Advantech Control IPC
Providing Fieldbus Control, Connectivity and Sustainability for Smart Factories

Smart Factories Applications
Control IPC
Software
Hardware Architectures & Design
Selection Guide

www.advantech.com.tw/APAX
Control IPC in Smart Factories

APAX-5580 Control IPC is an industry first modular IPC, it is a PC-based control platform with comprehensive I/O modules, communication ports and control software for choice. It is particularly designed for integrating Operational Technology (OT) and Information Technology (IT) to take advantage of the trend in Industry 4.0 and realize smart factories in MES Integration & Production Traceability, Machine Automation, Equipment Monitoring & Optimization and Factory Environment Monitoring applications.

Fieldbus support and complete I/O modules ensuring a reliable connection with all PLCs, controllers and equipment from major providers.

IEC 61131-3 integration for real-time, stable control.

Library support to reduce configuration effort & focus on system design.

Machine Controller

- Fieldbus support and complete I/O modules ensuring a reliable connection with all PLCs, controllers and equipment from major providers
- IEC 61131-3 integration for real-time, stable control
- Library support to reduce configuration effort & focus on system design

Equipment Monitoring & Optimization

Manufacturing Testing Controller

- Expandable I/O design for customizing a large tag system and meeting the needs of test data collection
- Real-time equipment control and reaction
Smart Factories Applications

Ready I/O modules to suit all types of environmental monitoring sensors in the factory.

Distributed I/O design to collect wide area data and simplify the system building and troubleshooting time.

Smart Factories Data Gateway

- All-in-one design with computing, I/O and communication integrated for easy configuration and rational wiring
- Real-time data acquisition and information display
- Compact Size and robust design for adapting to specific sites
- PC-based platform for satisfy diverse software application needs

MES Integration & Production Traceability

Facility Data Collector

- Readiness I/O modules to suit all types of environmental monitoring sensors in the factory
- Distributed I/O design to collect wide area data and simplify the system building and troubleshooting time
Advantech’s Control IPC is a powerful control platform for IoT and other industrial automation applications. Its computing power and different types of standard high speed communication interface make big data processing and decentralized architecture possible. Users can easily add their own vertical application software with the Control IPC and implement the system in automation field sites.

Reduce Data Acquisition Loading
- Built-in DSP for I/O access
- Modular APAX I/O module
- Distributed topology and decentralized comport

Scalable Solution
- Various CPU performance from RISC to Core i7
- Softlogic and SCADA software compatibly

Boundless Communication
- Internal SIM slot for cellular communication
- Reserve antenna hole
- mPCIe for Wi-Fi, BLE and GPS

Open Develop Environment
- Embedded Microsoft Windows support with EWF, HORM and VS.NET framework
- Free API for WDT, RTC, H/W monitoring and I/O access
- Linux support
Compact Control IPC

- Fanless design
- Compact size for control cabinet
- High accuracy RTC and Multilevel WDT
- 10 years lifetime battery

Robust Design

High Performance Control IPC

APAX-5580
By providing the latest Intel CPU inside, the high computing power, rich connectivity and I/O control system can be done by one platform. It brings the new description of the next generation control platform.

APAX-5620
Its bigger size brings the more serial interfaces and Ethernet ports and even two CANBus ports. It means users have more chances to design more complex topologies. Data gateway is one of its applications.
New Automation Platform for Smart Factories

For the Industrial IoT, computing and connectivity are both key features of the automation controller. Big data processing and the capacity to connect with other devices or sensors will become the baseline of an IoT control platform.

Real-time H/W Monitoring
A stable platform is the most important thing in automation sites. As soon as there’s an abnormal situation on the system, users can take action and avoid any unexpected errors at the beginning. Advantech’s Control IPC can monitoring to monitor CPU load, system voltage and I/O module status, then users can access this data by API or our utility without any complicated programming.

Versatile Connectivity Interface
Connectivity is another major aspect of PC-based control, especially for integrating Information technology and Operation technology in the Industry 4.0 eras. The standard interface enable control platform connect different kinds of remote devices and become a data gateway through wired or wireless technology. Whether using industrial or IT communication protocols, Advantech Control IPC is the best solution as a data gateway or data process center.

Data Analysis and Storage
Advantech’s Control IPC series can provide not only excellent real-time I/O control, but also information processing benefits for automation application. With the ability to perform field operations, data exchange and valuable information collection, Control IPC is able to execute efficient decision-making. Information processing includes data logging and analysis with storage devices like SD or CF cards, and database exchanges through SQL and OPC.

Data Synchronization
Control IPC deliver data synchronization functionality for CPU redundancy to significantly decrease the risk that the system will fail when the controller crashes. To leverage this, two controllers with the same control program are installed in one system. After both controllers’ redundancy function is enabled, the APAX system will automatically delegate one controller to be the master. If the controller is switched, it means an error occurred on the previous master device. Therefore engineers can repair or swap this without shutting down the whole system.
Sustainability
Maintains data availability
• RTC accuracy: 2 mins/year
• 10 year lifetime battery

Security
Ensures system dependability with internal interfaces
• Inner SD slot for system backup
• Internal USB for S/W dongle

Telecommunication
Ensures data is processed locally and bridges the remote server
• SIM slot and mini PCI express for cellular communication
Software

SoftLogic Software and Utility

IEC 61131-3 SoftLogic Control
CODESYS

- Programming languages according to IEC 61131-3 standard
- Controllers can be configured and operated using a Web server via intranet or Internet
- Available in multiple languages and free to download from the CODESYS website

The CODESYS engineering tool is a de-facto standard widely implemented in OEM products. The Logic support and integration with the Human Interface makes CODESYS ideal for use in many different applications in the market; from machine automation, factory automation, building automation, facility, infrastructure etc.

I/O System Configuration and Testing Utility
AdamApax .NET Utility

Control IPC provides one free configuration and testing utility in the system. Users can search local and remote I/O module by this utility, and get current value of each channel. This is one very easy way to check the status of each module with our controller without any programming. AdamApax Utility is based on VS.NET, that means all the functionality in this utility you can find the API in our .NET library. User can integrate those functionality into their own programming.

Remote Monitoring Software

Real-time Remote Diagnosis and Maintenance
DiagAnywhere

“DiagAnywhere”, an abbreviation of “Diagnose Anywhere”, is remote maintenance software for remotely monitoring and controlling Advantech control platform with Windows-based operating systems. Currently, DiagAnywhere includes the utility on the client side and the server on the target devices. The supported OS’s include Windows XP, XP Embedded, Windows 7, WinCE 5.0 and WinCE 6.0. 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 concerns.

