Automation for a Changing World

Delta Industrial Automation

2018 Full Range Catalogue

www.deltaww.com
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## AC Motor Drive

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## AC Servo Drives and Motors

AC Servo Drives
- ASDA-A3 **New**
- ASDA-A2
- ASDA A2-E
- ASDA-B2
- ASDA-M
- Spindle Motor Drive
  - ASDA-S
- IPM Spindle Motor
  - ECMS

### Actuators

Linear Motion Drive
- ASDA-A2R
- Ironless Linear Motor
  - ECML
- Linear Shaft Motor
  - ECML-S
- Linear Stages
  - LU
  - LA-S

### Gearboxes

Planetary Gearboxes
- PS / PA

### PC-Based Motion Controllers

PC-Based Motion Controllers (PAC)
- MH1 / MP1
- Delta High-Speed Motion Control System
  - DMCNET
- High-Speed Motion Control System **New**
  - EtherCAT

### CNC Solutions

Open CNC Solution **New**
- NC E
- CNC Solution
Robot Controller

Robot Controller with Servo Drive Integrated
ASDA-MS

Controller with Human Machine Interfaces

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

7-inch Controller with Handheld HMI
HMC08-N500S52

8-inch Controller with HMI
HMC08-N500S52

Programmable Logic Controllers

Hot Swappable Mid-range PLC
AH500

Compact Modular Mid-range PLC
AS

High Performance PLC
DVP-EH3

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

Advanced Network Type Slim PLC
DVP-SE

High Performance Slim PLC
DVP-SV2

Standard Slim PLC
DVP-SS2

Advanced Slim PLC
DVP-SA2

Analog I/O Slim PLC
DVP-SX2

Multi-axis Motion Controllers
DVP-10MC / 15MC New

General Motion Controller
DVP-PM
### Human Machine Interfaces

**Advanced Ethernet HMI**
- DOP-103WQ (4.3-inch) / DOP-107WV (7-inch) / DOP-110WS (10.1-inch)

**Large-Size HMI**
- DOP-W105B (10.4-inch) / DOP-W127B (12-inch) / DOP-W157B (15-inch)

**Widescreen HMI**
- DOP-B03S(E)211 (4.3-inch) / DOP-B07S(E)411 (7-inch) / DOP-B07S(E)415 (7-inch) / DOP-B10S411 (10.1-inch) / DOP-B10S(E)615 (10.1-inch)

**Standard HMI**
- DOP-B05S111 (5.6-inch) / DOP-B07S(E)515 (7-inch) / DOP-B08S(E)515 (8-inch) / DOP-B10S511 (10.4-inch) / DOP-B10E515 (10.4-inch)

**Functional HMI**
- DOP-B07PS415 (7-inch Widescreen) / DOP-B07PS515 (7-inch)

**Widescreen Handheld HMI**
- DOP-H07 (7-inch)

### Text Panel HMIs

**4-Line Text Panel HMI**
- TP04G-AL-C / TP04G-AL2 / TP04G-BL-C

**8-Line Text Panel HMI**
- TP08G-BT2

### Touch Panel HMIs with Built-in PLC

**7-Inch Touch Panel HMI**
- TP70P-RM0 / TP70P

**4-Line Text Panel HMI with Built-in PLC**
- TP04P

### Sensor / Process Controller / Field Device

#### Sensors

**Photoelectric Sensors**
- PS-R / PS-F / PS-L / PS-M

**Inductive Proximity Sensor**
- IS

**Fiber Amplifier**
- FA

**Laser Displacement**
- LD

**Area Sensor**
- AS
Rotary Encoders

Rotary Encoders
HS/ES/EH

Barcode Scanner

Handheld Barcode Scanner
DAH

Temperature Controllers

Advanced Intelligent Temperature Controller
DT3
Intelligent Temperature Controller
DTK
Standard Temperature Controller
DTA
Advanced Temperature Controller
DTB
Modular Temperature Controller
DTC
Basic Temperature Controller
DTD
Multi-Channel Modular Temperature Controller
DTE

Pressure Sensors/Flow Switch

Standard Multifunction Pressure Sensor
DPA
Basic Multifunction Pressure Sensor
DPB
Flow Switch
DFM

Timer/Counter/Tachometer/Valve Controllers

Valve Controller
DTV
Timer/Counter/Tachometer
CTA

Power Meters

Multifunction Power Meters
DPM-C530 / DPM-C520 / DPM-C501L / DPM-C520W / DPM-C520I
## Machine Vision

**Machine Vision Systems**

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<td>DMV1000</td>
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</table>

## Industrial Power Supply

**DIN Rail Models**

- CliQ / CliQ II / CliQ III / CliQ M / Lyte / Chrome / Sync / DVP

**Panel Mount Models**

- PMC / PMF / PMH / PMR / PMT / PMU

**Open Frame Models**

- PJ / PJB / PJT / PJU

## Network

### Industrial Ethernet Solutions

**Managed Switches**

- **New** DVS-328 / DVS-110 / DVS-109 / DVS-108

**PoE+ Managed Switch**

- DVS-G512

**Unmanaged Switches**

- DVS-G005I00A / DVS-005 / 008 / 016

**PoE+ Unmanaged Switches**

- DVS-G408W01 / DVS-G406W01-2GF

**SFP Fiber Transceivers**

- LCP-GbE / LCP-1FE

**PoE+ Splitter**

- DVS-G401

**PoE+ Injector**

- DVS-G402

**IEEE 802.11 WLAN**

- DVW-W02W2-E2

**High-gain Antenna**

- DVW-ANT

**Industrial 3G Cloud Router**

- DX-2100
Industrial Ethernet Cloud Router
DX-2300

Industrial 3G/WAN VPN Router
DX-3001

Industrial Fieldbus Solutions

BACnet MS/TP Slave Module
DVPSCM52-SL

PROFIBUS DP Slave Module
DVPPF02-SL

Ethernet Master Module
DVPEN01-SL

RS-422/485 Master Module
DVPSCM12-SL

CANopen Master Module
DVPCOPM-SL

DeviceNet Master Module
DVPDNET-SL

Ethernet Remote I/O Communication Module
RTU-EN01

PROFIBUS DP Remote I/O Communication Module
RTU-PD01

DeviceNet Remote I/O Communication Module
RTU-DNET

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

DVP Series Slave Modules (Right-side)
DVPSCP02-H2/DVPPF01-S/DVPPF02-H2/DVPT01-S/DVPT02-H2

USB Converters
UC-PRG015-01A/IFD6500/IFD6503/IFD6530

MODBUS Serial Converters
IFD8500A/IFD8510A/IFD8520

Industrial Network Converters
IFD9502/IFD9503/IFD9506/IFD9507

Industrial Automation Solutions
## Industrial PC / Equipment IoT Platform / Software

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<td>SCADA System</td>
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<td>Industrial Energy Management System</td>
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## Robot

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## Global Operations

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About Delta

Delta, founded in 1971, is a global leader in power and thermal management solutions and a major player in several product segments such as industrial automation, displays, and networking. Its mission statement, “To provide innovative, clean and energy-efficient solutions for a better tomorrow,” focuses on addressing key environmental issues such as global climate change. As an energy-saving solutions provider with core competencies in power electronics and innovative research and development, Delta’s business categories include Power Electronics, Automation, and Infrastructure. Delta has 163 sales offices, 64 R&D centers and 39 manufacturing facilities worldwide.

Throughout its history, Delta has received many global awards and recognition for its business achievements, innovative technologies and dedication to corporate social responsibility. Since 2011, Delta has been selected as a member of the Dow Jones Sustainability™ World Index (DJSI World) for 7 consecutive years. In 2016, Delta was selected out of 5,800 large companies by CDP (formerly the Carbon Disclosure Project) for its Climate Change Leadership Level.

Delta IABG Milestones

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<td>Pressure Sensor (DPA Series)</td>
<td>Active Front End Unit (AFE2000 Series)</td>
<td>Motion Control Card (PCI Series)</td>
<td>CNC Controller (NC300 Series)</td>
<td>Hybrid Energy Saving System (HES)</td>
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<tr>
<td>Compact Modular Mid-range PLC (AS Series)</td>
<td>IloT Cloud-based Platform (DIACloud)</td>
<td>IloT Industrial Cloud Routers (DX-2100 / 2300 Series)</td>
<td>Industrial PCs (DIAV Series)</td>
<td>Planetary Gearboxes (PS Series)</td>
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Delta IABG Profile

- Mission: To elevate the living environment through advanced automation technology with value added innovation.
- Headquarters in Taoyuan, Taiwan
- Launched AC motor drives in 1995
- Manufacturing and R&D technology centers in Taoyuan (Taiwan), Taichung (Taiwan), Tainan (Taiwan), Wujiang (China), Shanghai (China), and Hosur (India)
- Number of employees: 7,451 (R&D 1,047)

About Delta Industrial Automation

As a world-class industrial automation brand, we are dedicated to the development of AC motor drives, servo and motion control systems, programmable logic controllers, human machine interfaces, machine vision systems, meters and sensors, industrial control and monitoring software, and industrial robots.

Our industrial automation solutions extend to a broad range of industry applications, including electronics, textiles, food, pharmacy, rubber and plastics, packaging, printing, woodworking, and machine tools. We integrate our automation products, equipment networking, system software, IoT technology, and big data analysis to build innovative and reliable smart, green factory automation solutions for global customers, and to realize our promise of “Automation for a Changing World”.

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<td>Time/Counter/Tachometer (CTA Series)</td>
<td>Industrial Power Supply (PMC/CiQ Series)</td>
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2012

- Integrated Elevator Drive (IED Series)
- Unmanaged Industrial Ethernet Switch (DVS Series)
- High Performance Mid-range PLC (AH500 Series)
- Controller with Human Machine Interface (HMC Series)

2015

- Robot Controller with Servo Drive Integrated (ASDA-MS Series)
- SCARA Robot (DRS40L Series)
- Industrial Energy Management System (DIAEnergie)
- SCADA System (DIAView)

2016

- Articulated Robots (DRV70L/DRV90L Series)

2017

- Flow Switch (DFM Series)
- Laser Displacement (PS Series)
- Barcode Scanner (PS Series)
- Area Sensor (PS Series)
High Performance / Standard Compact Drive
MH300/MS300

Compact-designed Powerful Multifunction Drives

Optimized Space Utilization
- Compact design with up to 40% size reduction compared to existing models

Outstanding Drive Performance
- Support both induction and permanent magnet motors
- MS300 series: supports open-loop control
- MH300 series: supports open-loop/closed-loop control

Strong System Support
- High speed models: support up to 1500 Hz (MS300)/2000 Hz (MH300) output frequency under open-loop control
- Built-in PLC with 2k steps (MS300); 5k steps (MH300) program capacity
- Built-in braking choppers for the entire series
- Various communications: EtherCAT, PROFIBUS DP, DeviceNet, MODBUS TCP, EtherNet/IP, CANopen

High Safety, Stability and Reliability
- Built-in STO (SIL2/PLd) safety function and safety measures for sudden power outages
- Enhanced 100% PCBs conformal coating; compliant with IEC 60721-3-3 class 3C2
- Extended key components lifetime

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

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<th>Power Range</th>
<th>0.2 kW 0.25 HP</th>
<th>0.4 kW 0.5 HP</th>
<th>0.75 kW 1 HP</th>
<th>1.5 kW 2 HP</th>
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<td>230V/3-phase</td>
<td>460V/3-phase</td>
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<tr>
<td>MH300: 0–2000Hz MS300: 0–1500Hz</td>
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Applications

**MS300**: Machine tools, textile machines, woodworking machines, packaging machines, electronics, fans, pumps and air compressors

**MH300**: Machine tools, textile machines, woodworking machines, rubber & plastic machines and cranes
Sensorless Vector Control Compact Drive
VFD-E/EL
Small Size with Multifunctions

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

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<thead>
<tr>
<th>Power Range</th>
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Applications
Food packaging machines, conveyor equipment, textile machines, woodworking machines, fans and water pumps
Economy Vector Control Drive C200

High Speed Frequency Output

- Support both induction and permanent magnet motors
- Built-in PLC with 5k steps program capacity
- Special PCB coating and ventilation design for enhanced environment tolerance
- Flange mount design for Frame A and removable panel to facilitate installation process
- Built-in pulse input terminal with encoder for closed-loop control
- Built-in CANopen and RS-485 (MODBUS) communication

<table>
<thead>
<tr>
<th>Power Range</th>
<th>0.4 kW 0.5 HP</th>
<th>0.75 kW 1 HP</th>
<th>1.5 kW 2 HP</th>
<th>2.2 kW 3 HP</th>
<th>3.7 kW 5 HP</th>
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Applications

Food packaging machines, conveyor equipment, textile machines, woodworking machines, fans and water pumps
Vector Control Drive
C2000
For Universal Drive Controls

- Support both induction and permanent magnet motors
- Field oriented vector control
- Wide power range for different industry needs
- Built-in PLC with 10k steps program capacity
- Long service life design
- Enhanced protections and adaptation to industrial environments
- Modular design for easy maintenance and extensions
- Built-in MODBUS communication and provides for optional communication cards: PROFIBUS DP, DeviceNet, MODBUS TCP, EtherNet/IP, EtherCAT and CANopen

**Power Range**

<table>
<thead>
<tr>
<th>Power Range</th>
<th>0.75 ~ 3.7 kW</th>
<th>5.5 ~ 18.5 kW</th>
<th>22 ~ 37 kW</th>
<th>45 ~ 90 kW</th>
<th>110 ~ 185 kW</th>
<th>220 ~ 450 kW</th>
<th>560 ~ 630 kW</th>
<th>715 ~ 850 kW</th>
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<td>1 ~ 5 HP</td>
<td>7.5 ~ 25 HP</td>
<td>30 ~ 50 HP</td>
<td>60 ~ 125 HP</td>
<td>150 ~ 250 HP</td>
<td>300 ~ 600 HP</td>
<td>715 ~ 850 HP</td>
<td></td>
</tr>
<tr>
<td>C2000</td>
<td>230V/3-phase</td>
<td>460V/3-phase</td>
<td>575V/3-phase</td>
<td>690V/3-phase</td>
<td></td>
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</tr>
</tbody>
</table>

**Applications**

Printing machines, extruders, calender machines, paper machines, compressors and wire drawing machines
**Fan/Pump Vector Control Drive**

**CP2000**

Excellent for Large Power Fans and Pumps Applications

- Built-in BACnet and RS-485 (MODBUS) communication protocols
- Enhanced conformal coating on PCBs for superior durability in critical environments
- Fire mode and Bypass mode: continuous pressure output to extract smoke when a fire accident or other emergencies occur
- Quick setting functions to support self-defined 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 frequency-hopping functions
- Built-in LCD keypad is easy-to-use, and the TPEditor software allows users to customize the main page screen
- Multi-pumps synchronous control of up to 8 motors at one time, fixed amount and fixed time circulation control. Relay expansion card is optional
- Built-in PLC with 10k steps program capacity and Real Time Clock
- Optional communication cards: PROFIBUS DP, DeviceNet, MODBUS TCP, EtherNet/IP and CANopen

