![Delta Electronics, Inc. logo]

DELTA ELECTRONICS, INC.
www.delta.com.tw/industrialautomation

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

![Delta Electronics, Inc. logo with globe network graphic]

Industrial Fieldbus Solutions

www.delta.com.tw/industrialautomation

Great Leap Forward in Industrial Network!

In answering the demand for large quantity and highly efficient communication, a variety of industrial networks have gradually replaced the conventional serial communication in terms of their higher transmission speed and better transmission quality in remote applications.

Rapid Transmission

The Ethernet 10/100Mbps network solution is applicable in large quantity of data transmission and remote monitoring. The real-time data transmission offered by CANopen/DeviceNet solution is applicable in communication control system.

Flexible Application

All kinds of industrial networks construct multi-layer networks, offering various and flexible applications.

Easy Software Configuration

The exclusively designed software, graphical network nodes and tabulated data exchange make the configuration easier than ever.
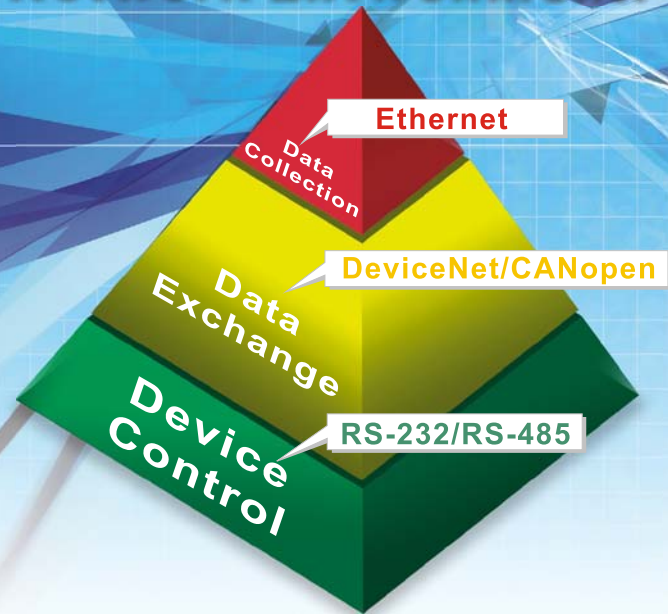
Strong Noise Resistance

Fieldbus system: The cables with isolation for DeviceNet and CANopen are able to combat all kinds of on-site noise interference.

Control

Industrial Fieldbus Solutions

Flexible & Highly-Efficient Network Environment!

Ethernet
Data Collection

DeviceNet/CANopen
Data Exchange

RS-232/RS-485
Device Control

Delta's industrial network products offer the users stable, fast and accurate solutions.
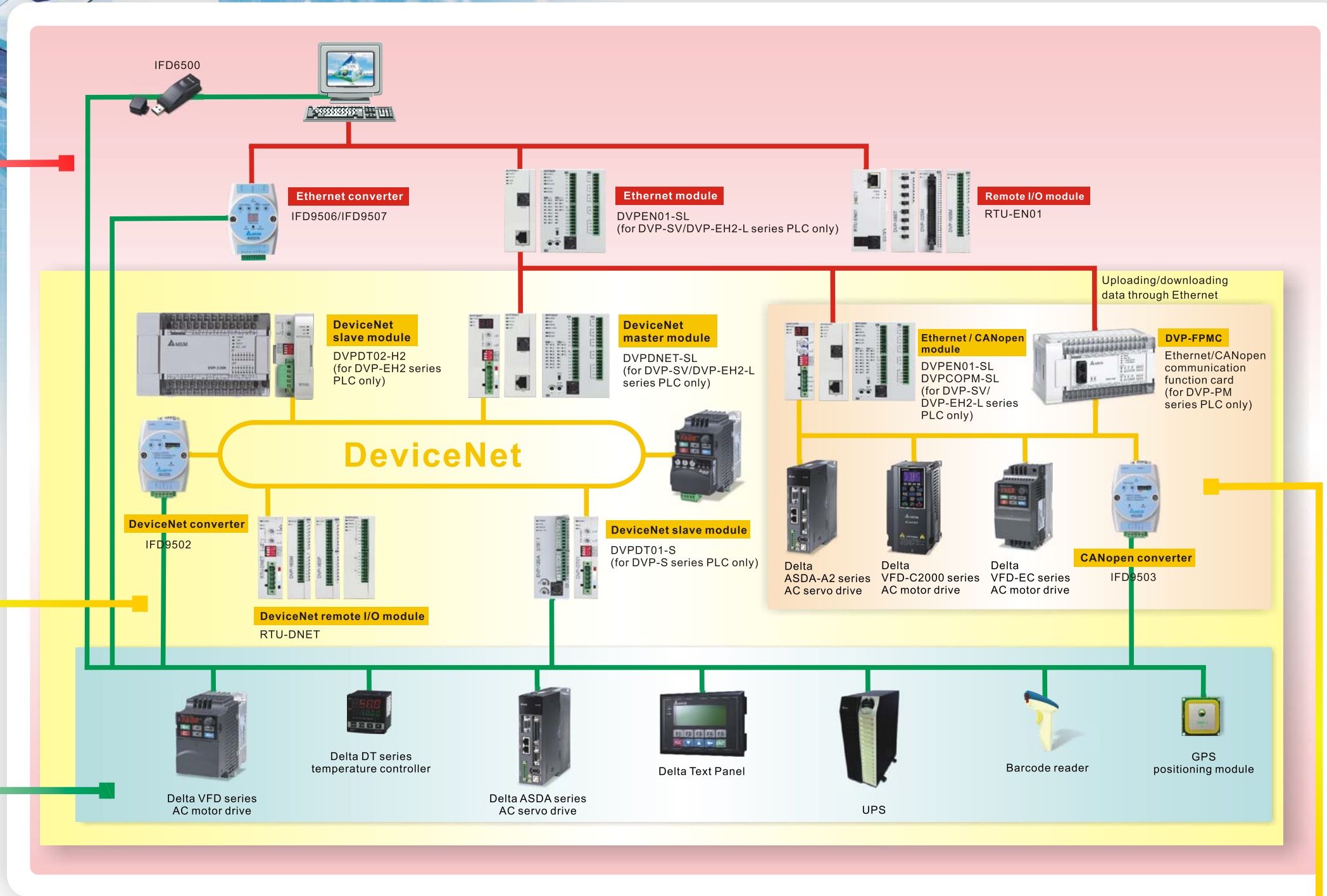
Ethernet

All of Delta's Ethernet communication products provide 10/100Mbps transmission speed, web browser, all kinds of software tools and highly efficient on-site monitoring functions for remote users.

DeviceNet

All of Delta's DeviceNet communication products offer maximum 500kbps transmission speed, PLC master station, slave station, remote I/O module and converter. They can all be integrated through DeviceNet, realizing standard and wiring-saving applications in complicated industral environment of high interference.

RS-485

All of Delta's industrial automation products are built-in with RS-485 communication interface, support Modbus communication and can be easily integrated with devices of other brands.

Remote I/O

Delta's industrial network products specific for remote I/O application support DeviceNet, Ethernet, PROFIBUS and RS-485, satisfying all kinds of users' demands in terms of cost and efficiency.

