APAX Series Overview

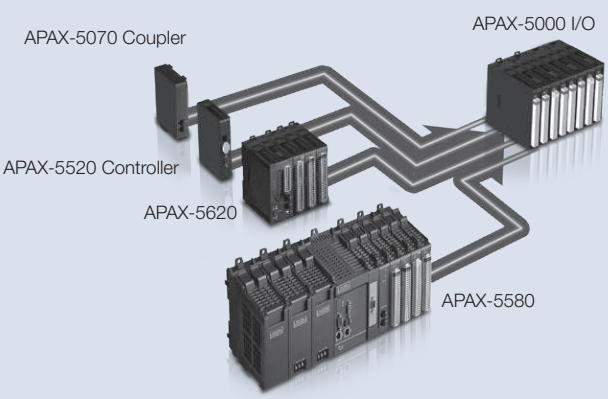
Advantech's New Generation DIN-Rail IPCs - APAX Series

APAX series, the new DIN-Rail IPCs from Advantech, integrates control, information processing and networking in a single platform. By leveraging the latest automation technology, APAX series offers a unique system architecture, providing dual controllers for different tasks, same I/O with changeable controllers, and flexible I/O expansion with deterministic performance. All these features make Advantech's DIN-Rail IPCs more reliable, scalable and flexible, satisfying various complicated control and automation applications.

Dual Controllers for Different Tasks

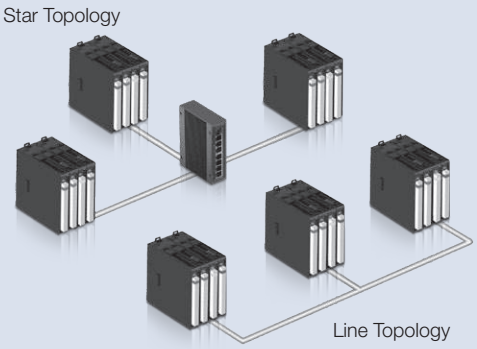
One controller focuses on I/O processing, while another controller can execute other tasks such as HMI/SCADA, database, recipe, image processing, etc. This architecture ensures system reliability since I/O processing won't be affected by other tasks.

Changeable Controllers and Couplers



APAX I/O modules can combine different controllers or couplers to satisfy different applications. Using different couplers, I/O modules can link to various real-time Ethernet and fieldbus systems. It saves investment in I/O and offers scalability for future needs.

Flexible Expansion Topology



All APAX I/O modules are inserted on the backplane. Through the expansion port and Ethernet cable, different backplanes can be connected. This decentralized architecture retains high-speed data transfers, so the distributed I/O modules provide real-time performance. Almost any topology, such as line, tree or star, can be easily established. The hot swap capability is also available for remote expansion I/O modules.

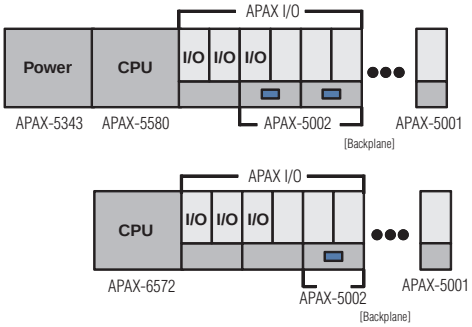
APAX System Architecture

Introduction

To simplify the system configuration, Advantech's new APAX-6000 and APAX-5000 series provide easy and flexible way to setup different functions and configurations. There are multiple APAX series system combinations that can be selected to develop reliable control systems as detailed below.

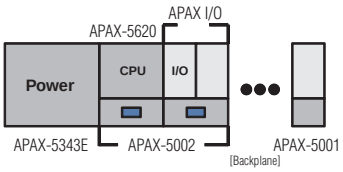
Application Ready High Performance DIN-Rail IPCs

Advantech's APAX-5580 and 6572 series offers several high performance controllers with Atom and Celeron M grade CPUs. These controllers benefit from the high throughput, openness, flexibility and connectivity brought by PC-based architectures. Contributed by excellent heat dissipation technology with no hard disks, they deliver great system reliability. Various peripheral interfaces such as LAN, USB, DVI, audio, RS-232, RS-422/485, etc, are provided. These high performance DIN-Rail IPCs are suitable for many complex control applications. Besides, its powerful integration ability makes it an ideal platform to integrate video, audio, HMI/SCADA software, database, data processing into one single solution.



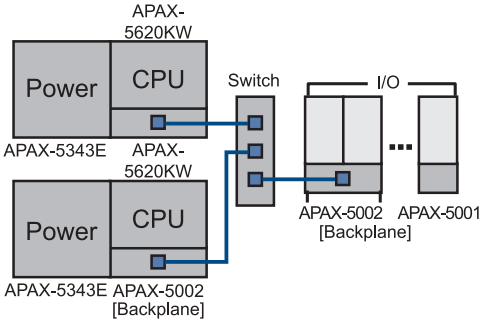
Robust, Compact DIN-Rail IPCs

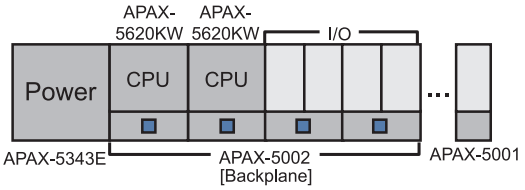
APAX-5620 series controllers offer a compact size without fans. These controllers have no rotating parts, helping further increase system reliability. APAX-5520/5620 features a VGA interface, enabling local displays, and its RS-485 and LAN ports offer communication ability with Modbus protocol. CF slot and battery backup RAM can be used for data storage. These features make APAX-5520/5620 as compact and robust as a PLC, but with enhanced displays, connectivity, and storage.



Redundant System

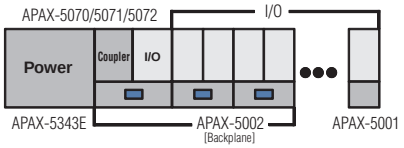
With the data synchronization, the secondary controller can take over the control tasks at the same position which primary fails within a very short time. Depending on customers request , the power supply can be separated to increase the availability.





Scalable Systems with Remote I/O

For different fieldbus or real-time Ethernet networks, such as Modbus/TCP, Ethernet/IP, PROFINET, etc, APAX series offers different kinds of couplers for communication. Controllers, HMI, and computers in the same network can access APAX I/O modules through the coupler. Not having to change I/O modules for different fieldbus or real-time Ethernet networks helps ensuring current I/O modules' investment for future demands. These couplers feature daisy-chain design, making installation easier.

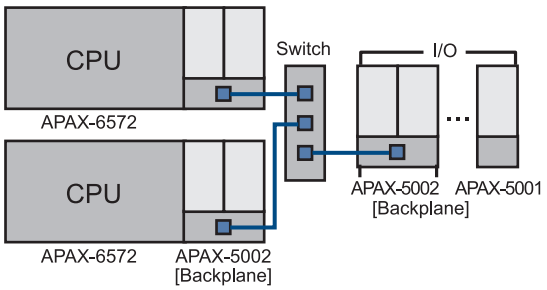


Reliable Backup System

APAX-5000 series delivers system backup functionality to significantly decrease the risk that the system will fail when the controller crashes. To leverage this, two controllers with the same control program are installed in one system. After both controllers' backup functions are enabled, APAX-5000 will automatically delegate one controller as the master controller.

The master controller will run the control program to execute the control process, while another controller (the backup controller) is put on standby. The master controller periodically sends live messages to the backup controller. If the backup controller does not receive a message from the master controller, it will automatically become the master controller and restart the control process.

