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EtherCAT Solutions and Automation Controllers

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Vertrieb durch



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ADVANTECH iAutomation

Premier Partner

EtherCAT I/O Solution and Automation Controller Overview

Introduction

EtherCAT is a high-performance field network able to connect drive devices, intelligent sensors and I/O devices using Ethernet technologies, and is now a popular fieldbus in automation. Advantech, to fulfill real-time I/O demands for smart factories and equipment manufacturers, launched EtherCAT I/O product series, AMAX-4800 and AMAX-5000. They each have different form factors, but use the same Advantech mature I/O technology and standard EtherCAT for each single IO module.

Real-time I/O for Industrial 4.0

Industrial 4.0 will create a big demand for integrating IT and OT (Operation Technology: traditional automation technology). To bridge IT and OT, data needs to be aggregated from the field site. Following current trends, the data type and data volume from the field will go through exponential growth, therefore traditional SCADA systems with standard I/O will become overwhelmed trying to handle complex and time sensitive tasks. In the meantime, Ethernet-based Real-time I/O solutions have become price-acceptable in the market.

Controllers with time-deterministic responses and low cycle-times not only provide a very good solution for the executing device, but they also reduce the huge effort required for integrators to handle all data communication.

APAX-5000 with EtherIO

APAX-5000 is the first generation of real-time I/O systems in Advantech. It has hot swappable and high density I/O features, and is a competitive solution for facility and factory monitoring applications. APAX-5000 I/O system can be attached to general embedded systems, and can easily enable an embedded system to deliver 1ms real-time capability for maximum 768 I/O points.

AMAX-4800/AMAX-5000 with EtherCAT

AMAX-4800 series is a pioneer of EtherCAT I/O in Advantech. It features high volume I/O with good C/P ratio and user friendly designs. If a customer faces the challenge of limited space, AMAX-5000 series offers flexibility for future I/O expansion. It has an EtherCAT modularized slice I/O architecture in a very compact and slim form factor. And the easy slide-in design reserves space for extra expansion capability for future customer demands.

AMAX-5580, Controller IPC with EtherCAT Slice I/O Expansion

The trend in IPC is for smaller and more powerful applications. AMAX-5580 is an IPC designed for automation users. Its fanless design provides high reliability and its compact size facilitates installation in space limited cabinets. Its front-accessible design provides easy for installation and maintenance. AMAX-5580 is not only reliable and user friendly, but it also enhances I/O scalability. It offers I/O expansion through its EtherCAT slice I/O interface on the right hand side. One the other side, it can be expanded for GigE / PoE / USB 3.0 / Serial / CAN / Wireless interfaces. Its high flexibility makes it a perfect embedded automation platform that can fulfill most of requirements for smart factory solutions.

Advantech CODESYS

CODESYS is a well-known control software based on the international standard IEC-61131-3 softlogic. Through the embedded CODESYS RTE, Advantech IPC have the capability to handle EtherCAT real-time I/O, provide PLC-like logic control, and offer HMI in the factory or remote site. Advantech supports all kinds of CODESYS runtimes, including RTE, SoftMotion, and CNC/Robotics, which are based on the Windows Embedded 7/10 OS. To bridge IT and OT, Advantech has also developed many plugin packages, including the WISE-EdgeLink support, ODBC Database Direct Connection, MQTT, and Data Connect for 3rd party integration or customer interface development.

These functions help establish upstream communication and assist easy Industry 4.0 application development.

AMAX-5580 Controller IPC

- Intel 6th Generation CORE i CPU, i7/ i5/ Celeron
- DDR4 4G/8G Memory (Max capability 32G)
- Internal expansion slot for PCIe-mini card / M.2 / USB 2.0
- HDMI + VGA Dual Display
- 4 x USB3.0, 2 x GbE, 2 x RS-232/422/485
- Windows Embedded 7/10 Support
- Dual Power Input and Hardware monitoring
- CE/FCC/UL Certification



Advantech CODESYS Softlogic

- Follows IEC-61131-3 / PLCopen International Standard
- Supports RTE / Softmotion and CNC/Robotics
- CNC G-Code & M-Code Support
- Target Visualization and Web Visualization for HMI on near site and remote site
- ODBC Database Direct Connection
- Fieldbus Support : EtherCAT Master, CANopen, Ethernet/IP Master, Profinet Master
- Upstream Communication : Modbus / OPC DA / OPC UA / MQTT
- API/SDK for Development : Data Connect



