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<td>ECU-P1300</td>
<td>Vibration Signal Modulate Card</td>
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<td>APAX-5522PELX/CE</td>
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To view all of Advantech’s Serial & Wireless I/O Modules, please visit www.advantech.com/products.
Energy Automation Overview

Introduction

Advantech is dedicated to exploring new technologies for the power and energy industry. With an edge in the research and design of industrial products, Advantech provides rugged and highly reliable system components that are not only environmentally friendly, but also power efficient with control technology enabled by intelligent software. Advantech’s products can be applied to various power and energy markets, including: renewable solar and wind power generation, nuclear simulation, substation automation systems, electrical car charging station solutions, and building energy saving systems.

On the other hand, power & energy applications are becoming more and more critical as demand for electricity continues to increase worldwide. Additionally, new challenges are arising due to the limitations of traditional power resources as we try to minimize the impact our power usage has on the environment. To that end, renewable energies, such as wind and solar power are playing more significant roles in modern electricity grids. Furthermore, the modernization of legacy Transmission & Distribution (T&D) systems and providing reliable T&D information for electric power management are becoming key goals for today’s power and energy applications. Thus, Advantech’s power & energy solutions will focus on renewable energy generation and substation automation system development.

Renewable Solar Energy and Wind Power Generation

Renewable solar and wind generation play important roles in high power and low carbon demand. With harsh environment factors, such as drastic day-night temperature differences, dust/sand storms, vibration, heat and electrical noise, Advantech provides rugged, reliable and real-time communication, monitoring, tracking, testing and DAQ control solutions for renewable energy applications.

Wind Power Generation Monitoring Solution

Wind Power Turbine Gearbox Vibration Monitoring System

The vibration signals of a wind turbine gearbox contain a wide range of data, which can be used to detect defects within the gearbox. With an Energy Controller, vibration signal modulation card and simultaneous analog input card, Advantech provides an ideal solution for a Wind Power Turbine Gearbox Vibration Monitoring System. With a redundant Ethernet communication port, the analysis of data can be transferred to the remote management center in real time.

Wind Power Box-type Transformer Monitoring System

Box-type substations in a wind power turbine integrate the generated power into a power grid. Like traditional substation monitoring systems, the status of the transformer must be monitored in real time. Advantech Energy remote I/O monitors the status of the various parts of the transformer i.e. oil temperatures, 3-phase voltage, current, active and in-active power, and transfers the data to the remote control center via Ethernet.

Solar Tracking System

Advanced sun tracking systems and solar cells are vital in providing efficient solar powered solutions. By detecting the strength of sunlight from different directions, sun tracking systems determine the location of the strongest sunlight and direct the solar cells in that direction. Accordingly, multi-axis motion control systems and robust controllers are required to control the stepper motors of the sun tracking system and constantly adjust the direction of the solar cells.

Advantech supplies ideal facilities for solar tracking systems, including embedded motion controllers, rugged remote analog input modules and IEC 61850 controllers that are used in control center for solar power applications.
Smart Substation Automation

Station and Bay Level Application
- HMI/SCADA Application in Substation
  Working status of devices within cabinet is controlled and monitored via HMI/SCADA, besides information and event trigger collection, time synchronization, such as IRIG-B function is also implemented in the automation controller.
- Application Requirements
  - Reliable IEC 61850-3 platform
  - Redundancy
- Cyber Security for Smart Grid
  Communication within smart substations is based on network connection, and so is connection between smart substations. Hence, the cyber security to ensure smart substation maintenance becomes more critical than before. The UTM (Unified Threat Management) is the key to preventing hacker attacks.
- Application Requirements
  - Reliable IEC 61850-3 platform
  - Fiber optic LAN
- Network Recorder and Analyzer
  A network recorder at substation operates in the same way as an aircraft flight recorder and is critical for recording and analyzing network flow information. It is possible to record and analyze data to discover the reason behind IED damage.
- Application Requirements
  - Reliable IEC 61850-3 platform
  - High-speed computing & packet acquisition
  - Synchronized time stamp
  - RAID for storage
- Data Gateway for IEC 61850
  Within a substation, there are lots of devices using a wide variety of protocols. Status and information of devices need to be monitored and controlled reliably; hence, a reliable automation controller plays such an important data protocol gateway, communication server and IED analyzer at a substation.
- Application Requirements
  - Reliable IEC 61850-3 platform
  - Isolated COM port
  - IRIG-B Time Sync. Receiver
  - Fiber optic LAN

Bay and Process Level Application
- Partial Discharge Detection & Analytic Device
  In electrical engineering, partial discharge is a localized dielectric breakdown if a small portion of a solid or fluid electrical insulation system under high voltage stress, which does not bridge the gap between two conductors. Protracted partial discharge can erode solid insulation and eventually lead to breakdown of insulation. Hence, a detection and analytic device to monitor the partial discharge is essential.
- Application Requirements
  - Reliable IEC 61850-3 platform
  - High-speed analog input for partial discharge detection
- Vibration Detection &Analytic Device
  The most common cause of power transformer failures in mechanical defect is excessive vibration, which is formed by the combination of multiples of a frequency of 120 Hz. The vibration generated from machine structures causes abnormal vibration, breakage of machine and noise. The vibration level depends on the transformer construction and design, and it is increased through fault current, phase to ground or phase to phase fault. This electrical fault will change the transformer core or winding construction by mechanical force produced. The effect of the fault can be found by measuring the vibration level before and after several faults on low voltage side. Thus, a vibration analysis of the structure is important to prevent this vibration.
- Application Requirements
  - Reliable IEC 61850-3 platform
  - High-speed analog input for partial discharge detection
- Distribution Substation RTU Application
  In substation automation systems, the RTU has interfaces towards protection and control equipment, as well as metering devices and other automation products. Local and remote monitoring and control can be easily achieved via the integrated RTU. The IEC 61850 client and server functionality of the RTU opens up an additional application area. It allows the combination of traditional protocols, parallel wiring and the IEC 61850 station bus. The hybrid solution provides the possibility to gradually upgrade the station to an IEC 61850 architecture.
- Application Requirements
  - High isolation for I/O and communication
  - Powerful platform bundled with high density I/O
## Energy Automation

### Model Name

<table>
<thead>
<tr>
<th>Model Name</th>
<th>UNO-4671A</th>
<th>UNO-4672</th>
<th>UNO-4672 (UNO-4672P154)</th>
<th>UNO-4678</th>
<th>UNO-4673A/4683</th>
<th>ECU-1710A/PEC-3710</th>
<th>ECU-1601A</th>
<th>ECU-1911</th>
</tr>
</thead>
</table>