**Applications**

Factory automation, HVAC, fans and pumps
IP55 Fan & Pump Drive

CFP2000

For HVAC, Fans and Pumps Applications

- IP55 and IP41 enclosure protections
- Built-in mains switch option for the IP55 models
- Built-in Safe Torque Off (STO) SIL2 function
- Built-in EMC filter; IEC61800-3 C2, C1 standard
- Built-in DC reactor effectively reduces the harmonic distortion; IEC61000-3-12 standard
- Enhanced PCB (Printed Circuit Board) conformal coating improves drive durability; Class 3C3 standard
- 2 sets of PID controller functions
- Built-in PLC with 10k steps program capacity and Real Time Clock (RTC)
- Built-in MODBUS and BACnet MS/TP communication
- Optional communication cards: PROFIBUS DP, DeviceNet, MODBUS TCP, EtherNet/IP, CANopen
- Built-in Quick Start function and application groups to simplify the installation and setup

<table>
<thead>
<tr>
<th>Power Range</th>
<th>0.75 ~ 5.5 kW</th>
<th>11 ~ 22 kW</th>
<th>30 ~ 37 kW</th>
<th>45 ~ 55 kW</th>
<th>75 ~ 90 kW</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 ~ 7.5 HP</td>
<td>15 ~ 30 HP</td>
<td>40 ~ 50 HP</td>
<td>60 ~ 75 HP</td>
<td>100 ~ 125 HP</td>
</tr>
<tr>
<td>CFP2000</td>
<td>380 to 480V/3-phase</td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

Applications

Fans

Chiller

Water treatment
Heavy Duty Vector Control Drive
CH2000

Large Overload Capability Excellent for Impact Loading Applications

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

Advanced Crane Functions

- **Forward**
  - Current
  - Frequency
- **Dwell function**
  - Stabilizes torque output to prevent slipping
- **Reverse**
  - Current
  - Frequency
- **Brake delay**
  - Ensures torque output before brake release

**Advanced Crane Functions**

- **Mechanical Brake Control**
  8 independent brake control settings for different criteria. High flexibility to meet complex application needs and to ensure operation safety

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

Light Load Acceleration

- **Target speed**
  - Check Time
  - Confirmed as light load and accelerates
- **Check current level**
  - Checking light load status

Applications

- Machine tools, punching machines, cranes and hoists

<table>
<thead>
<tr>
<th>Power Range</th>
<th>0.75 ~ 3.7 kW</th>
<th>5.5 ~ 18.5 kW</th>
<th>22 ~ 37 kW</th>
<th>45 ~ 75 kW</th>
<th>90 ~ 185 kW</th>
<th>220 ~ 280 kW</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 ~ 5 HP</td>
<td>7.5 ~ 25 HP</td>
<td>30 ~ 50 HP</td>
<td>60 ~ 100 HP</td>
<td>125 ~ 250 HP</td>
<td>300 ~ 375 HP</td>
</tr>
<tr>
<td>CH2000</td>
<td>230V/3-phase</td>
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<tr>
<td></td>
<td>460V/3-phase</td>
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</table>
Textile Vector Control Drive
CT2000
Highly Flexible Flange Mount and Wall Mount Methods

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

\(^{(*)}\): For model names ending with code A or B
\(^{(2)}\): For model names ending with code C

<table>
<thead>
<tr>
<th>Power Range</th>
<th>11 kW</th>
<th>15 kW</th>
<th>18.5 kW</th>
<th>22 kW</th>
<th>30 kW</th>
<th>37 kW</th>
<th>45 kW</th>
<th>55 kW</th>
<th>75 kW</th>
<th>90 kW</th>
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<tr>
<td>CT2000</td>
<td>460V/3-phase</td>
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Applications
Textile machines and all textile applications that require flange mount or wall mount method.
* Flange mount: Please refer to the CT2000 user manual for airway design requirements before installing the drive
Elevator Drive
VFD-ED

Excellent Time Sequence Control for Smooth Rides

- Support both induction and permanent magnet motors
- Precise control of S curve performs smooth start and stop for a comfortable ride
- Optional PG feedback cards (for ABZ & Heidenhain encoder)
- Advanced field oriented vector control
- Automatic torque compensation function to prevent elevator from slipping or vibrating
- Emergency operation is enabled using UPS or battery set when power outage occurs
- Support both wall-mount and embedded installation methods
- Built-in LED digital keypad
- 4 relay output and 2 multi-function digital signal output terminals (MO)
- 2 analog signal input (AI) and 2 analog signal output (AO)
- 1 CANopen and 2 RS-485 with MODBUS communication

Emergency Operation

- Support single phase 230VAC Uninterrupted Power System (UPS)
- Automatically determine the light load operation direction when a power outage occurs

<table>
<thead>
<tr>
<th>Power Range</th>
<th>2.2 kW</th>
<th>3.7 kW</th>
<th>4 kW *</th>
<th>5.5 kW</th>
<th>7.5 kW</th>
<th>11 kW</th>
<th>15 kW</th>
<th>18.5 kW</th>
<th>22 kW</th>
<th>30 kW</th>
<th>37 kW</th>
<th>45 kW</th>
<th>55 kW</th>
<th>75 kW</th>
<th>100 kW</th>
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<tr>
<td>3 HP</td>
<td>5 HP</td>
<td>7.5 HP</td>
<td>10 HP</td>
<td>15 HP</td>
<td>20 HP</td>
<td>25 HP</td>
<td>30 HP</td>
<td>40 HP</td>
<td>50 HP</td>
<td>60 HP</td>
<td>75 HP</td>
<td>100 HP</td>
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</table>

(UL: does not include VFD22ED21S and VFD037ED21S models)

*Minimum Power Range of the 460V model is 4 kW
Door Control Drive
VFD-DD
Door Control Solution

- Compact and Thin Design
  55mm

- Safety Switch

- Removable Terminal Blocks

- Built-in Digital Keypad

- Distance Control Mode
  • Simplified elevator door control system
  • Support both induction and permanent magnet motors
  • Easy to install with I/O input/output design
  • Various protection functions ensure passenger safety
  • Auto-tuning of door width

- Speed Control Mode
  • Auto-positioning when power is applied
  • Smooth door re-open / re-close curve
  • Demo mode
  • Support elevator door obstruction detection

- Multi-step Speed Control Mode

Optional Motors
ECMD-B91207MS
ECMD-B91608MS
ECMD-B81610MS

Applications
Elevator doors

<table>
<thead>
<tr>
<th>Power Range</th>
<th>0.2 kW 0.25 HP</th>
<th>0.4 kW 0.5 HP</th>
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</thead>
<tbody>
<tr>
<td>VFD-DD</td>
<td>230V/1-phase</td>
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</table>
Integrated Elevator Drive
IED
Integrated Drive and Control to Save Installation Space

Control
• High-efficiency group control function capable of controlling multiple elevators without the need of additional control cards
• Various operation modes including demo mode; attendant service mode and time-based modes
• Single and double door elevator applications
• Max. 48 floors

Design
• Compact design, suitable for limited installation spaces
• Modular design of fans and capacitors for easy replacement and maintenance
• A small-size LED keypad allows users to check and set the drive control

Drive
• Support induction and permanent magnet motors
• Emergency Power Supply (EPS) function
• Dual safety protection functions. All time output phase loss check and confirms torque output before releasing mechanical brake

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

Energy Saving
• Power regeneration function available when installed with Delta’s Active Front End (AFE2000 Series) or Power Regenerative Unit (REG2000 Series)
• 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 bypass operation: arrives at designated floor without stopping

Optional
External Digital Keypad
• Controller setting
• Drive setting
• Parameter copy

One drive for all control needs

| Power Range | 2.2 kW  | 3.7 kW  | 4 kW   | 5.5 kW  | 7 kW   | 7.5 kW  | 11 kW  | 15 kW  | 18.5 kW | 22 kW  | 30 kW  | 37 kW  | 45 kW  | 55 kW  | 75 kW  | 100 kW |
|-------------|---------|---------|--------|---------|--------|---------|--------|--------|---------|--------|--------|--------|--------|--------|--------|
| 3 HP        | 2.2 kW  | 3.7 kW  | 4 kW   | 5.5 kW  | 7 kW   | 7.5 kW  | 11 kW  | 15 kW  | 18.5 kW | 22 kW  | 30 kW  | 37 kW  | 45 kW  | 55 kW  | 75 kW  | 100 kW |
| 5 HP        | 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 facilitates program upload/download and tuning process
Hybrid Energy Saving System
HES

Energy Saving for Injection Molding Machine

- **Superior Energy-Saving Outcomes:** 40% less energy consumption compared to variable pump hydraulic systems; 60% less energy consumption compared to traditional quantitative pump hydraulic systems
- **Low Oil Temperature:** oil temperature decreased by 5°C to 10°C, saving costs on oil cooler
- **Reduce Oil Usage:** 50% to 60% oil usage savings and a 50% smaller oil tank
- **High Duplication Accuracy:** Precise flow and pressure control featuring duplication of products with less than 0.09% difference
- **Long Holding Pressure:** Keep mold halves securely closed for a longer period for thick plastic products formation
- **Fast Frequency Response:** Delta HES with permanent magnet servo motor (PMSM) speeds up frequency response to 50ms
- **Suitable for Harsh Environments:** Resolver is resistant to earthquakes, oil and dust
- **Easy to Refurbish Old Machines:** Analog command 0~10V and linear correction (3 points), no need to replace the computer
- **Flow Convergence:** Saves cost on tubes, large flow capacity, and outstanding energy-saving performance

### Power Consumption Curve of the Injection Molding Process

![Power Consumption Curve](image)

<table>
<thead>
<tr>
<th>Power Range</th>
<th>50 L/min</th>
<th>63 L/min</th>
<th>80 L/min</th>
<th>100 L/min</th>
<th>125 L/min</th>
<th>160 L/min</th>
<th>200 L/min</th>
<th>250 L/min</th>
<th>320 L/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>HES</td>
<td></td>
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<tr>
<td></td>
<td>230 V/3-phase</td>
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<td></td>
<td>460 V/3-phase</td>
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</tbody>
</table>

**Applications**

Injection molding machines, bottle blowing machines, pipe bending machines, bending machines and other hydraulic equipment
Power Regenerative Unit
REG2000

Replaces Traditional Brake Resistor and Features Power Regeneration

- Compact design with reactor included and easy to install
- Outstanding energy-saving performance with more than 95% power regeneration efficiency
- Replace traditional brake resistors to reduce the generation of heat
- Improve motor braking capability from 125% to 150%
- Built-in RS-485 (MODBUS) communication and real-time monitoring of energy-saving performance and cost
- Compatible with the drives and servo drives that have a DC terminal
- Support parallel connections for large power applications
- Optional communication cards: MODBUS TCP, EtherNet/IP, CANopen, PROFINET DP and DeviceNet

* 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

**Long-term energy feedback applications:** printing machines, escalators and more

**Quick braking applications:** machine tools, bag making machines, auto storage and retrieval systems, press machines and more

<table>
<thead>
<tr>
<th>Power Range</th>
<th>7.5 kW</th>
<th>11 kW</th>
<th>15 kW</th>
<th>18.5 kW</th>
<th>22 kW</th>
<th>30 kW</th>
<th>37 kW</th>
<th>45 kW</th>
<th>55 kW</th>
</tr>
</thead>
<tbody>
<tr>
<td>REG2000</td>
<td>230V/3-phase</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>460V/3-phase</td>
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</tbody>
</table>
Active Front End
AFE2000
The Best Energy Saving Device with AC Motor Drives

- More than 95% power regeneration efficiency
- Improve power factor to more than 99% with input current THD ≤5%
- Realize 4-quadrant operation with variable frequencies and speed control when applied with AC motor drives
- Maintain constant DC BUS voltage and current when the voltage provided by the mains is unstable
- Supports all kinds of fieldbus for real time power status monitoring and control

![Available from Delta upon request](image)

<table>
<thead>
<tr>
<th>Power Range</th>
<th>7.5 kW 10 HP</th>
<th>15 kW 20 HP</th>
<th>22 kW 30 HP</th>
<th>37 kW 50 HP</th>
<th>45 kW 60 HP</th>
<th>75 kW 100 HP</th>
</tr>
</thead>
<tbody>
<tr>
<td>AFE2000</td>
<td>230V 3-phase</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>460V 3-phase</td>
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</tr>
</tbody>
</table>

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
- **Power quality improvement**: semiconductor and panel industries
- **Long energy feedback time applications**: wind power, water power, steel printing and paper making machinery (winding equipment)

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
- Adopts special Delta power supply modules to provide a wide range application from 220 V~480 V and 525 V~690 V
- Modular design of fan, power, drive, control and reactor modules
- 7" touch screen TFT LCE expression in 65,536 colors

<table>
<thead>
<tr>
<th>Capacity</th>
<th>300 k VAR</th>
<th>500 k VAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>SVG2000</td>
<td>220V~480V/3-phase</td>
<td>525V~690V/3-phase</td>
</tr>
</tbody>
</table>

Applications
- A new solution to replace traditional phase-leading capacitors, applicable to the power distribution systems of industry, infrastructure, commercial buildings and homes
Active Power Filter
APF2000
For Power Quality Improvement

- Filter the 2\textsuperscript{nd} to 50\textsuperscript{th} order harmonics with efficiency of more than 90%.
  IEEE519 standard
- Full response speed faster than 20 ms
- 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" touch screen TFT LCD expression in 65,536 colors
- Compact design: the 300 A model only measured 600W x 800D x 2200H (mm)
- Parallel connection of multiple units to expand total capacity
- Built-in RS-485 communication and provides various communication and fieldbus card options

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

<table>
<thead>
<tr>
<th>Capacity</th>
<th>50 A</th>
<th>100 A</th>
<th>200 A</th>
<th>300 A</th>
</tr>
</thead>
<tbody>
<tr>
<td>APF2000</td>
<td>200 V ~ 480 V/3-phase</td>
<td></td>
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</tr>
</tbody>
</table>

Applications

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

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

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

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

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

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

Telecommunication, medical and construction industries:
Server station, EPS, UPE, converter, charger and inverter
AC Servo Drive & Motor
New
ASDA-A3

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

3.1 kHz Bandwidth
- Higher responsiveness and shorter settling time increases productivity

24-bit Absolute Type Encoder
- Positioning precision is enhanced by the 16,777,216 pulses/turn encoder
- The speed variance in low speed is reduced.
- Absolute type encoder helps to keep the motor's position when the power is off

16,777,216 pulses for one single turn

Advanced Motion Control Functions
- 99 sophisticated motion commands and segments allowed
- Graphical user interface offers simple setup and programming
- Arithmetic operation and condition jump commands are added
- General motion functions like homing, position, speed, superimposition, blending, on-the-fly change motion commands and E-CAM functions are available
Low Frequency Vibration Suppression Function
- Keeps the machining process stable when mechanisms with higher elasticity such as a belt or a swing arm are applied

Auto-Tuning Function
- This function will optimize machine performance with less tuning effort and with simple setup procedures via panel keypad or software

Smart and Intuitive Software Interface
- Tree-view index window with organized list and collapsible menu helps to access functions easily
- Intuitive user interface provides set up functions and parameters with efficiency and accuracy

Compact Size Design
- ASDA-A3 is 20% smaller than A2 in dimensions, which requires less installation space

Applications
Machine tools, electronic assembly or detection equipment, industrial robots, packaging, labeling, semiconductor and textile equipment
AC Servo Drive & Motor
ASDA-A2

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

Built-in Motion Control Functions
- 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 1,280,000 p/rev resolution for high-precision positioning

Full-Closed Loop Control (Accuracy of positioning guaranteed)
- Direct signal transmission through CN5 port to perform full-closed function
- Reduces the effect of backlash and flexibility from the machine and ensures the accuracy of positioning
**Versatile PR mode**

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

**Basic Features**

- Input voltage: 200 V<sub>AC</sub> ~ 230 V<sub>AC</sub>, 0.1 kW ~ 15 kW, 1-phase / 3-phase, or 3-phase
- Input voltage: 400 V<sub>AC</sub>, 0.4 kW ~ 15 kW, 3-phase
- Up to 1 kHz bandwidth 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

<table>
<thead>
<tr>
<th></th>
<th>Type</th>
<th>RS-485 (CN3)</th>
<th>Full-Closed Control (CN5)</th>
<th>Extension Port for Digital Input (CN7)</th>
<th>PR Parameters</th>
<th>E-CAM&lt;sup&gt;3&lt;/sup&gt;</th>
<th>EtherCAT&lt;sup&gt;4&lt;/sup&gt;</th>
<th>CANopen</th>
<th>DMCNET</th>
<th>Analog Voltage Control</th>
<th>Pulse Input Port</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Model</td>
<td>L</td>
<td>O</td>
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<td>X X</td>
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<td>O</td>
<td>X</td>
<td>O</td>
<td>O</td>
<td>X O</td>
<td>X</td>
<td>O O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

<sup>1</sup> In PR mode, only A2-F supports full-closed control function.

