Digitized Automation for a Changing World

Delta Industrial Automation

2022 Full Range / Catalogue

www.deltaww.com

NELTA

About Delta

Bruce Cheng
Founder and Honorary Chairman

Yancey Hai
Chairman

Corporate Mission

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

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

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

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

Delta is a frequent recipient of international awards and related recognition for innovation, design, and continuous dedication to ESG. Since 2011, Delta has been listed on the DJSI World Index of Dow Jones Sustainability™ Indices for 10 consecutive years. In 2020, Delta was also recognized by CDP with two "A" leadership level ratings for its substantial contribution to climate change and water security issues and named Supplier Engagement Leader for its continuous development of a sustainable value chain

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

About Delta Industrial Automation (IABG)

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

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

Delta IABG Milestones

1995	1999		2003	
AC Motor Drive	Small PLC	AC Servo Drive and Motor	Temperature Controller	Optical Incremental Encoder

2011			
CNC Controller	Hybrid Energy Saving System	Integrated Elevator Drive	Unmanaged Industrial Ethernet Switch

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

2017				2018	2019	
Flow Switch	Laser Displacement	Barcode Scanner	Area Sensor	Motion Controller Based on CODESYS	Servo Press	Extended Motion Controller

IABG Profile

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

Founded
1995

Headquarters
Taoyuan, Taiwan

Number of employees
7,500 (R&D 1,389)

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

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

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 Robot	Compact Modular Mid-range PLC	IIoT Cloud-based Platform	IIoT Industrial Cloud Router	Industrial PC	Planetary Gearbox
		DIACloud			

2020		2021		2022		
Smart Equipment	Manufacturing Management & Visualization	Smart Machine Box for Injection Molding	VTScada SCADA System	Servo Screw Driver	Delta Industrial Camera	Machine Vision Software

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Drive & Power Quality

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■ AC Motor Drive

■ Power Quality Solution

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Networking

103

■ Industrial Ethernet & IIoT Solution

■ Industrial Fieldbus Solution

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Manufacturing Operation Management

Global Operations

High Performance Vector Control Drive ⓝⓔⓦ
C2000 Plus

Best Choice for General Drive Controls

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

Single-point Positioning

Positions the motor at a specific point (within a single rotation) for precise stop upon request
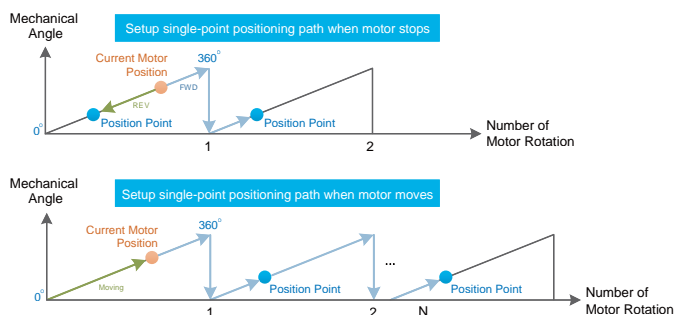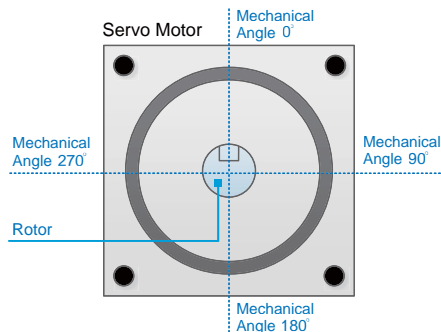
CE UL CERTIFIED EAC ⚠ ⓟ KC SEMI F47

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

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

Applications

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

Heavy Duty Vector Control Drive
CH2000

Excellent High Overload Capability for Impact Loading Applications

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

Real-Time Anti-Sway
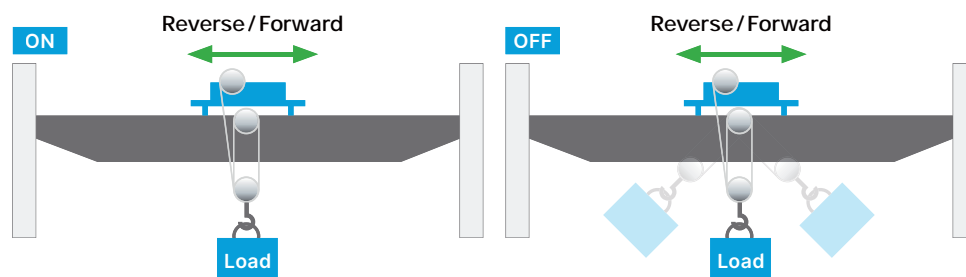
Advanced Crane Functions

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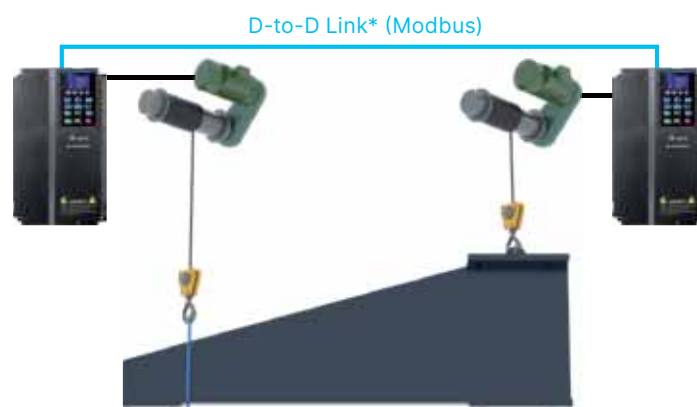
*Device-to-device link

CE · UL CERTIFIED · SEMI F47

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

Applications

Machine tools, punching machines, cranes and hoists

NELTA

Fan / Pump Vector Control Drive
CP2000

Excellent for Large Power Fans and Pumps Applications

- Supports induction / PM / SynRM motors
- Built-in Modbus and BACnet MS/TP communication
- Enhanced PCB (Printed Circuit Board) conformal coating improves drive durability; compliant with Class 3C3
- Fire mode and Bypass mode: Continuous pressure output to extract smoke when a fire accident or other emergency occurs
- Fast and easy installation with quick settings for self-defined parameter groups and parameter duplication
- Various modes for fans / pumps applications: PID control, sleep/wake up functions, flying start and frequency-hopping functions
- Supports Delta's MSI motors for an IE5 energy-efficient system (please refer to p.15)
- Built-in LCD keypad for easy operation, and the TPEditor software allows user-defined home page editing
- Synchronous multi-pump control of up to 8 motors, and fixed amount / fixed time circulation control (optional relay expansion cards available)
- Built-in PLC with 10k steps program capacity and real-time clock (RTC)
- Optional communication cards: PROFIBUS DP, DeviceNet, Modbus TCP, EtherNet/IP, CANopen, PROFINET and BACnet IP

CE UL CERTIFIED EHC RCM FO KC SEMI F47
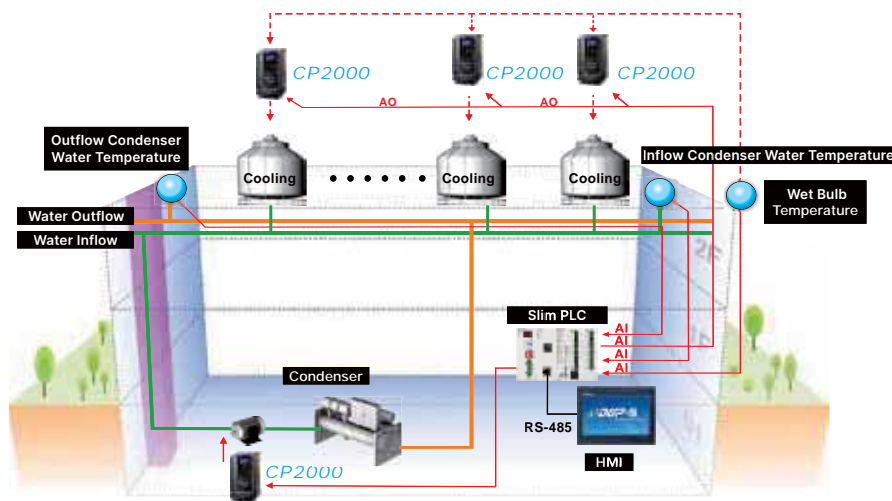
Power Range	0.75 ~ 3.7 kW 1 ~ 5 HP	5.5 ~ 18.5 kW 7.5 ~ 25 HP	22 ~ 37 kW 30 ~ 50 HP	45 ~ 90 kW 60 ~ 125 HP	110 ~ 185 kW 150 ~ 250 HP	220 ~ 450 kW 300 ~ 600 HP	560 ~ 630 kW 715 ~ 850 HP
CP2000	230 V / 3-phase						
	460 V / 3-phase						
	575 V / 3-phase						
			690 V / 3-phase				

Applications
Factory automation, HVAC, fans and pumps

IP55 Fan / Pump Drive
CFP2000

For HVAC and Fans / Pumps Applications

- Supports induction / PM / SynRM motors
- IP55 and IP41 enclosure protections
- Built-in main switch for the IP55 models[optional]
- Built-in Safe Torque Off (STO) SIL2
- Built-in EMC filter; compliant with IEC 61800-3 C2 / C1
- Built-in DC reactor effectively reduces harmonic distortion; compliant with IEC 61000-3-12
- Enhanced PCB (Printed Circuit Board) conformal coating improves drive durability; compliant with Class 3C3
- 2 sets of PID controllers
- Built-in PLC with 10k steps program capacity and real-time clock (RTC)
- Built-in Modbus and BACnet MS/TP communication
- Optional communication cards: PROFIBUS DP, DeviceNet, Modbus TCP, EtherNet/IP, CANopen, PROFINET and BACnet IP
- Built-in Quick Start and industry recipes to simplify installation and setup

Built-in EMC Filter	Built-in DC Choke	Protection Class	

- EN61800-3 C2 & C1
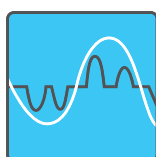
- Suppress harmonics, THDi < 48%
- EN61000-3-12

- IP41 Dust Resistant Type (standard)
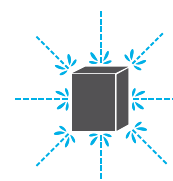
- IP41 Water Resistant Type[optional]

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

Applications

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

NELTA

High Performance Compact Drive
MH300

Transmission & Tension Control Solutions

Outstanding Drive Performance

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

Strong System Support

- Built-in PLC with 5k steps; system programming function saves costs
- Built-in STO (SIL2 / PL d) safety function and measures for sudden power outages
- All models can be connected through common DC bus
- Built-in Modbus and CANopen communication; optional communication card: EtherNet/IP, Modbus TCP, EtherCAT, DeviceNet, PROFIBUS DP, and PROFINET*
- Optional models with built-in filter
- Optional 24 V power supply card to reduce unexpected downtime

* Please contact Delta for purchase.

Flexible Expansion

- Built-in two 33 kHz high-speed pulse input terminals (MI6 & 7) and one output terminal (DFM)
- Built-in two accessory card slots for PG card, I/O expansion card, communication card, or 24 V power card at the same time
- Expandable to 3 DI and 3 DO, including 6 ports in total
- Expandable to 2 or 3 relays

Tension Control

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

• Closed-loop tension, speed control

Deceleration Box

Tension Lever

Tension Rebound

Tension Command

• Closed-loop tension, torque control

Tension Sensor

Deceleration Box

Tension Rebound

Tension Command

• Open-loop tension, torque control

Deceleration Box

Tension Command
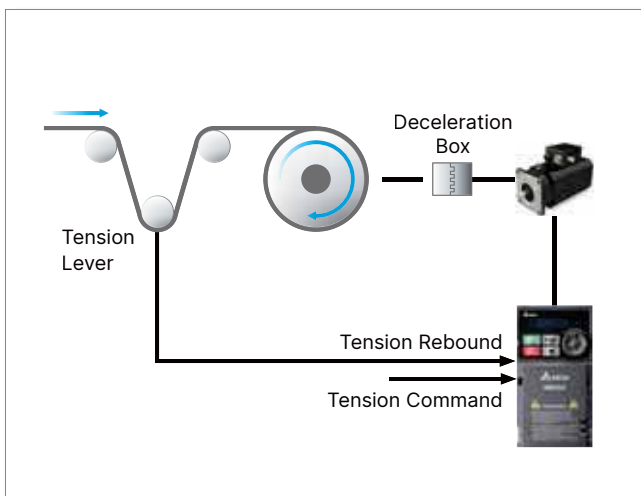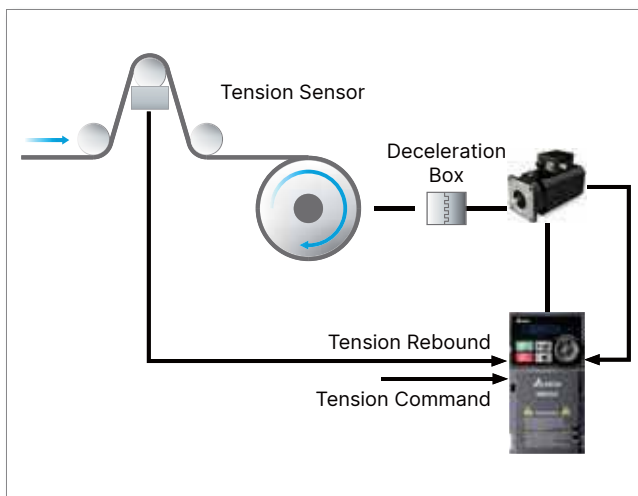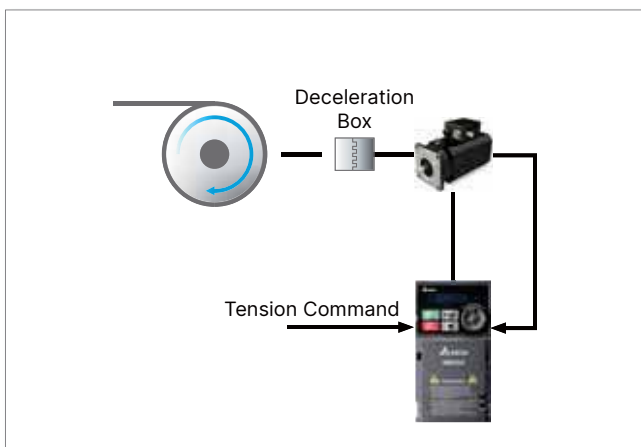
• Steady linear velocity control

Deceleration Box

Encoder

Linear Velocity Feedback

Linear Velocity Command

SEMI F47
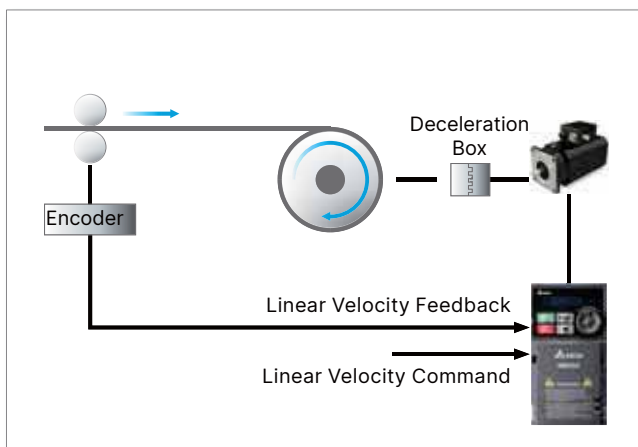
Power Range	0.2 kW 0.25 HP	0.4 kW 0.5 HP	0.75 kW 1 HP	1.5 kW 2 HP	2.2 kW 3 HP	3 kW 4 HP	3.7/4 kW 5 HP	5.5 kW 7.5 HP	7.5 kW 10 HP	11 kW 15 HP	15 kW 20 HP	18.5 kW 25 HP	22 kW 30 HP	30 kW 40 HP	37 kW 50 HP	45 kW 60 HP	55 kW 75 HP	75 kW 100 HP
MH300 115 V / 1-phase																		
230 V / 1-phase																		
230 V / 3-phase																		
460 V / 3-phase																		

Applications

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

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Compact Drive
MS300

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

- Overload capacity up to 150% / 60 secs and 200% / 3 secs for various constant torque loads
- Supports IM / IPM / SPM motors
- Supports Delta's MSI motors for an IE5 energy-efficient system (please refer to p.15)
- High torque at low speed (up to 200% at 0.5 Hz with vector control) for stable operation of heavy-duty equipment
- Integrated PLC function (2k steps)
- Highly safe and reliable with Safe Torque Off (STO) SIL 2 / PL d
- Built-in EMC filter(optional)
- Pull-out keypad
- 24 V power supply card(optional) for unexpected shutdowns
- USB charging on PC is available for parameter setting and update (no need for power supply from main circuit)
- Built-in Modbus and optional communication cards:
  CANopen, DeviceNet, EtherNet/IP, EtherCAT, PROFIBUS DP, Modbus TCP, and PROFITNET*
- High-speed model up to 1,500 Hz

  * Under development

Optimized Space Utilization

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

Existing low power drive models

Size reduction 40%

0 mm

SEMI F47

Power Range		0.2 kW 0.25 HP	0.4 kW 0.5 HP	0.75 kW 1 HP	1.5 kW 2 HP	2.2 kW 3 HP	3 kW 4 HP	3.7 kW 5 HP	5.5 kW 7.5 HP	7.5 kW 10 HP	11 kW 15 HP	15 kW 20 HP	18.5 kW 25 HP	22 kW 30 HP
MS300	Standard 0 ~ 599 Hz	115 V / 1-phase												
		230 V / 1-phase												
		230 V / 3-phase												
		460 V / 3-phase			New									
	High-speed 0 ~ 1500 Hz	230 V / 1-phase												
		230 V / 3-phase												
		460 V / 3-phase												

Applications

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

Basic Compact Drive
ME300

Compact and Low Power Range for Basic Applications

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

Pumping Functions

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

Multi-pump Control

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

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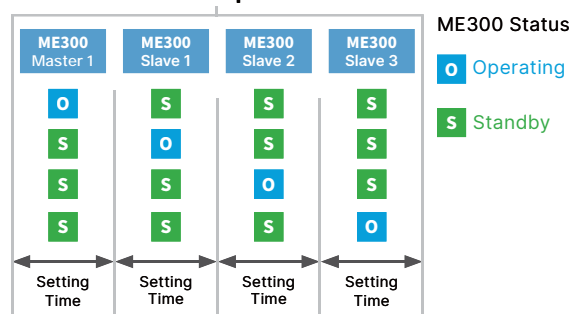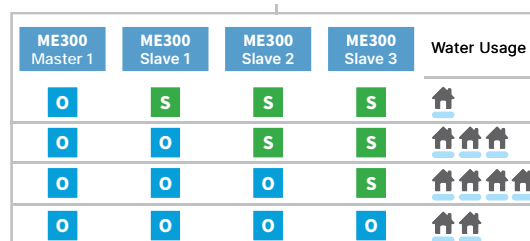
ME300 Master 1	ME300 Slave 1	ME300 Slave 2	ME300 Slave 3
O	S	S	S
S	O	S	S
S	S	O	S
S	S	S	O
Setting Time	Setting Time	Setting Time	Setting Time

ME300 Status
- O Operating
- S Standby

Constant Pressure Mode

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

Power Range		0.1 kW 0.125 HP	0.2 kW 0.25 HP	0.4 kW 0.5 HP	0.75 kW 1 HP	1.5 kW 2 HP	2.2 kW 3 HP	3 kW 4 HP	3.7 kW 5 HP	5.5 kW 7.5 HP	7.5 kW 10 HP
ME300	**Standard 0 ~ 599 Hz**	115 V / 1-phase									
		230 V / 1-phase									
		230 V / 3-phase									
			460 V / 3-phase					New			

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

ΔELTA

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

Durable Operation under Harsh Conditions

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

  *Contact Delta for more details.

IP66 / NEMA 4X Rated Protection Against Water and Dust

SPM
(Surface Permanent Magnet Motor)

IPM
(Interior Permanent Magnet Motor)

IM
(Induction Motor)

SEMI F47

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

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

Sensorless Vector Control Compact Drive
VFD-E

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

Sensorless Vector Control Compact Drive
VFD-EL

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

Sensorless Vector Control Compact Drive
VFD-EL-W

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

CE · UL CERTIFIED * · * · ** · * Supports VFD-E and VFD-EL
** Only for VFD-E

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

Applications

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

DELTA

Integrated Elevator Drive 🔴New
IED-S

Integrated Drive and Control Saves Space

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

Versatile I/O Terminals
- 25 digital input ports
- 8 relay output ports
- 5 high-voltage input ports

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

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

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

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

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

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

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

11
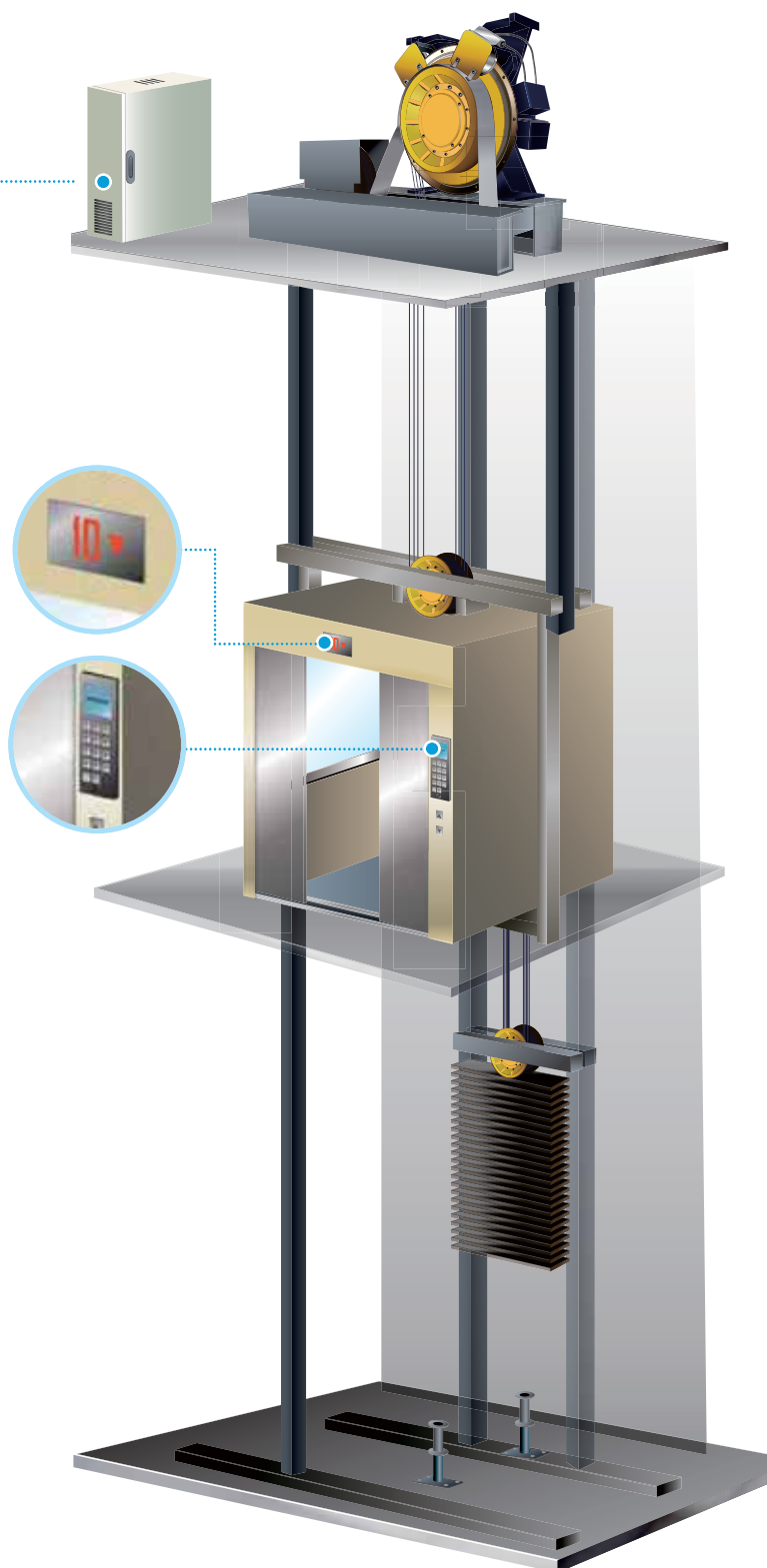
Hall Call / Car Call Display Boards

- **EA-FM02MVN02**

- **EA-FM02MBT01**
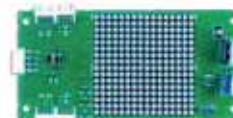
Car top Board

- **EA-CT01**

Command Board

- **EA-CP16**

(Optional)
External Digital Keypad

- **KPC-CC01**

- Control settings
- Drive settings
- Parameter duplication

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

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

∆ NELTA

Elevator Drive
VFD-ED

Excellent Time Sequence Control for Smooth Rides

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

Emergency Operation

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

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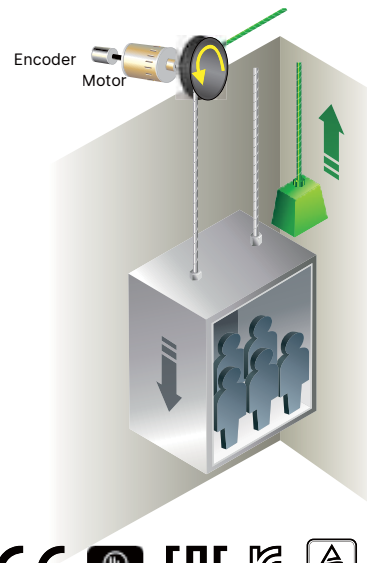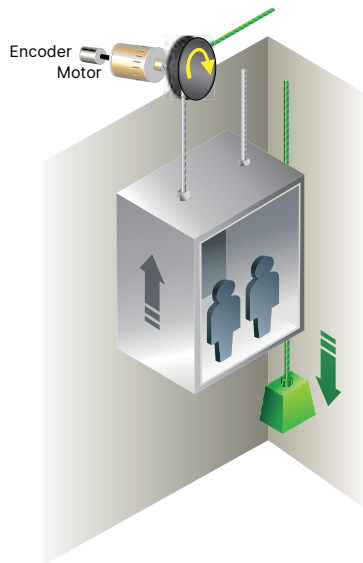
Power Range	2.2 kW 3 HP	3.7 kW 5 HP	4 kW * 5 HP	5.5 kW 7.5 HP	7.5 kW 10 HP	11 kW 15 HP	15 kW 20 HP	18.5 kW 25 HP	22 kW 30 HP	30 kW 40 HP	37 kW 50 HP	45 kW 60 HP	55 kW 75 HP	75 kW 100 HP
ED	230 V / 1-phase													
			230 V / 3-phase											
			460 V / 3-phase											

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

Applications

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

Compact Elevator Drive
MH300-L

Compact Design with Open-loop Control for Precise Time Sequence

Size Reduction 40%

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

Emergency Stop → Controller → Contactor 1

Traditional → AC Motor Drive + Contactor 2

Cost and space saving

Integrated STO SIL2 → Elevator Drive MH300-L
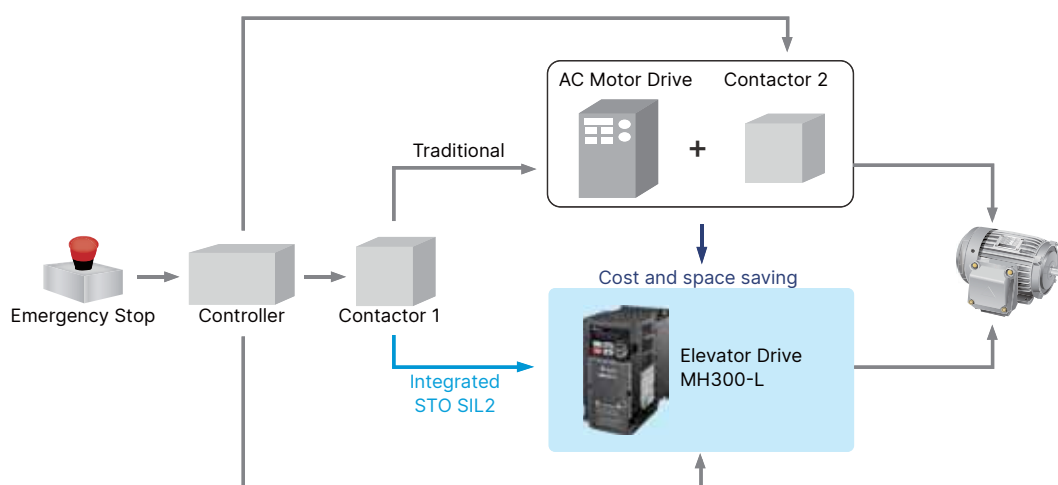
Power Range	2.2 kW 3 HP	3.7 kW 5 HP	5.5 kW 7.5 HP	7.5 kW 10 HP	11 kW 15 HP	15 kW 20 HP
MH300-L	230 V / 3-phase					
		460 V / 3-phase				

Applications

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

Hybrid Injection Molding Solution **New**

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

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

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

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

  - **Control Unit for Injection Molding Machine CSJ:**
    Connects all the components in the system to reduce system complexity and achieves seamless integration

- Up to 75% energy-saving for holding and cooling processes
- Compatible with dedicated production monitoring and management software (DIAeBOX) for real-time production data collection, handling and monitoring

Delta Hybrid Injection Molding Solution

Ethernet

Control Unit for Injection Molding Machine **CSJ**

Production Monitoring and **Management Software for** Injection Molding Machine (**DIAeBOX**)

Hybrid Energy Saving System **HES-C**

Door Control Drive **VFD-DD**

Synchronous Torque Motor **MST**

15

Hybrid Energy Saving System
HES-C

- Significant energy efficiency
- High overload capability
- Three sets of PID pressure control
- S-Curve for pressure / smooth flow control
- Field-weakening control of motor

