



Automation for a Changing World

Delta Industrial Automation

www.deltaww.com



Table of Content

Milestones 1

About Delta

Motor & Drive 3

AC Motor Drive

| | |
|--|----|
| General Field Oriented Control Drive • C2000 | 3 |
| Intelligent Sensorless Vector Control Drive • CP2000 | 4 |
| Intelligent Drive For Textile Machinery • CT2000 | 5 |
| Intelligent Vector Control Micro Drive • C200 | 5 |
| Heavy Duty Field Oriented Control Drive • CH2000 | 6 |
| Power Regenerative Unit • REG2000 | 7 |
| Hybrid Energy Saving System • HES | 8 |
| Integrated Elevator Drive • IED | 9 |
| Door Control Drive • VFD-DD | 11 |
| Elevator Drive • VFD-ED | 12 |
| Intelligent Multifunction Micro Drive • VFD-E/EL | 13 |

Power Quality Solution 15

Power Quality Solution

| | |
|--------------------------------------|----|
| Active Front End • AFE2000 | 15 |
| Static Var Generator • SVG2000 | 15 |
| Active Power Filter • APF2000 | 16 |

Motion 17

AC Servo Motor and Drive

| | |
|--|----|
| Advanced Servo Drive for High-end Motion Systems • ASDA-A2 | 17 |
| Standard Servo Drive for a Vast Range of Machines and Systems • ASDA-B2 | 19 |
| 3-Axis Synchronous Servo System for Multi-Axis Motion Control Applications • ASDA-M | 21 |
| Delta EtherCAT Interface Servo Drive • ASDA A2-E | 23 |
| Delta High-Speed Motion Control System • DMCNET | 25 |
| Programmable Automation Controller (PAC) with EtherCAT Motion Platform and Centralized Slave Module • MH1-S30E-A11 | 27 |
| Linear Motion Drive • ASDA-A2R | 29 |
| Ironless Linear Motor • ECML | 29 |
| Spindle Motor Drive • ASDA-S | 30 |
| IPM Spindle Motor • ECMS | 30 |

CNC Solution

31

Control 33

Programmable Logic Controller

| | |
|---|----|
| High Performance Mid-range PLC • AH500 | 33 |
| High Performance PLC • DVP-EH3 | 35 |
| 2 nd Generation Standard PLC / 2 nd Generation Analog I/O PLC • DVP-ES2/EX2 | 36 |
| Network Type Advanced Slim PLC • DVP-SE | 36 |
| High Performance Slim PLC • DVP-SV2 | 37 |
| 2 nd Generation Standard Slim PLC • DVP-SS2 | 38 |
| 2 nd Generation Advanced Slim PLC • DVP-SA2 | 38 |
| 2 nd Generation Analog I/O Slim PLC • DVP-SX2 | 38 |
| CANopen Motion Controller • DVP-MC | 39 |
| Pulse-train Motion Controller • DVP-PM | 40 |

| | | |
|---|---|-----------|
| | Control | 41 |
| Text Panel | | |
| Standard 4 Line Text Panels ▪ TP04G-AL-C / TP04G-AL2 | | 41 |
| Basic 2/4 Line Text Panels ▪ TP02G-AS1 / TP04G-AS2 | | 41 |
| Standard Numeric Entry 4 Line Text Panel ▪ TP04G-BL-C | | 42 |
| Standard Numeric Entry 4 Line Text Panel PLC (Built-in DIO/AIO) ▪ TP04P | | 42 |
| Multifunction 8 Line Text Panel ▪ TP08G-BT2 | | 42 |
| Human Machine Interface | | 43 |
| 4.3-inch High Color, High Resolution, Widescreen ▪ DOP-B03S(E) | | 43 |
| 5.6-inch Standard High Color ▪ DOP-B05S | | 43 |
| 7-inch High Color, High Resolution, Widescreen ▪ DOP-B07S(E) | | 44 |
| 7-inch High Color, Professional Type ▪ DOP-B07PS | | 44 |
| 7-inch High Color, High Resolution ▪ DOP-B07S(E) | | 45 |
| 8-inch High Color, High Resolution ▪ DOP-B08S(E) | | 45 |
| 10.1-inch High Color, High Resolution, Widescreen ▪ DOP-B10S(E) | | 45 |
| 10.4-inch High Color, High Resolution ▪ DOP-B10S(E) | | 45 |
| 7-inch Handheld Type ▪ HMC07 | | 46 |
| 8-inch Standard Type ▪ HMC08 | | 46 |
| Industrial Ethernet Solution | | 47 |
| Managed Switches ▪ DVS-110 | | 47 |
| Unmanaged Switches ▪ DVS-G008I / G005I00A / 005 / 008 / 016 | | 48 |
| SFP Fiber Transceiver ▪ LCP-GbE | | 48 |
| SFP Fiber Transceiver ▪ LCP-1FE | | 49 |
| IEEE 802.11 WLAN ▪ DVW-W02W2-E2 | | 49 |
| Industrial Fieldbus Solution | | 50 |
| (Slave Module) : BACnet MS/TP / (Master Module) : RS422/485 | | 50 |
| (Master Module) : Ethernet/CANopen/DeviceNet / (Slave Module) : PROFIBUS DP | | 51 |
| DVP Series Right-Side Slave Modules | | 51 |
| Remote I/O Communication Module: Ethernet/PROFIBUS DP/DeviceNet/RS-485 | | 52 |
| USB Converters | | 53 |
| MODBUS Serial Converters / Industrial Network Converters | | 54 |
| Industrial Automation Solutions | | 55 |
| Industrial Power Supply | | 57 |
| Temperature Controller | | 59 |
| High Speed Intelligent Temperature Controller ▪ DT3 | | 59 |
| Standard Models ▪ DTA | | 61 |
| Advanced Models ▪ DTB | | 61 |
| Modular & Extendable Models ▪ DTC | | 62 |
| Economical Models ▪ DTD | | 62 |
| Multi-Channel Modular Models ▪ DTE | | 62 |
| Valve Controllers ▪ DTV | | 63 |
| Timer/Counter/Tachometer ▪ CTA | | 63 |
| | Sensor | 64 |
| Pressure Sensor | Multifunction Small Pressure Sensor ▪ DPA | 64 |
| Machine Vision System | Machine Vision System ▪ DMV | 65 |
| | Global Operations | 67 |

About Delta

Delta Electronics, Inc. is the world's leading provider of switching power supplies, and a major source for power management, components, visual displays, networking products and industrial automation solutions. Delta's strength in power electronics and extensive knowledge in control technology has made us a leader in the industrial automation marketplace. We continue to research and develop key technologies, and have integrated our industrial automation products into complete systems and total solutions to suit various industrial automation needs.



Today, Delta's IABG (Industrial Automation Business Group) has manufacturing plants in Taiwan and China, as well as R&D technology centers, and sales and service offices around the world. With many years of experience in the design and manufacturing of industrial automation solutions, Delta IABG believes that everyone should benefit from advances in industrial automation. For this reason we offer our customers "Quality, Reliability, and Excellence" in each product and system we sell. Our goal is to provide innovative, clean and energy-efficient solutions, create the greatest value for customers and improve the quality of life for everyone touched by our industrial automation products and solutions.

Milestones

| 1995 | 1999 | 2003 | 2004 | 2011 | 2012 |
|--|--|--|--|---|---|
| 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 (ASDA-B Series) |
| CNC Controller (NC300 Series) | Unmanaged Industrial Ethernet Switch (DVS Series) | High Performance Mid-range PLC (AH500 Series) | High Color, High Resolution Controller with Human Machine Interface (HMC Series) | 3-Axis Synchronous Servo System (ASDA-M 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:** 4830 (540 people in R&D)

Delta IABG (Industrial Automation Business Group)

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, developed industrial control networks, provided advanced

technical support, and offered 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.



| 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|--|---|---|---|---|--|
| Variable Motor Drive (VFD Series, V Series) | 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) |
| | | | | | |
| 2013 | 2014 | | | | |
| Power Quality Active Power Filter (APF Series) | Power Quality Static Var Generator (SVG Series) | Delta EtherCAT Interface Servo Drive (ASDA-A2-E Series) | Industrial Ethernet Solution (IES Series) | Programmable Automation Controller (PAC) (MH1 Series) | |
| | | | | | |



General Field Oriented Control Drive

C2000

For Traditional Drive System Controls



- ▶ Field oriented control with built-in PLC functions
- ▶ Wide variety of applications
- ▶ Wide range of models to fit different industries
- ▶ Built-in high speed communication CANopen protocols and MODBUS
- ▶ Long-life design and self diagnosis
- ▶ Enhanced protections and adaptation to ambient environments
- ▶ Complies with global safety standards, including CE, UL and cUL
- ▶ Modular design for easy maintenance and many extensions
- ▶ Optional communication cards:
PROFIBUS-DP, DeviceNet, MODBUS TCP and EtherNet/IP Cards

Standard models (IP/20/NEMA1)

Power range: 230V 0.75~90kW, 460V 0.75~355kW, 690V 22~560kW

| 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 | 400~560kW 530~745HP |
|-------------|---------------------|------------------------|--------------------|---------------------|------------------------|------------------------|------------------------|
| C2000 | 230V/3-phase | | | | | | |
| | 460V/3-phase | | | | | | |
| | | | 690V/3-phase | | | | |

Applications

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



reddot design award
winner 2010



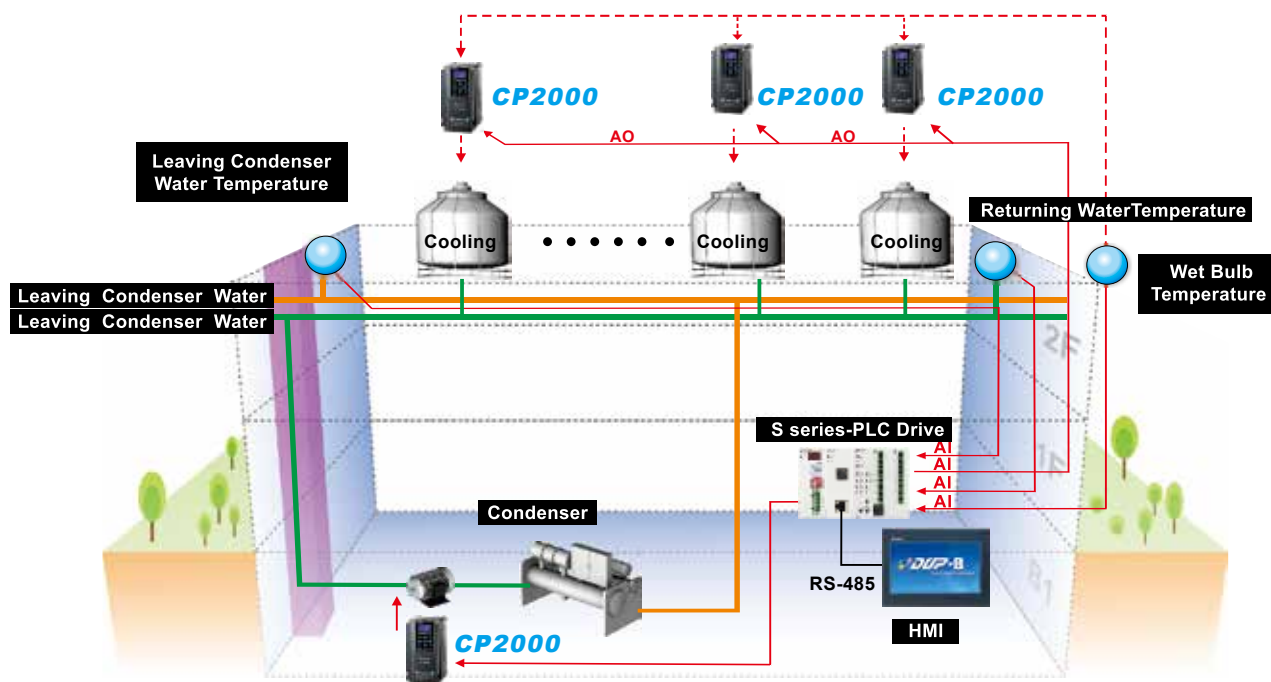
Intelligent Sensorless Vector Control Drive

CP2000

For HVAC, Fans and Pumps Applications



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



Intelligent Drive For Textile Machinery

CT2000

Flange Mount Drive with Special Heatsink Design for Best Cooling Results

- ▶ High efficiency, special heatsink for natural cooling
- ▶ Flange mounting method prevents fiber and dust from clustering or entering the drive
- ▶ Field oriented control (FOC) with 10K steps PLC programming capacity
- ▶ Built-in CANopen communication and MODBUS protocol RS-485 port for remote control of PLC I/O extension modules via network
- ▶ Deceleration Energy Backup (dEb) function synchronously controls multiple drives and motors to decelerate to a stop via DC bus when sudden power failure occurs
- ▶ LCD Keypad with extension cable provided, can be mounted on the control panel
- ▶ Shares common extension cards with C2000 series including communication, IO and PG card



Standard Model (IP00 11~90kW)

Power range: 460V 11~90kW

| Power Range | 11kW | 15kW | 18.5kW | 22kW | 30kW | 37kW | 45kW | 55kW | 75kW | 90kW |
|-------------|--------------|------|--------|--------------|------|------|--------------|------|------|------|
| Frame B | 460V/3-phase | | | | | | | | | |
| Frame C | | | | 460V/3-phase | | | | | | |
| Frame D | | | | | | | | | | |
| | | | | | | | 460V/3-phase | | | |

Applications

All flange mount installation requires an environment that has an airway design compatible with the CT2000 specified standard compatible as the CT2000 series specified.

Intelligent Vector Control Micro 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 (Printed Circuit Board) and ventilation channel
- ▶ 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 protocol and MODBUS RS-485 port for network connection



Applications

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

| Power Range | 400W 0.5HP | 750W 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 | | | | | | |

Heavy Duty Field Oriented Control Drive

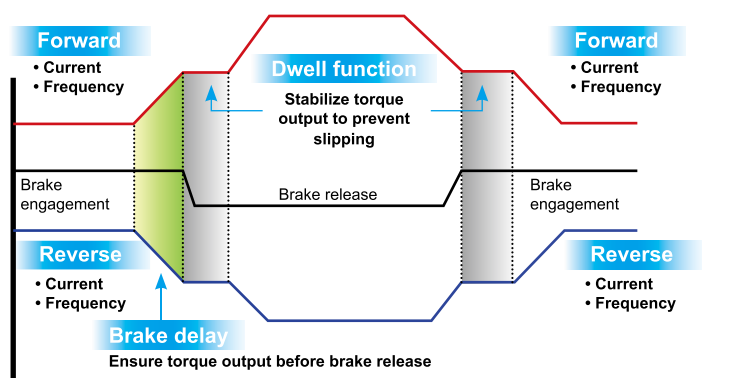
CH2000

Large Overload Capability Excellent for Impact Loading Applications

- ▶ Built-in 10 K steps PLC programming capacity
- ▶ Fast response to impact loads
- ▶ Single super heavy duty setting
- ▶ Various communication and network functions
- ▶ Modular design facilitates installation process and is easy to maintain
- ▶ Various crane functions provides high operation performance
- ▶ Supports both asynchronous and synchronous motors
- ▶ 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



Advanced Crane Function

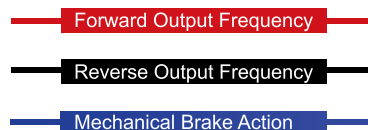


▲ Advanced Crane Time Sequence

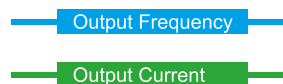
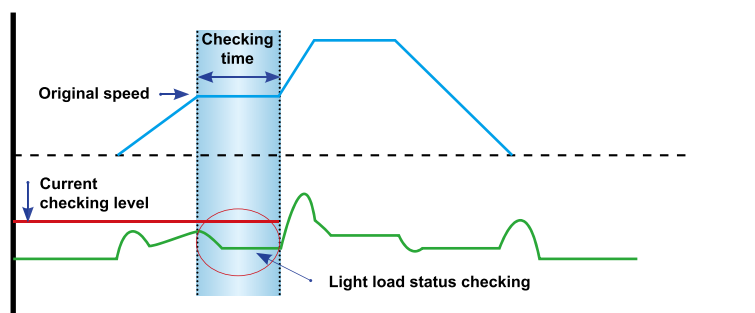
Brake delay and dwell function for smooth operation

