Automation for a Changing World

Delta Industrial Automation

DELTA

Smarter. Greener. Together.

Table of Contents

SCARA 33

SCARA Robot

Control 37

Programmable Automation Controller

Programmable Logic Controller

Touch / Text Panel HMI

Human Machine Interface

Industrial Power Supply

Temperature Controller

Valve Controllers/Timer/Counter/Tachometer

Pressure Sensor

Machine Vision System

Power Meter

Sensor

Global Operations 77

About Delta

Delta, founded in 1971, is a global leader in power and thermal management solutions. Our mission statement, "To provide innovative, clean and energy-efficient solutions for a better tomorrow," focuses our role in addressing key environmental issues such as global climate change. As an energy-saving solutions provider with core competencies in power electronics and in innovative research and development, Delta's businesses encompass Power Electronics, Energy Management, and Smart Green Life. Delta has sales offices worldwide with manufacturing facilities and R&D centers in Taiwan, China, USA, Europe, Thailand, Japan, Singapore, India, Mexico and Brazil.

Throughout its history, Delta has received many global awards and recognition for its business milestones, innovative technology and corporate social responsibility. Since 2011, Delta has been selected as a member of the prestigious Dow Jones Sustainability™ World Index (DJSI World) for 4 consecutive years. In 2014, Delta was ranked at the highest A-level of the Climate Performance Leadership Index (CPLI) of the Carbon Disclosure Project (CDP), and it was the only company from Greater China to be named to the CPLI from nearly 2,000 listed companies.

Delta IABG Milestones

1995	1999		2003		2004	2005
AC Motor Drive (General Purpose A Series)	Small PLC (DVP-ES Series)	AC Servo Motor and Drive (ASDA-A Series)	Temperature Controller (DTA Series)	Optical Incremental Encoder (ES Series / EH Series)	Human Machine Interface (5.7", 7.5", 10.4" DOP-A Series)	AC Servo Motor and Drive (ECMA Series, ASDA-B Series)

2011	2012				2013	
CNC Controller (NC300 Series)	Unmanaged Industrial Ethernet Switch (DVS Series)	High Performance Mid-range PLC (AH500 Series)	Controller with Human Machine Interface (HMC Series)	Machine Vision System (DMV Series)	Power Quality Active Power Filter (APF Series)	Power Quality Static Var Generator (SVG Series)

Delta IABG Profile

- **Mission: To elevate the living environment through advanced automation technology with value added innovation.**
- **Headquarters in Taoyuan, Taiwan**
- **Started manufacturing AC motor drives in 1995**
- **Manufacturing and R&D technology centers in Taoyuan (Taiwan), Tainan (Taiwan), Wujiang (China), Shanghai (China)**
- **Number of Employees: 4895 (550 people in R&D)**

Delta IABG (Industrial Automation Business Group) focuses on developing industrial automation products with a strong belief in providing our customers innovative and energy-saving solutions. We began with the design and manufacturing of variable speed AC motor drives in 1995. With our knowledge and experience in automation control and power quality improvement, we continue to develop and produce innovative products, and offer integrated systems & solutions to satisfy a variety of applications in many industrial automation fields. The industries we serve include: food, textiles, chemicals, electronics, metals, plastics, pharmaceuticals, printing, processing, and CNC machine tools. Our industrial automation products, systems & solutions are also used in energy saving air-conditioning systems and water treatment facilities for building automation and process automation.

To date, Delta IABG has built professional R&D capabilities and developed industrial control networks as we provide advanced technical support and integrated global services to our customers around the world. While striving for "Quality, Reliability and Excellence", Delta IABG continues to provide "Automation for a Changing World" and advances for our customers through our continuous pursuit of innovation.

2006	2007	2008	2009	2010	
Timer / Counter / Tachometer (CTA Series)	Brushless DC Motor and Drive (BLDCM Series)	Industrial Power Supply (PMC Series, CliQ Series)	Pressure Sensor (DPA Series)	Active Front End Unit (AFE2000 Series)	CNC Controller (NC300 Series)

2014		2015			
Power Meter (DPM Series)	Programmable Automation Controller (MH1 Series)	Linear Stage / Linear Shaft Motor (Linear Stage / ECML-S)	Photoelectric Sensor (PS-F / PS-R Series) Inductive Proximity Sensor (M12 / M18 Series)	Robot Controller with Servo Drive Integrated (ASDA-MS Series)	SCARA Robot (DRS40L Series)

ΔELTA

Vector Control Drive
C2000

For Universal Drive Controls

▶ Supports both asynchronous and synchronous motors

▶ Field oriented vector control

▶ Wide power range for different industry needs

▶ built-in 10K steps PLC programming capacity

▶ Long service life design

▶ Enhanced protections and adaptation to ambient environments

▶ Modular design for easy maintenance and many extensions

▶ Built-in MODBUS communication and provides optional communication cards: ProfiBUS-DP, DeviceNet, MODBUS TCP, EtherNet-IP and CANopen

Standard models (IP/20/NEMA1)
Power range: 230V 0.75 ~ 90kW, 460V 0.75 ~ 355kW

Power Range	0.75 ~ 3.7kW 1 ~ 5HP	5.5 ~ 18.5kW 7.5 ~ 25HP	22 ~ 37kW 30 ~ 50HP	45 ~ 90kW 60 ~ 125HP	110 ~ 185kW 150 ~ 250HP	220 ~ 355kW 300 ~ 475HP
C2000	230V/3-phase					
	460V/3-phase					

▶ Applications

Printing machines, extruders, calender machines, paper machines, compressors, wire drawing machines

CE $_c(UL)_{US}$ EAC

Fan/Pump Vector Control Drive
CP2000

For HVAC, Fans and Pumps Applications

▶ High-speed communications includes BACnet and MODBUS RS-485

▶ Printed Circuit Board (PCB) enhances drive durability in critical environments

▶ Fire mode and bypass mode: continuous pressure output to extract smoke when fire accident or other emergencies occur

▶ Quick setting function for users to self-define the parameter groups and parameter duplication for fast and easy installation

▶ Various modes for fans/pumps applications including PID control, sleep/wake up functions, flying start and skip frequency

▶ LCD keypad - An easy-to-use text panel and the TP editor software allows users to self-define the main page screen

▶ Multi-pumps synchronous control up to 8 motors at one time, fixed amount and fixed time circulation control

▶ Built-in 10K step PLC programming capacity and Real Time Clock

▶ Optional communication cards: ProfiBUS-DP, DeviceNet, MODBUS TCP, EtherNet-IP and CANopen
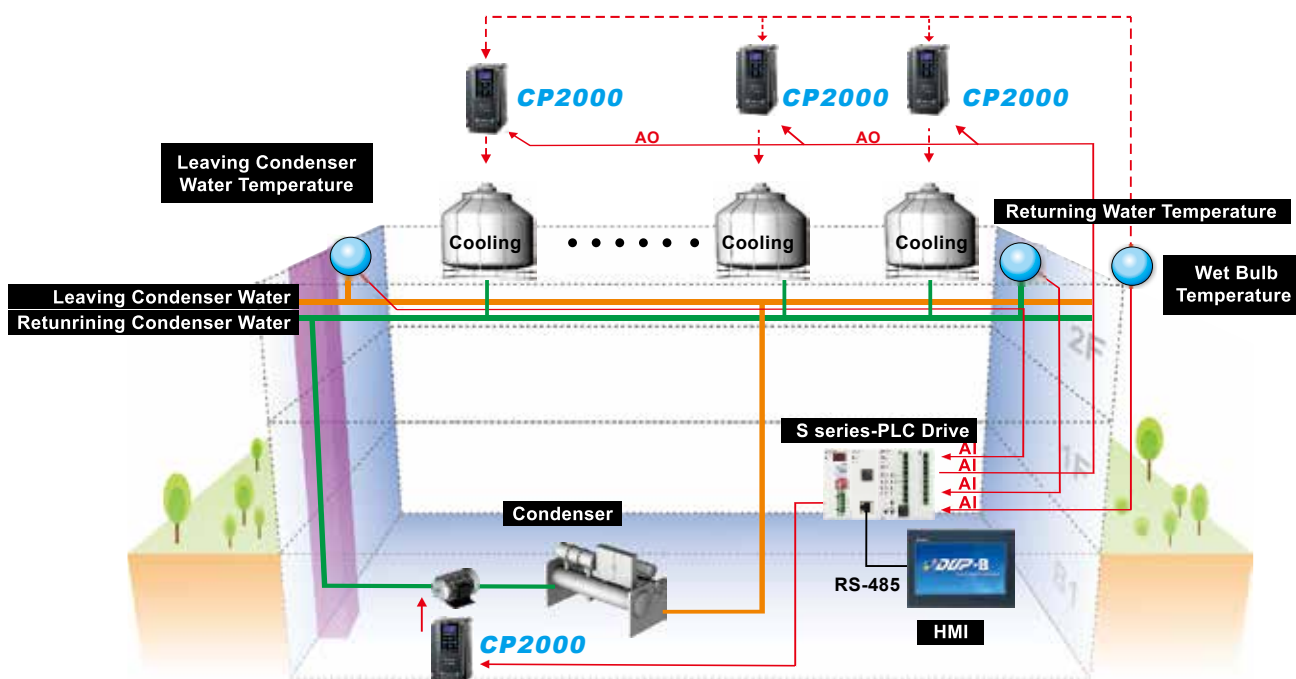
Standard models (IP20/NEMA1)
Power range: 230V 0.75 ~ 90kW, 460V 0.75 ~ 400kW

Power Range	0.75 ~ 5.5kW 1 ~ 7.5HP	7.5 ~ 18.5kW 10 ~ 25HP	22 ~ 37kW 30 ~ 50HP	45 ~ 90kW 60 ~ 125HP	110 ~ 185kW 150 ~ 250HP	220 ~ 400kW 300 ~ 536HP
CP2000	230V/3-phase					
	460V/3-phase					

Applications

Factory automation, HVAC, fans, pumps

4

Textile Vector Control Drive
CT2000

Flange Mount Drive with Special Heatsink Design for Best Cooling Performance

▶ Special heatsink for natural cooling

▶ Flange mounting method prevents fiber and dust from clustering or entering the drive

▶ Supports both asynchronous and synchronous motors

▶ Built-in 10K steps PLC programming capacity

▶ LCD keypad is removable and is provided with an extension cable for installing onto a control panel

▶ Deceleration Energy Backup (dEb) function synchronously controls multiple drives and motors to decelerate to a stop via DC bus when sudden power outage occurs

▶ Built-in MODBUS communication and provides optional communication cards: ProfiBUS-DP, DeviceNet, MODBUS TCP, EtherNet-IP and CANopen

Standard Model (IP00 11 ~ 90kW)
Power range: 460V 11 ~ 90kW

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

Applications

Applicable for all flange mounting applications that have an airway design compatible with the CT2000 standard.

Economy Vector Control Drive
C200

High Speed Frequency Output

▶ Supports both asynchronous and synchronous motors

▶ Built-in 5K steps PLC programming capacity

▶ Enhanced environment tolerance with special PCB coating and ventilation design

▶ Flange mounting design for Frame A and removable panel to facilitate installation process

▶ Built-in pulse input terminal with encoder for closed-loop control

▶ Built-in CANopen and MODBUS RS-485 ports for network connection

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

Applications

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

Heavy Duty Vector Control Drive
CH2000

Large Overload Capability Excellent for Impact Loading Applications

► Fast response to impact loads

► Super Heavy Duty (SHD) setting for high overload capability: 150% of rated current for 60sec and 200% of rated current for 3sec

► Large starting torque: above 200% at 0.5Hz, and 200% at 0Hz in FOC+PG mode

► Supports both asynchronous and synchronous motors

► Various crane functions for high operation performance

► Modular design facilitates installation process and is easy to maintain

► Built-in 10K steps PLC programming capacity

► Built-in MODBUS communication and provides optional communication cards: ProfiBUS-DP, DeviceNet, MODBUS TCP,EtherNet-IP and CANopen

Advanced Crane Functions
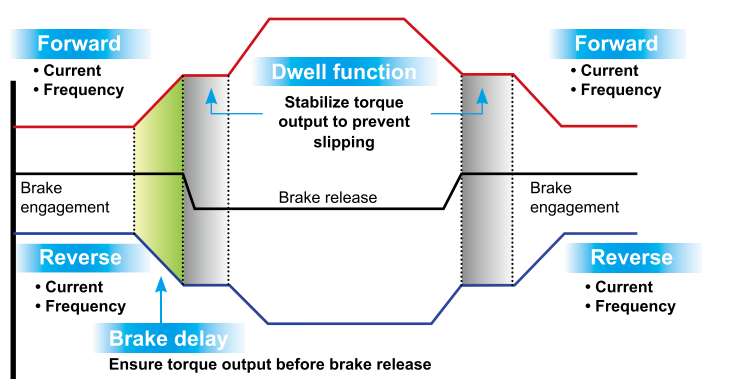
▲ **Advanced Crane Time Sequence**
Brake delay and dwell function for smooth operation

▲ **Mechanical Brake Control**
Eight independent conditions for brake control for safety and complex applications

Forward Output Frequency
Reverse Output Frequency
Mechanical Brake Action
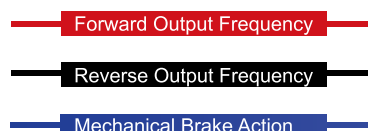
Auto-acceleration of Light Load

Output Frequency
Output Current
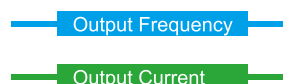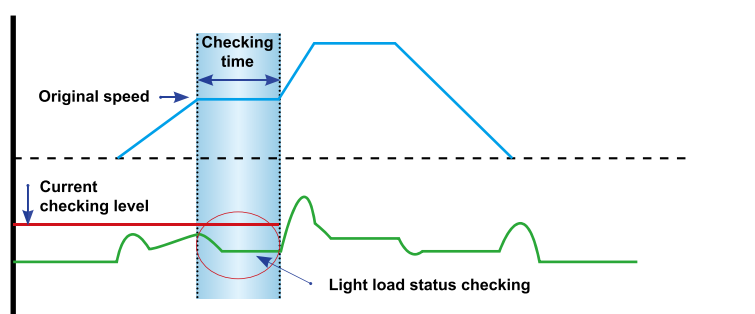
Standard models (IP20/NEMA1)
Power range: 230V 0.75 ~ 75kW, 460V 0.75 ~ 280kW

Power Range	0.75 ~ 3.7kW 1 ~ 5HP	5.5 ~ 18.5kW 7.5 ~ 25HP	22 ~ 37kW 30 ~ 50HP	45 ~ 75kW 60 ~ 100HP	90 ~ 185kW 125 ~ 250HP	220 ~ 280kW 300 ~ 375HP
CH2000	230V/3-phase					
	460V/3-phase					

Applications

Hoists, machine tools, printing machines

6

Power Regenerative Unit
REG2000

Replaces Traditional Brake Resistor and Features Power Regeneration

▶ Compact design with reactor included and easy to install

▶ Replaces the traditional brake resistors to reduce heat generation and achieves more than 95% power regeneration efficiency, delivering clear energy savings

▶ Improves motor braking capability from 125% to 150%[*]

▶ Built-in MODBUS RS-485 communication for real time monitoring of kWh and cost

▶ Compatible with DC inverters and DC servo drives

▶ Parallel connections for large power applications

▶ Provides optional communication cards: MODBUS TCP, CANopen (DS301), PROFIBUS, DeviceNet and EtherNet/IP

* Please contact Delta Industrial Automation

REG2000
Converts regenerative energy into reusable electricity

Power consumed
Regenerative energy

Traditional Brake Resistor
Dissipates regenerative energy as heat

Drive

Mains

Inverter

Regenerative Energy

Lights

HVAC

Regenerative Energy ➡ Reusable Power

Drive

Mains

Regenerative Energy

Braking Unit

HOT

Regenerative Energy ➡ Heat
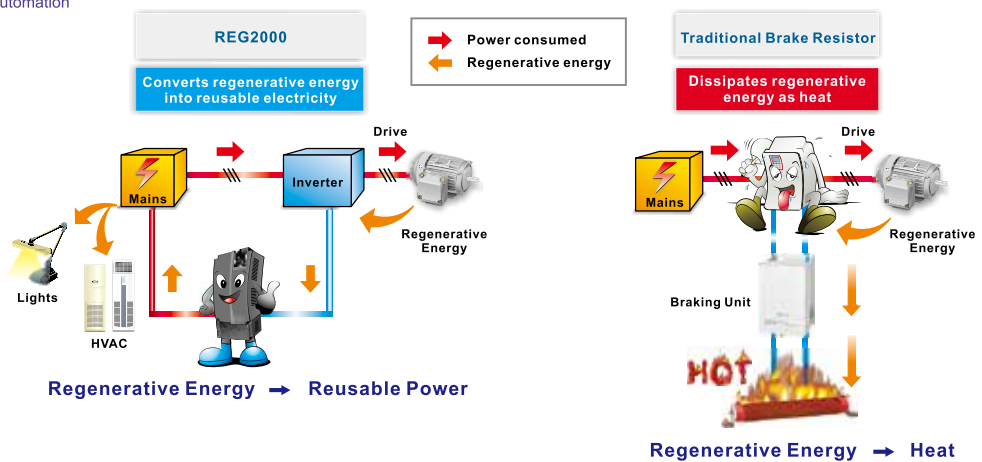
Applications

- **Large-inertia load applications:** centrifuge equipment, industrial laundries, roving machines and more
- **4-quadrant load applications:** elevators, cranes, pumpjacks and more
- **Quick braking applications:** machine tools, bag making machines, auto storage and retrieval systems, press machines and more
- **Long-term energy feedback applications:** printing machines, escalators and more

Escalators | Elevators | Tension Controls | Hoists | Centrifuge Equipment | Press Machines | Industrial Laundries | Machine Tools

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

EAC

Hybrid Energy Saving System
HES

Energy Saving for Injection Molding Machinery

▶ Superior Energy-Saving Outcomes: Lowers energy consumption rate at the clamping and cooling stage while maintaining high productivity and high precision. 40% less energy consumption compared to variable pump hydraulic systems. 60% less energy consumption compared to a traditional quantitative pump hydraulic system

▶ Low Oil Temperature: Oil temperature reduced by 5 ~ 10 ºC; oil usage reduced by 50 ~ 60%; 50% less oil tank volume; lower cooler specifications required or even no cooler required

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

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

▶ Good Frequency Response: Delta HES with permanent magnet servo motor (PMSM) speeds up frequency response to 50ms

▶ Suitable for Harsh Environments: Resolver is resistant to earthquakes, oil and dust

▶ Old Machine Replenishment: Analog command 0 ~ 10V and linear correction (3 points), no need to replace the computer

▶ Flow Convergence: Saves cost on tubes, large flow capacity, and outstanding energy saving performance

Power Consumption Curve of the Injection Molding Process

Traditional injection molding machine with fixed displacement pump

Hybrid Energy Saving System (HES)

Extreme low power consumption at the pressure holding phase

Almost no power consumption at the cooling phase
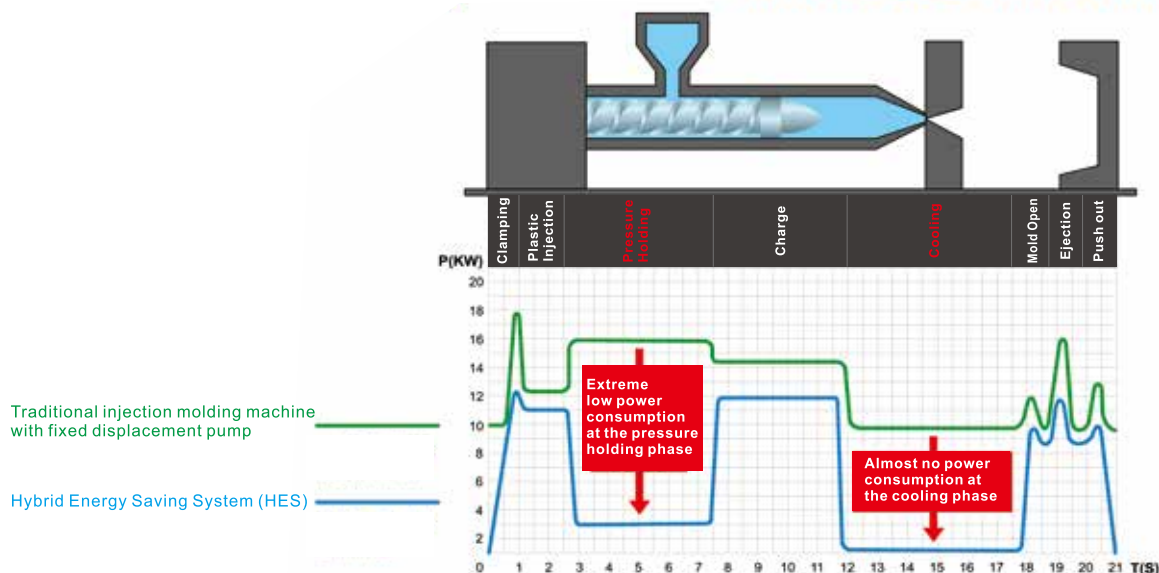
Applications

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

Flow Range	50L/min	63L/min	80L/min	100L/min	125L/min	160L/min	200L/min	250L/min
HES	230V/3-phase							
	460V/3-phase							

變頻器和馬達已作 CE,UL 認證

8

Integrated Elevator Drive
IED

Drive and Control All-in-One, Saves Installation Space

IED

Control
► High-efficiency group control function capable of controlling multiple elevators without the need of additional control cards
► Demo and Attendant service modes
► Single and double door elevator applications
► Max. 48 floors

Design
► Compact design, suitable for machine-room-less applications
► Modular design of fans and capacitors for easy replacement and maintenance
► A small-size LED keypad allows users to check and set the drive control

Drive
► Supports asynchronous and synchronous motors
► Emergency Power Supply (EPS) function
► Dual safety protection functions. All time output phase loss check and confirms torque output before releasing mechanical brake

One drive for all control needs

Tune
► Auto-learns hoistway and auto-detects floor height
► Auto-tunes 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)
► Scheduled lighting and air circulation time function for the elevator car
► Standby mode to save energy

<Optional>

External Digital Keypad

- Controller setting
- Drive setting
- Parameter copy

Efficiency
► Direct stop - multi-speed control to provide a comfortable ride with higher efficiency
► Peak hour operation - improves peak hour operation efficiency
► Full-load operation - arrives at designated floor without stopping

CE EAC

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

Floor Display Board

● Vertical matrix display board - Standard Type
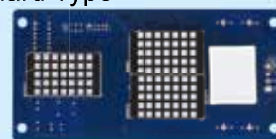
● Vertical/Horizontal matrix display board - Standard Type

Integrated Cartop and Button Board

● Integrated cartop and button board

● Button extension board

PC Software

USB port:
Easy program upload, download and tuning

ΔELTΛ
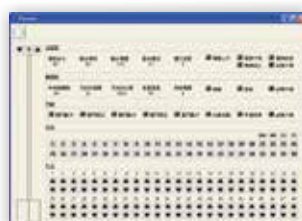
Door Control Drive
VFD-DD
Door Control Solution

■ **Compact and Thin Design 55mm**

■ **Safety Switch**

■ **Removable Terminal Blocks**

■ **Built-in Digital Keypad**

■ **Distance Control Mode**   ■ **Speed Control Mode**   ■ **Multi-step Speed Control Mode**