If the master controller is switched, it means there was an error happening on the previous master controller. Therefore, engineers can repair or change the previous master controller and re-enable it as the backup controller. Then if the new master controller fails, the new backup controller will automatically take over the control once again. This mechanism ensures the control system will continuously run the control process.



APAX Controller Selection Guide

NEW

NEW

System		APAX-5520	APAX-5620	APAX-6572	APAX-5580
CPU		XScale PXA270 520 MHz		Intel Atom D510 1.66 GHz	Intel Core i7-4650U 1.7GHz Dual Core Intel Core i3-4010U 1.7GHz Dual Core Intel Celeron 2980U 1.6GHz Dual Core
Memory		Flash 32 MB, SDRAM 64 MB		2 GB DDR2 DRAM	4GB DDR3L SDRAM
Storage		1 x CF slot		1 x CF slot (internal)	1 x mSATA slot 2 x SD card slots
Local Display		VGA		VGA	VGA
USB Ports		1 x USB 1.1		4 x USB 2.0	2 x USB 2.0, 2 x USB 3.0
Audio		-		Mic in, Line in, Line out	Line Out
Cooling System		Fanless		Fanless	Fanless
Power Input		18 ~ 30 V_{DC}		9 ~ 36 V_{DC}	24V ± 20%
Diagnostics LED		Power, Battery, Run, Error		Power, IDE, LAN, Serial	PWR, RUN, SATA, UPS, ERR, Over Temp.,Abnormal Volt, SYS Recovery
Real-time Clock		Yes			
Watchdog Timer		Yes			
Control Software		C/C++ library and .NET class library for C and .NET programming environment KW IEC 61131-3 SoftLogic programming tool			C/C++ library and .NET class library for C and .NET programming environment CODESYS IEC 61131-3 SoftLogic S/W
Local Real-time I/O Modules		32 (max.)*			
Digital I/O Points		2048 (max.)			
Analog I/O points		512 (max.)			
Communication (Ethernet)	LAN Ports	1	2	3	2
	Speed	10/100 Mbps		10/100/1000 Mbps	10/100/1000Mbps
	Protocol	Modbus/TCP			
Communication (Serial)	COM 1	RS-485	RS-485	RS-232/422/485	RS-232/422/485
	COM 2	-	RS-485	RS-232/422/485	-
	COM 3	-	-	-	-
	CAN Bus	-	2	-	-
	Protocol	Modbus/RTU, CANopen (APAX-5620 only)			
Isolation	Communication	2500 V_{DC} (RS-485)	2500 V_{DC} (CAN & RS-485)	-	-
Environment	Operating Temperature (when mounted vertically)	-10 ~ 55°C		-10 ~ 50°C	-10 ~ 60°C
	Storage Temperature	-40 ~ 70°C			
	Relative Humidity	0 ~ 95 % (non-condensing)			
	Vibration Protection	IEC 60068-2-64/60068-2-6: 1 Grms @ 5 ~ 500 Hz (Random, operating) 2 G @ 5 ~ 500 Hz (Sine, non-operating)		IEC 60068-2-64: 2 Grms @ 5 ~ 500 Hz (Random, operating)	IEC 60068-2-64: 2 Grms @ 5 ~ 500 Hz (Random, operating)
	Shock Protection	IEC 60068-2-27: 20 G @ wall mount		IEC 60068-2-27: 50 G @ wall mount	IEC 60068-2-27: 50 G @ wall mount
Power Supply Module (Optional)		APAX-5343E			
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*APAX DI/O modules can use ID numbers 0 ~ 31, while AI/O modules and counter modules can only use ID numbers 0 ~ 15

APAX I/O Module Selection Guide





Module Name		APAX-5013	APAX-5017	APAX-5017H	APAX-5018	APAX-5028
Description		8-ch RTD Module	12-ch AI Module	12-ch High Speed AI Module	12-ch Thermocouple Module	8-ch AO Module
Analog Input	AI Channels	8	12	12	12	-
	Input Type*	RTD (2-wire or 3-wire)	V, mV, mA	V, mV, mA	V, mV, mA, Thermocouple	-
	Sampling Rate (Samples/second)	50 Hz filter: 8 (Total**) 60 Hz filter: 10 (Total**)	12/120 selectable (Total**)	1000 (per channel)	12 (Total**)	-
	Input Resolution	16-bit	16-bit (voltage) 14 ~ 15-bit (current)	12-bit	16-bit (voltage) 14 ~ 15-bit (current, thermocouple)	-
	Input Accuracy	±0.1 % of FSR	±0.1 % of FSR (Voltage) ±0.2 % of FSR (Current)	±0.1 % of FSR (Voltage) ±0.2 % of FSR (Current)	±0.1 % of FSR (Voltage) ±0.2 % of FSR (Current)	-
	Voltage Input	-	±150 mV, ±500 mV, ±1 V, ±5 V, ±10 V	0 ~ 500 mV, ±10 V, 0 ~ 10 V	±50 mV, ±100 mV, ±500 mV, ±1 V, ±2.5 V	-
	Current Input	-	±20 mA, 0 ~ 20 mA, 4 ~ 20 mA	0 ~ 20 mA, 4 ~ 20 mA	±20 mA, 0 ~ 20 mA, 4 ~ 20 mA	-
	Direct Sensor Input	RTD (Pt-100, Pt-200, Pt-500, Pt-1000, Balco, Ni 518)	-	-	Thermocouple (Type J, K, T, E, R, S, B)	-
	Wire Burnout Detection	All RTD range	4 ~ 20 mA	4 ~ 20 mA	4 ~ 20 mA and all Thermocouple range	-
Analog Output	AO Channels	-	-	-	-	8
	Output Type*	-	-	-	-	V, mA
	Output Resolution	-	-	-	-	14-bit
	Output Accuracy	-	-	-	-	±0.1 % of FSR
	Output Slew Rate	-	-	-	-	0.7 V_{DC}/µs (per channel)
	Voltage Output	-	-	-	-	±2.5 V, ±5 V, ±10 V, 0 ~ 2.5 V, 0 ~ 5 V, 0 ~ 10 V
	Current Output	-	-	-	-	0 ~ 20 mA, 4 ~ 20 mA
	Short Circuit Protection	-	-	-	-	Yes
	Fail Safe Value	-	-	-	-	Yes
General	Weight	170 g	170 g	175 g	170 g	175 g
	Operating Temperatrure	-10 ~ 60°C (when mounted vertically)				
	Storage Temperature	-40 ~ 85°C				
	Relative Humidity (non-condensing)	5 ~ 95%				
	Power Consumption (typical)	2.5 W @ 24 V_{DC}	4 W @ 24 V_{DC}	3.5 W @ 24 V_{DC}	3.5 W @ 24 V_{DC}	3.5 W @ 24 V_{DC}
	Isolation between channels and backplane	2500 V_{DC}				
	Power Supply Module (optional)	APAX-5343E				
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*Each channel can be configured with different type and range

