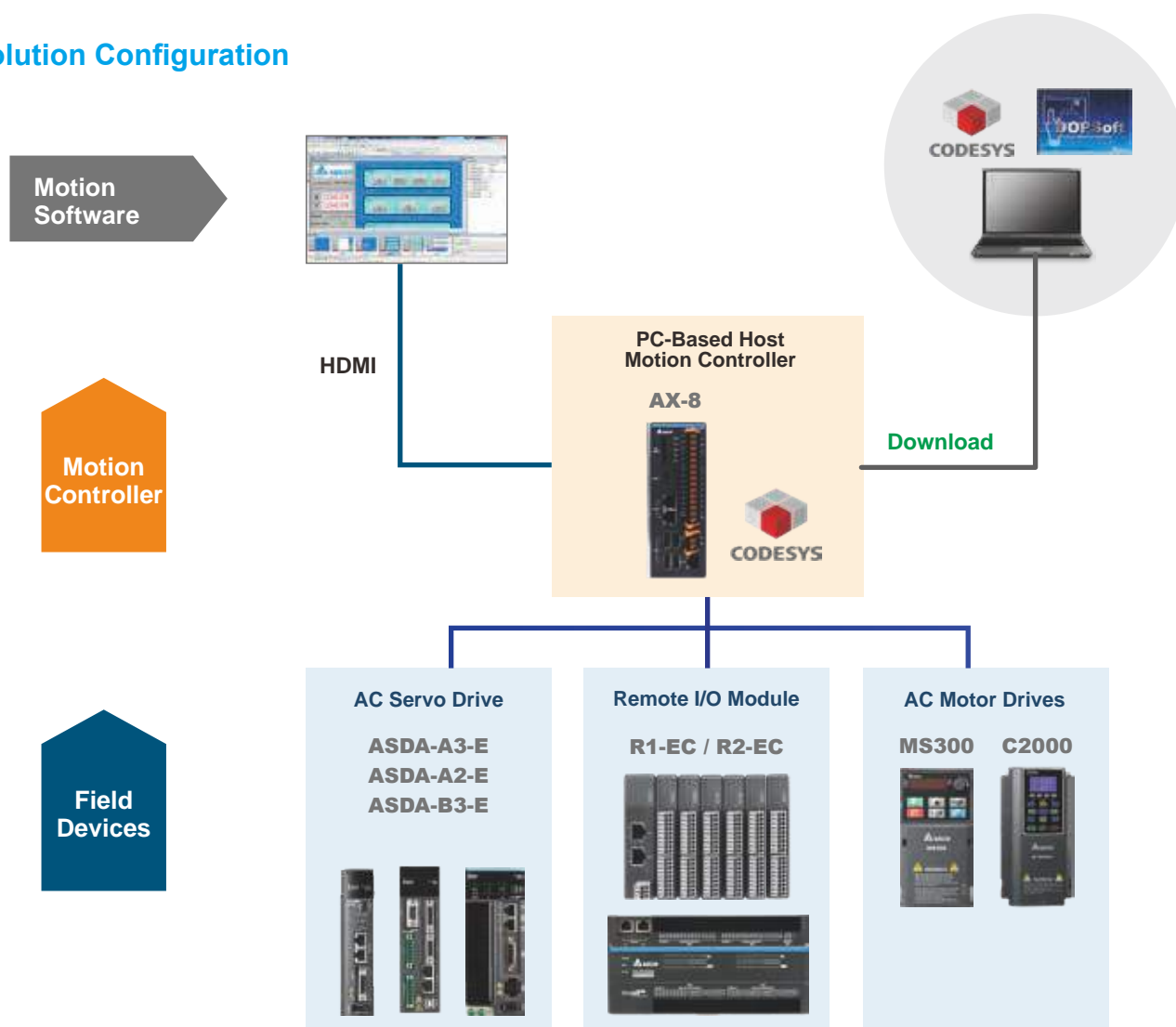
Open CNC Solution
NC E

Open-structured CNC Control System for Customization and Flexibility

Solution 1: Standard

VGA output for external display with Delta's standard interface

- 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
- Reduce additional hardware cost for customers to focus more on software upgrades and better integration for higher operation performance

VGA

USB

OPEN CNC Controller
NC30E

Ethernet

VGA

USB

Motion Control Host PAC
MH1-A12N Series

DMCNET

AC Servo Drives
ASDA-A2

Spindle Motor Drive
ASDA-S

AC Servo Motors
ECMA

High Speed PM Spindle Motor
ECMS
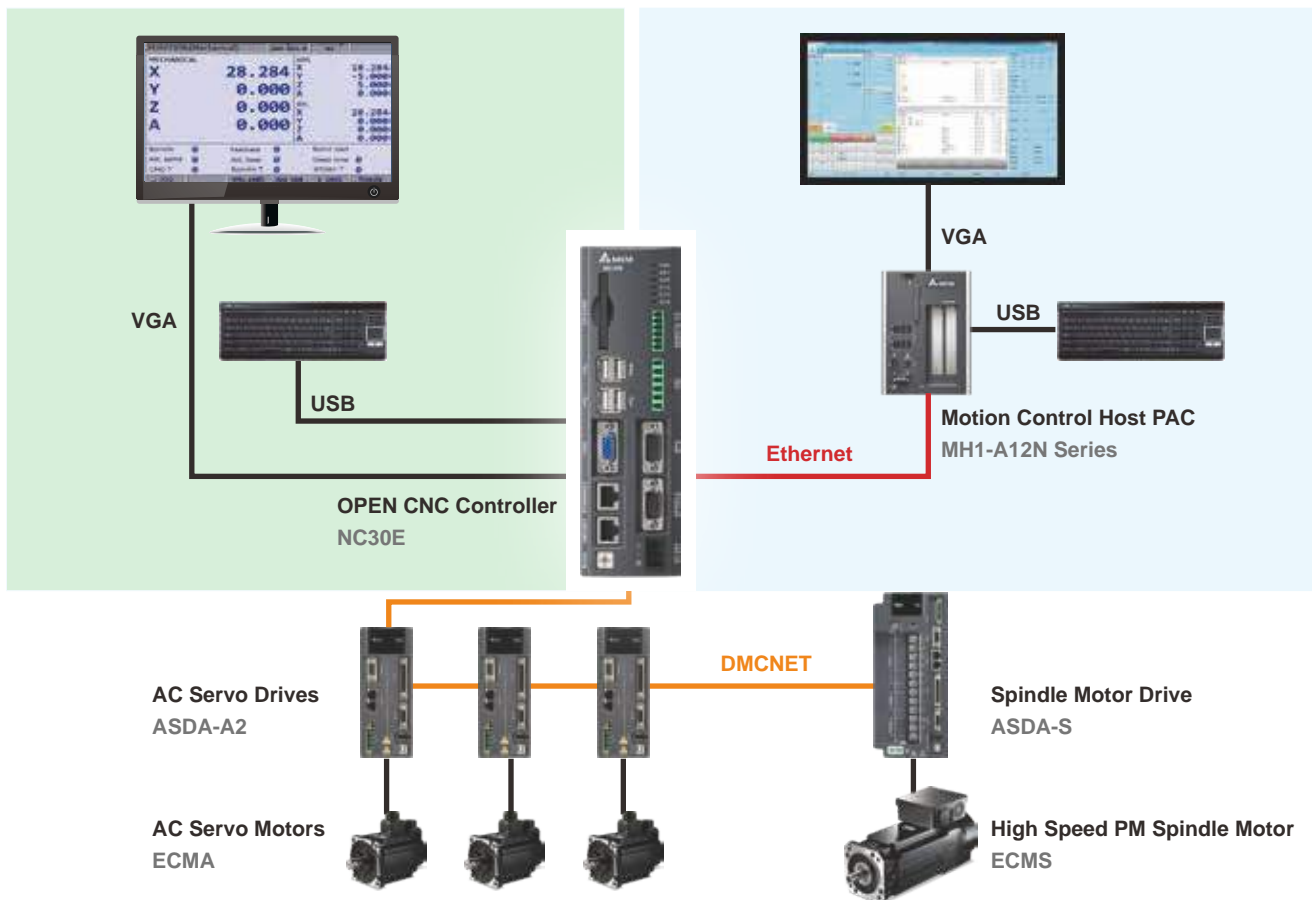
Applications

Customized CNC systems, woodworking machines, lathes, grinding machings, 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 high 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
- CNCSoft software offers user-friendly setup and user-defined operation to build customized interface
- Capable of connecting serial digital I/O modules to greatly improve the extension capacity

System Configuration

CNCSoft Software

Spindle Drive
ASDA-S

Ethernet

DMCNET

AC Servo Drives
ASDA-A2

High- Speed Serial I/O

Local I/O

MPG
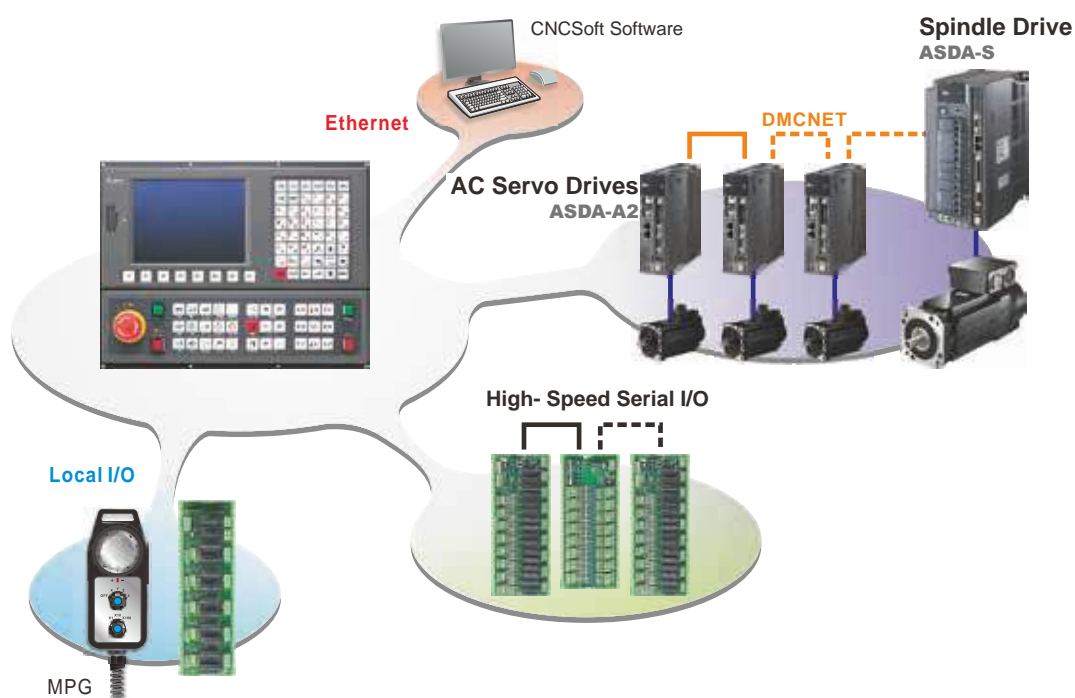
Applications

**CNC Machining Center /
High-speed Tapping Machine**
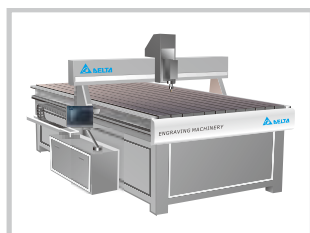
Engraving Machine

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 axes 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
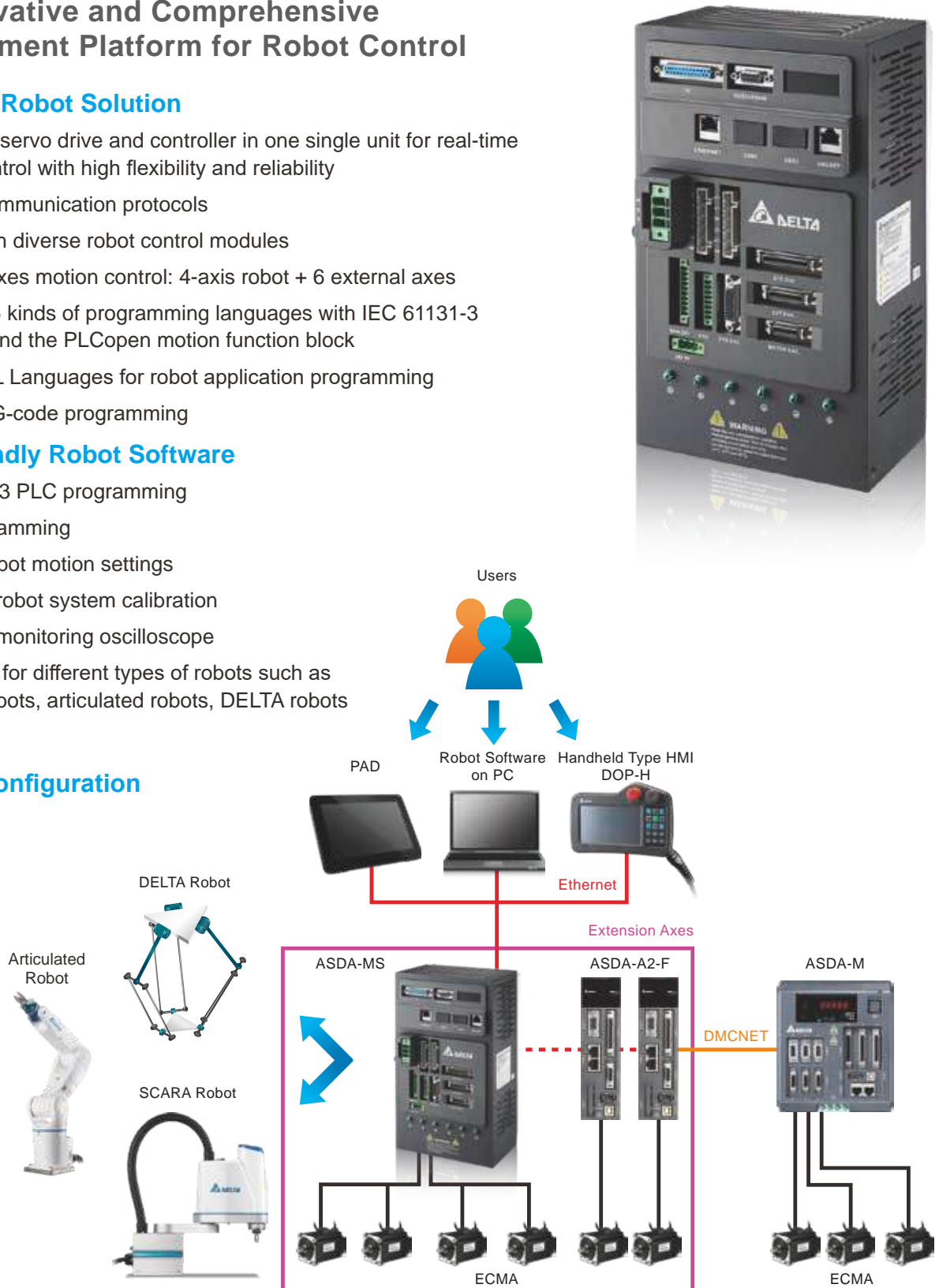
All-in-One Robot Controller

- 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 such as the 4-axis SCARA robot, the Linear DELTA, DELTA robot, and the 2 axes extension via DMCNET for 6-axis articulated robot to meet diverse requirements with flexibility and reliability
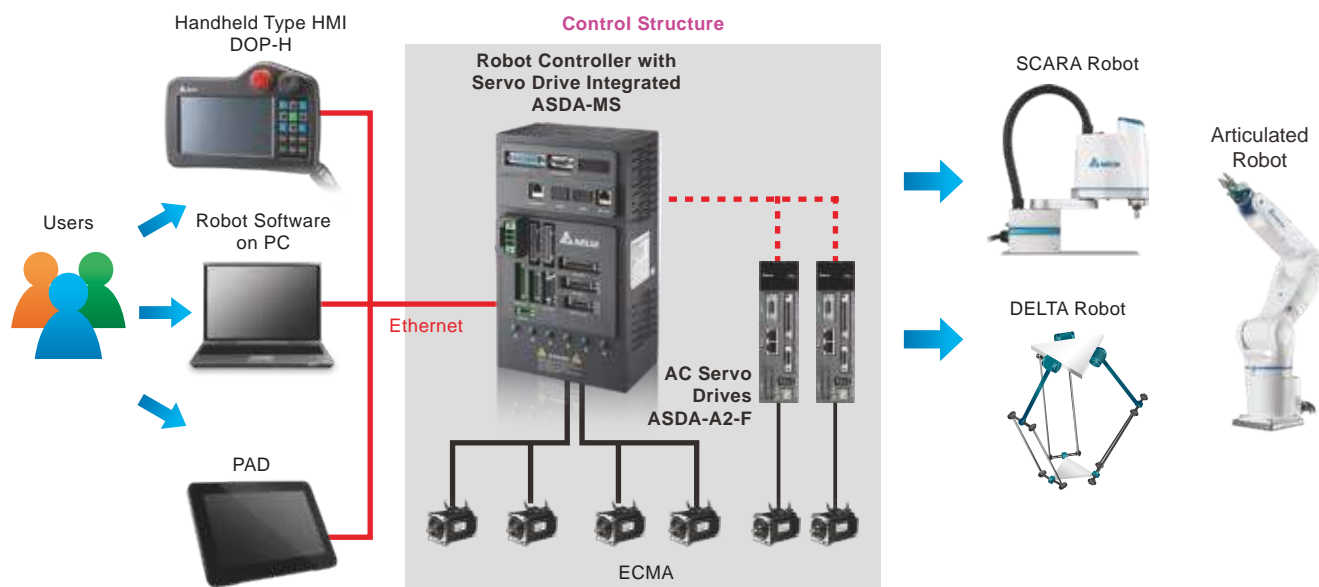
Comprehensive Development Platform

- 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 single robot and robot workstation applications
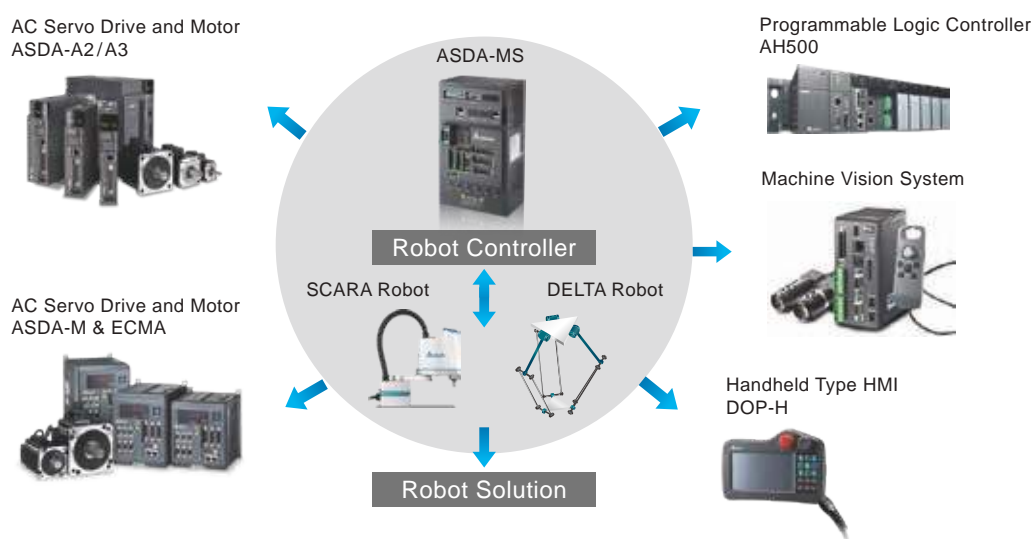
Applications