<sup>2</sup> PR parameters can be read and written through communication by DMCNET only.

<sup>3</sup> E-CAM function can only be used in PR mode.

<sup>4</sup> For information about ASDA A2-E EtherCAT interface servo drive, please refer to the ASDA A2-E brochure.

**Applications**

Precise motion control applications, food packaging machines, filling and bottling equipment, labeling machines, feeding machines, TFT LCD cutting machines, IC packaging machines, injection processing equipment, lathes, electric discharge machines (EDM), woodworking machines, wire cutting machines, printing machines, textile equipment

[Images of Food Packaging Machines, Wire Cutting Machines, Feeding Machines, High-speed Labeling Machines]
Delta’s ASDA A2-E, an advanced AC Servo Drive with an EtherCAT communication interface, complies with IEC61158 and IEC61800-7 to enable faster, real time, and accurate performance in high-end applications. The new A2-E the supports a CoE device profile based on CiA402, and all command types of EtherCAT.

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

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

**Applications**

- Metal Working Machines
- Woodworking Machines
- Food Processing
- Printing Machines
Communication Specifications

<table>
<thead>
<tr>
<th>Physical Layer</th>
<th>IEEE802.3u (100 BASE-TX)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EtherCAT Commands</td>
<td>APRD, FPRD, BRD, LRD, APWR, FPWR, BWR, LWR, ARMW, FRMW, APRW, FPRW, BRW, LRW</td>
</tr>
<tr>
<td>(Data Link Layer)</td>
<td></td>
</tr>
<tr>
<td>Device Profile</td>
<td>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</td>
</tr>
<tr>
<td>(CiA402)</td>
<td></td>
</tr>
<tr>
<td>Process Data Size</td>
<td>Tx: 8 Object (32 byte, Max.)</td>
</tr>
<tr>
<td></td>
<td>Rx: 8 Object (32 byte, Max.) Dynamic Mapping Support.</td>
</tr>
<tr>
<td>Bus Clock</td>
<td>DC cycle with min. 250μs</td>
</tr>
<tr>
<td>LED Indicator</td>
<td>EtherCAT Link/Activity Indicator (L/A) x 2</td>
</tr>
<tr>
<td></td>
<td>EtherCAT RUN Indicator (RUN) x 1</td>
</tr>
<tr>
<td></td>
<td>EtherCAT ERROR Indicator (ERR) x 1</td>
</tr>
</tbody>
</table>

Part Names and Functions

- Servo Status Display
- Operation Panel
- Charge LED
- External Encoder
- Digital I/O
- Extension DI Port
- Motor Encoder
- EtherCAT Status LED
- EtherCAT Port
- Safe Torque Off (STO) I/O
- USB Port

Accessories for ASDA A2-E

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASD-CNSC0026</td>
<td>CN1 connector</td>
</tr>
<tr>
<td>ASD-CNFS0808</td>
<td>Pack of connectors used for STO wiring, 8 pcs of connectors in one pack</td>
</tr>
</tbody>
</table>
AC Servo Drive & Motor
ASDA-B2
Implements 17-bit (160,000 p/rev) high resolution encoder as a standard

Power Range: 0.1 kW ~ 3 kW
- Input Voltage: 200 VAC ~ 230 VAC, 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 the 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 (400W and above models) is provided. Simplifies wiring and minimizes space.
AC Servo Drive & Motor
ASDA-M
Three-in-one Intelligent Servo System Harmonizing Motion Controller and Servo Drive

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

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

High Precision, High Performance Servo Motors
- Supports incremental type and absolute type encoders
- Incremental type encoder provides up to 1,280,000 p/rev resolution for high-precision positioning

Product Line-up

<table>
<thead>
<tr>
<th>Power Level</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>750 W</td>
<td>32 DI / 32 DO</td>
</tr>
<tr>
<td></td>
<td>4-Channel 16-bit D/A</td>
</tr>
<tr>
<td></td>
<td>or 4-Channel 16-bit 4 A/D</td>
</tr>
<tr>
<td>1.5 kW</td>
<td>16 DI / 16 DO</td>
</tr>
<tr>
<td></td>
<td>4-Channel Pulse Interface</td>
</tr>
</tbody>
</table>

Product Line-up

<table>
<thead>
<tr>
<th>Power Level</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 W ~ 750 W</td>
<td>32 DI / 32 DO</td>
</tr>
<tr>
<td></td>
<td>4-Channel 16-bit D/A</td>
</tr>
<tr>
<td></td>
<td>or 4-Channel 16-bit 4 A/D</td>
</tr>
<tr>
<td>0.75 kW ~ 1.5 kW</td>
<td>16 DI / 16 DO</td>
</tr>
<tr>
<td></td>
<td>4-Channel Pulse Interface</td>
</tr>
</tbody>
</table>
Real Time, Reliable and High-Speed Motion Control Network

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

Advanced Gantry Control

- A large amount of data can be exchanged in real time among 3 axes without any time delay. This greatly increases the efficiency and performance of gantry control
- In rigid or general mechanical systems, no matter if the loading on multiple axes is equal or not, the ASDA-M Series can perform precise motion control and drive for each axis simultaneously

Built-in G-code Interpreter

- G-code commands are downloaded and executed to the servo drive through HMI or PC
- ASDA-M Series provides built-in G-code interpreter to decode the G-code commands and complete the motion movement
Spindle Motor Drive
ASDA-S
Ensuring Premium Surface Finish Quality for the CNC Industry

Power range: 3 kW ~ 15 kW
- Supports Delta permanent magnet spindle motors and other induction motors
- Provides high performance servo vector control as in the ASDA-A2 Series
- Supports pulse encoder signals (ABZ phase) via CN5 port. 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
- 200 V models and 400 V 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/6.7 kW
- Encoder Type: Incremental 20-bit
- Max. torque: 14.72 N·m/26.65 N·m
- Speed range: 6000 r/min ~ 12000 r/min
- Options: Coolant through spindle
- IP degree: IP54
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.

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

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
Linear Shaft Motor
ECML-S

High-speed, High-precision Linear Motor
Position Repeatability within ±1 um

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

Thrust Range

<table>
<thead>
<tr>
<th>Model</th>
<th>Continuous Thrust</th>
<th>Maximum Thrust</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECML-S1606</td>
<td>21</td>
<td>87</td>
</tr>
<tr>
<td>ECML-S1608</td>
<td>29</td>
<td>116</td>
</tr>
<tr>
<td>ECML-S2003</td>
<td>33</td>
<td>133</td>
</tr>
<tr>
<td>ECML-S2004</td>
<td>44</td>
<td>177</td>
</tr>
<tr>
<td>ECML-S2005</td>
<td>55</td>
<td>221</td>
</tr>
<tr>
<td>ECML-S2504</td>
<td>64</td>
<td>258</td>
</tr>
<tr>
<td>ECML-S2506</td>
<td>97</td>
<td>387</td>
</tr>
<tr>
<td>ECML-S2508</td>
<td>131</td>
<td>525</td>
</tr>
<tr>
<td>ECML-S3204</td>
<td>87</td>
<td>350</td>
</tr>
<tr>
<td>ECML-S3206</td>
<td>140</td>
<td>561</td>
</tr>
<tr>
<td>ECML-S3208</td>
<td>187</td>
<td>748</td>
</tr>
</tbody>
</table>

Length of Magnetic Way (Dimensions are in mm)

<table>
<thead>
<tr>
<th>Shaft Diameter</th>
<th>Minimum Length</th>
<th>Maximum Length</th>
<th>Increments</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECML - SM16</td>
<td>250</td>
<td>1240</td>
<td>30</td>
</tr>
<tr>
<td>ECML - SM20</td>
<td>250</td>
<td>1270</td>
<td>60</td>
</tr>
<tr>
<td>ECML - SM25</td>
<td>330</td>
<td>1650</td>
<td>60</td>
</tr>
<tr>
<td>ECML - SM32</td>
<td>450</td>
<td>2310</td>
<td>60</td>
</tr>
</tbody>
</table>
Linear Stage
LU
High Precision Steel Ballscrew Driven Stage
Position Repeatability of ±3 um

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

Characteristic Analysis

![Delta LU Series (without coupling)](image1)
![Conventional Linear Stage (with coupling)](image2)

Measured Data by Laser Interferometer

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

Following error 0.005 mm

Thrust Range

<table>
<thead>
<tr>
<th>Actuator</th>
<th>Continuous Thrust</th>
<th>Maximum Thrust</th>
</tr>
</thead>
<tbody>
<tr>
<td>LU-46 (400W / Lead 10)</td>
<td>718</td>
<td>2160</td>
</tr>
<tr>
<td>LU-46 (400W / Lead 20)</td>
<td>359</td>
<td>1080</td>
</tr>
<tr>
<td>LU-33 (100W / Lead 5)</td>
<td>362</td>
<td>1086</td>
</tr>
<tr>
<td>LU-33 (100W / Lead 10)</td>
<td>181</td>
<td>543</td>
</tr>
<tr>
<td>LU-26 (100W / Lead 2)</td>
<td>302</td>
<td>905</td>
</tr>
<tr>
<td>LU-26 (100W / Lead 6)</td>
<td>450</td>
<td>2714</td>
</tr>
<tr>
<td>LU-26 (50W / Lead 2)</td>
<td>150</td>
<td>1349</td>
</tr>
<tr>
<td>LU-26 (50W / Lead 6)</td>
<td>450</td>
<td></td>
</tr>
</tbody>
</table>
Linear Stage
LA-S
High Speed, High Precision Linear Motor Driven Stage
Position repeatability of ±1 um

- **Direct driving with zero backlash**
  - Directly driven by Delta’s linear motor, without backlash and alignment issues
- **High speed and high precision**
  - Provides high-precision and high-stability motion operation:
    - High speed capability of up to 4 m/s
  - Integrates with linear motor and optical linear encoder for direct driving and preventing backlash and accumulated offsets caused by changing machines
- **Cog-free design with low thrust ripple**
  - Uses an ironless forcer for zero cogging and low thrust ripple to perform smooth motion, even at low speed
- **Long travel distance with multiple sliders**
  - Good performance on long travel distances (up to 1.5 m) for various positioning applications
  - Single-axis platform supports more than 2 linear motors, creating multiple sliders within one stage unit for efficient space savings and independent operation

**Mechanism Design**

**Thrust Range**

<table>
<thead>
<tr>
<th>Model</th>
<th>Continuous Thrust</th>
<th>Maximum Thrust</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA-S4</td>
<td>44</td>
<td>177</td>
</tr>
<tr>
<td>LA-S5</td>
<td>55</td>
<td>221</td>
</tr>
<tr>
<td>LA-S6</td>
<td>64</td>
<td>257</td>
</tr>
<tr>
<td>LA-S7</td>
<td>96</td>
<td>386</td>
</tr>
<tr>
<td>LA-S8</td>
<td>131</td>
<td>525</td>
</tr>
<tr>
<td>LA-SA</td>
<td>138</td>
<td>555</td>
</tr>
<tr>
<td>LA-SB</td>
<td>185</td>
<td>740</td>
</tr>
</tbody>
</table>

**Notes:**
- Thrust values are given in Newtons (N).
- Continuous thrust values are lower limits, while maximum thrust values are upper limits.

**Legend:**
- Continuous Thrust
- Maximum Thrust
High Precision Planetary Gearbox
PS

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

High efficiency
- Efficiency for 1-stage model exceeds 97%
- Efficiency for 2-stage model exceeds 94%

Low noise
Under 65dB

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

Precision Planetary Gearbox
PA

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

High efficiency
- Efficiency for 1-stage model exceeds 95%
- Efficiency for 2-stage model exceeds 92%

Low noise
- Uses helical gears capable of meshing to ensure smooth
  - and quiet operation

Lifetime lubrication
- Protective class IP65 sealed design avoids leakage problems and requires no maintenance during the product's lifetime
PC-Based Motion Controller (PAC)  
MH1/MP1  
A Perfect Balance of EtherCAT Fieldbus and High-Performance Motion Control  

- **Energy Efficient and Robust Hardware**  
  - The MH1 Series: provides a cable-less, fan-less and low-power consumption design, increasing reliability and providing CFast card and SSD slots inside for fast and stable data transmission  
  - The MP1 Series: equipped with a 10.1-inch touchscreen for more flexible operation  

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

- **Supports EtherCAT and DMCNET Master and Slave Modules**  
  Up to 12 units of DMCNET modules and 12 servo axes of motion control, and up to 100 units of EtherCAT modules and 64 axes of motion control are able to be connected and controlled. For implementing multiple I/O extensions and achieving more axes of motion control: the PCI-DMC-B01 and PCI-L221-B1  

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

- **Software Support**  
  The MH1 Series: equipped with Real Time OS (Windows CE, RTX)*, Windows 7/10 Embedded and a library of other software  

  * When changing to this environment, please contact customer service  

<table>
<thead>
<tr>
<th>Motion Control</th>
</tr>
</thead>
</table>
| • Point-to-point position control  
| • Linear interpolation (multi-axis)  
| • Two-speed motion (single-axis)  
| • Circular interpolation  
| • Helical interpolation  
| • Backlash compensation  
| • Compensation for helix deviation  
| • Compare  
| • Table motion  
| • JOG  
| • PT/PVT  
| • Gantry control (EtherCAT Communication)  
| • E-CAM (EtherCAT Communication Structure) |

- **Speed Curve Tracing**  
  Integrates speed curves tracing function for tracing current motion commands to achieve better synchronization effects between multiple axes efficiently  

- **Simulation Scope**  
  Verifies and controls timer, sequential and motion tracks for fast response and high-end motion via 2-dimension scope function  

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

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

Woodworking: CNC drilling machines, woodwork cutting machines, board slitting machines

Other: Bending machines

Centralized Slave Module

- **Gateway Type E-BUS Remote Power Coupler**
  - R1-EC5500D0 / R1-EC5512D0
  - Connect to digital I/O, analog I/O and pulse I/O extension modules

- **16 Digital Input Remote Module**
  - R1-EC6002D0 / R1-EC6022D0
  - Use E-Bus power module and EtherCAT remote modules for digital control

- **4-Channel Analog Input Remote Module**
  - R1-EC8124D0
  - Use E-Bus power module and EtherCAT remote modules for analog I/O control

- **1-Channel Pulse Remote Module**
  - R1-EC5521D0
  - Use E-BUS power module and EtherCAT remote modules for single-axis pulse motion control

- **16 Digital Output Remote Module**
  - R1-EC7062D0 / R1-EC70A2D0 / R1-EC70E2D0 / R1-EC70F2D0
  - Use E-Bus power module and EtherCAT remote modules for digital I/O control

- **4-Channel Analog Output Remote Module**
  - R1-EC9144D0
  - Use E-Bus power module and EtherCAT remote modules for analog I/O control
Delta High-Speed Motion Control System
DMCNET

Delta’s Motion Control NETwork (DMCNET) is a high speed, real-time communication system, capable of controlling up to 12 axes of servo system units within 1ms simultaneously: with 3-axis helical and linear interpolation in 4 groups, or 2-axis linear and arc interpolation in 6 groups. It supports 64-bit dual-precision floating point, allowing high-precision system calculations and flexible operation, and also absolute commands, incremental commands and T-curve / S-curve velocity profiles for different uses. With built-in position, speed and torque control modes, and 35 homing modes, it is able to receive real-time servo information, parameters, or change control modes via communication command, offering fast communication and motion control for various applications.

