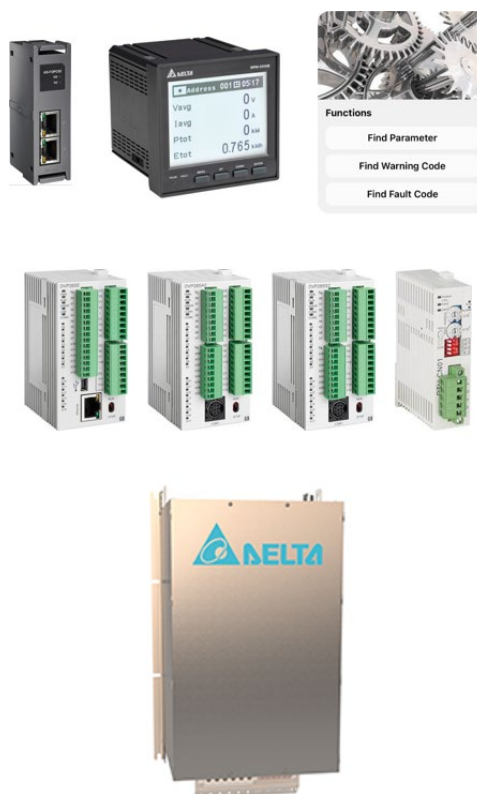


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### 1 News

#### 1.1 FTP-Site Link & Update

Our FTP server provides product information that is not available in Delta's Download Center on the global website, e.g. datasheets, technical notes, presentations, software, etc. Please visit our FTP site with below account info.

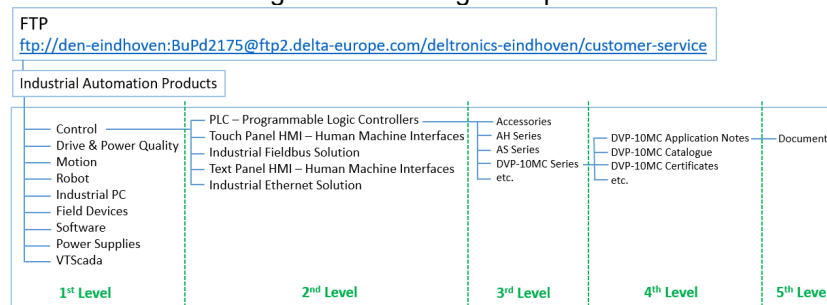
<ftp://den-eindhoven:BuPd2175@ftp2.delta-europe.com/deltronics-eindhoven/customer-service>

Name and password are included in the link.

Name: den-eindhoven

Password: BuPd2175

- **NOTE** After migration of the ftp-server, from now on it is only possible to access our FTP via TCP port 22/23. Therefore, please use common FTP clients such as FileZilla or Total Commander. Access with standard web browsers, like Edge, Chrome, Opera, etc. is not possible anymore.
- **Update** To align the data categories with Delta's official Download Center, we adjusted the folder structure according to the following example.



#### 1.2 NEW IABG EMEA HQ Nearly Finished

Within a few weeks from now, the IABG EMEA office will move from Eindhoven to Helmond.

As usual for Delta, the building design has a strong focus on sustainability to contribute our share to hold climate change.

The new facilities provide open design and layout, promoting communication. We increased the overall space to offer improved training and testing facilities. The integrated warehouse allows for better and faster availability of our products.

We will reveal more details in the next newsletter.



## 2 Product update

### 2.1 NEW – AS-FOPC02 OPC UA Function Card



Delta's AS-FOPC02 OPC UA function card enhances the system integration ability of AS series PLCs. It provides connectivity between AS series PLCs and OPC UA client devices. Improved M2M connectivity adds value for the end customer.

It mounts into the extension card slot of AS300 series CPUs or AS00SCM-A communication modules and occupies both card slots.



#### Features

1. Supports OPC UA server
2. 2 x RJ-45 integrated (switch mode)
3. Max. 6 OPC UA client connections
4. Max. 1000 OPC UA tags in ISPSOFT 3.13
5. Max. 64 OPC UA tags in ISPSOFT 3.12
6. Provides WebUI for management

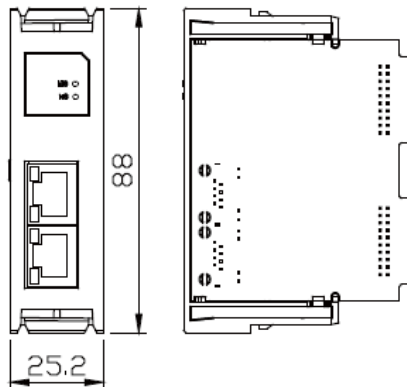
#### Benefits

7. M2M connectivity
8. IIoT suitable
9. CE marked and UL listed

#### Electrical Specifications

Operating Temperature	-20~60 °C (AX Series CPU: -20~55 °C)
Storage Temperature	-40~80 °C
Operating Humidity	5~95%, non-condensing
Storage Humidity	5~95%, non-condensing
Vibration	IEC 61131-2, IEC 60068-2-6 (TEST Fc); 5 Hz ≤ f ≤ 8.4 Hz, constant amplitude 3.5 mm; 8.4 Hz ≤ f ≤ 150 Hz, constant acceleration 1g
Shock	IEC 61131-2, IEC 60068-2-27 (TEST Ea); 15g peak, 11 ms duration, half-sine
Operating Environment	Non-corrosive gas
Installation	Inside of the control panel
Pollution Degree	2
Protection Rating	IP20
Conformal Coating	Yes

### Dimensions



Unit: mm

### Ordering Information

Model	Description
AS-FOPC02	AS OPC UA function card

## 2.2 NEW – DPM-C530E Panel Mount Power Meter with Ethernet Communication

The new advanced power meter DPM-C530E possesses the same functions as DPM-C530 and is equipped with Ethernet communication to provide better communication efficiency and make installation and maintenance easier.



### Features

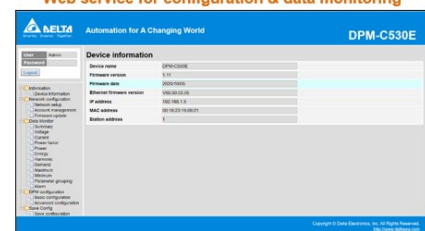
- Panel mount and LCD Display
- Active energy accuracy level: Class 0.5S
- Supports Modbus-RTU protocol, making integration into SCADA and EMS easy
- Dual Ethernet port allows daisy-chaining
- Web service for configuration and monitoring
- Advanced energy management functions such as harmonics measurement, demand calculation, data recording and many more

### Benefits

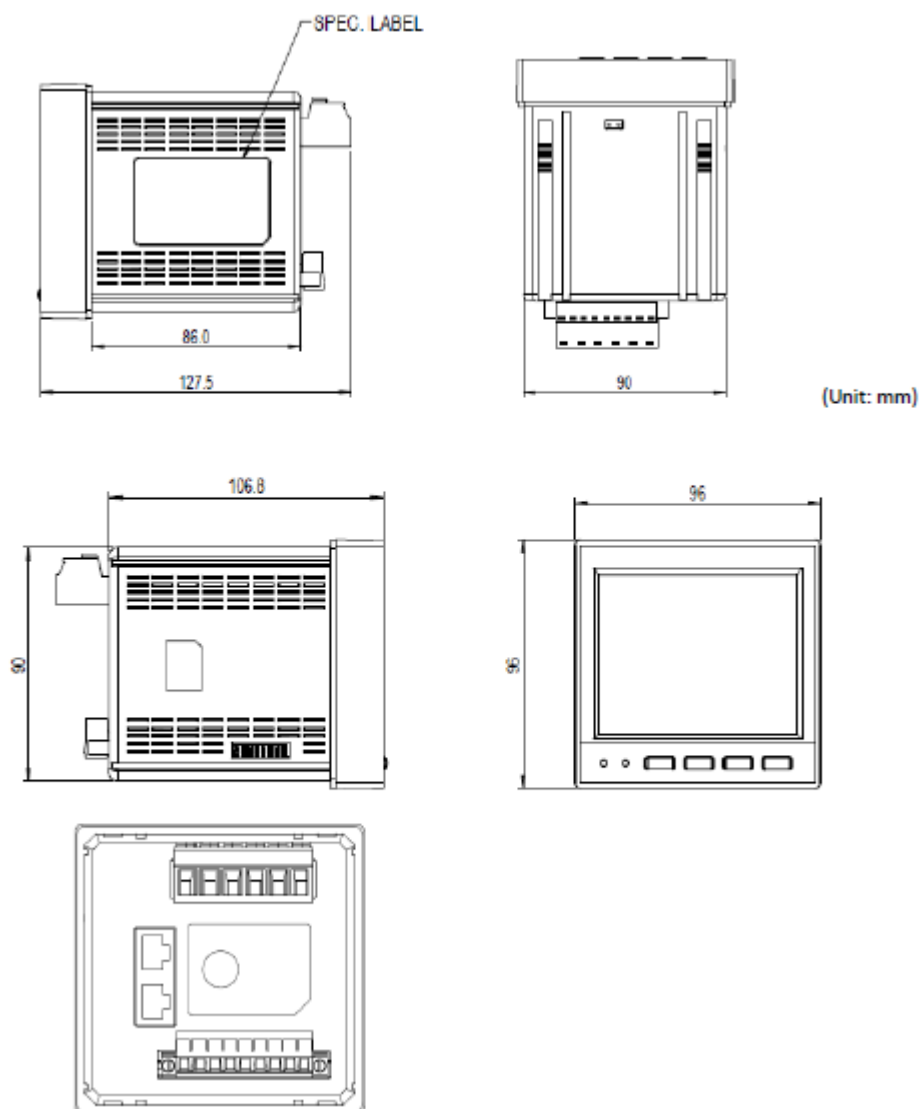
- Same functionality level as DPM-C530
- Increased communication efficiency
- CE marked and UL listed



Web service for configuration & data monitoring



### Dimensions



### Product Specifications

Measurement Accuracy					
Electric Quantities	Real Power	± 0.5%	Electric Energy	Real Power	± 0.5%
	Reactive Power	± 1%		Reactive Power	± 1%
	Apparent Power	± 2%		Apparent Power	± 2%
Voltage		± 0.5%	Current		± 0.5%
Power factor		± 0.5%	THD for Current		± 1%
Reactive power		± 1%	Frequency		± 0.5%
Apparent power		± 2%	Harmonics		± 1%
Input					
Voltage Connection	1PH2W, 1 CT			3PH3W, Δ connection, 3 CT, 2 PT	
	1PH3W, 2 CT			3PH4W, Y connection, 3 CT, no PT	
	3PH3W, Δ connection, 3 CT, no PT			3PH4W, Y connection, 3 CT, 3 PT	
	3PH3W, Δ connection. 2 CT. no PT			3PH4W. Y connection. 2 CT. 3 PT	

Rated Voltage	Line Voltage: 35 – 690 V AC (L-L)	
	Phase Voltage: 20 – 400 V AC (L-N)	
Rated Current	1 A / 5 A	
Measuring Current	20 mA to 6 A (in accordance with IEC62053-22, accuracy specification is 50 mA to start calculation)	
Start Current	20 mA	
Frequency	50 Hz / 60 Hz	
Harmonic Distortion for Individual Current / Voltage	31 <sup>st</sup>	
Voltage Input	Measuring Category: CAT III	
Alarm	Set up multi-level alarms	10 multi-level alarms
Power	Operating Range	80-265 V AC (maximum 4.6 W) 100-300 V DC
Frequency	Operating Frequency	50 Hz / 60 Hz
Mechanical Characteristics	Dimensions (W x H x D)	96 x 96 x 127.5 mm
	Degree of Protection	IP52 (front display) IP20 (meter body)
Environment	Ambient Operating Temperature	-20-60 °C -4-144 °F
	Storage Temperature	-30-70 °C -22-158 °F Display becomes normal 10 minutes after cold start
	Relative Humidity	5-95° RH
	Altitude	Up to 2000 m
Data Recording		
Maximum / Minimum Instantaneous Values	39 / 39	
Alarm Type	29	
Alarm History	500	
Display		
Screen Type	LCD	
Backlight	White LED	
Resolution	198 x 160 pixels	
LED Indicator	Green: pulse light Red: fault light	
Electromagnetic Compatibility		
Electrostatic Discharge	IEC 61000-4-2	
Immunity to Radiated Fields	IEC 61000-4-3	
Immunity to Fast Transients	IEC 61000-4-4	
Immunity to Impulse Waves	IEC 61000-4-5	
Conducted Immunity	IEC 61000-4-6	
Immunity to Magnetic Fields	IEC 61000-4-8	
Immunity to Voltage Dips	IEC 61000-4-11	
Radiated Emissions	FCC Part 15 Class A, EN55011 Class A	
Conducted Emissions	FCC Part 15 Class A, EN55011 Class A	
Harmonics	IEC 61000-3-2	
Communications		
Ethernet	Modbus-TCP	
Bandwidth	10 / 100 Mbps	

Connection Number	16 (TCP/IP)
-------------------	-------------

### Ordering Information

Model	Description
DPM-C530E	Delta Advanced Multi-Function Meter

## 2.3 NEW – DVP Slim Series New CPUs with PNP Output

In order to serve the European and American market demands better, Delta releases three new DVP-S series CPU models with the established unbeatable cost/performance ratio.

### DVP28SS211S

- Increased IO integrated – 16 DI and 12 DO (PNP)
- All other specifications identical to other DVP-SS2 models



### DVP28SA211S

- Increased IO integrated – 16 DI and 12 DO (PNP)
- Not compatible with left-side expansions
- All other specifications identical to other DVP-SA2 models



### DVP26SE11S

- Increased IO integrated – 14 DI and 12 DO (PNP)
- Not compatible with left-side expansions
- Supports Ethernet/IP adapter mode
- All other specifications identical to other DVP-SS2 models





### CPU Specifications

#### DVP28SS211S

- ✓ 32-bit CPU
- ✓ Program: 8 k steps, Data register: 5 k words
- ✓ Execution speed: Basic instruction: 0.35  $\mu$ s
- ✓ Built-in RS232 & RS485 (master/slave)
- ✓ Supports MODBUS ASCII/RTU & PLC Link
- ✓ 4 pulse outputs 10 kHz
- ✓ 8 high-speed counter input channels (4 x 20 kHz + 4 x 10 kHz)

Built-in High-Speed Counters					
1-phase 1 input		1-phase 2 inputs		2-phase 2 inputs	
Counters	Bandwidth	Counters	Bandwidth	Counters	Bandwidth
4/4	20 kHz / 10 kHz	2	20 kHz	2/2	10 kHz / 5 kHz

#### DVP28SA211S

- ✓ 32-bit CPU
- ✓ Program: 16 k steps, Data register: 10 k words
- ✓ Execution speed: Basic instruction: 0.35  $\mu$ s
- ✓ Built-in RS-232 & RS-485 (master/slave)
- ✓ Supports MODBUS-ASCII / -RTU & PLC Link
- ✓ 4 high-speed output channels (2 x 100 kHz + 2 x 10 kHz)
- ✓ 8 high-speed counter channels (2 x 100 kHz + 6 x 10 kHz / 1 x 2-phase 50 kHz)
- ✓ Supports line and arc interpolation

Built-in High-Speed Counters					
1-phase 1 input		1-phase 2 inputs		2-phase 2 inputs	
Counters	Bandwidth	Counters	Bandwidth	Counters	Bandwidth
2/6	100 kHz / 10 kHz	2	100 kHz	1/3	50 kHz / 5 kHz

#### DVP26SE11S

- ✓ 32-bit CPU
- ✓ Program: 16k steps, Data register: 12k words
- ✓ Execution speed: Basic instruction: 0.35  $\mu$ s
- ✓ Built-in Ethernet, RS485 and USB ports
- ✓ Supports MODBUS ASCII/RTU, MODBUS TCP and Ethernet/IP (Adapter mode)
- ✓ 4 high-speed pulse output channels (2 x 100 kHz + 2 x 10 kHz)
- ✓ 8 high-speed counter channels (2 x 100 kHz + 6 x 10 kHz)

Built-in High-Speed Counters					
1-phase 1 input		1-phase 2 inputs		2-phase 2 inputs	
Counters	Bandwidth	Counters	Bandwidth	Counters	Bandwidth
2/6	100 kHz / 10 kHz	2	100 kHz	1/3	50 kHz / 5 kHz

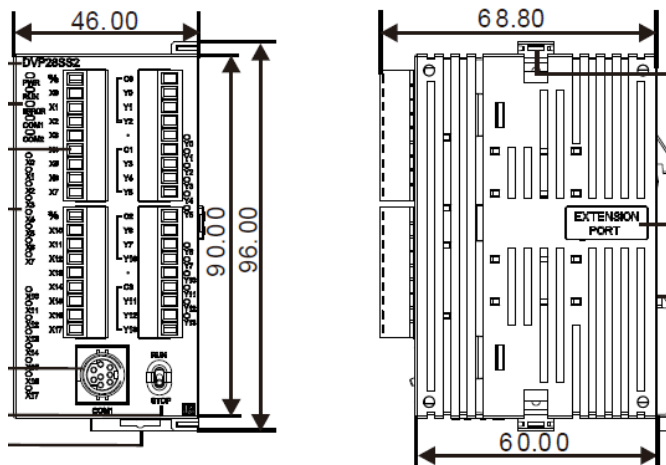


### Electrical Specifications

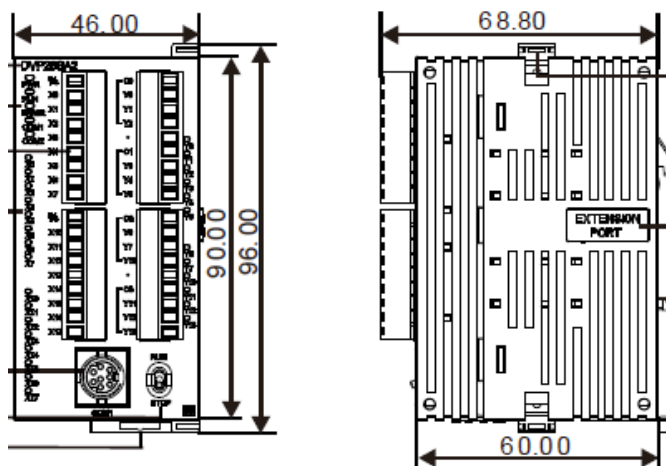
Power Supply Voltage	24 V <sub>DC</sub> (-15% ~ 20%)
Fuse Capacity	2A/250 V <sub>AC</sub>
Spike Voltage Durability	1500 V <sub>AC</sub> (Primary-secondary); 1500 V <sub>AC</sub> (Primary-PE); 500 V <sub>AC</sub> (Secondary-PE)
Insulation Impedance	>5 MΩ (all I/O point-to-ground: 500 V <sub>DC</sub> )
Noise Immunity	ESD: 8 kV Air Discharge EFT: Power Line, 2 kV Digital I/O: 1 kV Analog & Communication I/O: 1 kV RS: 26 MHz ~ 1 GHz, 10 V/m
Earth	The diameter of grounding wire shall not be shorter than that of the power supply cable. (When many PLCs are in use at the same time, please make sure every PLC is properly grounded.)
Storage / Operation	Storage: -25°C ~ 70°C (temperature); 5% ~ 95% (humidity) Operation: 0°C ~ 55°C (temperature); 5% ~ 95% (humidity); pollution degree 2

### Dimensions

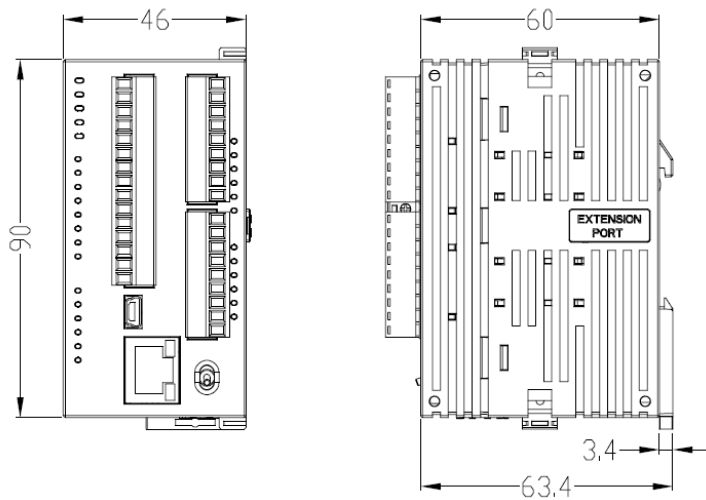
#### DVP28SS211S



#### DVP28SA211S



### DVP26SE11S



### Ordering Information

Model	Power Supply	Digital Input	Digital Output	Output Type	Certification
DVP28SS211S	24 V DC	16	12	Transistor (PNP)	CE, UL
DVP28SA211S	24 V DC	16	12	Transistor (PNP)	CE, UL
DVP26SE11S	24 V DC	14	12	Transistor (PNP)	CE, UL

## 2.4 NEW – DVP Slim Series CANopen RTU Module – RTU-CN01

RTU-CN01 is a CANopen Bus coupler compatible with the successful extension modules of the Delta DVP PLC series.

Its focus are cost-sensitive motion solutions. It integrates perfectly with Delta's DVP15MC and DVP50MC motion controllers. Just as well, it combines with any other CANopen master from Delta or other brand.