### Certification


### CPU

| - | Intel Atom D510, 1.66 GHz | - | Intel Atom D510, 1.66 GHz | - | Intel Atom D510, 1.66 GHz | - | Intel Atom D510, 1.66 GHz | - | Intel Atom D510, 1.66 GHz |

### Onboard RAM

| - | 2GB DDR2 SDRAM | - | 1GB DDR2 SDRAM | - | 2GB DDR2 SDRAM | - | 512MB DDR SDRAM | - | - |

### Display

| - | VGA | - | VGA | - | VGA | - | VGA/Dual DVI | - | - |

### Serial Ports

| - | 2 x isolated RS-232 | - | 2 x isolated RS-232 | - | 2 x isolated RS-232 | - | 2 x DB-9 | - | - |

### Ethernet Ports

| - | 6 x 10/100Base-T RJ-45 | - | 2 x 10/100Base-T 4 x 10/100Base-T | - | 2 x 10/100Base-T 4 x 10/100Base-T | - | 2 x 10/100Base-T RJ-45 | - | - |

### Smart LAN

| - | - | - | - | - | - | - | - | - | - |

### USB Ports

| - | Four (One internal) | - | Four (One internal) | - | Two (Six internal) | - | Two | - | One |

### Onboard I/O

| - | 8-ch isolated DI 8-ch isolated DO | - | - | - | - | 16-ch AI/4-ch AD 16-ch isolated DI 1-ch isolated counter | - | - |

### Watchdog Timer

| - | Yes | - | Yes | - | Yes | Yes | Yes | Yes |

### Operating Systems


### Power Consumption

| - | 30W | - | 45W | - | 44W | - | 24W | - | 45W |

### Power Requirement

| - | Supports dual power input: Power 1: 30W | - | AC: 90 ~ 250 VAC (EC-U170A: 100 ~ 240 VAC) | - | 48V x 4W @24A | - | 30W | - | 30W |

### Dimensions (W X D X H)

| - | 440 x 220 x 88 mm (17.3" x 8.6" x 3.4") | - | 440 x 220 x 88 mm (17.3" x 8.6" x 3.4") | - | 440 x 220 x 44 mm (17.3" x 8.6" x 1.7") | - | 255 x 152 x 59 mm (10.7" x 5.9" x 2.3") | - | 220 x 150 x 89 mm (8.7" x 5.9" x 3.5") |

### Weight

| - | 6.0 kg | - | 6.0 kg | - | 6.0 kg | - | 6.0 kg | - | 6.0 kg |

### Page

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**ADANTECH Energy Automation**

**SHOP ONLINE at www.airlinehyd.com**

**800-999-7378**
## PAC Controller

### Analog Input

<table>
<thead>
<tr>
<th>Module Name</th>
<th>APAX-5017PE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certification</td>
<td>IEC 61850-3/IEEE 1613</td>
</tr>
<tr>
<td>Description</td>
<td>12-ch AI Module</td>
</tr>
</tbody>
</table>

- **AI Channels**: 12
- **Input Type**: V, mV
- **Sampling Rate (Sample/second)**: 12 (Total**)
- **Input Resolution**: 16-bit (voltage) 14 – 15-bit (current)
- **Input Accuracy**: ±0.1 % of FSR (Voltage) ±0.2 % of FSR (Current)
- **Voltage Input**: ±150 mV, ±500 mV, ±1 V, ±5 V, ±10 V
- **Current Input**: -
- **Direct Sensor Input**: -
- **Wire Burnout Detection**: -
- **Weight**: 170 g
- **Operating Temperature**: -20 – 70°C (when mounted vertically)
- **Storage Temperature**: -40 – 85°C
- **Relative Humidity (non-condensing)**: 5 – 95%
- **Power Consumption (typical)**: 2 W @ 24 V (C)
- **Isolation between channels and backplane**: 2500 V (C)
- **Page**: 3-15

### Analog/Output

- **AI Channels**: 12
- **DO Channels**: -
- **Output Type**: -
- **Rated Output Voltage**: -
- **Rated Output Current (signal “1”)**: -
- **IO Channels**: -
- **Input Filter**: -
- **Over Voltage Protection**: -
- **DD Channels**: -
- **Output**: -
- **Weight**: 160 g
- **Operating Temperature**: -20 – 70°C (when mounted vertically)
- **Storage Temperature**: -40 – 85°C
- **Relative Humidity (non-condensing)**: 5 – 95%
- **Power Consumption (typical)**: 2 W @ 24 V (C)
- **Isolation between channels and backplane**: 2500 V (C)

### General

- **Sampling Rate**: Value depends on used channel
- **Each channel can be configured with different type and range**
- **Sampling rate value depends on used channel number.
  Example: Using 6 channels on APAX-5017, sampling rate for each used channel will be 12/6 = 2 samples/second.

*APAX/DIO modules can use ID numbers 0~31, while AI/DO modules and counter modules can only use ID numbers 0~15.

## Digital Input/Output

### Module Name

<table>
<thead>
<tr>
<th>Module Name</th>
<th>APAX-5040PE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certification</td>
<td>IEC 61850-3/IEEE 1613</td>
</tr>
<tr>
<td>Description</td>
<td>24-ch DI Module 12-ch Relay Module</td>
</tr>
</tbody>
</table>

- **DI Channels**: 24
- **Input Type**: Sink or Source Load
- **Rated Input Voltage**: 24 V (C)
- **Input Voltage Range (signal “0”)**: -5 – 5 V (C)
- **Input Voltage Range (signal “1”)**: 15 – 30 V (C)
- **Rated Input Current**: 4.4 mA (typical)
- **Input Filter**: 3 ms
- **Over Voltage Protection**: -
- **DO Channels**: -
- **Output**: -
- **Weight**: 200 g
- **Operating Temperature**: -20 – 70°C
- **Storage Temperature**: -40 – 85°C
- **Relative Humidity**: 5 ~ 95%
- **Power Consumption (typical)**: 2 W @ 24 V (C)
- **Isolation between channels and backplane**: 2500 V (C)

### General

- **Sampling Rate**: Value depends on used channel
- **Each channel can be configured with different type and range**
- **Sampling rate value depends on used channel number.
  Example: Using 6 channels on APAX-5017, sampling rate for each used channel will be 12/6 = 2 samples/second.

