Advantech Edge Controller and EtherCAT I/O Solution

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Enabling an Intelligent Planet

Vertrieb durch AMC

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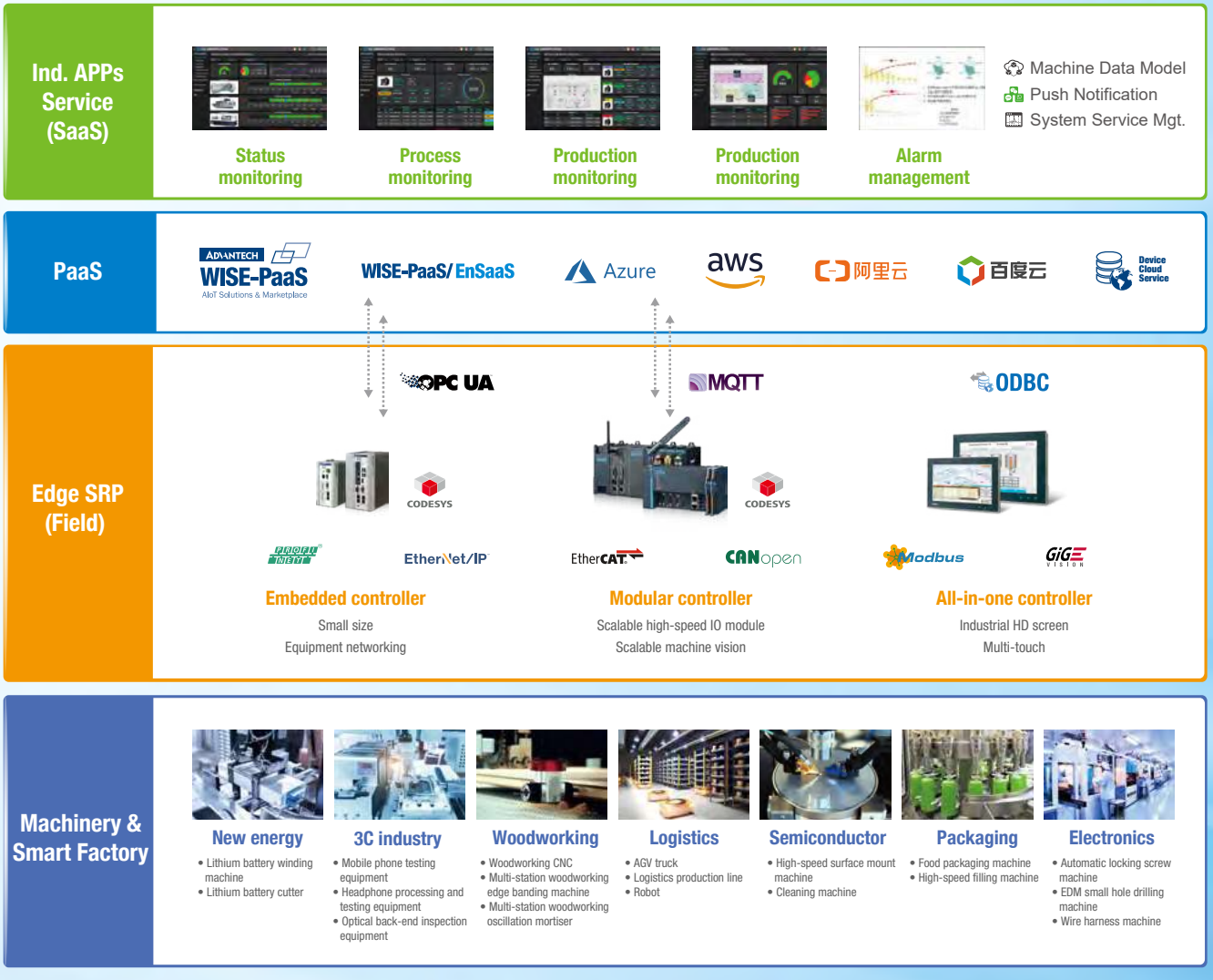
Advantech IIoT Edge Control Solutions

Traditional manufacturing companies face great challenges to the digital transformation of their operations and factories. With increasing demand for customized production, customers have become accustomed better quality products. The status of equipment affects both production efficiency and product quality. Production and equipment data are becoming the core driving force of digital transformation and upgrading of production lines. A traditional digital upgrade solution requires a combination of products and functions such as PLCs, PCs, gateways, SCADA software and more, all in the same system. System architecture is complex, costs are high, and there are security risks. These are also the reasons that increase the difficulty of programming and development for software engineers, which in turn raises the cost of software development, on-site maintenance, and the replacement of spare parts.

With the accelerating trend for smarter equipment, Advantech's industrial IoT edge control solution series combines PLC automation and PC IT technology, and integrates the functions of PLC controllers, PCs, gateways, motion control, I/O data acquisition, fieldbus protocols, machine vision, and equipment networking, all in the same control platform. This control solution is ideal for equipment motion control, machine vision, predictive maintenance, and equipment networking. Data from analysis and optimization control can be directly connected to the industrial cloud platform, and remote coordination on the network edge realizes smart production line control.



Advantech—A Pioneer in Smart Automation

The key steps for realizing smart manufacturing require networking all devices, computing systems, machines, and equipment to enable data collection; next, import services and perform data integration in one step; lastly, initiate all manufacturing process integration. Advantech can help you realize your dream of network-connected smart machinery, advanced integration of machines and equipment, and the digital transformation at the core of a smart manufacturing operation.

Advantech's industrial IoT products include: The IoT software WebAccess, industrial communication products, IoT gateways, PC-based control platforms, industrial computing platforms, servers, energy management platforms, data acquisition modules, etc.; Advantech also provides complete solutions for equipment automation and smart factories.

EtherCAT Edge Controller and Slice I/O

Traditional manufacturing companies are facing severe challenges in digital transformation and equipment upgrades. With increasing demand for personalized production, customers have become more and more demanding for improved product quality. The status of production equipment affects both production efficiency and product quality. Production data and equipment data are becoming the core driving force of digital transformation and the upgrade of production lines. Traditional digital upgrade solutions require a combination of products with functions for diverse fields such as PLCs, PCs, gateways, SCADA software, etc. Systems are complex, costs are high, and there are great security risks. Facing this trend, Advantech offers a new generation of its modular edge controller AMAX-5580 series, with its high-performance processing capabilities, open platform, and powerfully solid expansion capabilities, providing automation manufacturers with better IoT solutions.

AMAX-54xx Series PCIe Expansion Module

- 4 × USB 3.0
- 2 x Isolated 232/422/485
- 2 x Intel i350 GigE
- 2 x PoE Port
- PCIe-mini Card Expansion

AMAX-5580 Embedded Controller

- 6th generation Intel® Core™ i7/i5/Celeron processors up to 2.6 GHz with 4GB/8GB DDR4 memory
- 2 x GbE, 4 x USB 3.0, 2 x RS-232 /422/485, 1 x VGA, 1 x HDMI
- Dual power input with alarm output
- Compact and fanless design for DIN-rail mount in control cabinet

EtherCAT

AMAX-5079
EtherCAT Extension Module

AMAX-5400E PCIe-mini Card Expansion Module

- SIM Card Module
- 4G Module
- WIFI Module
- AI Module

AMAX-5000 Slice EtherCAT I/O

- Standard EtherCAT stack
- Independent power input
- Supports up to 65534 slave modules
- IEC 61131-3 programming
- Supports C/C# high-level programming language

Intel i210 GbE with independent PCIe resource
Supports LAN redundancy & Multiple EtherCAT Master

AMAX-5001
Smart Power Input Module for EtherCAT Slice I/O

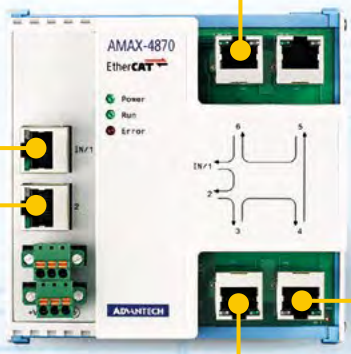
EtherCAT

AMAX-5074

EtherCAT Slice I/O Coupler

AMAX-5000 I/O Module

- 8-ch/16-ch Digital Input/Output
- 6-ch Analogue Input
- 4-ch Analogue Output
- 2-ch Encoder Input
- 6-ch Thermal Couple Input
- 4-ch RTD input
- Time Stamp Module



AMAX-4870

EtherCAT Junction Module

3rd EtherCAT I/O

3rd EtherCAT Driver

EtherCAT

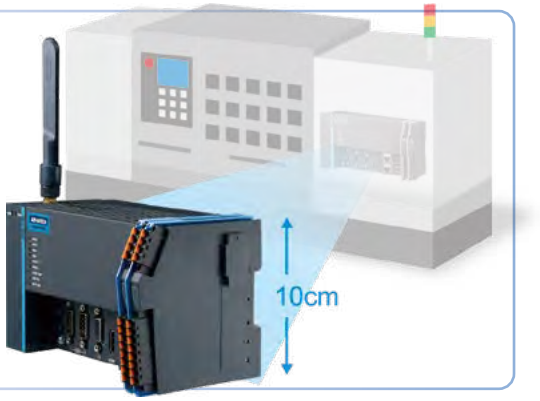
AMAX-48XX Series Module

Distributed EtherCAT I/O Module

Product Advantages

Compact Size, Save Your Space

AMAX-5000 is the industry's smallest and fastest open platform. Its compact form factor has a height of 10 cm and the slice I/O modules are all mounted on standard DIN rails, eliminating the need for additional drilling while installing the equipment in a control cabinet. Not only does this save space but also allows industrial equipment to be quickly integrated.



High-Speed Processing, Boost Up Your Machine

AMAX-5580 is equipped with Intel 6th generation Skylake Core i processor. The controller's left and right side are designed with standard PCI Express high-speed interface and EtherCAT communication protocol which provides up to 100 Mbps transmission speed. It can greatly improve the immediacy and accuracy of AMAX-5580 for transferring and processing big data.

Flexible Expansion Meets Your Needs

AMAX-5000's modular EtherCAT I/O and PCI Express interface design provides users with the ability to select specific I/O and communication modules to perform data acquisition, control and transmission. AMAX-5000 meets multiple application needs whilst retaining scalability and accuracy.

Highly Integrated, Cross Your Border

AMAX-5000 integrates traditional PLC and PC applications. It provides communication, high-speed data acquisition, control, data storage and computing functions in a single platform. What's more, it can be integrated with third-party software, making it easier for industrial equipment manufacturers to develop cross border OT to IT IoT applications.