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

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

Controller with Human Machine Interface
HMC

Optimum Combination of Controller and Display

7-inch Controller with Widescreen Handheld HMI
HMC07-N411H5C5(A)

- 7" 16:9 widescreen 65,536 colors TFT
- Display Resolution: 800 x 480 pixels
- Built-in PLC functions
- Built-in emergency stop switch
- Built-in enable switch (rear side)

- Built-in MPG (Manual Pulse Generator)
- Supports SDHC card
- Supports DMCNET
- Compact and lightweight (750 g)

7-inch Controller with Handheld HMI
HMC08-N500S52

- 7" 65,536 colors TFT
- Display Resolution: 800 x 600 pixels
- Built-in PLC functions
- RS-422 high-speed remote I/O connection
- Supports Ethernet
- Supports DMCNET

- Supports SDHC card
- Supports audio output: MP3, Wav files
- USB Host for direct connection to USB disk, printer, mouse and keypad

8-inch Controller with HMI
HMC08-N500S52

- 8" 65,536 colors TFT
- Display Resolution: 800 x 600 pixels
- Built-in PLC functions
- RS-422 high-speed remote I/O connection
- Supports MPG (Manual Pulse Generator) Input
- Supports Ethernet
- Supports DMCNET
- Supports SDHC card
- Supports audio output: MP3, Wav files

Robotic Loading / Unloading Control for Machine Tools

HMC

DMCNET

3-Axis Synchronous Servo System
ASDA-M

AC Servo Drive
ASD-A2

General Digital I/O

Process Completion Signal

Loading Completion Signal

Clamp Switch Signal

Orthogonal Axes

X-Axis   Y-Axis   Z-Axis

Material Rotating Shaft
Ø-Axis

Delta Permanent-Magnet AC Servo Motor
ECMA
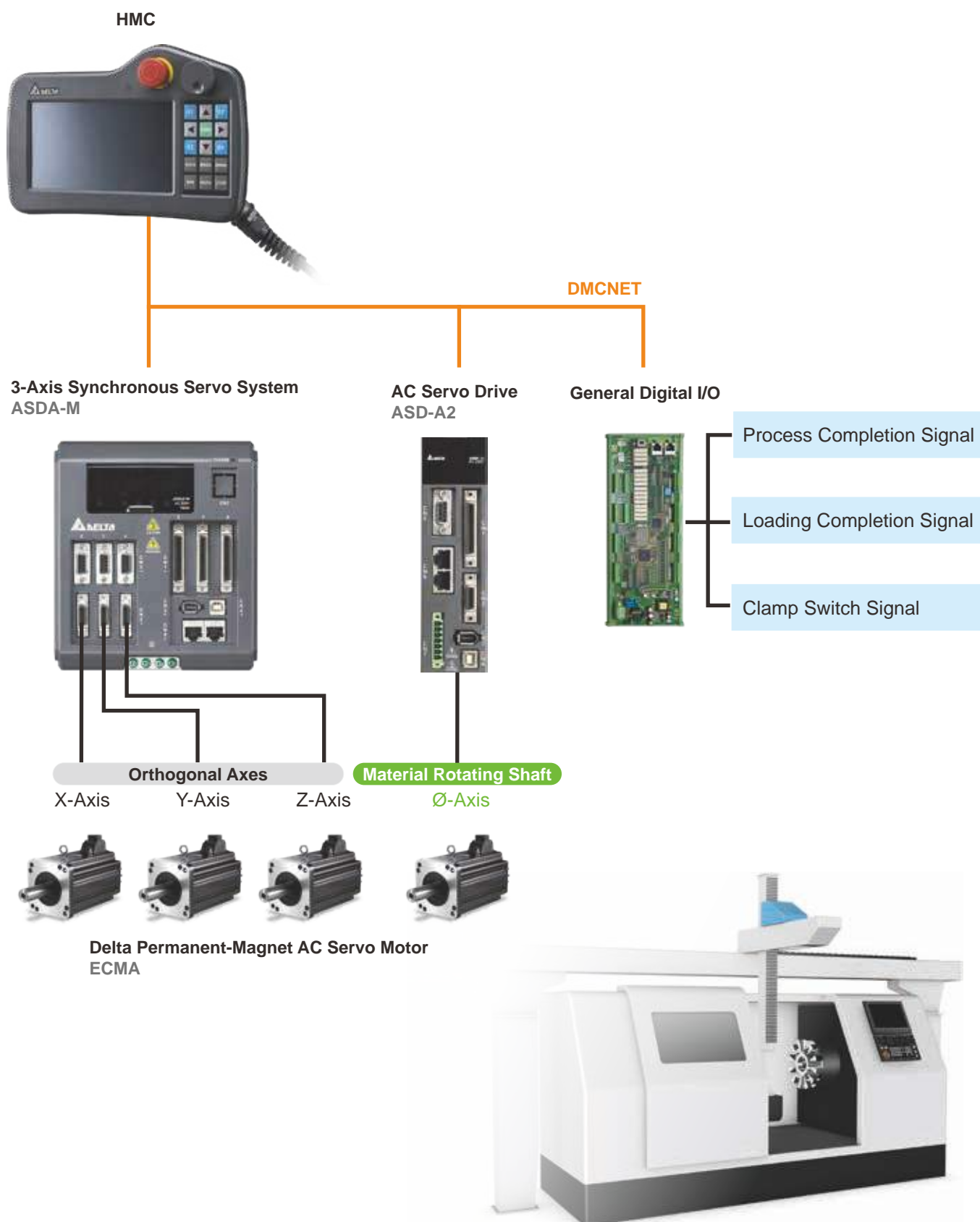
Hot Swappable Mid-range PLC
AH

The Smart Solution for High-end Machinery and System Integration

- 32-bit dual-core multitasking processor
- Excellent program execution speed (LD: 20 ns)
- 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

Max. 100 m (cable) or 2 km (optical fiber) between 2 racks

I/O Hot Swapping

Automation System

High-level Applications

Standard Applications

Advanced Hardware Structure

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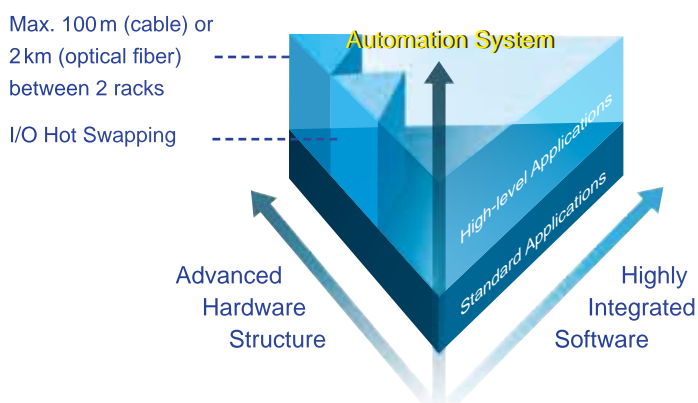
- Highly integrated programming software ISPSoft: Graphical interface with 5 programming languages
- Enhanced flexibility: Max. 100 m (cable) or 2 km (optical fiber) between 2 local extension racks
- Redundant system and hot-swapping function ensure non-stop system operation for improved maintainability

System Scalability

Remote I/O Bus
- DeviceNet
- PROFIBUS
- EtherNet/IP

Fiber Module

Extension bus

Local extension bus:
- Max. extension: 7 racks
- Max. distance:
  - Between 2 racks: 100 m (cable) or 2 km (optical fiber)
  - Total: 700 m (cable) or 14 km (optical fiber)

Extension bus (Optical Fiber)

Local extension bus:
- Max. extension: 7 racks
- Max. distance:
  - Between 2 racks: 100 m (cable) or 2 km (optical fiber)
  - Total: 700 m (cable) or 14 km (optical fiber)

Fiber Module

Motion Control Structure

Example: AH20EMC

(Modbus)
RS-485

Ethernet
(Modbus TCP)

Power supply module

Backplane for motion control modules (AHBP05M2-5A)

MORE

AH-20EMC / AH-20MC / AH-10PM

Pulse train
Total: 6 axes

DMCNET
Total: 12 axes

EtherCAT
Total: 32 axes
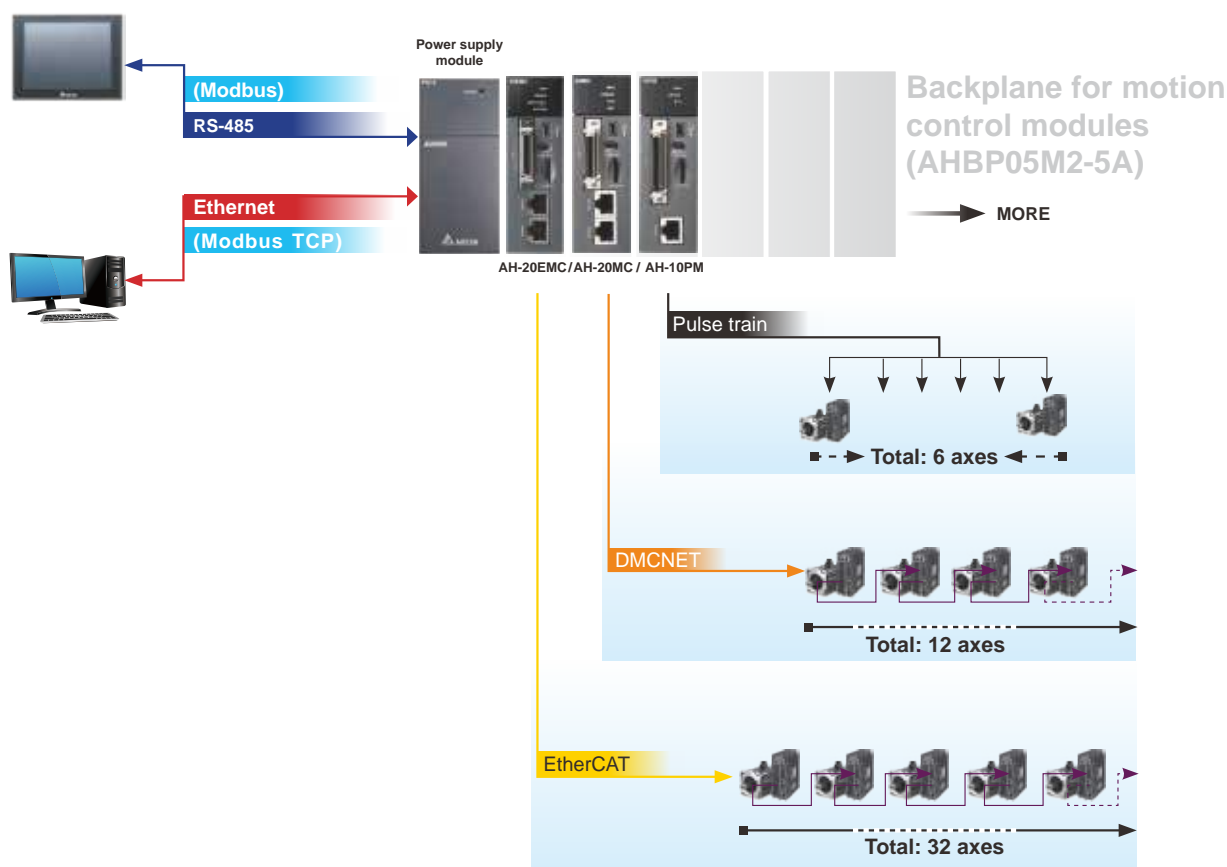
Applications

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 system, traffic monitoring system

NELTA

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

Serial port
- Removable terminal block
- RS-232 / RS-485

Sync. optical port
- Data sync.

SD card
- Micro SD (max. 32 GB)

Ethernet port
- RJ45 x 2
- EtherNet/IP (DLR)
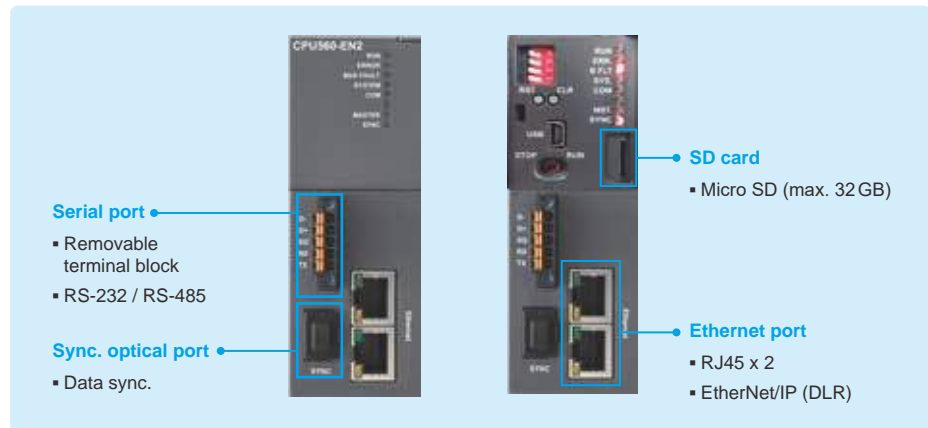
Redundant Backplane

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

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

Redundant Power

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

Redundant Ext. Ports   Redundant Power

Redundant System

Full Redundancy Structure

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

Modules

Main Backplane	Expansion Backplane	RTU rack
▪ Ethernet module: AH10EN-5A (V3) ▪ Serial module: AH10SCM-5A (V3)	▪ DIO ▪ AIO (includes temperature modules) ▪ Serial modules: AH10SCM-5A and AH15SCM-5A	▪ DIO ▪ AIO (including 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)

EtherNet/IP
Modbus TCP

Master PLC   Backup PLC

Ext. cable for backplane

EtherNet/IP (DLR)

Redundant expansion backplane

Redundant expansion backplane

RTU

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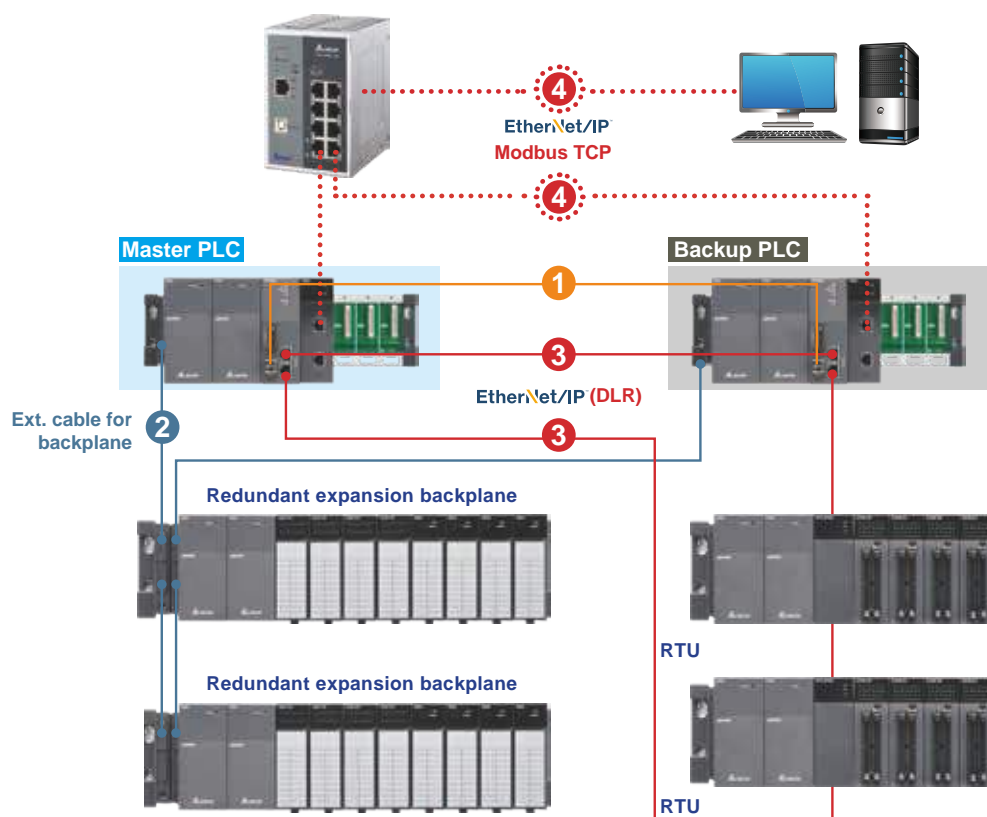
① Sync. optical fiber   ② Ext. cable for backplane   ③ EtherNet/IP ring topology (DLR)   ④ Star topology EtherNet/IP, Modbus TCP

DELTA

Compact Modular Mid-range PLC
AS

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

- Max. I/O: 1,024 points
- 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, and micro SD card slot
- Max. 8 axes control via CANopen motion network / max. 6 axes control via pulse control (200 kHz)
- Robust rackless design and patented DIN rail clips for 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

Advanced CPU Performance

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

LD instruction	25 ns
MOV instruction	0.15 μs
Floating point operation nstruction	1.6 μs
Trigonometric function instruction	3.5 μs

Positioning Control - Delta's CANopen Control

- AS200/300 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 CANopen data exchange table
- Axis control by instructions for easy maintenance and high PLC program readability

CANopen
DS301
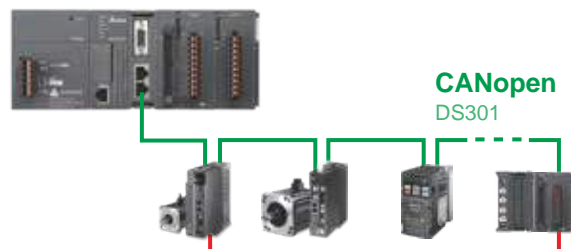
Supports up to 8 servo drives, 8 AC motor drives, and 7 AS RIO stations

Positioning Control - High-speed Pulse

- AS332T-A / AS332P-A transistor CPU: 6 axes (or 12 channels) 200 kHz

- AS324MT-A differential CPU: 2 axes 4 MHz + 4 axes 200 kHz

- Positioning planning table for fast positioning planning and path simulation

- Choose any given 2 axes for linear and arc interpolation

AC Servo Drive
ASDA-B2
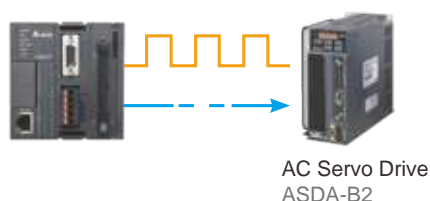
Flexible Network System Configuration

- 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 application and industrial upgrades

Linear   Star   EtherNet/IP
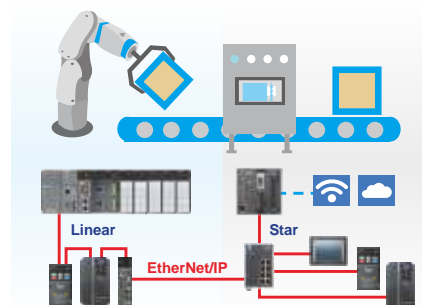
New Programming Software