▶ Simplified elevator door control system
▶ Supports both asynchronous and synchronous motors
▶ Protects passenger safety
▶ Auto-tuning for door width
▶ Auto-positioning as power turns ON

▶ Smooth door re-open/re-close curve
▶ Demo mode
▶ Easy installation with special I/O contacts
▶ Supports elevator door obstruction detection function

Power range: 230V 1-phase 0.2kW~0.4kW

Power Range	0.2kW 0.25HP	0.4kW 0.5HP
DD	230V/1-phase	

Optional Motors
ECMD-B91207MS
ECMD-B91608MS
ECMD-B81610MS

Applications
Elevator doors

11
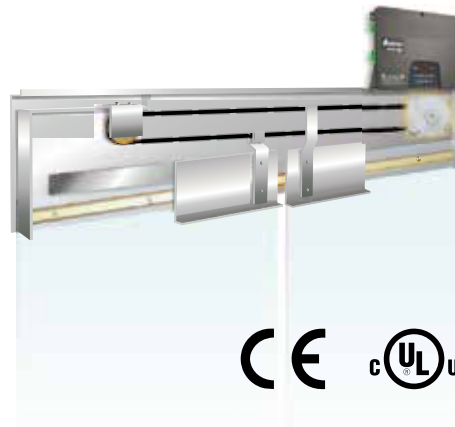
Elevator Drive
VFD-ED

Excellent Time Sequence Control Provides Smooth Rides

► Supports both asynchronous and synchronous motors

► Precise control of S curve performs smooth start and stop for a comfort ride

► Optional PG feedback cards (for ABZ & Heidenhain encoder)

► Advanced field oriented vector control

► Automatic torque compensation function to prevent elevator from slipping or vibrating

► Emergency operation is enabled using UPS or battery set when power outage occurs

► Supports both wall-mount and embedded installation methods

► Built-in LED digital keypad

► Power range: 2.2kW to 75kW

► 4 relay output and 2 multi-function digital signal output terminals (MO)

► 2 analog signal signal input (AI) and 2 analog signal output (AO)

► 2 MODBUS RS-485 and 1 CANopen communication ports

■ Emergency Operation

► Supports single phase 230VAC Uninterrupted Power System (UPS)

► Automatically determine the light load operation direction when power outage occurs

Encoder
Motor

Encoder
Motor
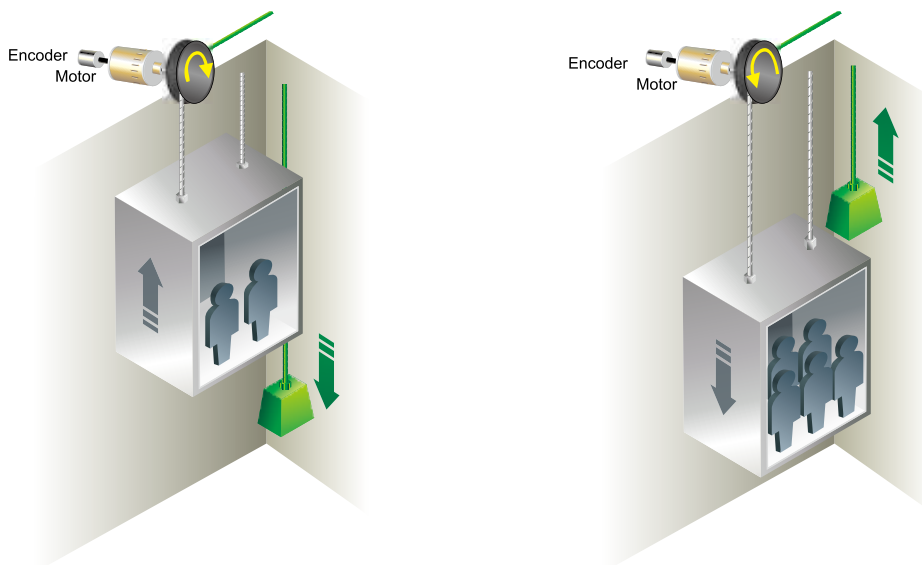
CE EHC c(UL)us (UL: does not include VFD22ED21S and VFD037ED21S models)

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

*Minimum power range of the 460V model is 4kW

ΔELTA

Sensorless Vector Control Compact Drive
VFD-E/EL
Smaller Size with Multifunction

▶ Optional extension modules for more flexible applications
(Highspeed fieldbus, braking modules, I/O cards and PG cards for VFD-E series)

▶ Fans with modular design for easy maintenance and replacement

▶ Built-in EMI filter for 230V single-phase and 460V models to minimize the electromagnetic interference effectively

▶ Built-in RFI Switch for noise suppression (all models)

▶ Built-in 500 steps PLC programming capacity (VFD-E Series)

▶ Supports common DC bus. The regenerative energy generated during braking is shared by the parallel connected AC motor drives to make the DC bus voltage of each drive more stable

▶ Innovative thermal design allows side-by-side installation and DIN RAIL mounting

▶ Built-in PID feedback control. The VFD-EL series also provides special functions for constant pressure pump

▶ Built-in RS-485, compatible with MODBUS communication (baud rate up to 38400 bps)

▶ VFD-E series offers two types of models for selection, the CANopen drive with CANopen communication protocols and the plate drive with no fan and cooling fins installed

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

▶ **Built-in PLC Function**
Easy to write PLC program
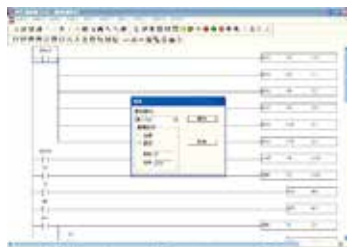
▶ **Side-by-Side Installation (40°C)**
High-efficiency cooling and flexible space

▶ **Easy Maintenance**
Removable cooling fan

▶ **Various Communication Modules**

PROFIBUS
(CME-PD01)

DeviceNet
(CME-DN01)

CANopen
(CME-COP01)

Applications

▲Food packaging machine

▲Textile machine

▲Punching machine

▲Conveyor belt

14
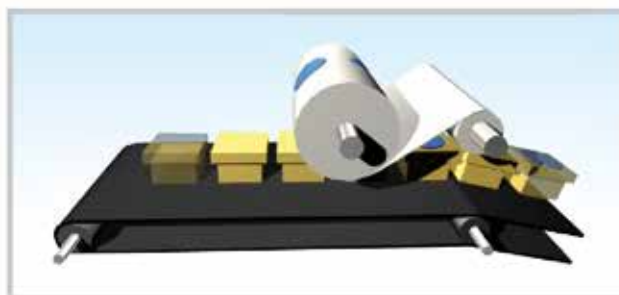
Active Front End
AFE2000

Best Energy Saving Device to Use with AC Motor Drives

▶ More than 95% power regeneration efficiency providing outstanding energy saving results

▶ Filter input current THD to less than 5% and improved power factor to 99% and more

▶ When installed with AC motor drive: realizes 4-quadrant operation with variable frequencies and adjustable functions for a system

▶ Ability to maintain and provide constant DC bus voltage/current when the voltage provided by the mains is unstable

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

Applications

- **Large-inertia loads applications:** centrifuge equipment, dewatering machines and roving machines
- **4-quadrant loads applications:** elevators, cranes and pumpjacks (oil extraction machines)
- **Quick braking applications:** machine tools, bag making machines, auto storage and retrieval systems, and lathes
- **Long energy feedback time applications:** wind power, water power, steel printing and paper making machinery (winding equipment)
- **Power quality improvement:** semiconductor and panel industries

CANopen
MODBUS TCP

PROFIBUS

DeviceNet

EtherNet/IP

EAC

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

Static Var Generator
SVG2000

Comprehensive Reactive Power Compensation to Improve Power Efficiency

▶ Compensates both leading and lagging reactive current. Improves power factor to 0.99

▶ Includes specially designed Delta power module for power voltage rating 200V to 480V and 525V to 690V

▶ Modular design of fan, power, drive, control and reactor

▶ 7-inches TFT LCD 65536 full color touch screen

▶ Capacity: 300kVAR/500kVAR

Applications

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

Active Power Filter
APF2000

For Power Quality Improvement

► Filters 2 ~ 50th order harmonics with efficiency of more than 90%. IEEE519 standard

► Full response speed faster than 20ms

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

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

► 7" HMI TFT LCD 65536 color

► Compact design of 300A model with only 600W x 800D x 2200H (mm)

► Parallel connection of multiple units to expand total capacity

● Concept

An active power filter is a large power filter device for real time monitoring of three-phase current and effectively filtering out harmonics by providing an equally opposite phase to the affected component. It is connected in parallel with the grid and uses current transformers to monitor a real time 3-phase current waveform and obtain the required compensation harmonic current and reactive power elements. An active power filter unit creates an opposite current input to the power system and achieves a harmonic filter effect. Using a real current phase compensates a leading/lagging reactive current to improve grid power factor and the compensating reactive power.

Grid current   Compensating   Load current
                      current
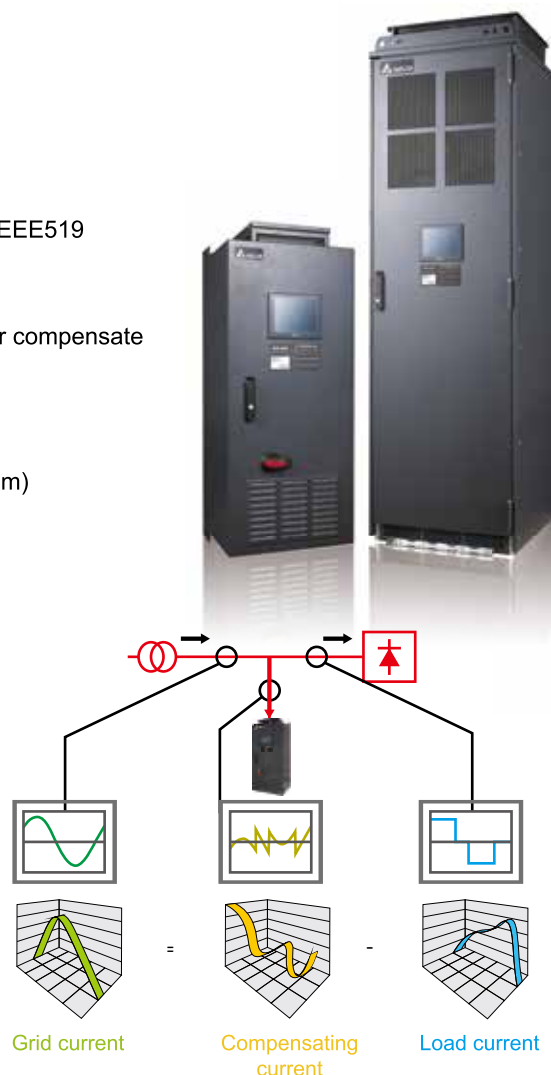
Applications

▪ **Metallurgy and petrochemicals industries:**
rectifier, converter, rolling mill, electric arc furnace, medium frequency furnace, inverter

▪ **Chemical and electrolysis industries:**
rectifier, calcium carbide furnace, electric soldering, inverter

▪ **Mechanical industries:**
rectifier, rolling mill, inverter, electric arc equipment

▪ **Metal, paper, plastic processing and textile industries:**
rectifier, rolling mill, inverter, electric arc furnace, electric furnace

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

▪ **Automobile manufacturing industries:**
soldering equipment, car painting equipment, battery charger and inverter

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

Built-in RS485. Also supports various communication and fieldbus cards, available upon request

CANopen (DS301)
MODBUS TCP

PROFIBUS

DeviceNet

Capacity	50A	100A	200A	300A
APF	200V ~ 480V/3-phase			

DELTA

Advanced Servo Drive for High-end Motion Systems
ASDA-A2

Implements 20-bit (1,280,000 p/rev) superior resolution encoder as a standard

Built-in Motion Control Functions

► Electronic Cam (E-Cam) function for mark tracing, positioning, synchronous control applications. 720 points max. for E-Cam outline

► High-speed Capture and Compare function for position latch and detection. Max. 800 records can be stored in the memory

► Built-in gantry control algorithm
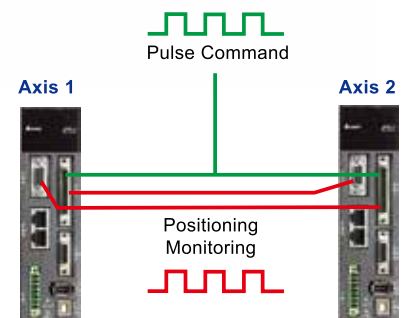
Pulse Command

Axis 1   **Axis 2**

Positioning Monitoring

High Precision, High Performance Servo Motors

► Supports incremental type and absolute type encoders

► Incremental type encoder provides up to 1,280,000 p/rev resolution for high-precision positioning

GOOD DESIGN PRODUCT   CE   c(UL)us

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

Main Encoder
CN5
CN2
Linear Scale
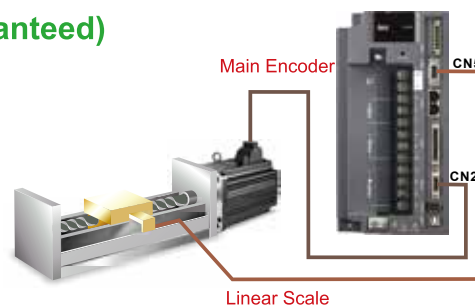
Versatile PR mode

▶ 64 procedures can be applied for various and multiple points continuous motion movements

▶ 35 Homing modes / Jump mode / Write parameter mode / Speed mode / Position mode

Speed
Sequential Command
P_Command 1   P_Command 2
Time
Delay 1
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
Time
External command triggered
Insertion changes the command executed at the moment it is inserted.

Basic Features

▶ Input voltage: AC 200V ~ 230V, 0.1 kW ~ 15 kW, 1-phase / 3-phase, or 3-phase

▶ Input voltage: AC 400V, 0.4 kW ~ 15 kW, 3-phase

▶ Up to 1kHz frequency response for high speed and high precision applications

▶ Supports CANopen, DMCNET, EtherCAT communication protocols

▶ A2-E model is equipped with Safe Torque Off function (STO) complying with the international standard IEC61800-5-2

	Type	RS-485 (CN3)	Full-Closed Control (CN5)	Extension Port for Digital Input (CN7)	EtherCAT	CANpen	DMCNET	Analog Voltage Control	PT Mode	PR Mode	E-Cam
Standard Type	L	○	○	X	X	X	X	○	○	○	X
	U	○	○	○	X	X	X	○	○	○	○
Network Type	E	X	○	X	○	X	X	X	X	○	○
	F*	X	○	X	X	X	○	X	X	○	X
	M	X	○	X	X	○	X	X	○	○	○

Note:
*-A2-F model type supports DMCNET only

Applications

Filling and bottling equipment, feeding machines, lathes, electric discharge machines (EDM), woodworking machines, wire cutting machines, packaging machines, printing machines, textile equipment

Food Packaging Machines   **Wire Cutting Machines**   **High-speed Labeling Machines**   **Feeding Machines**
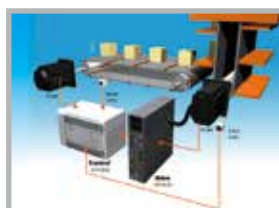
ΔELTΛ
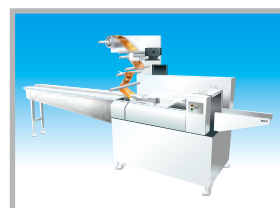
Standard Servo Drive for a Vast Range of Machines and Systems
ASDA-B2

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

Power Range: 0.1 kW ~ 3 kW

► Input Voltage: AC 200V ~ 230V, 1-phase / 3-phase, or 3-phase

► Meets high precision positioning control requirements of general-purpose machine tools

- Built-in Position, Speed and Torque modes (Speed and Torque modes can be controlled via internal parameters or external voltage)
- Provides pulse input (up to 4 Mpps) and analog voltage commands
- Three notch filters are provided to optimize the operation of the mechanical system automatically
- Friction compensation and motor protection functions are available to reinforce the system
- Power of main circuit and control circuit is separated
- Maintenance is easy and very safe
- Built-in regenerative resistor is featured as standard (400 W and above models). No need to purchase or wire up a separate regenerative resistor

Applications
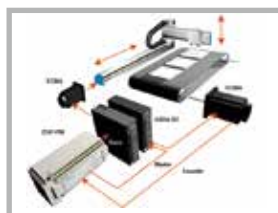
Bar Feeders	Transporting and Conveying Equipment	Electric Discharge Machines (EDM)	Cutting Machines
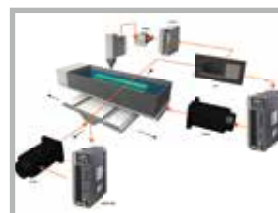
High Accuracy for Positioning

▶ ASDA-B2 series features 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
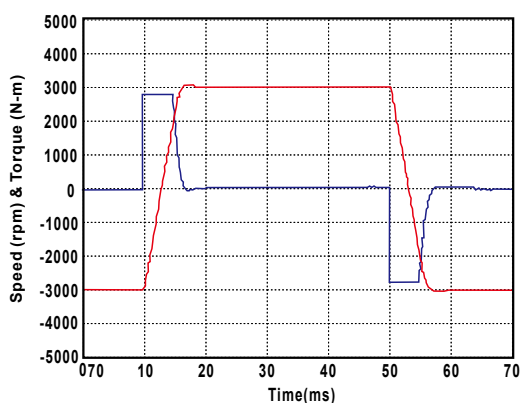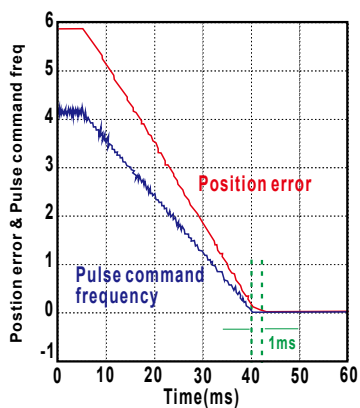
▶ Three auto notch filters are provided to suppress mechanical resonance efficiently

Exact!
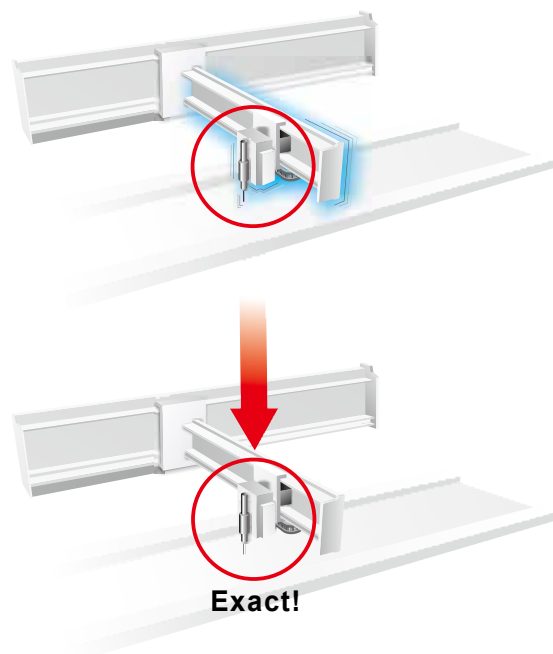
Easy-to-Use and Cost-Saving

▶ The same power and encoder cables as ASDA-B series. Easy to set up and no extra accessories are required

▶ Easy-to-use digital keypad is ideal for setting parameters and monitoring the system directly

▶ Built-in regenerative resistor (400 W and above models) is provided. Simplifies wiring and minimizes space

Charge LED

LED Display

Operation Panel

Separated power supply for main circuit and control circuit

Built-in regenerative resistor

CH1
CH2
Supports two analog outputs

DELTA
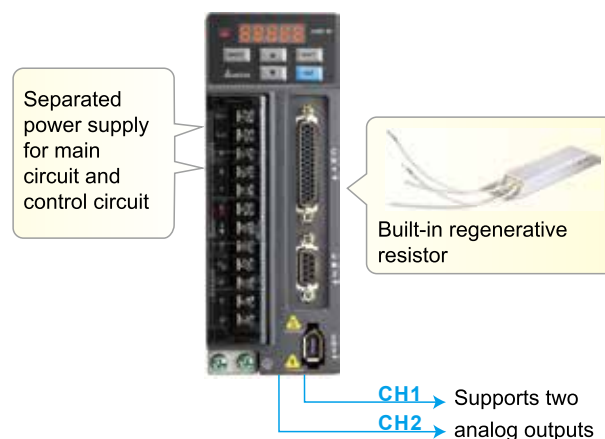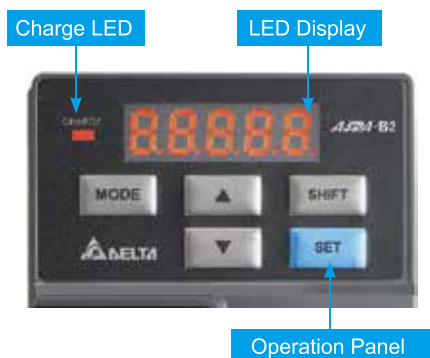
3-Axis Synchronous Servo System for Multi-Axis Motion Control Applications
ASDA-M

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

Impeccable motion control inside
- ▶ 3-axis synchronous servo module with performance better than comparable three servo drives
- ▶ Built-in motion control and PLC functions
- ▶ Multi-axis synchronous interpolation and built-in motion control commands are ideal for applications requiring high synchronous control accuracy
- ▶ Versatile PR mode for various continuous motion movements
- ▶ Built-in G-Code interpreter

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

Product Line-up

750 W	1.5 kW	2 kW
100 W ~ 750 W	0.75 kW ~ 1.5 kW	1 kW ~ 2 kW

USB Connection Port, for direct connection to personal computers or notebooks

ASDA-M Series Servo System

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

Z-Axis   Y-Axis   X-Axis

HMC Series Controller with Human Machine Interface

Supports DMCNET communication protocol

ASDA-A2 Series Servo Drives

DMCNET High-Speed Motion Control

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

▶ With the aid of Delta's Controller with Human Machine Interface (HMC), it can establish an integrated system configuration by DMCNET

▶ Supports DMCNET extension digital input and output modules

Advanced Gantry Control

▶ A large amount of data can be exchanged in real time among 3 axes without any time delay
This greatly increases the efficiency and performance of gantry control

