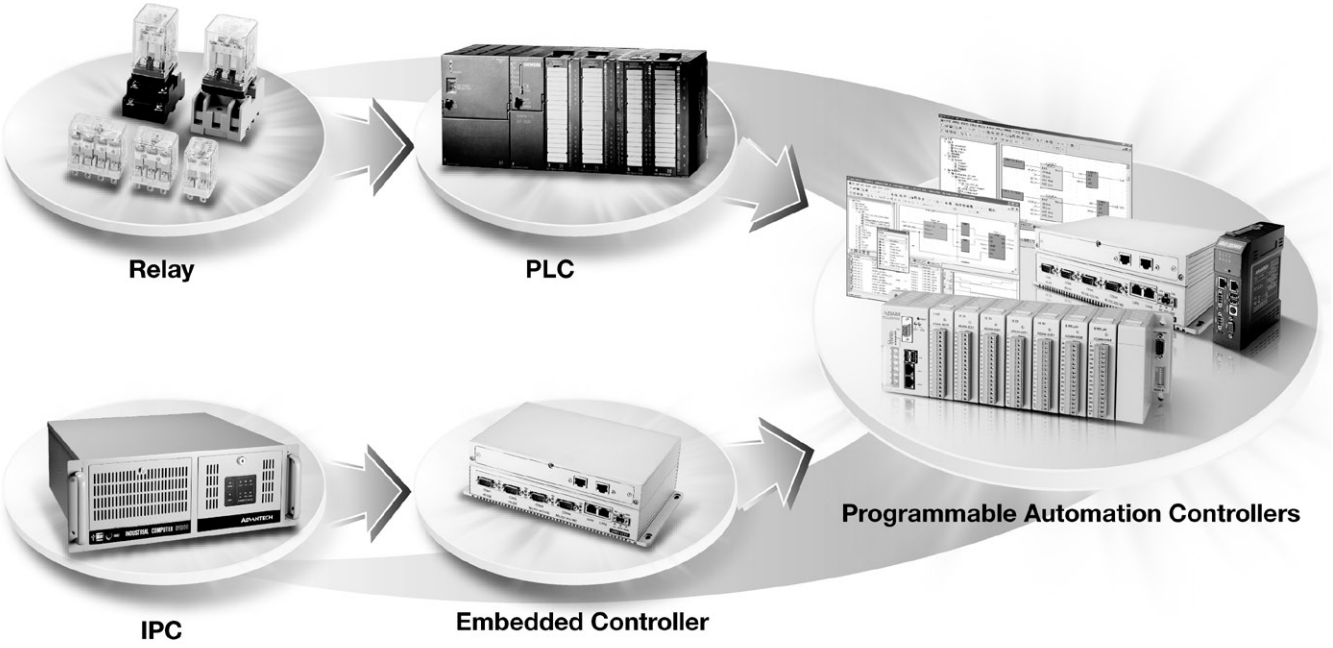
Simplify Complex Control Tasks with Programmable Automation Controllers



The Next Generation of Automation Controller

High level industrial applications require complex control capabilities, high speed analog measurements, multiple program support with different cycle times, open communication functions and enterprise-level network integration. In order to satisfy the market demands for complex control, Programmable Automation Controllers (PAC) are emerging in the market. PAC's define the new generation of industrial controllers which feature the PC's openness, high performance CPU, rich memory and powerful software functionality as well as the PLC's reliability and robustness.

The above figure shows the evolution of the automation controller. The PAC acronym is being used both by traditional PLC vendors to describe their high end systems and by PC-based Control companies to describe their industrial control platforms. PAC development is the same goal of PLC and PC-based Controller manufacturers. Programmable Automation Controllers incorporate multi-domain functionality, common development platforms, open standard interfaces and distributed modular architectures. PLC simply understates the capability of current automation systems. As the new generation comes to market, the more apt notion of PAC will displace its predecessor. PAC's augment the function and role of traditional PLC's by defining new capabilities.

Another approach of PAC is evolving from Industrial PC with mature embedded computing technology. With the nature of open architecture, PAC provides not only Industrial Computer's high computing performance but also the PLC's robustness.

One Control Engine & Development Environment with Multiple Application Domains & Hardware Platforms

The Breakthrough of Embedded Computing Technology

Progressive embedded computing technology overcomes traditional engineering obstacles, allowing easier changeover from PC-Based Controllers to Programmable Automation Controllers.

Stable Operating System:

Industrial applications require highly stable operating systems to satisfy certain conditions such as real-time functions, system crashes and unpredictable system resets. The embedded operating systems such as Windows CE and Embedded XP are typical in the market. Windows CE can meet the real-time application requirements. Embedded XP is a modularized Windows XP. After proper programming, the control program can work correctly even the system is under blue screen status. Through Embedded XP's SP2 EWF function, engineers have no fear of OS crash by an unexpected system reset.

Reliable Parts:

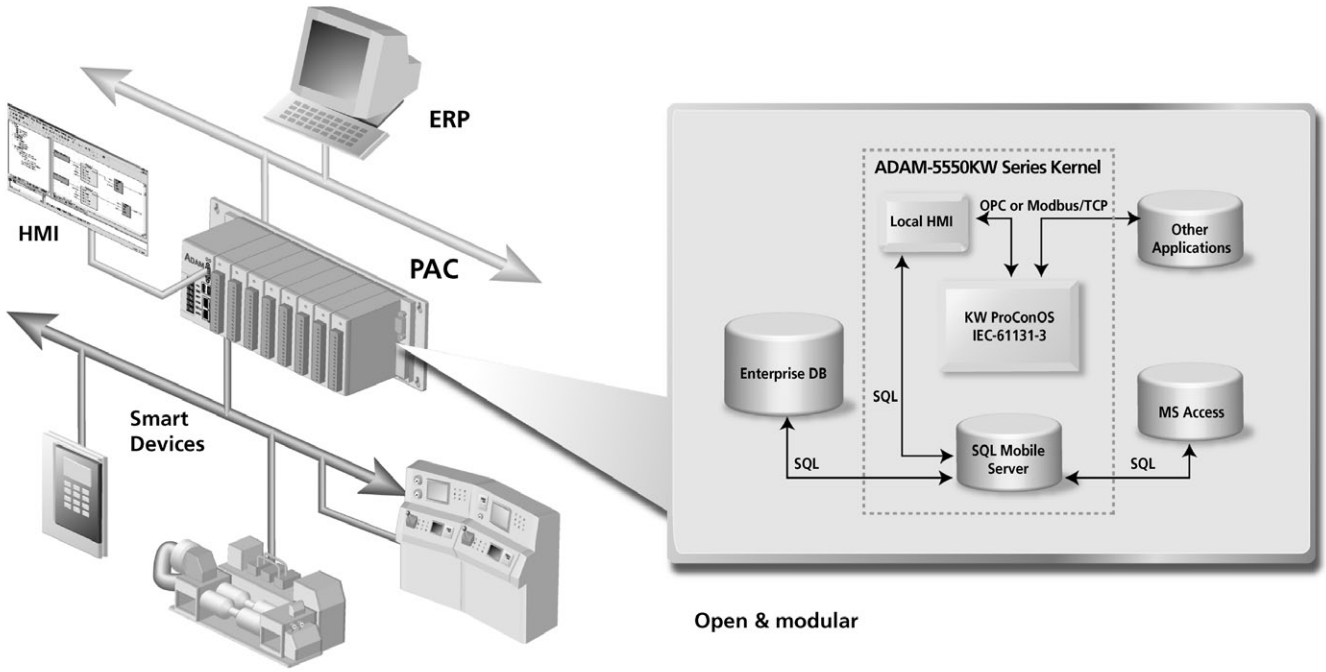
PAC's have removed unreliable moving parts, such as fans and hard disks. Low power consumption CPU's and fanless technologies are mature now. The wide operating temperature (-40 ~ 85° C) of CF cards as well as Ethernet Chips is available in the market. High capacity CF cards with sizes up to 2GB are also common and standard in the market today.

Standard Programming Language:

Operators in the plant need to fix malfunctions and recover systems in the shortest amount time. By using ladder diagrams, they can recover the system manually by forcing the coils to return to the default status and fix the affected codes. Now, the IEC-61131-3 standard can allow up to 5 PLC programmable languages, which allows manufacturers to save on developing time by using three kinds of graphical mixed languages.

Openness of Automation Architecture:

The use of Ethernet TCP/IP, Internet and IT standards maximizes data integration throughout an enterprise. In a collaborative manufacturing environment, the multi-functional capabilities of a PAC enable easy access and exchange of production process information, and connect factory-floor operations to enterprise-level systems. Where traditional PLC products require proprietary programming languages, a PAC can be commanded using IT standards, such as SQL queries, and open data transfer technology, such as OLE for process control (OPC) and extensible markup language (XML). This provides faster updates of actual, not copied, data, and consumes minimal bandwidth because the enterprise system does not have to poll the controllers. Rather, the PAC's send data based on events.



The Use of Ethernet TCP/IP, Internet and IT Standards Maximizes Data Integration Throughout an Enterprise

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Programmable Automation Controllers (ADAM-5000) & Software

Programmable Automation Controllers

What Are Programmable Automation Controllers (PAC's)?

The programmable logic controller (PLC), was introduced in the 1960's, and has been proven as a reliable and rugged automation controller for harsh industrial environments. Surveys by the ARC and VDC show that more than 70% of PLC applications require less than 128 points of digital I/O. About 80% of applications can be finished by 20 ladder-logic instructions. These average requirements have resulted in the recent growth of low-cost, tiny PLC's with digital I/O that uses ladder logic.

Although 80% of applications can be satisfied by low-cost simple controllers, the other 20% are more complex, and traditional PLC's cannot fully satisfy them. These higher level applications usually require complex control capabilities, high speed analog measurements, multiple programs support with different cycle times, open communication functions and enterprise-level network integration.

Different domain applications, such as discrete control, process control and motion control, have traditionally adopted proprietary controllers, which require developers to spend a lot of effort on software development and maintenance. These requirements would be best suited with a controller that supports single development tools and has multiple domain functionality. The new controller architecture integrates multiple domain functionality on single controller which saves on system design costs, project implementation, maintenance, training efforts and spare part stock.

In order to satisfy the market demands for complex control, the concept of the Programmable Automation Controller (PAC) is emerging in the market. PAC's define the new generation of industrial controllers which feature the PC's openness, high performance CPU, rich memory and powerful software functionality as well as the PLC's reliability and robustness. The terminology Programmable Automation Controller (PAC) is defined by ARC Advisory Group.

The Definition of a PAC is as Follows:

- Multi-domain functionality, including logic, motion, drives and process on a single platform
- Single multi-discipline development platform incorporating common tagging and a single database
- Software tools that allow design by process flow across several machines or process units
- Open, modular architectures that mirror industry applications from machine layouts in factories to unit operations in process plants
- Employs de-facto standards for network interfaces and languages, etc., allowing data exchange as part of networked multi-vendor systems

How Will PAC's Penetrate the PLC Market?

PAC's focus on complex control applications, rather than displace the traditional configurations of simple control applications, where PLC's currently work very well.

Complex control applications need a PAC's flexibility, so users can customize and optimize it to meet their particular requirements for controlling and automating both machines and plants. All parts of the PAC system are designed to maximize software and hardware integration. There should be one programming and engineering tool for a complete system. This capability includes transparent access for all parameters and functions within the entire system, combining PLC, remote I/O, motion control, drives, PID control, and data handling, along with a maximum integration level to the enterprise though the use of Ethernet TCP/IP, Internet, and IT standards.

Use of PAC's will continue to shift the emphasis toward open communication standards and software integration, with less focus on the hardware. Users will become more focused on the total system performance rather than the hardware selection. So PAC's will win more satisfactions from customers who are not satisfied by traditional PLC's especially when they need more than simple discrete I/O control function.

Advantech PAC Solutions

Open PAC System – ADAM-5550KW Series

ADAM-5550KW is a Programmable Automation Controller designed for control tasks which require Industrial PC computing performance with the PLC's robustness. ADAM-5550KW offers an AMD Geode GX533 CPU along with control specific features such as watchdog timer, battery backup RAM and deterministic I/O. ADAM-5550KW features 5 standard IEC61131-3 programming languages in CE 5.0, so PLC users can develop control strategies with their own familiar programming languages. The powerful Multiprog KW Software and stable ProConOS have allowed ADAM-5550KW to become the best choice for a Programmable Automation Controller on the market today. With the optional HMI Software and built-in VGA port, no longer will users be required to build up additional SCADA PC's in their applications. This open PAC system is ideal for a variety of applications ranging from machine automation to SCADA applications.

Compact PAC System – UNO-2171KW

UNO-2171KW is a compact size Programmable Automation Controller designed for control tasks which require Industrial PC computing performance with the PLC's robustness. UNO-2171KW offers a high-performance Celeron M 1GHz CPU and supports PC/104 expansion. The selected PC-104 cards such as AMONet Motion Control ,Analog I/O modules, Digital I/O modules and Serial communication module are available for the KW SoftLogic support. This compact PAC system is ideal for a variety of applications such as motion, vision and transportation applications.

Distributed PAC System – AMAX-2050KW

AMAX-2050KW is a Pentium III grade platform with an onboard AMONet controller, which is designed for embedded machine automation applications. It provides special mechanism to protect machine builder's IP, also the self diagnostic function. From the peripheral point of view, with one AMONet, master port AMAX-2050KW can control up to 2048 I/O points and 64 axes. Also, AMAX-2050KW offers one LAN and dual USB interfaces to fulfill user's various communication needs. In addition, it also offers two RS-232 and one RS-422/485 communication port with automatic flow control functionality. Because of its openness, great expansion capabilities and reliable design (fanless and diskless), the AMAX-2050KW is an ideal distributed PAC system to implement custom applications for diversified applications.

PAC Characteristics

Multi-domain Functionality on a Single Platform

- PAC's will play a major role in different application domains by adhering to open industry standards and providing multidiscipline programming and functionality.

Single Developing Tool for Various Form Factors

- A single programming tool provides transparent access for all parameters and functions within the entire system. A single platform can combine PLC, SoftLogic, remote input/output (I/O), motion control, PID control and data handling.
- Requires only a one-time design, and then can easily leverage the control know-how into different control platforms to meet versatile automation projects needs

Supports IEC-61131-3 Programming Languages

- The standard includes Ladder Diagram, Function Block, Sequential Function Chart, Structure Text and Instruction List which covers almost all PLC programming languages.
- Cross languages for three graphical languages is supported to simplify control programs

Multiple Speeds with Deterministic I/O

- Some control systems require various speed applications, and PAC's provide multiple speeds with deterministic I/O.

VGA Port

- Most of PAC system provides VGA port, no need additional Human Machine Interface, the system can connect directly to display and that save lot of cost.

Seamless Integration between SoftLogic and HMI Software

- SoftLogic creates single tagging database and HMI Software shares the same tagging database

Transfer Data and Information via Ethernet and IT Standard Technology

- Utilization of Ethernet, Internet and IT standards such as FTP, Web Server, Email Alarm, SQL, and OPC

Standard Communication

- Multi-vendor data exchange by utilizing de-facto standard such as Modbus

Open and Modular Architecture

- Flexible for upgrade and maintenance
- Easy to expand local and remote I/O modules

Storage Function

- PAC Storage function can be set for your assigned time and conditions.

Complex Control Functions

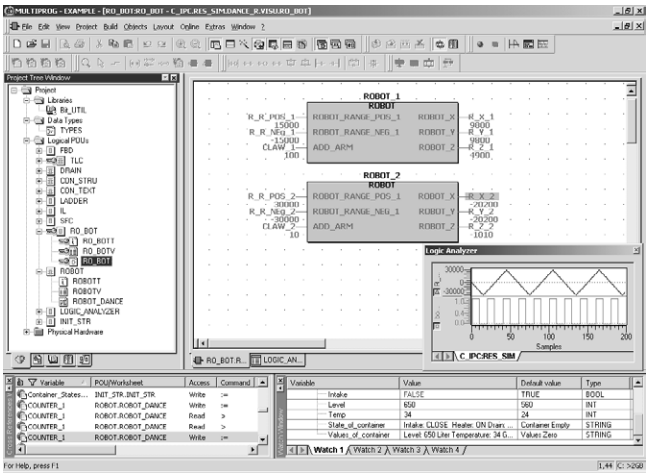
- Complex control algorithms need powerful floating point calculations and large memory capacity.
- The software development tool provides PID Function Block and allows users to develop custom function blocks with proprietary complex controls, such as Fuzzy Logic Control and Neural Network Control.

Remote Maintenance

- Operators can access the supplier's Web site, allowing technicians to diagnose and troubleshoot problems directly from the plant floor by PAC's Web-based monitoring and maintenance function.

KW MULTIPROG®

IEC-61131-3 SoftLogic Control Software



Features

- IEC 61131-3 Programming languages
- Intuitive programming with a clear project structure
- Cross-compiling: FBD, LD and IL can be cross-compiled to each other
- Multi user functionality shortens programming time
- Management of distributed controls
- Network variables: Easy and powerful configuration of distributed communication
- Powerful debugging tools: Online changes, PLC simulation, Overwriting & forcing, breakpoints, watch windows & recipes, Logic analyzer, and cross reference.

Introduction

MULTIPROG® supports all IEC 61131-3 programming languages. Depending on the task to be handled, your experience and company standards, you may choose one of the five standardized programming languages. The use of MULTIPROG offers you many advantages. Our long-term experience in the automation industry guarantees you a sophisticated software product.

The open architecture of MULTIPROG provides a new direction in the creation of automation software. MULTIPROG Automation Interface guarantees consistent data. Via the automation interface, MULTIPROG opens its data for other tools. MULTIPROG allows external creation and modification of its project data. Furthermore, specific attributes can be added. As all essential data can be displayed in MULTIPROG, frequent switching between different tools during PLC programming and commissioning is no longer necessary. Observers guarantee data consistence with other tools, thus the engineering effort for the programming of PLCs is reduced.

Reliability by Experience

KW MULTIPROG is based on an embedded softlogic controller that has been applied in the automation industry since 1991. With over 250,000 runtime installations worldwide, a sophisticated and reliable product is available which is continuously adapted to new technologies.