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 execution

- **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
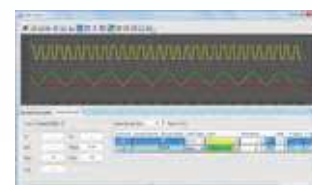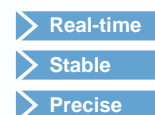
Applications

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

Compact Modular Motion Controller
AS500 `New`

The Best Solution for OEM Equipment

EtherCAT Motion Control System

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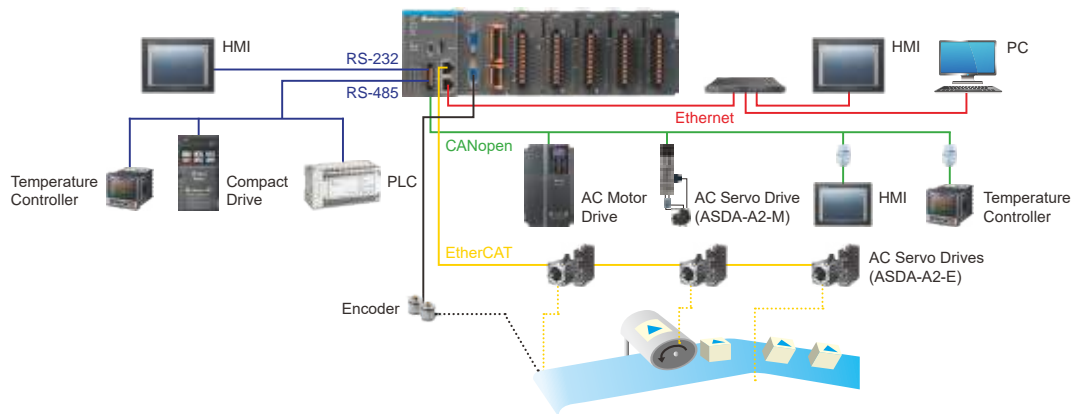
CANopen Motion Control System

- 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)
- 1 GHz processor provides high operation performance
- Provides various motion commands: position, velocity, torque, multi-axis interpolation, E-gear, E-CAM, G-code, etc.
- Built-in 16 DI & 8 DO, 2 incremental encoders, SSI absolute encoder, RS-232/485, Ethernet x 2, CANopen DS301 and CANopen motion interfaces
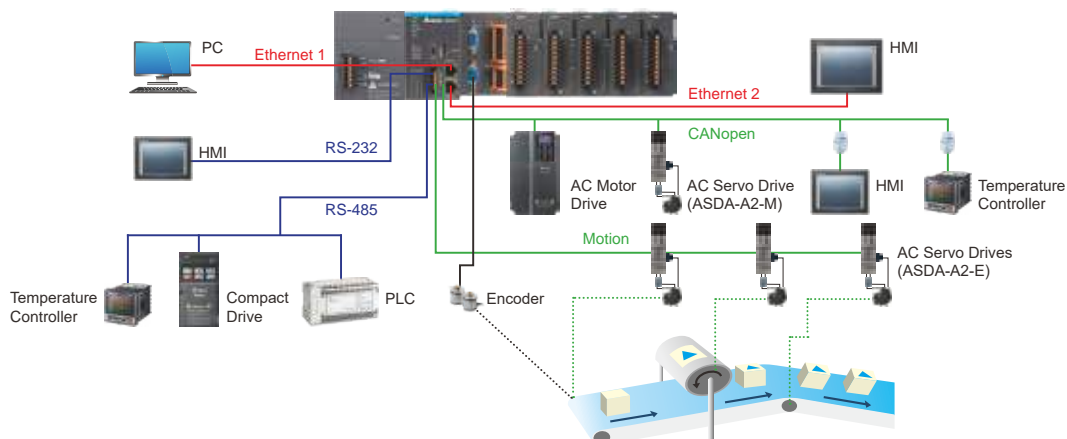
Higher Scalability in DVP-MC and AS500

The AS500 motion CPUs are designed based on Delta DVP-MC motion platform, which allows users to scale up/down their systems to AS/DVP systems without rewriting all programs

AS500

DVP15/50MC

Programs
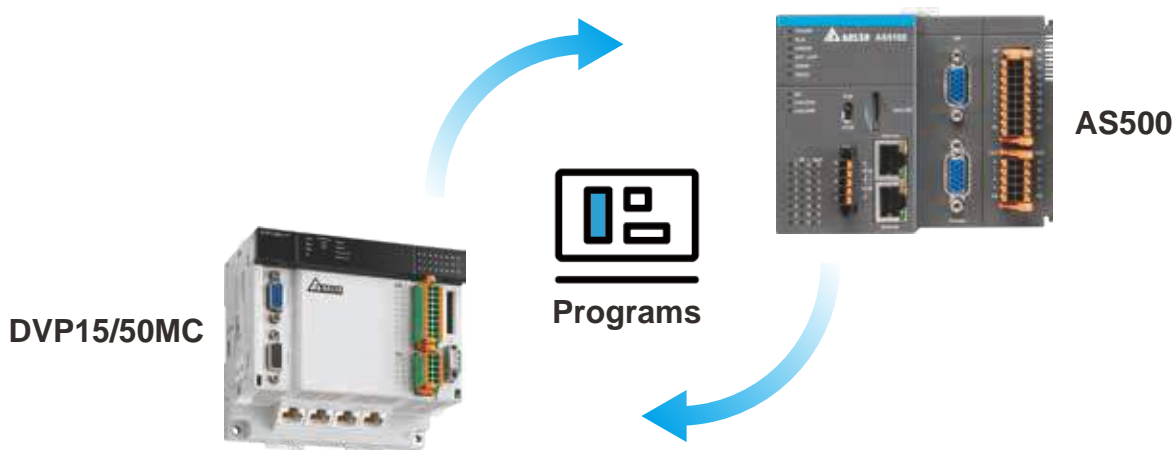
Highly Integrated CPU Design

The AS500 motion control CPUs feature various built-in I/O and communication protocols to satisfy customer needs of compact design and high performance

Micro SD card slot

SSI absolute encoder interface

16 DI

RS-232/485

8 DO

Incremental encoder interface x 2

Ethernet

AS516E	CANopen (2-port)		EtherCAT
AS524C	CANopen	CAN Motion	Ethernet

ΔELTA
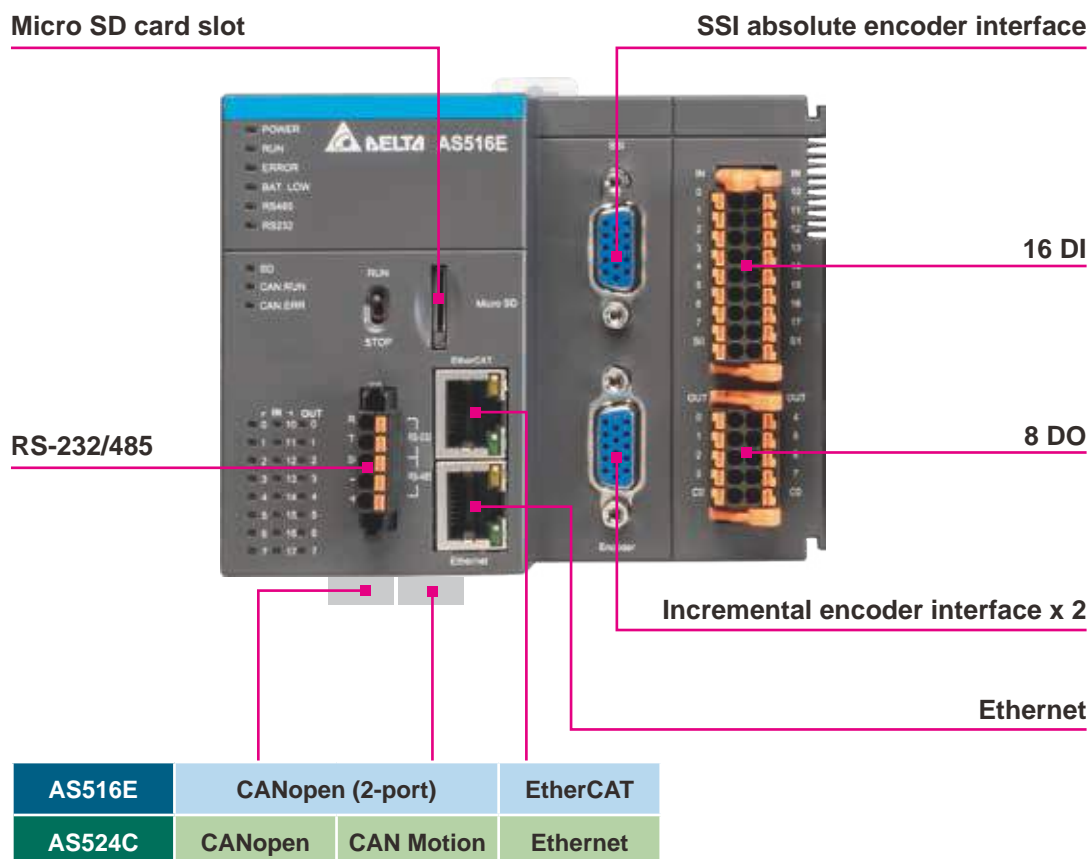
Compact Modular CODESYS Motion Controller
AX-3 New

Perfect Integration of High Performance, Flexibility and User-friendliness

CODESYS EtherCAT Motion Control System

- AX-308E CPU supports up to 8 axes EtherCAT servo drives (min. sync time: 2 ms / 8 axes)
- Supports AS power, DIO, AIO and temperature expansion modules (max. 32 modules)
- High performance, min. command execution time: 5 ns
- Various motion commands: position, velocity, torque, multi-axis interpolation, E-gear, E-CAM, etc.
- Built-in 16 DI & 8 DO, incremental encoder x 2, SSI absolute encoder, RS-232/485, Ethernet and EtherCAT interfaces
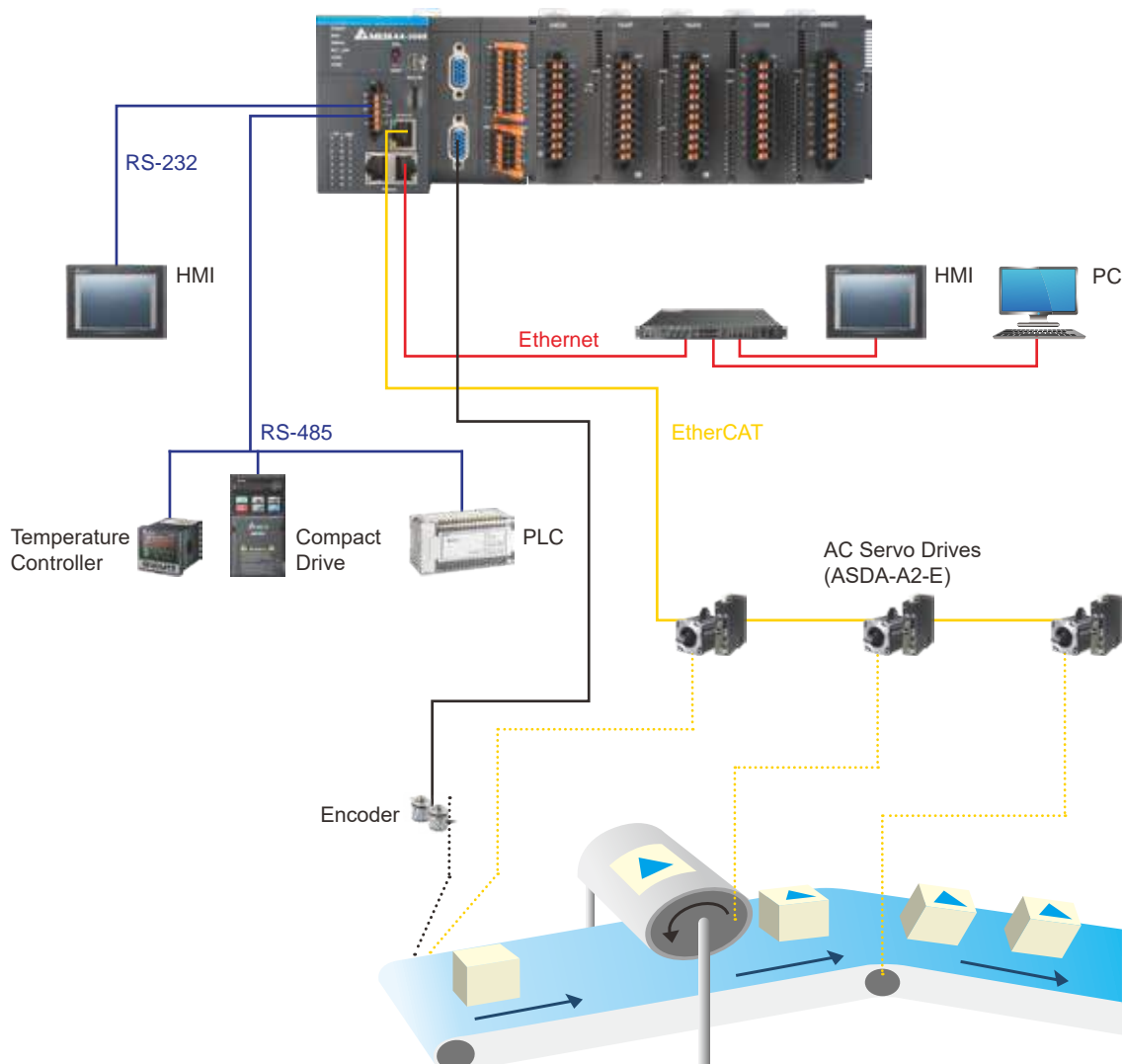
Benefits of CODESYS Platform

- IEC61131-3 standards
- High performance and stable operation system
- Enhances project development efficiency with a standardized programming and controller development platform for parameter setting, configuration and PLCOpen editing

Time Saving

IEC 61131-3

High Performance
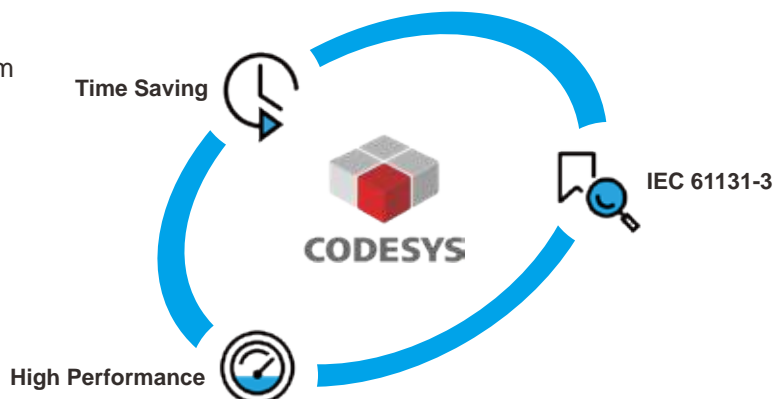
User-friendly Programming Software New

The DIADesigner+ is a new programming software for Delta AX series CPUs; it provides an optimized user-friendly programming environment and reduces programming time and efforts for users
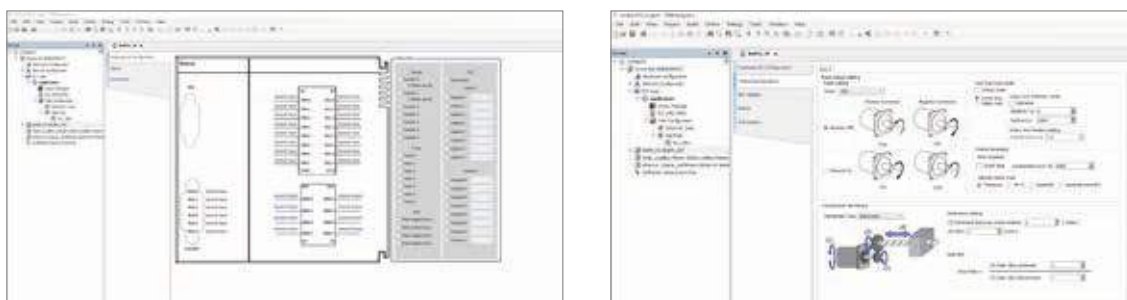
The user interface of built-in IO and axis parameter configuration

Highly Integrated CPU Design

The AX-3 motion control CPUs feature various built-in I/O and communication protocols to satisfy customer needs of compact design and high performance

Micro SD card slot

SSI absolute encoder interface

16 DI

RS-232/485

8 DO

Incremental encoder interface x 2

EtherCAT

Ethernet

NELTA
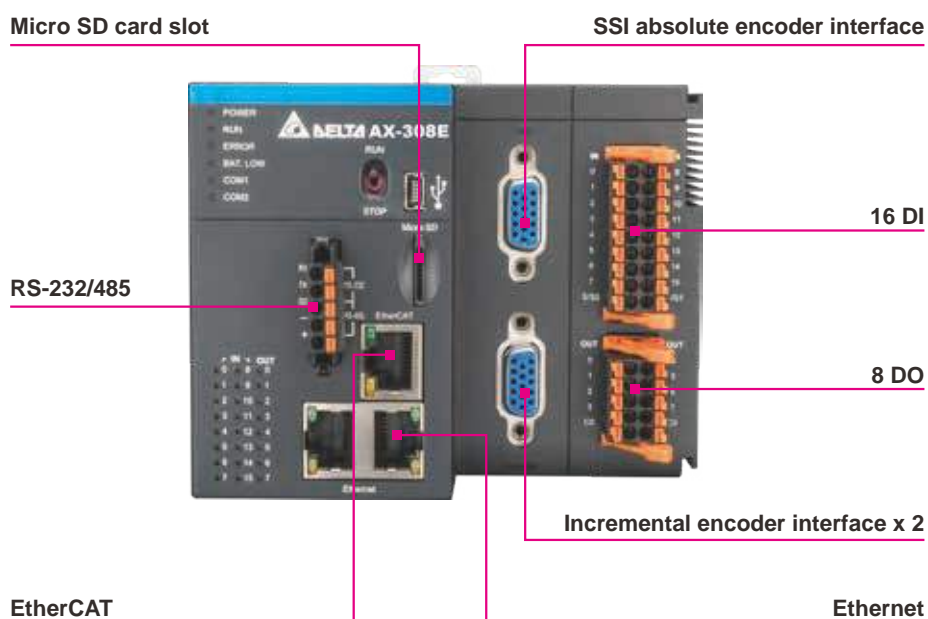
High Performance PLC
DVP-EH3

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

Program capacity		Data register	
EH3	**30k steps**	**EH3**	**12k words**
EH2	16k steps	EH2	10k words
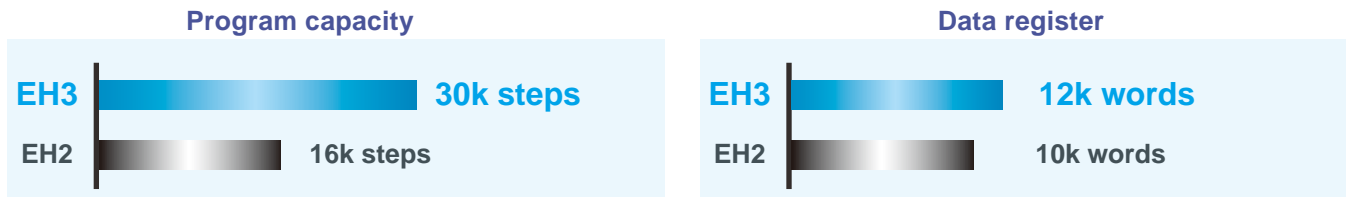
Excellent Motion Control