▶ In rigid or general mechanical systems, no matter if the loading on multiple axes is equal or not, the ASDA-M series can perform precise motion control and drive for each axis simultaneously
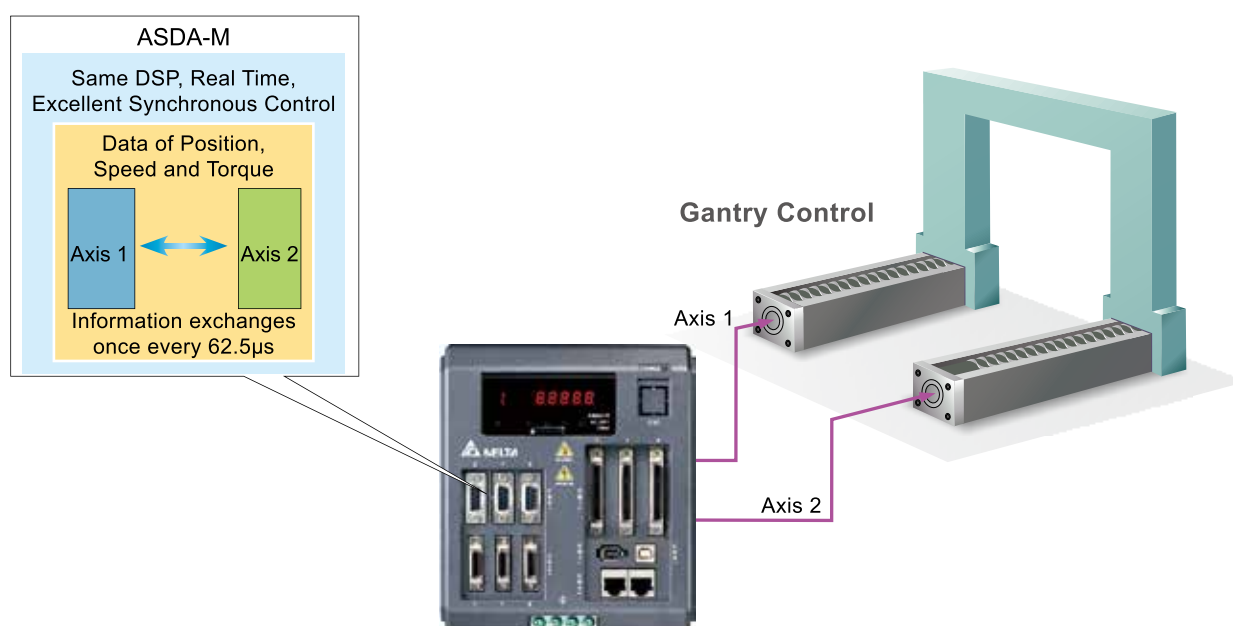
Built-in G-Code Interpreter

▶ G-Code commands are downloaded and executed to the servo drive through HMI or PC

▶ ASDA-M series provides built-in G-Code interpreter to decode the G-Code commands and complete the motion movement
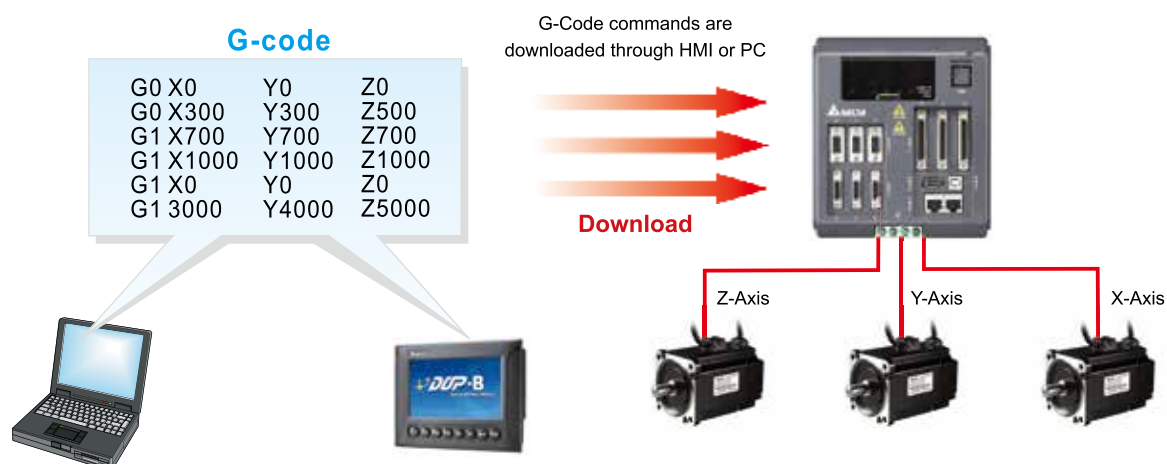
EtherCAT Interface Servo Drive
ASDA A2-E
Supports EtherCAT High-speed Communication

Delta's ASDA A2-E, an advanced AC Servo Drive with an EtherCAT communication interface, complies with IEC61158 and IEC61800-7 to enable faster, real time, and accurate performance in high-end applications.

The new A2-E the supports a CoE device profile based on CiA402, and all command types of EtherCAT.

In addition to the EtherCAT communication function, the A2-E features the integrated Safe Torque Off (STO), short cycle time, and extension digital input port, which makes the A2-E ideal for multi-axis synchronization applications in a wide range of machinery automation applications. This series offers a wide range of rated power to drive motors, from 400 W to 7.5 kW for 400V and 100 W to 3 kW for 220V.

▶ Touch probe function can be enabled with two dedicated Digital Inputs (DI) on CN7 or the external encoder
▶ Integrated Safe Torque Off (STO) safety function complies with the standards of IEC61508, SIL2; IEC62061, SILCL2; ISO13849-1, Cat. 3 PL=d
▶ Wide power range coverage for both 220V and 400V versions
▶ Supports full-closed loop control
▶ Supports absolute type and incremental type ECMA series motors

Applications

EtherCAT controllers

Third party controllers   Delta's controller
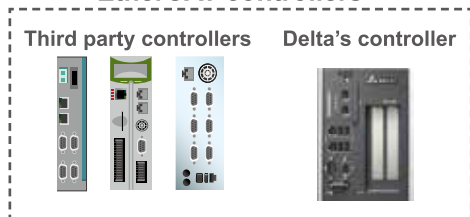
EtherCAT

| Metal Working Machines | Woodworking Machines | Food Processing | Printing Machines |

■ 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 (32 byte, Max.) Rx: 8 Object (32 byte, Max.) Dynamic Mapping Supportsed.
Bus Clock	DC cycle with min. 250 us
LED Indicator	EtherCAT Link/Activity Indicator (L/A) x 2 EtherCAT RUN Indicator (RUN) x 1 EtherCAT ERROR Indicator (ERR) x 1

■ Part Names and Functions

Servo Status Display / Operation Panel / Charge LED

External Encoder

Extension DI Port

Safe Torque Off (STO) I/O

Digital I/O

Motor Encoder

EtherCAT Status LED

EtherCAT Port

USB Port
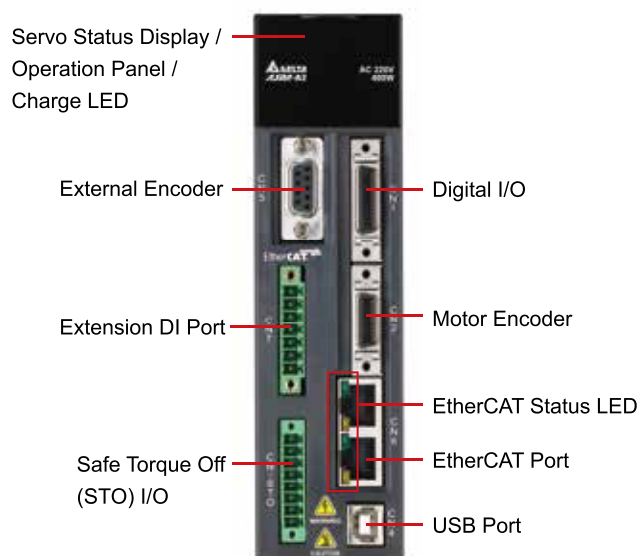
■ Accessories for ASDA A2-E

Part Number	ASD-CNSC0026
Description	CN1 connector

Part Number	ASD-CNFS0808
Description	Pack of connectors used for STO wiring, 8 pcs of connectors in one pack

High-Speed Motion Control System
DMCNET

High-Speed Communication Solution for Multi-Axis and Synchronous Motion Control

Delta's DMCNET motion control card provides high performance and extended functions for multi-axis motion control.
It is capable of controlling up to 12 units of ASDA-A2-F, ASDA-B2-F series AC servo drives and motors within 1 ms simultaneously.
It also supports various motion control modules, such as for linear, arc, helical, and continuous interpolation.
A complete DMCNET motion control structure can satisfy a variety of requirements for automating industries.

DMCNET is the best integrated platform for multi-axis and synchronous motion control. It is also the ultimate solution that provides effortless wiring, enhanced stability, flexible extension capabilities and versatile operation for industry upgrading and adding value to products. To help industry excel and stay competitive, Delta provides the new 12-axis PCI-DMC-B01 motion control card for multi-axis applications and the new 6-axis PCI-DMC-F01 motion control card for point-to-point applications within a 4-axis pulse train interface, offering a cost-effective motion control system enabling implementation and control of most high speed and high precision applications.

■ System Configuration

ASDA-A2   ASDA-A2R   ASDA-B2   GA (Main Station) + GE (Extension Module)   RM (Remote Module)   RM-04 PI (Pulse Output Module)

Servo Motor   Linear Stage   Linear Motor   Servo Motor   DI   DO   Stepping Motor   AI/DI   AO/DO   Stepping Motor
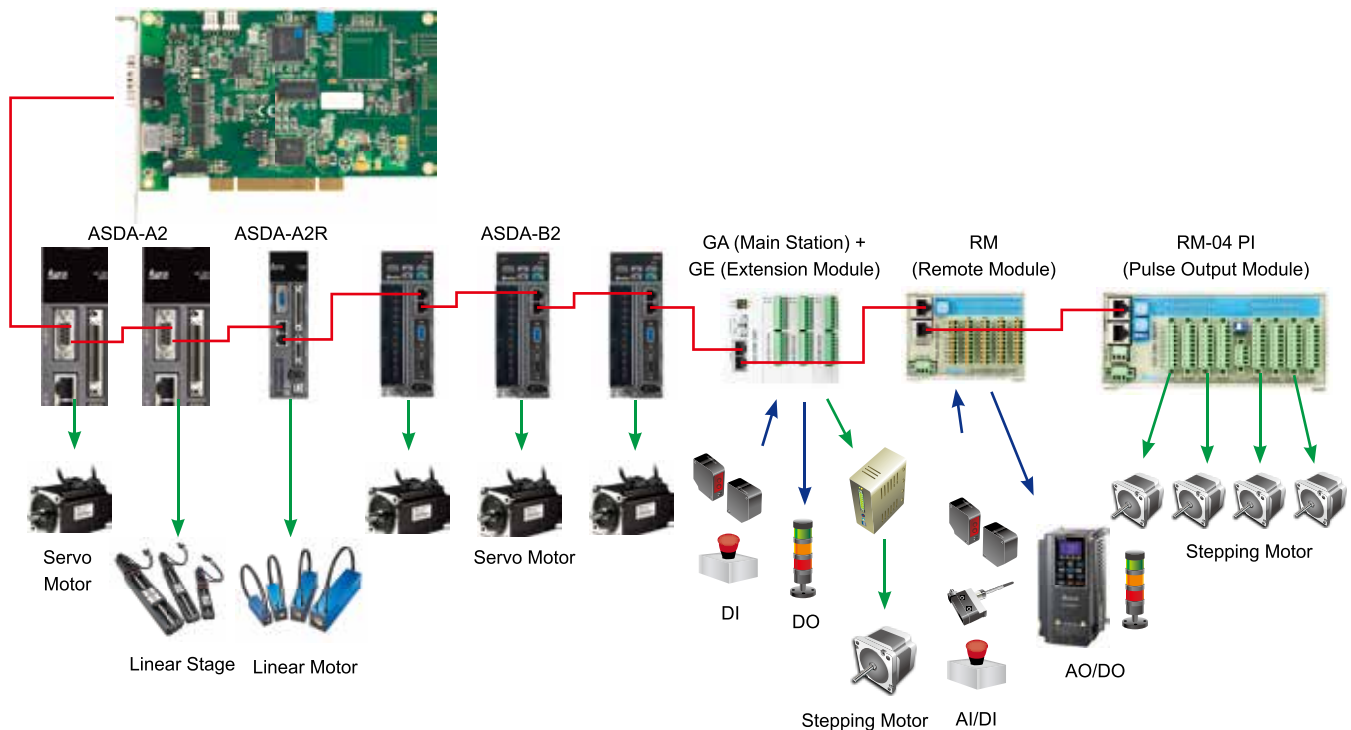
Applications

Electronic components processing, printing machines, woodworking machines, discharge machines, adhesive machines, tube bending machines

Woodworking Machines   **Discharge Machines**   **Adhesive Machines**

25
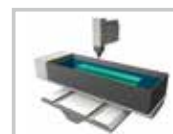
Industrial PC-Based Motion Control Solution

DMCNET is a high speed and real time communication system capable of controlling up to 12 servo system units within 1ms simultaneously.

The PCI-DMC-B01 motion control card can be connected to 12 slaves, and each slave can have one servo motion axis (i.e., each card can operate 12 servo axes). The PCI-DMC-F01 motion control card can be connected to 12 slaves among 6 axes, offering customers a more cost-effective option.

PCI-DMC-B01   PCI-DMC-F01   PC-based

PCI

or

├─ PCI-DMC-F01 : Up to 6 Axes of Control ─┤
├─ PCI-DMC-B01 : Up to 12 Axes of Control ────────

ASDA-A2 or ASDA-B2
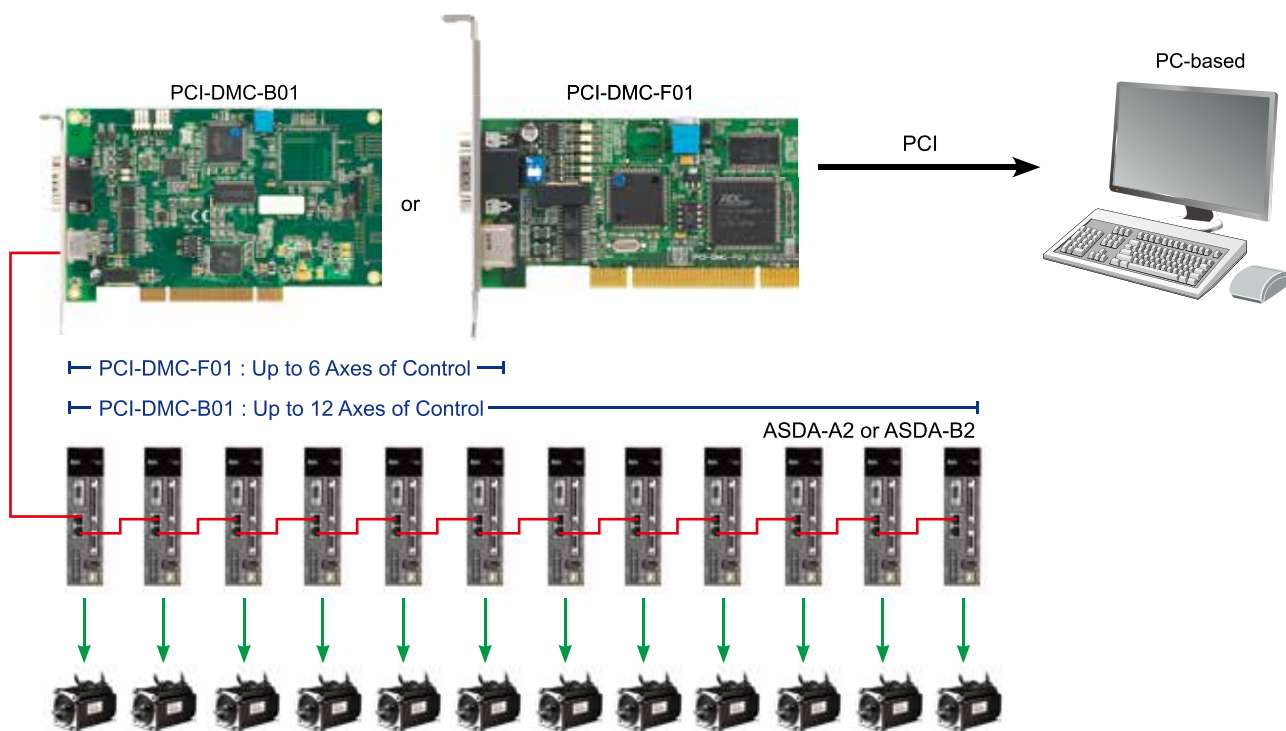
Soft Numeric Control (SNC)

The Soft Numeric Control (SNC) Library built-in G-Code interpreter, Jerk control, S-curve smoothing, automatic corner deceleration, high speed multi-block look-ahead, curve fitting, tool management and other functions to make BCB, C#, Delphi, VB, VB.Net, and VC easy to program for developing user-defined NC programs.

User Interface	G-Code Interpreter	Motion Control
Screen Editing	**G-Code Interpreter**	**Motion Control**
Operating Procedure	G-Code	Single-Axis JOG
Read File	M-Code	Multi-Axis Synchronization
Save File	T-Code	Arc Motion
Status Display	Curve Fitting	2.5D Processing Motion
Interface Design	Coordinate Alignment	Contour Processing Motion
	Speed Change	
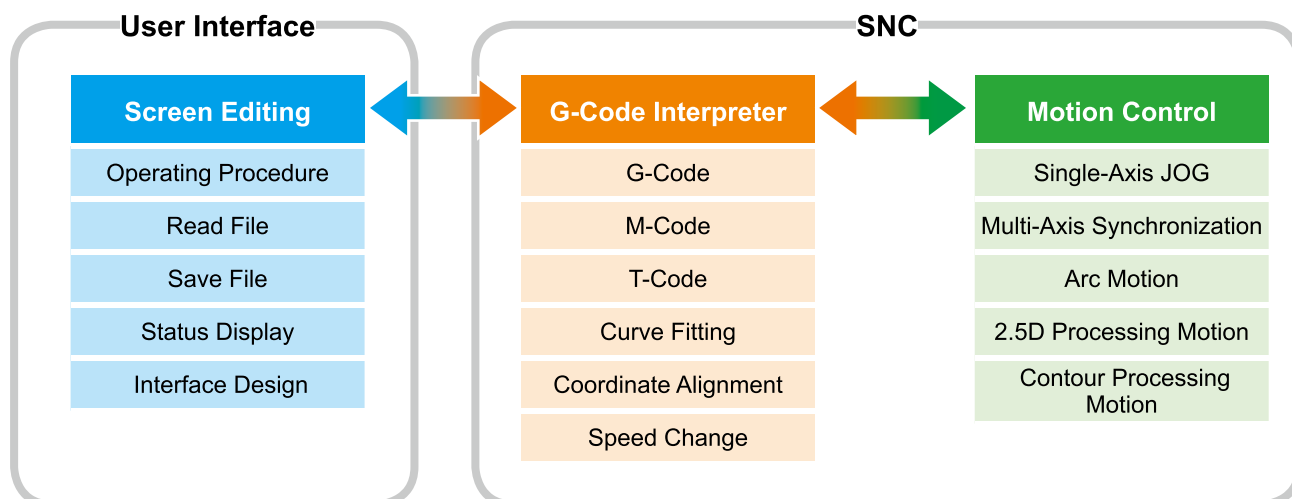
Linear Motion Drive
ASDA-A2R
Delivering a Superior Linear Motor

The new ASDA-A2R series linear drive system provides high accuracy, high rigidity and high response. It not only expands the applications of the servo system, but also increases the work efficiency of the motion contol system and satisfies high-precision requirements.

The ASDA-A2R follows in the footsteps of Delta's successful servo system and provides the same functions such as high-speed and high response performance, excellent vibration and resonance suppression, versatile PR mode, DMCNET and CANopen communication interfaces, built-in E-Cam and gantry control functions.

Motion inside. Cost-effective!

Power range: 100 W ~ 3 kW
▶ Intelligent motor parameter measuring, easy and fast auto tuning
▶ Accurate positioning and initiation without a Hall sensor unit
▶ High flexibility in connecting various kinds of linear motors and servo motors
▶ Signal Converter Box (Delta option) available for high speed and high precision requirements
  ▪ Supports AB phase square waves of digital signals and sine waves of analog signals
  ▪ Signals can be divided up into a multiple of 2048 to increases positioning resolution for precise position control
▶ Detection and compensation of cogging force

Disabling compensation of cogging force

Enabling compensation of cogging force
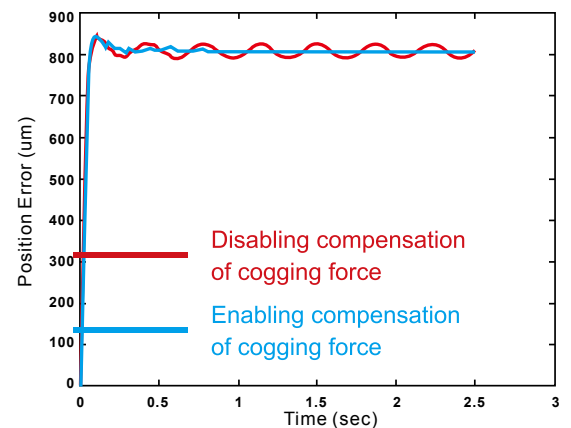
Ironless Linear Motor
ECML
Power range: 100 W ~ 750 W
▶ Rated thrust: 21 ~ 177 N
▶ Direct driving mechanism, high speed and high precision control
▶ No cogging forces and low thrust ripple

27

Spindle Motor Drive
ASDA-S

Ensuring Premium Surface Finish Quality for the CNC Industry

Power range: 3 kW ~ 7.5 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. External converter card is no longer necessary

► 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

► Accepts analog voltage, position pulse and DMCNET communication commands

► 200V models and 400V 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

Feed Axis ASDA-A2 Series
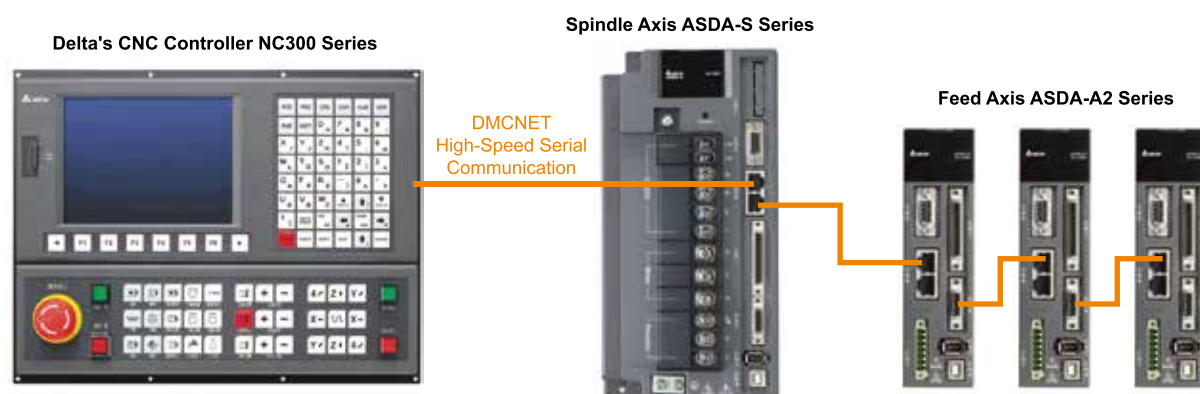
IPM Spindle Motor
ECMS

Power range: 3.7 kW / 6.7 kW

► Encoder Type: Incremental 20-bit

► Max. torque: 14.72 N-m / 26.65 N-m

► Speed range: 6000 r/min ~ 12000 r/min

► Options: Coolant through spindle

► IP degree: IP54

AELTA

Linear Stage `New`
LU (Linear U-rail)

High Precision Steel Ballscrew Driven Stage
Position repeatability reaches ±3 um

▶ Non-coupling installation design
▶ High rigidity and high accuracy
▶ Fast response
▶ Compact and easy installation
▶ Low inertia ratio

Characteristic Analysis

Delta LU Series
(without coupling)

Conventional Linear Stage
(with coupling)

