

## Why Choose Advantech for Your Solar Energy System?



Industrial grade products at a competitive cost



Strict revision control and design reliability



Global logistics and RMA services with local support



Product warranty up to 2-5 years and superior service options



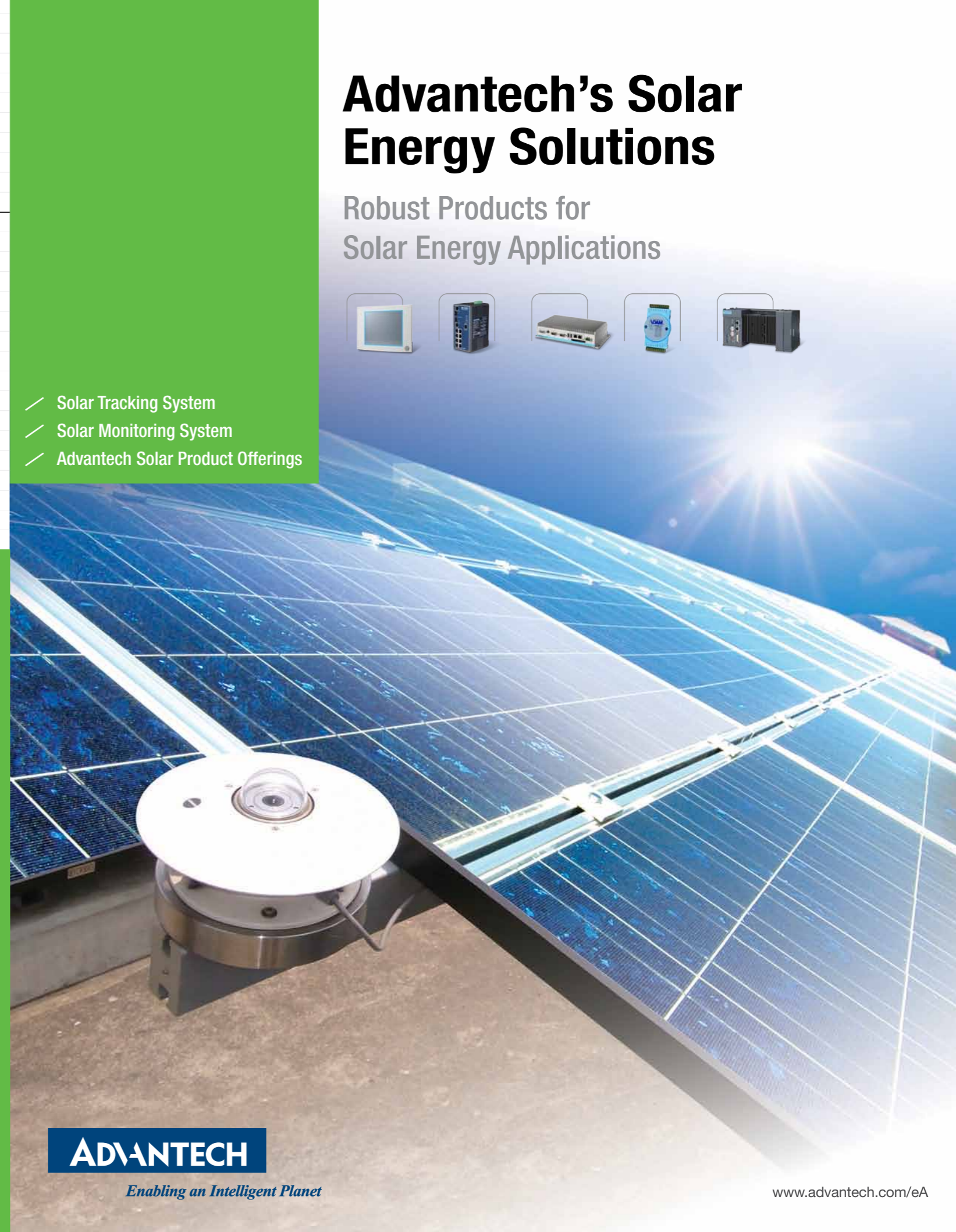
Partnerships with multiple respected software companies

# Advantech's Solar Energy Solutions

### Robust Products for Solar Energy Applications



- ✓ Solar Tracking System
- ✓ Solar Monitoring System
- ✓ Advantech Solar Product Offerings



# ADVANTECH

Enabling an Intelligent Planet

[www.advantech.com/eA](http://www.advantech.com/eA)

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Enabling an Intelligent Planet