## Ethernet I/O Module

### Module Name

<table>
<thead>
<tr>
<th>Module Name</th>
<th>DMU-3010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support Protocol</td>
<td>Modbus/TCP</td>
</tr>
<tr>
<td>Channels</td>
<td>8</td>
</tr>
<tr>
<td>Resolution</td>
<td>16 bit</td>
</tr>
<tr>
<td>Sampling Rate</td>
<td>105s/s</td>
</tr>
<tr>
<td>Voltage Input</td>
<td>0 – 10 V</td>
</tr>
<tr>
<td>Current Input</td>
<td>0 – 20mA, 4 – 20mA</td>
</tr>
<tr>
<td>HTD Input</td>
<td>P100, P5100</td>
</tr>
<tr>
<td>Burn-out Detection</td>
<td>Yes</td>
</tr>
<tr>
<td>Input Channels</td>
<td>8</td>
</tr>
<tr>
<td>Output Channels</td>
<td>4</td>
</tr>
<tr>
<td>Counter Input</td>
<td>200 Hz</td>
</tr>
<tr>
<td>Frequency Input</td>
<td>200 Hz</td>
</tr>
<tr>
<td>Pulse Output</td>
<td>Yes</td>
</tr>
<tr>
<td>High/Low Alarm Settings</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### General

- **Isolation Protection**: 2500 V (C)
- **Connectors**: 1 x RJ-45 (LAN) 4 x Plug-in screw terminal block (IO & Power)
- **LED Indicators**: Power & DO
- **Watchdog Timer**: -
- **Power Consumption**: 3 W @ 24 V (C)
- **Operating Temperature**: -40 – 70°C (-40 – 158°F)
- **Dimensions (W x D x H)**: 120 x 130 x 44 mm (4.72” x 4.72” x 1.73”)

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UNO-4671A

NEW

Intel® Atom™ D510 Substation Computer with 6 x LAN, 10 x COM, and 1 x PCI-104

Features

- China Electricity Certificate IV level
- IEC 61850-3 and IEEE 1613 compliant for substation automation applications
- Onboard Intel Atom D510 1.66 GHz processor
- Supports wide range and dual power input
- 2 x RS-232 isolated ports, 4 x RS-422/485 isolated ports and 4 x RS-485 isolated ports
- 6 x 10/100Base-T RJ-45 connector
- Supports 1 x internal CF card and 1 x 2.5” SATA HDD
- Fanless design
- WES 2009, Windows XP, Windows CE 6.0 and Linux ready solution

Introduction

UNO-4671A is compliant with Electricity Certificate IV level (especially for China) and IEC 61850-3 certification, which defines the international standards of network and system communications in power substations. Featuring a fanless design with low power consumption and high performance Intel Atom D510 processor, the UNO-4671A comes with 10 isolated serial ports, 6 x LAN, 4 x USB (Internal) and 1 x PCI-104 extension. With rich OS and driver support, such as WES 2009, Windows XP, Windows CE 6.0 and Linux, users can integrate applications easily with a platform that can provide versatile functions to fulfill diverse requirements.

Specifications

General

- Certification: CE, FCC class A, CCC, Electricity IV level for China (Compatible IEC 61850-3, IEEE 1613)
- Dimension (W x D x H): 2U (440 x 220 x 88 mm/17.3” x 8.6” x 3.4”) fits into standard 19 inch rack
- Enclosure: SECC
- Mounting: 2U Rackmount
- Power Consumption: 30 W @ 24 V (Typical)
- Power Requirements: Supports dual power input
  - Power 1: 100 – 240 VAC or 100 – 240 VDC
    - Optional 18 – 30 VDC
  - Power 2: 100 – 240 VAC or 100 – 240 VDC
    - Optional 18 – 30 VDC
- Weight: < 5.5 kg
- System Design: Fanless design
- OS Support: WES 2009, Windows XP, Windows CE 6.0 and Linux
- Remote Management: Built-in Advantech DiagAnywhere agent on Windows CE/XPe

System Hardware

- CPU: Intel Atom D510 1.66 GHz
- Memory: 2 GB DDR2 SDRAM
- Indicators: LEDs for Power1&2, IDE, LAN (Active,Link) and Serial (Tx, Rx)
- Storage CF: 1 x internal type I/II CompactFlash® slot
  - HDD: Built-in one 2.5” SATA HDD bracket
- Display: DB15 VGA connector, Intel® Atom™ D510 up to 1920 x 1024
- PCI-104 Slot: 1 x PCI-104 supports +3.3 V & +5 V power
- Reset Button: Yes
- WatchDog Timer: Programmable 256 levels time interval, from 1 to 255 seconds for each tier

I/O Interface

- Serial Ports: 2 x DB-9 RS-232
  - 4 x screw terminals with 5-wired RS-422/485
  - 4 x screw terminals with 3-wired RS-485 (Automatic RS-485 data flow control)
  - 2,500 Vdc isolation
- Serial Port Speed: (COM1, COM2) RS-232: 50 ~ 115200bps
  - (COM3 – COM6) RS-422/485: 50 ~ 921600bps
  - (COM7 – COM10) RS-485: 50 ~ 921600bps
- LAN: 6 x 10/100Base-T RJ-45 ports
- USB Ports: 4 x USB, UHCI, Rev. 2.0 compliant 1 x Front, 2 x Rear and 1 x Internal ports
- Extension: 1 x PCI-104

Environment

- Humidity: 95% @ 40°C (non-condensing)
- Operating Temperature: IEC 60068-2-2 with 100% CPU/ I/O loading, 48 hrs
  - -20 ~ 60°C (-4 ~ 140°F)
- Operating Humidity: 20 ~ 95% (non-condensing)
- Shock Protection: IEC 68 2-27 CompactFlash®: 30 G half sine, 11 ms
  - HDD: 20 G half sine, 11 ms
- Vibration Protection: IEC 68 2-64 (Random 1 Oct./min, 1hr/axis.)
  - CompactFlash: 2 Grms @ 5 ~ 500 Hz,
  - HDD: 1 Grms @ 5 ~ 500 Hz

Ordering Information

- UNO-4671A-A33E: Intel Atom D510 1.66 GHz, 2 GB RAM Automation Computer
- PCLS-DIAGAW10: Advantech Remote Monitoring & Diagnosis Utility

RoHS COMPLIANT 2002/95/EC
UNO-4672/P154

Substation Network Recorder/Analyzer

Features
- IEC 61850-3 and IEEE 1613 compliant for substation automation applications
- Intel Core Duo LV L2400 1.66 GHz SOM-4780
- 4-ch Fiber Smart LAN for data acquisition
- DSP LAN data manage and support online firmware update
- 10 Mbyte for IEC 61850 standard MU (20 MU Module Data Acquisition)
- 2-ch 10/100Base-F LAN, SC Multi-Mode 1300 nm
- 1-ch Fiber IRIG interface, ST Multi-Mode 850 nm
- 1-ch RS-485 IRIG interface
- Fanless design with no internal cabling
- Isolation power design with wide AC/DC input range
- Isolation between chassis and power ground
- One internal USB for dongle and flash drive

Introduction
UNO-4672 features a fanless design with built-in isolated PSU and ten isolated serial communication ports and is even suitable for any harsh applications. The rear I/O connection and LEDs on the front panel for all ports and modes highly simplify monitoring operation and maintenance.