AMAX-5400 PCIe Expansion Module

- Supports Max 4 slots, and support PCIe4 for first slot
- Auto Board ID configuration for software identification
- Full-bandwidth USB3.0 for vision application
- Multiple interface : USB3.0, PoE /GigE, RS-232/422/485, CAN, Wireless
- AMAX-5400E with PCI-mini +SIM card slot for cellular Networking

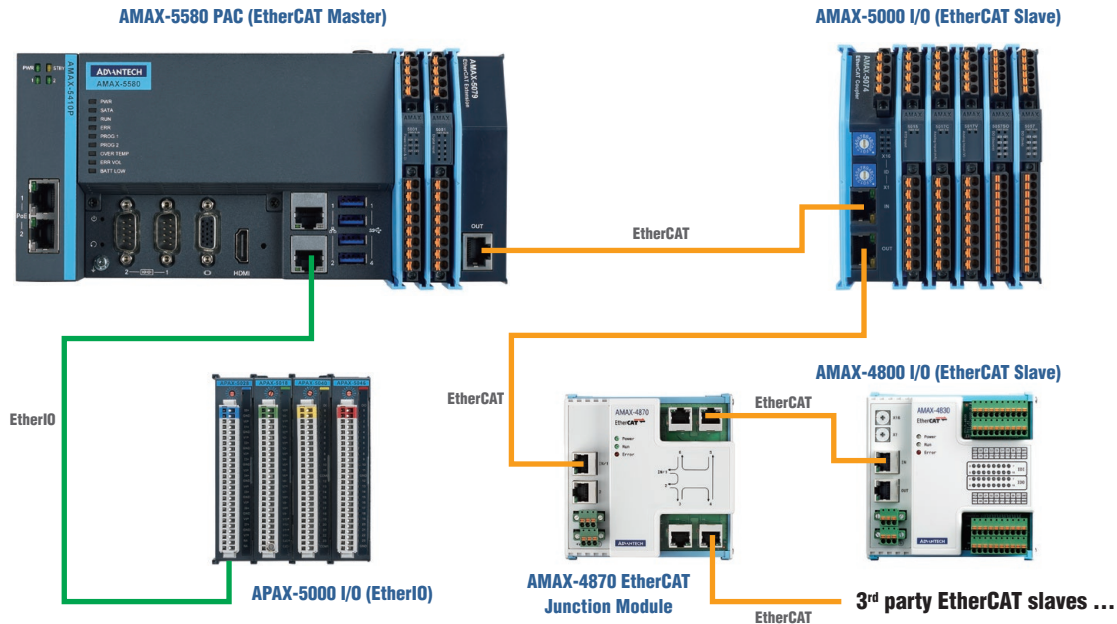


AMAX-5000 EtherCAT Slice I/O Module

- Standard EtherCAT slave
- Compact design and easy for slide-in
- Removable push-in terminal
- Supports centralized and decentralized I/O topology
- Supports multi-range for one module
- Sample rate 100S/s per channel for Analogue Input
- LED indicator for status check
- Wide operation temperature from -25~60 °C



APAX-5000 System



AMAX-5580 series:



EtherCAT Master Controller

- **AMAX-5580** Intel® Core™ i7/i5/Celeron® Control IPC (Selectable CODESYS ready solution)

AMAX-5000 series:



EtherCAT Slave I/O

- **AMAX-5001** EtherCAT power module
- **AMAX-501X** EtherCAT AI module
- **AMAX-502X** EtherCAT AO module
- **AMAX-505X** EtherCAT DIO module
- **AMAX-508X** EtherCAT counter /encoder module
- **AMAX-5074** EtherCAT coupler module
- **AMAX-5079** EtherCAT extension module



AMAX-4800 series:



EtherCAT Slave I/O

- **AMAX-4870** EtherCAT junction module
- **AMAX-486X** EtherCAT relay output module
- **AMAX-481x** EtherCAT AI module
- **AMAX-482x** EtherCAT AO module
- **AMAX-483x** EtherCAT DIO module
- **AMAX-485x** EtherCAT DIO module