▲ Mechanical Brake Control

Eight independent conditions for brake control for safety and complex applications



Light Load Auto-Acceleration



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 | 45~90kW 60~125HP | 110~185kW 150~250HP | 220~280kW 300~375HP |
|-------------|---------------------|------------------------|--------------------|---------------------|------------------------|------------------------|
| CH2000 | 230V/3-phase | | | | | |
| | 460V/3-phase | | | | | |

Applications

Hoists, machine tools,
printing machines

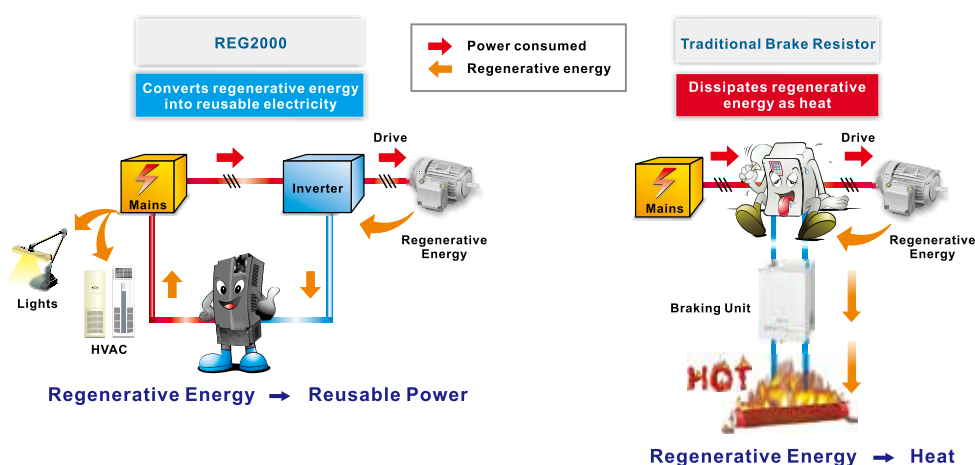
Power Regenerative Unit

REG2000

Replaces Traditional Brake Resistors and Provides Power Regeneration Functions

- ▶ Compact design with reactor included and easy to install
- ▶ Replace traditional brake resistor providing reduced heat generation and more than 95% of power regeneration efficiency for energy saving
- ▶ Improves motor braking capability 125% to 150%*
- ▶ MODBUS 485 communication to real-time monitor kWh and cost
- ▶ Compatible with DC inverters and DC servo drives
- ▶ Parallel connections for large power applications
- ▶ More option cards* available upon purchase: MODBUS TCP, CANopen (DS301), PROFIBUS, DeviceNet, EtherNet/IP

* Please contact Delta Industrial Automation



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 |
|-------------|--------------|------|--------------|--------|------|--------------|------|------|------|
| Frame A | 200V/3-phase | | | | | | | | |
| | 400V/3-phase | | | | | | | | |
| Frame B | | | 200V/3-phase | | | | | | |
| | | | 400V/3-phase | | | | | | |
| Frame C | | | | | | 200V/3-phase | | | |
| | | | | | | 400V/3-phase | | | |

Hybrid Energy Saving System

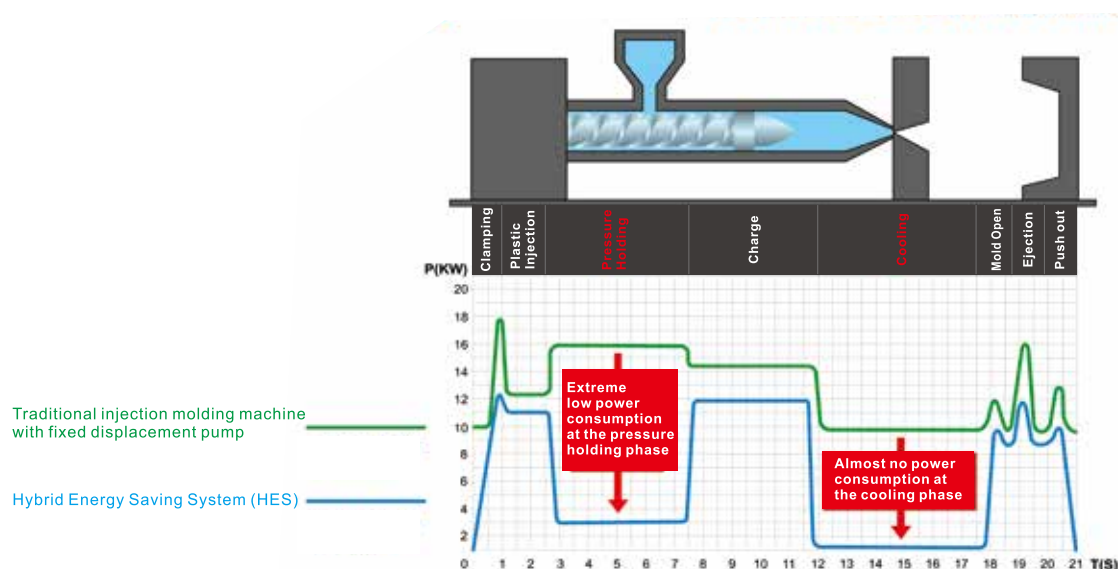
HES

Energy Saving for Plastic Injection Molding Machinery

- ▶ **Superior Energy-Saving Outcomes:** Lower 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 °C; 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 magnetic servo motor (PMSM) speeds up frequency response to 50ms
- ▶ **Suitable for Harsh Environments:** Resolver is resistant to earthquakes, oil and dust
- ▶ **Old Machine Replenishment:** Supports analog command 0~10V and linear correction (3 points), no replacing
- ▶ **Flow Convergence:** Saves cost on tubes, large flow capacity, enhances energy-saving



Power Consumption Curve at Injection Molding



| Power Range | 50L/min | 63L/min | 80L/min | 100L/min | 125L/min | 160L/min | 200L/min | 250L/min |
|-------------|--------------|---------|---------|----------|----------|----------|----------|----------|
| HES | 220V/3-phase | | | | | | | |
| | 380V/3-phase | | | | | | | |

Applications

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

Integrated Elevator Drive

IED

Drive and Control All-in-one Saves Installation Space

Control

- ▶ High-efficiency group control function to control multiple-elevators without additional control cards
- ▶ Provides Demo and Attendant service modes
- ▶ For single and double door elevator applications
- ▶ Controls up to 48 floors

Design

- ▶ Compact design, suitable for machine-room-less applications
- ▶ Modular design of fans and capacitors for easy replacement and maintenance
- ▶ Includes a small-size LED keypad that allows users to set and check drive status

Drive

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

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 Regeneration Unit (REG2000 series)
- ▶ Scheduled lighting and air circulation time function for the elevator car
- ▶ Standby mode to save energy

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



One for All Control

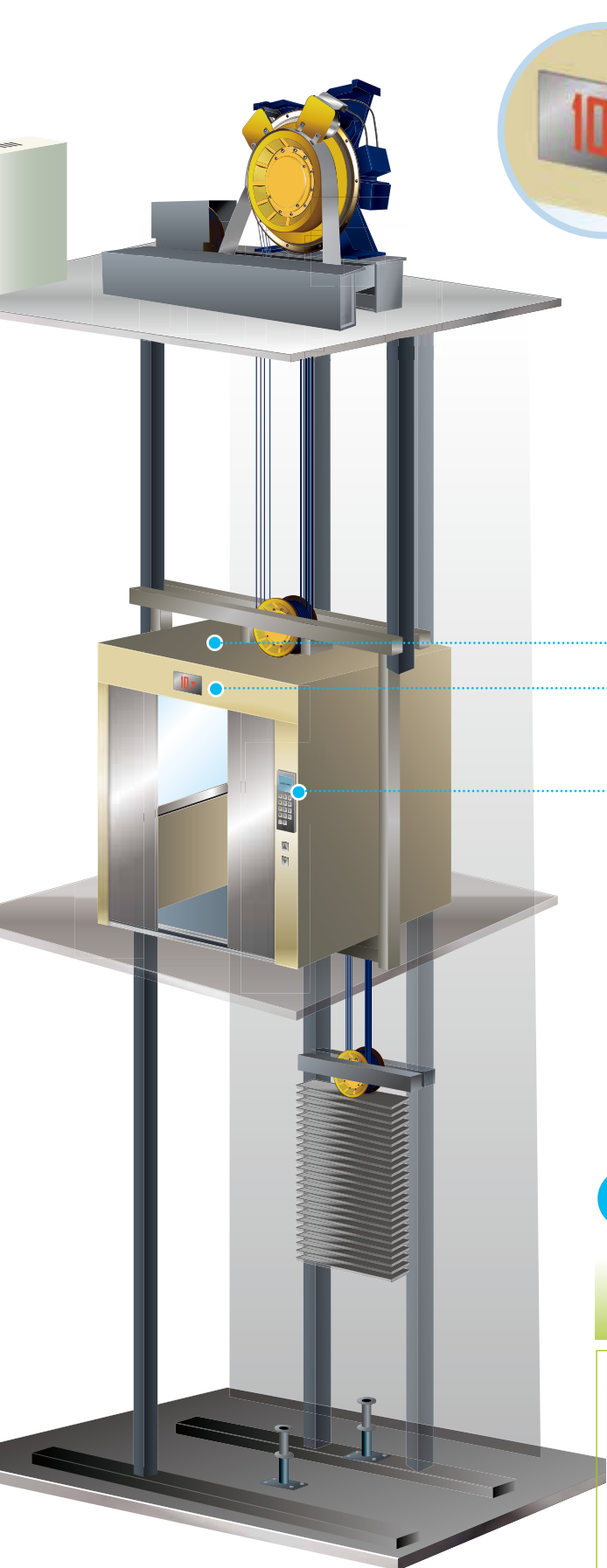
<Optional>

External Digital Keypad

- Controller setting
- Drive setting
- Parameter copy

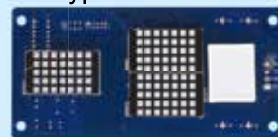


| Power Range | 2.2KW 3HP | 4KW 5HP | 5.5KW 7.5HP | 7.5KW 10HP | 11KW 15HP | 15KW 20HP | 18.5KW 25HP | 22KW 30HP | 30KW 40HP | 37KW 50HP | 45KW 60HP | 55KW 75HP | 75KW 100HP |
|-------------|--------------|--------------|----------------|---------------|--------------|--------------|----------------|--------------|--------------|--------------|--------------|---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

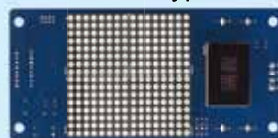


Floor Display Board

- Vertical matrix display board - Standard Type



- Vertical/Horizontal matrix display board - Standard Type



Integrated Cartop and Button Board

- Integrated cartop and button board

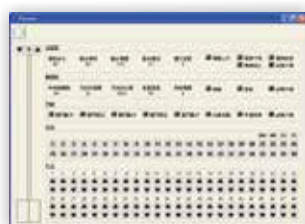


- Button extension board



PC Software

USB port convenient for program upload, download and tuning processes



Door Control Drive

VFD-DD

Door Control Solution



< Distance 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

< Speed Control Mode

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

< Multi-step Speed Control Mode

Power range: 200W/400W are 230V single phase

Optional Motors

ECMD-B91207MS
ECMD-B91608MS
ECMD-B81610MS



Applications

Elevator doors



Elevator Drive

VFD-ED

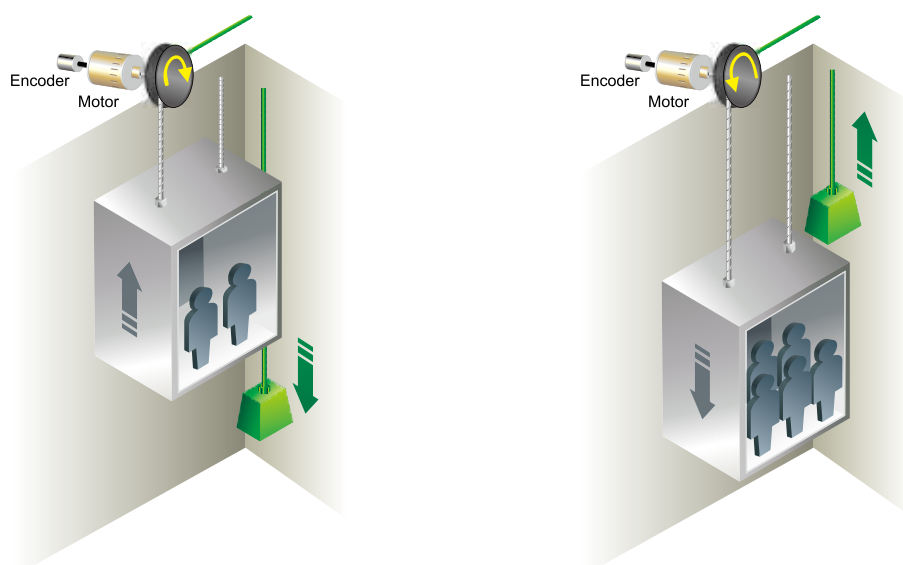
Excellent Time Sequence Control Provides Smooth Rides

- ▶ Supports both asynchronous and synchronous motors
- ▶ 5-point adjustable S curve
- ▶ 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 as power failure occurs
- ▶ Allows both embedded installation and wall-mounting
- ▶ Built-in LED digital keypad
- ▶ Power range: 2.2kW to 75kW
- ▶ Higher rated current compared to the VFD-VL series
- ▶ 4 sets of Relay output
- ▶ 2 sets of analog signal input (AI) and 2 sets of analog signal output (AO)
- ▶ 2 sets of MODBUS RS-485 and 1 set of CANopen communication ports



<Emergency Operation

- ▶ Supports single phase 230VAC Uninterrupted Power System (UPS)
- ▶ Automatically determine the light load operation direction when power failure occurs



| 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

Intelligent Multifunction Micro Drive

VFD-E/EL

New Generation Micro-type and Multifunction AC Motor Drives

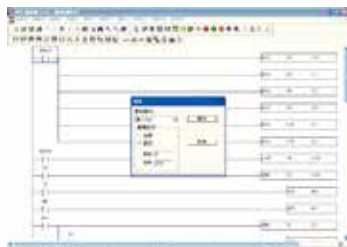


- ▶ Optional expansion modules for more flexible applications (PG cards for VFD-E series, highspeed fieldbus, braking modules, I/O card for VFD-E series)
- ▶ Fans with modular design for easy maintenance and replacement
- ▶ Built-in EMI filter for 230V single-phase and 460V models to minimize the electromagnetic 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 | 200W 0.25HP | 400W 0.5HP | 750W 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)**



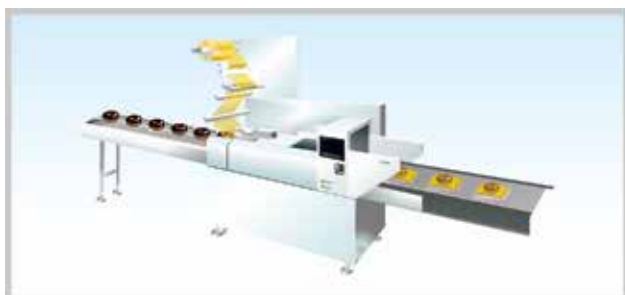
**LonWorks
(CME-LW01)**



**CANopen
(CME-COP01)**



Applications



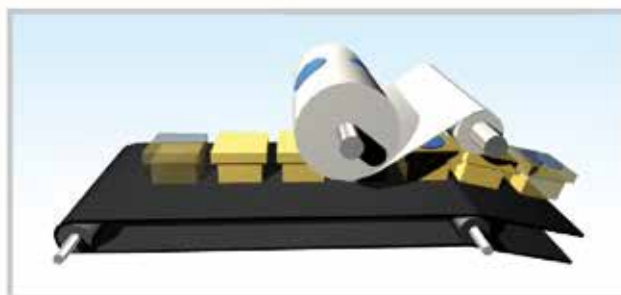
▲ Food packaging machines



▲ Textile machines



▲ Punching machines



▲ Conveyor belts

Active Front End AFE2000

Best Energy Saving Device to Use with AC Motor Drives

- ▶ More than 95% of 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

PROFI
NET

DeviceNet

EtherNet/IP

| Power Range | 7.5kW 10HP | 15kW 20HP | 22kW 30HP | 37kW 50HP | 45kW 60HP | 75kW 100HP |
|-------------|------------------------------|------------------------------|--------------|------------------------------|--------------|---------------|
| Frame B | 230V 3-phase 460V 3-phase | | | | | |
| Frame C | | 230V 3-phase 460V 3-phase | | | | |
| Frame D | | | | 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

