Environmental and Facility Management Systems

Develop Your SCADA System with ADAM Solutions

Advantech has gained a great reputation in Supervisory Control and Data Acquisition (SCADA) by continuously improving its advanced ADAM series. Advantech's ADAM series distinguishes itself by featuring a wide variety of I/O and communication modules to meet high-volume SCADA requirements in environmental monitoring applications such as air/water quality measurement & control services, warning systems for landscapes, dams, bridges, traffic monitoring and unmanned station monitoring. In energy management, we also have field-proven solutions for pipeline management, power distribution and supply.

Project Implementation

ADAM-5510/TCP Ethernet-enabled PC-based Controller
- 10/100Base-T Ethernet Interface
- Four serial communication ports
- Supports HTTP server, FTP server, and e-mail alarm functions
- Supports Modbus/TCP server/client functions

ADAM-6000W Wireless I/O Modules
- Supports IEEE802.11b wireless LAN
- Embedded web server with built-in web page
- Supports Modbus/TCP & UDP protocols
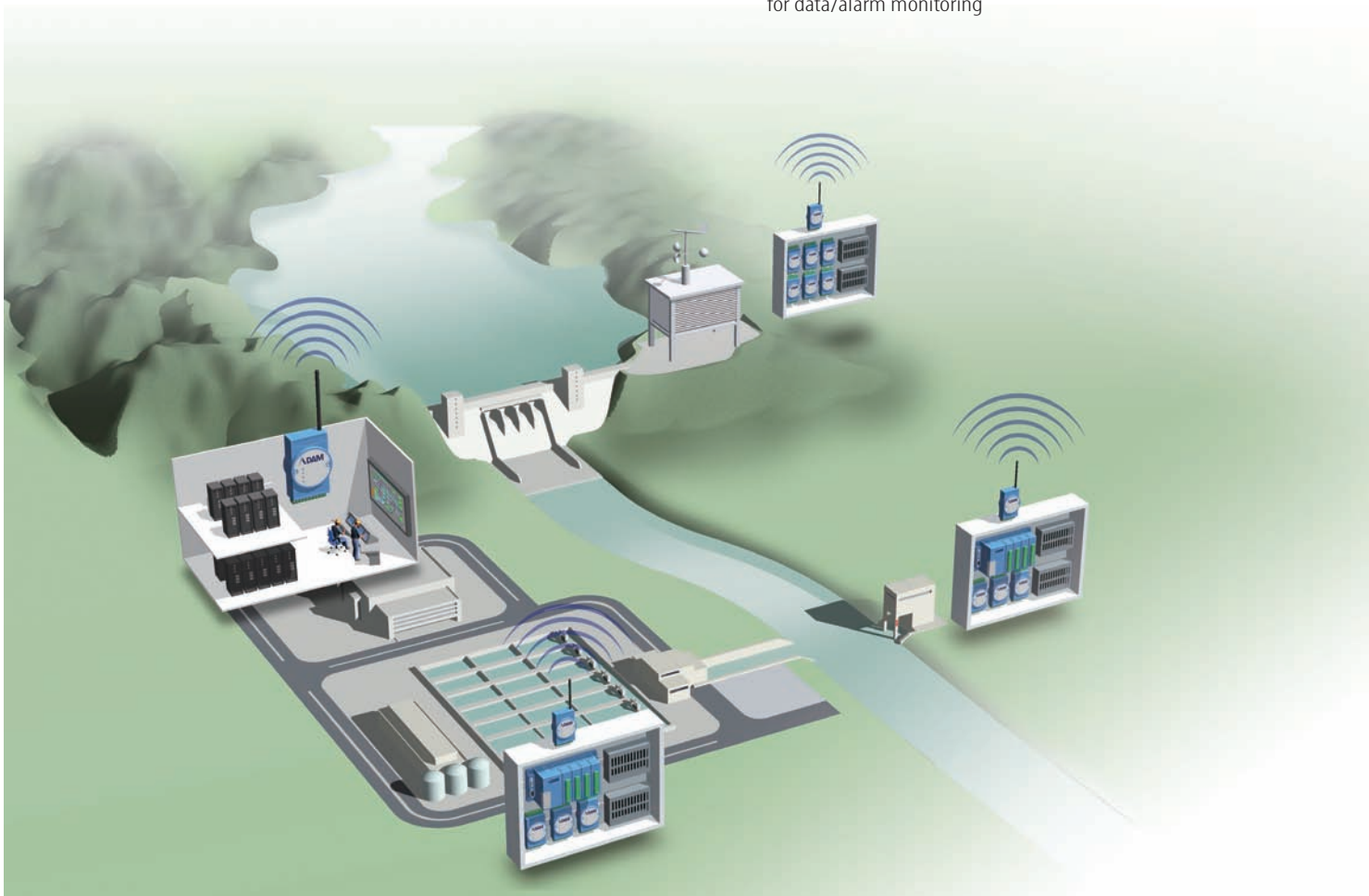- Supports event trigger function

ADAM-4100 Robust I/O Modules
- Robust design for harsh environment
- Easy plug-in system integration
- ADAM and Modbus/RTU dual protocol support

ADAM-6000 Ethernet I/O Modules
- Ethernet-based smart I/O
- Mixed I/O in single module
- Pre-built HTTP server and web page in each module for data/alarm monitoring

Intelligent Transportation Systems

Smooth Traffic Flow with PC-based Vehicle Detection System

Advantech offers advanced product solutions for the ITS market segment, especially for Vehicle Detection (VD) systems and Changeable Message Sign (CMS) systems for Advanced Traffic Management System (ATMS). Along with the benefits of an open architecture, Advantech's PC-based product solutions emphasizes a robust design for outdoor installations.

Project Implementation

UNO-3000 Embedded Automation Computer
- Built-in real-time operating system
- Efficient application development
- Standard communication interfaces integrate with remote I/O solutions
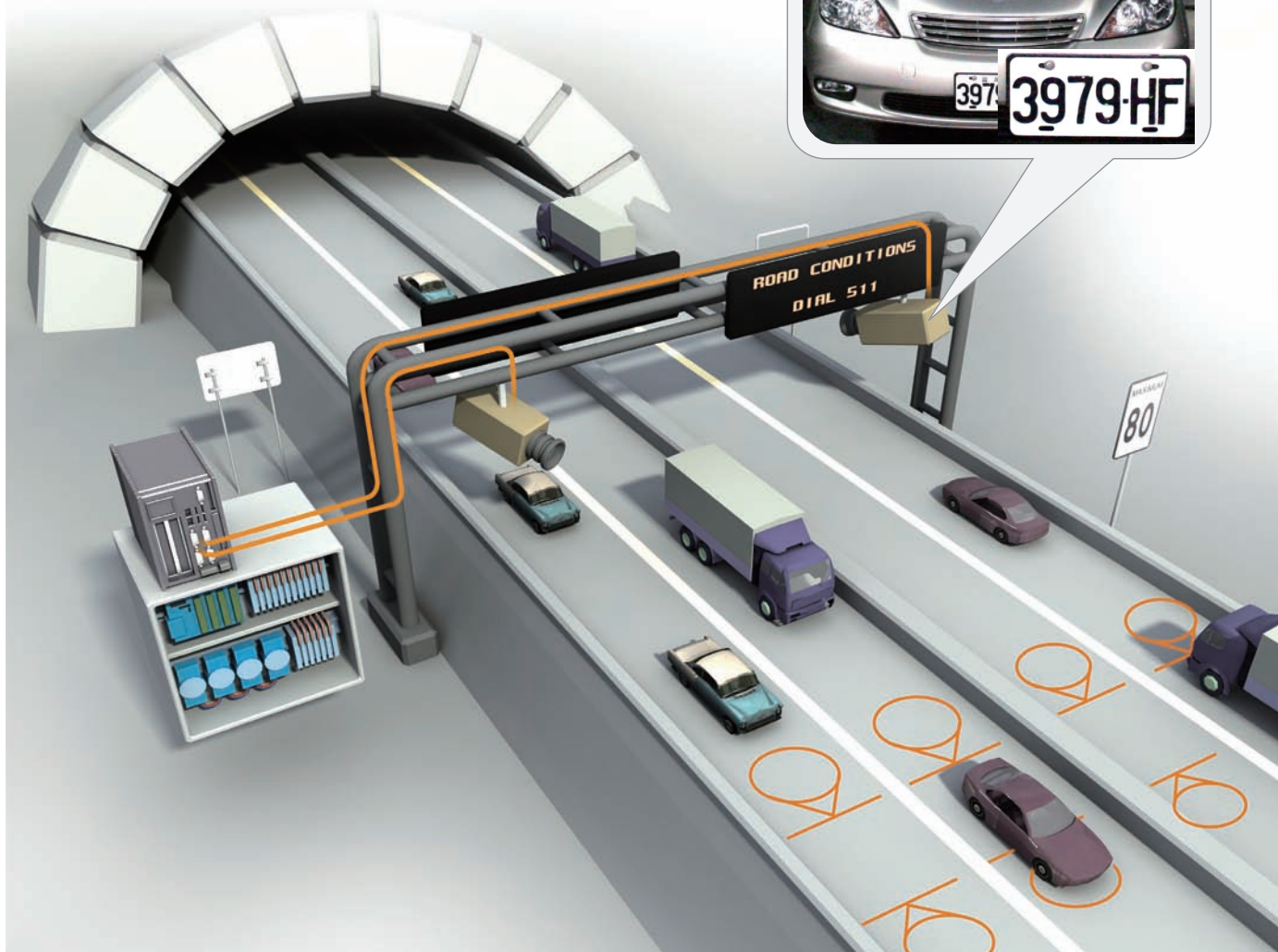- Flexible networking options