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

CE

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

Synchronous Torque Motor
MST

- High torque at low speed and stable operation: Precise control of feeding position
- Direct drive, no energy loss during transmission
- Fast acceleration / deceleration response and zero-speed holding function to avoid screw rotation during injection

- High efficiency, low noise
- Long service life, easy maintenance (No oil lines, belts, or gearboxes)
- Direct oil cooling in oil tanks, no need to install additional water tanks
- Shortens molding cycle and improves production efficiency

CE

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

Control Unit for Injection Molding Machine
CSJ

- 12" full-color display for operation via both keyboard and touchscreen
- Dedicated PLC programming for secondary development
- Adopts Delta's superior drive technology, tuning capability, and monitoring interface

- Supports CANopen and Modbus for connection to other equipment
- Supports high-speed pulses for servo rotary tables
- Integrated as an all-in-one injection molding machine solution with one-stop-shop service

CE

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

DELTA

Motor-Mounted Pump Drive New
MPD

Highly Efficient Pumping Solution

- Adopts an efficient IE5 motor for energy efficiency, compliant with EN61800-9-2 IES2
- IP55-rated protection level
- Built-in PLC with 14k steps program capacity and RTC for flexible operation
- Suitable for water pumps requiring constant pressure and variable frequency; built-in multi-pump control of up to 8 pumps
- Smart pumping: Multi-pump redundancy, flow estimation, cavitation protection
- Pumping protection: Dry pump, high/low water pressure
- Optional EMI for EN61800-3 C1 compliance
- Delta's optional dedicated pumping application with bluetooth connection for monitoring and adjustment

Structure
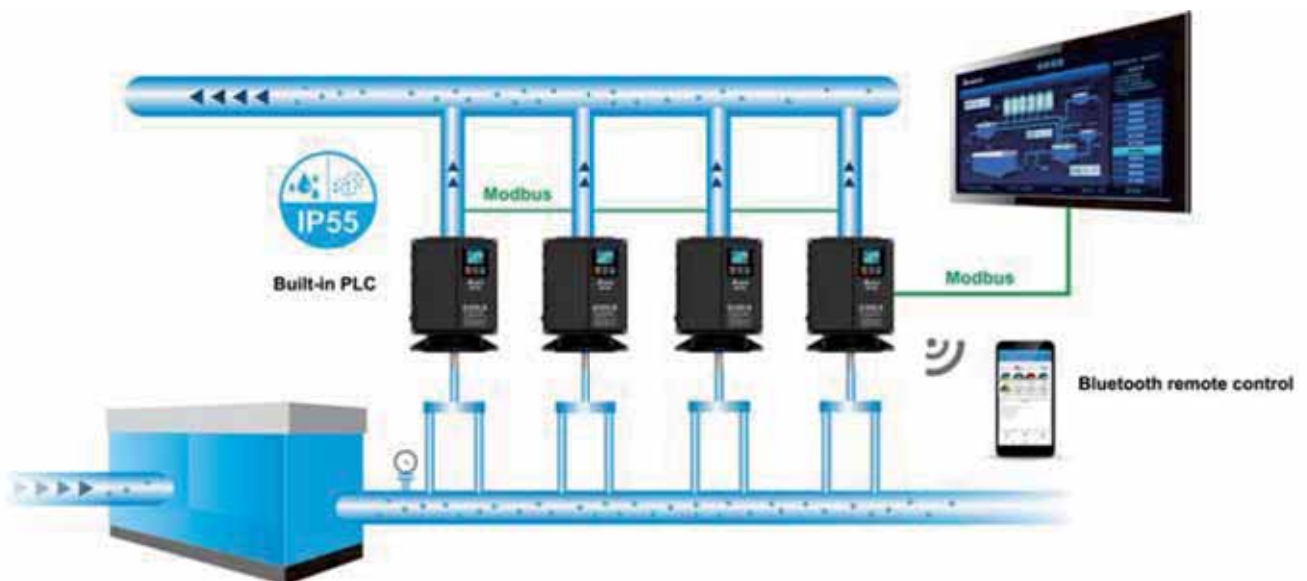
Power Range	0.75 ~ 7.5 kW 1 ~ 10 HP	11M ~ 22 kW 15 ~ 30 HP
MPD	460 V / 3-phase	Estimated Launch in Q3, 2022

Applications

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

Active Magnetic Bearing Drive New
AMBD

Excellent Functions for High-Speed Operation

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

Structure

High Frequency Output Motor Drive C2000-HS

Output reactor

Impeller

Position sensor

Electromagnet

High-speed motor rotor

Magnetic levitation controller

Magnetic levitation signal

Radial bearing

Sensor ring

This product photo is for reference only.

Active magnetic bearing drive AMBD
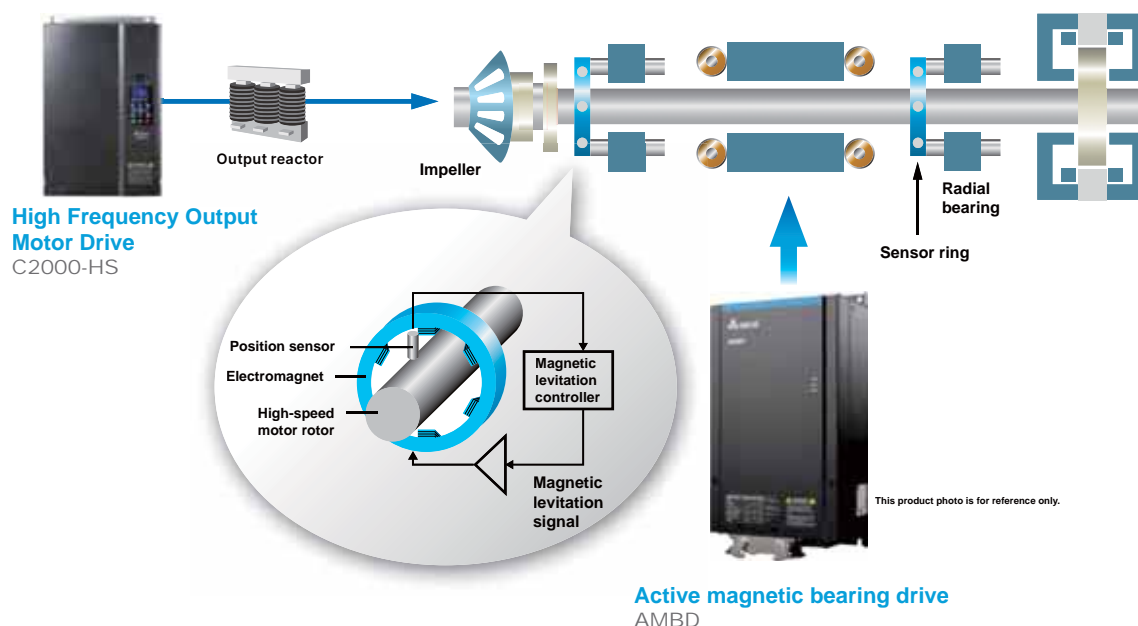
Peak Power Range		1.5 kW	3.0 kW
VFD-DD	Input Voltage	250 ~ 600 V$_{DC}$	
	Rated Output Voltage	6 Arms	10 Arms

Applications

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

Textile Vector Control Drive
CT2000

Highly Flexible Flange Mount and Wall Mount Methods

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

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

Flange-Mounting Types

Wall-Mounting Types

Flange-Mounting Types

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

Available for models with names ending in A or B

Air Suction System

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

Electric Cabinet

Dust Collector

Drive

Fan
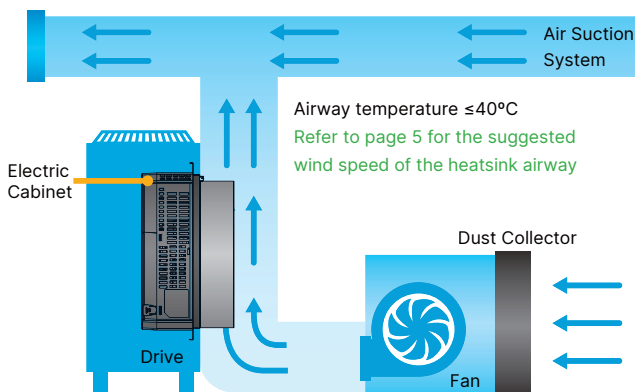
Wall-Mounting Types

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

Larger fan is available for models with names ending in C
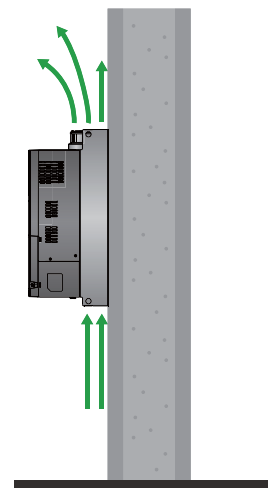
Applications

Textile machines and all textile applications that require flange-mount or wall-mount installation
* Flange-mount: Please refer to the CT2000 user manual for airway design requirements before installation

Synchronous Reluctance Motor
MSI
High Power Density and High Efficiency

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

High Efficiency and Energy-Saving Systems:

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

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

Standard
Compact Drive
MS300

* Refer to page 7 for MS300.

Synchronous Reluctance Motor
(Standard)
MSI

- Overload capacity up to 120% / 60 secs

IE5 MOTOR   IE4 MOTOR

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

Fan / Pump Vector
Control Drive
CP2000

* Refer to page 3 for CP2000.

Synchronous Reluctance Motor
(Models of SF 1.2)
MSI

- Up to 120% operational capacity

IE4 MOTOR

Power Range (kW)	0.75	1.1	1.5	2.2	3	4	5.5	7.5	11	15	18.5	22	30	37	45	55	75
1500 rpm Standard MSI + MS300 Series	380 V / 3-phase																
3000 rpm Standard MSI + MS300 Series	380 V / 3-phase																
MSI SF 1.2 + CP2000 Series							380 V / 3-phase										

* Applicable system voltage is 380 V.

Applications

Fans, pumps, compressors, industrial machinery

DELTA

Active Front End
AFE2000

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

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

Motor Drive
C2000

Motor

Lights & HVAC

Active Front End
AFE2000

Elevator

Winding/ Unwinding Equipment

Crane & Hoist

Centrifuge Equipment

Power consumption

Power generation

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

Power Regenerative Unit
REG2000

Replaces Traditional Brake Resistor and Features Power Regeneration

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

* Requires workload lower by 20%.

Motor Drive C2000

Motor

Lights & HVAC

Power Regenerative Unit REG2000

Power consumption

Power generation

Elevator **Winding / Unwinding Equipment**

Crane & Hoist **Centrifuge Equipment**

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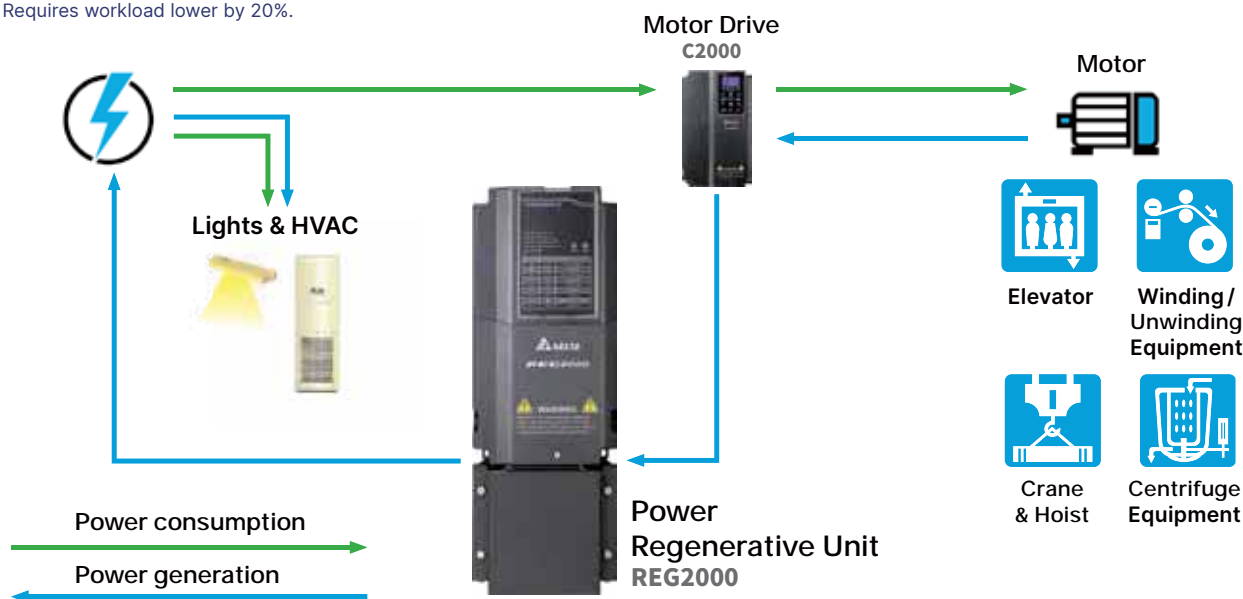
Power Range	7.5 kW	11 kW	15 kW	18.5 kW	22 kW	30 kW	37 kW	45 kW	55 kW
REG2000	230 V / 3-phase								
	460 V / 3-phase								

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

DELTA

AC Servo Drive & Motor `New`
ASDA-A3

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

200 V: 0.1 ~ 15 kW

400 V: 0.4 ~ 15 kW

3.1 kHz Bandwidth and Shorter Synchronization Cycle

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

Response Bandwidth

Synchronization Cycle

Command
Previous Models
A3 Cycle Time
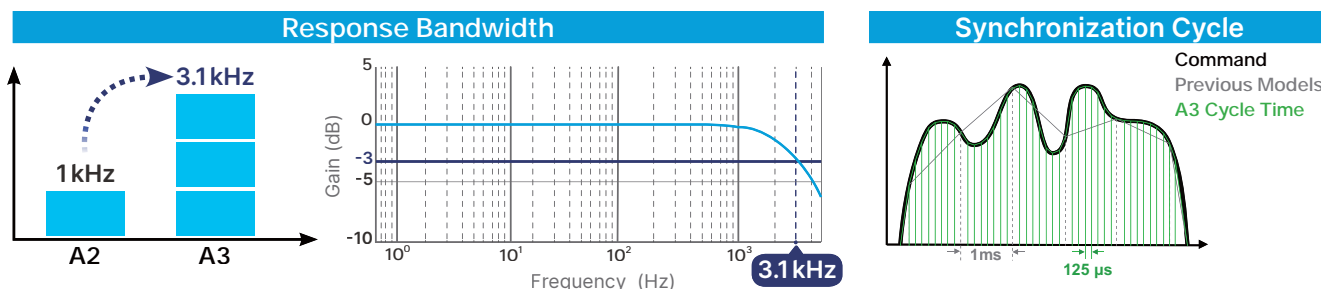
24-bit Absolute Encoder

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

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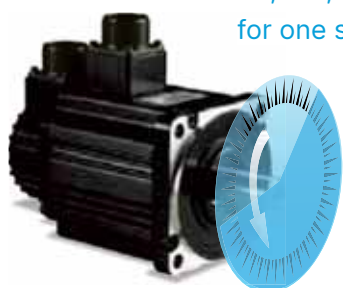
46,603 pulses for one degree
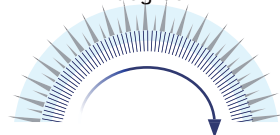
Advanced Motion Control Functions

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

Low Frequency Vibration Suppression

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

Without Vibration Suppression	Delta Vibration Suppression

Stable
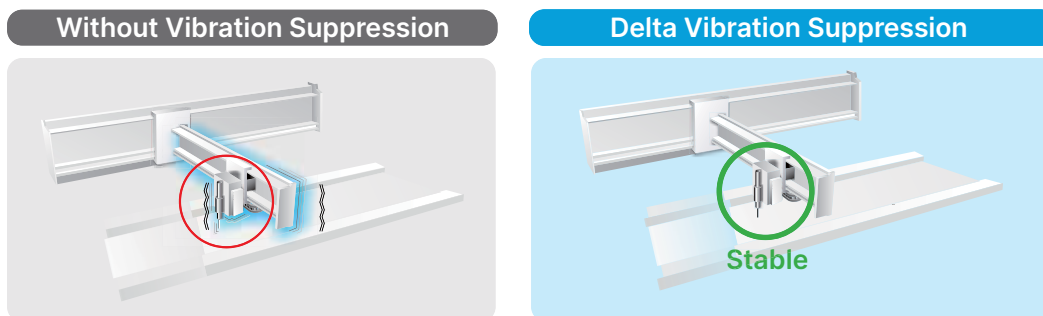
Auto-Tuning

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

Compact Size

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

ASDA-A3
200 W

ASDA-A2
200 W

20%

Servo motor shorter in length

ASDA-A2
ASDA-A3

20%
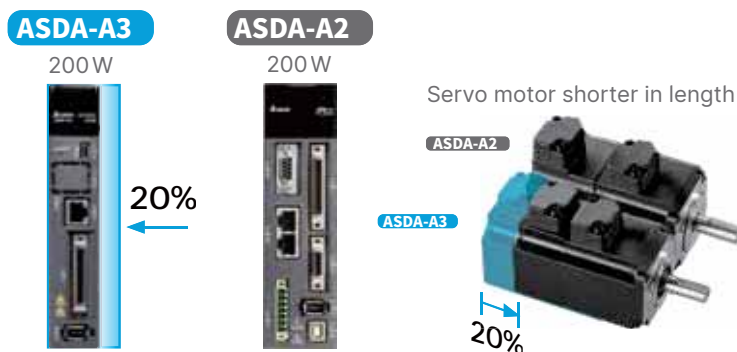
Model Types

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

Applications

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

∆NELTA

AC Servo Drive & Motor New
ASDA-B3

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

200 V: 0.1 ~ 3 kW
400 V: 1 ~ 7.5 kW

Model Types

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

High Response Bandwidth and Shorter Synchronization Cycle

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

Response Bandwidth

3.1 kHz — B3
1 kHz — A2
0.5 kHz — B2

Increased Productivity

40%
B2 → B3

Synchronization Cycle

Command
Previous Models
B3 Cycle Time

1 ms
125 µs

25
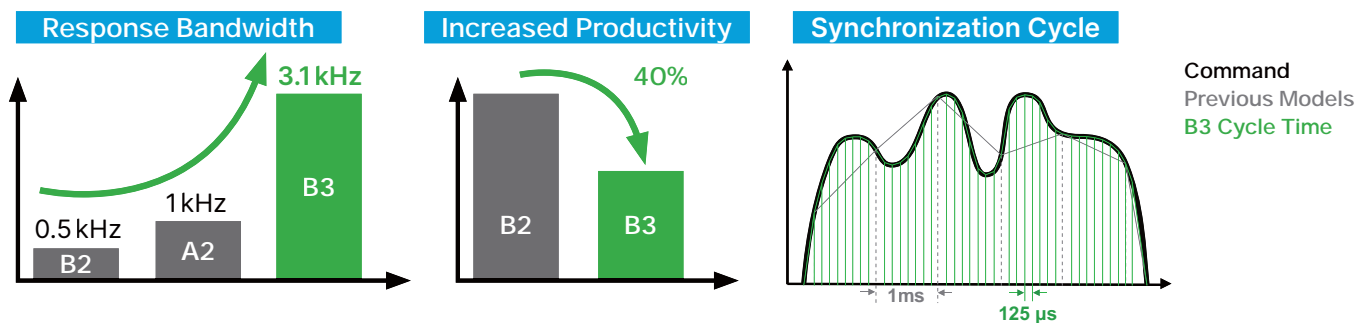
Increased Speed and Torque

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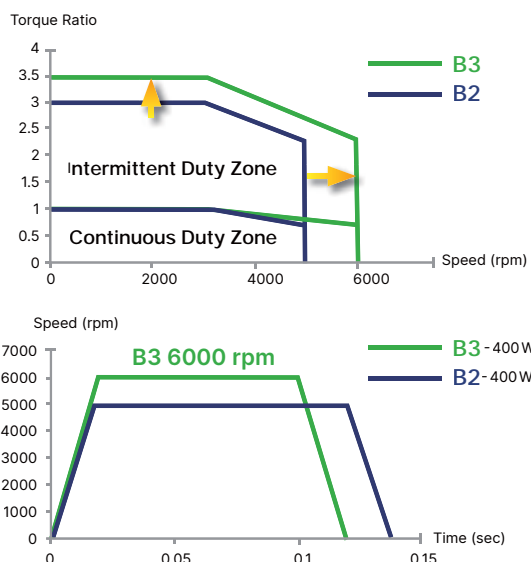
Analog Feedback PID Control

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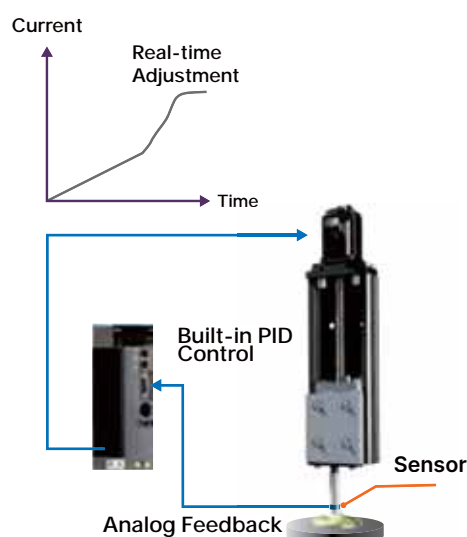
High Resolution Encoder

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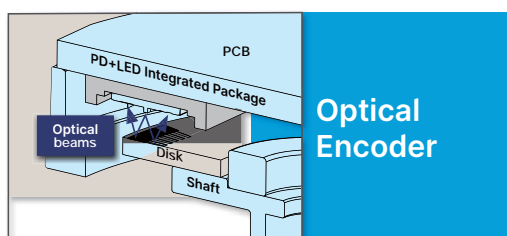
Applications

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

AC Servo Drive & Motor
ASDA-A2

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

Built-in Motion Control Functions

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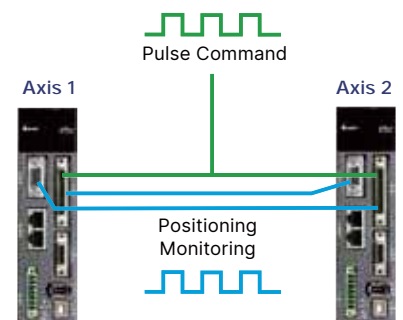
High Precision, High Performance Servo Motors

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

Full-Closed Loop Control (Accuracy of Positioning Guaranteed)

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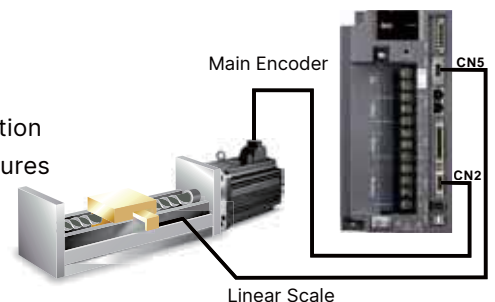
Versatile PR mode

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

Speed — Sequential Command P_Command 1, P_Command 2 **Delay 1**, **Time** A command is executed only when the previous command is completed	**Speed** — Overlap Command P_Command 1, P_Command 2 **Time** The second command is executed after the delay time or during the deceleration period	**Speed** — Insertion Command P_Command 1, P_Command 2 External command triggered, **Time** 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
- Input voltage: 400 V_{AC}, 0.4 kW ~ 15 kW, 3-phase
- Up to 1kHz bandwidth for high speed and high precision applications
- CANopen, DMCNET, EtherCAT communication protocols
- ASDA-A2-E model is equipped with Safe Torque Off function (STO), compliant with IEC31800-5-2

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

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

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

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

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

Applications

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

Food Packaging Machine	**Wire Cutting** Machine	Feeding Machine	High-speed **Labeling Machine**

NELTA

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 and incremental ECMA Series motors

EtherCAT controllers

Third party controllers

Delta PC-Based Motion Controller

EtherCAT
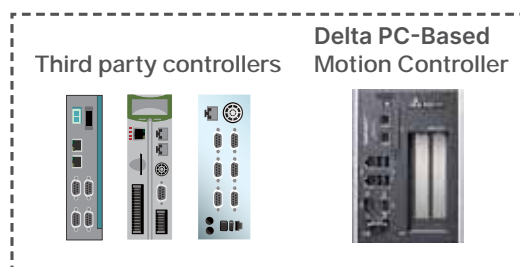
Applications

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

Digital I/O

Extension DI Port

Motor Encoder

EtherCAT Status LED

Safe Torque Off (STO) I/O

EtherCAT Port

USB Port
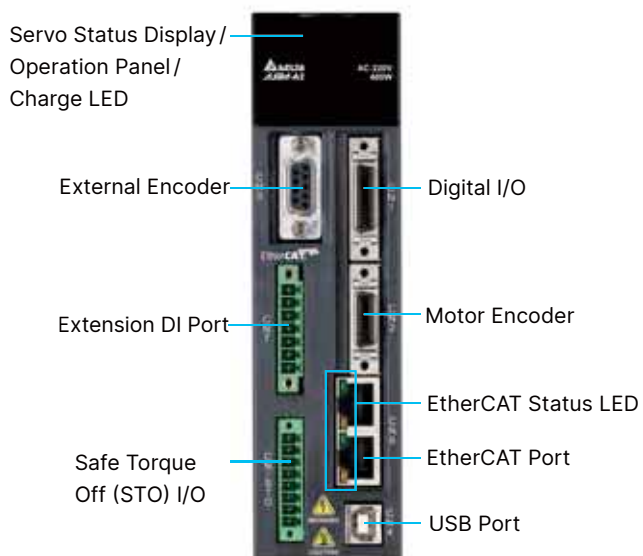
Accessories

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 costs

Applications

Bar Feeder
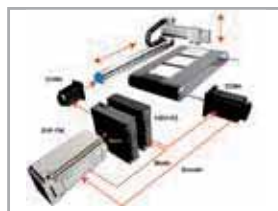
Transporting and
Conveying Equipment

Electric Discharge
Machines (EDM)

Cutting Machine

High Accuracy for Positioning

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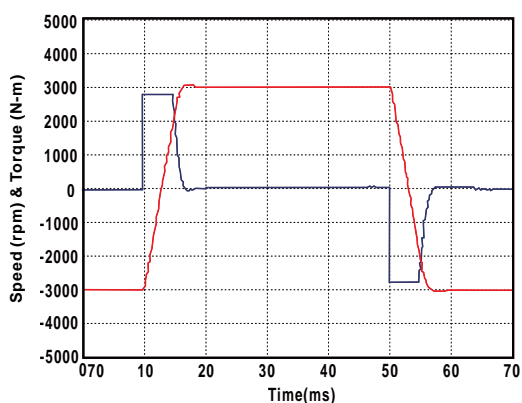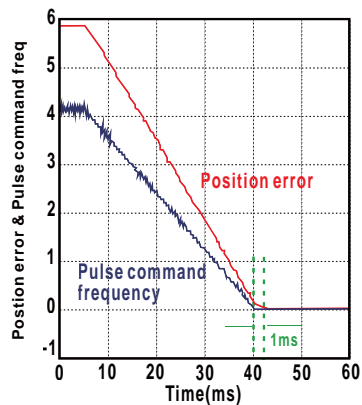
- Three auto notch filters to suppress mechanical resonance efficiently

Exact
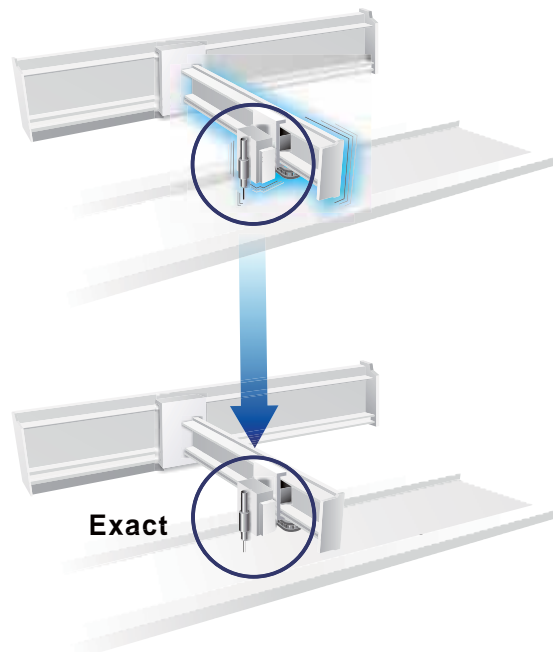
Easy-to-Use and Cost-Saving

- Same power and encoder cables as the ASDA-B Series
- User-friendly digital keypad, ideal for parameter settings and monitoring

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

Charge LED

LED Display

ASDA-B2

MODE   ▲   SHIFT

▼   SET

△ELTA

Operation Button
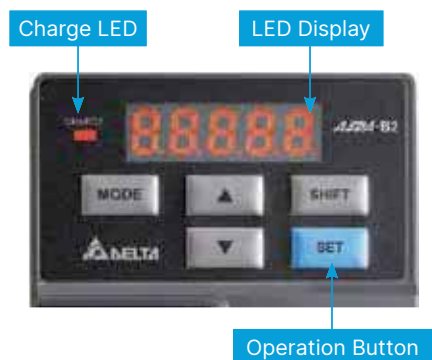
Separated power supply for main circuit and control circuit
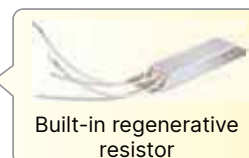
Built-in regenerative resistor

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 accuracy
- Advanced synchronous gantry control
- Versatile PR mode for various continuous motion movements

