

Digitized Automation for a Changing World

# Delta Motion Control Solution AX Series



[www.deltaww.com](http://www.deltaww.com)



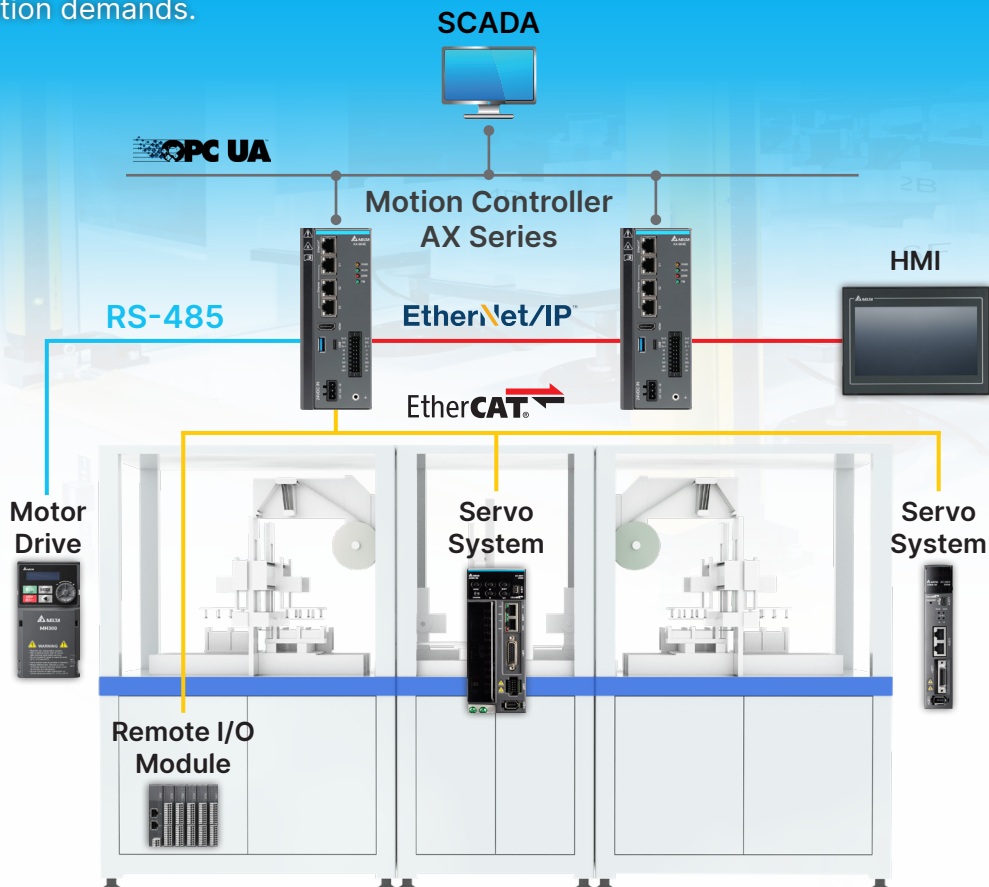
# Delta Motion Control Solution AX Series

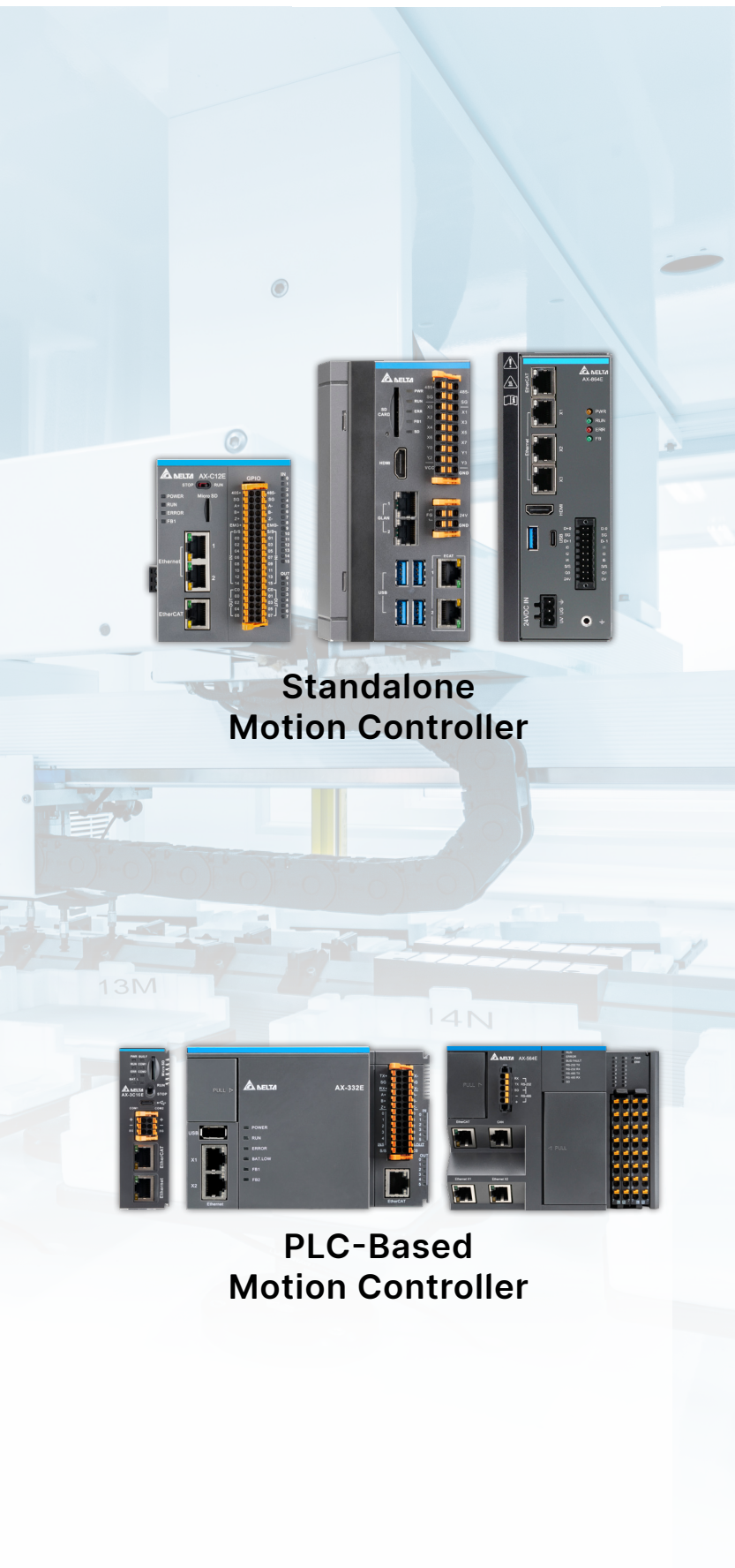
Automation and digitalization play important roles in smart manufacturing. To enhance competitiveness, machine makers around the world are seeking solutions to facilitate quick expansion and save development time and labor.