**Sampling rate value 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.





Module Name		APAX-5040	APAX-5045	APAX-5046/SO	APAX-5060	APAX-5080
Description		24-ch DI Module	24-ch DI/O Module	24/20-ch DO Module	12-ch Relay Module	4/8-ch Counter Module
Digital Input	DI Channels	24	12	-	-	4
	Input Type	Sink or Source Load	Sink or Source Load	-	-	Source Load
	Rated Input Voltage	24 V_{DC}	24 V_{DC}	-	-	24 V_{DC}
	Input Voltage Range (signal "0")	-5 ~ 5 V_{DC}	-5 ~ 5 V_{DC}	-	-	0 ~ 3 V_{DC}
	Input Voltage Range (signal "1")	15 ~ 30 V_{DC} -15 ~ -30 V_{DC}	15 ~ 30 V_{DC} -15 ~ -30 V_{DC}	-	-	10 ~ 30 V_{DC}
	Rated Input Current	4.4 mA (typical)	4.4 mA (typical)	-	-	10 mA (typical)
	Input Filter	3 ms	3 ms	-	-	3 ms
	Over Voltage Protection	Yes	Yes	-	-	Yes
Counter Input	Counter Channels	-	-	-	-	8 (Up and Frequency mode) 4 (Pulse/Direction, Up/Down, A/B phase mode)
	Rated Input Voltage	-	-	-	-	24 V_{DC}
	Input Voltage Range (signal "0")	-	-	-	-	0 ~ 3 V_{DC}
	Input Voltage Range (signal "1")	-	-	-	-	10 ~ 30 V_{DC}
	Rated Input Current (signal "1")	-	-	-	-	5 ~ 15 mA (typical)
	Counting Range	-	-	-	-	32-bit + 1-bit overflow/underflow
	Counter Frequency	-	-	-	-	1 MHz (max.)
	Counter Gate and Alarm Function	-	-	-	-	Yes
Digital Output	DO Channels	-	12	24/20	12	4
	Output Type	-	Sink	Sink/Source	Relay (Form A, SPST)	Sink
	Rated Output Voltage	-	24 V_{DC}	24 V_{DC}	250 V_{AC}, 30 V_{DC}	24 V_{DC}
	Rated Output Current (signal "1")	-	0.5 A	0.5A/1A	5 A	0.5 A
	Short Circuit Protection	-	Yes	Yes	-	Yes
	Thermal Shutdown Protection	-	Yes	Yes	-	Yes
General	Weight	160 g	165 g	165 g	195 g	170 g
	Operating Temperatrure	-10 ~ 60°C (when mounted vertically)				
	Storage Temperature	-40 ~ 85°C				
	Relative Humidity (non-condensing)	5 ~ 95%				
	Power Consumption (typical)	2 W @ 24 V_{DC}	2.5 W @ 24 V_{DC}	2.5 W @ 24 V_{DC}	2 W @ 24 V_{DC}	2.5 W @ 24 V_{DC}
	Isolation between channels and backplane	2500 V_{DC}				
	Channel Status LED	Yes (per channel)				
	Fail Safe Value	-	Yes (DO channel)	Yes	Yes	Yes (DO channel)
	Power Supply Module (optional)	APAX-5343E				
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APAX Communication Module Selection Guide

Coupler Modules



Module Name		APAX-5070	APAX-5071	APAX-5072
Description		Modbus/TCP Communication Coupler	PROFINET Communication Coupler	EtherNet/IP Communication Coupler
Communication	Protocol	Modbus/TCP	PROFINET RT	EtherNet/IP
	Data Transfer Rates	10/100 Mbps	100 Mbps	10/100 Mbps
	Connected I/O Modules	32 (max.)*		
	Digital Signals	768 (max.)		
	Analog Signals	192 (max.)		
General	Connector	2 x RJ-45 (2-channel switch, share same IP address)		
	Topology	Line or star wiring		
	Operating Temperature	-10 ~ 60°C (when mounted vertically)		
	Storage Temperature	-40 ~ 85°C		
	Relative Humidity	5 ~ 95% (non-condensing)		
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*APAX DI/O modules can use ID number 0 ~ 31, while AI/O modules and counter modules can only use ID numbers 0 ~ 15

Communication Modules



Module Name		APAX-5490	APAX-5495	APAX-5090
Description		4-port RS-232/422/485 Communication Module	2-port CANopen Master Module	4-port RS-232/422/485 Communication Module
Serial Communication	Baud Rate	50 bps ~ 230.4 kbps	-	600 bps ~ 115.2kbps
	Data Bits	5, 6, 7, 8	-	8
	Stop Bits	1, 1.5, 2	-	1, 1.5, 2
	Parity	None, even, odd	-	None, even, odd
CANopen Communication	Data Transfer Rates	-	Max. 1 Mbits/s	-
Motion	Transmission Speed	-	-	-
	Slaves Number	-	-	-
General	Interface	4 x RS-232/422/485	2 x CAN Bus	2 x RS-422/485 2 x RS-232/422/485
	Connector	26-pin clamp-type terminal	DB9	26-pin clamp-type terminal
	Operating Temperature	0 ~ 60°C (when mounted vertically)		
	Storage Temperature	-40 ~ 70°C		
	Relative Humidity	5 ~ 95% (non-condensing)		
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Note: APAX-5090P, APAX-5095P and APAX-5202P can only be used by controller with a PCI interface

APAX-6572

Intel® Atom™ D510 1.66 GHz, 2 GB RAM Controller with 3 x LAN, 2 x COM, VGA

RoHS COMPLIANT 2002/95/EC CE FCC

Features

- Intel Atom D510 1.66 GHz CPU
- Onboard 2 GB DDR2 DRAM
- Backup system with two controllers (master and slave) to ensure continuous I/O control
- Expands I/O by connecting with APAX-5000 I/O modules
- Supports Windows WES2009 and Windows CE
- Provides C/C++ and .NET library for I/O control and communication
- Supports real-time control tasks under Windows CE through ProConOS
- 2 x RS-232/422/485 (automatic flow control)
- 3 x 10/100/1000 Mbps LAN, 4 x USB 2.0

Introduction

The APAX-6572 is a high performance controller with an Intel Atom D510 CPU. By installing Windows WES2009 or Windows CE operating system, it becomes an application ready platform. It is an ideal open control platform which can be combined with APAX I/O modules, and features flexible I/O expansion, real-time I/O control, and powerful computing and networking capability through various interfaces.

Specifications

General

- **Certification** CE, FCC Class A
- **Cooling System** Fanless
- **Mounting** DIN-rail, Wall mount (panel mount)
- **Dimensions (W x H x D)** 222 x 155 x 140 mm
- **Enclosure** Aluminum + SECC, ABS + PC (I/O)
- **Weight** 2.6 kg (APAX-6572)
- **Power Consumption** 35 W @ 24 V_{DC} (APAX-6572, Typical, Without I/O modules)
- **Power Requirement** 10 ~ 36 V_{DC} (e.g +24 V @ 1 A) (Min. 24 W), AT

System Hardware

- **CPU** Intel Atom D510 1.66 GHz
- **Memory** 2 GB DDR2 DRAM (onboard)
- **Battery Backup SRAM** 1 MB
- **Watchdog Timer** Programmable 7-tier event handler, from 1 ~ 255 seconds for each tier
- **LED Indicators** Power, CF, LAN (Active, Status), Serial (Tx, Rx)
- **Display** VGA (DB15 connector), up to 1600 x 1200 @ 85Hz
- **Audio** Line in, Line out, Mic in
- **Storage** 1 x internal Type I/II CompactFlash card slot

Software

- **Operating System** Windows WES2009, Windows CE
- **Control Software** C/C++ and .NET library with utility
  KW MultiProg (development), ProConOS (kernel)
- **Remote Management** Built-in Advantech DiagAnywhere agent
  Modbus/ASCII master/slave mode
  KW MultiProg (development), ProConOS (kernel)

I/O Expansion

- **Accompanied I/O slots** 4 x APAX/PCI combo slots
- **Connected I/O Modules** 32 (max.)*
- **Digital Signals** 768 (max.)
- **Analog Signals** 192 (max.)