New PC Software Functions

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

High Precision, High Performance Servo Motors

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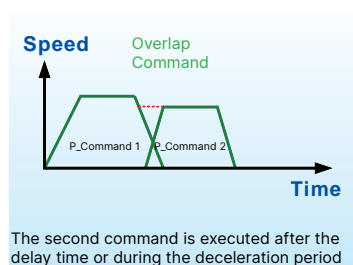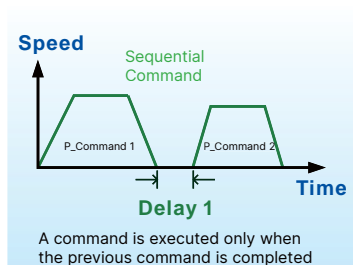- Incremental encoder provides up to 1,280,000 p/rev resolution for high-precision positioning

Product Line-up

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

USB 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)

DMCNET communication protocol

ASDA-A2 Series
Servo Drives

DMCNET High-Speed
Motion Control

Z-Axis   Y-Axis   X-Axis

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

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

Advanced Gantry Control

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

ASDA-M

Same DSP, Real-time, Excellent Synchronous Control

Data of Position, Speed and Torque

Axis 1 ↔ Axis 2

Data exchanges cycle time: 62.5 μs

Gantry Control

Axis 1

Axis 2
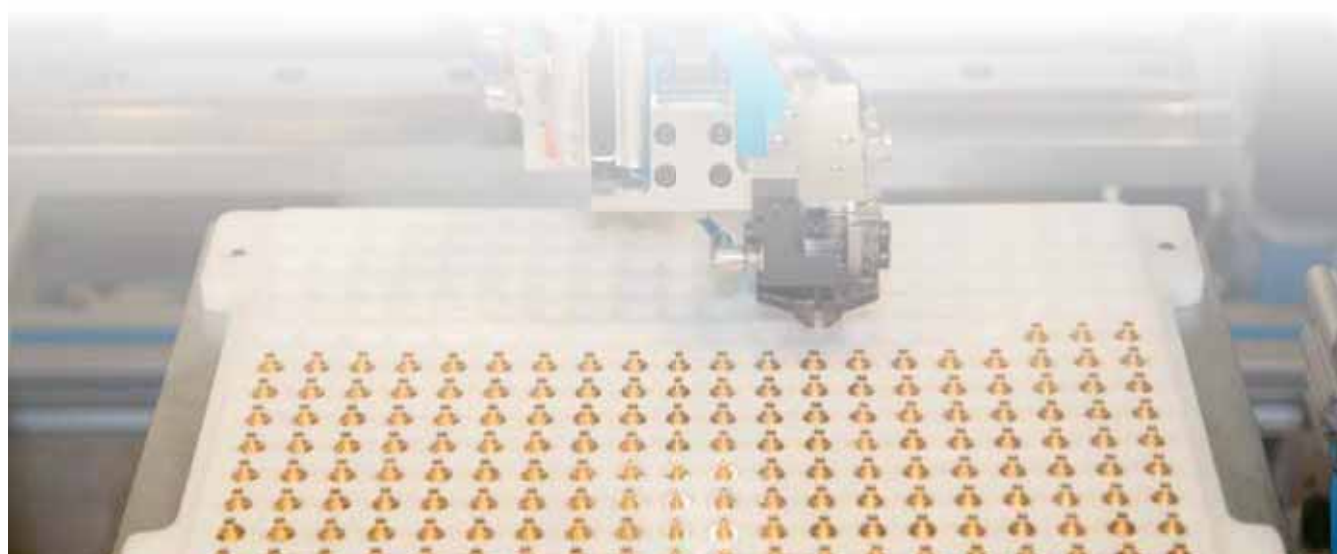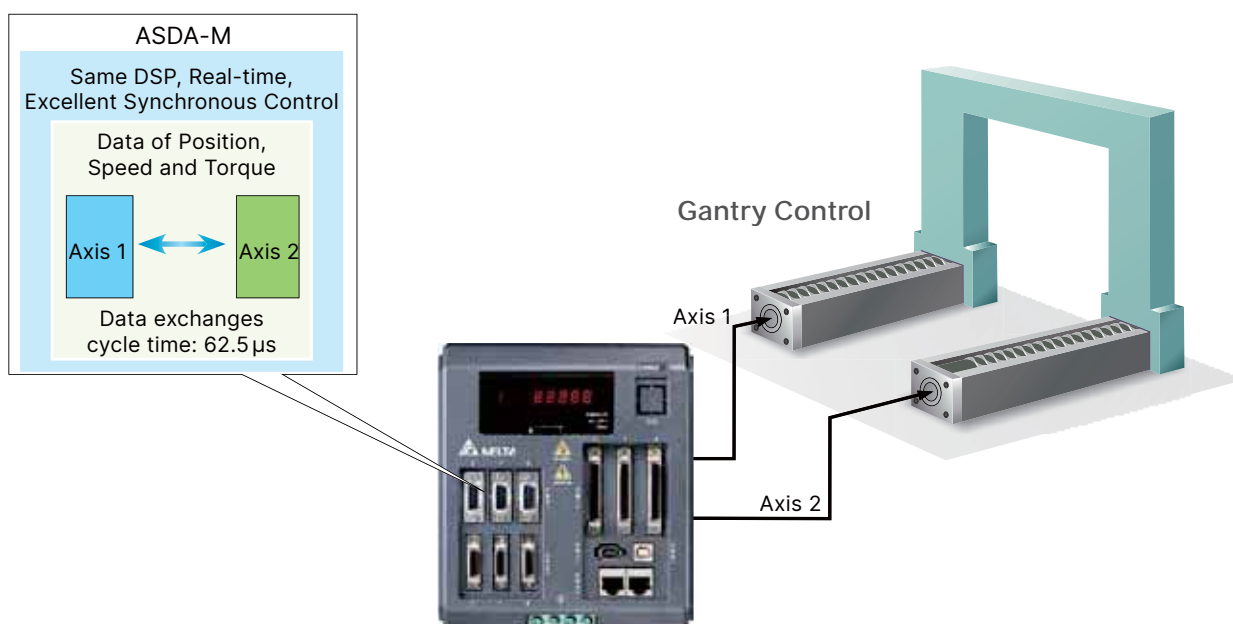
Spindle Motor Drive
ASDA-S

Ensures Premium Surface Finish Quality for the CNC Industry

Power range: 3 kW ~ 15 kW

- Supports Delta permanent magnet spindle motors and other induction motors
- Provides high-performance servo vector control as in the ASDA-A2 Series
- Supports pulse encoder signals (ABZ phase) via CN5 port, no external converter card required
- Built-in induction motor parameter measuring and estimating function
- Offers V/F control for induction motors without encoders
- Equipped with analog speed and resolution switching function
- Supports analog voltage, position pulse and DMCNET motion commands
- 200 V 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
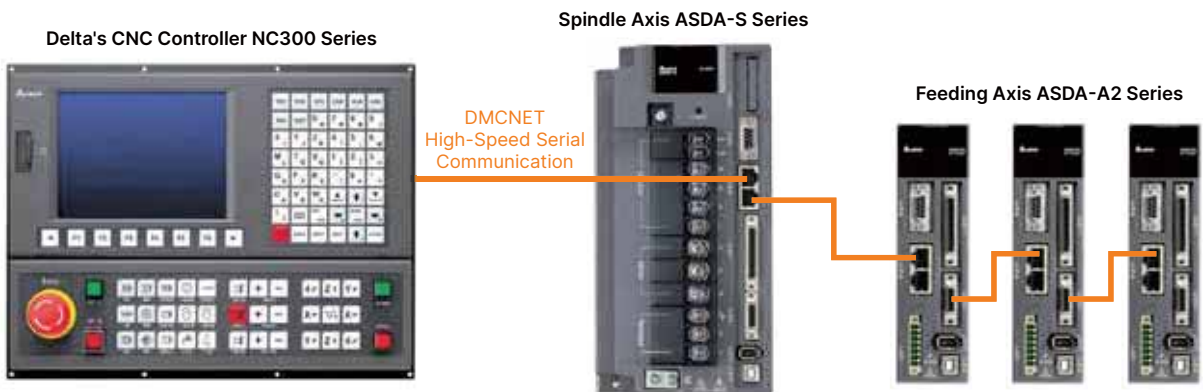
Linear Shaft Motor
ECML-S

- 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
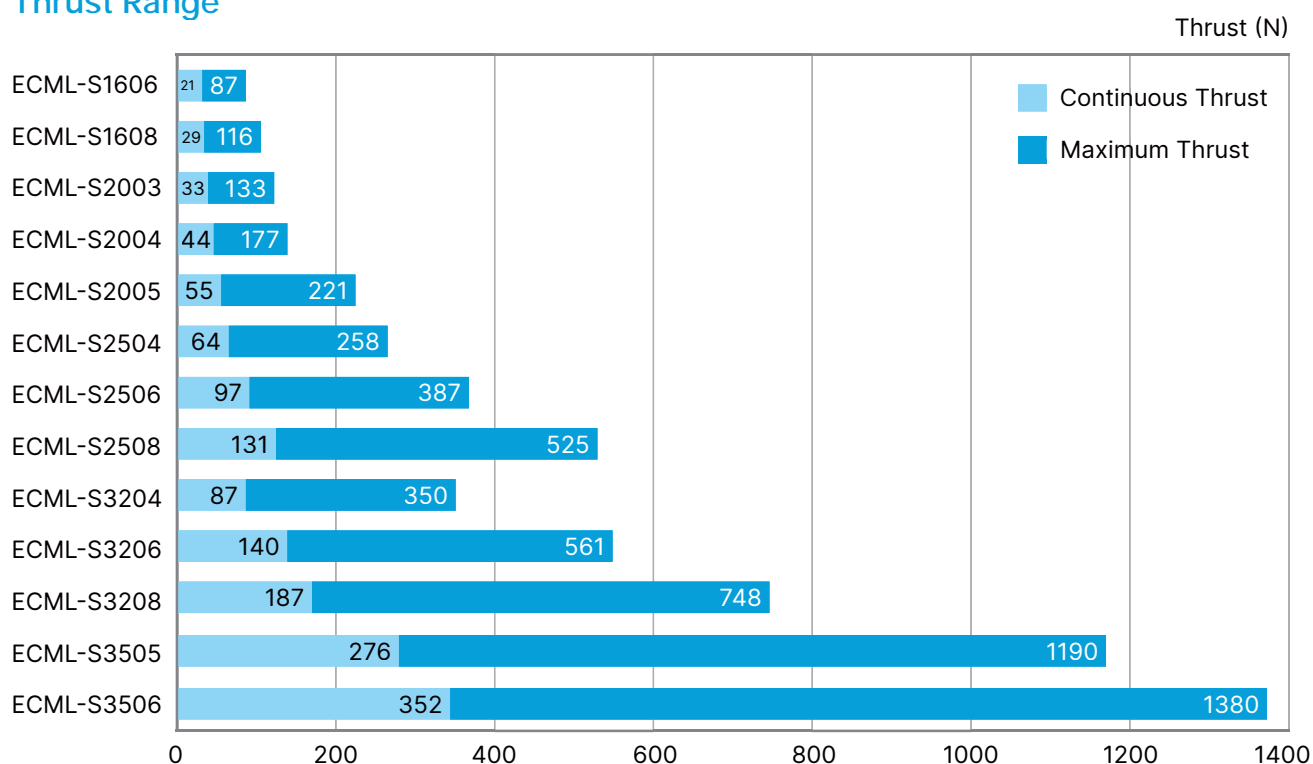
Magnetic Shaft Length (Unit: mm)

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

NELTA

U-shaped Ironless Linear Motor
ECM-PU

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

Thrust Range

Thrust (N)

Model	Continuous Thrust	Maximum Thrust
ECM-PU211	65	
ECM-PU212	130	
ECM-PU381	51	258
ECM-PU382	102	515
ECM-PU383	130	885
ECM-PU384	167	1184
ECM-PU432	169	891
ECM-PU433	286	1274
ECM-PU434	321	1955
ECM-PU435	377	2420

(Scale: 0, 400, 800, 1200, 1600, 2000, 2400, 2800)
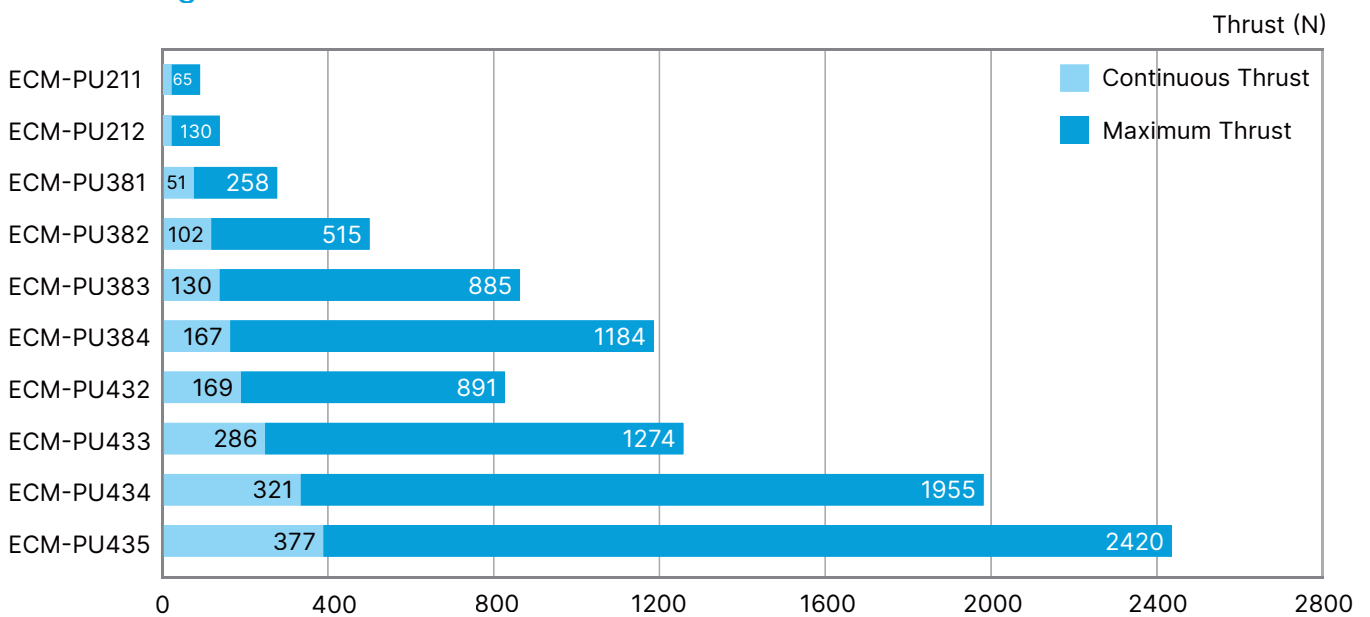
Magnetic Track Length (Unit: mm)

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

Flat Iron-Core Linear Motor
ECM-PF

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

Thrust Range

Thrust (N)

Continuous Thrust / Maximum Thrust

Model	Continuous Thrust	Maximum Thrust
ECM-PF801	125	377
ECM-PF802	248	760
ECM-PF803	329	1090
ECM-PF804	500	1431
ECM-PFC81	240	753
ECM-PFC82	400	1520
ECM-PFC83	657	2140
ECM-PFC84	1000	2862
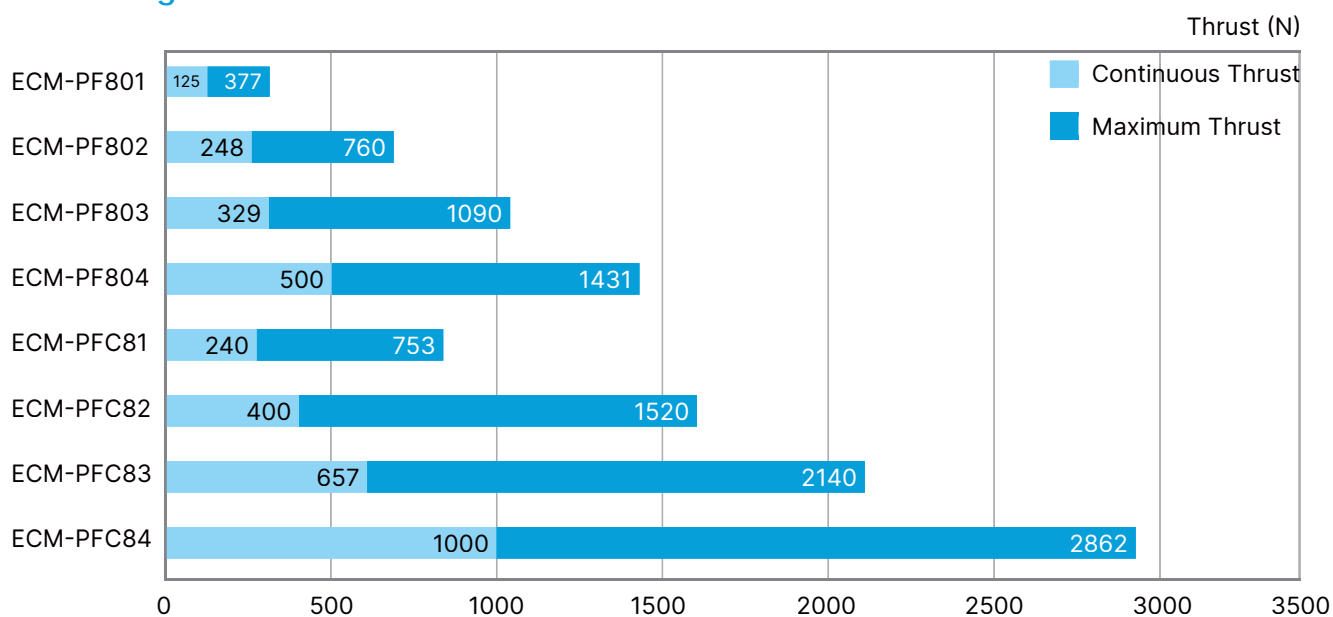
Magnetic Track Length (Unit: mm)

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

NELTA

Linear Stage
LU

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

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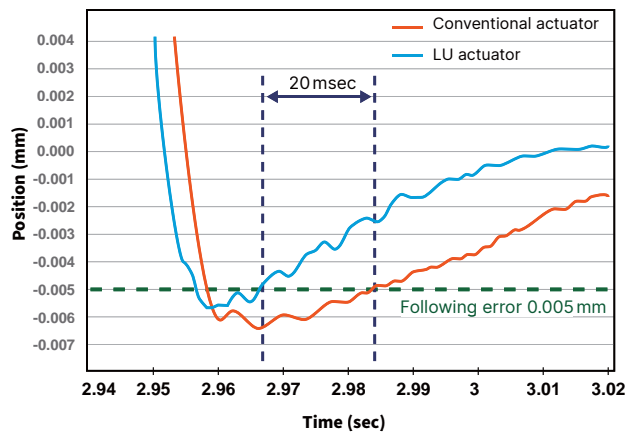
Test condition
- Without load
- Motor speed: 3,000 rpm
- Acceleration time: 50 ms

Thrust Range

Thrust (N)

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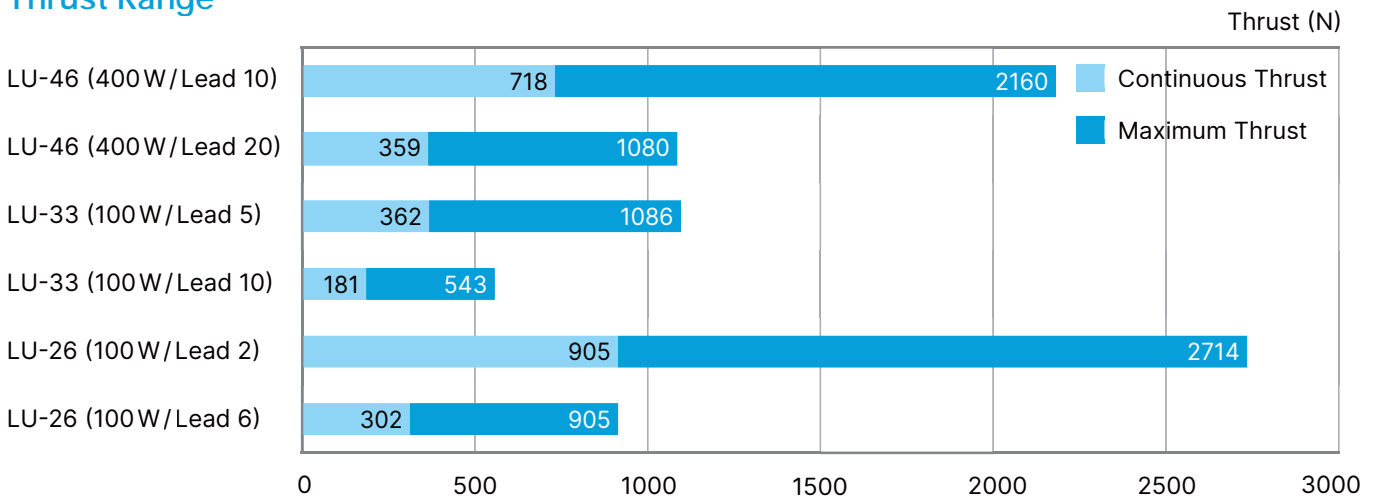
Linear Stage
LA-S

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

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

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

Mechanism Design

Motor Coil Assembly
Motor Magnetic Way
Optical Readhead
Linear Guideway
Scale

Thrust Range

Thrust (N)

Model	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
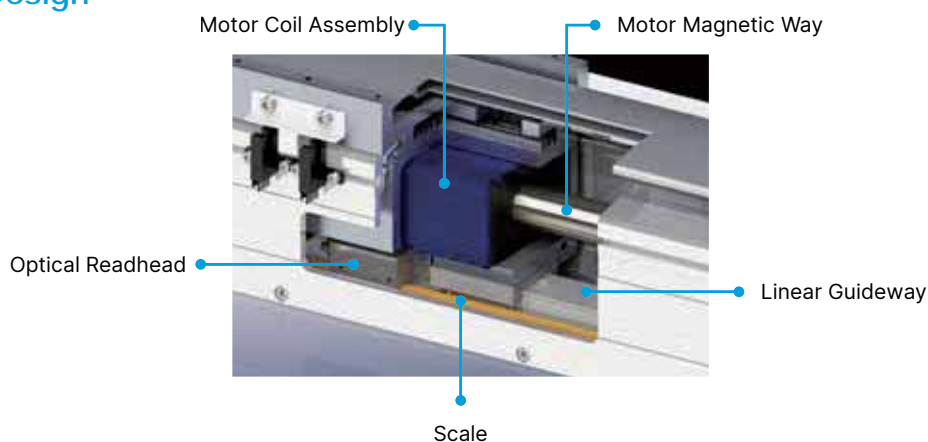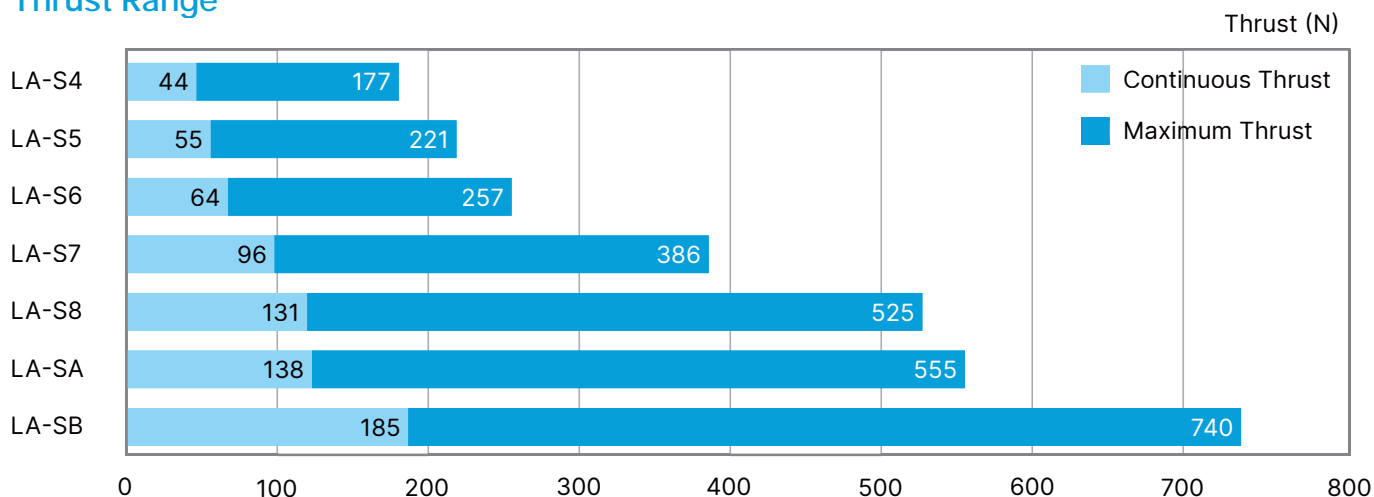
Smart Servo Screwdriver System `New`

Servo Screwdriver
ECM-SD3

» High-resolution position feedback encoder
» High precision torque sensor signals directly fed to the full closed-loop control
» **Low cogging torque of the AC servo motor**

- Indicator light signals screwing status
- Front LED light eliminates shading during operation
- Easily mounted on robots and equipment with a coupling

Servo Screwdriver Controller
ASD-SD3

» Dual-spindle control for higher efficiency
» **Enables dual-spindle synchronization and separate operation**

- 10.1 inch large screen displays the results of both drivers at a time
- Large memory capacity stores more than 20,000 results

System Features

- Control two screwdrivers with just one controller
- Stores up to 500 sets of model configurations and 500 screw parameters
- Manufacturing data can be retained at a local machine or uploaded to a manufacturing execution system
- Provides multiple control modes, including torque, angle and seating points control

- Sets two screwdrivers to operate synchronously or at different intervals to meet different needs
- Analyze defects causes such as stripping, tilted screws to continually optimize quality
- Ensures to implementing the correct screwdriver and processes in operation to prevent resource waste and enhance yield rate

Operation and User Interface

Tightening Status Monitoring

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

Parameter Settings

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

Integration with a PLC

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

Intuitive Parameter Configuration

- User-friendly parameter configuration interface

Dual-spindle Operation with One Controller

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

System Structure

MES

PC

PLC

HMI

Modbus TCP

Modbus RTU

USB/D-sub

Peripherals EQ

Barcode Scanner

42
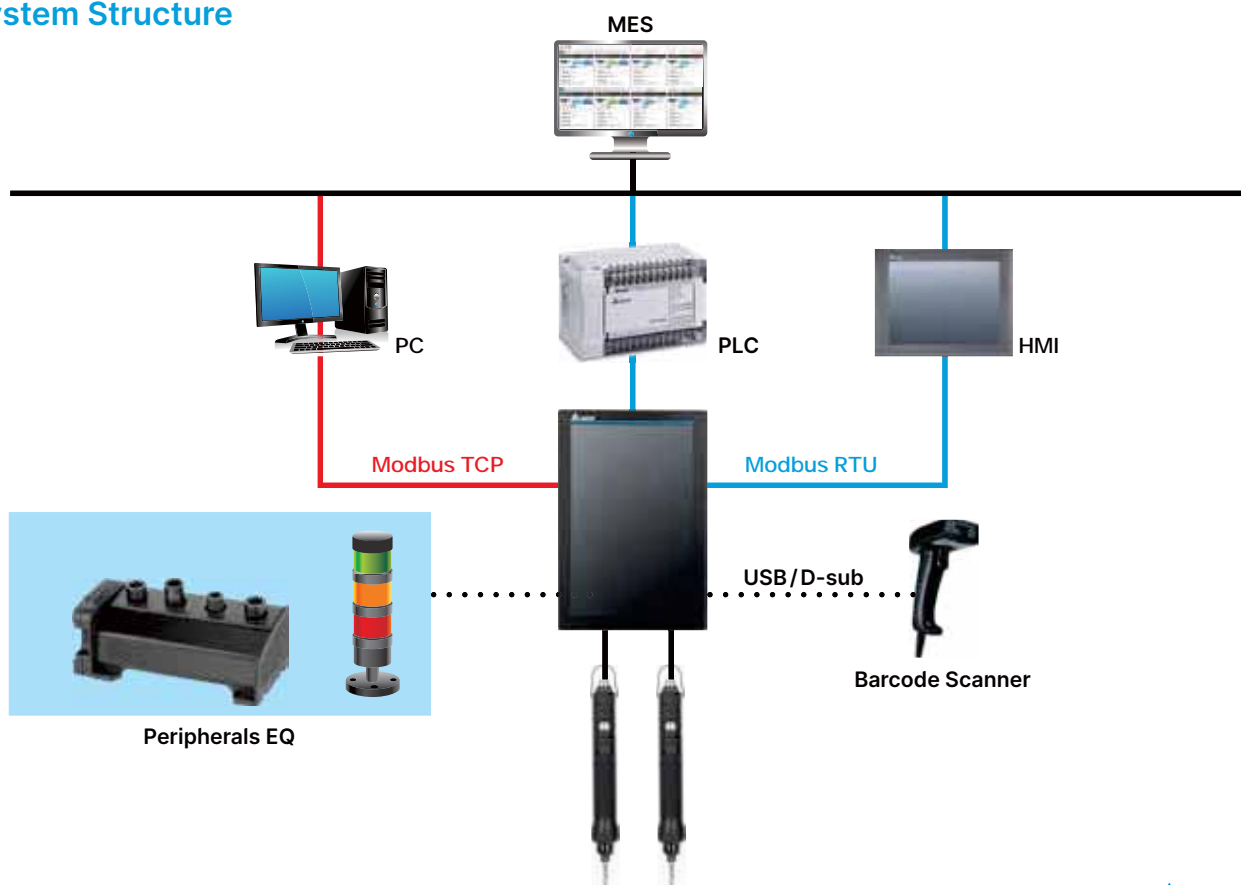
High Precision Planetary Gearbox
PS

- **Supports all series of Delta servo motors**
- **Provides concentric and right-angle models**
- **High precision**
  - Backlash for concentric 1-stage gearbox is under 3 arcmin
  - Backlash for right angle 1-stage gearbox is under 4 arcmin
- **High input speed**
  Input speed allows for 5,000 RPM
- **High torque**
  Helical gear design offers higher output torque in comparison with spur gearbox