- 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)**

DVP-F232   DVP-F422   DVP-F485

- **Ethernet Communication**   • **Analog Input/Output**

DVP-FEN01   DVP-F2AD
                   DVP-F2DA

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 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: 200 kHz x 4 (pulse + direction) or 200 kHz 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 x 2: 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 DIO points
- Supports micro SD cards

Program Capacity

ES3	**64k steps**
ES2	**16k steps**

Data Register

ES3	**64k words**
ES2	**10k words**

Execution Speed

ES3	**40X**
ES2	**1X**

DELTA
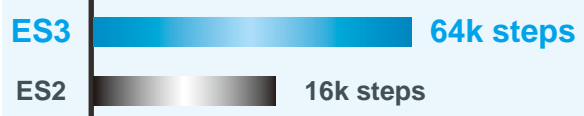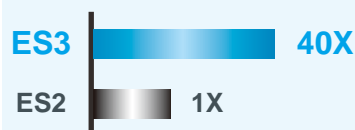
Modules

- **Digital I/O Modules**

Input Point Extension	**Output Point Extension**	**Input / Output Point Extension**
DVP08XM211N	DVP08XN211R/T	DVP08XP211R/T
DVP16XM211N	DVP16XN211R/T	DVP16XP211R/T
	DVP24XN200R/T	DVP24XP200R/T
		DVP32XP200R/T

- **Analog I/O Modules**

Input Point Extension	**Output Point Extension**	**Input / Output Point Extension**
DVP04AD-E2	DVP04DA-E2	DVP06XA-E2
	DVP02DA-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 ability 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: 1 Mbps)

- 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 μs

- Highly efficient processing abillity: 1k steps of programs can be processed within 1ms

- Max. 100 kHz 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

GOLDEN PIN
DESIGN MARK

reddot design award
winner 2010

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 μs

- Built-in Ethernet
  DVP12SE: Modbus & Ethernet/IP (explicit message)
  DVP26SE: Modbus & Ethernet/IP (adapter mode, explicit message)

- 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)

NELTA

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

Program Capacity

SV2	**30k steps**
SV	16k steps

Data Register

SV2	**12k words**
SV	10k words
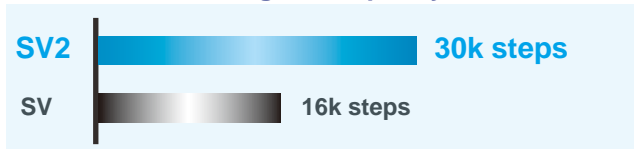
Excellent Motion Control

- High-speed pulse output: 4 axes of 200 kHz pulse output
- Supports max. 4 high-speed counters (200 kHz)
- Various motion control instructions to achieve high-speed and high-precision positioning control for labeling machines, packaging machines, printing machines and more 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

- **DeviceNet Master**
  DVPDNET-SL

- **Ethernet**
  DVPEN01-SL

- **RS-422 / RS-485 Serial Communication Module**
  DVPSCM12-SL

- **CANopen Master**
  DVPCOPM-SL

- **PROFIBUS DP Slave**
  DVPPF02-SL

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

Analog Input / Output Modules

- **Analog Input**
  DVP04AD-SL

- **Analog Output**
  DVP04DA-SL

Load Cell Modules

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 μs

- Built-in RS-232 and RS-485 ports (Master/Slave)

- Supports standard Modbus ASCII/RTU protocol and PLC Link function

- Motion control functions:
  - 4 points of 10 kHz pulse output
  - 8 points of high-speed counters: 20 kHz / 4 points, 10 kHz / 4 points

Advanced Slim PLC
DVP-SA2

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

- Program capacity: 16k steps

- Data register: 10k words

- Max. execution speed of basic instructions: 0.35 μs

- 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: 100 kHz / 2 points, 10 kHz / 2 points
  - 8 points of high-speed pulse input: 100 kHz / 2 points, 10 kHz / 6 points, 1 set of A/B phase 50 kHz
  - Supports 2-axis linear and arc interpolation

Analog I/O Slim PLC
DVP-SX2

Analog Type with Highly Efficient PID Control Function

- Program capacity: 16k steps

- Data register: 10k words

- Max. execution speed of basic instructions: 0.35 μs

- Built-in 4 analog inputs / 2 analog outputs

- Supports standard Modbus ASCII / RTU protocol and PLC Link function

- No battery required; RTC 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: 100 kHz / 2 points, 10 kHz / 2 points
  - 8 points of high-speed pulse input: 100 kHz / 2 points, 10 kHz / 6 points
  - Supports 2-axis linear and arc interpolation

NELTA

Multi-axis Motion Controller
DVP-10MC / 15MC / 50MC New

High Speed, High Precision, and High Performance Motion Control

6-axis Motion Controller
DVP15MC11T-06 (CANopen)
DVP50MC11T-06 (EtherCAT)

16-axis Motion Controller
DVP10MC11T (CANopen)

24-axis Motion Controller
DVP15MC11T (CANopen)
DVP50MC11T (EtherCAT)

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 16 k steps / Motion 1 Mbytes
  - 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)
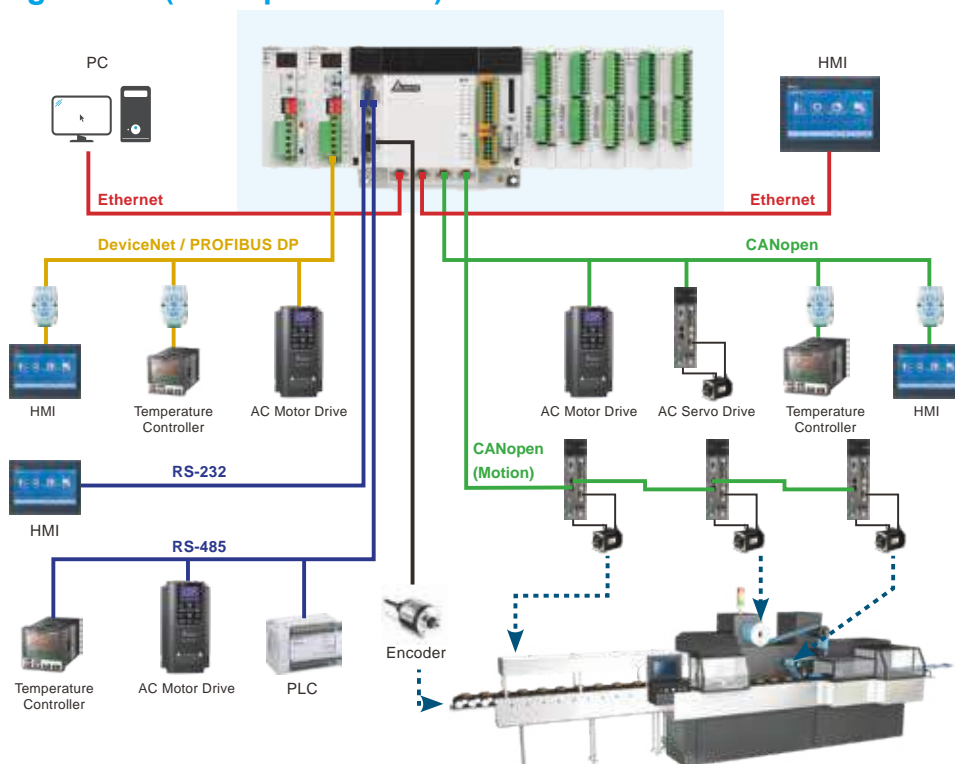
General Motion Controller
DVP-PM

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 µs, MOV: 2.1 µs
- 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. 500 kHz
  - Supports MPG inputs
  - Single-axis motion control function (supports MPG, single-speed and two-speed positioning)
  - Electronic gear function

NELTA

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 800 MHz 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 800 MHz 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

DELTA

Advanced Type HMI

15-inch Advanced HMI
DOP-115WX

- 15" 24-bit colors TFT / Display resolution: 1,024 x 768 pixels
- Dual core 1 GHz 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 New

- 7 " 65,536 colors TFT / Display resolution: 800 x 480 pixels
- Cortex-A8 800 MHz 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 New

- 8 " 65,536 colors TFT / Display resolution: 800 x 600 pixels
- Cortex-A8 800 MHz 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 New

- 10 " 65,536 colors TFT / Display resolution: 800 x 600 pixels
- Cortex-A8 800 MHz 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 New

- 10 " 65,536 colors TFT / Display resolution: 1024 x 600 pixels
- Cortex-A8 800 MHz 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 800 MHz 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 800 MHz 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 `New`

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

10-inch Standard HMI
DOP-110CS

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

10-inch Standard HMI
DOP-110CG `New`

- 10.4 " 65,536 colors TFT / Display resolution: 800 x 600 pixels
- Cortex-A8 800 MHz 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 `New`

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

WinCE Human Machine Interface
DOP-W

High Color, High Resolution Human Machine Interfaces

10-inch WinCE HMI
DOP-W105B

- 10.4" 65,536 colors TFT LCD
- Display resolution: 800 x 600 pixels
- 1 GHz high speed processor
- Supports audio output (MP3, Wav files)
- USB host for direct connection to USB disk, printer, mouse and keypad

- 2 Ethernet ports
- Supports SDHC cards
- Supports video formats: MPEG1, MPEG2, WMV
- Audio output: MP3, Wav files (built-in front speaker)

12-inch WinCE HMI
DOP-W127B

- 12" 65,536 colors TFT LCD
- Display resolution: 1,024 x 768 pixels
- 1 GHz high speed processor
- Aluminum enclosure with dark gray mold texturing
- 2 sets of COM ports, support RS-232 / RS-422 / RS-485
- USB host for direct connection to USB disk, printer, mouse and keypad

- 2 Ethernet ports
- Supports SDHC cards
- Supports video formats: MPEG1, MPEG2, WMV
- Audio output: MP3, Wav files (built-in frontspeaker)

15-inch WinCE HMI
DOP-W157B

- 15" 65,536 colors TFT LCD
- Display resolution: 1,024 x 768 pixels
- 1 GHz high speed processor
- Aluminum enclosure with dark gray mold texturing
- 2 sets of COM ports, support RS-232 / RS-422 / RS-485
- USB host for direct connection to USB disk, printer, mouse and keypad

- 2 Ethernet ports
- Supports SDHC cards
- Supports video formats: MPEG1, MPEG2, WMV
- Audio output: MP3, Wav files (built-in front speaker)

Handheld Human Machine Interface
DOP-H

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 (5 m / 10 m)

ΔELTA

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

Dimensions	3.8" (83 x 41 mm)
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-RM0

- Adopt the core of DVP-SS2 Series PLC: program capacity: 2k steps / D device: 5k words
- 7" TFT-LCD
- Touch screen
- Built-in USB port for program upload/download
- Built-in RS-232 and RS-485 ports
- Modbus ASCII/RTU modes
- Built-in real-time clock (RTC)

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	RS-232 & RS-485
Editing Software	TPEditor

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

- Adopts the CPU of DVP-SS2 Series PLC: program capacity: 4k steps / D device: 5k words
- Provides 2 sets of 10 kHz high-speed pulse input
- 7" TFT-LCD
- Touch screen
- Built-in USB port for program upload/download
- Built-in RS-485 port 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
TP04P

- Adopts the CPU of DVP-SS2 Series PLC: program capacity: 8k steps / D device: 5k words
- Provides 2 sets of 10 kHz high-speed pulse input
- 4.1" STN-LCD
- Provide 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

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
IS

- Nickel-coated brass
- Standard sensors for ferrous metal detection
- Electrical circuit protection
- IP67 and CE certification

Laser Displacement New
LD

- Aluminum case, robust structure
- Slim and small, easy to install
- High precision, sampling time setting available
- IP67 and CE certification
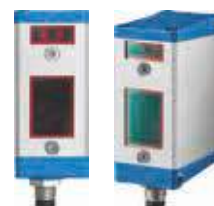
Area Sensor New
AS-B Standard

- 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: TX cable (grey) and CX cable (blue)

AS-E

- Aluminum case, robust structure
- Compact design: 17 x 15 mm
- Sensing distance: 5 m

Applications

Electronics, warehousing / logistics, wood and steel processing, textile, food and beverage, machine making, protection and more

NELTA

Rotary Encoder
ES / EH / HS / HH

Incremental

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

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

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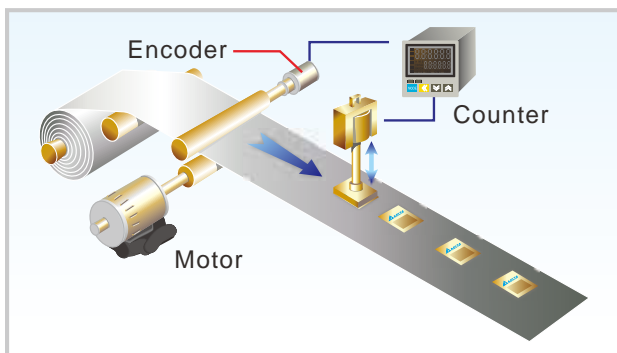
Label Printing Machine
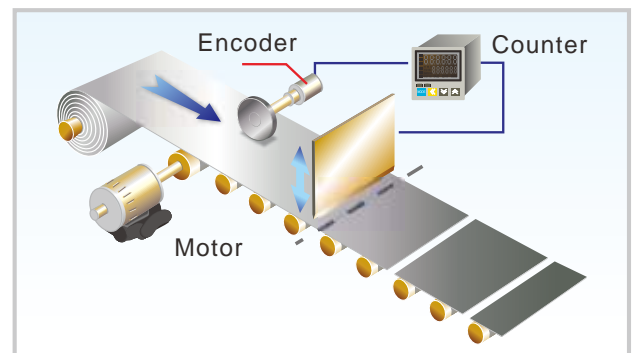
Cutting Machine
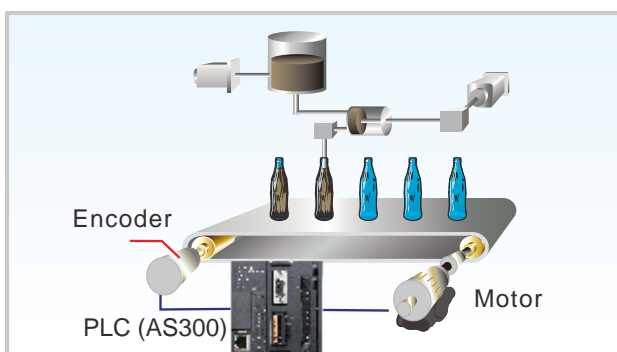
Bottling Machine
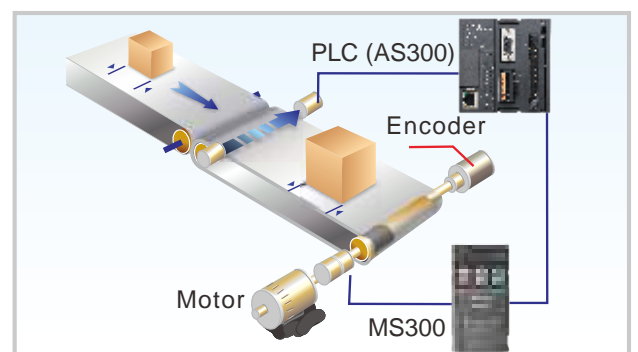
Testing / Inspection Machine

Applications

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

Handheld Barcode Scanner
DAH1000S / DAH2000H **New**

Wide Target Range, Fast and Reliable Capturing

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

- High-speed code capturing without aiming precisely
- Easy to read barcodes 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-defined data export of scanned codes for flexible usage
- Robust design: drop impact resistance at 1 m high
- No detachable components save maintenance cost

Advanced Decode Algorithm for Excellent Reading Performance

1D Codes (Barcodes)

Low contrast	Optical noise	Under glare	Damaged

2D Codes (QR Codes)

Optical noise	Ill-printed	Unevenly exposed	Ill-illuminated
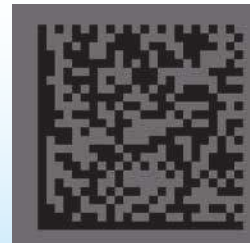
Applications

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

NELTA

Fixed-mount Barcode Scanner
DFS131

The DFS Series adopts built-in LED indicators and a CMOS sensor to ensure effective auto barcode detection under any lighting conditions when objects passing 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 DFS131 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
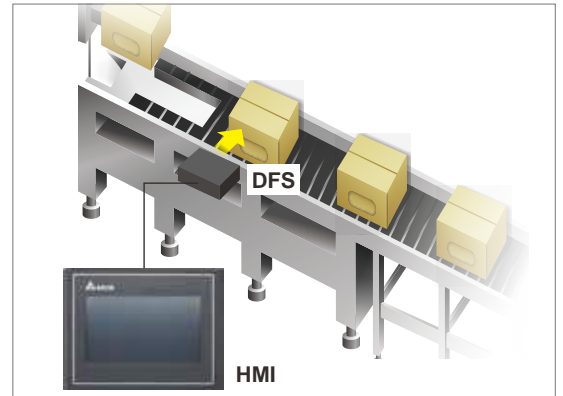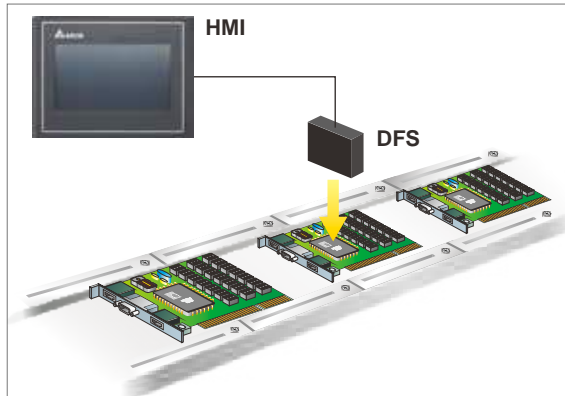
Applications

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 in 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 additional lighting device