ADAM-5510KW PC-based SoftLogic Controller
- 4 expansion I/O slots
- Supports IEC-61131-3 standard package
- Graphical programming interface

ADAM-6541 Fiber Optic Converter
- Supports 1-port Mbps multi- and single-mode fiber optics
- Supports 10~30 V$_{DC}$ power input
- Supports MDI/MDI-X auto crossover

eA-13

Building Automation

Enhanced Building Automation Management with Web-enabled Technology

Advantech has successfully implemented the eAutomation concept in diverse building automation (BA) applications to help users achieve advanced building management systems with simple Ethernet-enabled solutions. Through Ethernet-enabled technology, Security Systems, Facility Management Systems (HVAC, water treatment, power, etc.), DDC Systems and CCTV Systems all integrate into one system. Moreover, Web-enabled HMI software (WebAccess) provides remote monitoring capability anytime, anywhere.

Project Implementation

UNO-2000 Embedded Automation Computers
- Bowser-only client saves costs and facilitates maintenance
- Remotely view and control I/O anytime, anywhere
- Alarm/event instantly handled through email

ADAM-6000 Smart Web I/O Modules
- Ethernet-based smart I/O
- Boundless monitoring and management with embedded web page
- Cost-effective, combined I/O design in one module

WebView Web-enabled Operator Interface Terminal
- Super slim and compact design with plastic housing
- NEMA4/IP65 compliant front panel
- Built-in Windows CE with Advantech WinCE WebAccess
- Supports Vector-based graphics

BAS-2000 Building Automation Controller
- Functional blocks for BA facility control
- A combination of universal I/O
- Supports IEC61131-3 control languages
- Supports Modbus/RTU and BACnet protocols
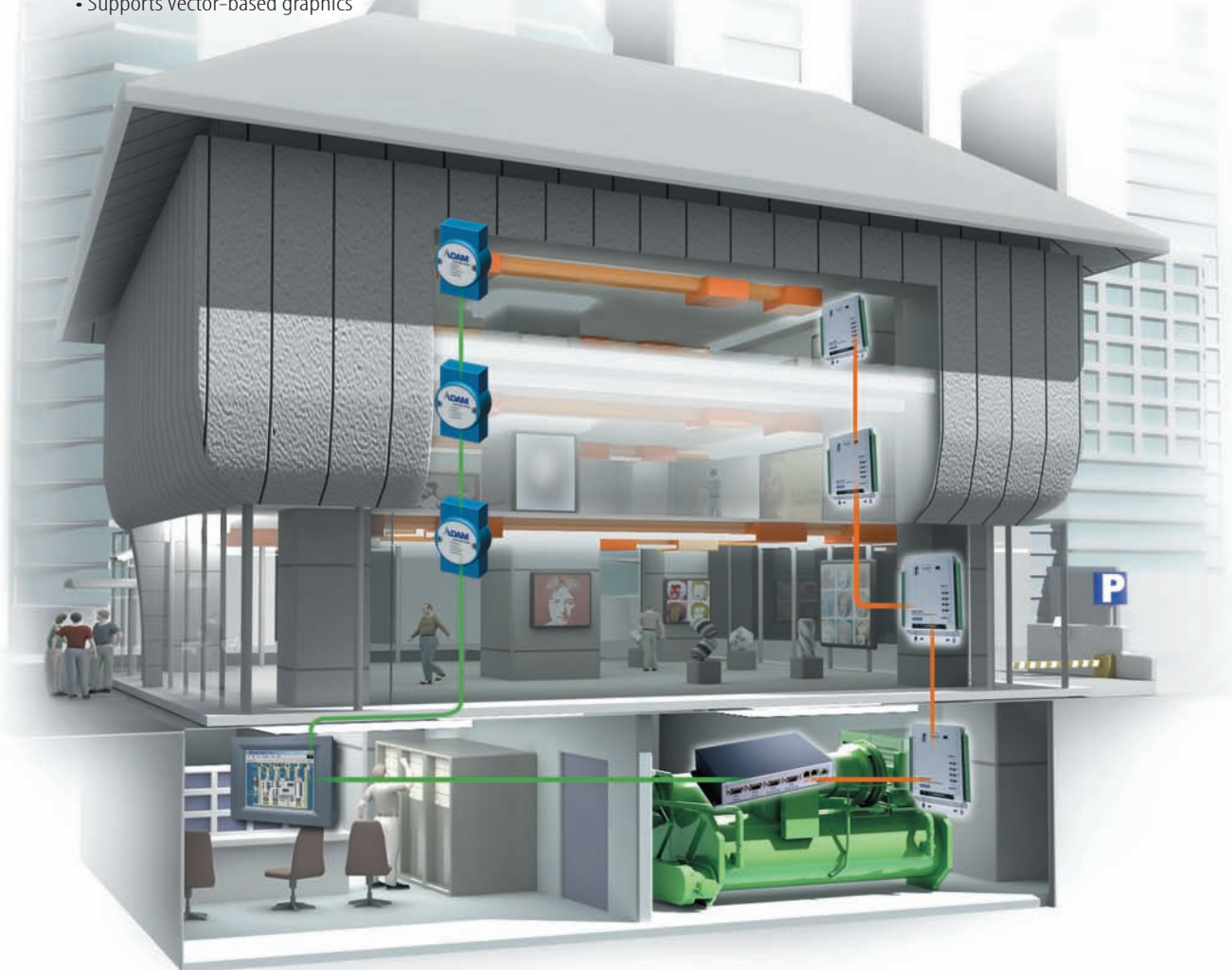
Factory Automation

Bringing PAC Solutions to Factory Floors

Advantech's ADAM-5550KW PAC Series is designed for high level industrial applications in factory floors which require complex control capabilities, high speed analog measurements, local storage and database, multiple programs support with different cycle times, open communication functions and enterprise-level network integration. For food and beverage machinery, high speed analog measurement is required for weight measuring. Advantech's ADAM-5550KW Series also supports distributed motion control functions, making it the best solution for food and beverage machineries by replacing IPC plus PLC combinations.