### Features

- Connects right-side DVP-S expansion modules to the CANopen network
- Complies with CANopen DS301 V4.02
- Supports CANopen NMT and error control by heartbeat
- Up to 8 TxPDO and 8 RxPDO configurable
- Supports asynchronous, synchronous & cyclic as well as synchronous & acyclic PDO transmission
- SDO service
- Supports up to 128 DI and 128 DO points
- Supports up to 14 DVP-S modules, up to eight of them can be special modules, like analog, temperature, pulse and others
- In combination with DVP-MC devices
  - Graphical configuration software



- Automatic scan and recognition of extension modules
- Control register (CR) configuration of special modules as I/O data
- Error status diagnosis and error handling settings for each module
- Adjustable behaviour after master disconnection: restore last recorded output status or reset all outputs to zero

### Specifications

#### ■ CANopen communication port

Item	Specification
Transmission Method	CAN
Electrical Isolation	500 VDC
Interface	Removable connector (5.08 mm)
Transmission Cable	Two communication wires, one shield wire and one ground wire

#### ■ CANopen communication

Item	Specification
Message type	PDO, SDO, SYNC, Emergency, NMT
Baud Rates	10 kbps, 20 kbps, 50 kbps, 125 kbps, 250 kbps, 500 kbps, 800kbps, 1M kbps

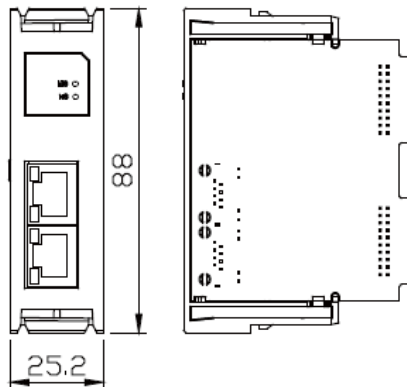
#### ■ Electrical specification

Item	Specification
Power voltage	24 VDC (-15% ~ 20%)
Consumption power	2.5W
Insulation voltage	500V

#### ■ Environment

Item	Specification
Noise Immunity	ESD (IEC 61131-2, IEC 61000-4-2): 8KV Air Discharge, 6KV Contact Discharge EFT (IEC 61131-2, IEC 61000-4-4): Power Line: 2KV, Digital I/O: 1KV Communication I/O: 2KV Damped-Oscillatory Wave: Power Line: 1KV, Digital I/O: 1KV RS (IEC 61131-2, IEC 61000-4-3): 80MHz~1000MHz , 10V/m; 2000 MHz ~6000 MHz, 3V/m
Operation	0°C ~ 55°C (temperature), 50 ~ 95% (humidity), pollution degree 2
Storage	-25°C ~ 70°C (temperature), 5 ~ 95% (humidity)
Vibration/shock resistance	Standard: IEC 61131-2, IEC 68-2-6 (TEST Fc)/IEC 61131-2 & IEC 68-2-27 (TEST Ea)
Certificates	IEC 61131-2, UL508
Weight	71g

### Dimensions



### Ordering Information

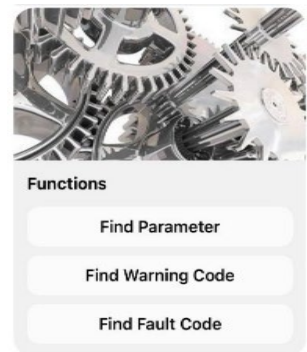
Model	Description
RTU-CN01	CANopen Bus Coupler

## 2.5 NEW – Delta Motor Drive Facebook ChatBot

Delta releases a portable consultant and product expert for variable frequency drives with immediate response 24/7 for smartphone or tablet PC.

### Features

- Find parameter information
- Find warning and fault codes for fast troubleshooting
- Download catalogues and technical manuals
- Make suggestions and provide feedback
- Global service, no regional limitation
- Guided dialogue and intuitive operation



### Shortcut



### 2.6 NEW – New filter types for AC Motor Drives

We have increased our range of solutions to achieve EMC requirements with our variable frequency drives. Detailed information is available on request.

#### Features

- EMC filters for all C2000 series drives
- Passive Harmonic Filters, which reduce harmonics to 5-8% in combination with a DC reactor, confirmed with our CFP2000 drives
- Output filters
  - Zero phase reactors to reduce common mode noise
  - Dv/dt chokes to reduce slew-rate-dependent voltage peaks
  - Sine-wave filters to reduce slew-rate dependent voltage peaks, acoustic switching noise and to allow the use of long motor cables
  - SineFormers to reduce slew-rate dependent voltage peaks so much, they render the use of shielded cables or shielding cable ducts unnecessary



### 2.7 UPDATE – DIASstudio 1.1.0

The latest version of Delta's DIASstudio software suite provides support for new devices and new features. Be sure to update to the latest version of DIAInstaller first, to avoid conflicts during the update.


#### DIAInstaller download

<https://diastudio.deltaww.com/home/downloads?sec=download#software>

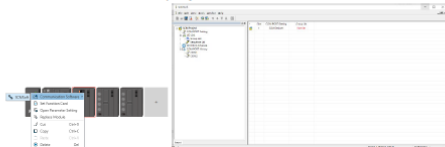
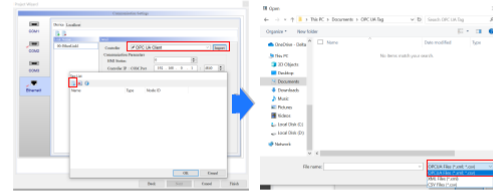
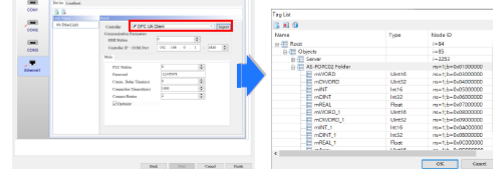

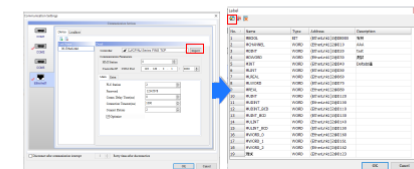
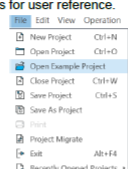
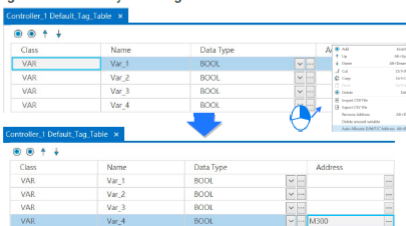
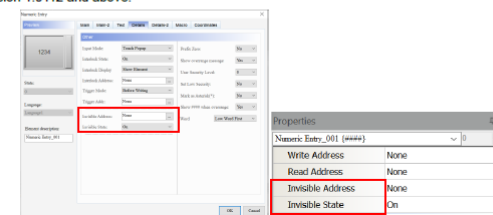
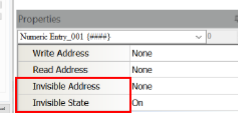
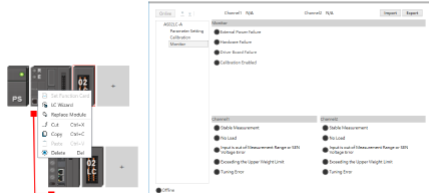


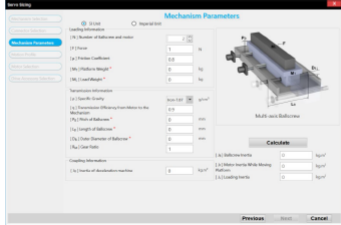
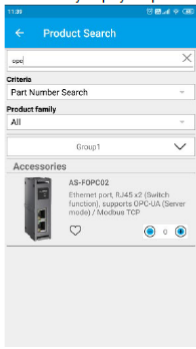
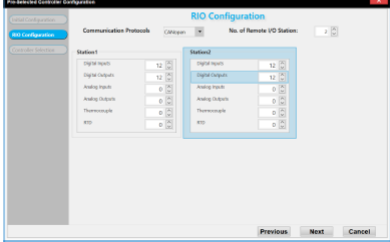
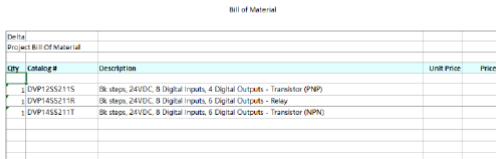

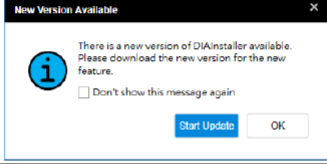

#### Features

##### 1. New devices support.

No.	Software	New Version	No.	Software	New Version
1.	DIADesigner	V1.1.0	4.	DIASelector (Desktop/Mobile)	V1.1.0
<input checked="" type="checkbox"/> New Device Support <input type="checkbox"/> New Feature <input type="checkbox"/> Update Function			<input checked="" type="checkbox"/> New Device Support <input type="checkbox"/> New Feature <input type="checkbox"/> Update Function		
<b>Description</b> New device support: Industry-specific MPD Series.			<b>Description</b> The following is new device support:		
<b>Content</b> Dedicated MPD series models for water pump industry application can be added in a project, and their functions include network configuration and hardware configuration. MPD series supports IEC61131-3 PLC programs and built-in water pump control programs. Users can enable the built-in water pump control programs by setting parameters.			Controller    AX-308EA0MA1T    DXMC-1S08TE-00 AX-364ELA0MA1T    DXMC-1S16TE-00 DXMC-1S32TE-00 DXMC-1P08NE-7S DXMC-1P08NE-A0		
			AC Motor Drive    C2000 Plus Series		
No.	Software	New Version	No.	Software	New Version
7.	COMMGR	V2.1.0			
<input checked="" type="checkbox"/> New Device Support <input type="checkbox"/> New Feature <input type="checkbox"/> Update Function			<input checked="" type="checkbox"/> New Device Support <input type="checkbox"/> New Feature <input type="checkbox"/> Update Function		
<b>Description</b> New device support: Industry-specific MPD Series.			<b>Description</b> Support MPD Series communication.		
<b>Content</b>			<b>Content</b>		

## 2. New features

No.	Software	New Version	No.	Software	New Version
2.	DIADesigner	V1.1.0	3.	DIAScreen	V1.1.0
<input type="checkbox"/> New Device Support	<input checked="" type="checkbox"/> New Feature	<input type="checkbox"/> Update Function	<input type="checkbox"/> New Device Support	<input checked="" type="checkbox"/> New Feature	<input type="checkbox"/> Update Function
<b>Description</b>			<b>Description</b>		
<b>2.1 Add the user-defined serial communication (UD LINK) function of the AS00SCM-A module.</b>			<b>3.1 Add the importing OPC UA variables function.</b>		
<b>Content</b>			<b>Content</b>		
For the AS00SCM-A module, users can edit serial communication packets to communicate with the devices with special communication formats through the SCM tool function, such as customized suffix/prefix code, continuous waiting for receiving/sending multiple packets, etc., to facilitate the connection with the third-party devices.			For HMI DOP-100 Series/DXMC-P Series/AX-8 Series, users can import OPC UA variables through CSV files or OPC UA Server, and use the variables in DIAScreen to edit elements.		
			<ul style="list-style-type: none"> <li>Importing CSV files:</li> </ul> 		
<b>Description</b>			<b>Description</b>		
<b>2.2 Add Device Restore Wizard (Currently limited to C2000 Plus Series drives).</b>			<ul style="list-style-type: none"><li>Importing from OPC UA Server via Ethernet.</li></ul>		
<b>Content</b>					
The parameters of AC motor drives connected to AS200/300 Series PLC can be backed up in PLC memory cards. When the equipment is damaged or needs to be mass replicated, the files can be used to replicate and restore devices.			<b>Description</b>		
Note: It applies to AS300 EtherNet/IP and MODBUS TCP communication protocol.			<b>3.3 Support importing Omron C/J/CS/CP variable tables.</b>		
			<b>Content</b>		
<b>Description</b>			When HMI DOP-100 Series connects to the following Omron controllers, users can import Omron .cjr variable tables through the importing function.		
<b>2.3 Add the Open Example Project function.</b>			<ul style="list-style-type: none"> <li>CS/CJ/CP1/CV/CVM Series</li> <li>CS/CJ/CP1/CV/CVM Series TCP</li> <li>CJ/CP/NJ Series FINS TCP</li> <li>CJ/NJ/NX Series FINS UDP</li> </ul>		
<b>Content</b>					
Provide three Delta example projects for user reference.			<b>Description</b>		
			<b>3.4 Expand the private image file name numbers to 1,000,000.</b>		
<b>Description</b>			<b>Content</b>		
<b>2.4 Add the variable auto allocate addresses function for AS200/300 Series models.</b>			Expand the private image file name numbers from 1,000 to 1,000,000 to create more custom image libraries.		
<b>Content</b>			<b>Description</b>		
The PLC models variables can be automatically allocated register addresses (D/M/T/C) within a specified range without manually allocating addresses.			<b>3.5 Add the "Invisible state" attribute to elements.</b>		
			<b>Content</b>		
<b>Description</b>			The elements that support Invisible Address also support Invisible State, allowing users to flexibly use elements.		
<b>2.5 Add the LC Wizard function of the AS02LC-A module.</b>			Applicable models: HMI DOP-100 Series/DXMC-P Series/AX-8 Series ; HMIapp firmware version 1.0112 and above.		
<b>Content</b>					
Add LC Wizard, which provides the parameter editing, online calibration & monitoring of the AS02LC-A module.					
					

No.	Software	New Version	No.	Software	New Version
5.	DIASelector (Desktop)	V1.1.0	6.	DIASelector (Mobile)	V1.1.0
<input type="checkbox"/> New Device Support <input checked="" type="checkbox"/> New Feature <input type="checkbox"/> Update Function			<input type="checkbox"/> New Device Support <input type="checkbox"/> New Feature <input checked="" type="checkbox"/> Update Function		
<b>Description</b> <b>5.1 Add Multi-axis Ballscrew mechanism to Servo Sizing.</b>			<b>Description</b> <b>6.1 Update Product Search function.</b>		
<b>Content</b> This function helps users to accurately select servo motors, servo drives, and the related accessories for multi-axis ballscrew mechanism. • Multi-axis Ballscrew mechanism: 			<b>Content</b> When users search products through Part Number Search, some products will appear twice. The function is updated as below to normally display the products that match the search result. 		
<b>Description</b> <b>5.2 For Pre-Selected Controller Configuration of DVP Series, add the CANopen option for Communication Protocols in Remote I/O Configuration page.</b>			<b>Description</b> <b>6.2 Update the BOM (Bill of Material) function.</b>		
<b>Content</b> This function helps users to quickly add the CANopen Remote I/O module of the DVP Series controllers (RTU-CN01). After entering the RIO Configuration page of Pre-Selected Controller Configuration, select CANopen for Communication Protocols. Enter the required input/output points, and wizard will configure the required analog and digital I/O modules. Note: This function supports DVP Series controllers. 			<b>Content</b> After BOM is generated, if BOM is in the Excel format, product description of some products will be missing. The function is updated as below. Product description is normally displayed. 		
<b>Description</b> <b>5.3 Add Pre-selected Remote I/O Configuration wizard of DVP Series.</b>			<b>Description</b> <b>8.1 Add the new feature of Software update notification.</b>		
<b>Content</b> Users enter digital and analog points, and this function automatically configures digital and analog I/O modules for Remote I/O modules. Note: This function supports Remote I/O modules, which are RTU-EN01/RTU-CN01 with the right digital and analog modules, DVP08SP11R, DVP16SP11R, DVP06XA-S, DVP06XA-S2, etc. 			<b>Content</b> DIAInstaller provides new version/update notifications to optimize user experience. 		
<b>Description</b> <b>8.2 Add Revision History information.</b>			<b>Description</b> <b>8.2 Add Revision History information.</b>		
<b>Content</b> Add a Revision History open button for users to learn more about new features. 					

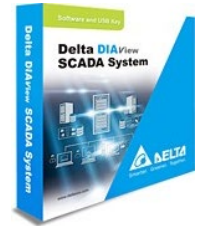


## 2.8 UPDATE – DIAView 3.6.0

A new version of Delta's DIAView SCADA software is released

### DIAView V3.6.0 download

<https://downloadcenter.deltaww.com/downloadCenterCounter.aspx?DID=4947&DocPath=1&hl=en-US>



### Features

1. Web publishing supports https protocol
2. Added number of Web client to the user list in the service manager
3. Optimized B/S data agent to improve data transmission performance
4. Fixed the issue that special characters cannot be entered in the text box
5. Added a shortcut key "ctrl + mouse scroll" to control the screen size of the web
6. Pictures can be quickly imported to the web window by dragging the pictures from the folder to the window
7. Added an object browser in web window
8. Added a graphics library in web window
9. Added extendable property of combined graphics in web window
10. Added advanced controls: pie chart, report, dashboard, web browser in web window
11. Optimized C/S data agent to improve data transmission performance
12. Added project backup automatically and abnormal restoring
13. Optimized the virtual keyboard, supports inputs of simplified Chinese, traditional Chinese, and English characters
14. Fixed the issue that the object cannot be dragged to move by a mouse
15. Added a script to save workspace image: 'SaveFullWorkSpaceAsImage'
16. Fixed the issue that the alarm information in the text box cannot be viewed by scrolling the mouse
17. Optimized the animation of the analog value string and added the function of marking on text or resources
18. Fixed the issue that the 'Moving' animation does not work on some basic graphics.
19. Added the function of automatically creating animation connections in the value of input events
20. Added 337 new graphics in graphic libraries, including sensors, icons and graphics, motor pump fans, valve containers, and control computers
21. Added 'Parent' property for the combined graphics
22. Added 'GetElementByName' method for the combined graphics
23. Optimized an extendable property, which can take effect immediately during development
24. Added bar code control
25. Added QR code control
26. Optimized the presentation of the curve
27. Optimized toolbar icons, providing a variety of icon sizes to choose from, and added more optional configurations for the toolbar buttons
28. Fixed the issue that no meshes on the axis transposition property of bar chart and customized curves
29. Added historical variable filter function for selection
30. Fixed the data error issue where the same variable appears in multiple history record groups

31. Fixed the issue that when executing multiple customized curve 'CategoryPointCount' scripts, only one curve can be shown
32. Optimized the curve performance to improve curve rendering speed
33. Added a header and footer in the printing report
34. Optimized cell editing in the report
35. Added alarm loop function
36. Added alarm control by scrolling
37. Added the function of dynamically adding recipe ingredients and binding variables at runtime
38. Added customized expression alarm
39. Added customized editing project - loading pictures and icons
40. Added alarm API for third parties to obtain alarm information
41. Added customizable user types
42. Optimized the performance of variable dictionary to improve the efficiency of variable processing and response
43. Fixed the issue that temporary license cannot be recognized
44. Added time program and condition program grouping. Each group occupies a thread independently, not affecting each other; the maximum number of groups is 128
45. Fixed the issue of memory overflow when global functions are frequently called
46. Added the string type in data exchange
47. Fixed the issue that the IO address cannot be read due to the length of the IO address exceeding the range
48. Project packaging function optimized, added information icon in the process of reading
49. Project packaging function optimized, added rollback function when packaging errors occur
50. Project packaging function optimized, fixed the issue of packaging error caused by controls or icons in Chinese shown in English version
51. Project packaging function optimized, fixed the issue that the prompt information shown during packaging is incorrect

## **2.9 UPDATE – DIAView Temporary Soft License**

In order to work around the current worldwide semiconductor shortage and logistic constraints, we offer a temporary soft license during the coming six months. This soft license allows the full use of DIAView until we can provide USB dongles again.

### **How to acquire your soft license**

- Contact your sales representative
- Provide the order code
- Provide the MAC address of the device, in which you plan to use DIAView
- We will provide the credentials and all required information

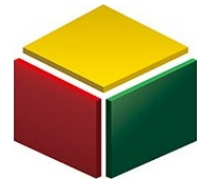


### 2.10 UPDATE – ISPSOFT 3.13

We improved our successful PLC programming software further. This new version supports new devices and adds new functionalities.