System Structure
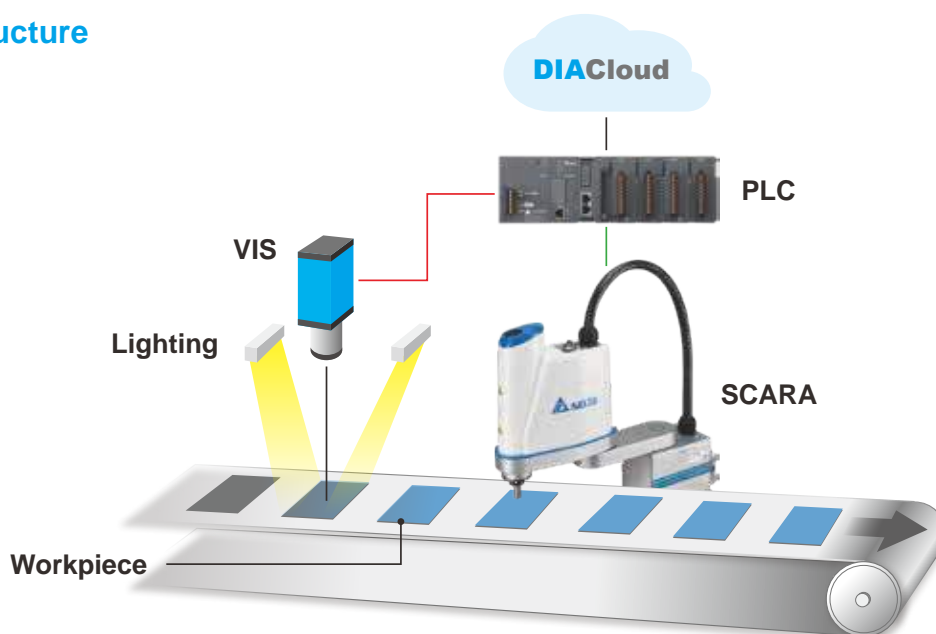
Applications

Automated quality inspection for packaging, electronics manufacturing and product assembly

| Barcode Reading | Quality Assurance | Object Inspection |

Advanced Intelligent Temperature Controller
DT3

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

Remote Control

Temperature settings via
analog output of host controller

Hotplate

Output control | Temperature signal input

0~20 mA, 4~20 mA
0~5 V, 0~10 V

Analog signal mA/V

Remote control via analog signal
or communication protocols
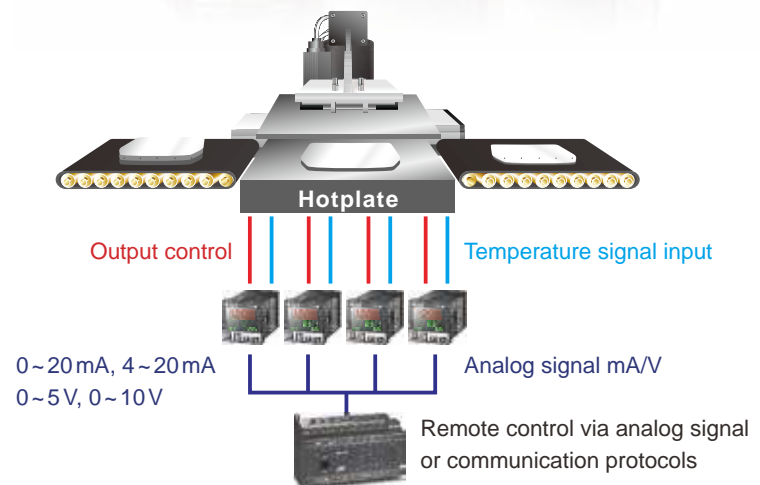
Various Control Modes

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

When disturbance occurs

PID control

Default value

Fuzzy PID control

The Fuzzy mode effectively reduces
temperature fluctuation

PID control

Fuzzy PID control
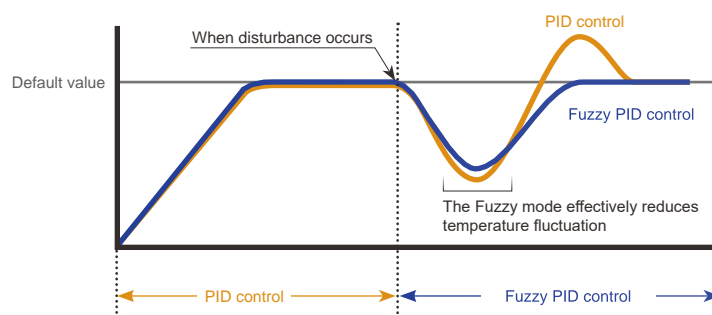
Applications

**Solar panel manufacturing, food 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 100 A

Point-to-Point Control (Proportional Output mA)

Sets the target value by point-to-point control

Retransmission Output

0 ~ 20 mA, 4 ~ 20 mA / 0 ~ 5 V, 0 ~ 10 V
Target Value Transmission mA/V

Current Transformer
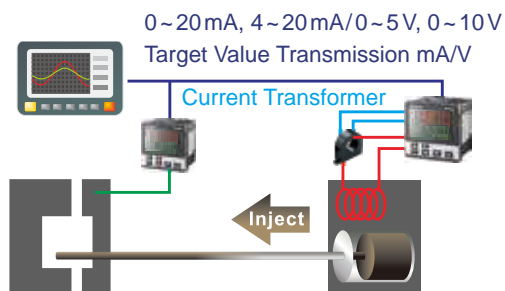
Dual-output Control

- 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

Output 2
(Cooling Control)

Output 1
(Heating Control)
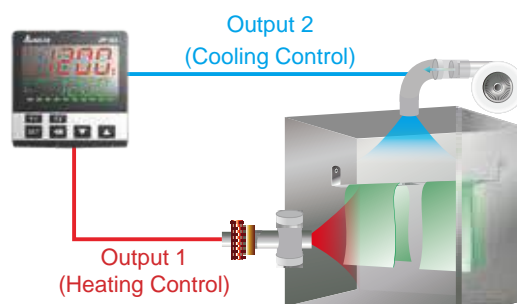
Temperature Sensor Input

- 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 100~240 V, 50/60 Hz
- Thermocouple: K, J, T, E, N, R, S, B, L, U, TXK (supports max. 8 sets of inputs)
- Platinum resistance: Pt100, JPt100 (supports max. 6 sets of inputs)
- RTD: Cu50, Ni120
- Output: Relay, current 4~20 mA, pulse voltage
- 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 100~240 V, 50/60 Hz
- 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: 48 x 48, 48 x 96, 72 x 72, 96 x 48, 96 x 96 (mm)
- IP66 protection
- Certifications: CE, UL

Advanced Temperature Controller
DTB

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

Modular Temperature Controller
DTC

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

Valve Controller
DTV

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

Multi-Channel Modular Temperature Controller
DTE

- Power input: DC 24 V ± 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 4~20 mA, pulse voltage, analog voltage 0~10 V
- Control mode: ON-OFF, PID, manual, PID process control
- Built-in Modbus communication
- 2 sets of alarm outputs, 18 alarm modes
- 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-saving

- 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, semiconductor, electronics, assembly automation

91
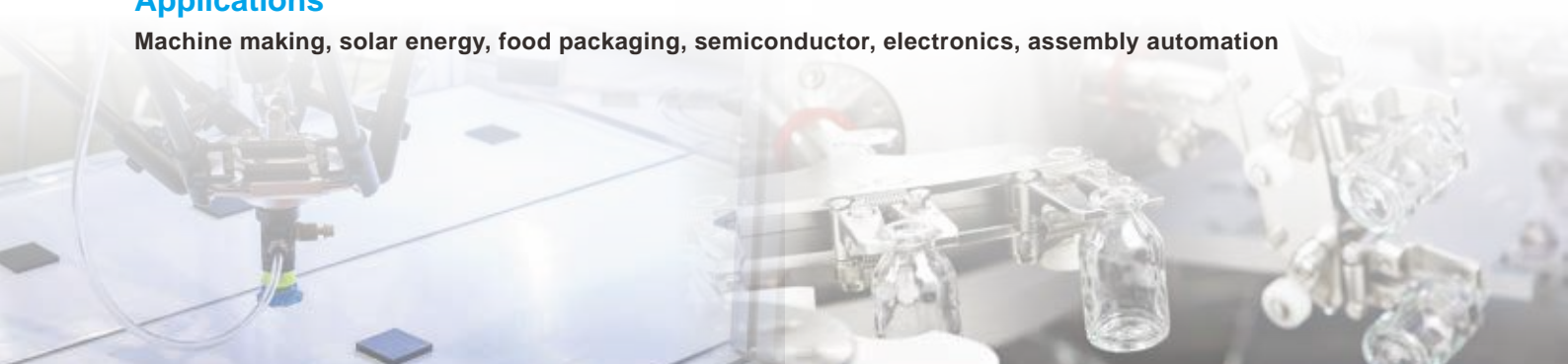
Flow Switch New
DFM

High-precision and Multiple Air Flow Range

- Flow range: 2 ~ 200 L/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, electronic manufacturing, rubber and plastic welding, Laser Beam Machining (LBM), air compressors (in factories and others), and nitrogen generator

Timer/Counter/Tachometer
CTA

All-in-One Device

- Power input: AC 100 ~ 240 V, 50/60 Hz, DC 24 V ± 10%
- Simultaneous counting and timing in the mixed mode
- 6-digit LCD display
- Max. counting speed: 10 Kpps
- 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
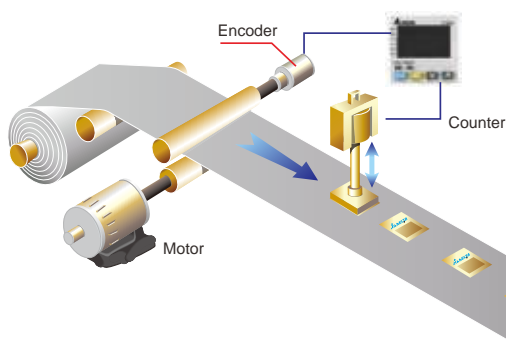
Fixed Length Cutting Machine
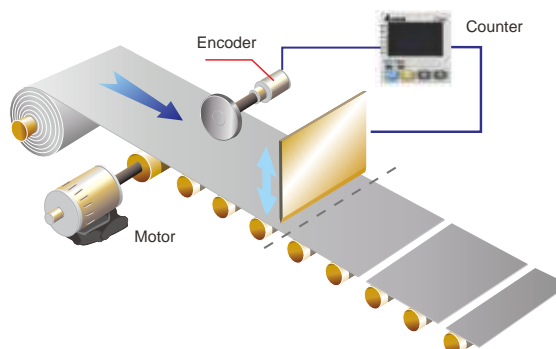
Power Meter
DPM
High Accuracy Solution for Reliable Power Monitoring

Precisely measures various electrical energy and power quality parameters (power factors, harmonics, and current/voltage unbalance) with functions such as off-limit alarms, history logs, communication quality and monitoring; suitable for power-critical applications

Product Introduction

Advanced Models		Standard Model	Wireless Model
DPM-C530	**DPM-C530E** New	**DPM-C520**	**DPM-C520W**
- **Front panel: 96 mm x 96 mm** - **History logs (62 days)** - **Demand calculation** - **Period energy accumulation** - **BACNet MS/TP**	- **Front panel: 96 mm x 96 mm** - **History logs (62 days)** - **Demand calculation** - **Period energy accumulation** - **BACNet MS/TP** - **RJ-45 x 2** - **Modbus, EIP**	- **Front panel: 96 mm x 96 mm**	- **Front panel: 96 mm x 96 mm** - **Modbus TCP** - **(Wifi, IEEE801.11 b/g/n)**

Compact Model	DIN-rail Model	Basic DI/DO Relay Model	Water Treatment Model
DPM-C310 New	**DPM-D520I**	**DPM-C501L**	**DPM-C502** New
- **Front panel: 72 mm x 72 mm**	- **Current measurement: 63 A** - **Period energy accumulation**	- **Front panel: 96 mm x 96 mm** - **4 DI / 2 DO**	- **Front panel: 96 mm x 96 mm** - **4 DI / 2 DO** - **History logs (14 days)** - **Demand calculation**

Features

- Precise measurement of bidirectional electrical energy and power parameters; compliant with IEC 62053-22
- Two mounting clips hold the meter in place, no other tools required
- Built-in RS-485 communication port supports Modbus protocol to transmit all values measured to PLC controllers
- Parameter grouping function expedites data transmission and PLC data reading for higher efficiency and performance
- Total Harmonic Distortion (THD) measurement function for power quality analysis
- User-defined alarm conditions for abnormal records

Applications

The DPM series are suitable for: energy usage monitoring, medium or low voltage distribution system, smart switch cabinet, energy management system, smart building, factory automation system, energy storage system, electric grid measurement, and energy quality analysis

The DPM-C520W is suitable for: elevators, semiconductor plants, high-ceiling plants, and mobility equipment

The DPM-D520I/D530I are suitable for: industrial machines, communication base stations, IIoT equipment, and areas where CT is difficult to install

Multi-factories Energy Management and Integrated Application

Corp. Control Room - Dashboard
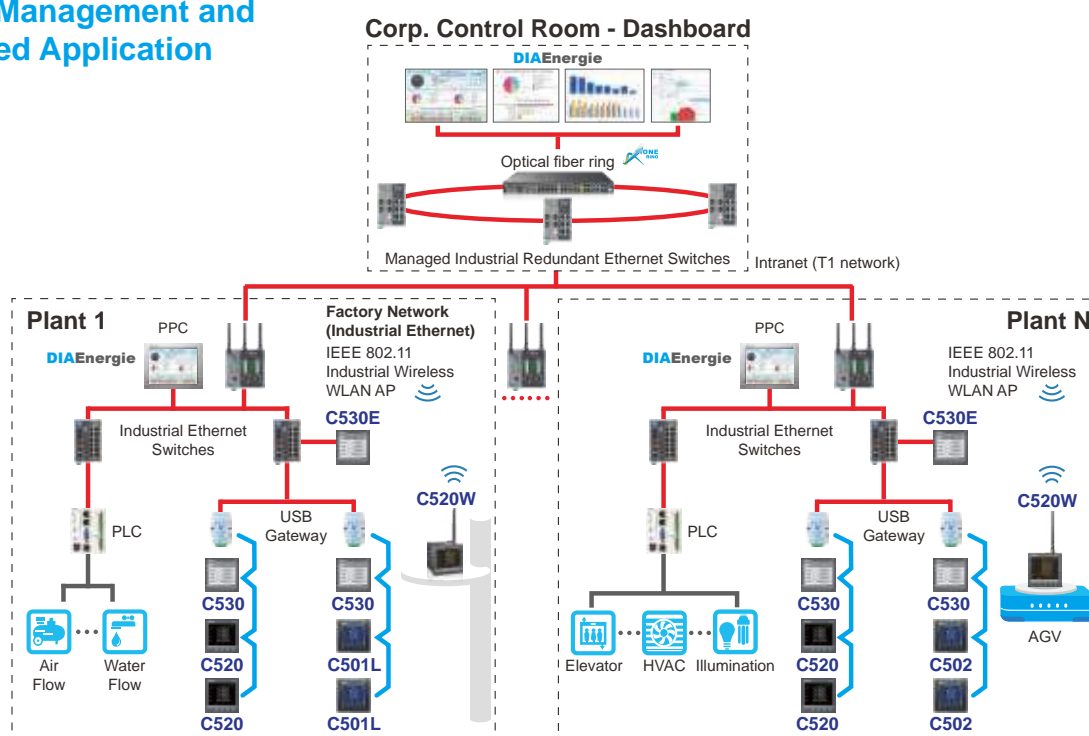
Factory Automation - Energy Consumption Analysis of Production Line
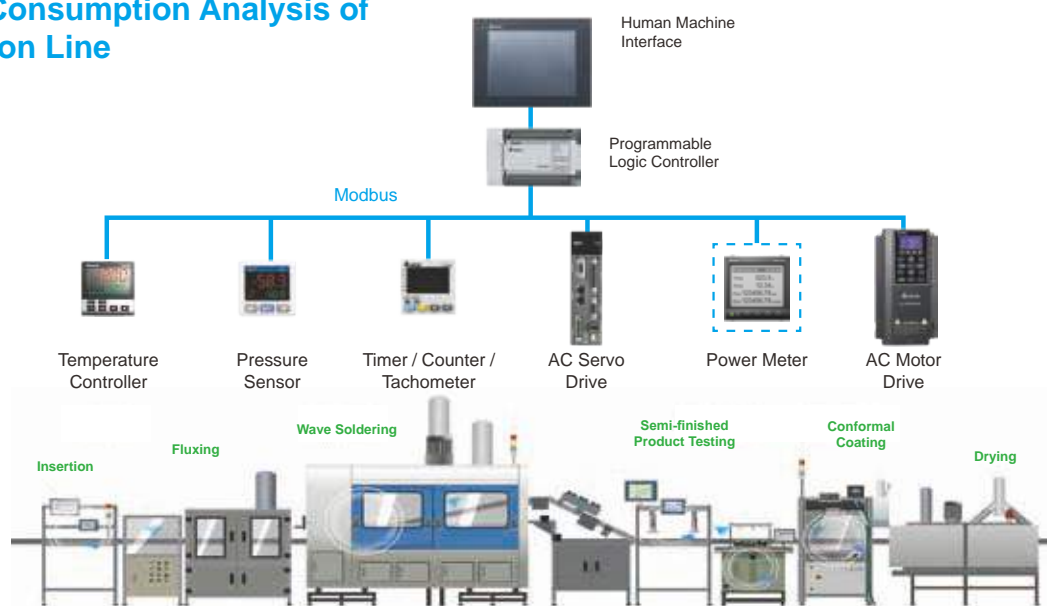
Machine Vision System ⓝⓔⓦ
DMV3000G

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 PC-based system

- 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
DMV2000

Multi-task operation for high-speed inspection applications

- Multiple cameras work synchronously in parallel processes to enhance efficiency and save development costs
- User-friendly operation interface
- Smart operation process and interface for faster programming
- Built-in multi-functional developing tools
- Superior hardware specifications compared with same grade products, achieving high-speed processing
- High-speed cameras with CameraLink interface
- Ethernet, RS-232, RS-485 interfaces for data output
- Compliant with high industrial standards; higher stability than PC-based system
- Built-in communication system connected by PLC, no need for extra programming
- Self-defined display and operation interfaces in operation mode
- Provides 2 types of controllers which support 2 or 4 cameras

High-speed Cameras with CameraLink Interface
Supports maximum 12 M pixels in gray scale using standard CameraLink cameras

Resolution		0.3 M	2 M	4 M	5 M	12 M
Level	**Mono**	√	√	√	√	√
	Color	√	√	√	√	√
Frame Rate		480 fps	295 fps	159 fps	35 fps	50 fps
Pixel Dimensions (Horizontal x Vertical)		640×480	2,048×1,088	2,048×2,048	2,448×2,048	4,096×3,072
Sensor Size		1/3"	2/3"	1"	2/3"	1.76"
Pixel Size (Horizontal x Vertical)		7.4 µm	5.5 µm	5.5 µm	3.45 µm	5.5 µm
Lens Mount		C mount	C mount	C mount	C mount	M42

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

Machine Vision System
DMV1000

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
- Standard FireWire 1,394 Series CCD
- 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 SD cards
- Compliant with high industrial standards; higher stability than PC-based systems