As for data recording and analysis from a network, the UNO-P154 provides four smart LAN ports to collect high-density network packets that come with 32K byte FIFO to keep data integrity, and two standard 10/100 Mbps fiber optic interfaces, which are used to respond to real-time data. IRIG time decode could more accurately record time information to facilitate data analysis.

Specifications

General
- Certification: IEC 61850-3 and IEEE 1613 compliant
- Dimension (W x D x H): 2U (440 x 220 x 88 mm) / 17.3” x 8.6” x 3.4”
- Enclosure: SECC
- Power Consumption: 44 W (Typical)
- Power Requirements: AC : 90 ~ 250 VAC (47 ~ 400 Hz)
- Weight: 6.0 kg
- OS Support: Windows® XP Embedded, Windows 2000/XP, XPe
- System Design: Fanless with no internal cabling
- Remote Management: Built-in Advantech DiagAnywhere agent on Windows CE/XP

System Hardware
- CPU: Intel Core Duo LV L2400 1.66 GHz
- Memory: 2 GB DRAM built-in
- Indicators: LEDs for Power, IDE, Diagnosis (programmable), LAN (Active, Status) and Serial (Tx, Rx)
- Storage: 1 x Front, 2 x Rear and 1 x Internal ports
- SSD: 2 x internal type I/II Compact Flash® slots
- HDD: One built-in 2.5” SATA HDD bracket
- Display: DB15 VGA connector, 1600 x 1200 @ 85 Hz
- Watchdog Timer: Programmable 256 levels time interval, from 1 to 255 seconds for each tier

IRIG Time Code
- Channels: 1 ST Multi-mode, 1 Isolated RS-485
- Accuracy: 0.1us
- Transmission Distance: ST Multi-mode 2.7 km, RS485 1.2 km

I/O Interface
- LAN: 2 x 10/100/1000Base-T RJ-45 ports, teaming function supported
- Smart LAN: 4 x 10/100Base-T RJ-45 ports
- USB Ports: 4 x USB, UHCI, Rev. 2.0 compliant
- Data Transfer Mode: DMA
- Remote Management: 1 x Front, 2 x Rear and 1 x Internal ports

Environment
- Humidity: 95% @ 40°C (non-condensing)
- Operating Temperature: -20 ~ 60°C (4 ~ 140°F)
- Operating Humidity: 20 ~ 95% (non-condensing)
- Shock Protection: 20 G half sine, 11 ms
- Vibration Protection: 2 G rms @ 5 ~ 500 Hz

Ordering Information
- UNO-P154-AE
- UNO-4672-D03E
- UNO-4672I-D03E

Online Download: www.advantech.com/products

Motion Control
Energy Automation
Building Automation Systems
Industrial Automation Software
Operator Panels
Automotive Panel PCs
Industrial Monitors
Industrial Ethernet
Device Servers & Adapters
Serial Communication Cards
Extended Auto. Communication Cards
I/O Cards
Mem. VO
Uninterrupted Power Supplies
RES-6100 OO
Extended DO
I/O Boards
Introduction
UNO-4673A and UNO-4683 are compliant with the hardware requirements of IEC 61850-3, which defines the international standards of network and system communications in power substations. Featuring fanless designs with built-in isolated PSU and 3 expansion slots for I/O plug-in cards, the UNO-4673A and UNO-4683 are suitable for harsh environments. The rear I/O connection and LEDs on front panel for all ports and modes highly simplify monitoring for operation and maintenance.

Specifications

General
- Certification: IEC 61850-3, IEEE 1613, CE, FCC Class A, UL, CCC
- Dimension (W x D x H): 2U (440 x 220 x 88 mm/ 17.3” x 8.6” x 3.4”) fits into standard 19 inch rack
- Enclosure: SECC
- Mounting: 2U Rackmount
- Power Consumption: 45 W (Typical)
- Power Requirements: AC : 100 ~ 240 VAC (47 ~ 63 Hz) DC : 106 ~ 250 VDC
- Weight: 6.0 kg
- System Design: Fanless with no internal cabling
- Remote Management: Built-in Advantech DiagAnywhere agent on Windows CE/XPe

System Hardware
- CPU: Intel Atom D510 1.66 GHz/Core i7 2.0 GHz
- Memory: 2 GB DDR2 SDRAM/4G DDR3 SDRAM built-in
- Indicators: LEDs for Power, IDE, Alarm for battery backup SRAM, Diagnosis (programmable), LAN (Active, Status) and Serial (Tx, Rx)
- KeyBoard/Mouse: 2 x PS/2 connector for Keyboard & Mouse
- Storage: 1 x internal type I/II CompactFlash® slot
- Display: DB15 VGA connector, 2048 x 1536 @ 85 Hz (UNO-4673A) 1 x DVI-I (UNO-4683)
- Watchdog Timer: Programmable 7-tier event handler, from 1 to 255 seconds for each tier
- Battery Backup SRAM: 1 M8

I/O Interface
- Serial Port Speed: 2 x 10/100/1000Base-T RJ-45 ports,teaming function supported
- LAN: 4 x 10/100Base-T RJ-45 ports Line-out
- Audio: 6 x USB, UHCI, Rev. 2.0 compliant
- USB Ports: 2 x Front, 3 x Rear and 1 x Internal ports
- Expansion: 3 x Domain I/O expansions (Only slot 1 supports PCIe resource)

Environment
- Humidity: 95% @ 40°C (non-condensing)
- Operating Temperature: IEC 60068-2-2 with 100% CPU/ I/O loading, 48 hrs -20 ~ 70°C (optional for -40°C)
- Operating Humidity: 20 ~ 95% (non-condensing)
- Vibration Protection: IEC 60068-2-64 (Random 1 Oct./min, 1hr/axis.) CompactFlash®: 2 Grms @ 5 – 500 Hz, HDD: 1 Grms @ 5 – 500 Hz

Ordering Information
- UNO-4673A-A33E: Intel Atom 1.66 GHz, 2 GB RAM Automation Computer Intel Core i7 2.0 GHz, 4 GB RAM Automation Computer
- UNO-4683-D34E: Intel Atom 1.66 GHz, 4 GB RAM Automation Computer