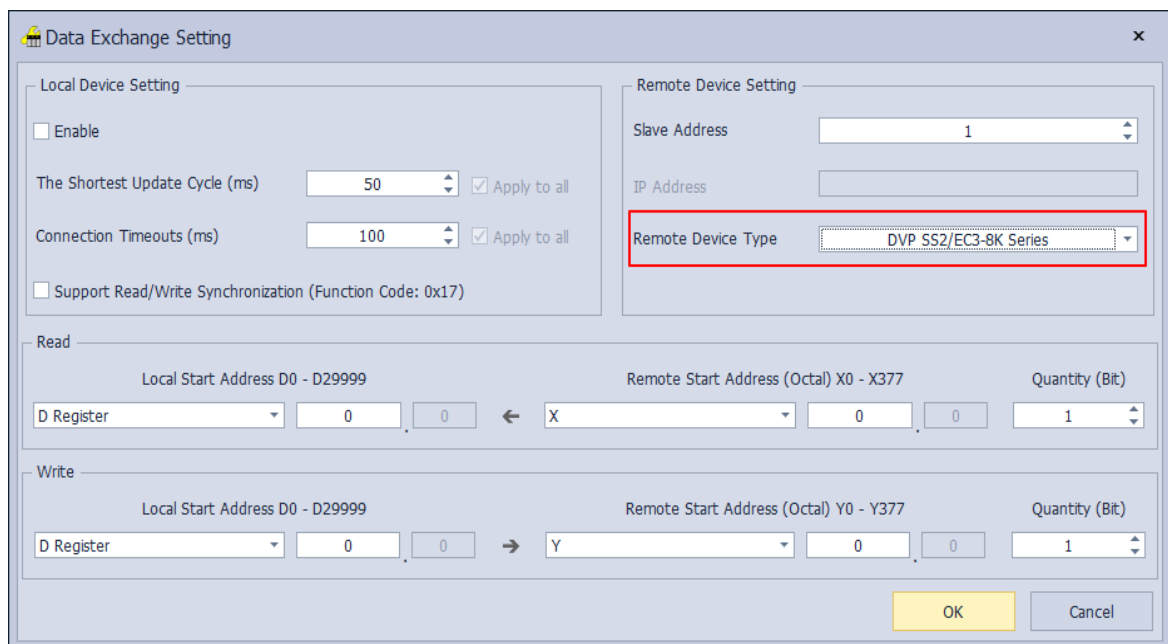
#### DIAView V3.6.0 download

[https://downloadcenter.deltaww.com/en-US/DownloadCenter?v=1&q=ISPSOFT%20V3.13&sort\\_expr=cdate&sort\\_dir=DESC](https://downloadcenter.deltaww.com/en-US/DownloadCenter?v=1&q=ISPSOFT%20V3.13&sort_expr=cdate&sort_dir=DESC)

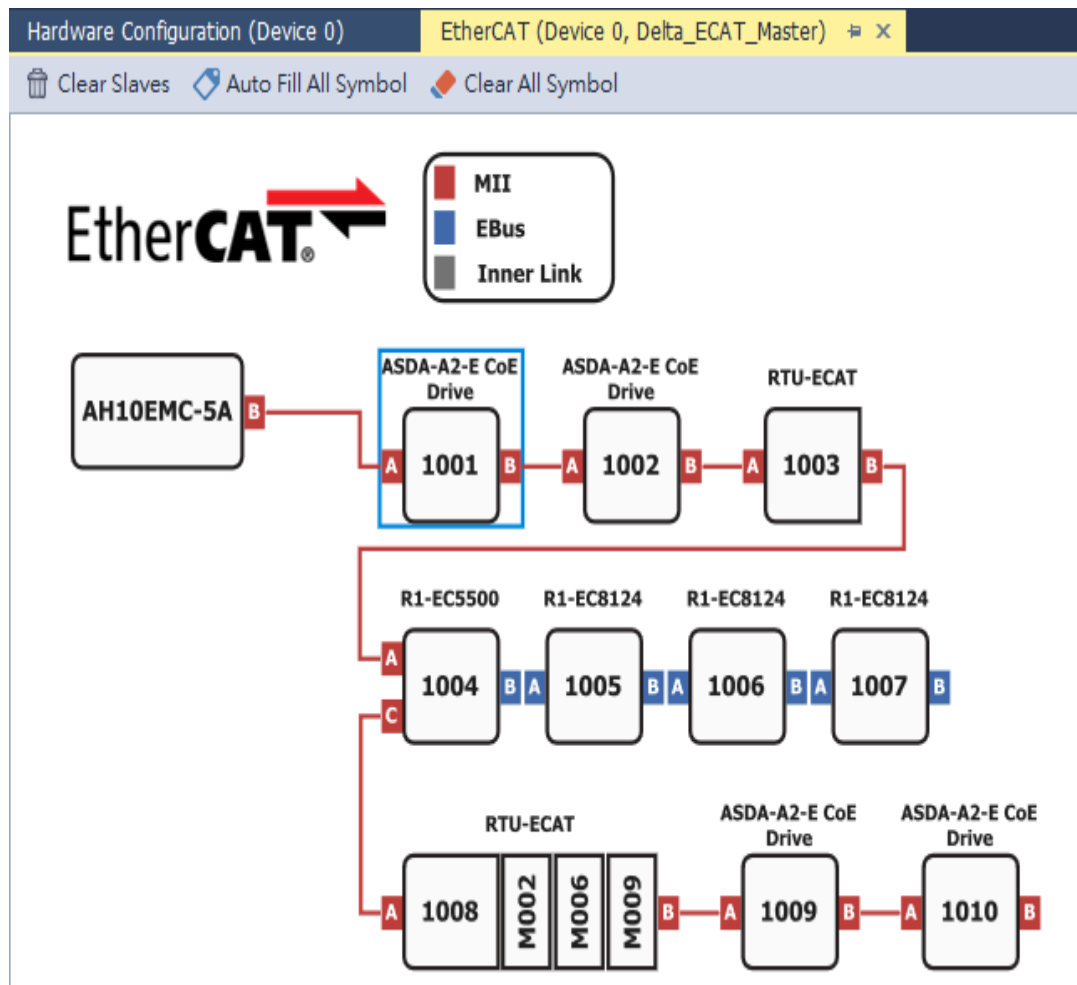


#### Features

1. HWCONFIG now supports the following PLC CPUs, DVP 50MC-04S, DVP 50MC-16S, AS532EST, and AS564EST
2. HWCONFIG now supports the module AS02ADH-A when used with AS300, AS200 or AS100
3. DVP SS2/EC3-8K Series is now supported in Data Exchange for AS, AH and AH Motion PLC in HWCONFIG



4. HWCONFIG integrated the embedded EtherCAT configuration software, ECAT Builder, for AH Motion Series PLC CPU (when acting as an EtherCAT Master). You can simply right click on the PLC CPU to see the option and double-click it to open the EtherCAT setting window
5. Besides the existing helpful functions, the integrated HWCONFIG has more to offer
  - a. Shorten the time to start EtherCAT setting window
  - b. The existing EtherCAT projects created by ECAT Builder can be used in the integrated HWCONFIG
  - c. Optimized the way EtherCAT graphical topology shows to illustrate an actual EtherCAT network topology. The best part is you can set up directly from the EtherCAT graphical topology



- d. Add your own self-defined PDO entry

Add PDO Entry

General

Name
Test123

Comment

Swapping
None

Settings

Index
0x0
Dec
Hex
Subindex
0
Dec
Hex


Type
BIT
Size
8

CoE Object Dictionary

	Index:Sub	Name	Type
▶	---	Reserved	BIT
	0x2000	DRV's Parameter P0-00	UINT
	0x2001	DRV's Parameter P0-01	UINT
	0x2002	DRV's Parameter P0-02	UINT
	0x2003	DRV's Parameter P0-03	UINT
	0x2004	DRV's Parameter P0-04	UDINT
	0x2005	DRV's Parameter P0-05	UDINT
	0x2006	DRV's Parameter P0-06	UDINT
	0x2007	DRV's Parameter P0-07	UDINT
	0x2008	DRV's Parameter P0-08	UINT

OK
Cancel

- e. Add your own self-defined Initial Command

 Add Init Commands

General

Index
0x5678
Dec
Hex
SubIndex
0
Dec
Hex
Value
0
Comment
add user defined initial command

Transition

☐ Init->Pre-Op
☐ Safe-Op->Pre-Op
☒ Pre-Op->Safe-Op
☐ Op->Safe-Op
☐ Safe-Op->Op

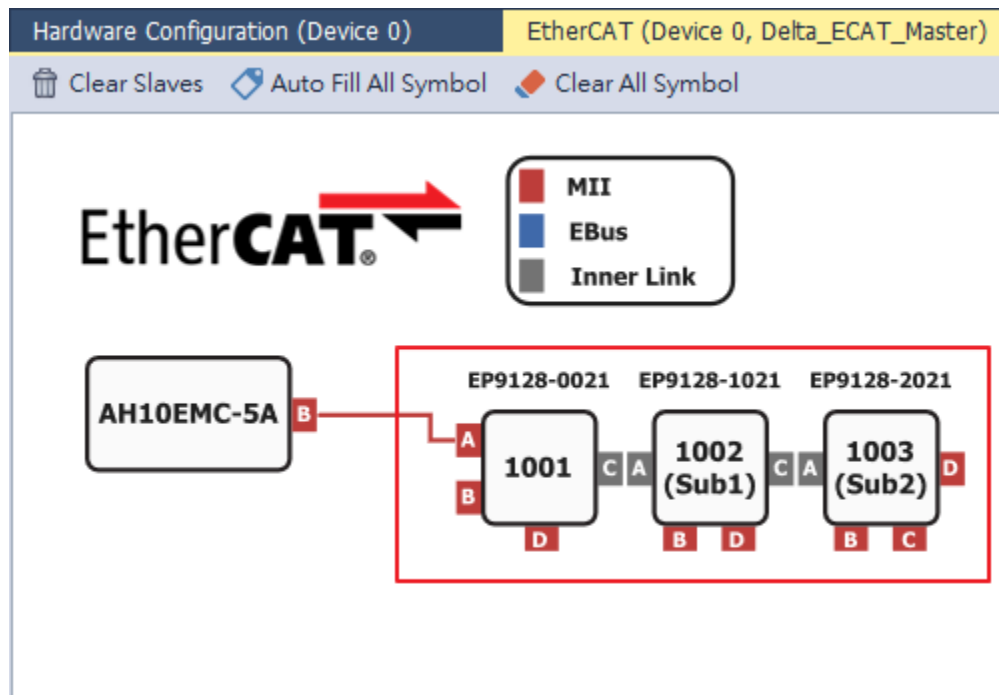
CoE Object Dictionary

	Index:Sub	Name	Flags	Data Type	Value
▶	0x2001	DRV's Parameter P0-01	RX TX (RW)	UINT	--
	0x2002	DRV's Parameter P0-02	RX TX (RW)	UINT	--
	0x2003	DRV's Parameter P0-03	RX TX (RW)	UINT	--
	0x2004	DRV's Parameter P0-04	RX TX (RW)	UDINT	--
	0x2005	DRV's Parameter P0-05	RX TX (RW)	UDINT	--
	0x2006	DRV's Parameter P0-06	RX TX (RW)	UDINT	--
	0x2007	DRV's Parameter P0-07	RX TX (RW)	UDINT	--
	0x2011	DRV's Parameter P0-17	RX TX (RW)	UINT	--
	0x2012	DRV's Parameter P0-18	RX TX (RW)	UINT	--

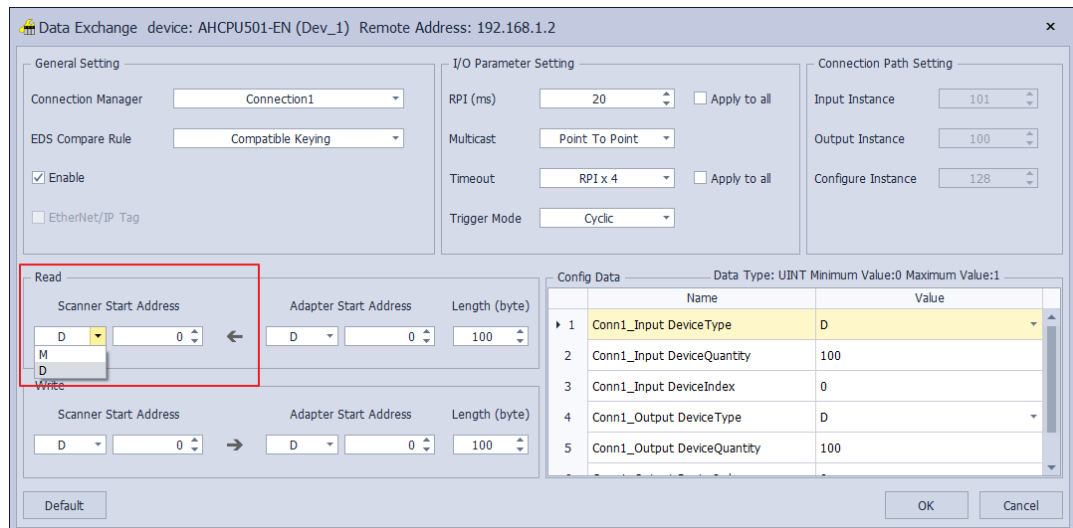
OK

Cancel

- f. You can also set up the connected EtherCAT Sub-devices



- g. If an error occurs while importing an ESI file, the Device Description File Manager provides more detailed information
- h. When AS Series PLC CPU (FW V1.10 or later) acts as an EtherNet/IP Scanner, M type registers are supported in Data Exchange

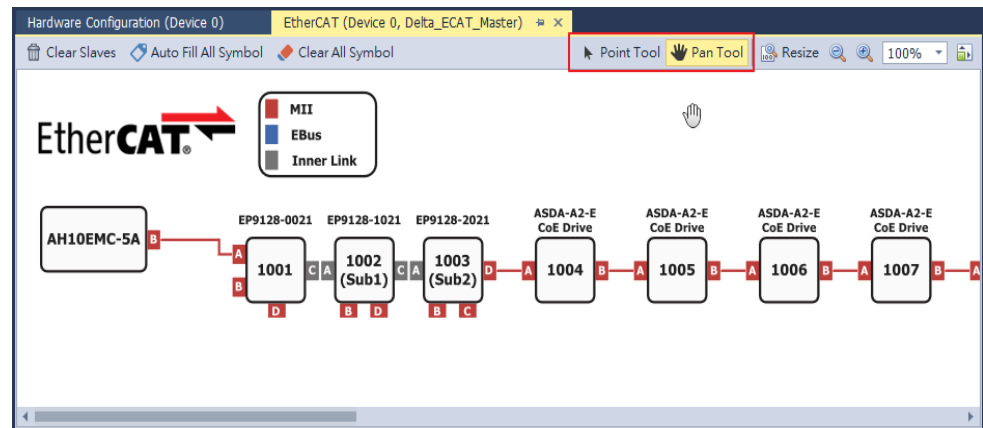


- i. For parameter backup and restoration functions, more EtherNet/IP communication cards and inverters are supported, including
- CMC-EIP02
  - VFD-C2000 Plus / C2000 (+ CMC-EIP01)
  - VFD-CH2000 (+ CMC-EIP01)
- j. Optimized HWCONFIG UI

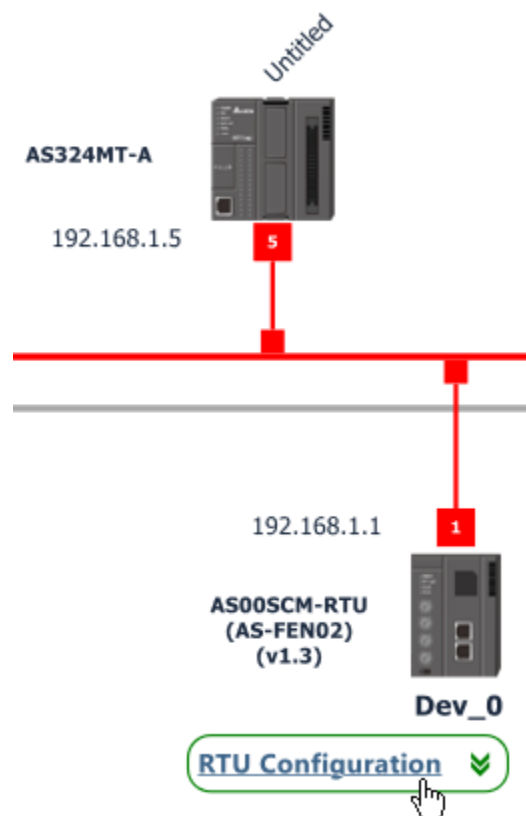


i. Added a Pan Tool

When there are too many devices and they cannot be shown on the same display window, you can use the Pan Tool to move around and look for the device that is not on the current the display window



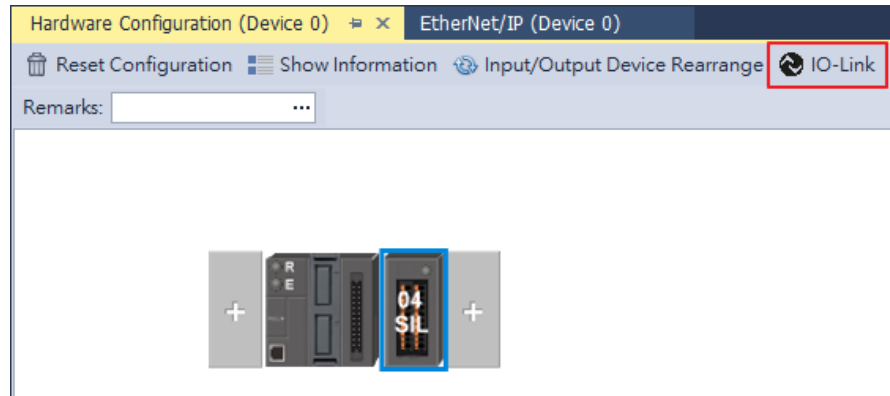
ii. When you add an AS RTU device in the EtherNet/IP topology, you can use the embed link to enter the setting page of the RTU right-side modules



iii. For a more intuitive access, you can click the device on the setting page to see its corresponding functions on the tool bar. Click the function button to get into its setting window. The corresponding functions may include the following:

1. supported protocols, EtherNet/IP, EtherCAT, IO-Link and more
2. EtherNet/IP AS RTU configurations

3. Extension functions, e.g. parameter backup, firmware update, LC wizard and more
4. External software, e.g. CANopen Builder, DeviceNet Builder, SCMSOft and more



- k. Added SynMode in the option of Mode in Data Tracer, available for the following Series PLC, DVP Motion / AS Motion / AH Motion. Now you can chose from three modes, including Auto, Trigger and Sync. The SynMode is used to read the variable value in the PLC cyclically. Up to 4 variables can be traced. Refer to section 23.2.6 in ISPSOft User Manual for more details

How to open Data Tracer (with SynMode function):

- i. For DVP/AS Motion Series PLC:  
Go to ISPSOft -> Wizard -> Data Tracer
- ii. AH Motion

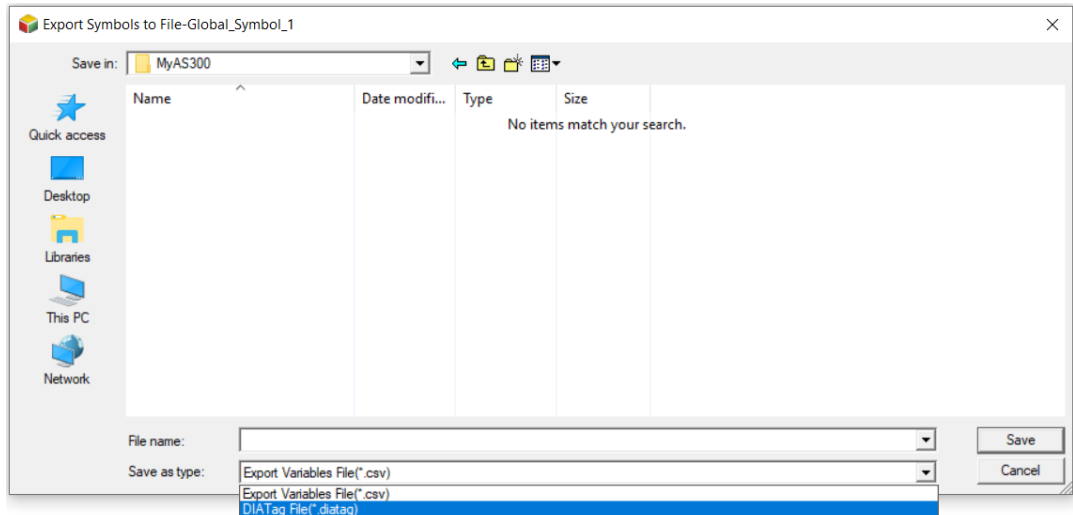
Firstly you need to enable SynMode function.

Go to ISPSOft -> Tools -> Options -> General -> Project Setting -> Data Tracer -> Enable SyncMode.