Applications

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

Bottle Cap Position Identification
Identifies the bottle capping position
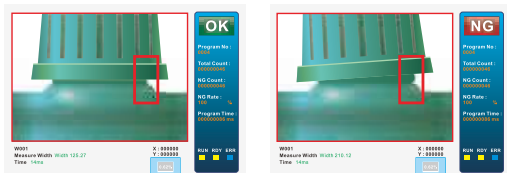
Direction Identification
Inspects the direction of workpieces conveyed on a production line
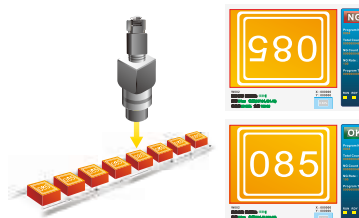
Beverage Packing Inspection
Inspects the liquid level of each bottle
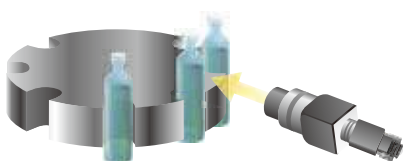
Character Inspection
Inspects the characters on electronic devices
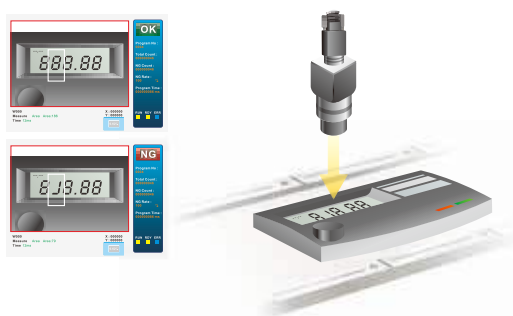
Luminance Inspection
Inspects LED luminance automatically
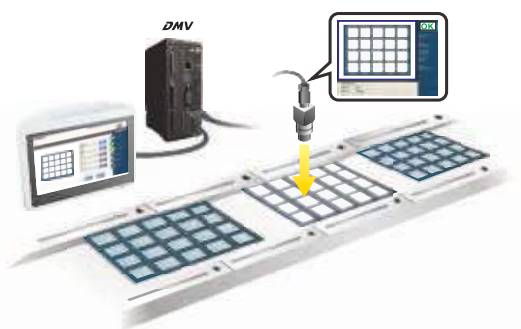
Position Identification
Inspects the position of IC components on PCBs
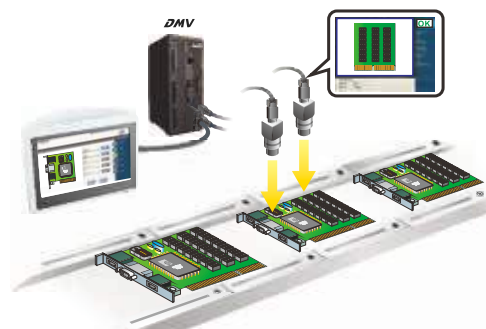
Module Inspection
Inspects mobile phone modules such as touch screens and buttons
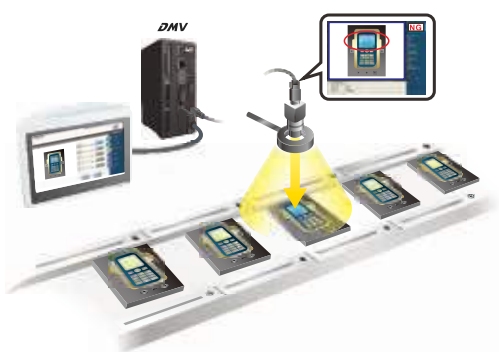
Object Counting
Counts the quantity of objects in a basket or carton

DELTA
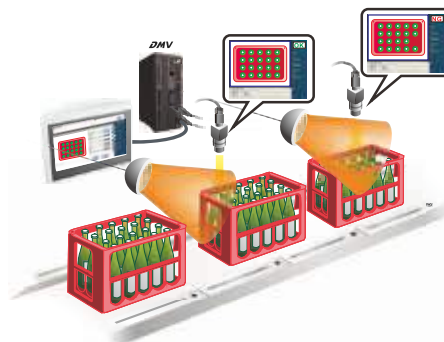
Industrial Power Supply

The World's Number One in Industrial Power Solutions

DIN Rail Models
CliQ, CliQ II, CliQ III, CliQ M, CliQ VA, Lyte, Chrome

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

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

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

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

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

Lyte	Model Name	Output Voltage	Output Power
	DRL-12V75W1AA	12 V	75 W
	DRL-24V75W1AA	24 V	75 W
	DRL-24V120W1AA		120 W
	DRL-24V240W1AA		240 W
	DRL-24V480W1AA		480 W
	DRL-48V75W1AA	48 V	75 W
	DRL-48V120W1AA		120 W

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

DIN Rail Models
Sync, DVP, Modules

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

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

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

DC-UPS Module	Model Name	Output Voltage	Output Power
	DRU-24V40ABN	24 V	40 A
	DRU-24V10ACZ		10 A

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

DIN Rail Power Management

50% Load	Redundancy Module	① Buffer Module	
	100% Load	Battery	
50% Load		② DC-UPS Module	
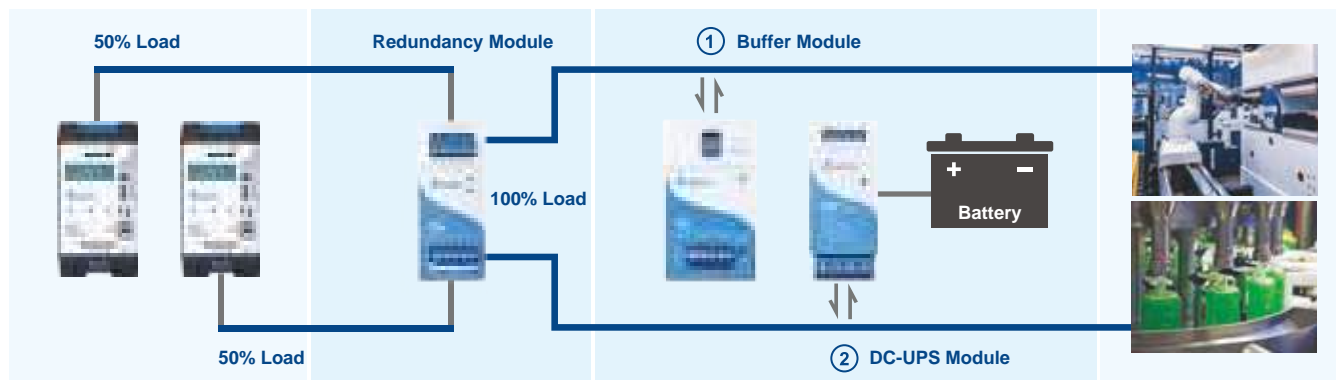
Industrial Power Supplies

Redundancy Module N+1 can be added to protect against system shutdown

1. Buffer Module allows a system to continue running even during sudden power sources disruption lasting from milliseconds to seconds

2. DC-UPS (Uninterruptible Power Supply) Module allows a system to continue running even during sudden power sources disruption lasting from minutes to hours

ΔELTA

Panel Mount Models
PMC, PMF, PMH, PMR, PMT, PMU

PMC	Model Name	Output Voltage	Output Power
	PMC-05V015W1AA	5 V	15 W
	PMC-05V035W1AA		35 W
	PMC-05V050W1AA		50 W
	PMC-12V035W1AA	12 V	35 W
	PMC-12V050W1AA		50 W
	PMC-12V060W1NA		60 W
	PMC-12V100W1AA		100 W
	PMC-12V150W1BA		150 W
	PMC-12V600W1BA		600 W
	PMC-24V035W1AA	24 V	35 W
	PMC-24V050W1AA		50 W
	PMC-24V075W1AA		75 W
	PMC-24V100W1AA		100 W
	PMC-24V150W1AA		150 W
	PMC-24V150W2AA		150 W
	PMC-24V150W1BA		150 W
	PMC-24V300W1BA		300 W
	PMC-24V600W1BA		600 W
	PMC-DSPV100W1A	24 V / 5 V	100 W
	PMC-48V150W1BA	48 V	150 W
	PMC-48V600W1BA		600 W

PMF	Model Name	Output Voltage	Output Power
	PMF-4V320WCGB	4.2 V	231 W
	PMF-5V320WCGB	5 V	275 W
	PMF-24V200WCGB	24 V	201.6 W
	PMF-24V240WCGB		240 W
	PMF-24V320WCGB		320 W

PMH	Model Name	Output Voltage	Output Power
	PMH-12V100WCLS	12 V	100 W
	PMH-12V100WCMS		100 W
	PMH-24V50WCAA	24 V	50 W
	PMH-24V100WCAA		100 W
	PMH-24V100WCCA		100 W
	PMH-24V100WCLS		100 W
	PMH-24V100WCMS		91.2 W
	PMH-24V100WCNS		91.2 W
	PMH-24V150WCBA		150 W
	PMH-24V150WCDA		150 W
	PMH-24V150WCLS		150 W
	PMH-24V200WCBA		200 W

PMR	Model Name	Output Voltage	Output Power
	PMR-4V320WCAA	4.2 V	252 W
	PMR-4V320WDAA		252 W
	PMR-4V320WDGA		252 W
	PMR-4V320WDBA		252 W
	PMR-4V320WDCA		252 W
	PMR-5V320WCAA	5 V	300 W
	PMR-5V320WDAA		300 W
	PMR-5V320WDGA		300 W
	PMR-5V320WDBA		300 W
	PMR-5V320WDCA		300 W

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

PMT	Model Name	Output Voltage	Output Power
	PMT-4V350W1AM	4.2 V	252 W
	PMT-5V35W1AA	5 V	35 W
	PMT-5V50W1AA		50 W
	PMT-5V350W1AM		300 W
	PMT-12V35W1AA	12 V	35 W
	PMT-12V50W1AA		50 W
	PMT-12V100W1AA		102 W
	PMT-12V150W1AA		150 W
	PMT-12V350W1AAR		348 W
	PMT-15V50W1AA	15 V	51 W
	PMT-24V35W1AA	24 V	35 W
	PMT-24V50W1AA		50 W
	PMT-24V100W1AA		108 W
	PMT-24V150W1AA		156 W
	PMT-24V200W1AM		211.2 W
	PMT-24V350W1AG		350.4 W
	PMT-24V350W1AM		350.4 W
	PMT-24V350W1AK		350.4 W
	PMT-24V350W1AR		350.4 W
	PMT-36V350W1AR	36 V	349.2 W
	PMT-48V150W1AA	48 V	158.4 W
	PMT-48V350W1AR		350 W
	PMT-D1V100W1AA	12 V / 5 V	100 W
	PMT-D2V100W1AA	24 V / 5 V	100 W

PMT2	Model Name	Output Voltage	Output Power
	PMT-12V35W2BA	12 V	36 W
	PMT-12V50W2BA		50.4 W
	PMT-12V75W2BA		72 W
	PMT-12V100W2BA		102 W
	PMT-12V150W2BA		150 W
	PMT-12V350W2BM		348 W
	PMT-12V350W2BR		348 W
	PMT-15V35W2BA	15 V	36 W
	PMT-15V50W2BA		51 W
	PMT-15V75W2BA		75 W
	PMT-15V100W2BA		105 W
	PMT-15V150W2BA		150 W
	PMT-24V35W2BA	24 V	36 W
	PMT-24V50W2BA		52.8 W
	PMT-24V75W2BA		76.8 W
	PMT-24V100W2BA		108 W
	PMT-24V150W2BA		150 W
	PMT-24V350W2BM		350.5 W
	PMT-24V350W2BR		350.5 W
	PMT-30V35W2BA	30 V	36 W
	PMT-30V50W2BA		57 W
	PMT-30V75W2BA		75 W
	PMT-30V100W2BA		105 W
	PMT-30V150W2BA		150 W
	PMT-36V35W2BA	36 V	36 W
	PMT-36V50W2BA		52.2 W
	PMT-36V75W2BA		75.6 W
	PMT-36V100WBA		100.8 W
	PMT-36V150W2BA		154.8 W
	PMT-36V350W2BR		349.2 W
	PMT-48V35W2BA	48 V	38.4 W
	PMT-48V50W2BA		52.8 W
	PMT-48V75W2BA		76.8 W
	PMT-48V100W2BA		110.4 W
	PMT-48V150W2BA		158.4 W
	PMT-48V350W2BR		350 W
	PMT-D1V75W2BA	12 V / 5 V	75 W
	PMT-D2V75W2BA	24 V / 5 V	75 W

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

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

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

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

PJT	Model Name	Output Voltage	Output Power
	PJT-12V40WBAA	12 V	40 W
	PJT-12V65WBAA		60 W
	PJT-12V100WBAA		100 W
	PJT-12V100WBBA		80 W [A] 100 W [B]
	PJT-15V40WBAA	15 V	40 W
	PJT-15V65WBAA		63 W
	PJT-15V100WBAA		100 W
	PJT-15V100WBBA		80 W [A] 100 W [B]
	PJT-18V40WBAA	18 V	40 W
	PJT-18V65WBAA		65 W
	PJT-18V100WBAA		100 W
	PJT-18V100WBBA		80 W [A] 100 W [B]
	PJT-24V40WBAA	24 V	40 W
	PJT-24V65WBAA		65 W
	PJT-24V100WBAA		100 W
	PJT-24V100WBBA		80 W [A] 100 W [B]
	PJT-27V150WBNA	V_1: 27 V V_{SB}: 12 V	150 W

A) Convection
B) Forced Cooling

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

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

Applicable Series

Building Automation
- Escalator & Elevator
- CCTV Surveillance
- HVAC Control

CliQ III, Lyte, Chrome, Sync, PMT, PMT2, PMC, PMH, PMU, PJT, PJ, PJU

Machine Automation
- Robotic Arm
- Injection Molding Machine

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

Renewable Energy
- Wind Turbine
- Solar Tracker System

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

Process Automation
- Petrochemicals Plant
- Waste Water Treatment
- Oil Refinery

CliQ, CliQ II, CliQ III, CliQ M, CliQ VA, Lyte, Chrome, Sync, PMT, PMT2, PMC, PMF, PMU
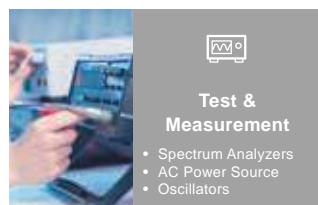
Test & Measurement
- Spectrum Analyzers
- AC Power Source
- Oscillators

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

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

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

LED Lighting
- Stage Lighting
- Signage

PMT, PMC, PMF, PMR, PJL

Food & Beverage
- Coffee Machine
- Vending Machine
- Kiosk

PMT, PMT2, PMC, PMH, PMF, PJT, PJ, PJB, PJH, PJU

DELTA

Industrial Ethernet & IIoT Solution
State-of-the-art Industrial Networking for Smart Industry

Layer 3 Managed Switch
DVS-G928W01 🆕New

- 28-Port full GbE (10GbE optional), modular design for flexible configuration
- Layer 3 routing function 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 larger network and neighbor discovery
- EtherNet/IP and Modbus TCP protocols that facilitates the remote management by SCADA and other industrial devices
- Proprietary redundancy RING and redundancy CHAIN high-end redundancy technology adopts easy-to-build multiple ring topology, with self-healing recovery time < 30 ms to ensure reliable network transmission
- Enhanced network security with IEEE 802.1X, TACACS+, SSH, HTTPS and SNMP v3
- IEEE 1588v2 PTP (Precision Time Protocol) for precise time synchronization of network
- Loopback-detection to avoid broadcast storms by automatically shutting down the ports over a switching loop
- Cable diagnostic to auto-detect and report potential cabling issues
- Auto warning by emails, relay, Syslog & SNMP trap
- Compatible with various industrial protocols, including EtherNet/IP, Profinet, CC-LINK IE and DNP 3.0
- $100 \sim 240$ V_{AC} and $125 \sim 370$ V_{DC} wide range redundant power input
- IP30 metal case, $-40^{\circ}C \sim 85^{\circ}C$ operating temperature
- Electrical substation: IEC 61850-3, IEEE 1613
- Rail traffic: EN 50121-4
- Certifications: 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 `New`

- 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 larger network and neighbor discovery
- Modbus TCP and EtherNet/IP protocols that facilitate remote management by SCADA and other industrial devices
- Proprietary ONE RING and ONE CHAIN high-end redundancy technology adopts easy-to-build multiple ring topology, with self-healing recovery time < 20 ms to ensure reliable network transmission
- 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 warning by emails, DI, relay, syslog & SNMP trap
- Compatible with various industrial protocols, including EtherNet/IP, Profinet, CC-LINK IE and DNP 3.0
- $85 \sim 264\,V_{AC}$ and $88 \sim 370\,V_{DC}$ wide range redundant power input
- IP40 metal case, -40ºC ~ 70ºC operating temperature
- Certifications: UL 60950-1, IEC 60950-1, CCC, CE, FCC and RCM

DVS-G116 `New`

- 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 larger network and neighbor 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; proprietary ONE RING Plus and ONE CHAIN Plus high-end redundancy technology adopts easy-to-build multiple ring topology, with self-healing recovery time < 10 ms to ensure reliable network transmission
- 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 warning 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, -40ºC ~ 75ºC wide operating temperature
- Certifications: UL 61010, IEC 62368-1, CE, FCC and RCM

DVS-G112 `New`

- 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 larger network and neighbor 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; proprietary ONE RING Plus and ONE CHAIN Plus high-end redundancy technology adopts easy-to-build multiple ring topology, with self-healing recovery time < 10 ms to ensure reliable network transmission
- 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 warning 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, -40ºC ~ 75ºC wide operating temperature
- Certifications: UL 61010, IEC 62368-1, CE, FCC and RCM

DVS-G106 `New`

- 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 larger network and neighbor 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; proprietary ONE RING Plus and ONE CHAIN Plus high-end redundancy technology adopts easy-to-build multiple ring topology, with self-healing recovery time < 10 ms to ensure reliable network transmission
- 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 warning 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, -40ºC ~ 75ºC wide operating temperature
- Certifications: 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 larger network and neighbor discovery
- Modbus TCP and EtherNet/IP protocols that facilitate remote management by SCADA and other industrial devices
- Proprietary ONE RING and ONE CHAIN high-end redundancy technology adopts easy-to-build multiple ring topology, with self-healing recovery time < 20 ms to ensure reliable network transmission
- Loopback-detection to avoid broadcast storms by automatically shutting down the ports over a switching loop
- DDM diagnosis function by SFP fiber module
- Auto warning by emails, DI, relay, syslog & SNMP trap
- IP40 metal case, -40ºC ~ 75ºC operating temperature
- Certifications: 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 larger network and neighbor discovery
- Modbus TCP and EtherNet/IP protocols that facilitate remote management by SCADA and other industrial devices
- Proprietary ONE RING and ONE CHAIN high-end redundancy technology adopts easy-to-build multiple ring topology, with self-healing recovery time < 20 ms to ensure reliable network transmission
- Loopback-detection to avoid broadcast storms by automatically shutting down the ports over a switching loop
- Auto warning by emails, DI, relay, syslog & SNMP trap
- IP40 metal case, -40ºC ~ 75ºC operating temperature
- Certifications: 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 larger network and neighbor discovery
- Modbus TCP and EtherNet/IP protocols that facilitate remote management by SCADA and other industrial devices
- Proprietary ONE RING and ONE CHAIN high-end redundancy technology adopts easy-to-build multiple ring topology, with self-healing recovery time < 20 ms to ensure reliable network transmission
- Loopback-detection to avoid broadcast storms by automatically shutting down the ports over a switching loop
- DDM diagnosis function by SFP fiber module
- Auto warning by emails, DI, relay, syslog & SNMP trap
- IP40 metal case, -40ºC ~ 75ºC operating temperature
- Certifications: UL 508, IEC 61131-2, CE, FCC and RCM