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

Precision Planetary Gearbox
PA

- **Supports all series of Delta servo motors**
- **Provides concentric models**
- **High rigidity and high torque**
  - Employs uncaged needle roller bearings with a set design
  - Includes ring teeth, gearbox and helical gears for high rigidity and output torque
- **High precision**
  - Backlash for 1-stage gearbox is under 8 arcmin
  - Backlash for 2-stage gearbox is under 12 arcmin

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

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PC-Based Motion Controller
MH2 / MP1

Supports EtherCAT / DMCNET fieldbus for various motion control applications

- **Energy Efficiency and Robust Hardware**
  - The MH2 Series: cable-less, fan-less and low-power consumption design supports stable operation; built-in SD card, SSD and M.2 SSD slots provide fast and stable data transmission
  - The MP1 Series: equipped with a 15" touchscreen for more flexible operation

Host PAC   Panel PAC
MH2   MP1

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

- **Supports Master and Slave Modules**
  Built-in EtherCAT / DMCNET fieldbus for servo system and motion control module connection (up to 64 axes / 100 stations via EtherCAT; up to 12 axes / 12 stations via DMCNET)

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

- **OS and Software Support**
  The MH2 Series is built in with Windows 10 IoT and DLL for flexible usage and software development
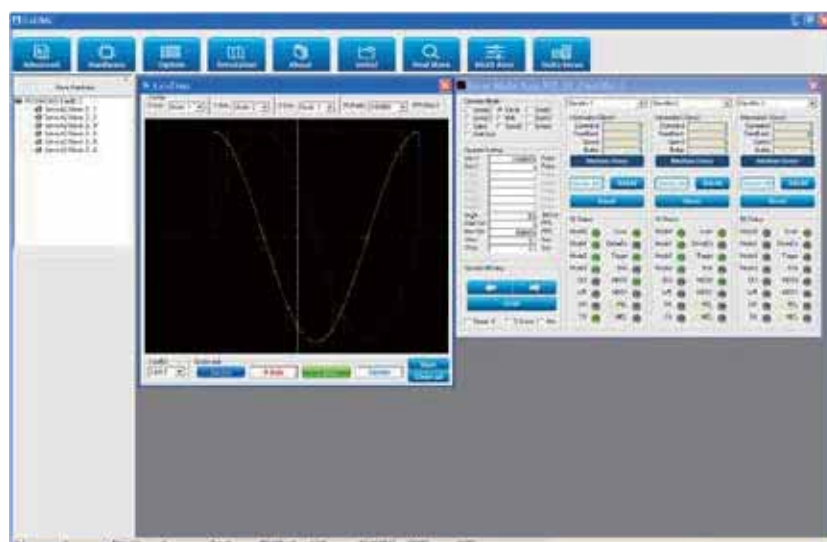
Motion Control Functions

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

- **Speed Curve Tracing**
  Speed curve tracing function traces current motion speed and adjusts commands

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

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

MH2 / MP1

EtherCAT Modules Supported

Touch Panel

PAC

DMCNET

AC Servo Drives

ASDA-A3-F ASDA-A2-F ASDA-A2R-F ASDA-B3-F ASDA-B2-F ASDA-M-F

DMCNET
Remote Modules

**Max. 12 axes
or 12 remote
modules**

External
Touch Panel

PAC

EtherCAT

AC Servo Drives

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

EtherCAT
Remote Modules

**Max. 64 axes
or 100 remote
modules**
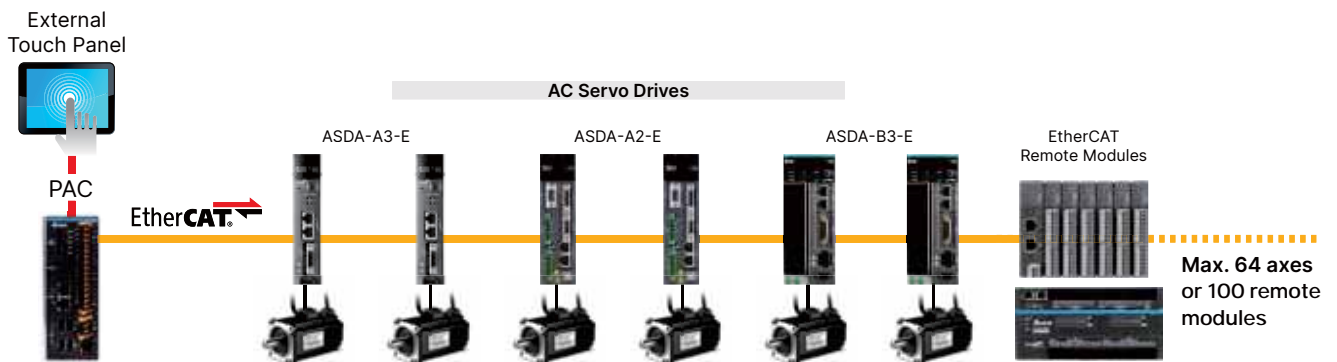
Applications

● **Electronics Production:**
Automated Optical Inspection (AOI) machines, LED machines, TFT/OLED inspection machines, PCB machines, semi-conductor machines, TAP machines, GPU testing machines, IC testers, optical lens processing machines, lens assembly machines, laser dicing machines, electronic assembly, consumer electronics, winding machines, glue-dispensing machines

● **Woodworking:**
CNC drilling machines, woodworking machines, board slitting machines

● **Other:**
Aluminum & stone processing equipment

MH2 / MP1

EtherCAT Modules Supported

- **Gateway Type E-Bus Remote Power Coupler**
  R1-EC5500D0
  Connects to digital I/O, analog I/O and pulse I/O extension modules

With E-Bus power module

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

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

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

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

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

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

EtherCAT High-Speed Motion Control System

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

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

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

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

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

EtherCAT System Configuration
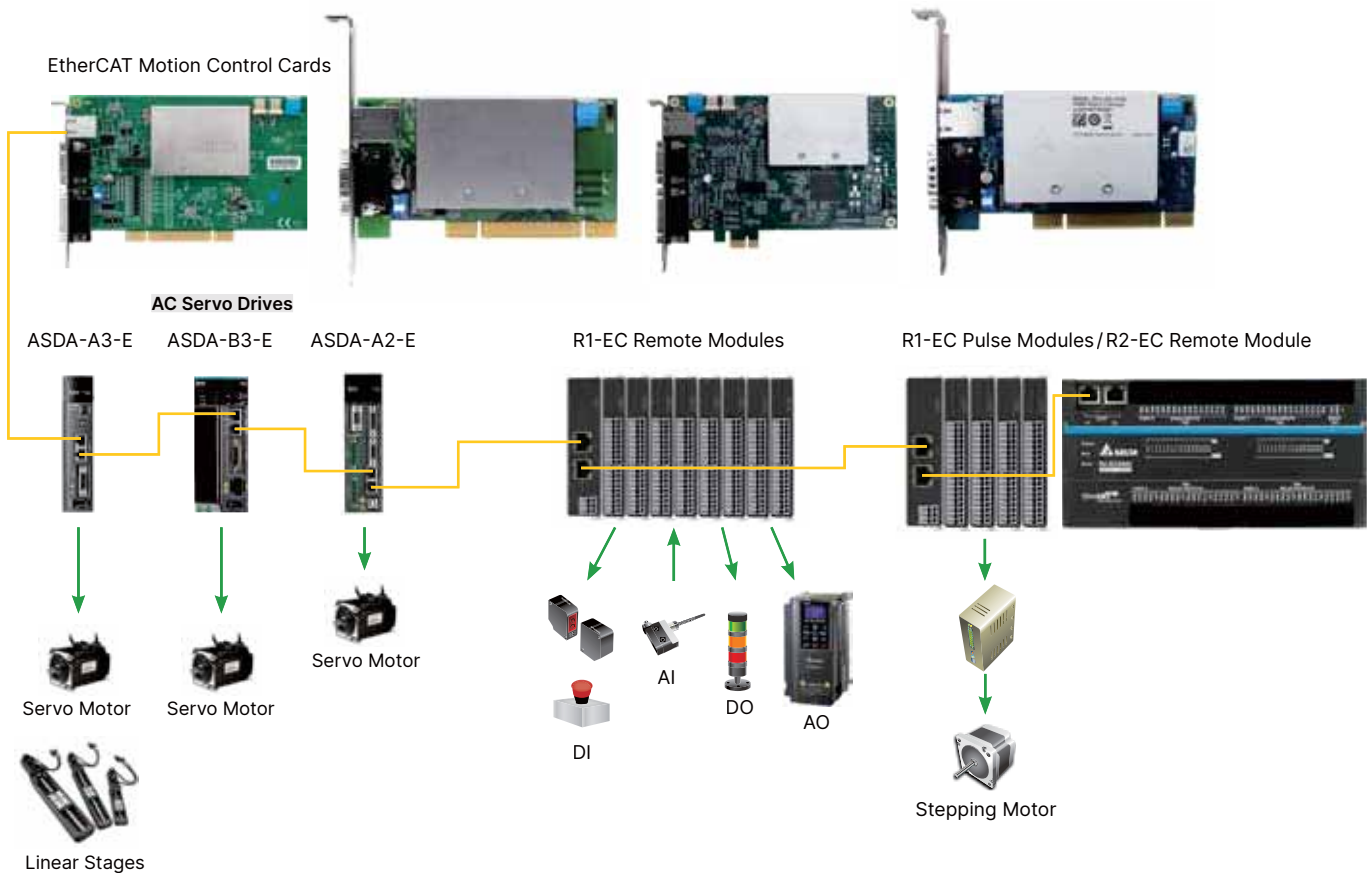
EtherCAT Motion Control Cards

AC Servo Drives

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

Linear Stages

Stepping Motor

Applications

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

High-Speed Motion Control System
DMCNET

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

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

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

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

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

DMCNET System Configuration
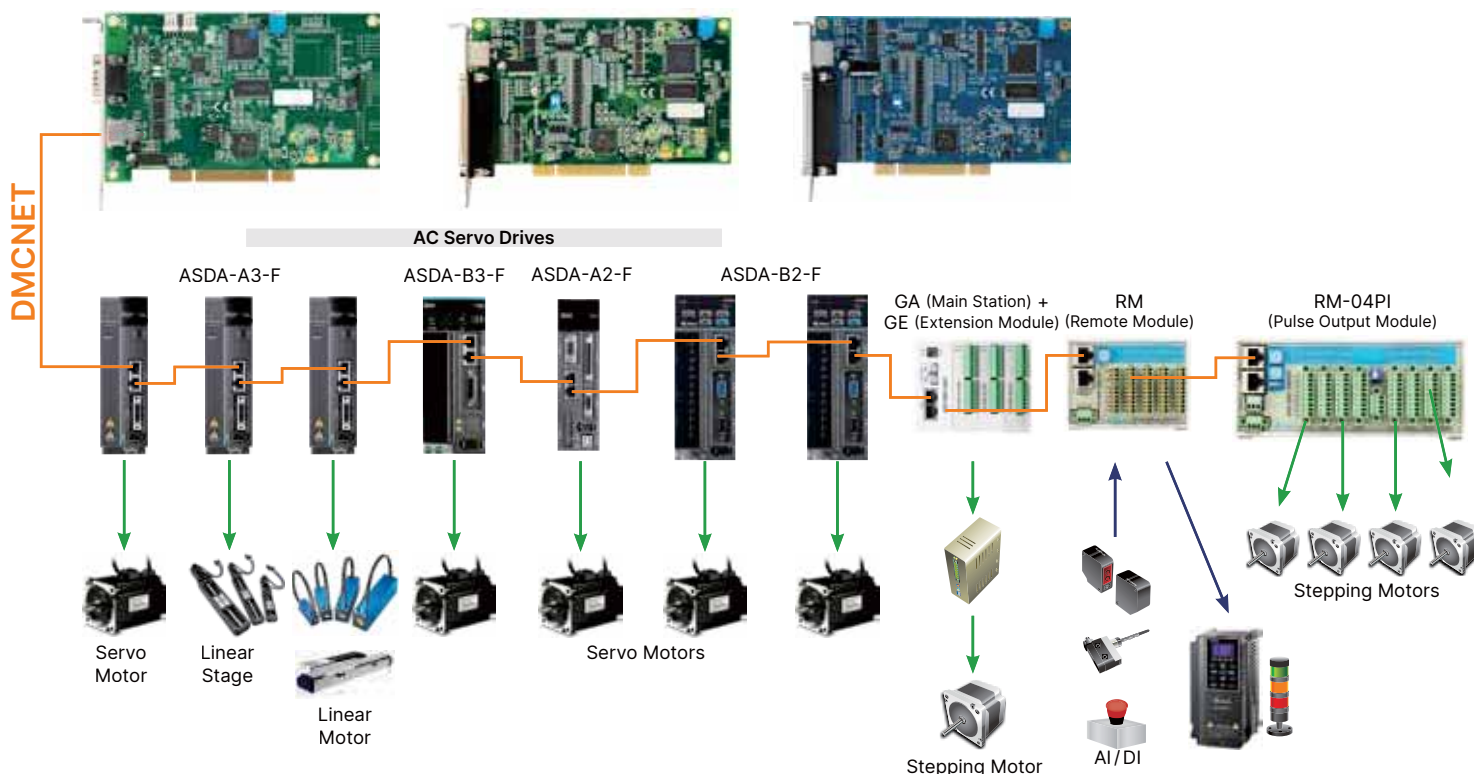
Applications

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

CODESYS Motion Solution

PC-Based Motion Controller
AX-8 Series

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

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

AX-8 Series

EtherCAT

Max. 100m between two stations

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

Max. 64 axes/1ms
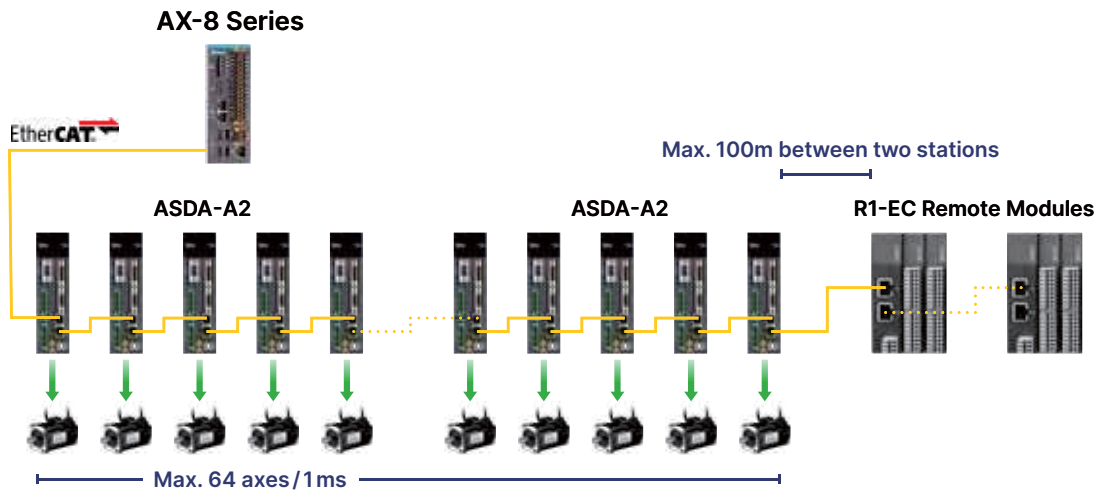
PLC-Based Motion Controller
AX-3 Series New

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

- AX-308E/AX-316E/AX-332E CPU support up to 8/16/32-axis EtherCAT motion control ability and the min sync. time of AX-332E reaches up to 0.5ms for 16 axes
- AX-304EL/AX-364EL CPU support 4/64-axis EtherCAT point-to-point control ability, which provides robust functions and higher values
- Supports PLC AS series' power, DIO, AIO and temperature expansion modules (Max. 32 modules)
- High performance: min. execution time of basic instruction is 5ns
- Provides common instructions such as position, velocity, torque, multi-axis interpolation, E-gear, E-CAM, and more
- Built-in 6~16 DI, 6~8 DO, incremental encoder (x1~2), SSI absolute encoder, RS-232/RS-485, Ethernet and EtherCAT ports

Software - **DIA**Desinger-AX

DIADesigner-AX is a programming platform compliant with IEC 61131-3 for Delta's PC-based motion controller AX Series. It provides a large number of application commands and a useful motion library. It has multiple built-in languages and enables easy and highly efficient development with its user-friendly interface.

- **Standardized programming**
  IEC 61131-3 compliant software provides a standardized programming and controller development platform
- **Unified integrated software**
  Programs all of Delta's automation products on a single platform to shorten development time and costs
- **Open and modular platform**
  Allows secondary development for customized functionalities and components with users' industry know-how
- **Single PLC / Motion platform**
  CODESYS runtime supports Windows, VxWork, and Linux operating systems to program PC-based or PLC-based controllers
- **Supports EtherCAT high-speed fieldbus**
  Highly efficient, precise and instant motion control enhances productivity
- **Tag sharing between HMI and controllers based on CODESYS**
  Easy and simple variable sharing saves editing time and labor
- **Supports diverse industry applications**
  Suitable for industrial robots, woodworking, printing and packaging applications
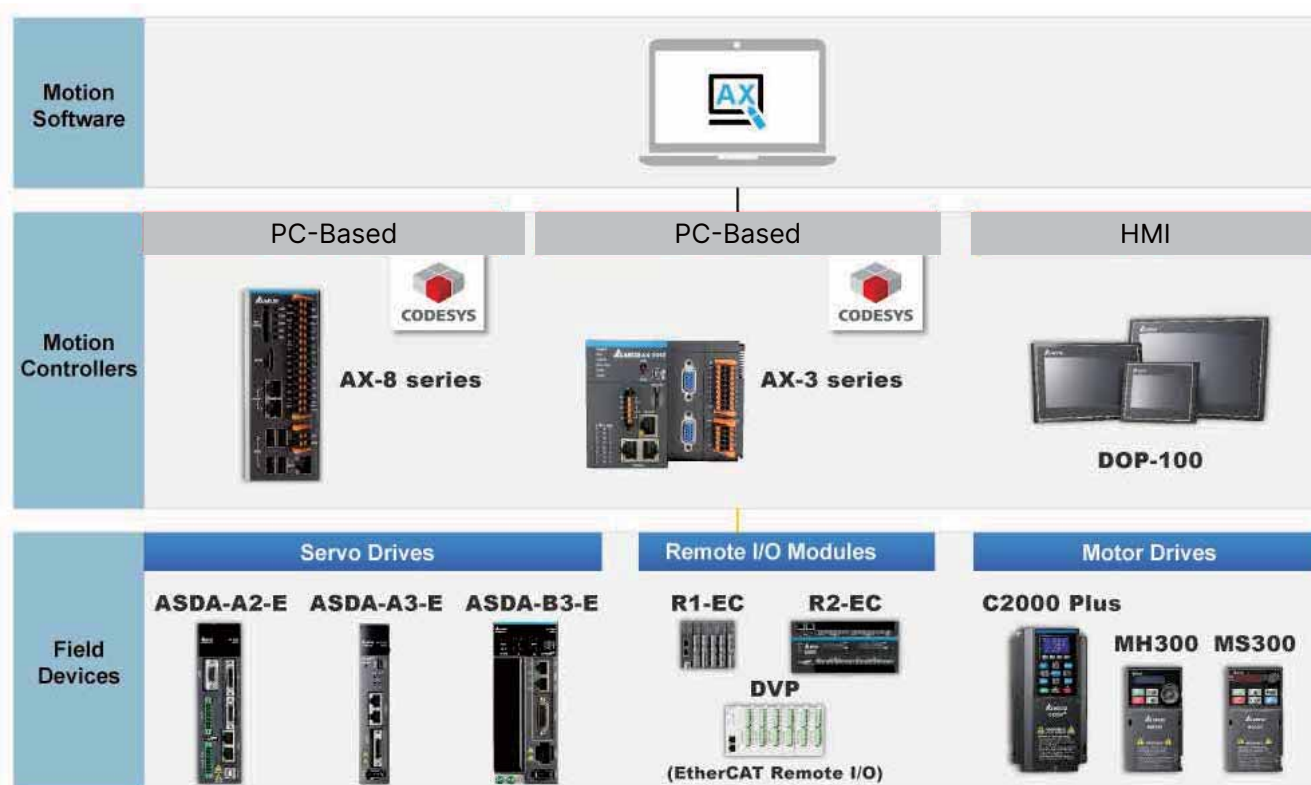
Open CNC Solution
NC30EB

Open-structured CNC Control System for Customization and Flexibility

Solution 1: Standard

VGA output for external display with Delta's standard interface

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

Solution 2: Function-Oriented

Match with panels or other products based on applications

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

VGA

USB

VGA

USB

Motion Control Host PAC
MH1-A12N Series

Ethernet

OPEN CNC Controller
NC30EB

DMCNET

AC Servo Drives
ASDA-A3

Spindle Motor Drive
ASDA-S

AC Servo Motors
ECMA

High Speed PM Spindle Motor
ECMS
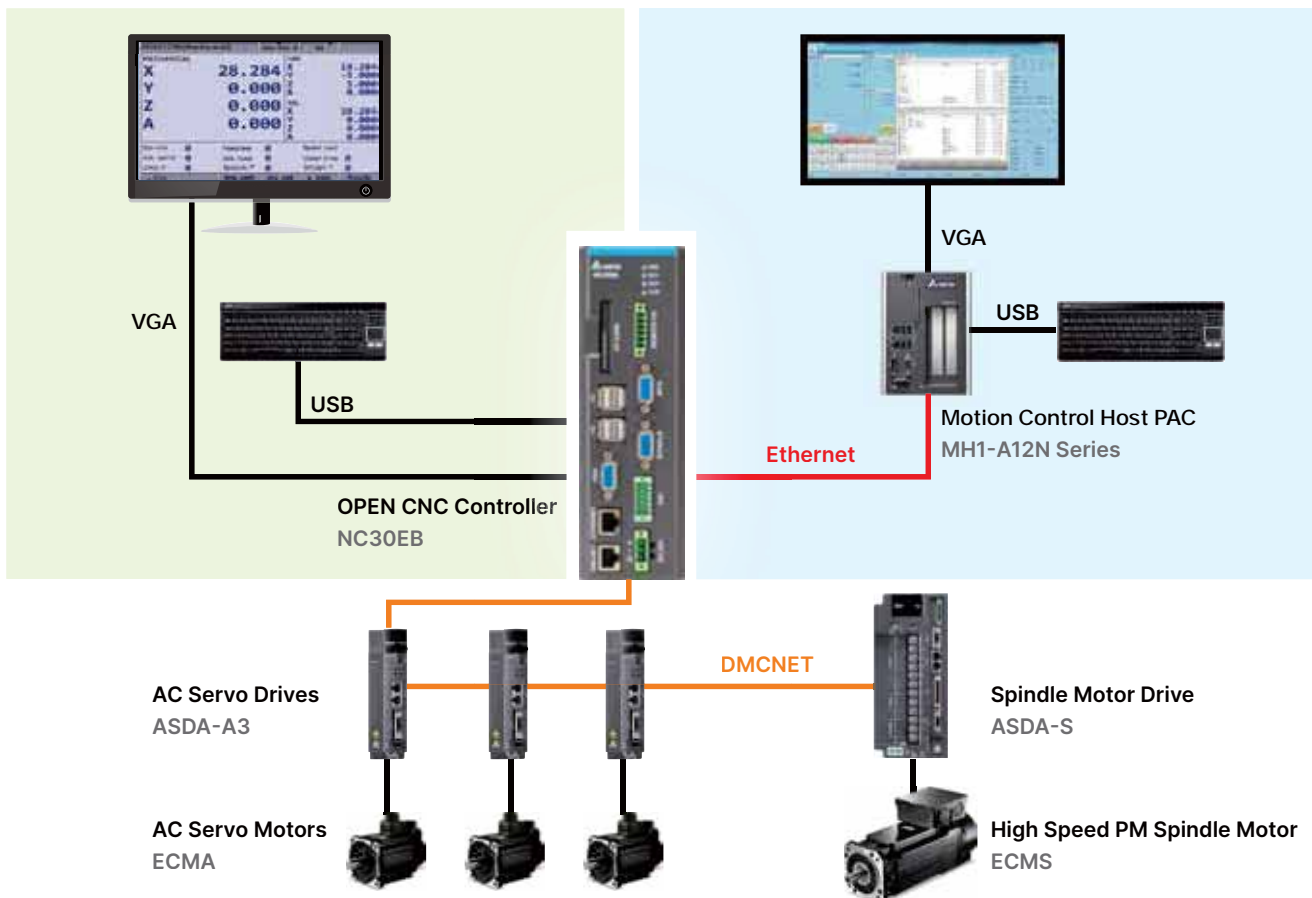
Applications

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

CNC Solution

Integrated Total Solution for the CNC Machine Tools Industry

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

System Configuration

CNCSoft Software

Spindle Drive
ASDA-S

Ethernet

DMCNET

AC Servo Drives
ASDA-A3

High- Speed Serial I/O

Local I/O
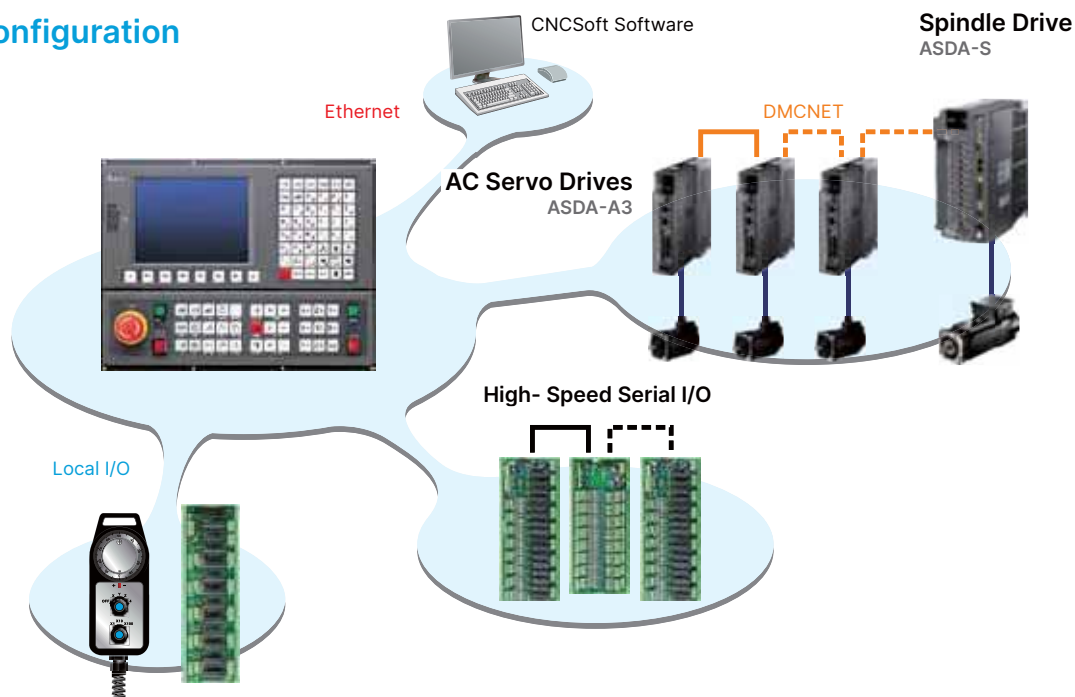
Applications

CNC Machining Center / High-speed Tapping Machine
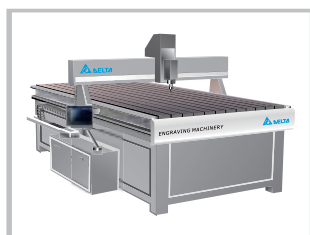
Engraving Machine