Accessories
- UNOP-1000I-AE: Expansion card for standard PCI and Mini PCI
- UNOP-1000J-AE: Expansion card for standard PCI-104 and Mini PCIE
- UNOP-1514C-AE: 4-port Fiber Optic LAN card
- UNOP-1618D-AE: 8-port RS-232/422/485 w/EFT protection
- UNOP-1623D-AE: 8-port RS-232/422/485 w/Iso and EFT
- UNOP-1624D-AE: 4-port RS-232/422/485 w/Iso and EFT, 1-port IRIG-B
- PCLS-DIAGAW10: Advantech Remote Monitoring & Diagnosis Utility
UNOP-1628D/1618D
UNOP-1624D
UNOP-1514C

Specifications

General
- Connector: 120-pin connector for UNO-4673A/PCI
- Dimension: 5.3” x 6.0” (136 x 150 mm)
- Power Consumption: 5V ± 5% @ 2000 (at least) mA
- Certification: CE/FCC

Communication
- IRQ: All COM ports use the same IRQ assigned by PCI Bus
- COM Ports: 4 x RS-232/422/485 ports
- Data Bits: 5, 6, 7, 8
- Stop Bits: 1, 1.5, 2
- Parity: None, Even, Odd
- Baud-rate (bps): RS-232: 50 ~ 115.2 kbps, RS-422/485: 50 ~ 921.6 kbps
- Data Signals: TxD, RxD, RTS, CTS, DSR, DTR, DCD, GND for RS-232/485 ports
- IRIG Time Code Input: RS-422 output signal; TTL Female BNC
- IRIG Time Code Output: RS-422 input signal isolated by optocoupler Optical signal @ 820nm, TTL
- IRIG Time Code Decoding: Male 9-pole D-Sub connector (COM4 or IRIG-B)

Protection
- Isolation Protection: 2000 VDC (UNOP-1628D)

Environment
- Operating Temp.: -20 ~ 70°C (-4 ~158°F)
- Operating Humidity: 10 ~ 90% RH non-condensing (refer to IEC 60608-2-3)
- Storage Humidity: 5 ~ 95% RH non-condensing (refer to IEC 60608-2-3)

Ordering Information
- UNOP-1618D: 8-port RS-232/422/485 for UNO-4673A
- UNOP-1624D: 4-port RS-232/422/485 and IRIG B for UNO-4673A
- UNOP-1514C: 4-port Fiber Optic LAN Card for UNO-4673A

8-port RS-232/422/485 with and without port-to-port Isolation
4-port Isolated RS-232/422/485 with IRIG B

4-port Fiber Optic LAN Card

Connection
- Connector: 120-pin connector for UNO-4673A/PCI
- Dimension: 5.3” x 6.0” (136 x 150 mm)
- Power Consumption: 5V ± 5% @ 2000 (at least) mA
- Certification: CE/FCC

Fiber Optic LAN
- Standard: IEEE 802.3, 802.3u, 802.3x
- Transmission Distance: 100Base-FX
- Transmission Speed: Up to 100 Mbps
- Environment
  - Operating Temp.: -20 ~ 70°C (-4 ~158°F)
  - Operating Humidity: 10 ~ 90% RH non-condensing (refer to IEC 60608-2-3)
  - Storage Humidity: 5 ~ 95% RH non-condensing (refer to IEC 60608-2-3)

Ordering Information
- UNOP-1514C: 4-port Fiber Optic LAN Card for UNO-4673A

Ordering Information
- UNOP-1624D: 4-port RS-232/422/485 and IRIG B for UNO-4673A
**Introduction**

ECU-1710A is a standalone automation controller with integrated PCI-1710UL and PCI-1720U to provide 16-ch Analog Input, 4-ch Analog Output, 16-ch Isolated Digital Input and 16-ch Isolated Digital Output. This controller also supports serial communication ports and several other networking interfaces. You can seamlessly integrate your applications into the ECU-1710A and speed up your system development with these application ready controllers.

**Specifications**

**General**
- Dimension (W x D x H): 255 x 152 x 59 mm (10” x 6.0” x 2.3”)
- Power Consumption: 28 W (Typical)
- Power Requirements: 18 ~ 30 VDC (e.g. 24 V @ 2 A) (Min. 48 W), AT
- Weight: 2.4 kg (Typical)
- OS Support: WES 2009

**System Hardware**
- CPU: Intel Atom D510 1.66 GHz/ 512 KB L2 Cache
- Memory: 1GB DDRII 667MHZ
- Indicators: LEDs for Power, IDE and LAN (Active, Status)
- Keyboard/Mouse: 1 x PS/2
- Storage: SSD: 1 x type I/II CompactFlash® slot
  HDD: 1 x integrated 2.5" SATA HDD bracket
- **I/O Interface**
  - Serial Ports: 2 x RS-232 with DB9 connectors
  - LAN: 2 x 10/100Base-T RJ-45 ports
  - USB Ports: 2 x USB, EHCI, Rev. 2.0 compliant

**Analog Input**
- Channels: 16 single-ended/ 8 differential
- Resolution: 12 bits
- Max. Sampling Rate: 100 Ks/s
- FIFO Size: 4,096 samples
- Overvoltage Protection: 30 Vp-p
- Input Impedance: >18M ohm
- Sampling Mode: Delay to Start, Delay to Stop, None
- Input Range (V):
  - Unipolar: N/A, 0 ~ 10, 0 ~ 5, 0 ~ 2.5, 0 ~ 1.25
  - Bipolar: ±10, ±5, ±2.5, ±1.25, ±0.625
- Accuracy (% of FSR ±1LSB): 0.1, 0.1, 0.2, 0.2, 0.4

**Analog Output**
- Channels: 4
- Resolution: 12 bits

**Features**
- Onboard Intel Atom D510 1.66 GHz processor
- 2 x RS-232 ports
- 2 x 10/100Base-T RJ-45 ports
- 2 x USB ports
- Integrated PCI-1710UL & PCI-1720U modules
- Unipolar (V) 0 ~ 5, 0 ~ 10
- Bipolar (V) ±5, ±10
- Current Loop (mA) 0 ~ 20, 4 ~ 20
- Driving Capability: Relative: ±1 LSB; Differential: Non-Linearity: ±1 LSB (monotonic)
- Excitation Voltage: 48 V (max.)
- Output Range (Software programmable)
  - Unipolar (V): 0 ~ 5, 0 ~ 10
  - Bipolar (V): ±5, ±10
- Input Impedance: >18M ohm
- Sampling Mode: Delay to Start, Delay to Stop, None
- Input Range (V):
  - Unipolar: N/A, 0 ~ 10, 0 ~ 5, 0 ~ 2.5, 0 ~ 1.25
  - Bipolar: ±10, ±5, ±2.5, ±1.25, ±0.625
- Accuracy (% of FSR ±1LSB): 0.1, 0.1, 0.2, 0.2, 0.4