Gateway

Delta currently offers the following industrial network converters: RS-485 to RS-232, USB to RS-485, DeviceNet to RS-485/232, CANopen to RS-485/232, Ethernet (Modbus TCP, EtherNet/IP) to RS-232/485 .
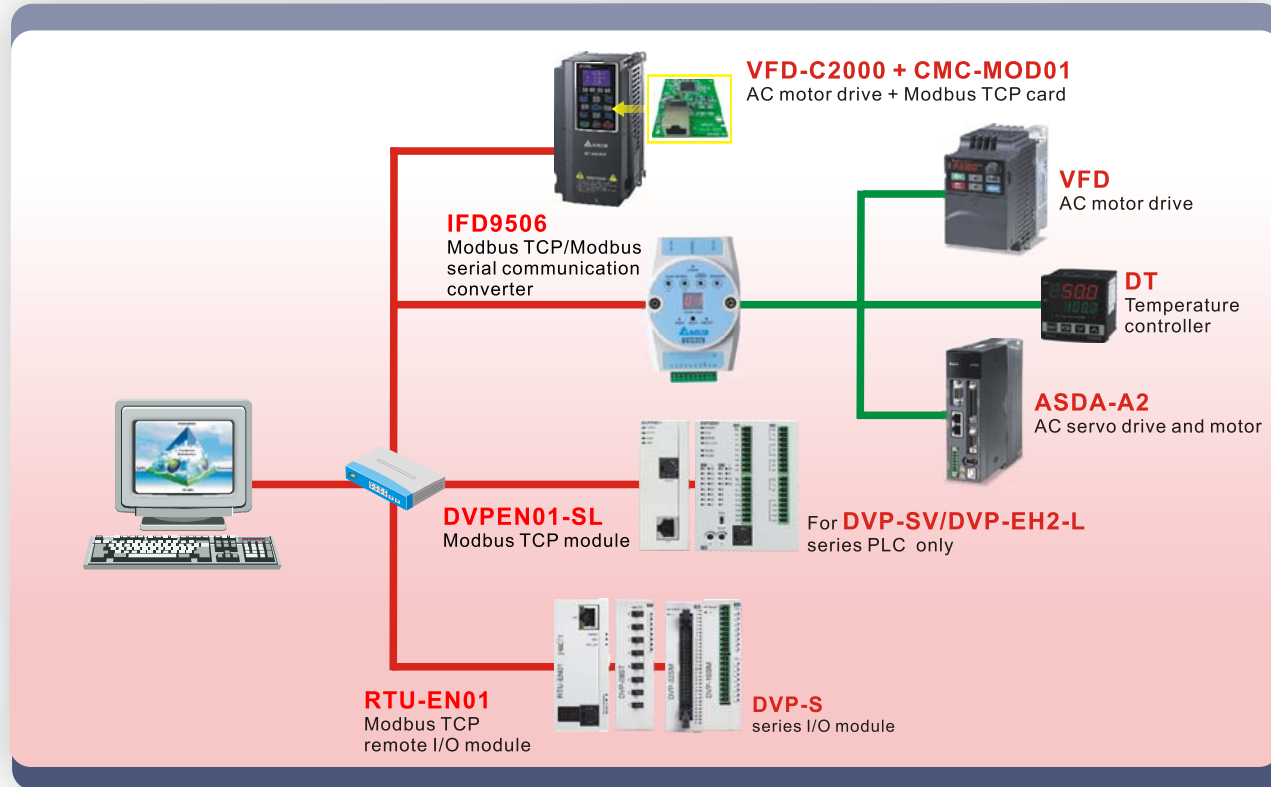
CANopen

All of Delta's CANopen communication products offer maximum 1Mbps communication speed. For the motion control solution, there are CANopen master stations with 301 and 402 protocols and ASDA-A2 series AC servo drives built-in with CANopen, which are able to easily realize complicated and multi-axis high-speed motion control.

IFD6500

Ethernet converter IFD9506/IFD9507
Ethernet module DVPEN01-SL (for DVP-SV/DVP-EH2-L series PLC only)
Remote I/O module RTU-EN01

DeviceNet slave module DVPDT02-H2 (for DVP-EH2 series PLC only)
DeviceNet master module DVPDNET-SL (for DVP-SV/DVP-EH2-L series PLC only)

Uploading/downloading data through Ethernet

Ethernet / CANopen module DVPEN01-SL DVPCOPM-SL (for DVP-SV/ DVP-EH2-L series PLC only)
DVP-FPMC Ethernet/CANopen communication function card (for DVP-PM series PLC only)

DeviceNet

DeviceNet converter IFD9502
DeviceNet slave module DVPDT01-S (for DVP-S series PLC only)
DeviceNet remote I/O module RTU-DNET

Delta ASDA-A2 series AC servo drive
Delta VFD-C2000 series AC motor drive
Delta VFD-EC series AC motor drive
CANopen converter IFD9503

Delta VFD series AC motor drive
Delta DT series temperature controller
Delta ASDA series AC servo drive
Delta Text Panel
UPS
Barcode reader
GPS positioning module

3

4

Ethernet: The Boundaryless Application

VFD-C2000 + CMC-MOD01
AC motor drive + Modbus TCP card

VFD
AC motor drive

IFD9506
Modbus TCP/Modbus serial communication converter

DT
Temperature controller

ASDA-A2
AC servo drive and motor

DVPEN01-SL
Modbus TCP module

For **DVP-SV/DVP-EH2-L** series PLC only

RTU-EN01
Modbus TCP remote I/O module

DVP-S series I/O module

Delta's industrial automation products offer a complete Ethernet solution by conducting remote maintenance, modification and monitoring through Internet/Intranet. A variety of software is handy for the user to connect to SCADA or interface developed by VB/VC.

🔴 Virtual COM

The virtual COM function in Delta's IFD9506, IFD9507 and RTU-EN01 allows the user to simulate the Ethernet communication port into many serial ports by PC to increase the flexibility of the use of device.

🔴 TCP Connection

Maximum 16 host devices are able to conduct monitoring through IFD9506 or IFD9507.

🔴 Webpage Monitoring

The user can easily connect to RTU-EN01, IFD9506 or IFD9507 to monitor the remote equipment by using web browser anyplace at any time.

🔴 Monitoring Function

The monitoring function in IFD9506 and IFD9507 read the data in the slave device non-stop and save them to the internal register. When the host PC or PLC are to read the content in the slave device, the registers in IFD9506/IFD9507 will respond directly, which enhances the efficiency of data response.
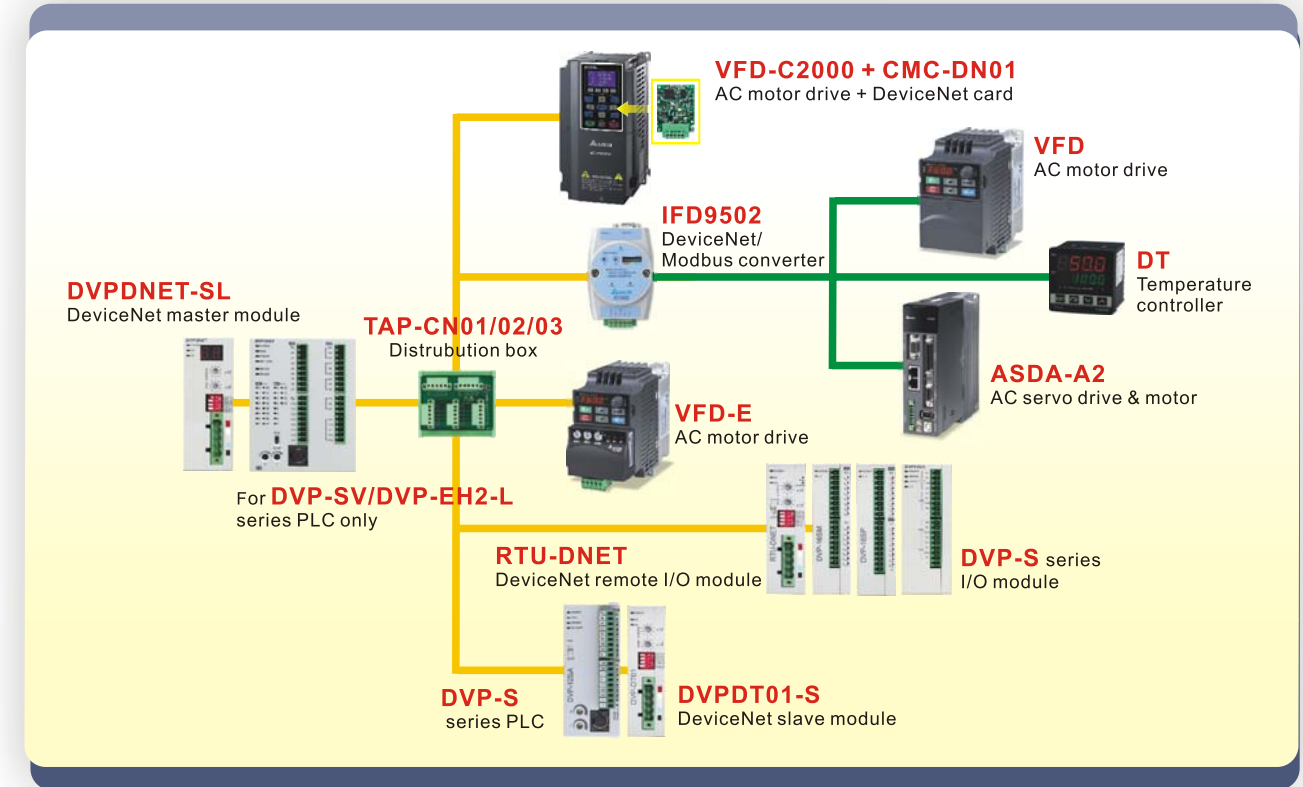
🔴 E-Mail Alarm

All of Delta's Ethernet communication modules are designed with e-mail alarm function. The alarm from on-site equipment can be sent to designated mailboxes by e-mail.