CNC Gantry Control Machine

CNC Woodworking Machine

52

NELTA

Robot Controller with Servo Drive Integrated
ASDA-MS

An Innovative and Comprehensive
Development Platform for Robot Control

Complete Robot Solution

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

User-Friendly Robot Software

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

System Configuration

Users

PAD

Robot Software on PC

Handheld Type HMI DOP-H

Ethernet

DELTA Robot

Articulated Robot

SCARA Robot

Extension Axes

ASDA-MS

ASDA-A2-F

ASDA-M

DMCNET

ECMA

ECMA

53
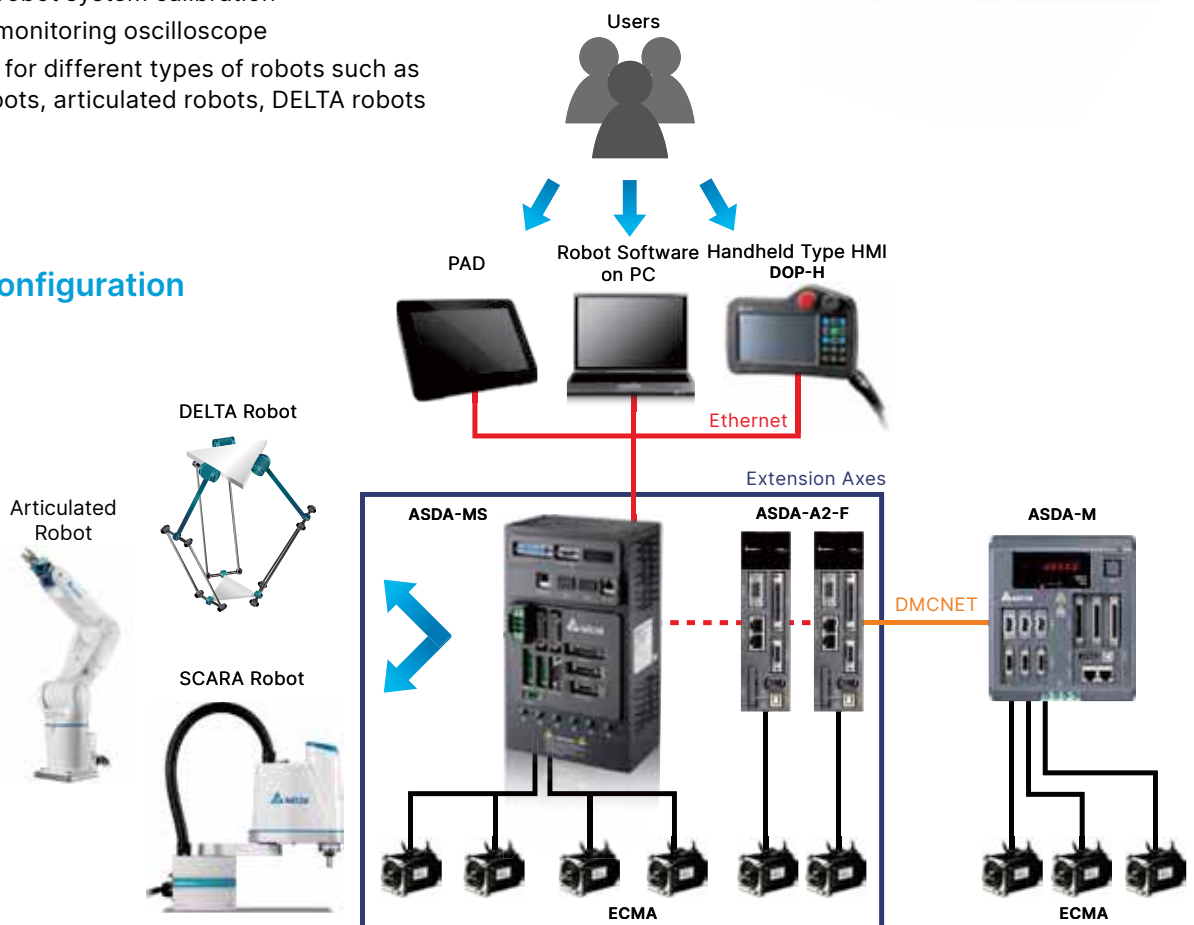
All-in-One Robot Controller

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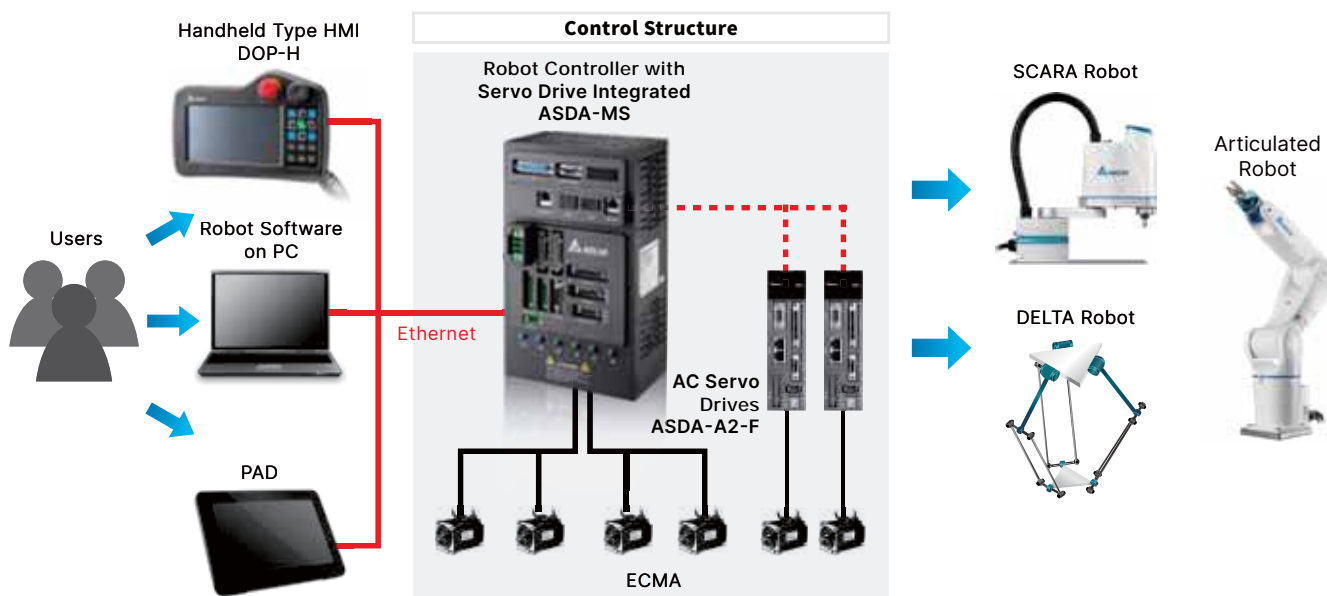
Comprehensive Development Platform

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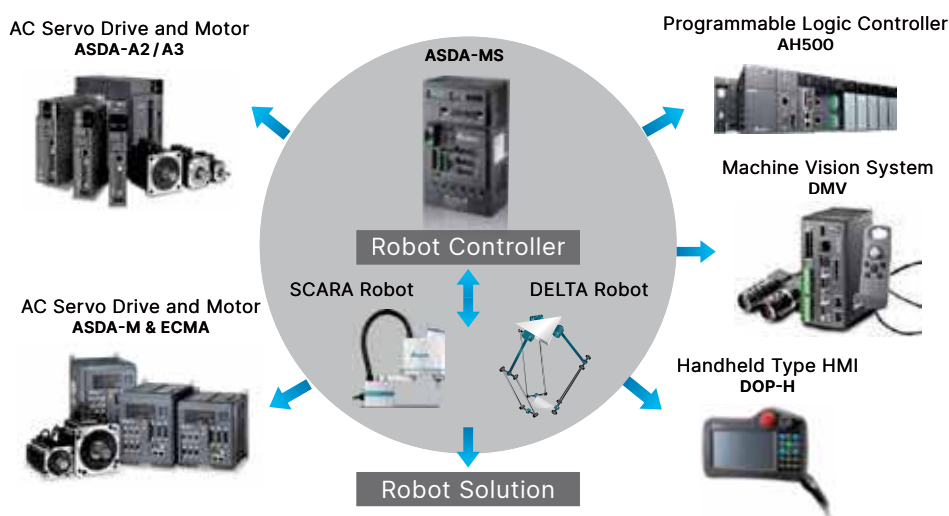
Applications

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

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

54

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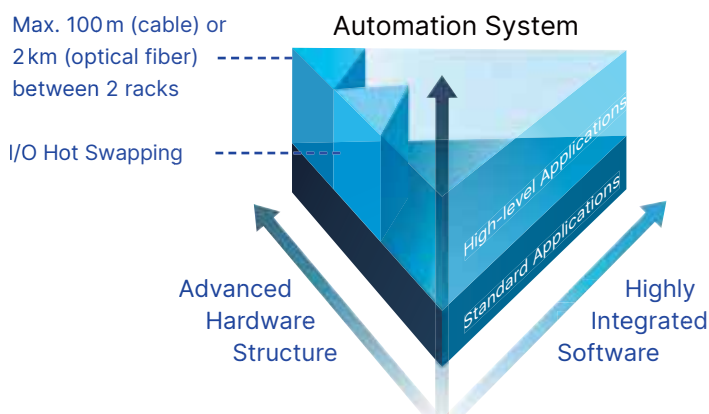
- Highly integrated programming software ISPSoft: Graphical interface with 5 programming languages
- Enhanced flexibility: Max. 100 m (cable) or 2 km (optical fiber) between 2 local extension racks
- Redundant system and hot-swapping function ensure non-stop system operation for improved maintainability

System Scalability

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

Extension bus

Fiber
Module

**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)

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

Power supply
module   CPU   IO Mod.   IO Mod.

**Backplane for motion
control modules
(AHBP05M2-5A)**

**(Modbus)
RS-485**

**Ethernet
(Modbus TCP)**

AH20EMC / AH10EMC / AH10PM

MORE

Pulse train

Total: 6 axes

EtherCAT

Total: 16 axes

EtherCAT

Total: 32 axes
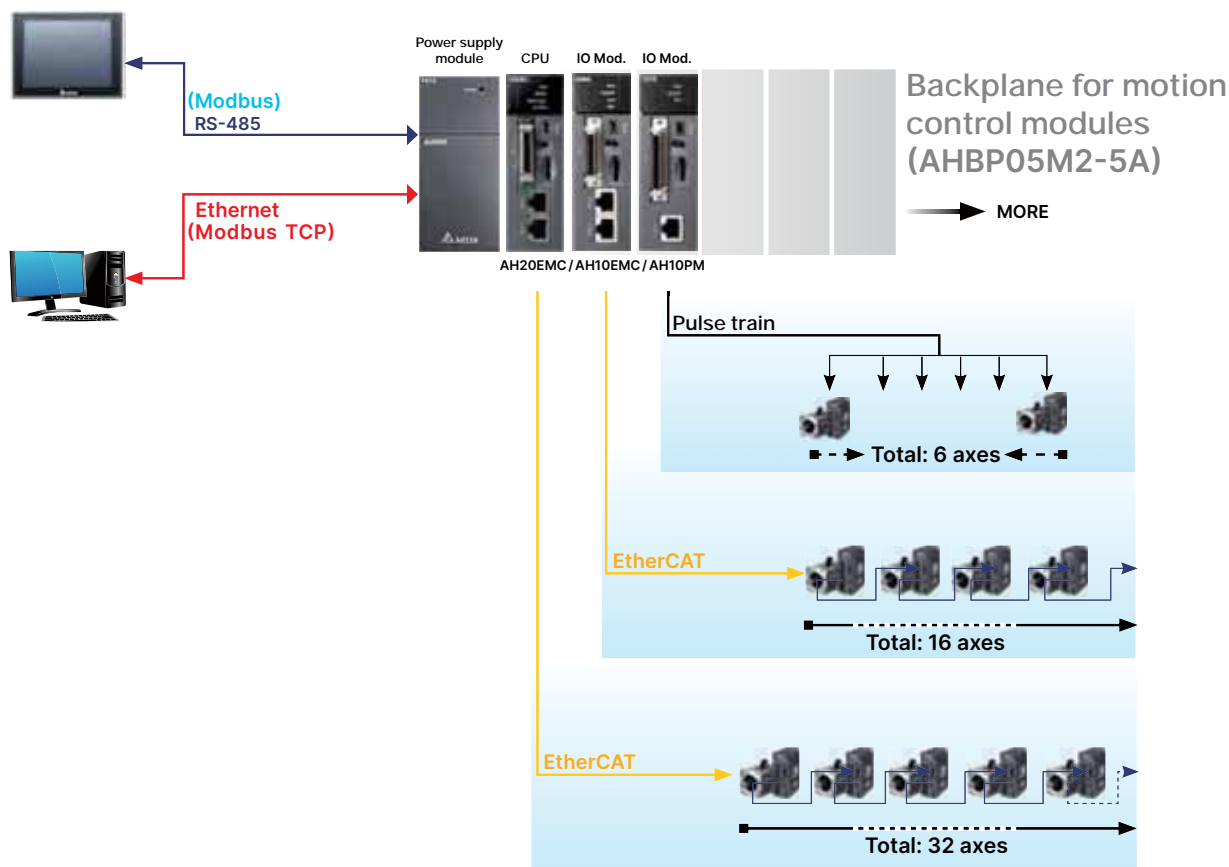
Applications

● **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 systems, traffic monitoring systems

ELTA

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)
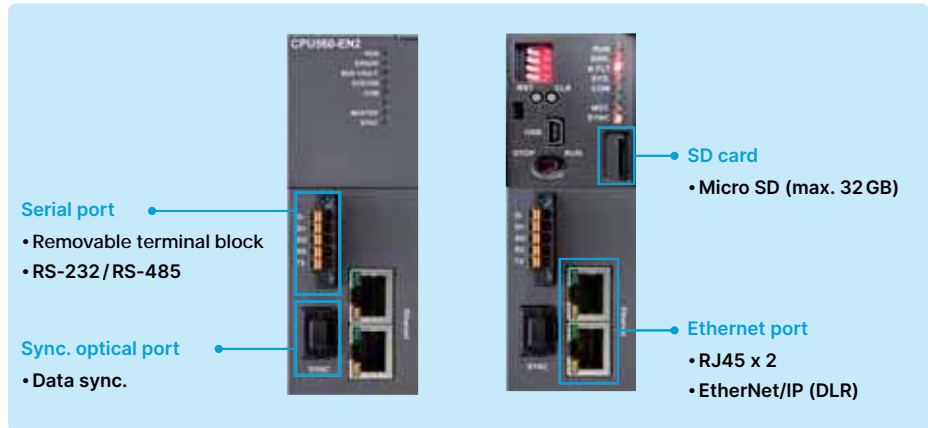
Redundant Backplane

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 (includes temperature modules)**

Tasks

Cyclic	Timer Interrupt

CPU built-in sync. module   CPU switch-over time: 20 ms

RTU nodes for expansion backplanes

Standard backplanes available (under some conditions)

EtherNet/IP
Modbus TCP

Master PLC   **Backup PLC**

Ext. cable for backplane

EtherNet/IP (DLR)

Redundant expansion backplane

Redundant expansion backplane

RTU

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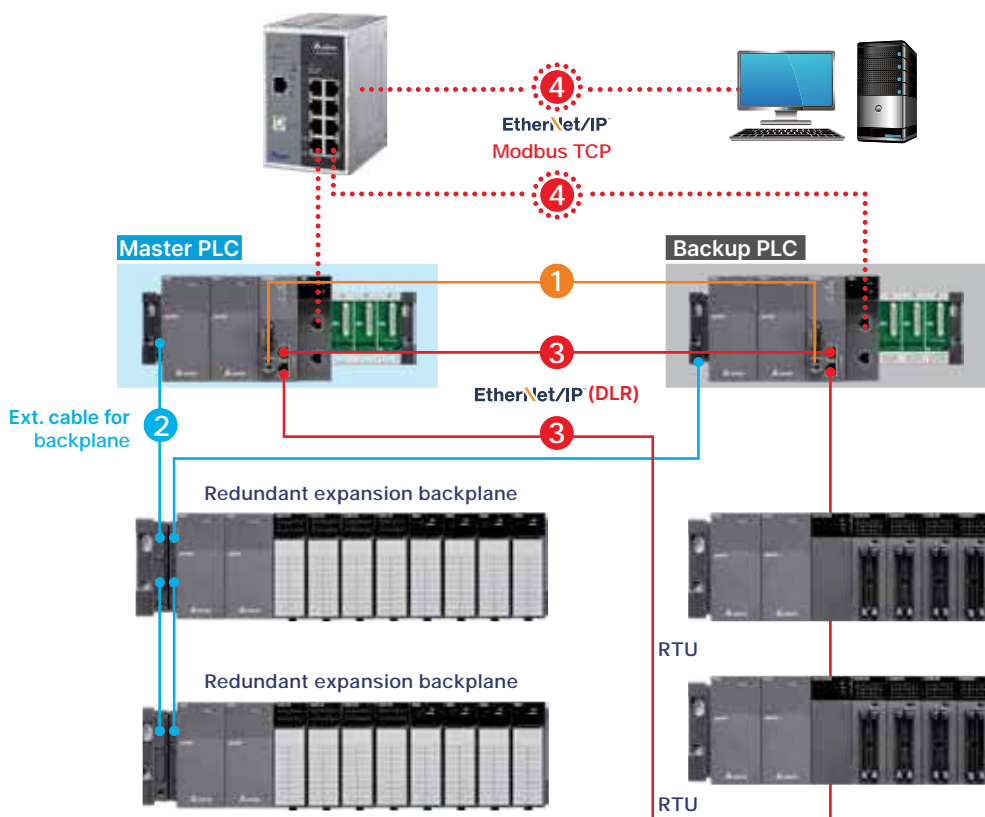
① **Sync. optical fiber**   ② **Ext. cable for backplane**   ③ **EtherNet/IP ring topology (DLR)**   ④ **Star topology** EtherNet/IP, Modbus TCP

Compact Modular Mid-range PLC
AS

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

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

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

Advanced CPU Performance

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

LD instruction	25 ns
MOV instruction	0.15 μs
Floating point operation instruction	1.6 μs
Trigonometric operation instruction	3.5 μs
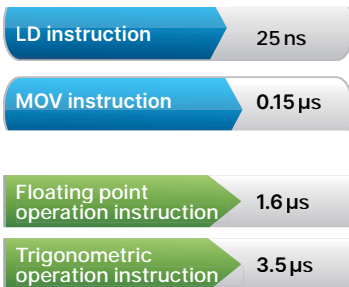
Positioning Control - Delta's CANopen Control

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

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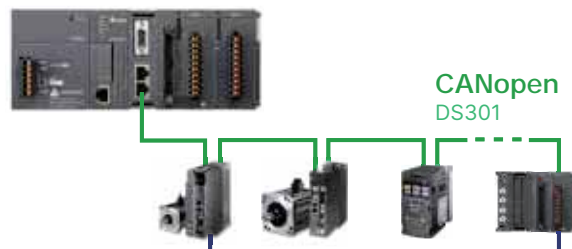
Supports up to 8 servo drives, 8 AC motor drives, and 7 AS RIO stations

Positioning Control - High-speed Pulse

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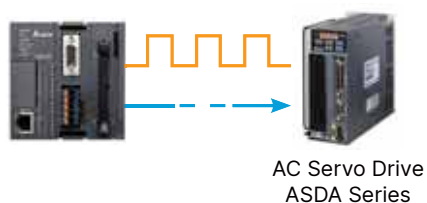
Flexible Network System Configuration

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

AC Servo Drive
ASDA Series

Linear

Star

EtherNet/IP
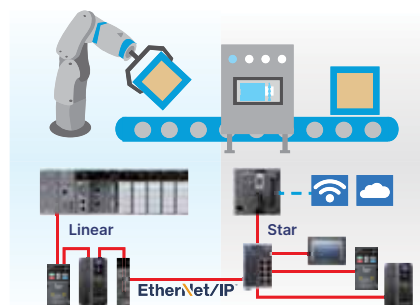
New Programming Software

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 executions

- **Convenient comparison:**
  Multiple data logs in various data formats can be recorded at the same time

- **Efficient data analysis:**
  Supports trend display, scaling, arrangement, merge and measurement

Real-time

Stable

Precise

Applications

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

DELTA

Compact Modular Motion Controller
AS500

The Best Solution for OEM Equipment

EtherCAT Motion Control System

- Provides a variety of controller options
  - Standard controller: 16-axis
  - Point-to-point controller: 32-axis and 64-axis

- AS516E CPU supports up to 16 axes Delta EtherCAT servo drives (min. sync time: 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, and more
- Built-in 16 DI & 8 DO, incremental encoder x 2, SSI absolute encoder, RS-232 / 485, Ethernet, CANopen DS301 and EtherCAT interfaces
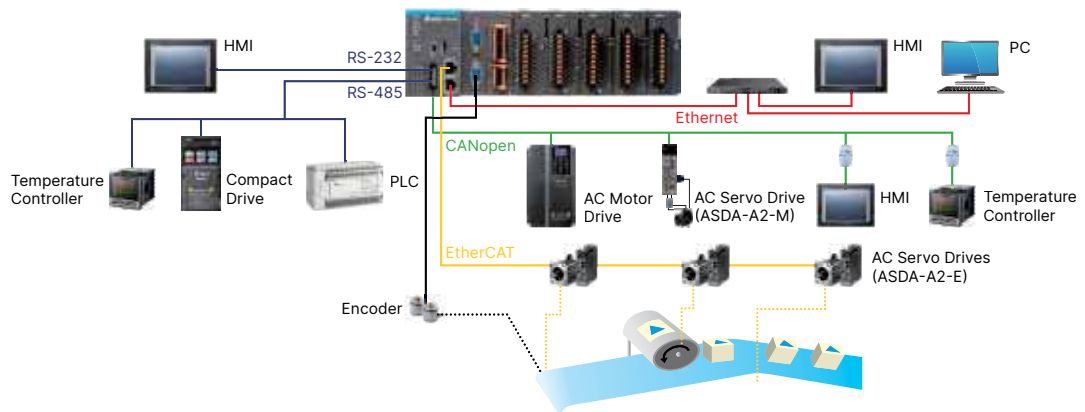
CANopen Motion Control System

- AS524C CPU supports up to 24 axes Delta CANopen servo drives (min. sync time: 2 ms / 4 axes)
- Supports AS power, DIO, AIO, temperature and load cell expansion modules (max. 32 modules)
- 1 GHz processor provides high operation performance
- Provides various motion commands: position, velocity, torque, multi-axis interpolation, E-gear, E-CAM, G-code, and more
- Built-in 16 DI & 8 DO, 2 incremental encoders, SSI absolute encoder, RS-232 / 485, Ethernet x 2, CANopen DS301 and CANopen motion interfaces
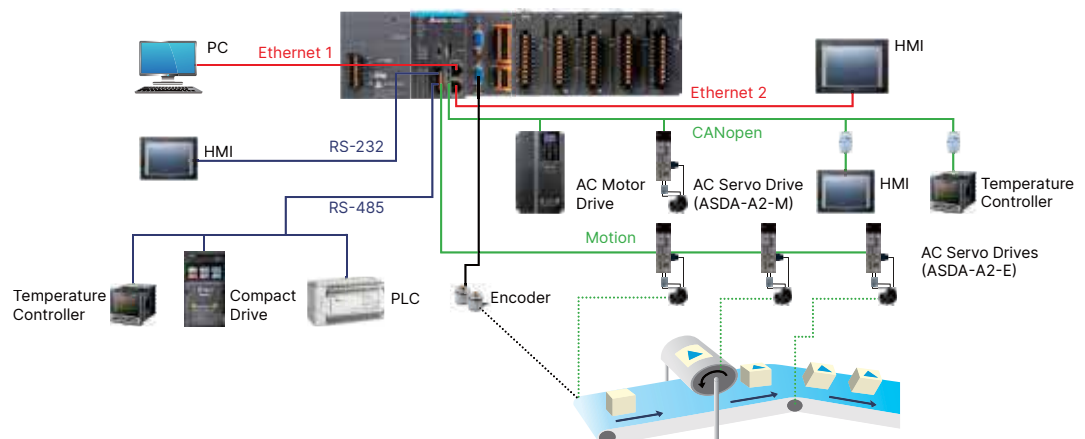
Compact Modular CODESYS Motion Controller
AX-3 `New`

Perfect Integration of High Performance,
Flexibility and User-friendliness

CODESYS EtherCAT Motion Control System

- Provides a variety of controller options
  - Standard controller: 8-axis and 16-axis
  - Point-to-point controller: 4-axis and 64-axis
- 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, and more
- Built-in 16 DI & 8 DO, incremental encoder x 2, SSI absolute encoder, RS-232/485, Ethernet and EtherCAT interfaces

RS-232

HMI

Ethernet

HMI

PC

EtherCAT

RS-485

Temperature
Controller

Compact
Drive

PLC

AC Servo Drives
(ASDA-A2-E)

Encoder

62
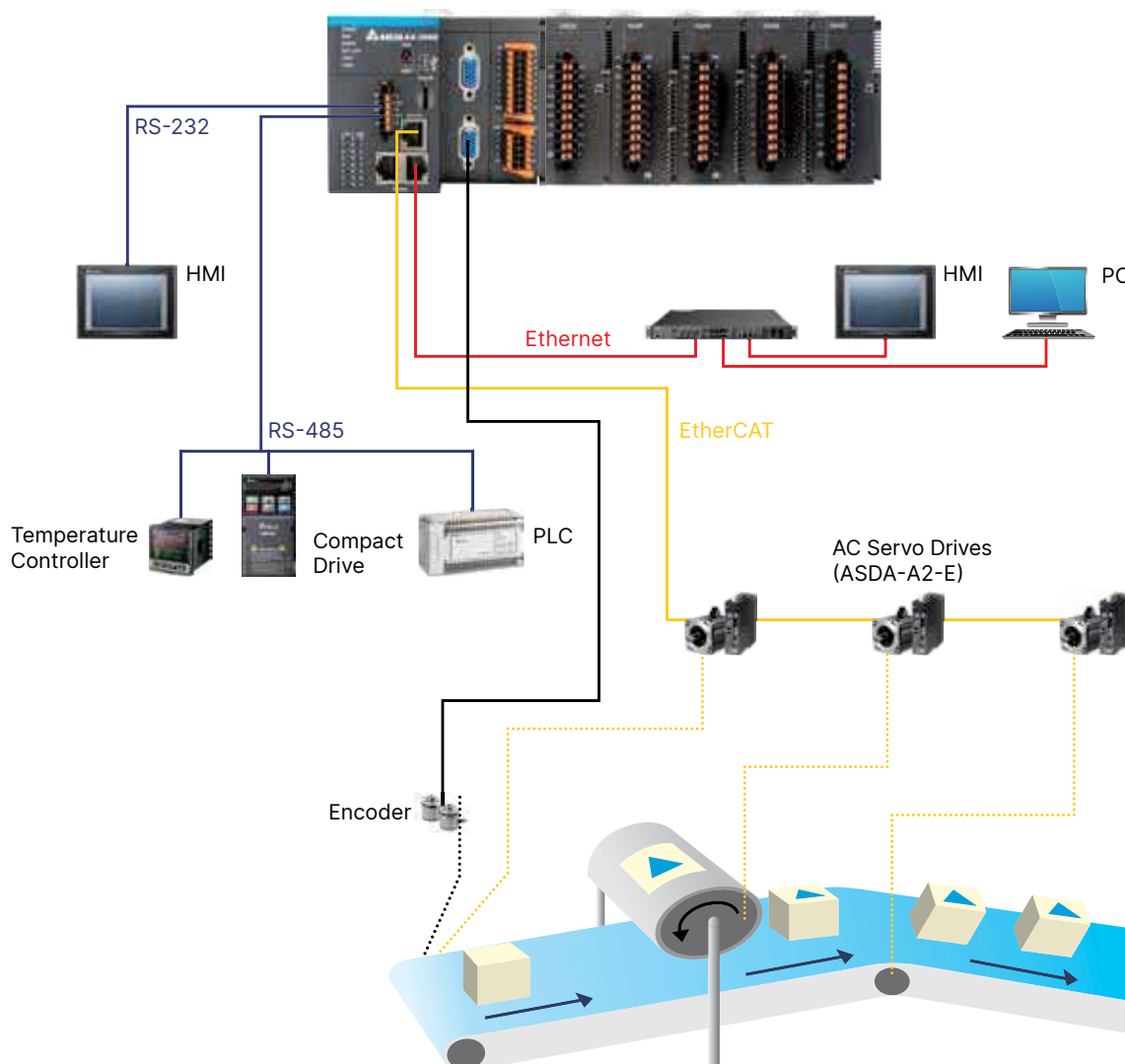
High Performance PLC
DVP-EH3

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

Excellent Motion Control

- High speed counter: 200 kHz x 4 (A/B phase) or 200 kHz x 8 (single phase)
- High speed pulse out: 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 / 48 / 64 / 80 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

ΔELTA
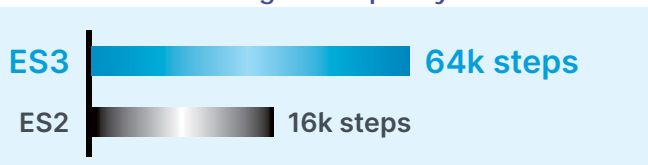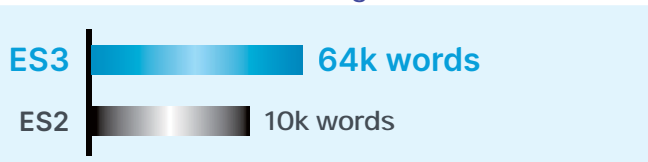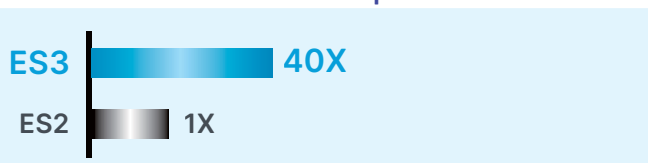
Modules

- **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 capabilities for your control systems

- Standard PLC DVP-ES2 Series:
  - 16/20/24/32/40/60/80 I/O points for a variety of applications
  - No battery required; RTC function operates for at least one week after power off (hardware version 2.0 or above)
  - DVP32ES2-C model with built-in CANopen (Baud: 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 1 ms
- 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 and supports Modbus TCP and EtherNet/IP (Adapter mode)
- IP Filter function as firewall for first line protection against malware and network threats
- No battery required; RTC function operates for 15 days after power off
- Supports DVP-S Series modules (left-side and right-side) (DVP26SE only supports right-side modules)

DELTA

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		Data Register	
SV2	30k steps	**SV2**	12k words
SV	16k steps	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
- **CANopen Master**
  DVPCOPM-SL

- **Ethernet**
  DVPEN01-SL
- **PROFIBUS DP Slave**
  DVPPF02-SL

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

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

High Speed, High Precision, and High Performance Motion Control

Provides a variety of controller options

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

CANopen motion controller
- Standard: 6 and 24 axes

DVP-10MC   DVP-15MC   DVP-50MC

Perfect Controllers for EtherCAT / CANopen Motion Solutions

- Built-in 16 / 24 I/O points; max. 480 I/O points
- Program capacity:
  - DVP10MC: Ladder 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)