**Digital Input /Output / Counter**
- DI Channels: 16
- DI Input Voltage: Logic 0: 0 V max.
  Logic 1: 5 V min. (30 V max.)
- DO Channels: 16
- DO Output Type: Sink Type (NPN)
- DO Output Voltage: 5 ~ 40 VDC
- DO Sink Current: 300 mA max. per channel
- Counter Channels: 1
- Counter Resolution: 16 bits
- Counter Input Voltage: Logic 0: 2 V max.
  Logic 1: 5 V min. (30 V max.)
- Counter Max. Input Frequency: 1 MHz
- Isolation Protection: 1,000 VDC

**Environment**
- Humidity: 5 ~ 95% RH, non-condensing (IEC-60068-2-3)
- Operating Temperature: -10 ~ 60°C (14 ~140°F)
- Storage Temperature: -20 ~ 80°C (-4 ~176°F)

**Ordering Information**
- ECU-1710A-A32E: Intel Atom D510 1.66 GHz controller with AI/O and DI/O
- PEC-3710-AE: AMD LX800 500 MHZ controller with AI/O and DI/O

**Accessories**
- PCL-10137-1: DB37 Cable, 1m
- PCL-10125-1: DB25 Cable, 1m
- ADAM-3925: DB25 DIN-rail Wiring Board
- ADAM-3937: DB37DIN-rail Wiring Board
**ECU-1801A**

**Intel® Atom™ D510 Energy Controller with 2 x LAN, 3 x COM, IRIG-B, and I/O Extension**

**Features**
- China Electricity Certificate IV level
- IEC 61850-3 and IEEE-1613 compliant for substation application
- Built-in Time Synchronize IRIG-B
- Support more Smart-Substation application I/O extension
- Onboard Intel Atom D510 1.66 GHz CPU
- 1 x RS-232 port/ 2 x RS-485 isolation ports
- 2 x 10/100Base-T RJ-45 ports
- Windows® CE 6.0, WES 2009, and Linux ready solution
- Support PCIe-104 & PCI-104 extension

**Introduction**

ECU-1801A is compliant with Electricity Certificate IV Level (especially for China) and IEC 61850-3 certification. Featuring a fanless design with low power consumption and high performance Intel Atom D510 processor, the ECU-1801A comes with 2 x Ethernet, 1 x RS-232, and 2 x isolation RS-485 ports. The ECU-1801A supports two extension interface, PCI-104 & PCIe-104, and users can easily order other Energy I/O boards to integrate into the ECU-1801A and speed up your system development with an energy controller.

**Specifications**

**General**
- **Dimension (W x D x H)**: 220 x 150 x 89 mm (8.7”x 5.9”x 3.5”)
- **Power Consumption**: 24 W (Typical)
- **Power Requirements**: 18 – 30 VDC (e.g. 24 V @ 2 A) (Min. 48 W), AT
- **Weight**: 2.4 kg (Typical)
- **Mounting**: 2U Rack-mount & Wall-mount
- **OS Support**: WES 2009, Windows CE
- **System Design**: Fanless with no internal cabling

**System Hardware**
- **CPU**: Intel Atom D510 1.66 GHz/ 512 KB L2 Cache
- **Memory**: 1G DDRII 667 MHz
- **Indicators**: LEDs for Power, HDD and LAN (Active, Status)
- **Storage**: SSD: 1 x type I/II CompactFlash® slot
  HDD: 1 x integrated 2.5” SATA HDD bracket
- **Display**: DB15 VGA connector, 1600 x 1200 @ 85 Hz
- **Watchdog Timer**: Programmable 256 levels time interval, from 1 to 255 seconds for each tier
- **PCI-104/PCIe-104**: Supports +3.3/-5 V power

**Communication Interface**
- **Serial Ports**: RS-232 DB9 connector 1 Port
  RS-485 Screw Plug-in Terminal block 2 Ports
  2500 Vdc Isolation
- **Serial Ports Speed**: RS-232 50 – 115.2 kbps
  RS-485 50 – 230.4 kbps
- **LAN**: 2 x 10/100/1000Base-T RJ-45 ports
- **USB Ports**: 2 x USB, UHCI, Rev. 2.0 compliant

**Time Synchronization Interface**
- **Type**: IRIG-B
- **Channel**: 1
- **Support Format**: IRIG-B00X according to IRIG STANDARD 04, 200-98
- **Input Signal**: ST Multi-mode, 1 Isolation RS-485 (Optional)
- **Message Syntax**: QQQHHMMSS(year, day, hour, minute & second)
- **Resolution of Time**: 1s

**Environment**
- **Humidity**: 5 – 95% RH, non-condensing (IEC 60068-2-3)
- **Operating Temperature**: -10 – 60°C (14 –140°F) @ 5 – 85% RH
- **Storage Temperature**: -20 – 80°C (-4 –176°F)

**Ordering Information**
- **ECU-1801A-A32E**: Intel Atom Energy Controller with 2 x LAN, 3 x COM, IRIG-B and I/O Extension

**Accessories**
- **ECU-P1060-AE**: 250 KS/s, 16 bit, Simultaneous 8-ch Analog input PCI-104 Card
- **ECU-P1300-AE**: Vibration Signal Modulate, Vibration Sensor Driver, 8-order Low-pass Filter
- **ECU-P104B-AE**: 30 MS/s, 14bit, Simultaneous 4-ch Analog input PCIe-104 Card

**RoHS COMPLIANT**

2002/95/EC
ECU-P1060
ECU-P1020
ECU-P1300

New Features
- Designed for Smart-Grid Applications
- ECU-P1060 focuses on the Vibration/Substation Signal Analytics (Wind-Power / Smart Substations)
- ECU-P1020 focuses on the Partial Discharge Detection and Analytical Devices (Smart Substations)
- ECU-P1300 focuses on Vibration Applications (Wind-Power / Smart Substations)
- Easy to install to ECU-1801A Energy Controller

Specifications
ECU-P1060

General
- Power Consumption: Typical: 5V @ 850mA
- Bus Type: PCI-104
- I/O Connector: Plug-in Terminal Block
- Operating temperature: -10 ~ 60°C (-14 ~ 140°F)
- Storage Temperature: -20 ~ 80°C (-4 ~ 176°F)
- Storage Humidity: 5 ~ 95% RH, non-condensing

Analog Input
- Channels: 8 differential
- Resolution: 16 bits
- Max. Sampling Rate: 250 KS/s
- FIFO Size: 32K samples
- Overvoltage Protection: 87.5 Mohm
- Input Impedance: Delay to Start, Delay to Stop
- Sampling Mode: 187 Mohm
- Trigger Source: Sync. Software
- Input Range: V. Software Programmable