Specifications

Hardware Requirements

Device	Minimum	Recommended
IBM compatible PC with Pentium Processor	200 MHz	350 MHz
System RAM	64 MB	128 MB
Hard Disk	60 MB free memory space	
CD-ROM drive		
VGA Monitor Color Settings Resolution	256 colors 800 x 600	True color 1024 x 768
RS-232 interface	Optional	
Mouse	Recommended	

Advantech Hardware Supported

- ADAM-5550KW Series
- ADAM-5510KW Series
- UNO-2171KW
- AMAX-2050KW

Software Requirements

- Microsoft® Windows NT 4.0 SP5 or Windows 2000/XP
- Microsoft Internet Explorer 5.02 or above

IEC 61131-3 Programming Languages (all supported)

- Instruction List (IL)
- Structured Text (ST)
- Function Block Diagram (FBD)
- Ladder Diagram (LD)
- Sequential Function Chart (SFC)
- All programming languages can be mixed within one project

Ordering Information

- **MPROG-BAS33** KW Multiprog Softlogic Development Kit Basic Edition v3.3 for Windows NT/2000/XP (128-byte I/O)
- **MPROG-ADV33** KW Multiprog Softlogic Development Kit Advanced Edition v3.3 for Windows NT/2000/XP (64k-byte I/O)
- **PROCON-NTOPC20** KW ProConOS OPC Server Runtime License V 1.12 for Windows NT/2000/XP (ADAM-5510KW Series is not supported)
- **PROCON-CEOPC20** KW ProConOS OPC Server Runtime License v2.0 for Windows CE.NET (ADAM-5510KW Series is not supported)

KW for Programmable Automation Controllers

Advantech Programmable Automation Controller (PAC) solution leverages KW-Software's Multiprog and ProConOS as the single developing tool and SoftLogic control kernel. It requires only a one-time design, and then can easily leverage the control know-how into different control platforms to meet versatile automation projects needs. KW SoftLogic also creates single tagging database and HMI Software, such as Advantech Studio, shares the same tagging database by OPC server under Windows CE operating system. All the features can help users to save the visible and invisible cost.

Industry Standard IEC 61131-3 Programming

For faster time-to-market and reduced support costs, take advantage of programming support for the five globally recognized PLC languages: Ladder Diagram, Function Block, Sequential Function Chart, Structured Text, and Instruction List. Develop your application in any one of the five languages, or use any combination that fits your development needs.

Real-time Logic Execution

Programmable Automation Controllers offers real-time, deterministic execution of your application code down to 1 milli-second resolution. Take advantage of Programmable Automation Controllers optimized logic runtime engine that automatically complies your IEC-61131 application code for maximum performance. Programmable Automation Controllers brings the benefits of real-time control to a cost effective, so you can take advantage of local real-time control with a wide range of remote monitoring and management features. All this integrated into one package!

Integrated Development Environment

Programmable Automation Controllers brings integrated programming of logic and HMI to simplify programming and maintenance tasks. Integrated and synchronized database management eliminates the need to create and track multiple database items for HMI and logic programs, with the benefits of reduced programming time and fewer startup errors for your project. And, take advantage of Programmable Automation Controllers powerful on-line debugging tools to quickly track down and correct programming errors.

Broad Range of I/O Support

The Programmable Automation Controllers product series offers flexible I/O support to meet a wide range of application requirements. Take advantage of Programmable Automation Controllers powerful integrated HMI and logic functions in combination with an array of distributed serial and Ethernet I/O products, or choose a platform with fully integrated I/O for maximum performance and cost effectiveness.

Automatic Remote Handling of Events & Alarms via Email

Programmable Automation Controllers support alarm and event handling. Track local conditions and generate reports based on time, event, or exception conditions, then automatically issue reports or alarms via e-mail worldwide! By monitoring conditions and trends in real time, Programmable Automation Controllers offers the possibility to predict failures before they cause service interruptions or lost production. Protect and optimize the investment in your machine, process, or facility with Programmable Automation Controllers.

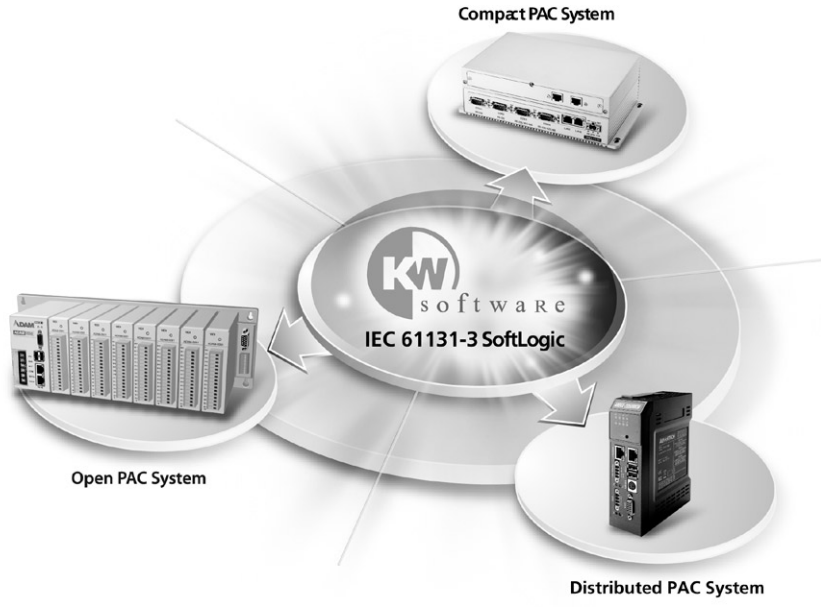
Browser-only Client for Remote Monitoring

With Programmable Automation Controllers use Internet Explorer or Netscape browser software to remotely (via Intranet or Internet) monitor or control your machine, process, or facility. This offers true "zero cost" remote access with full security capability, so you can efficiently monitor and troubleshoot from anywhere in the world. Take advantage of this feature to lower your service costs and reduce or eliminate downtime.

Open Interfaces for Maximum Flexibility

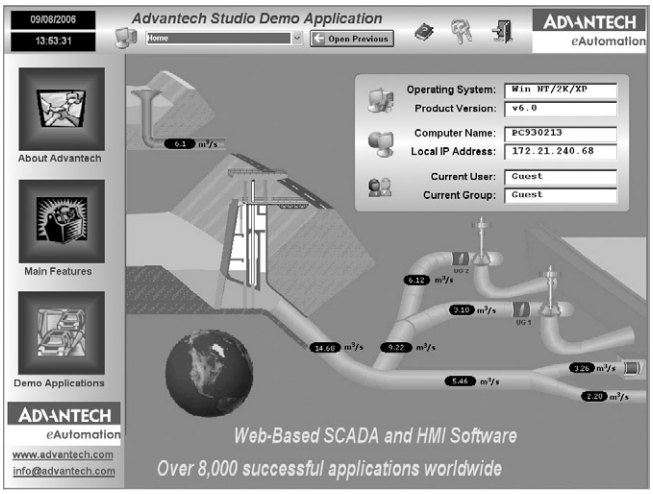
Take advantage of the open architecture of the Programmable Automation Controllers with support for standard connectivity interfaces like OPC, XML, and SQL. Easily integrate standard information technologies into your existing factory or building network structure and take advantage of the benefits of local control with global connectivity!

Programmable Automation Controllers



Advantech Studio

Web-enabled HMI/ SCADA Software



Features

- Publish real-time dynamic and animated graphic screens, trends, alarms, reports, and recipes to standard browsers
- Import and export recipes, reports and real-time data using the XML format
- Use the same development environment as applications running on Microsoft® Windows® NT/2000/XP and CE.NET or on the Web
- Integrates seamlessly with your Windows desktop applications (such as Microsoft Word and Excel)
- View multiple clients from one Web browser
- Multi-level security for applications, including use over Intranets and Internet
- Conforms to industry standards such as Microsoft DNA, OPC, DDE, ODBC, XML, and ActiveX
- Software protection type: Softkey

Introduction

Advantech Studio is a powerful, integrated collection of automation tools that includes all the building blocks required to develop modern Human Machine Interfaces (HMIs), and Supervisory Control and Data Acquisition System (SCADA) applications that run on Windows NT/2000/XP and CE.NET, or in an Internet/Intranet environment. A simple drag and drop, point and click development environment simplifies the most complex behavior of your live processes, but a flexible and easy-to-use scripting language is also available for special requirements. Advantech Studio is currently being used in nearly 2,000 installations worldwide.

Advantech Studio for Windows CE.NET is based on Advantech Studio's full scale supervisory control and monitoring system, and has almost all of the same features, including an object-oriented database, math functions, report generation, archiving, alarms, batch recipes, and interfaces for PLCs, remote I/O and TCP/IP networking. In other words, Advantech Studio for Windows CE.NET is a full-function supervisory control and monitoring system that fits in the palm of your hand or can be embedded in the chipset of a low-cost operator interface. Advantech Studio for Windows CE.NET is software for complete supervisory control and process monitoring with an operator interface that is available for the Microsoft Windows CE.NET operating system platform.

System Requirements

	Product Series or Part Number	AS256-WR60	AS256-WD60	AS512-WR60	AS512-WD60	AS1500-WS60	AS1500-WR60
Type	S/W Scope	Win32 Lite	Win32 Lite	Win32 Lite Plus	Win32 Lite Plus	Local Interface	Local Interface
	Authorized Version	R	D	R	D	S	R
Overview	Development Tool OS	-	WinNT/2K/XP	-	WinNT/2K/XP	WinNT/2K/XP	-
	Runtime OS	WinNT/2K/XP	-	WinNT/2K/XP	-	WinNT/2K/XP	WinNT/2K/XP
Database	Application Tags	up to 256	up to 256	up to 512	up to 512	up to 1,500	up to 1,500
Communicatation	Drivers	only 2	only 2	only 2	only 2	3 by default	3 by default

	Product Series or Part Number	AS1500-WD60	AS4000-WS60	AS4000-WR60	AS1500-CD60	AS4000-CD60	WebLink	WebOIT
Type	S/W Scope	Development	Operator Workstation	Operator Workstation	Development for CE Runtime	Development for CE Runtime	CE Runtime	CE Runtime
	Authorized Version	D	S	R	D	D	R	R
Overview	Development Tool OS	WinNT/2K/XP	WinNT/2K/XP	-	WinNT/2K/XP	WinNT/2K/XP	-	-
	Runtime OS	-	WinNT/2K/XP	WinNT/2K/XP	-	-	WinCE	WinCE
Database	Application Tags	up to 1,500	up to 4,000	up to 4,000	up to 1,500	up to 4,000	up to 4,000	up to 4,000
Communicatation	Drivers	3 by default	5 by default	5 by default	only 3	up to 3	up to 3	up to 3

Legend	
Supported	✓
D	Determined by Development version only
R	Determined by Runtime version only
S	Suit version includes Development and Runtime versions

Specifications

- **Pre-built Servers** Web Server, FTP Server, Telnet Server, Remote Access Server (RAS)
- **HMI Functions** 100+ built-in PLC drivers (up to 3 running simultaneously)
- 8 simultaneous web clients
- OPC Client and Server
- Email (SMTP) Integration
- Fully featured dynamic graphics with object library
- Alarming, Trending, Reporting features
- Scripting Language with 100+ standard functions
- Recipes (ASCII and XML formats)
- Remote project management including online editing
- Multi-level security for use over Intranet and Internet

System Requirements: Development Environment

- Microsoft Windows XP, 2000, NT 4.0 service pack 4 or higher
- Min. 256 MB of RAM. (512 MB Recommended)
- 100 MB of free hard-disk space for installation
- CD-ROM drive (for installation only)

System Requirements: Runtime Environment

- Windows CE.Net
- Min. 64 MB of memory

or

- Microsoft Windows 2000/XP/NT 4.0 with Service Pack 4 or higher
- Min. 32 MB of RAM. (64 MB Recommended)
- Web Browser that supports ActiveX objects

Hardware Platforms Supported

- **ADAM-5550KWAS** 8-slot Programmable Automation Controller with KW & AS1500-CR60

Applications

- Remote Utility Management
- Building Automation
- Water and Wastewater Management
- Factory Automation
- Machine Builder

Ordering Information

Suit Version

- **AS1500-WS60** AStudio Development Kit Professional Edition for Windows XP/2000/NT (including DEV and RT Editions)
- **AS4000-WS60** AStudio Workstation Professional Edition for Windows XP/2000/NT (including DEV and RT Editions)

Development Version

- **AS256-WD60** AStudio Developement Kit for Windows XP/2000/NT (Asia Only)
- **AS512-WD60** AStudio Developement Kit for Windows XP/2000/NT (Asia Only)
- **AS1500-WD60** AStudio Developement Kit for Windows XP/2000/NT
- **AS1500-CD60** AStudio Developement Kit for Windows CE .NET
- **AS4000-CD60** AStudio Workstation Development Kit for Windows CE .NET

Runtime Version

- **AS256-WR60** AStudio Runtime Edition for Windows XP/2000/NT (Asia Only)
- **AS512-WR60** AStudio Runtime Edition for Windows XP/2000/NT (Asia Only)
- **AS1500-WR60** AStudio Runtime Edition for Windows XP/2000/NT
- **AS4000-WR60** AStudio Runtime Edition for Windows XP/2000/NT

Upgrade Kit

- **AS1500-CD60/U** Upgraded kit from AS1500-CD51 to AS1500-CD60
- **AS1500-WD60/U** Upgraded kit from AS1500-WD51 to AS1500-WD60
- **AS4000-CD60/U** Upgraded kit from AS4000-CD51 to AS4000-CD60
- **AS4000-WS60/U** Upgraded kit from AS4000-WS51 to AS4000-WS60

Communication Drivers

Advantech	ADAM-4000, ADAM-5000/485, ADAM-6000
AEG Schneider (Modicon Square D Telemecanique)	AEG Compact PLC*, ModCon 984E*, Quantum Family
	ModCon 984E* Ethernet Quantum Ethernet Family
	MODBUS Plus compatible equipment
	Symax
Allen-Bradley	Family PLC2 Family PLC5 Family SLC500 Family 5000
Cutler-Hammer	D50*, D300
GE-Fanuc	Series 90, 90/30 CPU 341*
Mitsubishi	FX-232AW
Omron	C-series Rack PCs Sysmac way Host link units Sysmac C200H*
	E5CK/E5AF
Phoenix	Interbus Compatible
Siemens	S5 (PG port)
	S5/S7 3964R, S7 (MPI)
	Profibus DP Slave Compatible
	Profibus DP Master Compatible
	Profibus FMS Compatible
	S5-945 PG Port
	MXT521
Yokogawa	UT35
	HR2500E
	DA100
	UT37/UT38
	UT750, UP750, UT550, UT520, UP550, UT350, UT320, UM350, UM330, UP350
	YS100
Modbus Ethernet	Modbus/TCP
Modbus	RTU/ASCII
OPC	Server/Client

Note: Advantech Studio V6.0 supports more than 150 communication drivers for 3rd party devices from different manufacturers such as Omron, Allen-Bradley, Siemens, and many more.

ADAM-5500 Series Controllers Selection Guide

System	ADAM-5510M/5510E	ADAM-5510/TCP ADAM-5510E/TCP	ADAM-5510KW/ 5510EKW	ADAM-5510EKW/TP	ADAM-5550KW
CPU	80188				AMD Geode GX533 (GX2)
RAM	640 KB				128 MB DDR SDRAM
Flash ROM	256 KB				-
Flash Memory	256 KB	256 KB	768 KB	768 KB	-
Flash Disk	1 MB	1 MB	512 KB	512 KB	-
OS	ROM-DOS				WinCE 5.0
Real-time Clock	Yes				
Watchdog Timer	Yes				
COM1	RS-232 (ADAM-5510M) RS-232/485 (ADAM-5510E)	RS-232 (ADAM-5510/TCP) RS-232/RS-485 (ADAM-5510E/TCP)	RS-232 (ADAM-55510KW) RS-232/485 (ADAM-5510EKW)	RS-232/485	RS-232/485
COM2	RS-485				
COM3 (Programming)	RS-232 (TX, RX, GND)	RS-232 (TX, RX, GND)	RS-232 (TX, RX, GND)	RS-232 (TX, RX, GND)	RS-232
COM4	RS-232/485				
I/O Slots	4/8			8	
Power Consumption	4 W				12 W
Isolation					
Communication	$2500V_{DC}$ (COM2 RS-485)				$2500V_{DC}$ (COM2 RS-485) $1000V_{DC}$ (COM4 RS-485)
Communication Power	3000 V_{DC}				
I/O Module	3000 V_{DC}				
Diagnosis					
Status Display	Power, CPU, Communication, Battery				Power, User define
Self Test	Yes, while ON				
Software Diagnosis	Yes				
Communication					
Network	RS-232/485	Ethernet (RJ-45)	RS-232/485	Ethernet (RJ-45)	Ethernet (2 x RJ-45)
Speeds	1200 bps ~ 115.2 kbps	10/100 Mbps	9600, 38400, 57600 bps and 115.2 kbps	10/100 Mbps	10/100 Mbps
Max. Distance	4000 feet (1.2 km)	150 m	4000 feet (1.2 km)	150 m	150 m
Data Format	N, 8, 1, 1	-	N, 8, 1, 1	-	-
Max. Nodes	32	256 for Ethernet, 32 for RS-485	32	32	-
Protocol	User Defined Modbus/RTU	User Defined Modbus/RTU Modbus/TCP	Modbus/RTU	Modbus/RTU, Modbus/TCP	Modbus/RTU, Modbus/TCP
Remote I/O	Modbus Device				
Power Requirements	+10 ~ +30 V_{DC}				
Environment					
Operating Temperature	-10 ~ 70° C (14 ~ 158° F)				0 ~ 50° C (32 ~ 122° F)
Storage Temperature	-25 ~ 85° C (-13 ~ 185° F)				
Humidity	5 ~ 95%				
Page	1-20	1-22	1-24	1-26	1-14

System	ADAM-5000/485	ADAM-5000E	ADAM-5000L/TCP	ADAM-5000/TCP
CPU	80188	80188	RISC CPU	
RAM	-	-	4 MB	
Flash ROM (user's AP)	-	-	512 KB	
Flash Memory (data storage)	-	-	-	
Flash Disk	-	-	-	
OS	-	-	real-time OS	
Timer BIOS	-	-	-	
Real-time Clock	-	-	-	
Watchdog Timer	Yes			
COM1/COM2	RS-485	RS-485	RS-485 (Modbus)	
COM3 (Programming)	TX, RX, GND			
I/O Slots	4	8	4	8
Power Consumption	3 W		4.0 W	5.0 W
Isolation				
Communication	2500 V_{DC}	3000 V_{DC}	RS-485: 1500 V_{DC} Ethernet: 3000 V_{DC}	
Communication Power	3000 V_{DC}			
I/O Module	3000 V_{DC}			
Diagnosis				
Status Display	Power, CPU, Communication		Power, CPU, Error Diagnostic, Communication	
Self Test	Yes, while ON			
Software Diagnosis	Yes			
Communication				
Interface	RS-232/485 (2-wire)	RS-232/485 (2-wire)	Ethernet	
Speeds (bps)	1200, 2400, 4800, 9600, 192 K, 38.4 K, 57.6 K, 115.2 K	1200, 2400, 4800, 9600, 19.2 K, 38.4 K, 57.6 K, 115.2 K	10 M, 100 M	
Max. Distance	4000 feet (1.2 km)	4000 feet (1.2 km)	100 m without repeater	
Data Format	Advantech protocol: N,8,1 Modbus protocol: N,8,1 N,8,2 E,8,1 O,8,1	Advantech protocol: N,8,1 Modbus protocol: N,8,1 N,8,2 E,8,1	TCP/IP	
Max. Nodes	128	128	Depend on IP address	
Protocols	ADAM ASCII/Modbus Protocol	ADAM ASCII/Modbus Protocol	Modbus/TCP	
Remote I/O	-	-	20 nodes Modbus devices	
Power Requirements	+10 ~ +30 V_{DC}			
Environment				
Operating Temperature	-10 ~ 70° C (14 ~ 158° F)			
Storage Temperature	-25 ~ 85° C (-13 ~ 185° F)			
Humidity	5 ~ 95%			
Page	1-18		1-20	