Specifications

AMAX-5580 EtherCAT Controller



Model		AMAX-5580-74000A	AMAX-5580-54000A	AMAX-5580-C3000A
Description		Intel® Core™ i7 ® Control IPC With EtherCAT Slice IO Expansion	Intel® Core™ i5 ® Control IPC With EtherCAT Slice IO Expansion	Intel® Core™ Celeron® Control IPC With EtherCAT Slice IO Expansion
Sysem Hardware	BIOS	AMI EFI 128Mbit Flash BIOS		
	Watchdog Timer	Programmable 255 levels timer interval, from 1 to 255 sec		
	Processor	Intel® Core™ i7-6600U 2.6GHz Skylake Dual Core, 4MB L2	Intel® Core™ i5-6300U 2.4GHz Skylake Dual Core, 3MB L2	Intel® Celeron 3955U 2.0GHz Skylake Dual Core, 2MB L2
	System Chip	Integrated PCH-LP		
	Memory	Dual Channel DDR4 2133 4GB*2	Dual Channel DDR4 2133 4GB*2	DDR4 2133 4GB*1
	Graphics Engine	Intel® Gen 9 LP GT2		
	Ethernet	Intel® i210-IT GbE, 802.1Qav, IEEE1588/802.1AS, 802.3az		
	LED Indicators	LEDs for Power, Storage, Program and Abnormal status		
	Storage	1x SATA M.2 SSD slot (2280 M-Key) (optional)		
	Expansion	1x Full-size mPCIe Slot, for wireless module or NVRAM module AMAX-5400 function modules expansion from left side (max. 4) AMAX-5000 EtherCAT Slice IO from right side		
I/O Interfaces	Serial Ports	2 x RS-232/422/485, DB9, 50 ~ 115.2kbps		
	LAN Ports	2 x RJ45, 10/100/1000 Mbps IEEE 802.3u 1000BASE-T Fast Ethernet		
	USB Ports	4 x USB ports (4 x USB 3.0 compliant) 1 x internal USB		
	Display	1 x VGA, support up to 1920 x 1200 @ 60 Hz 24 bpp 1 x HDMI, support up to 4096 x 2160 @ 24Hz 24bpp		
	Power Connector	Dual power input with alarm output		
	Grounding Protection	Chassis grounding		
General	Certification	CE, FCC, UL		
	Dimensions (W x H x D)	139 x 100 x 80 mm		
	Form Factor	Passive Cooling and Front Accessible		
	Enclosure	Aluminum housing		
	Mounting	DIN-rail		
	Weight (Net)	Approx. 1.3kg		
	Power Requirement	24 VDC ± 20%		
	Power Consumption	15 W (Typical), 42 W (Max)		
	OS Support	Support Microsoft® WES 7 32/64 bits / Windows 10 64 bits (optional)		
Environment	Operating Temperature	-10 ~ 60°C (-4 ~ 140°F) @ 5 ~ 85% RH with 0.7m/s airflow		
	Storage Temperature	-40 ~ 85°C (-40 ~ 185°F)		
	Relative Humidity	10 ~ 95% RH @ 40°C, non-condensing		
	Shock Protection	Operating, IEC 60068-2-27, 10G, half sine, 11 ms		
	Vibration Protection	Operating, IEC 60068-2-64, 1 Grms, random, 5 ~ 500 Hz, 1hr/axis (M.2)		

AMAX-5000 Digital I/O Modules






Model		AMAX-5051-A	AMAX-5052-A	AMAX-5056-A	AMAX-5057-A	AMAX-5056SO-A	AMAX-5057SO-A
Description		8-ch DI module	16-ch DI module	8-ch sink type DO module	16-ch sink type DO module	8-ch source type DO module	16-ch source type DO module
Digital Input/ Output	Input Channels	8-ch.	16-ch.	-	-	-	-
	Output Channels	-	-	8-ch.	16-ch.	8-ch.	16-ch.
	Rating	Dry Contact Logic level 1: close to Iso.GND Logic level 0: open Wet Contact Rated voltage: 24VDC Logic level 1: 10~30 VDC and -10~-30 VDC Logic level 0: -3~3 VDC		Rated Voltage 10~30 VDC Rated Current Output Logic level 1: 0.3 A per channel Logic level 0: 25 µA per channel (leakage current)		Rated Voltage 10~30 VDC Rated Current Output Logic level 1: 0.5 A per channel Logic level 0: 10 µA per channel (leakage current)	
	Input / Output Delay	From logic level 0 to 1: 4ms From logic level 1 to 0: 4ms		From logic level 0 to 1: 10us From logic level 1 to 0: 100us		From logic level 0 to 1: 150us From logic level 1 to 0: 2ms	
	Digital Filter	3ms		-		-	
LED Indicator		PWR, RUN / ERROR, DIO status					
Interface		100Mbps EtherCAT					
Power Consumption		2W@24VDC			2.5W@24VDC	2W@24VDC	2.5W@24VDC
Isolation Voltage		2,000 VDC					
Weight (g)		Approx. 80g					
Operation/Storage Temperature		-25 ~ 60°C (-14~140°F) / -40 ~ 85°C (-40~185°F)					
Operating/Storage Humidity		5 ~ 95% RH (non-condensing)					
Certification		CE, FCC class A					

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AMAX-5000 Analogue & Temperature I/O Modules

		Analog I/O Module				Temperature Input Module	
Model		**AMAX-5017C-A**	**AMAX-5017V-A**	**AMAX-5017H-A**	**AMAX-5024-A**	**AMAX-5015-A**	**AMAX-5018-A**
Description		6-ch Current AI module	6-ch Voltage AI, multi-gain, 16-bit	4-ch High speed AI module	4-ch AO multi-gain, 16-bit	4-ch RTD (2/3 wire)	6-ch Thermocouple (Open detect)
Analog Input	Channels	6-ch.	6-ch.	4-ch.	4-ch.	4-ch.	6-ch.
	Input Type	mA	V, mV	V, mA	V, mA		
	Input Impedance	>120Ω	>1M Ω	800 kΩ (V) 500 Ω (mA)	-	-	-
	Common Voltage Range	±350V	±350V	±275V	-	-	-
	Input / Output	±20 mA, 0 ~ 20 mA, 4 ~ 20 mA	±150 mV, ±500 mV, ±1V, ±5 V, ±10 V	±10 V, 0~10V, 0~20mA	0~5V, 0~10V, ±5V, ±10V, 4~20mA, 0~20mA	-	±50 mV, ±100 mV, ±500 mV, ±1 V, ±2.5 V
	Resolution	16-bit with ±0.2% FSR accuracy @25°C	16-bit with ±0.1% FSR accuracy @25°C	16-bit with ±0.1% FSR accuracy @25°C (V) 16-bit with ±0.2% FSR accuracy @25°C (mA)	16-bit with ±0.01% FSR accuracy @25°C	16 bit with ±0.1% FSR accuracy	
	Sample Rate	100 sample/s (per channel)		10k sample/s (per channel)	-	100 sample/s (per channel)	
	Burn-out detection	YES	-	-	-	Yes	Yes
	Slew Rate	-	-	-	Configurable (Default: 1 V/μs & 2.4 mA/μs)	--	
	Current Load	-	-	-	Max. 500 Ω	-	-
	Voltage Load	-	-	-	Min. 1KΩ	-	-
	Voltage Range	-	-	-	-	-	-
	Sensor Type	-	-	-	-	Pt 100 Pt 1000 Balco 500 Ni 518	Type J (0~760° C) Type K (0~1370° C) Type T (-100~400° C) Type E (0~1000° C) Type R (500~1750° C) Type S (500~1750° C) Type B (500~800° C)
LED Indicator		PWR, RUN / ERROR					
Interface		100Mbps EtherCAT					
Power Consumption		2W@24V_{DC}		2.5W@24V_{DC}	3.5W@24V_{DC}	2W@24V_{DC}	
Isolation Voltage		2,000 V_{DC}					
Weight (g)		Approx. 80g					
Operation/Storage Temperature		-25 ~ 60°C (-14~140°F) / -40 ~ 85°C (-40~185°F)					
Operating/Storage Humidity		5 ~ 95% RH (non-condensing)					
Certification		CE, FCC class A					

Encoder / Counder Module

Model		AMAX-5080-A	AMAX-5081-A
Description		2-ch Counter/Encoder 32-bit	1-ch TTL/RS-422 Encoder/Counter
Encoder / Counter	Channels	2-ch.	1-ch.
	Counting Range	32-bit	32-bit
	Function	Counter Mode: - Encoder x4 - Pulse/ Dir. Features: - Frequency Measurement (1Hz) - Set counter value - Latch counter value - Reset counter value - Input Filter - Overflow/underflow detection and reload counter	Counter Mode: - Encoder x4 - Pulse/ Dir. - CW/ CCW - Pulse/ Gate - Pulse Train Features: - Frequency Measurement (real time update) - Set Counter Value - Latch Counter Value - Reset Counter Value - Input filter - Overflow/ underflow detection - Position Compare Output - Reversion of rotation
	Auxiliary I/O	-	Voltage: 24V DI Latch / Pulse output
	Encoder power supply	-	+5V, 100mA
	Signal Input	Logic level 0: 0~5VDC Logic level 1: 11~30V	Single-ended 5V RS-422 differential
	Input Frequency	1 MHz * 4	10MHz *4
LED Indicator		PWR, RUN / ERROR, A+, A-, B+, B-, Z+, Z-, L+, L-	PWR, RUN / ERROR, A, B, Z, IN, OUT
Interface		100Mbps EtherCAT	
Power Consumption		2W@24VDC	3W@24VDC
Isolation Voltage		2,000 V_{DC}	
Weight (g)		Approx. 80g	
Operation/Storage Temperature		-25 ~ 60°C (-14~140°F) / -40 ~ 85°C (-40~185°F)	
Operating/Storage Humidity		5 ~ 95% RH (non-condensing)	
Certification		CE, FCC class A	

Digital I/O Module with Time Stamp

Model		AMAX-5051T-A		AMAX-5056T-A
Description		8-ch DI module (2-ch w/ timestamp, 6-ch w/o timestamp)		2-ch sink type DO module w/ timestamp
Digital Input/ Output	Input Channels	2-ch. w/ timestamp	6-ch. w/o timestamp	-
	Output Channels	-	-	2-ch. w/ timestamp
	Rating	Wet Contact: Logic level 1: 11~30 VDC Logic level 0: -3~5 VDC (similar to EN 61131-2, type 3)	Dry Contact: Logic level 1: Close GND Logic level 0: Open Wet Contact: Logic level 1: 11~30 VDC Logic level 0: -3~5 VDC (similar to EN 61131-2, type 3)	Rated Voltage 10~30 VDC Rated Current Output: Logic level 1: 0.3A per channel Logic level 0: 25 μA per channel (leakage current)
	Input / Output Delay	< 0.5us	<10μs	<0.5μs
	Resolution Timestamp	1ns	N/A	1ns
	Timestamp Latch / Sync	Rising Edge & Falling Edge DI Latch	N/A	DO Sync.
LED Indicator		PWR, RUN / ERROR, DI status		PWR, RUN, DO status
Interface		100Mbps EtherCAT		
Power Consumption		2W@24V_{DC}		
Isolation Voltage		2000 V_{DC}		
Weight (g)		Approx. 80g		
Operation/Storage Temperature		-25 ~ 60°C (-14~140°F) / -40 ~ 85°C (-40~185°F)		
Operating/Storage Humidity		20 ~ 95 % RH (non-condensing) / 5 ~ 95% RH (non-condensing)		
Certification		CE, FCC class A		