Remote Management and Hardware Monitoring
SUSIAccess

SUSIAccess is a remote management suite exclusively designed for Advantech embedded solutions to perform remote monitoring, active control, failure recovery and connected system protection. SUSIAccess supports both Windows and Linux platforms and works from the very entry level to high-end processors. Ready-to-use, easy-to-integrate.
PC-based Programming Software

VS.NET Development Environment
C/C++ and .NET library

• Complete PC-based open platform
• Multiple built-in libraries for industrial tasks to shorten development time
• Various C/C++ and .NET examples for reference

APAX-5000 series offers a complete PC-based open platform with Application Programming Interface (API). With C/C++ libraries and .NET class libraries provided by Advantech, programmers can develop their own programs for industrial control and automation tasks, involving I/O control, communication, SQL, and scheduling. Plenty of C/C++ and .NET examples save programmer learning time, helping save programmers’ development and effort to shorten time to market.

HMI/SCADA Software

Web-based HMI/SCADA Software
Advantech WebAccess

• View, control, configure system remotely over Intranet or Internet using web browser
• Supports vector-based graphics
• Uses the open standard programming TCL, JScript or VB script

Advantech WebAccess is a 100% web-based HMI/SCADA software. It supports powerful remote monitoring and control functions through standard web browsers, so that users can easily monitor and control automation equipment with full featured SCADA functions by their Client or Thin Client device.

Web-browser Client to View and Control

Using a standard Web browser, users can view and control automation equipment used in industrial, manufacturing, process and building automation systems. Data is displayed to users in real-time with dynamically updated graphics using full-motion animation.

Historical and Real-time Trending, Data Logging and Centralized Logs

Each tag is logged to a separate file on the SCADA node, and user can view the real-time and historical data from the historical trend. Besides, new tags can be added to a historical trend display without losing history of other tags. Real-time data, alarms and events from all nodes are logged to central ODBC database.

Scheduler and Report

The Scheduler provides control and changes setpoint status based on time and date. Lights, fans, and HVAC equipment are turned on and off based on the time, day of week and date. The Scheduler is also used in process control and manufacturing applications. All these schedule configurations can be modified remotely through Internet.
Flexible System Architectures

Robust Power System
Not only the single option of the power input, APAX provide the power redundancy and UPS to make our controller have the highest reliability in automation field.

Controller Platform
Deliver fast computing, powerful functionality and rich connectivity like an industrial PC. Three different level controller to make sure the best solution in the different application.

I/O System
APAX real-time I/O system can be working stand alone with APAX controller or linking to other automation system through couplers.

Dual CPU
With the data synchronization, the secondary controller can sync the parameters and take over the control task at the some unexpected condition within a very short time. By APAX dual power architecture, it can increase the availability.

Distributed Topology
The standard physical interface is not only the connection between controller and I/O system, but also provide the more possibility of the topology by switch.

To simplify the system configuration, Advantech’s APAX series provides an easy and flexible way to setup different functions and configurations. There are multiple APAX series system combinations that can be selected to develop reliable control systems as detailed below.
User-friendly Modules Design

Real-time Local Bus

APAX I/O local bus adopts real-time I/O access methodology to ensure deterministic control with real-time performance. Contributed by the dedicated Digital Signal Processor (DSP) which handles I/O data process without controller’s CPU resource, the I/O scan rate can be maintained within 1 ms, offering time deterministic I/O. The I/O processing is running on the back-end, and controller’s CPU and DSP can share data through built-in dual port RAM. All these deliver real-time performance regardless of the number of I/O points. Programmers can concentrate on their application program development, and APAX system can perform real-time I/O access automatically.

User-friendly Designs

Hot Swappable, High Density I/O Modules

APAX I/O modules can communicate and obtain power through backplanes. APAX I/O modules are hot swappable, allowing them removed from or inserted on the backplane, even when the system is powered-on. Operators can replace specific I/O modules without shutting down the whole system. This significantly saves system maintenance costs.

Clamp Type Terminal Blocks

All APAX I/O modules offer detachable clamp type terminal blocks for I/O wiring. Compared to traditional screw type terminal blocks, clamp type terminal blocks can save installation time (up to 75%), and doesn’t require the connection to be checked or retightened. They also have higher resistance to shock and vibration.

Easily Identifiable Modules

The labeled front-side ID switch enables operator to change the module ID number. The power LED not only displays the module power status, but also performs self diagnostic functions. All digital modules offer channel status LED. Inserting the terminal block on the wrong module may cause module damaged. Matching the terminal block and front label with the same color can prevent this.

Writable Labels with Wiring Information

For all I/O modules, a detachable label gives operators the ability to write important notes on it, like channel information. The opposite side shows the wiring diagram, so operators can refer to it for wiring. This label provides convenience for maintenance and operation.
## APAX-5000 Controllers

<table>
<thead>
<tr>
<th>Model</th>
<th>CPU</th>
<th>Memory</th>
<th>Storage</th>
<th>USB Ports</th>
<th>VGA</th>
<th>Audio</th>
<th>General</th>
<th>Software</th>
<th>Environment</th>
<th>Communications (Ethernet)</th>
<th>Communications (Serial)</th>
</tr>
</thead>
<tbody>
<tr>
<td>APAX-5580 Controller with Intel® Celeron® CPU</td>
<td>Intel® Celeron® 2980U ULT 1.6GHz Haswell Dual Core, 2MB L2</td>
<td>On-board 4GB (8GB optional)</td>
<td>1 x mSATA, 1 x SD, 1 x SD (for OS backup)</td>
<td>4 x USB ports (2 x USB 2.0, 2 x USB 3.0 compliant), 1 x internal USB</td>
<td>1 x VGA, supports 1920 X 1080 @ 60 Hz 24 bpp</td>
<td>Line-Out</td>
<td>128 x 106 x 110 mm</td>
<td>C/C++ library and .NET class library for C and .NET programming environment, CODESYS IEC 61131-3 SoftLogic control software</td>
<td>Operating, IEC 60068-2-27, 50G, half sine, 11ms</td>
<td>2 x RJ45, 10/100/1000 Mbps IEEE 802.3u 1000Base-T Fast Ethernet</td>
<td>1 x RS-232/422/485, DB9, 50~115.2kbps</td>
</tr>
<tr>
<td>APAX-5580 Controller with Intel® Core™ i3 CPU</td>
<td>Intel® Core™ i3-4010U ULT 1.7GHz Haswell Dual Core, 3MB L2</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>-</td>
<td>60 x 139 x 100 mm</td>
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<td></td>
</tr>
<tr>
<td>APAX-5580 Controller with Intel® Core™ i7 CPU</td>
<td>Intel® Core™ i7-4650U ULT 1.7GHz Haswell Dual Core, 4MB L2</td>
<td>-</td>
<td>1 x Type II CompactFlash card slot</td>
<td>1 x USB 1.1</td>
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<td></td>
</tr>
<tr>
<td>APAX-5620 Controller</td>
<td>Marvel XScale PXA270 520 MHz</td>
<td>-</td>
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<td></td>
</tr>
</tbody>
</table>