Applicable industry, infrastructure, commercial and home power distribution systems as a new solution to traditional phase-leading capacitor



Active Power Filter

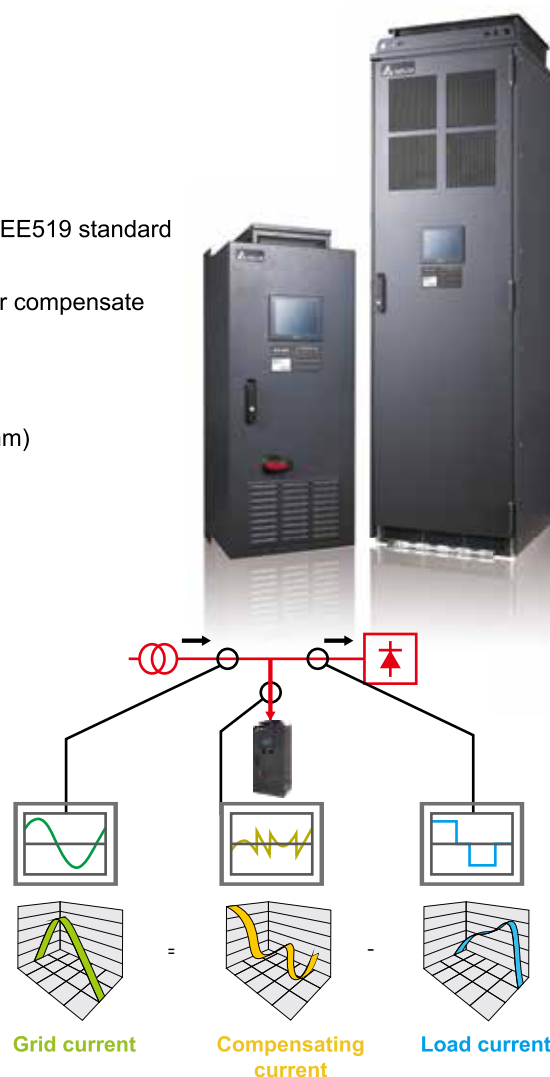
APF2000

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 series 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.



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 protocol and we provide various communication and fieldbus cards available upon request

| Voltage Range 200V~480V | |
|-------------------------|------|
| Capacity | 50A |
| | 100A |
| | 200A |
| | 300A |

CANopen (DS301)
MODBUS TCP

PROFI
NET

DeviceNet





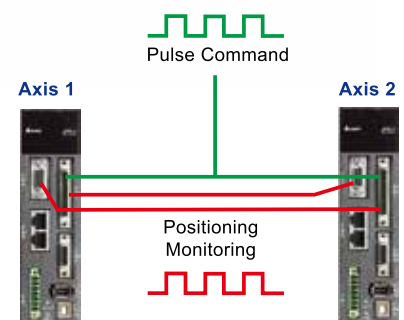
Advanced Servo Drive for High-end Motion Systems ASDA-A2

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



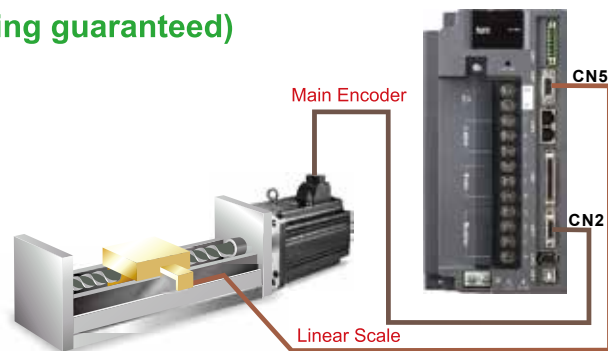
High Precision, High Performance Servo Motors

- ▶ Supports incremental type and absolute type encoders
- ▶ Incremental type encoder provides up to 1280000 p/rev resolution for high-precision positioning



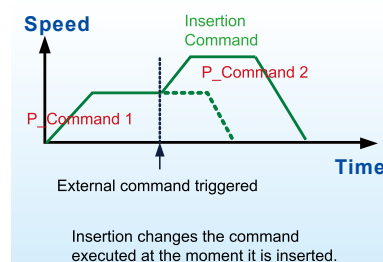
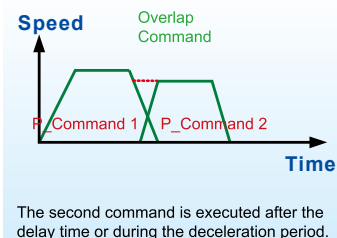
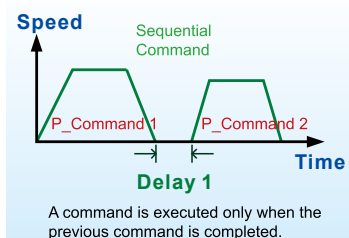
Full-Closed Loop Control (Accuracy of positioning guaranteed)

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



Versatile PR mode

- ▶ 64 procedures can be applied for various and multiple points continuous motion movements
- ▶ 35 Homing modes / Jump mode / Write parameter mode / Speed mode / Position mode



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

Model Designation

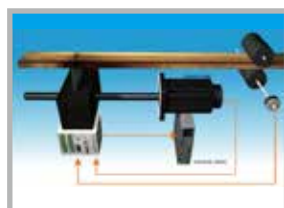
| Type | PR mode | E-Cam | Extension Slot for Digital Input | EtherCAT/STO | CANopen | DMCNET |
|------|---------|-------|----------------------------------|--------------|---------|--------|
| A2-F | Yes | No | No | No | No | Yes |
| A2-E | Yes | Yes | Yes | Yes | No | No |
| A2-M | Yes | Yes | No | No | Yes | No |
| A2-U | Yes | Yes | Yes | No | No | No |
| A2-L | Yes | No | No | No | No | No |

Applications

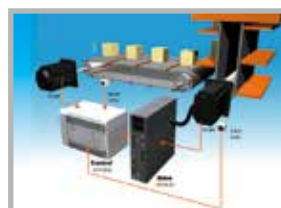
Filling and bottling equipment, feeding machines, lathes, electric discharge machines (EDM), woodworking machines, wire cutting machines, packaging machines, printing machines, textile equipment



Food Packaging Machines



Wire Cutting Machines



High-speed Labeling Machines



Feeding Machines

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



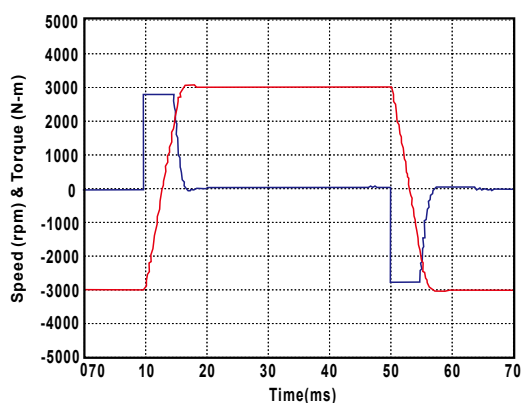
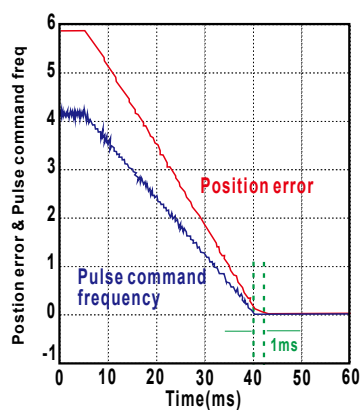
Electric Discharge
Machines (EDM)



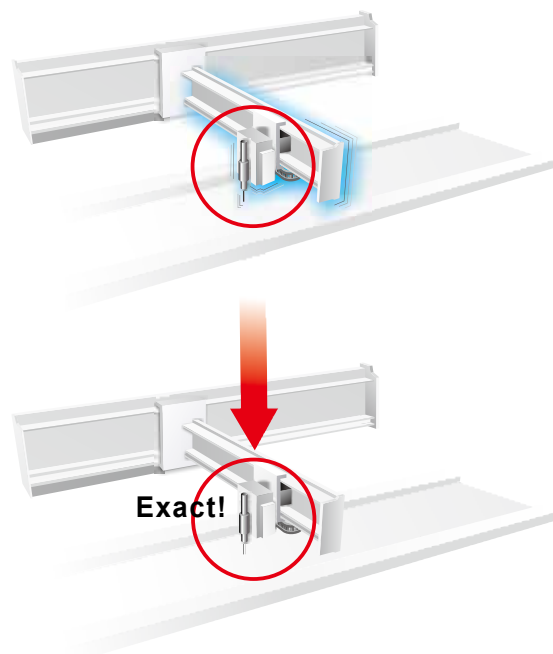
Cutting Machines

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

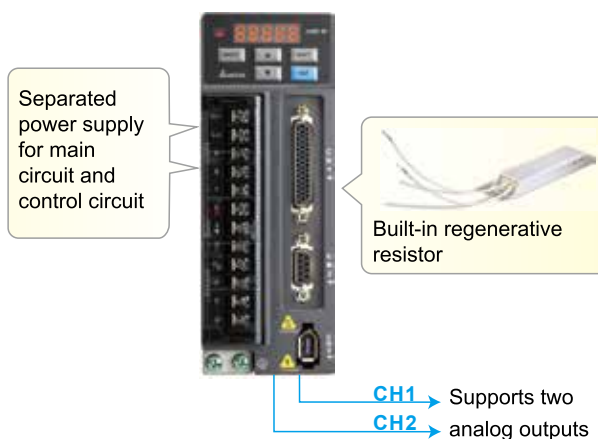
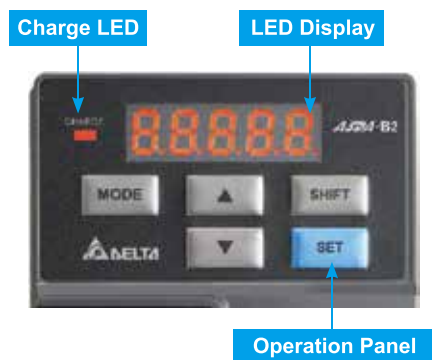


- ▶ Three auto notch filters are provided to suppress mechanical resonance efficiently



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



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

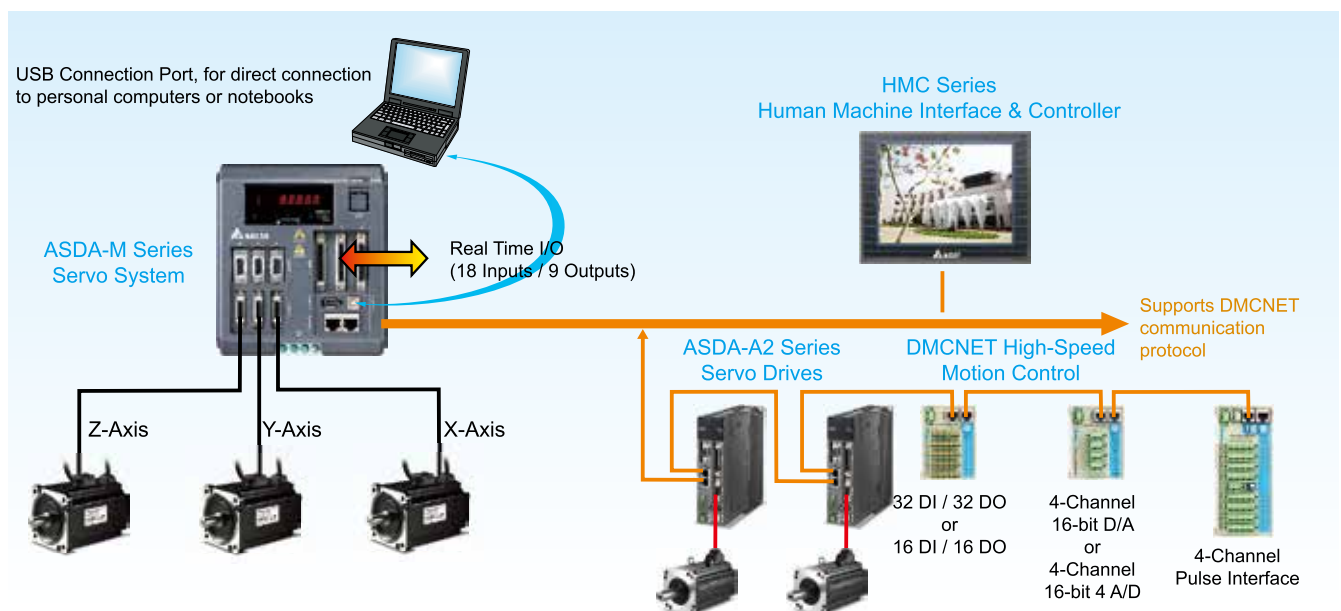
High Precision, High Performance Servo Motors

- ▶ Supports incremental type and absolute type encoders
- ▶ Incremental type encoder provides up to 1280000 p/rev resolution for high-precision positioning



Product Line-up

| 750 W | 1.5 kW | 2.0 kW |
|---------------|------------------|-----------------|
| | | |
| 100 W ~ 750 W | 0.75 kW ~ 1.5 kW | 1.0 kW ~ 2.0 kW |
| | | |

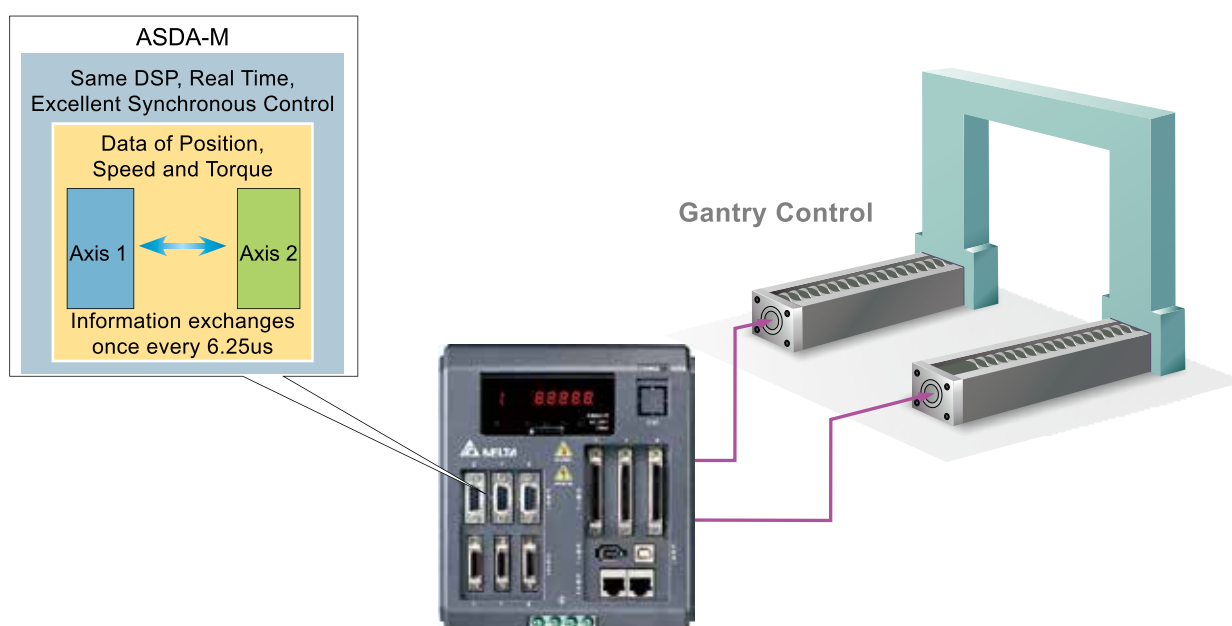


Real Time, Reliable and High-Speed Motion Control Network

- ▶ Supports DMCNET or CANopen communication protocol
- ▶ With the aid of Delta's Human Machine Interface & Controller (HMC), it can establish an integrated system configuration by DMCNET
- ▶ Supports DMCNET extension digital input and output modules

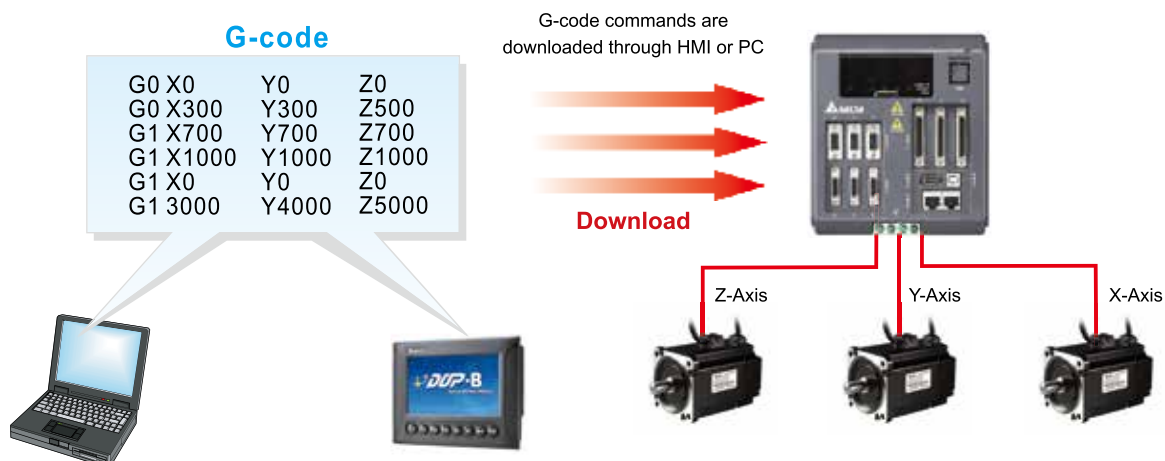
Advanced Gantry Control

- ▶ 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



Delta 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 ASDA A2-E follows in the footsteps of the successful ASDA A2 series. This new A2-E supports all the modes of the CoE device profile based on CiA402, and all command types of EtherCAT.