ADAM-5000 Modules Selection Guide

Module		ADAM-5013	ADAM-5017	ADAM-5017P	ADAM-5017UH	ADAM-5018	ADAM-5018P	ADAM-5024	ADAM-5050	ADAM-5051	ADAM-5051D	ADAM-5051S
Analog Input	Resolution	16 bit	16 bit	16 bit	12 bit	16 bit	16 bit	-	-	-	-	-
	Input Channel	3	8	8	8	7	7	-	-	-	-	-
	Sampling Rate	10	10	10	200K	10	10	-	-	-	-	-
	Voltage Input	-	±150 mV ±500 mV ±1 V ±5 V ±10 V	±150 mV ±500 mV ±15V ±10V ±5 V ±1 V 0 ~ 150mV 0 ~ 500mV 0 ~ 1V 0 ~ 5V 0 ~ 10V 0 ~ 15V	±10 V 0 ~ 10 V 0 ~ 20 mV	±15 mV ±50 mV ±100 mV ±500 mV ±1 V ±2.5 V	±15 mV ±50 mV ±100 mV ±500 mV ±1 V ±2.5 V	-	-	-	-	-
	Current Input	-	±20 mA	±20 mA, 4 ~ 20mA	4 ~20 mA	±20 mA	4 ~ 20 mA	-	-	-	-	-
	Direct Sensor Input	Pt or Ni RTD	-		-	J, K, T, E, R, S, B	J, K, T, E, R, S, B	-	-	-	-	-
Analog Output	Resolution	-	-		-	-	-	12 bit	-	-	-	-
	Voltage Output	-	-		-	-	-	0~10 V	-	-	-	-
	Current Output	-	-		-	-	-	0~20 mA 4~20 mA	-	-	-	-
Digital Input and Digital Output	Digital Input Channels	-	-		-	-	-	-	16 DIO (bit-wise selectable)	16	16 W/LED	16 W/LED
	Digital Output Channels	-	-		-	-	-	-		-	-	
Counter (32-bit)	Channels	-	-		-	-	-	-	-	-	-	-
	Input Frequency	-	-		-	-	-	-	-	-	-	-
	Mode	-	-		-	-	-	-	-	-	-	-
COMM	Channels	-	-		-	-	-	-	-	-	-	-
	Type	-	-		-	-	-	-	-	-	-	-
Isolation		3000 V_{DC}	3000 V_{DC}	300V_{DC}	3000 V_{DC}	3000 V_{DC}	3000 V_{DC}	3000 V_{DC}	-	-	-	2500 V_{DC}
Page		1-28			1-29			1-30				1-31

ADAM-5052	ADAM-5055S	ADAM-5056	ADAM-5056D	ADAM-5056S /5056SO	ADAM-5060	ADAM-5068	ADAM-5069	ADAM-5080	ADAM-5081	ADAM-5090
-	-	-	-	-	-	-	-	-		-
-	-	-	-	-	-	-	-	-		-
-	-	-	-	-	-	-	-	-		-
-	-	-	-	-	-	-	-	-		-
-	-	-	-	-	-	-	-	-		-
-	-	-	-	-	-	-	-	-		-
-	-	-	-	-	-	-	-	-		-
-	-	-	-	-	-	-	-	-		-
-	-	-	-	-	-	-	-	-		-
-	-	-	-	-	-	-	-	-		-
-	8 w/LED	-	-	-	-	-	-	-		-
8	8 w/LED	16	16 w/LED	16 w/LED	6 relay (2 form A/ 4 form C)	8 relay (8 form A)	8 power relay (form A)	-		-
-	-	-	-	-	-	-	-	4	8	-
-	-	-	-	-	-	-	-	5000 Hz (max)	5 Hz ~ 1 MHz max. (frequency mode) 1 MHz max. (counter mode)	-
-	-	-	-	-	-	-	-	Frequency, Up/ Down Counter, Bi-direction Counter	Frequency, up/down, Bi-direction, up, A/B Phase, Counter	-
-	-	-	-	-	-	-	-	-		4
-	-	-	-	-	-	-	-	-		RS-232
5000 V_{RMS}	2500 V_{DC}	-	-	2500 V_{DC}	-	-	4000 V_{RMS}	1000 V_{RMS}	2500V_{DC}	-
1-31		1-32			1-33			1-34		

ADAM-5000 Modules Selection Guide

Model		ADAM-5202	ADAM-5240
Axes	Number of Axes	-	4
	Linear Interpolation	-	v
	2-Axis Circle Interpolation	-	v
Advanced Functions	Encoder Channels	-	4
	Limit switch Input Channel	-	8
	Home Input Channel	-	4
	Emergency stop Input Channel	-	1
	Slow Down Limit Switch	-	8
	General Purpose DI Channel	-	-
	Servo On Output Channel	-	4
	General Purpose DO Channel	-	4
	Position Compare Event	-	V
	Remote Motion	V	-
	Remote I/O	V	-
	Board ID	-	-
Connectors		2 x RJ-45	100-PinSCSI-II
Wiring Board		AMAX-3752F AMAX-3754F AMAX-3756F	ADAM-3952, ADAM-3952J2S
Remote Motion Wiring Board		AMAX-3210 AMAX-3211/PMA AMAX-3212/J2S AMAX-3213/YS2	
Supported Controller		ADAM-5550KW	
Page		1-35	

Model		ADAM-5030
Storage	Type	SD (Secure Digital Card)
	Channel	2
	Size	2 GB (Max)
USB	Type	V2.0 (compliant)
	Channel	2
Supported Controller		ADAM-5550KW
Page		1-35

ADAM-5550KW

8-slot Programmable Automation Controller

Features

- Designed for control tasks that meet robust and computing performance requirements for PLC and Industrial PC's
- SoftLogic support in Win CE 5.0
- Can be operated with or without display/keyboard/mouse
- Remote monitoring through Web Server and Email Alarm
- Remote maintenance via FTP Server
- Supports Modbus/RTU Master and Modbus/TCP (Server/Client) Protocol
- Supports OPC Server
- Supports SQL database
- Supports SD Storage I/O Module
- Supports AMONet Master Module
- Supports Motion Control Modules
- Deterministic I/O at 1 ms
- Remote I/O expansibility
- Rich support to ADAM-5000 I/O Modules

Introduction

ADAM-5550KW is a Programmable Automation Controller designed for control tasks which require Industrial PC computing performance with the PLC's robustness. ADAM-5550KW offers an AMD Geode GX533 CPU along with control specific features such as watchdog timer, battery backup RAM and deterministic I/O. ADAM-5550KW features 5 standard IEC61131-3 programming languages in CE 5.0, so PLC users can develop control strategies with their own familiar programming languages. The powerful Multiprog KW Software and stable ProConOS have allowed ADAM-5550KW to become the best choice for a Programmable Automation Controller on the market today. With the optional HMI Software and built-in VGA port, no longer will users be required to build up additional SCADA PC's in their applications. This compact and powerful PAC is ideal for a variety of applications ranging from machine automation to SCADA applications.

Specifications

Control System

- **CPU** AMD Geode GX533 (GX2)
- **I/O Capacity** 8 slots
- **LED Indicators** Power, User define
- **Memory** 128 MB DDR SDRAM with 1 MB Battery Backup
  1 x CompactFlash® Card (Internal)
- **Operating System** Windows® CE 5.0
- **Real-time Clock** Yes
- **Watchdog Timer** Yes

Communications

- **Comm. Protocol** Modbus/RTU and Modbus/TCP
- **Medium** 2 x 10/100 Base-T Ethernet Interface with RJ-45 connectors

Protection

- **Communication** 2500 V_{DC} (COM2 RS-485)/1000 V_{DC} (COM4 RS-485)
- **Power Reversal Protection** Yes

Power

- **Power Consumption** 12 W @ 24 Vdc (not including I/O modules)
- **Power Input** Unregulated +10 to +30 V_{DC}

General

- **Certificate** CE
- **Connectors** 1 x RS-232/485 (COM1)
  1 x RS-485 (COM2)
  1 x RS-232 (COM3)
  1 x RS-232/485 (COM4)
  2 X USB 1.1 ports (KB/Mouse via USB Ports)
  1 x VGA (1024 X 768 Resolution)
- **Dimensions** 355 x 110 x 75 mm
- **Enclosure** ABS+PC
- **Plug-in Screw Terminal** Accepts 0.5 mm^2 to 2.5 mm^2, 1 - #12 or 2 - #14 to #22 AWG

Environment

- **Humidity** 5% to 95%, non-condensing
- **Operating Temperature** 0 ~ 50° C (32 ~ 122° F)
- **Storage Temperature** - 25 ~ 85° C (-13 ~ 185° F)

Ordering Information

- **ADAM-5550KW** 8-slot Programmable Automation Controller with KW
- **ADAM-5550KWAS** 8-slot Programmable Automation Controller with KW & AS1500-CR60
- **MPROG-BAS33** KW Multiprog Softlogic Development Kit Basic Edition v3.3 for Windows NT/2000/XP (128-byte I/O)
- **MPROG-ADV33** KW Multiprog Softlogic Development Kit Advanced Edition v3.3 for Windows NT/2000/XP (64k-byte I/O)

PAC Features

ADAM-5550KW is designed for control tasks which need Industrial PC's computing performance and PLC's robustness. Its multiple functionalities include descrete, analog and motion functions. The well-integrated programming tool and optional HMI software provide a flexible and easy-to-use software solution for versatile applications. ADAM-5550KW supports Modbus protocol which allows data exchange with various Modbus devices.

SoftLogic Support in CE 5.0

ADAM-5550KW supports IEC-61131-3 programming in WinCE 5.0. The five programming languages of Ladder Diagram, Function Block, Sequential Function Chart, Structured Text and Instruction List cover most of the PLC programming languages in the market. The reliable ProConOS runtime engine and powerful MULTIPROG software from KW-Software empower ADAM-5550KW as the best solution of Programmable Automation Controller.

Visualization

ADAM-5550KW has a built-in VGA port which can directly connect to a display. So HMI function can be integrated into this controller. ADAM-5550KW can be operated with or without display/keyboard/mouse which can meet different requirements of applications.

Widely Used IT Technology

ADAM-5550KW supports widely used IT technology of industrial PC. For remote monitoring function, the built-in web server can provide local I/O status for internet access and email alarm function can send alarm message to dedicated email addresses when there is any alarm occurs. For remote maintanance function, the buit-in FTP server provides service for uploading application program or downloading data logging files.

Dual Ethernet Ports

ADAM-5550KW provides two ethernet ports for different application requirements such as redundant ethernet connetion for reliability concern or separated network connections for security concern. Both of the functions are possible to be implemented by customer's application program.

Deterministic I/O

ADAM-5550KW can guarantee deterministic I/O at 1 ms. This feature guarantees control and response speed at I/O level so HMI software or operations of other application programs cannot affect the I/O control performance.

Remote I/O Expansibility

ADAM-5550KW supports not only Modbus/RTU Master function via serial ports, but also the Modbus/TCP Client to retrieve data from remote I/O, and Modbus/TCP Server to exchange data with other Modbus devices via Ethernet port. This Modbus feature is very useful when the control system needs expand the remote I/O modules or connect to other controllers.

Rich Support to ADAM-5000 I/O Modules

Most of the ADAM-5000 I/O modules are supported by ADAM-5550KW including analog I/O modules, digital I/O modules, and motion control module. All the operations of supported modules are the same with the operations of ADAM-5510KW series.

AMONet Motion Control Modules

AMONet Module supports two RS-485 master ports, and transfers data between host and slaves directly without any operations in between. Each port of the master can control up to 2048 I/O points, 64 axes, or a combination of I/O points and axes for motion control. The master ports support up to 20 Mbps transfer rate and a maximum communication distance of up to 100 meters. The communication between master and slave is based on a customized RS-485 solution that saves wires, covers a long distance, supports high-speed communication and has time-deterministic features. Various functions can be chosen on the slave modules, and standard industrial DIN rail mounting design makes it easy to distribute them in the field.

Motion Control Modules

ADAM-5550KW supports two types of motion control modules. One is a stepping/pulse-type servo motor control module, designed for general-purpose applications, and the other is the cost-effective intelligent stepping motor control module. The servo motor control module's intelligent NOVAR MCX314-motion ASIC comes built-in with a variety of motion control functions, such as 2/3-axis linear interpolation, 2-axis circular interpolation, T/S-curve acceleration/deceleration rate and more. It performs these motion control functions without processor loading during driving. The intelligent stepping motor control module's PCD-4541 motion controller can execute a variety of motion-control commands. Each axis can be controlled directly through the card's I/O registers.

ADAM-5510KW
ADAM-5510EKW

4-slot PC-based SoftLogic Controller

8-slot PC-based SoftLogic Controller

Features

- IEC-61131-3 standard package
- Supports LD/FB/SFC/IL/ST language
- Graphical programming interface
- Cross programming language compiling capability
- Supports floating point calculation
- Supports AI/AO/DI/DO/Counter Function Blocks
- Powerful debug tool
- Built-in Modbus/RTU Master and Slave
- Supports up to 128 Local I/O Points
- Handles typical 32 Modbus/RTU remote I/O modules
- Supports more than 9000 coils in LD language
- Supports 3 serial ports including 1 RS-485 and 2 RS-232/485 ports

Introduction

ADAM-5510EKW and ADAM-5510KW are PC-based Soft-Logic Controllers. They feature 5 standard IEC61131-3 programming languages so PLC users can develop control strategies in their familiar programming languages. The strong MULTIPROG software and stable ProConOS make ADAM-5510EKW and ADAM-5510KW the best choice for PC-based Soft-logic controllers in the market.

ProConOS, (Programmable Controller Operating System), has over 250,000+ installations, and is a pre-emptive, multi-tasking run-time software providing deterministic operation down to one millisecond and runs applications developed with MULTIPROG, a fully-featured IEC 61131-3 development environment. With this KW Software distribution agreement, Advantech has bundled the ProConOS run-time software on ADAM-5510EKW and ADAM-5510KW Controllers creating a SoftLogic Solution. It will greatly benefit PLC users to enjoy the PC- based advantage of ADAM-5510EKW and ADAM-5510KW

Different from the original ADAM-5510 hardware, the ADAM-5510EKW and ADAM-5510KW includes more memory to raise system efficiency and users' programming flexibility. The main unit of ADAM-5510EKW and ADAM-5510KW include a 1.5 MB flash memory and 640 KB SRAM which includes battery backup RAM up to 32 KB. In addition, 4 COM ports enrich the communication capacity of ADAM-5510EKW and ADAM-5510KW to integrate with remote I/O or other 3rd party devices based on the Modbus/RTU protocol.

For advanced system integration, the ADAM-5510EKW and ADAM-5510KW are built with a Modbus/RTU Server. Therefore, it also supports Modbus/RTU protocol to communicate with any Modbus® devices as well as HMI Software/User's APs built with Modbus driver or Modbus/RTU OPC Server, both of which are included in the SCADA systems.

Specifications

Control System

- **CPU** 16-bit microprocessor
- **I/O Capacity** 4 slots (ADAM-5510KW)
  8 slots (ADAM-5510EKW)
- **LED Indicators** Power, CPU, communication and battery
- **Memory** Flash disk: 512 KB
  Flash memory: 768 KB
  Flash ROM: 256 KB
  RAM: 640 KB SRAM, 32 KB with battery backup
- **Operating System** ROM-DOS
- **Real-time Clock** Yes
- **Watchdog Timer** Yes

Communications

- **Comm. Protocol** Modbus/RTU
- **Max. Nodes** 32 (in RS-485 daisy-chain network)
- **Medium** RS-485 (2-wire)
- **Transmission Distance** 1.2 km (4000 feet)
- **Transmission Speed** 9600, 19200 and 38400 bps

Protection

- **Power Input** 3000 V_{DC}
- **Communication** 2500 V_{DC} (COM2 only)
- **Power Reversal Protection** Yes

Power

- **Power Consumption** 4 W @ 24 Vdc (not including I/O modules)
- **Power Input** Unregulated 10 ~ 30 V_{DC}

General

- **Certifications** CE
- **Connectors** ADAM-5510KW: 1 x DB9-M for RS-232 (COM1)
  ADAM-5510EKW: 1 x DB9-M for RS-232/485 (COM1)
  1 x Screw terminal for RS-485 (COM2)
  1 x DB9-F for RS-232/Programming (COM3)
  1 x DB9-M for RS-232/485 (COM4)
  1 x Screw-terminal for power input
- **Dimensions** 4-slot: 231 x 110 x 75 mm
  8-slot: 355 x 110 x 75 mm
- **Enclosure** ABS+PC
- **Mounting** DIN 35 rail, stack, wall

Environment

- **Humidity** 5 ~ 95%, non-condensing
- **Operating Temperature** -10 ~ 70° C (14 ~ 158° F)
- **Storage Temperature** - 25 ~ 85° C (-13 ~ 185° F)

Ordering Information

- **ADAM-5510KW** PC-based SoftLogic Controller
- **ADAM-5510EKW** 8-slot PC-based SoftLogic Controller
- **MPROG-BAS 33** KW Multiprog Softlogic Development Kit Basic Edition v3.3 for Windows® NT/2000/XP (128-byte I/O)

ADAM-5510EKW/TP

8-slot Ethernet-enabled SoftLogic Controller

RoHS COMPLIANT 2002/95/EC CE FCC

Features

- 10/100Base-T Ethernet interface
- Built-in Modbus/TCP server
- Supports Modbus/TCP client
- Supports Modbus/RTU Master
- Supports Modbus/RTU Slave
- Supports Multiprog via Ethernet
- IEC-61131-3 standard package
- Supports LD/FB/SFC/IL/ST Languages
- Cross-Language compiling program
- 8 I/O slots base and handles up to 128 Local I/O Points
- Supports AI/AO/DI/DO/Counter Function Blocks

Introduction

The ADAM-5510EKW/TP is an Ethernet-enabled SoftLogic Controller. In addition to the features of ADAM-5510KW and ADAM-5510EKW, the ADAM-5510EKW/TP has Ethernet features including Modbus/TCP Server, Modbus/TCP Client and Multiprog via Ethernet functions. Therefore, users can easily and quickly complete their programming based on Ethernet architecture.

Standard Modbus Interface

For advanced system integration, the ADAM-5510EKW/TP supports not only Modbus/RTU Master and Slave functions via serial ports, but also the Modbus/TCP Client to retrieve data from remote I/O, and Modbus/TCP Server to send data back to the HMI/SCADA Software via Ethernet port. Furthermore, the ADAM-5510EKW/TP allows users to remotely maintain multiple ADAM-5510EKW/TP controllers by running Multiprog programming software via Ethernet.