### System Hardware
- **CPU:**
  - APAX-5580: Intel® Celeron® 2980U ULT 1.6GHz Haswell Dual Core, 2MB L2
  - APAX-5580: Intel® Core™ i3-4010U ULT 1.7GHz Haswell Dual Core, 3MB L2
  - APAX-5580: Intel® Core™ i7-4650U ULT 1.7GHz Haswell Dual Core, 4MB L2
  - APAX-5620: Marvel XScale PXA270 520 MHz

### General
- **Dimensions (W x H x D):**
  - APAX-5580: 128 x 106 x 110 mm
  - APAX-5620: 60 x 139 x 100 mm
- **Power Consumption:**
  - APAX-5580: 28 W (typical), 72 W (Max) @ 24 V<sub>oc</sub> ± 20%
  - APAX-5620: 5 W @ 24 V<sub>oc</sub> (typical)
- **Status Display:**
  - APAX-5580: LEDs for power, battery, LAN (Active, Status), Tx/Rx and HDD
  - APAX-5620: -

### Software
- **Control Software:**
  - APAX-5580: C/C++ library and .NET class library for C and .NET programming environment, CODESYS IEC 61131-3 SoftLogic control software
  - APAX-5620: C/C++ and .NET library KW Multiprog (development tool), KW ProConOS (runtime kernel)
- **OS Support:**
  - APAX-5580: Microsoft® Windows 7/8, Linux Kernel 3.X
  - APAX-5620: Windows CE

### Environment
- **Shock Protection:**
  - Operating, IEC 60068-2-27, 50G, half sine, 11ms
- **Vibration Protection:**
  - Operating, IEC 60068-2-64, 2Grms, random, 5 ~ 500Hz, 1hr/axis (mSATA)

### Communications (Ethernet)
- **LAN Ports:**
  - APAX-5580: 2 x RJ45, 10/100/1000 Mbps IEEE 802.3u 1000Base-T Fast Ethernet
  - APAX-5620: 2 x RJ-45 Port, 10/100 Mbps

### Communications (Serial)
- **COM Ports:**
  - APAX-5580: 1 x RS-232/422/485, DB9, 50~115.2kbps
  - APAX-5620: 2 x Isolated RS-485 (2-wire, isolated)
## APAX-5000 Analog I/O Modules

<table>
<thead>
<tr>
<th>Model</th>
<th>APAX-5013</th>
<th>APAX-5017</th>
<th>APAX-5017H</th>
<th>APAX-5018</th>
<th>APAX-5028</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td>8-ch RTD module</td>
<td>12-ch AI module</td>
<td>12-ch high speed AI module</td>
<td>12-ch thermocouple module</td>
<td>8-ch AO module</td>
</tr>
</tbody>
</table>

### General
- **Dimensions (W x H x D)**: 30 x 139 x 100 mm
- **Power Consumption**:
  - APAX-5013: 2.5 W @ 24 V<sub>DC</sub> (typical)
  - APAX-5017: 4 W @ 24 V<sub>DC</sub> (typical)
  - APAX-5017H: 3.5 W @ 24 V<sub>DC</sub> (typical)
  - APAX-5018: 3.5 W @ 24 V<sub>DC</sub> (typical)
  - APAX-5028: 3.5 W @ 24 V<sub>DC</sub> (typical)

### Analog Input
- **Channels**:
  - APAX-5013: 8 (differential)
  - APAX-5017: 12 (differential)
  - APAX-5017H: 12 (differential)
  - APAX-5018: 12 (differential)
- **Input Type**:
  - APAX-5013: RTD (2-wire or 3-wire), V, mV, mA
  - APAX-5017: V, mV, mA
  - APAX-5017H: V, mV, mA, Thermocouple
- **Sampling Rates**:
  - APAX-5013: 10 sample/second (total)
  - APAX-5017: 12 sample/second (total)
  - APAX-5017H: 1,000 sample/second (per channel)
  - APAX-5018: 12 sample/second (total)
  - APAX-5028: -
- **Resolution**:
  - APAX-5013: 16-bit with accuracy ±0.1% of Full Scale Range
  - APAX-5017: 16-bit with accuracy ±0.1% or better of Full Scale Range (Voltage), ±0.2% or better of Full Scale Range (current)
  - APAX-5017H: 12-bit with accuracy ±0.1% or better of Full Scale Range (Voltage), ±0.2% or better of Full Scale Range (current)
  - APAX-5018: 16-bit with accuracy ±0.1% or better of Full Scale Range (Voltage), ±0.2% or better of Full Scale Range (current)
- **Input Impedance**:
  - APAX-5013: > 10 MΩ (voltage), 120 Ω (current)
  - APAX-5017: > 10 MΩ (voltage), 120 Ω (current)
  - APAX-5017H: 2 MΩ (voltage), 120 Ω (current)
  - APAX-5018: > 1 MΩ (voltage), 120 Ω (current)
  - APAX-5028: -
- **Wire Burnout Det.**:
  - APAX-5013: Yes
  - APAX-5017: Yes (4~20 mA only)
  - APAX-5017H: Yes (4~20 mA only)
  - APAX-5018: Yes (4~20 mA and Thermocouple)
  - APAX-5028: -

### Analog Output
- **Resolution**:
  - APAX-5013: -
  - APAX-5017: -
  - APAX-5017H: -
  - APAX-5018: -
  - APAX-5028: -
- **Channels**: 8
- **Output Type**: V, mA
- **Slew Rate**: 0.7 V<sub>DC</sub>/μs (per channel)

### Environment
- **Operating Temperature**: -10 ~ 60°C (when mounted vertically)
- **Storage Temperature**: -40 ~ 70°C
- **Relative Humidity**: 5 ~ 95% (non-condensing)
# APAX-5000 Digital I/O Modules