In addition to the EtherCAT communication function, 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 fields. This series covers a wide range of rated power to drive the 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 Input (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

Third Party Controllers



EtherCAT[®]



Metal Working Machines



Woodworking Machines



Food Processing

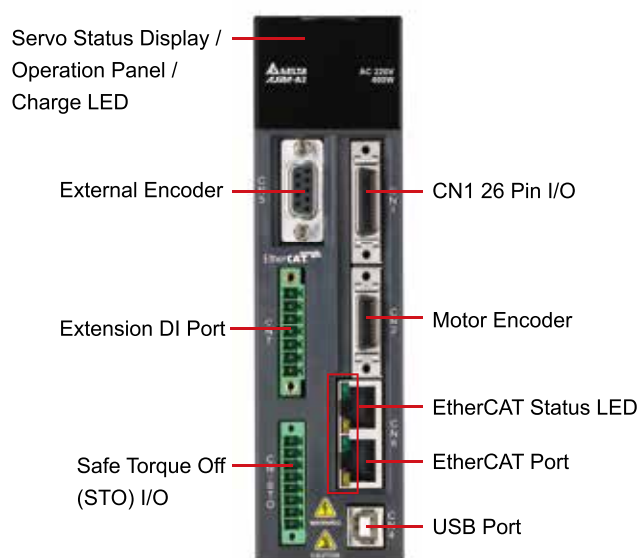


Printing Machines

■ Communication Specifications

| | |
|-------------------------|--|
| Physical Layer | IEEE802.3u (100 BASE-TX) |
| 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 supported. |
| 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



■ Accessories for ASDA A2-E

| | | |
|-------------|---|---|
| Part Number | ASD-CN5C0026 |  |
| Description | CN1 connector | |
| Part Number | ASD-CNFS0808 |  |
| Description | Pack of connectors used for STO wiring, 8 pcs of connectors in one pack | |



Delta High-Speed Motion Control System

DMCNET

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

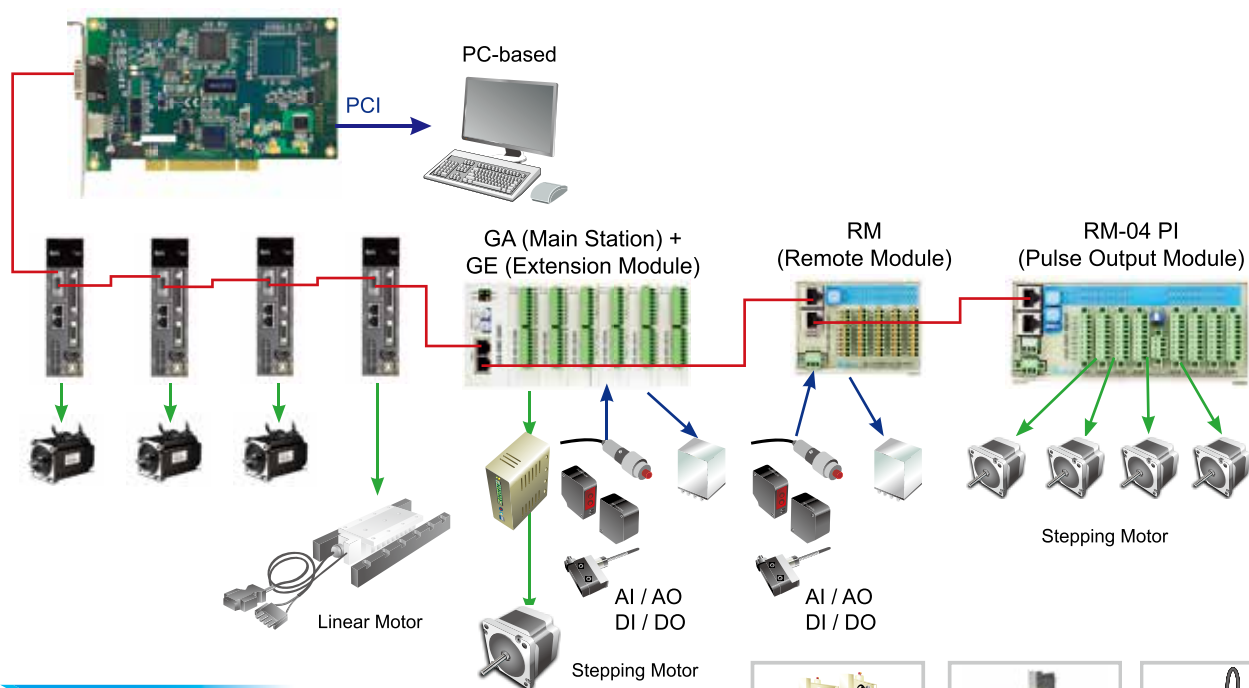
Delta's DMCNET motion control card provides high performance and extended functions for multi-axis motion control. It is capable of controlling up to 12 units of ASDA-A2-F series AC servo drives and motors within 1 ms simultaneously.

It also supports various motion control modules (linear interpolation, arc interpolation, helical interpolation and continuous interpolation). A complete DMCNET motion control structure can satisfy a variety of requirements for automated 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.

■ Mix Motion & I/O NET System Configuration

► PCI-DMC-B01 (12 Axes)

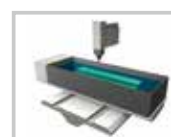


Applications

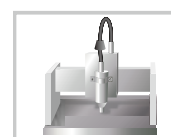
Electronic components processing, printing machines, woodworking machines, discharge machines, adhesive machines, tube bending machines



Woodworking Machines

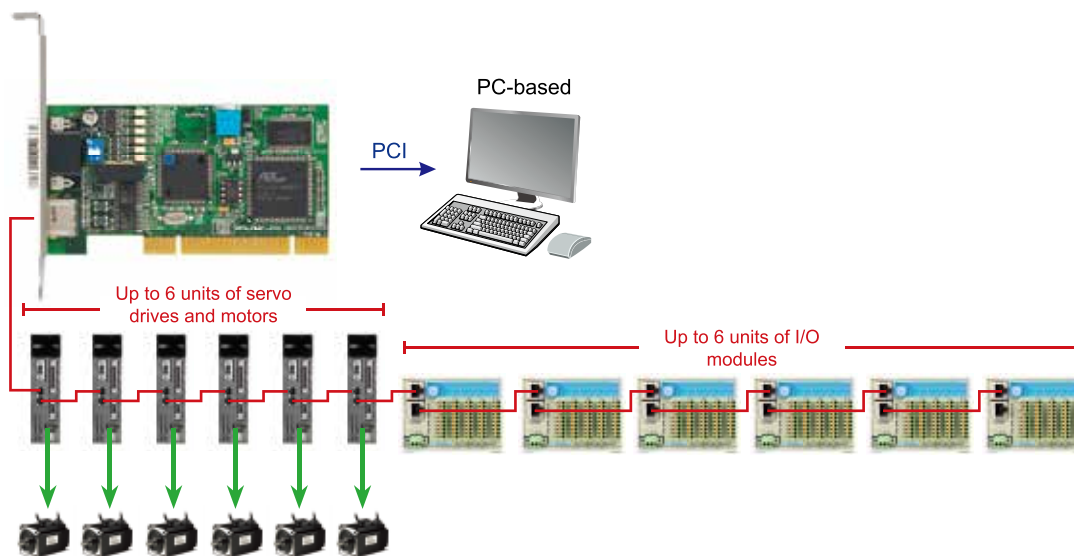


Discharge Machines

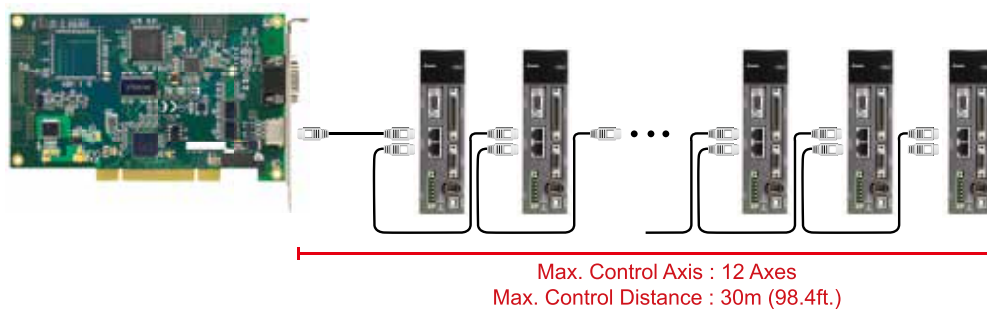


Adhesive Machines

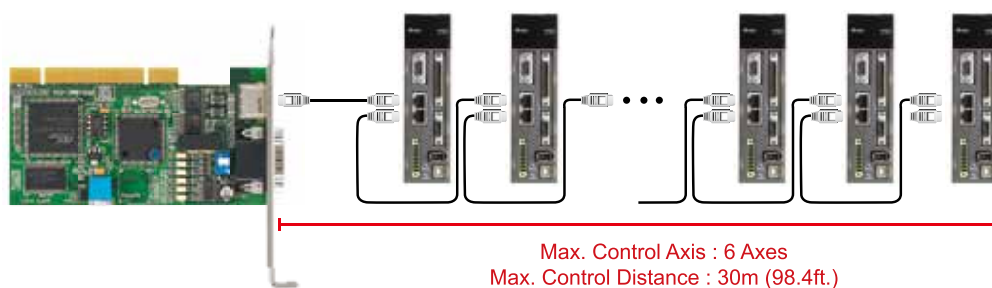
► PCI-DMC-F01 (6 Axes)



► PCI-DMC-B01 (12 Axes)



► PCI-DMC-F01 (6 Axes)



■ Synchronous Control

Simultaneous 3-axis linear interpolation, 2-axis arc interpolation, 3-axis helical interpolation and continuous interpolation can be implemented.

DMCNET is a motion control communication network which is able to update data every 1 ms and offer the ability to control 12 units of servo systems or 4 groups, 3-axis interpolation algorithm synchronously. It is also capable of transferring the data of 12 units of servo motors, or 768 digital inputs and outputs within 1 ms simultaneously.

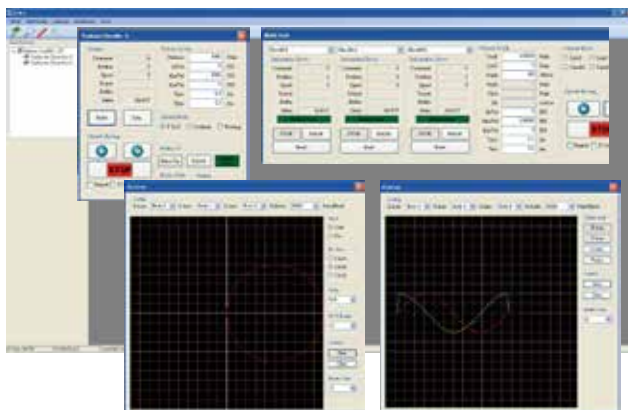
Programmable Automation Controller (PAC)

MH1-S30E-A11

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



- ▶ **Robust Hardware:** 1.2 GHz dual-core 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, 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



- ▶ **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

Motion

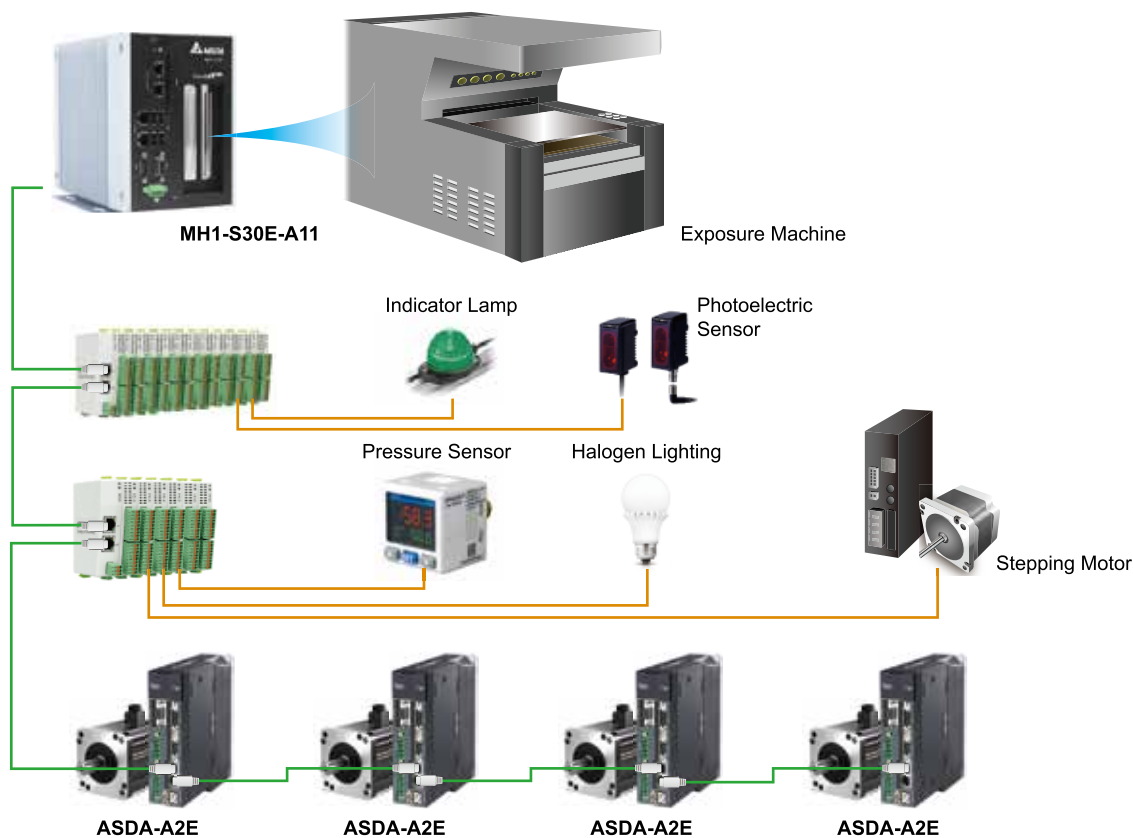
- Built-in EtherCAT and DMCNET
- Enables up to 64 axes of control via EtherCAT or up to 12 axes of servo system units via DMCNET
- Connects max. 100 units of EtherCAT slave modules or 24 units of DMCNET slave modules
- Electronic Cam (E-Cam) function
- Linear, arc and high-speed continuous interpolation
- Multi-axis motion control and PLC tasks on one PAC platform

Software

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

Applications

Exposure machines, laser engraving, frame cutting, robot arms, five-axis CNC machine tools



Centralized Slave Module

Bus Adapter Type Module

ESC-5500

EtherCAT to E-BUS power module



Motion Type Module

ESC-5621

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



Digital Input Type Module

ESC-6002/ESC-6012/ESC-6022/ESC-6032

16 digital inputs, sink / source type
The available models are listed below for different response-time requirements:

- ESC-6002: < 0.1ms
- ESC-6012: 1ms
- ESC-6022: 2ms
- ESC-6032: 3ms



Digital Output Type Module

ESC-7062

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



ADC Type Module

ESC-8124

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



DAC Type Module

ESC-9144

4 channels 16-bit D/A control module
Voltage output: $\pm 5V$, $\pm 10V$, $0 \sim 5V$, $0 \sim 10V$
Current output: $0 \sim 20 mA$, $4 \sim 24 mA$, $0 \sim 24 mA$



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 control system and satisfies high-precision requirements.