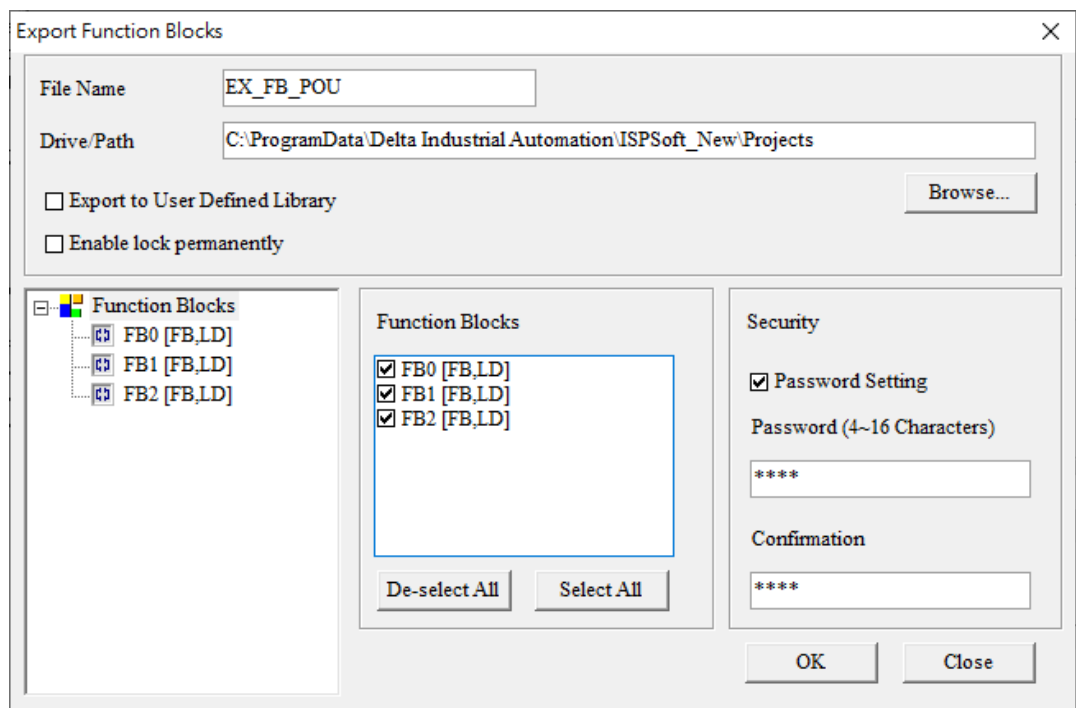
Once SynMode function is enabled, you can open Data Tracer the same way as to open it for DVP and AS Motion Series PLC: Go to ISPSOft -> Wizard -> Data Tracer



- I. Added a new file type .diatag for Export Symbols to File. The information for the self-defined data type is included in this file type. Select this file type if you need the definition for the self-defined data type

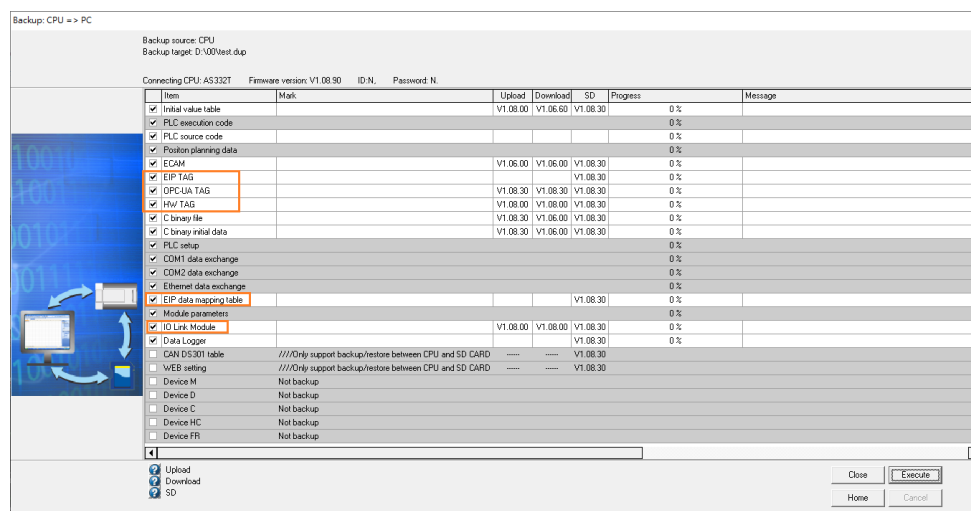


- m. Optimized the function "Enable lock permanently"  
The option "Enable lock permanently" is moved to the window of Export Function Block. Enable this option is to lock the going-to-be-exported function blocks only. You can still edit your function blocks in the project and you can select all function blocks that you'd like to export with one click



### n. Updates in "Card Utility"

- i. The following PLCs, AS524C and AS516E, are supported for Controller Type, AS
- ii. AS200 and AS300 Series PLC now can backup/restore the followings, HW TAG, OPC-UA TAG, EIP TAG, EIP Data Exchange Table and IO-Link modules



- p. New instruction \$MOV is available for the following DVP Series PLC CPU. With this new instruction \$MOV, you can edit the string directly and move it to the appointed devices

Series	DVP-ES2 Series		DVP Slim Series				DVP-EH3 Series
Module	ES2, EX2, ES2-C	ES2-E	SS2	14SA2, SX2	28SA2	SE	EH3, EH3L, SV2
Firmware Version	V3.68	V1.46	V3.62	V3.02	V3.00	V2.02	V2.26

- p. You can use constant strings in the program. The STRING escape sequence (\$) as defined in IEC\_61131-3 is supported. For example, the escape sequence \$\$ produces \$ and "\$ produces"
- q. Up to 1000 symbols can be added in OPC UA Table

### Corrections

- Fixed an issue that if the project was created by previous versions of HWCONFIG, some data cannot be read correctly
- Corrected the quantity of parameters for backup/restoration in AS300 Series PLC CPU in HWCONFIG
- Fixed an issue that the firmware version of the function card 1 installed in AS300 Series PLC CPU is not shown completely in HWCONFIG online mode
- Fixed an issue that the firmware version of AS00SCM is not shown completely in HWCONFIG online mode
- The data exchange table will only appear when AS Series PLC CPU is connected to AS00SCM which is installed with a communication card
- Updated the parameter names of AH Series to be consistent with the parameter names of AS Series in HWCONFIG
- If HWCONFIG receives the code (07x740A) while AH Series PLC CPU is downloading, HWCONFIG will prolong the timeout time and keep trying to communicate

8. Fixed an issue that firmware version and MAC address of AHxxEMC are not shown completely in HWCONFIG online mode
9. If switching among various DDF versions in HWCONFIG and then to open SCMSOFT, the module versions of AH10SCM and AH15SCM will be shown incorrectly
10. Updated the embedded EDS file in HWCONFIG
11. Fixed an issue that the communication setting value is shown differently on the graphic in NWCONFIG
12. Fixed an issue that setting values on PLC-Link UI are shown incorrectly in NWCONFIG
13. Fixed the security vulnerability issue (CNVD-2020-33323) found in ISPSOFT project and reported by CNVD
14. Fixed an issue that if using device E inside the array in ST programming language, an error message that states incorrect positioning will show up while compiling
15. Fixed an issue that if ES3 Series using devices X and Y in ST programming language, after compiling, the corresponding addresses will NOT be correct
16. Fixed an issue that the POU created in C language can only be used in cyclic tasks; if used in other tasks, the POU is not working
17. Fixed an issue that when AS Series PLC CPU (FW V1.08.20) uses ISPSOFT (V3.12) to download, an error code C212(8101) will appear
18. Fixed an issue that if MOV instruction uses WORD ARRAY in the input contact and to extract a bit of a word (e.g. myArray[0].0), an error will occur while compiling

## 2.11 UPDATE – COMMGR 1.13

A new version for Delta's COMMGR software for use with ISPSOFT is released.

### DIASstudio V1.0 download

[https://downloadcenter.deltaww.com/en-US/DownloadCenter?v=1&q=COMMGR%20V1.1&sort\\_expr=cdate&sort\\_dir=ASC](https://downloadcenter.deltaww.com/en-US/DownloadCenter?v=1&q=COMMGR%20V1.1&sort_expr=cdate&sort_dir=ASC)



### Corrections

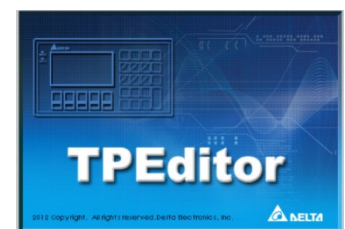
1. Since AH Simulator is replaced by Simulators of AH5X0 and AX5X1, removed AH Simulator from COMMGR V1.13 to fixed the security vulnerability issues reported by ICS-CERT
2. The simulators of AS200 and ES3 are upgraded
3. New devices are added in Ethernet Search:  
DVP-MC Series: 50MC-04S, 50MC-16S  
AS MC Series: AS532EST, AS564EST  
Function Cards: AS-FOPC02

## 2.12 UPDATE – TPEditor Version 1.98.06

Delta's latest TPEditor software version 1.98.06 is released, it can be downloaded from Delta official Download Center.

### DIASstudio V1.0 download

[https://downloadcenter.deltaww.com/en-US/DownloadCenter?v=1&q=TPEditor%20V1.98.06&sort\\_expr=cdate&sort\\_dir=DESC](https://downloadcenter.deltaww.com/en-US/DownloadCenter?v=1&q=TPEditor%20V1.98.06&sort_expr=cdate&sort_dir=DESC)



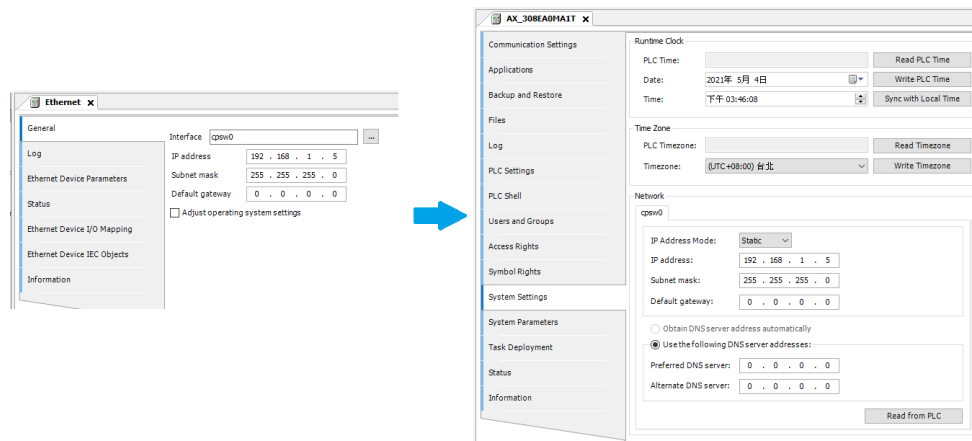
### Corrections

- Fixed the security vulnerability issues.

## 2.13 UPDATE – AX308EA0MA1T Firmware Upgraded to Version 1.00.01

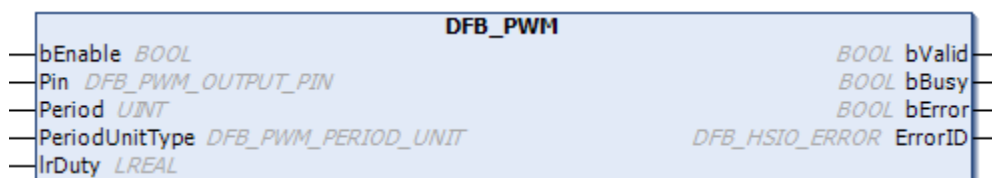
### New functions

- New settings for AX308E CPU (available for DIADesigner-AX V1.1 or later)
  - The options of network-related settings are moved from the tab, Ethernet (General) to System Settings
  - New DNS Server settings are included



- More AS series modules are supported as the right-side extension modules of AX308E CPU
  - Positioning modules: AS02PU (V1.02.20 or later), AS04PU (V1.02.20 or later)
  - Counter module: AS02HC (V1.00.00)
- More instructions are available for the right-side extension modules
  - For load cell modules: DFB\_DLCCAL, DFB\_DLCWEI
  - For temperature measurement modules: DFB\_DMPID
  - For positioning modules: DFB\_DPUCNT, DFB\_DPUCONF, DFB\_DPUDRA, DFB\_DPUDRI, DFB\_DPUJOG, DFB\_DPUMPG, DFB\_DPUPLS, DFB\_DPUZRN, DFB\_PUSTAT

Refer to Chapter 6 from AX Series - Standard Instruction Manual (V3) for more information
- Added new built-in IO output PWM function block



Refer to Chapter 10 from AX Series - Standard Instruction Manual (V3) for more information

### Corrections

- When using an AS Series DIO module on the right-side of AX-308E CPU, if the variable is declared in IO Mapping and performed comment out selected lines in the POU in the original

- project, and before downloading the project again if the comment is removed from the POU, the actual input points will be incorrect, e.g. %IX1 ON will become %IX0.2 ON
2. If the settings of the right-side modules are not matched with what are set in DIADesigner-AX, AX-308E CPU will NOT RUN
  3. Updated the procedures of turning on AX-308E CPU to eliminate the chance of NOT being able to turn AX-308E CPU on
  4. Fixed an issue that when the communication of Delta\_Modbus\_Master\_COM\_Port failed, the attempt to retry stops working
  5. Fixed an issue that when executing the function block DFB\_ModbusRequest or DFB\_ModbusRequest2 of the library DL\_ModbusComMaster\_AX3 to read coils or registers and if the reading length is set to 1920/120, AX308-E CPU will crash
  6. Fixed an issue that while the function block DFB\_ModbusRequest2 or DFB\_ModbusRequest of the library DL\_ModbusComMaster\_AX3 uses the function of READ\_WRITE\_MULTIPLE\_REGISTERS, if the reading length is set over the value 120, an error code will be sent but it is not the error code intended for the incident. The correct error code should be DFB\_MB\_ERROR\_CODE\_DFB\_INVALID\_TRANSMISSION\_MODE
  7. Set the value to 0 in usiSlaveAddr, the contact of DFB\_ModbusRequest2 or DFB\_ModbusRequest of the library DL\_ModbusComMaster\_AX3 is forbidden
  8. Fixed an issue that if the value is set to 0 in tResponseTimeout (the contact of DFB\_ModbusRequest2 of the library DL\_ModbusComMaster\_AX3), once the execution of DFB\_ModbusRequest2 is complete, the state changes to DONE even when nothing is received
  9. Fixed an issue that when using the function block DFB\_COMRS of the library DL\_COM\_AX3 to communicate, if an ending character is set in 1 byte, the communication will not stop immediately after receiving the ending character
  10. Fixed an issue that when a Modbus TCP Slave device receives a command with a wrong ID number, an error code will be sent but it is not the error code intended for the incident
  11. Fixed an issue that the error of exceeding the maximum TCP connection number (32) is not recorded
  12. Fixed an issue that if the socket TCP connection is created through Auto-Reconnect, the error flag will not be cleared, even after the connection is established
  13. Fixed an issue that if the AX-308E CPU firmware is V1.01.0 and its DDF is V1.01.0 or previous versions, after downloading the project to the PLC, the Delta\_Modbus\_TCP\_Slave\_Device can NOT communicate again
  14. The maximum setting number of COM ID in Delta\_Modbus\_Serial\_Device is changed from 254 to 247
  15. The library of DL\_EtherneLib provides various data transmission options for the same connection to enhance conveniences
  16. Fixed an issue that when AX308E CPU switches from STOP to RUN, the function blocks of the DL\_EtherneLib\_AX3 will clear the states of the previous connections
  17. Fixed an issue that when the settings in the function blocks of the DL\_EtherneLib\_AX3 are NOT matched with what are set in actual placements, a connection can still be established
  18. When the Ethernet network cable is being removed, an error message will appear in DL\_EtherneLib\_AX3 or DL\_ModbusTCPMaster\_AX3, depending on the situation
  19. Fixed an issue that the state of bSlaveError (the contact of the function block DFB\_ModbusTCPMaster of the library DL\_ModbusTCPMaster\_AX3) stays TRUE, even after the error had been corrected
  20. If executing the function block DFB\_ModbusTCPChannel of the library DL\_ModbusTCPMaster\_AX3 before setting up the Modbus TCP Master device in the setting page of Channel, an error code will be sent, however AX-308E CPU can stay in the state of RUN
  21. Fixed an issue that if deleting some channel settings in the function block DFB\_ModbusTCPChannel of the library DL\_ModbusTCPMaster\_AX3, other channels that are unedited may also be affected and respond with errors



### 2.14 UPDATE – AS200 & AS300 Firmware Updated to Version 1.10.00

#### New Instructions and Functions

The following instructions and functions require ISPSOFT 3.12 or later.



No.	API No.	Function / Instruction	Description	Reference
1	1426 1427	IOLINKR IOLINKW	New instructions for IO-Link modules. Read the parameters from the IO-Link devices and write the parameters into the IO-Link devices.	Attachment B-1
2		SM203	Use SM203 to clear the settings in the non-latched areas when PLC is from RUN to STOP.	
3		Backup and Restore	New items are added for the backup and restoration in the SD card.	Note B-3
4		Manual + Flags in I/O allocation setting	Added remote IO modules in Manual + Flags in I/O allocation settings	Attachment B-4
5	2710	DPPMR	Instruction for 2-Axis relative-coordinate point-to-point synchronized motion; now you can change the target speed point during output.	
6	1229	FSORT	New sorting instruction for data in floating-point format	Attachment B-6
7	0709	XCMP	Added a new flag SM603; when the objects in the stack area exceed the capacity of the stack area, SM603 switches to True, indicating the input objects have exceeded the capacity of the stack area, and the running speed of coming objects should be slow down	
8		Number of Ethernet connections	Added SR1017; users can monitor the Ethernet connection number of the current PLC scan cycle stored in SR1017	
9	2700	Execute DPLSY in interrupts	Now you can execute the instruction DPLSY in an interrupt to perform high-speed pulse output	Attachment B-11

#### Note B-3:

New items are added for the backup and restoration in the SD card.

1. Users' C execution code and initial values
2. Device initial value table
3. ECAM table
4. Data Logger parameter
5. EIP TAG table
6. OPC UA table
7. IO-LINK device parameter
8. EIP data exchange table
9. CAN DS301 data exchange table
10. Webpage account and authorization settings

### Modified Instructions and Functions

The following instructions and functions are compatible with your compiled PLC programs.

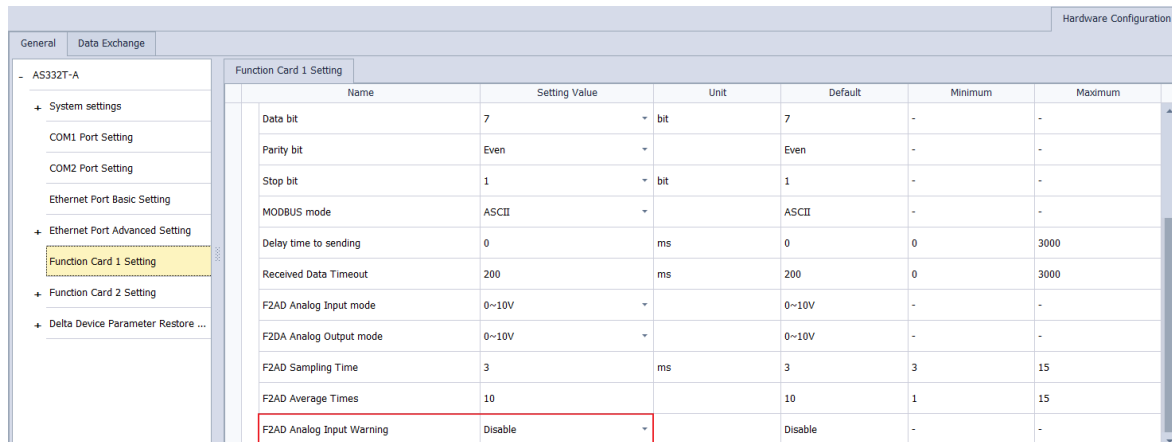
No.	Functions / Instructions	Description	Remark
1	PU module instructions (API 1402-1410)	<ul style="list-style-type: none"> <li>Added a new error code for the incident of exceeding the limit. When it is the first time to execute the PU instruction, it clears the completion flags automatically</li> <li>Now you can use a negative number in the target speed in instruction PUZRN</li> </ul>	
2	Operation Speed	Improve the speed of instruction execution and enhance the accuracy of the TMRH execution to shorten the PLC program scan time	
3	Memory card instructions (API 2300-2304)	Words used as a filename is expanded from 9 words to 255 words.	
4	Download record	The source of the downloaded data is included in the record.	Note C-4
5	MCONF (API 2210)	In the past, the connection needed to be cut off, before executing instruction MCONF. Now if the IP address is detected to be the same, the connection is kept	
6	CSFO (API 2708)	<ul style="list-style-type: none"> <li>New backlash compensation function is added.</li> <li>To lessen the lag time during the output that follows a desired reference signal, new flags SM1700~SM1705 are added to enable/disable the backlash compensation and new SR1700~SR1710 are added to define the value in frequency for compensation.</li> </ul>	Attachment C-6
7	DTQC (API 2817) DTQLC (API 2818)	Increased the torque range from -300 ~ 300 to -3000 ~ 3000 to accommodate the improved torque accuracy of Delta servo system, ASDA-A3 and ASDA-B3 Series.	
8	HWCONFIG	Added SM27 flag to enable/disable analog input warning and add SR27 to show the error code. Available for F2AD (installed in AS300) and AS218 built-in AD channels.	Note C-8

Note C-4:

1. PLC operation codes (ISP)
2. PLC parameters (HWCONFIG)
3. Module configurations (HWCONFIG)
4. PLC operation codes and programs (ISP)
5. PLC operation codes (Online editing)
6. PLC operation codes and programs (Online editing)
7. PLC operation codes and programs (Restoration from SD card)
8. Module configurations and PLC parameters (HWCONFIG)
9. Module configurations and data exchange table (HWCONFIG)
10. Module configurations, PLC parameters and data exchange table (HWCONFIG)
11. Module configurations (EIP Builder)
12. Module configurations, PLC parameters and data exchange table (Restoration from SD card)

### Note C-8:

Example of disabling F2AD Analog Input Warning.