Communication

- **Serial Ports** 2 x RS-232/422/485 (supports automatic RS-485 data flow control)
- **Serial Baud Rate** 50 ~ 115.2 kbps
- **LAN Ports** 3 x RJ-45 Ports, 10/100/1000 Mbps
- **USB Ports** 4 x USB 2.0

Environment

- **Operating Temperature** -10 ~ 50°C (when mounted vertically)
- **Storage Temperature** -40 ~ 70°C
- **Operating Humidity** 20 ~ 95% (non-condensing)
- **Storage Humidity** 0 ~ 95% (non-condensing)
- **Vibration Protection** 2 Grms @ 5 ~ 500 Hz
  (Random, operating, 1hr/axis)
  (Conforms to IEC 60068-2-64)

Ordering Information

- **APAX-6572** Intel Atom D510 1.66 GHz, 2 GB RAM Controller
- **PWR-244** Panel Mount Power Supply

PAC softlogic option (for CTOS only)

- **SQF-P10S2-8G-ETE** Suggested CF 8G CF NR, DMA (-40 ~ 85°C)
- **2070012262** WinCE image with KW support for APAX-6572
- **2010000007** License Agreement for KW ProConOS Embedded

PC-base controller option (for CTOS only)

- **SQF-P10S2-16G-ETE** Suggested CF 16G CF NR, DMA (-40 ~ 85°C)
- **2070012263** WES2009 MUI for APAX-6572

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APAX-5580

Intel® Core™ i7/i3/Celeron DIN-Rail PC Controller w/ 2 x GbE, 2 x mPCIe, VGA

Preliminary

SUSIAccess RoHS COMPLIANT 2002/95/EC CE FCC

Features

- 4th Generation Intel® Core™ i7/i3/Celeron Processors up to 1.7 GHz with 4GB/8GB DDR3L Memory
- 2 x GbE, 4 x USB 2.0/3.0, 1 x RS-232 /422/485, 1 x VGA, Audio
- Dual power input and UPS support
- Compact with Fanless Design
- Supports Fieldbus Protocol by iDoor Technology
- 3G/GPS/GPRS/Wi-Fi Communication by mPCIe
- Chassis Grounding Protection
- LAN Redundancy (Teaming)
- Fault-Protected RS-485 Transceivers With Extended Common-Mode Range
- One button system recovery
- 10 year lifetime RTC battery

Introduction

Advantech's APAX-5580 is a powerful DIN-Rail PC Controller with an Intel Core i7/i3/Celeron CPU. It is the ideal open control platform to be combined with APAX I/O modules, and features flexible I/O expansion, real-time I/O control, network capability through various interfaces, and support dual power input and UPS module for robust power system. It also has a built-in the standard mini PCI express interface for wireless communication and Advantech's iDoor technology. The APAX-5580 is the best solution for data gateway, concentrator and data server applications, its seamless integration with I/O can save your costs and fulfill a diverse range of automation projects.

Specifications

General

- **Certification**: CE, FCC
- **Dimensions (W x D x H)**: 128 x 106 x 110 mm
- **Form Factor**: Regular Size
- **Enclosure**: Aluminum Housing
- **Mounting**: DIN-Rail
- **Weight (Net)**: 1.8 kg (4.0 lbs)
- **Power Requirement**: 24 V_{DC} ± 20%
- **Power Consumption**: 28 W (Typical), 72 W(Max)
- **OS Support**: Microsoft® Windows 7/8, Linux Kernel 3.X

System Hardware

- **BIOS**: AMI UEFI 128Mbit Flash BIOS
- **Watchdog Timer**: Programmable 256 levels timer interval, from 1 to 255 sec
- **Processor**: 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
- **System Chip**: Integrated Intel 8 Series Chipset
- **Memory**: On-board 4GB (8GB optional)
- **Graphics Engine**: Intel® HD Graphics 5000/4400
- **Ethernet**: Intel® i210-IT GbE, 802.1Qav, IEEE1588/802.1AS, 802.3az
Intel® i218-LM GbE, Intel® AMT, IEEE1588/802.1AS, 802.3az
- **LED Indicators**: LEDs for Power, battery, LAN (Active, Status), Tx/Rx and HDD
- **Storage**: 1 x mSATA, 1 x SD, 1 x SD (for OS backup)
- **Expansion**: 1 x Full-size mPCIe slot, 1 x Half-size mPCIe slot, mPCIe 2.0

I/O Interfaces

- **Serial Ports**: 1 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 (2 x USB 2.0, 2 x USB 3.0 compliant)
1 x internal USB
- **Display**: 1 x VGA, supports 1920 X 1080 @ 60 Hz 24 bpp
- **Audio**: Line-Out
- **Power Connector**: Dual power input and UPS support
- **Grounding Protection**: Chassis Grounding

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, 50G, half sine, 11ms
- **Vibration Protection**: Operating, IEC 60068-2-64, 2Grms, random, 5 ~ 500Hz, 1hr/axis (mSATA)

Ordering Information

- **APAX-5580-4C3AE**: Intel Celeron 1.6 GHz with 4 GB memory, no external expansion slot
- **APAX-5580-433AE**: Intel Core i3 1.7 GHz with 4 GB memory, no external expansion slot
- **APAX-5580-473AE**: Intel Core i7 1.7 GHz with 4 GB memory, no external expansion slot

Accessories

- **APAX-5430**: APAX Battery Module
- **APAX-5343**: AC to DC APAX Power Supply
- **APAX-5402-E2A1AE**: 2 expansion slots with APAX Bus and PCI express
- **APAX-5402-E2A0AE**: 2 expansion slots with PCI express only
- **SQF-SMSM4-XG-S8E**: SQFlash 820 series mSATA MLC 16/32/64/128G (-40~85°C)

Application Software

SUSIAccess	Version : V3.0 or above An innovative remote device management software, allowing efficient remote monitoring, quick recovery & backup, and real-time remote configuration, to create a more intelligent and interconnected embedded computing solution.
WebAccess	Version : V7.1 or above WebAccess, as the core of Advantech's IoT solution, is full web browser-based software package for HMI and SCADA software. All HMI and SCADA software features including: Animated Graphics Displays, Real-time Data, Control, Trends, Alarms and Logs, are available in a standard web browser. WebAccess is built around the latest internet technologies. With its open architecture, vertical domain applications can easily be integrated.

APAX-5430
APAX-5435

SATA HDD module

mPCIe module to support iDoor

APAX-5430

FCC CE RoHS

Specifications

General

- **Certification** CE, FCC class A
- **Dimensions (W x H x D)** 30 x 139 x 100 mm
- **Enclosure** ABS+PC
- **Weight** 165 g
- **Power Consumption** 2.5 W @ 24 V_{DC} (typical)

Function

- **Interface** SATA
- **RAID** Supports RAID 0/1
- **Power Supply** 5V:2A
  3.3V:2A
- **Support SATA I/II/III 2.5" HDD/SDD**
- **Support Hot swap**

Environment

- **Operating Temperature** -10 ~ 60°C (when mounted vertically)
- **Storage Temperature** -40 ~ 70°C
- **Relative Humidity** 5 ~ 95% (non-condensing)

Ordering Information

- **APAX-5430** SATA HDD Module

APAX-5435

iDoor FCC CE RoHS

Specifications

General

- **Certification** CE, FCC class A
- **Dimensions (W x H x D)** 30 x 139 x 100 mm
- **Enclosure** ABS+PC
- **Weight** 165 g
- **Power Consumption** 2.5 W @ 24 V_{DC} (typical)

Function

- **Interface** mini PCI express 2.0 (Support iDoor)
  mSATA
- **Support Hot Plug**

Environment

- **Operating Temperature** -10 ~ 60° C (when mounted vertically)
- **Storage Temperature** -40 ~ 70° C
- **Relative Humidity** 5 ~ 95% (non-condensing)