Measured Data by Laser Interferometer

Conventional actuator
LU actuator

20 msec
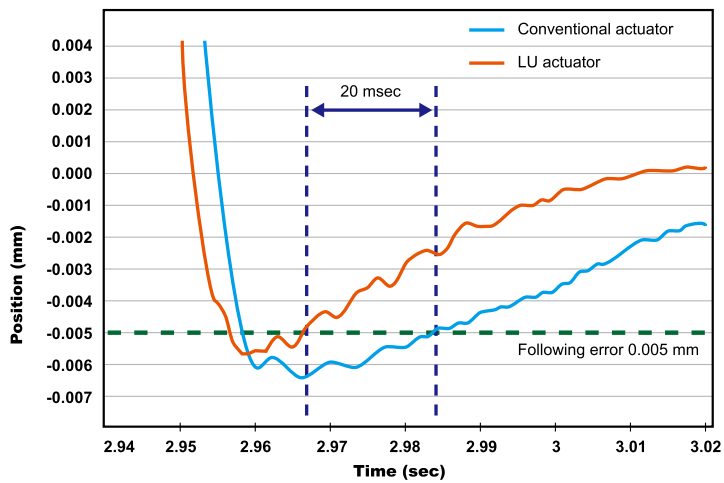
Test condition (without load)
■ Motor speed: 3,000 rpm
■ Acceleration time: 50 ms
■ RPM: 3000
■ No Load

Following error 0.005 mm

Position (mm): 0.004, 0.003, 0.002, 0.001, 0.000, -0.001, -0.002, -0.003, -0.004, -0.005, -0.006, -0.007

Time (sec): 2.94, 2.95, 2.96, 2.97, 2.98, 2.99, 3, 3.01, 3.02

▶ **Applications**

IC packaging, Auto-Optical Inspection (AOI) equipment, pick-and-place machines, inspection machines, materials handling

29

Linear Shaft Motor New
ECML-S
High Speed and High Precision Linear Motor

▶ Simple mechanism structure for quick installation
▶ 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 in both sides for easy mounting

Thrust Range

Legend: Maximum Thrust, Rated Thrust

Models: ECML-S1606, ECML-S1608, ECML-S2003, ECML-S2004, ECML-S2005, ECML-S2504, ECML-S2506, ECML-S2508, ECML-S3204, ECML-S3206, ECML-S3208

X-axis: 0, 200, 400, 600, 800 N

Length of Magnetic Way (Units:mm)

Model	Shaft Diameter	Minimum Length	Maximum Length	Increments
SM16	Ø16	250	1240	30
SM20	Ø20	250	1270	60
SM25	Ø25	330	1650	60
SM32	Ø32	450	2310	60

Applications

IC packaging, Auto-Optical Inspection (AOI) equipment, pick-and-place machines, inspection machines, materials handling

CNC Solution

Integrated Total Solutions for the CNC Machine Tools Industry

► Features a built-in 32-bit high speed and high processing dual CPU that can construct a real time and multi-functional control center
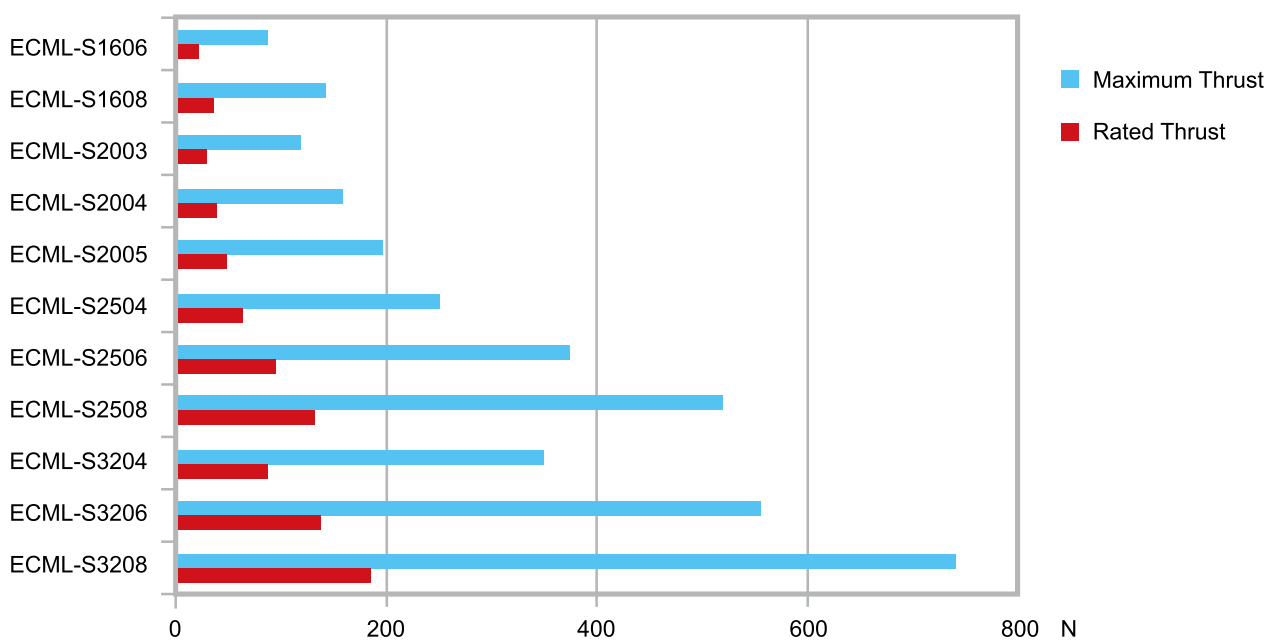
► With the aid of Delta's high-speed servo and spindle systems, high-quality digital data transmission can be achieved and noise suppression is enhanced

► Provides auto-gain tuning for the servo system so the servo parameters can be set automatically. Optimum control of the mechanical system is easy and in real time

► CNCSoft software offers user-friendly setup Supports and allows users to build custom screens for user-defined operation

► Capable of connecting serial digital I/O modules to has greatly improve the extension capacity

Applications

CNC Machining Centers, High-speed Tapping Machines
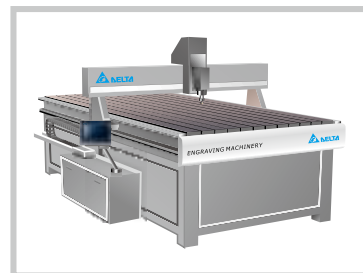
Engraving Machines
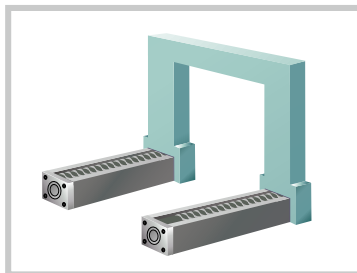
CNC Gantry Control Machines

CNC Woodworking Machines

31

**High-speed, High-precision,
Premium Surface Finish Quality**

**CNC
Solution**

**User-friendly,
Integated Interface**

**New Working
Structure**

**Feed Axis Servo Motors, High Speed
Permanent Magnet Spindle Motors**

**Multiple CPUs,
Embedded Hardware**

■ System Configuration

CNCSoft software

ASD-S-N

Ethernet

DMCNET

ASD-A2-N

High-speed Serial I/O

Local I/O

MPG

32
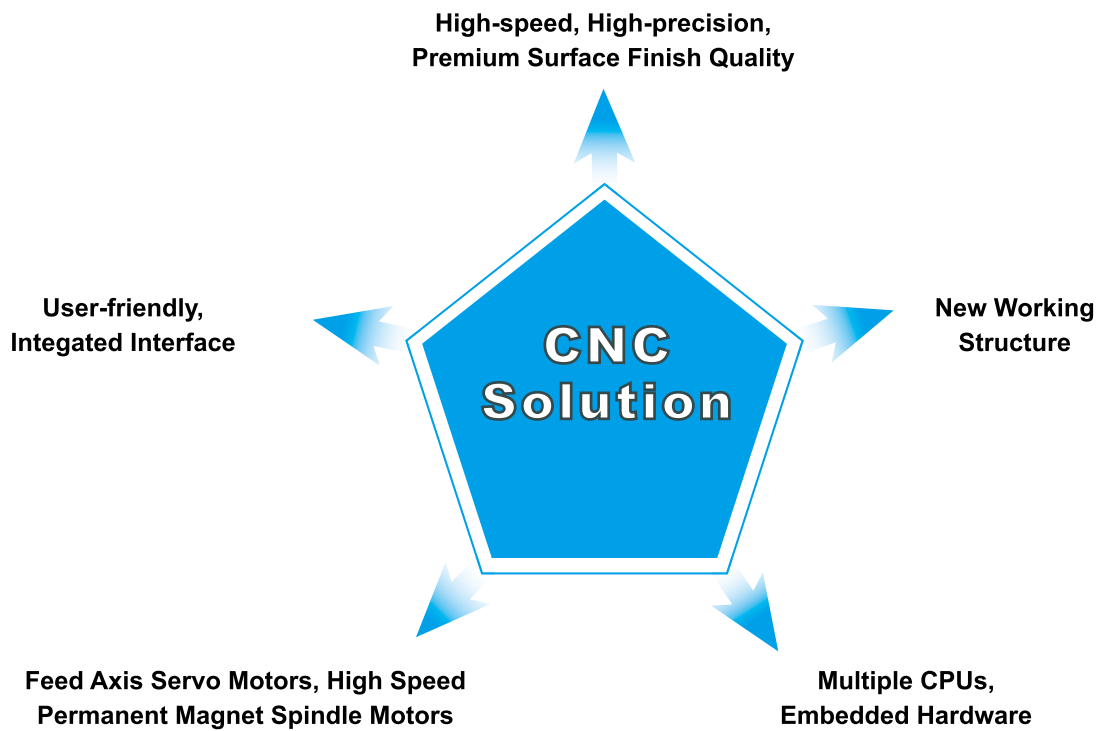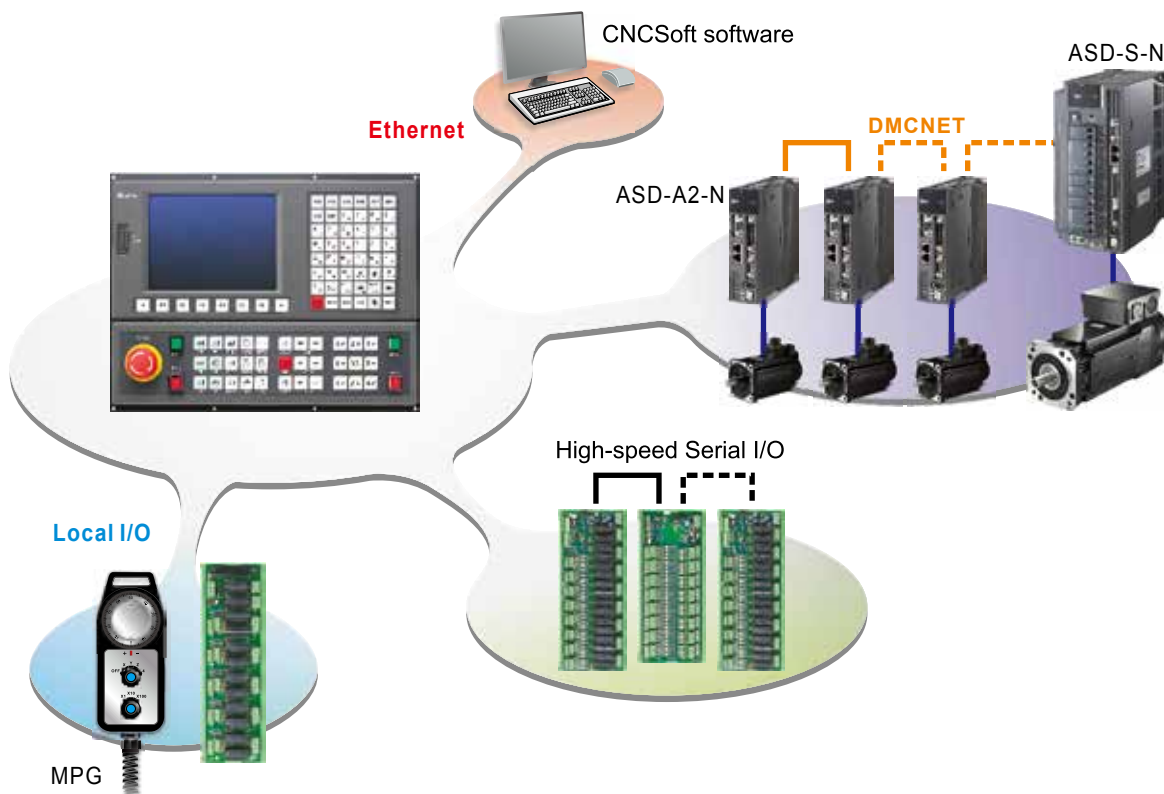
DELTA

SCARA Robot New

DRS40L

Smart Automation for Industry Upgrades

Delta SCARA fulfills industry needs for processes such as insertion, screw locking, assembly, gluing, coating, soldering, load and unload, pick-and-place, stacking, packaging, and inspection for industries such as consumer electronics, electrical/electronics, rubber and plastic, packaging, metal fabrication and others.

When matched with control units and other peripheral devices such as servo systems, machine vision systems and linear modules, the SCARA becomes a highly integrated work station. It satisfies requirements for both single devices and workstation applications, and enables modularized production lines and multi-products production with consistently good quality. Delta SCARA is easily applied to production automation for higher flexibility in achieving smart and efficient production, and improving productivity, quality, and labor efficiency.

► **Excellent speed, linearity, verticality and repeatability**

Motion Stroke (Back & Forth)
Z Axis: 25 mm
X / Y Axis: 300 mm

300 mm

25 mm

Payload (Kg)	Cycle Time (sec)
1	0.42
2	0.45
3	0.48

Arm Length: 400 mm

Max. Payload: 3 Kg

Repeatability: ±0.01 mm

► **Compliance control functions without sensors to compensate for the deviation between workpieces and insertion holes.**
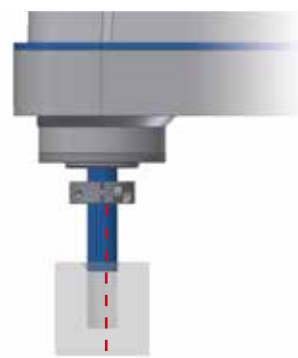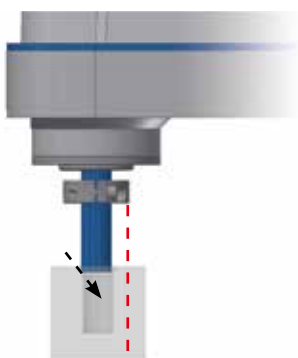
Sensor-less compliance control realizes smooth insertion within the deviation of the motor torque range.

*Insertion performance may differ depending on workpiece hardness.

► **Simple and Easy-to-Operate with Versatile Control Approaches**

PAD

Multiple Teaching Methods

Teaching Pendant

PC

► **User-friendly Robotic Integration Software**

1. Offers built-in standard testing modules for quick I/O points and motor testing, saving system test time.
2. Provides a standard modular program designing process for easy robot motion programming, increasing maintainability and lowering maintenance cost.
3. Integrates customer's UI tools to ensure the uniqueness and completeness of individual robotics systems.

| Simulation Module | Programming Module | Built-in Testing Module | Customized UI Module |

* UI = User Interface

► **Direct Teaching**

Points are directly taught by hand and recorded by SCARA.

Robot Controller with Integrated Servo Drive `New`
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

▶ Supports various communication protocols

▶ Built-in with diverse robot control modules

▶ Up to 10 axes motion control: 4-axis robot + 6 external axes

▶ Supports IEC 61131-3 standard for five kinds of programming languages and the PLCopen motion function block

▶ Offers DRL Languages for developing robot application programs

▶ Supports G-Code programming for path planning

User-Friendly Robot Software

▶ IEC61131-3 PLC programming languages

▶ DRL programming languages

▶ Easy robot motion planning and operation

▶ Intelligent robot calibration

▶ Real-time monitoring oscilloscope

▶ Applicable for different types of robots such as DELTA robots, SCARA robots, and more

Users

PAD

Robot Software on PC

Handheld Type HMI DOP-H

System Configuration

DELTA Robot

SCARA Robot

ASDA-MS

Ethernet

Extension Axes

ASDA-M-F

ASDA-A2-F

DMCNET

ECMA

ECMA
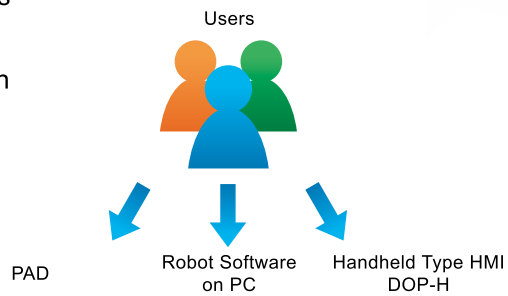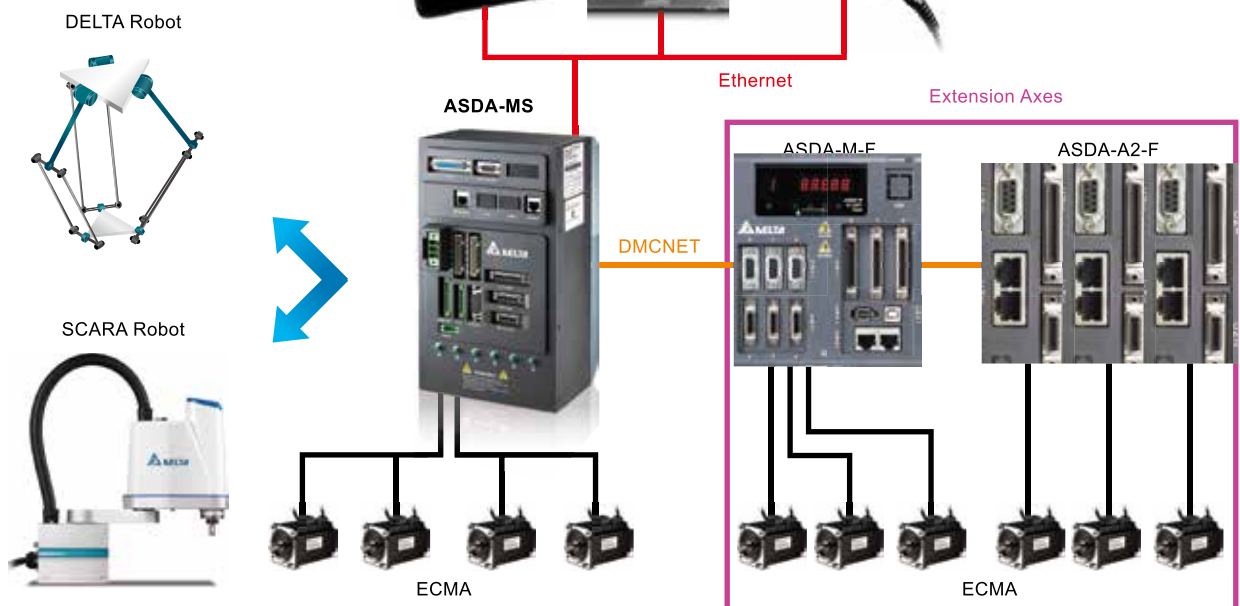
All-in-One Robot Controller

▶ The MS Series integrates motion controller, robot controller and four servo drives in one single unit to speed up data exchange efficiency of communication, enhance system control performance and dynamically compensate non-linear terms that affect robot motion during robot moving processes. This integration into one unit satisfies high speed and high precision requirements of robot or motion control applications.

▶ The MS Series also provides a variety of useful tools to help users quickly implement their required functions on their applications and easily control different types of robots which include 4-axis SCARA robots, DELTA robots and more with high flexibility and reliability.

Handheld Type HMI
DOP-H

Control Structure

SCARA Robot

ASDA-MS

Users

Robot Software
on PC

Ethernet

DELTA Robot

PAD

Comprehensive Development Platform

▶ Provides a comprehensive development platform for customers to design their specific applications, which can support value-added secondary development and customization work.

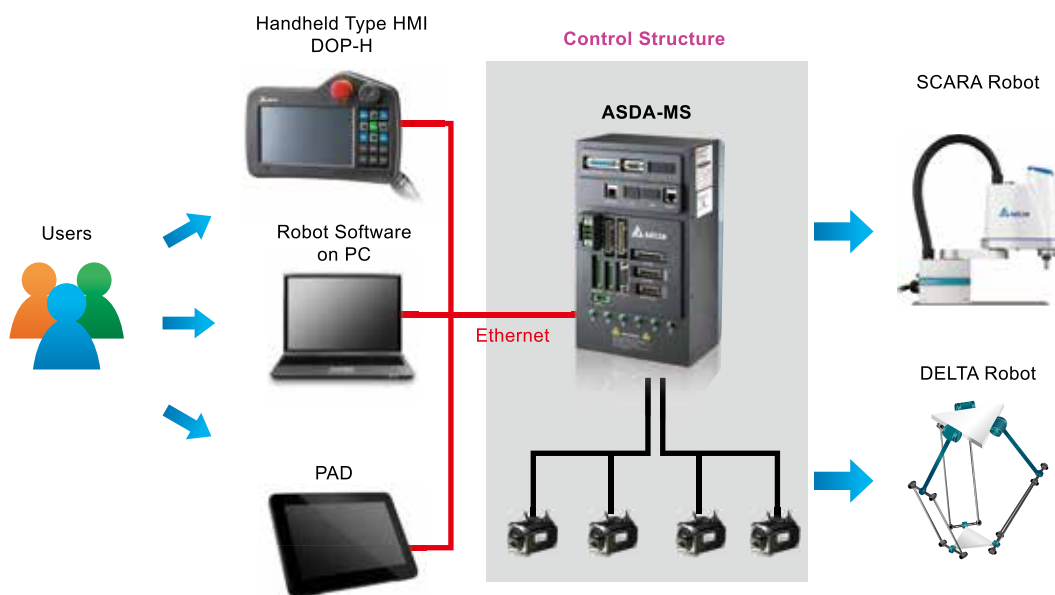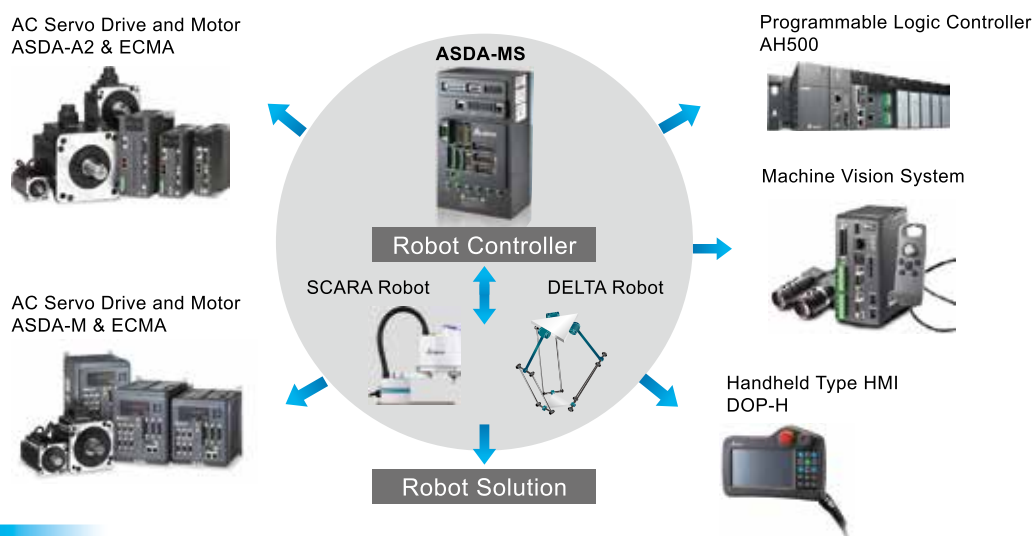▶ Satisfies the requirements for both single robots and workstation applications in conjunction with Delta's industrial automation products and related robot peripheral devices.