Compliant with the IEC 61131-3 standard, the Delta Motion Control Solution AX Series offers a comprehensive development software platform to integrate PLCs, HMIs, servo drives, motor drives, and remote I/O modules for customized development, operation, and maintenance.

The AX Series supports EtherCAT communication for simultaneous control of various field devices, including Delta's AC Servo Drive ASDA-A3-E, ASDA-B3-E, High Performance Compact Drive MH300 Series, Compact Drive MS300 Series, and the General Vector Control Drive C2000 Plus Series. The solution also provides excellent remote I/O scalability with the Remote Module R1-EC, R2-EC and R3-C Series.

With its highly integrated offerings, Delta's versatile AX series can fulfill various application demands.





**Standalone  
Motion Controller**

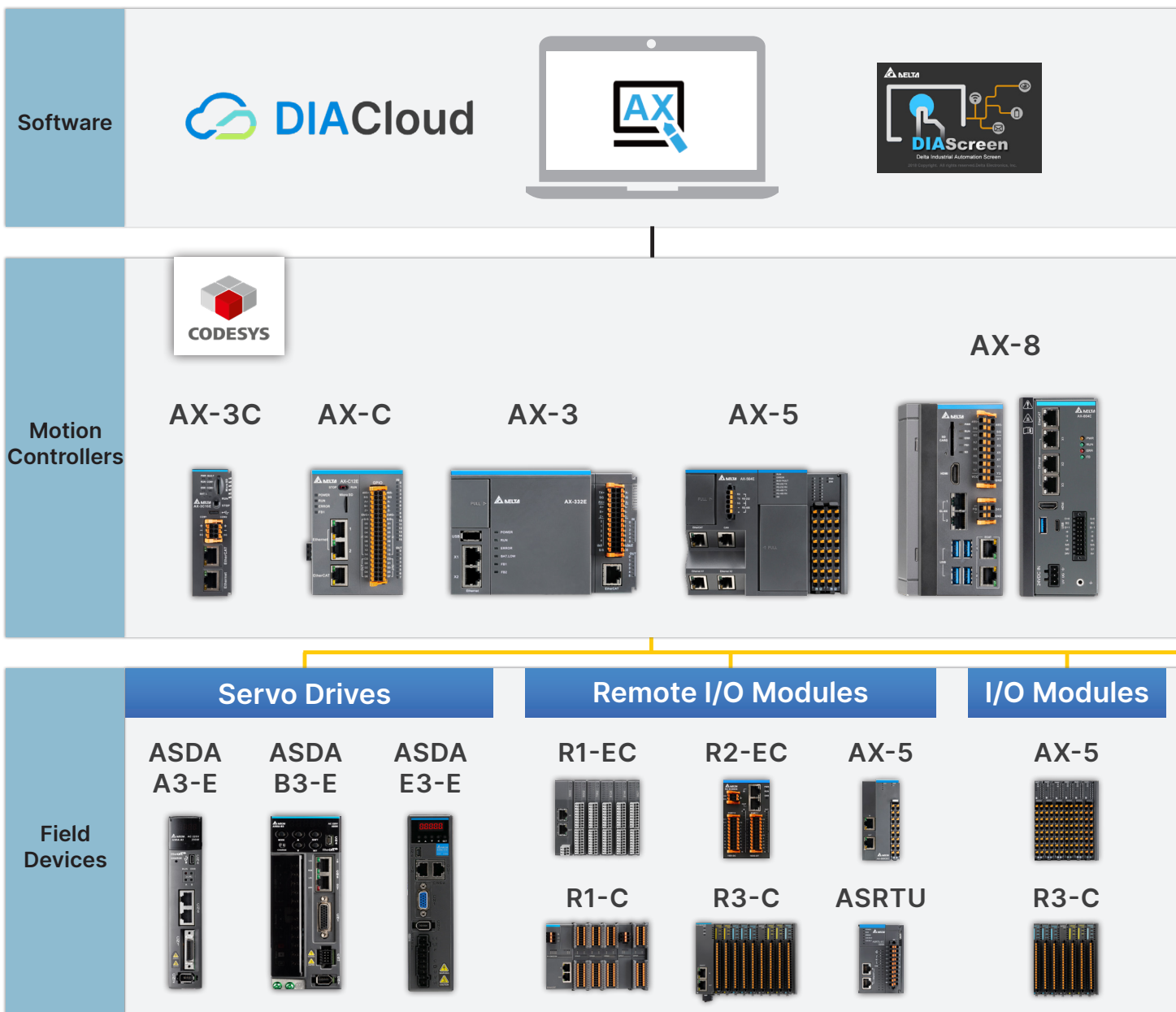
**PLC-Based  
Motion Controller**

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## Delta Motion Control Solution AX Series





## Solution Features

- ▶ **Various programming languages:**  
Provides various programming languages that can be used simultaneously on projects, including
  - Structured Language (ST)
  - Ladder Diagram (LD)
  - Sequential Function Chart (SFC)
  - Function Block Diagram (FBD)
  - Continuous Function Chart (CFC)
  
- ▶ **Highly integrated software platform:**  
The integrated development platform optimizes project development efficiency and supports parameter reading, configuration, and PLCopen standard motion control language. Users can configure multiple projects and settings on the same platform and can quickly share tags with HMIs
  
- ▶ **Comprehensive system solution:**  
Supports a variety of communication protocols and connects easily with servo drives, motor drives, remote modules and robotic arms as well as MES, SCADA, HMIs, and cloud services to build comprehensive systems