DMCNET is equipped with the high-speed and reliable one-wire DMCNET communication protocol for diverse motion control applications. Adapted for customer’s needs, Delta’s PCI motion control cards are available in three series: the 12-axis PCI-DMC-A02, 6-axis PCI-DMC-F02 with digital I/O interfaces and the PCI-DMC-B01 with pulse compare & capture functions. All series are able to connect to multiple servo systems, such as the high-performance ASDA-A2-F Series, standard ASDA-B2-F Series, or ASDA-A2R Series. Combining with Delta’s linear motors, the series establishes a total motion control solution enabling lower system cost and superior performance to increase end-product value and competitiveness.

DMCNET System Configuration

Applications
Electronic integrated applications, glue dispensing machines, woodworking machines, tube bending machines
IPC Motion Platform (IMP1.5)

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

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

- **Power Motion Control Core**: Upgrades Delta’s PAC and PC with a motion control card installed to become an advanced
- **Simple Secondary Development Platform**: Combines with Delta’s standard HMI editor DOPSoft and PLC editor WPLSoft in one customer-driven platform to make complex programming and development easy and time-saving without depending on technical support from the manufacturer
- **Scalable Communication for Expandable Network**: Through PCI extension slots, three DMCNET communication networks with up to 36 stations can be established, which means 36 axes of servo motors can be controlled simultaneously without connecting to any remote modules
- **Industry-Oriented Controller**: Provides Soft Numeric Control (SNC) and Motion Program Macro (MPM) to adjust and modify self-defined motion paths and commands according to changing application requirements
- **Standard Communication Interfaces**: Supports built-in standard MODBUS and MODBUS TCP gateways to enable more convenient data transmission exchange between machines
High-Speed Motion Control System
New
EtherCAT

EtherCAT Motion Control Products (Ethernet Control Automation Technology) is an open Ethernet-based fieldbus system that provides high-efficiency and high-performance synchronization quality for automation control. With EtherCAT, Delta’s EtherCAT motion control card PCI-L221-P1 achieves rapid and real-time multiple axes of motion control, and is capable of controlling up to 100 slave stations that enable a 64-axis motion control within 1ms cycle time. It also provides 35 homing modes, point-to-point position control, 2-axis interpolation, 3-axis interpolation, multi-axis synchronization, continuous motion, gantry control, speed control, torque control and more.

Delta provides a high-speed motion control card PCI-L221-XXD0 with complete functions for EtherCAT masters. Supporting device descriptions in XML format (EtherCAT Slave Information - ESI), the PCI-L221-XXD0 also allows the system to quickly identify ESI files and offers the capability of real-time connection via EtherCAT for high level integration. It can adjust the communication cycle time between stations within 1ms to 0.5ms according to customer needs.

EtherCAT System Configuration

Applications
Electronic integrated applications, glue dispensing machines, woodworking machines, tube bending machines
**IPC Motion Platform (IMP1.5)**

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

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

- **Power Motion Control Core:** Upgrades Delta’s PAC and PC with a motion control card installed to become an advanced motion controller that integrates the functions of motion control, HMI, PLC and high-speed communication fieldbus in one unit
- **Simple Secondary Development Platform:** Combines with Delta’s standard HMI editor DOPSoft and PLC editor WPLSoft in one customer-driven platform to make complex programming and development easy and time-saving without depending on technical support from the manufacturer
- **Scalable Communication for Expandable Network:** Through PCI extension slots, three DMCNET communication networks with up to 36 stations can be established, which means 36 axes of servo motors can be controlled simultaneously without connecting to any remote modules
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- **Standard Communication Interfaces:** Supports built-in standard MODBUS and MODBUS TCP gateways to enable more convenient data transmission exchange between machines
Open CNC Solution  New
NC E
Open-structured CNC Control System for Customization and Flexibility

Solution 1: Standard
VGA output for external display with Delta’s standard interface
- Two-language CNC operation interface (Chinese, English)
- Embedded control system provides high efficiency
- Allows easy customization with accessories including a monitor and a keyboard
- Supports DMCNET communication for easy wiring and excellent synchronous multi-axis control

Solution 2: Function-Oriented
Matches with panels or other products based on applications
- API platform and template are provided for users to self-define the HMI functions
- Easy integration with third party software via IPC
- Reduces additional hardware cost for customers to focus more on software upgrades and better integrated operation performance

Applications
Customized CNC system, woodworking machine, lathe, grinding, glass cutting, spot welding, rim engraving, robot arms, milling
CNC Solution

Integrated Total Solution for the CNC Machine Tools Industry

- Built-in 32-bit high speed and high processing dual CPU to construct a real-time and multi-functional control center
- High-quality digital data transmission when matched with Delta's high-speed servo and spindle systems
- Auto-gain tuning allows automatic servo system parameter settings to achieve easy and real-time optimum control
- CNCSoft software offers user-friendly setup and user-defined operation to build customized screens
- Capable of connecting serial digital I/O modules to greatly improve the extension capacity

System Configuration

Applications

- CNC Machining Centers, High-speed Tapping Machines
- Engraving Machines
- CNC Gantry Control Machines
- CNC Woodworking Machines
Robot Controller with Servo Drive Integrated ASDA-MS

An Innovative and Comprehensive Development Platform for Robot Control

**Complete Robot Solution**

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

**User-Friendly Robot Software**

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

**System Configuration**
All-in-One Robot Controller

- Integrates motion controller, robot controller and 4 servo drives into one single unit to speed up data transmission, enhance system control performance and dynamically compensate non-linear terms that affect robot motion during robot moving processes, which meets the high speed and high precision requirements of robot or motion control applications.

- Provides a variety of tools for implementing required functions and supports different types of robots such as the 4-axis SCARA robot, the Linear DELTA, DELTA robot, and the 2 axes extension via DMCNET for 6-axis articulated robot to meet diverse requirements with flexibility and reliability.

Comprehensive Development Platform

- Provides a comprehensive development platform for customers to design their specific applications, which enhances value-added secondary development and efficiency of various manufacturing techniques.

- Meets the requirements for both single robot or workstation applications integrated with Delta’s industrial automation products and related robot peripheral devices to create a complete robotic automation solution.

Applications

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

Techniques: Insertion, screw driving, assembly, glue dispensing, soldering, load and unload, stacking, inspection
Optimum Combination of Display and Controller Controllers with Human Machine Interfaces

**HMC Series**

### 7-inch Controller with Widescreen Handheld HMI

**HMC07-N411H5C5(A)**
- 7" 16:9 widescreen 65536 colors TFT
- Display Resolution: 800 x 480 pixels
- Built-in PLC functions
- Built-in emergency stop switch
- Built-in enable switch (rear side)
- Optional MPG (Manual Pulse Generator)
- Supports SDHC card
- Supports DMCNET
- Compact and lightweight 750g design

### 7-inch Controller with Handheld HMI

**HMC08-N500S52**
- 7" 65536 colors TFT
- Display Resolution: 800 x 600 pixels
- Built-in PLC functions
- RS-422 high-speed remote I/O connection
- Supports Ethernet
- Supports SDHC card
- Supports DMCNET
- Supports audio output: MP3, Wav files
- USB Host for direct connection to USB disk, printer, mouse and keypad

### 8-inch Controller with HMI

**HMC08-N500S52**
- 8" 65536 colors TFT
- Display Resolution: 800 x 600 pixels
- Built-in PLC functions
- RS-422 high-speed remote I/O connection
- Supports MPG (Manual Pulse Generator) Input
- Supports Ethernet
- Supports SDHC card
- Supports DMCNET
- Supports audio output: MP3, Wav files
Control of a Material Loading/Unloading Robot for Machine Tools

HMC

3-Axis Synchronous Servo System
ASDA-M

Orthogonal Axes
X-Axis  Y-Axis  Z-Axis

Material Rotating Shaft
Ø-Axis

AC Servo Drive
ASD-A2

General Digital I/O
Process Completion Signal
Loading Completion Signal
Clamp Switch Signal

Delta Permanent-Magnet AC Servo Motor
ECMA
Hot Swappable Mid-range PLC
AH500
The Smart Solution for High-end Machinery
and System Integration

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

Modularized Hardware Structure and Highly Integrated Software

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

Remote I/O bus
- Supports
  - DeviceNet
  - PROFIBUS
  - EtherNet/IP

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

Motion Control Structure

Example: AH20EMC

Applications
High-end industrial equipment (textile machines, packaging machines, injection and molding machines, electronics equipment, printing machines, paper making machines, warehousing management systems, logistics management systems) and system integration applications (water treatment, HVAC system, traffic monitoring system)
**Redundant CPU**

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

**Redundant Backplane**

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

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

**Redundant expansion backplane: AHBP06ER1-5A (6-slot), AHBP08ER1-5A (8-slot)**
Redundant System

Full Redundancy Structure

<table>
<thead>
<tr>
<th>Modules</th>
<th>Redundant CPU</th>
<th>Redundant main backplane</th>
<th>Redundant power</th>
<th>Redundant ext. ports</th>
<th>Ring topology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main backplane</td>
<td>Expansion backplane</td>
<td>RTU rack</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Ethernet module - AH10EN-5A (V3)</td>
<td>• DIO</td>
<td>• DIO (includes temperature modules)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Serial module - AH10SCM-5A (V3)</td>
<td>• AIO (includes temperature modules)</td>
<td>• AIO (includes temperature modules)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Tasks

<table>
<thead>
<tr>
<th>Cyclic</th>
<th>Timer interrupt</th>
</tr>
</thead>
</table>

CPU built-in sync. module

CPU switch-over time: 20 ms

RTU nodes to support expansion backplanes

Standard backplanes available (under some conditions)
Compact Modular Mid-range PLC AS
Flexible, Smart, Friendly - The Best Choice for Automated Equipment Control

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

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

<table>
<thead>
<tr>
<th>Instruction Type</th>
<th>Time (μs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LD instruction</td>
<td>25 ns</td>
</tr>
<tr>
<td>MOV instruction</td>
<td>0.15 μs</td>
</tr>
<tr>
<td>Floating point operation instruction</td>
<td>1.6 μs</td>
</tr>
<tr>
<td>Trigonometric function instruction</td>
<td>3.5 μs</td>
</tr>
</tbody>
</table>

Positioning Control - Delta’s CANopen Control
- Up to 8-axis CANopen positioning control with AS-FCOPM communication card
- Fast positioning configuration in one initialization instruction without building CANopen data exchange table
- Batch download of programmable servo drive parameters to avoid data loss
- Axis control by instructions to enhance the legibility and maintainability of PLC programs

Up to 8 axes control
AC Servo Drive ASDA-A2
Positioning Control - High-speed Pulse

- AS332T-A / AS332P-A transistor CPU: 6 axes (or 12 channels) 200kHz
- AS324MT-A differential CPU: 2 axes 4 MHz + 4 axes 200kHz
- Supports positioning planning table for fast positioning planning and path simulation
- Choose any given 2 axes for linear and arc interpolation

Flexible Network System Configuration

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

New Programming Software

Various, Convenient Software Wizards for Effortless Planning

Positioning Planning Table

- 2D simulation
  Intuitive 2D track simulation without complicated calculation for real-time path planning
- Path list
  Multiple combination for positioning modes and tracks
  Fast path planning via table-structured planning
- Axis parameter setting
  Intuitive configuration interface for easy axis parameter setting without manual reference

Complete Diagnosis Tools for Quick and Effective System Monitoring

Data Logger / Tracer

- Real-time monitoring:
  High-speed tracer for fast sampling within 1 scanning cycle
- Stable logging:
  Long-time data logger saves up to 32,768 data records, able to be transferred to SD cards
- Precise data capture:
  Supports a variety of sampling intervals, trigger modes, software settings, and hardware execution
- Convenient comparison:
  Multiple data logs in various data formats can be recorded at the same time
- Efficient data analysis:
  Supports trend display, scaling, arrangement, merge and measurement

Applications

High-end equipment for electronics manufacturing, machinery processing, food packaging and other industries
High Performance PLC
DVP-EH3
Excellent for OEM Monitoring Solution

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

<table>
<thead>
<tr>
<th>Program capacity</th>
<th>Data register</th>
</tr>
</thead>
<tbody>
<tr>
<td>EH3</td>
<td>30k steps</td>
</tr>
<tr>
<td>EH2</td>
<td>16k steps</td>
</tr>
</tbody>
</table>

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

Complete Program Protection
- Auto backup function prevents program and data loss even when the battery runs out
- Secondary backup function saves an extra copy of programs and data to enhance program safety
- Up to 4-level password protection protects your source programs and intellectual property

Function Cards
- For RS-232/RS-422 Communication (COM3 Port, DVP-EH3 Series PLC only)
  - DVP-F232
  - DVP-F422
  - DVP-F485
- For Ethernet Communication
- Analog Input/Output
  - DVP-F2AD
  - DVP-F2DA
Standard PLC
Analog I/O PLC
DVP-ES2/EX2

Comprehensive Functions for General Applications

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

- Standard PLC DVP-ES2 Series:
  - 16/20/24/32/40/60/80 I/O points for a variety of applications
  - No battery required; RTC function operates for at least one week after power off (hardware version 2.0 or above)
  - DVP32ES2-C model with built-in CANopen (Baud: 1 Mbps)

- Analog I/O PLC DVP-EX2 Series:
  - DVP-20EX2 model:
    - Built-in 12-bit 4 analog inputs / 2 analog outputs; and 14-bit analog I/O extension module
    - Built-in PID auto tuning function for complete analog control solution
  - DVP30EX2 model as temperature and analog I/O PLC

- Program capacity: 16k steps
- Data register: 10k words
- Max. execution speed of basic instructions: 0.35 \( \mu \)s
- Highly efficient processing ability: 1k steps of programs can be completed within 1ms
- Max. 100 kHz pulse control; specific motion control instructions (mark/masking and instant frequency changing) available for multi-axis applications
- Up to 4-level password protection protects your source programs and intellectual property