Bipolar -10 ≤ ≤ +10 ±5 ±12.5
Accuracy % of FSR±1LSB 0.04 0.04 0.06 0.08

Timer Counter
- Channels: 2
- Resolution: 32 bits
- Mode: Event counting, Frequency in, PWM in
- Compatibility: 5 V, TTL
- Frequency: 10 MHz

Ordering Information
- ECU-P1060-AE: 250 KS/s, 16bit, Simultaneous 8-ch PCI-104

Specifications
ECU-P1020

General
- Power Consumption: Typical: 5V @ 850mA
- Bus Type: PCIe-104
- I/O Connector: BNC
- Operating temperature: -10 ~ 60°C (-14 ~ 140°F)
- Storage Temperature: -20 ~ 80°C (-4 ~ 176°F)
- Storage Humidity: 5 ~ 95% RH, non-condensing

Analog Input
- Channels: 4 signal end
- Resolution: 12 bits
- Max. Sampling Rate: 30 MS/s
- FIFO Size: 32K samples
- Overvoltage Protection: 14 VP-P
- Input Impedance: 4mA Constant Current
- Sampling Mode: 50 ohm/1M ohm/Hi Z jumper selectable/100pF
- Trigger Source: Sync. Software
- Input Range: ±5, ±2.5, ±1.25

Ordering Information
- ECU-P1020-AE: 30 MS/s, 12bit, Simultaneous 4-ch PCIe-104

Specifications
ECU-P1300

General
- Power Consumption: Typical: 5V @ 400mA
- Operating temperature: -10 ~ 60°C (-14 ~ 140°F)
- Storage Temperature: -20 ~ 80°C (-4 ~ 176°F)
- Storage Humidity: 5 ~ 95% RH, non-condensing

Vibration Modulate
- Channels: 8
- Sensor zCurrent: 4mA Constant Current
- Supply: 24 Vdc
- Sensor Voltage Supply: 0.1%
- Drive Ability: 0 ~ 5K
- Sensor Signal Gain: 1, 10, 100, 1000 (adjustable by jumper)
- Signal Gain: 1, 10, 100, 1000
- Analog Filter: 8th order Lowpass Bessel Filters
- Filter Adjustable: 0.1 Hz ~ 5K Hz Adjustable by Software program

Ordering Information
- ECU-P1300-AE: Vibration Signal Modulate Card

250 KS/s, 16bit, Simultaneous 8-ch PCI-104
30 MS/s, 12bit, Simultaneous 4-ch PCIe-104

Vibration Signal Modulate Card

SHOP ONLINE at www.airlinehyd.com 800-999-7378
**Introduction**

ECU-1911 focuses on RTU monitor application. The ECU-1911 is also a standalone RTU that provides a 16-bit 8-ch A/D converter, 32-ch Relay and 32-ch Digital Input. This controller also supports four serial communication ports and two networking interfaces. You can seamlessly integrate your applications into the ECU-1911 and speed up your system development with this application ready RTU.

**Specifications**

**General**
- **Power Consumption**: <10 W (Typical)
- **Power Requirements**: 10 - 30 VDC
- **OS Support**: Windows CE 5.0

**System Hardware**
- **CPU**: Xscale @ PXA-270 520 MHz
- **Memory**: Onboard 64 MB SDRAM / 32 MB Flash
- **Storage**: 1 x type I/II Compact Flash slot

**Digital Input**
- **Channels**: 32
- **I/O Type**: Sink
- **Wet Contact**: Logic 0: 0 – 10 V, Logic 1: 19 – 30 V
- **Isolation**: 3000 VDC
- **Connector**: Terminal Block (#14 – 22 AWG)

**Digital Output**
- **Channels**: 32
- **I/O Type**: Power Relay Form A
- **Contact Rating**: AC: 5 A @ 250 V, DC: 30 V @ 5 A (Resistive Load)
- **Isolation**: 500 VDC
- **Connector**: Terminal Block (#14 – 22 AWG)

**Analog Input**
- **Channels**: 8 differential
- **Resolution**: 16 bits
- **Sampling rate**: 10 Hz/sec (total)
- **Input Impedance**: Voltage: 20 MΩ, Current: 120 Ω (Build-in 120 Ω for Current)
- **Input Range**: 0 – 150 mV, 0 – 500 mV, 0 – 1 V, 0 – 5 V, 0 – 10 V, ±15 V, ±500 mV, ±1 V, ±5 V, ±10 V, ±15 V, ±20 mA, ±30 mA

**Environment**
- **Humidity**: 5 – 95% @ 40°C (non-condensing)
- **Operating Temperature**: -10 – 60°C (14 – 140°F)
- **Storage Temperature**: -20 – 80°C (-4 – 176°F)

**I/O Interface**
- **Serial Ports**: 1 x RS-232 with DB9 (RTS,CTS,TX,RX)
- **LAN**: 3 x RS-485 with Terminal Block connector, Automatic RS-485 data flow
- **LAN**: 2 x 10/100Base-T RJ-45 ports
- **USB Port**: 1 x USB, OpenHCI, Rev. 1.1 compliant

**Ordering Information**
- **ECU-1911-AE**: Xscale @ PXA-270 520 MHz RTU with 8-ch 16-bit Analog Input, 32-ch Digital Input, and 32-ch Digital Output
IEC 61850-3 Certified PAC with Marvel XScale® CPU

**APAX-5522PELX/CE**

**Features**
- IEC 61850-3 and IEE-1613 certified for substation automation application
- XScale PXA270 520 MHz processor
- Wide temperature support (-20 – 70°C)
- Supports up to 32 APAX I/O modules
- Time-stamp function support
- WinCE/Linux OS support
- 2 x LAN ports support
- 2 x RS-232 ports support (DCD, RTS, RX, TX, GND)
- AutomationX aX5 SW support

**Introduction**
IEC 61850-3 standards specify a number of "hardened" characteristics that network products should meet to withstand the potentially electromagnetically harsh substation environment: such as immunity to electrical surge, electrostatic discharges and other phenomena that would cause non-hardened devices to fail. The APAX-5000PE series modules are IEC 61850-3 compliant and can be used in power & energy applications e.g. smart substation for good protection features and also support automationX aX5 software.