🔴 Smart PLC

RTU-EN01 is built-in with smart PLC function, including timer, counter and real-time clock. It also allows the user to customize their own simple action for logical and sequential control over I/O points, which saves the resource and work load of the PLC.

DeviceNet: Best Communication Tool in Manufacturing Site

VFD-C2000 + CMC-DN01
AC motor drive + DeviceNet card

VFD
AC motor drive

IFD9502
DeviceNet/Modbus converter

DT
Temperature controller

DVPDNET-SL
DeviceNet master module

TAP-CN01/02/03
Distrubution box

ASDA-A2
AC servo drive & motor

VFD-E
AC motor drive

For **DVP-SV/DVP-EH2-L** series PLC only

RTU-DNET
DeviceNet remote I/O module

DVP-S series I/O module

DVP-S series PLC

DVPDT01-S
DeviceNet slave module

Delta's DeviceNet communication products respond fast and are able to combat interference, applicable in all kinds of harsh manufacturing environment. They also support DeviceNet Builder, the software for the user to fast plan the FA network.

🟡 Automatic Off-line Diagnosis

DeviceNet can automatically conduct off-line diagnosis and send the off-line situation to the master station to save the time for checking the wiring.

🟡 Auto Connection Recovery

After the off-line problem is solved, DeviceNet will automatically recover the connection without resetting the software or going through extra procedures.

🟡 Interference Resistance

DeviceNet is excellent in combating interference, so is suitable for manufacturing site of big interference.

🟡 Compatible Software

The software for Delta's DeviceNet communication products is built-in with EDS files for all the products and allows creating all kinds of devices by importing EDS files.

🟡 Cross-Product Integration

Apart from PLC modules, Delta also offers AC motor drive, remote I/O module, branch cable distribution box and connection cable for the user to integrate all the products in use by DeviceNet.

🟡 Topological Network Structure

The user can customize many different types of topology for more flexible use of the network structure.
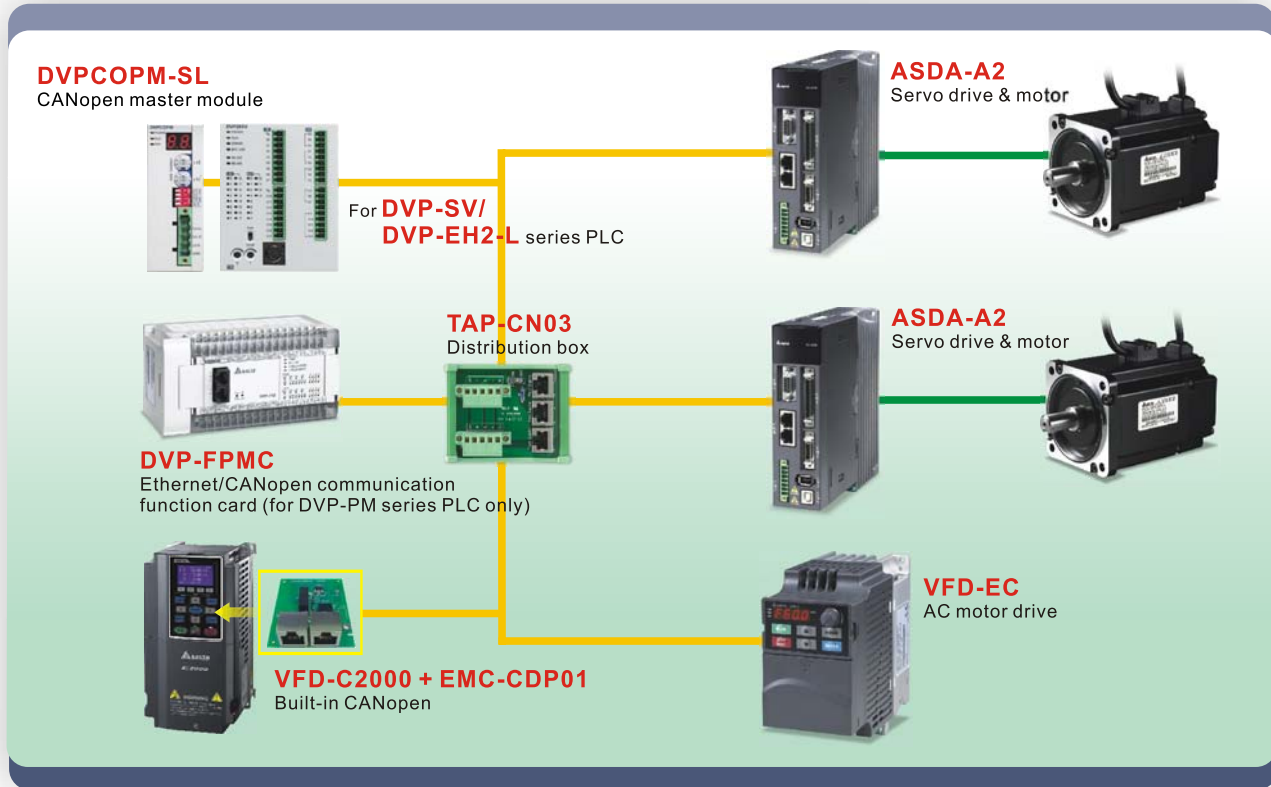
🟡 Simple Wiring

The DeviceNet terminals make the on-site wiring easier. The enclosed fastening screws stabilize the wiring.

CANopen: Perfect Solution for Motion Control

DVPCOPM-SL
CANopen master module

For **DVP-SV/ DVP-EH2-L** series PLC

TAP-CN03
Distribution box

DVP-FPMC
Ethernet/CANopen communication
function card (for DVP-PM series PLC only)

VFD-C2000 + EMC-CDP01
Built-in CANopen

ASDA-A2
Servo drive & motor

ASDA-A2
Servo drive & motor

VFD-EC
AC motor drive

Delta's CANopen related products feature fast response speed and are able to work with ASDA-A2 series AC servo drive and DSP402 motion control communication protocol for communication. In terms of motion control, there is a breakthrough in the pulse output frequency and control axes for PLC MPU and the achievement in single wiring to allow the servo drive to exert its function to fullness.

Sophisticated Motion Control

The CANopen communication in DVP-PM series PLC not only supports standard CiA DSP402 communication protocol but also is built-in with E-CAM and electronic gear, devices for *sophisticated motion control.*
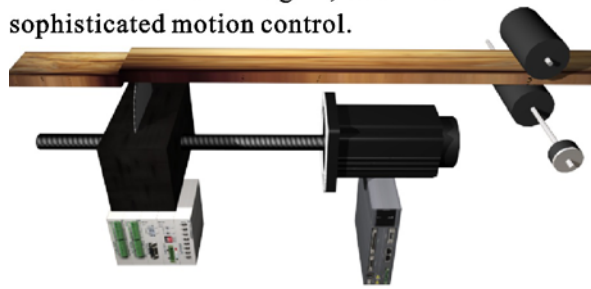
Real-Time Communication

CANopen improves the procedure of Modbus communication, so the next command can be sent out without having to wait for the slave station to complete the processing of data, which enhances the communication efficiency and realizes the accuracy required for motion control.

Function Block

Delta's CANopen software, CANopen Builder, offers function blocks for the user to organize complicated motion control easily through CANopen.

Cross-Product Integration

Delta's VFD-EC and VFD-C2000 series AC motor drive and ASDA-A2 series AC servo drive and motor are built-in with CANopen communicaiton protocol. The user can realize CANopen communication in these products directly without the use of converter.