69
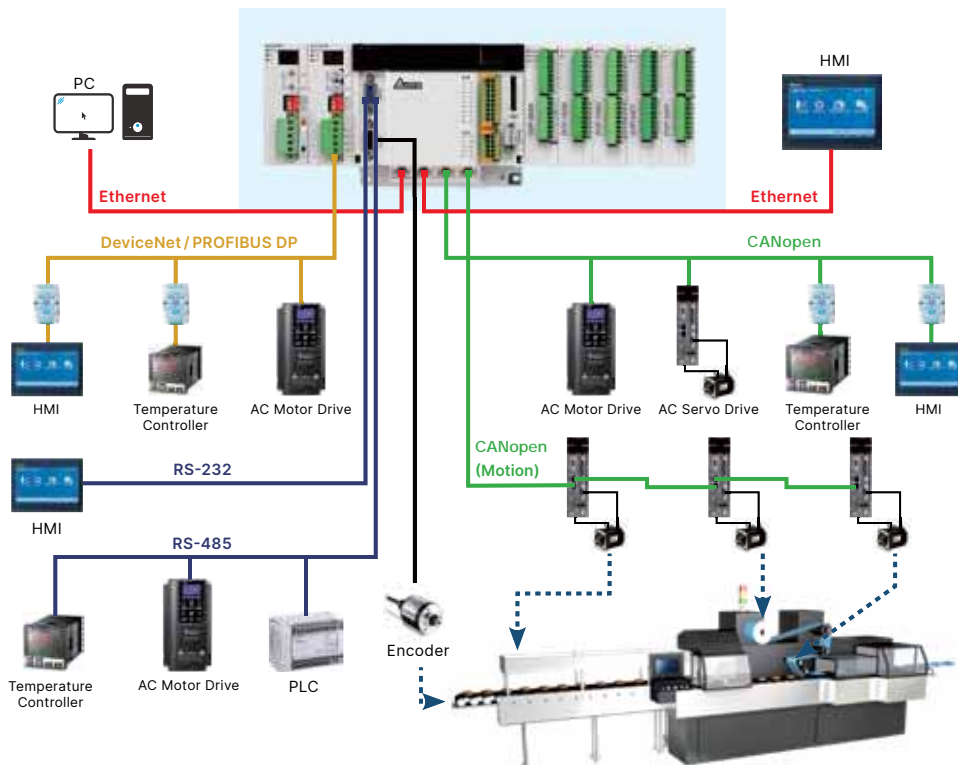
General Motion Controller
DVP-PM

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

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 800 MHz 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

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

- 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

- 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

- 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

- 10" 65,536 colors TFT / Display resolution: 1,024 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

- 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 & USB client

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

- 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

- 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 set of COM ports / 1 extension COM port
- USB host
- Supports FTP / Email / VNC / Web monitor

Basic Type HMI

4.3-inch Basic HMI
DOP-103BQ

- 4.3" 65,536 colors TFT / Display resolution: 480 x 272
- Cortex-A8 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

Handheld HMI

7-inch Widescreen Handheld HMI
DOP-H07

- 7" 16:9 widescreen, 65,536 colors TFT
- Display Resolution: 800 x 480 pixels
- Supports SDHC cards
- Built-in emergency stop switch
- Built-in enable switch (rear side)
- Serial communication models support RS-485 / RS-422
- Ethernet communication models support one Ethernet port
- Optional MPG (Manual Pulse Generator)
- Compact and lightweight design: 750 g
- Integrated style cables available (5 m / 10 m)

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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

- Adopts the CPU of the DVP-SS2 Series PLC: program capacity: 4k steps / D device: 5k words
- Provides 2 sets of 10 kHz high-speed pulse input
- 7" TFT-LCD
- Touch screen
- Built-in USB port for program upload / download
- Built-in RS-485 port 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 the DVP-SS2 Series PLC: program capacity: 8k steps / D device: 5k words
- Provides 2 sets of 10 kHz high-speed pulse input
- 4.1" STN-LCD
- Provides 0 ~ 9 numeric keys with user-defined functions
- Built-in USB port for program upload / download
- Built-in RS-485 port 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

DELTA

SCADA System
VTScada

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

Fully Integrated Architecture (Standard & Optional)
- Complete SCADA functions available with one-time installation
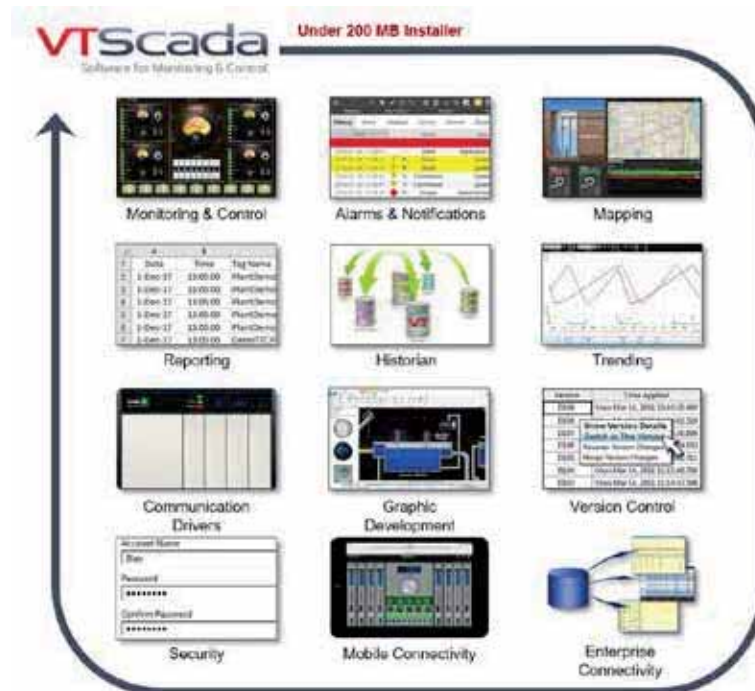
Applications

Water & Wastewater Treatment

Oil & Gas | Chemicals

Electronics Manufacturing

Food & Beverage

Device Driver Library (Standard)

- More than 100 industry standard and proprietary protocols
- Integrated device driver library allows users to connect to any combination of hardware
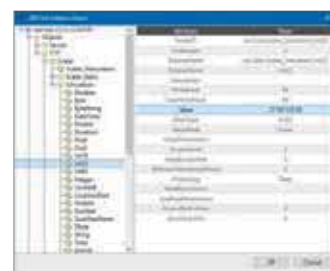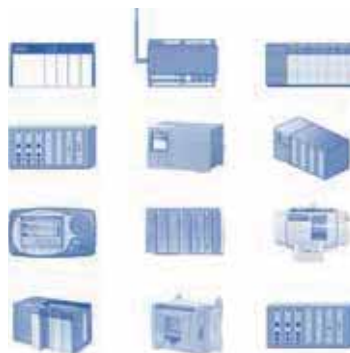
**OPC UA Client
Configuration Driver**

The VTScada Historian (Standard)

- Built-in historical database, requiring no additional costs

Redundancy across the System (Requires Multiple Licenses)

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

VTScada Thin Clients^(Optional)

- Supports HTML5 browsers on mobile devices and PCs

VTScada Idea Studio (Standard in Development Runtime License)

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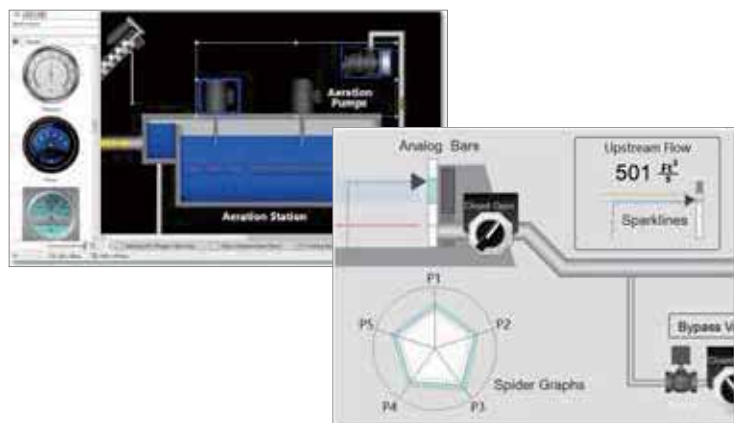
SCADA System

DIAView

Remote Monitoring for Smart Factory Management

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

System Structure and Applications

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

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

Success Stories
Wood Edge Sealing Machine Monitoring

Customer Needs

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

Solution

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

Benefits

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

DIAView

PLC

CANopen

Woodworking Machine **AC Servo Drive & Motor** **AC Motor Drive**

ΔNELTA

Photoelectric Sensor
PS-R

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

PS-F / PS-L

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

PS-M

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

Inductive Proximity Sensor
ISE New

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

Laser Displacement
LD-N (Standard Type)

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

Laser Displacement
LD-E (Long-range Type)

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

Area Sensor
AS-B (Standard)

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

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

AS-B (Communication)

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

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

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

AS-E

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

Applications

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

ᐃNELTA

Rotary Encoder
ES / EH / HS / HH

Incremental

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

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

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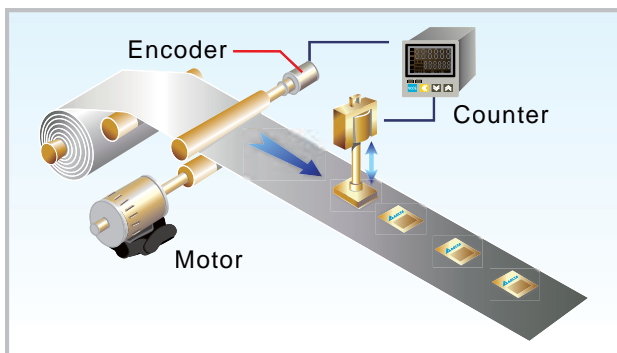
Label Printing Machine
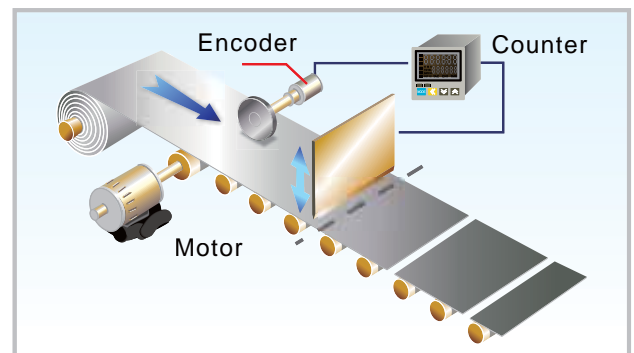
Cutting Machine
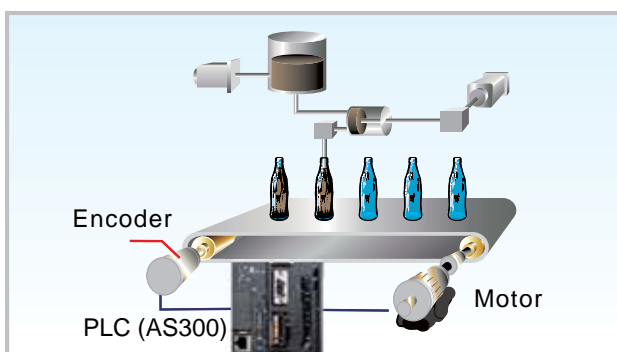
Bottling Machine
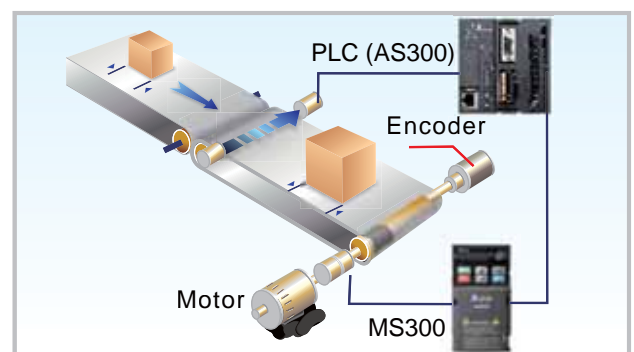
Testing / Inspection Machine

Applications

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

Handheld Barcode Scanner
DAH1000S / DAH2000H

Wide Target Range, Fast and Reliable Capturing

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

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

Advanced Decode Algorithm for Excellent Reading Performance

1D Barcodes

Low contrast	Optical noise	Under glare	Damaged

2D Barcodes

Optical noise	Poorly printed	Unevenly exposed	Poorly illuminated
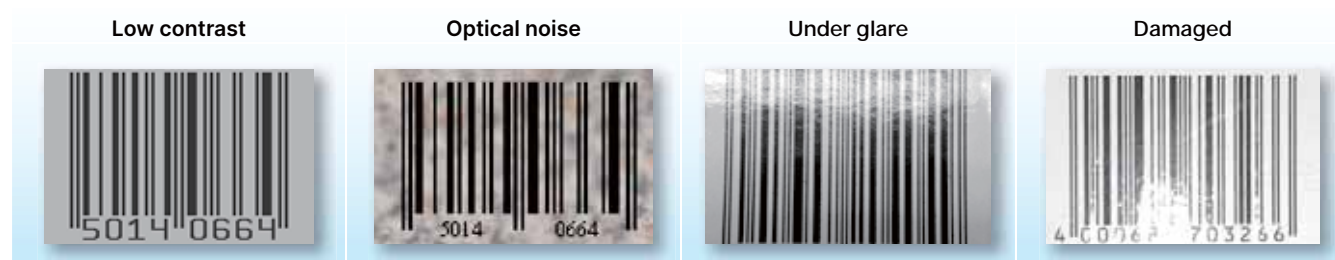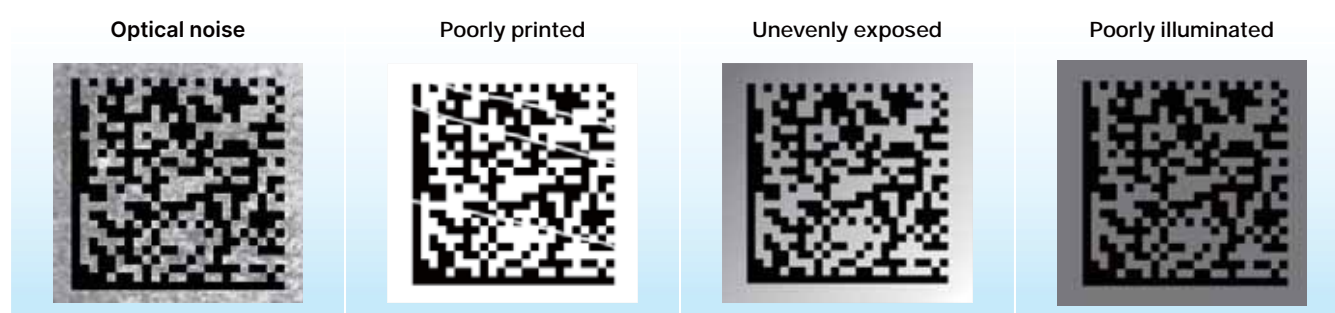
Applications

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

Fixed-mount Barcode Scanner
DFS131 / DFS150

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

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

System Structure
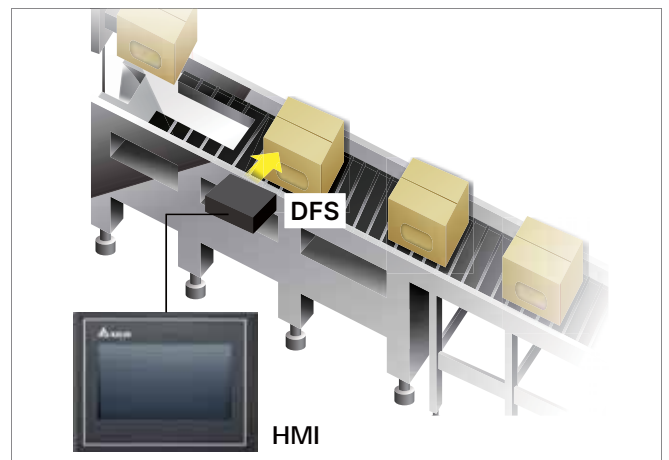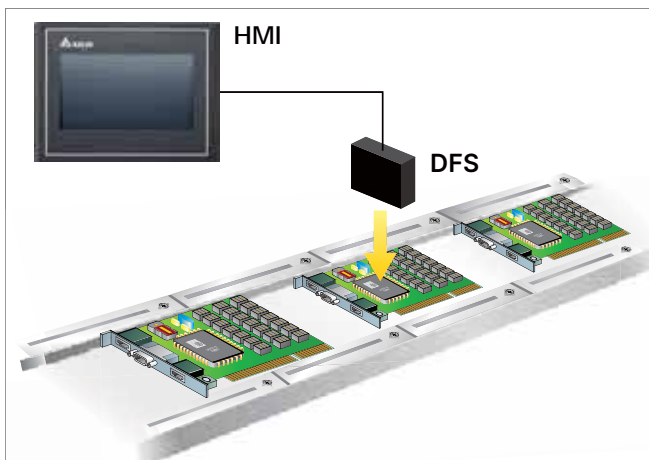
Applications

| Retail | Logistics | Manufacturing | Medical Service |

Vision Sensor
VIS

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

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

System Structure
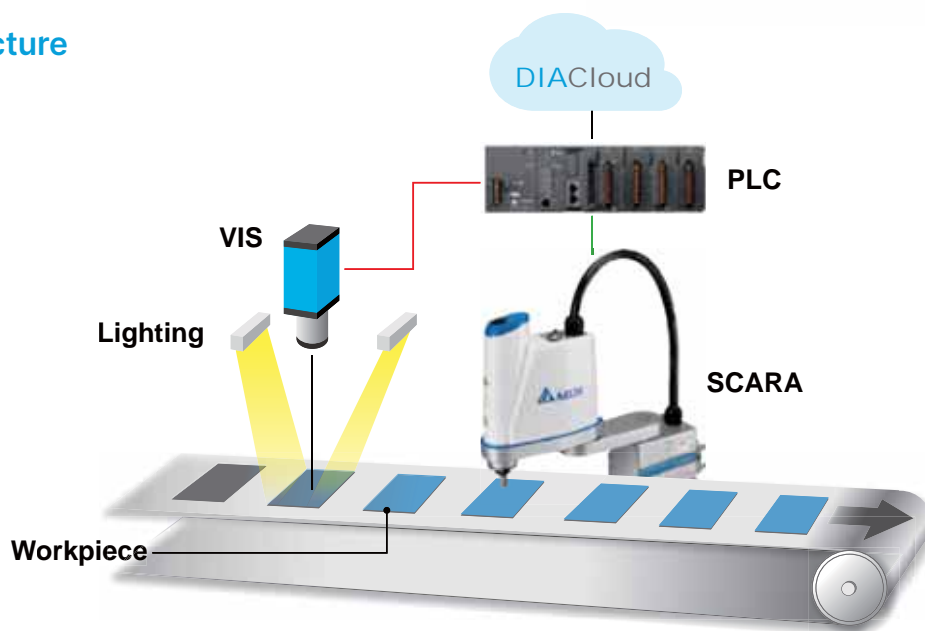
Applications
Automated quality inspection for packaging, electronics manufacturing and product assembly

Barcode Reading   Quality Assurance   Object Inspection

Multi-Loop Modular Temperature Controller
DTM

Quick Start and User-friendly Interface for Settings

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

Module Introduction

CPUs
RS-485 Type
DTMR08 / DTMR04

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

Ethernet Type
DTME08 / DTME04

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

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

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

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

I/O Extension Modules

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

Output Extension Cassettes

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

  * Please refer to the picture on the right for installation

Output
Terminal
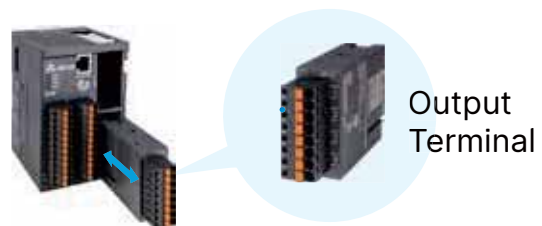
Data Collection by CPU

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

The CPU sends all data from the DTM group to the master controller
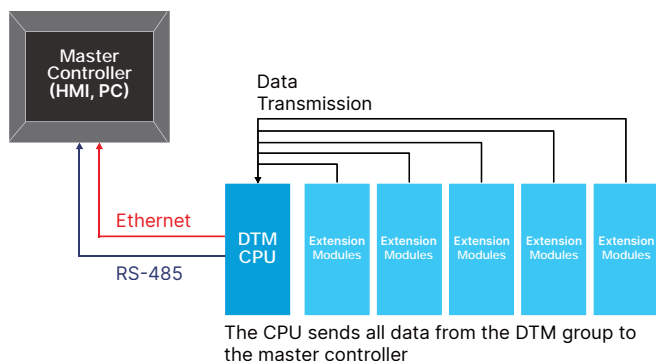
User-Defined Communication Address

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

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

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

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

Complete Isolation Between Channels

- Complete isolation between channels prevents electricity leakage of the heating device and damage to the electric circuit of the thermocouple input channels
- 8 sets of input channels are completely isolated to ensure a stable measurement signal and avoid interference
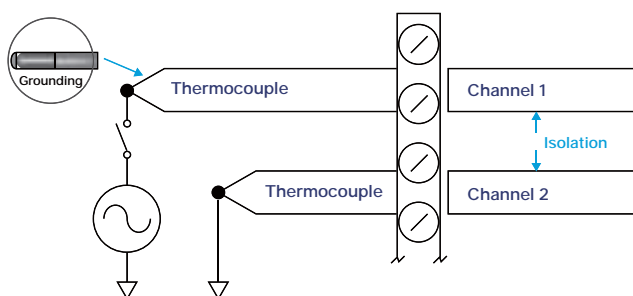
Multi-Point Temperature Control via RS-485 and Ethernet

1. Multi-point control

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

2. Various input channels

- A single channel supports analog voltage, analog current, thermocouple and platinum RTD input
- Allows users to select the sensor type for each channel separately
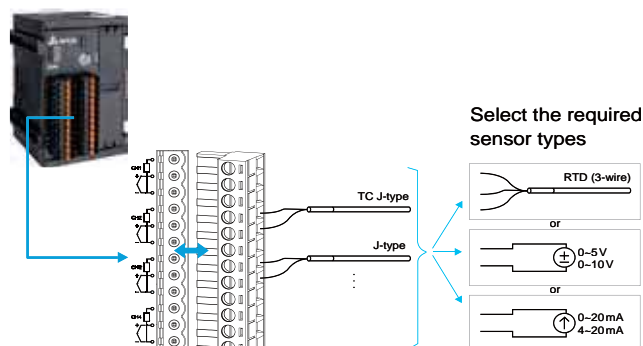
3. RS-485 and Ethernet introduction

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

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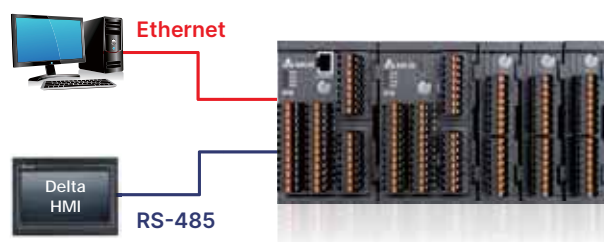
Advanced Intelligent Temperature Controller
DT3

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
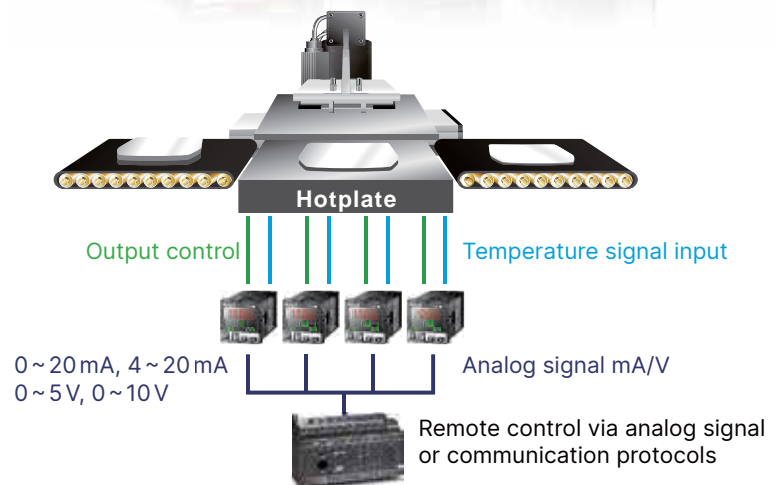
Various Control Modes

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

PID control

When disturbance occurs

Default value

Fuzzy PID control

The Fuzzy mode effectively reduces temperature fluctuation

PID control — Fuzzy PID control
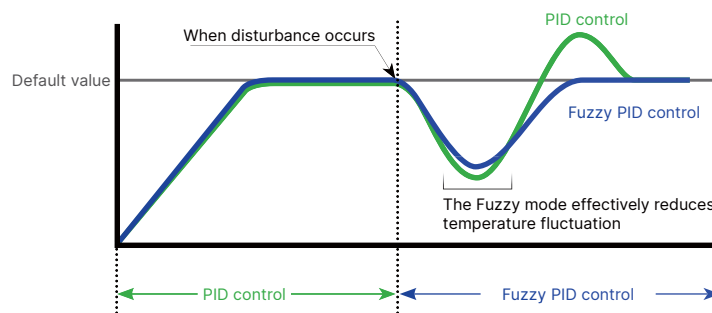
Applications

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

Power
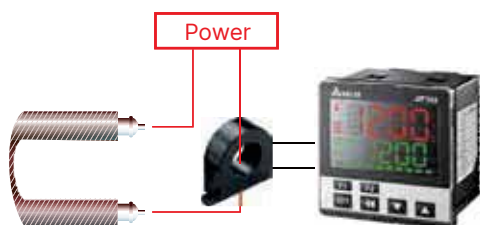
Point-to-Point Control (Proportional Output mA)

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

Inject
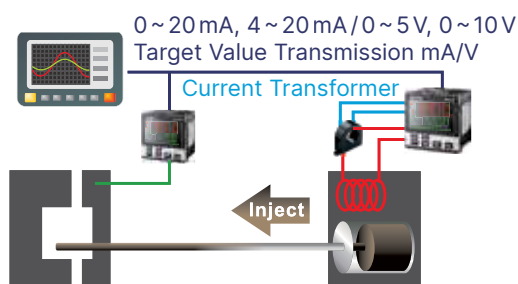
Dual-output Control

- 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)
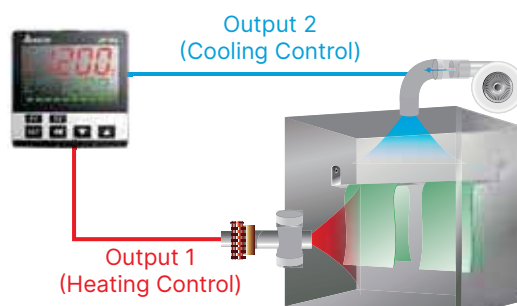
Temperature Sensor Input

- 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%

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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 communication
- 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 Savings

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

Applications

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

Flow Switch
DFM

High-precision and Multiple Air Flow Range

- Flow range: 2~200 L/min., 0.5~50 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, electronics manufacturing, rubber and plastic welding,
Laser Beam Machining (LBM), air compressors (in factories and others), and nitrogen generators

Timer/Counter/Tachometer
CTA

All-in-One Device

- Power input: AC 100~240 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
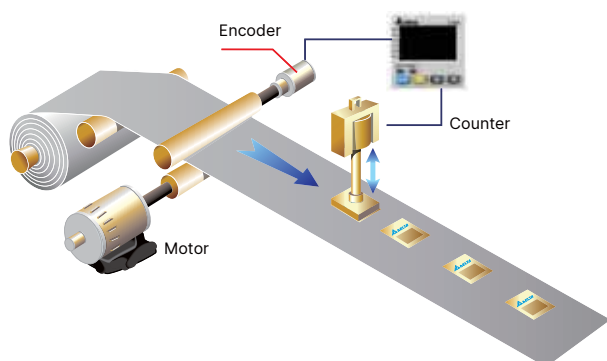
Fixed Length Cutting Machine
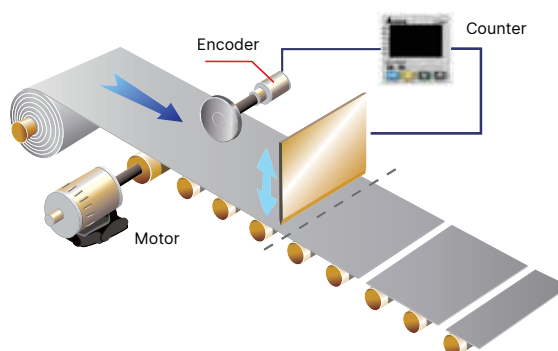
Power Meter
DPM

Highly Accurate, Reliable Power Monitoring Solution

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

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

Panel Mounting Type
DPM-C Series

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

Applications

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

DIN-Rail Mounting Type
DPM-D Series

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

Applications

High power-consuming equipment, electrical equipment cabinets, enclosures

Multi-loop Type
DPM-M Series

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

Applications

Shopping malls, dormitories, telecommunication systems

Cross-Factory Energy Management and Integrated Applications

Control Center - Dashboard

DIAEnergie

Optical Fiber Ring

Managed Industrial Redundant Ethernet Switches

Intranet (T1 Network)

Plant 1

PPC

DIAEnergie

Factory Network
(Industrial Ethernet)