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## Overview

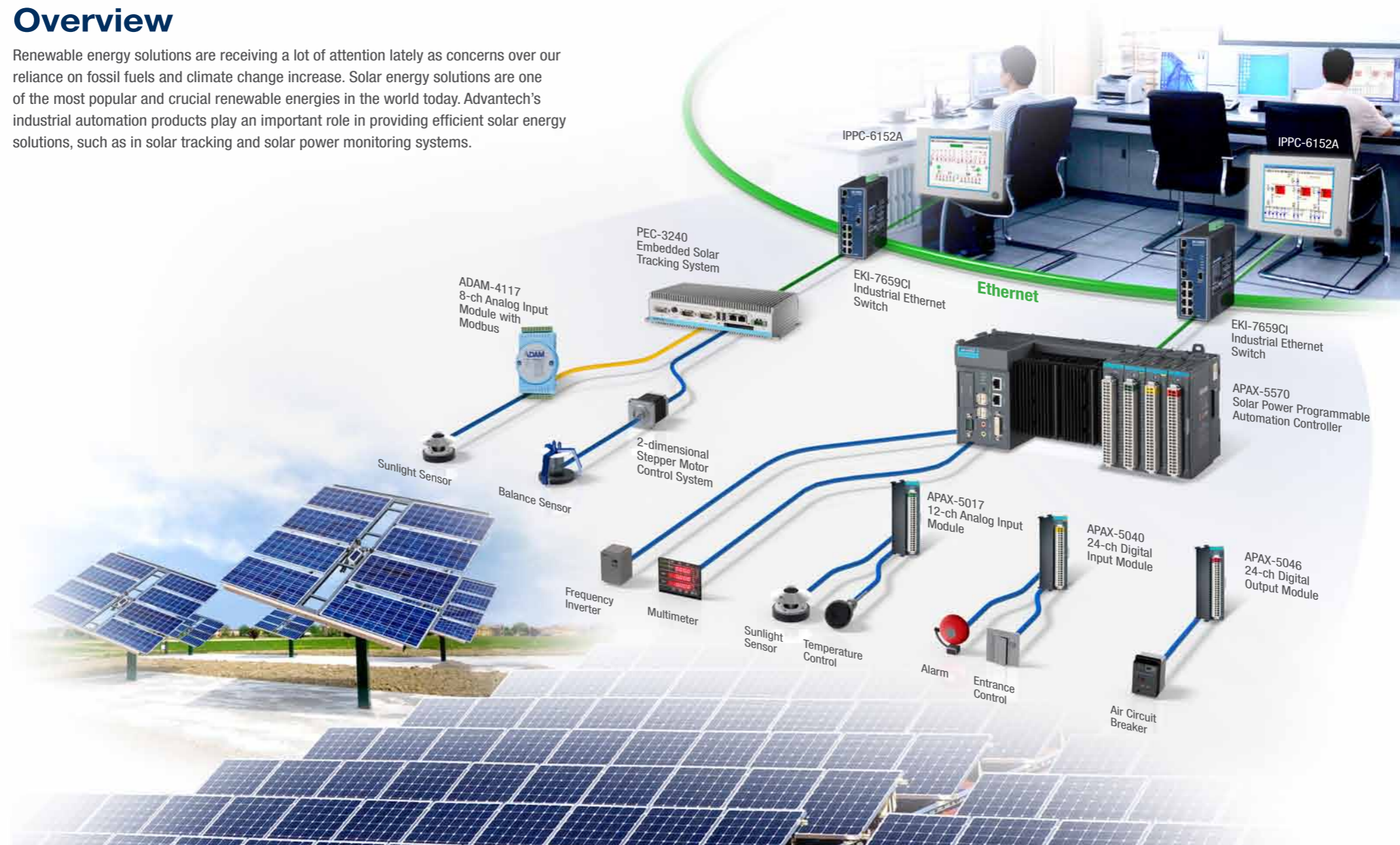
Renewable energy solutions are receiving a lot of attention lately as concerns over our reliance on fossil fuels and climate change increase. Solar energy solutions are one of the most popular and crucial renewable energies in the world today. Advantech's industrial automation products play an important role in providing efficient solar energy solutions, such as in solar tracking and solar power monitoring systems.

### Solar Tracking System

Solar energy is not available 24 hours a day; thus, 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 constantly adjust the solar cells.

### Advantech's Solar Tracking Solution

In Advantech's solar tracking solution, the ADAM-4117 measures the input voltage signals from the sunlight transmitters to detect the direction of the strongest sunlight. The sunlight information is then sent to the PEC-3240, an Intel Celeron M Embedded Motion Controller, which can control the stepper motors of the sun tracking system and easily adjust the solar plates to the correct direction of the strongest sunlight. If two transmitters detect different sunlight strengths, the PEC-3240 will calculate the sunlight strength difference to adjust the stepper motors and find the optimal position of the solar cells. Combined with the ADAM-4117, the PEC-3240 with 4-axis motion control and 32-channel isolated digital I/O enables the solar tracking systems to continuously track the relative data and optimize the efficiency of solar cell modules.



### Solar Power Monitoring System

In order to effectively collect and analyze the accurate sunlight and power generation data, advanced solar power monitoring systems must have robust and compact controllers for power plant control inquiries. Fast sampling, recording and analysis of data such as sunlight strength, overall direct current power, average energy conversion efficiency of solar cell modules and power converters are also important. In addition, the systems must be able to efficiently perform remote configuration, troubleshooting, and maintenance as well.