Network Type Advanced Slim PLC
DVP-SE

Complete network communication functions for advanced industrial applications

- Program capacity: 16k steps
- Data register: 12k words
- Max. execution speed of basic instructions: 0.64 \( \mu \)s
- Built-in Ethernet
  - DVP12SE: MODBUS & Ethernet/IP (Explicit message)
  - DVP26SE: MODBUS & Ethernet/IP (Adapter mode, explicit message)
- IP Filter function as firewall for first line protection against malware and network threats
- No battery required; RTC function operates for 15 days after power off
- Supports DVP-S Series modules (left-side and right-side) (DVP26SE only supports right-side modules)
High Performance Slim PLC
DVP-SV2
Best Choice for Slim Type PLC

High-end model of DVP-S Series with larger program capacities and data registers for more demanding and complex applications

<table>
<thead>
<tr>
<th>Program capacity</th>
<th>Data register</th>
</tr>
</thead>
<tbody>
<tr>
<td>SV2</td>
<td>12,000 words</td>
</tr>
<tr>
<td>30k steps</td>
<td></td>
</tr>
<tr>
<td>SV</td>
<td>10,000 words</td>
</tr>
<tr>
<td>16k steps</td>
<td></td>
</tr>
</tbody>
</table>

Excellent Motion Control
- High-speed pulse output: 4 axes of 200 kHz pulse output
- Supports max. 4 hardware 200 kHz and 2 hardware 20 kHz high speed counters
- Various motion control instructions to achieve high-speed and high-precision positioning control for labeling machines, packaging machines, printing machines and more applications
- Linear/arc interpolation motion control function
- Provides up to 16 external interrupt pointers

Complete Program Protection
- Auto backup function to prevent program and data loss even when the battery runs out
- Secondary backup function saves an extra copy of programs and data to enhance program safety
- Up to 4-level password protection protects your source programs and intellectual property

Supports DVP-S Series modules (left-side and right-side); additional new Ethernet communication command (ETHRW)

High-speed Modules (Left-side)

<table>
<thead>
<tr>
<th>Network Modules</th>
<th>Analog Input/Output Modules</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DeviceNet Master</strong> DVPDNET-SL</td>
<td><strong>Analog Input</strong> DVP04AD-SL</td>
</tr>
<tr>
<td><strong>Ethernet</strong> DVPEN01-SL</td>
<td><strong>Analog Output</strong> DVP04DA-SL</td>
</tr>
<tr>
<td><strong>RS-422/RS-485 Serial Communication Module</strong> DVPSCM12-SL</td>
<td><strong>PROFIBUS DP Slave</strong> DVPPF02-SL</td>
</tr>
<tr>
<td><strong>BACnet MS/TP Slave Serial Communication Module</strong> DVPSCM52-SL</td>
<td><strong>Load Cell Modules</strong></td>
</tr>
<tr>
<td><strong>CANopen Master</strong> DVPCOPM-SL</td>
<td>DVP01LC-SL</td>
</tr>
<tr>
<td><strong>PROFIBUS DP Slave</strong> DVPPF02-SL</td>
<td>DVP02LC-SL</td>
</tr>
<tr>
<td><strong>BACnet MS/TP Slave</strong> DVPSCM52-SL</td>
<td>DVP201LC-SL</td>
</tr>
<tr>
<td><strong>BACnet MS/TP Slave</strong> DVPSCM52-SL</td>
<td>DVP211LC-SL</td>
</tr>
<tr>
<td><strong>BACnet MS/TP Slave</strong> DVPSCM52-SL</td>
<td>DVP202LC-SL</td>
</tr>
</tbody>
</table>
Standard Slim PLC
DVP-SS2

Economic and compact model
- Max. I/O: 480 points
- Program capacity: 8k steps
- Data register: 5k words
- Max. execution speed of basic instructions: 0.35 μs
- Built-in RS-232 and RS-485 ports (Master/Slave)
- Supports standard MODBUS ASCII/RTU protocol and PLC Link function
- Motion control functions:
  - 4 points of 10kHz pulse output
  - 8 points of high-speed counters: 20kHz/4 points, 10kHz/4 points

Advanced Slim PLC
DVP-SA2

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

Analog I/O Slim PLC
DVP-SX2

Analog model with highly efficient PID control function
- Program capacity: 16k steps
- Data register: 10k words
- Max. execution speed of basic instructions: 0.35 μs
- Built-in 4 analog inputs/2 analog outputs
- Supports standard MODBUS ASCII/RTU protocol and PLC Link function
- No battery required; RTC function operates for at least one week after power off (hardware version 2.0 or above)
- Supports DVP-S Series modules (including left-side high-speed modules)
- Motion control functions:
  - 4 points of high-speed pulse output: 100kHz/2 points, 10kHz/2 points
  - 8 points of high-speed pulse input: 100kHz/2 points, 10kHz/6 points
  - Supports 2-axis linear and arc interpolation
Multi-axis Motion Controller
DVP-MC
High Speed, High Precision Motion Control Brings Outstanding Performance

16-axis Motion Controller / 24-axis Motion Controller
DVP10MC11T / DVP15MC11T New

Perfect controllers for motion solutions via CANopen communication
- Built-in 16/24 I/O points. Max. 480 I/O points
- Program capacity:
  - DVP10MC: Ladder 16k steps / Motion 1 Mbytes
  - DVP15MC: 20 Mbytes
- Built-in Ethernet, RS-232 and RS-485 ports
- Supports standard MODBUS ASCII/RTU protocol
- Flexible industrial networking applications
  (DeviceNet Master/Slave, CANopen Master/Slave and PROFIBUS DP Slave modules)
- Provides standard communication cables, terminal resistors, distribution boxes and more accessories for easy wiring and connection

System Configuration
General Motion Controller
DVP-PM

Standard Motion Controller
DVP10PM00M

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

Advanced Motion Controller
DVP20PM00M/D/DT

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

**DOP-100 Series**

**4.3-inch Widescreen Ethernet HMI**

**DOP-103WQ**
- 4.3” 16:9 widescreen, 65,536 colors TFT
- Display Resolution: 480 x 272 pixels
- USB Host for direct connection to USB disk, printer, mouse and keypad
- Supports Ethernet
- Supports FTP/ Email / VNC / Web Monitor
- Supports multi-language input

**7-inch Widescreen Ethernet HMI**

**DOP-107WV**
- 7” 16:9 widescreen, 65,536 colors TFT
- Display Resolution: 800 x 480 pixels
- USB Host for direct connection to USB disk, printer, mouse and keypad
- Supports Ethernet
- Supports FTP/ Email / VNC / Web Monitor
- Supports multi-language input

**10.1-inch Widescreen Ethernet HMI**

**DOP-110WS**
- 10.1” 16:9 widescreen, 65,536 colors TFT
- Display Resolution: 1024 x 600 pixels
- USB Host for direct connection to USB disk, printer, mouse and keypad
- Supports SDHC card
- Supports Ethernet
- Supports FTP/ Email / VNC / Web Monitor
- Supports multi-language input
High Color, High Resolution Human Machine Interfaces

**DOP-W Series**

### 10.4-inch Large-Size HMI
**DOP-W105B**
- 10.4" 65536 colors TFT LCD
- Display Resolution: 800 x 600 pixels
- 1GHz high speed processor
- Supports audio output (MP3, Wav files)
- USB Host for direct connection to USB disk, printer, mouse and keypad
- Supports 2 Ethernet ports
- Supports SDHC card
- Supports video format: MPEG1, MPEG2, WMV

### 12-inch Large-Size HMI
**DOP-W127B**
- 12" 65536 colors TFT LCD
- Display Resolution: 1024 x 768 pixels
- 1GHz high speed processor
- Aluminum enclosure with dark gray mold texturing
- 2 sets of COM ports, supports RS-232/RS-422/RS-485
- USB Host for direct connection to USB disk, printer, mouse and keypad
- Supports 2 Ethernet ports
- Supports SDHC card
- Supports video format: MPEG1, MPEG2, WMV
- Supports audio output: MP3, Wav files (built-in front speaker)

### 15-inch Large-Size HMI
**DOP-W157B**
- 15" 65536 colors TFT LCD
- Display Resolution: 1024 x 768 pixels
- 1GHz high speed processor
- Aluminum enclosure with dark gray mold texturing
- 2 sets of COM ports, supports RS-232/RS-422/RS-485
- USB Host for direct connection to USB disk, printer, mouse and keypad
- Supports 2 Ethernet ports
- Supports SDHC card
- Supports video format: MPEG1, MPEG2, WMV
- Supports audio output: MP3, Wav files (built-in front speaker)
DOP-B Series

4.3-inch Widescreen HMI
DOP-B03S(E)211
- 4.3" 16:9 widescreen, 65536 colors TFT
- Display Resolution: 480 x 272 pixels
- Supports Ethernet
- USB Client for high-speed data transfer
- USB Host for direct connection to USB disk, printer, mouse and keypad

7-inch Widescreen HMI
DOP-B07S(E)411 / DOP-B07S(E)415
- 7" 16:9 widescreen, 65536 colors TFT
- Display Resolution: 800 x 480 pixels
- Supports Ethernet
- Supports SDHC card
- USB Client for high-speed data transfer
- USB Host for direct connection to USB disk, printer, mouse and keypad
- Supports audio output: MP3, Wav files

10.1-inch Widescreen HMI
DOP-B10S411 / DOP-B10S(E)615
- 10.1" 16:9 widescreen, 65536 colors TFT
- Display Resolution: 800 x 480 pixels / 1024 x 600 pixels
- USB Client for high-speed data transfer
- USB Host for direct connection to USB disk, printer, mouse and keypad
- Supports audio output: MP3, Wav files
- Supports Ethernet
- Supports SDHC card
5.6-inch Standard HMI
DOP-B05S111
- 5.6" 65536 colors TFT
- Display Resolution: 320 x 234 pixels
- USB Client for high-speed data transfer
- USB Host for direct connection to USB disk, printer, mouse and keypad

7-inch Standard HMI
DOP-B07S(E)515
- 7" 65536 colors TFT
- Display Resolution: 800 x 600 pixels
- USB Client for high-speed data transfer
- USB Host for direct connection to USB disk, printer, mouse and keypad
- Supports audio output: MP3, Wav files
- The world's first design: the effective display area is the same as 7-inch models, but the panel cutout's dimensions are just the same as 5.6-inch models.

8-inch Standard HMI
DOP-B08S(E)515
- 8" 65536 colors TFT
- Display Resolution: 800 x 600 pixels
- USB Client for high-speed data transfer
- USB Host for direct connection to USB disk, printer, mouse and keypad
- Supports audio output: MP3, Wav files
- Supports Ethernet
- Supports SDHC card

10.4-inch Standard HMI
DOP-B10S511 / DOP-B10E515
- 10.4" 65536 colors TFT
- Display Resolution: 800 x 600 pixels
- Supports audio output: MP3, Wav files
- Host for direct connection to USB disk, printer, mouse and keypad
- Supports Ethernet
- Supports SDHC card

Human Machine Interface
7-inch Widescreen HMI with Delta Professional Functions
DOP-B07PS415
- 7” 16:9 widescreen, 65536 colors TFT
- Display Resolution: 800 x 480 pixels
- Supports SDHC card
- USB Client for high-speed data transfer
- USB Host for direct connection to USB disk, printer, mouse and keypad
- Supports audio output: MP3, Wav files
- Supports Electronic Cam (E-Cam) function (ASDA-A2)
- Supports G-code download function (DVP-10MC/DVP-20PM/AH20MC)

7-inch HMI with Delta Professional Functions
DOP-B07PS515
- 7” 65536 colors TFT
- Display Resolution: 800 x 600 pixels
- Supports SDHC card
- USB Client for high-speed data transfer
- USB Host for direct connection to USB disk, printer, mouse and keypad
- Supports audio output: MP3, Wav files
- Supports Electronic Cam (E-Cam) function (ASDA-A2)
- Supports G-code download function (DVP-10MC/DVP-20PM/AH20MC)
- The world’s first design: the effective display area is the same as 7-inch models, but the panel cutout’s dimensions are just the same as 5.6-inch models
DOP-H Series

7-inch Widescreen Handheld HMI
DOP-H07

- 7" 16:9 widescreen, 65536 colors TFT
- Display Resolution: 800 x 480 pixels
- Supports SDHC card
- Built-in emergency stop switch
- Built-in enable switch (rear side)
- Serial communication models support RS-485/RS-422
- Ethernet communication models support one Ethernet port
- Optional MPG (Manual Pulse Generator)
- Compact and lightweight 750g design
- Integrated style cables available (5m/10m)
4-Line Text Panel HMI
TP04G-AL-C / TP04G-AL2

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

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>4.1” (101.8 x 35.24 mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution</td>
<td>192 x 64</td>
</tr>
<tr>
<td>Display Color</td>
<td>Monochrome</td>
</tr>
<tr>
<td>Flash Memory</td>
<td>256k bytes</td>
</tr>
<tr>
<td>Function Key</td>
<td>10 function keys</td>
</tr>
<tr>
<td>Password</td>
<td>Available</td>
</tr>
<tr>
<td>Recipe Function</td>
<td>Not available</td>
</tr>
<tr>
<td>RTC</td>
<td>Available</td>
</tr>
<tr>
<td>Serial COM Port</td>
<td>RS-232 &amp; RS-422/485</td>
</tr>
<tr>
<td>Editing Software</td>
<td>TPEditor</td>
</tr>
</tbody>
</table>

4-Line Text Panel HMI
TP04G-BL-C

- 4.1” STN-LCD
- 0-9 numeric keys and user-defined function available
- Built-in RS-232 and RS-422/RS-485 ports
- Supports MODBUS ASCII/RTU modes
- Password protection function available
- User-defined boot screen available
- Built-in real time clock (RTC)

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>4.1” (101.8 x 35.24 mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution</td>
<td>192 x 64</td>
</tr>
<tr>
<td>Display Color</td>
<td>Monochrome</td>
</tr>
<tr>
<td>Flash Memory</td>
<td>256k bytes</td>
</tr>
<tr>
<td>Function Key</td>
<td>17 function keys</td>
</tr>
<tr>
<td>Password</td>
<td>Available</td>
</tr>
<tr>
<td>Recipe Function</td>
<td>Not available</td>
</tr>
<tr>
<td>RTC</td>
<td>Available</td>
</tr>
<tr>
<td>Serial COM Port</td>
<td>RS-232 &amp; RS-422/485</td>
</tr>
<tr>
<td>Editing Software</td>
<td>TPEditor</td>
</tr>
</tbody>
</table>

8-Line Text Panel HMI
TP08G-BT2

- 3.8” STN-LCD
- Resolution: 240 x 128 dots
- Built-in 1,024KB flash memory
- 24 user-defined function keys
- Built-in RS-232 and RS-422/RS-485 ports
- Supports recipes and macro functions

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>3.8” (83 x 41 mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution</td>
<td>240 x 128</td>
</tr>
<tr>
<td>Display Color</td>
<td>Monochrome</td>
</tr>
<tr>
<td>Flash Memory</td>
<td>1M bytes</td>
</tr>
<tr>
<td>Function Key</td>
<td>24 function keys</td>
</tr>
<tr>
<td>Password</td>
<td>Available</td>
</tr>
<tr>
<td>Recipe Function</td>
<td>Available</td>
</tr>
<tr>
<td>RTC</td>
<td>Available</td>
</tr>
<tr>
<td>Serial COM Port</td>
<td>RS-232 &amp; RS-422/485</td>
</tr>
<tr>
<td>Editing Software</td>
<td>TPEditor</td>
</tr>
</tbody>
</table>