Specifications

Control System

- **CPU** 16-bit microprocessor
- **I/O Capacity** 8 slots
- **LED Indicators** Power, CPU, communication, and battery
- **Memory** Flash disk: 512 KB
  Flash memory: 768 KB
  Flash ROM: 256 KB
  RAM: 640 KB SRAM, 17 KB with battery backup
- **Operating System** ROM-DOS
- **Real-time Clock** Yes
- **Watchdog Timer** Yes

Communications (Ethernet)

- **Medium** Cat.5 cable with RJ-45 connectors
- **Transmission Speed** 100 Mbps (10/100Base-T)

Communications (Serial)

- **Max. Nodes** 32 (in RS-485 daisy-chain network)
- **Medium** RS-485 (2-wire)
- **Protocols** Modbus/RTU, Modbus/TCP
- **Transmission Speed** 9600, 19200 and 38400 bps

Protection

- **Power Input** 3000 V_{DC}
- **Communication Line Isolation** 2500 V_{DC} (COM2 only)
- **Power Reversal Protection** Yes

Power

- **Power Consumption** 4 W @ 24 Vdc (not including I/O modules)
  Unregulated 10 ~ 30 V
- **Power Input** Unregulated 10 ~ 30 V_{DC}

General

- **Certifications** CE, FCC class A
- **Connectors** 1 x DB9-M for RS-232/485 (COM1)
  1 x Screw terminal for RS-485 (COM2)
  1 x DB9-F for RS-232/Programming (COM3)
  1 x DB9-M for RS-232/485 (COM4)
  1 x Screw-terminal for power input
  1 x RJ-45 for LAN
- **Dimensions** 355 x 110 x 75 mm
- **Enclosure** ABS+PC
- **Mounting** DIN 35 rail, stack, wall

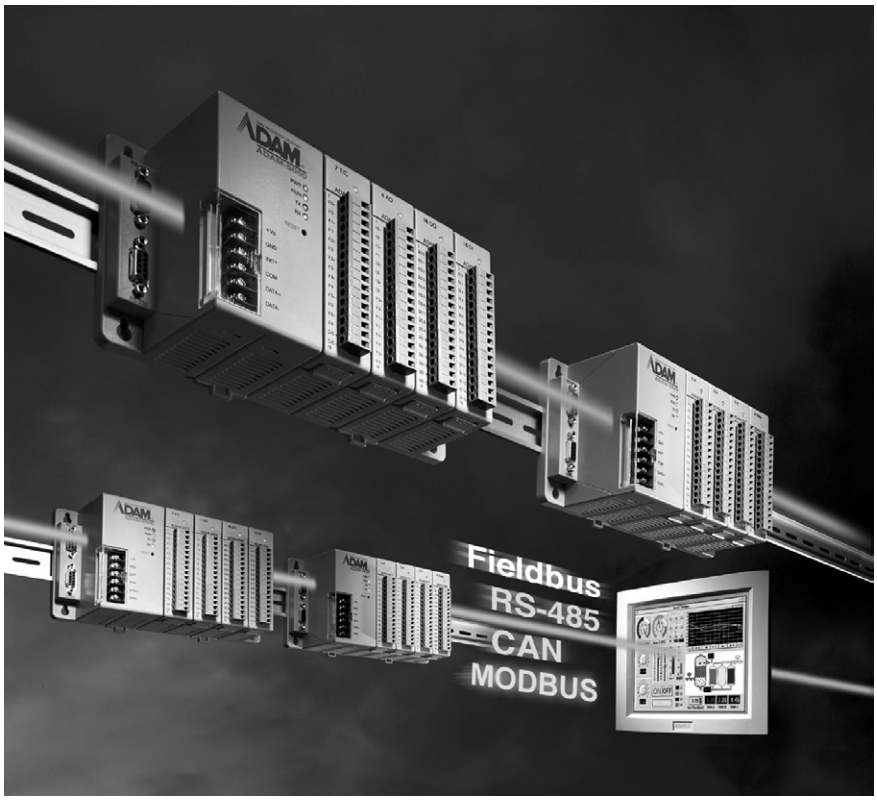
Environment

- **Humidity** 5 ~ 95%, non-condensing
- **Operating Temperature** - 10 ~ 70° C (14 ~ 158° F)
- **Storage Temperature** - 25 ~ 85° C (-13 ~ 185° F)

Ordering Information

- **ADAM-5510EKW/TP** 8-slot Ethernet-enabled SoftLogic Controller
- **MPROG-BAS33** KW Multiprog SoftLogic Development Kit Basic Edition v3.3 for Windows® NT/2000/XP (128-byte I/O)

ADAM-5000 Series



ADAM-5000 Series - Distributed I/O System

Ethernet-based Data Acquisition and Control System

With the ADAM-5000/TCP as your Ethernet I/O data processing center, you can monitor and control field signals at a speed of 10/100 Mbps. The best field-proven communication performance that can be reached in industrial network environments. Additionally, the popular Modbus/TCP protocol is supported as well.

RS-485 based Data Acquisition and Control System

The ADAM-5000/485 system is a data acquisition and control system that can acquire, monitor and control data through multi-channel I/O modules. It communicates with a network master over a twisted-pair, multi-drop RS-485 network. Both ADAM ASCII and Modbus/RTU protocols are supported.

ADAM-5510 Series - PC-based Programmable Controller

Ethernet-Enabled Programmable Controller

The ADAM-5510 series of PC-based programmable controllers includes ADAM-5510M, ADAM-5510E, ADAM-5510/TCP and ADAM-5510E/TCP. They feature Intel x86-based CPUs running Datalight ROM-DOS.

Users can use Borland C 3.0 to develop the application program and then download it by Windows-based ADAM-5510 series utility. The Ethernet-enabled feature of ADAM-5510/TCP and ADAM-5510E/TCP enables features like:FTP server, web server, TCP/UDP connections and email alarm. The ADAM-5510 controllers also have high expansion capability by supporting Modbus/RTU master/slave and Modbus/TCP client/server functions.

Open Network and Fieldbus Solutions for Device Networking

Introduction

The Fieldbus concept will change the control environment and device characteristics of future control systems in both processing and manufacturing. Compared with traditional systems, the Fieldbus system reduces cost of cabling, commissioning, and installation. In addition, the Fieldbus system has greater reliability.

The ADAM-5000 series, a compact distributed data acquisition and control system, supports the shift toward Fieldbus-based systems. Based on popular Fieldbus data communication structures such as RS-485 and Modbus, the ADAM-5000 series now offers two different DA&C systems that allow field I/O devices to easily connect to PC network applications: the ADAM-5000 DA&C systems and the ADAM-5510 series of PC-based programmable stand-alone controllers.

FM APPROVED
Class I, Div. 2 Groups ABCD
(NI / I / 2 / ABCD / T*)

Maximum System Design Flexibility

The ADAM-5000's modular design allows users to tailor solutions based on their own requirements. Built-in programmable I/O ranges and alarm outputs enhance flexibility in system design. A variety of communication media such as twisted-pair wiring, radio modems and fiber optics are supported.

System Maintenance and Troubleshooting

The ADAM-5000 series uses hardware self-test and software diagnosis to monitor system problems. Also included is a watchdog timer that monitors the microprocessor. If the system crashes, the watchdog automatically resets the system. Node ID setting is easily accomplished by setting a DIP switch on the front of the system.

Easy Installation and Networking

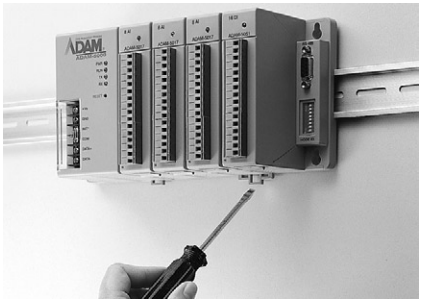
The ADAM-5000 series can be easily mounted on a DIN-rail or on a panel. Signal connections, network modifications and maintenance are simple and quick. Building a multi-drop network only requires a single twisted pair of wires.

Proven for Industrial Environments

The ADAM-5000 series can operate in industrial environments at temperatures between -10 and 70° C, and can use unregulated power sources between 10 and 30 V_{DC}. These units are protected against accidental power supply reversals. A 3-way isolation design (I/O, power & communication) prevents ground loops and reduces the effect of electrical noise in the system.

Extensive Software Support

The ADAM-5000 series is supported by most standard process controls and HMI software. .NET Class LIB is provided for use with Windows applications. OPC drivers provide links to a wide range of HMI/SCADA software packages such as InTouch, FIX and ICONICS. Advantech data acquisition software and Advantech Studio SCADA/HMI software are both tightly integrated with the ADAM-5000 systems.

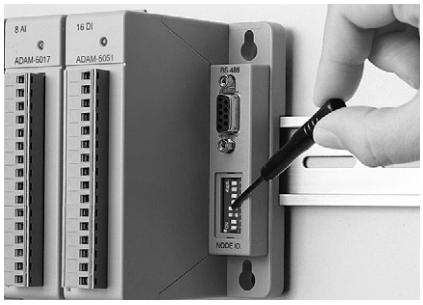


DIN-rail Mounting

Installed with industrial standard DIN-rails

Panel/Wall Mounting

Flat surface system mounting



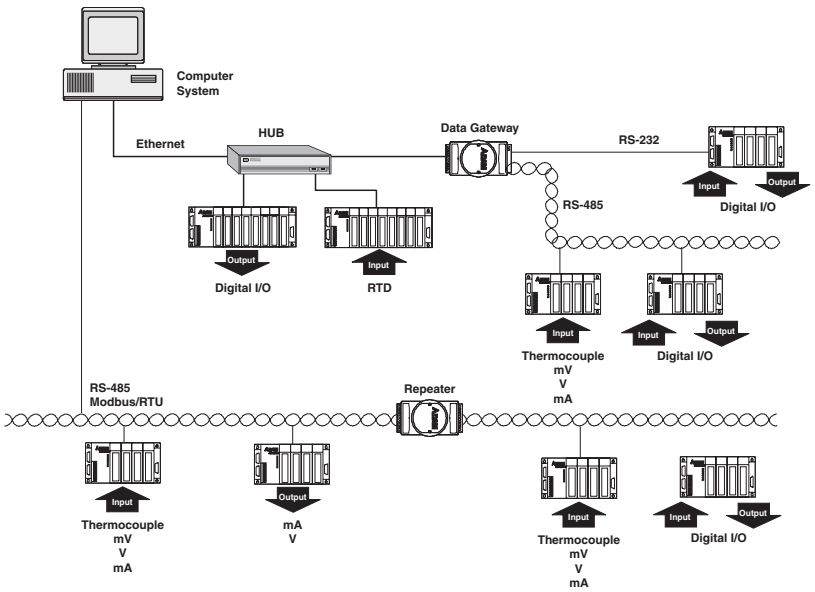
Node ID Setting

8-pin dip switch configuration

Connection

Pre-wired plug-in terminals with I/O modules

Simple & Low Cost Network Diagram



ADAM-5510/TCP
ADAM-5510E/TCP

4-slot Ethernet-enabled Programmable Controller

8-slot Ethernet-enabled Programmable Controller

RoHS COMPLIANT 2002/95/EC FCC CE

Features

- 10/100Base-T Ethernet interface
- Supports Web Server function
- Supports Email Alarm function
- Supports FTP Server and Client functions
- Supports Modbus/TCP Server and Client function libraries
- Supports Modbus/RTU Master and Slave function libraries
- 1.5 MB Flash ROM (960 KB for user applications)
- 640 KB SRAM (384 KB for battery backup)
- ROM-DOS operating system
- Watchdog timer and real-time clock
- 4 serial communication ports
- 4 or 8 I/O slot expansion

Introduction

In the ADAM-5510 series of PC-based programmable controllers, Advantech has introduced Ethernet-enabled features. The new 4-slot ADAM-5510/TCP and 8-slot ADAM-5510E/TCP support HTTP server, FTP server, and e-mail alarm functions. These functions can be used to monitor a system via the Internet, acquire data through an FTP connection and send alarms to designated e-mail addresses if a critical situation emerges. Both products also support Modbus/TCP server/client functions. The ADAM-5510/TCP and ADAM-5510E/TCP can work as a Modbus/TCP client to retrieve data from remote I/Os, and Modbus/TCP server to connect with the HMI/SCADA software.

Specifications

Control System

- **CPU** 16-bit processor
- **I/O Slots** ADAM-5510/TCP: 4
ADAM-5510E/TCP: 8
- **LED Indicators** Power, CPU, communications, and battery
- **Memory** Flash disk: 1 MB (960 KB for user applications)
Flash memory: 256 KB
Flash ROM: 256 KB
RAM: 640 KB SRAM (384 KB for battery backup RAM)
- **Operating System** ROM-DOS
- **Real-time Clock** Yes
- **Watchdog Timer** Yes
- **Communications (Ethernet)**
- **LAN** 10/100Base-T
- **Transmission Distance** 100 m
- **Communications (Serial)**
- **Max. Nodes** 256 (in RS-485 daisy-chain network)
- **Transmission Distance** 1.2 km (4000 feet)
- **Transmission Speed** 1200 bps ~ 115.2 kbps

Protection

- **Communication Line Isolation** 2500 V_{DC} (COM2 only)
- **Communication Power Isolation** 3000 V_{DC}
- **I/O Module Isolation** 3000 V_{DC}

Software

- **C Library** Borland C++ 3.0 for DOS

Power

- **Power Consumption** 4 W @ 24 Vdc (not including I/O modules)
Unregulated 10 ~ 30 V
- **Power Input** Unregulated 10 ~ 30 V_{DC}

General

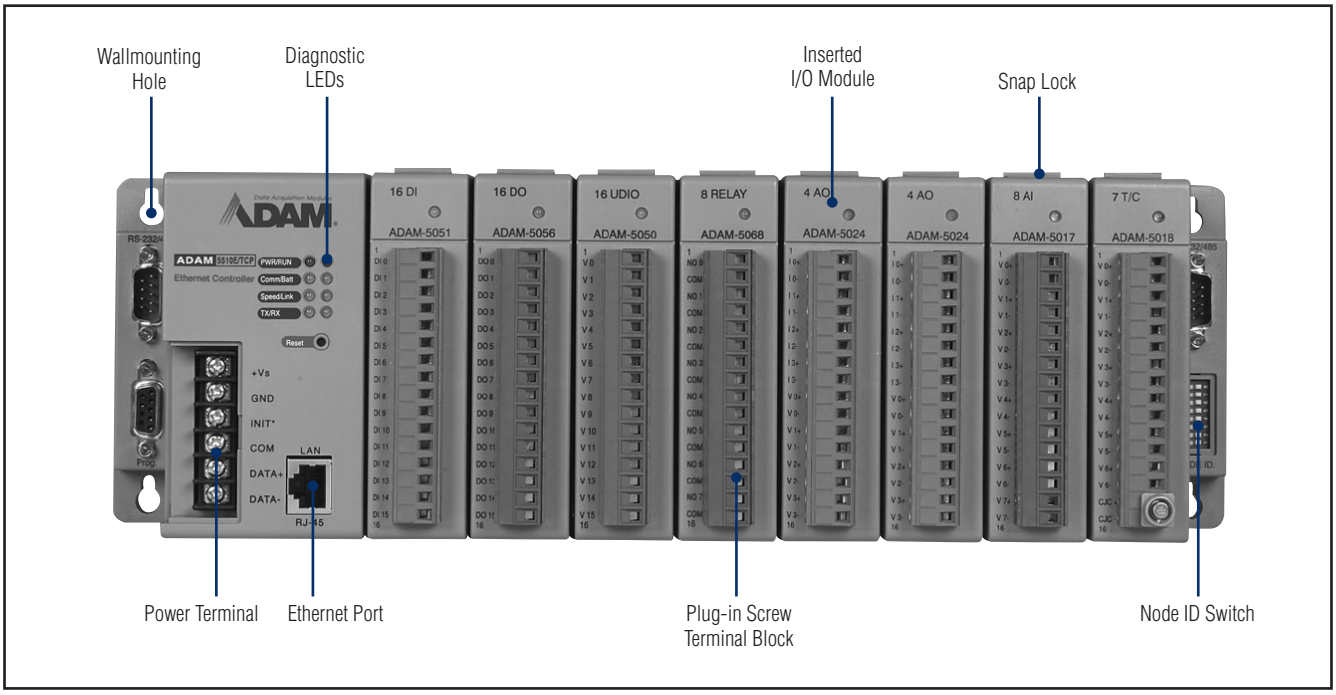
- **Certifications** CE, FCC class A
- **Connectors** ADAM-5510/TCP: 1 x DB9-M for RS-232 (COM1)
ADAM-5510E/TCP: 1 x DB9-M for RS-232/485 (COM1)
1 x Screw terminal for RS-485 (COM2)
1 x DB9-F for RS-232/Programming (COM3)
1 x DB9-M for RS-232/485 (COM4)
1 x Screw-terminal for power input
1 x RJ-45 for LAN
- **Dimensions** 4-slot: 231 x 110 x 75 mm
8-slot: 355 x 110 x 75 mm
- **Enclosure** ABS+PC
- **Mounting** DIN 35 rail, stack, wall

Environment

- **Humidity** 5 ~ 95%, noncondensing
- **Operating Temperature** -10 ~ 70° C (14 ~ 158° F)
- **Storing Temperature** -25 ~ 85° C (-13 ~ 185° F)

Ordering Information

- **ADAM-5510/TCP** 4-slot Ethernet-enabled Programmable Controller
- **ADAM-5510E/TCP** 8-slot Ethernet-enabled Programmable Controller



Feature Details

Supports Powerful Ethernet Features

ADAM-5510/TCP and ADAM-5510E/TCP are Ethernet-enabled Programmable Controllers. The new 4-slot ADAM-5510/TCP and 8-slot ADAM-5510E/TCP support HTTP server, FTP server, and e-mail alarm functions. These functions can be used to monitor a system via the Internet, acquire data through an FTP connection and send alarms to designated e-mail addresses if a critical situation emerges.

Enable Ethernet Connectivity with Other Devices

ADAM-5510/TCP and ADAM-5510E/TCP support both Modbus/TCP Server function library and Modbus/TCP Client function library. The ADAM-5510/TCP and ADAM-5510E/TCP can work as a Modbus/TCP client to retrieve data from remote I/O modules, and Modbus/TCP server to connect with the HMI/SCADA software.

More Data Memory & I/O Slots to Support Versatile Applications

The ADAM-5510/TCP and ADAM-5510E/TCP offer more than enough spare memory for developing complex logic or data storage applications, such as data recording, which is difficult for traditional controllers. The ADAM-5510/TCP and ADAM-5510E/TCP feature 1.5 MB flash memory and 640 KB SRAM (up to 384 KB battery backup memory). ADAM-5510/TCP and ADAM-5510E/TCP also support up to 4 or 8 I/O slots for I/O modules, which can provide more flexibility and I/O points for user's applications.