Project Implementation

ADAM-5550KW Programmable Automation Controller
- Designed for control tasks that meet robust and computing performance requirements for PLC and Industrial PC's
- Supports IEC 61131-3 Standard PLC Programming languages and PLCopen-compliant motion control function blocks
- Open Architecture & Versatile Connectivity

AMAX-2000 and AMONet RS-485 Motion Slave Modules
- AMAX-2212 1-axis AMONet RS-485 Motion Slave Module
- AMAX-2752 32-ch Isolated Digital Input Module
- AMAX-2754 32-ch Isolated Digital Output Module
- AMAX-2756 6/16-ch Isolated Digital Input/Output Module

Machine Automation

Complete Application Ready Platforms for the GMC Market

During the LCD manufacturing process, having a zero fault tolerance is almost impossible. Moreover, LCD panels are very delicate products, and can frequently have minor defects. Therefore, defect inspection is essential at each assembly station. Our customer wanted to increase the efficiency of their defect inspection stations and speed up their overall LCD production. They were using the traditional method of inspection, which consisted of having just one camera to complete the process, which is slow and cumbersome. With a new PC-based automation solution from Advantech, more cameras can be set up for inspections, allowing a smoother and faster production flow.

Project Implementation

PCI-1202U
2-port AMONet RS-485 Master Card
- Max. 20 Mbps transfer rate 2 independent AMONet – RS-485 Master Rings
- Max. 128 AMONet RS-485 slave modules supported
- Programmable digital input to notify events
- Easy installation with RJ45 phone jack and LED diagnostic

AMAX-2212/J2S
1-axis AMONet RS-485 Motion Slave Module for Mitsubishi MR-J2S
- Max. 20 Mbps transfer rate
- Max. 6.5 Mhz, 1-Axis pulse output 28 bits counter for incremental encoder
- Programmable acceleration and deceleration time
- T-curve and S-curve velocity profiles support

AMAX-2752
32-ch Isolated Digital Input Module

AMAX-2754
32-ch Isolated Digital Output Module

AMAX-2756
16/16-ch Isolated Digital Input/Output Module
- DIN-rail mounting (L x W x H): 125 x 47.6 x 156 mm
- Max. 20 Mbps transfer rate
- Onboard terminal for direct wiring
- Easy installation with RJ45 phone jack and LED diagnostic
- LED indicator for each IO channel (Switch by SW4)
- Selection of I/O-channel configuration (32 DI, 32 DO or 16/16 DI/O)
- 2500 Vrms Isolation voltage

Conveyor Control

AMAX-2756

AMAX-2754

AMAX-2752

AMAX-2212/J2S

PCI-1202U

eA-16

Automatic Test Equipment

Complete Solutions for your ATE Requirements

The high cost of state-of-the-art quality control systems for mobile phones has created a demand for more cost-effective alternatives. A leading ODM mobile phone manufacturer in Taiwan found such an alternative with Advantech. Standard products from Advantech were used to verify GSM and GPRS signals of mobile phones. The basic quality control procedure for frequencies used to require the phone to be tested, an operator, a test instrument, and a test station. This test would take approximately 1 minute per phone.

After implementing the new test equipment, the testing time was reduced to one operator using 4 test stations to simultaneously check 4 phones in 20 seconds; an output improvement of 1,200%. Reduced human error was another bonus, and the entire process is now accomplished at the fraction of the cost of a high-end, quality control system.

Project Implementation

PCI-1762
Relay Actuator and Isolated D/I Card
- 16 relay output channels and 16 isolated digital input channels
- LED indicators to show activated relays
- Jumper selectable Form A/Form B-type relay output channel
  Output status read-back

PCI-1723
**Non-isolated Analog Output Card**
- Auto calibration function
- A 16-bit DAC is equipped for each analog output channel
- Synchronized output function
- Output values retained after system hot reset

PCI-1671UP
GPIB Interface
- IEEE 488.2 Standard interface
- Complete Talker/Listener/Controller
- Industry standard 32-bit PCI bus
- Data transfer rates over 1.5 Megabytes/sec
- 1024-word FIFO buffer
- High-Speed State Machine Bus Manager
- 7 Interrupt lines, shared interrupt capability
- Transparent interrupt enabling/disabling
- Includes GPIB-Library software
- Low profile MD1 size

Quality Control Frequencies for Mobile Phones
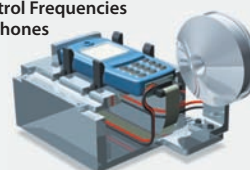
PCI-1671UP ——	GPIB
PCI-1762 ——	Relay Output
PCI-1723 ——	Analog Output

Programmable Automation Controllers

The New Generation of Automation Controllers

ADAM-5550KW is the first in our line of new Programmable Automation Controllers (PAC's). PAC's are powerful and versatile controllers combining a PLC's ruggedness with a PC's functionality under a flexible, open architecture. The robust ADAM-5550KW complies with PLC certifications and allows users to build complex systems with advanced control, communication, data logging, and signal processing capabilities. ADAM-5550KW is designed for satisfying users who need a high performance and cost-effective solution for complex control applications.

Controllers

ADAM-5550KW
8-slot Programmable Automation Controller
• Designed for control tasks that meet robust and computing performance requirements for PLC and Industrial PC's
• Supports IEC-61131-3 Standard PLC Programming Languages
• Built-in VGA Port
• Remote monitoring through Web Server and Email Alarm
• Remote maintenance via FTP Server
• Supports Modbus/TCP and Modbus/RTU Master Function

ADAM-5550KWAS
8-slot PAC w/Advantech Studio
• Designed for control tasks that meet robust and computing performance requirements for PLC and Industrial PC's
• Supports IEC-61131-3 Standard PLC Programming Languages
• Built-in VGA Port
• Built-in Advantech Studio HMI Software
• Built-in CE OPC Server
• Remote monitoring through Web Server and Email Alarm
• Remote maintenance via FTP Server
• Supports Modbus/RTU Master and Modbus/TCP

I/O Modules

ADAM-5202
2-ring AMONet Master Module
• Supports 2 independent AMONet RS-485 rings
• Supports up to 128 AMONet RS-485 slave modules
• Maximum 20 Mbps transfer rate
• Easy installation with RJ-45 phone jack
• Maximum 100 m (20 Mbps / 32 slave modules) communication distance

ADAM-5030
2-slot SD Storage Module
• Supports 2 SD slots for storage function on ADAM-5550KW
• Supports 2 USB 2.0 ports for ADAM-5550KW

ADAM-5017UH
8-ch Ultra High Speed Analog Input Module
• 1K Samples/sec per channel on ADAM-5550KW
• 8 Channels differential inputs
• 16-bit effective resolution
• 3000 V_{DC} isolation voltage
• Supports ±10V and 4~20mA input ranges

Distributed I/O

Streamlined Automation Systems with M2M Technology

In order to meet the integration requirements of Environmental Monitoring Systems and Facility Management Systems, ADAM Remote I/O Series offers a diversified product range, powerful networking and communication capabilities, rich analog measurements with noise immunity and wide operating temperature. The following are the new products in the ADAM Remote I/O Modules.

Robust I/O Modules

ADAM-4520I
Robust RS-232 to RS-422/485 Converter
• Wide operating temperature: -40 ~ 85° C
• Automatic RS-485 data flow control
• 3000 V$_{DC}$ isolation protection
• Surge protection RS-485 data line

ADAM-4510I
Robust RS-422/485 Repeater
• Wide operating temperature: -40 ~ 85° C
• Automatic RS-485 data flow control
• 3000 V$_{DC}$ isolation protection
• Surge protection RS-485 data line

ADAM-4117/4118
Robust 8-ch Analog Input/Thermocouple Input Modules with Modbus
• 8 differential and independent configuration channels
• Wide operating temperature: -40 ~ 85° C
• Higher noise immunity: 1 KV surge protection on power inputs, 3 KV EFT, and 8 KV ESD protection

ADAM-4150/4168
Robust Digital I/O / Relay Output Modules with Modbus
• 7 input channels and 8 output channels for ADAM-4150
• 8 Form A output channels for ADAM-4168
• Wide operating temperature: -40 ~ 85° C
• Higher Noise Immunity: 1 KV surge protection on power inputs, 3 KV EFT, and 8 KV ESD protection

Wireless I/O Modules

ADAM-6050W
18-ch Wireless LAN-enabled DI/O Module
• Supports IEEE802.11b wireless LAN
• Built-in 12 DI / 6 DO
• Embedded web server with built-in web page
• Supports Modbus/TCP & UDP protocols
• Supports event trigger function