Applications
Intelligent control systems for aquaculture, steel sleeve tapping machines, air compressors, plant factories
7-Inch Touch Panel HMI with Built-in PLC

TP70P-RM0

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

Dimensions

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>7&quot; (154 × 85mm)</td>
</tr>
<tr>
<td>Resolution</td>
<td>800 × 480</td>
</tr>
<tr>
<td>Display Color</td>
<td>65,535 colors</td>
</tr>
<tr>
<td>Flash Memory</td>
<td>64 M bytes</td>
</tr>
<tr>
<td>Function Key</td>
<td>Not available</td>
</tr>
<tr>
<td>Password</td>
<td>Available</td>
</tr>
<tr>
<td>Recipe Function</td>
<td>Not available</td>
</tr>
<tr>
<td>RTC</td>
<td>Available</td>
</tr>
<tr>
<td>Serial COM Port</td>
<td>RS-232 &amp; RS-485</td>
</tr>
<tr>
<td>Editing Software</td>
<td>TPEditor</td>
</tr>
</tbody>
</table>

7-Inch Touch Panel HMI with Built-in PLC

TP70P

- Adopts the core of DVP-SS2 Series PLC:
  - program capacity: 4k steps / D device: 5k words
- Provides 2 sets of 10kHz high-speed pulse input
- 7" TFT-LCD
- Touch screen
- Built-in USB port for program upload/download
- Built-in RS-485 port*2
- Supports MODBUS ASCII/RTU modes
- Built-in real time clock (RTC)
- Digital and analog I/O terminals available

Dimensions

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>7&quot; (154 × 85mm)</td>
</tr>
<tr>
<td>Resolution</td>
<td>800 × 480</td>
</tr>
<tr>
<td>Display Color</td>
<td>65,535 colors</td>
</tr>
<tr>
<td>Flash Memory</td>
<td>64 M bytes</td>
</tr>
<tr>
<td>Function Key</td>
<td>Not available</td>
</tr>
<tr>
<td>Password</td>
<td>Available</td>
</tr>
<tr>
<td>Recipe Function</td>
<td>Not available</td>
</tr>
<tr>
<td>RTC</td>
<td>Available</td>
</tr>
<tr>
<td>Serial COM Port</td>
<td>2 sets of RS-485</td>
</tr>
<tr>
<td>Editing Software</td>
<td>TPEditor</td>
</tr>
</tbody>
</table>

4-Line Text Panel HMI with Built-in PLC

TP04P

- Adopts the core of DVP-SS2 Series PLC:
  - program capacity: 8k steps / D device: 5k words
- Provides 2 sets of 10kHz high-speed pulse input
- 4.1" STN-LCD
- Provides 0~9 numeric keys with user-defined function
- Built-in USB port for program upload/download
- Built-in RS-485 port*2
- Supports MODBUS ASCII/RTU modes
- User-defined boot screen available
- Built-in real time clock (RTC)
- Digital and analog I/O terminals available

Dimensions

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>4.1&quot; (101.8 × 35.24 mm)</td>
</tr>
<tr>
<td>Resolution</td>
<td>192 × 64</td>
</tr>
<tr>
<td>Display Color</td>
<td>Monochrome</td>
</tr>
<tr>
<td>Flash Memory</td>
<td>1 M bytes</td>
</tr>
<tr>
<td>Function Key</td>
<td>17 function keys</td>
</tr>
<tr>
<td>Password</td>
<td>Available</td>
</tr>
<tr>
<td>Recipe Function</td>
<td>Not available</td>
</tr>
<tr>
<td>RTC</td>
<td>Available</td>
</tr>
<tr>
<td>Serial COM Port</td>
<td>2 sets for RS-485</td>
</tr>
<tr>
<td>Editing Software</td>
<td>TPEditor</td>
</tr>
</tbody>
</table>
**Inductive Proximity Sensor**

**IS**
- Nickel-coated brass
- Standard sensors for detecting ferrous metals
- Electrical circuit protection
- IP67 and CE certification

---

**Photoelectric Sensor**

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

**PS-F/PS-L**
- Slim and small, easy to install
- Electrical circuit protection
- IP67 and CE certification

**PS-M**
- Standard size (M18) for mounting
- Sensing range adjustment (TEACH)
- M3 mounting hole, easy to install
- Electrical circuit protection
- IP67 and CE certification
Fiber Amplifier New
FA
• Light and slim, easy to install
• Dual display, visualized setting
• Easy function setting with buttons
• CE certification

Laser Displacement New
LD
• Aluminum case, strong structure
• Slim and small, easy to install
• High precision, sampling time setting available
• IP67 and CE certification

Area Sensor New
AS
• Aluminum case, strong structure
• No dead zone
• Effective aperture angle: less than 2.5 degrees
• IP67 and CE certification

Applications
Electronics Industry, warehouse / logistics, wooden and steel industry, textile industry, food and beverages, equipment, machine, protection and more
Rotary Encoder
**HS / ES / EH**

**Incremental**
- Configurable Resolution
- Wide Input Voltage: 5~30 VDC
- Resolution: 50~2500 PPR
- Output Form: Open Collector, Line Driver, Push Pull
- HS / ES Outer Diameter of Solid Shaft: 36.6 mm, 50 mm
- EH Outer Diameter of Hollow Shaft: 36.6 mm, 50 mm

**Applications**
Label printing machines, detecting machines, elevators, bottling machines, cutting machines, elevator doors, testing/inspection machines
Handheld Barcode Scanner** New **
DAH
Wide Target Area, Fast and Reliable Capture

- Fast code capture speed without aiming precisely
- Easy to read barcodes under low contrast, optical noise, uneven exposure or damaged conditions
- Easy commands for users to set up:
  - Manually adjust illumination based on various environment
  - Supports single and multiple trigger modes
  - Manually select barcode types based on user’s demands
  - Users can self-define exported contents of the scanning codes for flexible data acquisition
- Robust design: drop impact resistance at 1m high
- No detachable components to save maintenance cost

**Applications**
Food and beverage packaging, electrical machines, printing machines, pharmaceutical machinery, automated product line

**Advanced Decode Algorithm for Excellent Reading Performance**

<table>
<thead>
<tr>
<th>1-D low contrast</th>
<th>1-D optical noise</th>
<th>1-D glare</th>
<th>1-D damaged code</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="1D Example" /></td>
<td><img src="image2.png" alt="1D Example" /></td>
<td><img src="image3.png" alt="1D Example" /></td>
<td><img src="image4.png" alt="1D Example" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2-D optical noise</th>
<th>2-D ill-printed codes</th>
<th>2-D ill-printed codes</th>
<th>2-D ill-printed codes</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image5.png" alt="2D Example" /></td>
<td><img src="image6.png" alt="2D Example" /></td>
<td><img src="image7.png" alt="2D Example" /></td>
<td><img src="image8.png" alt="2D Example" /></td>
</tr>
</tbody>
</table>
Advanced Intelligent Temperature Controller
DT3
High Speed. High Precision. High Performance
Next Generation Multifunction Temperature Controller

Applications
Solar panel manufacturing, food and beverage packaging, pharmaceuticals, semiconductors, rubber and plastics, high-tech electronics industries, air-conditioning and heating system

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

When disturbance occurs
PID control
FUZZY PID control
The FUZZY mode effectively reduces temperature fluctuation
User-defined Function Keys
- Control Modes Selection
- Alarm Clearing
- Controller ON/OFF
- Start PID
- Save Menu
- Process Control ON/OFF

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

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:
- Platinum Resistance Thermometer:
  Pt100, JPt100, Cu50, Ni120
- Analog Input:
  0~5 V, 0~10 V, 0~20 mA, 4~20 mA, 0~50 mA

Output
Relay, current 4~20 mA, pulse voltage, analog voltage 0~10 V
Intelligent Temperature Controller
DTK
- Thermocouple: K, J, T, E, N, R, S, B, L, U, TXK (Supports max. 8 sets of input)
- Platinum Resistance: Pt100, JPt100 (Supports max. 6 sets of input)
- RTD: Cu50, Ni120
- Analog Input: AC 100~240V, 50/60Hz
- Output: Relay, current 4~20 mA, pulse voltage
- Control Mode: ON-OFF, PID, manual
- MODBUS communication: Optional
- 1 set of alarm output (2 sets of alarm outputs are optional), 9 alarm modes
- Certification: CE, UL

Standard Temperature Controller
DTA
- Platinum Resistance: Pt100, JPt100
- RTD: Cu50
- Analog Input: N/A
- Output: Relay, current, pulse voltage
- Control Mode: ON-OFF, PID, manual
- MODBUS communication: Optional
- 2 sets of alarm outputs, 12 alarm modes
- Dimensions: 48x48, 48x96, 72x72, 96x48, 96x96 (mm)
- IP66 protection
- Certifications: CE, UL

Advanced Temperature Controller
DTB
- Platinum Resistance: Pt100, JPt100
- Analog Input: 0~5 V, 0~10 V, 0~20 mA, 4~20 mA, 0~50 mA
- Output: Relay, current 4~20 mA, pulse voltage, analog voltage 0~10V
- Control Mode: ON-OFF, PID, manual, PID process control
- MODBUS communication: Built-in
- 2 sets of alarm outputs, 18 alarm modes
- Dimensions: 48x24, 48x48, 48x96, 96x96 (mm)
- IP66 protection
- Certifications: CE, UL
Modular Temperature Controller
DTC

- Platinum Resistance: Pt100, JPt100
- Analog Input: 0 ~ 5 V, 0 ~ 10 V, 0 ~ 20 mA, 4 ~ 20 mA, 0 ~ 50 mA
- Output: Relay, current 4 ~ 20 mA, pulse voltage, analog voltage 0 ~ 10 V
- Control Mode: ON-OFF, PID, manual, PID process control
- MODBUS communication: Built-in
- 2 sets of alarm outputs, 18 alarm modes
- Certifications: CE, UL

Basic Temperature Controller
DTD

- Platinum Resistance: Pt100, JPt100, Cu50
- RTD: Cu50
- Analog Input: 0 ~ 70 mV, 0 ~ 5 V, 0 ~ 10 V, 0 ~ 20 mA, 4 ~ 20 mA
- Output: Relay, current 4 ~ 20 mA, pulse voltage, analog voltage 0 ~ 10 V
- Control Mode: ON-OFF, PID, manual, PID process control
- 1 set of alarm outputs, 8 alarm modes
- Dimensions: 48 x 48, 48 x 96, 72 x 72 (mm)
- IP66 protection
- Certification: CE

Multi-Channel Modular Temperature Controller
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 ~ 20 mA, pulse voltage, analog voltage 0 ~ 10 V
- Control Mode: ON-OFF, PID, manual, PID process control
- MODBUS communication: Built-in
- 2 sets of alarm outputs, 18 alarm modes
- Certifications: CE, UL
Standard Multifunction Pressure Sensor
DPA
High-Precision Pressure Sensor with comprehensive functions

- 3 sets of color display
- Easy code display
- Various unit conversions
- Various output modes
- Supports RS-485 communication and analog output
- 10 sets of output response time setup
- Safety control function
- Energy-saving mode

Basic Multifunction Pressure Sensor
DPB
Miniature Pressure Sensor for Easy Integration and Cost-saving

- Various unit conversions
- 10 sets of output response time setup
- Various output modes
- 3 sets of color display
- Fast zero reset
- Safety control function
- Easy code display

Flow Switch New
DFM
High-precision and Multiple Air Flow Range

- Bidirectional flow amount measurement, unaffected by fluid direction
- Embedded Laminar Flow Element (LFE), no extra straight pipes needed for stabilizing air flow
- Easy installation and maintenance
- High quality LCD display
- Supports analog output

Applications
Food and beverage packaging, electronic manufacturing, rubber and plastic welding, Laser Beam Machining (LBM), factory air compressor (for energy saving), nitrogen generator, air compressor flow record and detection
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 displays valve openness in percentage form
- 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: 10 Kpps
- NPN or PNP input signals
- Pre-scale function
- Counting modes: 1-stage, 2-stage, batch, total, dual
- MODBUS communication: Optional

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Applications

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

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Label Printing Machine

Fixed Length Cutting Machine

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DELTA
Power Meter
DPM
High Accuracy Solution for Reliable Power Monitoring

Delta Multifunction Power Meter DPM Series precisely measures various electrical energy and power quality parameters, including power factors, harmonics, and current/voltage unbalance. With functions such as off-limit alarms, history logs, communication quality and monitoring, it is suitable for power-critical applications. The DPM-C530, DPM-C520 and DPM-C520W are certified with CE and UL.

High Precision Power Measurement
- Precise measurement of bidirectional electrical energy and power parameters, Class 0.5S meeting IEC62053 and CNS14607 standards
- Supports power quality measurement, total and 31st individual harmonic distortion, voltage and current unbalance, and more
- The DPM-D520I supports 63A current for direct measurement, no current transformer (CT) required

Easy Operation and Installation
- Two mounting clips hold the meter in place, no other tools required
- White-light widescreen LCD with resolution of 198 x 160 dots (DPM-C530)
- Language customization: Traditional Chinese, Simplified Chinese and English (DPM-C530)

Event Alarms and History Logs
- The DPM-C530 / D520I keeps max. 2 months of energy measurement values for history analysis. Up to 17 power parameters selectable for recording different time intervals (e.g. recording 17 electricity parameters every 5 minutes, for up to 2 months)
- DPM-C530 / D520I: 29 types of built-in event alarms for up to 500 event records
  DPM-C520: 10 types of built-in event alarms
- The DPM-C520W supports 802.11 b/g/n wireless communication. The DPM-C530 supports BACnet MS/TP protocol
- Built-in RS-485 communication port supports MODBUS protocol, and all measurement values can be transmitted to the PLCs via communication

Parameter Grouping
The parameter grouping function allows faster data transmission and reading by PLCs to improve efficiency and performance
Applications
The DPM-C530 / C520 / C501L are suitable for: energy management, medium or low voltage distribution system, smart switch cabinet, energy management system, factory automation system, building automation system, railway energy management system, electric heating system, wind power system, energy storage system, electric grid measurement, and energy quality analysis.

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

The DPM-D520i is suitable for: industrial machines, communication base station, IIoT equipment, and areas where CT is difficult to install with current lower than 63A.