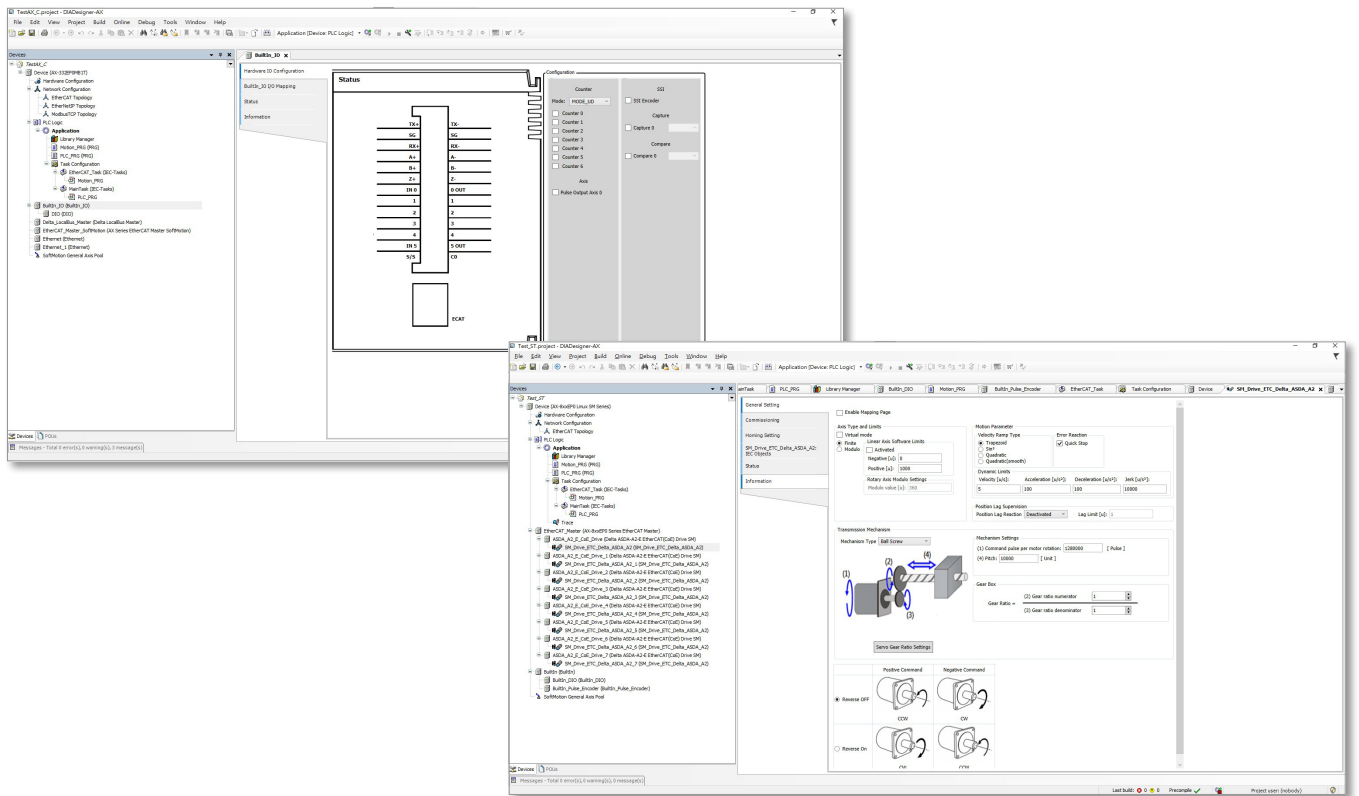
## Motor Drives



# New Software Design Brings a More User-Friendly Interface

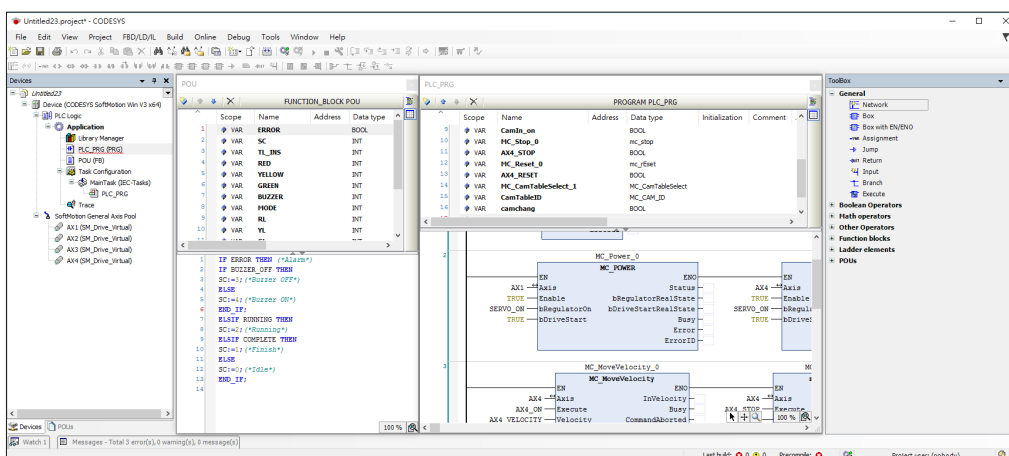
The new programming software DIADesigner-AX provides a friendly and versatile programming environment to reduce development time and costs

## Software Interface of I/O Configuration & Axis Parameter Setting



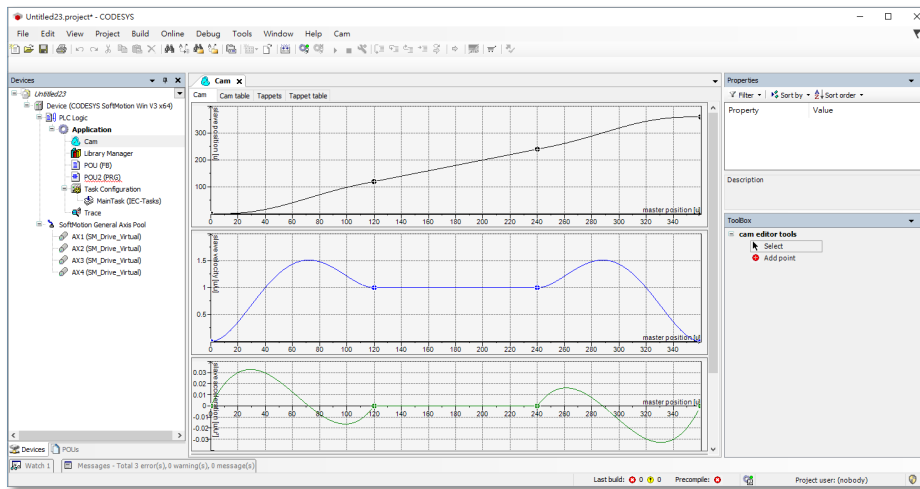
## Standard IEC 61131-3 Programming

- Structured Text (ST)
- Ladder Programming (LD)
- Function Block Diagram (FBD)
- Sequential Function Chart (SFC)



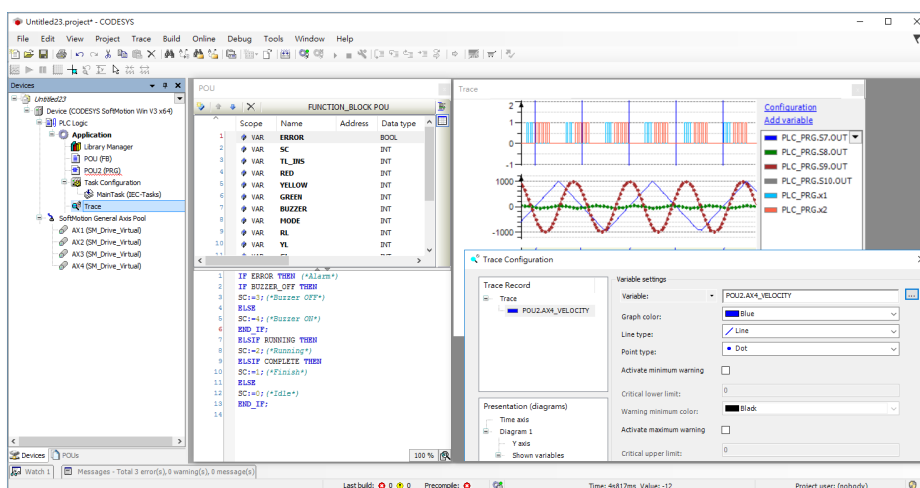
## Motion Control Programming Software

- Supports single-axis and multi-axis motion (master/slave axis motion and CAM control)
- Adopts PLCopen certified POU libraries for programming
- Provides a graphical CAM programming interface