Multi-Axis Motion Control

CANopen communication network supports multi-axis motion control and solves the problem of limited pulse output points on the PLC for pulse control in the past.
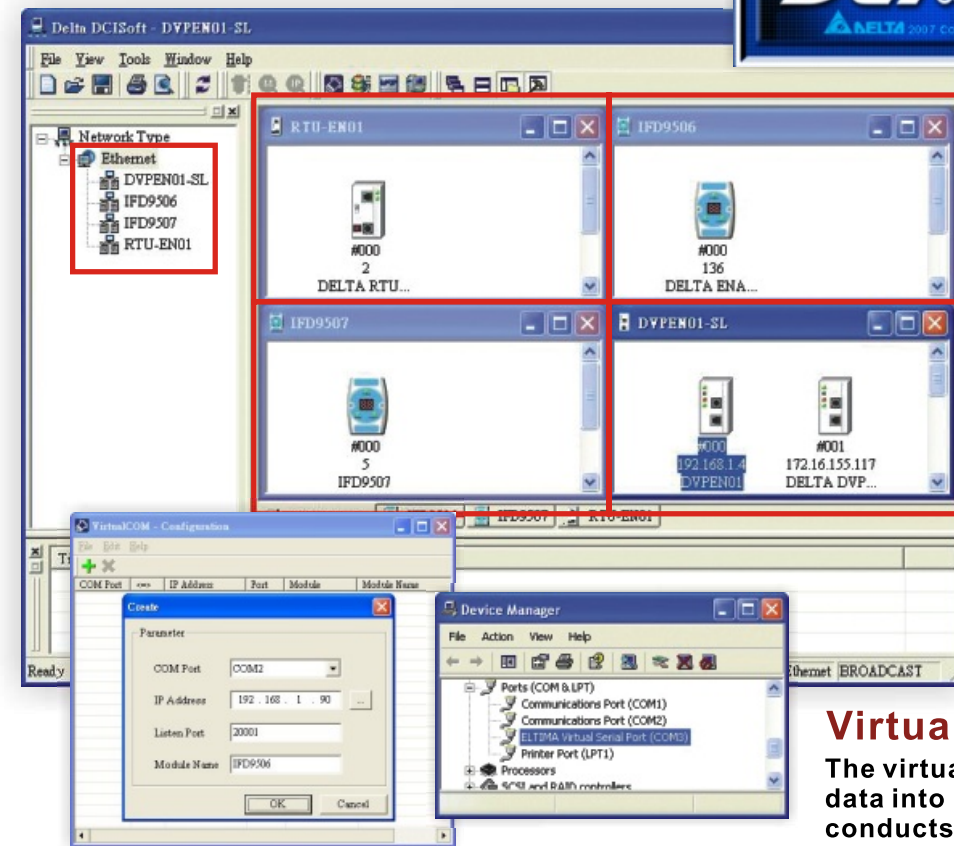
Software Integrating Delta's Communication Products: DCISoft

DCISoft provides graphic module setup and user-friendly interface and supports setup and on-line monitoring for all Delta's Ethernet communication modules.

- For setting up Delta's Ethernet communication products
- Graphical module setup, user-friendly interface
- Auto-search function
- Virtual COM setup interface

Supporting Delta's Ethernet Communication Products
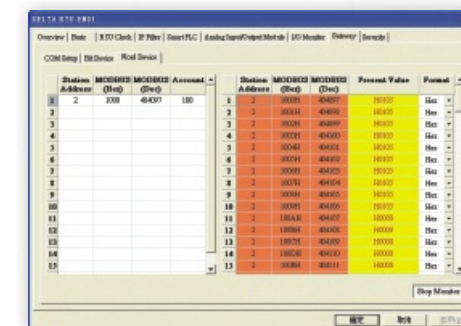
On-line device list :

Virtual COM

The virtual COM converts RS-232 data into network packets and conducts sending and receiving of data through the network.

On-line Monitoring
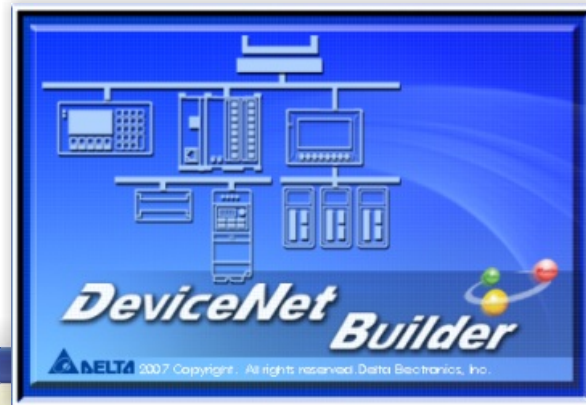
Able to remote monitor the values in devices.

Software Integrating Delta's Communication Products: DeviceNet Builder

DeviceNet Builder is designed specifically for DeviceNet communication. Devices and remote I/O can be planned directly through parameter distribution, and a standard monitoring structure can be built easily.

- **DeviceNet configuration software**
- **Supporting all Delta's industrial automation products (built-in EDS files)**
- **User can create new EDS files**
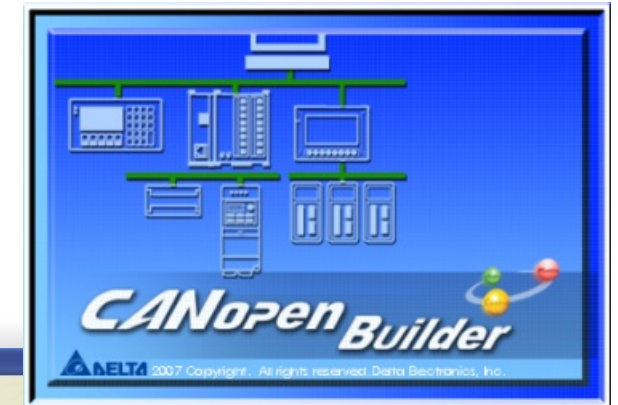- **Configuring I/O data of all devices on DeviceNet**

Software Integrating Delta's Communication Products: CANopen Builder

CANopen Builder is designed specifically for CANopen communication, offering the user a handy interface to organize motion control and to greatly enhance the productivity.

- **CANopen configuration software**
- **Supporting all Delta's industrial automation products (built-in EDS files)**
- **User can create new EDS files**
- **Configuring I/O data of all devices on CANopen**
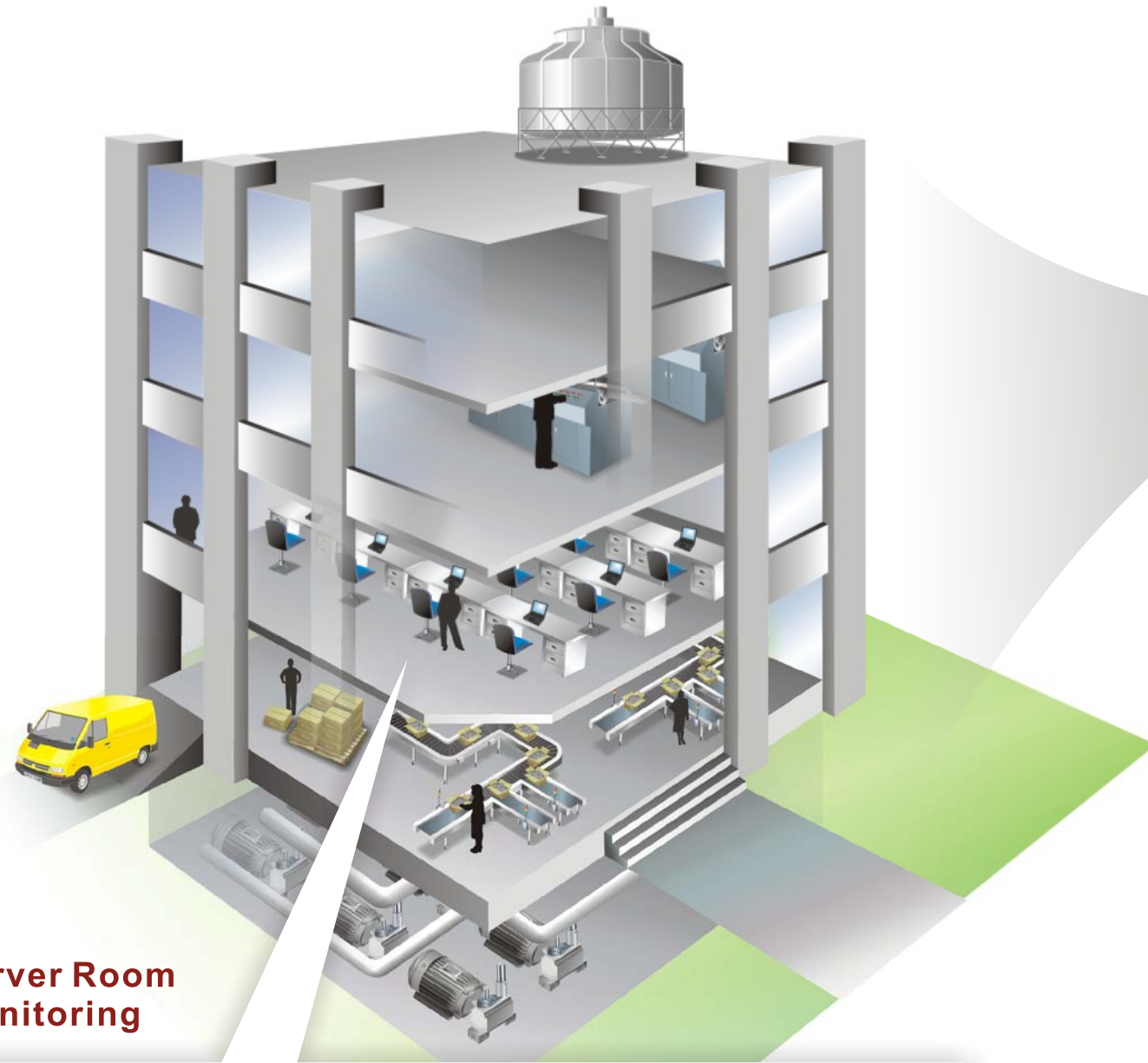- **Able to conduct the planning of motion control**