ADAM-6051W
16-ch Wireless LAN-enabled Isolated I/O
• Supports IEEE802.11b wireless LAN
• Built-in 12 DI / 2 DO / 2 counters
• Embedded web server with built-in web page
• Supports Modbus/TCP & UDP protocols
• Supports event trigger function

ADAM-6060W
6-ch Wireless LAN-enabled Relay Output Module
• Supports IEEE802.11b wireless LAN
• Built-in 6 DI / 6 relay
• Embedded web server with built-in web page
• Supports Modbus/TCP & UDP protocols
• Supports event trigger function

Programmable Communication Controllers

ADAM-4501/4501D
Ethernet-enabled Communication Controllers with 4 x DI/O (Optional LED Display)
• 10/100Base-T Ethernet Interface
• Email alarm function
• Built-in Web Server
• Built-in FTP Server and Client
• Supports functionally versatile I/O modules
• Full Functions of Standard TCP and UDP Sockets
• Optional 4 digit 7-segment LED display
• Supports Modbus/RTU and Modbus/TCP function libraries
• 1.5 MB Flash ROM/640 KB SRAM with 384 KB backup SRAM

Embedded Automation Computers

Open and Robust Computing Power for Automation Applications

Advantech's Embedded Automation Computers are designed to fullfill the needs of mission-critical automation applications. Their embedded design, rugged features and powerful computing technology delivers reliability and flexibility. These computers are targeted to satisfy customers who are looking for a robust and compact computing platform with industrial design and built-in I/O for diverse automation applications.

UNO-2000 Series
Compact High Performance Embedded Automation Computers

UNO-2171
Intel Pentium M UNO w/2 x LAN, 4 x COM, PC/104+
- Onboard Pentium M 1.4 GHz or Celeron M 1.0 GHz, 512 MB/1 GB DDR SDRAM
- Provides 512 KB battery-backup SRAM
- Two RS-232 and two RS-232/422/485 ports with automatic flow control
- Two 10/100Base-T RJ-45 ports
- Audio with Mic in, Line in, Line out
- Two USB and one type I/II PC Card
- PC/104+ expansion slots

UNO-2052E
AMD GX2 UNO w/2 x CAN, LAN, 8 DI/O
- Onboard GX2-400 MHz, 256MB DDR SDRAM
- Provides two CAN interfaces
- Provides one 10/100Base-T RJ-45 port and one USB port
- Isolated 8-ch DI/O and 2-channel AI
- Windows CE 5.0, Windows XP Embedded SP2, and Linux ready solution

UNO-2176
Intel Pentium M UNO w/2 x LAN, 6 x COM, 16 DI/O
- Onboard Pentium M 1.4 GHz/ Celeron M 1.0 GHz, 512 MB DDR SDRAM
- Provides 512 KB battery-backup SRAM
- Two RS-232 and four isolated RS-232/422/485 ports with automatic flow control
- 8-ch Digital Input and 8-ch Digital Output
- Two 10/100Base-T RJ-45 ports
- Two USB and one type I/II PC Card
- PC/104 expansion slots

UNO-2053E
AMD GX2 UNO w/2 x LAN, 2 x COM, Audio
- Onboard GX2-400 MHz, 256MB DDR SDRAM
- Two standard RS-232 and one DB-15 VGA connector
- Two 10/100Base-T RJ-45 ports
- Two USB and one type I/II PC Card slots
- Audio with Mic in, Line in, Line out
- Windows CE 5.0, Windows XP Embedded SP2, and Linux ready solution

UNO-2050E
AMD GX2 UNO w/2 x LAN, 4 x COM, 16 DI/O
- Onboard GX2-400 MHz, 256 MB DDR SDRAM
- Two RS-232 and two-isolated RS-232/422/485 with automatic flow control
- Two 10/100 Base-T RJ-45 port
- Isolated 8-ch DI and 8-ch DO with counter and timer
- Windows CE 5.0, Windows XP Embedded SP2, and Linux ready solution

UNO-2059E
AMD GX2 UNO w/4 x COM, LAN, PC Card
- Onboard GX2-400 MHz, 256MB DDR SDRAM
- 2 x RS-232/485, 2 x RS-232/422/485 with automatic flow control
- 1 x 10/100Base-T RJ-45 port
- 2 x USB ports and 1 x type I/II PC Card
- One programmable diagnostic LED and buzzer
- Windows CE 5.0, Windows XP Embedded SP2, and Linux ready solution

UNO-3000 Series
Embedded Automation Computers
with PCI Expansion

UNO-3072
Intel Pentium M UNO w/2 x PCI slot, 1 x PC Card
• Onboard Pentium M 1.4 GHz/ Celeron M 1.0 GHz, 512 MB
  DDR SDRAM
• Provides 512 KB battery-backup
• Two RS-232 & two RS-232/422/485 ports with RS-485
  automatic flow control
• Two 10/100Base-T RJ-45 ports and four USB ports
• Two PCI-bus expansion slots for versatile applications
• Windows 2000/XP driver ready and Linux driver support
• Windows XP(SP2) Embedded Ready Platforms with write
  protection(EWF)

UNO-3072L
Intel Celeron M UNO w/2 x PCI slot, 1 x PC Card
• Onboard Pentium M 1.6 GHz/Celeron M 1.0 GHz,
  512 MB DDR SDRAM
• Two RS-232 & two RS-232/422/485 ports with RS-485
  automatic flow control
• Two 10/100Base-T RJ-45 ports and four USB ports
• Two PCI-bus expansion slots for versatile application
• Windows 2000/XP driver ready and Linux driver support
• Windows XP(SP2) Embedded Ready Platforms with write
  protection(EWF)

UNO-3074
Intel Pentium M UNO w/4 x PCI slot, 1 x PC Card
• Onboard Pentium M 1.4 GHz// Celeron M 1.0 GHz ,
  512 MB DDR SDRAM
• Provides 512 KB battery-backup SRAM
• Two RS-232 & two RS-232/422/485 ports with RS-485
  automatic flow control
• Two 10/100Base-T RJ-45 ports and four USB ports
• Four PCI-bus expansion slots for versatile applications
• Industrial proven design: anti-shock up to 50G, anti-
  vibration up to 2 G

UNO-1000 Series
DIN-rail Mounted Embedded Automation
Computers

UNO-1019
Intel XScale UNO w/2 x LAN, 4 x COM, CF Card
• Intel XScale PXA-255 200 MHZ Processor
• 2 x RS-232, 2 x RS-232/422/485 Serial Ports
• Dual 10/100 Mbps Ethernet
• 1 x CompactFlash
• Windows CE.NET Ready Platform
• Included Remote Display for Easy Configuration
• DIN-rail and Wallmounting Options

eA-21

Open HMI Platforms

Seamless Integration Between Humans and Machines

Advantech offers a wide range of HMI products for automation needs. We offer not only hardware platforms such as the Industrial Panel PC (IPPC), the Industrial Workstation (AWS), Flat Panel Monitors (FPM), and Touch Panel Computers (TPC), but also very powerful NT/CE and Linux-based HMI solutions to easily migrate applications up or down as the scope changes.