DVS-103 `New`

- 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, -20ºC ~ 70ºC operating temperature
- Certifications: UL 61010, IEC 62368-1, CE, FCC and RCM

PoE+ Managed Switch
DVS-G512

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

Unmanaged Switch
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
- EEE Green Ethernet for power savings
- IP40 metal case, -10ºC ~ 60ºC operating temperature
- Certifications: 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 warning by relay output for link-down and power failure
- 12 ~ 48 V_{DC} redundant terminal block power input
- IP40 metal case, -40ºC ~ 75ºC operating temperature
- Certifications: UL 508, IEC 61131-2, CE, FCC and RCM

DVS-G005I00C *New*

- 5-Port GbE
- Jumbo frame size up to 10k Bytes
- 12~48 V_{DC} redundant terminal block power input
- IP40 PC case, -20ºC~70ºC operating temperature
- Certifications : UL 61010, IEC 62368-1, CE, FCC and RCM

DVS-008W00-M12 *New*

- 8-Port 10/100Base-T(X) M12, ensures robust and tight connection
- Strong 5g resistance by extreme vibration environment
- 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
- -40ºC~75ºC wide operating temperature
- Certifications: 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 warning by relay output for power failure
- IP30 metal case, -40ºC~70ºC operating temperature
- Certifications: 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 30 W 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, -40ºC~70ºC operating temperature
- Certifications: CE, FCC and RCM

ΔELTA

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

- 1-Port 100/1000Base-T to 100/1000Base-SFP
- Jumbo frame size up to 10k Bytes
- Supports Link fault Pass-Through (LFP)
- 12 ~ 48 V_{DC} redundant terminal block power input
- IP40 PC case, -20ºC ~ 70ºC operating temperature
- Certifications : 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, -40ºC ~ 85ºC 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, -40ºC ~ 85ºC 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 30 W power supply
- Intelligent PoE input overvoltage protection
- Power output up to 27 W
- IP30 metal case, -20ºC ~ 70ºC operating temperature
- Certifications: CE, FCC and RCM

PoE+ Injector
DVS-G402

- 2-Port GbE for PoE+ data / power output and 2-Port GbE for data input
- All ports compliant with IEEE 802.3at and IEEE 802.3af standards, each provides 30 W power supply
- Intelligent PoE output overvoltage protection
- Built-in 12 V$_{DC}$ power booster for flexible PoE deployment
- IP30 metal case, -20ºC ~ 70ºC operating temperature
- Certifications: 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 (< 50 ms) 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 warning by emails, DI, relay, Syslog and SNMP trap
- IP40 metal case, -40ºC ~ 75ºC operating temperature
- Certifications: UL 508, IEC 61131-2, CE, FCC, RCM, BSMI, SRRC and NCC

DVW-W01I2-E1   New

- 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 (< 150 ms) among APs
- Multiple wireless modes: AP, Client, repeater
- Supports serial device servers and Modbus gateways
- Wireless QoS (IEEE 802.11e, WMM) for video packet transmission precedence
- Enhanced wireless security: WPA-PSK / WPA2-PSK (TKIP/AES)
- Modbus TCP protocol that facilitates the remote management by SCADA and other industrial devices
- Auto warning by emails, DI and relay
- IP40 metal case, -10ºC ~ 60ºC operating temperature
- Certifications: UL 61010, IEC 62368-1, CE, FCC, RCM, SRRC and NCC

ΔELTA

High-gain Antenna
DVW-ANT

- Supports IEEE 802.11 b/g/n or IEEE 802.11 a/b/g/n
- 2.4 & 5 GHz dual-band omni-directional 5.5 & 8dBi, or 2.4 GHz omni-directional 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
- -30ºC ~ 60ºC operating temperature

Industrial 4G/WAN Cloud Router
DX-3021L9 New

- 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
- Internet connection via cellular network or broadband interfaces; allows self-defined internet connectivity priority
- Firewalls: SPI, DoS attacks , IP/MAC filter
- IP30 metal case, -20ºC~70ºC operating temperature
- Certifications: 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, 2100 MHz
- GSM/GPRS/EDGE: 850, 900, 1800, 1900 MHz
- 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, -20ºC~70ºC operating temperature
- Certifications: 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, -20ºC～70ºC operating temperature

- Certifications: CE, FCC and UL

Industrial 3G/WAN Cloud Router
DX-3001H9 **New**

- 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, -20ºC ~ 70ºC operating temperature

- Certifications: 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, -20ºC ~ 70ºC operating temperature

- Certifications: 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
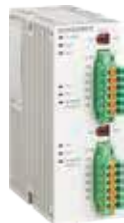
RS-422/485 Master Module
DVPSCM12-SL

- 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 baudrate, max. baudrate: 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

	UC-PRG020-12A **USB » RS-232**	• Delta programming cables • RS-232 port provides mini-DIN and DB9 connectors • A portable hot-plugging USB device, no power supply required
	IFD6500 **USB » RS-485**	• Lightweight design for easy portability • Auto-detection of data flow direction • A portable USB device • Supports Win XP, Win7 32 / 64-bit
	IFD6503 **USB » CAN**	• 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. 1 Mbps • A portable USB device
	IFD6530 **USB » RS-485**	• Lightweight design for easy portability • Auto-detection of data flow direction • Supports KPC-CC01keypad 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**	• RS-232 to RS-422 / 485 isolated converter • Auto transmission speed adjustment
	IFD8510A **RS-422/485**	• 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**	• 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**	• Bluetooth to RS-485/232 isolated converter • Supports Bluetooth GATT and Mesh mode • With external antenna

Industrial Network Converter

	IFD9502 **DeviceNet »** **Modbus**	• DeviceNet protocol • Able to connect Delta industrial automation products • Isolation in RS-485 channel (incl. power supply) • Full compatibility test passed
	IFD9503 **CANopen »** **Modbus**	• 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**	• 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

DELTA

Industrial Automation Solutions

Information

Industrial Wireless AP

Manufacturing Visualization & Management

DIAMMP

Industrial Ethernet Switch

Industrial Ethernet Switch

Manufacturing Execution

DIAMES

Industrial Managed Rack Mount Ethernet Switch

Control

Hot Swappable Mid-range PLC

CNC Controller

PAC

Electric Injection Molding Controller

DMCNET

Modbus

DMCNET

Field

Spindle Motor Drive

Servo System

Power Meter

Remote I/O

Power Meter

Servo Drive

Remote I/O Module

Clamp Axis
Injection Axis
Charging Axis
Ejector Axis

Metal Processing

Plastic Processing

Energy Management

DIAEnergie

Industrial Ethernet Switch

Production Management

DIAView

DIACloud

Try Me!

Industrial Ethernet Switch

Industrial 3G Cloud Router

ONE RING · ONE CHAIN **Fiber Ring** (recovery time < 20ms)

Equipment IoT Platform

Ethernet

Compact Modular Mid-range PLC

HMI

DOP

Compact Modular Mid-range PLC

HMI

DOP

7-inch Widescreen Handheld HMI

Robot Controller

EtherNet/IP

Modbus

DI/DO

USB

CANopen

Modbus

EtherNet/IP

DI/DO

SCARA Robot

Machine Vision System

Compact Drive

Area Sensor

Barcode Scanner

AC Servo Drive

Power Meter

Machine Vision System

Compact Drive

Smart Sensor

Assembly / Inspection

Packaging

ΔELTA

Industrial PC New
DIAV / IPC
Stable and High-performance Integration Platform

- IPC with 10"/12"/15"/17"/19"/21" TFT LCD touch screen
- Wide operating temperature range, suitable for applications in harsh industrial environments
- Fanless and low power Intel Core i3/i5/i7 and Celeron J1900 processor with high efficiency and excellent performance
- One-click start up click (power-on)
- Embedded Windows 10 operating system (Pro/IoT version) with 64G/128G/256G/512G SSD
- Full compatibility with SCADA and IEMS software platform

SCADA System (SCADA)
DIAView

Industrial Panel PC
DIAH-PPC15

Industrial PC
IPC-E200

Ethernet

Managed Industrial
Ethernet Switch
DVS-110W02-3SFP

Industrial PC
IPC-A300

Industrial PC
DIAVH-IPC

Modbus

Modbus

PLC
AS300

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

Plugin Program Manufacturing Process | FLUX Spraying | Wave Soldering | Semi-finished Product Testing | Damp Proof Coating | Damp Proof Membrane Furnace
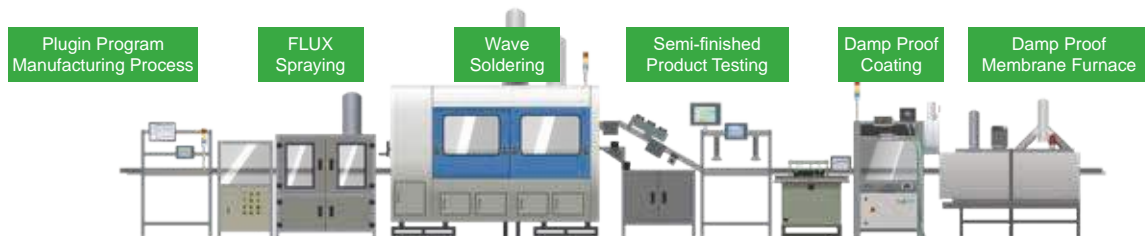
Applications

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

Factory Digitalization

- Factory data acquisition, process control and management
- Distributed system calculation for data and information storage and analytics
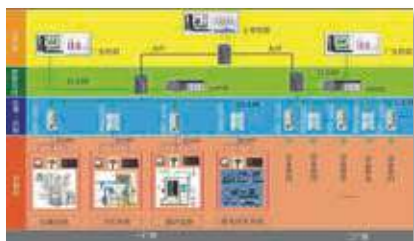
Factory Digitalization

Factory Equipment Monitoring

Inspection & Monitoring of Electronic Equipment

- DIAView interacts with the programming processes of PLCs and inspection equipment, realizing powerful group control
- With DIAView, the system can record daily production, identify qualified and unqualified products, and provide inquiry functions

Electronic Inspection Equipment

Inspection and Monitoring of Electronic Equipment

Logistic Application: Transportation and Stereoscopic Warehouse

- The database saves the location of materials; barcode scanning enhances load/unload and sorting efficiency to save space and labor costs

Warehousing System
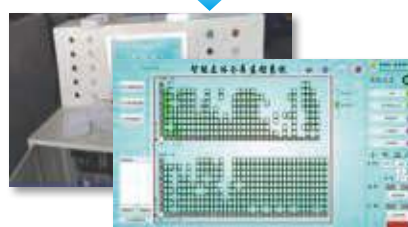
Warehouse Monitoring

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
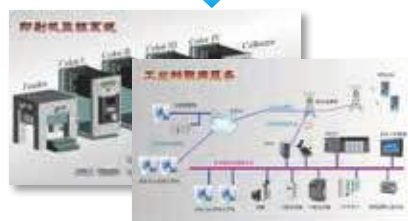
Equipment Remote Monitoring

Delta Articulated Robot
DRV

Automation for Smart Manufacturing Trend

- 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

New **New**

DRV70L **DRV90L** **DRVA1L7** **DRVA4L7**

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

PC

AC Servo Drives
ASDA-A2

Digital I/O Modules

AC Servo Motors
ECMA

Indicator Lights Push buttons

**Robot Controller
DCV**

Ext. Axes

Ext. Encoder

RS-232/485

**Machine Vision System
DMV 2000**

Indicator Lights Push buttons

**Teaching Pendant
DTV**

Safety Safety Fencing **Area Sensor
AS**

**Articulated Robot
DRV70L / DRV90L
DRVA1L / DRVA4L**

Product Specifications

Model		DRV70L	DRV90L	DRVA1L	DRVA4L
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	±170º (450º/sec)	±170º (370º/sec)	±170°(240º/sec)	±170°(200º/sec)
	J2	+133º / -105º (340º/sec)	+135º / -105º (260º/sec)	+135 / -105 (220º/sec)	+135 / -105 (165º/sec)
	J3	+65º / -205º (510º/sec)	+65º / -205º (410º/sec)	+60 / -205 (295º/sec)	+60 / -205 (220º/sec)
	J4	±190º (550º/sec)		±190º (465º/sec)	
	J5	±120º (550º/sec)		±120º (480º/sec)	
	J6	±360º (820º/sec)		±360º (705º/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 ºC ~ 40 ºC			
	Humidity	20 ~ 85%RH			
	Vibration	0.5 G			
Weight		37 kg	39 kg	76 kg	82 kg
Controller Series		Robot Controller DCV Series			

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

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

• High Flexibility / Multiple Installations

- Max. working range: 710mm ~ 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
Enhance reliability of extension wire / cords

• Simple and User-Friendly Operation Interface

DRAStudio Robotic Automation Studio software system

Intuitive user interface

- Real-time equipment data
- Dynamic-link library
- Self-defined user 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**

DELTA

SCARA Robot
DRS

High Repeatability, High Precision, Excellent Linearity and Verticality

DRS40L   **DRS60L**   **DRS80LC**

New

Teaching Pendant
DTS

Robot Controller
DCS

Product Specifications						
Model	New 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°
Motion Range J2	±145°	±146.6°	±148°	±153°	±153°	±153°
Motion Range J3	150 mm	150 mm	150 mm	200 mm / 300 mm	200 mm / 300 mm	200 mm / 300 mm
Motion Range J4	±360°	±360°	±360°	±360°	±360°	±360°
Motion Range J5	-	-	-	-	-	-
Motion Range J6	-	-	-	-	-	-
Maximum Speed J1	4,058 mm/s	4,710 mm/s	4,050 mm/s	4,400 mm/s	5,000 mm/s	5,500 mm/s
Maximum Speed J2						
Maximum Speed 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
Maximum Speed J4	1,875°/s	1,875°/s	1,875°/s	2,000°/s	2,000°/s	2,000°/s
Maximum Speed J5	-	-	-	-	-	-
Maximum Speed 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	0.01 kg-m^2	0.01 kg-m^2
Allowable Inertia Moment Max.	0.075 kg-m^2	0.075 kg-m^2	0.075 kg-m^2	0.023 kg-m^2	0.023 kg-m^2	0.023 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 25ºC 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 25ºC and within a humidity of 45% ~ 65% RH (non-condensing).

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

Loading/Unloading	Insertion	Glue Dispensing

Product Inspection	Screw-Driving	Soldering
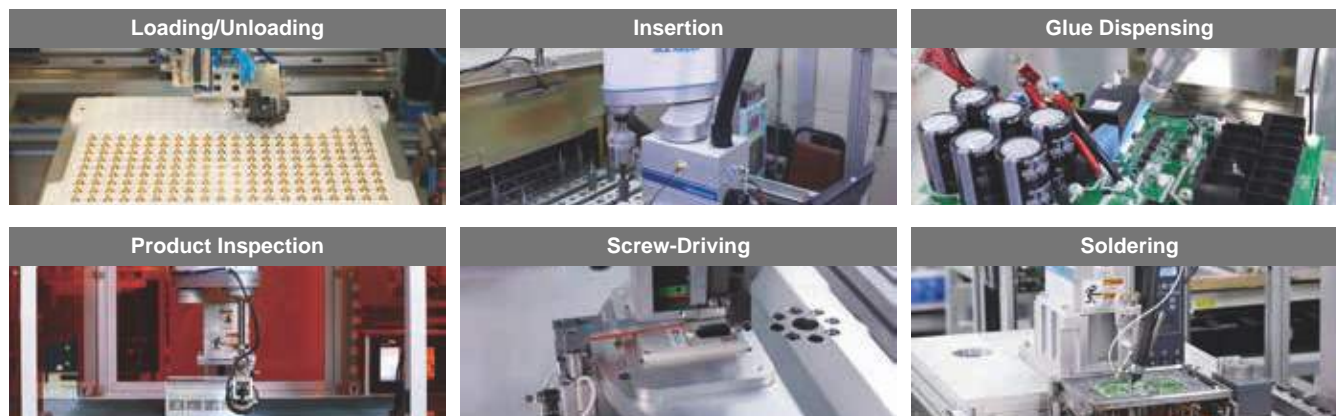
Product Specifications

Model		New DRS60LC SS1BN002	New DRS70LC SS1BN002	New 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°	±133°
	J2	±152.5°	±152.5°	±152.5°	±150°	±153°	±153°
	J3	200 mm / 420 mm	200 mm / 420 mm	200 mm / 420 mm	200 mm	200 mm	200 mm
	J4	±360°	±360°	±360°	±360°	±360°	
	J5	-	-	-	-	±360°	-
	J6	-	-	-	-	-	-
Maximum Speed	J1	7,100 mm/s	7,700 mm/s	8,300 mm/s	5,000 mm/s	5,500 mm/s	5,000 mm/s
	J2						
	J3	118 mm/s	1,180 mm/s	1,180 mm/s	1,100 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		
	Max.	0.25 kg*m^2	0.25 kg*m^2	0.25 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 25mm in vertical and 300mm in horizontal directions under an operating temperature of 25ºC 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 25ºC 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
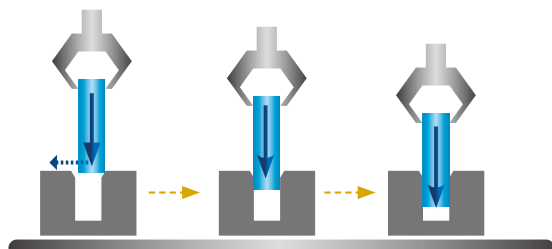
  - Insertion performance may differ depending on workpiece hardness

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

| PAD | HMI | Teaching Pendant | PC |

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

- **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 total solution

- **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

- **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
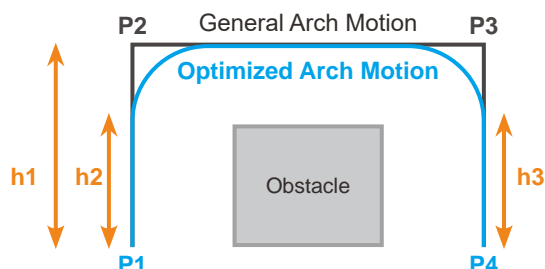
- **Optimizes Operational Efficiency**
  - Safe operation, improves operational stability
  - Excellent dynamic display for operational efficiency and intelligent control
  - Smart temperature control, real-time control of working environment
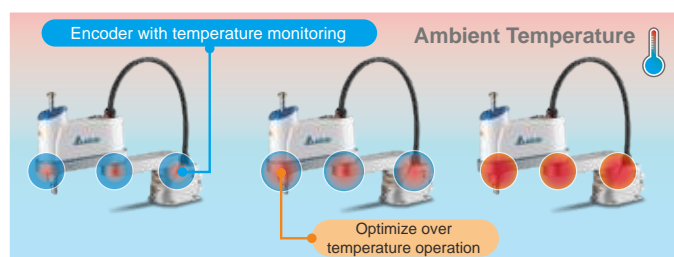
Normal Mode   **Adjustment Mode**   **Overload Mode**

Delta Screw Driving Robot ᴺᵉʷ
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: 0.32~43 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
SCARA Robot	Number of Axes	3					4				
	Arm Length (1 + 2 axis)	600 mm									
	Max. Speed — J1+J2	5,000 mm/sec									
	Max. Speed — J3	1,100 mm/sec									
	Max. Speed — J4	N.A.					600°/s				
	Range of Motion — J1	±133°					±133°				
	Range of Motion — J2	±153°					±153°				
	Range of Motion — J3	200 mm					200 mm				
	Range of Motion — J4	N.A.					±105°				
	Repeatability — J1+J2	±0.015 mm					±0.015 mm				
	Repeatability — J3	±0.01 mm					±0.01 mm				
	Repeatability — J4	N.A.					±0.01 mm				
	Net Weight	20 kg									
Delta Screw Driving Robot Module	Torque (kgf/cm)	0.32~1.8	1.5~9.0	1.5~9.0	6.0~25.0	10.0~43.0	0.32~1.8	1.5~9.0	1.5~9.0	6.0~25.0	10.0~43.0
	Torque (N/m)	0.03~0.17	0.15~0.88	0.15~0.88	0.58~2.45	0.78~4.20	0.03~0.17	0.15~0.88	0.15~0.88	0.58~2.45	0.78~4.20
	Max. Speed (rpm)	2,000	2,000	2,000	1,200	1,000	2,000	2,000	2,000	1,200	1,000
	Dimensions (L x W x H, mm)	250 x 57 x 63	250 x 57 x 63	250 x 57 x 63	318 x 57 x 63	318 x 57 x 63	250 x 57 x 63	250 x 57 x 63	250 x 57 x 63	318 x 57 x 63	318 x 57 x 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
	Screw Size — Screwdriver Bit	Ø4	Ø5	Hex 1/4"	Hex 1/4"	Hex 1/4"	Ø4	Ø5	Hex 1/4"	Hex 1/4"	Hex 1/4"
Environment	Ambient Temperature	5ºC~40ºC									
	Storage Temperature	-20ºC~55ºC									
	Humidity	0~90% RH (non-condensing)									

Delta Robotic Simulation Platform
DRASimuCAD

One software for workstation design, simulation and operation path generation, saving setup time and boosting introduction efficiencys.