## Tasks and Debugger

- Displays application data in SoftPLC and controller runtime simulation mode
- Enables users to monitor specific values in a watch list
- Supports reading, writing, and forced setting of variables in the editor
- Code can be executed in a single step or cycle





# New Software Design Brings a More User-Friendly Interface

## Features

- One single platform to create project programs from configuration to commissioning
- Supports IEC 61131-3 standard object-oriented programming and can integrate project functional programs
- Files can be directly integrated into the test library for easy development

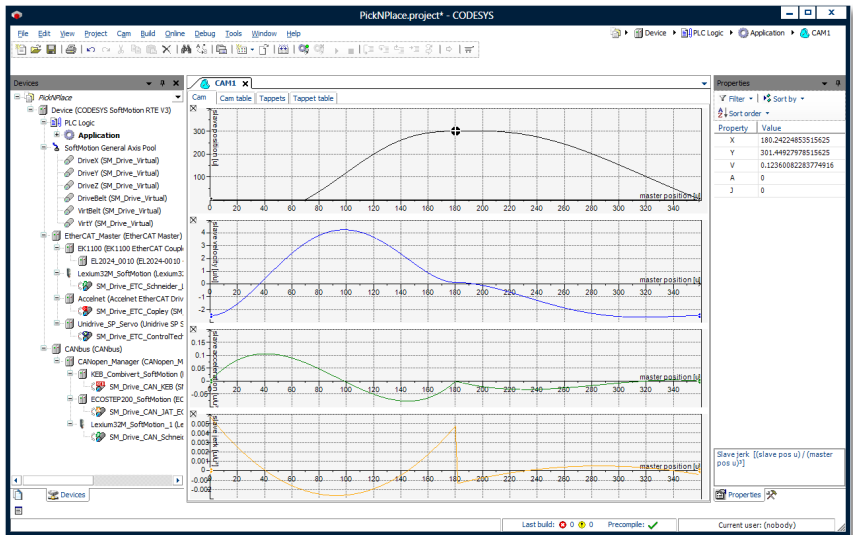
## Benefits

### Standard PLCopen Language

- Supports PLCopen motion control POU for single-axis or multi-axis control

### Electronic CAM

- Supports electronic CAM synchronous motion control
- Provides a graphical electronic CAM programming interface





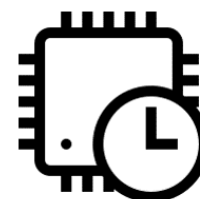
## Features

- Highly compatible, can be deployed on multiple platforms and in various applications
- Modular design for multi-function expansion
- A simple user interface and customizable windows

## Benefits

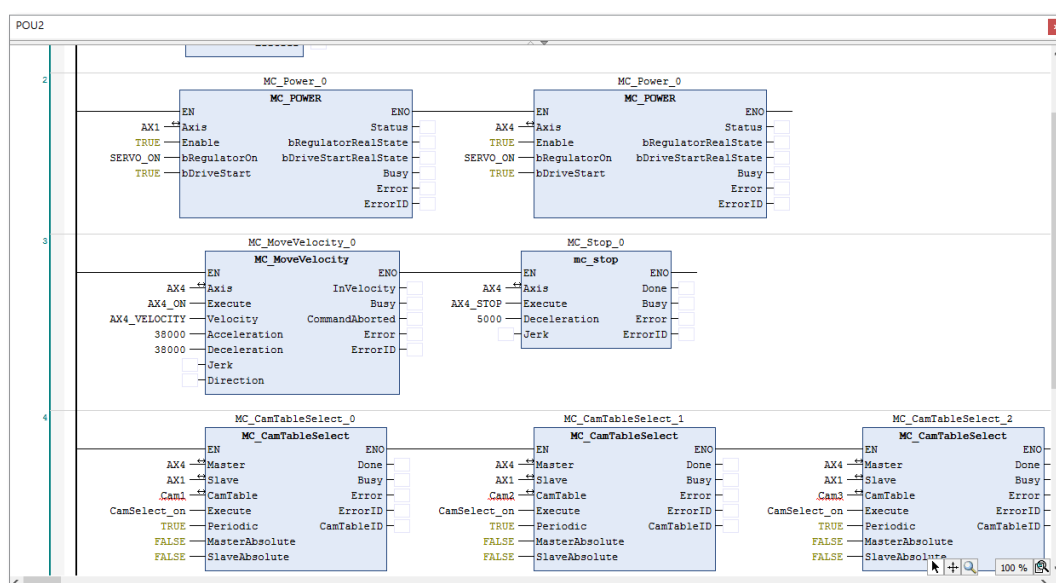
### Real-Time System

- Synchronizes 64 axes in 1 ms (real and virtual axes)