APAX-5000 series:



I/O Backplane

- **APAX-5001** 1-slot backplane module
- **APAX-5002** 2-slot backplane module

AMAX-5400 series:



PCIe Expansion module for AMAX-5580 controller

- **AMAX-5400E** PCIe mini card expansion module



- **AMAX-5410** GigE vision frame grabber module
- **AMAX-5410P** PoE vision frame grabber module



- **AMAX-5424V** USB3.0 module



- **AMAX-5490** RS-232/422/485 communication module
- **AMAX-5495** CAN Port Module



Analog I/O Modules

- **APAX-501X** Analog input modules
- **APAX-502X** Analog output modules



Digital I/O Modules

- **APAX-504X** Digital IO modules
- **APAX-5060** Relay output modules
- **APAX-5080** Counter modules



Remote Serial Modules

- **APAX-5090** 4-port RS-232/422/485 virtual COM with APAX bus (EtherIO)

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- 4 Machine Vision Solutions
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- 6 Automation Computers
- 7 D4Q and Communication Gateways
- 8 Industrial Communication
- 9 Remote I/O, Wireless Sensing Modules and Converters
- 10 Intelligent Motion Control Solutions
- 11 EtherCAT Solutions and Automation Controllers
- 12 Industrial I/O Solutions
- 13 Intelligent Transportation Platforms
- 14 Utility and Energy Solutions

EtherCAT Edge Controllers

AMAX-5580 Controller



APAX-5580 Controller



Model		AMAX-5580	APAX-5580
Description (English)		Intel® Core™ i7/i5/Celeron® Control IPC With EtherCAT Slice IO Expansion	Intel® Core™ i7/i5/Celeron® Control IPC With EtherIO Expansion
General	Certification	CE, FCC, UL	CE, FCC, UL
	Dimensions (W x H x D)	139 x 100 x 80 mm	128 x 106 x 110 mm
	Form Factor	Passive Cooling and Front Accessible	Passive Cooling and Front Accessible
	Power Requirement	24 V _{DC} ± 20%, Dual Power Input with Alarm output	24 V _{DC} ± 20%, Dual Power Input with Alarm output
	Power Consumption	15 W (Typical), 42 W (Max)	28 W (Typical), 72 W (Max)
	OS Support	Microsoft Windows 7 32/64 bit Microsoft Windows 10 64 bit	Microsoft Windows 7 32/64 bit Microsoft Windows 10 64 bit Linux Kernel 3.X
System Hardware	BIOS	AMI EFI 128Mbit Flash BIOS	AMI EFI 128Mbit Flash BIOS
	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	Intel® Core™ i7-4650U ULT 1.7GHz Haswell Dual Core, 4 MB L2 Intel® Core™ i3-4010U ULT 1.7GHz Haswell Dual Core, 3 MB L2 Intel® Celeron 2980U ULT 1.6GHz Haswell Dual Core, 2 MB L2
	Memory	Build in 4G for Celeron, 8G for Core i5/i7	Build in 4 GB for Celeron/i3, 8GB for i7
	Retentive Memory	2M MRAM (Option)	2M MRAM (Option)
	Ethernet	Intel® i210-IT GbE, 802.1Qav, IEEE1588/802.1AS, 802.3az	Intel® i210-IT GbE, 802.1Qav, IEEE1588/802.1AS, 802.3az
	Storage	1x M.2, 2280 M-Key	1 x mSATA, 1 x SD, 1 x SD (for OS backup)
	Expansion	AMAX-5400 (PCIe, left side), AMAX-5000 (EtherCAT, right side)	APAX-5402L + APAX-5002 X n, 2x APAX-5400 (PCIe) + APAX-5000 x 32 (max)
I/O Interfaces	Serial Ports	2 x RS-232/422/485, DB9, 50 ~ 115.2kbps	1 x RS-232/422/485, DB9, 50 ~ 115.2 kbps
	LAN Ports	2 x RJ45, 10/100/1000 Mbps IEEE 802.3u 1000BASE-T Fast Ethernet	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	4 x USB ports (2 x USB 2.0, 2 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	1 x VGA, supports 1920 X 1080 @ 60 Hz 24 bpp
	Grounding Protection	Chassis grounding	Chassis grounding
Environment	Operating Temperature	-10 ~ 60°C (14 ~ 140°F) @ 5 ~ 85% RH with 0.7m/s airflow	-10 ~ 60°C (14 ~ 140°F) @ 5 ~ 85% RH with 0.7m/s airflow
	Storage Temperature	-40 ~ 85°C (-40 ~ 185°F)	-40 ~ 85°C (-40 ~ 185°F)
	Relative Humidity	10 ~ 95% RH @ 40°C, non-condensing	10 ~ 95% RH @ 40°C, non-condensing
	Shock Protection	Operating, IEC 60068-2-27, 10G, half sine, 11 ms	Operating, IEC 60068-2-27, 50g, half sine, 11 ms
	Vibration Protection	Operating, IEC 60068-2-64, 1 Grms, random, 5 ~ 500 Hz, 1hr/axis (M.2)	Operating, IEC 60068-2-64, 2grms, random, 5 ~ 500 Hz, 1 hr/axis (mSATA)
CODESYS Softlogic	Runtime Support	Pure Logic Control (RTE), P2P Motion (RTE + Softmotion) Advanced Motion (RTE + Softmotion + CNC/Robotics)	
	Visualization (HMI) Option	Target Visualization (VGA or HDMI) Web Visualization (Web Browser)	
	Fieldbus Support	EtherCAT Master MODBUS/RTU Master (Client) MODBUS/TCP Master (Client) and Slave PROFINET Master ETHERNET/IP Master CANopen	
	Advantech Value-added Function	Advantech Direct Database connection (FBD) OPC/DA & OPC/UA Server (supported after SP13) PLCHandle Driver for WebAccess Advantech MQTT Agent Advantech Data Connect (API)	