Multi-factories Energy Management and Integrated Application

Factory Automation - Energy Consumption Analysis of Production Line
Machine Vision System
DMV2000
Speed, Precision and Humanization
- Smart Visual Inspection

- Multiple cameras work synchronously in parallel processes to enhance efficiency and save development costs
- Image auto correction and lens distortion correction function
- User-friendly operation interface
- Smart operation process and interface for faster programming
- Built-in multi-functional developing tools
- Provides industrial networking module, digital I/O and flash control module for various applications
- Superior hardware specifications compared to same grade products. Achieves high-speed processing
- High-speed cameras with CameraLink interface
- Ethernet, RS-232, RS-485 interfaces for data output
- With high industrial standards, stability better than PC-based system
- Built-in communication system connected by PLC, no need for extra programming
- Self-defined display and operation interfaces in operation mode

Product Types
Two types for different applications
- Standard model: 2 or 4 cameras connectable; high performance and big storage
- Basic model: Maximum 2 cameras connectable; supports GigE camera

* Basic model will be released in Q4, 2018

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

<table>
<thead>
<tr>
<th>Functions</th>
<th>0.3 M</th>
<th>2 M</th>
<th>4 M</th>
<th>5 M</th>
<th>12 M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution (Mega Pixels)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mono</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Color</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Frame Rate</td>
<td>480fps</td>
<td>295fps</td>
<td>159fps</td>
<td>35fps</td>
<td>50fps</td>
</tr>
<tr>
<td>Pixel Dimensions (Horizontal x Vertical)</td>
<td>642 x 484</td>
<td>2048 x 1088</td>
<td>2048 x 2048</td>
<td>2448 x 2048</td>
<td>4096 x 3072</td>
</tr>
<tr>
<td>Sensor Size</td>
<td>1/3”</td>
<td>2/3”</td>
<td>1”</td>
<td>2/3”</td>
<td>1.76”</td>
</tr>
<tr>
<td>Pixel Size (Horizontal x Vertical)</td>
<td>7.4 x 7.4 μm</td>
<td>5.5 x 5.5 μm</td>
<td>5.5 x 5.5 μm</td>
<td>3.45 x 3.45 μm</td>
<td>5.5 x 5.5 μm</td>
</tr>
<tr>
<td>Lens Mount</td>
<td>C Mount</td>
<td>C Mount</td>
<td>C Mount</td>
<td>C Mount</td>
<td>M42</td>
</tr>
</tbody>
</table>

High-speed Cameras with CameraLink Interface

Supports high-speed CameraLink Full configuration with maximum frame rate up to 690 M Bytes/sec.
Supports maximum 12 M pixels in gray scale using standard CameraLink cameras.
Machine Vision System
DMV1000

Intelligent Human Visual Inspection System for a Variety of Applications

- User-friendly operation interface for a quick system setup
- Flowchart programming interface saves development time
- Built-in multi-functional developing tools save users from complex programming
- Offers versatile digital I/O terminals
- Compact and light, saves wiring and space
- Hardware specification meets high-speed processing requirements and offers exceptional performance better than competing products
- Supports standard FireWire 1394 Series CCD
- Provides a complete product line-up including lighting and lenses
- Compatible with Ethernet and RS-232/485 communication interfaces for a quick link up with external devices
- Supports SD card
- Meeting a high industrial standard, stability better than PC-based system
**Applications**

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

- **Bottle Cap Position Identification**
  Identifies the bottle capping position

- **Beverage Packing Inspection**
  Inspects the liquid level of each bottle

- **Luminance Inspection**
  Inspects LED luminance automatically

- **Module Inspection**
  Inspects mobile phone modules such as touch screens and buttons

- **Direction Identification**
  Inspects the direction of work pieces conveyed on a production line

- **Character Inspection**
  Inspects the characters on electronic devices

- **Position Identification**
  Inspects the position of IC components on PCBs

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

---

**Machine Vision System**
**Industrial Power Supply**
The World's Number One in Industrial Power Solutions

### DIN Rail Models

#### CliQ, CliQ II, CliQ III, CliQ M, Lyte, Chrome, Sync, DVP

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

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### Open Frame Models
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A) Convection  
B) Forced Cooling
State-of-the-art Industrial Network Communication for Smart Industry

**Industrial Ethernet Switch**

**Managed Switches**

**DVS-328 New**

- 24-Port FE + 4-Port GbE Combo SFP, designed for backbone network transmission at control centers
- Complete L2 network management functions: Q-in-Q VLAN, QoS, LACP, IGMP & SNMP v1/v2c/v3
- IPv6 address suitable for larger network and neighbor discovery
- Supports MODBUS TCP and EtherNet/IP protocols that facilitate remote management by SCADA and other industrial devices
- Proprietary ONE RING and ONE CHAIN high-end redundancy technology adopts easy-to-build multiple ring topology, with self-healing recovery time <20 ms to ensure reliable network transmission
- Enhanced network security with IEEE 802.1X, TACACS+, SSH, HTTPS and SNMP v3
- Loopback-Detection to avoid broadcast storms by automatically shutting down the ports over a switching loop
- Cable diagnostic to automatically detect twisted-pair cable quality and periodically report issues
- Auto warning by email, DI, relay, syslog & SNMP trap
- Compatible with various industrial protocols, including EtherNet/IP, Profinet, CC-LINK IE and DNP 3.0
- 85 ~ 264 VAC and 88 ~ 370 VDC wide range redundant power input
- IP40 metal case. -40ºC ~ 70ºC operating temperature
- Certifications: UL 60950-1, IEC 60950-1, CCC, CE, FCC and RCM

**DVS-110**

- 7-Port FE + 3-Port GbE Combo SFP, designed for backbone networks
- Complete L2 network management functions: VLAN, QoS, LACP, IGMP & SNMP v1/v2c/v3
- IPv6 address suitable for larger network and neighbor discovery
- Supports MODBUS TCP and EtherNet/IP protocols that facilitate remote management by SCADA and other industrial devices
- Proprietary ONE RING and ONE CHAIN high-end redundancy technology adopts easy-to-build multiple ring topology, with self-healing recovery time <20 ms to ensure reliable network transmission
- Loopback-Detection to avoid broadcast storms by automatically shutting down the ports over a switching loop
- DDM diagnosis function by SFP fiber module
- Auto warning by email, DI, relay, syslog & SNMP trap
- IP40 metal case. -40ºC ~ 70ºC operating temperature
- Certifications: UL 508, IEC 61131-2, CE, FCC and RCM
**DVS-109**

- 8-Port FE + 1-Port GbE, Gigabit uplink port elevating transmission bandwidth
- Complete L2 network management functions: VLAN, QoS, LACP, IGMP & SNMP v1/v2c/v3
- IPv6 address suitable for larger network and neighbor discovery
- Supports MODBUS TCP and EtherNet/IP protocols that facilitate remote management by SCADA and other industrial devices
- Proprietary ONE RING and ONE CHAIN high-end redundancy technology adopts easy-to-build multiple ring topology, with self-healing recovery time < 20 ms to ensure reliable network transmission
- Loopback-Detection to avoid broadcast storms by automatically shutting down the ports over a switching loop
- Auto warning by email, DI, relay, syslog & SNMP trap
- IP40 metal case. -40ºC ~ 75ºC operating temperature
- Certifications: UL 508, IEC 61131-2, CE, FCC and RCM

**DVS-108**

- 6-Port FE + 2-Port GbE Combo SFP, designed for backbone network
- Complete L2 network management functions: VLAN, QoS, LACP, IGMP & SNMP v1/v2c/v3
- IPv6 address suitable for larger network and neighbor discovery
- Supports MODBUS TCP and EtherNet/IP protocols that facilitate remote management by SCADA and other industrial devices
- Proprietary ONE RING and ONE CHAIN high-end redundancy technology adopts easy-to-build multiple ring topology, with self-healing recovery time < 20 ms to ensure reliable network transmission
- Loopback-Detection to avoid broadcast storms by automatically shutting down the ports over a switching loop
- DDM diagnosis function by SFP fiber module
- Auto warning by email, DI, relay, syslog & SNMP trap
- IP40 metal case. -40ºC ~ 75ºC operating temperature
- Certifications: UL 508, IEC 61131-2, CE, FCC and RCM

**PoE+ Managed Switch**

**DVS-G512**

- 8-Port GbE + 4-Port 100/1000Base-SFP, full Gigabit
- 8 10/100/1000Base-T PoE (PSE) ports, each provides 30 W power supply to meet IEEE 802.3at and IEEE 802.3af standards
- Complete L2 network management functions: VLAN, QoS, LACP, IGMP & SNMP v1/v2c/v3
- IPv6 address suitable for larger network and neighbor discovery
- Advanced PoE management and intelligent powered device(PD) class detection
- IEC 62439-2 MRP media redundancy protocol; IEEE 1588v2 PTP precision time protocol
- DDM diagnosis function by SFP fiber module
- Auto warning by email, relay, syslog & SNMP trap
- IP30 metal case. -40ºC ~ 70ºC operating temperature
- Certifications: CE, FCC and RCM
Unmanaged Switches
DVS-G005I00A
- 5-Port GbE
- Supports IEEE 802.1p based QoS for packet forwarding precedence
- Built-in Broadcast Storm Protection
- Transparent transmission of VLAN tagged packets
- Jumbo packet transmission: up to 9,216 Bytes
- EEE Green Ethernet for power savings
- IP40 metal case. -10ºC ~ 60ºC operating temperature
- Certifications: UL 508, IEC 61131-2, CE, FCC and RCM

DVS-005/008/016
- 5/8/16-Port FE; supports long distance transmission via fiber optics
- 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
- 12 ~ 48Vdc redundant terminal block power input
- IP40 metal case. -40ºC ~ 75ºC operating temperature
- Certifications: UL 508, IEC 61131-2, CE, FCC and RCM

PoE+ Unmanaged Switches
DVS-G408W01
- 8-Port GbE, full Gigabit
- 8 10/100/1000Base-T PoE (PSE) ports, each provides 30 W power supply
to meet IEEE 802.3at and IEEE 802.3af standards
- Jumbo packet transmission: up to 9,216 Bytes
- Auto warning by relay output for power failure
- IP30 metal case. -40ºC ~ 70ºC operating temperature
- Certifications: CE, FCC and RCM

DVS-G406W01-2GF
- 4-Port GbE + 2-Port 100/1000Base-SFP, full Gigabit
- 4 10/100/1000Base-T PoE (PSE) ports, each provides 30 W power supply
to meet IEEE 802.3at and IEEE 802.3af standards
- Jumbo packet transmission: up to 9,216 Bytes
- Auto warning by relay output for power failure
- IP30 metal case. -40ºC ~ 70ºC operating temperature
- Certifications: CE, FCC and RCM
SFP Fiber Transceivers

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

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

---

**PoE+ Splitter**

**DVS-G401**
- 1-Port GbE for PoE+ data / power input and 1-Port GbE for data output
- Provides 30W power supply / per port to meet IEEE 802.3at and IEEE 802.3af standards
- Intelligent PoE input overvoltage protection
- Power output up to 27 W
- IP30 metal case. -20°C ~ 70°C operating temperature
- Certifications: CE, FCC and RCM

**PoE+ Injector**

**DVS-G402**
- 2-Port GbE for PoE+ data / power output and 2-Port GbE for data input
- Provides 30W power supply / per port to meet IEEE 802.3at and IEEE 802.3af standards
- Intelligent PoE output overvoltage protection
- Built-in 12V DC power booster for flexible PoE deployment
- IP30 metal case. -20°C ~ 70°C operating temperature
- Certifications: CE, FCC and RCM
IEEE 802.11 WLAN
DVW-W02W2-E2

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

High-gain Antenna
DVW-ANT

- Supports IEEE 802.11 b/g/n or IEEE 802.11 a/b/g/n
- 2.4 & 5 GHz dual-band omni-directional 5.5 & 8dBi, or 2.4 GHz omni-directional 7dBi
- Powerful magnetic base with 3-meter extension cord and RP-SMA (male) connector
- IP65 waterproof and UV resistant design, suitable for applications under all kinds of weather conditions
- -30ºC ~ 60ºC operating temperature
**Industrial 3G Cloud Router DX-2100**

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

**Industrial Ethernet Cloud Router DX-2300**

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

**Industrial 3G/WAN VPN Router DX-3001**

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

**BACnet MS/TP Slave Module DVPSCM52-SL**
- BACnet MS/TP slave, standard MODBUS and user-defined RS-422/485 communication protocols
- Compatible with BACnet software and DDC of major brands on the market. Remote I/O and converter function available when connected with a PLC with I/O point extension
- Isolated power and communication provide strong noise immunity. Built-in 120 ohm terminal resistor switch and feed-through terminals with spring plugs
- Data transmission settings via software, no complex programming required

**RS-422 / 485 Master Module DVPSCM12-SL**
- Standard MODBUS communication and user-defined RS-422/485 communication protocols
- Two sets of independent RS-422/485 communication interfaces
- Isolated power and communication provide strong noise immunity. Built-in 120 ohm terminal resistor switch and feed-through terminals with spring plugs
- Data transmission settings via software, no complex programming required
- Applied as PLC communication ports for program uploading/downloading and monitoring

**Ethernet Master Module DVPEN01-SL**
- MODBUS TCP protocol
- MODBUS TCP connections: Client: 32, Server: 16
- Smart data exchange
- RTU mapping
- Simple firewall
- Email alarm

**CANopen Slave Module DVPFFP02-SL**
- CANopen protocol
- Support for 110 slaves
- Various PDO and high-speed SDO transmission
- Supports NMT slave, Heartbeat, Emergency and more protocols

**DeviceNet Master Module DVPDNET-SL**
- DeviceNet protocol
- Able to connect max. 63 slaves
- Supports EDS files identification and cyclic data transmission
- Max. network connection distance: 500 m
- RTU mapping
**Ethernet Remote I/O Communication Module**
**RTU-EN01**
- MODBUS TCP slave protocol
- Able to connect 8 DVP-S Series analog I/O modules
- Able to connect digital I/O (256 points) modules
- RS-485 port supports max. 32 MODBUS slaves
- Smart PLC if-then function
- Smart Monitor function
- Supports webpage setup and on-line monitoring
- Serial Virtual COM available

**PROFIBUS DP Remote I/O Communication Module**
**RTU-PD01**
- PROFIBUS DP slave protocol
- Auto-detects baudrate, max. baudrate: 12Mbps
- Supports GSD files for identification and cyclic data transmission
- Able to connect 8 DVP-S Series analog I/O modules
- Able to connect digital I/O (256 points)
- RS-485 port supports max. 16 MODBUS slaves

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

**RS-485 Remote I/O Communication Module**
**RTU-485**
- MODBUS protocol
- Able to connect 8 DVP-S Series analog I/O modules
- Able to connect digital I/O (256 points) modules
- Max. baud rate: 115.2Kbps

**DVP Series Slave Modules (Right-side)**

<table>
<thead>
<tr>
<th>Module</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DVCP02-H2</td>
<td>CANopen slave module Supports DVP-EH2/3 Series</td>
</tr>
<tr>
<td>DVPPF01-S</td>
<td>PROFIBUS slave module Supports DVP-S Series</td>
</tr>
<tr>
<td>DVPPF02-H2</td>
<td>PROFIBUS slave module Supports DVP-EH2/3 Series</td>
</tr>
<tr>
<td>DVPDT01-S</td>
<td>DeviceNet slave module Supports DVP-S Series</td>
</tr>
<tr>
<td>DVPDT02-H2</td>
<td>DeviceNet slave module Supports DVP-EH2/3 Series</td>
</tr>
</tbody>
</table>
Impedance to Noise with a Range of Fieldbus Converters

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

**USB Converters**

<table>
<thead>
<tr>
<th>Model</th>
<th>Type</th>
<th>Features</th>
</tr>
</thead>
</table>
| UC-PRG020-12A | USB » RS-232 | • Delta programming cables  
• RS-232 port provides Mini-DIN and DB9 connectors  
• A portable hot-plugging USB device, no power supply required |
| IFD6500  | USB » RS-485 | • Lightweight design for easy portability  
• Auto-detection of data flow direction  
• A portable USB device  
• Supports Win XP, Win 7 32 / 64-bit |
| IFD6503  | USB » CAN | • Extracts CAN messages (incl. standard and extended frames), decodes and displays following DeviceNet and CANopen protocols  
• Filters by set conditions  
• Sends CAN messages (1 message by manual mode, 8 messages by auto mode)  
• Max. 1 Mbps  
• A portable USB device |
| IFD6530  | USB » RS-485 | • Lightweight design for easy portability  
• Auto-detection of data flow direction  
• Supports KPC-CC01 keypad in conducting parameters and page editing  
• Supports Win XP, Win 7 32 / 64-bit  
• A portable USB device |
## MODBUS Serial Converters