Complete I/O Module and C Library Support

The ADAM-5510/TCP and ADAM-5510E/TCP support industrial I/O modules including digital I/O, analog I/O, counter and special purpose I/O modules such as Thermocouple and RTD. It also offers well-stocked Borland C libraries, including system resources function, I/O functions, communication functions, socket functions, Modbus/TCP functions, Modbus/RTU functions and the functions of Ethernet features. All the functions have sample programs which can save development time and efforts.

Supports Four Communication Ports

The ADAM-5510/TCP and ADAM-5510E/TCP has four independent communication ports. That means they can simultaneously communicate with one RS-232/485 device (COM1), one RS-485 device (COM2), one RS-232 3-wire device (COM3), and one RS-232/485 device (COM4). They also support Modbus/RTU master function library for connecting Modbus remote I/O modules and Modbus/RTU slave function library for connecting to HMI/SCADA software.

Multiple RS-232 Port Support

The ADAM-5090 is a 4-port RS-232 module that is equipped with 4 RS-232 ports, which make it especially suitable for bi-direction communication. It can simultaneously read/write data from other third-party devices such as barcode readers or PLCs, as long as they have an RS-232 interface. Furthermore, commands can be issued through the ADAM-5090 to control other devices. It is fully integrated with the ADAM-5510/TCP and ADAM-5510E/TCP, and transmits data through RS-232 ports. The whole integrated system supports Modbus/RTU master function, which can connect and issue commands to control Modbus remote I/O devices by Modbus/RTU protocol.

ADAM-5510M
ADAM-5510E

4-slot PC-based Programmable Controller

8-slot PC-based Programmable Controller

Features

- Supports Modbus/RTU Master and Slave function libraries
- Windows-based Utility
- Control Flexibility with C Programming
- Complete Set of I/O Modules
- Built-in 1.5 MB Flash and 640 KB SRAM
- Built-in Real-Time Clock and Watchdog Timer
- ROM-DOS operating system
- 4 serial communication ports
- 4 or 8 I/O slot expansion

Introduction

The ADAM-5510M AND ADAM-5510E are ideal for PC-based data acquisition and control applications. They are compact, controllers with an Intel x86- based CPU running Datalight ROM-DOS. Built-in battery backup SRAM is the best choice for complex logic or data storage applications. For professional C/C++ programmers, the ADAM-5510M AND ADAM-5510E application programs may be written and compiled in Borland C++ 3.0, and downloaded to the ADAM-5510M AND ADAM-5510E. With the power of the ADAM-5510M AND ADAM-5510E, users can easily accomplish specialized functions, which are difficult with traditional controllers. Each ADAM-5510M AND ADAM-5510E system can handle up to 4 or 8 I/0 slots (up to 64 or 128 I/O points).

Specifications

Control System

CPU	16-bit microprocessor
I/O Slots	ADAM-5510E: 8 ADAM-5510M: 4
LED Indicators	Power, CPU, communications and battery
Memory	Flash disk: 1 MB (960 KB for user applications) Flash memory: 256 KB Flash ROM: 256 KB RAM: 640 KB (up to 384 KB with battery backup)
Operating System	ROM-DOS (MS-DOS 6.22 Compatible)
Real-time Clock	Yes
Watchdog Timer	Yes

Communications

Max. Nodes	256 (in RS-485 daisy-chain network)
Transmission Distance	1.2 km (4000 feet)
Transmission Speed	1200 bps ~ 115.2 kbps

Power

Power Consumption	4 W @ 24 Vdc (not including I/O modules) Unregulated 10 ~ 30 V
Power Input	Unregulated 10 ~ 30 V_{DC}

Software Support

C Library	Borland C++ 3.0 for DOS

Protection

Communication Power Isolation	3000 V_{DC}
Communication Line Isolation	2500 V_{DC} (COM2 only)
Power Reversal Protection	Yes

General

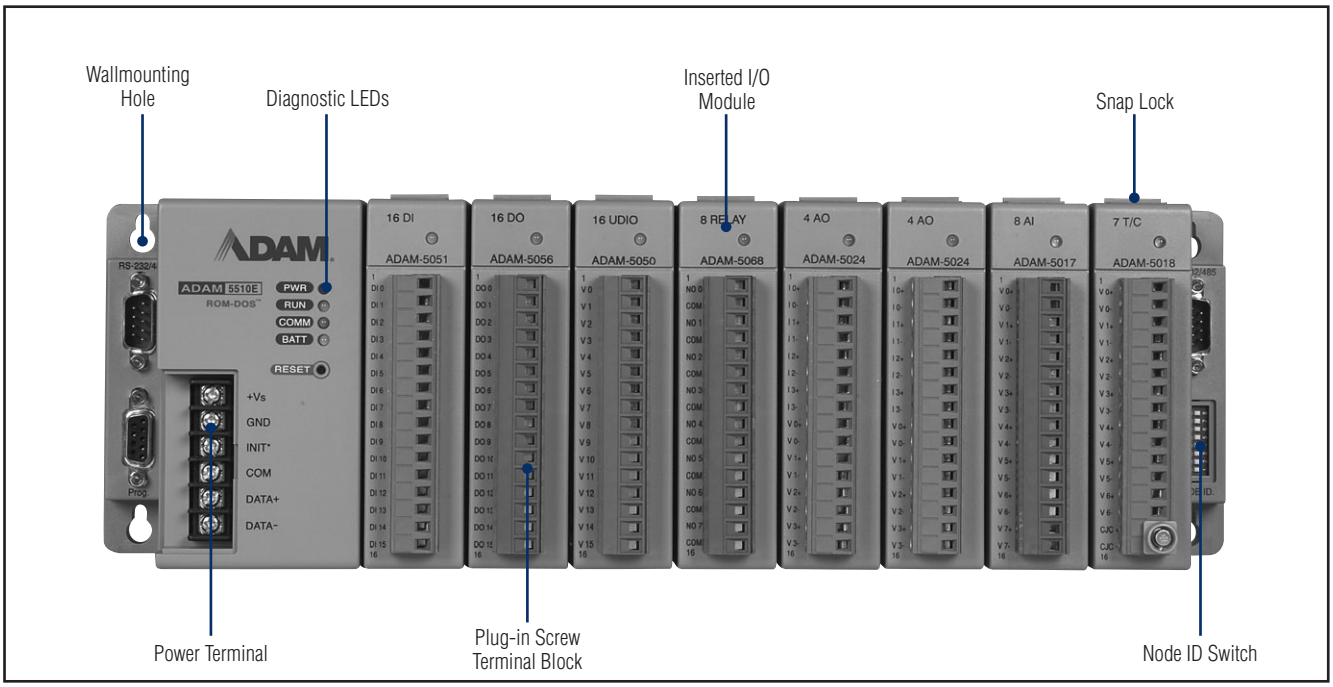
Certifications	CE
Connectors	ADAM-5510E: 1 x DB9-M for RS-232/485 (COM1) ADAM-5510M: 1 x DB9-M for RS-232 (COM1) 1 x Screw terminal for RS-485 (COM2) 1 x DB9-F for RS-232/Programming (COM3) 1 x DB9-M for RS-232/485 (COM4) 1 x Screw-terminal for power input
Dimensions	4-slot: 231 x 110 x 75 mm 8-slot: 355 x 110 x 75 mm
Enclosure	ABS+PC
Mounting	DIN 35 rail, stack, wall

Environment

Humidity	5 ~ 95%, non-condensing
Operating Temperature	-10 ~ 70° C (14 ~ 158° F)
Storing Temperature	-25 ~ 85° C (-13 ~ 185° F)

Ordering Information

ADAM-5510M	4-slot PC-based Programmable Controller
ADAM-5510E	8-slot PC-based Programmable Controller



Why PC-based Control?

Today, more and more major manufacturers are gaining a competitive edge by replacing their factory floor PLC "black boxes" and utilizing the latest advances in automation control technology. One of the major drawbacks of the PLC is its proprietary nature. Not only is the PLC proprietary, but so is everything associated with it – the hardware, the operating system, the programming methods, the networks, the processors, the I/O, and more. Once you have selected a PLC supplier, you are essentially locked into their product line. This exclusivity limits how far you can expand your operations – and expand your business

– since you can only grow as far as your supplier's technology will let you. On the other hand, PC-based controllers are designed as an open structure with advanced capabilities for computing, communication and controlling. There will be no more limitation to user's further integration and expansion.

ADAM-5510M AND ADAM-5510E PC-based "C" Programmable Controller

The design of the ADAM-5510M and ADAM-5510E are based on the experience of various needs in industrial control. The ADAM-5510M and ADAM-5510E adopt a popular RS-485 bus, which can work either as a standalone unit or within a distributed control system. The user only needs to write a program in C to run on the ADAM-5510M and ADAM-5510E for a general-purpose application.

Windows-based Utility for Configuring I/O Modules and Downloading Control Program

The ADAM-5510M and ADAM-5510E utility is fully-Windows based so users can configure the I/O modules and download control program under Windows environment easily. In order to provide a convenience operation environment for former users, the Windows Utility keeps the DOS mode operation interface too.

More Data Memory and I/O Slots to Support Versatile Applications

The ADAM-5510M and ADAM-5510E offer plenty of spare memory for developing complex logic or data storage applications, such as data recording, which is difficult for traditional controllers. The ADAM-5510M and ADAM-5510E features 1.5 MB flash memory and 640 KB SRAM (up to 384 KB battery backup memory). ADAM-5510M and ADAM-5510E also support up to 4 or 8 I/O slots for I/O modules, which can provide more flexibility and I/O points for user's applications.

Supports 4 Serial Ports with Modbus/RTU Master and Slave Function Libraries

The ADAM-5510M and ADAM-5510E has four independent communication ports. That means they can simultaneously communicate with one RS-232/485 device (COM1), one RS-485 device (COM2), one RS-232 3-wire device (COM3), and one RS-232/485 device (COM4). They also support Modbus/RTU master function library for connecting Modbus remote I/O modules and Modbus/RTU slave function library for connecting to HMI/SCADA software.

Complete I/O Module and C Library Support

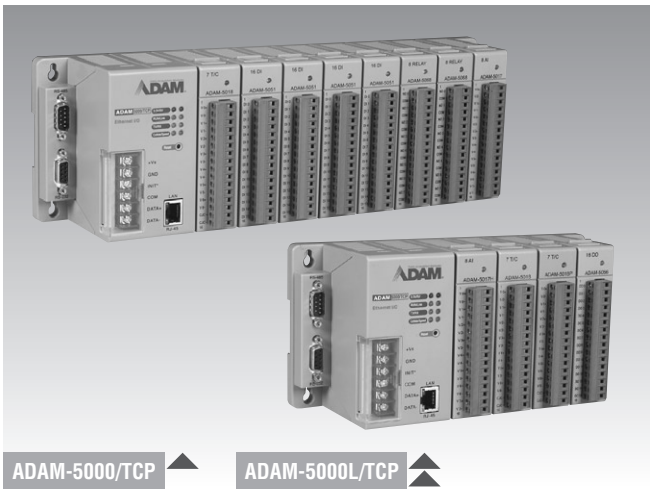
The ADAM-5510M and ADAM-5510E support industrial I/O modules including digital I/O, analog I/O, counter and special purpose I/O modules such as Thermocouple and RTD. It also offers well-stocked Borland C libraries, including system resources function, I/O functions, communication functions and Modbus/RTU functions. All the functions have sample programs which can save the developing time and efforts.

Multiple RS-232 Port Support

The ADAM-5090 is a 4-port RS-232 module that is equipped with 4 RS-232 ports, which make it especially suitable for bi-direction communication. It can simultaneously read/write data from other third-party devices such as barcode readers or PLCs, as long as they have an RS-232 interface. Furthermore, commands can be issued through the ADAM-5090 to control other devices. It is fully integrated with the ADAM-5510M and ADAM-5510E, and transmits data through RS-232 ports. The whole integrated system supports Modbus/RTU master function, which can connect and issue commands to control Modbus remote I/O devices by Modbus/RTU protocol.

ADAM-5000L/TCP
4-slot Ethernet-based Distributed DA&C System

ADAM-5000/TCP
8-slot Ethernet-based Distributed DA&C System



RoHS COMPLIANT 2002/95/EC CE FCC

Features

- ARM 32-bit RISC CPU
- 10/100Base-T auto-negotiation high-speed communication port
- Supports Modbus/TCP for easy integration
- Supports UDP event handling function
- Up to 100 m communication distance w/o repeater
- Allows remote configuration via Ethernet
- Allows concurrent access for 8 host PCs
- 4 I/O slots for up to 64 points and 8 I/O slots for up to 128 points data monitoring and control
- 1500 V_{DC} isolation for Ethernet communication
- Built-in watchdog timer for system auto-reset
- Windows utility
  - I/O modules configuration and calibration
  - Network auto searching
  - Data stream setting
  - Current status monitoring and alarm trigger
- Provides .NET Class LIB to develop applications

Introduction

ADAM-5000L/TCP and ADAM-5000/TPC are both Ethernet-based I/O systems. Without a repeater, ADAM-5000L/TCP and ADAM-5000/TCP can cover a communication distance up to 100 m. This allows remote configuration via Ethernet and eight PCs can simultaneously access the data. The ADAM-5000L/TCP and ADAM-5000/TCP are the solutions for easy configuration and efficient management. An ideal and cost-effective solution for eAutomation architecture.

Specifications

Control System

- **CPU** 32-bit ARM RISC
- **I/O Slots** ADAM-5000L/TCP: 4
ADAM-5000/TCP: 8
- **Memory** Flash ROM: 512 KB
RAM: 4 MB
- **Operating System** Real-time OS
- **LED Indicators** Power (3.3 V, 5 V)
CPU
Communication (Link, Active, 10/100 Mbps, Tx, Rx)
Battery

Communications (Ethernet)

- **Comm. Distance** 100 meters w/o repeater
- **Comm. Protocol** Modbus/TCP, TCP, UDP, IP, ARP
- **Data Transfer Rate** Up to 100 Mbps
- **Event Response Time** < 5 ms
- **Interface** 1 x 10/100Base-T (RJ-45)
- **Wiring** UTP, category 5 or greater

Communications (Serial)

- **Comm. Distance** RS-485: 1.2 km (4000 feet)
RS-232: 15 m
- **Comm. Protocol** Modbus/RTU
- **Data Transfer Rate** Up to 115.2 kbps
- **Interface** 1 x DB9-M for RS-485
1 x DB9-F for RS-485
1 x DB9-F for RS-232
- **Max. Nodes** 12 (in RS-485 daisy-chain network for Remote I/O connection)

Power

- **Power Consumption** 4.0 W @ 24 Vdc (ADAM-5000L/TCP) (not including I/O modules)
5.0 W @ 24 Vdc (ADAM-5000/TCP) (not including I/O modules)
- **Power Input** Unregulated 10 ~ 30 V_{DC}

Software

- **.NET Class LIB**
- **Windows Utility** Network setting, I/O configuration & calibration, data stream, alarm setting
- **Modbus/TCP OPC Server**

Protection

- **Communication Line Isolation** 3000 V_{DC}
- **I/O Module Isolation** 3000 V_{DC}
- **LAN Communication** 1500 V_{DC}
- **Overvoltage Protection** Yes
- **Power Reversal Protection** Yes

General

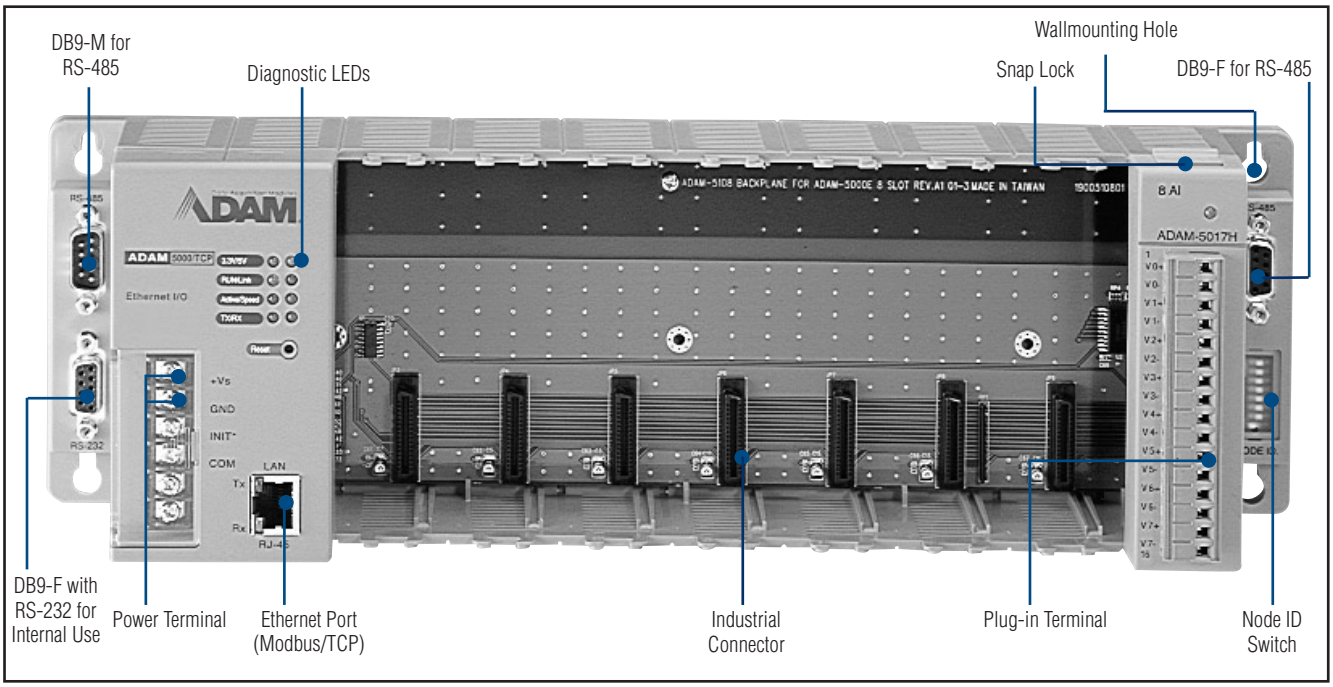
- **Certifications** CE, FCC class A
- **Connectors** 1 x DB9-M/DB9-F/screw terminal for RS-485 (communication)
1 x DB9-F for RS-232 (internal use)
1 x Screw-terminal for power input
1 x RJ-45 for LAN
- **Dimensions (W x H x D)** ADAM-5000L/TPC: 231 x 110 x 75 mm
ADAM-5000/TCP: 355 x 110 x 75 mm
- **Enclosure** ABS+PC
- **Mounting** DIN 35 rail, wall

Environment

- **Humidity** 5 ~ 95%, non-condensing
- **Operating Temperature** - 10 ~ 70° C (14 ~ 158° F)
- **Storage Temperature** - 25 ~ 85° C (-13 ~ 185° F)

Ordering Information

- **ADAM-5000L/TCP** 4-slot Ethernet-based Distributed DA&C System
- **ADAM-5000/TCP** 8-slot Ethernet-based Distributed DA&C System



Feature Details

Communication Network

With a 32-bit RISC CPU, ADAM-5000/TCP and ADAM-5000L/TCP greatly enhances data processing performance and ability, especially in network communication. There is a standard RJ-45 modular jack Ethernet port on the ADAM-5000/TCP and ADAM-5000L/TCP's CPU board, and the field I/O modules are able to link to an Ethernet network directly without any other converter or data gateway. The communication speed can be auto-switched between 10 Mbps and 100 Mbps data transfer rates, depending on the network environment. In addition, ADAM-5000/TCP and ADAM-5000L/TCP can be used as an Ethernet data gateway. It provides an RS-485 interface to integrate serial devices supporting the Modbus/RTU protocol.