IEEE 802.11
Industrial Wireless
WLAN AP

C530E

Industrial Ethernet
Switches

PLC

USB
Gateway

C520W

C530   C530

C520   C501L

C520   C501L

Air
Flow

Water
Flow

Plant N

PPC

DIAEnergie

IEEE 802.11
Industrial Wireless
WLAN AP

C530E

Industrial Ethernet
Switches

PLC

USB
Gateway

C520W

C530   C530

C520   C502

C520   C502

AGV

Elevator   HVAC   Illumination

Factory Automation - Energy Consumption Analysis of Production Lines

Human Machine
Interface

Programmable
Logic Controller

Modbus

Temperature
Controller

Pressure
Sensor

Timer / Counter /
Tachometer

AC Servo
Drive

Power Meter

AC Motor
Drive

Insertion

Fluxing

Wave Soldering

Semi-finished
Product Testing

Conformal
Coating

Drying

DELTA
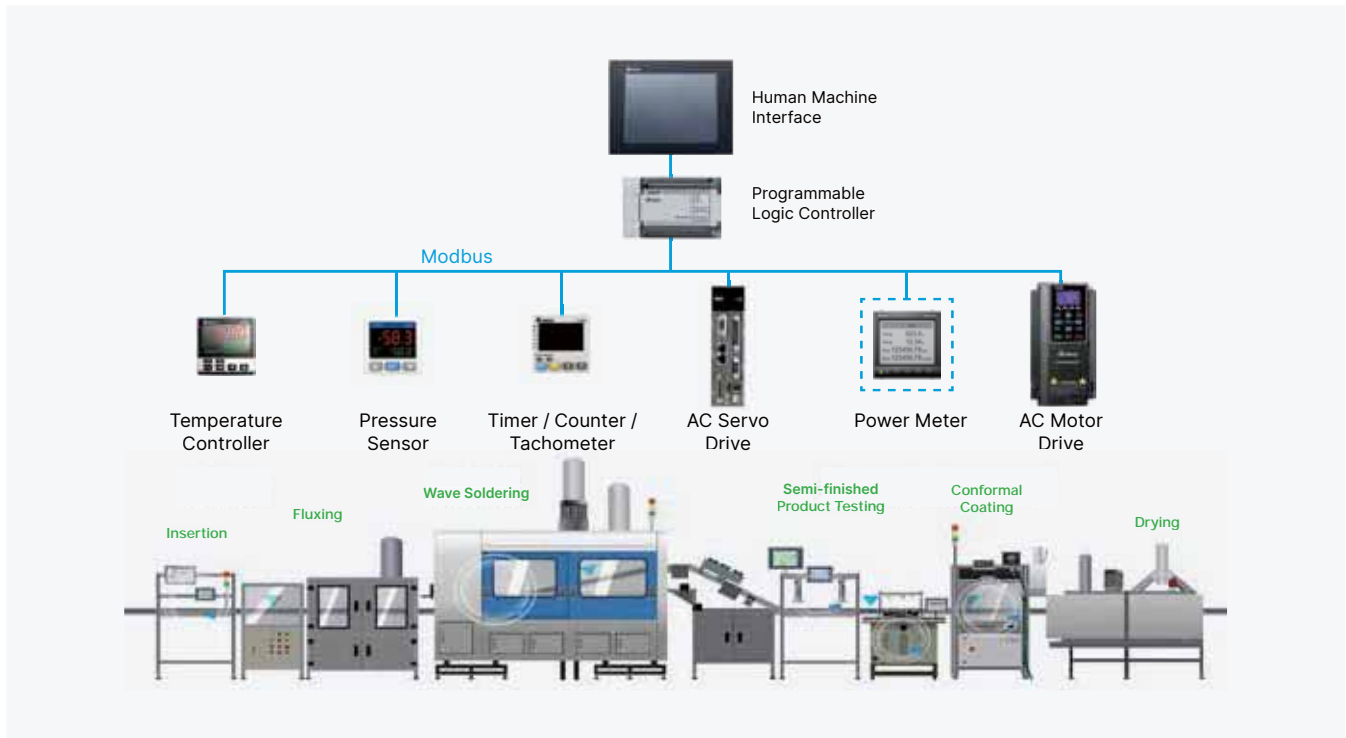
Machine Vision System
DMV3000G

Smart Machine Vision System with a User-friendly Interface

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

Camera Specifications

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

Applications

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

Machine Vision System
DMV1000G

Basic and Easy-to-use Machine Vision System

- User-friendly operation interface for quick system setup
- Flowchart programming interface saves development time
- Built-in multi-functional developing tools save users from complex programming
- Offers versatile digital I/O terminals
- Compact and light, saves wiring and space
- Hardware specification meets high-speed processing requirements and offers exceptional performance better than competing products
- Supports GigE interface industrial camera
- Complete product line-up including lighting and lenses
- Compatible with Ethernet and RS-232 / 485 communication interfaces for a quick link up with external devices
- Supports Micro SD cards
- Compliant with high industrial standards; higher stability than PC-based systems

Camera Specifications

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

Applications

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

Machine Vision Software **New**
DIAVision VGR

Easily achieve high-efficiency inspection requirements

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

System Configurations

DIAVision VGR

PC-Based Controller

Multi-axis Servo Drive   SCARA Robot   GigE Camera
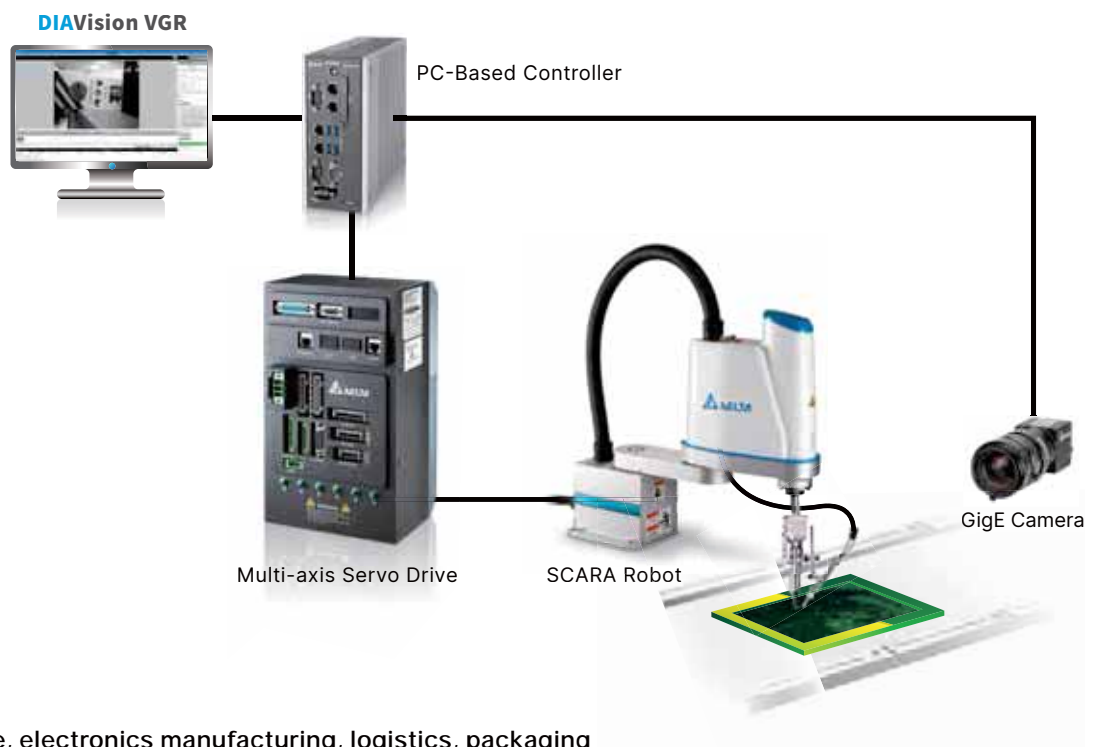
Applications

Food & beverage, electronics manufacturing, logistics, packaging

Delta Industrial Camera New
DMV-C

High-speed, High Performance & High Stability

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

DMV-CC (Standard Type)

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

DMV-CL (Basic Type)

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

Model	Sensor Model	Resolution (H × W)	Optical Size (inch)	Shutter	Exposure Time	Pixel Size (µm)	FPS	Mono/Color	Pixel Format	GPIO
DMV-CC400GM290	IMX287	720 × 540	1/2.9	Global	20 us ~ 1s	6.9	290	Mono	Mono (12,10,8) Bayer (12,10,8)	Isolated Input × 1 Isolated Output × 2
DMV-CC400GC290	IMX287						290	Color	Mono (12,10,8) Bayer (12,10,8)	
DMV-CL400GM120	IMX297						120	Mono	Mono (10,8) Bayer (10,8)	
DMV-CL400GC120	IMX297						120	Color	Mono (10,8) Bayer (10,8)	
DMV-CC1M6GM075	IMX273	1,440 × 1,080				3.45	75	Mono	Mono (12,10,8) Bayer (12,10,8)	
DMV-CC1M6GC075	IMX273						75	Color	Mono (12,10,8) Bayer (12,10,8)	
DMV-CL1M6GM060	IMX296						60	Mono	Mono (10,8) Bayer (10,8)	
DMV-CL1M6GC060	IMX296						60	Color	Mono (10,8) Bayer (10,8)	
DMV-CC2M1GM055	SNAPPY 2M	1,920 × 1,080	1/2.8			2.8	55	Mono		
DMV-CC2M1GC055	SNAPPY 2M						55	Color		
DMV-CC5M0GM023	SNAPPY 5M	2,560 × 1,936	1/1.8			2.8	23	Mono		
DMV-CC5M0GC023	SNAPPY 5M						23	Color		
DMV-CL5M0GM023	IMX335	2,592 × 1,944	1/2.8	Rolling		2	23	Mono	Mono (12,10,8) Bayer (12,10,8)	
DMV-CL5M0GC023	IMX335						23	Color		
DMV-CL6M3GM016	IMX178	3,072 × 2,048	1/1.8			2.4	16	Mono		
DMV-CL6M3GC016	IMX178						16	Color		
DMV-CL12MGM008	IMX226	4,000 × 3,000	1/1.7			1.85	8	Mono		
DMV-CL12MGC008	IMX226						8	Color		
DMV-CL20MGM005	IMX183	5,472 × 3,648	1			2.4	5	Mono		
DMV-CL20MGC005	IMX183						5	Color		

ΔELTA

Industrial Power Supply

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

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

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

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

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

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

Lyte	Model Name	Output Voltage (V)	Output Power (W)
	DRL-12V75W1AA	12	75
	DRL-24V75W1AA	24	75
	DRL-24V480W1AA	24	480
	DRL-48V75W1AA	48	75.36

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

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

DIN Rail Models
Chrome, Modules, DVP

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

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

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

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

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

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

Industrial Power Supply CliQ M Series Sets for Uninterruptible Systems

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

Power Supply   DC-UPS Module   Battery Module   Equipment

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

PMT2	Model Name	Output Voltage (V)	Output Power (W)
	PMT-12V35W2BA	12	36
	PMT-12V50W2BA		50.4
	PMT-12V75W2BA		72
	PMT-12V100W2BA		102
	PMT-12V150W2BA		150
	PMT-12V150W2CA		150
	PMT-12V200W2BM		204
	PMT-12V200W2BR		204
	PMT-12V350W2BM		348
	PMT-12V350W2BR		348
	PMT-15V35W2BA	15	36
	PMT-15V50W2BA		51
	PMT-15V75W2BA		75
	PMT-15V100W2BA		105
	PMT-15V150W2BA		150
	PMT-15V150W2CA		150
	PMT-24V35W2BA	24	36
	PMT-24V50W2BA		52.8
	PMT-24V75W2BA		76.8
	PMT-24V100W2BA		108
	PMT-24V150W2BA		150
	PMT-24V150W2CA		150
	PMT-24V200W2BM		211.2
	PMT-24V200W2BR		211.2
	PMT-24V350W2BM		350.4
	PMT-24V350W2BR		350.4
	PMT-30V35W2BA	30	36
	PMT-30V50W2BA		57
	PMT-30V75W2BA		75
	PMT-30V100W2BA		105
	PMT-30V150W2BA		150
	PMT-30V150W2CA		150
	PMT-36V35W2BA	36	36
	PMT-36V50W2BA		52.2
	PMT-36V75W2BA		75.6
	PMT-36V100WBA		100.8
	PMT-36V150W2BA		154.8
	PMT-36V150W2CA		154.8
	PMT-36V200W2BM		212.4
	PMT-36V150W2BR		212.4
	PMT-36V350W2BM		349.2
	PMT-36V350W2BR		349.2
	PMT-48V35W2BA	48	38.4
	PMT-48V50W2BA		52.8
	PMT-48V75W2BA		76.8
	PMT-48V100W2BA		110.4
	PMT-48V150W2BA		158.4
	PMT-48V150W2CA		158.4
	PMT-48V200W2BM		211.2
	PMT-48V200W2BR		211.2
	PMT-48V350W2BM		350.4
	PMT-48V350W2BR		350.4
	PMT-D1V75W2BA	12 / 5	73
	PMT-D1V75W2CA	12 / 5	73
	PMT-D2V75W2BA	24 / 5	75.4
	PMT-D2V75W2CA	24 / 5	75.4

PMC	Model Name	Output Voltage (V)	Output Power (W)
	PMC-05V015W1AA	5	15
	PMC-05V035W1AA		35
	PMC-05V050W1AA		50
	PMC-12V035W1AA	12	35
	PMC-12V050W1AA		50
	PMC-12V060W1NA		60
	PMC-12V100W1AA		100
	PMC-12V150W1BA		150
	PMC-12V600W1BA		600
	PMC-24V035W1AA	24	35
	PMC-24V050W1AA		50
	PMC-24V075W1AA		75
	PMC-24V100W1AA		100
	PMC-24V150W1AA		150
	PMC-24V150W2AA		150
	PMC-24V150W1BA		150
	PMC-24V300W1BA		300
	PMC-24V600W1BA		600
	PMC-24V600W1RW		600
	PMC-DSPV100W1A	24 / 5	100
	PMC-48V150W1BA	48	150
	PMC-48V600W1BA		600

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

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

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

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

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

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

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

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

A) Convection
B) Forced Cooling

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

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

Applicable Series

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

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

Machine Automation
- Robotic Arms
- Injection Molding Machines

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

Renewable Energy
- Wind Turbines
- Solar Tracker Systems

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

Process Automation
- Petrochemicals Plants
- Wastewater Treatment
- Oil Refinery

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

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

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

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

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

LED Lighting
- Stage Lighting
- Digital Signage Solutions

PMT, PMC, PMF, PMR, PJL

Food & Beverage
- Coffee Machines
- Vending Machines
- Self-service Kiosks (SSKs)

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

ΔELTA

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

Layer 3 Managed Switch
DVS-G928W01

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

Modules

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

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

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

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

Managed Switch
DVS-328

- 24-Port FE + 4-Port GbE Combo SFP, designed for backbone network transmission at control centers
- Complete L2 network management functions: Q-in-Q VLAN, QoS, LACP, IGMP & SNMP v1/v2c/v3
- IPv6 address for large network and neighboring node discovery
- Modbus TCP and EtherNet/IP protocols that facilitate remote management by SCADA and other industrial devices
- Adopts high-end proprietary redundancy technologies ONE RING & ONE CHAIN for quick self-recovery within 20 ms from network disconnection
- Enhanced network security with IEEE 802.1X, TACACS+, SSH, HTTPS and SNMP v3
- Loopback-detection to avoid broadcast storms by automatically shutting down the ports over a switching loop
- Cable diagnostic to automatically detect twisted-pair cable quality and periodically report issues
- Auto alarm notifications by emails, DI, relay, syslog & SNMP trap
- Compatible with various industrial protocols, including EtherNet/IP, PROFINET, CC-LINK IE and DNP 3.0
- $85 \sim 264\,V_{AC}$ and $88 \sim 370\,V_{DC}$ wide-range redundant power input
- IP40 metal case, -40ºC ~ 70ºC operating temperature
- Certification: UL 60950-1, IEC 60950-1, CCC, CE, FCC and RCM

DVS-G116

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

DVS-G112

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

DVS-G106

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

DVS-110

- 7-Port FE + 3-Port GbE Combo SFP, designed for backbone networks
- Complete L2 network management functions: VLAN, QoS, LACP, IGMP & SNMP v1/v2c/v3
- IPv6 address for large network and neighboring node discovery
- Modbus TCP and EtherNet/IP protocols that facilitate remote management by SCADA and other industrial devices
- Adopts high-end proprietary redundancy technologies ONE RING & ONE CHAIN for quick self-recovery within 20 ms from network disconnection
- Loopback-detection to avoid broadcast storms by automatically shutting down the ports over a switching loop
- DDM diagnosis function by SFP fiber module
- Auto alarm notifications by emails, DI, relay, syslog & SNMP trap
- IP40 metal case, -40ºC ~ 75ºC operating temperature
- Certification: UL 508, IEC 61131-2, CE, FCC and RCM

DVS-109

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

DVS-108

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

DVS-103

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

PoE+ Managed Switch
DVS-G512

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

Unmanaged Switch
DVS-G008W01

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

DVS-G005I00A

- 5-Port GbE
- IEEE 802.1p based QoS for packet forwarding precedence
- Built-in broadcast storm protection
- Transparent transmission of VLAN tagged packets
- Jumbo packet transmission: up to 9,216 Bytes
- EEE Green Ethernet for power savings
- IP40 metal case, -10ºC ~ 60ºC operating temperature
- Certification: UL 508, IEC 61131-2, CE, FCC and RCM

DVS-005 / 008 / 016

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

DVS-G005I00C

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

DVS-008W00-M12

- 8-Port 10/100Base-T(X) M12, ensures robust and tight connection
- Strong 5g resistance to extreme vibration environments
- IP67-rated waterproof and dustproof metal housing to prevent penetrating water and micro dust ingress
- Transparent transmission of VLAN tagged packets
- 12 ~ 48 V_{DC} redundant power input
- -40°C ~ 75°C wide operating temperature
- Certification: UL 61010, EN 62368-1, CE, FCC and RCM

PoE+ Unmanaged Switch
DVS-G408W01

- 8-Port GbE, full Gigabit
- 8 10/100/1000Base-T PoE (PSE) ports, each provides 30 W power supply to meet IEEE 802.3at and IEEE 802.3af standards
- Jumbo packet transmission: up to 9,216 Bytes
- Auto alarm notification by relay output for power failure
- IP30 metal case, -40°C ~ 70°C operating temperature
- Certification: CE, FCC and RCM

DVS-G406W01-2GF

- 4-Port GbE + 2-Port 100/1000Base-SFP, full Gigabit
- 4 10/100/1000Base-T PoE (PSE) ports, each provides 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, -40°C ~ 70°C operating temperature
- Certification: CE, FCC and RCM

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

- 1-Port 100/1000Base-T to 100/1000Base-SFP
- Jumbo frame size up to 10k Bytes
- Supports Link Fault Pass-Through (LFP)
- With a terminal block for 12 ~ 48 V_{DC} redundant power input
- IP40 PC case, -20°C ~ 70°C operating temperature
- Certification: UL 61010, IEC 62368-1, CE, FCC and RCM

SFP Fiber Transceiver
LCP-GbE

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

LCP-1FE

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

PoE+ Splitter
DVS-G401

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

PoE+ Injector
DVS-G402

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

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 alarm notification by emails, DI, relay, Syslog and SNMP trap
- IP40 metal case, -40ºC ~ 75ºC operating temperature
- Certification: UL 508, IEC 61131-2, CE, FCC, RCM, BSMI, SRRC and NCC

DVW-W01I2-E1

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

ΔNELTA

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

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

Industrial 3G Cloud Router
DX-2100RW

- 1-Port FE + 1-Port RS-232 + 1-Port RS-485
- UMTS / HSPA+: 800 / 850, 900, AWS1700, 1900, 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
- Certification: CE, FCC and UL

Industrial Ethernet Cloud Router
DX-2300LN

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

Industrial 3G/WAN Cloud Router
DX-3001H9

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

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

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

ΔNELTA

Communication Module

High-speed and Stable Industrial Network Solutions

BACnet MS/TP
Slave Module
DVPSCM52-SL

- BACnet MS/TP slave, standard Modbus and user-defined RS-422/485 communication protocols
- Compatible with software and DDC of major brands on the market; remote I/O and converter function available when connected with a PLC with I/O point extension
- Isolated power and communication provide strong noise immunity; built-in 120 ohm terminal resistor switch and feed-through terminals with spring plugs
- Data transmission settings via software, no complex programming required
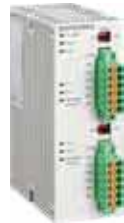
RS-422/485
Master Module
DVPSCM12-SL

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

Ethernet Master Module
DVPEN01-SL

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

CANopen Master Module
DVPCOPM-SL

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

PROFIBUS DP
Slave Module
DVPPF02-SL

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

DeviceNet
Master Module
DVPDNET-SL

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

Ethernet Remote I/O Communication Module
RTU-EN01

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

PROFIBUS DP Remote I/O Communication Module
RTU-PD01

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

DeviceNet Remote I/O Communication Module
RTU-DNET

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

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

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

CANopen Remote I/O Communication Module
RTU-CN01

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

EtherCAT Remote I/O Communication Module
RTU-ECAT

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

DVP Series Slave Modules (Right-side)

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

ΔNELTA

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-CC01 keypad in conducting parameters and page editing • Supports Win XP, Win7 32 / 64-bit • A portable USB device

Modbus Serial Converter

	IFD8500A **RS-232 « » RS-485**	• 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

Industrial Automation Solutions

Information

Industrial Wireless AP

Manufacturing Visualization & Management

Manufacturing Execution

DIAMMP

Industrial Ethernet Switch

DIAMES

Industrial Ethernet Switch

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 < 20 ms)

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
DIAVH / IPC

Stable and High-performance Integration Platform

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

SCADA System (SCADA)
DIAView

Industrial Panel PC
DIAVH-PPC15

Industrial PC
IPC-E200

Ethernet

Managed Industrial
Ethernet Switch
DVS-110W02-3SFP

Industrial PC
DIAVH-IPC

Modbus

Modbus

PLC
AS300
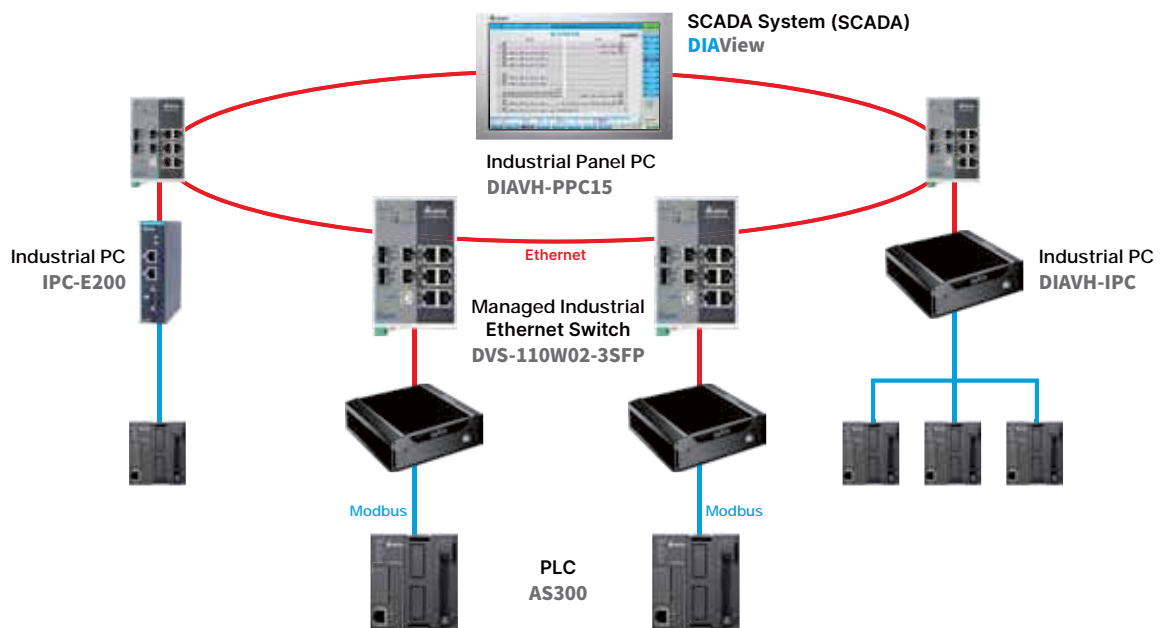
Facility Control & Management System

Equipment Management System

Production Process Control System

Production Quality Management System

Plugin Program Manufacturing Process

FLUX Spraying

Wave Soldering

Semi-finished Product Testing

Damp Proof Coating

Damp Proof Membrane Furnace
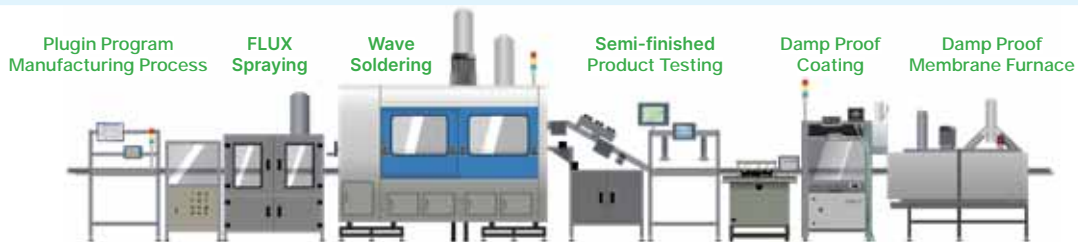
Applications

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

Factory Digitalization

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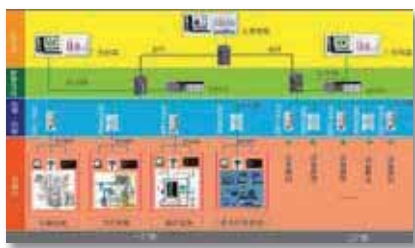
Factory Digitalization

Factory Equipment Monitoring

Inspection & Monitoring of Electronic Equipment

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

Electronic Inspection Equipment

Inspection and Monitoring of Electronic Equipment

Logistic Applications: Transportation and Stereoscopic Warehouse

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

Warehousing System

Warehouse Monitoring

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

ΔELTA

Articulated Robot
DRV

Automation for Smart Manufacturing

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

New

New

DRV70L7   **DRV90L7**   **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

Robot Controller
DCV

Indicator Lights   Push buttons

AC Servo Motors
ECMA

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
DRV70L7 / DRV90L7
DRVA1L7 / DRVA4L7

Product Specifications

Model		DRV70L7	DRV90L7	DRVA1L7	DRVA4L7
Number of Axes		6			
Max. Working Range		710 mm	900 mm	1,111 mm	1,411 mm
Max. Payload		7 kg			
Motion Range (Max. Speed)	J1	±170º (450º/sec)	±170º (370º/sec)	±170º(240º/sec)	±170º(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	0ºC ~ 40ºC			
	Humidity	20 ~ 85%RH			
	Vibration	0.5G			
Weight		37 kg	39 kg	76 kg	82 kg
Controller Series		Robot Controller DCV Series			

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

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

● High Flexibility/Multiple Installations

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

● Hollow-wrist Design

No Hollow Design
Tangled wire/cords lead to equipment interference

Hollow Design
Enhanced reliability of extension wire/cords

● Simple and User-Friendly Operation Interface

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

SCARA Robot
DRS

High Repeatability, High Precision, Excellent Linearity and Verticality

DRS40L3 **DRS60L6** **DRS80LC**

Teaching Pendant
DTS

Robot Controller
DCS

Product Specifications						
Model	DRS30L3 SS1BN002	DRS40L3 SS1BN002	DRS60L3 SS1BN002	DRS50L6 SS1BN002	DRS60L6 SS1BN002	DRS70L6 SS1BN002
Number of Axes	4	4	4	4	4	4
Arm Length (X+Y)	300 mm	400 mm	600 mm	500 mm	600 mm	700 mm
Rated / Max. Payload	1 kg / 3 kg	1 kg / 3 kg	1 kg / 3 kg	2 kg / 6 kg	2 kg / 6 kg	2 kg / 6 kg
Motion Range — J1	±130°	±130°	±114°	±133°	±133°	±133°
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 + J2	4,058 mm/s	4,710 mm/s	4,050 mm/s	4,400 mm/s	5,000 mm/s	5,500 mm/s
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 (600°/s ***)	2,000°/s (600°/s ***)	2,000°/s (600°/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	$0.0091\,kg\text{-}m^2$	$0.0091\,kg\text{-}m^2$	$0.0091\,kg\text{-}m^2$	$0.01\,kg\text{-}m^2$ (0.07 kg-m2***)	$0.01\,kg\text{-}m^2$ (0.07 kg-m2***)	$0.01\,kg\text{-}m^2$ (0.07 kg-m2***)
Allowable Inertia Moment — Max.	$0.075\,kg\text{-}m^2$	$0.075\,kg\text{-}m^2$	$0.075\,kg\text{-}m^2$	$0.01\,kg\text{-}m^2$ (0.07 kg-m²***)	$0.01\,kg\text{-}m^2$ (0.07 kg-m²***)	$0.01\,kg\text{-}m^2$ (0.07 kg-m²***)
Repeatability	±0.010 mm	±0.010 mm	±0.015 mm	±0.015 mm	±0.015 mm	±0.015 mm

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

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

*** High-inertia models

Applications

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

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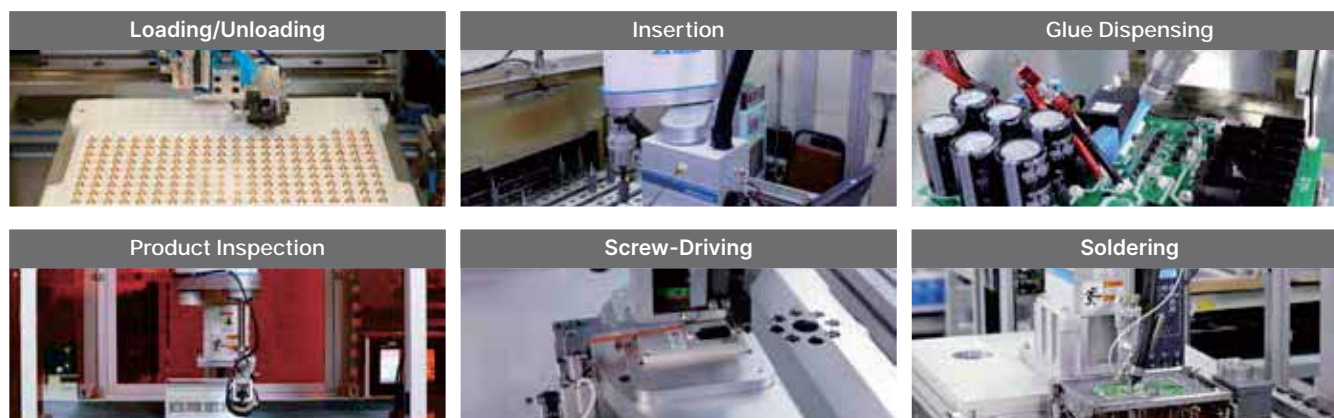
Product Specifications						
Model	DRS60LC SS1BN002	DRS70LC SS1BN002	DRS80LC SS1BN002	DRS60H6 SS1BN002	DRS60L3 SS1BN502	DRS60L6 SS1BN302
Number of Axes	4	4	4	4	5	3
Arm Length (X+Y)	600 mm	700 mm	800 mm	600 mm	600 mm	600 mm
Rated / Max. Payload	5 kg / 12 kg	5 kg / 12 kg	5 kg / 12 kg	2 kg / 6 kg	1 kg /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