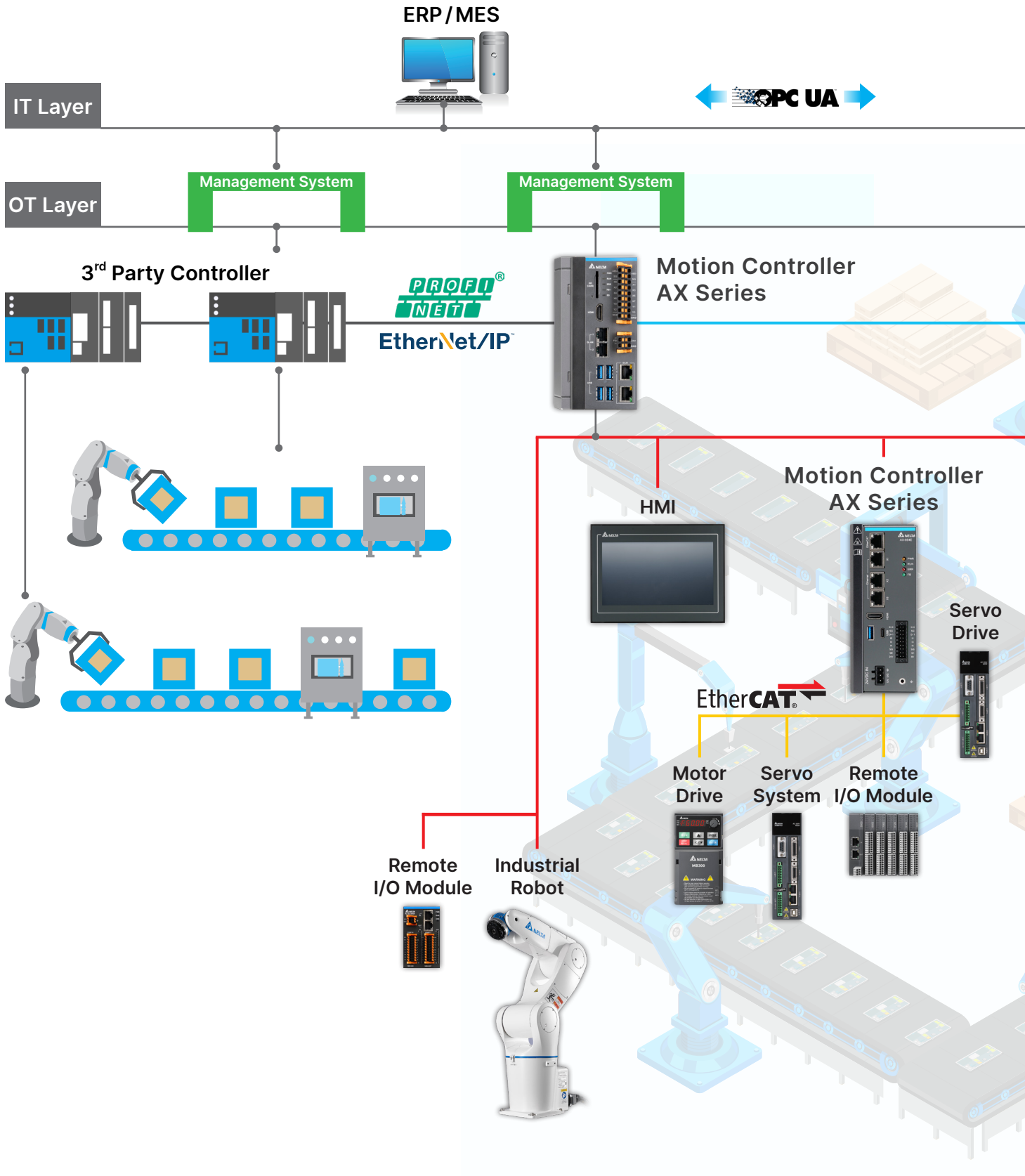
### Multi-Axis Function Block

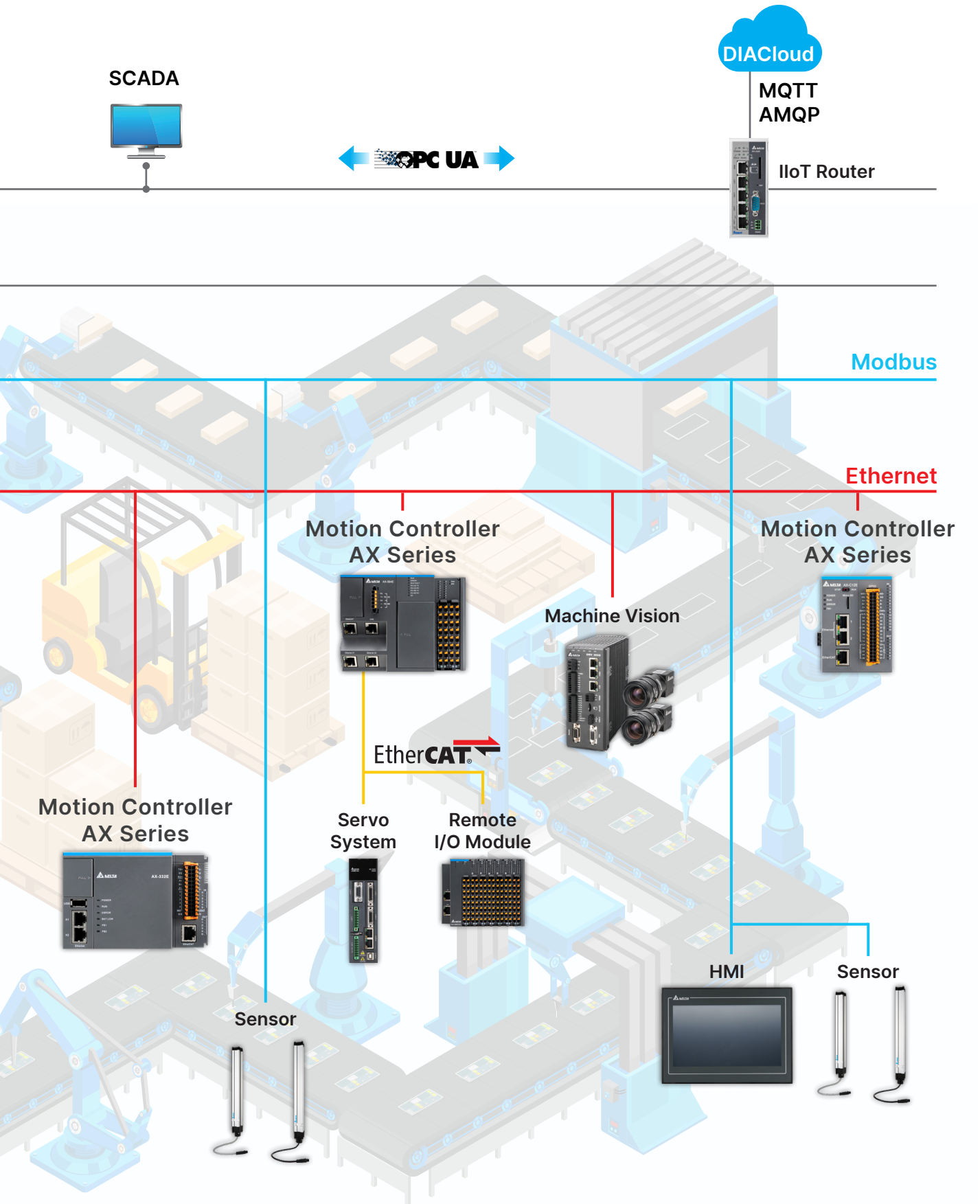
- Supports motion control function blocks compliant with the IEC 61131-3 standard






# Solution Architecture



Creates Comprehensive Systems with Exceptional Interoperability







# Hardware Specifications

Product Model		Standalone Motion Controller		
		AX-8H1E30CD2T	AX-864EP1ME1TP	AX-8DH1ECP1CE1TP
				