<table>
<thead>
<tr>
<th>Model</th>
<th>APAX-5040</th>
<th>APAX-5045</th>
<th>APAX-5046/ APAX-5046SO</th>
<th>APAX-5060</th>
<th>APAX-5080</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td>24-ch DI module</td>
<td>24-ch D/I/O module</td>
<td>24-ch/20-ch DO module</td>
<td>12-ch Relay module</td>
<td>4/8-ch Counter module</td>
</tr>
<tr>
<td><strong>General</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimensions (W x H x D)</td>
<td>30 x 139 x 100 mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Power Consumption</strong></td>
<td>2 W @ 24 V&lt;sub&gt;DC&lt;/sub&gt; (typical)</td>
<td>2.5 W @ 24 V&lt;sub&gt;DC&lt;/sub&gt; (typical)</td>
<td>2.5 W @ 24 V&lt;sub&gt;DC&lt;/sub&gt; (typical)</td>
<td>2 W @ 24 V&lt;sub&gt;DC&lt;/sub&gt; (typical)</td>
<td>2.5 W @ 24 V&lt;sub&gt;DC&lt;/sub&gt; (typical)</td>
</tr>
<tr>
<td>Status Display</td>
<td>LED per channel On: Logic level 1 Off: Logic level 0</td>
<td></td>
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</tr>
<tr>
<td><strong>Digital Input</strong></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Channels</td>
<td>24</td>
<td>12</td>
<td></td>
<td></td>
<td>4 (Sink)</td>
</tr>
<tr>
<td>Input Voltage</td>
<td>Rated Value: 24 V&lt;sub&gt;DC&lt;/sub&gt;, For “0” signal: -5 ~ 5 V&lt;sub&gt;DC&lt;/sub&gt;, For “1” signal: 15 ~ 30 V&lt;sub&gt;DC&lt;/sub&gt; and -15 ~ 30 V&lt;sub&gt;DC&lt;/sub&gt;</td>
<td>Rated Value: 24 V&lt;sub&gt;DC&lt;/sub&gt;, For “0” signal: -5 ~ 5 V&lt;sub&gt;DC&lt;/sub&gt;, For “1” signal: 15 ~ 30 V&lt;sub&gt;DC&lt;/sub&gt; and -15 ~ 30 V&lt;sub&gt;DC&lt;/sub&gt;</td>
<td>-</td>
<td>-</td>
<td>For “0” signal: 0 ~ 3 V&lt;sub&gt;DC&lt;/sub&gt;, For “1” signal: 10 ~ 30 V&lt;sub&gt;DC&lt;/sub&gt;</td>
</tr>
<tr>
<td>Type</td>
<td>Sink or Source Load</td>
<td>Sink or Source Load</td>
<td>-</td>
<td>-</td>
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<tr>
<td><strong>Digital Output</strong></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Channels</td>
<td>-</td>
<td>12 (Sink)</td>
<td>24 (Sink)</td>
<td>-</td>
<td>4 (Sink)</td>
</tr>
<tr>
<td>Voltage Range</td>
<td>-</td>
<td>8 ~ 35 V&lt;sub&gt;DC&lt;/sub&gt;</td>
<td>8 ~ 35 V&lt;sub&gt;DC&lt;/sub&gt;</td>
<td>-</td>
<td>8 ~ 35 V&lt;sub&gt;DC&lt;/sub&gt;</td>
</tr>
<tr>
<td>Rated Current Output</td>
<td>-</td>
<td>0.5 A (per channel, at signal “1”)</td>
<td>0.5 A (per channel, at signal “1”)</td>
<td>-</td>
<td>0.5 A (per channel)</td>
</tr>
<tr>
<td>Relay Output</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Channels</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>12</td>
</tr>
<tr>
<td><strong>Counter/ Frequency Input</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Channels and Mode</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Counting Range</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Minimum Pulse Width</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Counter Frequency</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Input Voltage</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Operating Temperature</strong></td>
<td>-10 ~ 60°C (when mounted vertically)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Storage Temperature</strong></td>
<td>-40 ~ 70°C</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Relative Humidity</strong></td>
<td>5 ~ 95% (non-condensing)</td>
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</tr>
</tbody>
</table>
## APAX-5000 Coupler Modules

<table>
<thead>
<tr>
<th>Model</th>
<th>APAX-5070</th>
<th>APAX-5071</th>
<th>APAX-5072</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Modbus/TCP Communication Copuler</td>
<td>PROFINET Communication Copuler</td>
<td>EtherNET/IP Communication Copuler</td>
</tr>
<tr>
<td>General</td>
<td>Dimensions (W x H x D)</td>
<td>30 x 139 x 100 mm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Power Consumption</td>
<td>2 W @ 5 V&lt;sub&gt;DC&lt;/sub&gt; (typical)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Connectors</td>
<td>2 x RJ-45 (2-channel switch, share same IP address)</td>
<td></td>
</tr>
<tr>
<td>Communications</td>
<td>Protocols</td>
<td>Modbus/TCP</td>
<td>PROFINET RT</td>
</tr>
<tr>
<td></td>
<td>Data Transfer Rates</td>
<td>10/100 Mbps</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Connected I/O Modules</td>
<td>32 (max.)*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Digital Signals</td>
<td>768 (max.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Analog Signals</td>
<td>192 (max.)</td>
<td></td>
</tr>
<tr>
<td>Environment</td>
<td>Operating Temperature</td>
<td>-10 ~ 60°C (mounted vertically)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Storage Temperature</td>
<td>-40 ~ 85°C</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Relative Humidity</td>
<td>5 ~ 95% (non-condensing)</td>
<td></td>
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</table>

## APAX-5580 PCIe Modules

<table>
<thead>
<tr>
<th>Model</th>
<th>APAX-5490</th>
<th>APAX-5435</th>
<th>APAX-5430</th>
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</thead>
<tbody>
<tr>
<td>Description</td>
<td>RS-232/422/485 Module</td>
<td>mPCIe module for iDoor technology expansion</td>
<td>SATA HDD module</td>
</tr>
<tr>
<td>General</td>
<td>Dimensions (W x H x D)</td>
<td>30 x 139 x 100 mm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Power Consumption</td>
<td>2 W @ 5 V&lt;sub&gt;DC&lt;/sub&gt; (typical)</td>
<td>2.5 W @ 24 V&lt;sub&gt;DC&lt;/sub&gt; (typical)</td>
</tr>
<tr>
<td></td>
<td>Connectors</td>
<td>1 x 26-pin clamp-type terminal</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Interface</td>
<td>RS-232/422/485</td>
<td></td>
</tr>
<tr>
<td></td>
<td>mPCIe express 2.0 (Support iDoor, mSATA)</td>
<td>mini PCI express 2.0 (Support iDoor, mSATA)</td>
<td>SATA</td>
</tr>
<tr>
<td>Environment</td>
<td>Operating Temperature</td>
<td>-10 ~ 60°C (mounted vertically)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Storage Temperature</td>
<td>-40 ~ 70°C</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Relative Humidity</td>
<td>5 ~ 95% (non-condensing)</td>
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</table>
### Regional Service & Customization Centers

<table>
<thead>
<tr>
<th>Country</th>
<th>City</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>Kunshan</td>
<td>86-512-5777-5666</td>
</tr>
<tr>
<td>Taiwan</td>
<td>Taipei</td>
<td>886-2-2792-7818</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Eindhoven</td>
<td>31-40-267-7000</td>
</tr>
<tr>
<td>Poland</td>
<td>Warsaw</td>
<td>48-22-33-23-740 / 41</td>
</tr>
<tr>
<td>USA/Canada</td>
<td>Milpitas, CA</td>
<td>1-408-519-3898</td>
</tr>
</tbody>
</table>