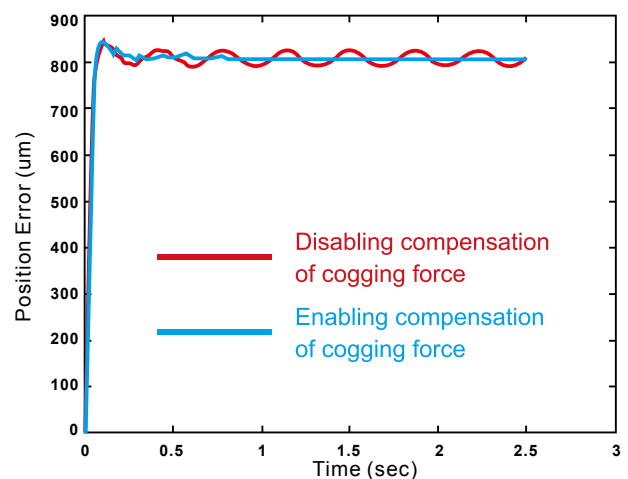
The ASDA-A2R follows in the footsteps of Delta's successful servo system and provides the same functions such as high-speed and high response performance, excellent vibration and resonance suppression, versatile PR mode, DMCNET and CANopen communication interfaces, built-in E-Cam and gantry control functions.

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 increase positioning resolution for precise position control
- ▶ Detection and compensation of cogging force

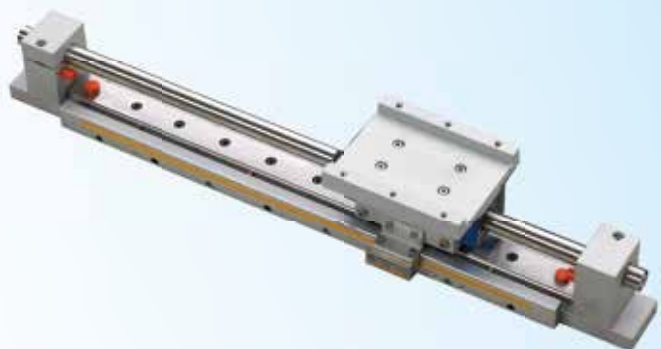


Ironless Linear Motor

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

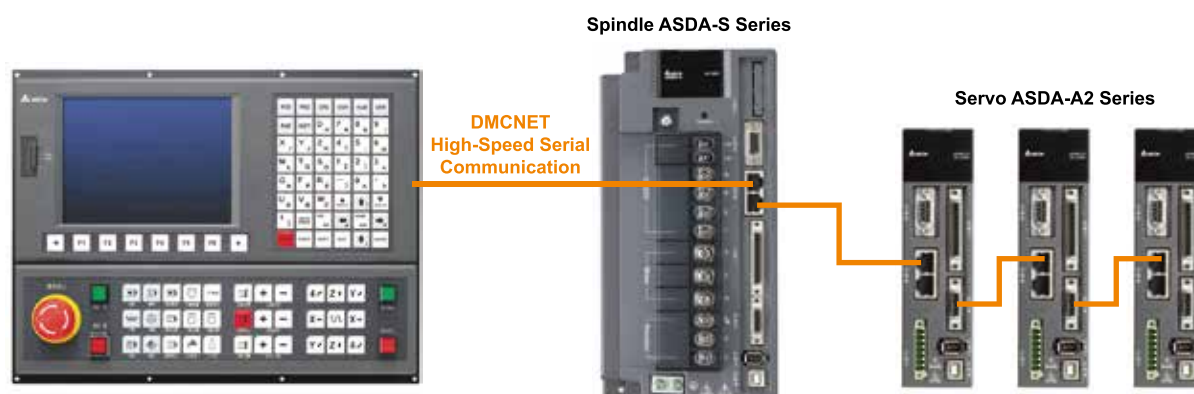


Spindle Motor Drive ASDA-S

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 communication



IPM Spindle Motor ECMS

Power range: 3.7 kW / 5.5 kW / 6.7 kW

- ▶ Encoder resolution: 13-bit
- ▶ Max. torque: 14.72 N-m / 21.88 N-m / 26.65 N-m
- ▶ Speed range: 6000 r/min~12000 r/min
- ▶ Options: Coolant through spindle
- ▶ IP degree: IP54





CNC Solution

Integrated Total Solutions for the Machine Tool Industry

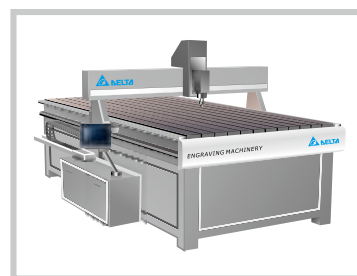


- ▶ Features a built-in 32-bit high speed and high processing dual CPU that can construct a real-time and multi-functional control center
- ▶ With the aid of Delta's high-speed servo and spindle systems, high-quality digital data transmission can be achieved and noise suppression is enhanced
- ▶ Provides 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 support and allows users to build custom screens for user-defined operation
- ▶ Capable of connecting serial digital I/O modules that has greatly improved the extension capacity

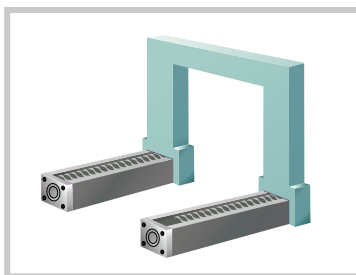
Applications



**CNC Machining Centers,
High-speed Tapping Machines**



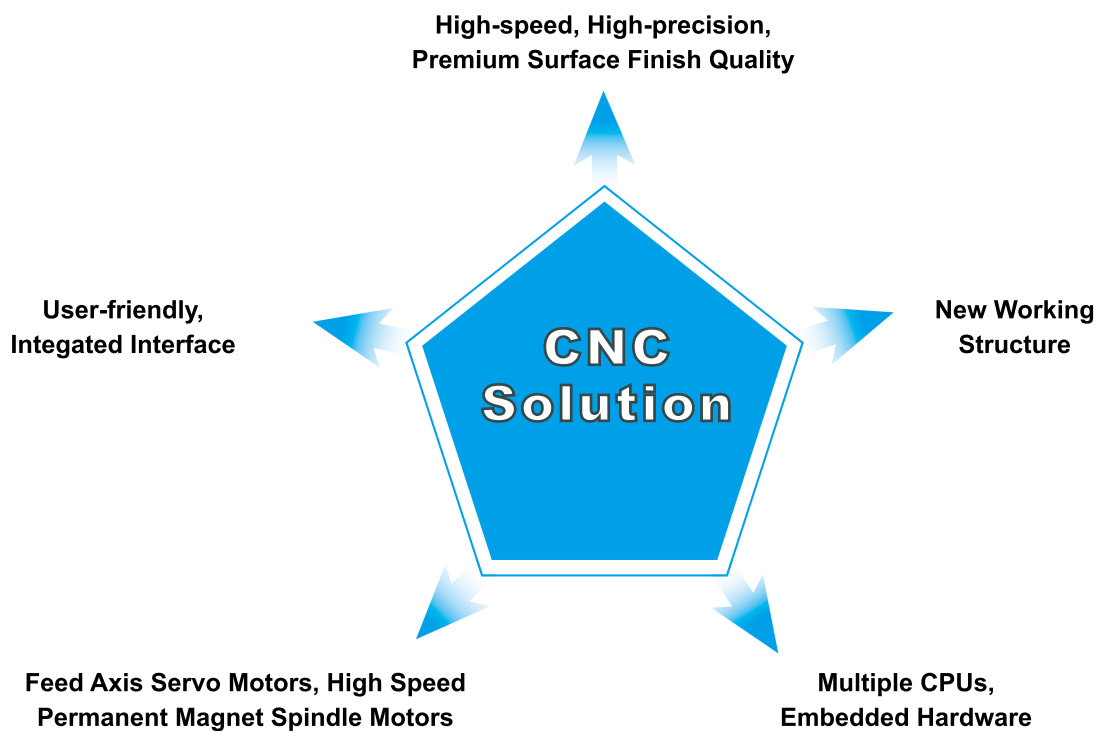
Engraving Machines



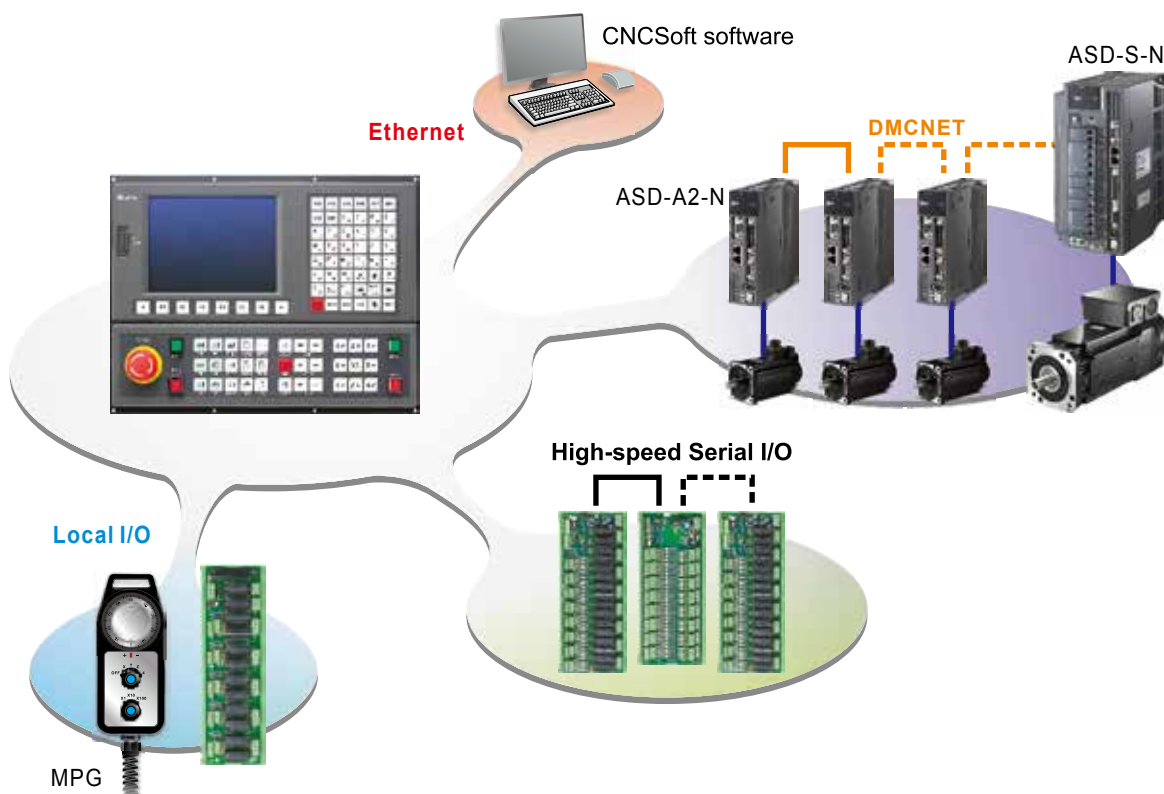
CNC Gantry Control Machines



CNC Woodworking Machines



■ System Configuration



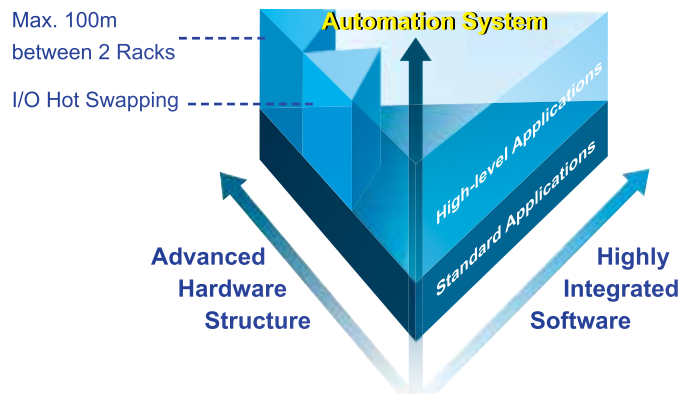


High Performance Mid-range PLC AH500 Series

The Smart Solution for High End Machinery
and System Integration



**Modularized Hardware Structure, Highly
Integrated Software**



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

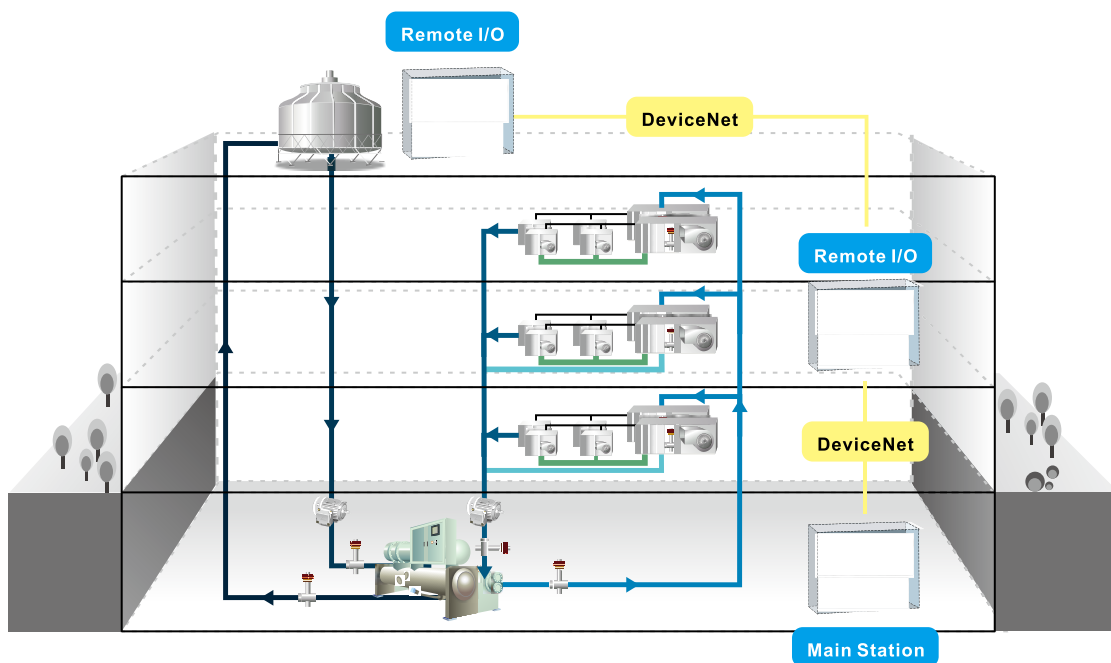
< **Enhanced flexibility: Max. 100m between 2 local extension racks**