* When carrying a payload of 1kg and reciprocating 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
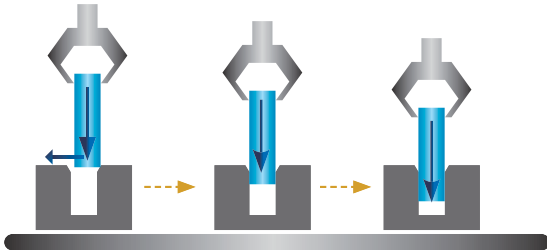
- Insertion performance may differ depending on workpiece hardness

On-the-Fly & Conveyor Tracking

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

Real-time Information Monitoring and Collection

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

Equipment Data Acquisition Platform
DIALink

Overall Equipment Effectiveness Platform
DIAOEE

Intuitive Teaching Methods with Versatile Control Approaches

PAD   HMI   Teaching Pendant   PC

Position Adjustment (left / right)

Position Adjustment (forward / backward)

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

Arch Motion Control

- Route optimization
- Saves motion time
- Quick and easy setting
- Optimizes arch route setting, fast operational speed

- Prevents crash when near the top or edge of robot route planning

P2   General Arch Motion   P3

Optimized Arch Motion

h1   h2   Obstacle   h3

P1   P4
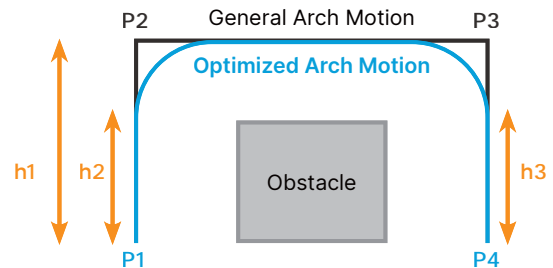
Optimizes Operational Efficiency

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

Encoder with temperature monitoring

Ambient Temperature

Optimize over temperature operation
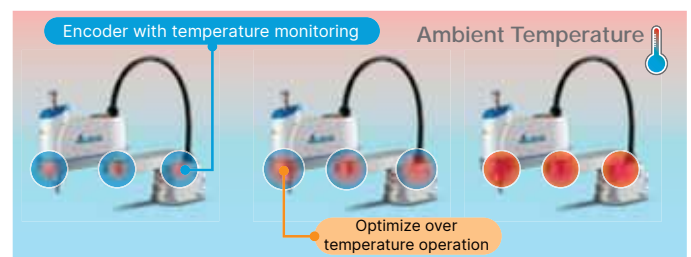
Normal Mode   Adjustment Mode   Overload Mode

Screw Driving Robot
RS-AFS

One-Station Total Solution
- Robot + Screw Driver + Teaching Pendant

Easy to Use
- High integration
- Simple screwing parameter setup

Real-time monitoring
- Screw driving status
- Force monitoring
- Torque control

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

Benefits
Precise torque control
Products & screws not damaged

	Model	RS-AFS 60LA01	RS-AFS 60LA02	RS-AFS 60LA04	RS-AFS 60LA05	RS-AFS 60LA06	RS-AFS 60LB01	RS-AFS 60LB02	RS-AFS 60LB04	RS-AFS 60LB05	RS-AFS 60LB06
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)	0.5 ~ 1.8	1.5 ~ 9.0	1.5 ~ 9.0	6.0 ~ 25.0	10.0 ~ 43.0	0.5 ~ 1.8	1.5 ~ 9.0	1.5 ~ 9.0	6.0 ~ 25.0	10.0 ~ 43.0
	Torque (N/m)	0.05 ~ 0.17	0.15 ~ 0.88	0.15 ~ 0.88	0.58 ~ 2.45	0.98 ~ 4.20	0.05 ~ 0.17	0.15 ~ 0.88	0.15 ~ 0.88	0.58 ~ 2.45	0.98 ~ 4.20
	Max. Speed (rpm)	2,000	2,000	2,000	1,200	1,000	2,000	2,000	2,000	1,200	1,000
	Dimensions (L x W x H, mm)	250 × 57 × 63	250 × 57 × 63	250 × 57 × 63	318 × 57 × 63	318 × 57 × 63	250 × 57 × 63	250 × 57 × 63	250 × 57 × 63	318 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	5°C ~ 40°C									
	Storage Temperature	-20°C ~ 55°C									
	Humidity	0 ~ 90% RH (non-condensing)									

Robotic Simulation Platform
DRASimuCAD

One software provides workstation design, simulation and operation path generation, saving setup time and boosting introduction efficiency

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

Modeling (CAD)

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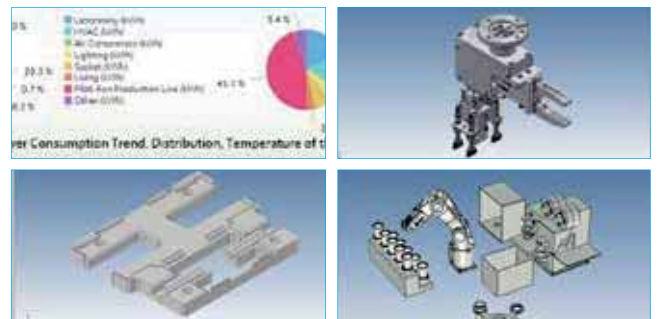
Virtual Robot Simulation

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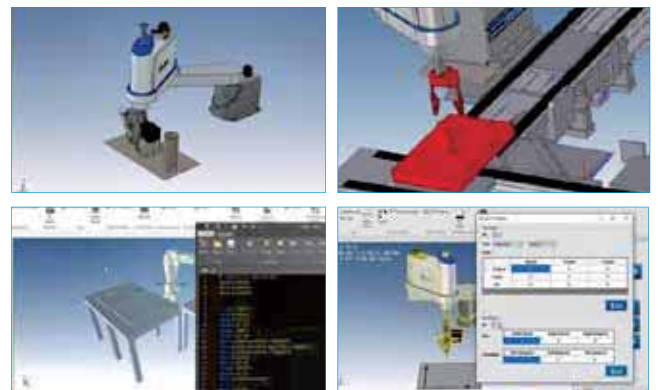
Path Generating (CAM)

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

Applications

Conveyor belt dynamic processing simulation, deburring, sole gluing, remote TCP

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Servo Press
ESP-S / ESP-E

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

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

Precise Force & Position Control

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

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

Multiple Control Modes: Real-time Control and Monitoring

Reduces defect rates and elevates forming efficiency for specific products

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

Comprehensive PC-Based Software for High Efficiency (Optional)

- Real-time Monitoring on Pressing Status
- Real-time display of pressing curves and status, sensor values and statistics
- Production visualization (productivity, yield rates, and more) to enhance management efficiency

Standard
ESP-S

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

Cylinder
ESP-E

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

Remote Control for Fast Execution

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

Applications

Vehicle Charging Devices / Metal Parts/Electronic & Electrical Appliance Components / Industrial Robots

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Equipment IoT Platform
DIALink

DIAEnergie
Industrial Energy Management System

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

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

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

App

Equipment Management System

Database

RS-232

DIALink

3G Industrial Cloud Router

Ethernet

Industrial Network Converter

RS-232

Articulated Robot
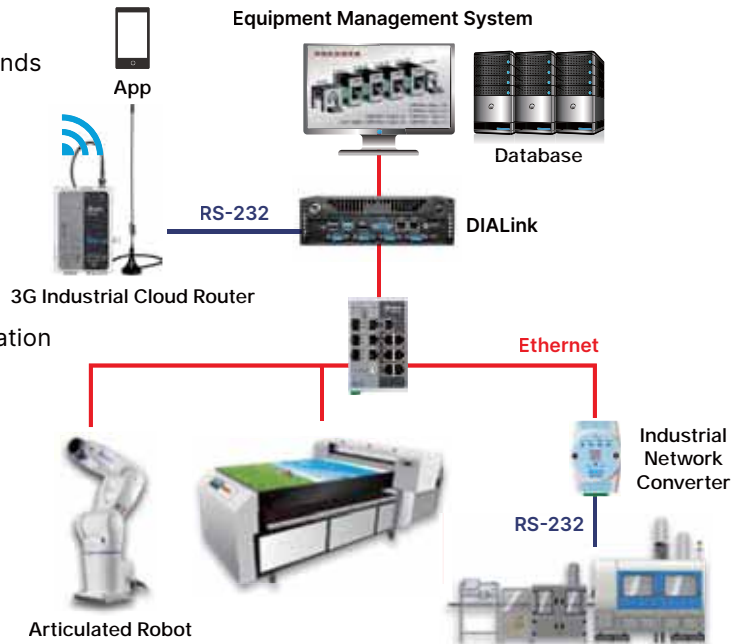
Rapid, Seamless and Secure Data Transfer

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

Data Collection (DIALink)

CNC Machine Tools

DIALink for CNC Machines

Industrial Robots

DIALink for Robots

PLCs

DIALink for PLCs

Modbus

Drivers
Web API

CNC / PLC
Driver
OPCUA
client

Management Platform

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

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

Modbus
slave

Web API

MQTT

OPCUA*
server

Cloud Platform (DIACloud)

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

- Remote monitoring and control with mobile devices
- Client monitoring

* Option module

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	PLC	Delta Robots
Tapping / Milling / Machining	Packing / Printing / Surface Mounting / Soldering / Laser Engraving	Industrial Robots

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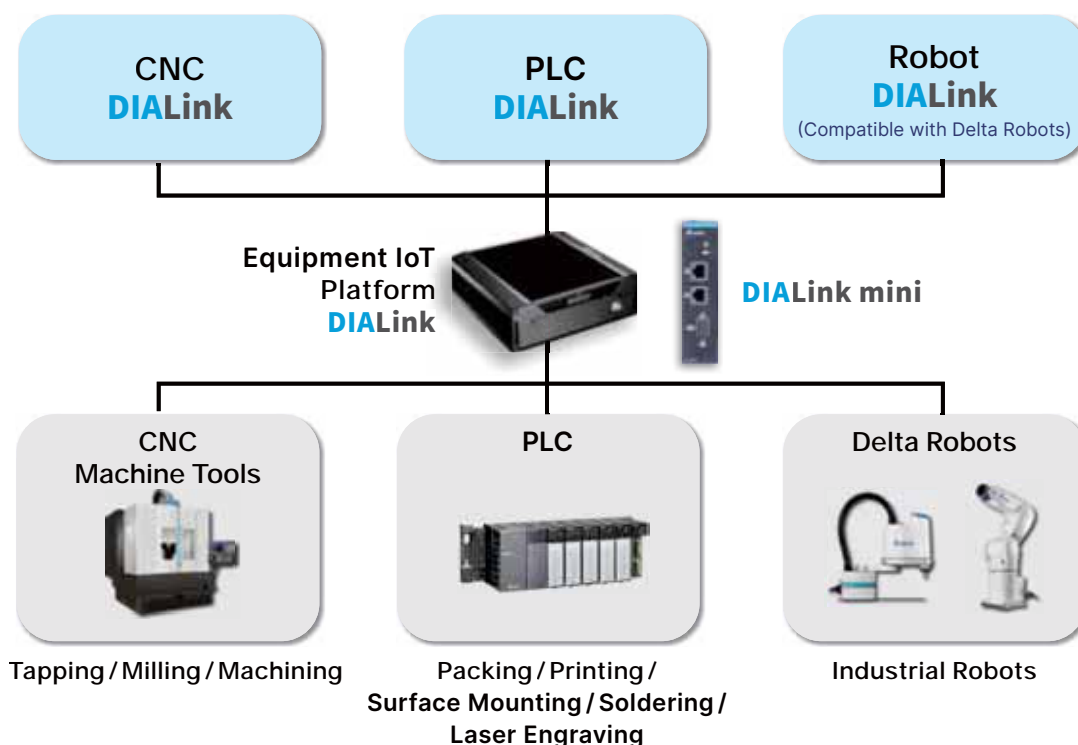
Statistical Process Control System `New`
DIASPC

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

Alarms notify and ensure the stability of the process capability

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

PDCA management cycle used to continuously optimize production quality

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

Reduces system maintenance costs

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

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

Control Chart
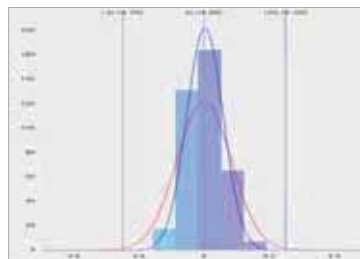
Histogram
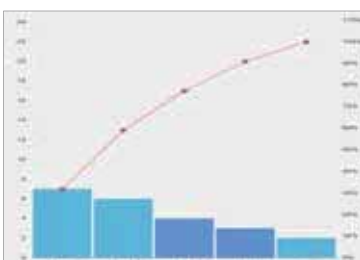
Pareto Chart

CPK Report

System Operation Process

Source	DIASPC	Board

Source
- MES/ERP
- Measuring instrument
- Equipment
- User input

Web Service

Excel / USB

DIASPC Server

DIASPC

Variable
Control chart
Xbar-R
Xbar-S
X-RM
Xmed-R
Xmed-S

Report
Cpk report
Pareto chart
Histogram
Merge chart
Odd report

Attribute
Control chart
C chart
U chart
P chart
NP chart

Report
Trend chart
Pareto chart
Odd report

Board
- Alarm Board
- E-mail
- Dashboard platform

Out of Control Action Plan (OCAP)

Provides cloud version based on SaaS service

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

	Servo	Cloud
Users	• Volumes of data/Real-time monitor • **Specific IT department** • **Large-scale**	• **Less data/Small-scale** • Non real-time • Report tool
Price	High	Low
Implementation time	Slow	Fast
Cost	High	Low
Integration time	Longer	Less
Training	On Site	E-learning
Customize function	Provided	Not Provided

System functions

Various control charts

Users can choose a chart to monitor according to the factory management

Multiple reports

Analysis tool to find the abnormal data

Alarm mail and dashboard

Abnormal occurrence, to provide users with a quick grasp of relevant information

Scheduling report sending

Select the chart and report and flexibly set the sending schedule

Measurement Systems Analysis (GRR)

Evaluate the credibility of the measurement and establish a reliable and accurate system

Alarm Management System New

DIAAMS

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

Effectively sends warnings to ensure immediate disposal by the responsible units

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

Flexible alarm condition setting and reduces maintenance cost

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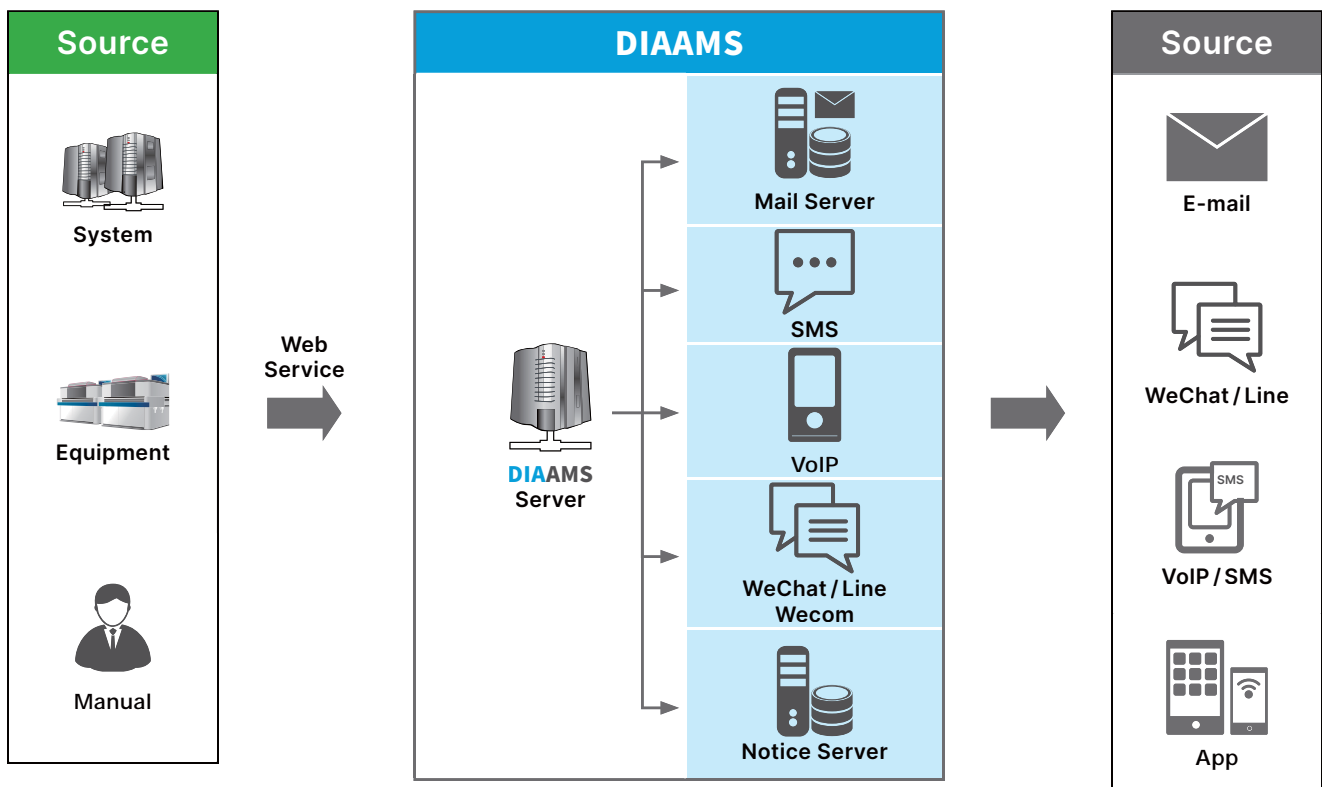
System functions

Alarm classification setting	Multiple level setting	Alarm Management	Alarm Reports
Alarm classification and summary based on plant area and other systems	Set the alarm sending path, and multi-level sending settings	It can confirm and interrupt or end the event according to special circumstances	Provide a variety of report records to query the alarm status and analysis

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Equipment Management System New
DIAEMS

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

Systemizes equipment management, simplifies the flow and increases efficiency

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

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

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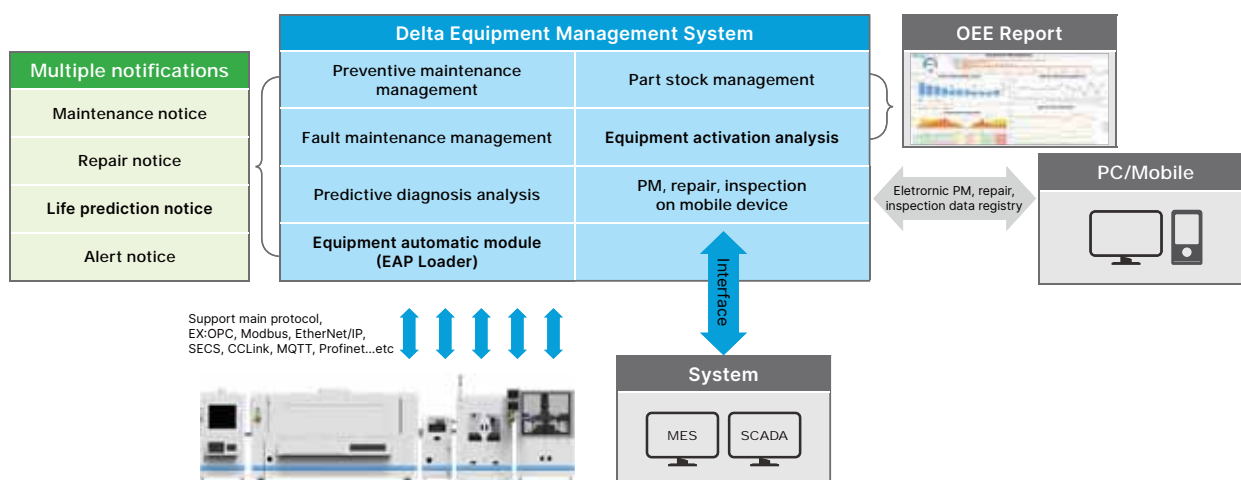
System functions

Predictive diagnosis
Modeling prediction, predict service life, diagnose or analyze abnormalities

Preventive maintenance
PM work reminders and execution records

Malfunction repair
Malfunction reason and management records, intelligently create repair work order

Part stock
Manage part in/out-stock and inventory, control the usage and stock

Equipment activation
Real time collection of equipment product information and analyze the activation and status to a report

Applications

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

Semiconductor Equipment Communication and Control Software New

DIASECS

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

Complies with SEMI standards, high performance, easy to use

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

High integration, user-friendly, issue tracking.

- Highly automated integration of SECS/GEM specifications, supports most PLC communication protocols out of the box
- Quickly complete parameter configuration and settings for quick start
- Record raw data and SML log at the same time, analysis is more accurate and easy to use

SECS/GEM Library & Runtime

SECS/GEM gateway

PLC
Delta, Mitsubishi, Omron, Siemens ect. PLC
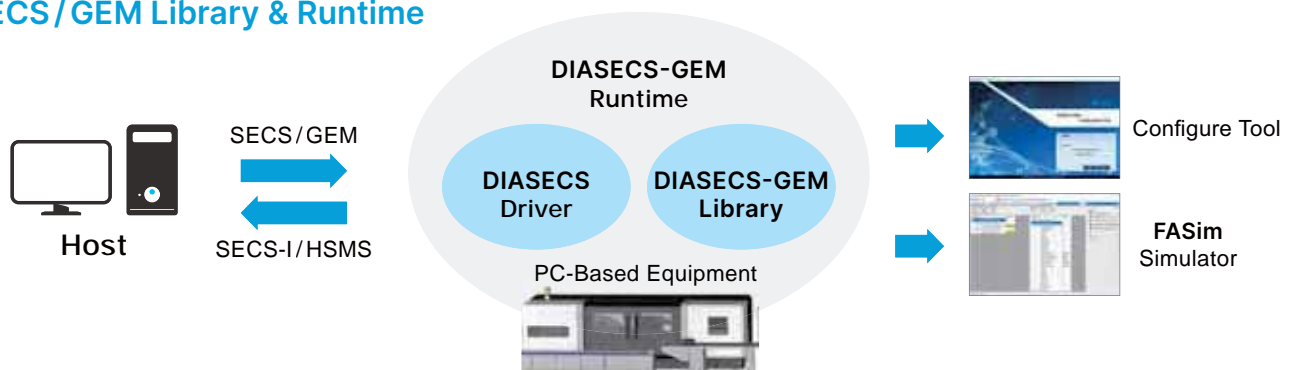
DIASECS Box
SECS/GEM gateway
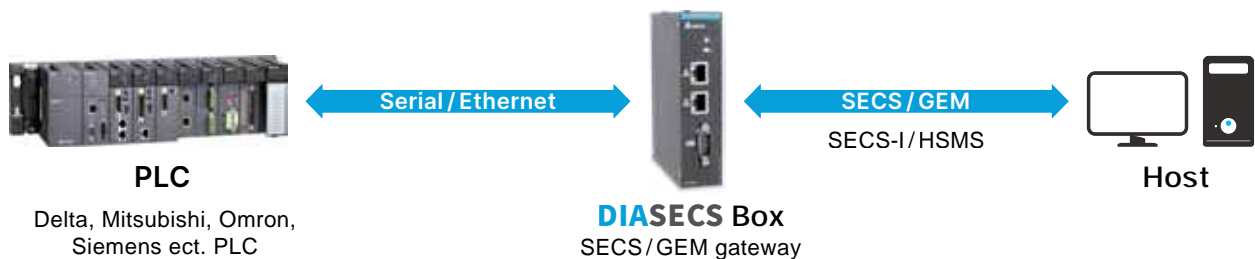
Applications

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

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

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

Software architecture
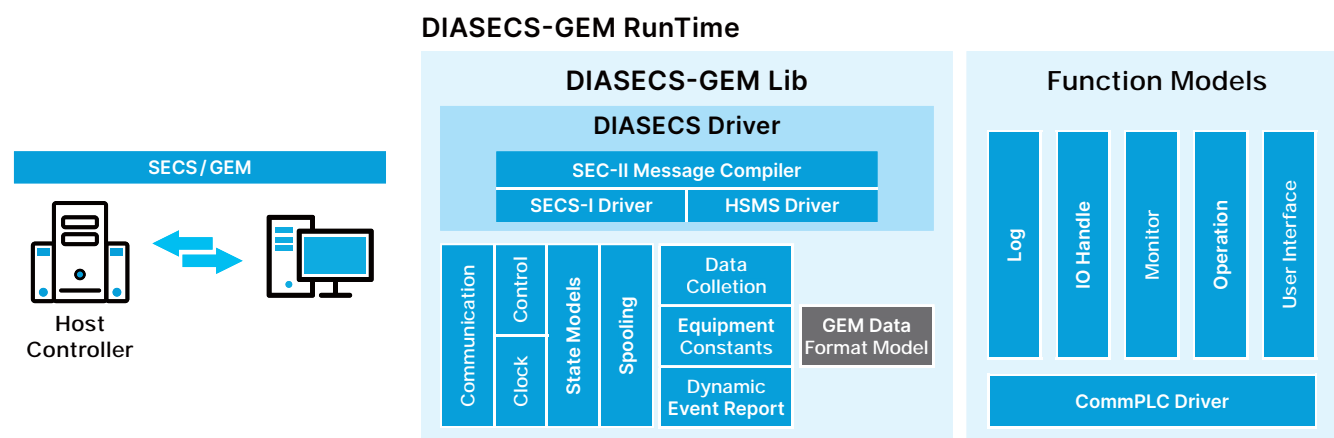
Industrial Energy Management System
DIAEnergie
Innovative Solution for Smart Energy Saving

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

System Structure and Applications

Centralized Control and Management Center

DIAEnergie IEMS

DIAView SCADA System

Internet

DIACloud Platform
Internet

Ethernet

Hot Swappable Mid-range PLC AH500

RS-485

Unmanaged16-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

Notes

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

▲ 8 Facto

Canada

Zurich

Sonoma

Fremont

Los Angeles

USA

Kitchener

Chicago

Boston

Plano

Raleigh

Mexico

Brit.Virgin Is.

El Salvador

Colombia

Ecuador

Peru

Brasil

Bolivia

Sao Paulo

Bela Vista

Paraná

Paraguay

Chile

Santa Catarina

Uruguay

Argentina

Netherlands
Amsterdam
Eindhoven

United Kingdom

Ireland

Belgium

France
Paris

Spain
Barcelona
Madrid

France

Spain

Italy
Milan
Rome

Morocco

Germany
Suster

Italy

Northern Europe

A Finland
B Estonia
C Latvia
D Lithuania

E Swe
F Den

Belarus

Serbia

Ukraine

Moldova

Kosovo

Romania

Bulgaria

Georgia

Greece

Albania

Malta

Turkey

Cyprus

Syria

Ar

Lebanon

Israel

Jordan

Ira

Tunisia

Libya

Ru
Mos

Central Europe

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

Egypt
Cairo

Kada

Saud
Arab

Nigeria

Ghana

Congo

Kenya

Tanzania

South Africa

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ASIA (Japan)
Tokyo Office

ASIA (India)
Rudrapur Plant
(Green Building)

EUROPE
Amsterdam, the Netherlands

AMERICA
Research Triangle Park, U.S.A.

...ries ■ **112 Branch Offices** ● **13 R&D Centers** ■ **909 Distributors**

Korea ■ ● ■ **Japan**
Seoul   Tokyo
Daegu   Osaka

● **Dalian**
■ ● **Shanghai**
▲ ■ ● **Wujiang** (Wujiang Plant 3 & Wujiang Motor Plant)
▲ ● **Dongguan**
▲ ■ ● **Taoyuan** (Technology Center & Plant 1)
▲ ■ ● **Chungli**
▲ **Pingjhen**
■ ● **Taichung**
■ ● **Tainan**

■ ■ **Philippines**

China

■ Kazakhstan
■ Uzbek
...-Istanbul
...menia

Russia
...scow

Arab
Dubai
■ Oman

■ Pakistan

● ▲ ■ ■
India
Gurgaon
Calcutta
Mumbai
Hyderabad
Bangalore
Chennai
Ke Yingbeto
Pune
Ahmedabad
Chandigarh
Visakhapatnam
Chhattisgarh

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

■ Korea   ■ Japan

■ Taiwan

[1] [2] [3] [4] [5] [6] [7]

Australia
■ Perth   Sydney
Melbourne ■ ■

[1] **Northeast Region**	[3] **North China Region**	[4] **South China Region**	[7] **West China Region**
Harbin	Baotou	Foshan	Chengdu
Changchun	Beijing	Fuzhou	Lanzhou
Shenyang	Hengyang	Guangzhou	Xi'an
Dalian	Jinan	Guiyang	Chongqing
[2] **Shanghai-Hangzhou Region**	Luoyang	Guilin	Urumqi
Hangzhou	Qinhuangdao	Liuzhou	[6] **Suwan Region**
Jiading	Qingdao	Nanning	Hefei
Ningbo	Shijiazhuang	Quanzhou	Nanjing
Shanghai	Taiyuan	Xiamen	Nantong
Shaoxing	Tangshan	Shenzhen	Suzhou
Songjiang	Tianjin	[5] **Central China Region**	Wuxi
Wenzhou	Xiangyang	Nanchang	Wuhu
Kunshan	Yantai	Wuhan	Xuzhou
	Changyuan	Changsha	Yangzhou
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■ **∆ELTA**

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