### Worldwide Offices

#### Greater China

**China**
- **Toll Free**
  - 800-810-0345
  - 86-10-6298-4346
- **Beijing**
  - 86-10-6298-4346
- **Shanghai**
  - 86-21-3632-1616
- **Shenzhen**
  - 86-755-8212-4222
- **Chengdu**
  - 86-28-8545-0198
- **Hong Kong**
  - 852-2702-5118

**Taiwan**
- **Toll Free**
  - 0800-777-111
- **Neihu**
  - 886-2-2792-7818
- **Xindian**
  - 886-2-2218-4576
- **Taichung**
  - 886-4-2378-6250
- **Kaohsiung**
  - 886-7-229-3600

#### Asia Pacific

**Japan**
- **Toll Free**
  - 0800-500-1055
- **Tokyo**
  - 81-3-6802-1021
- **Osaka**
  - 81-6-6267-1887

**Korea**
- **Toll Free**
  - 080-363-9494
- **Seoul**
  - 82-2-3663-9494

**Singapore**
- **Singapore**
  - 65-6442-1000

**Malaysia**
- **Kuala Lumpur**
  - 1800-88-1809
  - 60-3-7725-4188
  - 60-4-537-9188

**Indonesia**
- **Jakarta**
  - 62-21-769-0525

**Thailand**
- **Bangkok**
  - 66-2-248-3140

**India**
- **Toll Free**
  - 1-800-425-5070
  - 91-20-39482075
  - 91-80-2545-0206

**Australia**
- **Toll Free**
  - 1300-308-531
  - 61-3-9797-0100
  - 61-2-9476-9300

### Europe

**Germany**
- **Munich**
  - 49-89-12599-0
- **Hildesheim / D’dorf**
  - 49-2103-97-885-0

**France**
- **Paris**
  - 33-1-4119-4666

**Italy**
- **Milano**
  - 39-02-9544-961

**Benelux & Nordics**
- **Breda**
  - 31-76-5233-100

**UK**
- **Reading**
  - 44-0118-929-4540

**Poland**
- **Warsaw**
  - 00800-2426-8080

**Russia**
- **Moscow**
  - 8-800-550-01-50
  - 7-495-232-1692

### Americas

**North America**
- **Toll Free**
  - 1-888-576-9668
  - 1-513-742-8895
  - 1-408-519-3898
  - 1-949-420-2500

**Brazil**
- **Toll Free**
  - 0800-770-5355
  - 55-11-5592-5355

**Mexico**
- **Toll Free**
  - 1-800-467-2415
  - 52-55-6275-2777

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www.advantech.com

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ADAM-5560CDS

7-slot PC-based Intel® Atom™ CPU soft logic Controller with integrated target visualization

Features

- Cost effective DIN Rail IPC with VGA port for integrated target visualization
- Optional CoDeSys web Visu for Remote monitoring using Web browser based HMIs
- Free of charge CoDeSys V3 IEC-61131-3 development tool
- Supports five logic programming languages (LD,IL,FBD,SFC,CFC)
- Supports Modbus/RTU (Master/Slave) and Modbus/TCP (Server/Client)
- Supports SD Storage I/O Module
- Fully integration of all Advantech Modbus TCP/RTU remote I/O modules of the ADAM 4000/6000 series
- Seven I/O expansion slots supporting a wide range of cost effective local I/O Modules
- Two alternative slots for serial communication expansion (RS-232/422, CAN)

Introduction

The ADAM-5560CDS is a cost effective DIN RAIL IPC for control and data acquisition tasks which require Industrial PC computing performance with a PLC’s robustness. The ADAM-5560CDS, is equipped with an Intel Atom CPU, along with control specific features such as watchdog timer, battery backup RAM and deterministic I/O. The ADAM-5560CDS features five standard IEC 61131-3 programming languages in Windows CE, so PLC users can develop control strategies with their own familiar programming languages such as LD,IL,FBD,SFC,CFC. The powerful CoDeSys V3 Development Software and CoDeSys Integrated stable run time allows the ADAM-5560CDS to become the best choice for building cost effective, compact and reliable control solutions on the market today. With integrated target visualization HMI software and built-in VGA port there is no need to develop software for an additional Operator Panel. The additional optional CoDeSYS web Visu allows easy integration for remote monitoring through cost effective browser based HMI terminals or mobile devices. The powerful and flexible ADAM-5560CDS DIN RAIL IPC controller is ideal for a variety of control and data acquisition applications ranging from factory facilities, green house automation, water and waste water to environmental monitoring.

Specifications

I/O Interfaces

- Serial Ports 1 x RS-485, Terminal, 50~115.2kbps
  3 x RS-232/485, DB9, 50~115.2kbps
- LAN Ports 2 x RJ-45, 10/100Mbps
- USB Ports 2 x USB 2.0
- Displays 1 x VGA, supports 1024 x 768

Environment

- Humidity 5% to 95%, non-condensing
- Operating Temperature 0 ~ 55°C (32 ~ 131°F)
- Storage Temperature -25 ~ 85°C (-13 ~ 185°F)

Ordering Information

- ADAM-5560CDS 7-slot PC-based Controller with Intel Atom CPU and CoDeSYS V3 Runtime with target visualization

ADAM-5560CDS
7-slot PC-based Intel® Atom™ CPU soft logic Controller with integrated target visualization

Programmable Automation Controllers

All product specifications are subject to change without notice

Date updated: 4-Nov-2014
<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Part Number</th>
<th>Description</th>
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<tbody>
<tr>
<td>ADAM-5013</td>
<td>3-ch RTD Input</td>
<td>ADAM-5051</td>
<td>16-ch DI</td>
</tr>
<tr>
<td>ADAM-5017</td>
<td>8-ch AI</td>
<td>ADAM-5051D</td>
<td>16-ch DI w/LED</td>
</tr>
<tr>
<td>ADAM-5017P</td>
<td>8-ch AI w/Independent Input Range</td>
<td>ADAM-5051S</td>
<td>16-ch Isolated DI w/LED</td>
</tr>
<tr>
<td>ADAM-5018P</td>
<td>7-ch TC Input w/Independent Input Range</td>
<td>ADAM-5052</td>
<td>8-ch Isolated Differential DI</td>
</tr>
<tr>
<td>ADAM-5017UH</td>
<td>8-ch Ultra High Speed AI</td>
<td>ADAM-5056</td>
<td>16-ch DO</td>
</tr>
<tr>
<td>ADAM-5024</td>
<td>4-ch AO</td>
<td>ADAM-5056D</td>
<td>16-ch DO w/LED</td>
</tr>
<tr>
<td>ADAM-5018</td>
<td>7-ch TC Input</td>
<td>ADAM-5056S</td>
<td>16-ch Isolated DO w/LED</td>
</tr>
<tr>
<td>ADAM-5018</td>
<td>7-ch TC Input</td>
<td>ADAM-5056SO</td>
<td>16-ch Source Type Isolated DO w/LED</td>
</tr>
<tr>
<td>ADAM-5024</td>
<td>4-ch AO</td>
<td>ADAM-5055S</td>
<td>16-ch Isolated DI/O w/LED</td>
</tr>
<tr>
<td>ADAM-5018</td>
<td>7-ch TC Input</td>
<td>ADAM-5060</td>
<td>6-ch Relay Output</td>
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<tr>
<td>ADAM-5017</td>
<td>8-ch AI</td>
<td>ADAM-5069</td>
<td>8-ch Power Relay Output w/LED</td>
</tr>
<tr>
<td>ADAM-5017UH</td>
<td>8-ch Ultra High Speed AI</td>
<td>ADAM-5081</td>
<td>4-ch/8-ch High Speed Counter/Frequency</td>
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</tbody>
</table>