Ordering Information

- **APAX-5435** mPCIe Module to support iDoor

APAX-5490
APAX-5495

4-port RS-232/422/485 Communication Module

2-port CANopen Communication Module

NEW

APAX-5490

RoHS CE FCC

NEW

APAX-5495

CANopen RoHS CE FCC

Specifications

General

- **Certification** CE, FCC class A
- **Interface** COM 1, COM 2: RS-232/422/485
  COM 3, COM 4: RS-232/422/485
- **Connectors** 1 x 26-pin clamp-type terminal
- **Dimensions (W x H x D)** 30 x 139 x 100 mm
- **Enclosure** ABS+PC
- **Weight** 180 g
- **Power Consumption** 2 W @ 5 V_{DC} (typical)

Communications

- **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

Protection

- **ESD Protection** 15 kV
- **EFT Protection** 2,500 V_{DC}
- **Isolation Protection** 2,500 V_{DC} (between COM port and backplane)

Environment

- **Operating Temperature** 0 ~ 60°C (mounted vertically)
- **Storage Temperature** -40 ~ 70°C
- **Relative Humidity** 5 ~ 95% (non-condensing)

Ordering Information

- **APAX-5490-P4AE** Non Isolation 4-port RS-232/422/485 Comm. Module (Isolation is optional)

Note: APAX-5490 can only be used by controllers with a PCI express interface (ex. APAX-5580)

Specifications

General

- **Certification** CE, FCC class A
- **Interface** 2 x CAN Bus
- **Connectors** DB9
- **Dimensions (W x H x D)** 30 x 139 x 100 mm
- **Enclosure** ABS+PC
- **Weight** 180 g
- **Power Consumption** 2 W @ 5 V_{DC} (typical)

Communications

- **Protocol** CANopen
- **Speed** Max. 1 Mbits/s
- **Supports PDO transmission mode**
- **Supports NMT and SDO communication object**
- **Supports Heartbeat producer and consumer**
- **Supports Emergency objects**

Protection

- **Isolation Protection** 2,500 V_{DC}

Environment

- **Operating Temperature** 0 ~ 60°C (mounted vertically)
- **Storage Temperature** -40 ~ 70°C
- **Relative Humidity** 5 ~ 95% (non-condensing)

Ordering Information

- **APAX-5495-P2AE** 2-port CANopen Module

Note: APAX-5495 can only be used by controllers with a PCI express interface (ex. APAX-5580)

APAX-5520CE/KW
APAX-5620CE/KW

PAC with Marvel XScale® CPU

PAC with Marvel XScale® CPU and CAN

APAX-5520CE/KW

RoHS CE FCC

Specifications

General

- **Certification** CE, FCC class A
- **Dimensions (W x H x D)** 30 x 139 x 100 mm
- **Enclosure** ABS+PC
- **Weight** 210 g
- **Power Consumption** 4.5 W @ 24 V_{DC} (typical)

System Hardware

- **CPU** Intel XScale PXA270 520 MHz
- **Memory Flash** 32M bytes, SDRAM 64M bytes
- **Battery Backup Memory** 256 KB file system, 256 KB direct access
- **Real-time Clock** Yes
- **Watchdog Timer** Yes
- **VGA** DB15 connector
- **SB Ports** 1 x USB 1.1
- **Storage** 1 x Type II CompactFlash card slot

Software

- **OS Support** Windows CE
- **Control Software** C/C++ and .NET library
  KW Multiprog (development tool)
  KW ProConOS (runtime kernel)

I/O Expansion

- **Connected I/O Modules** 32 (max.)*
- **Digital Signals** 768 (max.)
- **Analog Signals** 192 (max.)

Communication (Ethernet)

- **LAN Ports** 1 x RJ-45 Port, 10/100 Mbps
- **Offers Modbus/TCP Server and Client APIs**

Communication (Serial)

- **Medium** 1 x Isolated RS-485 (2-wire, isolated)
- **Offers Modbus/RTU Master and Slave APIs**

Environment

- **Operating Temperature** -10 ~ 55°C (when mounted vertically)
- **Storage Temperature** -40 ~ 70°C
- **Relative Humidity** 5 ~ 95% (non-condensing)

Ordering Information

- **APAX-5520CE** PAC with Marvel XScale CPU, WinCE
- **APAX-5520KW** PAC with Marvel XScale CPU, KW

Accessories

- **APAX-5002** 2-slot Backplane Module
- **APAX-5343E** Power Supply for APAX Expansion Module

NEW

APAX-5620CE/KW

RoHS CE FCC

Specifications

General

- **Certification** CE, FCC class A
- **Dimensions (W x H x D)** 60 x 139 x 100 mm
- **Enclosure** ABS+PC
- **Weight** 310 g
- **Power Consumption** 5 W @ 24 V_{DC} (typical)
- **Redundancy** 25ms data sync, 20ms changeover time and 14kbytes for data sync

System Hardware

- **CPU** Intel XScale PXA270 520 MHz
- **Memory Flash** 32M bytes, SDRAM 64M bytes
- **Battery Backup Memory** 256 KB file system, 256 KB direct access
- **Real-time Clock** Yes
- **Watchdog Timer** Yes
- **VGA** DB15 connector
- **USB Ports** 1 x USB 1.1
- **Storage** 1 x Type II CompactFlash card slot

Software

- **OS Support** Windows CE
- **Control Software** C/C++ and .NET library
  KW Multiprog (development tool), KW ProConOS (runtime kernel)

I/O Expansion

- **Connected I/O Modules** 32 (max.)*
- **Digital Signals** 768 (max.)
- **Analog Signals** 192 (max.)

Communication (Ethernet)

- **LAN** 2 x RJ-45 Port, 10/100 Mbps
- **Offers Modbus/TCP Server and Client APIs**
- **Modbus/TCP under KW** Server : 64 connections
  Client : 128 connections

Communication (Serial)

- **Medium** 2 x Isolated RS-485 (2-wire, isolated)
- **Offers Modbus/RTU Master and Slave APIs**

Communication (CAN)

- **Medium** 2 x Isolated CAN
- **Protocol** CANopen (DS301/302)
- **Speed maximum** 1 Mbit/s

Environment

- **Operating Temperature** -10 ~ 55°C (when mounted vertically)
- **Storage Temperature** -40 ~ 70°C
- **Relative Humidity** 5 ~ 95% (non-condensing)

Ordering Information

- **APAX-5620CE** PAC with Marvel XScale CPU, CAN, WinCE
- **APAX-5620KW** PAC with Marvel XScale CPU, CAN, KW

Accessories

- **APAX-5002** 2-slot Backplane Module
- **APAX-5343E** Power Supply for APAX Expansion Module

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

APAX-5522PE

Linus based RTU Controller

NEW

RoHS COMPLIANT 2002/95/EC CE FCC

Features

- IEC 61850-3 and IEEE-1613 certified for substation automation application
- XScale PXA270 520 MHz processor
- Wide temperature support (-20 ~ 70°C)
- Supports up to 32 APAX I/O modules
- Time-stamp function support
- Linux OS support
- 2 x LAN ports support

Introduction

IEC 61850-3 standards specify a number of "hardened" characteristics that network products should meet to withstand the potentially electromagnetically harsh substation environment: such as immunity to electrical surge, electrostatic discharges and other phenomena that would cause non-hardened devices to fail. The APAX-5000PE series modules are IEC 61850-3 compliant and can be used in power & energy applications e.g. smart substation for good protection features.