Delta's Building Automation Solution

Server Room Monitoring

Communication
Ethernet, RS-232/485 (Modbus protocol)

PC

HMI

ID Card Reader

Web Camera

Power Meter

Temperature controller

Input
DI : Emergency button
    Air-conditioning status
    Smoke detection
    Action detection
    Water leakage detection
    Safety system
    Fire alarm detection
AI : Temperature
    Humidity
    Current value detection

Output
DO : Lighting control
    Air-conditioning control
AO : Flow valve control

Multi-Machine Synchronous Operation

When many water towers need to run at the same time, the PLC can control many chillers at a time through DeviceNet and make them run or stop as well as controlling the running speed of motor to save energy.

(cooling tower)

Motor modulation 2

AC motor drive 1

Motor modulation 1

AC motor drive 2

Cooling tower motor

(cooling tower)

Central Monitoring

Ethernet

DeviceNet

Motor for air-conditioning case

3F

(ACU air-conditioning case)

2F

DeviceNet

Motor for cool water circulation pump

Motor for chilled water circulation pump

Ethernet

(chilled water)

1F

(cool water)

(return water)

(chiller)

B1

(measuring temperature of cool return water)

(measuring temperature of return water/chilled water)

RTU-DNET (Node 3)

Motor for cool water circulation pump

Motor for chilled water circulation pump

(chilled water)

(cool water)

(return water)

Variable Frequency Operation of Cool Water Circulation Pump

- The smart PLC function in RTU-EN01 is able to remote modulate the frequency of motor in proportional to the temperature of the cool return water.
- To avoid energy waste on the cool water due to insufficient cool water circulation, RTU-EN01 is able to remote control the variable frequency operation in time.

Variable Frequency Operation of Chilled Water Circulation Pump

Gauging temperature difference

- RTU-DNET is able to gauge the energy load immediately according to the on-site temperature difference between the chilled water pipe and return water pipe to modulate the running speed of the pump.
- When the load demand becomes smaller, the temperature difference between the two pipes will also become smaller, and the modulation motor will run in low speed. When the load demand becomes bigger, the temperature difference will be bigger, leading to acceleration of the modulation motor.
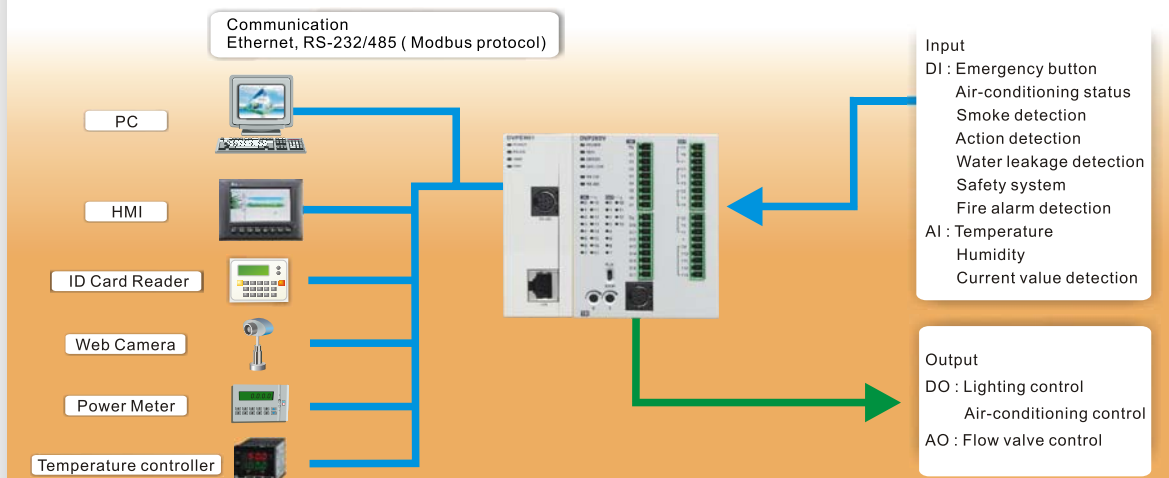
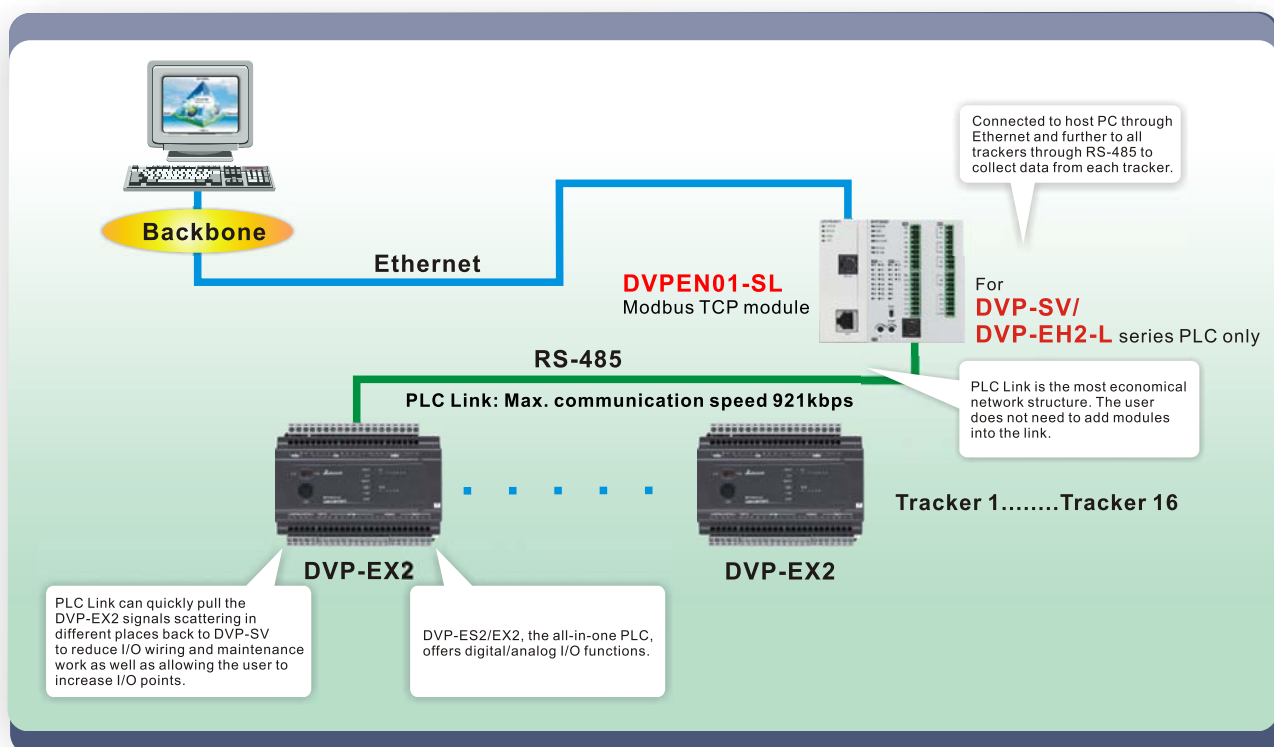# Delta's Factory Automation Solution