### Error Codes in SR27:

Error Code	Description	Solution
16#0040	Function card 1 AS-F2AD: the value of the built-in AD input channel 1 exceeds the acceptable range.	Check the actual input signal
16#0041	Function card 1 AS-F2AD: the value of the built-in AD input channel 2 exceeds the acceptable range.	Check the actual input signal
16#0042	Function card 2 AS-F2AD: the conversion value of the input channel 1 exceeds the acceptable range.	Check the actual input signal
16#0043	Function card 2 AS-F2AD: the conversion value of the input channel 2 exceeds the acceptable range.	Check the actual input signal
16#0044	Function card 1 AS-F2AD: the current input of the built-in AD input channel 1 is disconnected. (4mA~20mA mode)	Check the connection
16#0045	Function card 1 AS-F2AD: the current input of the built-in AD input channel 2 is disconnected. (4mA~20mA mode)	Check the connection
16#0046	Function card 2 AS-F2AD: the current input of the input channel 1 is disconnected. (4mA~20mA mode)	Check the connection
16#0047	Function card 2 AS-F2AD: the current input of the input channel 2 is disconnected. (4mA~20mA mode)	Check the connection

### Attachment B-1 IOLINKR & IOLINKW

API	Instruction			Operand								Description					
1426		IOLINKR		Execute ~ DataRead								Read the parameter from the O-Link device					

Device	X	Y	M	S	T	C	HC	D	FR	SM	SR	E	K	16#	"\$"	F
Group								●					○	○		
Module								●					○	○		
Port								●					○	○		
Index								●					○	○		
SubIndex								●					○	○		
DataType								●					○	○		
Done		●	●	●				●								
Error		●	●	●				●								
ErrCode								●								
ReadLen								●								
DataRead								●								

Device	BOOL	WORD	DWORD	LWORD	INT	DINT	LINT	REAL	LREAL	TMR	CNT	STRING
Group		●			●							
Module		●			●							
Port		●			●							
Index		●			●							
SubIndex		●			●							
DataType		●			●							
Busy	●											
Done	●											
Error	●											
ErrCode		●			●							
ReadLen		●			●							
DataRead		●			●							

Pulse Instruction	16-bit instruction	32-bit instruction
-	AS	-

### Symbol

IOLINKR	
En	
Group	Done
Module	Error
Port	ErrCode
Index	ReadLen
SubIndex	DataRead
Data Type	

<b>Group</b>	: Group number
<b>Module</b>	: Module number
<b>Port</b>	: Communication port number
<b>Index</b>	: Index number of the parameter
<b>SubIndex</b>	: Subindex number of the parameter
<b>Data Type</b>	: Data type
<b>ReadLen</b>	: The length of the read data
<b>DataRead</b>	: Data that is read
<b>Done</b>	: Communication complete
<b>Error</b>	: Error flag
<b>ErrCode</b>	: Error code

### Explanation

1. This instruction is available for PLC with FW V1.08.50 or later and ISPSOft V3.12 or later
2. You can refer to the IODD file of the IO-Link device to learn more about the device parameters. You can also use this instruction to read the IO-Link device parameters
3. There is no limit on the number of times you execute the instruction but only one instruction (IOLINKR or IOLINKW) can be executed at a time
4. During communication, it takes at least 5 seconds for the IO-Link device to response. Do NOT stop or start another instruction during this time. After the communication with IO-Link is done, it is suggested to use the flags DONE or ERROR to stop or start the instruction
5. Group: The group number of AS04SIL that is connected to the right side of PLC directly or connected to the remote module that acts as PLC, e.g. the first connected module is module number 1, the second connected module is number 2. Up to 15 modules can be connected. If the connected module is not AS04SIL, the Error flag switches to ON
6. Module: The module number that is connected to the right side of PLC directly or connected to the remote module that acts as PLC, e.g. the first connected module is module number 1, the second connected module is module number 2. Up to 32 modules can be connected and counted and each type of modules should be included in the count. If the module is not AS04SIL, the Error flag switches to ON
7. Port: The communication port number, ranging from 1 to 4. If the port number used is not the port for AS04SIL, the Error flag switches to ON
8. Index is the index number that is read from the parameter of the IO-Link device
9. SubIndex is the sub-index number that is read from the parameter of the IO-Link device. The sub-index number can be set from 0 to 255. If the value exceeds the setting range, the Error flag switches to ON

10. DateType is the parameter data type of the IO-Link device. You need to set the correct datatype before executing this instruction  
If the setting value exceeds the setting range, the Error flag switches to ON.

Error Code	Data Type	Description
0x0000	BooleanT	Boolean; data length: 1 byte
0x0001	UIntegerT	Unsigned integer; data length: 1, 2, 4, 8 byte
0x0002	IntegerT	Signed integer; data length: 1, 2, 4, 8 byte
0x0003	Float32T	Floating-point; data length: 4 byte
0x0004	StringT	String; data length: 1~232 byte; Null (0x00) is seen as the ending character for the string.
0x0005	OctetStringT	Fixed length string, defined by the IODD fixed length; data length: 1~232 byte
0x0006	TimeT	Time; data length: 4 byte (Resolution: 1 second) + 4 Byte (Resolution: 2 <sup>-32</sup> second)
0x0007	TimeSpanT	Time; data length: 8 byte (Resolution: 2 <sup>-32</sup> second)
0x0008	ArrayT	A whole array that is read from the sub-index number 0
0x0009	RecordT	A whole record that is read from the sub-index number 0
Others	Reserved	Reserved

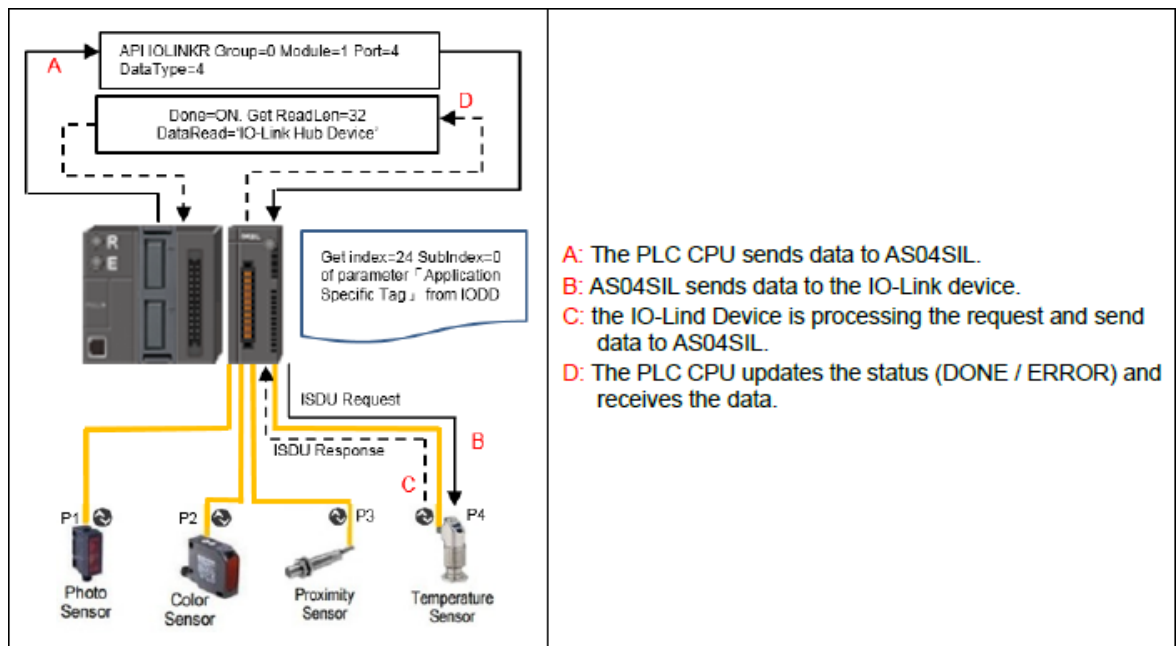
11. DataRead is the data read from the IO-Link device; unit: byte, arranged by high byte and low byte
12. ReadLen is the data length of the data read from the IO-Link device; unit: byte
13. Done is a communication complete flag. When this flag is ON, it indicates the parameter of the IO-Link device is read completely. The range of the read data (ReadData) will be used according to the data length (READLen)
14. Error is a communication error flag. When this flag is ON, it indicates an error occurs during the communication among the PLC CPU, AS04SIL and the IO-Link device. Refer to the following Error Codes for troubleshooting

15. Refer to the following table for more details when any of the Error flag is ON

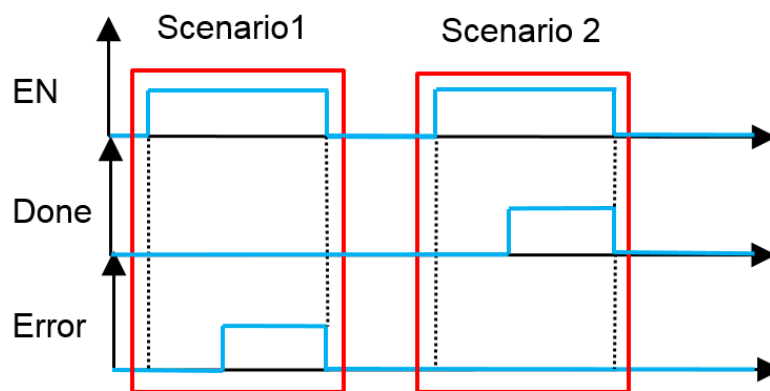
Error Code	Description
0x8000	IO-Link device application error
0x8011	The main index does NOT exist.
0x8012	The sub-index does NOT exist.
0x8020	The function is currently NOT available.
0x8021	The function is currently NOT available – Local Control.
0x8022	The function is currently NOT available – Device Control.
0x8023	Access denied.
0x8030	The parameter exceeds the setting range.
0x8031	The parameter exceeds the upper limit.
0x8032	The parameter exceeds the lower limit.
0x8033	The parameter length overrun
0x8034	The parameter length underrun
0x8035	The function is NOT available.
0x8036	The function is currently NOT available.
0x8040	Invalid parameters set
0x8041	Inconsistent parameters set
0x8082	Application is NOT ready for use.
0x8101	The IO-Link device is NOT in IO-Link mode.
0x8102	The communication port is NOT connected to any IO-Link device.
0x8103	The connection to IO-Link device is establishing.
0x8104	Communication port number exceeds the setting range 1~4.
0x8105	The sub-index number of the parameter exceeds the setting range 0~255.
0x8106	The data to be read and written exceeds the setting range 1~232.
0x8107	Reserved
0x8108	Communication timeout; no response from IO-Link device for over 5000 ms.
0x8109	Incorrect AS04SIL module number or group number
0x810A	Internal communication error
0x810B	Execute more than two IO-Link read/write instructions on the same AS04SIL module.
0x810C	The starting address of the read/write device + the data length to read/write exceed the device setting range.
0x810D	The value of the parameter data type exceeds the setting range.
0x810E	The parameter data type and the read/write data length are inconsistent.



16. The communication process among the PLC CPU, AS04SIL and IO-Link device:

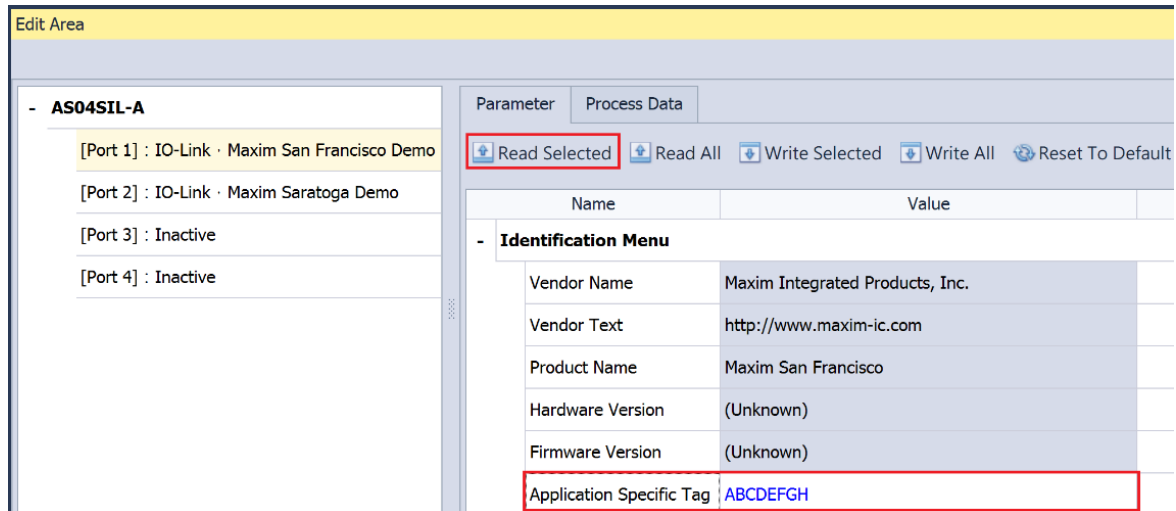


17. Sequences of the EN, Done, and Error flags: when an error occurs during communication (scenario 1) and when the communication is complete (scenario 2)



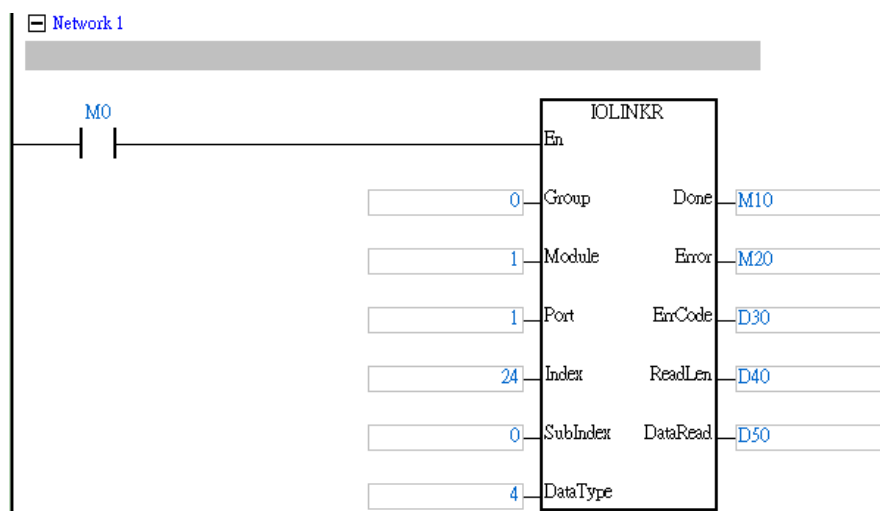
**Example 1: Read the parameter of Application Specific Tag on the first device of the communication port.**

1. Check HWCONFIG to learn the setting value in Application Specific Tag is "ABCDEFGH"



2. AS04SIL is the first module that installed on the right side of the PLC CPU. The setting value in **Group** is 0, and 1 in both **Module** and **Port**
3. We learnt that its index is 24, its Sub-index is 0, and the data type is StringT from its IODD file or the IO-Link device manual. Set the setting values in Index to 24, in Sub-index to 0, in data type to 4 (StringT)
4. Start sending "to read" request when M0 is ON. When M10 (DONE) is ON, it indicates the device has responded and has complete reading. ReadLen (D40) is 32, and the data string is stored in DataRead (D50~D65). IO-Link device reads the data and stores it in accordance with the order of high byte and low byte

**Example 2: Read the parameter of the gain trim green channel on the first device of the second communication port.**



Object	Identifiers	Device Name	Status	Data Type	Value (16bits)	Value (32bits)	Float	Radix	Comment...
		M1							
		M10							
		M20							
		D30			0000	00000000	0.0000	Hexadecimal	
		D40			32	32	0.0000	Signed Decima	
		D50			4241	44434241	781.0352	Hexadecimal	
		D51			4443	46454443	12625.0654	Hexadecimal	
		D52			4645	48474645	204057.0781	Hexadecimal	
		D53			4847	00004847	0.0000	Hexadecimal	
		D54			0000	00000000	0.0000	Hexadecimal	
		D55			0000	00000000	0.0000	Hexadecimal	
		D56			0000	00000000	0.0000	Hexadecimal	
		D57			0000	00000000	0.0000	Hexadecimal	
		D58			0000	00000000	0.0000	Hexadecimal	
		D59			0000	00000000	0.0000	Hexadecimal	
		D60			0000	00000000	0.0000	Hexadecimal	
		D61			0000	00000000	0.0000	Hexadecimal	
		D62			0000	00000000	0.0000	Hexadecimal	
		D63			0000	00000000	0.0000	Hexadecimal	
		D64			0000	00000000	0.0000	Hexadecimal	

1. Check HWCONFIG to learn the setting value in gain trim green channel is “-63”

Edit Area

AS04SIL-A

[Port 1] : IO-Link , Maxim San Francisco Demo

[Port 2] : IO-Link , Maxim Saratoga Demo

[Port 3] : Inactive

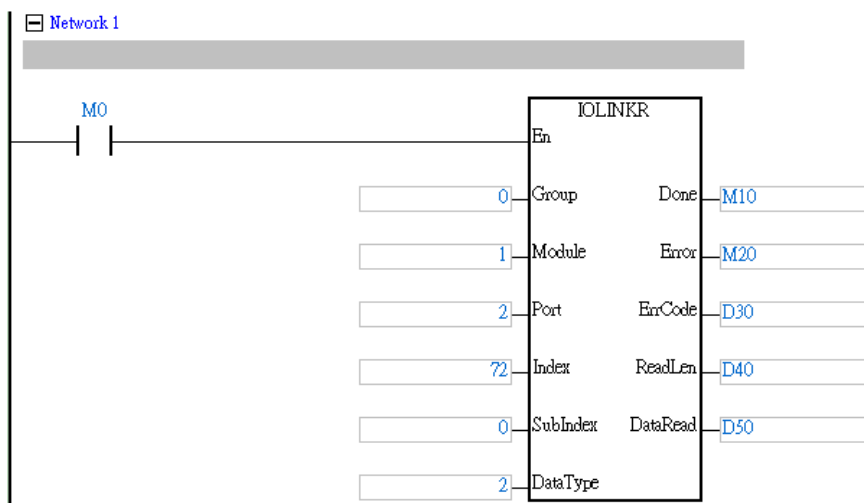
[Port 4] : Inactive

Parameter Process Data

Read Selected Read All Write Selected Write All Reset To Default

Name	Value	Unit
gain trim green cha...	-63	
gain trim IR channel	-2	

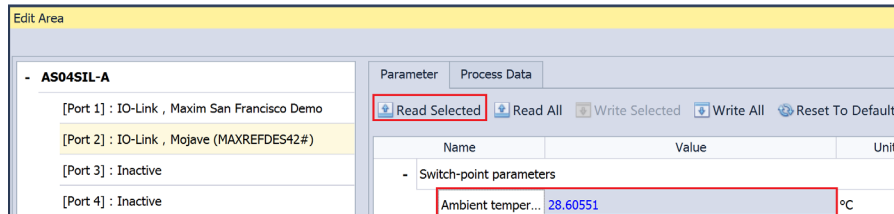
2. AS04SIL is the first module that installed on the right side of the PLC CPU. The setting value in **Group** is 0, 1 in **Module** and 2 in **Port**
3. We learnt that its index is 72, its Sub-index is 0, and the data type is IntegerT from its IODD file or the IO-Link device manual. Set the setting values in Index to 72, in Sub-index to 0, in data type to 2 (IntegerT)
4. Start sending “to read” request when M0 is ON. When M10 (DONE) is ON, it indicates the device has responded and has complete reading. ReadLen (D40) is 1, and the data is stored in DataRead (D50 Low Byte). IO-Link device reads the data and stores it in accordance with the order of high byte and low byte



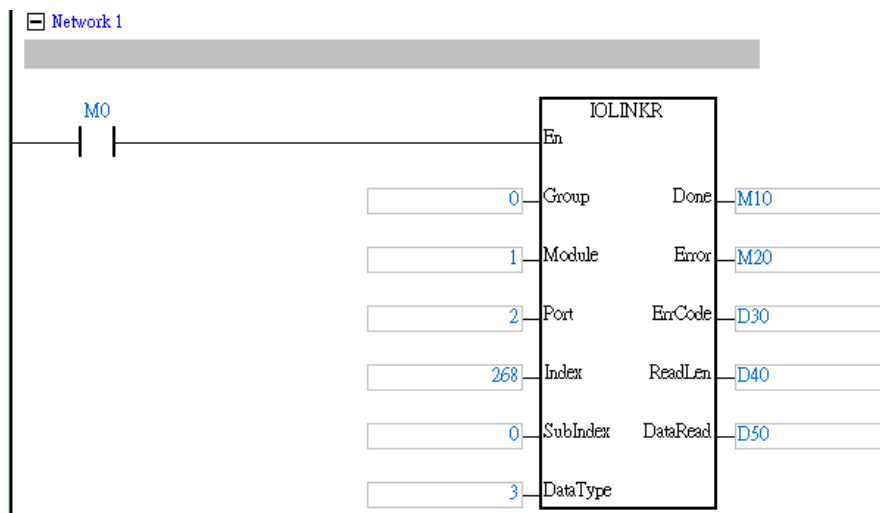
Object	Identifiers	Device Name	Status	Data Type	Value (16bits)	Value (32bits)	Float	Radix	Comment...
		M1							
		M10							
		M20							
		D30			0000	00000000	0.0000	Hexadecimal	
		D40			1	1	0.0000	Signed Decima	
		D50			00C1	000000C1	0.0000	Hexadecimal	

**Example 3: Read the parameter of gain trim green channel on the first device of the second communication port.**

1. Check HWCONFIG to learn the setting value in Ambient temperature is 28.60551



2. AS04SIL is the first module that installed on the right side of the PLC CPU. The setting value in **Group** is 0, 1 **Module** and 2 in **Port**
3. We learnt that its index is 268, its Sub-index is 0, and the data type is Float32T from its IODD file or the IO-Link device manual. Set the setting values in Index to 268, in Sub-index to 0, in data type to 3 (Float32T)
4. Start sending "to read" request when M0 is ON. When M10 (DONE) is ON, it indicates the device has responded and has complete reading. ReadLen (D40) is 4, and the data is stored in DataRead (D50~D51). IO-Link device reads the data and stores it in accordance with the order of high byte and low byte



Object	Identifiers	Device Name	Status	Data Type	Value (16bits)	Value (32bits)	Float	Radix	Comment...
		M1							
		M10							
		M20							
		D30			0	0	0.0000	Signed Decima	
		D40			4	4	0.0000	Signed Decima	
		D50			-26209	1105566111	28.7000	Signed Decima	
		D51			16869	16869	0.0000	Signed Decima	

### Symbol

IOLINKW	
En	
Group	Done
Module	Error
Port	ErrCode
Index	
SubIndex	
DataType	
WriteLen	
DataWrite	

**Group** : Group number

**Module** : Module number

**Port** : Communication port number

**Index** : Index number of the parameter

**SubIndex** : Subindex number of the parameter

**DataType** : Data type

**WriteLen** : The length of the written data

**DataWrite** : Data that is written

**Done** : Communication complete

**Error** : Error flag

**ErrCode** : Error code

API	Instruction			Operand								Description					
1427		IOLINKW		Execute ~ ErrCode								Write the parameter into the IO-Link device					

Device	X	Y	M	S	T	C	HC	D	FR	SM	SR	E	K	16#	"\$"	F
Group								●					○	○		
Module								●					○	○		
Port								●					○	○		
Index								●					○	○		
SubIndex								●					○	○		
DataType								●					○	○		
WriteLen								●					○	○		
DataWrite								●								
Done		●	●	●				●								
Error		●	●	●				●								
ErrCode								●								