AC Servo Drive and Motor
ASDA-A2 & ECMA

ASDA-MS

Programmable Logic Controller
AH500

Machine Vision System

Robot Controller

SCARA Robot   DELTA Robot

AC Servo Drive and Motor
ASDA-M & ECMA

Handheld Type HMI
DOP-H

Robot Solution

Applications

Industry: Electrical/electronics, rubber and plastic, packaging, and metal fabrication
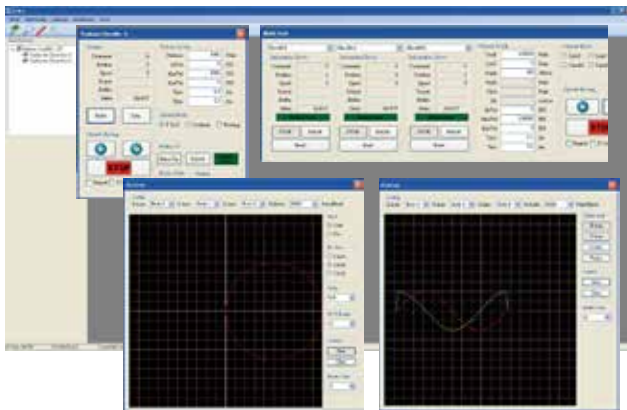
Applications: Insertion, screw locking, assembly, gluing, coating, soldering, load and unload, pick-and-place, stacking, packaging, and inspection

Programmable Automation Controller (PAC)
MH1-S30D

A Perfect Balance of EtherCAT Fieldbus and High-Performance Motion Control

▶ **Robust Hardware:** 1.2 GHz dual-code processor, built-in USB and CFast Card slots, cable-less and fan-less design for increased reliability and low power consumption

▶ **Stable Storage:** Easy installation of large-capacity SATA hard disk for easy maintenance and data management

▶ **Integrated Control:** Perfect integration of motion control and logic programming control enables better synchronization with EtherCAT communication

▶ **Multiple Communication Interfaces:** 1 COM port, 2 giga Ethernet ports and 2 DMCNET communication ports for fast and convenient data transmission

▶ **Flexible Extension Interfaces:** 2 PCI or 1 PCIe extension slots for more flexible applications

▶ **EtherCAT Master Port:** Up to 4 kHz synchronous cycle time for multi-axis control and automation

▶ **Extended Monitor Display:** 1 VGA signal port splits the display into multiple screens for real time monitoring

▶ **Complete Functionality:** A compact and modularized controller with capabilities of logic handling, motion control, communication and monitoring

▶ **Easy Setting:** Control of the slave modules and servo systems are simple with easy to understand key operation

▶ **High Security:** Customizable IC device for secured confidential programming protection

Motion

- Built-in EtherCAT and DMCNET master
- Enables up to 64 axes of control via EtherCAT or up to 12 axes of servo system units via DMCNET
- Connects max. 100 units of EtherCAT slave modules or 24 units of DMCNET slave modules
- Electronic Cam (E-Cam) function
- Linear, arc and high-speed continuous interpolation

Software

- Easy-to-operate user-defined interface
- Optional Soft HMI functions
- Optional CNC control functions
- Optional robot arm control functions
- Optional IEC61131 PLC functions

▶ **Speed Curve Tracing:** Synchronously traces the speed curves of current motion commands to achieve better synchronization effects between multiple axes in more efficient ways

▶ **Simulation Scope:** 2D dimension scope function performs timer, sequential and motion events for quick response and high-end motion graphics verification

▶ **EtherCAT Automation Software:** EcNAVI development software is for configuring an EtherCAT network that includes an EtherCAT master controller and slave devices for data communication, functional identification, programming and debugging
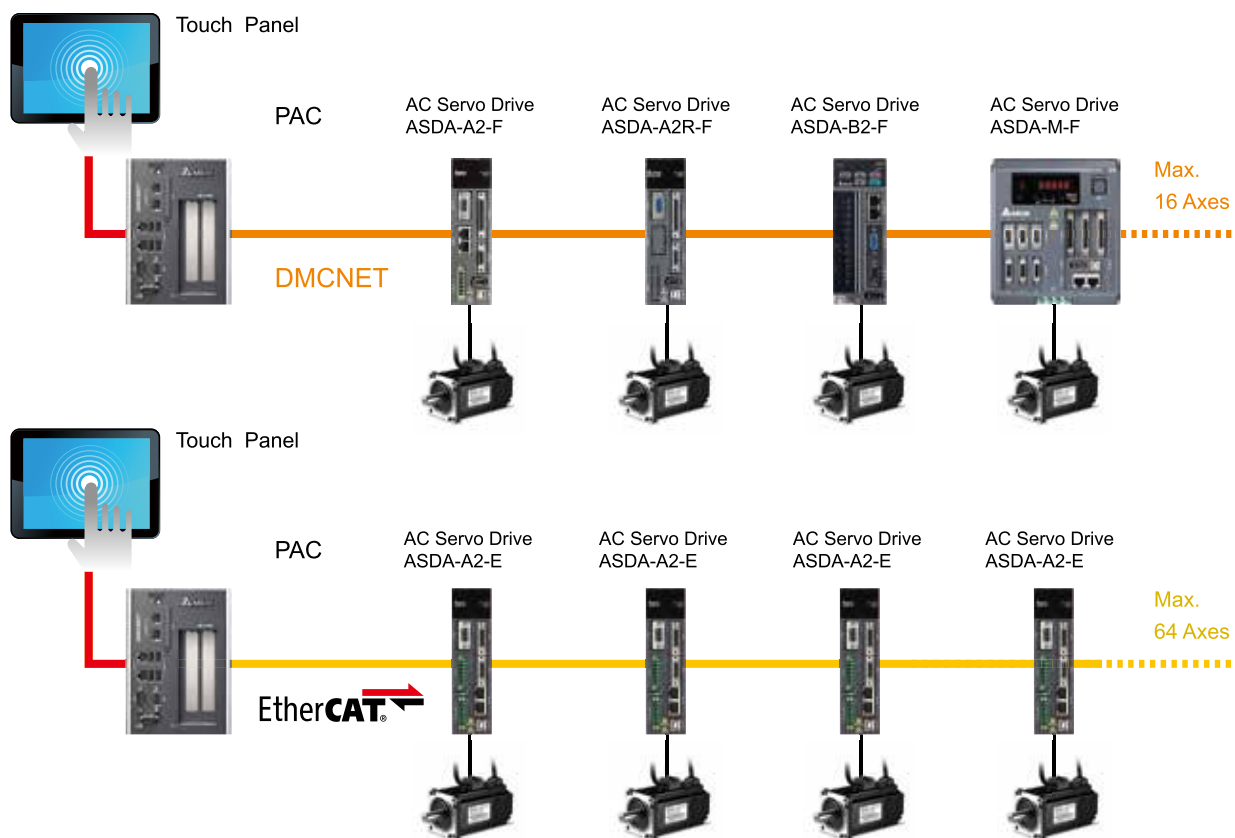
Exposure machines, laser engraving, frame cutting, robot arms, five-axis CNC machine tools, waterjet cutting

Touch Panel

PAC

AC Servo Drive
ASDA-A2-F

AC Servo Drive
ASDA-A2R-F

AC Servo Drive
ASDA-B2-F

AC Servo Drive
ASDA-M-F

Max.
16 Axes

DMCNET

Touch Panel

PAC

AC Servo Drive
ASDA-A2-E

AC Servo Drive
ASDA-A2-E

AC Servo Drive
ASDA-A2-E

AC Servo Drive
ASDA-A2-E

Max.
64 Axes

EtherCAT.

■ Centralized Slave Module

■ Bus Adapter Type Module

R1-EC5500
EtherCAT to E-BUS power module

■ Motion Type Module

R1-EC5621
Single-axis pulse output motion control module,
suitable for stepping and servo-based systems

■ Digital Input Type Module

R1-EC6002 / R1-EC6012 / R1-EC6022 / R1-EC6032

16 digital inputs, sink / source type
The available models are listed below for
different response-time requirements:
- R1-EC6002: < 0.1ms
- R1-EC6012: 1ms
- R1-EC6022: 2ms
- R1-EC6032: 3ms

■ Digital Output Type Module

R1-EC7062

16 digital outputs, sink type
Max. output current: 0.5A per each port

■ ADC Type Module

R1-EC8124
4 channels 16-bit single-ended A / D control
module Input filter limit frequency: 10 kHz
Signal voltage: ±5V, ±10V

■ DAC Type Module

R1-EC9144
4 channels 16-bit D / A control module
Voltage output: ±5V, ±10V, 0 ~ 5V, 0 ~ 10V
Current output: 0 ~ 20 mA, 4 ~ 24 mA, 0 ~ 24 mA

ΔNELTA

High Performance Mid-range PLC
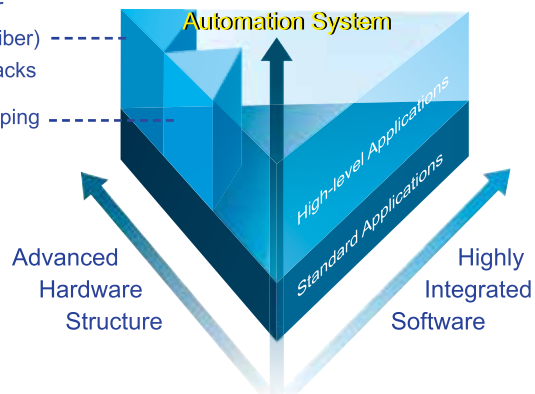## AH500 Series

The Smart Solution for High End Machinery and System Integration

Modularized Hardware Structure, Highly Integrated Software

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

I/O Hot Swapping

Automation System

High-level Applications

Standard Applications

Advanced
Hardware
Structure

Highly
Integrated
Software

< **Highly integrated software ISPSoft: Graphical Interface with 5 programming languages**

< **Enhanced flexibility: Max. 100m or 2km (optical fiber) between 2 local extension racks**

< **Improved maintainability: Hot-swapping function keeps the system running**

▶ Utilizes 32-bit dual-core multitasking processor

▶ Excellent program execution speed: 0.3ms / 1k steps

▶ Max. I/O points:
  DIO: Max. 4,352 points
  AIO: Max. 544 channels
  RIO: Max. 125,440 digital points / 3,920 analog channels

▶ Program capacity: Max. 256k steps (1MB)

▶ Data register (D+L): 128k words

▶ CPU built-in with fully isolated RS-232/422/485, Mini-USB, Ethernet, SD Card 1.0 (compatible with the memory cards on the market)

▶ Abundant selection of AIO modules, DIO modules, temperature modules, network modules, pulse-train and DMCNET motion control modules

■ System Extension Structure

Remote I/O bus

Extension bus

Fiber Module

Extension bus (Optical Fiber)

Supports
- DeviceNet
- PROFIBUS

Local Extension Bus:
- Max. Extension = 7 Racks
- Max. Distance = 100m or 2km (Optical fiber)
  (Between 2 Racks)
  = 700m or 14km (Optical fiber)
  (Total)

Local Extension Bus:
- Max. Extension = 7 Racks
- Max. Distance = 100m or 2km (Optical fiber)
  (Between 2 Racks)
  = 700m or 14km (Optical fiber)
  (Total)

Fiber Module

■ Motion Control Structure

Example: AH10PM / AH20MC

MODBUS RS-485

Ethernet

AH-CPU

Backplane Bus

AH-10PM

AH-20MC
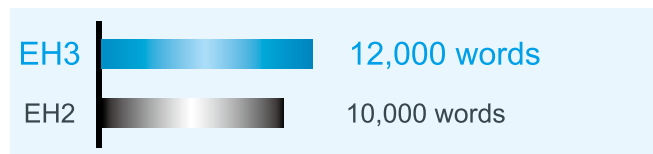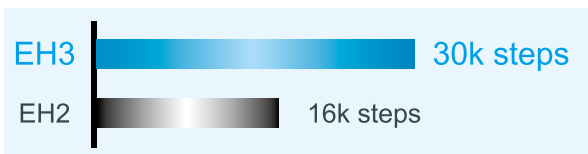
Micro SD Card

Total: 6

Total: 12
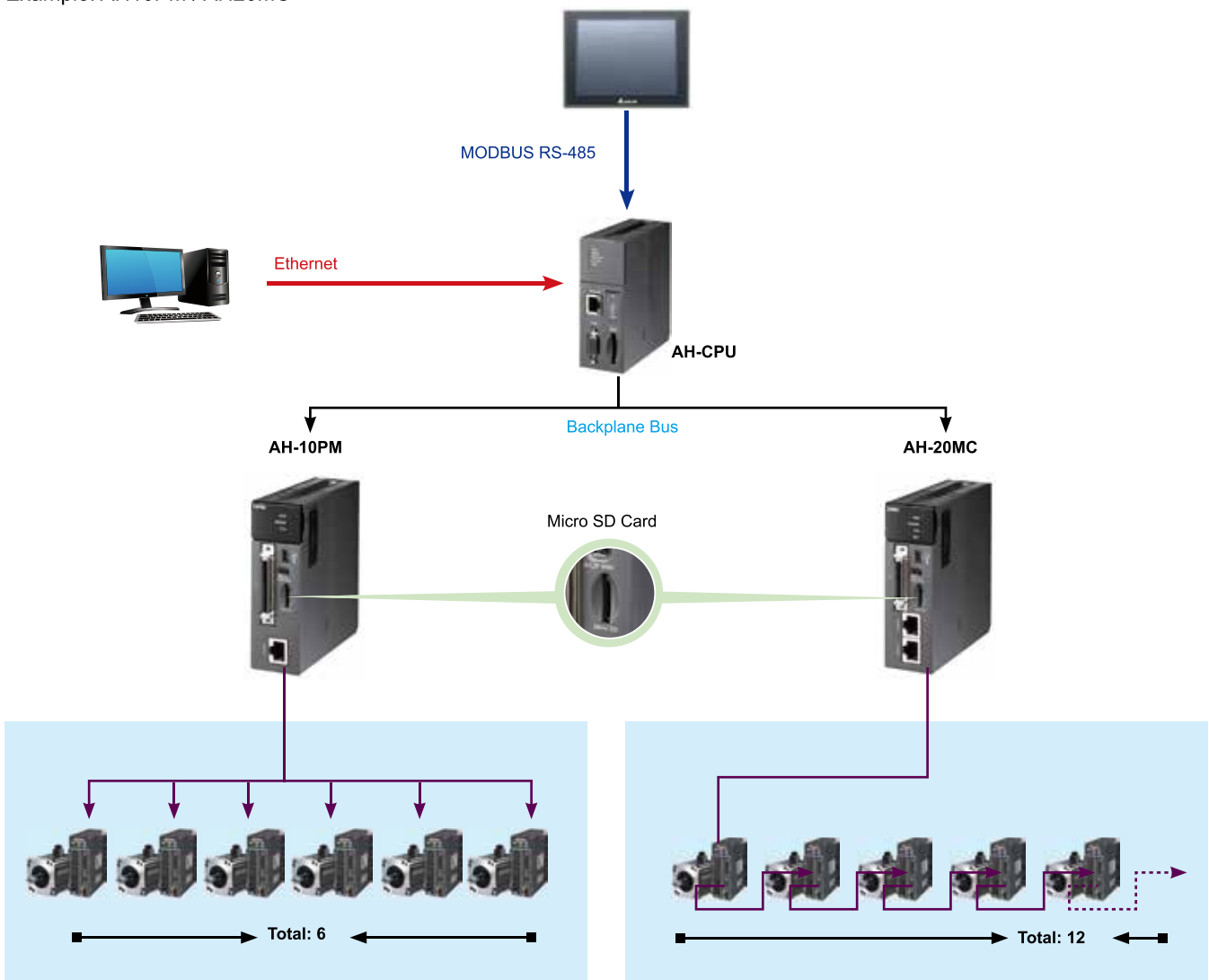
High Performance PLC
DVP-EH3
The Excellent OEM Monitoring Solution

The new generation DVP-EH3 PLC is the high-end model of the Delta DVP-E series. It provides larger program capacities and data registers for more demanding and complex applications.

EH3	30k steps	EH3	12,000 words
EH2	16k steps	EH2	10,000 words

Excellent Motion Control
▶ High-speed pulse output: max. 4 axes of 200kHz pulse output (DVP40/48/64/80EH00T3)
▶ Supports max. 4 hardware 200kHz high-speed counters
▶ Increases many motion control instructions to meet the applications that require high-speed and high-precision positioning control such as labeling machines, packaging machines and printing machines
▶ Offers linear/arc interpolation motion control
▶ Provides up to 16 external interrupt pointers

Complete Program Protection
▶ Auto backup function prevents the loss of programs and data even when the battery runs out
▶ Second copy function provides a backup for extra insurance in the event that one set of programs and data are damaged
▶ Up to 4-level password protection protects your source programs and intellectual property

Function Cards

■ For RS-232/RS-422 Communication (COM3 Port, DVP-EH3 series PLC only)

DVP-F232   DVP-F422   DVP-F485

■ For Ethernet Communication   ■ Analog Input/Output

DVP-FEN01   DVP-F2AD
                   DVP-F2DA

41

2nd Generation Standard PLC / 2nd Generation Analog I/O PLC

DVP-ES2 / EX2

Comprehensive Standard PLC

■ **Integrated communication functions. Built-in 1 RS-232 and 2 RS-485 Ports.**

■ **New DVP32ES2-C: Second Generation Standard PLC (built-in CANopen, Baud Rate: 1Mbps)**

■ **New DVP30EX2: Second Generation Temperature/Analog I/O PLC**

▶ DVP-ES2 provides
  - 16/20/24/32/40/60 I/O points for a variety of applications
  - No battery required
  - Supports real time clock for version 2.0 or above, capable to operates
    for at least one week after power off

▶ DVP20EX2 provides 12-bit 4 analog inputs/2 analog outputs.
  With the aid of 14-bit analog input/output extension module
  and built-in PID auto tuning function, it offers a complete analog control solution

▶ Program capacity: 16k steps/Data register: 10k words

▶ Execution Speed: LD: 0.35μs, MOV: 3.4μs

▶ High efficient processing abillity: 1k steps of programs can be completed within 1ms

▶ Max. 100kHz pulse control. Specific motion control instructions such as mark/masking
  and instant frequency changing are available for multi-axes applications

▶ Up to 4-level password protection protects your source programs and intellectual property

Network Type Advanced Slim PLC

DVP-SE

■ **The most complete network type slim PLC in the industry**
■ **Provides 8 digital inputs and 4 digital outputs**
■ **Built-in mini USB, Ethernet, and 2 RS-485 ports**

▶ Program capacity: 16k steps/Data register: 12k words

▶ Execution Speed: LD: 0.64μs, MOV: 2μs

▶ Built-in Ethernet and supports MODBUS TCP and Ethernet/IP Slave (Adapter)

▶ IP Filter function is a firewall that offers the first line of defense and provides protection from
  malware and network threats

▶ No battery required. Maintenance-free (Real time clock operates for 15 days after power off)

High Performance Slim PLC
DVP-SV2
Best Choice for Slim Type PLC

The new generation DVP-SV2 PLC is the high-end model of the Delta DVP-S series. It provides larger program capacities and data registers for more demanding and complex applications

| SV2 | 30k steps |
| SV | 16k steps |

| SV2 | 12,000 words |
| SV | 10,000 words |
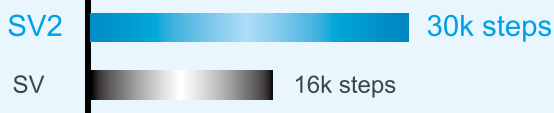
Excellent Motion Control

▶ High-speed pulse output: 4 axes of 200kHz pulse output

▶ Supports max. 2 hardware 200kHz and 2 hardware 20kHz high speed counters

▶ Increases many motion control instructions to meet the applications that require high-speed and high-precision positioning control such as labeling machines, packaging machines and printing machines

▶ Offers linear/arc interpolation motion control

▶ Provides up to 16 external interrupt pointers

Complete Program Protection

▶ Auto backup function to prevent the loss of programs and data even when the battery runs out

▶ Second copy function provides a backup for extra insurance in the event that one set of programs and data are damaged

▶ Up to 4-level password protection protects your source programs and intellectual property

Supports DVP-S series left-side and right-side modules. Increases Ethernet communication commands

> **New** 24SV2 PLC has built in 2AI (12bit) with Y10 / Y12 of 10KHz output.

Left- Side High-Speed Modules

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 / Tension Control

■ **Load Cell Module**
DVP01LC-SL
DVP02LC-SL
DVP201LC-SL
DVP211LC-SL[*1] **New**
DVP202LC-SL[*1] **New**

*1.Please contact your sales representative for the official launch date.

2nd Generation Standard Slim PLC
DVP-SS2

Economic and Compact PLC. Max. 480 I/O points
▶ Program capacity: 8k steps/Data register: 5k words

▶ Execution speed LD: 0.35μs, MOV: 3.4μs

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

▶ Supports standard MODBUS ASCII/RTU protocol and PLC Link function

Motion Control Functions
▶ 4 points of 10kHz pulse output

▶ 8 points of high-speed counters: 20kHz/4 points, 10kHz/4 points

2nd Generation Advanced Slim PLC
DVP-SA2

Compact and Motion Control PLC
▶ 4 points of high-speed pulse output: 100kHz/2 points, 10kHz/2 points

▶ 8 points of high-speed pulse input: 100kHz/2 points, 10kHz/6 points, 1 set of A/B phase 50kHz

▶ Supports 2-axis linear and arc interpolation

▶ Program capacity: 16k steps/Data register: 10k words

▶ Execution speed LD: 0.35μs, MOV: 3.4μs

▶ 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. Maintenance-free. (Real time clock operates for 15 days after power off)

▶ Supports DVP-S series left-side and right-side modules

2nd Generation Analog I/O Slim PLC
DVP-SX2

Built-in 4 analog inputs / 2 analog outputs. Highly efficient PID Control Function with New PID Auto Tuning Instructions
▶ Program capacity: 16k steps/Data register: 10k words

▶ Execution speed LD: 0.35μs, MOV: 3.4μs

▶ Supports standard MODBUS ASCII/RTU protocol and PLC Link function.