<table>
<thead>
<tr>
<th>Model</th>
<th>Interface</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>IFD8500A</td>
<td>RS-232 « » RS-485</td>
<td>- RS-232 to RS-422 / 485 isolated converter&lt;br&gt;- Auto transmission speed adjustment</td>
</tr>
<tr>
<td>IFD8510A</td>
<td>RS-422 / 485</td>
<td>- RS-422 / 485 isolated regenerator&lt;br&gt;- RS-422 / 485 transmission distance extended to 1.2 km&lt;br&gt;- Able to connect to 32 RS-485 devices&lt;br&gt;- Auto transmission speed adjustment and data flow direction control</td>
</tr>
<tr>
<td>IFD8520</td>
<td>RS-232 « » RS-485</td>
<td>- RS-232 to RS-422/485 addressable isolated converter&lt;br&gt;- Connects RS-232 to RS-422/485 by setting up MODBUS address</td>
</tr>
</tbody>
</table>

## Industrial Network Converters

<table>
<thead>
<tr>
<th>Model</th>
<th>Protocol</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>IFD9502</td>
<td>DeviceNet » MODBUS</td>
<td>- DeviceNet protocol&lt;br&gt;- Able to connect Delta industrial automation products&lt;br&gt;- Isolation in RS-485 channel (incl. power supply)&lt;br&gt;- Full compatibility test passed</td>
</tr>
<tr>
<td>IFD9503</td>
<td>CANopen » MODBUS</td>
<td>- CANopen protocol&lt;br&gt;- Able to connect all Delta industrial automation products&lt;br&gt;- Isolation in RS-485 channel (incl. power supply)&lt;br&gt;- Full compatibility test passed</td>
</tr>
<tr>
<td>IFD9506</td>
<td>MODBUS TCP « » MODBUS</td>
<td>- Isolation in RS-485 channel (incl. power supply)&lt;br&gt;- MODBUS TCP protocol&lt;br&gt;- Smart Monitor function&lt;br&gt;- Supports webpage setup and on-line monitoring&lt;br&gt;- Serial Virtual COM available&lt;br&gt;- Alarm notification through email</td>
</tr>
<tr>
<td>IFD9507</td>
<td>EtherNet/IP » MODBUS</td>
<td>- Isolation in RS-485 channel (incl. power supply)&lt;br&gt;- EtherNet/IP and MODBUS TCP protocols&lt;br&gt;- Smart Monitor function&lt;br&gt;- Supports webpage setup and on-line monitoring&lt;br&gt;- Serial Virtual COM available&lt;br&gt;- Alarm notification through email</td>
</tr>
</tbody>
</table>
Industrial PC
DIAV
Stable and High-performance Integration

- IPC with 15" and 19" TFT LCD touch screen
- Wide operating temperature range, suitable for applications in harsh industrial environments
- Fanless and low power Intel Core i3 / i5 processor with high efficiency and excellent performance
- One-click start up click (Power-on)
- Embedded Windows 7 operating system with 256G / 512G SSD
- Full compatibility with SCADA and IEMS software platform

Applications
Equipment for electronics manufacturing, machinery equipment, HVAC, water treatment, facility management and monitoring control
Factory Digitalization
- Factory data acquisition, process control and management
- Distributed system calculation for data and information storage and analytics

Logistic Application: Transportation and Stereoscopic Warehouse
- The database saves the location of materials; barcode scanning enhances load/unload and sorting efficiency to save space and labor costs

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

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

DIALink

**DIAEnergie**
Industrial Energy Management System
- Power Monitoring
- Rate Analytics
- Demand Control

**DIAView**
SCADA System
- Real-time Monitoring
- Data Acquisition
- Alarm Management

**DIAMES**
Manufacturing Execution System
- Production Process Management
- Equipment Management and Maintenance
- Overall Equipment Effectiveness (OEE) Management

**Equipment Data Acquisition**

**Easy Programming Software**

**Software and Hardware integrating Platform**

**Seamless Software / Data Transmission**

---

**Equipment Monitoring and Data Acquisition**

**Features**
- Supports all major CNC and PLC drivers
- Equipment monitoring and data acquisition
- Data temporary storage function

**Benefits**
- Equipment data digitalization and management
- Customized (user-defined) real-time information visualization
- Machine abnormality and idle time monitoring
- Enhanced efficiency by improving control of Overall Equipment Effectiveness (OEE)

**Applications**
- Equipment data real-time collection
- Equipment analysis and management
- Remote monitoring and control
Rapid, Seamless and Secure Data Transfer

- Supports OPC Server
- Supports MODBUS slaves, XML, JSON data formats
- Open Web API

**DIALink**

- **CNC Machine Tools**
  - CNC Link
- **Robot**
  - Robot Link
- **PLC**
  - Device Link

**DIA Software**

- **SCADA System DIAView**
  - Real-time Monitoring
  - Data Acquisition & Visualization
  - Alarm Management

- **Industrial EMS DIAEnergie**
  - Energy Consumption Diagnosis & Tracking
  - Electricity Cost Analysis
  - Demand Analysis and Control

**DIACloud**

- **Real-time Monitoring**
- **Equipment Management**
- **Service Management**
- **Remote Monitoring and Control**
- **Client monitoring**

**DIALink Models - PLC/CNC/Robot**

- **CNC DIALink**
- **PLC DIALink**
- **Robot DIALink** (Compatible with Delta Robots)

- **CNC Machine Tools**
  - Tapping / Milling / Machining
- **PLC**
  - Packing / Printing / Surface Mounting / Point Soldering / Soldering / Laser Engraving
- **Delta Robot**
  - Robotic Arms / SCARA
SCADA System

DIAView

Evolution of Factory Visualization and Analysis Management

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

System Structure and Applications

Applications

HVAC, water treatment, central heating, electronics manufacturing
Industrial Energy Management System

**DIAEnergie**

Innovative Solution for Smart Energy Saving

- Visualization and remote monitoring of critical power consumption
- Data analysis by areas and user levels
- Monitoring and analysis to meet energy performance strategy
- Instant record and alarm delivery for abnormal machine actions
- Power consumption measurement and analysis to achieve more efficient electricity usage and electricity cost savings
- Demand management and forecast to avoid over-limit demand penalties
- Customized user-defined reporting tools for displaying a variety of data analysis

**System Structure and Applications**

Centralized Control and Management Center

- **Internet**
- **DIACloud Platform**
- **Ethernet**
- **Fiber Optics/LAN**

**Plant 1**

- **Hot Swappable Mid-range PLC AH500**
- **RS-485**

**Plant 2**

- **Hot Swappable Mid-range PLC AH500**
- **RS-485**

**Devices**

- **HVAC System**
- **Air Compressor System**
- **Boiler System**
- **Wastewater Treatment**
Delta Articulated Robot
DRV70L / DRV90L
New Emerging Intelligent Industrial Automation Trend

- High precision, high speed
- Built-in 3 solenoid valves for quick integration and application
- Hollow design of the robot wrist (the 6th axis) for wiring and tool placement
- Slim and compact body design
  - Overall width: Max. 235 mm
  - Footprint: 190 x 190 mm
- High integration and efficiency
  - Matches with key devices for production automation
  - Quick integration with peripheral components for workstation applications
### Product Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>DRV70L</th>
<th>DRV90L</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model</strong></td>
<td>DRV70L</td>
<td>DRV90L</td>
</tr>
<tr>
<td><strong>Number of axes</strong></td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td><strong>Max. Working Range</strong></td>
<td>710 mm</td>
<td>900 mm</td>
</tr>
<tr>
<td><strong>Max. Payload</strong></td>
<td>7 kg</td>
<td>7 kg</td>
</tr>
<tr>
<td><strong>Motion Range (Max. Speed)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>J1</td>
<td>±170° (450 sec)</td>
<td>±170° (370 sec)</td>
</tr>
<tr>
<td>J2</td>
<td>±135° / -105° (340 sec)</td>
<td>±135° / -105° (260 sec)</td>
</tr>
<tr>
<td>J3</td>
<td>+65° / -205° (510 sec)</td>
<td>+65° / -205° (410 sec)</td>
</tr>
<tr>
<td>J4</td>
<td>±190° (550 sec)</td>
<td>±190° (450 sec)</td>
</tr>
<tr>
<td>J5</td>
<td>±120° (550 sec)</td>
<td>±120° (450 sec)</td>
</tr>
<tr>
<td>J6</td>
<td>±360° (820 sec)</td>
<td>±360° (820 sec)</td>
</tr>
<tr>
<td><strong>Repeatability</strong></td>
<td>±0.02 mm</td>
<td>±0.03 mm</td>
</tr>
<tr>
<td><strong>Standard Cycle Time</strong></td>
<td>0.32 sec</td>
<td>0.35 sec</td>
</tr>
<tr>
<td><strong>Installations</strong></td>
<td>Desk mounted, Wall mounted, Ceiling mounted</td>
<td></td>
</tr>
<tr>
<td><strong>Installed Wire for Customer Use</strong></td>
<td>One 12Pos. connector for sensor connections and two ø6 pneumatic tubings (one is for three built-in solenoids, the other is for extension purpose)</td>
<td></td>
</tr>
<tr>
<td><strong>IP rating</strong></td>
<td>IP40 (Standard) / IP65 (Optional)</td>
<td></td>
</tr>
<tr>
<td><strong>Environment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td>0°C ~ 40°C</td>
<td></td>
</tr>
<tr>
<td>Humidity</td>
<td>20 ~ 85%RH</td>
<td></td>
</tr>
<tr>
<td>Vibration</td>
<td>0.5 G</td>
<td></td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>37kg</td>
<td>39kg</td>
</tr>
<tr>
<td><strong>Controller Series</strong></td>
<td>Robot Controller DCV Series</td>
<td></td>
</tr>
</tbody>
</table>

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**Hollow design of the robot wrist**

- Hollow Design
  - Tangled wire / cords lead to equipment interference
- No Hollow Design
  - Enhance reliability of extension wire / cords

**DROE (Delta Robot Environment Operation) Software**

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**DRV70L** Unit: mm

**DRV90L**

**DRV70L / 90L**

We reserve the right to change the information in this catalogue without prior notice.
SCARA Robot
DRS40L/DRS50L New / DRS60L/DRS60H New / DRS70L New
New Emerging Intelligent Industrial Automation Trend

Product Specifications

<table>
<thead>
<tr>
<th>Product Series</th>
<th>DRS40L</th>
<th>DRS50L New</th>
<th>DRS60L (To be launched)</th>
<th>DRS60H New</th>
<th>DRS70L New</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installations</td>
<td>Desk mounted</td>
<td>Desk mounted</td>
<td>Desk mounted</td>
<td>Ceiling mounted</td>
<td>Desk mounted</td>
</tr>
<tr>
<td>Arm Length (X+Y)</td>
<td>400 mm</td>
<td>500 mm</td>
<td>600 mm</td>
<td>600 mm</td>
<td>700 mm</td>
</tr>
<tr>
<td>Max. Payload</td>
<td>3 kg</td>
<td>6 kg</td>
<td>6 kg</td>
<td>6 kg</td>
<td>6 kg</td>
</tr>
<tr>
<td>Motion Range</td>
<td>J1 ±130°</td>
<td>±133°</td>
<td>±133°</td>
<td>±130°</td>
<td>±133°</td>
</tr>
<tr>
<td></td>
<td>J2 ±146.6°</td>
<td>±153°</td>
<td>±153°</td>
<td>±150°</td>
<td>±153°</td>
</tr>
<tr>
<td></td>
<td>J3 150 mm</td>
<td>200 mm</td>
<td>200 mm</td>
<td>200 mm</td>
<td>200 mm</td>
</tr>
<tr>
<td></td>
<td>J4 ±360°</td>
<td>±360°</td>
<td>±360°</td>
<td>±360°</td>
<td>±360°</td>
</tr>
<tr>
<td>Standard Cycle Time (1kg)</td>
<td>0.42 sec</td>
<td>0.39 sec</td>
<td>0.39 sec</td>
<td>0.39 sec</td>
<td>0.40 sec</td>
</tr>
<tr>
<td>Repeatability</td>
<td>X-Y ±0.01 mm</td>
<td>±0.015 mm</td>
<td>±0.015 mm</td>
<td>±0.015 mm</td>
<td>±0.015 mm</td>
</tr>
<tr>
<td></td>
<td>Z ±0.01 mm</td>
<td>±0.01 mm</td>
<td>±0.01 mm</td>
<td>±0.01 mm</td>
<td>±0.01 mm</td>
</tr>
<tr>
<td></td>
<td>RZ ±0.01 °</td>
<td>±0.01 °</td>
<td>±0.01 °</td>
<td>±0.01 °</td>
<td>±0.01 °</td>
</tr>
</tbody>
</table>

SCARA Robot Applications

- High repeatability, high precision, excellent linearity and verticality

Standard cycle time:
Time required for robot to move back and forth with 1kg payload between two points 300 mm apart and at a height of 25 mm

<table>
<thead>
<tr>
<th>Product Series</th>
<th>Payload</th>
<th>Standard Cycle Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRS40L</td>
<td>1 kg</td>
<td>0.42 sec</td>
</tr>
<tr>
<td>DRS50L</td>
<td>1 kg</td>
<td>0.39 sec</td>
</tr>
<tr>
<td>DRS60L</td>
<td>1 kg</td>
<td>0.39 sec</td>
</tr>
<tr>
<td>DRS60H</td>
<td>1 kg</td>
<td>0.39 sec</td>
</tr>
<tr>
<td>DRS70L</td>
<td>1 kg</td>
<td>0.40 sec</td>
</tr>
</tbody>
</table>
• **Sensor-less Compliance Control Function**
  - Compensates for the deviation between workpieces and insertion holes
  - Fast and precise smooth insertion
  - Improves assembly and production performance

- Insertion performance may differ depending on workpiece hardness.

• **Intuitive Teaching Methods with Versatile Control Approaches**
  - Positions are directly taught and controlled by hand, and recorded by SCARA.

• **Offline Simulation Function**
  - Robotic integration software with simulation modules
  - Fast programming

- Shortens development time
  - Pre-evaluation, saves cost
  - Simple and easy-to-operate

• **Arch Motion Control**
  - Route optimization
  - Saves motion time
  - Quick and easy setting
  - Optimizes arch route setting, fast operational speed

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

• **Real-Time Information Monitoring and Gathering**
  - Robot machine data monitoring and analysis
  - Oversees real-time machine operation data
  - On-site production information acquisition

- Equipment Data Acquisition Platform DIALink
- Overall Equipment Effectiveness Platform DIAOEE

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

- Encoder with temperature monitoring
- Ambient Temperature

**Applications**

**Industries:** Electrical/electronics, consumer electronics, rubber and plastic and metal fabrication, food and beverages

**Techniques:** Palletizing, assembly, packaging, insertion, glue dispensing, soldering, labeling and inspection, screw driving, load and unload, pick-and-place
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