Specifications

General

- **Certification** CE, FCC class A
  Dielectric Strengh and Impulse Tests: IEC60255-5:2000
  EMC Immunity: Electronic Discharge: IEC 61000-4-2:2001,level3
  Radiated RF Immunity: IEC 61000-4-3:2002, 10 V/m
  IEEE C37.90.2-1995, 35 V/m
  Fast Transient, Burst Immunity: IEC 61000-4-4:1995 + A1:2001, 4kV @ 2.5KHz
  Surge Immunity: IEC 61000-4-5:2001, 2kV line to line, 4kV line to earth
  Conducted RF Immunity: IEC 61000-4-6:2004, 10 Vrms
  Magnetic Field Immunity: IEC 61000-4-8:2001, 1000 A/m for 3 seconds, 100 A/m for 1 minute
  DOMF: IEC 61000-4-10:2001, 30 A/m @ 100KHz and 1 MHz
  EMC Emissions
  Conducted Emissions: EN 55011: 2002, Class A
  Radiated Emissions: EN 55011: 2002, Class A
- **Dimensions (W x H x D)** 60 x 139 x 100 mm (without backplane)
- **Enclosure** ABS+PC
- **Weight** 180 g
- **Connectors** DB-9
- **Power Consumption** 2 W @ 5 V_{DC} (typical)

System Hardware

- **CPU** Intel XScale PXA270 520 MHz
- **Memory Flash** 32 M bytes, SDRAM 64 M bytes
- **Battery Backup Memory** 256 KB file system, 256 KB direct access
- **Real-time Clock** Yes
- **Watchdog Timer** Yes
- **Storage** 1 x Type II CompactFlash card slot

Software

- **OS Support** Linux Kernel 2.6 RT, KW software on WinCE
- **Control Software** API library / MultiProg KW

I/O Expansion

- **Connected I/O Modules** 32 (max.)*
- **Digital Signals** 768 (max.)
- **Analog Signals** 192 (max.)

Communication (Ethernet)

- **LAN** 2 x RJ-45 Port, 10/100 Mbps

Communication (Serial)

- **Medium** 2 x Isolated RS-232

Environment

- **Operating Temperature** -20 ~ 70°C (mounted vertically)
- **Storage Temperature** -40 ~ 85°C
- **Relative Humidity** 5 ~ 95% (non-condensing)

Ordering Information

- **APAX-5522PELX** IEC 61850-3 Compliant PAC
- **APAX-5522PEKW** IEC 61850-3 Compliant PAC, KW softlogic on WinCE

Accessories

- **APAX-5002L** 2-slot Backplane Module
- **APAX-5350** APAX Power Filter for APAX PE modules

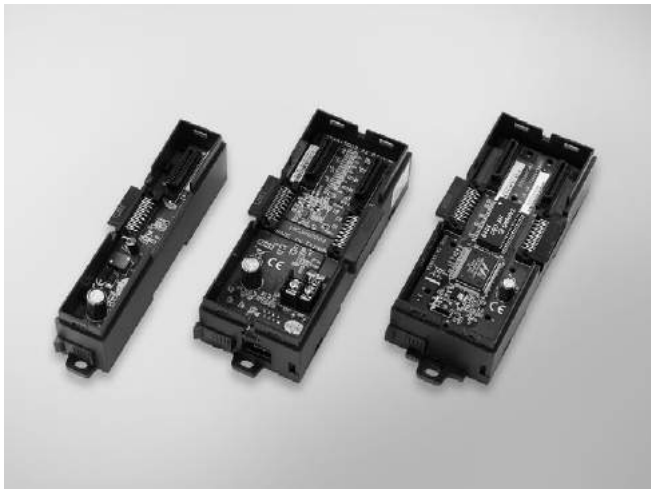
*APAX DI/O modules can use ID number 0 ~ 31, while AI/O modules and counter modules can only use ID numbers 0 ~ 15

APAX-5343/E
APAX-5001/5002/5002L

Power Supply for APAX-5570 Series/ APAX Expansion Modules

1/2/2-slot Backplane Modules

APAX-5343 APAX-5343E



APAX-5001 APAX-5002/L APAX-5004L

Specifications

Input

- **Rated Voltage** 115/230 V_{AC}
- **Voltage Range** 90 ~ 264 V_{AC}
- **Rated Input Current** 1.5 A (at rated load)
- **Rated Input Frequency** 50/60 Hz
- **Input Frequency Range** 47 ~ 63 Hz
- **Inrush Current Limit** < 50 A

Output

- **Output Power** 72 W
- **Power Loss** about 8~9 W (at rated load)
- **Efficiency** > 88% (at rated load)
- **Rated Voltage** 24 V_{DC}
- **Rated Output Current** 3 A
- **Output Current Limit** 3.5 ~ 4.3 A
- **Residual Ripple** < 240 mVpp
- **Startup Delay** < 3 second
- **Voltage Rise** 60 ms (typical)

Protection

- **Isolation Protection (In/Out)** 42/42 V_{DC}
- **Output Over Voltage Protection** shutdown as approximate 25 ~ 27 V_{DC}, latch off mode
- **Over Load Protection** auto-recovery mode
- **Short Circuit Protection** auto-recovery mode

General

- **Certification** CE, FCC class A, UL 508, Energy Star
- **Dimensions (W x H x D)** 75 x 151 x 115 mm
- **Enclosure** PC
- **Operating Temperature** 0 ~ 50°C (mounted vertically)
- **Storage Temperature** -20 ~ 75°C
- **Relative Humidity** 5 ~ 95% (non-condensing)
- **Mounting** DIN-rail, wall mount (panel mount)

Ordering Information

- **APAX-5343** Power Supply for APAX-5570 Series
- **APAX-5343E** Power Supply for APAX Expansion Module

Specifications

General

- **Certification** CE, FCC class A
- **Dimensions (W x H x D)** 28 x 151 x 38 mm (APAX-5001)
  54 x 151 x 38 mm (APAX-5002, APAX-5002L)
  105 x 151 x 38 (APAX-5004L)
- **Enclosure** ABS+PC
- **Weight** 70 g (APAX-5001)
  120 g (APAX-5002, APAX-5002L)
- **Mounting** DIN-rail, Wall mount (panel mount)
- **Power Consumption** 0.3 W @ 24 V_{DC} (APAX-5001)
  1.3 W @ 24 V_{DC} (APAX-5002, APAX-5002L)
- **Power Input** 18 ~ 30 V_{DC}
- **Slot Number** 1 (APAX-5001)
  2 (APAX-5002, APAX-5002L)

Environment

- **Operating Temperature** APAX-5001*/APAX-5002*: 0 ~ 60°C
  APAX-5002L*: -20 ~ 70°C
- **Storage Temperature** -25 ~ 75°C
- **Relative Humidity** 5 ~ 95% (non-condensing)

*when mounted vertically

Ordering Information

- **APAX-5001** 1-slot Backplane Module
- **APAX-5002L** 2-slot Backplane Module
- **APAX-5002** 2-slot Backplane Module with RJ-45 Port and 24V_{DC} input

	Slot Number	Expansion Port (RJ-45)	Power Input Terminal
APAX-5001	1	N/A	N/A
APAX-5002L	2	N/A	N/A
APAX-5002	2	Yes	Yes

APAX-5070
APAX-5072
APAX-5071

Modbus/TCP Communication Coupler

EtherNet/IP Communication Coupler

PROFINET Communication Coupler

APAX-5070

APAX-5072

APAX-5071

Specifications

General

- **Certification** CE, FCC class A
- **Dimensions (W x H x D)** 30 x 139 x 100 mm
- **Enclosure** ABS+PC
- **Weight** 190 g
- **Connector** 2 x RJ-45 (2-channel switch, share same IP address)
- **Power Consumption** 2 W @ 5 V_{DC} (typical)

Communication

- **Protocol** Modbus/TCP
- **Connected I/O Modules** 32 (max.)*
- **Digital Signals** 768 (max.)
- **Analog Signals** 192 (max.)
- **Data Transfer Rates** 10/100 Mbps
- **Topology** Line or star
- **Isolation Protection** 1,500 V_{AC}