### Advantech's Solar Monitoring Solution

In Advantech's solar power monitoring solution, Programmable Automation Controllers (PACs) serve as efficient power controllers due to their outstanding performance in metering, recording, control, storage, and remote maintenance functionalities. With its fast computing capacity, the APAX-5570 is used as the control host to oversee the DC to AC conversion process, analyze equipment efficiency, and detect the service life length of voltage converters. The APAX-5017, an analog input module, is used to collect weather and sunlight information and the APAX-5040, a digital input module, is able to efficiently collect critical alarms, temperature sensors, thermal overshoot, IGBT over temperature, contactor, CT, MOV, and VAC sense circuits. The APAX-5046 acts as a digital output module to precisely control status of gas circuit breaker switching and power connection to the utility grid. The EKI-7659CI, a high-speed managed redundant Ethernet switch with wide operating temperature, provides excellent network communication and conveys important data to remote control rooms. Its fiber optic ports also build a high speed redundant network, which enables one switch to immediately take over data processing jobs and protect data loss in the breakdown of another switch. As well, the IPPC-6152A, a 15" XGA Industrial Panel PC, can be installed in remote control rooms to facilitate supervisory control of solar power generation.

## Product Offerings



#### IPPC-6152A

- 15" XGA TFT LCD Core™ 2 Quad/Core™ 2 Duo Industrial Panel PC with 2 x PCIe Slots
- Intel Core 2 Quad / Core 2 Duo CPU
  - Dual channel DDR3 SDRAM up to 4GB system memory
  - Dual Gigabit Ethernet with Intel vPro out-of-band management technology
  - Supports 2 x 2.5" SATA HDDs with RAID 0/1 compatibility and 2 PCIe expansion slots for PCIe add-on cards

#### Ordering Information

IPPC-6152A-R0AE / IPPC-6152A-R1AE



#### EKI-7659CI

8+2G Combo Port Gigabit Managed Redundant Industrial Ethernet Switch

- 2 Gigabit Copper/SFP combo ports, plus 8 fast Ethernet ports
- SFP socket for easy and flexible fiber expansion
- Redundancy: Gigabit X-Ring (ultra high-speed recovery time < 10ms), RSTP/STP (802.1w/1D)
- Control: VLAN/GVRP, QoS, IGMP Snooping/Query, LACP, Rate Limit

#### Ordering Information

EKI-7659CI-AE



#### PEC-3240

Intel® Celeron® M 1.0 GHz 4-axis Embedded Motion Controller with 32-ch Digital I/O

- 2 x RS-232 ports, 2 x 10/100Base-T RJ-45 ports
- 2 x USB ports (one with lockable cable mechanism)
- Windows® XP Embedded SP2 ready solution
- Independent 4-axis motion control
- 16-ch isolated digital input and 16-ch isolated digital output

#### Ordering Information

PEC-3240-AE



#### APAX-5570/APAX-5571

PAC with Celeron® M 1 GHz / 1.5 GHz CPU

- High performance CPU with high-speed interface and SD card storage
- DVI-I supports dual displays
- Dual power inputs for redundancy with power-fail relay
- C/C++, .NET and KW SoftLogic programming
- Built-in Modbus server to access connected APAX I/O

#### Ordering Information

APAX-5570-AE / APAX-5571-AE



#### APAX-5017

12-ch Analog Input Module

- Isolated voltage and current inputs including  $\pm 10$  V and 4~20 mA
- Each channel with different input type and range
- Common mode voltage up to 200 V<sub>DC</sub>
- 2500 V<sub>DC</sub> over voltage protection
- Input characteristic curve according to IEC 61131, type 1

#### Ordering Information

ADAM-5017P-AE



#### APAX-5040

24-ch Digital Input Module

- Isolated DI channels (sink and source type, 24 V<sub>DC</sub> rated voltage range)
- $\pm 70$  V<sub>DC</sub> over voltage protection
- Input characteristic curve according to IEC 61131, type 1
- Indicates each DI channel status by LED

#### Ordering Information

APAX-5040-AE



#### APAX-5046

24-ch Digital Output Module

- Isolated DO channels (sink and source type, 24 V<sub>DC</sub> rated voltage range)
- Voltage Range: 8 ~ 35 V<sub>DC</sub>
- Short circuit protection and thermal shutdown protection
- Indicates each DI channel status by LED

#### Ordering Information

APAX-5046-AE



#### ADAM-4117

Robust 8-ch Analog Input Module with Modbus

- 8 differential and independent configuration channels
- Wide operating temperature -40 ~ 85°C
- Supports Modbus/RTU protocol
- High common mode voltage 200 V<sub>DC</sub>
- 1 kV surge, 3 kV EFT, and 8 kV ESD protection

#### Ordering Information

ADAM-4117-AE