Processor	CPU	Intel® I3 Tiger Lake UP3 Dual Core 3.00 GHz	Intel® Celeron J6412 2.6 GHz	
	Memory	LPDDR4X 4 GB	DDR4 4 GB	
	Retain Memory	4 MB	15 MB	
Monitor	Display Type	HDMI 2.0 × 1	HDMI 1.4 × 1	
Number of Controllable Axes		128 Axes	64 Axes	128 Axes
DO Output Type		NPN	PNP / NPN (Switchable)	
Software and Firmware Version	Motion Function	PLCopen Part1, Part2 Multi-axis Interpolation CNC & Robotic (Advanced Type)	PLCopen Part1, Part2 Multi-axis Interpolation	PLCopen Part1, Part2 Multi-axis Interpolation CNC & Robotic (Advanced Type)
	Operating System	Linux		
	Visualization	N/A	Delta HMI	
Communication Interface	Ethernet I/F	IEEE 802.3/802.3u/802.3ab 2.5 Gbps × 2	IEEE 802.3/802.3u/802.3ab 1 Gbps	
	FieldBus I/F	EtherCAT × 2	EtherCAT × 1	EtherCAT × 2, CANopen × 1
	USB	USB 3.0 × 4	USB 3.0 × 1, Type C × 1	USB 3.0 × 1, USB 2.0 × 2 Type C × 1
	Serial Port	Isolated RS-485 × 1	Isolated RS-485 × 2	
Expansion Interface	Specifications	SD Card Slot × 1	N/A	Micro SD Card Slot × 1
Storage Device	HDD	M.2 SATA 32GB × 1	M.2 Module × 1 (Built-in SSD 32 G)	
	Program Capacity	512 MB	1 GB	
Power Supply	Input Voltage	24 V <sub>DC</sub> (-15% ~ +20%)		
	Rated Power	72 W (24 V/3 A)	90 W (24 V/3.75 A)	
	RTC Backup Battery	N/A		
Dimensions	Size (W×H×D)	140.5 × 77.7 × 141 mm	160 × 63 × 160 mm	225 × 63 × 163 mm
	Weight	1,000 g	1,800 g	2,800 g
Instruction Processing Speed	LD Instruction	0.4 ns		
	Math Instruction	0.4 ns	0.6 ns	
Environment	Operating Temp.	0 ~ 50 °C		
	Storage Temp.	-20 ~ 70 °C	-40 ~ 70 °C	
	Humidity	5 ~ 95 % RH (Non-Condensing)		
	Vibration Test	Sine Wave 5 Hz ≤ f ≤ 8.4 Hz ; Displacement 3.5 mm ; 8.4 Hz ≤ f ≤ 150 Hz, 1G Acceleration		
	Shock Test	Half Sine Wave Peak 15 g, 11 ms Duration		
	Protection Level	IP20		
	Certification	CE, UL		

Product Model		PLC-Based Motion Controller		
		AX-5_EB0MB1T/P	AX-564ELB0MB1T/P	AX-332E
				
Processor	CPU	N/A		Intel® Celeron J1900 2.0GHz Quad. Core
	Memory	N/A		DDR3L-1333 2 GB
	Retain Memory	N/A		4 MB
Monitor	Display Type	N/A		
Number of Controllable Axes		16: 16 Axes, 32: 32 Axes 64: 64 Axes	8 Axes	32 Axes
DO Output Type		T: NPN、P: PNP		NPN
Software and Firmware Version	Motion Function	PLCopen Part1, Part2 Multi-axis Interpolation	PP Mode	PLCopen Part1, Part2 Multi-axis Interpolation
	Operating System	N/A		
	Visualization	N/A		
Communication Interface	Ethernet I/F	100BASE-TX/1000BASE-T Switch 100/1000Mbps × 2		IEEE 802.3/802.3u/802.3ab 1G bps (Intel I210IT) × 2
	FieldBus I/F	Ethernet × 2 (dedicated IP), CANopen × 1, EtherCAT × 1		EtherCAT × 1
	USB	USB-Type A × 1, Type C × 1		USB 2.0 × 1
	Serial Port	RS-485 × 1, RS-232 × 1		Isolated RS-485/422 × 1
Expansion Interface	Specifications	Micro SD Card Slot (SDXC, 64 GB max/UHS-I)		SD Card Slot × 1
Storage Device	HDD	N/A		
	Program Capacity	64 MB	32 MB	128 MB
Power Supply	Input Voltage	24 V <sub>DC</sub> (-15% ~ +20%)		
	Rated Power	27 W		24 W
	RTC Backup Battery	N/A		Please contact local distributors
Dimensions	Size (W×H×D)	125 × 100 × 105 mm		135 × 88 × 100 mm
	Weight	560 g		390 g
Instruction Processing Speed	LD Instruction	1 ns		1.6 ns
	Math Instruction	7 ns		1.6 ns
Environment	Operating Temp.	-20 ~ 60 °C		-20 ~ 50 °C
	Storage Temp.	-40 ~ 85 °C		-40 ~ 80 °C
	Humidity	5 ~ 95% RH (Non-Condensing)		
	Vibration Test	Sine Wave 5 Hz ≤ f ≤ 8.4 Hz; Displacement 3.5 mm ; 8.4 Hz ≤ f ≤ 150 Hz, 1G Acceleration		
	Shock Test	Half Sine Wave Peak 15g, 11ms Duration		
	Protection Level	IP20		
Certification	CE, UL			

# Hardware Specifications

Product Model		Standalone Motion Controller	PLC-Based Motion Controller
		AX-C_EB_D1T	AX-3C_EB0MBL1
			
Processor	CPU	Cortex-A7, 1.0GHz	Cortex-A35, Dual, 800MHz
	Memory	DDR4-SDRAM 1GB	DDR3L-1066 256MB
	Retain Memory	896 KB	128 KB
Monitor	Display Type	N/A	
Number of Controllable Axes		12: 12 Axes, 24: 24 Axes	08: 8 Axes, 16: 16 Axes
DO Output Type		NPN	N/A
Software and Firmware Version	Motion Function	PLCopen Part1, Part2 Multi-axis Interpolation	
	Operating System	N/A	
	Visualization	N/A	
Communication Interface	Ethernet I/F	IEEE 802.3/802.3u/802.3ab 1Gbps × 2	IEEE 802.3/802.3u/802.3ab 100 MB bps × 2
	FieldBus I/F	EtherCAT × 1	
	USB	N/A	USB 2.0 × 1 (Type C, Device only) Supports firmware updates and program upload/download
	Serial Port	Isolated RS-485 × 1	Non-isolated RS-485 × 2
Expansion Interface	Specifications	SD Card Slot × 1	
Storage Device	HDD	N/A	
	Program Capacity	128 MB	16 MB
Power Supply	Input Voltage	24 V <sub>dc</sub> (-15% ~ +20%)	
	Rated Power	10 W	36 W
	RTC Backup Battery	N/A	
Dimensions	Size (W×H×D)	100 × 73 × 100 mm	31 × 100 × 80 mm
	Weight	360 g	125 g
Instruction Processing Speed	LD Instruction	1 ns	2.5 ns
	Math Instruction	70 ns	34.2 ns
Environment	Operating Temp.	-20 ~ 55 °C	
	Storage Temp.	-40 ~ 80 °C	
	Humidity	5 ~ 95 % RH (Non-Condensing)	
	Vibration Test	Sine Wave 5 Hz ≤ f ≤ 8.4 Hz ; Displacement 3.5 mm ; 8.4 Hz ≤ f ≤ 150 Hz, 1G Acceleration	
	Shock Test	Half Sine Wave Peak 15 g, 11 ms Duration	
	Protection Level	IP20	
	Certification	CE, UL	