**Fully Integrated Advantech Remote I/O Solutions**

Modbus/TCP Master/slave/RTU Protocol Support
Integration of ADAM-2000/4000/6000 and APAC 5000 remote IO
**Introduction**

The WA-CU Controller series is a complete application-ready-package which includes a PC-based Cabinet Controller with high performance Intel Atom/Core-i multi-core processor, DIN-rail fanless compact form factor design, 128GB SSD, 2MB MRAM, Microsoft Windows embedded 7 Pro and CODESYS Control Runtime & Visualization. This allows users to easily achieve an open control solution, the PC-based real-time control system, enabling real-time PLC or PLC/Sofmation control with flexible Fieldbus options such as PROFINET, EtherCAT, EtherNet/IP, CANopen, Modbus TCP/RTU and providing the visualization in parallel on different HMI clients. It also features with MRAM retaining the data values and dual-power input avoiding causing operating failure from unexpected power interruption. The software/hardware flexibility and stability of PC-based Cabinet Controller is able to fulfill various control applications in vertical industries.

**Ready-to-go Open Control Solution Package enabling Industry 4.0 includes:**

- PC-based Cabinet Controller
- 128GB SSD and 2MB MRAM
- Microsoft Windows embedded 7 Pro 32bit
- CODESYS Control Runtime & Visualization

**Open Control Solutions Specifications**

**One Open Controller for all Control Systems**

- Supports main Fieldbuses configurations and portable protocol stacks: PROFINET, EtherCAT, EtherNet/IP, CANopen, Modbus TCP (Server/Client) and Modbus RTU (Master)
- Flexible in selecting the object-oriented IEC 61131-3 (FBD, LD, IL, ST, SFC) standard programming languages
- Integrated Control Runtime & Visualization allow user to develop the HMI screen in parallel to the IEC 61131-3 program
- Easy hardware configuration by iDoor technology implement for flexible I/O expansion and wireless communication options

**High Performance CPU for Real-time Control Applications**

- Intel Atom/Core-i multi-core level CPU both for entry and high performance requirements
- The multi-core CPU distributes PLC Runtime, Visualization and other tasks to dedicated cores
- Optimized system BIOS setting guarantees the consistent CPU clock rate for real-time control

**Visualized Control on Field side Operation and Remote Mobile Clients**

- Creates Visualized HMI on extended touch panel for on-site operation
- Supports browser-based (HTML5) visualization enabling remote operating on iOS/Android mobile devices
- The complete visualization screens can be deposited into library and reused as IEC 61131-3 function blocks

**Features**

Enable Open Control Solution by Application-Ready-Package including:

- **PC-based Cabinet Controller**
  - Powerful Intel Atom/Core-i multi-core CPU dedicated for control and HMI
  - DIN-rail fanless compact design with less maintenance effort
  - 2MB MRAM retained control data value
  - 128 GB SSD installed
  - Microsoft Windows Embedded 7 Pro 32-bit installed
  - Supports iDoor technology providing flexible I/O and wireless options

- **CODESYS Control Runtime & Visualization**
  - Preinstalled CODESYS Control Runtime & Visualization
  - Supports real-time PLC/Sofmation control with main Fieldbuses: PROFINET, EtherCAT, EtherNet/IP, CANopen and Modbus
  - Supports PLCopen IEC-61131-3 standard programming languages
  - Displays and operates the same control program on different visualization clients

**Reliable Controller Design for harsh environment**

- Includes MRAM retaining the data values and dual-power input avoiding causing operating failure from unexpected power interruption
- DIN-rail mounting fanless compact design for higher reliability and less maintenance effort
- Supports remote system status monitoring by WISE-PaaS/RMM
- Approved Certifications: BSMI, CCC, CE, FCC Class A, UL
- Wide operating temperature

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All product specifications are subject to change without notice
## Configuration Options