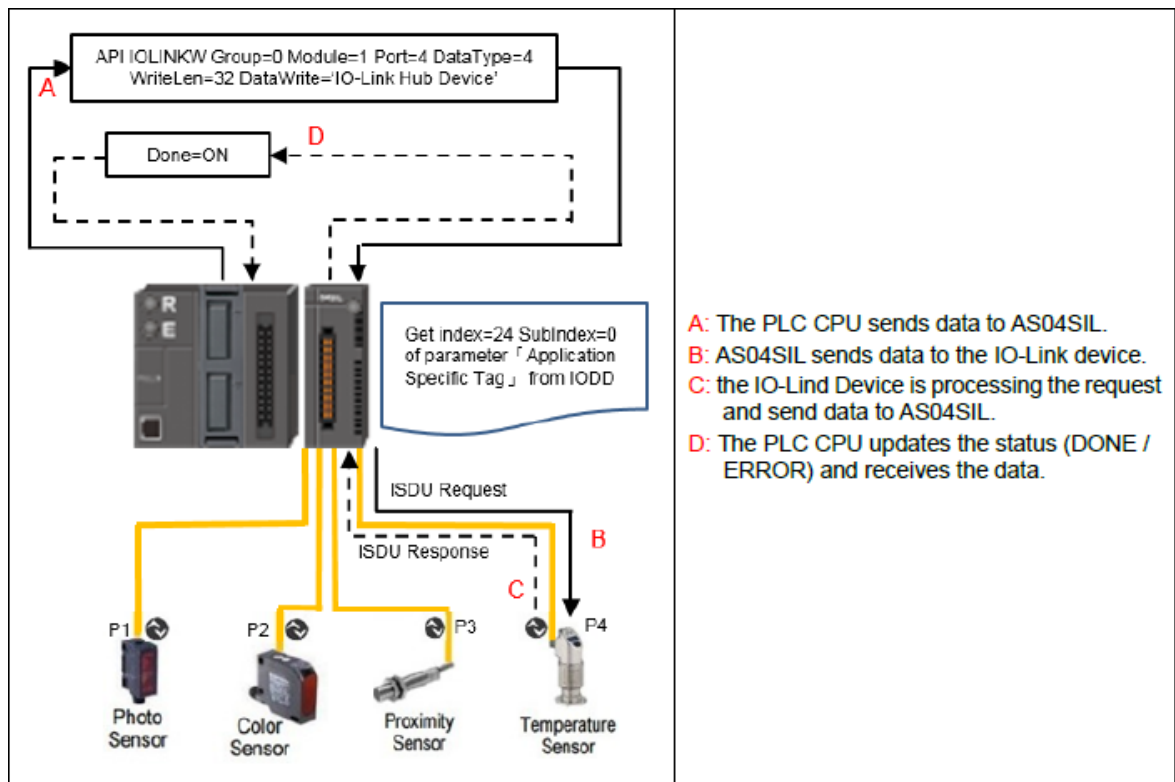
Device	BOOL	WORD	DWORD	LWORD	INT	DINT	LINT	REAL	LREAL	TMR	CNT	STRING
Group		●			●							
Module		●			●							
Port		●			●							
Index		●			●							
SubIndex		●			●							
DataType		●			●							
WriteLen		●			●							
DataWrite		●			●							
Done	●											
Error	●											
ErrCode		●			●							

Pulse Instruction	16-bit instruction	32-bit instruction
-	AS	-

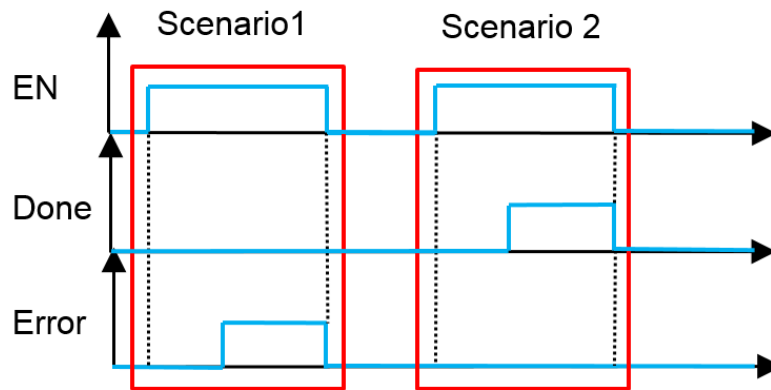
### Explanation

1. This instruction is available for PLC with FW V1.08.50 or later and ISPSOft V3.12 or later.
2. You can refer to the IODD file of the IO-Link device to learn more about the device parameters. You can also use this instruction to write the parameters into the IO-Link device
3. There is no limit on the number of times you execute the instruction but only one instruction (IOLINKR or IOLINKW) can be executed at a time
4. During communication, it takes at least 5 seconds for the IO-Link device to response. Do NOT stop or start another instruction during this time. After the communication with IO-Link is done, it is suggested to use the flags DONE or ERROR to stop or start the instruction
5. Group: The group number of AS04SIL that is connected to the right side of PLC directly or connected to the remote module that acts as PLC, e.g. the first connected module is module

- number 1, the second connected module is number 2. Up to 15 modules can be connected. If the connected module is not AS04SIL, the Error flag switches to ON
6. Module: The module number that is connected to the right side of PLC directly or connected to the remote module that acts as PLC, e.g. the first connected module is module number 1, the second connected module is module number 2. Up to 32 modules can be connected and counted and each type of modules should be included in the count. If the module is not AS04SIL, the Error flag switches to ON
  7. Port: The communication port number, ranging from 1 to 4. If the port number used is not the port for AS04SIL, the Error flag switches to ON
  8. Index is the parameter index number that is intended to write into the IO-Link device
  9. SubIndex is the parameter sub-index number that is intended to write into the IO-Link device. The sub-index number can be set from 0 to 255. If the value exceeds the setting range, the Error flag switches to ON
  10. DataType is the parameter data type of the IO-Link device. You need to set the correct datatype before executing this instruction. Refer to API1426 IOLINKR instruction for more information
  11. DataWrite is the data written into the IO-Link device; unit: byte, arranged by high byte and low byte
  12. WriteLen is the data length of the data to be written into the IO-Link device; unit: byte
  13. Done is a communication complete flag. When this flag is ON, it indicates the parameters have written into the IO-Link device completely
  14. Error is a communication error flag. When this flag is ON, it indicates an error occurs during the communication among the PLC CPU, AS04SIL and the IO-Link device. Refer to the Error Codes from API1426 IOLINKR instruction for troubleshooting
  15. The communication process among the PLC CPU, AS04SIL and IO-Link device:

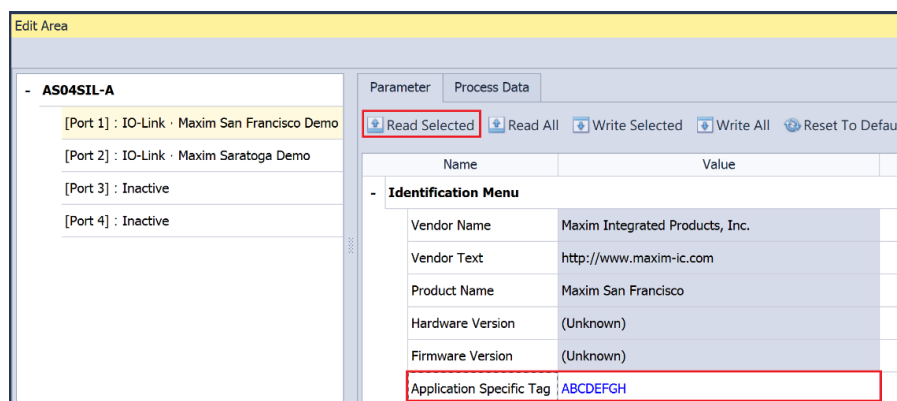


16. Sequences of the EN, Done, and Error flags: when an error occurs during communication (scenario 1) and when the communication is complete (scenario 1)



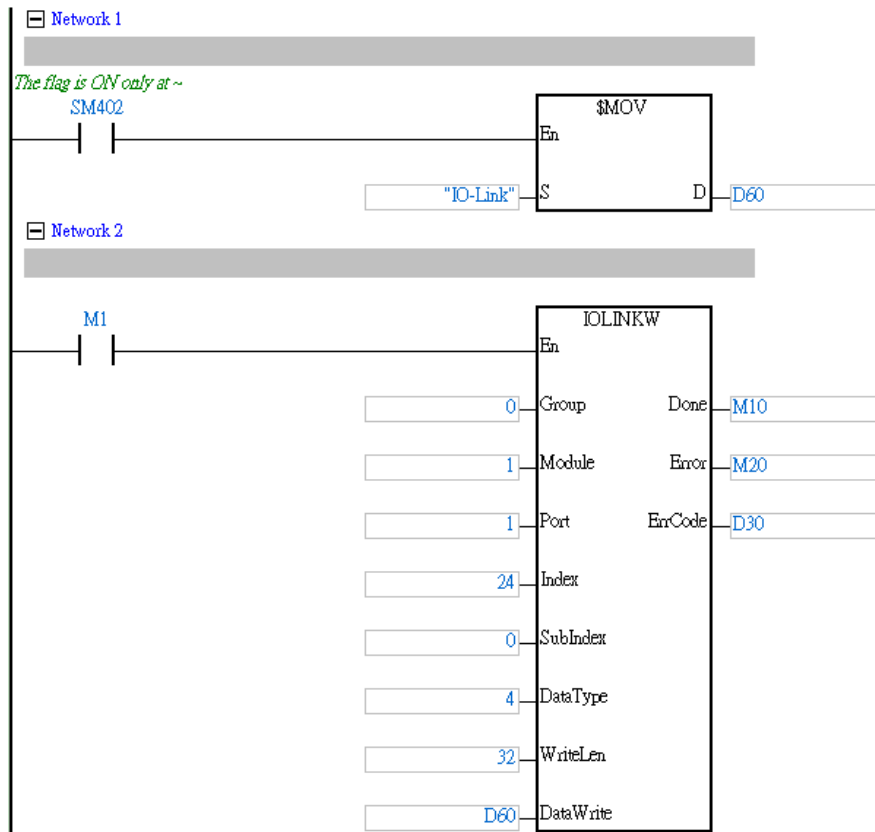
**Example 1: Write the parameter of Application Specific Tag into the first device of the first communication port.**

1. Check HWCONFIG to learn the setting value in Application Specific Tag is "ABCDEFGH"



2. AS04SIL is the first module that installed on the right side of the PLC CPU. The setting value in Group is 0, 1 in Module and 1 in Port
3. We learnt that its index is 24, its Sub-index is 0, and the data type is StringT from its IODD file or the IO-Link device manual. Set the setting values in Index to 24, in Sub-index to 0, in data type to 4 (StringT)
4. Use the instruction \$MOV to write the string "IO-Link" into the data device, starting from D60
5. Start sending "to write" request when M1 is ON. When M10 (DONE) is ON, it indicates the device has received the response and has complete writing. WriteLen is 32, and the data string is saved in DataWrite (D60~D75). IO-Link device writes the data into the data devices in accordance with the order of high byte and low byte





Object	Identifiers	Device Name	Status	Data Type	Value (16bits)	Value (32bits)	Float	Radix	Comment...
		M1							
		M10							
		M20							
		D30			0000	00000000	0.0000	Hexadecimal	
		D60			4F49	4C2D4F49	45432100.0000	Hexadecimal	
		D61			4C2D	6E494C2D	15574644460718199940000	Hexadecimal	
		D62			6E49	006B6E49	0.0000	Hexadecimal	
		D63			006B	0000006B	0.0000	Hexadecimal	
		D64			0000	00000000	0.0000	Hexadecimal	
		D65			0000	00000000	0.0000	Hexadecimal	
		D66			0000	00000000	0.0000	Hexadecimal	
		D67			0000	00000000	0.0000	Hexadecimal	
		D68			0000	00000000	0.0000	Hexadecimal	
		D69			0000	00000000	0.0000	Hexadecimal	
		D70			0000	00000000	0.0000	Hexadecimal	
		D71			0000	00000000	0.0000	Hexadecimal	
		D72			0000	00000000	0.0000	Hexadecimal	
		D73			0000	00000000	0.0000	Hexadecimal	
		D74			0000	00000000	0.0000	Hexadecimal	

6. Check HWCONFIG to learn the setting value in Application Specific Tag is updated to "IO-Link"

Edit Area

- AS04SIL-A

[Port 1] : IO-Link , Maxim San Francisco Demo

[Port 2] : IO-Link , Mojave (MAXREFDES42#)

[Port 3] : Inactive

[Port 4] : Inactive

Parameter Process Data

Read Selected Read All Write Selected Write All Reset To Default

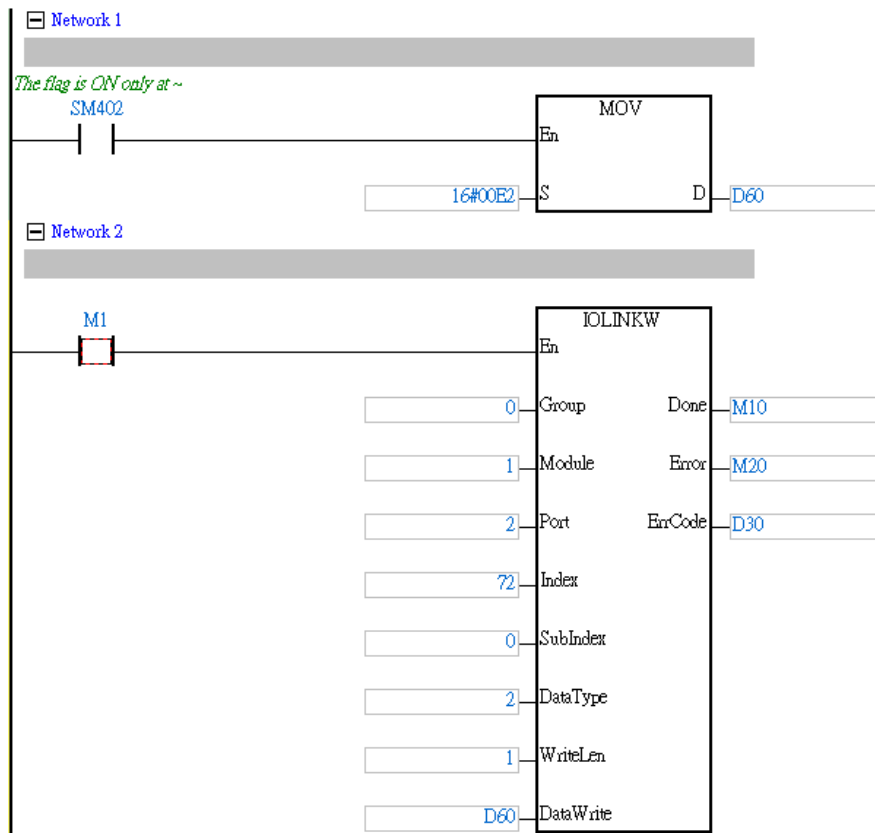
Name	Value	Unit
Firmware Version	1.0	
Application Specific...	IO-Link	

**Example 2: Write the parameter of gain trim green channel into the first device of the second communication port.**

1. Check HWCONFIG to learn the setting value in gain trim green channel is “-63”

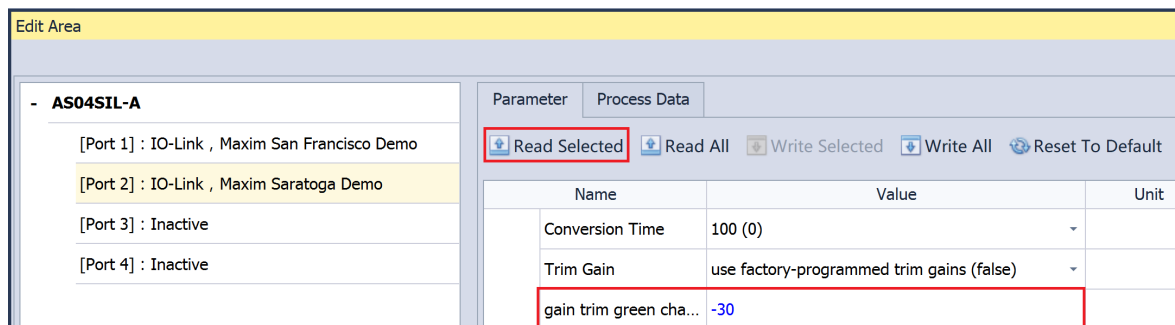
Name	Value	Unit
gain trim green cha...	-63	
gain trim IR channel	-2	

2. AS04SIL is the first module that installed on the right side of the PLC CPU. The setting value in Group is 0, 1 in Module and 2 in Port
3. We learnt that its index is 72, its Sub-index is 0, and the data type is IntegerT from its IODD file or the IO-Link device manual. Set the setting values in Index to 72, in Sub-index to 0, in data type to 2 (IntegerT)
4. Use the instruction \$MOV to write 0xE2 (-30) into the data device, starting from D60
5. Start sending “to write” request when M1 is ON. When M10 (DONE) is ON, it indicates the device has received the response and has complete writing. WriteLen is 1, and the data is saved in DataWrite (D60 Low byte). IO-Link device writes the data into the data devices in accordance with the order of high byte and low byte



Object	Identifiers	Device Name	Status	Data Type	Value (16bits)	Value (32bits)	Float	Radix	Comment...
		M1							
		M10							
		M20							
		D30			0000	00000000	0.0000	Hexadecimal	
		D60			00E2	000000E2	0.0000	Hexadecimal	

- Check HWCONFIG to learn the setting value in gain trim green channel is updated to "-30"



### Attachment B-4 IO Allocation Settings

#### IO Allocation Settings

When selecting "Manual + Flags (only I/O module of CPU module)" in "I/O allocation setting when Power On", use flags SM230-SM261 to activate the 1st – 32nd module on the right-side of the CPU module. (available for FW V1.06.00 or later).

When selecting "Manual + Flags (I/O module of CPU & Remote module)", use flags SM230-SM261 to activate the 1st – 32nd module on the right-side of the CPU module remotely (available for FW V1.08.50 or later and ISPSOFT V3.12 or later supports this function.)

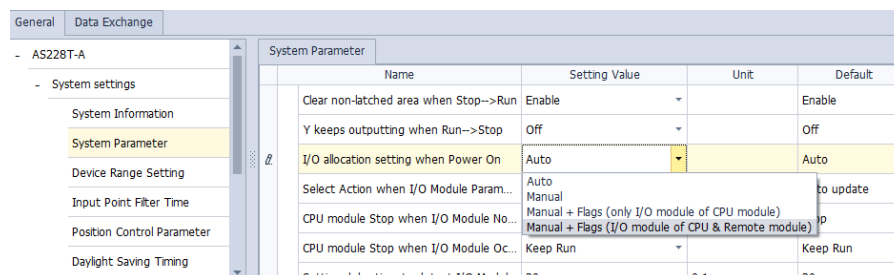
For less module applications, you can use the same PLC program and download the I/O allocation table once for various I/O applications. Two things to be noted when applying this mode:

- You need to use a bigger I/O allocation planning beforehand and store this planning in AS series PLC.
- You can simply use special flags to mark which I/O module will NOT be used to meet the actual I/O module placement. But you cannot rearrange the original order of the module placement.

Add a new selection "Manual + Flags" for the setting option "I/O module allocation setting when Power ON". Select this option, you need to use it with flags SM230-SM261. For less module applications, you can simply use special flags to mark which I/O module will NOT be used to meet the actual I/O module placement. In this mode, you can use the same PLC program and download the I/O allocation table once for various I/O applications.

#### Example:

Step 1: Select "Manual + Flags (I/O module of CPU & Remote module)" for the setting option "I/O module allocation setting when Power ON" in HWCONFIG.



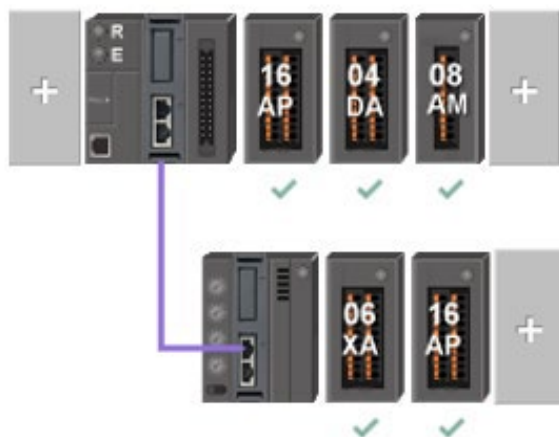
Step 2: Create an entire module allocation and download the I/O allocation table to HWCONFIG.

Step 3: When 16AP, 04DA, 08AM (right-side module) and 16AP as well as 06X6 (remote module) are not needed in the application, you can set the flags SM231 (indicating 16AP), SM233 (indicating 04DA),

SM235 (including 08AM), SM237 (indicating remote 16AP) and SM239 (indicating remote 06X6) to OFF to meet the actual I/O module placement. You do not need to change their order number in the PLC program. After turn the power off and then power-on again, the actual placement is as below. The IO number in the PLC program does NOT need to be changed.



Actual I/O Module Placement



The order numbers, the model names and their corresponding device numbers in the complete I/O allocation list.

Right-side modules:

Order Number	0	1	2	3	4	5	6	7
Model	AS332	16AP	16AP	04AD	04AD	06XA	08AM	08AN
Corresponding device starts from		X1.0 / Y1.0	X2.0 / Y2.0	D28040	D28060	D28080	X3.0	Y3.0

Remote modules:

Order Number	0	1	2	3	4	7
Model	SCM	16AP	06XA	06XA	16AP	08AN
Corresponding device starts from	D29000	X4.0 / Y4.0	D29040	D29060	X5.0 / Y5.0	Y3.0

The order number and the corresponding device numbers stay the same.