▶ Supports real time clock for version 2.0 or above. It operates for at least one week after power off

▶ Supports DVP-S series left-side and right-side modules

▶ No battery required

Motion Control Functions
▶ 4 points of high-speed pulse output: 100kHz/2 points, 10kHz/2 points

▶ 8 points of high-speed pulse input: 100kHz/2 points, 10kHz/6 points

▶ Supports 2-axis linear and arc interpolation

DELTA

CANopen Motion Controller
DVP-MC

High Speed, High Precision Motion Control Brings Out the Maximum in Performance

- **Up to 16 axes can be controlled through CANopen communication**
- **Supports electronic cam (2048 points) function for flying shear and rotary cut applications**
- **Supports DVP-S series left-side and right-side modules**

▶ Built-in 12 I/O points. Max. 480 I/O points

▶ Program capacity: Ladder 16k steps / Motion 1Mbyte

▶ Built-in Ethernet, RS-232 and RS-485 ports

▶ Supports standard MODBUS ASCII/RTU protocol

▶ Flexible industrial networking applications (Supports 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
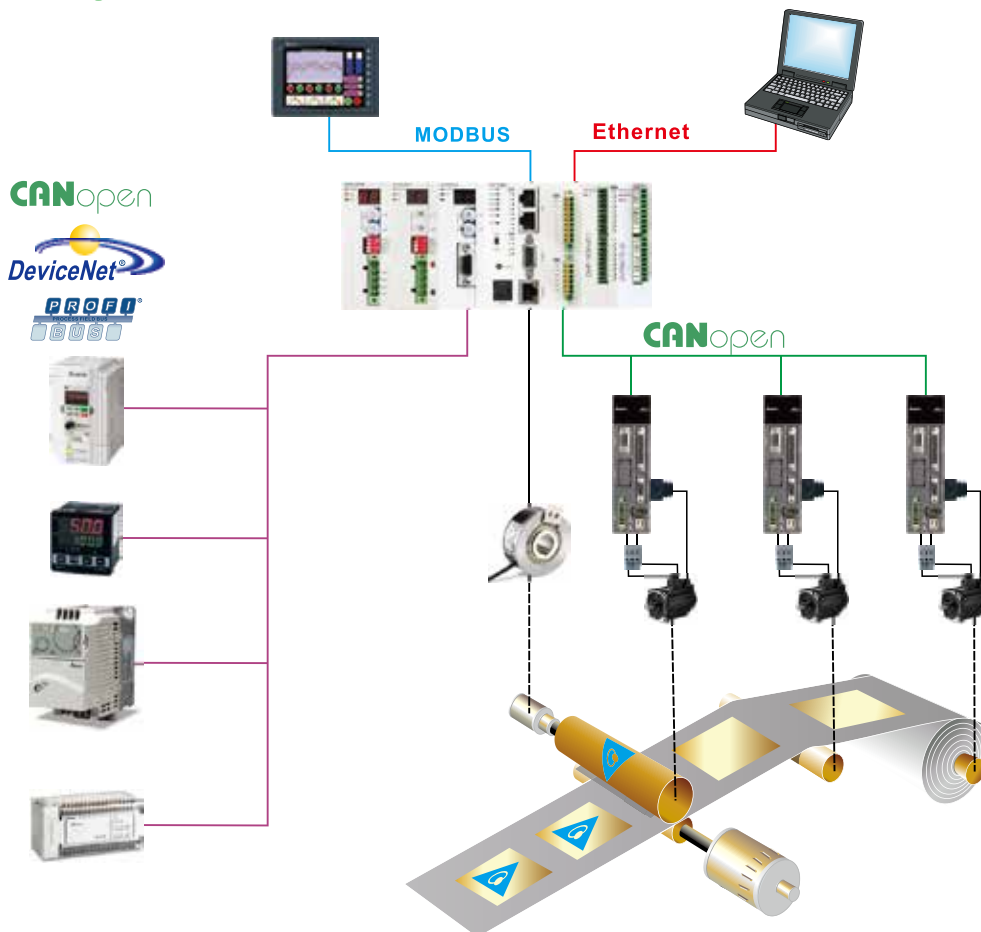
Pulse-train Motion Controller
DVP-PM

General Purpose Motion Controller
DVP10PM00M

- **2/3/4/5/6 axes linear interpolation motion control**
- **Highly accurate PWM 200kHz output, resolution 0.3%**
- **8 groups of high-speed captures (mark correction, frequency measurement), comparative output, Mark/Mask function (for bag making)**

▶ Built-in 24 I/O points. Max. 256 I/O points

▶ Program capacity: 64k steps. Data register: 10k words

▶ Execution speed LD: 0.1375μs, MOV: 2.1μs

▶ Built-in RS-232 and RS-485 ports

▶ Supports standard MODBUS ASCII/RTU protocol

■ Motion Control Functions

▶ High-speed pulse output: built-in 6 sets of A/B phase pulse outputs

▶ 2 sets of 200 kHz output, 4 sets of 1 MHz output

▶ 6 sets of high-speed counters and hardware digital filter for counting

▶ Single-axis motion control function (Supports 1st speed, 2nd speed, MPG function)

▶ Electronic gear function

Professional Motion Controllers
DVP20PM00D/M/DT

- **Compatible with G-Code/M-Code. 3-axis linear/arc/helical interpolation.**
- **Supports electronic cam (2048 points) function for flying shear and rotary cut applications.**
- **Not only a motion controller but also an extension module.**

▶ Built-in 16 I/O points. Max. 512 I/O points

▶ Program capacity: 64k steps/Data register: 10k words

▶ Built-in RS-232 and RS-485 ports

▶ Supports standard MODBUS ASCII/RTU protocol

■ Motion Control Functions

▶ Built-in A/B phase differential signal outputs: 2 groups (DVP20PM00D) / 3 sets (DVP20PM00M). Max. differential output frequecny is 500kHz

▶ Supports MPG inputs

▶ Single-axis motion control function (Supports 1st speed, 2nd speed, MPG function)

▶ Electronic gear function

▶ Applications

3-axis servo positioning control, engraving machines, high-speed winding machines, IC soldering equipment of semiconductor industries

NELTA

7-Inch Touch Panel HMI with Built-in PLC New
TP70P-RM0

▶ Adopts core of SS2 series PLC with program of 2K steps and D devices of 5K words
▶ 7" TFT-LCD
▶ Touch screen
▶ Built-in USB port for program upload / download
▶ Built-in 2 sets of communication ports
▶ Supports MODBUS ASCII / RTU modes
▶ Built-in real time clock (RTC)

Dimensions	7" (154 x 85mm)
Resolution	800 x 480
Display Color	65535 colors
Flash Memory	64M bytes
SRAM	64k bytes
Function Keys	Not available
Password	Available
Recipe Function	Not available
Real-time Clock	Available
Serial COM Port	2 Sets of Communication ports
Editing Software	TPEditor

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

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

Dimensions	4.1" (101.8 x 35.24mm)
Resolution	192 x 64
Display Color	Monochrome
Flash Memory	256k bytes
SRAM	16k/10k bytes
Function Keys	10 function keys
Password	Available
Recipe Function	Not available
Real-time Clock	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
▶ Supports MODBUS ASCII/RTU modes
▶ Password protection function available
▶ User-defined boot screen available
▶ Built-in real time clock (RTC)

Dimensions	4.1" (101.8 x 35.24mm)
Resolution	192 x 64
Display Color	Monochrome
Flash Memory	256k bytes
SRAM	10k bytes
Function Keys	17 function keys
Password	Available
Recipe Function	Not available
Real-time Clock	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 1024KB flash memory
▶ 24 user-defined function keys
▶ Built-in RS-232 and RS-422/RS-485 COM ports
▶ Supports recipes and macro functions

Dimensions	3.8" (83mm x 41 mm)
Resolution	240 x 128
Display Color	Monochrome
Flash Memory	1M bytes
SRAM	64k bytes
Function Keys	24 function keys
Password	Available
Recipe Function	Available
Real-time Clock	Available
Serial COM Port	RS-232 & RS-422/485
Editing Software	TPEditor

7-Inch Touch Panel HMI with Built-in PLC `New`

TP70P

▶ Adopts core of SS2 series PLC with program of 4K steps and D devices of 5K words

▶ Provides 2 sets of 10kHz high speed pulse input

▶ 7" TFT-LCD

▶ Touch screen

▶ Built-in USB port for program upload / download

▶ Built-in 2 sets of communication ports

▶ Supports MODBUS ASCII / RTU modes

▶ Built-in real time clock (RTC)

▶ Digital and Analog I/O points available

Dimensions	7" (154 x 85mm)
Resolution	800 x 480
Display Color	65535 colors
Flash Memory	64M bytes
SRAM	64k bytes
Function Keys	Not available
Password	Available
Recipe Function	Not available
Real-time Clock	Available
Serial COM Port	2 sets of RS-485
Editing Software	TPEditor

4-Line Text Panel HMI with Built-in PLC

TP04P

▶ Adopts core of SS2 series PLC with program of 8K steps and D devices of 5K words

▶ Provides 2 sets of 10kHz high speed pulse input

▶ 4.1" STN-LCD

▶ Provides 0 ~ 9 numeric keys with user defined function

▶ Built-in USB port for program upload/download

▶ Built-in 2 sets of RS-485 communication port

▶ Supports MODBUS ASCII/RTU modes

▶ User-defined boot screen available

▶ Built-in real time clock (RTC)

▶ Digital and Analog I/O points available

Dimensions	4.1" (101.8 × 35.24mm)
Resolution	192 x 64
Display Color	Monochrome
Flash Memory	1M bytes
SRAM	64k bytes
Function Keys	17 function keys
Password	Available
Recipe Function	Not available
Real-time Clock	Available
Serial COM Port	2 sets for RS-485
Editing Software	TPEditor

High Color, High Resolution Human Machine Interfaces

4.3-inch Widescreen HMI
DOP-B03S(E)211

▶ 4.3" 16: 9 widescreen, 65536 colors TFT

▶ Display Resolution: 480 x 272 pixels

▶ Supports Ethernet

▶ USB Client for high-speed data transfer

▶ USB Host for direct connection to USB disk, printer, mouse and keypad

5.6-inch HMI
DOP-B05S111

▶ 5.6" 65536 colors TFT

▶ Display Resolution: 320 x 234 pixels

▶ USB Client for high-speed data transfer

▶ USB Host for direct connection to USB disk, printer, mouse and keypad

7-inch Widescreen HMI
DOP-B07S411 / DOP-B07S(E)415

▶ 7" 16: 9 widescreen, 65536 colors TFT

▶ Display Resolution: 800 x 480 pixels

▶ Supports Ethernet

▶ Supports SDHC card

▶ USB Client for high-speed data transfer

▶ USB Host for direct connection to USB disk, printer, mouse and keypad

▶ Supports audio output: MP3, Wav files

7-inch Widescreen HMI with Delta Professional Functions
DOP-B07PS415

▶ 7" 16: 9 widescreen, 65536 colors TFT

▶ Display Resolution: 800 x 480 pixels

▶ Supports SDHC card

▶ USB Client for high-speed data transfer

▶ USB Host for direct connection to USB disk, printer, mouse and keypad

▶ Supports audio output: MP3, Wav files

▶ Supports Electronic Cam (E-Cam) function (ASDA-A2)

▶ **Supports G-Code download function (DVP-10MC / DVP-20PM / AH20MC)**

7-inch HMI with Delta Professional Functions
DOP-B07PS515

▶ 7" 65536 colors TFT

▶ Display Resolution: 800 x 600 pixels

▶ Supports SDHC card

▶ USB Client for high-speed data transfer

▶ USB Host for direct connection to USB disk, printer, mouse and keypad

▶ Supports audio output: MP3, Wav files

▶ Supports Electronic Cam (E-Cam) function (ASDA-A2)

▶ **Supports G-Code download function (DVP-10MC / DVP-20PM / AH20MC)**

▶ The world's first design: the effective display area is the same as 7-inch models, but the panel cutout's dimensions are just the same as 5.6-inch models.

7-inch HMI
DOP-B07S(E)515

▶ 7" 65536 colors TFT

▶ Display Resolution: 800 x 600 pixels

▶ USB Client for high-speed data transfer

▶ USB Host for direct connection to USB disk, printer, mouse and keypad

▶ Supports audio output: MP3, Wav files

▶ The world's first design: the effective display area is the same as 7-inch models, but the panel cutout's dimensions are just the same as 5.6-inch models.

▶ Supports Ethernet

▶ Supports SDHC card

8-inch HMI
DOP-B08S(E)515

▶ 8" 65536 colors TFT

▶ Display Resolution: 800 x 600 pixels

▶ USB Client for high-speed data transfer

▶ USB Host for direct connection to USB disk, printer, mouse and keypad

▶ Supports audio output: MP3, Wav files

▶ Supports Ethernet

▶ Supports SDHC card

10.1-inch Widescreen HMI
DOP-B10S411 / DOP-B10S(E)615

▶ 10.1" 16: 9 widescreen, 65536 colors TFT

▶ Display Resolution: 800 x 480 pixels/1024 x 600 pixels

▶ USB Client for high-speed data transfer

▶ USB Host for direct connection to USB disk, printer, mouse and keypad

▶ Supports audio output: MP3, Wav files

▶ Supports Ethernet

▶ Supports SDHC card

10.4-inch HMI
DOP-B10S511 / DOP-B10E515

- ► 10.4" 65536 colors TFT
- ► Display Resolution: 800 x 600 pixels
- ► Supports audio output: MP3, Wav files
- ► Host for direct connection to USB disk, printer, mouse and keypad

- ► Supports Ethernet
- ► Supports SDHC card

10.4-inch Large-Size HMI `New`
DOP-W105B

- ► 10.4" 65536 colors TFT LCD
- ► Display Resolution: 800 x 600 pixels
- ► 1GHz high speed processor
- ► Supports audio output (MP3, Wav files)
- ► USB Host for direct connection to USB disk, printer, mouse and keypad

- ► Supports 2 Ethernet ports
- ► Supports SDHC card
- ► Supports video format: MPEG1, MPEG2, WMV

12-inch Large-Size HMI `New`
DOP-W127B

- ► 12" 65536 colors TFT LCD
- ► Display Resolution: 1024 x 768 pixels
- ► 1GHz high speed processor
- ► Aluminum enclosure with dark gray mold texturing
- ► 2 sets of COM ports, support RS232 / RS422 / RS485
- ► USB Host for direct connection to USB disk, printer, mouse and keypad

- ► Supports 2 Ethernet ports
- ► Supports SDHC card
- ► Supports video format: MPEG1, MPEG2, WMV
- ► Supports audio output: MP3, Wav files (built-in front speaker)

15-inch Large-Size HMI `New`
DOP-W157B

- ► 15" 65536 colors TFT LCD
- ► Display Resolution: 1024 x 768 pixels
- ► 1GHz high speed processor
- ► Aluminum enclosure with dark gray mold texturing
- ► 2 sets of COM ports, support RS232 / RS422 / RS485
- ► USB Host for direct connection to USB disk, printer, mouse and keypad

- ► Supports 2 Ethernet ports
- ► Supports SDHC card
- ► Supports video format: MPEG1, MPEG2, WMV
- ► Supports audio output: MP3, Wav files (built-in front speaker)

Optimum Combination of Display and Controller
Controllers with Human Machine Interfaces

7-inch Controller with HMI, Handheld Type
HMC07-N510(1)52

- ▶ 7" 65536 colors TFT
- ▶ Display Resolution: 800 x 600 pixels
- ▶ **Built-in PLC functions**
- ▶ RS-422 high-speed remote I/O connection
- ▶ Supports Ethernet
- ▶ Supports SDHC card
- ▶ Supports DMCNET
- ▶ Supports audio output: MP3, Wav files
- ▶ USB Host for direct connection to USB disk, printer, mouse and keypad

8-inch Controller with HMI
HMC08-N500S52

- ▶ 8" 65536 colors TFT
- ▶ Display Resolution: 800 x 600 pixels
- ▶ **Built-in PLC functions**
- ▶ RS-422 high-speed remote I/O connection
- ▶ Supports MPG (Manual Pulse Generator) Input
- ▶ Supports Ethernet
- ▶ Supports SDHC card
- ▶ Supports DMCNET
- ▶ Supports audio output: MP3, Wav files
- ▶ USB Host for direct connection to USB disk, printer, mouse and keypad

High Quality Full-Color Display

Energy Saving Environmental Automation

A Wide Range of Options

Powerful Controller Drivers Support

Best Performance

Human Machine Interface

Beautiful Display

Beneficial Features

ΛELTA

Industrial Ethernet Switches

Managed Switches

DVS-110 Series

► 7-Port FE + 3-Port GbE Combo SFP, designed for backbone network

► Complete L2 network management functions: VLAN, QoS, LACP, IGMP & SNMP v1/v2c/v3

► IPv6 address suitable for larger network and neighbor discovery

► Supports MODBUS TCP protocol that facilitates the remote management by SCADA and other industrial devices

► STP/RSTP/MSTP for network redundancy further ensures reliability

► Enhanced network security with IEEE 802.1X, TACACS+, SSH, HTTPS and SNMP v3

► DDM diagnosis function by SFP fiber module

► Auto warning by email, DI, relay, syslog & SNMP trap

► Compatible with various industrial protocols, including EtherNet/IP, Profinet, EtherCAT, CC-LINK IE and DNP 3.0

► IP40 metal case. -40ºC ~ 75ºC operating temperature

► Certification: UL 508, IEC 61131-2, CE, FCC 7 RCM

DVS-109 Series [New]

► 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 suitable for larger network and neighbor discovery

► Supports MODBUS TCP protocol that facilitates the remote management by SCADA and other industrial devices

► Proprietary ONE RING and ONE CHAIN high end redundancy technology, easy to build multiple ring topology, self-healing recovery time < 20ms

► Enhanced network security with IEEE 802.1X, TACACS+, SSH, HTTPS and SNMP v3

► Loopback-Detection to avoid broadcast loops, and shutdown the corresponding ports automatically

► Cable diagnostic provides the mechanism to detect and report potential cabling issues

► Auto warning by email, DI, relay, syslog & SNMP trap

► Compatible with various industrial protocols, including EtherNet/IP, Profinet, EtherCAT, CC-LINK IE and DNP 3.0

► IP40 metal case. -40ºC ~ 75ºC operating temperature

► Certification: UL 508, IEC 61131-2, CE, FCC & RCM

DVS-108 Series `New`

▶ 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 suitable for larger network and neighbor discovery

▶ Supports MODBUS TCP protocol that facilitates remote management by SCADA and other industrial devices

▶ Proprietary ONE RING and ONE CHAIN high end redundancy technology, easy to build multiple ring topology, self-healing recovery time < 20ms

▶ Enhanced network security with IEEE 802.1X, TACACS+, SSH, HTTPS and SNMP v3

▶ Loopback-Detection to avoid broadcast loops, and shutdown the corresponding ports automatically

▶ DDM diagnosis function by SFP fiber module

▶ Cable diagnostic provides the mechanism to detect and report potential cabling issues

▶ Auto warning by email, DI, relay, syslog & SNMP trap

▶ Compatible with various industrial protocols, including EtherNet/IP, Profinet, EtherCAT, CC-LINK IE and DNP 3.0

▶ IP40 metal case. -40ºC ~ 75ºC operating temperature

▶ Certification: UL 508, IEC 61131-2, CE, FCC & RCM

PoE Unmanaged Switches `New`
DVS-G408W01 Series

▶ 8-Port GbE, fully Gigabit

▶ 8 10/100/1000Base-T PoE (PSE) ports. Based on IEEE 802.3at standard up to 30Watts per port. Backward compatible with IEEE 802.3af

▶ Jumbo frame size up to 9,216 Bytes

▶ 48 to 57VDC redundant terminal block power input

▶ Auto warning by relay output for power failure

▶ Compatible with various industrial protocols, including EtherNet/IP, Profinet, EtherCAT, CC-LINK IE and DNP 3.0

▶ IP30 metal case. -40ºC ~ 70ºC operating temperature

▶ Certification: CE, FCC & RCM

DVS-G406W01-2GF Series

▶ 4-Port GbE + 2-Port 100/1000Base-SFP, fully Gigabit

▶ 4 10/100/1000Base-T PoE (PSE) ports. Based on IEEE 802.3at standard up to 30Watts per port. Backward compatible with IEEE 802.3af

▶ Jumbo frame size up to 9,216 Bytes

▶ 48 to 57VDC redundant terminal block power input

▶ Auto warning by relay output for power failure

▶ Compatible with various industrial protocols, including EtherNet/IP, Profinet, EtherCAT, CC-LINK IE and DNP 3.0

▶ IP30 metal case. -40ºC ~ 70ºC operating temperature

▶ Certification: CE, FCC & RCM

Unmanaged Switches
DVS-G008I / G005I00A Series

- ▶ 5/8-Port GbE Ethernet Switches
- ▶ Supports IEEE 802.1p based QoS for packet forwarding precedence
- ▶ Built-in Broadcast Storm Protection
- ▶ Transparent transmission of VLAN tagged packets
- ▶ Jumbo frame size up to 9,216 Bytes
- ▶ EEE Green Ethernet for power savings
- ▶ Compatible with various industrial protocols, including EtherNet/IP, Profinet, EtherCAT, CC-LINK IE and DNP 3.0
- ▶ IP40 metal case. -40ºC ~ 75ºC operating temperature
- ▶ Certification: UL 508, IEC 61131-2, CE, FCC & RCM

DVS-005 / 008 / 016 Series

- ▶ 5/8/16-Port FE Ethernet switches. Long distance transmission enabled by fiber optics
- ▶ Supports IEEE 802.1p based QoS for packet forwarding precedence
- ▶ Built-in Broadcast Storm Protection
- ▶ Transparent transmission of VLAN tagged packets
- ▶ Auto warning by relay output for link-down and power failure
- ▶ Compatible with various industrial protocols, including EtherNet/IP, Profinet, EtherCAT, CC-LINK IE and DNP 3.0
- ▶ 12 to 48VDC redundant terminal block power input
- ▶ IP40 metal case. -40ºC ~ 75ºC operating temperature
- ▶ Certification: UL 508, IEC 61131-2, CE, FCC & RCM

SFP Fiber Transceiver
LCP-GbE Series

- ▶ 1-Port GbE, compliant with IEEE 802.3z
- ▶ Full duplex operation
- ▶ DDM diagnosis function enhances t ransmission quality
- ▶ Duplex LC connector interface. Hot-Pluggable for maximum flexibility
- ▶ Metal case. -40ºC ~ 85ºC wide operating temperature

LCP-1FE Series

- ▶ 1-Port Fast Ethernet. Compliant with IEEE 802.3u
- ▶ Full duplex operation
- ▶ DDM diagnosis function enhances transmission quality
- ▶ Duplex LC connector interface
- ▶ Metal case. -40ºC ~ 85ºC wide operating temperature

IEEE 802.11 WLAN
DVW-W02W2-E2 Series

- ▶ 2-Port GbE +2-Port RS-232/422/485
- ▶ Compliant with IEEE 802.11n wireless technology capable of up to 450Mbps data rate
- ▶ 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 precedence transmission
- ▶ Enhanced wireless security: 64/128-bit WEP, WPA/WPA2, WPA-PSK/WPA2-PSK (TKIP/AES) and 802.1X Authentication
- ▶ Supports MODBUS TCP protocol for facilitating the remote management by SCADA or with other industrial devices
- ▶ Auto warning by email, DI, relay, Syslog & SNMP trap
- ▶ IP40 metal case. -40ºC ~ 75ºC wide operating temperature
- ▶ Certification: UL 508, IEC 61131-2, CE, FCC, RCM, BSMI, SRRC & NCC

High Speed and Stable Industrial Network Solutions

BACnet MS/TP Slave Module
DVPSCM52-SL

▶ Supports 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 if connected with a PLC with I/O point extension