EtherCAT Infrastructure Module



Model		AMAX-5001	AMAX-5074	AMAX-5079
Description		Power input module w/ 4-ch. DI	EtherCAT coupler w/ power input	EtherCAT extension module
Power Input	Rated Voltage	24VDC (± 20%)		-
	Dual Power Input	Supported		
	Max Current on Bus	2A (provide power for approx. 10pcs AIO modules or 20pcs DIO modules)		
	Diagnosis Function	- Over/under voltage for input 1&2 - Over current output on bus		
Digital Input	Input Channels	4-ch.	-	-
	Rating	Wet Contact Rated voltage: 24VDC Logic level 1: 10~30 VDC and -10~-30 V_{DC} Logic level 0: -3~3 VDC	-	-
	Input Delay	From logic level 0 to 1: 4ms From logic level 1 to 0: 4ms	-	-
	Digital Filter	3ms	-	-
EtherCAT Coupler / Extention	Function	-	Coupling EtherCAT IO modules to 100BASETX EtherCAT network	
	Cable	-	Ethernet/EtherCAT cable (min. Cat. 5), shielded	
	Distance Between Stations	-	Max. 100 m (100BASETX)	
	Bus Interface	-	2 x RJ45 (1 x Input, 1 x Output)	1 x RJ45
LED Indicator		PWR, RUN / ERROR, LED for Power Alarm Status		-
Interface		100Mbps EtherCAT		
Power Consumption		2W@24VDC	2.5W@24VDC	No power from bus
Isolation Voltage		2,000 V_{DC}		
Weight (g)		Approx. 80g	Approx. 97g	Approx. 71g
Operation/Storage Temperature		-25 ~ 60°C (-14~140°F) / -40 ~ 85°C (-40~185°F)		
Operating/Storage Humidity		5 ~ 95% RH (non-condensing)		
Certification		CE, FCC class A		

PCIe Expansion Modules






Model	AMAX-5400E	AMAX-5410	AMAX-5410P	AMAX-5424V	AMAX-5490	AMAX-5495
Description	PCIe mini card expansion module	2-port GigE vision frame grabber module	2-port PoE vision frame grabber module	4-port USB3.0 vision frame grabber module	2-port Isolated RS-232/422/485 communication module	2-port CAN module
Communication	PCI mini card Interface: Full size mini PCI express 2.0 SIM card slot: Nano SIM card Antenna: 1x SMA hole on the top	Ethernet Compatibility: IEEE 802.3, IEEE 802.3u, IEEE802.3ab, IEEE802.3x, IEEE802.3af Speed: 10/100/1000 Mbps No. of Ports: 2 Gigabit Ethernet Media Access Control (MAC) and physical layer (PHY) ports. Input Voltage: 24 VDC direct from AMAX-5000 controller	Ethernet Compatibility: IEEE 802.3, IEEE 802.3u, IEEE802.3ab, IEEE802.3x, IEEE802.3af Speed: 10/100/1000 Mbps No. of Ports: 2 Gigabit Ethernet Media Access Control (MAC) and physical layer (PHY) ports. Input Voltage: 24 VDC direct from AMAX-5000 controller Output PoE: Power 48 VDC PoE Power output, 15.4W per port, total Max. 20W	USB 3.0 Host Bus: 4-lane Gen 2.0 PCIe interface, compliant with PCI Express Base Specification, Revision 2.0 Controller: Host Controller – Fresco FL1100 Compliant with USB 3.0 Specification and Intel® xHCI Specification, Revision 1.0 Max. current: 1500 mA maximum per port Data Transfer Rate: SuperSpeed (5.0 Gbps); High Speed (480.0 Mbps); Full Speed (12.0 Mbps); Low Speed (1.5 Mbps)	Serial Communication Data Bits: 5, 6, 7, 8 Stop Bits: 1, 1.5, 2 Parity: None, even, odd Baud Rate: 50 bps ~ 230.4 kbps Data Signals: RS-232: TxD, RxD, GND RS-422: Tx+, Tx-, Rx+, RX RS-485: Data+, Data- FIFO: 256 bytes Flow Control: Xon/ Xoff	CAN Protocol: CAN2.0 AB Max. Speed: 1Mbit/s Signal Support: CAN_H, CAN_L
LED Indicator	PWR, Standby				PWR, STBY, TX1, RX1, TX2, RX2	
Enclosure	Aluminum housing					
Interface	PCIe x1			PCIe x4 (1st. slot on the left side of AMAX-5580)	PCIe x1	
Power Consumption	0.5W@24VDC	2.5W@24VDC			2W@24VDC	3W@24VDC
Isolation Voltage	2,500 V_{DC}					
Weight (g)	Approx. 189g	Approx. 195g	Approx. 235g	Approx. 220g	Approx. 200g	Approx. 199g
Operation/Storage Temperature	-10 ~ 60°C (14 ~ 140°F) / -40 ~ 85°C (-40~185°F)					
Operating/Storage Humidity Humidity	5 ~ 95% RH (non-condensing)					
Certification	CE, FCC class A					

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Advantech Edge Controller Solutions

Advantech's CODESYS series controller is an entirely new control solution for the transformation from equipment automation to integrated information-based smart equipment. Advantech has real-time soft PLC software on a variety of its x86 platforms, and at the same time has constructed additional interfaces to realize real-time automatic controls while ensuring open information interlinking and processing. The open platform and multiple performance processing cores can be flexibly applied to complex and changeable industrial environments.

From the need for stable and real-time logic controls to motion control and machine vision applications, Advantech's CODESYS control solution has power and flexibility you need to help you realize your solution. Advantech's CODESYS edge controller uses familiar programming methods as its foundation base, which makes it convenient for customers to design, use, and install.

Smart Manufacturing Application Scenarios

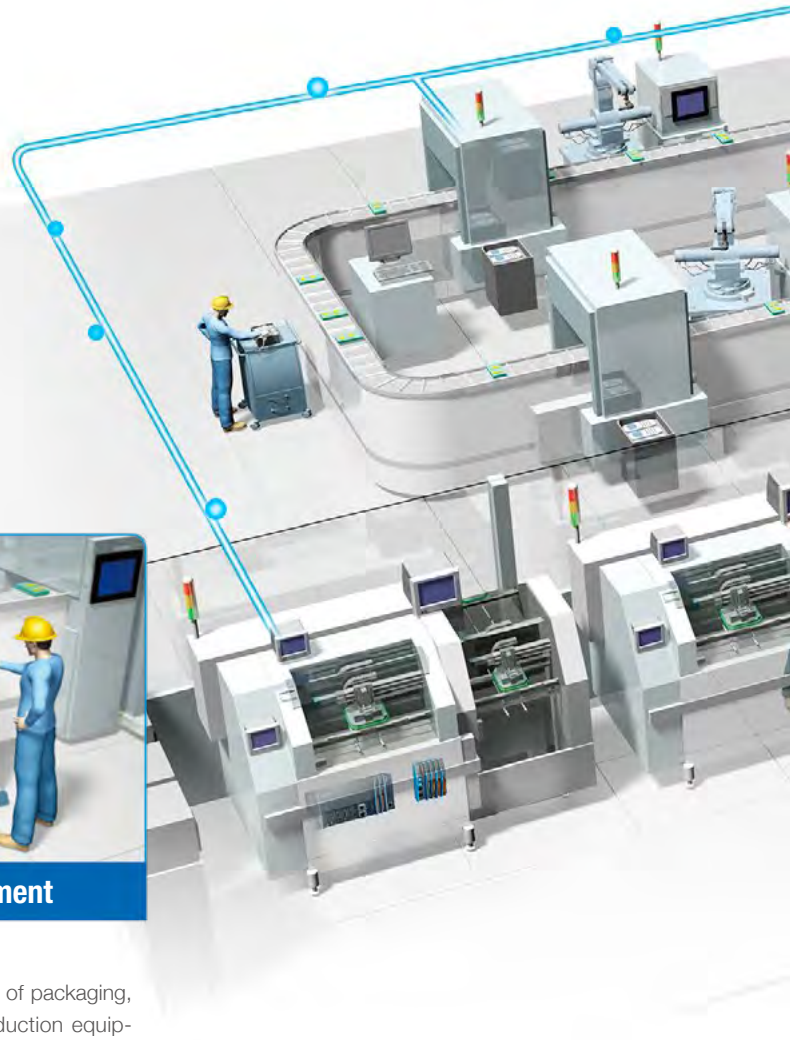
The Advantech edge control solution series provides optimal solutions that meet different equipment and scenario control requirements. The best hardware and software environment solutions have been developed according to the needs of smart manufacturers, helping them focus on algorithm solutions and optimized applications such as automation, production line condition monitoring, and factory environment monitoring.

Equipment automation

Embedded modular solution

- An abundance of fieldbus and I/O expansion modules are suitable for large, medium, and small edge control system requirements.
- Intel I7/I5/Celeron processors support motion control and machine vision in equipment and production lines.
- Supports database, MES, and cloud service access.

AMAX-5580
Edge controller



Production line quality test equipment

Tablet control solution

- Suitable for comprehensive operation control of packaging, automobile, pharmaceutical, and other production equipment in production lines.
- Integrates industrial computers and industrial displays.
- Expands I/O modules and drive motors through EtherCAT-bus.

Flexible automated production line

- Integrated I/O and communication design, easy to configure, operate, and control with clean cable layout.
- Data collection and information display.
- Compact body and solid design.
- PC-based platform meets the needs of various software applications.

Equipment status monitoring and prognosis

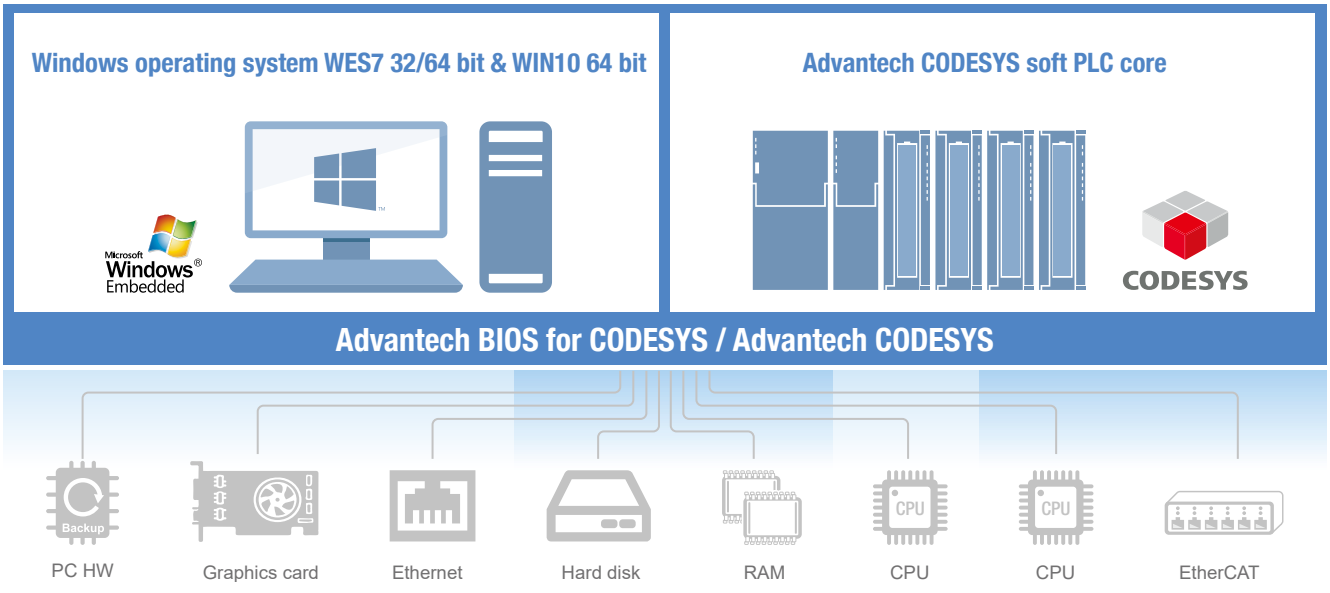
High-performance solution

- Suitable for medium and large edge computing solutions.
- Intel Core Processor Family have higher processing efficiency, can complete more machine vision tasks, and have more complex processing operations.