EtherCAT Edge Controllers- PCIe Expansion Modules

PCIe Module



Model	AMAX-5400E	AMAX-5410	AMAX-5410P
Description (English)	PCIe mini card expansion module	2-port GigE vision frame grabber module	2-port PoE vision frame grabber 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 V _{DC} 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 V _{DC} direct from AMAX-5000 controller Output PoE: Power 48 V _{DC} PoE Power output, 15.4W per port, total Max. 20W
LED Indicator	PWR, Standby		
Enclosure	Aluminum housing		
Interface	PCIe x1		
Power Consumption	0.5W@24V _{DC}	2.5W@24V _{DC}	
Isolation Voltage	2,500 V _{DC}		
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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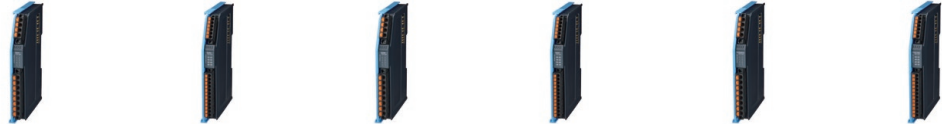


Model	AMAX-5424V	AMAX-5490	AMAX-5495
Description (English)	4-port USB3.0 vision frame grabber module	2-port Isolated RS-232/422/485 communication module	2-port CAN module
Communication	USB 3.0 Host Bus: 4-lane Gen 2.0 PCIe interface, compliant with PCI Express Base Specification, Revision 2.0 Controller: 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 x4 (1st. slot on the left side of AMAX-5580)	PCIe x1	
Power Consumption	2.5W@24V _{DC}	2W@24V _{DC}	3W@24V _{DC}
Isolation Voltage	2,500 V _{DC}		
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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EtherCAT Slice I/O Modules

Digital I/O



Model		AMAX-5051	AMAX-5052	AMAX-5056	AMAX-5057	AMAX-5056SO	AMAX-5057SO
Description (English)		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		Rated Voltage 10~30 V _{DC}		Rated Voltage 10~30 V _{DC}	
		Wet Contact Rated voltage: 24V _{DC} Logic level 1: 10~30 V _{DC} and -10~-30 V _{DC} Logic level 0: -3~3 V _{DC}		Rated Current Output Logic level 1: 0.3 A per channel Logic level 0: 25 µA per channel (leakage current)		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@24V _{DC}			2.5W@24V _{DC}		2W@24V _{DC}	2.5W@24V _{DC}
Isolation Voltage	2,000 V _{DC}						
Watchdog Timer	System (1.6 seconds)						
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 w/ Timestamp