<table>
<thead>
<tr>
<th>Configuration Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ordering P/N</strong></td>
<td>WA-CU1372G-ERHE5AE, UNO-1372G-E3AE, Control RTE &amp; Visua., 128G SSD, MRAM, WES7P</td>
</tr>
<tr>
<td><strong>Platform</strong></td>
<td>WA-CU1483G-3RHE5AE, UNO-1483G-434AE, Control RTE &amp; Visua., 128G SSD, MRAM, WES7P</td>
</tr>
<tr>
<td><strong>Operating System</strong></td>
<td>Microsoft Windows Embedded 7 Pro (32 bit)</td>
</tr>
<tr>
<td><strong>Control Software</strong></td>
<td>CODESYS V3.5 SP7 Control RTE &amp; Visualization</td>
</tr>
<tr>
<td><strong>Form Factor</strong></td>
<td>Small size for WA-CU1372G, Regular size for WA-CU1483G</td>
</tr>
<tr>
<td><strong>CPU</strong></td>
<td>Intel Atom E3845 Quad-core 1.91 GHz for WA-CU1372G, Intel Core i3-4010U Dual-core 1.7 GHz for WA-CU1483G</td>
</tr>
<tr>
<td><strong>Processing times</strong></td>
<td>Bit operation (3.654 µs) for WA-CU1372G, Bit operation (3.654 µs) for WA-CU1483G</td>
</tr>
<tr>
<td><strong>Word operation</strong></td>
<td>Word operation (3.672 µs) for WA-CU1372G, Word operation (3.672 µs) for WA-CU1483G</td>
</tr>
<tr>
<td><strong>REAL operation</strong></td>
<td>REAL operation (6.263 µs) for WA-CU1372G, REAL operation (6.263 µs) for WA-CU1483G</td>
</tr>
<tr>
<td><strong>Memory</strong></td>
<td>4GB DDR3L for WA-CU1372G, 8GB DDR3L for WA-CU1483G</td>
</tr>
<tr>
<td><strong>Backup Memory</strong></td>
<td>2MB MRAM</td>
</tr>
<tr>
<td><strong>Display Type</strong></td>
<td>HDMI: 1920 x 1080 @ 60Hz for WA-CU1372G, VGA: 1920 x 1200 @ 60Hz for WA-CU1483G</td>
</tr>
<tr>
<td><strong>Storage</strong></td>
<td>128GB SSD for both</td>
</tr>
<tr>
<td><strong>Diagnostics LED</strong></td>
<td>System Power x 3, RTC status x 1, HDD x 1, COM x 2, PL x 1 for WA-CU1372G, System Power x 3, RTC status x 1, HDD x 1, COM x 3 for WA-CU1483G</td>
</tr>
<tr>
<td><strong>Expansion Slots</strong></td>
<td>Full-size Mini PCIe x 1 mSATA x 1 for both</td>
</tr>
<tr>
<td><strong>Mounting</strong></td>
<td>DIN-rail, Wall</td>
</tr>
<tr>
<td><strong>Network(LAN)</strong></td>
<td>10/100/1000 Base-T x 3 for WA-CU1372G, 10/100/1000 Base-T x 4 for WA-CU1483G (LAN A/B: Intel i210)</td>
</tr>
<tr>
<td><strong>I/O Port</strong></td>
<td>RS-232 x 1, RS-422/485 x 1, USB 2.0 x 2, USB 3.0 x 1, 4-ch DI/O, Line-out x 1 for WA-CU1372G, RS-232 x 1, RS-422/485 x 2, USB 2.0 x 2, USB 3.0 x 2, 4-ch DI/O, Line-in/out x 1 for WA-CU1483G</td>
</tr>
<tr>
<td><strong>iDoor Expansion</strong></td>
<td>iDoor x 1 for both</td>
</tr>
<tr>
<td><strong>Dual DC Power Input</strong></td>
<td>10–36 VDC for WA-CU1372G, 12/24 VDC x 20% for WA-CU1483G</td>
</tr>
<tr>
<td><strong>Operating Temperature</strong></td>
<td>-20 to 60°C</td>
</tr>
<tr>
<td><strong>Storage Temperature</strong></td>
<td>-40 to 85°C</td>
</tr>
<tr>
<td><strong>Dimensions (W x D x H)</strong></td>
<td>85 x 139 x 152 mm for WA-CU1372G, 106 x 139 x 198 mm for WA-CU1483G</td>
</tr>
<tr>
<td><strong>Certification</strong></td>
<td>CE, FCC, UL, CCC, BSMI</td>
</tr>
</tbody>
</table>

*For Softmotion control, contact Advantech for further ordering information*

## Ordering Information

- **WA-CU1372G-ERHE5AE**
  - UNO-1372G-E3AE, Control RTE & Visua., 128G SSD, MRAM, WES7P
- **WA-CU1483G-3RHE5AE**
  - UNO-1483G-434AE, Control RTE & Visua., 128G SSD, MRAM, WES7P

## Accessories

- **PWR-247-CE**
  - 100-240V 60W 24V 2.5A Power Supply for WA-CU1372G
- **96PSA-A90W19OT-1**
  - 100-240V 90W 19V Power Supply for WA-CU1483G
- **1702002600**
  - Power Cable US Plug 1.8 M for WA-CU1372G
- **1702002605**
  - Power Cable EU Plug 1.8 M for WA-CU1372G
- **1702031801**
  - Power Cable UK Plug 1.8 M for WA-CU1372G
- **170000506**
  - Power Cable China/Australia Plug 1.8 M for WA-CU1372G
- **1700001524**
  - Power cable 3-pin US type 1.8 M for WA-CU1483G
- **170203183C**
  - Power cable 3-pin EU type 1.8 M for WA-CU1483G
- **170203180A**
  - Power cable 3-pin UK type 1.8 M for WA-CU1483G

## Selected iDoor Modules

- **PCM-2622CA-AE**
  - SJA1000 CANbus, CANopen, DB9 x 2
- **PCM-24D2R2-AE**
  - OXPCIe-952 UART, Isolated RS-232, DB9 x 2
- **PCM-24D2R4-AE**
  - OXPCIe-954 UART, Non-Isolated RS-232, DB37 x 1
- **PCM-24D4R2-AE**
  - OXPCIe-954 UART, Non-Isolated RS-422/485, DB37 x 1
- **PCM-24U2U3-AE**
  - USB 3.0, mPCIe, USB-A type x 2
- **PCM-24S2WF-AE**
  - Intel® 82574L, GbE, RJ45 x 1
- **PCM-24R2GL-AE**
  - Intel® i350 Gigabit Ethernet, mPCIe, RJ45 x 2
- **PCM-24R1TP-AE**
  - Intel®82574L, GbE, RJ45 x 1
- **PCM-24R4RF-AE**
  - Intel® 82574L, GbE, RJ45 x 2

*For Softmotion control, contact Advantech for further ordering information*
**Features**

Enable Open Control Solution by Application-Ready-Package including:

- **PC-based Panel Controller**
  - Industrial 15.6”/18.5” TFT LCD Panel with 50K Lifetime LED backlight
  - True-flat 16:9 wide screen with PCT multi-touch and IP66 protection
  - Powerful Intel Core-i multi-core CPU dedicated for control and HMI
  - 128 GB SSD installed and 2MB MRAM retained control data value
  - Microsoft Windows Embedded 7 Pro 32-bit installed
  - Supports iDoor technology providing flexible I/O expansion and wireless communication options

- **CODESYS Control Runtime & Visualization**
  - Preinstalled CODESYS Control Runtime & Visualization
  - Enables real-time PLC or PLC/Softmotion control with main Fieldbuses: PROFINET, EtherCAT, EtherNet/IP, CANopen, Modbus TCP/RTU and providing the on-site visualized HMI operation. It also features with 7H hardness anti-scratch surface and MRAM retaining the data values for any operation under harsh environment. The software/hardware flexibility and stability of PC-based Cabinet Controller is able to fulfill various control applications in vertical industries.

**PC-based Panel Controller with CODESYS Control Runtime & Visualization**

**Introduction**

The WA-CT Control series is a complete application-ready-package offering which includes PC-based Panel Controller with 15.6”/18.5” wide screen TFT LCD & multi-touch panel, high performance Intel Core-i multi-core processor, 128GB SSD, 2MB MRAM, Microsoft Windows embedded 7 Pro and CODESYS Control Runtime & Visualization. This allows users to easily achieve an open control solution, the PC-based real-time control system, enabling real-time PLC or PLC/Softmotion control with flexible Fieldbus options such as PROFINET, EtherCAT, EtherNet/IP, CANopen, Modbus TCP/RTU and providing the on-site visualized HMI operation. It also features with 7H hardness anti-scratch surface and MRAM retaining the data values for any operation under harsh environment. The software/hardware flexibility and stability of PC-based Cabinet Controller is able to fulfill various control applications in vertical industries.