Enhanced Command Application

SPA & GPS commands support solar tracker

- The 2 commands working with GPS can effectively achieve the highest efficiency for the solar tracker.
- GPS positioning function can be applied in the positioning of machine and used for protecting the user's intellectual property.
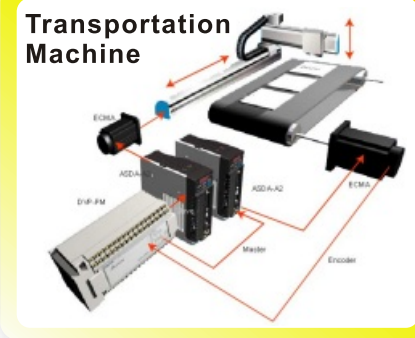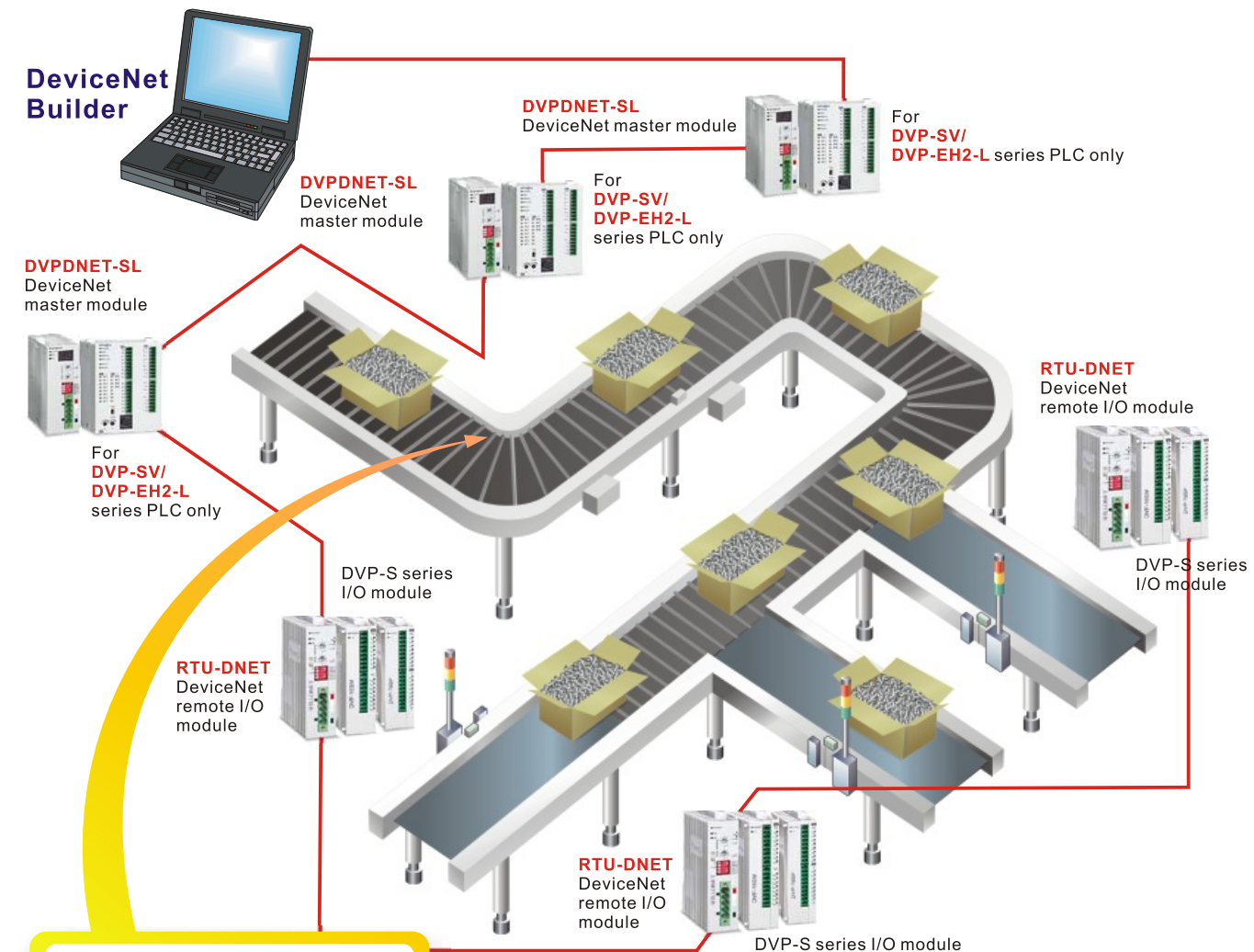
2-axis solar tracking
Single-axis solar tracking
Fixed mode

Efficiency

Time
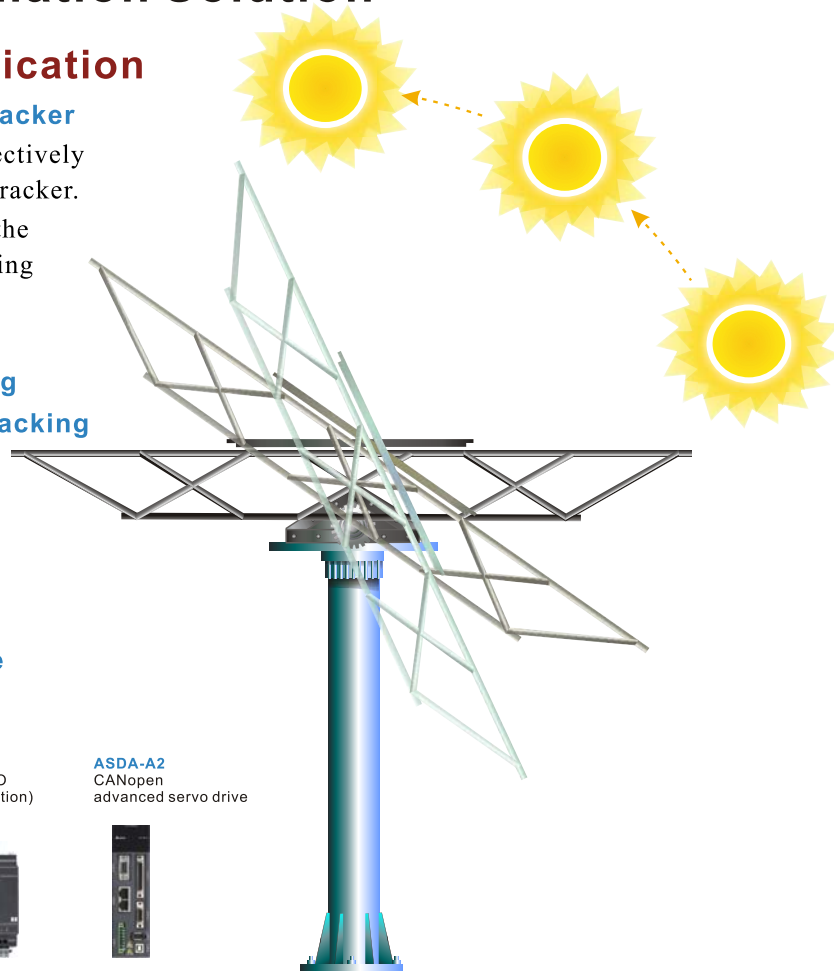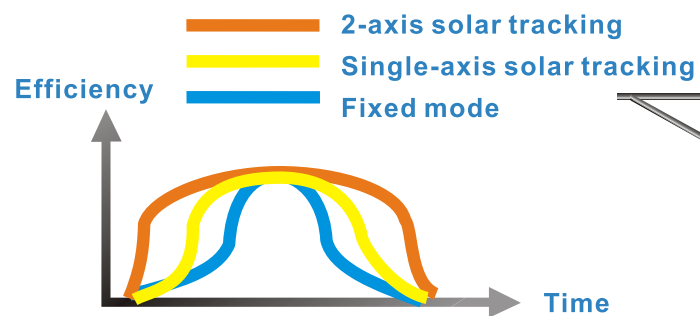
Applicable Products

DVP-SV
16 IN/12 OUT

DVPEN01-SL
10/100Mbps
Ethernet
communication module

DVP-EX2
8 IN/6 OUT/4AI/2AO
(MPU, 12-bit resolution)

ASDA-A2
CANopen
advanced servo drive

Backbone

Ethernet

Connected to host PC through Ethernet and further to all trackers through RS-485 to collect data from each tracker.

DVPEN01-SL
Modbus TCP module

For
**DVP-SV/
DVP-EH2-L** series PLC only

RS-485

PLC Link: Max. communication speed 921kbps

PLC Link is the most economical network structure. The user does not need to add modules into the link.

Tracker 1........Tracker 16

DVP-EX2   **DVP-EX2**

PLC Link can quickly pull the DVP-EX2 signals scattering in different places back to DVP-SV to reduce I/O wiring and maintenance work as well as allowing the user to increase I/O points.

DVP-ES2/EX2, the all-in-one PLC, offers digital/analog I/O functions.