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

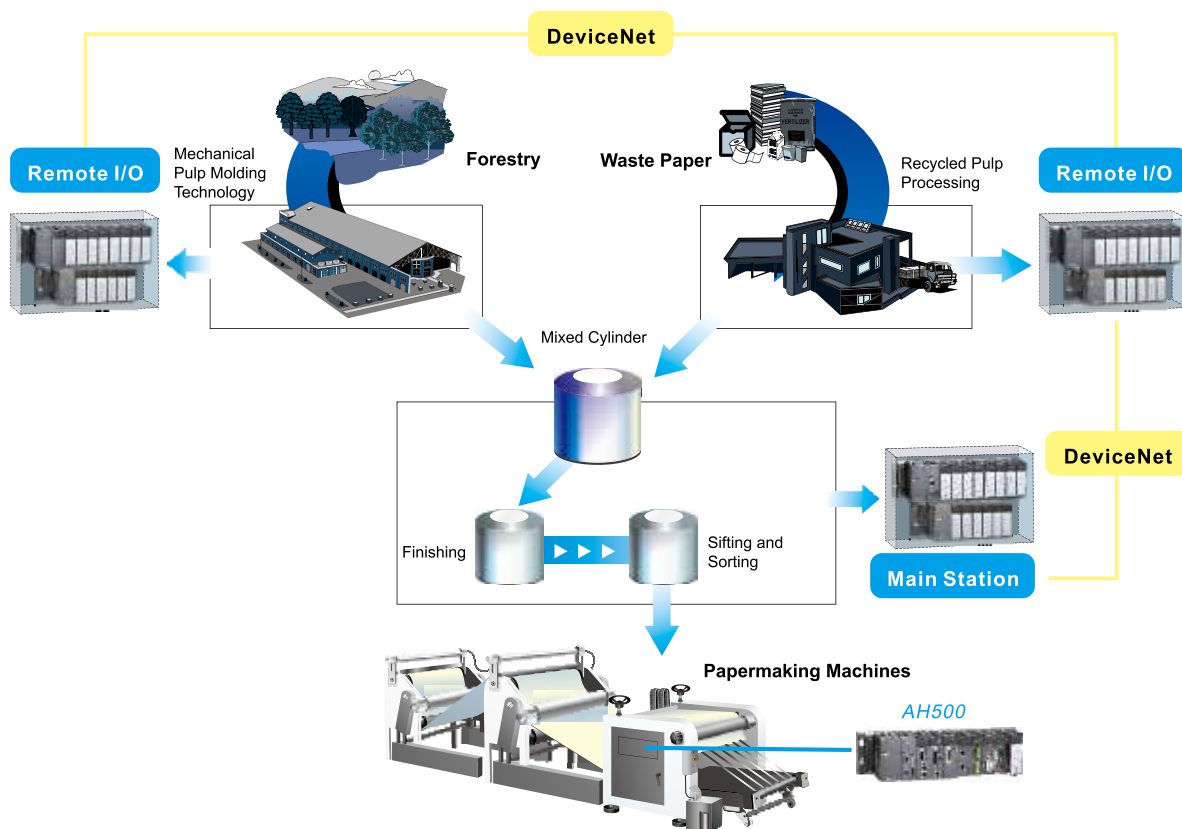
- ▶ Utilizes dual-core multi-tasking processor
- ▶ Excellent program execution speed: 0.3ms / 1k steps
- ▶ Max. I/O points:
DIO: Max. 4,352 points
AIO: Max. 544 channels
RIO: Max. 125,440 digital points / 3,920 analog channels
- ▶ Program capacity: Max. 256k steps
- ▶ Data register: Max. 64k words
- ▶ 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 Applications

■ HVAC



■ Papermaking Industries

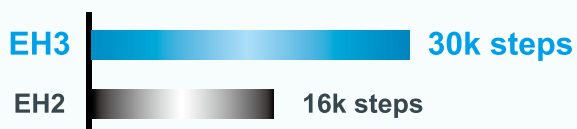


High Performance PLC

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



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



DVP-FEN01

■ Analog Input/Output



DVP-F2AD
DVP-F2DA

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
It 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
- ▶ Higher execution speed compared to the competition:
LD: 0.35μs, MOV: 3.4μs
- ▶ High efficient processing ability: 1k steps of programs can be completed within 1ms
- ▶ Max. 100kHz pulse control. Specific motion control instructions such as mark/masking and in frequency changing are available for multi-axes applications
- ▶ Up to 4-level password protection protects your source programs and intellectual property



reddot design award
winner 2010

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
- ▶ Higher execution speed compared to the competition:
LD: 0.64μs, MOV: 2μs
- ▶ Built-in Ethernet supports MODBUS TCP and EtherNet/IP
- ▶ 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)

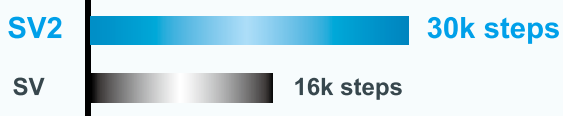


High Performance Slim PLC

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



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

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



2nd Generation Standard Slim PLC

DVP-SS2

Economic and Compact PLC. Max. 480 I/O points

- ▶ Program capacity: 8k steps/Data register: 5k words
- ▶ Higher execution speed compared to the competition: 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
- ▶ Higher execution speed compared to the competition: 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
- ▶ Higher execution speed compared to the competition: LD: 0.35μs, MOV: 3.4μs
- ▶ Built-in mini USB, RS-232 and RS-485 ports (Master/Slave)
- ▶ 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



CANopen Motion Controller

DVP-MC

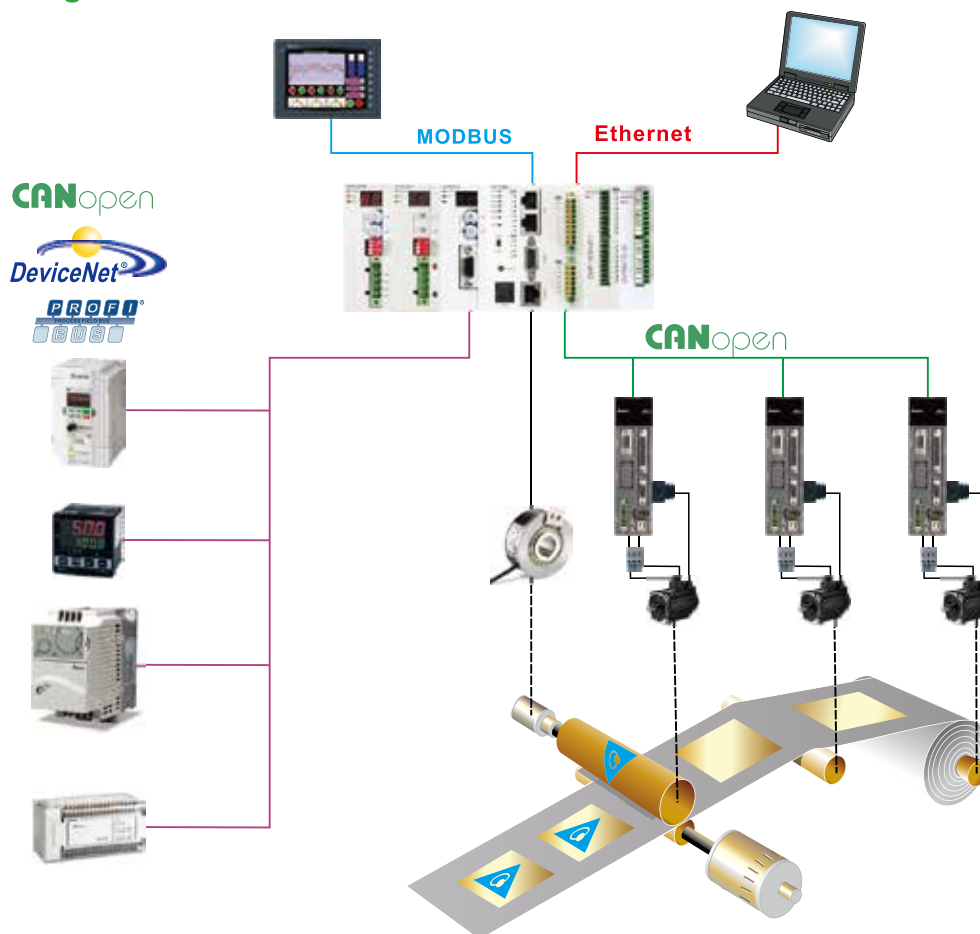
High Speed, High Precision Motion Control Brings Out the Maximum in Performance

- 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
- ▶ Higher execution speed compared to the competition:
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 frequency 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



Text Panels for Stability and Durability in Various Conditions

Standard 4 Line Text Panels TP04G-AL-C / TP04G-AL2

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



Basic 2/4 Line Text Panels TP02G-AS1 / TP04G-AS2

- ▶ STN-LCD size: 2.8" (TP02G), 3.0" (TP04G)
- ▶ Resolution: 160 x 32 dots (TP02G), 128 x 64 dots (TP04G)
- ▶ Built-in 256kB flash memory
- ▶ TP02 provides 16 user-defined function keys
- ▶ TP04 provides 12 user-defined function keys
- ▶ TP02 supports RS-232 and RS-485 COM ports
- ▶ TP04 supports RS-232 and RS-422/485 COM ports
- ▶ Password protection function available





Standard Numeric Entry 4 Line Text Panel TP04G-BL-C

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



Standard Numeric Entry 4 Line Text Panel PLC (Built-in DIO/AIO) TP04P

- ▶ 4.1" STN-LCD
- ▶ 0~9 numeric keys and user-defined function available
- ▶ Integrates PLC and TP in one machine
- ▶ Program capacity: 8K steps / Data register: 5K words
- ▶ 2 built-in sets of RS-485 communication ports
- ▶ Economical models
(16DI/16DO, 8DI/8DO, 8DI/8DO/4AI/2AO, 8DI/8DO/2PT/2AI/1AO) Suitable for smaller machines



Multifunction 8 Line Text Panel 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-422/485 COM ports
- ▶ Supports recipes and macro functions



High Color, High Resolution Human Machine Interfaces



4.3-inch High Color, High Resolution, Widescreen DOP-B03S(E)211

- ▶ 4.3" 16:9 widescreen, 65536 colors TFT
- ▶ Display Resolution: 480 x 272 pixels
- ▶ Supports Ethernet
- ▶ USB for high-speed data transfer (USB Client)
- ▶ USB for direct connection to USB disk, printer, mouse and keypad (USB Host)



5.6-inch Standard High Color DOP-B05S111

- ▶ 5.6" 65536 colors TFT
- ▶ Display Resolution: 320 x 234 pixels
- ▶ USB for high-speed data transfer (USB Client)
- ▶ USB for direct connection to USB disk, printer, mouse and keypad (USB Host)



Applications

All kinds of industrial monitoring systems,
e.g. HVAC, printing machines, exposure machines,
and other monitoring equipment for production management



reddot design award
winner 2010



»» DOP-B series

7-inch

High Color, High Resolution, Widescreen

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 for high-speed data transfer (USB Client)
- ▶ Supports audio output interface (mp3, wav files)
- ▶ USB for direct connection to USB disk, printer, mouse and keypad (USB Host)



7-inch

High Color, Widescreen, Professional Type

DOP-B07PS415

- ▶ 7" 16:9 widescreen, 65536 colors TFT
- ▶ Display Resolution: 800 x 480 pixels
- ▶ Supports SDHC card
- ▶ USB for high-speed data transfer (USB Client)
- ▶ Supports audio output interface (mp3, wav files)
- ▶ Supports Electronic Cam (E-Cam) download function (ASDA-A2)
- ▶ Supports G-Code download function (DVP10MC / DVP20PM)
- ▶ USB for direct connection to USB disk, printer, mouse and keypad (USB Host)



7-inch

High Color, Professional Type

DOP-B07PS515

- ▶ 7" 65536 colors TFT
- ▶ Display Resolution: 800 x 600 pixels
- ▶ Supports SDHC card
- ▶ USB for high-speed data transfer (USB Client)
- ▶ Supports audio output interface (mp3, wav files)
- ▶ Supports Electronic Cam (E-Cam) download function (ASDA-A2)
- ▶ Supports G-Code download function (DVP10MC / DVP20PM)
- ▶ USB for direct connection to USB disk, printer, mouse and keypad (USB Host)
- ▶ 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

High Color, High Resolution

DOP-B07S(E)515

- ▶ 7" 65536 colors TFT
- ▶ Display Resolution: 800 x 600 pixels
- ▶ USB for high-speed data transfer (USB Client)
- ▶ Supports audio output interface (mp3, wav files)
- ▶ USB for direct connection to USB disk, printer, mouse and keypad (USB Host)
- ▶ 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

High Color, High Resolution

DOP-B08S(E)515

- ▶ 8" 65536 colors TFT
- ▶ Display Resolution: 800 x 600 pixels
- ▶ USB for high-speed data transfer (USB Client)
- ▶ Supports audio output interface (mp3, wav files)
- ▶ USB for direct connection to USB disk, printer, mouse and keypad (USB Host)
- ▶ Supports Ethernet
- ▶ Supports SDHC card



10.1-inch

High Color, High Resolution, Widescreen

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 for high-speed data transfer (USB Client)
- ▶ Supports audio output interface (mp3, wav files)
- ▶ USB for direct connection to USB disk, printer, mouse and keypad (USB Host)
- ▶ Supports Ethernet
- ▶ Supports SDHC card



10.4-inch

High Color, High Resolution

DOP-B10S511 / DOP-B10E515

- ▶ 10.4" 65536 colors TFT
- ▶ Display Resolution: 800 x 600 pixels
- ▶ Supports audio output interface (mp3, wav files)
- ▶ USB for direct connection to USB disk, printer, mouse and keypad (USB Host)
- ▶ Supports Ethernet
- ▶ Supports SDHC card



»» HMC series

Optimum Combination of Display and Controller Controller with Human Machine Interface

7-inch Handheld Type HMC07-N500H52

- ▶ 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 interface (mp3, wav files)
- ▶ USB for direct connection to USB disk, printer, mouse and keypad (USB Host)



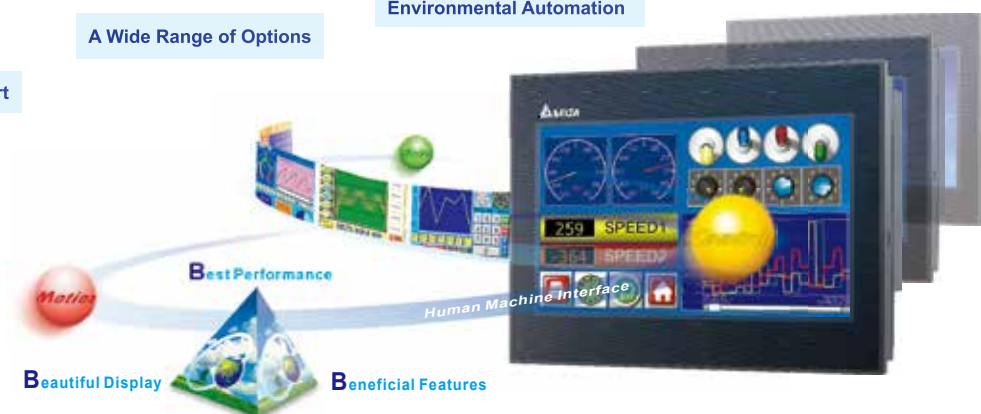
8-inch Standard Type HMC08-N500S52

- ▶ 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 interface (mp3, wav files)
- ▶ USB for direct connection to USB disk, printer, mouse and keypad (USB Host)

High Quality
Full-Color DisplayEnergy Saving
Environmental Automation

A Wide Range of Options

Powerful Controller Drivers Support



Industrial Ethernet

Matched to Maximize
State-of-the-art Industrial Network Communication



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/v2/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 aluminum metal case. -40°C ~ 75°C operating temperature
- ▶ UL508, IEC 61131-2, CE & FCC certified.



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
- ▶ IEEE 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. -40°C ~ 75°C operating temperature
- ▶ UL508, IEC 61131-2, CE & FCC certified.



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. -40°C ~ 75°C operating temperature
- ▶ UL508, IEC 61131-2, CE & FCC certified.



SFP Fiber Transceiver

LCP-GbE Series

- ▶ 1-port GbE, compliant with IEEE 802.3z
- ▶ Full duplex operation
- ▶ DDM diagnosis function enhances transmission quality
- ▶ Duplex LC connector interface. Hot-Pluggable for maximum flexibility
- ▶ Metal case. -40°C ~ 85°C 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. -40°C ~ 85°C 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. -40°C ~ 75°C wide operating temperature.
- ▶ UL 508, IEC 61131-2, CE, FCC & SRRC certified.