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Model		AMAX-5051T		AMAX-5056T	
Description (English)		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 V _{DC} Logic level 0: -3~5 V _{DC} (similar to EN 61131-2, type 3)		Dry Contact: Logic level 1: Close GND Logic level 0: Open	Rated Voltage 10~30 V _{DC}
		Wet Contact: Logic level 1: 11~30 V _{DC} Logic level 0: -3~5 V _{DC} (similar to EN 61131-2, type 3)		Wet Contact: Logic level 1: 11~30 V _{DC} Logic level 0: -3~5 V _{DC} (similar to EN 61131-2, type 3)	Rated Current Output: Logic level 1: 0.3A per channel Logic level 0: 25 µA per channel (leakage current)
	Input / Output Delay	< 0.5us		< 10us	<0.5us
Resolution Timestamp	1ns		N/A	1ns	
DI Latch / DO Sync	First Edge & Last 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	2,000 V _{DC}				
Watchdog Timer	System (1.6 seconds)				
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				

Analog I/O

Preliminary



Model		AMAX-5017C	AMAX-5017V	AMAX-5017H	AMAX-5024
Description (English)		6-Ch Current AI Module	6-Ch Voltage AI, multi-gain,	4-Ch High speed AI module	4-Ch AO multi-gain, 16-bit
Analog Input	Channels	6-ch.	16-bit 6-ch.	4-ch.	4-ch.
	Input Type	mA	V, mV	V, mA	V, mV, mA
	Input Impedance	120Ω	>10M Ω	Differential 800 kΩ, Common-mode 200 kΩ for voltage input Differential 500 Ω, Common-mode 200 kΩ for current input	-
	Input / Output Range	±20 mA, 0 ~ 20 mA, 4 ~ 20 mA	±150 mV, ±500 mV, ±1V, ±5 V, ±10 V	±10 V, 0~20mA	0~5V, 0~10V, ±5V, ±10V, 4~20mA, 0~20mA
	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	16-bit with ±0.01% FSR accuracy @25°C
	Sample Rate	100 sample/s (per channel)		10k sample/s (per channel)	-
	Burn-out detection	✓	-	-	-
	Slew Rate	-	-	-	Configurable
	Drift	-	-	-	± 50 ppm/°C
	Current Load Resistor Voltage Load Resistor	-	-	-	Max. 500 Ω Min. 1KΩ
LED Indicator Interface		Pwr, Run, Error 100Mbps EtherCAT			
Power Consumption		2W@24V _{DC}		2.5W@24V _{DC}	3.5W@24V _{DC}
Isolation Voltage		2,000 V _{DC}			
Watchdog Timer		System (1.6 seconds)			
Operation/Storage Temperature		-25 ~ 60°C (-14~140°F) / -40 ~ 85°C (-40~185°F)			
Operating/Storage Humidity Certification		5 ~ 95% RH (non-condensing) CE, FCC class A			

Temperature Module



Model		AMAX-5015	AMAX-5018	
Description (English)		4-Ch RTD (2/3 wire)	6-Ch Thermocouple (Open detect)	
Analog Input	Channels	4-ch.	6-ch.	
	Input Type	RTD: 2 or 3 wire	mV, V, T/C: J, K, T, E, R, S, B	
	Input Impedance	-	>2MΩ	
	Voltage Range	-	±50 mV, ±100 mV, ±500 mV, ±1 V, ±2.5 V	
	Temperature Range	Pt 100 RTD: Pt -50°C to 150°C Pt 0°C to 100°C Pt 0°C to 200°C Pt 0°C to 400°C Pt -200°C to 200°C IEC RTD 100 ohms (a = 0.00385) JIS RTD 100 ohms (a = 0.00392) Pt 1000 RTD -40°C to 160°C Balco 500 RTD -30°C to 120°C Ni 518 RTD -80°C to 100°C 0°C to 100°C	Type J (-210 ~ 1200° C) Type K (-270 ~ 1372° C) Type T (-270 ~ 400° C) Type E (-270 ~ 1000° C) Type R (0 ~ 1768° C) Type S (0 ~ 1768° C) Type B (300 ~ 1820° C)	
	Resolution	16 bit with ±0.1% FSR accuracy		
	Sample Rate	100 sample/s (per channel)		
	Burn-out detection	Yes	-	
	LED Indicator Interface		Pwr, Run, Error 100Mbps EtherCAT	
	Power Consumption		2W@24V _{DC}	2,000 V _{DC}
Isolation Voltage		2,000 V _{DC}		
Watchdog Timer		System (1.6 seconds), Communication (Programmable)		
Operation/Storage Temperature		-25 ~ 60°C (-14~140°F) / -40 ~ 85°C (-40~185°F)		
Operating/Storage Humidity Certification		5 ~ 95% RH (non-condensing) CE, FCC class A		