# Model Explanation

## Standalone Motion Controller



**AX - 8 D H1 EC P1 CE1 TP**

**Product Series**

AX - C Series  
AX - 8 Series

**Monitor**

D: LCM

**Number of Controllable Axes**

12: 12 Axes    24: 24 Axes  
64: 64 Axes    H1: 128 Axes

**Communication Protocol**

E: EtherCAT  
EC: EtherCAT + CANopen

**Hardware Version**

1 <sup>st</sup> Digit	B: Multi Core ARM P: Intel® Celeron Series 3: Intel® Core I3 Series
2 <sup>nd</sup> Digit	0: 1 <sup>st</sup> Version 1: 2 <sup>nd</sup> Version

**I/O: (Transistor)**

T: NPN

P: PNP

TP: NPN+PNP

**Software and Firmware Version**

1 <sup>st</sup> Digit	M: SoftMotion C: SoftMotion - CNC P: SoftPLC Only
2 <sup>nd</sup> Digit	B: B Type (Win10 IoT 64-bit OS) C: C Type (Win10 IoT 64-bit + CODESYS Target Visualization) D: D Type (Linux OS) E: E Type (Linux OS + QT HMI)
3 <sup>rd</sup> Digit	L: Lite version No-code for standard version
4 <sup>th</sup> Digit	1: 1 <sup>st</sup> Version 2: 2 <sup>nd</sup> Version

# Model Explanation

## PLC-Based Motion Controller

(Support local I/O expansion on the right side of the controller)

AX-3C



AX-3



AX-5



**AX - 3C 16 EC B0 MB1 T**

**Product Series**

- AX - 3C Series
- AX - 3 Series
- AX - 5 Series

**Number of Controllable Axes**

- 08: 8 Axes      16: 16 Axes
- 32: 32 Axes    64: 64 Axes

**Communication Protocol**

- E: EtherCAT
- EL: EtherCAT Delta Motion Light
- EC: EtherCAT + CANopen

**Hardware Version**

1 <sup>st</sup> Digit	A: Single Core ARM B: Multi Core ARM P: Intel® Celeron Series
2 <sup>nd</sup> Digit	0: Built-in IO Version 0 1: Built-in IO Version 1

**I/O: (Transistor)**

- T: NPN
- P: PNP

**Software and Firmware Version**

1 <sup>st</sup> Digit	M: SoftMotion
2 <sup>nd</sup> Digit	B: Linux OS
3 <sup>rd</sup> Digit	L: Lite version No-code for standard version
4 <sup>th</sup> Digit	1: 1 <sup>st</sup> Version 2: 2 <sup>nd</sup> Version for specification application

## Ordering Information

Standalone Motion Controller AX-8 Series			
Model	Description	Model	Description
AX-8H1E30CD2T	Advanced Type Motion Controller (128 Axes/NPN)	AX-8DH1ECP1CE1TP	Advanced Type Motion Controller (128 Axes & NPN/PNP Switchable)
AX-864EP1ME1TP	Basic Type Motion Controller (64 Axes & NPN/PNP Switchable)		
PLC-Based Motion Controller AX-5 Series			
Model	Description	Model	Description
AX-564EB0MB1T	Program Capacity 64 MB (64 Axes/NPN)	AX-564EB0MB1P	Program Capacity 64 MB (64 Axes/PNP)
AX-532EB0MB1T	Program Capacity 64 MB (32 Axes/NPN)	AX-532EB0MB1P	Program Capacity 64 MB (32 Axes/PNP)
AX-516EB0MB1T	Program Capacity 64 MB (16 Axes/NPN)	AX-516EB0MB1P	Program Capacity 64 MB (16 Axes/PNP)
AX-564ELB0MB1T	Program Capacity 32 MB (8 Axes/NPN/PP Mode×64)	AX-564ELB0MB1P	Program Capacity 32 MB (8 Axes/PNP/PP Mode×64)
PLC-Based Motion Controller AX-3 Series			
Model	Description	Model	Description
AX-332EP0MB1T	Basic Type Motion Controller (32 Axes/NPN)		
Standalone Motion Controller AX-C Series			
Model	Description	Model	Description
AX-C12EB0MD1T	Entry-Level Motion Controller (12 Axes/NPN)	AX-C12EB0CD1T	Entry-Level Motion Controller (12 Axes/NPN/CNC) Available in China, Turkey and India
AX-C24EB0MD1T	Entry-Level Motion Controller (24 Axes/NPN)		
PLC-Based Motion Controller AX-3C Series			
Model	Description	Model	Description
AX-3C08EB0MBL1	Entry-Level Motion Controller (8 Axes) Available in China, Turkey and India	AX-3C16EB0MBL1	Entry-Level Motion Controller (16 Axes) Available in China, Turkey and India

# Global Operations

## ASIA (Taiwan)



Taoyuan Technology Center (Green Building)



Taoyuan Plant 1



Tainan Plant (Diamond-rated Green Building)