- 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 abnormities, detects collision and operation range limitation, 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
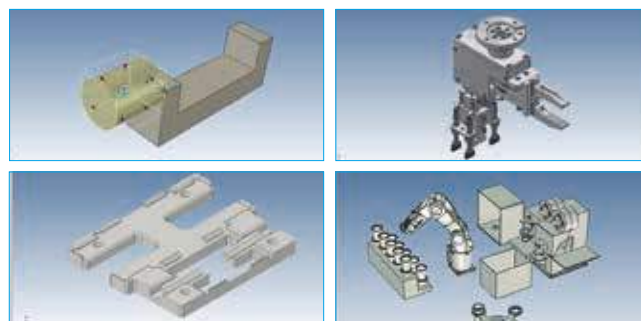
Virtual Robot Simulation

- 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 DRAStudio, allowing teaching points, setting coordinate system (user frame / tool frame) and creating robot project
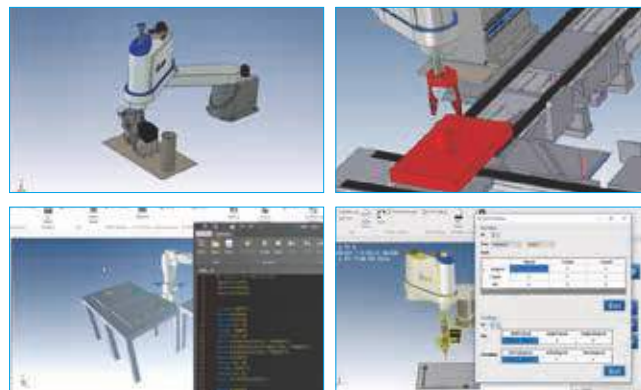
Path Generating (CAM)

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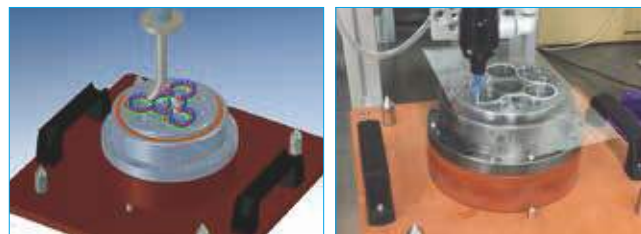
Applications

Conveyor belt dynamic processing simulation, deburring, sole gluing

Equipment IoT Platform
DIALink

DIAEnergie
Industrial Energy Management System

Power Monitoring

Rate Analytics

Demand Control

DIAView
SCADA System

Real-time Monitoring

Data Acquisition

Alarm Management

DIAMES
Manufacturing Execution System

Production Process Management

Equipment Management and Maintenance

Overall Equipment Effectiveness (OEE) Management

Equipment Data Acquisition

Easy Programming

Software and Hardware Integrating Platform

Seamless Data Transmission

Equipment Monitoring and Data Acquisition

Features

- Supports all major CNC controllers and PLCs
- Equipment monitoring and data acquisition
- Data temporary storage function

Benefits

- Equipment data digitalization and management
- Customized (user-defined) real-time information visualization
- Machine abnormality and idle time monitoring
- Enhanced equipment efficiency with Overall Equipment Effectiveness (OEE)

Applications

- Real-time equipment data collection
- Equipment analysis and management
- Remote monitoring and control

Equipment Management System

APP

Database

RS-232

DIALink

3G Industrial Cloud Router

Ethernet

Industrial Network Converter

RS-232

Articulated Robot

ΔELTA
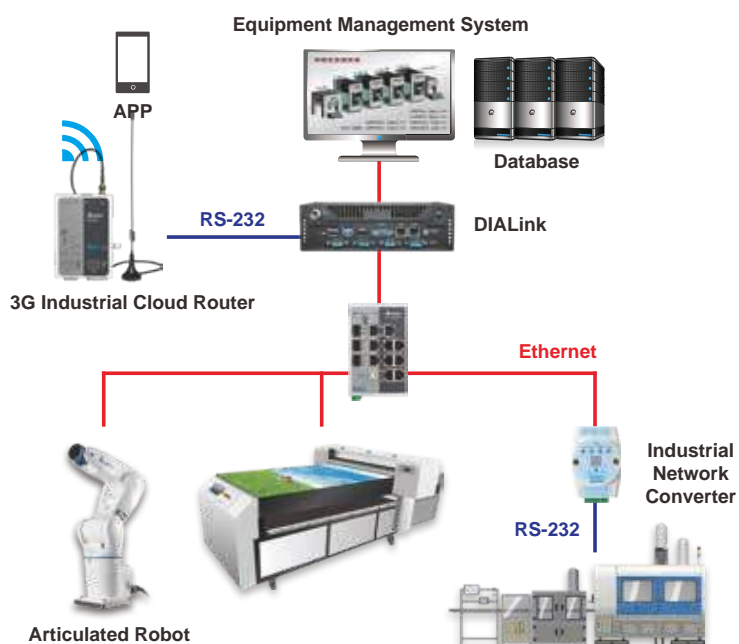
Rapid, Seamless and Secure Data Transfer

- Supports Modbus slaves, XML, JSON data formats
- Open Web API

Data Collection (DIALink)

CNC Machine Tools

DIALink for CNC Machines

Robots

DIALink for Robots

PLCs

DIALink for PLCs

Modbus

Drivers
Web API

Management Platform

SCADA System
DIAView

- Real-time monitoring
- Data acquisition & visualization
- Alarm management

Industrial EMS
DIAEnergie

- Energy consumption diagnosis & tracking
- Electricity cost analysis
- Demand analysis and control

Web API

MQTT

Cloud Platform (DIACloud)

DIACloud

- Real-time monitoring
- Equipment management
- Service management

- Remote monitoring and control
- Client monitoring

DIALink for CNC Machines / PLCs / Robots

| CNC DIALink | PLC DIALink | Robot DIALink (Compatible with Delta Robots) |

Equipment IoT Platform DIALink

DIALink mini

CNC Machine Tools
Tapping / Milling / Machining

PLC
Packing / Printing / Surface Mounting / Soldering / Laser Engraving

Delta Robot
Industrial Robots
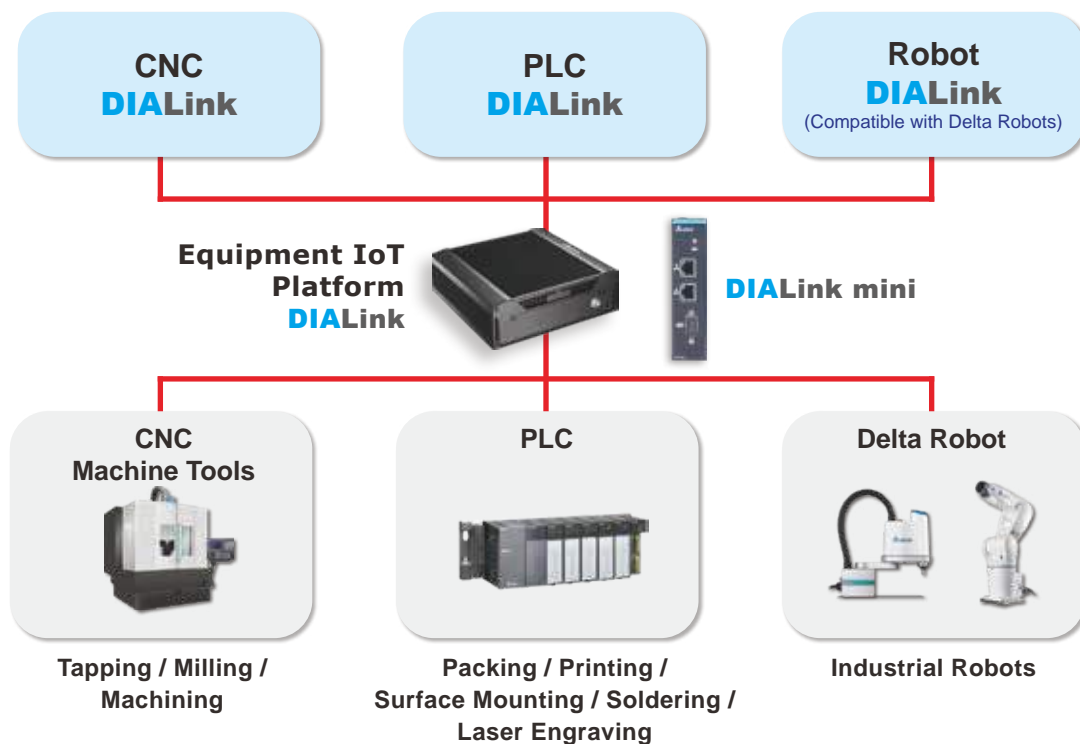
SCADA System

DIAView

Evolution of Factory Visualization, Digitalization, and Management

- Seamless integration with Delta's PLC products and I/O modules, supporting various industrial communication protocols and equipment drivers
- WPF technology for intuitive and vivid displays, and easy-to-navigate interfaces
- Flexible variables dictionary and batch editing parameters
- A variety of data visualization tools: reports, alarms, charts and trend graphs
- Diversified real-time and historical data analysis tools
- Strong and efficient alarm management
- Easy-to-learn VBScript language
- Reliable user authority management for different user levels

System Structure and Applications

DIAEnergie IEMS

DIAView SCADA System Standalone version

DIAView SCADA System C/S version

DIAView SCADA System Web version

Ethernet

Managed 10-Port Ethernet Switch
DVS-110W02-3SFP

Fiber Ring

Ethernet

Hot Swappable Mid-range PLC
AH500

Analog I/O Slim PLC
DVP20SX2

Network Type Advanced Slim PLC
DVP-12SE

HMI DOP

Fan/Pump Vector Control Drive
CP2000

Advanced Intelligent Temperature Controller
DT3

Advanced Multifunction Power Meter
DPM-C530

Air Compressor System

Water Treatment

HVAC System

Power System
Lighting System
Production Workshop

Applications

HVAC, water treatment, central heating, electronics manufacturing

Industrial Energy Management System

DIAEnergie

Innovative Solution for Smart Energy Saving

- Visualization and remote monitoring of critical power consumption
- Data analysis by areas and user levels
- Monitoring and analysis to meet energy performance strategy
- Real-time alarms for anomalies
- Power consumption measurement and analysis to achieve efficient electricity usage and cost savings
- Demand management and forecast to avoid over-limit demand penalties
- User-defined reporting tools for visualized data display

System Structure and Applications

Centralized Control and Management Center

DIAEnergie IEMS

DIAView SCADA System

Internet

Internet

DIACloud Platform

Ethernet

Hot Swappable Mid-range PLC AH500

RS-485

Unmanaged 16-Port FE Ethernet Switch DVS-016

HVAC System

Elevator System

Ethernet

Fiber Optics / LAN

Plant 1

Hot Swappable Mid-range PLC AH500

SCADA System

RS-485

HVAC System

Air Compressor System

Boiler System

Wastewater Treatment

Plant 2

Hot Swappable Mid-range PLC AH500

SCADA System

RS-485

HVAC System

Air Compressor System

Boiler System

Wastewater Treatment

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

Northern Europe
A Finland
B Estonia
C Latvia
D Lithuania
E Sweden
F Denmark
G Iceland

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

Canada
Edmonton
Zurich

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Sonoma
Fremont
Los Angeles
San Diego
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Kitchener
Boston
Plano
Raleigh

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Jalisco
Nuevo Leon
Queretaro
Mexico City
Guatemala
Puebla
El Salvador
Nicaragua
Costa Rica
Panama
R. Dominicana
Brit.Virgin Is.

Colombia
Ecuador
Peru

Brasil
Bolivia
Sao Paulo
Bela Vista
Paraná
Paraguay
Santa Catarina
Chile
Uruguay

Argentina

Netherlands
Amsterdam
Eindhoven

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Tunisia
Libya

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Moscow
Tashkent

Turkey
Istanbul
Georgia
Armenia
Uzbe
Lebanon
Jordan
Israel
Iraq
Qatar

UAE
Dubai
Oman
Saudi Arabia

Egypt
Cairo

Senegal
Togo
Nigeria
Benin
Congo
Ethiopia
Kenya
Tanzania
Zambia
South Africa

ASIA (Japan)

Tokyo Office

ASIA (India)

**Rudrapur Plant
(Green Building)**

EUROPE

Amsterdam, the Netherlands

AMERICA

Research Triangle Park, U.S.A.

▲ 6 Factories　■ 117 Branch Offices　⊙ 13 R&D Centers　■ 915 Distributors

Korea
Seoul
Daegu

Japan
Tokyo
Osaka

Kazakhstan

Uzbekistan
■ Tadzhikistan

1
2　Japan
3
26
23
4
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7　■
25 19 20 6 8
21 27 9
10
11
12
18
22 14 13　Taiwan
24
17 16 15

■⊙ **Dalian**
■■⊙ **Shanghai**
▲■■⊙ **Wujiang** (Wujiang Plant 3 & Wujiang Motor Plant)
▲　⊙ **Dongguan**
▲■■⊙ **Taoyuan** (Technology Center & Plant 1)
▲■⊙ **Zhong li**
■■⊙ **Taichung**
■■⊙ **Tainan**

⊙ **India**
Chandigarh
Gurgaon　■ Sri Lanka
Kolkata
Ahmedabad
Mumbai
Pune
Hyderabad
Bangalore
Chennai
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Visakhapatnam
Chhattisgarh

▲■ **Thailand**
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■ **Malaysia**
■ **Singapore**
■ **Indonesia**

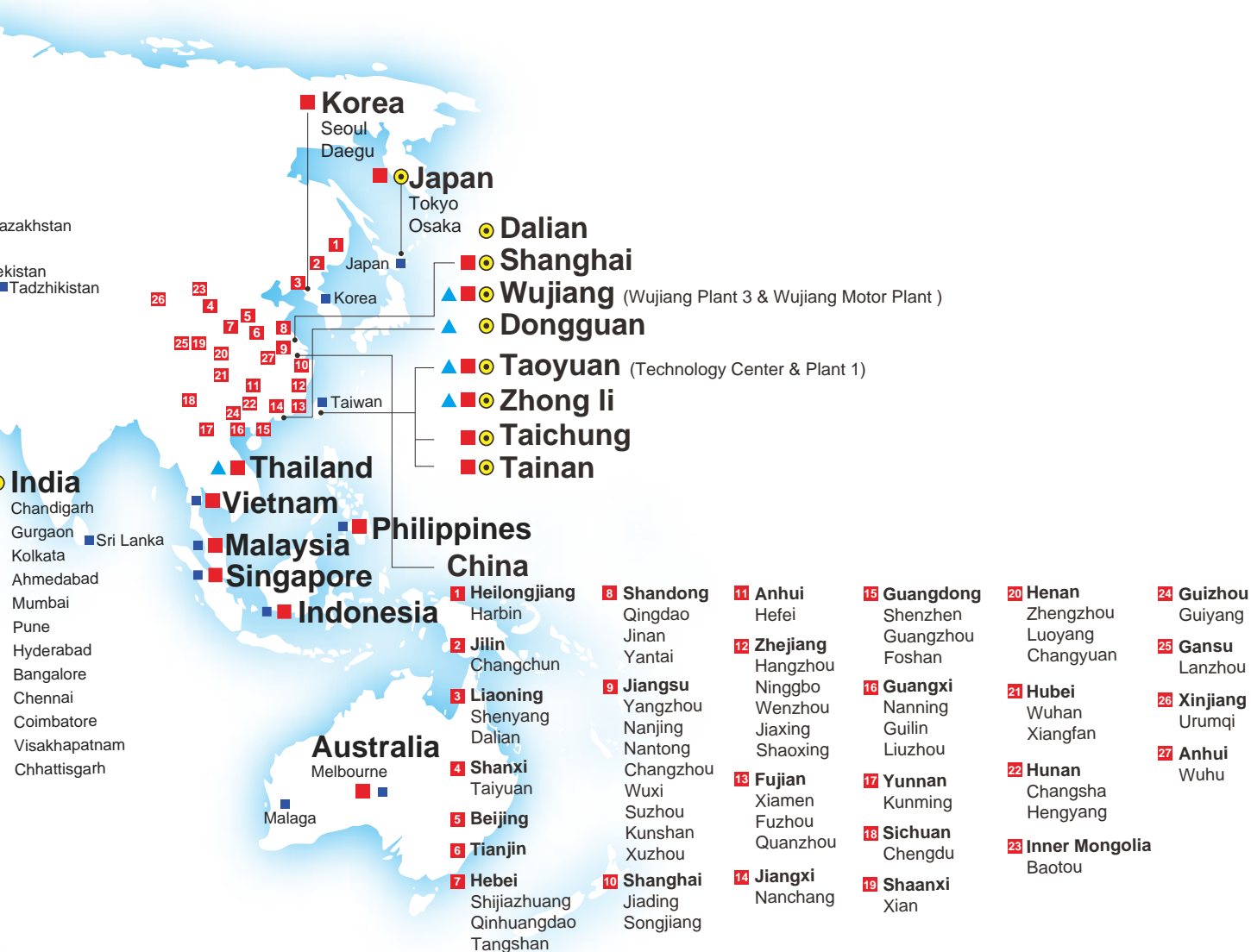**Philippines**

China

Australia
Melbourne

Malaga

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21 Hubei Wuhan Xiangfan	**25 Gansu** Lanzhou
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ΔELTA

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