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EtherCAT Slice I/O Modules

Encoder / Counder Module

Preliminary



Model		AMAX-5080	AMAX-5081
Description (English)		2-Ch Counter/Encoder 32-bit	1-Ch TTL/RS-422 Encoder/Counter
Encoder / Counder Input	Channels	2-ch.	1-ch.
	Counting Range	32-bits	32-bits
	Counter Mode	- up/down - bi-direction - up - A/B phase - Quadrature mode - Frequency measurement	- Event counting - Frequency measurement - Pulse width measurement - PWM output - PSO (Position Synchronized Output) - Quadrature mode
	Signal Input	Logic level 0: 0~5V _{DC} Logic level 1: 11~30V	Single-ended 5V RS-422 differential
	Sample Rate	1 MHz * 4	10MHz * 4
Preload FIFO Size		-	1024 (Absolute count or relative count)
LED Indicator		Pwr, Run, Error, A+, A-, B+, B-, Z+, Z-, L+, L-	
Interface		100Mbps EtherCAT	
Power Consumption		2W@24V _{DC}	
Isolation Voltage		2,000 V _{DC}	
Watchdog Timer		System (1.6 seconds), Communication (Programmable)	
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	

Infrastructure



Model		AMAX-5001	AMAX-5074	AMAX-5079
Description (English)		Power input modue w/ 4-ch. DI	EtherCAT coupler w/ power input	EtherCAT extension module
Power Input	Rated Voltage	24V _{DC} (± 20%)	-	-
	Dual Power Input	Supported	-	-
	Max Current on Bus	2A	-	-
	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: 24V _{DC} Logic level 1: 10~30 V _{DC} and -10~-30 V _{DC} Logic level 0: -3~3 V _{DC}	-	-
	Input Delay	From logic level 0 to 1: 4ms From logic level 1 to 0: 4ms	-	-
	Digital Filter	3ms	-	-
EtherCAT Coupler / Extension	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, Power Diagnosis LED		
Interface		100Mbps EtherCAT		
Power Consumption		2W@24VDC	2.5W@24V _{DC}	No power from bus
Isolation Voltage		2,000 V _{DC}		
Watchdog Timer		System (1.6 seconds)		
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		

EtherCAT I/O Modules

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: 3V _{DC} max. Logic 1: 10~30 V _{DC}		Input Voltage: Logic 0: 3V _{DC} max. Logic 1: 10~30 V _{DC}	-	Input Voltage: Logic 0: 3V _{DC} max. Logic 1: 10~30 V _{DC}
	Digital Output	Load voltage: 5 ~ 40 V _{DC} Load current: 350mA/ch (sink) @ 25°C 250mA/ch (sink) @ 60°C Opto-isolator Response Time: 100us	Load voltage: 5 ~ 40 V _{DC} Load current: 250mA/ch (sink) @ 25°C 200mA/ch (sink) @ 60°C Opto-isolator Response Time: 100us	-	Load voltage: 5 ~ 40 V _{DC} Load current: 350mA/ch (sink) @ 25°C 250mA/ch (sink) @ 60°C Opto-isolator Response Time: 100us	Load voltage: 5 ~ 40 V _{DC} 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 V _{DC} (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				

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 V _{DC} (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	

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- 7 DAO and Communication Gateways
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- 9 Remote I/O, Wireless Sensing Modules and Converters
- 10 Intelligent Motion Control Solutions
- 11 EtherCAT Solutions and Automation Controllers
- 12 Industrial I/O Solutions
- 13 Intelligent Transportation Platforms
- 14 Utility and Energy Solutions