Modbus/TCP Protocol

Modbus/TCP is one of the most popular standards used for industrial Ethernet networks. Using this communication protocol, ADAM-5000/TCP and ADAM-5000L/TCP is easy to integrate with any HMI software packages or user-developed applications which support Modbus. Users do not have to prepare a specific driver for the ADAM-5000/TCP and ADAM-5000L/TCP when they install the DA&C system with their own operating application. It reduces required engineering efforts. Moreover, ADAM-5000/TCP and ADAM-5000L/TCP works as a Modbus data server as well. It allows eight PCs or tasks to access its current data simultaneously, no matter if they connect from LAN, an intranet, or the Internet.

Hardware Capacity & Diagnostics

ADAM-5000/TCP and ADAM-5000L/TCP is designed with high I/O capacity and supports all types of ADAM-5000 I/O modules. Providing 8/4 slots for any mixed modules, this DA&C system handles up to 8/4 modules, providing 128/64 I/O points points (only four ADAM-5024s allowed). Different from other main units, the ADAM-5000/TCP and ADAM-5000L/TCP has not only higher I/O capacity, but also smarter diagnostics ability. There are eight indicators on the front case of the CPU module. Users can read the system status clearly, which includes power, CPU, Ethernet link, communication active, communication rate, etc. In addition, there are also Tx and Rx LEDs on the Ethernet port, indicating data sending and receiving.

Event Handling & Data Streaming

Though TCP/IP is the standard communication protocol for Ethernet, data transmission management is still a bottleneck when many clients are on the network at the same time. Therefore, the ADAM-5000/TCP and ADAM-5000L/TCP also supports the UDP protocol to deal with regular data stream broadcasting and event/alarm triggering. These functions will upgrade your system with intelligence and performance.

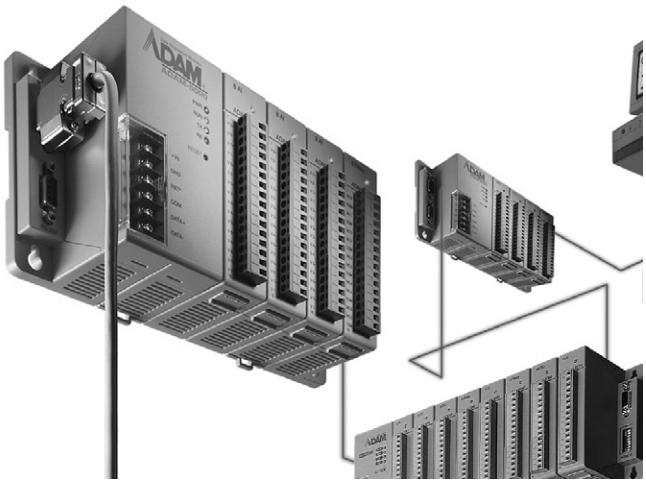
Isolated Communication

High speed transient suppressors isolate the ADAM-5000/TCP and ADAM-5000L/TCP Ethernet port from dangerous voltage up to 1500 V_{DC} power spikes and avoid surge damage to the whole system.

ADAM-5000/485
ADAM-5000E

4-slot Distributed DA&C System for RS-485 Networks

8-slot Distributed DA&C System for RS-485 Networks



Features

- RS-485 Communication for easy installation and networking
- 4 or 8 slots for up to 128 points data monitoning card control in one module
- Extensive Software support, includes windows DLL drivers, OCX drivers, OPC server and popular HMI/SCADA software drivers
- Seamlessly integrated with easy-to-use ADAMView data acquisition software
- Supports ADAM ASCII protocol or Modbus®/RTU protocol
- Supports Modbus/RTU protocol with user-defined Modbus address

Introduction

The ADAM-5000/485 and ADAM-5000E systems conform to the EIA RS-485 communication standard. This is the industry's most widely used, balanced, bidirectional transmission line standard. RS-485 was specifically developed for industrial applications to transmit and receive data at high rates over long distances.

Specifications

Control System

- **CPU** 16-bit 80188 microprocessor
- **I/O Slots** ADAM-5000/485: 4
ADAM-5000E: 8
- **LED Indicators** Power, CPU, communications
- **Watchdog Timer** 1.6 sec. (System)

Communications

- **Command Format** ASCII command/response protocol, Modbus/RTU
- **Communication Distance** RS-485: 1.2 km (4000 feet)
- **Data Format** Asynchronous. 1 start bit, 8 data bits, 1 stop bit, no parity
- **Network Protocols** Programming link: RS-232 (3-wire: TX, RX, GND)
Communication: RS-485 (2-wire)
- **Reliability Check** Communication error checking with checksum
- **Max. Nodes** 128 (in RS-485 daisy-chain network)
- **Speeds (kbps)** 1.2, 2.4, 4.8, 9.6, 19.2, 38.4, 57.6, and 115.2

Power

- **Power Consumption** 3 W @ 24 Vdc (ADAM-5000/485)
(not including I/O modules)
4.0 W @ 24 Vdc (ADAM-5000E)
(not including I/O modules)
- **Power Input** Unregulated 10 ~ 30 V_{DC}

Software

- Driver Support Windows DLL, OPC Server, Wonderware InTouch, Intellution, iFIX, Citect, Advantech Studio, ADAMView

Protection

- **Communication Line Isolation** 2500 V_{DC} (ADAM-5000/485)
3000 V_{DC} (ADAM-5000E)
- **Communication Power Isolation** 3000 V_{DC}
- **I/O Module Isolation** 3000 V_{DC}
- **Transient Protection** RS-485 communication lines, power input
- **Power Reversal Protection** Yes

General

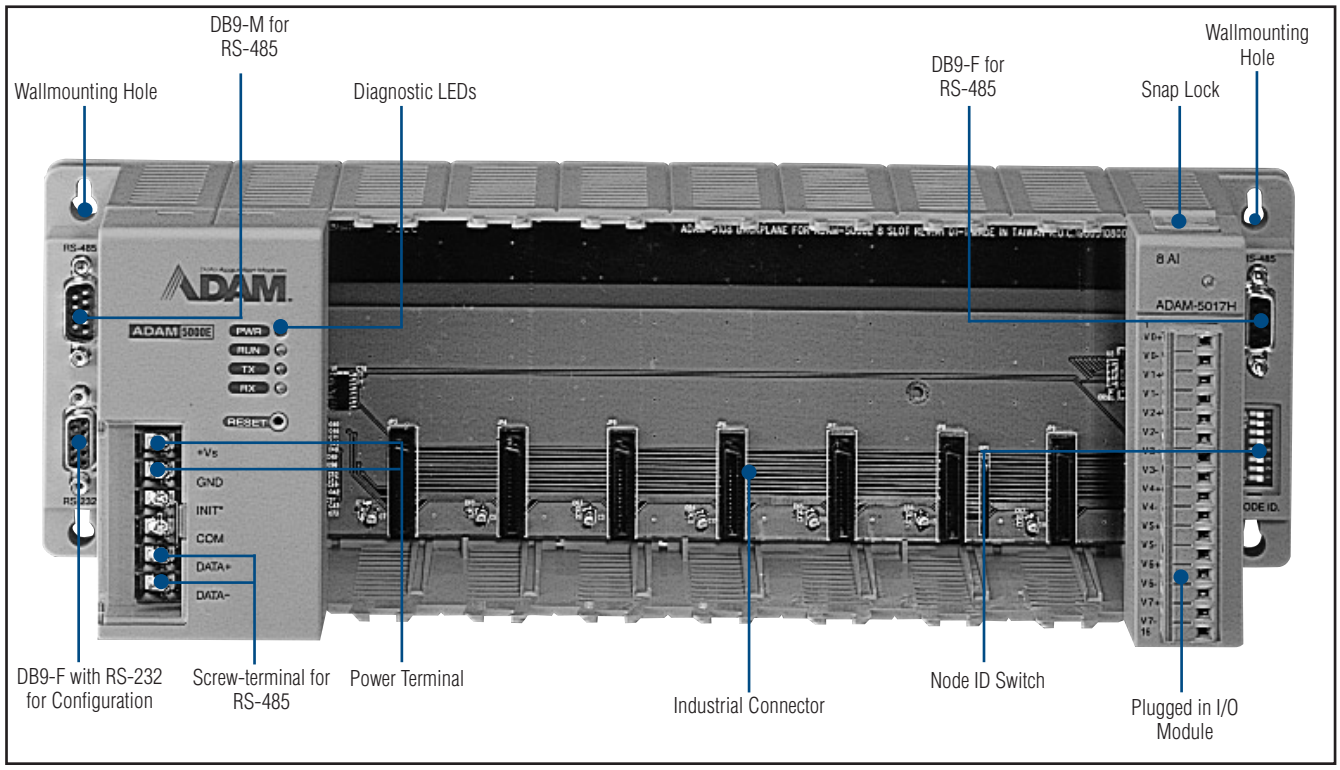
- **Certifications** CE, FM
- **Connectors** 1 x DB9-M/DB9-F/screw terminal for RS-485 (communication)
1 x DB9-F for RS-232 (configuration)
1 x Screw-terminal for power input
- **Dimensions (WxHxD)** 4-slot: 231 x 110 x 75 mm
8-slot: 355 x 110 x 75 mm
- **Enclosure** ABS+PC
- **Mounting** DIN 35 rail, wall, rack (with mounting kit)

Environment

- **Humidity** 5 ~ 95%, non-condensing
- **Operating Temperature** -10 ~ 70° C (14 ~ 158° F)
- **Storing Temperature** -25 ~ 85° C (-13 ~ 185° F)

Ordering Information

- **ADAM-5000/485** 4-slot Distributed DA&C System for RS-485 Networks
- **ADAM-5000E** 8-slot Distributed DA&C System for RS-485 Networks



Feature Details

Two-wire Communication

ADAM-5000/485 and ADAM-5000E systems use a single twisted pair of wires to transmit and receive data. Special circuitry ensures reliable communications and suppresses line noise on communication lines. This reduces overall network cost by simplifying installation and minimizing the number of cables, connectors, communication repeaters and filters required.

Transient Protection

High-speed transient suppressors protect the system from dangerous voltage surges or power spikes from both the power supply input and the communication ports.

Network Expansion

By using the ADAM-4510 repeater to amplify or boost existing signals, your networks can be stretched beyond 1.2 km.

Each ADAM-4510 repeater enables you to add up to 32 ADAM-5000 units to your network, extending the network by another 4000 feet (1.2 km). Up to 256 ADAM-5000/485, ADAM-5000E units can be connected to a single RS-485 network.

RS-232 to RS-485 Conversion

RS-232 serial ports are standard with most industrial computer systems. Though widely accepted, RS-232 has limited transmission speed, range and networking capabilities. The RS-485 standard overcomes these limitations by using differential voltage lines for data and control signals.

ADAM-4520 is an isolated converter that lets you take advantage of RS-485 on an RS-232 system by converting RS-232 signals to RS-485 signals. Software written for half-duplex RS-232 may also be used without modification. ADAM-4520 helps you build an industrial grade, long distance communication system with standard PC hardware.

Intelligent RS-485 Data Flow Control

The RS-485 communication protocol will support half-duplex communication. Only two wires are needed for transmitting and receiving data. Handshaking signals such as RTS (Request to Send) normally control the direction of the data flow. A special I/O circuit in the ADAM-4510 and ADAM-4520 modules sense the data flow direction and automatically switches the transmission direction, making handshaking signals unnecessary. This makes the RS-485 bus control completely transparent to the user.

Built-in RS-232 Communication

The RS-232 port is used to connect to a host PC for programming, control and monitoring of applications. This aids troubleshooting, and allows a PC to be linked with all the I/O points of the I/O modules.

ADAM ASCII Protocol and Modbus/RTU Protocol

ADAM-5000 commands are in ASCII format. ADAM applications can be written in any high-level language that supports ASCII string functions, such as C, Pascal or VB. ASCII support means you can use virtually any computer to manage your ADAM network.

Furthermore, the Modbus/RTU protocol is supported for connecting to 3rd party controllers.

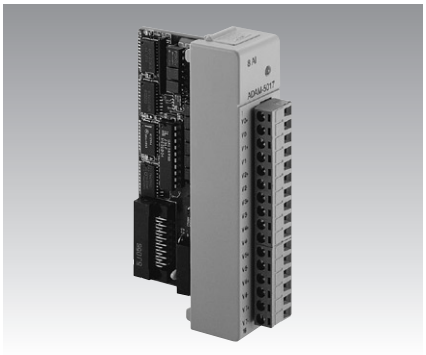
ADAM-5013
ADAM-5017
ADAM-5017P

3-ch RTD Input Module

8-ch Analog Input Module

8-ch Analog Input Module with Independent Input Range

ADAM-5013



ADAM-5017

ADAM-5017P

Specifications

General

- **Certifications** CE
- **Connectors** 1 x Plug-in screw terminal (# 14~22 AWG)
- **Power Consumption** 1.1 W (max.)

RTD Input

- **Accuracy** ±0.1% or better
- **Bandwidth** 13.1 Hz @ 50 Hz
  15.72 Hz @ 60 Hz
- **Channels** 3
- **CMR @ 50/60 Hz** 150 dB
- **Input Connections** 2, 3 or 4 wire
- **Input Impedance** 2 MΩ
- **Input Type** PT100 or Ni RTD
- **NMR @ 50/60 Hz** 100 dB
- **Resolution** 16-bit
- **RTD Types and Temperature Ranges**

IEC RTD 100 ohms

Pt	-100° C	to	+100° C	a=0.00385
Pt	0° C	to	+100° C	a=0.00385
Pt	0° C	to	+200° C	a=0.00385
Pt	0° C	to	+600° C	a=0.00385

JIS RTD 100 ohms

Pt	-100° C	to	+100° C	a=0.00392
Pt	0° C	to	+100° C	a=0.00392
Pt	0° C	to	+200° C	a=0.00392
Pt	0° C	to	+600° C	a=0.00392

Ni RTD

Ni	-80° C	to	+100° C
Ni	0° C	to	+100° C

- **Sampling Rate** 10 samples/sec. (total)
- **Span Drift** ±0.01° C/° C
- **Zero Drift** ±0.015° C/° C

Protection

- **Isolation Voltage** 3000 V_{DC}

Ordering Information

- **ADAM-5013** 3-ch RTD Input Module

Specifications

General

- **Certifications** CE, FM
- **Connectors** 1 x Plug-in screw terminal (# 14~22 AWG)
- **Power Consumption** 1.25 W (max.)

Analog Input

- **Accuracy** ±0.1% or better
- **Bandwidth** 13.1 Hz @ 50 Hz
  15.72 Hz @ 60 Hz
- **Channels** 8 differential
- **CMR @ 50/60 Hz** 92 dB min.
- **Input Impedance** Voltage: 2 MΩ
  Current: 120Ω (Build-in 120 Ω register for Current input)
- **Input Type** mV, V, mA
- **Input Range** ±150 mV, ±500 mV, ±1 V, ±5 V, ±10 V; ±20 mA
- **Resolution** 16-bit
- **Sampling Rate** 10 samples/sec. (total)
- **Span Drift** ±25 PPM/° C
- **Zero Drift** ±6 µV/° C

Protection

- **Isolation Voltage** 3000 V_{DC}
- **Fault and Overvoltage Protection** Withstands overvoltage up to ±35 V

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

Ordering Information

- **ADAM-5017** 8-ch Analog Input Module

Specifications

General

- **Certifications** CE
- **Connectors** 1 x Plug-in terminal block (#14 ~ 22 AWG)
- **Power Consumption** 1.25 W (max.)

Analog Input

- **Accuracy** Voltage mode : ±0.1% or better
  Current mode : ±0.2% or better
- **Channels** 8 differential and independent configuration channels
- **CMR @ 50/60 Hz** 92 dB min.
- **Input Impedance** Voltage: 20 M
  Current: 120Ω (Build-in 120Ω . register for Current Input)
  for Current Input)
- **Input Type** mV, V (supports uni-polar and bipolar), mA
- **Input Range** 0 ~ 150 mV, 0 ~ 500 mV, 0 ~ 1 V, 0 ~ 5 V, 0 ~ 10 V, 0 ~ 15 V, ±150 mV, ±500 mV, ±1 V, ±5 V, ±10 V, ±15 V, ±20 mA, 4 ~ 20 mA
- **Resolution** 16 bits
- **Sampling Rate** 10 samples/sec
- **Span Drift** ±25 ppm/° C
- **Zero Drift** ±6 µV/° C
- **High Common Mode** 200 V_{DC}

Protection

- **Over Voltage Protection** ±60 V_{DC}
- **Built-inTVS/ESD Protection**

Ordering Information

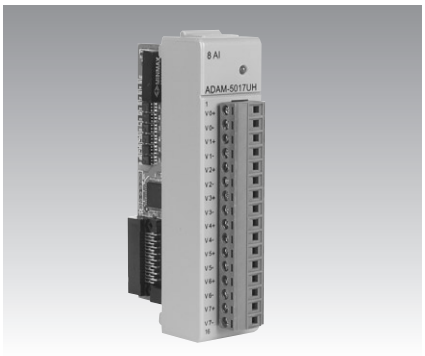
- **ADAM-5017P** 8-ch Analog Input Module with Independent Input Range

ADAM-5017UH
ADAM-5018
ADAM-5018P

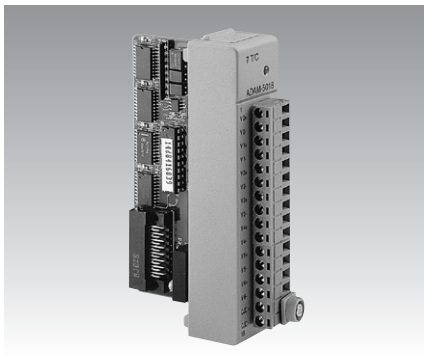
8-ch Ultra High Speed Analog Input Module

7-ch Thermocouple Input Module

7-ch Thermocouple Input Module with Independent Input Range



ADAM-5017UH



ADAM-5018

ADAM-5018P

Specifications

General

- **Certifications** CE
- **Connectors** 1 x Plug-in screw terminal (# 14~22 AWG)
- **Power Consumption** 2.2 W (max.)