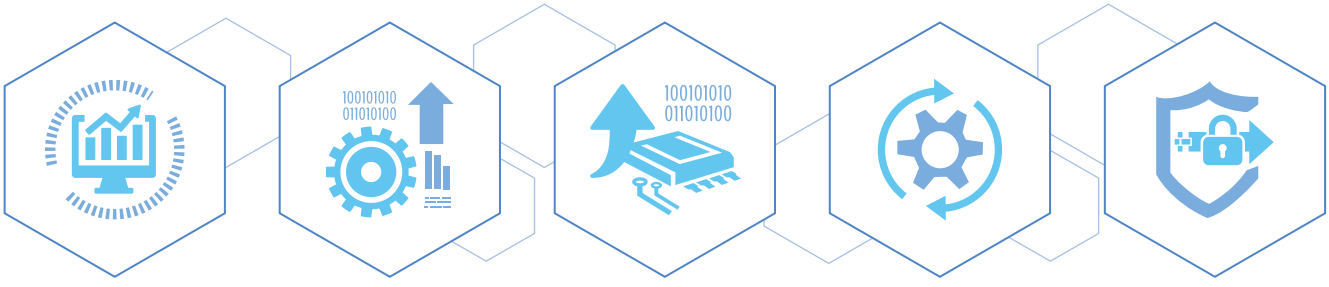
Introduction to Split-Core and Split-System Technology

To ensure the openness of Windows and the real-time nature of soft PLC, Advantech's CODESYS solution uses split-core split-system technology. Through BIOS optimization and re-integration of the underlying resources of CODESYS, the hardware resources of the controller are allocated to different systems to ensure independence between systems. Compared with the two traditional types of hardware which work through communication interaction methods, Advantech's CODESYS solution has a variety of open and dedicated information interaction methods between Windows and soft PLC, helping automation engineers to improve both interaction speed and system stability.

Integrates IPC and PLC – Integrates IT and OT



Features of split-core and split-system



System with upgraded-stability

Windows and Softlogic is with independent process core. Even if the Windows software crashes unexpectedly, the soft PLC can run normally and return to zero or stop safely according to the programming logic.

Maintaines Real-Time Performance

When the Windows core generates high CPU loads due to running complex software, the real-time performance of the soft PLC is not affected.

Optimized with Performance

One piece of hardware integrates PLC and IPC, and the integrated hardware design is more stable and reliable. Soft PLC can reach a 50μs program processing cycle and 100μS EtherCAT communication cycle.

Effective Internal Interaction

Based on integrated hardware design, data can be exchanged through shared memory, internal modbus, Socket or Advantech's proprietary high-speed communication API/ function block, with greater interaction volume and better realtime performance.

Multi-layer Encryption Enhance Security

Multi-level security encryption and user level settings, from development code and single program organization unit to library files. Also supports hardware information binding to protect the integrator's core process IP secrets.

Abundance of Fieldbus Networks

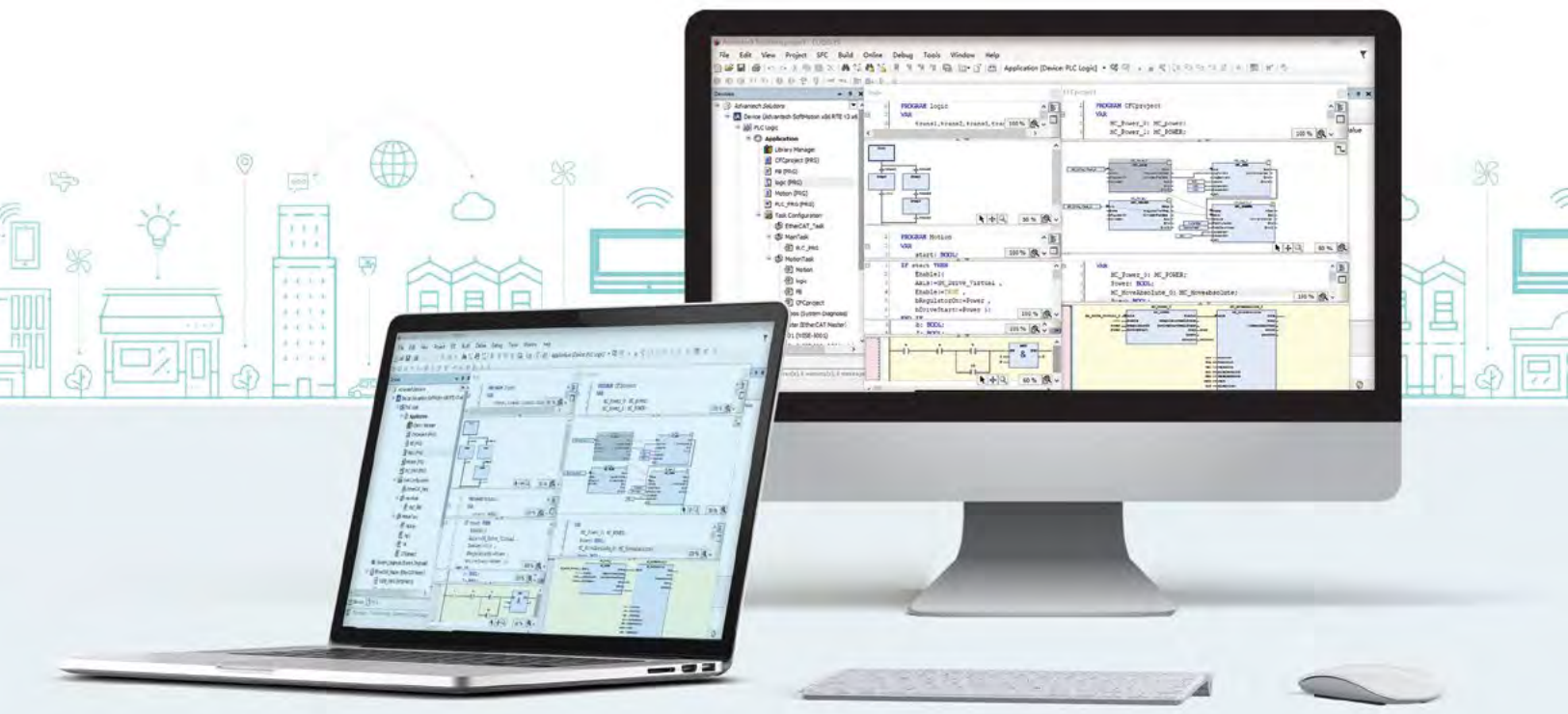
Advantech's CODESYS series controller is an entirely new control solution for the transformation from equipment automation to integrated information-based smart equipment. Advantech has real-time soft PLC software on a variety of its x86 platforms, and at the same time has constructed interfaces for soft PLC, database, and cloud platforms to realize real-time automatic controls while ensuring open information interlinking and processing data across equipment. The open platform and multiple performance processing cores can be flexibly applied to complex and changeable industrial environments. From the need for stable and real-time logic controls to the integration of motion control and machine vision applications with high processing performance and multiple interfaces, Advantech's CODESYS control solution has the controller you need to help you realize your application needs. Advantech's CODESYS edge controller uses familiar programming methods, which makes it easier to design, use, and install.

Software Solutions

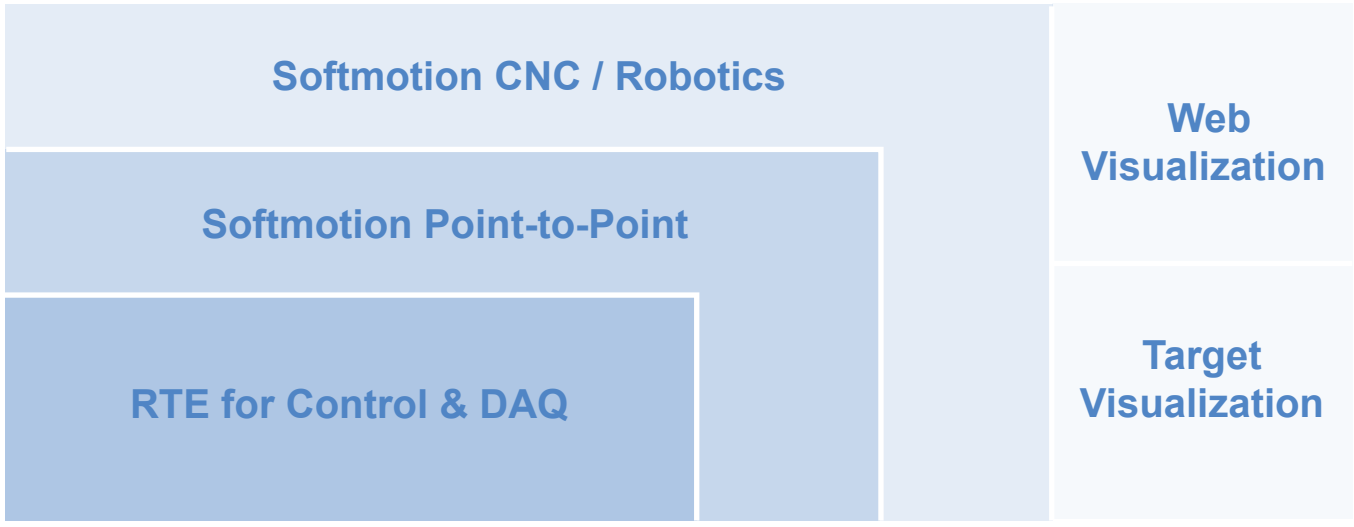
Supports IEC 61131-3 standard programming method

Advantech CODESYS solution software supports a variety of functional blocks, from high-speed communication and logic control to complex motion control, etc. At the same time, Advantech has a professional R&D team that encapsulates and produces industry-specific function blocks and library files for specific application fields, providing engineers with professional and easy-to-use software functions, helping partners to deepen their vertical industry knowledge.

Softmotion		CNC			
Point to point motion	Compare	2-axes linear interpolation	3-axes elliptical interpolation	Velocity look ahead	2-axes SCARA system
JOG motion	Position latch	2-axes circular interpolation	3-axes spline interpolation	3+2 axes gantry	3-axes SCARA system
Velocity motion	Homing motion	2-axes elliptical interpolation	3-axes parabolic interpolation	2-axes gantry system	DELTA system
E-Gear motion	Backlash compensation	2-axes spline interpolation	Helical interpolation	3-axes gantry system	4-axis palletizer kinematics
E-CAM motion		2-axes parabolic interpolation	Import from DXF file	T-Gantry system	6-axis articulated robot
Continue motion		3-axes Linear interpolation	G code/M code	H-Gantry system	
Tangential following		3-axes circular interpolation	Switch the coordinate	Polar coordinate	

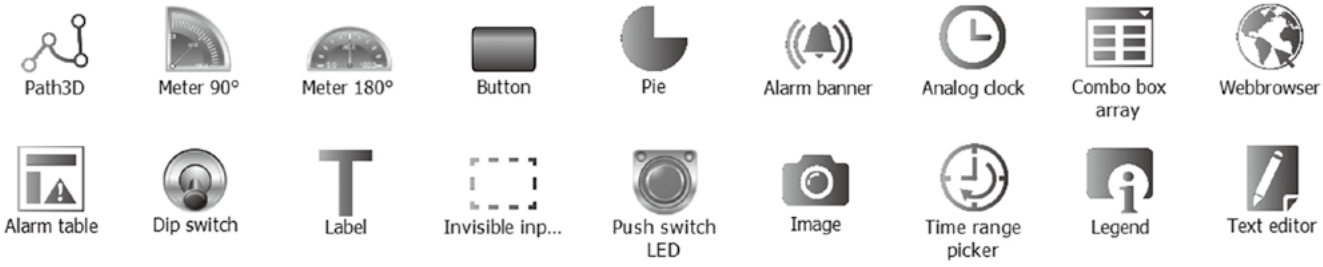


Function Modules for Edge Control Solution



Visualization Solution

Advantech CODESYS has an abundance of man-machine interface controls which can quickly plot the required interactive interface. The interface supports local VGA/HDMI and web-page displays, which can help engineers connect and use monitors; or they can log in remotely via Ethernet.