Environment

- **Operating Temperature** -10 ~ 60°C (mounted vertically)
- **Storage Temperature** -40 ~ 85°C
- **Relative Humidity** 5 ~ 95% (non-condensing)
- **Shock Protection** 10 G @ wall mount, half sine, 11 ms (Confirms to IEC 60068-2-27)
- **Vibration Protection** 1 Grms @ 5 ~ 500 Hz (Random, operating, 1 hr/axis)
  2 G @ 5 ~ 500 Hz (Sine, non-operating, 1 hr/axis) (Confirms to IEC 60068-2-64 and IEC 60068-2-6)

Ordering Information

- **APAX-5070** Modbus/TCP Communication Coupler

Specifications

General

- **Certification** CE, FCC class A
- **Dimensions (W x H x D)** 30 x 139 x 100 mm
- **Enclosure** ABS+PC
- **Weight** 180 g
- **Connectors** 2 x RJ-45 (2-channel switch, share same IP address)
- **Power Consumption** 2 W @ 5 V_{DC} (typical)

Communications

- **Protocol** EtherNet/IP
- **Connected I/O Modules** 32 (max.)*
- **Digital Signals** 768 (max.)
- **Analog Signals** 192 (max.)
- **Data Transfer Rates** 10/100 Mbps
- **Topology** line or star
- **Isolation Protection** 1,500 V_{AC}

Environment

- **Operating Temperature** -10 ~ 60°C (mounted vertically)
- **Storage Temperature** -40 ~ 85°C
- **Relative Humidity** 5 ~ 95% (non-condensing)
- **Shock Protection** 10 G @ wall mount, half sine, 11 ms (Confirms to IEC 60068-2-27)
- **Vibration Protection** 1 Grms @ 5 ~ 500 Hz (Random, operating, 1 hr/axis)
  2 G @ 5 ~ 500 Hz (Sine, non-operating, 1 hr/axis) (Confirms to IEC 60068-2-64 and IEC 60068-2-6)

Ordering Information

- **APAX-5072** EtherNet/IP Communication Coupler

Specifications

General

- **Certification** CE, FCC class A
- **Dimensions (W x H x D)** 30 x 139 x 100 mm
- **Enclosure** ABS+PC
- **Weight** 180 g
- **Connector** 2 x RJ-45 (2-channel switch, share same IP address)
- **Power Consumption** 2 W @ 5 V_{DC} (typical)

Communication

- **Protocol** PROFINET RT V2.2
- **Connected I/O Modules** 32 (max.)*
- **Digital Signals** 768 (max.)
- **Analog Signals** 192 (max.)
- **Data Transfer Rates** 10/100 Mbps
- **APAX IO Topology** Line or Star

Environment

- **Operating Temperature** -10 ~ 60°C (mounted vertically)
- **Storage Temperature** -40 ~ 85°C
- **Relative Humidity** 5 ~ 95% (non-condensing)
- **Shock Protection** 10 G @ wall mount, half sine, 11 ms (Confirms to IEC 60068-2-27)
- **Vibration Protection** 1 Grms @ 5 ~ 500 Hz (Random, operating, 1 hr/axis)
  2 G @ 5 ~ 500 Hz (Sine, non-operating, 1 hr/axis) (Confirms to IEC 60068-2-64 and IEC 60068-2-6)

Ordering Information

- **APAX-5071** PROFINET Communication Coupler

Accessories

- **APAX-5002** 2-slot Backplane Module
- **APAX-5343E** Power Supply for APAX Expansion Module

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

APAX-5017H
APAX-5028

12-ch High Speed Analog Input Module

8-ch Analog Output Module

APAX-5017H

RoHS CE FCC

Specifications

General

- **Certification** CE, FCC class A
- **Dimensions (W x H x D)** 30 x 139 x 100 mm
- **Enclosure** ABS+PC
- **Weight** 175 g
- **Power Consumption** 3.5 W @ 24 V_{DC} (typical)

Analog Input

- **Channels** 12
- **Input Impedance** 2 MΩ (Voltage), 120 Ω (Current)
- **Input Type** V, mV, mA
- **Input Range** 0 ~ 500 mV, ±10 V, 0 ~ 10 V, 0 ~ 20 mA, 4 ~ 20 mA
- **Configure Different Range for Each Channel**
- **Resolution** 12-bit with accuracy ±0.1% or better of Full Scale Range (Voltage), ±0.2% or better of Full Scale Range (Current)
- **Sampling Rate** 1,000 sample/second (per channel)

* Support Integration function to eliminate field site noise at sample rate: 100 sample/second

- **Span Drift** ±25 ppm/°C
- **Zero Drift** ±6 μV/°C
- **Wire Burn-out Detection** Yes (4~20 mA only)

Protection

- **Over Voltage Protection**
- **2,500 V_{DC} Isolation Between Channels and Backplane**

Note: The voltage between any two pins must not exceed 15 V

Environment

- **Operating Temperature** -10 ~ 60°C (when mounted vertically)
- **Storage Temperature** -40 ~ 70°C
- **Relative Humidity** 5 ~ 95% (non-condensing)

Ordering Information

- **APAX-5017H** 12-ch High Speed Analog Input Module

APAX-5028

RoHS CE FCC

Specifications

General

- **Certification** CE, FCC class A
- **Dimensions (W x H x D)** 30 x 139 x 100 mm
- **Enclosure** ABS+PC
- **Weight** 175 g
- **Power Consumption** 3.5 W @ 24 V_{DC} (typical)

Analog Output

- **Channels** 8
- **Output Type** V, mA
- **Output Range** ±2.5 V, ±5 V, ±10 V, 0 ~ 2.5 V, 0 ~ 5 V, 0 ~ 10 V, 0 ~ 20 mA, 4 ~ 20 mA
- **Configure Different Range for Each Channel**
- **Resolution** 14-bit with accuracy ±0.1% or better of Full Scale Range
- **Settling time** about 500 μs
- **Slew Rate** 0.7 V_{DC}/μs (per channel)
- **Span Drift** ±60 ppm/°C
- **Zero Drift** ±275 mV/°C (Voltage) ±250 mV/°C (Current)
- **Drive Voltage (Current Mode)** 15 V_{DC}
- **Load (Current Mode)** 0 ~ 500Ω

Protection

- **Short Circuit Protection**
- **2,500 V_{DC} Isolation Between Channels and Backplane**

Environment

- **Operating Temperature** -10 ~ 60°C (when mounted vertically)
- **Storage Temperature** -40 ~ 70°C
- **Relative Humidity** 5 ~ 95% (non-condensing)

Ordering Information

- **APAX-5028** 8-ch Analog Output Module

APAX-5046
APAX-5046SO

24-ch Digital Output Module

20-ch Source Type DO Module

APAX-5046

APAX-5046SO

Specifications

General

- **Certification** CE, FCC class A
- **Dimensions (W x H x D)** 30 x 139 x 100 mm
- **Enclosure** ABS+PC
- **Weight** 165 g
- **Power Consumption** 2.5 W @ 24 V_{DC} (typical)
- **Status Display** LED per channel
  On: Logic level 1
  Off: Logic level 0

Digital Output

- **Channels** 24 (Sink Type)
- **Voltage Range** 8 ~ 35 V_{DC}
- **Rated Current Output** 0.5 A (per channel, at signal "1")
- **Leakage Current** 0.1 mA (at signal "0")
- **Switch Rate:** Resistive load: 300 Hz (max.)
  Inductive load: 20 Hz (max.)
  Lamp load: 200 Hz
  (max. at 5W lamp and under 50 Ω, 24 V)