Right-side modules:

Order Number	0	1	3	5	7
Model	AS332	16AP	04AD	06XA	08AN
Corresponding device starts from		X1.0 / Y1.0	D28040	D28080	Y3.0

Remote modules:

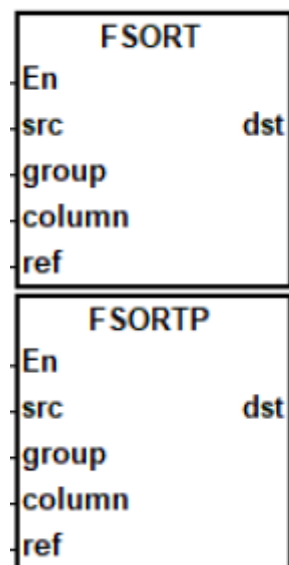
Order Number	0	2	4
Model	SCM	06XA	16AP
Corresponding device starts from	D29000	D29040	X5.0 / Y5.0

Note: The order number rule also applies when you use the FROM/TO or other module-related instructions.

## Attachment B-6 FSORT

API	Instruction code			Operand							Function						
1229	F	SORT	P	src ~ ref							Sorting data in floating-point format						
Device	X	Y	M	S	T	C	HC	D	FR	SM	SR	E	K	16#	"\$"	F	
src								●									
group								●					○	○			
column								●					○	○			
ref								●					○	○			
dst								●									
Data type	BOOL	WORD	DWORD	LWORD	UINT	INT	DINT	LINT	REAL	LREAL	TMR	CNT	STRING				
src									●								
group			●				●										
column			●				●										
ref			●				●										
dst									●								
						Pulse instruction		16-bit instruction				32-bit instruction					
						AS		AS				AS					

## Symbol



**src** : First device where the original data is stored

**group** : Number of rows of data

**column** : Number of columns of data

**dst** : First device where the sorted data is stored

**ref** : Reference value for sorting the data

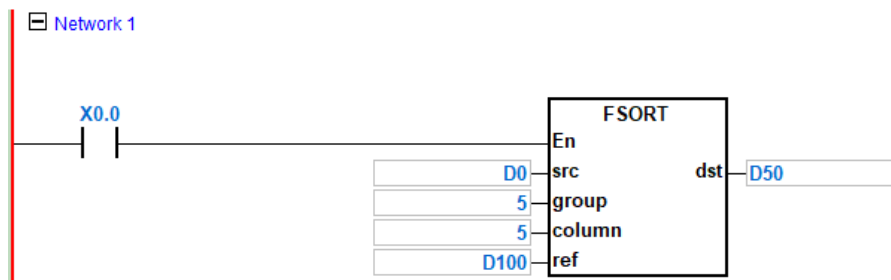
## Explanation

1. This instruction stores the data to be sorted in the group×column×2 registers starting from the register specified by dst. If src and dst specify the same register, the sorted data is the same as the original data in the register specified by src
2. The operand group must be between 1–32. The operand column must be between 1–6. The operand ref must be between 1– column
3. When SM604 is OFF, the instruction sorts the data in ascending order. When SM604 is ON, the instruction sorts the data in descending order

- It is suggested that you use the pulse type instruction, FSORTP, instead of sorting repeatedly

### Example

- Suppose SM604 is OFF. When X0.0 switches from OFF to ON, the instruction sorts the data in ascending order



- The data which to be sorted is as in the following table

		Number of columns of data column x 2				
		columns of data				
<div>Column Row</div>		1	2	3	4	5
		Student number	Chinese	English	Math	Physics
Number of rows of data : group x 2	↑ 1	(D0,D1) 1.0	(D10,D11) 90.0	(D20,D21) 75.0	(D30,D31) 66.0	(D40,D41) 79.0
	2	(D2,D3) 2.0	(D12,D13) 55.0	(D22,D23) 65.0	(D32,D33) 54.0	(D42,D43) 63.0
	3	(D4,D4) 3.0	(D14,D15) 80.0	(D24,D25) 98.0	(D34,D35) 89.0	(D44,D45) 90.0
	4	(D6,D7) 4.0	(D16,D17) 70.0	(D26,D27) 60.0	(D36,D37) 99.0	(D46,D47) 50.0
	↓ 5	(D8,D9) 5.0	(D18,D19) 95.0	(D28,D29) 79.0	(D38,D39) 75.0	(D48,D49) 69.0

3. When the value in D100 is 3, the data is sorted as in the following table

		Number of columns of data column x 2				
		columns of data				
Row	Column	1	2	3	4	5
	Student number	Chinese	English	Math	Physics	
Number of rows of data : group x 2	1	(D50,D51) 4.0	(D60,D61) 70.0	(D70,D71) 60.0	(D80,D81) 99.0	(D90,D91) 50.0
	2	(D52,D53) 2.0	(D62,D63) 55.0	(D72,D73) 65.0	(D82,D83) 54.0	(D92,D93) 63.0
	3	(D54,D55) 1.0	(D64,D65) 90.0	(D74,D75) 75.0	(D84,D85) 66.0	(D94,D95) 79.0
	4	(D56,D57) 5.0	(D66,D67) 95.0	(D76,D77) 79.0	(D86,D87) 75.0	(D96,D97) 69.0
	5	(D58,D59) 3.0	(D68,D69) 80.0	(D78,D79) 98.0	(D88,D89) 89.0	(D98,D99) 90.0

4. When the value in D100 is 5, the data is as in the following table

		Number of columns of data column x 2				
		columns of data				
Row	Column	1	2	3	4	5
	Student number	Chinese	English	Math	Physics	
Number of rows of data : group x 2	1	(D50,D51) 4.0	(D60,D61) 70.0	(D70,D71) 60.0	(D80,D81) 99.0	(D90,D91) 50.0
	2	(D52,D53) 2.0	(D62,D63) 55.0	(D72,D73) 65.0	(D82,D83) 54.0	(D92,D93) 63.0
	3	(D54,D55) 5.0	(D64,D65) 95.0	(D74,D75) 79.0	(D84,D85) 75.0	(D94,D95) 69.0
	4	(D56,D57) 1.0	(D66,D67) 90.0	(D76,D77) 75.0	(D86,D87) 66.0	(D96,D97) 79.0
	5	(D58,D59) 3.0	(D68,D69) 80.0	(D78,D79) 98.0	(D88,D89) 89.0	(D98,D99) 90.0

### Additional Remarks

1. If value in the the device exceeds the range, the instruction is NOT executed, SM0 is ON, and the error code in SR0 is 16#2003
2. If the value in **group**, **column**, or **ref** exceeds the range, the instruction is NOT executed, SM0 is ON, and the error code in SR0 is 16#200B
3. If the value in **src** exceeds the range of a floating-point value, the instruction is NOT executed, SM0 is ON, and the error code in SR0 is 16#2013



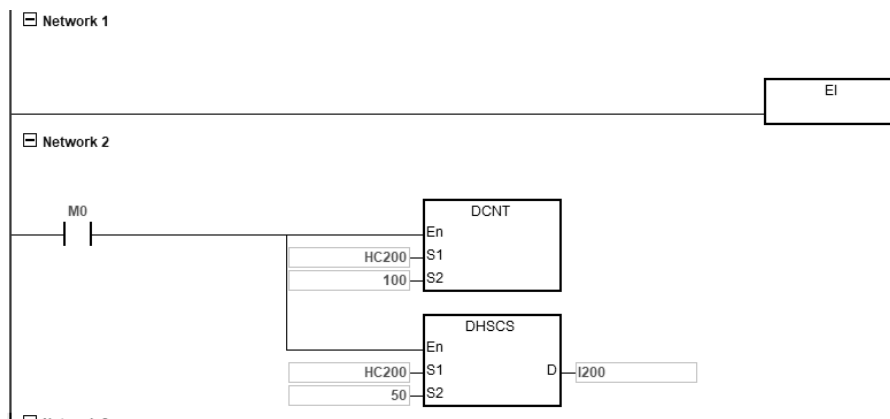
### Attachment B-11 DPLSY

#### Execute DPLSY in interrupts

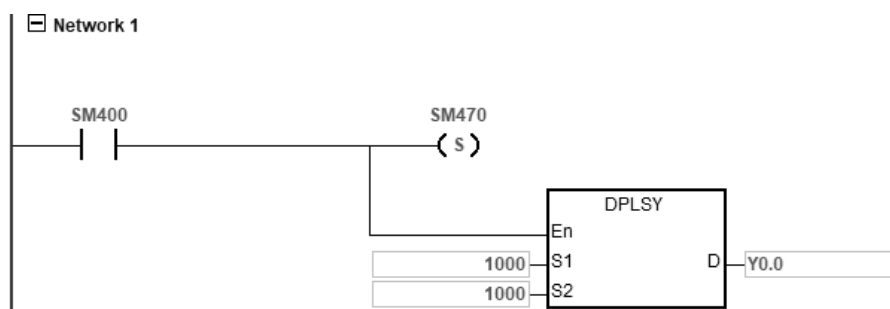
Use DPLSY in high-speed comparison interrupt (I2xx), available for FW V1.08.70 or later.

#### Example of the PLC program:

- Start the instructions of high speed counter (DCNT) and high speed comparison (DHSCS) in the program cycle



- Write an instruction DPLSY in the high-speed comparison interrupt I200



Note: Auto-reset the control when outputting 1000 pulses at 1kHz frequency from Y0.0. are complete.

- The procedure**

There are four procedures A-D, when the input counted value changes 49 -> 50 to output the pulses through Y0.0

A. The input counted value changes from 49 to 50

**B. The high-speed comparison interrupt is triggered. The PLC program is interrupted and the high-speed comparison interrupt is executed**

C. Execute instruction DPLSY that is written in the high-speed comparison interrupt

D. Pulses are put out from Y0.0

Since the interrupt is affected by the time it is triggered and by the PLC on-going executions, such as IO points refreshing, communication implementing and so forth, the time when the pulses to be outputted can be greatly delayed.

To improve the execution time, new SM flags are added.

- SM120-SM151: To pre-store the parameters for DPLSY to output**

Set the SM in this category to ON to save the DPLSY to-be-outputted parameters, including output point number, target frequency and number of pulses to the PLC flash memory. When the high-speed comparison interrupt is triggered and any of the SM360-391 is set to ON, the output can be started right away. Once any of SM120-151 is used, it is set to OFF. You need to set it to ON before using it again.

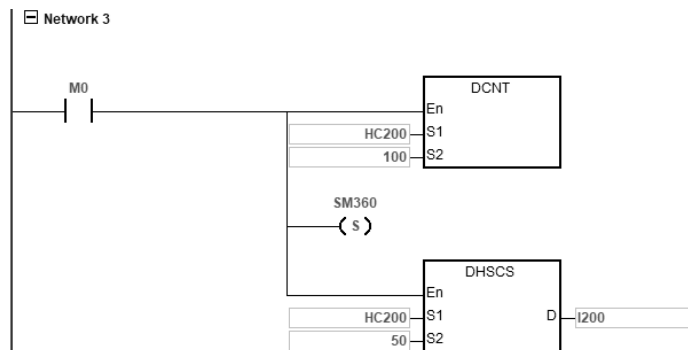
- SM360-SM391: To enable triggering DPLSY in the interrupt to output pulses**

When the high-speed comparison interrupt is triggered and any of the SM360-391 is set to ON, the output can be started right away to output any of the SM120-151 stored DPLSY parameters. Auto-reset the control, after the output is complete.

The corresponding numbers of high-speed comparison interrupt to the newly added SMs are listed below.

Number of the high-speed comparison interrupt	To pre-store the parameters for DPLSY to output	To enable triggering DPLSY in the interrupt to output pulses
I200	SM120	SM360
I201	SM121	SM361
I202	SM122	SM362
I203	SM123	SM363
I210	SM124	SM364
I211	SM125	SM365
I212	SM126	SM366
I213	SM127	SM367
I220	SM128	SM368
I221	SM129	SM369
I222	SM130	SM370
I223	SM131	SM371
I230	SM132	SM372
I231	SM133	SM373
I232	SM134	SM374
I233	SM135	SM375
I240	SM136	SM376
I241	SM137	SM377
I242	SM138	SM378
I243	SM139	SM379
I250	SM140	SM380
I251	SM141	SM381
I252	SM142	SM382
I253	SM143	SM383
I260	SM144	SM384
I261	SM145	SM385
I262	SM146	SM386
I263	SM147	SM387
I264	SM148	SM388
I265	SM149	SM389
I266	SM150	SM390
I267	SM151	SM390

Use the above-mentioned new SM in the PLC program.



### Explanation

Set M0 to ON to trigger SM120 to ON to save the DPLSY to-be-outputted parameters (outputting 1000 pulses at 1kHz frequency) to the PLC flash memory.

Start HC200 high-speed counter and set SM360 to ON. When the counted value in S2 reached 50, the high-speed comparison interrupt I200 is triggered. The moment when the interrupt is triggered, Y0.0 starts to output 1000 pulses at 1kHz frequency.

- The high-speed comparison interrupt I200



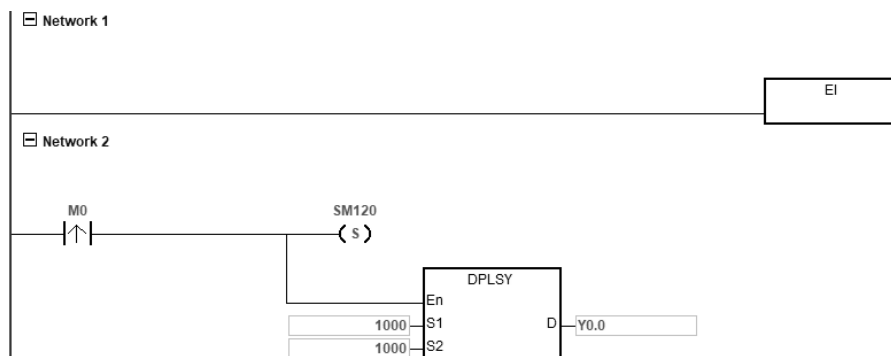
Since the execution of high-speed output has been completed in POU, there is no need to write any program in the interrupt.

### Attachment C-6 Backlash compensation for CSFO

#### Backlash Compensation

Use backlash compensation in CSFO (available for FW V1.08.30 or later)

PLC uses the propositional conversion formula to converse the frequency and pulse numbers for inputs into what are suitable for outputs. From input to output, this process not only takes time and it may also cause backlash issues. When the number of pulses run through the input goes larger, so does the backlash.



To precise operation, use the following SM/SR to compensate for backlashes caused by a longtime CSFO operation.

Output axis designated by CSFO	Flag to activate the backlash compensation	Increase the frequency to compensate backlashes (Hz)
Y0.0 / Y0.1	SM1700	SR1700
Y0.2 / Y0.3	SM1701	SR1702
Y0.4 / Y0.5	SM1702	SR1704
Y0.6 / Y0.7	SM1703	SR1706
Y0.8 / Y0.9	SM1704	SR1708
Y0.10 / Y0.11	SM1705	SR1710

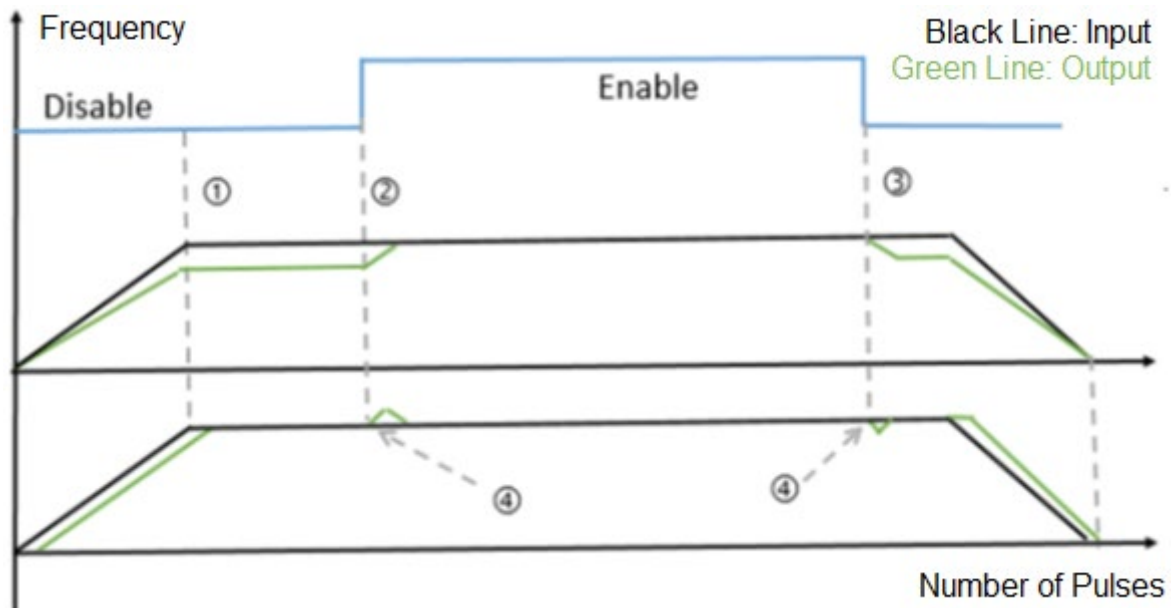
- **SM1700~1705: Flag to activate the backlash compensation ON:** To increase the actual output frequency and the number of output pulses to close the distance between the position of input and output. The compensation stops automatically once the positions of input and output are the same. You can also set this flag to OFF, if the positions of input and output do not need to be the same.

**OFF:** To decrease the actual output frequency and the number of output pulses to stop compensating till the output falls behind to its original delayed position.

**NOTE:** Be sure to close the flag to deactivate the compensation before stopping the execution of CSFO. If not, you may find the compensated output is still running even after the execution of CSFO has stopped.

- **SR1700~1710: Increase the frequency to compensate backlashes**  
You can define the frequency, ranging from 50 Hz~10 KHz (unit: 50 Hz) for the compensation of the backlashes. At first, it is recommended to try a lower frequency. Otherwise, sudden and quick movements may have an impact on the mechanism operation. The compensation stops automatically once the positions of input and output are the same. The frequency unit is 50 Hz; thus, if using 80 Hz, it will be seen as 50 Hz and 120Hz will be treated as 100 Hz.

The illustration of using backlash compensation in CSFO.



The ratio of the number of input and output pulses is 1:1. The timings are shown as ①, ②, ③, ④. See the explanations below

- ① Since the number of pulse runs through input is large and the input frequency is fast, the output cannot catch up with it, the distance between input and output grows bigger and bigger. The backlash compensation has not started yet
- ② Enable the flag to activate the backlash compensation. Increase the number of output pulses according to the frequency of input and compensation until the positions of input and output are the same
- ③ Disable the flag to deactivate the backlash compensation. Decrease the actual output frequency and number of output pulses to stop compensating until the output falls behind to its original delayed position
- ④ When the flag to activate the backlash compensation is enabled or disable, the PLC calculates and to increase or decrease the output frequency to enhance the smoothness of the compensation

The example here shows if the current output frequency is 1 KHz and the compensated frequency is 100 Hz, the actual output frequency should be around 1.1 KHz.

### Corrections

All the issues below can be fixed by upgrading firmware to V 1.10.00 or above (no tools are required). Contact the technical service of your sales agent for a firmware upgrade for AS series.

No.	Functions / Instructions	Description
1	CANopen DS301	It is possible for the slaves to loose communication, if reading/writing data from the connected SD card during CANopen communication.
2	SD Card	It is possible for the PLC to crash if reading/writing data from a broken SD card.
3	DCCMR (API 2716)	When the value of the X-coordinate is 0 and the value of the Y-coordinate is less than 0, it is possible that drawing a

		circle in the clockwise direction can go wrong from time to time.
4	HWCONFIG	<ul style="list-style-type: none"> <li>The firmware version of the function card 1 in AS300 Series PLC CPU is not shown completely in HWCONFIG online mode.</li> <li>The firmware version of AS00SCM is not shown completely in HWCONFIG online mode.</li> </ul>
5	PLSR (API 2701)	When setting the number of output pulses to unlimited, if you start executing the instruction PLSR and then stop it immediately, it is possible that the output still continues even after the instruction execution has been stopped.
6	Data Exchange through COM Port	When there is a strong interference to communication in RTU mode, the connection might be lost.
7	DDRV (API 2706) DDRVA (API 2707)	While executing the instructions to output, if changing the target position in the ramp-up zone, it is possible that the output direction may be incorrect.
8	DMPID (API 1417)	When setting MOUT_AUTO=TRUE, the value in MOUT does NOT change along with the parameter MV.
9	ZRNM (API 2810)	Use multiple ZRNM instructions in SFC programming, but only one ZRNM instruction will be executed.
10	Ethernet Communication	<ul style="list-style-type: none"> <li>The number of connected Client does NOT show in SR1012 during Modbus TCP communication.</li> <li>Solved the possible failure of network communication caused by broadcast storm attacks</li> </ul>
11	DPIDE (API 0708)	When using the constant values in decimal or hexadecimal format in the field of cycle parameter and using Auto Tuning at the same time, after auto tuning is complete, PLC will be in the state of STOP.
12	DPLSVC (API 2805)	While editing and updating in online mode, it is possible that the instruction execution cannot proceed.
13	JOG (API 2703) DDRV (API 2706) DDRVA (API 2707) DDRVM (API 2709)	It is possible that even after these instructions are closed, the output directions are not cleared as they should be.
14	DCNT (API 1004)	If using the software counter function in DCNT, along with any of the instructions DZRN, DZRN2, PWD, PPDT, or XCMP, or using the interrupt in X point, it is possible that after closing the mentioned instruction, the software counter function in DCNT will be closed as well.
15	PLC Project Download	When AS Series PLC CPU (FW V1.08.20) uses ISPSOFT (V3.12) to download, an error code C212(8101) will appear.