Analog Input

- **Accuracy** ±0.1% or better
- **Bandwidth** 200 kHz
- **Channels** 8 differential
- **CMR @ 50/60 Hz** 92 dB min
- **Differential Non-linear** +/-1 LSB
- **Input Impedance** Voltage: 2 MΩ
  Current: 120Ω (Build-in 12Ω. register for Current Input)
- **Integral Non-linear** +/-1 LSB
- **Input Type** mV, V, mA
- **Input Range** ±10 V, +0 ~ 10 V, 0 ~ 20 mV, +4 ~ 20 mA
- **Low pass filter** Configured by User
- **Resolution** 12-bit
- **Sampling Rate**
  Depends on base unit
  ADAM-5000/485 & 5000E: 100 Samples/sec max (Total): one ADAM-5017UH installed
  ADAM-5000/TCP: 100 Samples/sec max (Total) :one ADAM-5017UH installed
  ADAM-5510 : 200K Samples/sec max (Single Channel) : one ADAM-5017UH installed
  ADAM-5550 : 1K Samples/sec per channel: one ADAM-5017UH installed
  *Depending on the performance of client server or controller
- **Signal Input Bandwidth** 200 kHz for both voltage and current inputs

Protection

- **Isolation Voltage** 3000 V_{DC}

Note:

1) The voltage difference between any two pins must not exceed 15 V
2) Distinct range settings allowed on each channel

Ordering Information

- **ADAM-5017UH** 8-ch Ultra High Speed Analog Input Module

Specifications

General

- **Certifications** CE, FM
- **Connectors** 1 x Plug-in screw terminal (# 14~22 AWG)
- **Power Consumption** 0.63 W (max.)

Thermocouple Input

- **Accuracy** ±0.1% or better
- **Bandwidth** 13.1 Hz @ 50 Hz
  15.72 Hz @ 60 Hz
- **Channels** 7 differential
- **CMR @ 50/60 Hz** 92 dB min
- **Input Impedance** 2 MΩ
- **Input Range** ±15 mV, ±50 mV, ±100 mV, ±500 mV, ±1 V, ±2.5 V, ±20 mA
- **Input Type** mV, V, mA,thermocouple
- **Resolution** 16-bit
- **Sampling Rate** 10 samples/sec. (total)
- **Span Drift** ±25 PPM/° C
- **Zero Drift** ±6 μV/ ° C
- **T/C Type and Temperature Range**

J	0°	~	760° C
K	0°	~	1370° C
T	-100°	~	400° C
E	0°	~	1000° C
R	500°	~	1750° C
S	500°	~	1750° C
B	500°	~	1800° C

Protection

- **Fault and Overvoltage Protection** Withstands overvoltage up to ±35 V
- **Isolation Voltage** 3,000 V_{DC}

Ordering Information

- **ADAM-5018** 7-ch Thermocouple Input Module

Specifications

General

- **Certifications** CE
- **Connectors** 1 x Plug-in screw terminal (# 14~22 AWG)
- **Power Consumption** 0.63 W (max.)

Thermocouple Input

- **Accuracy Bandwidth** ±0.1% or better
  13.1 Hz @ 50 Hz
  15.72 Hz @ 60 Hz
- **Channels** 7 differential with Independent Input Range
- **CMR @ 50/60 Hz** 92 dB min
- **Input Impedance** 20 MΩ. (Build-in 120 Ω Register for Current Input)
- **Input Range and Types**
  Thermocouple

J	0	~	760° C
K	0	~	1370° C
T	-100	~	400° C
E	0	~	1000° C
R	500	~	1750° C
S	500	~	1750° C
B	500	~	1800° C

- **Current mode** ±20 mA, 4~20mA
- **Voltage** ±15 mV, ±50 mV, ±100 mV, ±500 mV ±1 V, ±2.5 V
- **Resolution** 16-bit
- **Sampling Rate** 10 samples/sec. (total)
- **Span Drift** ±25 PPM/°C
- **Zero Drift** ±6 μV/°C
- **High Common Mode** 2000 V_{DC}

Protection

- **Fault and Overvoltage Protection** Withstands over voltage up to ±35 V
- **Isolation Voltage** 3,000 V_{DC}
- **Filter function** Yes
- **Built-in TVS/ESD Protection**

Ordering Information

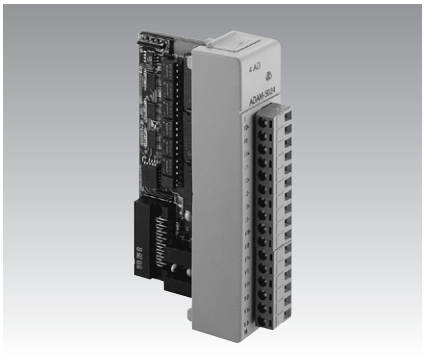
- **ADAM-5018P** 7-chThermocouple Input Module with Independent Input Range

ADAM-5024
ADAM-5050
ADAM-5051/5051D

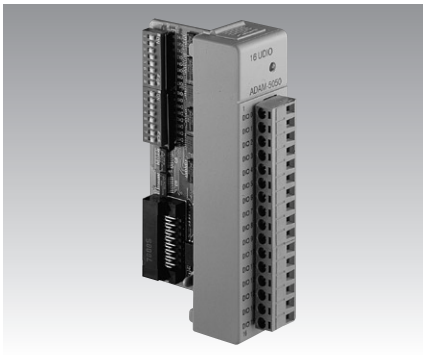
4-ch Analog Output Module

16-ch Universal Digital I/O Module

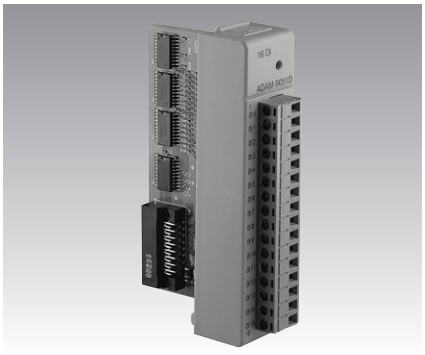
16-ch Digital Input Modules



ADAM-5024



ADAM-5050



ADAM-5051
ADAM-5051D

Specifications

General

- **Certifications** CE, FM
- **Connectors** 1 x Plug-in screw terminal (# 14~22 AWG)
- **Power Consumption** 2.9 W (max.)

Analog Output

- **Accuracy** ±0.1% of FSR for current output
  ±0.2% of FSR for voltage output
- **Channels** 4
- **Current Load Resistor** 0 ~ 500 Ω (source)
- **Output Type** mA, V
- **Output Range** 0 ~ 20 mA, 4 ~ 20 mA, 0 ~10 V
- **Programmable Output Slope** 0.125 ~ 128.0 mA/sec.
  0.0625 ~ 64.0 V/sec.
- **Resolution** 12-bit
- **Resolution** ±0.015% of FSR
- **Span Temperature Coefficient** ±25 PPM/° C
- **Zero Drift** Voltage: ±30 μV/ ° C
  Current: ±0.2 μV/ ° C

Protection

- **Isolation Voltage** 3,000 V_{DC}

Ordering Information

- **ADAM-5024** 4-ch Analog Output Module

Specifications

General

- **Certifications** CE, FM
- **Connectors** 1 x Plug-in screw terminal (# 14~22 AWG)
- **Power Consumption** 1.2 W (max.)

Digital I/O

- **Channels** 16
- **Channel I/O Type** Bit-wise selectable by DIP switch
- **Digital Input**
  Dry Contact:
  Logic level 0: close to GND
  Logic level 1: open
  Wet Contact:
  Logic level 0: 2 V max.
  Logic level 1: 4 ~ 30 V
- **Digital Output** Open collector to 30 V, 100 mA and 450 mW max. load
- **Power Dissipation** 300 mW for each channel

Ordering Information

- **ADAM-5050** 16-ch Universal Digital Input/Output Module

Specifications

General

- **Certifications** CE
  FM (ADAM-5051 only)
- **Connectors** 1 x Plug-in screw terminal (# 14~22 AWG)
- **LED Indicators: (ADAM-5051D)**
  On: Input logic level 1
  Input floating
  Off: Input logic level 0
- **Power Consumption** ADAM-5051: 0.53 W (max.)
  ADAM-5051D: 0.84 W (max.)

Digital Input

- **Circuit Type** Pull-up current: 0.5 mA (Source Type)
- **Channels** 16
- **Input Voltage** 30 V_{max}
- **Logic Level** Logic level 0: 1 V max.
  Logic level 1: 3.5 ~ 30 V

Ordering Information

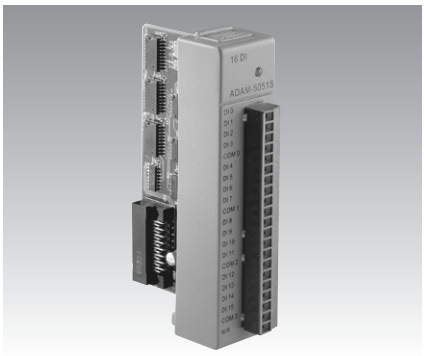
- **ADAM-5051** 16-ch Digital Input Module
- **ADAM-5051D** 16-ch Digital Input Module with LED

ADAM-5051S
ADAM-5052
ADAM-5055S

16-ch Isolated Digital Input Module w/LED

8-ch Isolated Digital Input Module w/LED

16-ch Isolated Digital I/O Module w/LED



ADAM-5051S

Specifications

General

- **Certifications** CE
- **Connectors** 1 x Plug-in screw terminal (# 14~28 AWG)
- **LED Indicators** On: Active
Off: Inactive
- **Power Consumption** 0.8 W (max.)

Digital Input

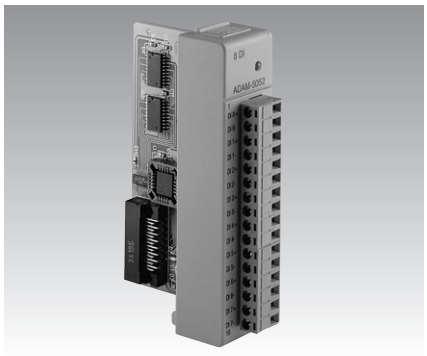
- **Channels** 16
- **Input Voltage** 50 V_{max}
- **Logic Level** Logic level 0: 3 V max.
Logic level 1: 10 ~ 50 V

Protection

- **Optical Isolation** 2500 V_{DC}
- **Overvoltage Protection** 70 V_{DC}

Ordering Information

- **ADAM-5051S** 16-ch Isolated Digital Input Module w/LED



ADAM-5052

Specifications

General

- **Certifications** CE, FM
- **Connectors** 1 x Plug-in screw terminal (# 14~22 AWG)
- **Power Consumption** 0.27 W (max.)

Digital Input

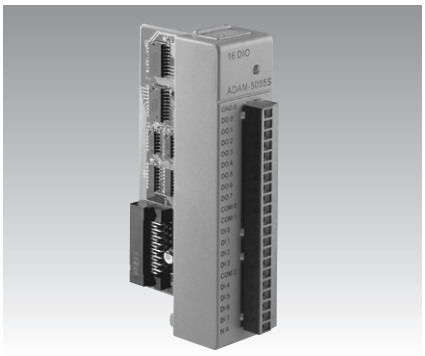
- **Channels** 8
- **Input Resistance** 3 kΩ/0.5 W
- **Logic Level** Logic level 0: 1 V_{max}
Logic level 1: 3.5 ~ 30 V

Protection

- **Isolation Voltage** 5000 V_{RMS}

Ordering Information

- **ADAM-5052** 8-ch Isolated Digital Input Module w/LED



ADAM-5055S

Specifications

General

- **Certifications** CE
- **Connectors** 1 x Plug-in screw terminal (# 14~28 AWG)
- **LED Indicators** On: Active
Off: Inactive
- **Power Consumption** 0.68 W (max.)

Digital I/O

- **Channels** 16
- **Channel I/O Type** 8 DO, 8 DI
- **Logic Level (DI)** Dry contact:
Logic level 0: open
Logic level 1: close to GND
Wet contact:
Logic level 0: 3 V max.
Logic level 1: 10 ~ 50 V
- **Digital Output** Open collector to 40 V
200 mA max. load
- **Power Dissipation** Channel : 1 W max.
Total : 2.2 W
(8 channels)

Protection

- **Isolation Voltage** 2500 V_{DC}
- **Overvoltage Protection** 70 V_{DC} (DI only)

Ordering Information

- **ADAM-5055S** 16-ch Isolated Digital I/O Module w/LED

ADAM-5056/5056D
ADAM-5056S
ADAM-5056SO

16-ch Digital Output Modules
16-ch Sink/Source Type Isolated Digital Output Module w/LED
16-ch Source type Isolated Digital Output Module w/LED

ADAM-5056
ADAM-5056D

Specifications

General

- **Certifications** CE
  FM (ADAM-5056 only)
- **Connectors** 1 x Plug-in screw terminal (# 14~22 AWG)
- **LED Indicators: (ADAM-5056D)**
  On: output logic level "1"
  Off: output logic level "0"
- **Power Consumption** ADAM-5056:0.53 W (max.)
  ADAM-5056D: 0.84 W (max.)

Digital Output

- **Channels** 16
- **Digital Output** Open collector to 30 V, 100 mA max. load
- **Operating Voltage** 30 Vmax
- **Power Dissipation** 300 mW for each channel

Ordering Information

- **ADAM-5056** 16-ch Digital Output Module
- **ADAM-5056D** 16-ch Digital Output Module w/LED

ADAM-5056S

Specifications

General

- **Certifications** CE
- **Connectors** 1 x Plug-in screw terminal (# 14~28 AWG)
- **LED Indicator** On: active
  Off: inactive
- **Power Consumption** 0.6 W (max.)

Digital Output

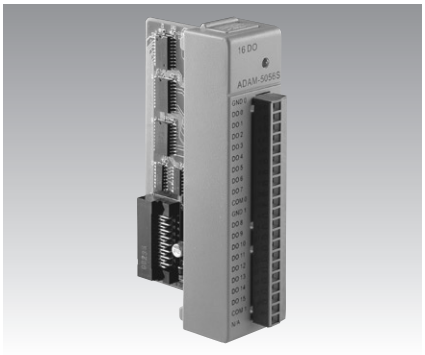
- **Channels** 16
- **Digital Output** Open collector to 40 V, 200 mA max. load (sink)
- **Power Dissipation** 300 mW for each channel

Protection

- **Optical Isolation** 2500 V_{DC}
- **Overvoltage Protection** 70 V_{DC}
- **Power Dissipation** 300 mW

Ordering Information

- **ADAM-5056S** 16-ch Sink Type Isolated Digital Output Module w/LED



ADAM-5056SO

Specifications

General

- **Certifications** CE
- **Connectors** 1 x Plug-in screw terminal (# 14~28 AWG)
- **LED Indicator** On: active
  Off: inactive
- **Power Consumption** 0.6 W (Max.)

Digital Output

- **Channels** 16
- **Digital Output** Open collector to 40 V, 200 mA max. load (source)
- **Power Dissipation** Channel : 1 W max.
  Total : 2.2 W
  (8 channels)

Protection

- **Optical Isolation** 2500 V_{DC}
- **Overvoltage Protection** 70 V_{DC}

Ordering Information

- **ADAM-5056SO** 16-ch Source Type Isolated Digital Output Module w/LED

ADAM-5060
ADAM-5068
ADAM-5069

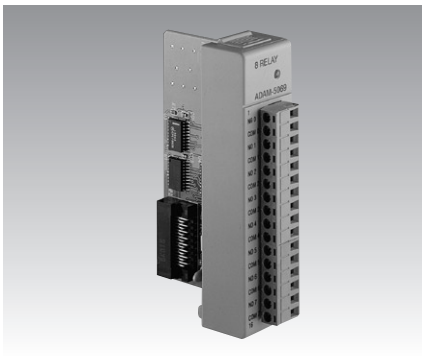
6-ch Relay Output Module

8-ch Relay Output Module

8-ch Power Relay Output Module w/LED

ADAM-5060

ADAM-5068



ADAM-5069

Specifications

General

- **Certifications** CE
  FM (ADAM-5060 only)
- **Connectors** 1 x Plug-in screw terminal (# 14~22 AWG)
- **Power Consumption** 1.8 W (max.)

Relay Output

- **Breakdown Voltage** 500 V_{AC} (50/60 Hz)
- **Channels** 2 x form A , 4 x form C
- **Contact Rating** AC: 125 V @ 0.6 A
  250 V @ 0.3 A
  DC: 30 V @ 2 A
  110 V @ 0.6 A
- **Insulation Resistance** 1 GΩ min. @ 500 V_{DC}
- **Relay Off Time (typical)** 2 ms
- **Relay On Time (typical)** 3 ms
- **Total Switching Time** 10 ms

Ordering Information

- **ADAM-5060** 6-ch Relay Output Module

Specifications

General

- **Certifications** CE
  FM (ADAM-5060 only)
- **Connectors** 1 x Plug-in screw terminal (# 14~22 AWG)
- **Power Consumption** 1.8 W (max.)

Relay Output

- **Breakdown Voltage** 500 V_{AC} (50/60 Hz)
- **Channels** 8 x form A
- **Contact Rating** AC: 120 V @ 0.5 A
  DC: 30 V @ 1 A
- **Insulation Resistance** 1 GΩ min. @ 500 V_{DC}
- **Relay Off Time (typical)** 3 ms
- **Relay On Time (typical)** 7 ms
- **Total Switching Time** 10 ms

Ordering Information

- **ADAM-5068** 8-ch Relay Output Module

Specifications

General

- **Certifications** CE, FCC class A
- **Connectors** 1 x Plug-in screw terminal (# 14~22 AWG)
- **LED Indicator** On: Active
  Off: Non-active
- **Power Consumption** 2.2 W (max.)

Relay Output

- **Breakdown Voltage** 750 V_{AC} (50/60 Hz)
- **Channels** 8 x form A
- **Contact Rating** AC: 250 V @ 5 A
  DC: 30 V @ 5 A
- **Insulation Resistance** 1 GΩ @ 500 V_{DC}
- **Relay On Time** 5 ms
- **Relay Off Time** 5.6 ms

Ordering Information

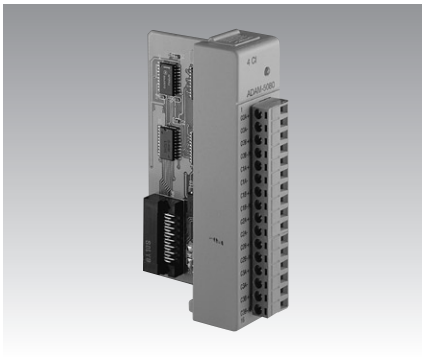
- **ADAM-5069** 8-ch Power Relay Output Module w/LED

ADAM-5080
ADAM-5081
ADAM-5090

4-ch Counter/Frequency Module

4-ch High Speed Counter/Frequency Module

4-port RS-232 Module



ADAM-5080

ADAM-5081

ADAM-5090

Specifications

General

- **Certifications** CE, FM
- **Connectors** 1 x Plug-in screw terminal (# 14~22 AWG)
- **Power Consumption** 1.5 W (max.)