Advantages of Edge Control

Reuse

One piece of software supports multiple platforms, maintains software technical processing, selects hardware according to equipment needs, and quickly realizes smart equipment and production line flexibility.

Efficient

Higher interaction cycles, improved device performance for more axes and cameras, and increased number of "hands" and "eyes" on each device.

Reliable

All screws are fastened securely, and there are no rotating moving parts, making the hardware more solid state and stable. It uses a split-core, split-system architecture, and the software is more reliable.

Integration

Supports PLC programming language and real-time operating environment opens up data interaction with cloud services, database, and other informatization platforms. Edge controller realizes the integration of IT and OT.

Advantech Edge Controller Series





SoftLogic	Embedded	Modular		HMI	
Model	ESRP-SCS-U1372	ESRP-SCS-W5580	CDS-APAX5580	ESRP-SCS-T1251-CN	ESRP-SCS-T1551-CN
Operating System	Microsoft Windows Embedded 7(32bit/64bit)/ Win10 LTSC		Microsoft Windows Embedded 7(32bit/64bit)	Microsoft® WES7 (32/64-bit), Windows 7 (32/64-bit), Windows 10 Enterprise LTSB ((Default))	
Software	CODESYS V3.5 Control RTE/Softmotion/CNC	CODESYS V3.5 Control RTE/Softmotion/ MotionNavi NCI/CNC	CODESYS V3.5 Control RTE/Softmotion/CNC	CODESYS V3.5 Control RTE/Softmotion/CNC	CODESYS V3.5 Control RTE/Softmotion/CNC
Processor	Intel® Celeron® J1900 (2 GHz)	Intel® Celeron 3955U 2.0GHz Skylake Dual Core, 2MB L2 Intel® Core™ i5-6300U 2.4GHz Skylake Dual Core, 3MB L2 Intel® Core™ i7-6600U 2.6GHz Skylake Dual Core, 4MB L2	Intel® Core™ i7-4650U ULT 1.7GHz Haswell Dual Core,4MB L2 Intel® Core™ i3-4010U ULT 1.7GHz Haswell Dual Core,3MB L2 Intel® Celeron 2980U ULT 1.6GHz Haswell Dual Core, 2MB L2	Intel® Atom™ E3827 1.75 GHz dual-core processor	Intel® Atom™ E3827 1.75 GHz dual-core processor
Memory	4GB DDR3L	DDR4 Celeron: 4GBx1 i5/i7: 4GBx2	DDR4 Celeron: 4GBx1 i3/i7: 4GBx2	4 GB (8 GB optional) DDR3L 1600 MHz SODIMM SDRAM	1 x SODIMM with 4 GB DDR3L SDRAM (Max. support 8GB)
Retentive Memory	2 MB MRAM	2 MB MRAM	2 MB MRAM	2 MB MRAM	2 MB MRAM
Display	1 x HDMI, supports 1920x1080 @ 60Hz 1 x DP, supports 2560x1440 @ 60Hz	1 x VGA, supports up to 1920 x 1200 @ 60 Hz 24 bpp 1 x HDMI, supports up to 4096 x 2160 @ 24Hz 24bpp	1 x VGA, supports up to 1920 x 1200 @ 60 Hz 24 bpp	Industrial-grade 15" XGA TFT LCD with 50K lifetime LED backlight and resistive touch screen	Industrial-grade 15" XGA TFT LCD with 50K lifetime LED backlight and resistive touch screen
Storage	1 x mSATA (Standard 128G SSD)	1x SATA M.2 SSD slot (2280 M-Key) (optional)	1x mSATA, 1 x SD, 1x SD (for OS backup)	1 x CFast, 1 x 2.5" SATA SSD (Standard 128G SSD)	1 x CFast, 1 x 2.5" SATA SSD (Standard 128G SSD)
Expansion	2 x Full-size mPCIe	AMAX-5400 (PCIe, left side) AMAX-5000 (EtherCAT, right side)	APAX-5402L + APAX-5002 x n, 2x APAX-5400 (PCIe) + APAX-5000 x32 (max)	1 x Full-size mPCIe	1 x Full-size mPCIe
Ethernet	2*RJ45, 10/100/1000Mbps BASE-T (LAN A/B:Intel i210)	2×RJ45, 10/100/1000 Mbps (2 x Intel® i210)	2 x RJ45, 10/100/1000 Mbps IEEE 802.3u 1000Base-T Fast Ethernet	1*RJ45, 10/100/1000BASE-T x 2	1*RJ45, 10/100/1000BASE-T x 2
I/O	4 x RS-232/422/485, 1 x DB9, 3 x USB 2.0, 1 x USB 3.0, 4 x DI/O	2×RS-232/422/484,DB9 50~115.2kbps, 4×USB3.0, 1× internal USB	1 x RS-232/422/485, DB9, 50~115.2kbps 4 x USB Ports (2 x USB 2.0, 2 x USB 3.0 compliant), 1 x internal USB	1 x RS-232 1 x RS-232/422/485 1 x USB 3.0 1 x USB 2.0	1 x RS-232 1 x RS-232/422/485 1 x USB 3.0 1 x USB 2.0
iDoor Expansion	1 x iDoor	N/A	2 x iDoor	1 x iDoor	1 x iDoor
Installation	DIN-rail mount	DIN-rail mount	DIN-rail mount	Desktop, Wall or Panel Mount	
Power Input	10~36VDC	24VDC±20%	24 VDC ± 20%	24 VDC ± 20%	24 VDC ± 20%
Working Temperature	-20~60°C (-4~140°F)	- 20 ~ 60°C (-4 ~ 140°F) @ 5 ~ 85% RH with 0.7m/s airflow	10~60°C(-4~140°F) @ 5~85% RH with 0.7m/s airflow	-20 ~ 60 °C (-4 ~ 140 °F)	-20 ~ 60 °C (-4 ~ 140 °F)
Storage Temperature	-40~85°C (-40~185°F)	-40~85°C (-40~185°F)	-40 ~ 85°C (-40 ~ 185°F)	-30 ~ 70 °C (-22 ~ 158 °F)	-30 ~ 70 °C (-22 ~ 158 °F)
Dimension (WxDxH)	65 x 105 x 150mm (2.55"×4.13"×5.90")	139 x 100 x 80 mm	117 x 148.5 x 106 mm	311.80 x 238 x 57.2 mm (12.28 x 9.37 x 2.25 in)	383.20 x 307.30 x 61.10 mm (15.09 x 12.10 x 2.41in)
Certifications	CE，FCC，Class A，UL，CCC，BSMI	CE,FCC,UL	CE, FCC, UL	BSMI, CCC, CE, FCC Class A, UL	BSMI, CCC, CE, FCC Class A, UL

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AMAX-4800 Series Selection Guide

Digital I/O





Model		AMAX-4830-AE	AMAX-4830SO-AE	AMAX-4833-AE	AMAX-4834-AE	AMAX-4856-AE
Description		16-ch DI / 16-ch DO module (Sink)	16-ch DI / 16-ch DO module (Source)	32-ch DI module	32-ch DO module (Sink)	32-ch DI / 32-ch DO module (Sink)
Digital Input/ Output	Input Channels	16-ch.		32-ch.	-	32-ch.
	Output Channels	16-ch.		-	32-ch.	32-ch.
	Digital Input	Input Voltage: Logic 0: 3VDC max. Logic 1: 10~30 VDC		Input Voltage: Logic 0: 3VDC max. Logic 1: 10~30 VDC	-	Input Voltage: Logic 0: 3VDC max. Logic 1: 10~30 VDC
	Digital Output	Load voltage: 5 ~ 40 VDC Load current: 350mA/ch (sink) @25°C 250mA/ch (sink) @60°C Opto-isolator Response Time: 100us		-	Load voltage: 5 ~ 40 VDC Load current: 350mA/ch (sink) @25°C 250mA/ch (sink) @60°C Opto-isolator Response Time: 100us	
LED Indicator		PWR, RUN, ERROR				
Interface		100Mbps EtherCAT				
Power Consumption		Typical 85mA @24V Max. 110mA @24V				Typical 85mA @24V Max. 130mA @24V
Isolation Voltage		2,500 VDC (IO)				
Operation/Storage Temperature		-20 ~ 60°C (32~140°F) / -40 ~ 70°C (-40~158°F)				
Operating/Storage Humidity		5 ~ 95% RH (non-condensing)				
Certification		CE, FCC class A				

Digital Input + Relay Output




Model		AMAX-4850-AE	AMAX-4860-AE	AMAX-4855-AE	AMAX-4862-AE
Description		16-ch DI / 8-ch PhotoMOS module	8-ch DI & 8-ch Relay module	32-ch DI / 16-ch PhotoMOS module	16-ch DI / 16-ch Relay module
Digital Input/ Relay Output	Input Channels	16-ch.	8-ch.	32-ch.	16-ch.
	PhotoMOS Relay Channels	8-ch.	-	16-ch.	-
	Relay Channels	-	8-ch.	-	16-ch.
	Digital Input	Input Voltage: Logic 0: 3VDC max. Logic 1: 10~30 VDC			
	Relay Output	Relay type: PhotoMOS SPST(Form A) Load Voltage: 60V (AC peak or DC) Load current: 1.2A Peak load current: 4A @100ms(1 pulse) Isolation protection: 1,500VDC Turn-on time: 1 ms typical Turn-off tim:e 0.6 ms typical	Relay Type: Form A Contact Rating (resistive): 2A@250VAC, 2A@30VDC Max. Switching Power: 500VA , 60W Max. Switching Voltage: 270VAC, 125VDC Resistance: 30mΩ max. Operating Time: Max. 10ms Releasing Time: Max. 5ms Life Expectancy: Mechanical 2 x 107 ops. at no load. Electrical 3 x 104 ops. @2A/250VAC	Relay type: PhotoMOS SPST(Form A) Load Voltage: 60V (AC peak or DC) Load current: 1.2A Peak load current: 4A @100ms(1 pulse) Isolation protection 1,500 VDC Turn-on time 1 ms typical Turn-off time 0.6 ms typical	Relay Type: Form A Contact Rating (resistive): 2A@250VAC, 2A@30VDC Max. Switching Power: 500VA , 60W Max. Switching Voltage: 270VAC, 125VDC Resistance: 30mΩ max. Operating Time: Max. 10ms Releasing Time: Max. 5ms Life Expectancy: Mechanical 2 x 107 ops. at no load. Electrical 3 x 104 ops. @2A/250VAC
LED Indicator		PWR, RUN, ERROR			
Interface		100Mbps EtherCAT			
Power Consumption		Typical 85mA @24V Max. 110mA @24V		Typical 85mA @24V Max. 130mA @24V	
Isolation Voltage		1,500 VDC (PhotoMOS Relay) / 2,500 VDC (IO)			
Operation/Storage Temperature		-20 ~ 60°C (32~140°F) / -40 ~ 70°C (-40~158°F)			
Operating/Storage Humidity		5 ~ 95% RH (non-condensing)			
Certification		CE, FCC class A			