Touch Panel Computers

TPC-660G
AMD LX800 Touch Panel Computer with 6.4" VGA TFT LCD Display
- AMD LX800 processor on board
- Super slim and compact design with plastic housing
- Fanless cooling system
- NEMA4/IP65 compliant front panel
- One CompactFlash slot
- Supports Windows XP/CE and WinXPe

TPC-66S/TPC-66T
Intel XScale Touch Panel Computer with 5.6" QVGA STN/5.7 QVGA TFT LCD Display
- Intel XScale PXA processor on board
- Super slim and compact design with plastic housing
- Fanless cooling system
- NEMA4/IP65 compliant front panel
- Built-in flash memory and Windows CE OS
- One CompactFlash slot

TPC-1070H
Intel Pentium M/Celeron M Touch Panel Computer with 10.4" SVGA TFT LCD
- Intel Pentium M processor up to 1.4 GHz on board
- Compact design with Die-Casting
- Fanless cooling system
- NEMA4/IP65 compliant front panel
- Supports Microsoft Windows XP/2000/CE and WinXPe
- Dual fast Ethernet supported

TPC-68T
Intel XScale Touch Panel Computer with 5.6" QVGA TFT LCD Display and CAN-bus Support
- Intel XScale PXA processor on board
- Super slim and compact design with plastic housing
- Fanless cooling system
- NEMA4/IP65 compliant front panel
- Built-in flash memory and Windows CE OS
- One CompactFlash slot
- CAN-bus 2.0B protocol compatibility

TPC-1270H
Intel Pentium M/Celeron M Touch Panel Computer with 12.1" SVGA TFT LCD
- Intel Pentium M processor up to 1.4 GHz on board
- 12.1" SVGA TFT LCD
- Compact design with Al-Mg housing and Al alloy die-casting
- Fanless cooling system
- NEMA4/IP65 compliant front panel
- Giga Ethernet and fast Ethernet supported
- Supports Microsoft Windows XP/2000 and WinXPe

TPC-120H
Intel XScale Touch Panel Computers with 12.1" SVGA TFT LCD Display
- Intel PXA 270 processor on board
- Super slim and compact design with Al-Mg housing
- Fanless cooling system
- NEMA4/IP65 compliant front panel
- Supports Microsoft Windows CE

Flat Panel Monitors

FPM-3060G

Industrial 6" VGA Flat Panel Monitor with Direct-VGA Port

• 6" VGA TFT LCD with resolution up to 640 x 480
• Robust design with stainless steel chassis and aluminum front panel
• Hard anodic coating to prevent panel abrasion and acid corrosion
• Anti-reflective screen with tempered glass
• Supports stainless steel front panel (Customization)
• OSD control pad on front panel

FPM-3170G

Industrial 17" SXGA Flat Panel Monitor with Direct-VGA Port, DVI, Video, S-Video

• 17" SXGA TFT LCD with resolution up to 1280 x 1024
• Robust design with stainless steel chassis and aluminum front panel
• Hard anodic coating to prevent panel abrasion and acid corrosion
• Anti-reflective screen with tempered glass
• Supports stainless steel front panel (Customization)
• OSD control pad on front panel

FPM-3190G

Industrial 19" SXGA Flat Panel Monitor with Direct-VGA Port, DVI, Video, S-Video

• 19" SXGA TFT LCD with resolution up to 1280 x 1024
• Robust design with stainless steel chassis and aluminum front panel
• Hard anodic coating to prevent panel abrasion and acid corrosion
• Anti-reflective screen with tempered glass
• Supports stainless steel front panel (Customization)
• OSD control pad on front panel

Industrial Panel PCs

IPPC-9151G

Rugged Intel Pentium 4 Industrial Panel PC with 15" LCD

• Intel Pentium 4 processors up to 2.8 GHz
• 15" XGA TFT LCD provides vivid, sharp and large images
• Offers two expansion slots for PCI add-on cards
• Front access USB connector
• Heavy-duty stainless steel chassis with aluminum front panel
• Strengthened glass protects the front panel from shock damage and is NEMA4/IP65 compliant
• Built-in FDD and support for one CD-ROM and 3.5" HDD Drive

IPPC-9171G

Rugged Intel Pentium 4 Industrial Panel PC with 17" LCD

• Intel Pentium 4 processor up to 2.8 GHz
• 17" SXGA TFT LCD provides vivid, sharp and large images
• Offers two expansion slots for PCI add-on cards
• Heavy-duty stainless steel chassis with aluminum front panel
• Strengthened glass protects the front panel from shock damage and is NEMA4/IP65 compliant
• Front access USB connector
• Hard anodic coating to prevent panel abrasion and acid corrosion

Industrial Workstations

AWS-8129H

Workstation w/12.1" LCD, 9 Expansion Slots & Touchpad w/Mouse Key

• 3 ISA, 4 PCI, 2 PICMG slot combined backplanes
• Case dimensions (W x H x D): 482 x 266 x 317 mm (18.98" x 10.5" x 12.5")
• Front accessible FDD, Power switch and CD-ROM
• Front accessible USB port
• OSD & Membrane Key & Touchpad with two mouse buttons
• NEMA4/IP65 compliant front panel
• Optional analog resistive touchscreen (USB Interface)

Industrial I/O

Excellence in PC-based Measurement and Automation

With over 22 years of plug-in I/O card design and manufacturing experience, Advantech has become a global leader, providing a full range of industrial data acquisition and control products. There are six major categories - CompactPCI, PCI-bus, ISA-bus, USB-bus, PC/104 modules and motion control products. With rich wiring terminal modules and software support, Advantech provides high-speed, high-quality, yet cost-saving products for industrial requirements. Moreover, bundled with versatile industrial PC chassis, backplanes, CPU modules, flat panel monitors and embedded controllers, Advantech offers a one-stop shopping solution to serve all your needs.

PCI-bus Data Acquisition & Control Cards

PCI-1742U
1 MS/s, 16-bit, 16-ch High-resolution Multifunction Card
- 16 single-ended, 8 differential or a combination of analog inputs
- 16-bit A/D converter, with up to 1 MHz sampling rate
- Onboard FIFO memory (1024 samples)
- Auto calibration
- Two 16-bit analog output channels
- 16 digital inputs and 16 digital outputs
- Onboard programmable counter
- Universal PCI Bus (support 3.3 V or 5 V PCI bus signal)
- BoardID switch

PCI-1715U
500 kS/s, 12-bit, 32-ch Isolated Analog Input Card
- 2500 VDC isolation protection
- 32 single-ended or 16 differential analog inputs, or a combination
- 12-bit resolution for A/D conversion
- Up to 500 kS/s sampling rate for A/D conversion
- Programmable gain for each input channel
- Onboard 1024 samples FIFO buffer
- Onboard FIFO memory (1024 samples)
- Universal PCI Bus (support 3.3 V or 5 V PCI bus signal)
- BoardID switch

PCI-1718HDU
PCI-1718HGU
100 kS/s, 12-bit, PCI Multifunction Card
- 16 single-ended or 8 differential analog inputs
- 12-bit A/D converter, with up to 100 kHz sampling rate
- Programmable gain
- Automatic channel/gain scanning
- Onboard FIFO memory (1024 samples)
- One 12-bit analog output channel
- 16 digital inputs and 16 digital outputs
- Universal PCI bus (support 3.3 V or 5 V PCI bus signal)
- BoardID switch

PCI-1727U
14-bit, 12-ch Analog Output PCI Card with Digital I/O
- 12 independent analog output channels
- Fuse on each channel
- Universal PCI for 5 V and 3.3 V support
- BoardID switch
- Synchronized output function
- Supports PCL-727 compatible mode

PCI-1735U
64-ch Digital I/O and Counter PCI Card
- 32 TTL-level digital input channels
- 32 TTL-level digital output channels
- High-output driving capacity
- Low-input loading 3 programmable counter/timer channels
- User configurable clock source Breadboard area for custom circuits

PCI-1737U
24-ch Digital I/O Card
- 24 TTL digital I/O channels
- Emulates mode 0 of 8255 PPI
- Interrupt handling
- Opto-22 compatible 50-pin connectors
- Output status readback
- Universal PCI Bus (support 3.3 V or 5 V PCI bus signal)

PCI-1739U
48-ch Digital I/O PCI Card
- 48 TTL digital I/O channels
- Emulates mode 0 of 8255 PPI
- Interrupt handling
- Opto-22 compatible 50-pin connectors
- Output status readback
- Universal PCI Bus (support 3.3 V or 5 V PCI bus signal)

PCI-1671UP
High-Performance IEEE-488.2 Interface for PCI
- IEEE 488.2 Standard interface
- Complete Talker/Listener/Controller
- Industry standard 32-bit PCI bus
- Data transfer rates over 1.5 Megabytes/sec
- 1024-word FIFO buffer
- High-Speed State Machine Bus Manager
- 7 Interrupt lines, shared interrupt capability
- Transparent interrupt enabling/disabling
- Includes GPIB-Library software
- Low profile MD1 size