## ASIA (China)

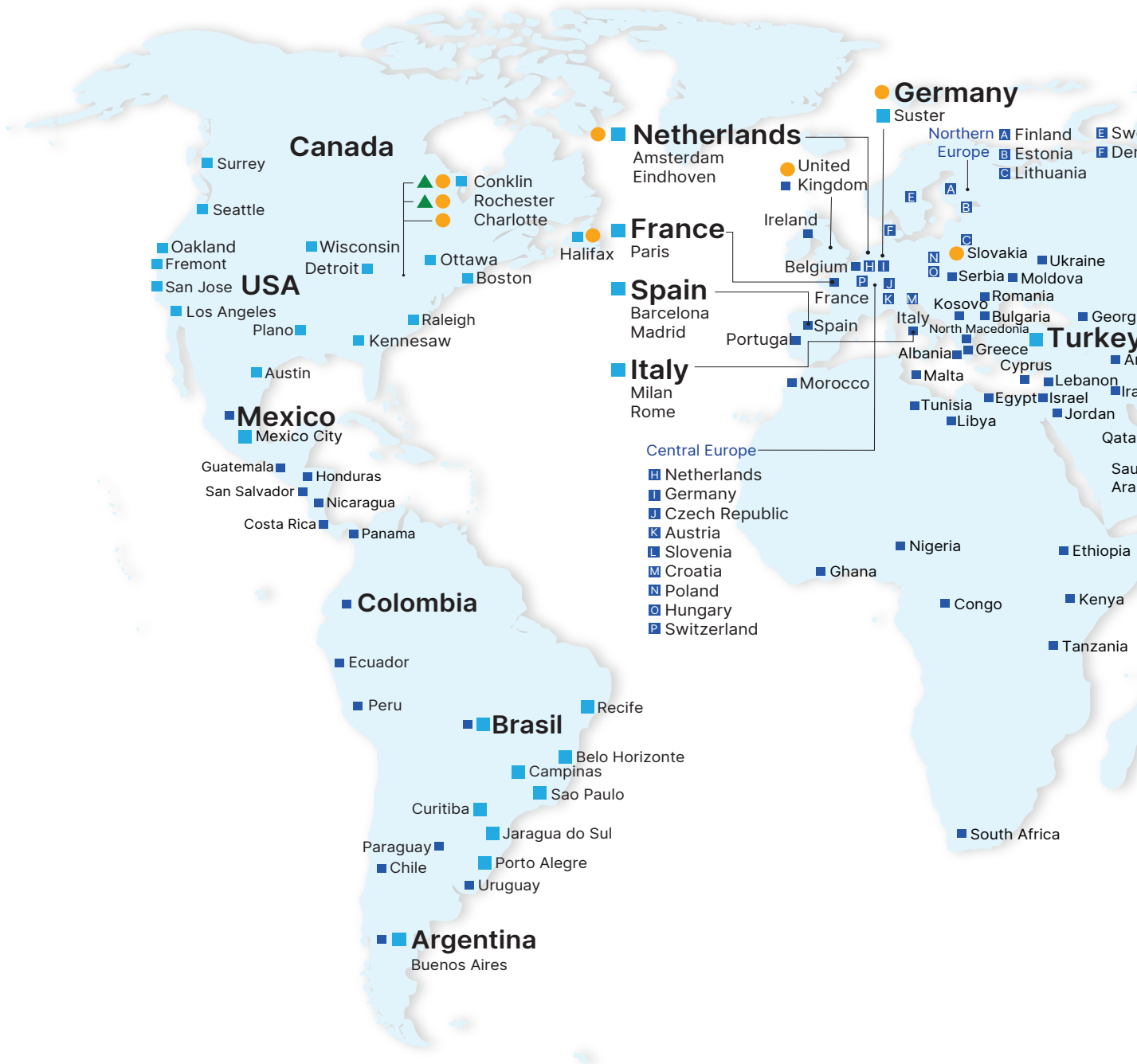


Wujiang Plant 3



Shanghai Office

▲ 10 Factories



**ASIA (Japan)**



Tokyo Office

**ASIA (India)**



Rudrapur Plant (Green Building)

**EUROPE**



Amsterdam, the Netherlands

**AMERICA**

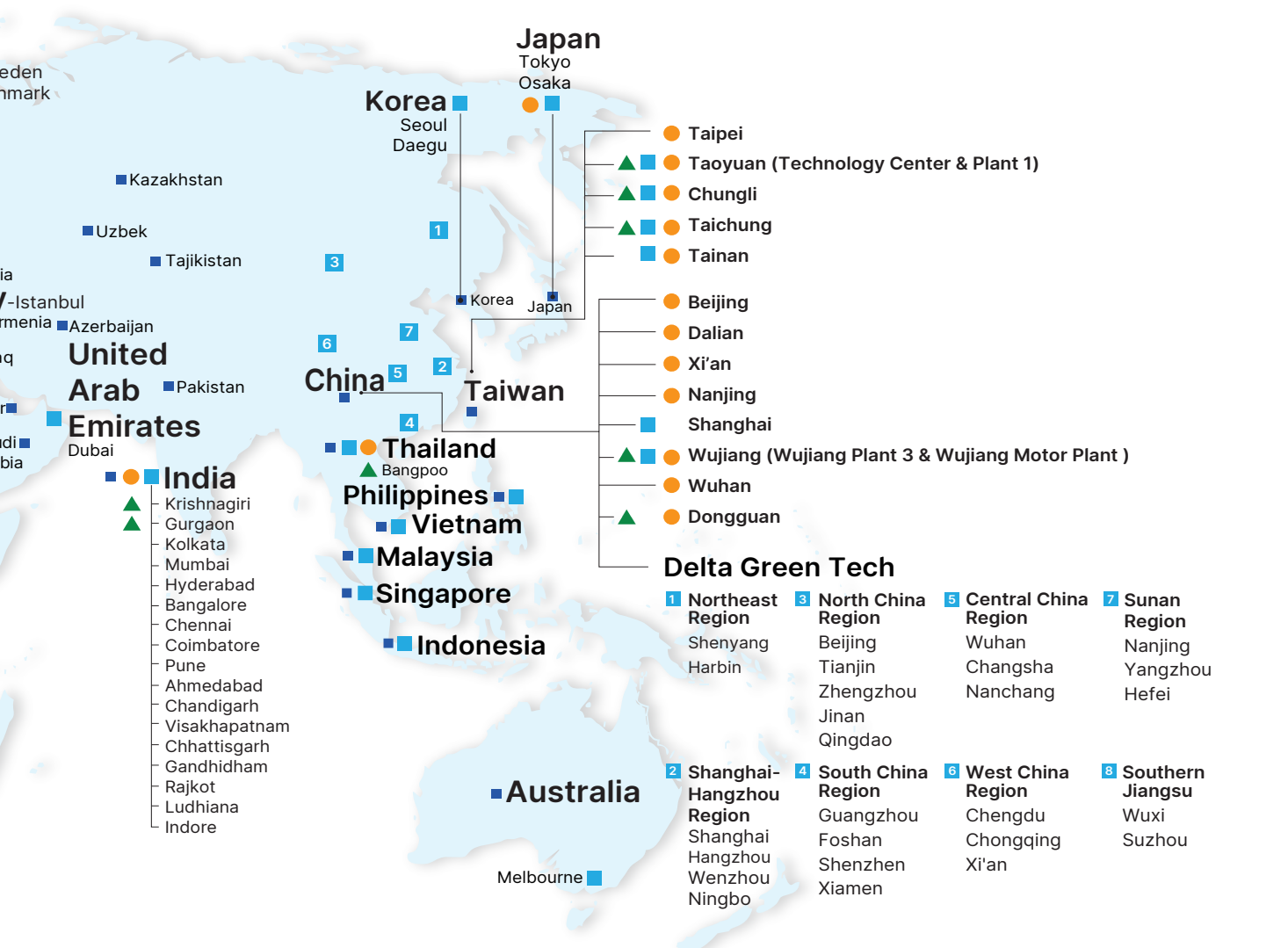


Research Triangle Park, U.S.A.

94 Branch Offices

23 R&D Centers

992 Distributors





Smarter. Greener. Together.

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