AMAX-4800 Series Selection Guide

Analog I/O

Model		AMAX-4817-AE	AMAX-4820-AE
Description		8-ch, 16-bit AI module	4-ch, 16-bit AO module
Analog Input	Channels	8-ch.	4-ch.
	Input Type	V	V, mA
	Input Impedance	120Ω	-
	Input / Output Range	0~10 V, ±10 V	Voltage: 0~5 V, 0~10 V, ±5 V, ±10 V Current: 0~20 mA, 4~20 mA
	Common-Mode Voltage Range	±275 V	-
	Resolution	16-bit with ±0.1% FSR accuracy @25°C	16-bit with ±0.1% FSR accuracy @25°C
	Sample Rate	10k sample/s (per channel)	
	Current Load Resistor	-	< 625 Ω
	Voltage Load Resistor	-	> 1 kΩ
LED Indicator		PWR, RUN, ERROR	
Interface		100Mbps EtherCAT	
Power Consumption		Typical 160 mA @24 V; Max.190 mA @24 V	
Isolation Voltage		2,500 VDC (IO)	
Operation/Storage Temperature		-20 ~ 60°C (32~140°F) / -40 ~ 70°C (-40~158°F)	
Operating/Storage HumidityHumidity		5 ~ 95% RH (non-condensing)	
Certification		CE, FCC class A	

Infrastructure

Model		AMAX-4870-AE
Description		6-port EtherCAT junction module
EtherCAT Junction	Ports	In: 1 port Out: 5 ports
	Cable	EtherCAT CAT6
LED Indicator		PWR, RUN, ERROR
Interface		100Mbps EtherCAT
Power Consumption		Typical 140 mA @24 V; Max.190 mA @24 V
Operation/Storage Temperature		-20 ~ 60°C (32~140°F) / -40 ~ 70°C (-40~158°F)
Operating/Storage Humidity		5 ~ 95% RH (non-condensing)
Certification		CE, FCC class A

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Application Story

Advantech's 3C Inspection Solution Integrates Motion Control, Machine Vision, and MES

The customer is a domestic company that specializes in AOI filter inspection algorithms, who, with the increase in market automation and intelligentization, needs a comprehensive AOI solution that includes materials storage, collection, inspection, sorting, and information which must be uploaded to a database and integrated with an MES.

Project Requirements

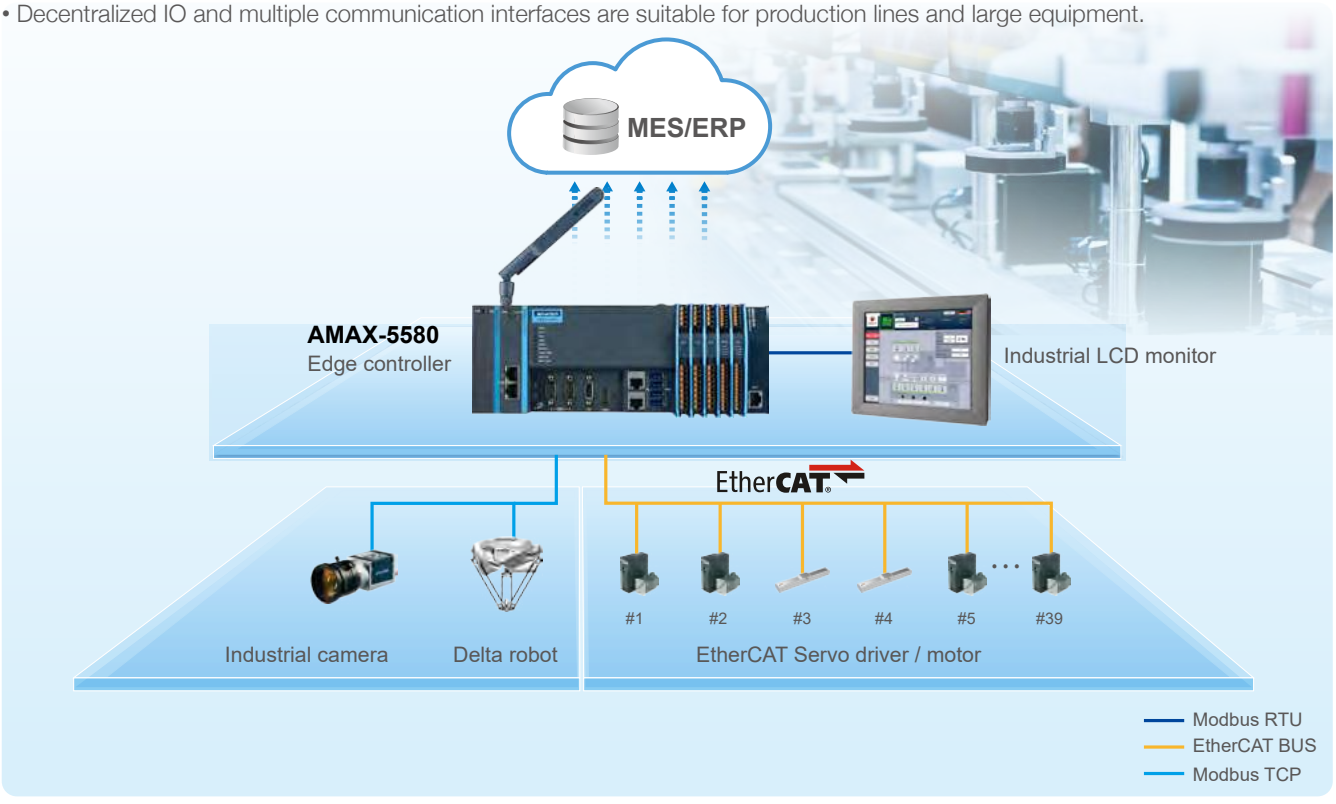
Currently, manufacturers in this market face a range of problems. Since multiple key processes such as motion control, visual inspection, and databases are involved, the realization of a filter inspection and control system requires industrial control computers and multiple PLCs. Programmers knowledgeable in two different programming languages are also necessary. Projects face delays due to due to time spent on integrating multiple systems. When there's a significant amount of communication between the controllers, it is necessary to sacrifice a portion of the equipment processing efficiency. At the same time, multiple controllers and large data transmission volumes also present hidden dangers that may reduce system stability and inspection accuracy.

System Description

- Hardware: As the main control system, AMAX-5580 controls the 39 servos and electric cylinders on site through EtherCAT, and the field sensor signals are accessed through distributed I/O;
- Software: CODESYS implements the motion control function and seamlessly connects with the C# program developed by the customer through shared memory, both of which run on the AMAX-5580;

Solution Description

- The split-core and sub-system architecture integrates the Windows core and the CODESYS real-time core while keeping each CPU independent of each other so that the Windows core does not affect the immediacy of the PLC core.
- The shared memory connects IT and OT seamlessly.
- The CODESYS programming method is flexible, making it suitable for PLC programmers and high-level language programmers. The whole system uses CODESYS and C# programming flexibly.
- Decentralized IO and multiple communication interfaces are suitable for production lines and large equipment.



Multi-station Woodworking CNC Solution

With the improvement of living standards and the awakening of the new generation's consciousness of individuality, custom furniture and full house customization is now the mainstream trend. Meeting customers' needs for custom furniture has become an important breakthrough point in the transformation of many traditional furniture manufacturers. Custom furniture for the whole house poses new challenges to production efficiency and styles. How to make custom furniture faster and more flexibly based on customer orders is a problem that equipment suppliers need to solve urgently.

Project Requirements

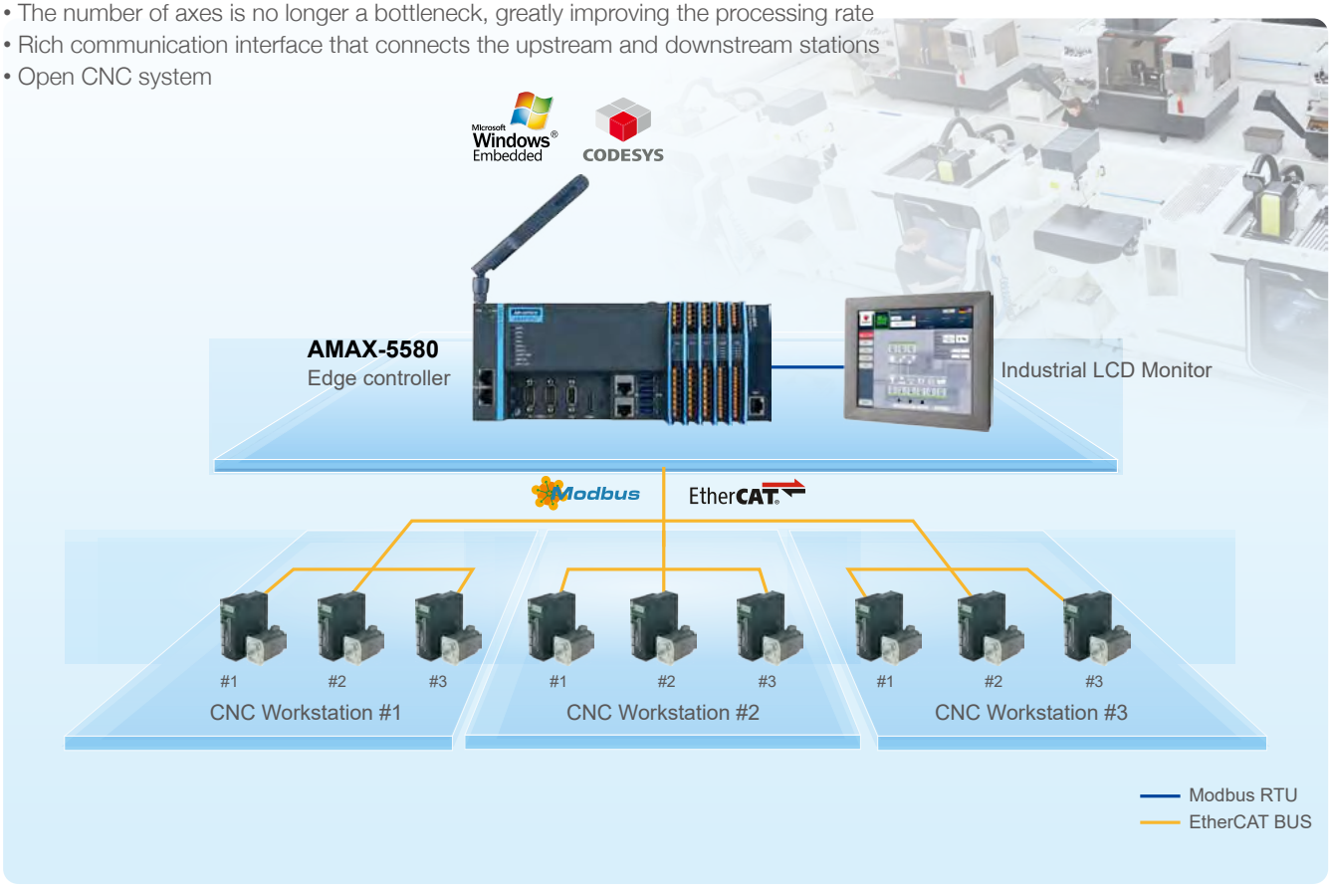
- Enhance processing rate and control costs
- Easy to connect other equipment
- High code compatibility
- Connect the database and MES to realize informatization

System Description

Advantech's edge control solution, high-performance Intel processing core, using a sub-core and sub-system structure, a set of solutions integrates the Windows7 open information environment and CODESYS real-time automation kernel to achieve multi-axis motion control, CNC processing, and database and human-machine interface features. The embedded CNC function allows customers to define M-code flexibly, supports the EtherCAT bus, breaks the bottleneck of the traditional controller's axis control, and works with Shihlin Electric's SDP EtherCAT series servo motor drivers to easily realize multi-station simultaneous processing, greatly improving equipment processing rate. Modular interface expansion allows equipment to connect upstream and downstream equipment. Advantech's CODESYS database module allows equipment to quickly connect to an MES to achieve online dispatch.