### 2.15 UPDATE – DVP01PU-H2 Firmware Upgraded to Version 5.48

#### Corrections

1. Deleted the error code 0x23
2. Fixed an issue that if a MPG is triggered to move in both positive and negative directions, the movement cannot be stopped
3. Fixed an issue that no value can be written in CR49
4. Fixed the issues that the velocity cannot be changed during JOG and JOG cannot be stopped
5. Improved the refreshing rate in CR43
6. Fixed an issue that when sending/receiving data through RS485, an communication error will occur
7. Fixed an issue that during homing, if the axis changes its direction after it reached the positive/negative limit, the pulse outputting will not be accurate
8. Fixed an issue that during homing, even if the axis has reached the positive/negative limit, it cannot be stopped
9. Fixed an issue that after the module reset to its default settings, the flag to record the homing state is NOT restored to the default value OFF
10. Fixed an issue that if JOG is triggered to move in both positive and negative directions, the motor drive cannot be stopped
11. Fixed an issue that after setting up the communication parameters through RS485, the received communication code is unreadable



### 2.16 UPDATE – DVP01PU-S Firmware Upgraded to Version 5.48

#### Corrections

1. Hardware-related updates:
  - a. Since the old IC used in the module had stopped production, changed to a new IC and upgraded the hardware and firmware of DVP01PU-S accordingly. Note: the old and new versions of hardware and firmware are not interchangeable
2. Firmware-related updates:
  - a. Fixed an issue that while using a MPG, the pulse output may not be able to stop occasionally
  - b. Fixed an issue that when PLC reads its right-side module, DVP01PU-S replied with wrong firmware version
  - c. Fixed an issue that changing velocity will lead to a non-stop movement
  - d. When the axis reaches the positive/negative limit while using a MPG, JOG instruction can be used to have the axis leave the positive/negative limit
  - e. Fixed an issue that after setting up the communication parameters through RS485, the received communication code is unreadable
  - f. Fixed an issue that if the value 65536 is written in CR44 (accumulated pulse input number of MPG), the value will NOT show 65536 when reading it back
  - g. Before enabling the MPG function, the value in CR44 (accumulated pulse input number of MPG) can be edited



### 2.17 UPDATE – DVP04AD-S2, DVP04DA-S2, DVP06XA-S2 Firmware Upgraded to Version 4.18

#### Issue

If any DIO point extension module of the DVP-S series, such as DVP08SM11N, DVP06SN11R, DVP08SP11R /T, DVP32SM11N, DVP32SN11TN, is installed right after the analog extension module, including DVP04AD-S2, DVP04DA-S2, DVP06XA-S2 which is installed as the first extension module on the right-side of the DVP CPU, chances are the DIO point extension module can NOT be detected.

#### Solutions

1. Install the DIO extension module as the first extension on the right side of the DVP-DPU (recommended!)
2. Use CPUs with the following firmware versions or later versions, and then you can install analog extension module as the first extension module on the right side of the CPU
3. When the above solution are not possible, contact Delta technical support team or the distributors for a firmware upgrade for the analog extension modules



### 2.18 UPDATE – DVP06AD-S Firmware Upgraded to Version 4.16

#### Corrections

1. Fixed an issue that the error status value "incorrect average times setting" in CR#30 cannot be cleared






### 2.19 UPDATE – VFD-ED-S Certificate EN81 Renewed

Liftinstituut renewed the EN81 certificate for our VFD-ED-S lift drive. The new certificate is valid until June 11<sup>th</sup>, 2026.





**liftinstituut**  
SINCE 1933

## TYPE EXAMINATION CERTIFICATE FOR LIFTCOMPONENTS

Issued by Liftinstituut B.V.

Certificate no.	: NL 16-400-1002-210-01	Revision no.:	1
Description of the product	: Lift drive with Safe Torque Off (STO) combined with single contactor operation and brake monitoring functionality		
Trademark	: Delta		
Type no.	: VFD-ED-S		
Name and address of the manufacturer	: Delta Electronics Netherlands BV Automotive Campus 260 5708 JZ Helmond The Netherlands		
Name and address of the certificate holder	: Delta Electronics Netherlands BV Automotive Campus 260 5708 JZ Helmond The Netherlands		
Certificate issued on the following requirements	: Lifts Directive 2014/33/EU		
Certificate based on the following standard	: Parts of EN 81-20:2020		
Test laboratory	: None		
Date and number of the laboratory report	: None		
Date of type examination	: 21-06-2016; June 2021		
Additional document with this certificate	: Report belonging to the type examination certificate no.: NL 16-400-1 002-210-01 rev.1		
Additional remarks	: - This revision replaces certificate NL 16-400-1002-210-01 Rev.- of 21-06-2016. : - See belonging report.		
Conclusion	: The lift component meets the requirements referred to in this certificate taking into account any additional remarks mentioned above.		


Amsterdam

Date : 11-06-2021

Valid until : 11-06-2026



ing A.J. van Ommen  
International Business  
Manager



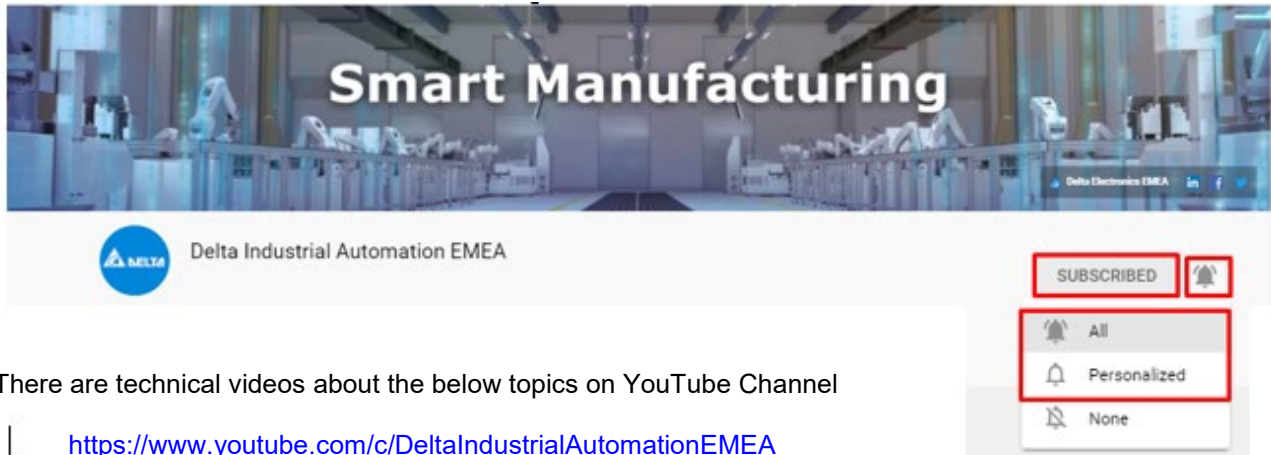
Certification decision by

- Liftinstituut B.V. - Bulkslootermeeplein 381 - P.O. Box 36027 - 1020 MA Amsterdam Netherlands - [www.liftinstituut.com](http://www.liftinstituut.com) -  
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F23-02-22-v22.0

### 3 Application

#### 3.1 NEW – More technical videos are available on YouTube Channel



There are technical videos about the below topics on YouTube Channel

<https://www.youtube.com/c/DeltaIndustrialAutomationEMEA>

Subscribe and enable notification in order to get notifications on all our new videos.

1. **AX308-E Series Tutorial 1 – Useful Hotkeys for Programming**  
This video shows how to achieve programming results faster with hotkeys.  
<https://www.youtube.com/watch?v=PGnUvJQEqUU>
2. **AX308-E Series Tutorial 2 – How to Create the Counter Function**  
This video shows you how to connect an incremental encoder to the controller and set it up.  
<https://www.youtube.com/watch?v=uFeNZQIltsU>
3. **AX308-E Series Tutorial 3 – Calculating Pulse Bandwidth**  
In this video, you can see how to setup servo control through high-speed pulses.  
<https://www.youtube.com/watch?v=X8U2vIlyauk>  
  
**AX308-E Series Tutorial 4 – The AS Series I/O Module Settings with AX-3 CPU**  
In this video, you can see how to setup I/Os for symbolic programming.  
<https://www.youtube.com/watch?v=S3ar-8E3e34>
4. **DIADesigner-AX – How to Create E-Cam**  
This video shows how to use E-cam in motion control.  
<https://www.youtube.com/watch?v=2WhkKpnkah4>
5. **DIADesigner-AX – How to Create Motion Axis via EtherCAT**  
In this video, you can see how to setup a motion axis in an EtherCAT system.  
[https://www.youtube.com/watch?v=8GHjo1o\\_zt8](https://www.youtube.com/watch?v=8GHjo1o_zt8)
6. **AX-3 Ethernet/IP Communication**  
This video shows how to set up Ethernet/IP communication.  
<https://www.youtube.com/watch?v=xXBY3moTVGM>
7. **Machine Vision System DMV3000G – Paper Cup Inspection**  
This video shows how to use the pre-configured items for paper cup inspection.  
<https://www.youtube.com/watch?v=dubK-kTkbrQ>
8. **Machine Vision System DMV3000G – Label Inspection**  
This video shows how to implement label inspection with.  
<https://www.youtube.com/watch?v=9swgssLdyAs>

### 4 FAQ

#### 4.1 AC Motor Drives

##### Variable Frequency Drives with integrated STO function, e.g. M300 or C2000 series

**Q** How to avoid the need for double reset, when using a safety relay or safety controller?

**A** Safety regulations require that after a safety stop, the user needs to confirm the safe operation of the drive before a restart is possible.

*If you connect a safety sensor, e.g. an emergency stop pushbutton directly to the STO inputs of the drive, it is required to acknowledge this by a reset on the drive. That is the factory default setting.*

*However, oftentimes the emergency stop button connects to a safety relay or safety controller, and safe outputs from that relay or controller connect to the STO inputs of the drive. In that case, the safety relay or controller already requires a reset, and a second reset on the drive is unnecessary.*

*Drive parameter 06-44 provides the user with a choice.*

*06-44 = 0 "STO latch" means, the drive needs a reset to enable restart.*

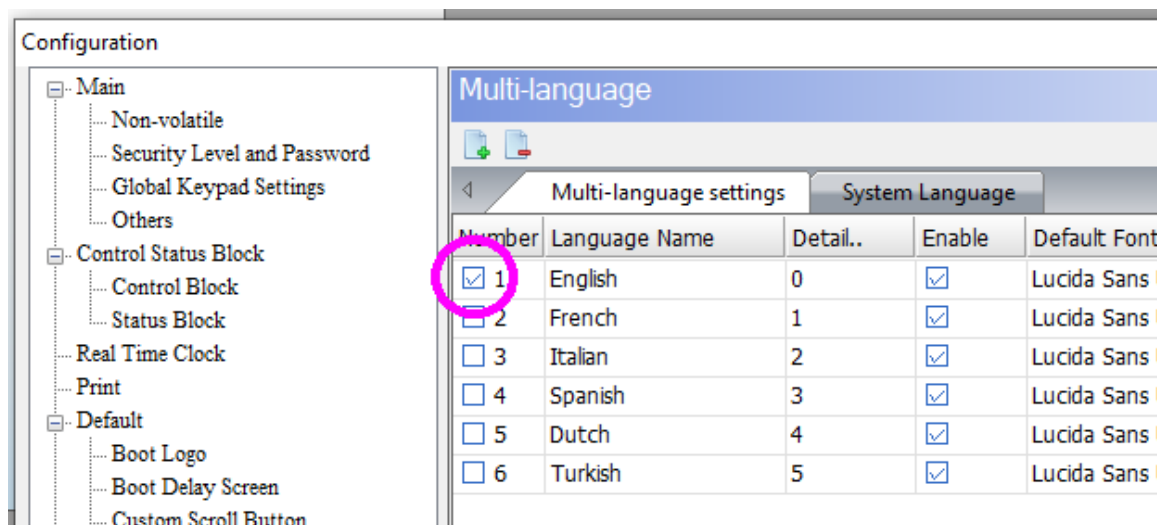
*06-44 = 1 "STO no latch" means, the reset takes place on the safety relay, and the drive can restart immediately after the STO inputs are active again.*

#### 4.2 HMI

##### DOP-W and DOP-100 Series

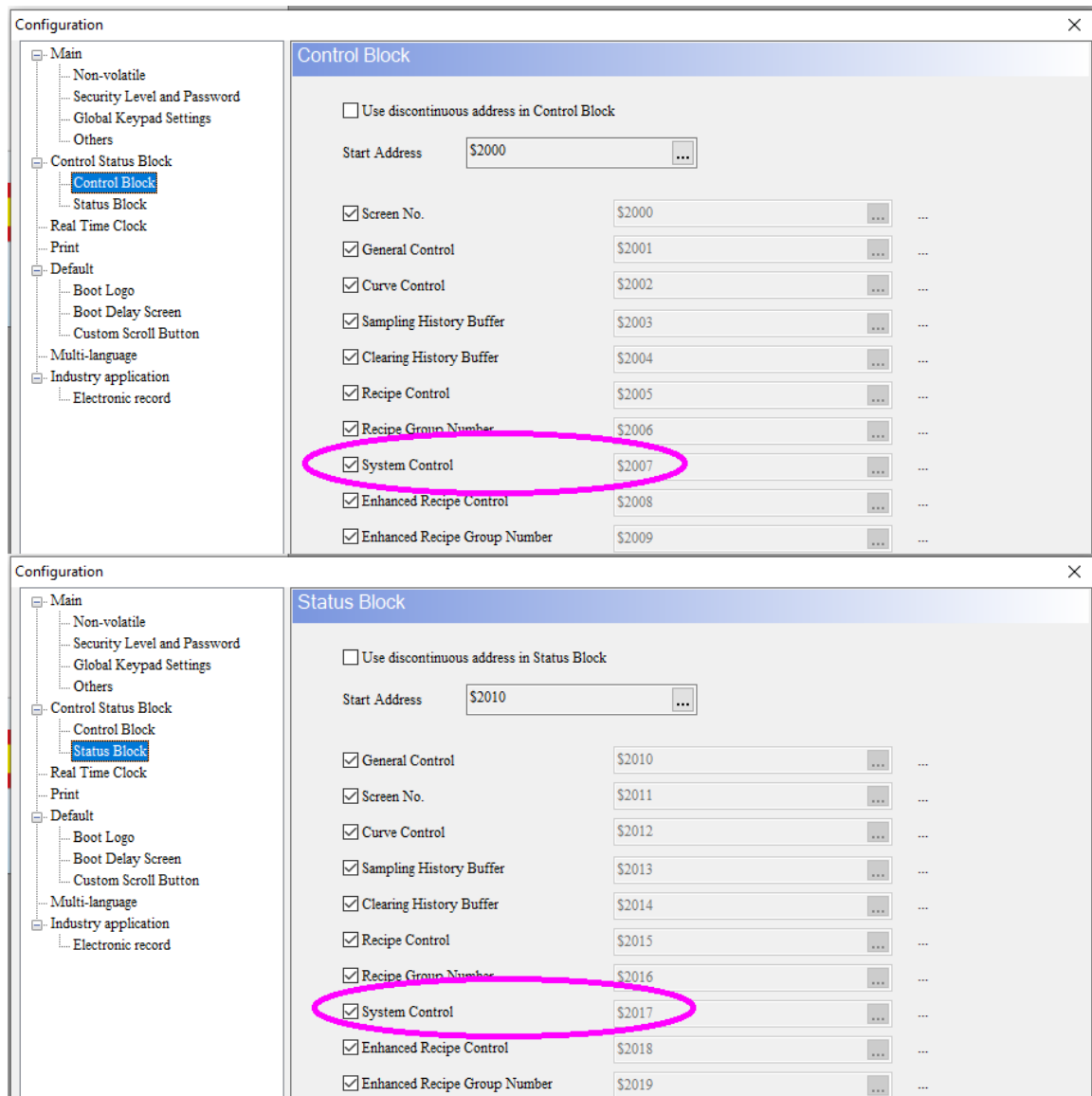
**Q** How to maintain the last active display language after power cycling?

**A** DOPSoft2, DOPSoft4 and DIAScreen make the user select a preferred language. That language will be the standard language when powering up the HMI.



*This is not always convenient, because users in a country with a different language will need to change the language every time they start the HMI up.*

To overcome this restriction, check System Control, both in the Control and Status Block.



**Control Block Configuration**

Use discontinuous address in Control Block: ☐

Start Address: \$2000

Option	Address	Value
<input checked="" type="checkbox"/> Screen No.	\$2000	...
<input checked="" type="checkbox"/> General Control	\$2001	...
<input checked="" type="checkbox"/> Curve Control	\$2002	...
<input checked="" type="checkbox"/> Sampling History Buffer	\$2003	...
<input checked="" type="checkbox"/> Clearing History Buffer	\$2004	...
<input checked="" type="checkbox"/> Recipe Control	\$2005	...
<input checked="" type="checkbox"/> Recipe Group Number	\$2006	...
<input checked="" type="checkbox"/> <b>System Control</b>	\$2007	...
<input checked="" type="checkbox"/> Enhanced Recipe Control	\$2008	...
<input checked="" type="checkbox"/> Enhanced Recipe Group Number	\$2009	...

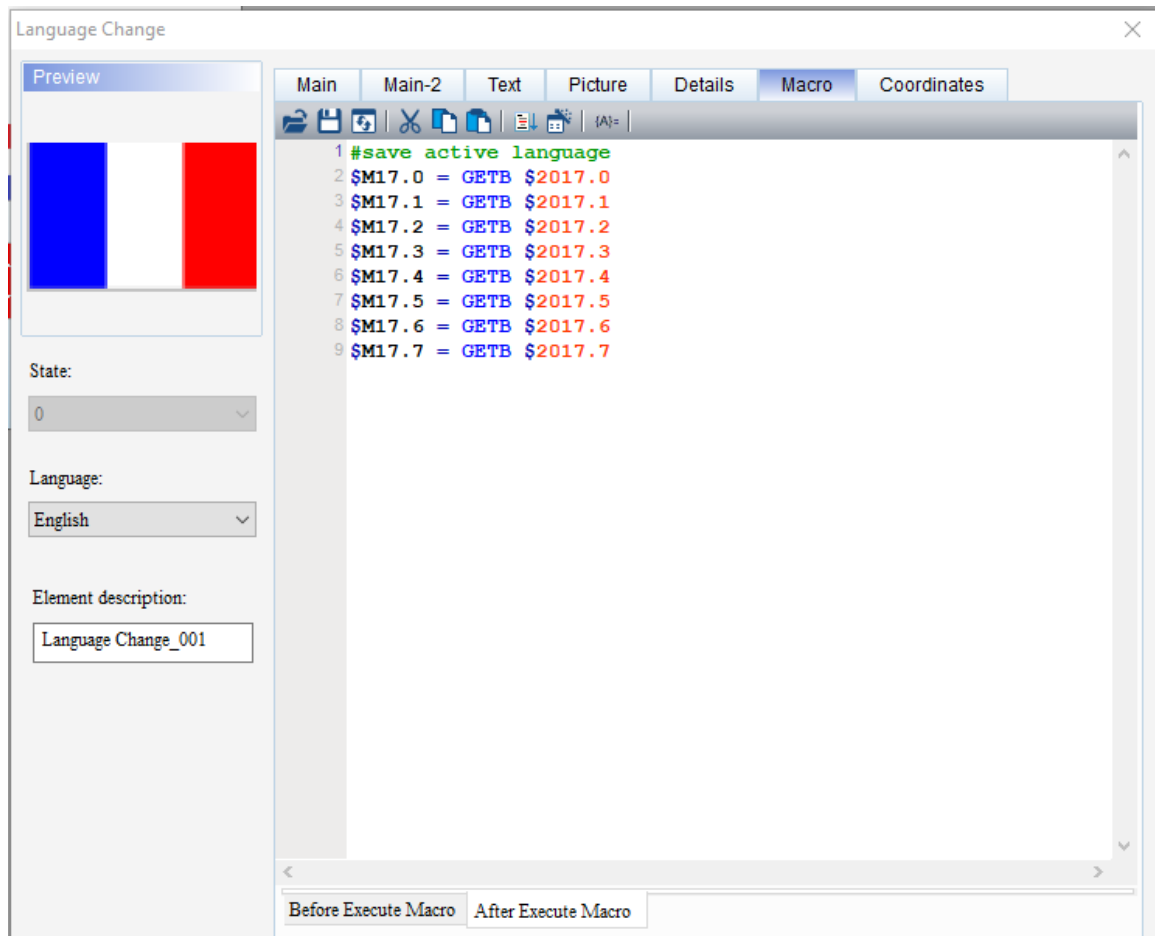
**Status Block Configuration**

Use discontinuous address in Status Block: ☐

Start Address: \$2010

Option	Address	Value
<input checked="" type="checkbox"/> General Control	\$2010	...
<input checked="" type="checkbox"/> Screen No.	\$2011	...
<input checked="" type="checkbox"/> Curve Control	\$2012	...
<input checked="" type="checkbox"/> Sampling History Buffer	\$2013	...
<input checked="" type="checkbox"/> Clearing History Buffer	\$2014	...
<input checked="" type="checkbox"/> Recipe Control	\$2015	...
<input checked="" type="checkbox"/> Recipe Group Number	\$2016	...
<input checked="" type="checkbox"/> <b>System Control</b>	\$2017	...
<input checked="" type="checkbox"/> Enhanced Recipe Control	\$2018	...
<input checked="" type="checkbox"/> Enhanced Recipe Group Number	\$2019	...

Add an "After Execute Macro" to each language change button, moving bits 0-7 of the Status Block's System Control word into retentive memory bits of the HMI as shown below.



In the "Initial Macro", move those seven bits back from the retentive memory to bits 0-7 of the Control Block's System Control word.