▶ Isolated power and communication provide strong noise immunity. Built-in 120 ohm terminal resistor switch. Feed-through terminals, with spring plugs

▶ Transmits data via software setting, no more complex programming is required

RS422/485 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. Feed-through terminals, with spring plugs

▶ Transmits data via software setting, no more complex programming is required

▶ Use as PLC communication ports for uploading/ downloading programs and monitoring purpose

DELTA

Ethernet Master Module
DVPEN01-SL

▶ Supports MODBUS TCP protocol
▶ MODBUS TCP connections
  Client: 32
  Server: 16
▶ Smart data exchange
▶ RTU mapping
▶ Simple firewall
▶ Email alarm

100Mbps

CANopen Master Module
DVPCOPM-SL

▶ Supports CANopen protocol
▶ Connectable to 110 slaves
▶ Various PDO and high speed SDO functions available
▶ Supports NMT slave, Heartbeat, Emergency and more protocols

1Mbps

PROFIBUS DP Slave Module
DVPPF02-SL

▶ Supports PROFIBUS DP protocol
▶ Supports GSD files for identification and cyclic data transmission
▶ Data transmission: Supports up to 100 words of I/O input and 100 words of I/O output

12Mbps

DeviceNet Master Module
DVPDNET-SL

▶ Supports DeviceNet protocol
▶ Connectable to 63 slaves
▶ Supports EDS files for identification transmission
▶ Max. network length: 500m
▶ RTU mapping

500Kbps

DVP Series Right-Side Slave Modules

DVPCP02-H2	DVPPF01-S	DVPPF02-H2	DVPDT01-S	DVPDT02-H2
Description				
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

Ethernet Remote I/O Communication Module
RTU-EN01

► Supports MODBUS TCP slave

► Connectable to 8 DVP-S series analog I/O modules

► Connectable to 256 points of digital I/O modules

► The RS-485 port is connectable to max. 32 MODBUS slaves

► Smart PLC if-then function

► Smart Monitor

► Supports webpage setup and on-line monitoring

► Serial Virtual COM available

PROFIBUS DP Remote I/O Communication Module
RTU-PD01

► Supports PROFIBUS DP slave

► Auto-detects baudrate, max. baudrate: 12Mbps

► Supports GSD files for identification and cyclic data transmission

► Connectable to 8 DVP-S series analog I/O modules

► Connectable to 256 points of digital I/O modules

► The RS-485 port is connectable to max. 16 MODBUS slaves

DeviceNet Remote I/O Communication Module
RTU-DNET

► Supports DeviceNet protocol

► Supports EDS files for identification and cyclic data transmission

► Connectable to 8 DVP-S series analog I/O modules

► Connectable to 256 points of digital I/O modules

► The RS-485 port is connectable to max. 8 MODBUS slaves

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

► Supports MODBUS protocol

► Connectable to 8 DVP-S series analog I/O modules

► Connectable to 256 points of digital I/O modules

► Max. baud rate: 115.2Kbps

DELTA

USB Converters

	IFD6500 **USB » RS-485**	▶ Lightweight design for easy portability ▶ Auto-detects the direction of data flow ▶ 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 ▶ Sends CAN messages, 1 message by manual mode, 8 messages by auto mode ▶ Max. 1Mbps ▶ A portable USB device
	IFD6530 **USB » RS-485**	▶ Lightweight design for easy portability ▶ Auto-detects the direction of data flow ▶ A portable USB device ▶ Supports KPC-CC01keypad in conducting parameters and page editing ▶ Supports Win XP, Win7 32 / 64 bit

MODBUS Serial Converters

	IFD8500 **RS-232 « » RS485**	▶ RS-232 to RS-422/485 isolated converter
	IFD8510 **RS-422/485**	▶ RS-422/485 fully isolated signal repeater ▶ Extends RS-422/485 transmission to 1.2km and connectable to 32 RS-485 devices ▶ Connectable to 32 RS-485 devices ▶ Auto-controls the direction of data flow
	IFD8520 **RS-232 « » RS485**	▶ RS-232 to RS-422/485 addressable isolated converter ▶ Connects RS-232 to RS-422/485 by setting up MODBUS address ▶ Allows different speed and data format transmission between RS-232, RS-485 / 422 ▶ Auto-controls the direction of data flow

Industrial Network Converters

	IFD9502 **DeviceNet »** **MODBUS**	▶ Complies with DeviceNet protocol ▶ Connectable to all Delta industrial automation products ▶ Isolation in RS-485 channel (incl. power supply) ▶ Passed full compatibility test
	IFD9503 **CANopen »** **MODBUS**	▶ Complies with CANopen protocol ▶ Connectable to all Delta industrial automation products ▶ Isolation in RS-485 channel (incl. power supply) ▶ Passed full compatibility test
	IFD9506 **MODBUS TCP** **« » MODBUS**	▶ Isolation in RS-485 channel (incl. power supply) ▶ Supports MODBUS TCP protocol ▶ Smart Monitor ▶ Supports webpage setup and on-line monitoring ▶ Serial Virtual COM available ▶ Email alarm
	IFD9507 **EtherNet/IP « »** **MODBUS**	▶ Isolation in RS-485 channel (incl. power supply) ▶ Supports EtherNet/IP and MODBUS TCP protocols ▶ Smart Monitor ▶ Supports webpage setup and on-line monitoring ▶ Serial Virtual COM available ▶ Email alarm

Industrial Automation Solutions

Factory Automation

INFO

DVW Switch
DVS Switch

Ethernet

DOP-B10

AH500

AH500

CONTROL

Delta PLC Link

DeviceNet

TP08-BT2 · DVP-EH3 · DOP-B04 · DVP-10MC · AH500 · DVP-ES2 · AH500 · AH500

MODBUS · CANopen · DMCNET

FIELD

C2000 · DT · DT · ASDA-A2 · DPA · ASDA-A2 · DPA · DMV DVP-SX2 · CP2000 · CP2000 · CP2000 · DT

Food Processing · Food Packaging · Inspection · H V A C
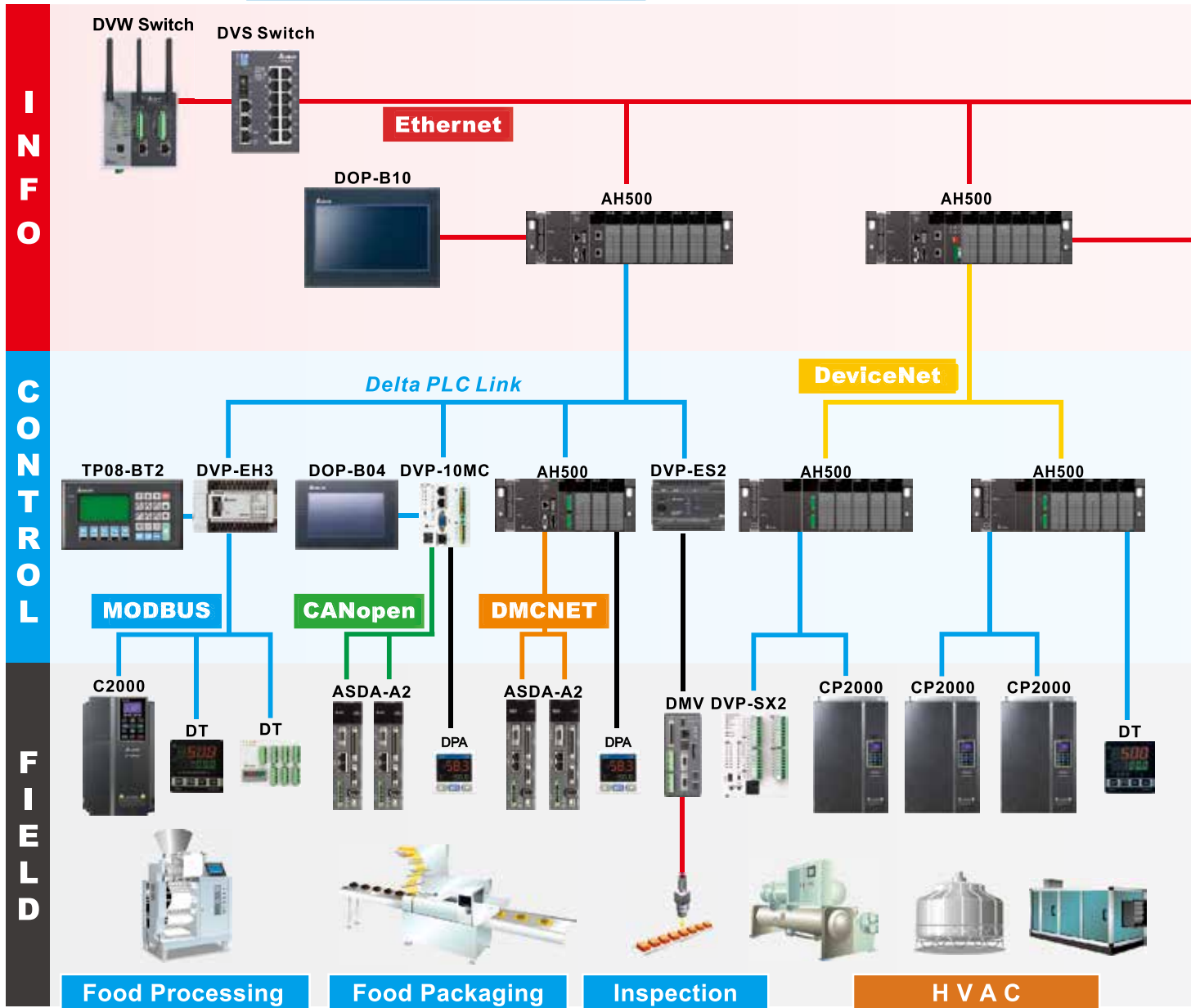
Ethernet

Delta Ethernet products transcend the limits of transmission distance, offering 10/100Mbps high-speed transmission and efficient remote monitoring.

CANopen

Delta CANopen products support CANopen DS301 and DSP402 protocols, and are able to achieve multi-axis, high-speed and complex motion control with max. speed of 1Mbps.

DMCNET

Delta DMCNET offers 10Mbps communication speed, constructing a real time control system which supports multi-axis synchronous motion. The system can be connected to servo motors, remote digital or analog I/O modules, step motors, DD motors, linear motors, MPG modules, and more.

Building Automation

Process Automation

Delta Ether Link

Ethernet

DOP-B07

AH500

AH500

DeviceNet

PROFIBUS

DVP-SE

AH500

AH500

AH500

AH500

MODBUS

IFD   IFD   AFE2000   IED   CP2000   C2000   C2000

| Access Control | Power & Elevator Control | Material Feeding | Mixing | Liquid Separation & Treatment |
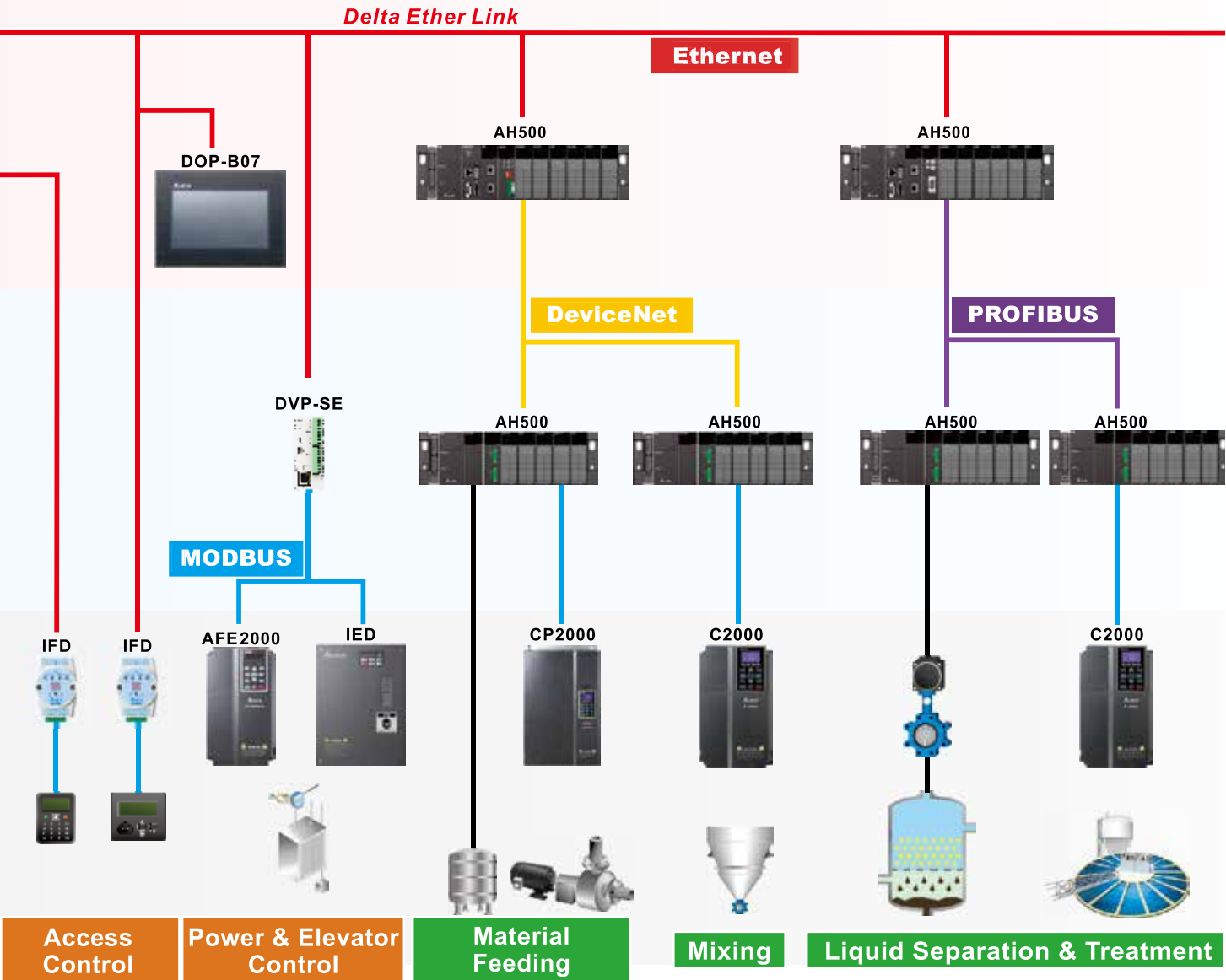
MODBUS

Delta MODBUS serial products integrate easily with devices of other brands, and for communication among RS-232, RS-422, RS-485 and custom-defined formats, offering greater flexibility for on-site applications.

DeviceNet

Delta DeviceNet products support interconnections among products of different brands and wire-saving network topology. The 500kbps stable and noise resistant fieldbus data transmission is suitable for harsh industrial sites.

PROFIBUS

Delta PROFIBUS products support 12Mbps communication speed and are suitable for distributed automated industrial control networks.

Industrial Power Supply
CliQ, CliQ II, PMC, PMT series
The World's Number One in Industrial Power Solutions

Delta is the world's largest power supply manufacturer. The state-of-the-art DVP, CliQ, CliQ II,PMC and PMT series power supplies offer a nominal output voltage of DC 24V/12V, a minimum holdup time of 20ms. The rugged and ultra-compact case material is shock and vibration resistant according to IEC 60068-2. The power supplies provide over-voltage, overload and thermal protection. The wide input voltage ranges from 85 to 264 VAC (1 phase) and 320 to 600 VAC (3 phase), and the multiple output terminals are for fast wiring and easy installation.

❭ DC 24V DIN rail models

DVP-PS01/02/05	DRP024V060W1BA	DRP024V120W1BA	DRP024V240W1BA
24W/48W/120W, DC24V 1-phase, White Plastic Case	60W, DC24V, 1-phase Aluminum Case, Removable Terminal Block	120W, DC24V, 1-phase Aluminum Case, Removable Terminal Block	240W, DC24V, 1-phase Aluminum Case, Removable Terminal Block

DRP024V060W1AZ	DRP024V060W1AA	DRP024V120W1AA	DRP024V240W1AA	DRP024V480W1AA
60W, DC24V, 1-phase Black Plastic Case	60W, DC24V, 1-phase Aluminum Case	120W, DC24V, 1-phase Aluminum Case	240W, DC24V, 1-phase Aluminum Case	480W, DC24V, 1-phase Aluminum Case

❭ DC 12V DIN rail models

DRP012V015W1AZ	DRP012V030W1AZ	DRP012V060W1AA	DRP012V100W1AA
15W, DC12V, 1-Phase Black Plastic Case	30W, DC12V, 1-Phase Black Plastic Case	60W, DC12V, 1-Phase Aluminum Case	100W, DC12V, 1-Phase Aluminum Case

DC 24V panel mount aluminum-case models

PMC-24V035W1AA	PMC-24V050W1AA	PMC-24V075W1AA	PMC-24V100W1AA	PMC-24V150W1AA
35W, DC24V, 1-phase	50W, DC24V, 1-phase	75W, DC24V, 1-phase	100W, DC24V, 1-phase	150W, DC24V, 1-phase

PMC-24V300W1BA	PMT-24V350W1AA
300W, DC24V, 1-phase	350W, DC24V, 1-phase

DC 24V panel mount models

PMT-24V035W1AA	PMT-24V050W1AA
35W, DC24V, 1-phase	50W, DC24V, 1-phase

DC 12V panel mount aluminum-case models

PMC-12V035W1AA	PMC-12V050W1AA	PMC-12V100W1AA
35W, DC12V, 1-phase	50W, DC12V, 1-phase	100W, DC12V, 1-phase

DC 12V panel mount models

PMT-12V035W1AA	PMT-12V050W1AA
35W, DC12V, 1-phase	50W, DC12V, 1-phase

DC 5V panel mount aluminum-case models

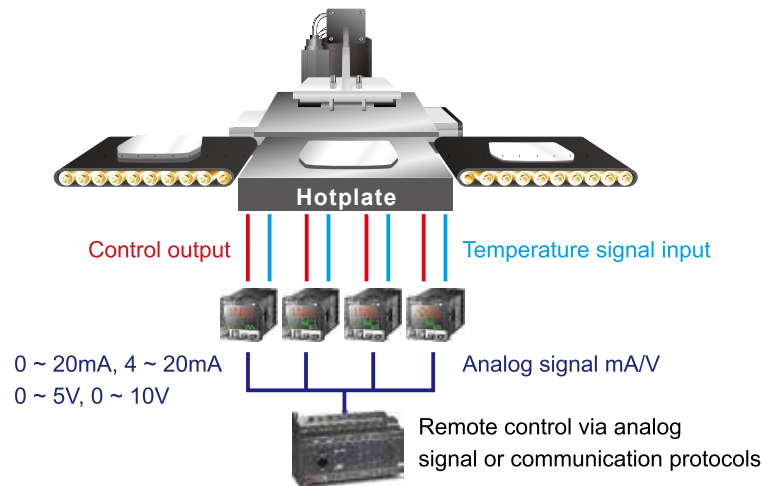| PMC-05V015W1AA	PMC-05V035W1AA	PMC-05V050W1AA
15W, DC5V, 1-phase	35W, DC5V, 1-phase	50W, DC5V, 1-phase

High Speed Intelligent Temperature Controller
DT3

High Speed. High Precision. High Performance
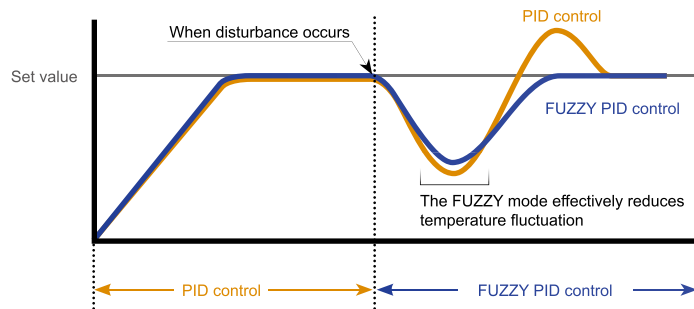**Next Generation Multifunction Temperature Controller**

Remote Control

Sets DT3 temperature via analog
output of host controller

Hotplate

Control output | Temperature signal input

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

Analog signal mA/V

Remote control via analog
signal or communication protocols

Various Control Modes

▶ Auto Tuning
▶ FUZZY
▶ Manual
▶ ON/OFF
▶ PID Process Control
▶ Self Tuning

When disturbance occurs

PID control

Set value

FUZZY PID control

The FUZZY mode effectively reduces
temperature fluctuation

PID control | FUZZY PID control

User-defined Function Keys

► Alarm Clearing
► Control Modes Selection
► Controller ON/OFF
► Process Control ON/OFF
► Save Menu
► Start PID

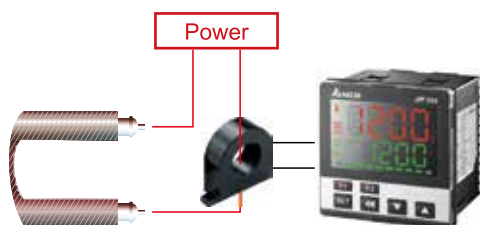## Large Tri-color LCD Display
The 1st Tri-color LCD temperature controller in Taiwan.
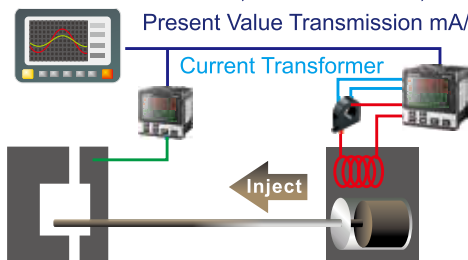
Heater Disconnection Detection
Measurable up to 100A

Power

Point-to-Point Control
(Proportional Output mA/V)
Sets the Present Value by point-to-point control

Retransmission Output

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

Current Transformer

Inject

Dual-output Control

► Preset temperature is rapidly attained using two sets of outputs for heating and cooling control
► AT function is used to automatically calculate two sets of PID parameters, one for heating and one for cooling

Output 2
(Cooling Control)

Output 1
(Heating Control)
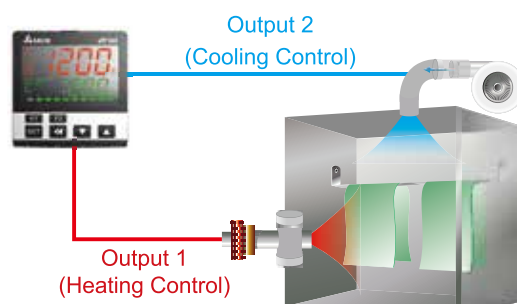
Temperature Sensor Input

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

Output
Relay, current 4-20mA, pulse voltage, analog voltage 0-10V

DELTA

Standard Models
DTA

▶ 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*48, 48*96, 72*72, 96*48, 96*96 (mm)

▶ IP66 protection

▶ Certification: CE, UL

Advanced Models
DTB

▶ Thermocouple: K, J, T, E, N, R, S, B, L, U, TXK

▶ Platinum Resistance: Pt100, JPt100

▶ Analog Input: 0-5V, 0-10V, 0-20mA, 4-20mA, 0-50mA

▶ Output: Relay, current 4-20mA, pulse voltage, analog voltage 0-10V

▶ Control Mode: ON-OFF, PID, manual, PID process control

▶ MODBUS communication: Built-in

▶ 2 sets of alarm outputs, 18 alarm modes

▶ Dimensions: 48*24, 48*48, 48*96, 96*96 (mm)