**Specifications**

**General**
- **Certification** CE, FCC class A
- Dielectric Strength and Impulse Tests: IEC60255-5-2000
- EMI: Electronic Discharge: IEC 61000-4-2:2001, 10 V/m
- Surge Immunity: IEC 61000-4-5:2001, 2kV line to line, 4kV line to earth
- Conducted RF Immunity: IEC 61000-4-8:2001, 1000 A/m @ 100kHz and 100 A/m for 1 minute
- DDFM: IEC 61000-4-10:2001, 30 A/m @ 100kHz and 1 MHz
- EMI Emissions: EN 55011: 2002, Class A

- **Dimension (W x H x D)** 30 x 139 x 100 mm
- **Enclosure** ABS+PC
- **Weight** 180 g
- **Connectors** DB-9
- **Power Consumption** 2 W @ 5 VDC (typical)

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

**Software**
- **OS Support** Linux Kernel 2.6 & WinCE 5.0
- **Control Software** VS .Net Library/ automationX aX5 runtime

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

**Communication (Ethernet)**
- **LAN** 2 x RJ-45 Port, 10/100 Mbps

**Communication (Serial)**
- **Medium** 2 x Isolated RS-232 (GND, TxD, RxD, RTS, DCD)

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

**Ordering Information**
- **APAX-5522PELX** IEC 61850-3 Compliant PAC with Marvel XScale CPU, Linux
- **APAX-5522PECE** IEC 61850-3 Compliant PAC with Marvel XScale CPU, WinCE
- **APAX-5002L** 2-slot Backplane Module

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

#### General
- **Certification**: CE, FCC class A, IEC 60255-5:2000 EMC Immunity, Radiated RF Immunity: IEC 61000-4-2001, 10 V/m, IEEE C37.90-2-1995, 30 V/m (no load, 300 operations/min)
- **Environment**: Operating Temperature: -20 ~ 70°C (-4 ~ 158°F), Storage Temperature: -40 ~ 85°C
- **Relative Humidity**: 5 ~ 95% (non-condensing)

#### Protection
- **Input Impedance**: +500 V, ±20 mA, 0 ~ 20 mA, 4 ~ 20 mA
- **Resolution**: 15-bit with accuracy ±0.1% or better of Full Scale Range (Voltage)
- **Power Consumption**: 2 W @ 24 V DC ( Typical)
- **Power Supply**: +50 V, ±20 mA, 0 ~ 20 mA, 4 ~ 20 mA
- **Over Voltage Protection**: Note: for current mode, customers should add external resistance

#### Ordering Information
- **APAX-5017PE**: IEC 61850-3 Certified 12-ch Analog Input Module
- **APAX-5040PE**: IEC 61850-3 Certified 24-ch Digital Input Module
- **APAX-5060PE**: IEC 61850-3 Certified 12-ch Relay Output Module

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### Specifications

#### General
- **Certification**: CE, FCC class A
- **Enclosure**: ABS-PC
- **Weight**: 160 g
- **Power Consumption**: 2 W @ 24 V DC ( Typical)
- **Status Display**: LED per channel
- **Operating Temperature**: -40 ~ 85°C
- **Relative Humidity**: 5 ~ 95% (non-condensing)

#### Digital Input
- **Channels**: 24
- **Points per Common**: 12
- **Type**: Sink or Source Load
- **Input Voltage**: Rated Voltage: 24 V DC
  - For "1" signal: 5 ~ 5 V DC
  - For "0" signal: -5 ~ 5 V DC
- **Input Impedance**: 10 kΩ
- **Input Delay**: From logic level 0 to 1: 0.2 ms; From logic level 1 to 0: 0.2 ms
- **Operating Frequency**: 3 kHz
- **Input Filter**: 3 ms

#### Protection
- **2,500 Vdc Isolation Between Channels and Backplane**: Over Voltage Protection

#### Environment
- **Operating Temperature**: -20 ~ 70°C (-4 ~ 158°F)
- **Storage Temperature**: -40 ~ 85°C
- **Relative Humidity**: 5 ~ 95% (non-condensing)

#### Ordering Information
- **APAX-5040PE**: IEC 61850-3 Certified 24-ch Digital Input Module
- **APAX-5002L**: 2-slot Backplane Module
DMU-3010

8-ch AI, 8-ch DI, 4-ch DO Ethernet I/O Module

Introduction

DMU-3010 is an Ethernet I/O module that supports the Modbus TCP protocol, and delivers various onboard I/Os including analog input, digital input, and digital output, providing flexible options to satisfy versatile application requirements. It also features the powerful Advantech Domain Focused Configuration Tool for engineers to quickly develop their applications.

Specifications

General
- **Dimension (W x H x D)**: 120 x 120 x 44 mm (4.72" x 4.72" x 1.73")
- **LAN**: 10/100Base-T
- **Connector**: 1 x RJ-45 (LAN), 4 x Plug-in screw terminal block (I/O & Power)
- **Watchdog**: System (1.6 sec)
- **Supported Protocols**: Modbus/TCP
- **Power Input**: 10 ~ 30 VDC
- **Power Consumption**: 3 W @ 24 VDC

Analog Input
- **Channels**: 8
- **Input Type**: V, mA*1, RTD*2
- **Voltage Range**: 0 – 10 V
- **Current Range**: 0 – 20 mA, 4 – 20 mA
- **RTD Type**: Pt 100 (3-wire): -50 ~ 150°C, 0 ~ 100°C, 0 ~ 200°C, 0 ~ 400°C, -50 ~ 200°C, Pt 1000 (3-wire): -40 ~ 160°C
- **Input Impedance**: 2 MΩ (voltage)
- **Accuracy**: ±0.1% (voltage); ±0.2% (current); ±0.5°C (RTD); or Better
- **Span Drift**: ±25 ppm/°C
- **Zero Drift**: ±5 μV/°C
- **Resolution**: 16-bit
- **Sampling Rate**: 10 samples/second
- **CMR @ 50/60 Hz**: 90 dB
- **NMR @ 50/60 Hz**: 60 dB
- **Over Voltage Protection**: ±35 VDC
- **Built-in TVS/ESD Protection**: ±35 VDC
- **Isolation Protection**: 2500 VDC

Digital Input
- **Channels**: 8
- **Dry Contact**: Logic level 0: Open, Logic level 1: Close to Ground
- **Supports 200 Hz pulse/accumulator input**: Supports 200 Hz pulse/accumulator input
- **Isolation Protection**: 2500 VDC

Digital Output
- **Channels**: 4
- **Open Collector to 30V**: 30 mA max load.
- **Power Dissipation**: 300 mW for each channel
- **PWM Period**: 20 ms ~ 3600 sec
- **PWM Minimum Duty On**: 2 ms
- **Isolation Protection**: 2500 VDC

Environment
- **Humidity**: 5 ~ 95% RH
- **Operation Temperature**: -40 ~ 70°C (-40 ~ 158°F)
- **Storage Temperature**: -40 ~ 70°C (-40 ~ 158°F)

Ordering Information
- **DMU-3010-AE**: 8-ch AI, 8-ch DI, 4-ch DO Ethernet I/O Module