Planning of Remote I/O Monitoring

DeviceNet Builder

DVPDNET-SL
DeviceNet master module

For
**DVP-SV/
DVP-EH2-L** series PLC only

DVPDNET-SL
DeviceNet
master module

For
**DVP-SV/
DVP-EH2-L**
series PLC only

DVPDNET-SL
DeviceNet
master module

For
**DVP-SV/
DVP-EH2-L**
series PLC only

RTU-DNET
DeviceNet
remote I/O module

DVP-S series
I/O module

RTU-DNET
DeviceNet
remote I/O
module

DVP-S series
I/O module

RTU-DNET
DeviceNet
remote I/O
module

DVP-S series I/O module

Transportation Machine

Applicable Products

DVP-SV
16 IN/12 OUT

DVPDNET-SL
DeviceNet
master module
for industrial
communication

DVPCOPM-SL
CANopen
master module
for motion
communication

RTU-DNET
DeviceNet
remote I/O module
for industrial
communication

ASDA-A2
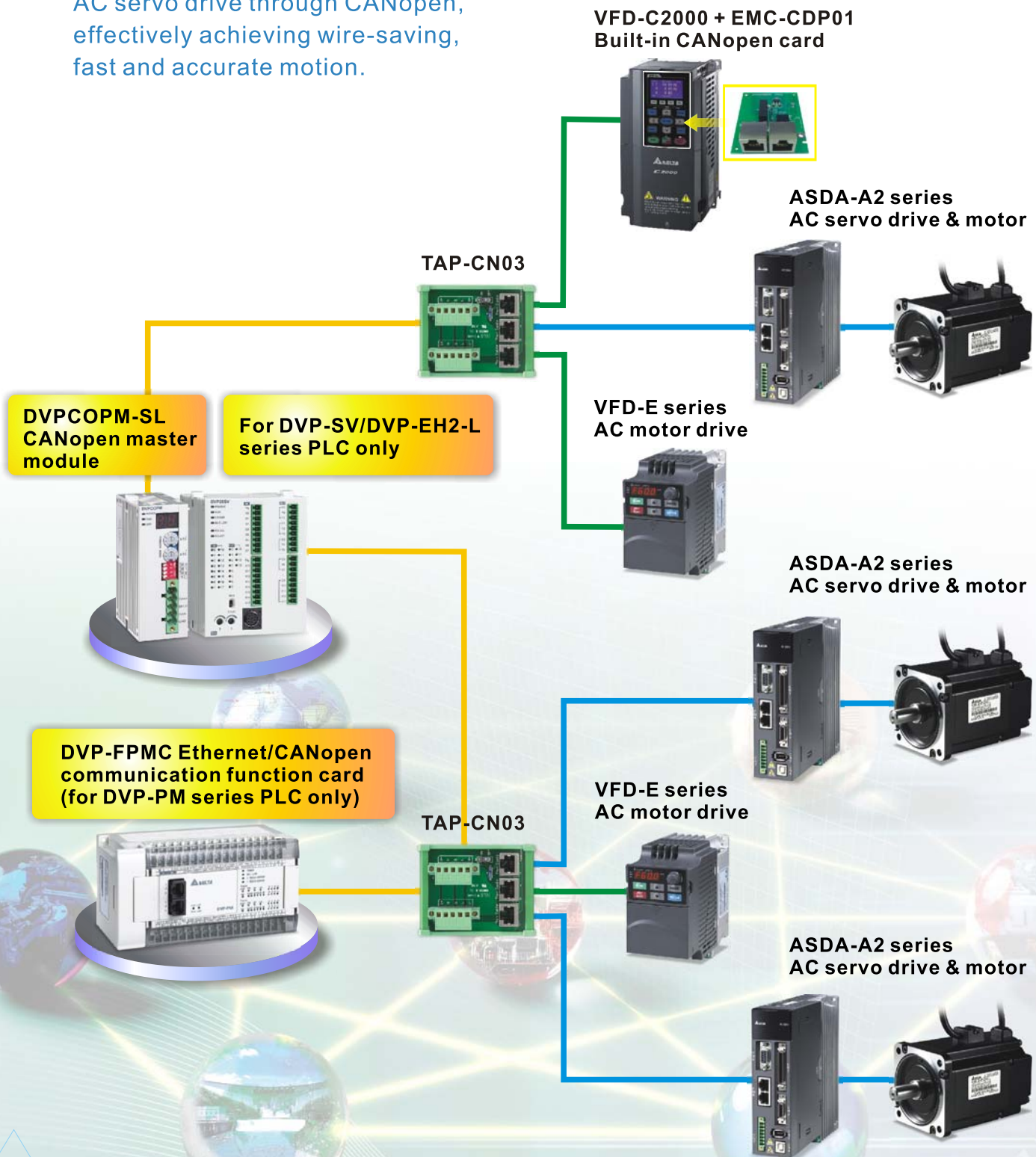CANopen
advanced
servo drive

Planning for Communication

CANopen Builder
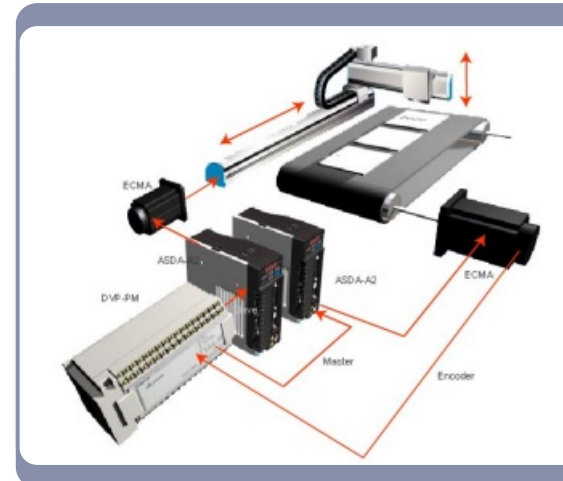
CANopen

CANopen

1Mbps 25m
500kbps 100m
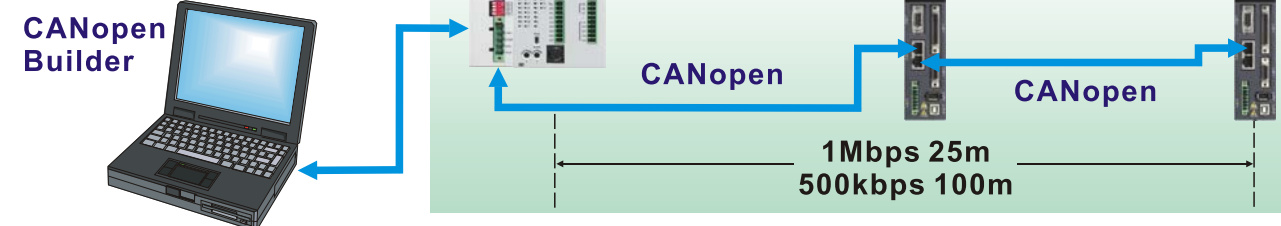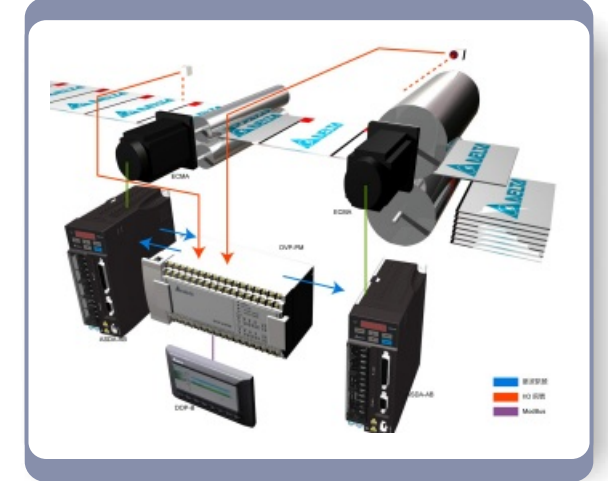
Delta's Motion Control Solution

The system conducts multi-axis synchronous control
with VFD-EC series AC motor drive and ASDA-A2 series
AC servo drive through CANopen,
effectively achieving wire-saving,
fast and accurate motion.