▶ IP66 protection

▶ Certification: CE, UL

Modular & Extendable Models
DTC

▶ Thermocouple: K, J, T, E, N, R, S, B, L, U, TXK

▶ Platinum Resistance: Pt100, JPt100

▶ Analog Input: 0-5V, 0-10V, 0-20mA, 4-20mA, 0-50mA

▶ Output: Relay, current 4-20mA, pulse voltage, analog voltage 0-10V

▶ Control Mode: ON-OFF, PID, manual, PID process control

▶ MODBUS communication: Built-in

▶ 2 sets of alarm outputs, 18 alarm modes

▶ Certification: CE, UL

Economical Models
DTD

▶ Thermocouple: K, J, T, E, N, R, S, B, L, U, TXK

▶ Platinum Resistance: Pt100, JPt100, Cu50

▶ RTD: Cu50

▶ Analog Input: 0-70mV, 0-5V, 0-10V, 0-20mA, 4-20mA

▶ Output: Relay, current 4-20mA, pulse voltage, analog voltage 0-10V

▶ Control Mode: ON-OFF, PID, manual, PID process control

▶ MODBUS communication: N/A

▶ 1 set of alarm outputs, 8 alarm modes

▶ Dimensions: 48*48, 48*96, 72*72 (mm)

▶ IP66 protection

▶ Certification: CE

Multi-Channel Modular Models
DTE

▶ Thermocouple: K, J, T, E, N, R, S, B, L, U, TXK (Supports max. 8 sets of input)

▶ Platinum Resistance: Pt100, JPt100 (Supports max. 6 sets of input)

▶ RTD: Cu50, Ni120

▶ Analog Input: N/A

▶ Output: Relay, current 4-20mA, pulse voltage, analog voltage 0-10V

▶ Control Mode: ON-OFF, PID, manual, PID process control

▶ MODBUS communication: Built-in

▶ 2 sets of alarm outputs, 18 alarm modes

▶ Certification: CE, UL

New Generation Intelligent Temperature Control `New`
DTK

▶ Thermocouple: K, J, T, E, N, R, S, B, L, U, TXK (Supports max. 8 sets of input)

▶ Platinum Resistance: Pt100, JPt100 (Supports max. 6 sets of input)

▶ RTD: Cu50, Ni120

▶ Analog Input: AC 100-240V, 50/60 Hz

▶ Output: Relay, current 4-20mA, pulse voltage

▶ Control Mode: ON-OFF, PID, manual

▶ MODBUS communication: Optional

▶ 1 set of alarm output (2 sets of alarm outputs are optional), 9 alarm modes

▶ Certification: CE

Applications   **Food packaging, electronics, rubber & plastic industries**

ΔELTA

Valve Controllers
DTV
Smart and Multifunctional Valve Controller

▶ Single key to switch between auto/manual modes

▶ Left-shift key for easy and quick parameter setting

▶ Real-time output percentage displays the valve openness

▶ Control mode designed for the features of electronic valves

▶ 2 sets of alarm outputs, supports 17 alarm modes

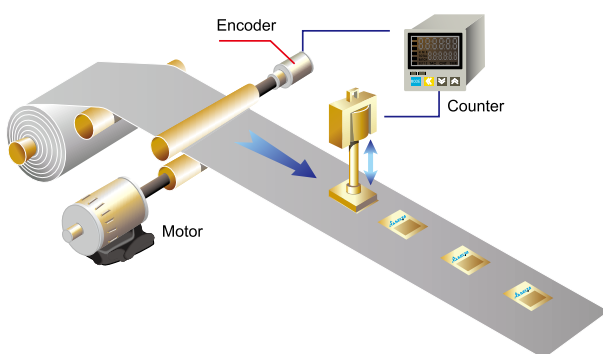▶ MODBUS communication: Built-in

Timer/Counter/Tachometer
CTA
All in One

▶ Simultaneous counting and timing in the mixed mode

▶ 6-digit LCD display

▶ Max. counting speed: 10Kpps

▶ NPN or PNP input signals

▶ Pre-scale function

▶ Counting modes: 1-stage, 2-stage, batch, total, dual
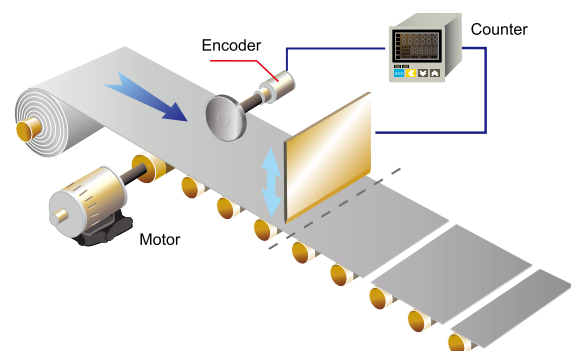
▶ MODBUS communication: Optional

▶ **Applications**

• **Label Printing Machine**

Encoder

Counter

Motor

• **Fixed Length Cutting Machine**

Encoder

Counter

Motor

69

Multifunction Small Pressure Sensor
DPA

Next Generation Multifunction Controller

▶ Energy-saving mode

▶ Easy code display

▶ 3 sets of color display

▶ Various unit conversion functions

▶ Various output modes

▶ Fast zero reset

▶ Analog output function

▶ Parameter copy function

▶ Safety control function

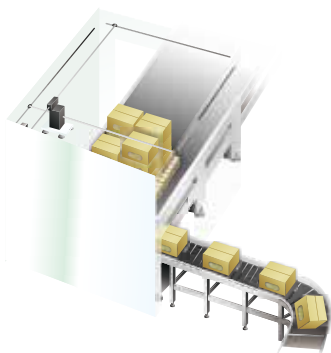▶ 10 sets of output response time setup

Applications

Machine processing industry, solar energy industry, food packaging industry, semiconductor industry, electronic component industry, automated assembly industry
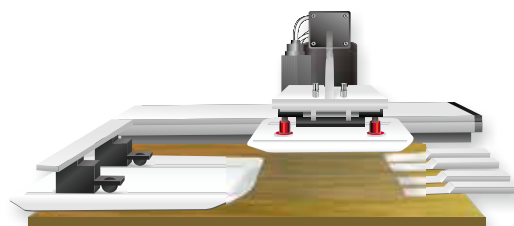
- **Food Packaging Industry**
  Drinks, cans suction & packaging
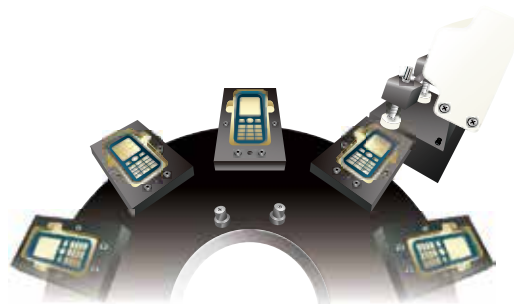
- **Solar Energy Industry**
  Turnkey module lines

- **Electronic Component Industry**
  IC component suction & detecting

- **Automated Assembly Industry**
  Automated component assembly & detection

70

ΔELTΛ

Machine Vision System
DMV

Intelligent Human Visual Inspection System for a Variety of Applications

### DMV System Features:

► User-friendly operation interface for a quick system setup

► Flowchart programming interface saves development time

► Built-in multifunctional 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 standard FireWire 1394 series CCD

► Provides a complete product line-up which includes lighting and lenses

► Compatible with Ethernet and RS-232 communication interfaces for a quick link up with external devices

► Supports SD card

► Passes high industrial standards with system reliability superior to PC-based systems
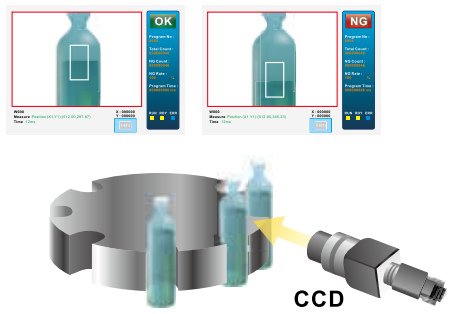
Applications

- ### Bottle Cap Position Identification
  Identifies the bottle capping position
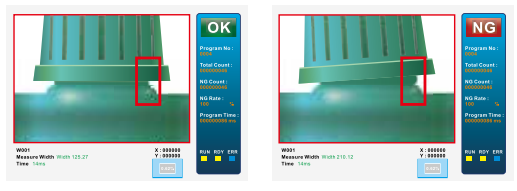
- ### Direction Identification
  Inspects the direction of work pieces conveyed on a production line
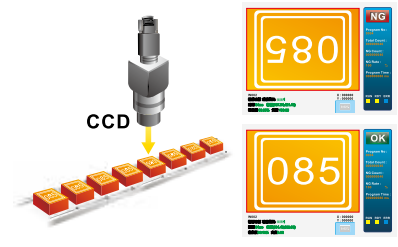
- ### Beverage Packing Inspection
  Inspects the liquid level of each bottle

- ### Character Inspection
  Inspects the characters on electronic devices
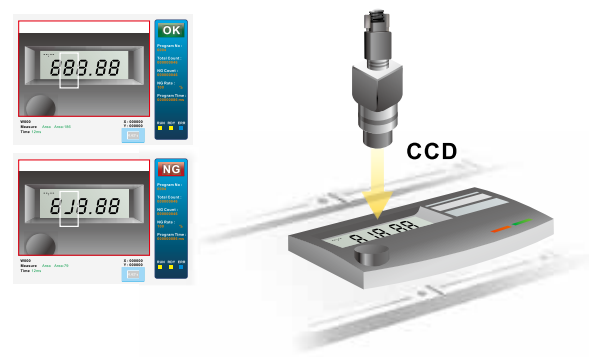
- ### Luminance Inspection
  Inspects the luminance of LEDs
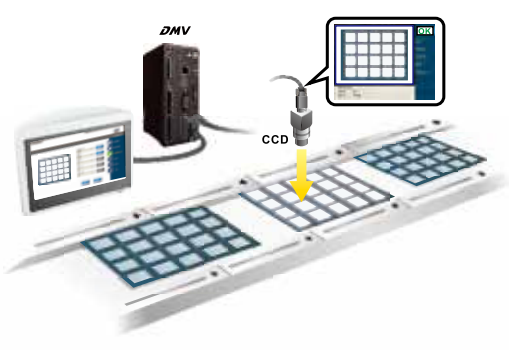
- ### Position Identification
  Inspects the position of IC components on PCB boards

- ### Module Inspection
  Inspects the normality of mobile phone modules, such as touchscreens and push buttons

- ### Object Counting
  Counts the quantity of objects in a basket or carton

72

Power Meter
DPM

Delta's Power Meter DPM-C530 Series offers precise measurement of various electrical energy values and power quality parameters, including power factor, harmonics, and current/voltage unbalance with functions such as off-limit alarms and history logs. It provides exceptio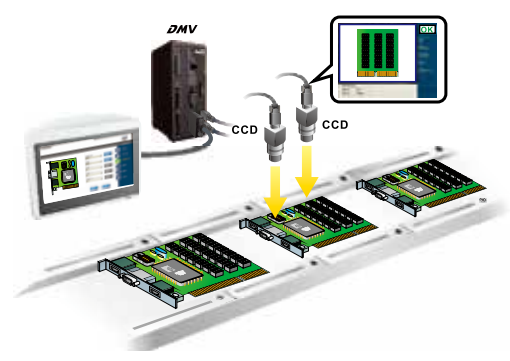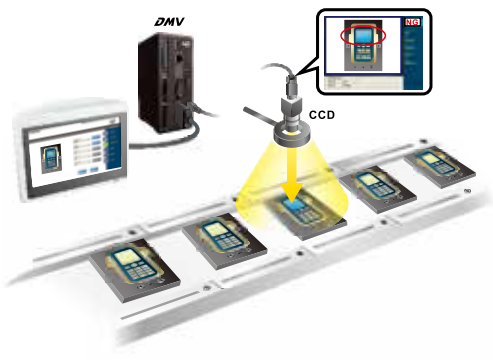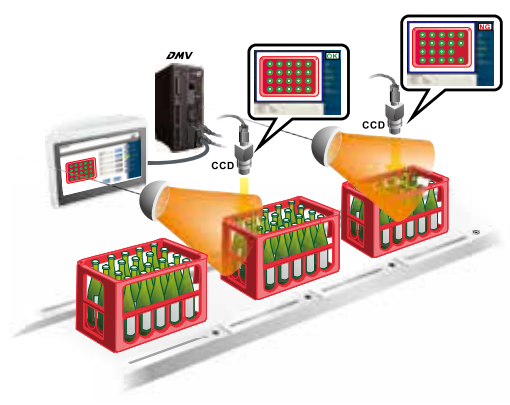nal communication quality and monitoring functions that are especially suitable for sectors where power quality is critical.

■ High Precision Power Measurement

▶ Highly precise measurement of bidirectional electrical energy and power parameters, meeting Class 0.5S of IEC62053 and CNS14607 standards

▶ Supports power quality measurement, including total harmonic distortion, up to 31st harmonics, voltage and current unbalance, and more

■ Easy Operation & Installation

▶ Language customization: Traditional Chinese, Simplified Chinese, English

▶ Built-in RS-485 communication port Supports MODBUS RTU/ASCII

■ Event Alarms and History Logs

▶ Keeps max. 2 months of power and electrical energy measurement values for history analysis

▶ 29 built-in types of event alarms

■ Large Screen LCD

▶ White-light widescreen LCD with resolution of 198x160 dots

■ Parameter Grouping

▶ Grouping the measurands for faster data transmission and reading by the upper-level controllers improves the efficiency and performance of the whole energy management system

Medium/low voltage power distribution panels, Energy Management Systems, Building Energy Management Systems, Factory Energy Management Systems

Energy Management Systems

Ethernet

Human Machine Interface

Active Front End

AC Reactor

Integrated Elevator Drive

MODBUS

Programmable Logic Controller

Power Meter

AC Motor Drive

Cooling Tower

Programmable Logic Controller

Permanent Magnet Synchronous Motor

7F
6F
5F
4F
3F
2F
1F

Light

Light

AC Motor Drive

Pump

AC Motor Drive

Air Handling Unit

Lighting System	Elevator	HVAC System

Factory Energy Management Systems

Human Machine Interface

Programmable Logic Controller

MODBUS

Temperature Controller

Pressure Sensor

Timer/ Counter/ Tachometer

AC Servo Drive

Power Meter

AC Motor Drive

Hand Insertion

Fluxing

Wave Soldering

Semi-finished Product Testing

Conformal Coating

Drying

Delta Photoelectric Sensor
M12 Series / M18 Series

▶ Standard sensors for detecting ferrous metals

▶ Short dimensions & long sensing distance

▶ Provides accurate detection

▶ Good interference immunity

▶ All sensors are IP67 rated

▶ Load short-circuit protection, reverse polarity protection with 24VDC power input

▶ High response frequency

Applications

Machinery for packaging, plastics, electronics, textiles, CNC industries and automated production lines

Appearance		Sensing Distance	Connection Method	Cable Specification	Operation Mode	Model	
						NPN Output	PNP Output
Isolation	M12	4mm	Pre-wired Models (2m)	PVC	NO	IS-E1204-BNOB2	IS-E1204-BPOB2
					NC	IS-E1204-BNCB2	IS-E1204-BPCB2
	M18	6mm			NO	IS-E1806-BNOB2	IS-E1806-BPOB2
					NC	IS-E1806-BNCB2	IS-E1806-BPCB2
Non-Isolation	M12	8mm			NO	IS-N1208-BNOB2	IS-N1208-BPOB2
					NC	IS-N1208-BNCB2	IS-N1208-BPCB2
	M18	12mm			NO	IS-N1815-BNOB2	IS-N1815-BPOB2
					NC	IS-N1815-BNCB2	IS-N1815-BPCB2

Delta Inductive Proximity Sensor

Flat type: PS-F Series
Standard Type: PS-R Series
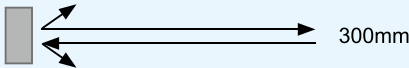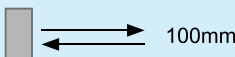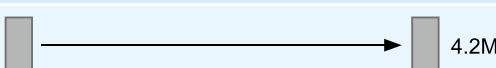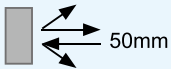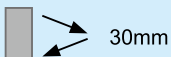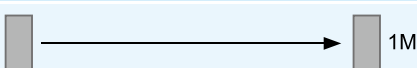
PS-F Series   PS-R Series

▶ Standard Type: one-turn screw for distance setting, Light/Dark-on adjustable

▶ Flat type: easy to install under any conditions

▶ High chemical resistance to Acetone, Xylene, Gas, Diesel and Alcohol

▶ Background suppression offers reliable detection of different objects

▶ Sensing distance from 30mm to 12M

▶ All sensors are IP67 rated

▶ Load short-circuit protection, reverse polarity protection with 24VDC power input

Applications

Machinery for packaging, plastics, electronics, textiles, CNC industries and automated production lines

Appearance	Type	Sensing Distance		Model
Standard Type (PS-R)	Through-Beam		12M	PS-RT9
	Diffuse Reflect		300mm	PS-RR3
	Small Spot Reflect	100mm		PS-RS2
	Retro-Reflect		4.2M	PS-RP3
Flat Type (PS-F)	Through-Beam		1M	PS-FT3
	Diffuse Reflect	50mm		PS-FR2
	BGS Reflect	30mm		PS-FB1
	Retro-Reflect		1M	PS-FP1

ΔELTA

Global Operations

ASIA (Taiwan)

Taoyuan
Technology Center
(Green Building)

Taoyuan Plant 1

Taoyuan Plant
(Diamond-rated Green Building)

ASIA (China)

Wujiang Plant 3

Delta Electronics

Sales Channels of Delta Industrial Automation are Located Worldwide in 74 Cou

Canada

Montreal
Toronto

Fremont

USA

Raleigh

Germany

Amsterdam
Eindhoven

France

UK
Belgium

Spain

Portugal

Italy

Morocco

A
C   B
D   G   Lithuania
E   F   Belarus
    N   Ukra
M H I   Romania
J   K L   Bulgaria
            Tur
Greece
        Cyprus
Malta   Israel

Egypt

Europe

A Finland
B Estonia
C Sweden
D Denmark
E Netherlands
F Germany
G Poland
H Czech
I Hungary
J Slovenia
K Croatia
L Serbia
M Austria
N Slovakia

Nigeria

Ghana

Sudan

B
C   .
A

Mexico

A Mexico City
B Monterey
C Guadalajara

Jamaica
Guatemala   Republica Dominicana
EL Salvador   Honduras   Puerto Rico

Costa Rica
Panama

Colombia

Ecuador

Venezuela

Peru

Bolivia

Paraguay

Chile

Argentina

B

Brasil

A
D   C
E
F   **Sao Paulo**
G

Zambia

South Afr

Keny

Brasil

A Minas Gerais
B Pernambuco
C Rio de Janeiro
D São Paulo
E Paraná
F Santa Catarina
G Rio Grande do Sul

ASIA (Japan)

ASIA (India)

EUROPE

AMERICA

Tokyo Office

Rudrapur Plant
(Green Building)

Amsterdam, Netherlands

Research Triangle Park

▲ Factories 2　■ Branch Offices 62　◉ R&D Centers 5　▫ Distributors 711

untries

Russia

aine

▫ Kazakhstan

Armenia

▫ Uzbekistan

Azerbaijan

rkey

Syria

Iran

Lebanon

Jordan Iraq

Kuwait

UAE

Saudi Abia

Pakistan

Delhi

ya

India

A Gurgaon
B Kolkata
C Mumbai
D Hyderabad
E Bangalore
F Chennai
G Coimbatore
H Pune
I Ahmedabad

ica

Myanmar

Thailand

I

A

C H

D

E F

G

Srilanka

Malaysia

Vietnam

Singapore

Indonesia

20

21

B

22

Bangladesh

23

27

24

28

25

29

8

26

30

Melbourne

Seoul

Tokyo

1

3 2

4 5

33　South Korea　Japan

9

11 31

34

15 6 7

17 14 12

18

16

13

10

19

32

Shanghai

▲ ■ ◉ **Wujiang**

▲ ■ ◉ **Taoyuan**
Technology Center
& Plant I

■ ◉ **Taichung**

◉ **Tainan**

Philippines

China

1	Harbin	13	Shanghai	25	Xiamen
2	Changchun	14	Hangzhou	26	Wenzhou
3	Shenyang	15	Zhengzhou	27	Nanning
4	Beijing	16	Xian	28	Guangzhou
5	Tianjin	17	Hefei	29	Foshan
6	Wuxi	18	Shaoxing	30	Shenzhen
7	Changzhou	19	Taizhou	31	Shijiazhuang
8	Subei	20	Chengdu	32	Qingdao
9	Taiyuan	21	Chongqing	33	Dalian
10	Ningbo	22	Changsha	34	Jining
11	Jinan	23	Wuhan		
12	Suzhou	24	Nanchang		

▫ Newzealand

ΔELTA

Smarter. Greener. Together.

Industrial Automation Headquarters
Delta Electronics, Inc.
Taoyuan Technology Center
18 Xinglong Road, Taoyuan District,
Taoyuan City 33068, Taiwan (R.O.C.)
TEL: 886-3-362-6301 / FAX: 886-3-371-6301

Asia
Delta Electronics (Jiangsu) Ltd.
Wujiang Plant 3
1688 Jiangxing East Road,
Wujiang Economic Development Zone
Wujiang City, Jiang Su Province, P.R.C. 215200
TEL: 86-512-6340-3008 / FAX: 86-769-6340-7290

Delta Greentech (China) Co., Ltd.
238 Min-Xia Road, Pudong District,
ShangHai, P.R.C. 201209
TEL: 86-21-58635678 / FAX: 86-21-58630003

Delta Electronics (Japan), Inc.
Tokyo Office
2-1-14 Minato-ku Shibadaimon,
Tokyo 105-0012, Japan
TEL: 81-3-5733-1111 / FAX: 81-3-5733-1211

Delta Electronics (Korea), Inc.
1511, Byucksan Digital Valley 6-cha, Gasan-dong,
Geumcheon-gu, Seoul, Korea, 153-704
TEL: 82-2-515-5303 / FAX: 82-2-515-5302

Delta Electronics Int'l (S) Pte Ltd.
4 Kaki Bukit Ave 1, #05-05, Singapore 417939
TEL: 65-6747-5155 / FAX: 65-6744-9228

Delta Electronics (India) Pvt. Ltd.
Plot No 43 Sector 35, HSIIDC
Gurgaon, PIN 122001, Haryana, India
TEL : 91-124-4874900 / FAX : 91-124-4874945

Americas
Delta Products Corporation (USA)
Raleigh Office
P.O. Box 12173,5101 Davis Drive,
Research Triangle Park, NC 27709, U.S.A.
TEL: 1-919-767-3800 / FAX: 1-919-767-8080

Delta Greentech (Brasil) S.A.
Sao Paulo Office
Rua Itapeva, 26 - 3° andar Edificio Itapeva One-Bela Vista
01332-000-São Paulo-SP-Brazil
TEL: 55 11 3568-3855 / FAX: 55 11 3568-3865

Europe
Deltronics (The Netherlands) B.V.
Eindhoven Office
De Witbogt 20, 5652 AG Eindhoven, The Netherlands
TEL: 31-40-2592850 / FAX: 31-40-2592851

*We reserve the right to change the information in this catalogue without prior notice.