Solution Description

- Integrate IT and OT to achieve flexible manufacturing
- The number of axes is no longer a bottleneck, greatly improving the processing rate
- Rich communication interface that connects the upstream and downstream stations
- Open CNC system



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Smart Crane Solution

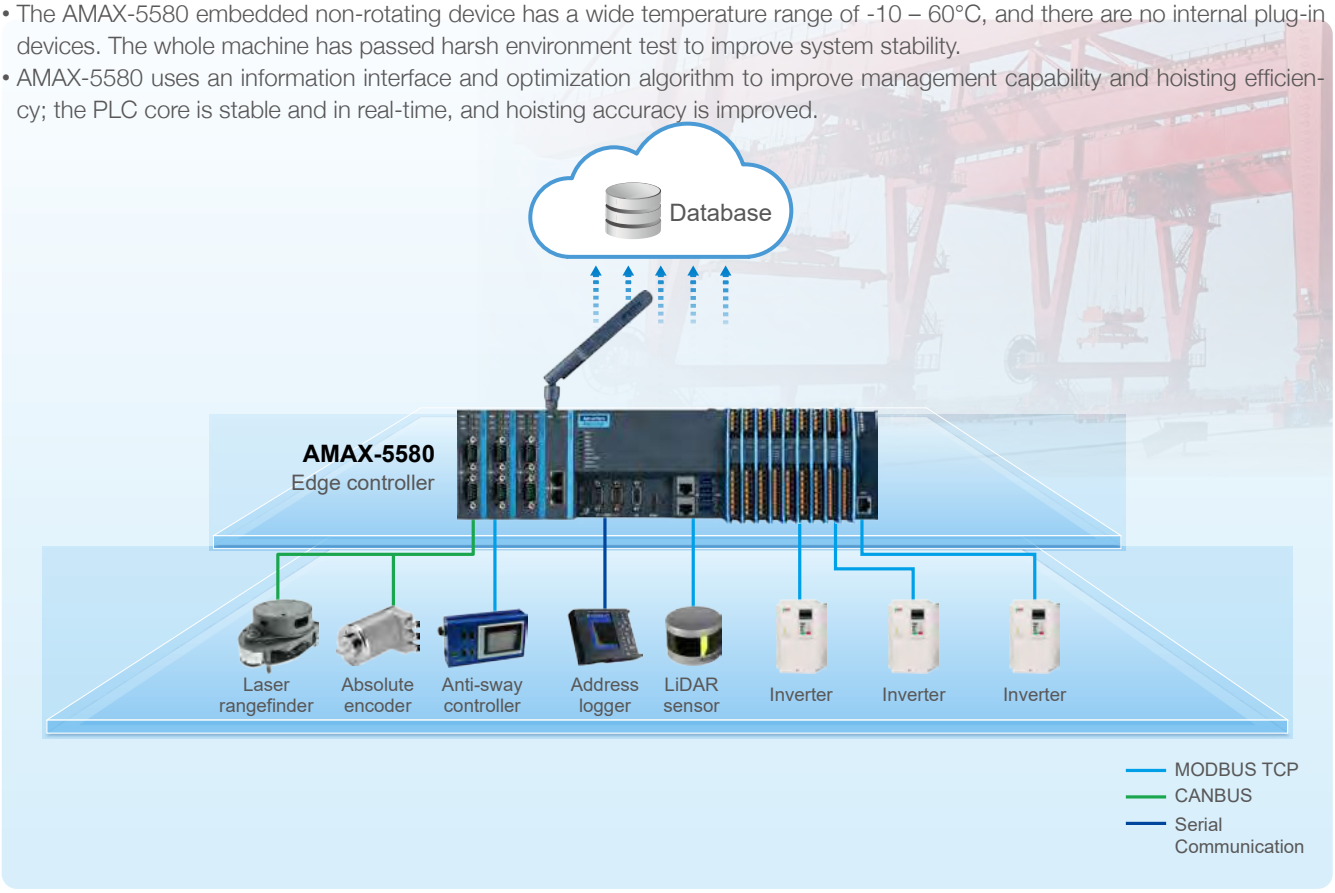
In order to improve the environment of workers and increase the accuracy and efficiency of hoisting, the traditional crane industry has gradually introduced IT technologies such as ERP and MES, combined with existing automation technologies, to achieve seamless connection between production management data and warehouse material information data, as well as to improve operations accuracy and efficiency. This has led warehouse management levels to new heights of efficiency.

Project Requirements

- Smart cranes require multiple control interface functions such as anti-sway devices, 3D scan imaging, encoders, laser rangefinders, current databases, and high-performance processors, to handle complex computations and analysis.
- The client's team has engineers with backgrounds in PLC programming and with C# programming skills and needed a platform compatible with PLCs and high-level languages.
- Traditionally, IPC+PLC solutions are used, but the on-site environmental temperature was high, and the traditional control system did not have wide-temperature operation equipment, which might have undermined the the stability of the system. The wide-temperature system was connected through a network cable and multiple nodes.
- The traditional overhead crane system needed to use a Manufacturing Execution System (MES) to improve operation efficiency and the management level, and at the same time to improve operation accuracy through automated systems.

System Description

- The Advantech AMAX-5580 is a compact and powerful control IPC and supports Modbus/CANBUS/serial port/analog and other interfaces to solve multi-component integration. Intel Core i7/i5/Celeron CPU is an ideal open control platform and features flexible I/O expansion, real-time I/O control, and support dual power input for robust power. Information is directly uploaded to the MES system by WIFI, ODBC, MQTT, and other interfaces and protocols.
- Advantech's solution supports real-time stable PLC core CODESYS and PLC programming; at the same time, the open Windows system is compatible with third-party algorithm software in high-level languages.
- The AMAX-5580 embedded non-rotating device has a wide temperature range of -10 – 60°C, and there are no internal plug-in devices. The whole machine has passed harsh environment test to improve system stability.
- AMAX-5580 uses an information interface and optimization algorithm to improve management capability and hoisting efficiency; the PLC core is stable and in real-time, and hoisting accuracy is improved.



AGV Forklift Solutions

As land and labor become more costly, enterprises are facing challenges for the development and profitability of warehousing and logistics management. Smart logistics systems are increasingly becoming the choice of large enterprises. One of the key components of an AGV (Automated Guided Vehicle) logistics systems is the stability of its control system and its connection with other key systems, which is a crucial component to the efficiency, security, and stability of the overall logistics solution.

Project Requirements

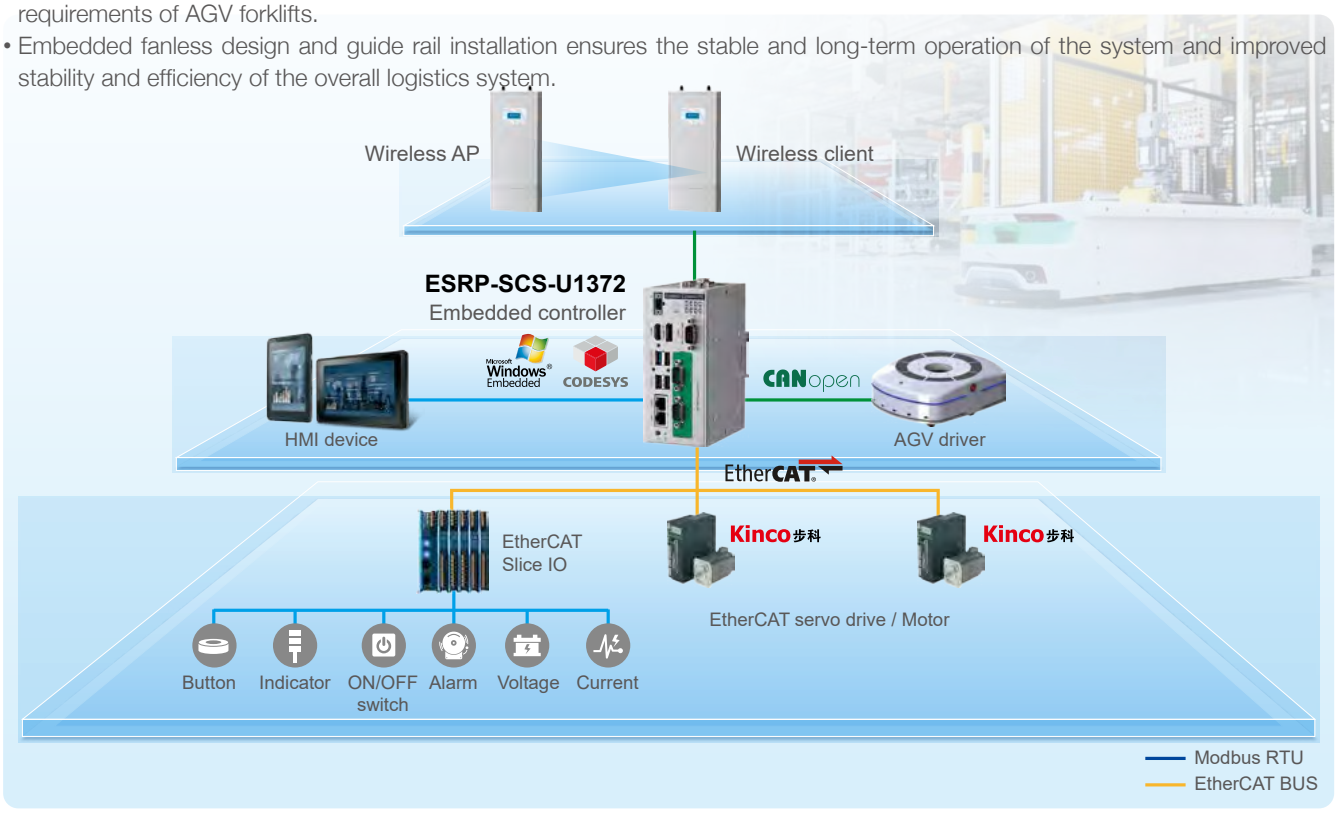
- The AGV forklift system needed EtherCAT bus to connect to the servo drives to control the extension of the forklift arm, and it also needed to support CAN bus to connect to the vehicle's power system. It also needed to connect to a wireless client through the serial port.
- The AGV system needed a powerful processing capability and an operating system for processing and computing the scheduling system path instructions, and a 3D interface display capability.
- The controller needed a compact low-voltage DC power supply and low power consumption to meet the body size and battery requirements.

System Description

- Controller: Edge controller ESRP-SCS-U1372 J1900 CPU, 4G RAM, 128G SSD, 2*CANBUS
- I/O module: AMAX-5000 EtherCAT plug-in IO module
- Control software: CODESYS V3.5
- Operating system: Windows 7 64-bit

Solution Description

- ESRP-SCS-U1372 simultaneously supports EtherCAT bus, CAN bus, Modbus TCP, and serial ports, opening up all the peripheral equipment required by AGV forklifts.
- Supports the Windows environment and soft PLC CODESYS real-time core; x86 processor can realize multiple data and display functions.
- The size of Advantech's edge control solution is only 65*105*150mm, and the power supply is 10 – 36VDC, which meets the requirements of AGV forklifts.
- Embedded fanless design and guide rail installation ensures the stable and long-term operation of the system and improved stability and efficiency of the overall logistics system.