EtherCAT I/O Modules

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: 3V _{DC} max. Logic 1: 10~30 V _{DC}	Input Voltage: Logic 0: 3V _{DC} max. Logic 1: 10~30 V _{DC}	Input Voltage: Logic 0: 3V _{DC} max. Logic 1: 10~30 V _{DC}	Input Voltage: Logic 0: 3V _{DC} max. Logic 1: 10~30 V _{DC}
	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: 1,500 V _{DC} Turn-on time: 1 ms typical Turn-off time: 0.6 ms typical	Relay type: Form A Contact Rating (resistive): 2A@250V _{AC} , 2A@30V _{DC} Max. Switching Power: 500VA, 60W Max. Switching Voltage: 270V _{AC} , 125V _{DC} Resistance: 30mΩ max. Operating Time: Max. 10ms Releasing Time: Max. 5ms Life Expectancy: Mechanical 2 x 10 ⁷ ops. at no load. Electrical 3 x 10 ⁴ ops. @2A/250V _{AC}	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 V _{DC} Turn-on time: 1 ms typical Turn-off time: 0.6 ms typical	Relay type: Form A Contact Rating (resistive): 2A@250V _{AC} , 2A@30V _{DC} Max. Switching Power: 500VA, 60W Max. Switching Voltage: 270V _{AC} , 125V _{DC} Resistance: 30mΩ max. Operating Time: Max. 10ms Releasing Time: Max. 5ms Life Expectancy: Mechanical 2 x 10 ⁷ ops. at no load. Electrical 3 x 10 ⁴ ops. @2A/250V _{AC}
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 V _{DC} (PhotoMOS Relay) / 2,500 V _{DC} (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			

Infrastructure



Model		AMAX-4870-AE
Description		6-port EtherCAT junction module
EtherCAT Junction	Ports	In: 1 port Out: 5 ports
	Cable	Ethernet CAT 5E
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

EtherIO I/O Modules

APAX Communication Module



Model		APAX-5070
Description		Modbus/TCP communication coupler
General	Dimensions (W x H x D)	30 x 139 x 100 mm
	Power Consumption	2 W @ 5 V _{DC} (typical)
	Connectors	2 x RJ-45 (2-ch switch, shared IP address)
Communications	Protocols	Modbus/TCP
	Data Transfer Rates	10/100 Mbps
	Connected I/O Modules	32 (max.)*
	Digital Signals	768 (max.)
Environment	Operating Temperature	-10 ~ 60°C (mounted vertically)
	Storage Temperature	-40 ~ 85°C
	Relative Humidity	5 ~ 95% (non-condensing)

Model		APAX-5090
Description		4-port RS-232/422/485 virtual COM
General	Dimensions (W x H x D)	30 x 139 x 100 mm
	Power Consumption	2 W @ 24 V _{DC} (typical)
	Connectors	1 x 26-pin clamp-type terminal
Interface	COM 1, COM 2:	RS-232/422/485
	COM 3, COM 4:	RS-232/422/485 (change mode via switch)
Environment	Operating Temperature	-10 ~ 60°C (mounted vertically)
	Storage Temperature	-40 ~ 70°C
	Relative Humidity	5 ~ 95% (non-condensing)

*APAX digital I/O modules can use ID number 0 ~ 31, while AI/O modules and counter modules can only use ID numbers 0 ~ 15