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



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



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



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








DeviceNet Master Module

DVPDNET-SL

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



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




Impedance to Noise with a Range of Fieldbus Converters




USB Converters

| | | |
|---|---|---|
|  | <p>IFD6500 USB to RS-485 Converter</p> | <ul style="list-style-type: none"> ▶ Max. 115.2kbps ▶ No external power supply required ▶ Auto-detects the direction of data flow ▶ A portable USB device |
| | <p>IFD6503 USB to CAN Converter</p> | <ul style="list-style-type: none"> ▶ Extracts CAN messages (incl. standard and extended frames), decodes and displays following DeviceNet and CANopen protocols ▶ Filters by set conditions ▶ Sends CAN messages, 1 message by manual mode, 8 messages by auto mode ▶ Max. 1Mbps ▶ A portable USB device |
| | <p>IFD6530 USB to RS-485 Converter</p> | <ul style="list-style-type: none"> ▶ Offers 9V power supply, supports keypad (KPC-CC01) for C2000 series AC motor drive in conducting parameter storage and page editing ▶ Max. 115.2kbps ▶ No external power supply required ▶ Auto-detects the direction of data flow ▶ A portable USB device |

MODBUS Serial Converters

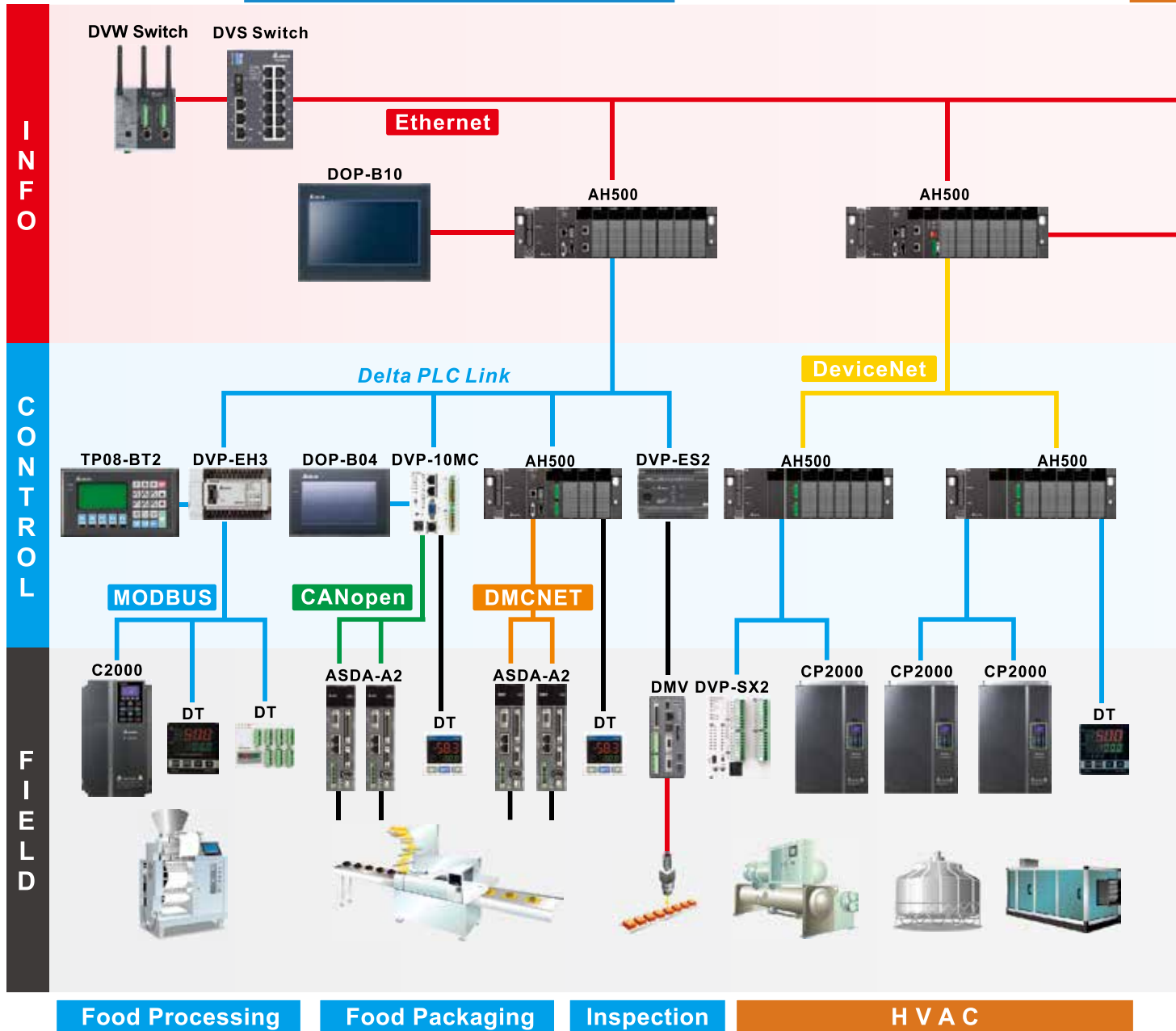
| | | |
|---|----------------|--|
|  | IFD8500 | <ul style="list-style-type: none"> ▶ RS-232 to RS-422/485 isolated converter |
| | IFD8510 | <ul style="list-style-type: none"> ▶ RS-422/485 fully isolated signal repeater ▶ Extends RS-422/485 transmission to 1.2km and connectable to 32 RS-485 devices |
| | IFD8520 | <ul style="list-style-type: none"> ▶ RS-232 to RS-422/485 addressable isolated converter ▶ Connects RS-232 to RS-422/485 by setting up MODBUS address |

Industrial Network Converters

| | | |
|---|---|--|
|  | IFD9502 DeviceNet to MODBUS Converter | <ul style="list-style-type: none"> ▶ 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 to MODBUS Converter | <ul style="list-style-type: none"> ▶ 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 to MODBUS Converter | <ul style="list-style-type: none"> ▶ 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 to MODBUS Converter | <ul style="list-style-type: none"> ▶ 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



Food Processing

Food Packaging

Inspection

H V A C

Ethernet

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

CANopen

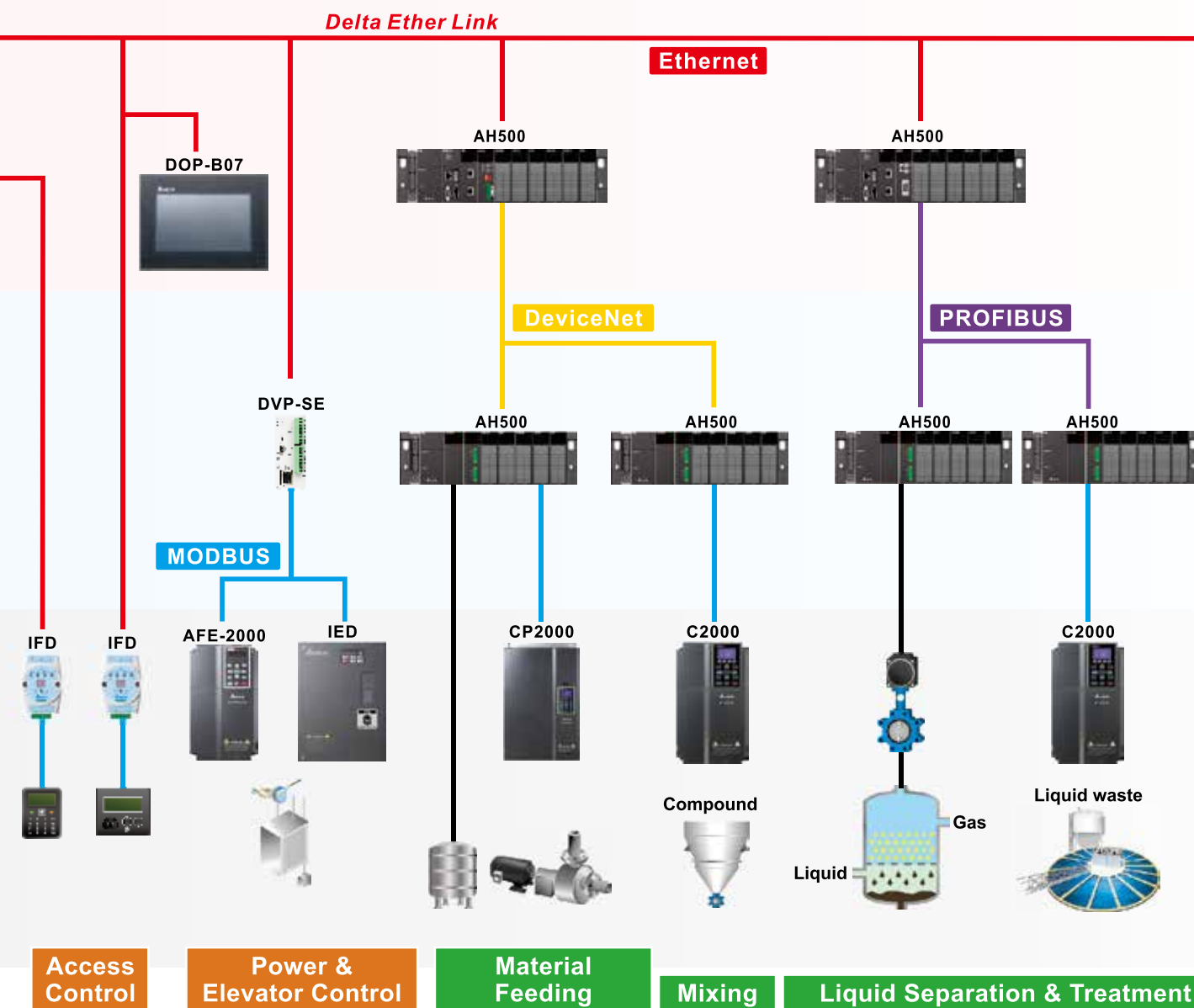
Delta CANopen products support CANopen DS301 and DSP402 protocols, and are able to achieve multi-axis, high-speed and complex motion control with max. speed 1Mbps.

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



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





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 and PMC series power supplies offer a nominal output voltage of DC 24V/12V, a wide temperature range from -20 to +75°C and 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

| | | | | |
|--|--|--|---|--|
| <div>DVP-PS01/02/05</div> <div>24W/48W/120W, DC24V 1-phase, White Plastic Case</div> <div></div> | <div>DRP024V060W1BA</div> <div>60W, DC24V, 1-phase Aluminum Case, Removable Terminal Block</div> <div></div> | <div>DRP024V120W1BA</div> <div>120W, DC24V, 1-phase Aluminum Case, Removable Terminal Block</div> <div></div> | <div>DRP024V240W1BA</div> <div>240W, DC24V, 1-phase Aluminum Case, Removable Terminal Block</div> <div></div> | |
| <div>DRP024V060W1AZ</div> <div>60W, DC24V, 1-phase Black Plastic Case</div> <div></div> | <div>DRP024V060W1AA</div> <div>60W, DC24V, 1-phase Aluminum Case</div> <div></div> | <div>DRP024V120W1AA</div> <div>120W, DC24V, 1-phase Aluminum Case</div> <div></div> | <div>DRP024V240W1AA</div> <div>240W, DC24V, 1-phase Aluminum Case</div> <div></div> | <div>DRP024V480W1AA</div> <div>480W, DC24V, 1-phase Aluminum Case</div> <div></div> |
| <div>DRP024V060W3AA</div> <div>60W, DC24V, 3-phase Aluminum Case</div> <div></div> | <div>DRP024V120W3AA</div> <div>120W, DC24V, 3- phase Aluminum Case</div> <div></div> | <div>DRP024V240W3AA</div> <div>240W, DC24V, 3-phase Aluminum Case</div> <div></div> | <div>DRP024V480W3AA</div> <div>480W, DC24V, 3-phase Aluminum Case</div> <div></div> | |

DC 12V DIN rail models

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

DC 24V panel mount aluminum-case models

| | | | | |
|--|---|--|--|--|
| PMC-24V035W1AA 35W, DC24V, 1-phase  | PMC-24V050W1AA 50W, DC24V, 1-phase  | PMC-24V075W1AA 75W, DC24V, 1-phase  | PMC-24V100W1AA 100W, DC24V, 1-phase  | PMC-24V150W1AA 150W, DC24V, 1-phase  |
| PMC-24V300W1BA 300W, DC24V, 1-phase  | PMT-24V035W1AA 35W, DC24V, 1-phase  | PMT-24V050W1AA 50W, DC24V, 1-phase  | PMT-24V350W1AA 350W, DC24V, 1-phase  | |

DC 12V panel mount aluminum-case models

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

DC 5V panel mount aluminum-case models

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



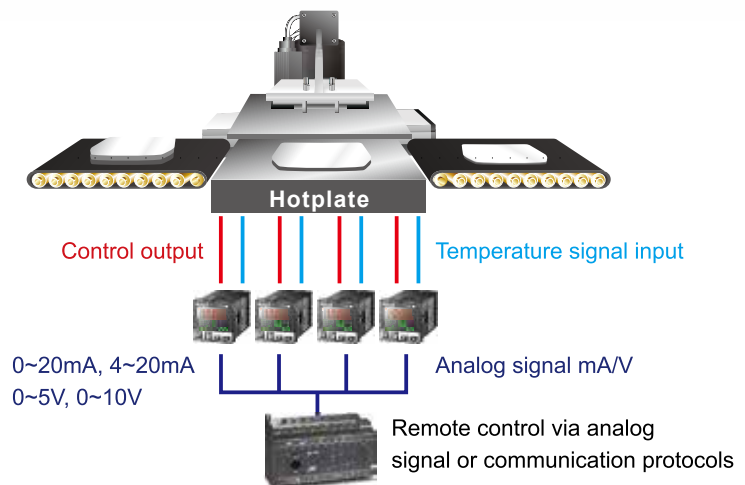
High Speed Intelligent Temperature Controller DT3

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



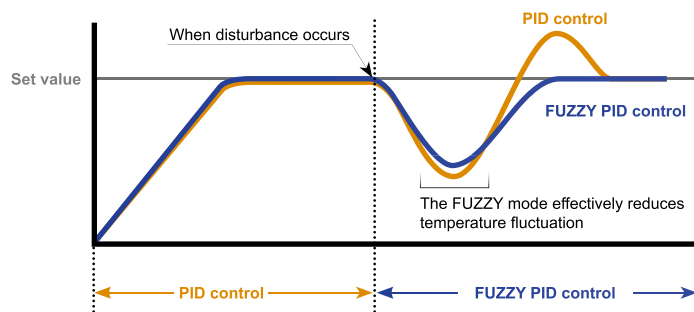
Remote Control

Sets DT3 temperature via analog output of host controller



Various Control Modes

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



User-defined Function Keys

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



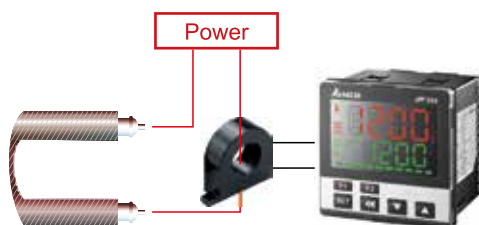
Large Tri-color LCD Display

The 1st Tri-color LCD temperature controller in Taiwan.