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Smart Factory Transformation for Water Hardware Production Line

In recent years, one of the world's largest manufacturers of zinc alloy faucet components, has been actively moving towards smart manufacturing, investing NT$ 5 billion in establishing a smart factory in Taichung, Taiwan. This move allowed them to upgrade their hardware manufacturing processes and helped them to diversify their products and services. It also transformed the company from an original equipment manufacturer (OEM) to an original design manufacturing (ODM) services company.

In the process of digital transformation, they needed a control system with sufficient flexibility, not only to interface with existing controllers and robotic arms, but also to instantly feedback execution status to the management system. The limitations of the overall equipment space also affected the choice of new equipment components.

Project Requirements

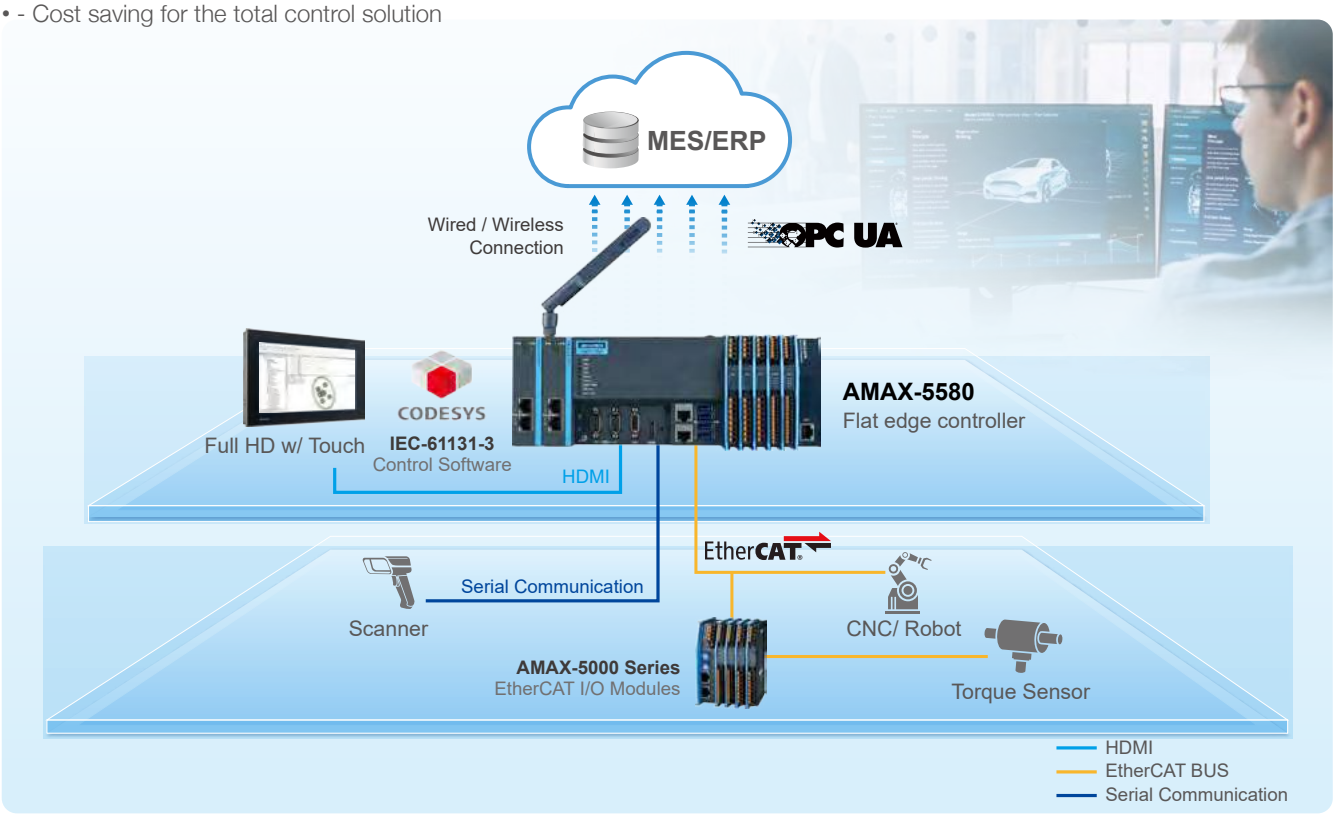
- Need a new integrated control architecture that could handle large amounts of data, with all the advantages of a PC, but also flexible I/O expansion and integration of legacy controllers.
- In the new architecture, they wanted to integrate devices and components with an open architecture.

System Description

AMAX-5580 PAC System with CODESYS Softlogic embedded was the main controller which collected all data on the status of the production line and reported back to the central controller via local HMI and web interface. CODESYS RTE—the main control software was installed in AMAX-5580 to provide a real-time control kernel that handles real-time control tasks. Advantech also provided additional value-added software components to facilitate up-stream communication.

Solution Description

- Worldwide No 1 IPC manufacturer with global support network
- Space saving, more space for other automation components
- Easy installation and maintenance
- One-stop-shopping for most of automation components
- Training for CODESYS and instant support
- - Cost saving for the total control solution



Food Packaging Solutions

With Industry 4.0 and evolving customer needs, packaging equipment manufacturers are paying more attention to small batches of equipment, customized production, and the improvement of packaging efficiency and intelligence.

Project Requirements

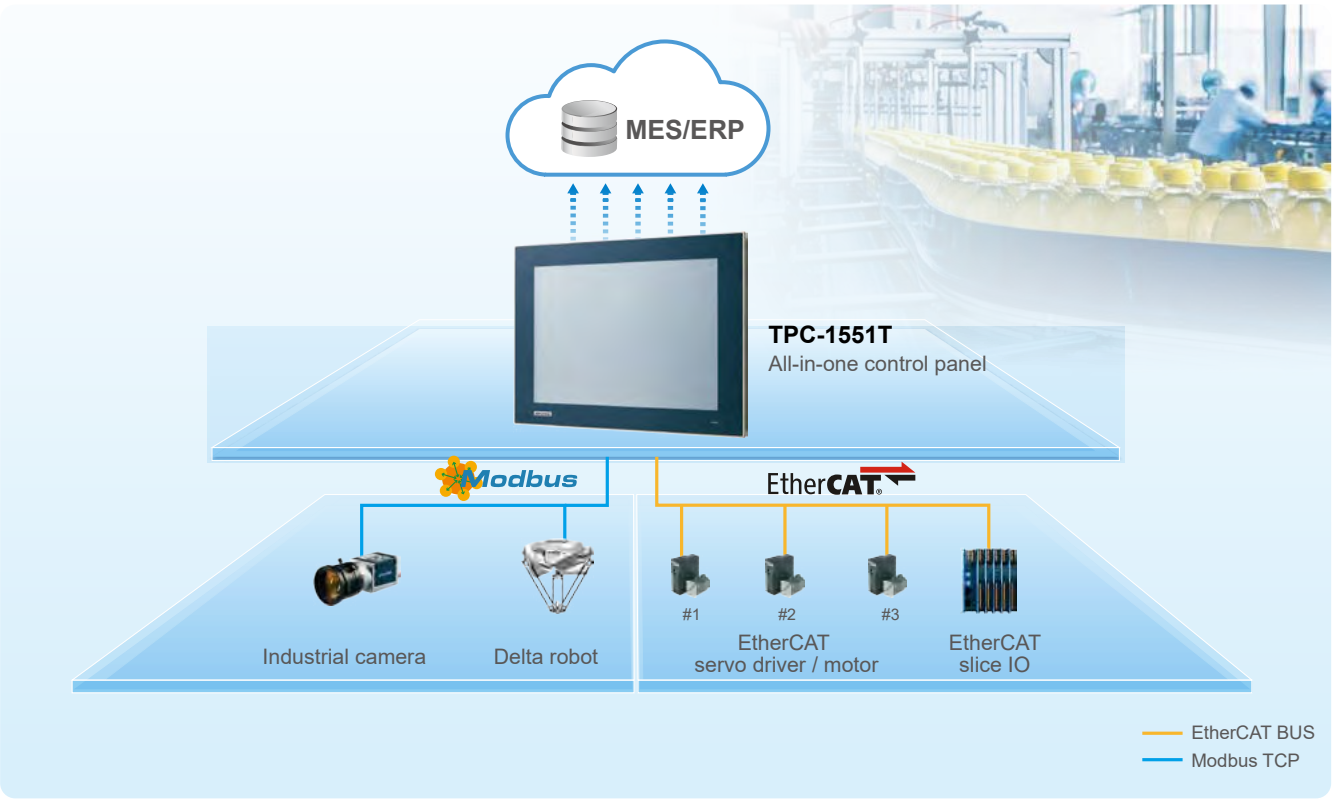
- Products require customized development, rapid line change, serial MES, ERP and cloud, and production is tailored according to market demand, avoidance of overproduction, and product traceability.
- Equipment functions are more complex, including integrating robots, machine vision equipment, distributed I/O, multi-axis control, and production efficiency; all of which needed to be improved.
- PC-based architecture is easy to maintain and can realize remote maintenance support.
- Requires IP66 protection against ingress of water and ease-of-cleaning.

System Description

- Controller: Flat Edge Controller TPC-1551
- I/O module: AMAX-5000 EtherCAT plug-in IO module
- Control software: CODESYS V3.5
- Operating system: Windows 10 64 bit
- Industrial camera: QCAM series Gige industrial camera

Solution Description

- Integrates Windows and PLC systems, supports MES, ERP system interface, allows loading of system management software and product traceability system, realizes customized processing and product traceability.
- EtherCAT bus architecture and powerful processing capabilities can realize motion control, machine vision, distributed I/O, axis control and better resource allocation, improving system productivity.
- Supports WIFI, 4G wireless communication, and Windows system remote control maintenance.
- The full IP66 dustproof and waterproof surface is easy to clean, and is more suitable for food and medical equipment scenarios.



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Factory Edge Optimization Station Solution

With the adoption of Industry 4.0, factory automation manufacturers (especially steel mills and chemical plants) are paying more and more attention to energy conservation, reduction of emissions, and personal safety in equipment production. Some smart factories need to use smart technology such as traditional PLC control systems to further optimize the energy conservation and preventive safety.

Project Requirements

- The client needed an edge control platform to be connected between the factory-side PLC and the main control room server for information sharing and optimization of energy configuration security monitoring.
- The edge control platform was required to parse a variety of software, including Python, PLC real-time algorithms, gateways, C/C# code, and human-computer interaction interfaces.
- The core system needed to be secure and reliable, and not easily hacked or cracked.
- Required support of PLC programming language, and ease of maintenance on site.

System Description

- Controller: Edge controller AMAX-5580 15 processor
- Control software: CODESYS V3.5
- Operating system: Windows7 64 bit

Solution Description

- The Advantech edge controller supports a variety of IT and OT protocols and interfaces. Factory PLCs are connected in series via fieldbuses, and OPC UA is connected to the main control room server.
- I5 high-performance processing core and the Windows open platform allow a variety of tools to run.
- The PLC control core is based on CODESYS and is secure and stable, and the PLC programming method is easy to maintain.

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