APAX Analog I/O Module



Model		APAX-5013	APAX-5017	APAX-5017H	APAX-5018	APAX-5028
Description		8-ch RTD module	12-ch analog input module	12-ch high-speed analog input module	12-ch thermocouple module	8-ch analog output module
General	Dimensions (W x H x D)	30 x 139 x 100 mm				
	Power Consumption	2.5 W @ 24 V _{DC} (typical)	4 W @ 24 V _{DC} (typical)	3.5 W @ 24 V _{DC} (typical)	3.5 W @ 24 V _{DC} (typical)	3.5 W @ 24 V _{DC} (typical)
Analog Input	Channels	8 (differential)	12 (differential)	12 (differential)	12 (differential)	-
	Input Type*	RTD (2-wire or 3-wire)	V, mV, mA	V, mV, mA	V, mV, mA, thermocouple	-
	Sampling Rates	10 sample/second (total)**	12 sample/second (total)**	1,000 sample/second (per channel)	12 sample/second (total)**	-
	Resolution	16-bit (accuracy: ±0.1% of scale range)	16-bit (accuracy: ±0.1% of scale range for voltage; ±0.2% of scale range for current)	16-bit (accuracy: ±0.1% of scale range for voltage; ±0.2% of scale range for current)	16-bit (accuracy: ±0.1% of scale range for voltage; ±0.2% of scale range for current)	-
	Input Impedance	>10 MΩ	>10 MΩ (voltage), 120 Ω (current)	2 MΩ (voltage), 120 Ω (current)	>1 MΩ (voltage), 120 Ω (current)	-
	Wire Burnout Detection	✓	✓ (4 ~ 20 mA only)	✓ (4 ~ 20 mA only)	✓ (4 ~ 20 mA and thermocouple)	-
	Analog Output	Resolution	-	-	-	-
Channels		-	-	-	-	8
Output Type*		-	-	-	-	V, mA
Slew Rate		-	-	-	-	0.7 V _{DC} /μs (per channel)
Environment	Operating Temperature	-10 ~ 60°C (when mounted vertically)				
	Storage Temperature	-40 ~ 70°C				
	Relative Humidity	5 ~ 95% (non-condensing)				

* Each channel can be configured with different type and range

** Sampling rate depends on used channel number.

Example: Using 6 channels on APAX-5017, sampling rate for each used channel will be 12/6 = 2 samples/second.

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EtherIO I/O Modules

APAX Digital I/O Module



Model	APAX-5040	APAX-5045	APAX-5046 APAX-5046SO	APAX-5060	APAX-5080	
Description	24-ch digital input module	24-ch digital I/O module	24-ch/20-ch digital output module	12-ch relay module	4/8-ch counter module	
General	Dimensions (W x H x D) 30 x 139 x 100 mm					
	Power Consumption 2 W @ 24 V _{DC} (typical) 2.5 W @ 24 V _{DC} (typical) 2.5 W @ 24 V _{DC} (typical) 2 W @ 24 V _{DC} (typical) 2.5 W @ 24 V _{DC} (typical)					
	Status Display LED per channel On: Logic level 1 Off: Logic level 0					
Digital Input	Channels	24	12	-	-	4 (sink)
	Input Voltage	Rated Value: 24 V _{DC} , For "0" signal: -5 ~ 5 V _{DC} , For "1" signal: 15 ~ 30 V _{DC} and -15 ~ 30 V _{DC}	Rated Value: 24 V _{DC} , For "0" signal: -5 ~ 5 V _{DC} , For "1" signal: 15 ~ 30 V _{DC} and -15 ~ 30 V _{DC}	-	-	For "0" signal: 0 ~ 3 V _{DC} , For "1" signal: 10 ~ 30 V _{DC}
	Type	Sink or source load	Sink or source load	-	-	-
Digital Output	Channels	-	12 (sink)	24 (sink)	-	4 (sink)
	Voltage Range	-	8 ~ 35 V _{DC}	8 ~ 35 V _{DC}	-	8 ~ 35 V _{DC}
	Rated Current Output	-	0.5 A (per channel, at signal "1")	0.5 A (per channel, at signal "1")	-	0.5 A (per channel)
Relay Output	Channels	-	-	-	12	-
Counter/ Frequency Input	Channels and Mode	-	-	-	-	8 (up and frequency mode), 4 (pulse/direction, up/down, A/B phase mode)
	Counting Range	-	-	-	-	32-bit + 1-bit overflow
	Minimum Pulse Width	-	-	-	-	1 μs for high-freq. mode and other modes
	Counter Frequency	-	-	-	-	10 Hz ~ 1 MHz for high-freq. mode and other modes
	Input Voltage	-	-	-	-	For "0" signal: 0 ~ 3 V _{DC} , for "1" signal: 10 ~ 30 V _{DC}
Environment	Operating Temperature	-10 ~ 60°C (when mounted vertically)				
	Storage Temperature	-40 ~ 70°C				
	Relative Humidity	5 ~ 95% (non-condensing)				

Vertrieb durch 

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