Counter/Frequency

- **Counter Aux. Function** Initial preset, hi-low alarm setting, alarm digital output mapping, overflag
- **Channels** 4
- **Input Frequency** 0.3 ~ 1000 Hz max. (frequency mode) 5000 Hz max. (counter mode) TTL only
- **Input Level** Isolated or TTL level
- **Isolation Input Level** Logic level 0: 1 V_{max} Logic level 1: 3.5 ~ 30 V
- **Isolation Voltage** 1000 V_{RMS}
- **Maximum Count** 4, 294, 967, 295 (32 bits)
-
- **Minimum Input Current** 2 mA (isolated)
- **Minimum Pulse Width** 500 ms (frequency mode) 100 ms (counter mode)
- **Modes** Counter (up/down, bi-direction) frequency
- **Programmable Digital Filter** 1 ~ 65000 µsec (Noise Filter function)
- **TTL Input Level** Logic level 0: 0 ~ 0.8 V Logic level 1: 2.3 ~ 5 V

Ordering Information

- **ADAM-5080** 4-ch Counter/Frequency Module

Specifications

General

- **Certifications** CE
- **Power Consumption** 1.1 W (Max.)
- **LED** Power/Communication Indicator
- **Channels** 4
- **Maximum Count** 4,294,967,295 (32 bit)
- **Input Frequency** 5 Hz ~ 1 MHz max. (frequency mode) 1 MHz max. (counter mode)
- **Input Level** Isolated or TTL level
- **Minimum Pulse Width** 1µsec. (frequency mode) 1µsec. (counter mode)
- **Minimum Input Current** 2 mA (isolated)
- **Isolation Input Level** Logic level 0: +3 Vdc (max), Logic level 1: +10 Vdc to 30 Vdc
- **TTL Input Level** Logic level 0: 0 Vdc to 0.8Vdc, Logic level 1: 2.3 Vdc to 5 Vdc
- **Isolation voltage** 2500 V_{RMS}
- **Modes** Counter (up/down, bi-direction, up, A/B Phase), Frequency
- **Counter Aux. Function** Initial preset,hi-low alarm setting, alarm digital output mapping, overflag
- **Programmable Digital Filter** 1 ~ 65000 µsec (Noise Filter Function)

Ordering Information

- **ADAM-5081** 4-ch High Speed Counter/Frequency Module

Specifications

General

- **Certifications** CE
- **Connectors** 4 x RJ-45
- **LED Indicators** TX, RX (each port)
- **Power Consumption** 0.6 W (max.)

Communications

- **Data Bits** 5, 6, 7, 8
- **Data Signals** TxD, RxD, RTS, TS, DTR, DSR, DCD, RI, GND
- **Parity** none, even, old
- **Ports** 4
- **UARTs** 1 x 16C954 (128-byte FIFO)
- **Speed** 50 ~ 115.2 kbps
- **Stop Bits** 1, 1.5, 2

Note: For ADAM-5510 Series, ADAM-5510KW Series, and ADAM-5511 only

Ordering Information

- **ADAM-5090** 4-port RS-232 Module

ADAM-5202
ADAM-5240
ADAM-5030

2-ring AMONet Master Module
4-axis Stepping/Pulse-type Servo Motor Control Module
2-slot SD Storage Module

ADAM-5202

ADAM-5240

ADAM-5030

Specifications

General

- **Certifications** CE
- **Power Consumption** 0.5 W (Max.)
- **Connectors** RJ-45
- **LED Indictors** Active, Error (Each Port)
- **Number of Rings** 2
- **Transmission Speed** 2.5, 5, 10 or 20 Mbps with automatic data flow control
- **Serial Interface** Half duplex RS-485 with transformer isolation
- **Cable Type** CAT5 UTP/STP Ethernet cable
- **Surge Protection** 10 kW
- **Communication** Max. 100 m (20 Mbps/32 slave modules) or 50 m (20 Mbps/64 slave modules) Distance
- **Communication Slave** 2 Rings with Max. 128 (1 Ring with 64 slaves) Module Number
- **Operating Temperature** 0 ~ 50° C (32 ~ 140° F)

Ordering Information

- **ADAM-5202** 2-ring AMONet Master Module

Specifications

General

- **Certifications** CE
- **Power Consumption** 1.1 W (Max.)
- **Connectors** 100-pin SCSI-II
- **Operating Temperature** 0 ~ 60° C (32 ~ 140° F)
- **Relative Humidity** 5 ~ 95 % RH non-condensing (refer to IEC 68-2-3)

Motion

- **Number of Axis** 4 Axis
- **External Power input** DC +12 ~ 24Vdc
- 2/3-axis Linear Interpolation/2-axis Circular Interpolation
- **Range** ±2, 147, 483. 646 for each axis
- **Speed** 1PPS ~ 4MPPS

Continuous Interpolation

- **Speed** 1PPS ~ 2MPPS

Drive Output Pulses

- **Range** 1PPS ~ 4MPPS
- **Pulse Output Type** Pulse /Direction (1-pulse, 1- direction type)
- Up/Down (2-pulse type)
- **Speed Curve** T/S-curve Acceleration/ Deceleration

Input Pulse for Encoder Interface

- **Encoder Pulse Input Type** Quadrature (A/B phase or Up/Down)
- **Counts per Encoder Cycle** X1, X2 ,X4 (A/B phase only)
- **Protection** 1000 Vdc isolation
- **Input Range** 5 V ~ 30 V

External Signals Driving

- **Input Signal** nEXOP + and nEXOP
- **Max Input Frequency** 100Hz
- **Protection** 1000 Vdc Photo coupler isolation

External Deceleration/Instantaneous Stop Signal

- **Input Signal** nIN1 ~3
- **Max Input Frequency** 4 kHz
- **Protection** 1000 Vdc Photo coupler isolation

Input Pulse for Servo Motor Drives

- **Input Signal** nALArm (servo alarm) nINPOS (position command completed)

General Purpose Output Signal

- **Ouput Signal** nOUT4 ~ 7

Emergency Stop

- **Input Signal** EMG – one emergency stop input for ADAM-5240
- **Protection** 1000 Vdc Photo coupler isolation and RC filtering

Ordering Information

- **ADAM-5240** 4-axis Stepping/Pulse Servo Motor Control Module

Specifications

General

- **Certification** CE
- **Power Consumption** 0.5 W (Max)
- **Storage Type** SD (Secure Digital Card)
- **Storage Number** 2
- **USB Type** USB Rev 2.0 (Compilant)
- **USB Number** 2
- **Operating Temperature** 0 ~ 60° C (32 ~ 140° F)

Ordering Information

- **ADAM-5030** 2-slot SD Storage Module

DiagAnywhere

Remote Maintenance Software

Features

- Remote Monitor Function
- Remote Control Function
- Remote Screen Snapshot
- Remote Screen Recording
- File Transfer Function
- Windows-based Authentication
- Favorite Devices Grouping Function

Introduction

The “DiagAnywhere”, an abbreviation of “Diagnose Anywhere”, is remote maintenance software for remotely monitoring and controlling Advantech TPC, UNO and ADAM devices with Windows-based operating systems. Currently, the DiagAnywhere includes the utility on client side and the server on the target devices. The supported platforms include Windows XP, Windows XP Embedded, Windows CE.NET 4.2, and Windows CE 5.0. This useful software can help users to achieve major remote maintenance tasks including remote monitoring and control, remote screen snapshot and recording, file upload and download. Windows-based authentication is also supported for security concern.

Remote Monitoring and Control

DiagAnywhere can monitor up to 16 target devices simultaneously. The total refresh rate of the screens can be optimized manually. The other supported functions including remote control function can be operated under only one target device is selected.

Remote Screen Snapshot and Recording

The remote screen snapshot function and remote screen recording function can be utilized for recording the important screen snapshots so the major symptoms of the target device can be analyzed efficiently. These functions are very helpful to the communication between field operators and technical support engineers when they need to investigate the problem remotely.

File Upload and Download

Remote maintenance always needs the functions of uploading files to and downloading files from target devices. DiagAnywhere adopts popular user interfaces of FTP client so users can operate the upload and download function easily.

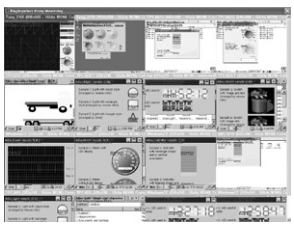
Windows Based Authentication

DiagAnywhere adopts Windows-based authentication which comes with Windows operating system. Only the account of administrator can logon to the target devices. For security consideration, the server can accept only one connection from the client utility at a time and other connection will be rejected if there is a connection alive.

Favorite Devices Grouping Function

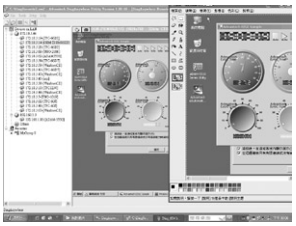
The selected target devices can be grouped under favorite groups. This function can help users to organize the device groups and save the maintenance time.

Monitoring 16 Target Devices

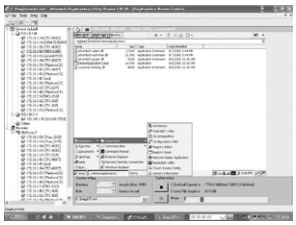


Controlling target device

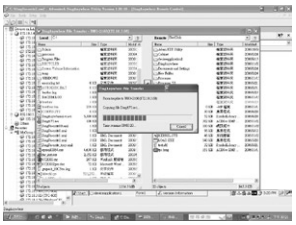
Remote Screen Snapshot



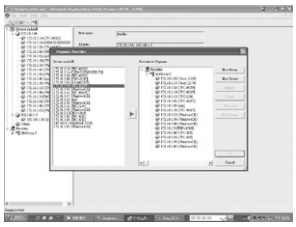
Remote Screen Recording

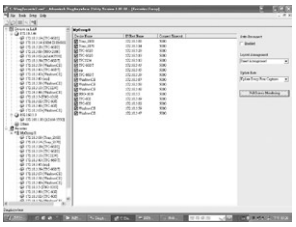


File Transfer

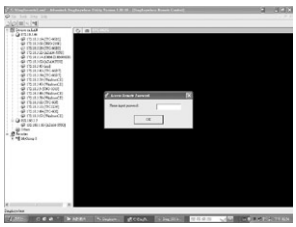


Devices Grouping





Windows-based Authentication



System Requirements

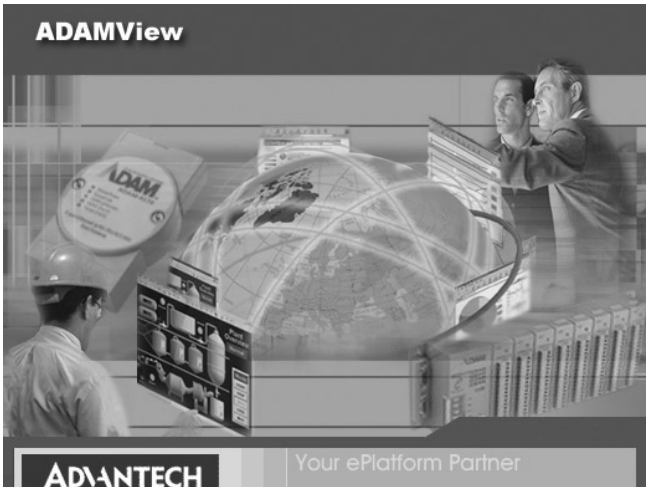
CPU	Intel Pentium processor 200 MHz or higher
RAM	64 MB memory (Minimum)
Disk Space	5 MB (Minimum)
Display	VGA resolution or higher
OS	Microsoft Windows 98, SE, Windows 4.0 (SP6 above), Windows 2000/XP
Win32 platform	Microsoft .NET Framework installed
WinCE platform	Microsoft .NET Compact Framework installed

Ordering Information

PCLS-DIAGAW32	DiagAnywhere Remote Maintenance Software

ADAMView

Data Acquisition Software



Features

- Complete software package
- Graphic panel configuration
- Modularized and prioritized task design
- BasicScript scripting language to customize your applications
- Easy connection with ADAM I/O series

Introduction

We have noticed that many users apply the ADAM Data Acquisition modules in small base projects. Because the cost ran higher than system hardware, Human Machine Interface software were never suitable for these projects. ADAMView, the ADAM Data Acquisition software, is especially designed for low-volume ADAM projects. It provides a 150 physical points database, ADAM Drivers, for all monitoring and control functions. In brief, ADAMView is a cost-effective and simple SCADA software for the ADAM I/O series.

Specifications

System Requirements

- **CPU** Intel® Pentium® 200 MHz or higher
- **RAM** 64 MB Minimum
- **Disk Space** 20 MB Minimum
- **Display** VGA Resolution or Higher
- **Microsoft Compatible Mouse**
- **OS** Microsoft® Windows® 98, Windows NT 4.0 SP4 or above, Windows 2000, Window XP

Supported Hardware

- ADAM-4000/5000 Series Modules: Link through DLL Driver (Device Manager)

Feature Details

Complete Software Package

ADAMView takes advantage of Microsoft's Windows graphical interface, offering fast and intuitive configuration for human-machine interface and data acquisition applications. This application software combines easy-to-use graphical development and the flexibility of BasicScript, a powerful programming tool. With ADAMView, you can easily design both simple and complex applications, such as factory processes and utility monitoring, Lab testing, or environmental monitoring.

Graphical Panel Configuration

ADAMView provides a wide variety of graphical wizards, allowing users to quickly create an intuitive operator interface. Built-in display objects include bar graph, button, indicator, real time/historical trending, knob, gauge, slider, imported bitmap, numeric display and control.

Modularized and Prioritized Task Design

ADAMView development environment allows you to decompose your system into several smaller modules or tasks. The modular design is very useful to develop, and facilitate large and complicated system maintenance. Each module or task has its own properties, such as scan rate, start/stop method, and priority etc. With 32-bit Windows' multi-tasking capability, all tasks run simultaneously. Moreover, ADAMView software allows you to prioritize your tasks to increase overall performance.

BasicScript Scripting Language to Customize Your Applications

ADAMView is easy to use. It fully integrates BasicScript language in its kernel to meet your specific needs. Over 600 commands are available to perform almost any function you can imagine, including calculations, reading and writing files, DDE, and ODBC. It allows you to access and share data with other applications, such as Microsoft Access and Microsoft Excel. With BasicScript scripting language, you can reuse existing code and build your applications faster and easier.

Easy Connection with ADAM I/O Series

Once you install ADAMView software, you can immediately connect with ADAM-4000/5000 I/O as a complete Data Acquisition System. Current ADAM users can apply direct driver to access all ADAM-4000 modules and ADAM-5000/485 I/O system.

Ordering Information

- **PCLS-ADAMVIEW32** ADAMView Data Acquisition Software

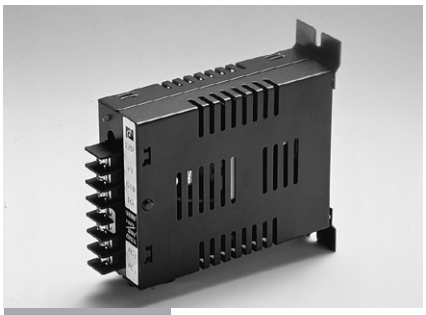
PWR-242
PWR-243
PWR-244

DIN-rail Power Supply

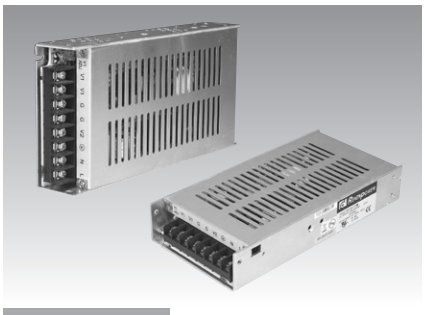
Panel Mount Power Supply

Panel Mount Power Supply

PWR-242



PWR-243



PWR-244

Specifications

Input

- **Input Current** 1.2 A max.
- **Inrush Current (cold)** 20 A/110 V_{AC}, 40 A/220 V_{AC}
- **Input Frequency** 47 ~ 63 Hz
- **Input Voltage** 90 ~ 264 V_{AC} wide input range
- **Short Protection**

Output

- **Output Current** 2.1 A max.
- **Output Voltage** +24 V_{DC} ±10%
- **Overload Protection**

General

- **Certifications** CE, UL
- **Connectors** Screw-terminal
- **Dimensions (L x W x H)** 181 x 113 x 60 mm (7.01" x 4.43" x 2.35")
- **Enclosure** Sheet metal
- **MTBF** 85,000 hrs
- **Operating Temperature** 0 ~ 50° C (32 ~ 122° F)

Ordering Information

- **PWR-242** DIN-rail Power Supply

Specifications

Input

- **Input Current** 1.4 A max.
- **Inrush Current (cold)** 20 A/110 V_{AC}, 40 A/220 V_{AC}
- **Input Frequency** 47 ~ 63 Hz
- **Input Voltage** 85 ~ 132 V_{AC} or 170 ~ 264 V_{AC}, (switchable)
- **Short Protection**

Output

- **Output Current** 3 A max.
- **Output Voltage** +24 V_{DC} ±10%
- **Overload Protection**

General

- **Certifications** CE, UL
- **Connectors** Screw-terminal
- **Dimensions (L x W x H)** 128 x 97 x 40 mm (5" x 3.8" x 1.6")
- **Enclosure** Sheet metal
- **MTBF** 78,000 hrs
- **Operating Temperature**: 0 ~ 50° C (32 - 122° F)

Ordering Information

- **PWR-243** Panel Mount Power Supply

Specifications

Input

- **Input Current** 1.4 A max.
- **Inrush Current (cold)** 25 A/110 V_{AC}, 50 A/220 V_{AC}
- **Input Frequency** 47 ~ 63 Hz
- **Input Voltage** 100~240 V_{AC}
- **Short Protection**

Output

- **Output Current** 4.2 A max.
- **Output Voltage** +24 V_{DC} ±10%
- **Overload Protection**

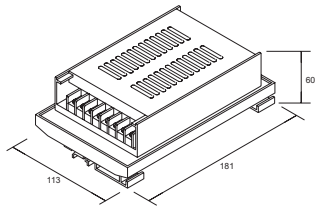
General

- **Certifications** CE, UL
- **Connectors** Screw-terminal
- **Dimensions (L x W x H)** 198 x 99 x 35 mm (7.80" x 3.90" x 1.38")
- **Enclosure** Sheet metal
- **MTBF** 70,000 hrs
- **Operating Temperature** 0 ~ 50° C (32 ~ 122° F)

Ordering Information

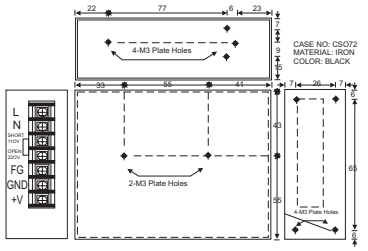
- **PWR-244** Panel Mount Power Supply

Dimensions



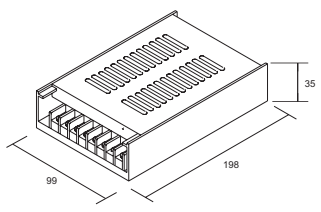
Unit: mm

Dimensions



Unit: mm

Dimensions



Unit: mm