GPIB Card

USB-based Data Acquisition & Control Modules

USB-4622
5-port USB 2.0 Hub
• 5 downstream USB 2.0 port (Type A)
• Compatible with USB 2.0/1.1/1.0
• 480Mbit/s high-speed data transfer
• LED indicators
• Suitable for DIN-rail mounting
• Lockable USB cable for rigid connection

USB-4711/4711A
100/150 kS/s, 12-bit USB Multifunction Module
• Supports USB 2.0
• Bus-powered
• 16 analog input channels
• 12-bit resolution AI
• Sampling rate up to 150 kS/s
• 8 DI/8 DO, 2 AO and one 32-bit event counter
• Wiring terminal on modules
• Suitable for DIN-rail mounting
• Lockable USB cable for rigid connection

USB-4716
200 kS/s, 16-bit USB Multifunction Module
• Supports USB 2.0
• Bus-powered
• 16 analog input channels
• 16-bit resolution AI
• Sampling rate up to 200 kS/s
• 8DI/8DO, 2 AO and 1 32-bit counter (USB-4716L w/o AO)
• Wiring terminal on Modules
• Suitable for DIN-rail mounting
• Lockable USB cable for rigid connection

USB-4718
8-ch Thermocouple Input Module
• Supports USB 2.0
• Support voltage, current, and thermocouple inputs
• Bus-powered
• 8 thermocouple input channels
• 2,500 VDC isolation
• Support 4 ~ 20 mA current output
• Wiring terminal on modules
• 8-ch isolated DI and 8-ch isolated DO
• Suitable for DIN-rail mounting
• Lockable USB cable for rigid connection

USB-4750
32-ch Isolated DI/O USB Module
• Compatible with USB 1.1/2.0
• Bus-powered
• 16 isolated DI and 16 isolated DO channels
• High voltage isolation on all channels (2500 V_{DC})
• High sink current on isolated output channels (100 mA/Channels)
• Supports 5 ~ 40 V_{DC} isolated input
• Interrupt handling
• Timer/Counter capability
• Suitable for DIN-rail mounting
• Lockable USB cable for rigid connection

USB-4751/4751L
48/24-ch TTL DI/O USB Module
• Compatible with USB 1.1/2.0
• Bus-powered
• 48 TTL digital I/O lines
• Emulates mode 0 of 8255 PPI
• Buffered circuits for higher driving capacity than 8255
• Interrupt handling
• Timer/Counter interrupt capability
• Supports both dry and wet contact
• 50-pin Opto-22 compatible box header
• Suitable for DIN-rail mounting
• Lockable USB cable for rigid connection

USB-4761
8-ch Relay, 8-ch Isolated DI USB Module
• Compatible with 1.1/2.0
• Bus-powered
• 8 relay output channels and 8 isolated digital input channels
• LED indicators to show activated relays
• 8 Form C type relay output channels
• High-voltage isolation on input channels (2,500 V_{DC})
• High ESD protection (2,000 V_{DC})
• Wide input range (5 ~ 30 V_{DC})
• Interrupt handling capability
• Wiring terminal on Modules
• Suitable for DIN-rail mounting
• Lockable USB cable for rigid connection

USB-4671
GPIB USB Module
• Supports USB 2.0
• Convenient portable design
• Bus-powered
• Complete IEEE 488.2 compatibility
• Full driver, library, and example support, including; Visual C++, C++ Builder, Visual Basic, and Delphi drivers.
• Provides powerful and easy-to-use configuration utility
• No GPIB cable required for instrument connection
• Plug & Play installation and configuration

eA-25

Industrial I/O

Motion Control Cards/Modules

PCI-1202U
2-port AMONet RS-485 Master Card
• Max. 20 Mbps transfer rate
• 2 independent AMONet RS-485 Master Rings
• Max. 128 AMONet RS-485 slave modules supported
• Programmable digital input to notify events
• Easy installation with RJ45 phone jack and LED diagnostic

PCM-3202P
2-port PC/104+ AMONet RS-485 Master Card
• Max. 20 Mbps transfer rate
• Supports 2 independent AMONet RS-485 rings
• Supports up to 128 AMONet RS-485 slave modules
• Easy installation with RJ45 phone jack and LED diagnostics
• Max. 100 m (20 Mbps/32 slave modules) communication distance

PCI-1240U
4-axis Universal PCI Stepping/Pulse-type Servo Motor Control Card
• Independent 4-axis motion control Hand wheel and jog function
• 2/3-axis linear interpolation function
• 2-axis circular interpolation function
• Continuous interpolation function
• Programmable T/S-curve acceleration/deceleration rate
• Up to 4 MPPS output for each axis
• Two pulse output types: CW/CCW or Pulse/Direction
• Up to 1 MHz encoder input for each axis
• Two encoder pulse input types: A/B phase or Up/Down
• Constant speed control Position management and software limit switch function
• BoardID switch

PCM-3240
4-axis PC/104 Stepping/Pulse-type Servo Motor Control Card
• PC/104 interface
• Independent 4-axis motion control Hand wheel and jog function
• 2/3-axis linear interpolation function
• 2-axis circular interpolation function
• Continuous interpolation function
• Programmable T/S-curve acceleration/deceleration rate
• Up to 4 MPPS pulse output for each axis
• Two pulse output types: CW/CCW or Pulse/Direction
• Up to 1 MHz encoder input for each axis
• Two encoder pulse input types: A/B phase or Up/Down
• Constant speed control Position management and software limit switch function
• BoardID switch

AMONet Machine Control Box

AMAX-2050KW
GX2-400 Machine Control Box with AMONet Interface
• Onboard AMD Geode GX2 processor, up to 256 MB onboard DDR
• 128 Kbyte battery backup RAM
• Supports AMONet series for remote motion control and data acquisition
• Two RS-232 and One RS-422/485 ports with automatic flow control
• One 10/100Base-T RJ-45 port and two USB ports
• Four programmable diagnostic LEDs, and one buzzer
• Design-in IP protection mechanism
• KW ready solution

AMONet Slave Modules

AMAX-2210 Series
1-axis AMONet RS-485 Motion Slave Modules
• DIN-rail mounting (L x W x H): 125 x 47.6 x 156 mm
• Max. 20 Mbps transfer rate
• Max. 6.5 Mhz, 1-Axis pulse output 28 bits counter for incremental encoder
• Programmable acceleration and deceleration time
• T-curve and S-curve velocity profiles support
• Change speed on-the-fly
• Easy installation with RJ45 phone jack and LED diagnostic
• Easy installation for servo or stepping motor driver

AMAX-2242/J2S
4-axis AMONet RS-485 Motion Slave Module
• Max. 20 Mbps transfer rate
• Max. 6.5 Mhz, 4-Axes pulse output
• 28 bits counter for incremental encoder
• 2~4 axes Linear interpolation
• 2 axes circular interpolation
• T-curve and S-curve velocity profiles support
• Change speed on-the-fly
• Easy installation with RJ45 phone jack and LED diagnostic
• Easy installation for servo or stepping motor driver

AMAX-2710
12-bit, 100kS/s, 16-ch Analog Input, 4-ch Analog Output Slave Module
• DIN-rail mounting (L x W x H): 125 x 47.6 x 156 mm
• Max. 20 Mbps transfer rate
• 16-ch single-ended or 8-ch differential analog input
• Resolution:12-bit
• Maximum sampling rate: 100 kS/s
• Easy installation with RJ45 phone jack

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Rugged, Portable and Rackmounted Chassis ——— High Performance Controllers ———

MIC-3001/8

4U CompactPCI Chassis with 8-slot Backplane, Fan Tray Module, I/O and AC ATX Power Supply
• 8-slot hot swap compliant backplane
• Easy installation: rackmount or panelmount
• Hot swap fan tray module

MIC-3001AR/8

4U CompactPCI Chassis with 8-slot Backplane, Fan Tray Module, Rear I/O and AC ATX Power Supply
• 8-slot hot swap compliant backplane
• Rear I/O support
• 400W ATX power supply
• Hot swap fan tray module