Protection

- **2,500 V_{DC} Isolation Between Channels and Backplane**
- **Short Circuit Protection**
- **Thermal Shutdown Protection**

Environment

- **Operating Temperature** -10 ~ 60°C (when mounted vertically)
- **Storage Temperature** -40 ~ 70°C
- **Relative Humidity** 5 ~ 95% (non-condensing)

Ordering Information

- **APAX-5046** 24-ch Digital Output Module
- **APAX-5001** 1-slot Backplane Module
- **APAX-5002** 2-slot Backplane Module
- **APAX-5343E** Power Supply for APAX Expansion Module

Specifications

General

- **Certification** CE, FCC class A
- **Dimensions (W x H x D)** 30 x 139 x 100 mm
- **Enclosure** ABS+PC
- **Weight** 165 g
- **Power Consumption** 2.5 W @ 24 V_{DC} (typical)
- **Status Display** LED per channel
  On: Logic level 1
  Off: Logic level 0

Relay Output

- **Channels** 20 (Source Type)
- **Voltage Range** 10~35V_{DC}
- **Rated Current Output** 1A(per channel, at signal "1")
- **Leakage Current** 0.1 mA (at signal "0")
- **Switch Rate** Resistive load : 300 Hz (max.)
  Inductive load: 20 Hz (max.)
  Lamp load: 200 Hz
  (max., at 5W amp and under 50 Ω, 24V)

Protection

- **2,500 V_{DC} Isolation Between Channels and Backplane**
- **Short Circuit Protection**
- **Thermal Shutdown Protection**

Environment

- **Operating Temperature** -10 ~ 60° C (when mounted vertically)
- **Storage Temperature** -40 ~ 70° C
- **Relative Humidity** 5 ~ 95% (non-condensing)

Ordering Information

- **APAX-5046SO** 20-ch Source-Type DO Module
- **APAX-5001** 1-slot Backplane Module
- **APAX-5002** 2-slot Backplane Module
- **APAX-5343E** Power Supply for APAX Expansion Module

APAX-5060
APAX-5080

12-ch Relay Output Module

4/8-ch High/Low Speed Counter Module

APAX-5060

APAX-5080

Specifications

General

- **Dimensions (W x H x D)** 30 x 139 x 100 mm
- **Weight** 195 g
- **Power Consumption** 2 W @ 24 V_{DC} (typical)
- **Status Display** LED per channel
  On: Logic level 1
  Off: Logic level 0

Relay Output

- **Channels** 12
- **Relay Type** Form A (SPST)
- **Switching Capacity and Lifetime of the Contact (For Resistive Load)**
  VDE: 30,000 operations (5 A @ 250 V_{AC}, 10 operations/minute at 8°C)
  70,000 operations (5 A @ 30 V_{DC}, 10 operations/ minute at 85°C)
  UL: 60,000 operations (5 A @ 250 V_{AC})
  100,000 operations (5 A @ 30 V_{DC})
  Mechanism: 20,000,000 operations (no load, 300 operations/min)
- **Breakdown Voltage** 500 V_{AC} (50/60 Hz)
- **Contact Resistance** 30 mΩ (maximum)
- **Insulation Resistance** 1 GΩ (minimum) at 500 V_{DC}

Protection

- **Isolation Between Channels and Backplane** 2,500 V_{DC}

Environment

- **Operating Temperature** -10 ~ 60°C (when mounted vertically)
  -20 ~ 70°C (for PE version)
- **Storage Temperature** -40 ~ 70°C
- **Relative Humidity** 5 ~ 95% (non-condensing)

Ordering Information

- **APAX-5060** 12-ch Relay Output Module
- **APAX-5060PE** 12-ch Relay Output Module with Wide Temperature

Specifications

General

- **Dimensions (W x H x D)** 30 x 139 x 100 mm
- **Weight** 170 g
- **Power Consumption** 2.5 W @ 24 V_{DC} (typical)
- **Status Display** LED per channel (for DI/O only)
  On: Logic level 1; Off: Logic level 0

Counter/Frequency Input

- **Channels & Mode** 8 (Up Counter, High/Low Freq. and Wave Width mode)
  4 (Pulse and Direction, Up/Down Pulse, A/B Phase)
- **Counting Range** 32-bit + 1-bit overflow
- **Minimum Pulse Width** 1 µs for High Freq. mode; 1 ms for Low Freq. mode
- **Counter Frequency** 0.1 Hz ~ 10 Hz for Low Freq. mode and Wave Width mode
  10 Hz ~ 1M Hz for High Freq. mode and other modes
- **Input Voltage** For "0" signal: 0 ~ 3 V_{DC}; For "1" signal: 10 ~ 30 V_{DC}
- **Accuracy** 0.1% for Low Freq. mode
- **Input Filter** 0.1 us ~ 40 ms

Digital Input

- **Channels** 4
- **Type** Sink (Wet contact)
- **Input Voltage** For "0" signal: 0 ~ 3 V_{DC}; For "1" signal: 10 ~ 30 V_{DC}

Digital Output

- **Channels** 4 (Sink Type)
- **Output Voltage Range** 8 ~ 35 V_{DC}
- **Normal Output Current** 0.5 A (per channel)

Protection

- **Isolation Between Channels and Backplane** 2,500 V_{DC}
- **Short Circuit Protection (For DO channel)**
- **Thermal Shutdown Protection (For DO channel)**

Environment

- **Operating Temperature** -10 ~ 60°C (when mounted vertically)
- **Storage Temperature** -40 ~ 70°C
- **Relative Humidity** 5 ~ 95% (non condensing)

Ordering Information

- **APAX-5080** 4/8-ch High Speed Counter Module

APAX Controller Support table

Type		Performance PAC		Compact PAC			Coupler		
System		APAX-6572	APAX-5580	APAX-5620	APAX-5520	APAX-5522PE	APAX-5070	APAX-5071	APAX-5072
Function	I/O module	PAC with Intel ATOM™ D510 1.66 GHz	PAC with Intel Core i CPU	PAC with Marvel Xscaler CPU and CAN	PAC with Marvel Xscaler CPU	IEC 61850-3 Certified PAC with Marvel Xscaler CPU	Modbus/TCP Communication Coupler	PROFINET Communication Coupler	EtherNet/IP Communication Coupler
Analog I/O	APAX-5013	•	•	•	•	•	•	•	•
	APAX-5017	•	•	•	•	•	•	•	•
	APAX-5017H	•	•	•	•	•	•	•	•
	APAX-5018	•	•	•	•	•	•	•	•
	APAX-5028	•	•	•	•	•	•	•	•
Digital I/O	APAX-5040	•	•	•	•	•	•	•	•
	APAX-5045	•	•	•	•	•	•	•	•
	APAX-5046	•	•	•	•	•	•	•	•
	APAX-5060	•	•	•	•	•	•	•	•
	APAX-5080	•	•	•	•	•	•	•	•
Communication (Serial/CAN/ AMAX)	APAX-5090P	•	•	-	-	-	-	-	-
	APAX-5095P	•	•	-	-	-	-	-	-
	APAX-5202P	•	•	-	-	-	-	-	-
Backplane Modules	APAX-5001	•	•	•	•	•	•	•	•
	APAX-5002/L	•	•	•	•	•	•	•	•
Power Supply Modules	APAX-5343	-	•	-	-	-	-	-	-
	APAX-5343E	-	-	•	•	-	•	•	•
IEC-61850 Certified I/O	APAX-5017PE	•	•	•	•	•	•	-	-
	APAX-5040PE	•	•	•	•	•	•	-	-
	APAX-5060PE	•	•	•	•	•	•	-	-