Heater Disconnection Detection

Measurable up to 100A

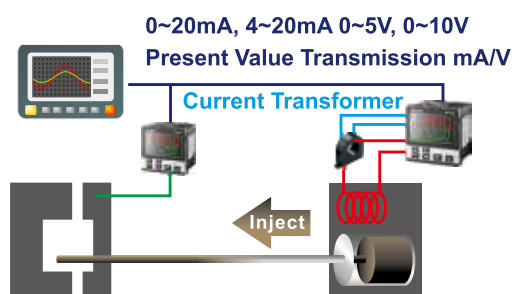


Point-to-Point Control (Proportional Output mA/V)

Sets the Present Value by point-to-point control

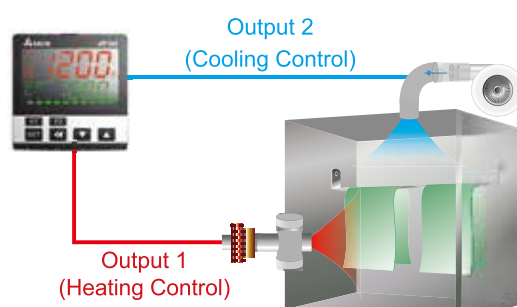


Retransmission Output



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



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

An Expert in Temperature Control

Delta All Series Smart Temperature Controller

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



Applications

Blower coil pipe in central air-conditioning systems, heating systems

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



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

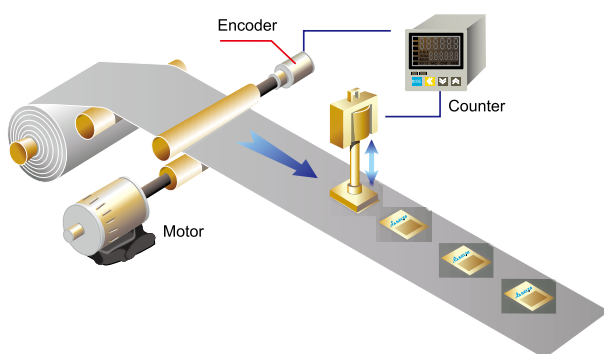
All in One

- ▶ 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

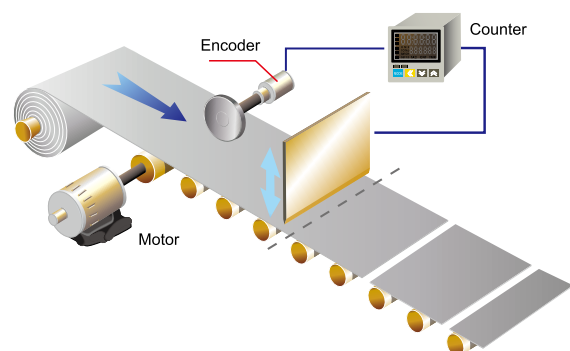


Applications

• Label Printing Machine



• Fixed Length Cutting Machine



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

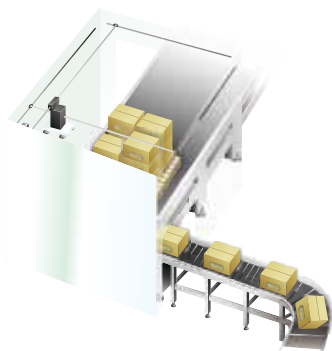


Applications

Machine processing industry, solar energy industry, food packaging industry, semiconductor industry, electronic component industry, automated assembly industry

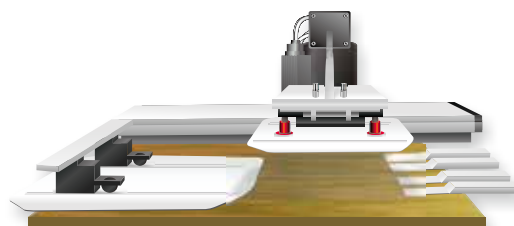
• Food Packaging Industry

Drinks, cans suction & packaging



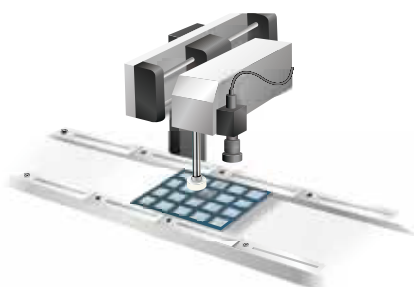
• Solar Energy Industry

Turnkey module lines



• Electronic Component Industry

IC component suction & detecting



• Automated Assembly Industry

Automated component assembly & detection





Machine Vision System DMV

Intelligent Human Visual Inspection System
for a Variety of Applications



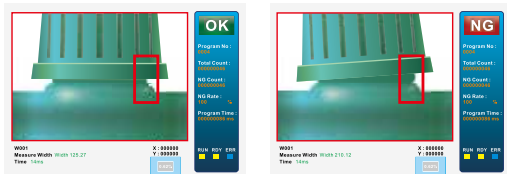
DMV System Features:

- ▶ 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

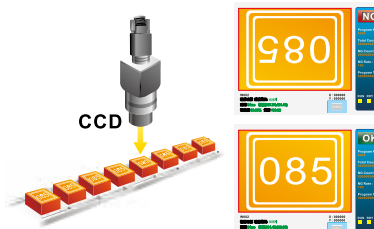
• Bottle Cap Position Identification

Identifies the bottle capping position



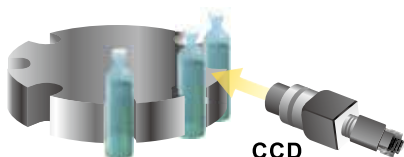
• Direction Identification

Inspects the direction of work pieces conveyed on a production line



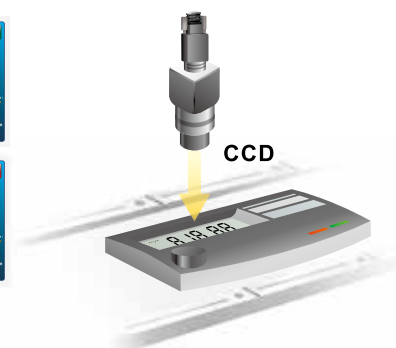
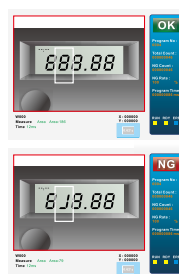
• Beverage Packing Inspection

Inspects the liquid level of each bottle



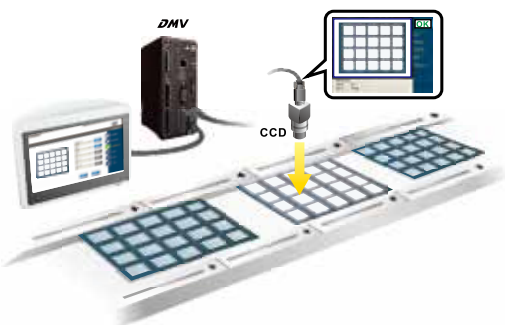
• Character Inspection

Inspects the characters on electronic devices



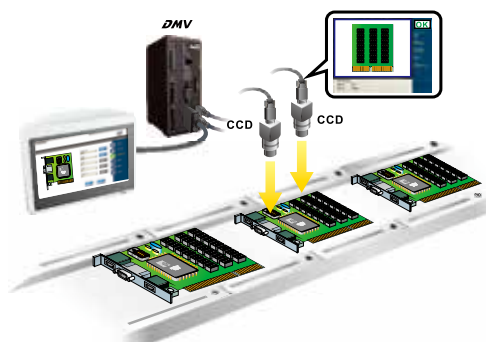
• Luminance Inspection

Inspects the luminance of LEDs



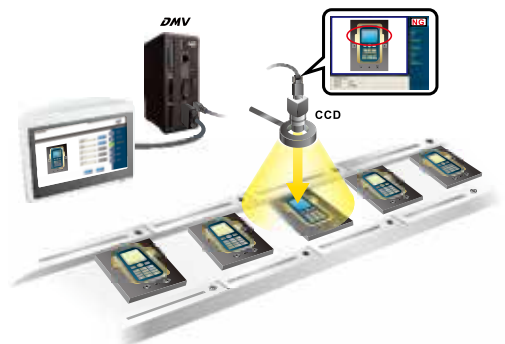
• Position Identification

Inspects the position of IC components on PCB boards



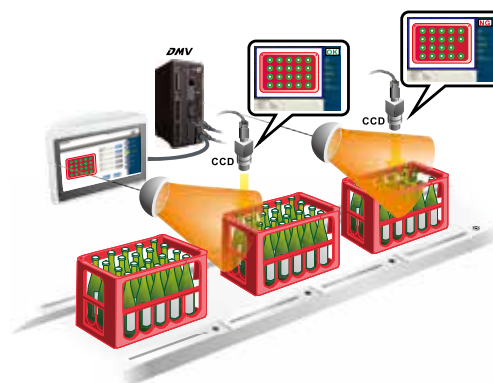
• Module Inspection

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



Global Operations

ASIA (Taiwan)



Taoyuan Technology Center (Green Building)



Taoyuan Plant 1



Taoyuan Plant (Diamond-rated Green Building)

ASIA (China)

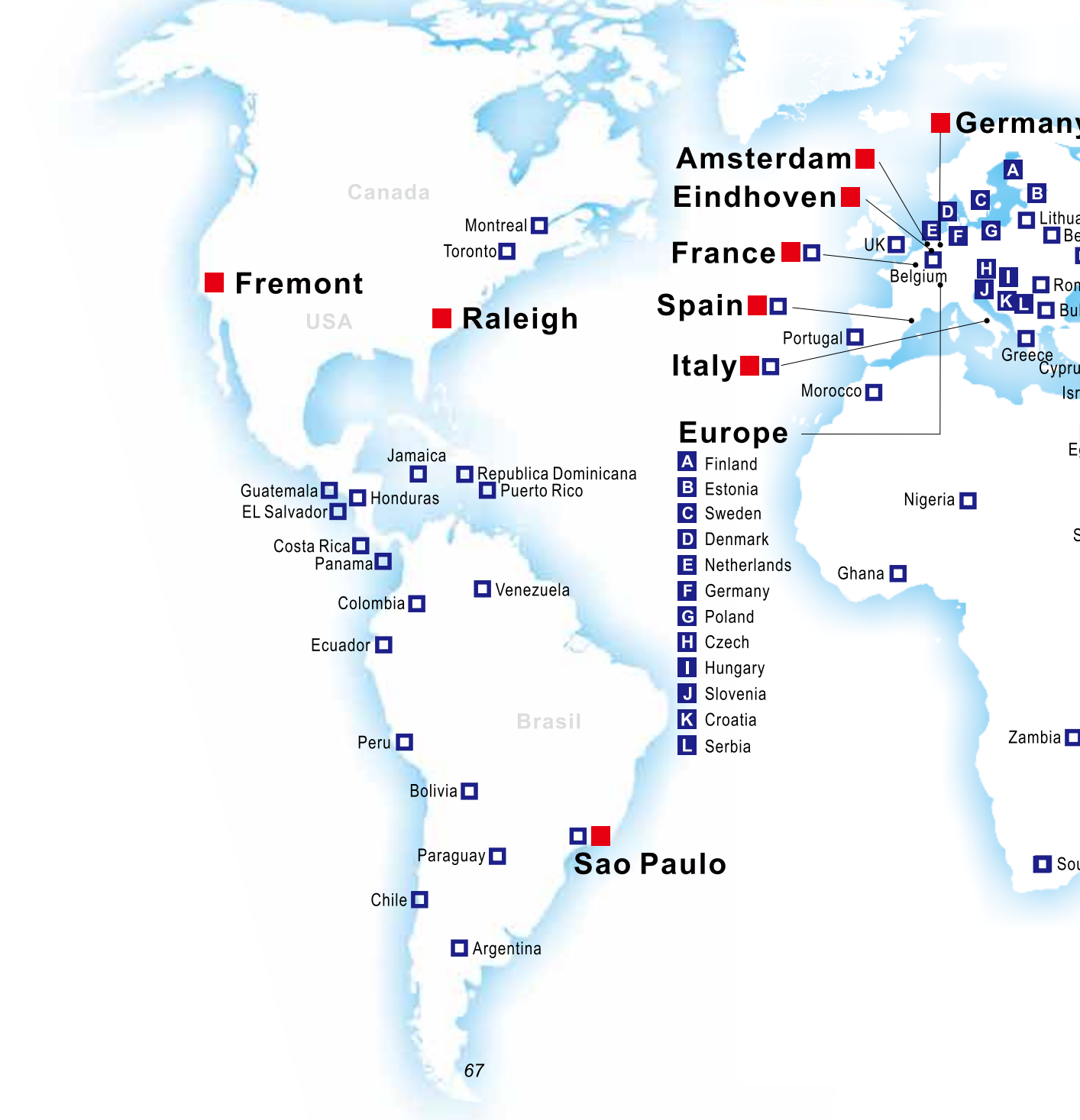


Wujiang Plant 3



Delta Electronics

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



ASIA (Japan)

Tokyo Office

ASIA (India)Rudrapur Plant
(Green Building)**EUROPE**

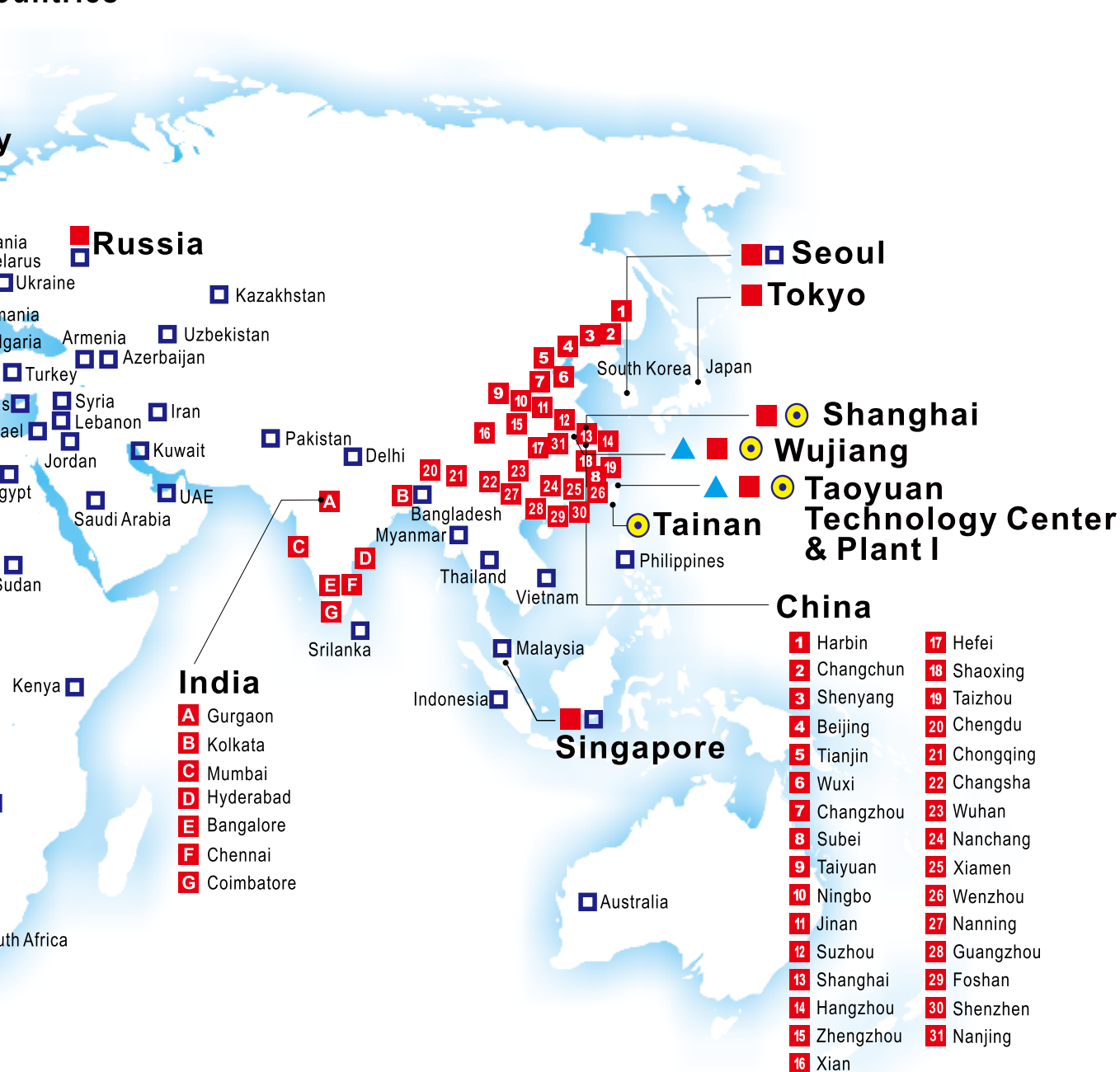
Amsterdam, Netherlands

AMERICA

Research Triangle Park

▲ Factories 2 ■ Branch Offices 64 ● R&D Centers 4 ■ Distributors 596

Countries



Leading the Future of Drive Technology

[illegible]



Smarter. Greener. Together.

Industrial Automation Headquarters

Delta Electronics, Inc.

Taoyuan Technology Center
No.18, Xinglong Rd., Taoyuan City,
Taoyuan County 33068, Taiwan
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, HSIIIDC
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 15, 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.