MIC-3001CR/14

4U CompactPCI Chassis with 14-slot Backplane, Fan Tray Module, Rear I/O and cPCI Standard Redundant Power Supply
• 14-slot hot swap compliant backplane
• Easy installation: rackmount or panelmount
• Hot swap compliant backplane
• Hot swap fan tray module
• Optional fault detection and alarm notification
• Logic Ground and Chassis Ground can be isolated or common

MIC-3002AR/6

4U CompactPCI Chassis with 6-slot Backplane and Rear I/O Support
• 6-slot 3U CompactPCI backplane
• Easy installation: rackmount or panelmount
• Hot swap compliant backplane
• Stand feet on the bottom side for desktop applications
• Logic Ground and Chassis Ground can be isolated or common

MIC-3002AD

4U CompactPCI Chassis with 6-slot backplane and 6" LCD
• 6-slot 3U CompactPCI backplane
• Compact size, 4U high enclosure for 3U cPCI modules
• Side handle design and optional 6" LCD display for portable applications
• Stand feet on the bottom side for desktop applications
• Hot swap compliant backplane
• Logic ground and chassis ground can be isolated or common

MIC-3321

3U CompactPCI Pentium M 760 2.0G High-performance Controller
• Built-in Intel Pentium M 760 2.0G processor with 2MB L2 Cache
• Mobile Intel 915GM express chipset
• Supports up to 1GB DDR2 533/400 SDRAM soldered on board
• Extended operating temp: -25 ~ 70° C (Optional; MIC-3321C/ CS only)
• Dual Giga LAN on PCI-Express
• High-performance Intel Graphics Media Accelerator 900 VGA display
• Onboard CompactFlash disk socket
• Onboard 2.5" HDD support
• Rear I/O signal support for easy wiring

Diversified Data Acquisition and Communication Cards ———

MIC-3723/3723R

16-bit, 8-ch Non-isolated Analog Output Cards
• 16-bit high resolution
• 8 Analog output channels
• Support hot swap function
• Auto-calibration
• BoardID switch
• Support Rear IO

MIC-3680/3680R

2-port Isolated CAN Communication Cards
• CompactPCI specification PICMG 2.0 R3.0 compatible
• Hot swap support
• Two individual CAN ports
• Supports CAN2.0 A/B high speed transmission up to 1 Mbps
• 16 MHz CAN controller frequency
• Optical isolation up to 2,500 VDC
• Microsoft Windows DLL library and examples included
• Supports Windows 98/ME/2000/XP drivers and utility
• Support Rear IO

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Industrial Communication

Complete Industrial Communication Solutions

Advantech's Industrial Communication series includes industrial communication cards and Fieldbus communication cards that offer cost-effective ways to add communication ports to your PC workstation, and industrial converters that connect control field devices to plant level systems. Industrial communication cards and Fieldbus communication cards support PCI-bus, ISA-bus, PC/104 and PC/104+ to fit into versatile industrial automation platforms.

Industrial Ethernet Switches

Gigabit Ethernet Solutions

EKI-6728
8-port 10/100/1000 Mbps Industrial Gigabit Unmanaged Ethernet Switch
- 8 x 10/100/1000 Mbps Ethernet ports
- Embedded switch controller for auto-negotiation
- Embedded memory buffer for store-and-forward transmissions
- 3,000 VDC surge EFT protection for power line
- 4,000 VDC Ethernet ESD protection
- Dual +10~48 VDC power inputs supported

EKI-6628F
6-port 10/100 Mbps Industrial Unmanaged Ethernet Switch with 2-port 1000 Mbps (SFP) Fiber port
- 6 x 10/100 Mbps Ethernet ports
- 2 x 1000 Mbps SFP-type fiber ports for optional 1000BaseSX/LX device
- Embedded memory buffer for store-and-forward transmissions
- 3,000 VDC surge EFT protection for power line
- 4,000 VDC Ethernet ESD protection
- Dual +10~48 VDC power inputs supported

EKI-7629C
8-port Robust 10/100 Mbps Unmanaged Ethernet Switch with 2-port Combo 10/100/1000 Mbps Ethernet Port / (SFP) Fiber Port
- 8 x 10/100 Mbps Ethernet ports
- 2 x combo 10/100/1000 Mbps Ethernet port / 1000Base-SX/LX (SFP) fiber ports (Optional)
- Embedded switch controller for auto-negotiation
- 3,000 VDC surge EFT protection for power line
- 4,000 VDC Ethernet ESD protection
- Dual +10~48 VDC power inputs supported

Fast Ethernet Solutions

EKI-6527M/SC
EKI-6527S/SC
6-port Industrial 10/100 Mbps Unmanaged Ethernet Switch with Multi-mode/Single-mode Fiber Port
- 6 x 10/100 Mbps Ethernet ports and 1 x 100 Mbps multi/single-mode fiber port (SC type)
- Embedded switch controller for auto-negotiation
- Embedded memory buffer for store-and-forward transmissions
- 3,000 VDC surge protection for power line
- 4,000 VDC Ethernet ESD protection
- Dual +10~48 VDC power inputs supported

EKI-7525
5-port Robust 10/100 Mbps Industrial Unmanaged Ethernet Switch
- 5 x 10/100 Mbps Ethernet ports
- Embedded switch controller for auto-negotiation
- Embedded memory buffer for store-and-forward transmissions
- 3,000 VDC surge EFT protection for power line
- 4,000 VDC Ethernet ESD protection
- Dual +10~48 VDC power inputs supported

EKI-7528
8-port Robust 10/100 Mbps Industrial Unmanaged Ethernet Switch
- 8 x 10/100 Mbps Ethernet ports
- Embedded switch controller for auto-negotiation
- Embedded memory buffer for store-and-forward transmissions
- 3,000 VDC surge EFT protection for power line
- 4,000 VDC Ethernet ESD protection
- Dual +10~48 VDC power inputs supported

Industrial Ethernet Switches

Managed Ethernet Switches

EKI-6558

8-port 10/100 Mbps Industrial Managed Redundant Ethernet Switch
• 8 x 10/100 Mbps Ethernet ports
• Smart Redundant Ethernet Ring (recovery time < 100ms) and RSTP (Rapid Spanning Tree Protocol) supported
• GMP Snooping to filter multicast traffic from Ethernet
• SNMP V1 network management protocol supported
• IEEE 802.1Q tagged Virtual LAN (VLAN) supported
• IEEE 802.1p/1Q QoS for traffic classification and prioritization

Industrial Media Converters

ADAM-6841SX
ADAM-6841LX

Gigabit Ethernet to Fiber Optic Converters
• 1-port 1000 Mbps Ethernet port
• 1-port 1000 Mbps fiber port with SC type connector for 1000Base-SX/LX device
• Internal jumper for full/half duplex setting
• 3,000 VDC surge EFT protection for power line
• 4,000 VDC Ethernet ESD protection
• +10~30 VDC voltage power input

ADAM-6541P
ADAM-6541S

Enhanced Ethernet to Multi-mode/Single-mode Fiber Optic Converter
• 1-port 100 Mbps multi-mode fiber optics
• Internal jumper for Link Fault Pass-Through (LFS) setting
• Remote/local loop back test for self-diagnostic
• +10~30 VDC voltage power input
• 3,000 VDC surge EFT protection for power line
• Wide operating temperature from 0 to 60° C

Ethernet Data Gateways

ADAM-4579W
ADAM-4577W

1/2-port RS-232/422/485 to 802.11b/g WLAN Universal Device Gateway
• IEEE 802.11b/g standard supported
• Supports standard network API : Winsock, socket
• Wireless LAN Ad-Hoc and infrastructure modes
• High transmission speeds up to 230 Kbps
• Advanced security mechanism to avoid unauthorized access
• Support any operating system with TCP/IP protocol: Windows, Linux, etc.