**Ready-to-go Open Control Solution Package enabling Industry 4.0 includes:**

- PC-based Cabinet Controller
- 128GB SSD and 2MB MRAM
- Microsoft Windows embedded 7 Pro 32bit
- CODESYS Control Runtime & Visualization

**Open Control Solutions Specifications**

**One Open Controller for all Control Systems**

- Supports main Fieldbuses configurators and portable protocol stacks: PROFINET, EtherCAT, EtherNet/IP, CANopen, Modbus TCP (Server/Clients) and Modbus RTU (Master)
- Flexible in selecting the object-oriented IEC 61131-3 (FBD, LD, IL, ST, SFC) standard programming languages
- Integrated Control Runtime & Visualization allow user to develop the HMI screen in parallel to the IEC 61131-3 program
- Easy hardware configuration by iDoor technology implement for flexible I/O expansion and wireless communication options

**High Performance CPU for Real-time Control Applications**

- Intel Core-i multi-core level CPU both for entry and high performance requirements
- The multi-core CPU distributes PLC Runtime, Visualization and other tasks to dedicated cores.
- Optimized system BIOS setting guarantees the consistent CPU clock rate for real-time control

**Visualized Control on Field side Operation and Remote Mobile Clients**

- Smoothly operates on-site HMI control on projected capacitive touch panel
- Supports browser-based (HTM/L5) visualization enabling remote operating on iOS/Android mobile devices
- The complete visualization screens can be deposited into library and reused as IEC 61131-3 function blocks

**Reliable Controller Design for harsh environment**

- Includes MRAM retaining data values during unexpected power interruption
- Rugged fanless Panel PC with backlight Life up to 50,000 hrs
- Touch screen passed 36 million touches test at single point
- True-flat touch screen designed with IP66 front protection
- Easy installation by panel mounting
- Supports remote system status monitoring by WISE-PaaS/RMM
- Approved Certifications: BSMI, CCC, CE, FCC Class A, UL
- Wide operating temperature
## Configuration Options

<table>
<thead>
<tr>
<th>Series</th>
<th>Panel Controller</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ordering P/N</td>
<td>WA-CT1581W-3RHE5AE</td>
</tr>
<tr>
<td></td>
<td>WA-CT1881W-3RHE5AE</td>
</tr>
<tr>
<td>Platform</td>
<td>TPC-1581WP-433AE</td>
</tr>
<tr>
<td></td>
<td>TPC-1881WP-433AE</td>
</tr>
<tr>
<td>Operating System</td>
<td>Microsoft Windows Embedded 7 Pro (32 bit)</td>
</tr>
<tr>
<td>Control Software</td>
<td>CODESYS V3.5 SP7 Control RTE &amp; Visualization</td>
</tr>
<tr>
<td>Aspect ratio</td>
<td>16 : 9</td>
</tr>
<tr>
<td>CPU</td>
<td>Intel Core i3-4010U Dual-core 1.7 GHz</td>
</tr>
<tr>
<td>Processing times</td>
<td>Bit operation (3.654 µs)</td>
</tr>
<tr>
<td></td>
<td>Word operation (3.672 µs)</td>
</tr>
<tr>
<td></td>
<td>REAL operation (6.263 µs)</td>
</tr>
<tr>
<td>Memory</td>
<td>4GB DDR3L</td>
</tr>
<tr>
<td>Backup Memory</td>
<td>2MB MRAM</td>
</tr>
<tr>
<td>Display Size/Type</td>
<td>15.6&quot; WXGA TFT LED LCD</td>
</tr>
<tr>
<td></td>
<td>18.5&quot; WXGA TFT LED LCD</td>
</tr>
<tr>
<td>Max. Resolution</td>
<td>1366 x 768</td>
</tr>
<tr>
<td>Backlight MTBF(hrs)</td>
<td>50,000 hrs</td>
</tr>
<tr>
<td>Touchscreen</td>
<td>Projected capacitive</td>
</tr>
<tr>
<td>Storage</td>
<td>128GB SSD</td>
</tr>
<tr>
<td>Expansion Slots</td>
<td>Full-size Mini PCIe slot x 1, CFast slot x 1</td>
</tr>
<tr>
<td>Mounting</td>
<td>Panel Mount</td>
</tr>
<tr>
<td>Network(LAN)</td>
<td>10/100/1000 Base-T x 2</td>
</tr>
<tr>
<td></td>
<td>(LANB: Intel i210)</td>
</tr>
<tr>
<td>I/O</td>
<td>RS-232 x 1</td>
</tr>
<tr>
<td></td>
<td>RS-232/422/485 x1</td>
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<tr>
<td></td>
<td>USB 3.0 x 2</td>
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<tr>
<td></td>
<td>HDMI x 1</td>
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<tr>
<td></td>
<td>Line-out x 1</td>
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<tr>
<td>iDoor Expansion</td>
<td>iDoor x1</td>
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<tr>
<td>DC Power Input (Voltage)</td>
<td>24 VDC ± 20%</td>
</tr>
<tr>
<td>Ingress Protection</td>
<td>Front Panel IP66</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>0 – 55°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-20 – 60°C</td>
</tr>
<tr>
<td>Dimensions (W x D x H)</td>
<td>419.7 x 269 x 56.7 mm</td>
</tr>
<tr>
<td>Certification</td>
<td>BSMI, CCC, CE, FCC, UL</td>
</tr>
</tbody>
</table>

* For Softmotion control, contact Advantech for further ordering information

## Ordering Information

- **WA-CT1581W-3RHE5AE**  
  TPC-1581WP-433AE, Control RTE & Visu., 128G SSD, MRAM, WES7P

- **WA-CT1881W-3RHE5AE**  
  TPC-1881WP-433AE, Control RTE & Visu., 128G SSD, MRAM, WES7P

## Accessories

- **PWR-248-AE**  
  100-240V 150W 24V 6.25A Power Supply

- **1702002600**  
  Power Cable US Plug 1.8 M

- **1702002605**  
  Power Cable EU Plug 1.8 M

- **1702031801**  
  Power Cable UK Plug 1.8 M

- **1700005986**  
  Power Cable China/Australia Plug 1.8 M

## Selected iDoor Modules

- **PCM-24D2R2-AE**  
  PXPCle-952 UART, Isolated RS-232, DB9 x 2

- **PCM-24D2R4-AE**  
  PXPCle-952 UART, Isolated RS-422/485, DB9 x 2

- **PCM-24D4R2-AE**  
  PXPCle-954 UART, Non-Isolated RS-232, DB9 x 1

- **PCM-24D4R4-AE**  
  PXPCle-954 UART, Non-Isolated RS-422/485, DB9 x 1

- **PCM-24S2WF-AE**  
  802.11 a/b/g/n 2T2R w/ Bluetooth4.0, Half-size mPCIe