**VFD-C2000 + EMC-CDP01
Built-in CANopen card**

**ASDA-A2 series
AC servo drive & motor**

TAP-CN03

**DVPCOPM-SL
CANopen master
module**

**For DVP-SV/DVP-EH2-L
series PLC only**

**VFD-E series
AC motor drive**

**ASDA-A2 series
AC servo drive & motor**

**DVP-FPMC Ethernet/CANopen
communication function card
(for DVP-PM series PLC only)**

TAP-CN03

**VFD-E series
AC motor drive**

**ASDA-A2 series
AC servo drive & motor**

Transportation Machine
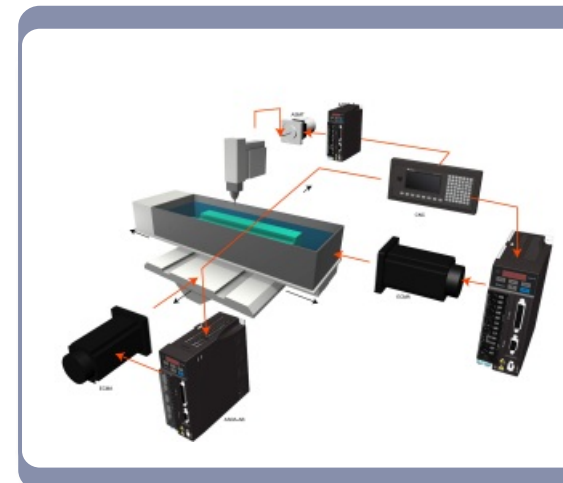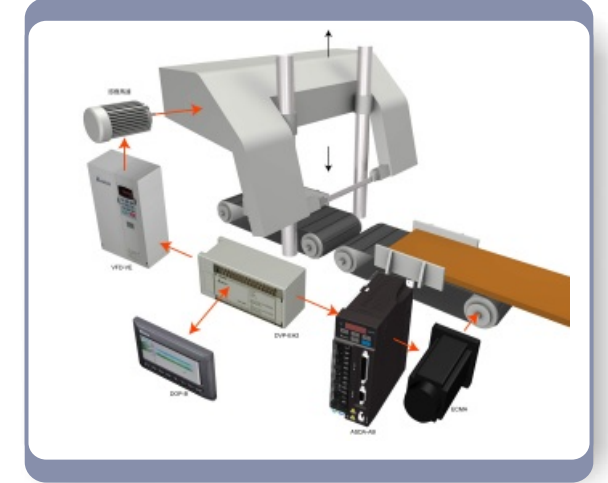

Cutting Machine

Bar Feeder
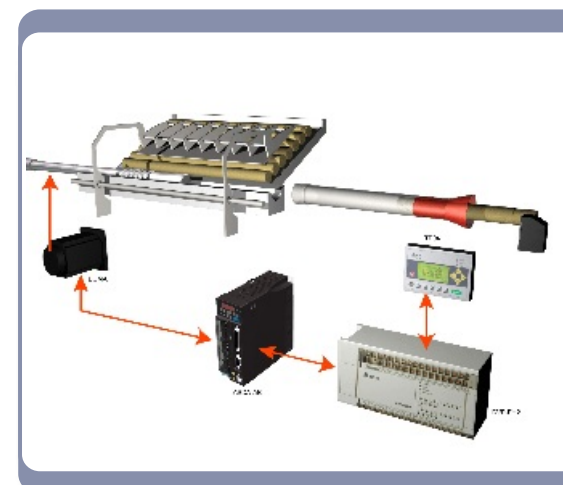
Milling Machine/Lathe
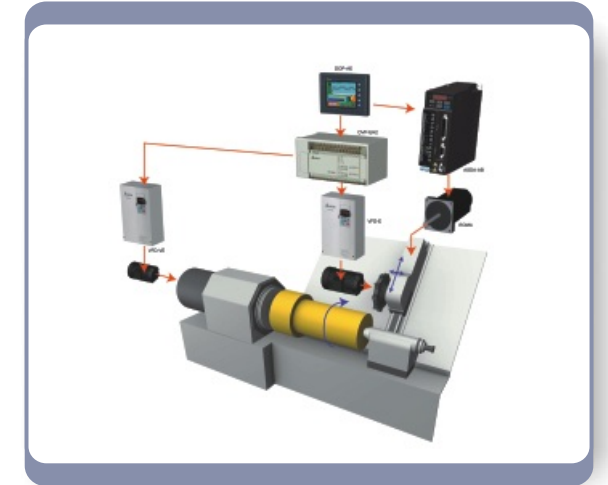
Electro-discharge Machine

Sawing Machine

Ordering Information

🔵 PLC Master Modules

Product	Exterior	Model name	Feature	Certificates
Left-side master modules for DVP-SV/DVP-EH2-L series PLC		DVPEN01-SL	Modbus communication module Ethernet 10/100M Base TX Number of Client connections: 8 Number of Server connections: 16	CE Mark / UL,cUL
		DVPDNET-SL	DeviceNet scan module Supports max. 500kbps Max. network distance: 500m Number of slaves connected: 63	
		DVPCOPM-SL	CANopen master module Supports max. 1Mbps Max. network distance: 1,000m Number of slaves connected: 110	
Communication card for DVP-PM series PLC		DVP-FPMC	Ethernet/CANopen communication function card	

🔵 PLC Slave Modules

Product	Exterior	Model name	Feature	Certificates
Slave modules for DVP-E series PLC		DVPDT02-H2	DeviceNet slave communication module Supports max. 500kbps	CE Mark / UL,cUL
		DVPCP02-H2	CANopen slave communication module Supports max. 1Mbps	
		DVPPF02-H2	PROFIBUS DP slave communication module	
Slave modules for DVP-S series PLC		DVPDT01-S	DeviceNet slave communication module Supports max. 500kbps	
		DVPPF01-S	PROFIBUS DP slave communication module	

🔵 Remote I/O Modules

Product	Exterior	Model name	Feature	Certificates
Remote I/O modules		RTU-485	RS-485 remote communication module Connectable to max. 8 analog I/O modules Connectable to max. 128 DI points and 128 DO points	CE Mark / UL,cUL
		RTU-DNET	DeviceNet remote I/O module Connectable to max. 8 analog I/O modules Connectable to max. 128 DI points and 128 DO points	
		RTU-EN01	Modbus TCP remote I/O module Modbus TCP Slave Ethernet 10/100M Base TX Connectable to max. 8 analog I/O modules Connectable to max. 256 DI/DO points	
		RTU-PD01	Supports PROFIBUS DPV0 Supports max. 12Mbps Connectable to max. 8 AI/AO modules Connectable to max. 256 DI/DO points	

🔵 Industrial Network Converters

Product	Exterior	Model name	Feature	Certificates
USB/RS-485 converter		IFD6500	USB/RS-485 converter Supports 75 ~ 115,200bps Supports hot plugging and plug and play	
USB/CAN converter		IFD6503	Able to gather CAN messages, decode and display them following DeviceNet and CANopen protocol. Able to set up filter condition and send CAN messages. Supports max. 1Mbps and plug and play.	
USB/RS-485 converter		IFD6530	Offers 9V power supply for parameter storage and page editing through KPC-CC01 (VFD-C2000 keypad) Supports 75 ~ 115,200 bps Supports hot plugging and plug and play	
RS-232/RS-485, 422 converter		IFD8500	RS-232 to RS-422/485 isolated conveter	
RS-485/RS-422 isolated repeater		IFD8510	RS-232/422/485 isolated signal regenerator	CE Mark / UL,cUL
RS-232/RS-485, 422 converter		IFD8520	Addressable RS-232 to RS-422/485 isolated converter	
DeviceNet converter		IFD9502	RS-232/485 to DeviceNet converter Supports max. 500kbps	
CANopen converter		IFD9503	RS-232/485 to CANopen converter Supports max. 1Mbps	
Ethernet converter		IFD9506	RS-232/485 to Modbus TCP converter Ethernet 10/100M Base TX 3 sets of external input alarm points RS-485 full isolation	
		IFD9507	RS-232/485 to EthernNet/IP converter 3 sets of external input alarm points RS-485 full isolation	

🔵 Accessories

Product	Model name	Feature
DeviceNet/CANopen network distribution box	TAP-CN01	1-branch distribution box; 121Ω termination resistance; switch
	TAP-CN02	3-branch distribution box; 121Ω termination resistance; switch
	TAP-CN03	3-branch distribution box; RJ-45 connector; 121Ω termination resistance; switch
DeviceNet power supply distribution box	TAP-CP01	Power supply distribution box
DeviceNet / CANopen cable	TAP-CB01	DeviceNet/CANopen trunk cable; thick cable for 305m/rollx
	TAP-CB02	DeviceNet/CANopen drop cable; thin cable for 305m/roll
	TAP-CB03	CANopen drop cable; RJ-45 connector; 0.5m
	TAP-CB04	CANopen drop cable; RJ-48 connector; 1m