USB-4602B
2-port RS-232 to USB Converter w/Surge Protection
USB-4602BM
2-port RS-232/422/485 to USB Converter w/Surge Protection
• 2 x RS-232/422/485 serial ports (USB-4602BM)
• Full compliance with USB V1.1 and V2.0 specifications
• Transmission speed up to 921.6 Kbps
• Automatic RS-485 data flow control
• Support bus power (5 VDC)and external power input (10~48 VDC)
• Plug & Play and How-swap

USB-4604B
4-port RS-232 to USB Converter w/Surge Protection
USB-4604BM
4-port RS-232/422/485 to USB Converter w/Surge Protection
• 4 x RS-232/422/485 serial ports (USB-4604BM)
• Full compliance with USB V1.1 and V2.0 specifications
• Transmission speed up to 921.6 Kbps
• Automatic RS-485 data flow control
• Support bus power (5 VDC)and external power input (10~48 VDC)
• Plug & Play and hot swap

Building Automation Systems

Web-enabled Building Automation Systems

Advantech offers a total solution for Building Automation systems including facility management (HVAC, water treatment, power, etc.) and security (access control, door/window alarm, etc.). Equipped with Advantech's WebView, WebLink, BAS-2000 and ADAM modules, system integrators can easily create powerful and flexible BAS applications. The following are the new products of BAS solutions.

Controllers

WebView-660

Web-enabled HMI with 6.4" VGA TFT LCD Display

- 6.4" TFT LCD
- Super slim and compact design with plastic housing
- NEMA4/IP65 compliant front panel
- Built-in Windows CE with Advantech WinCE WebAccess
- Support Vector-based graphics
- Support various of protocol driver to communicate with different devices
- Multi-thread communication, response time is fast
- Remote control and monitor by Web Browser
- All project programming, database and display configuration, alarm setting and schedule configuration can be done remotely
- Easy to diagnosis and maintenance, help to reduce maintenance cost
- Import BMP, JPEG, GIF

WebView-1261

Web-enabled HMI with 12.1" SVGA TFT LCD Display

- 12.1" SVGA TFT LCD
- Super slim and compact design with Al-Mg housing NEMA4/IP65 compliant front panel
- Automatic data flow control RS-485
- Built-in Windows CE with Advantech WinCE WebAccess
- Support Vector-based graphics
- Support various of protocol driver to communicate with different devices
- Multi-thread communication, response time is fast
- Remote control and monitor by Web Browser
- All project programming, database and display configuration, alarm setting and schedule configuration can be done remotely
- Easy to diagnosis and maintenance, help to reduce maintenance cost
- Import BMP, JPEG, GIF

WebLink-2170

Web-enabled Communication Gateway

- Two RS-232 and two RS-232/422/485 ports with automatic flow control.
- Two 10/100Base-T RJ-45 ports
- Two USB and one type I/II PC Card
- PC/104 expansion slots
- Built-in Windows CE with Advantech WinCE WebAccess Gateway
- Support various of protocol driver to communicate with different devices
- Multi-thread communication, response time is fast
- All project programming, database and display configuration, alarm setting and schedule configuration can be done remotely
- Easy to diagnosis and maintain, help to reduce maintenance costs

Simplify Complex Control Tasks with Programmable Automation Controllers

Relay → PLC → Programmable Automation Controllers

IPC → Embedded Controller →
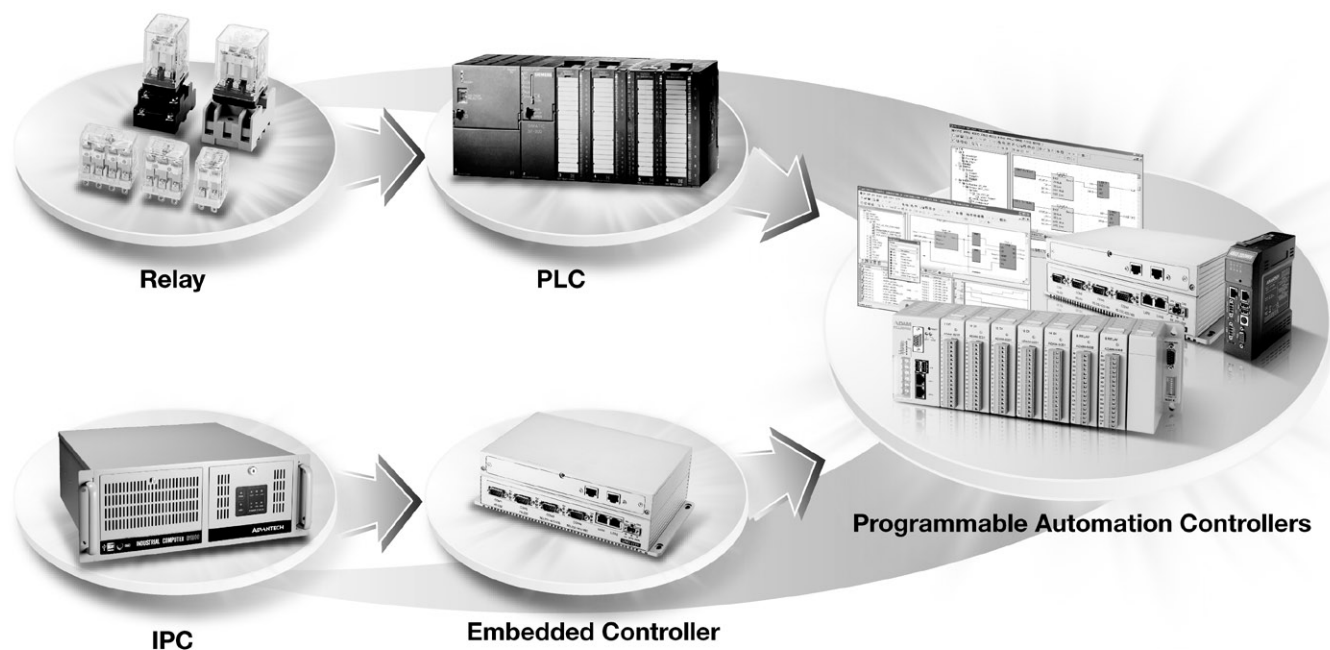
The Next Generation of Automation Controller

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.
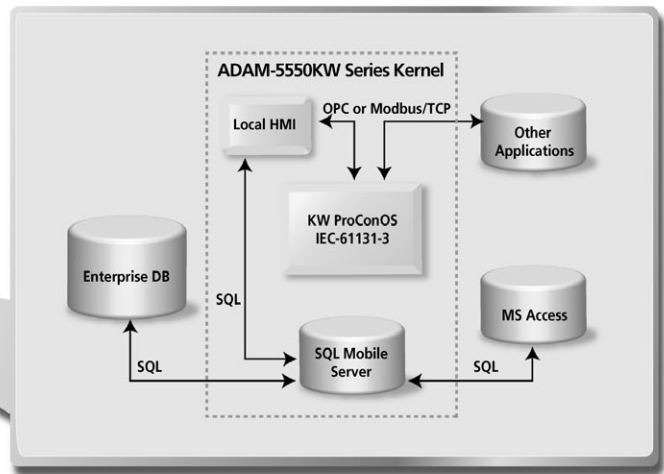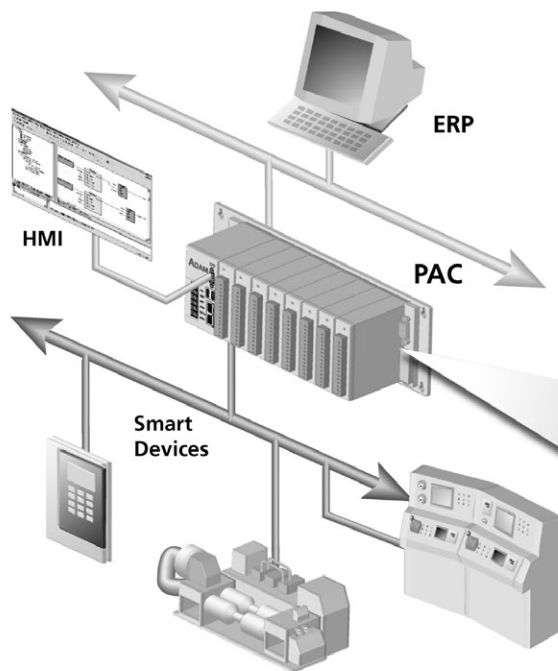
Reliable Parts:

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