

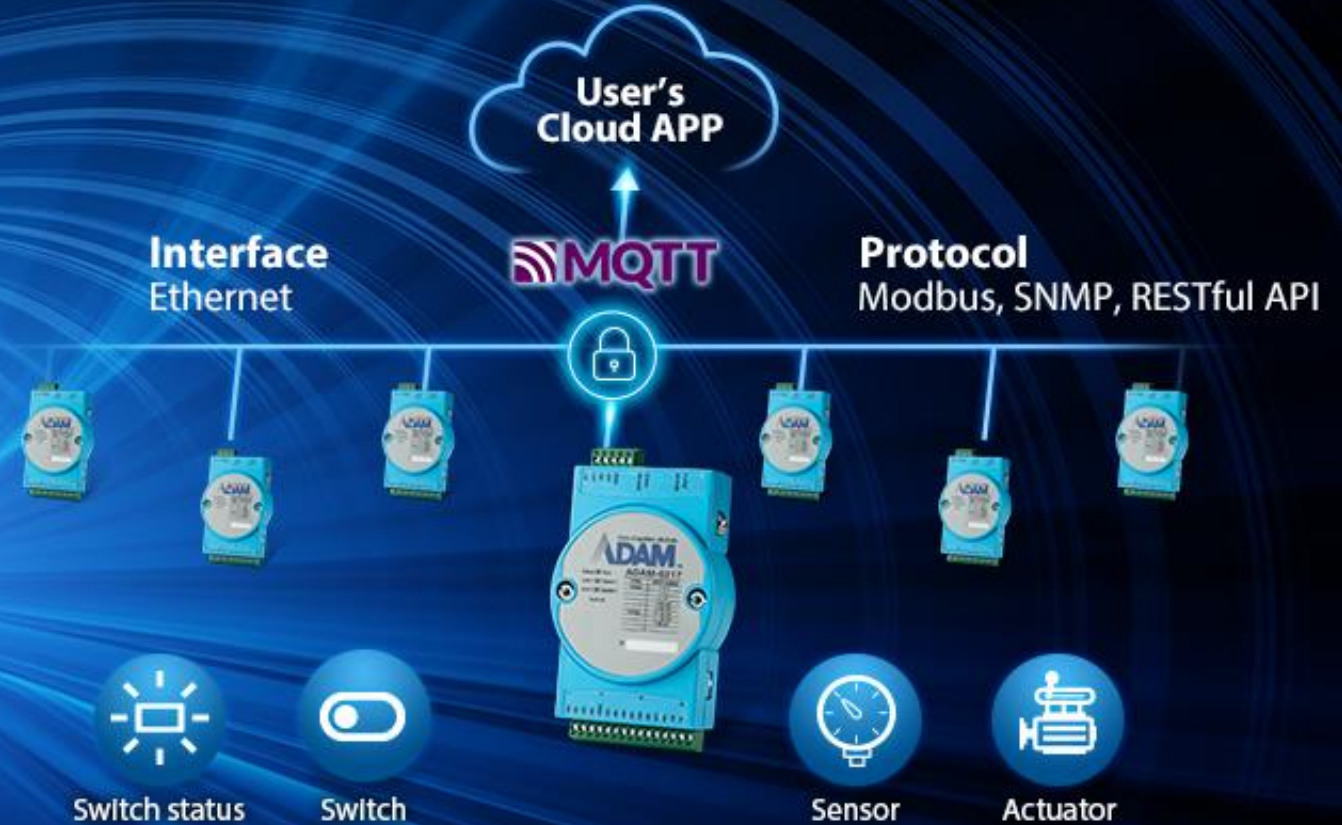
**ADVANTECH**

*Enabling an Intelligent Planet*

## Secured Cloud I/O: ADAM-6000/6200 Series E-brochure

- New Cloud I/O Features
- Cloud I/O Target Applications
- Ethernet I/O Fundamental Features
- Case Studies
- Product Selection Guide

**Smart. Flexible. IoT-enabled.**



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# ADAM Remote I/O Overview

AVEVA

WebAccess

Azure

aws

Ignition

WinCC®

Web Service

RESTful API

OPC UA

MQTT

SNMP

RS-485 I/O

RS-485/USB I/O

Ethernet I/O

OPC UA I/O

Modular I/O

Robust &amp; EMC Level 4

Daisy Chain



ADAM-4000



ADAM-4100



ADAM-6000



ADAM-6200



ADAM-6300

ADAM-5000 4/8 Slots  
Modular I/O

Modbus RTU

Modbus TCP

OPC UA

Modbus RTU / TCP



# Complete Remote I/O Portfolio with 40 Years of History



## Expanding in Size, Yet Increasing in Management Complexity

- ❑ Growing digitalization and monitoring of distributed assets
- ❑ Increasing maintenance costs and operational complexity

## Pain Points & Challenges



### High Volume

- ❑ Difficult to manually deploy data
- ❑ Challenging to manage large amounts of data



### Highly Distributed

- ❑ Large territories, inaccessible or dangerous locations
- ❑ High maintenance service costs

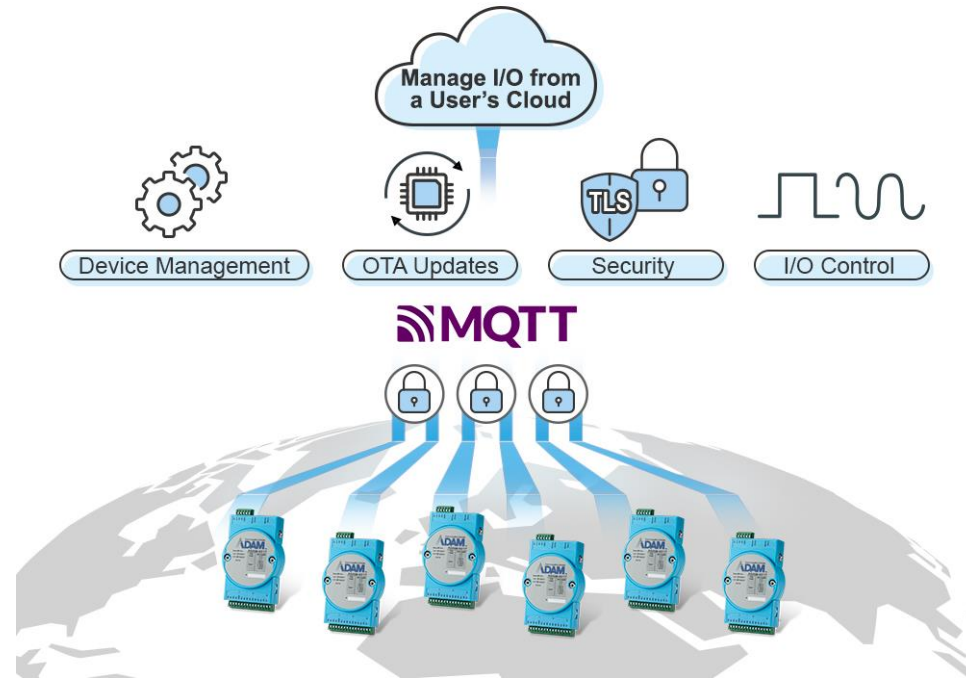


### High Maintenance Cost

- ❑ Not enough technicians on site
- ❑ Difficult to upgrade
- ❑ Security issues and cyber attacks

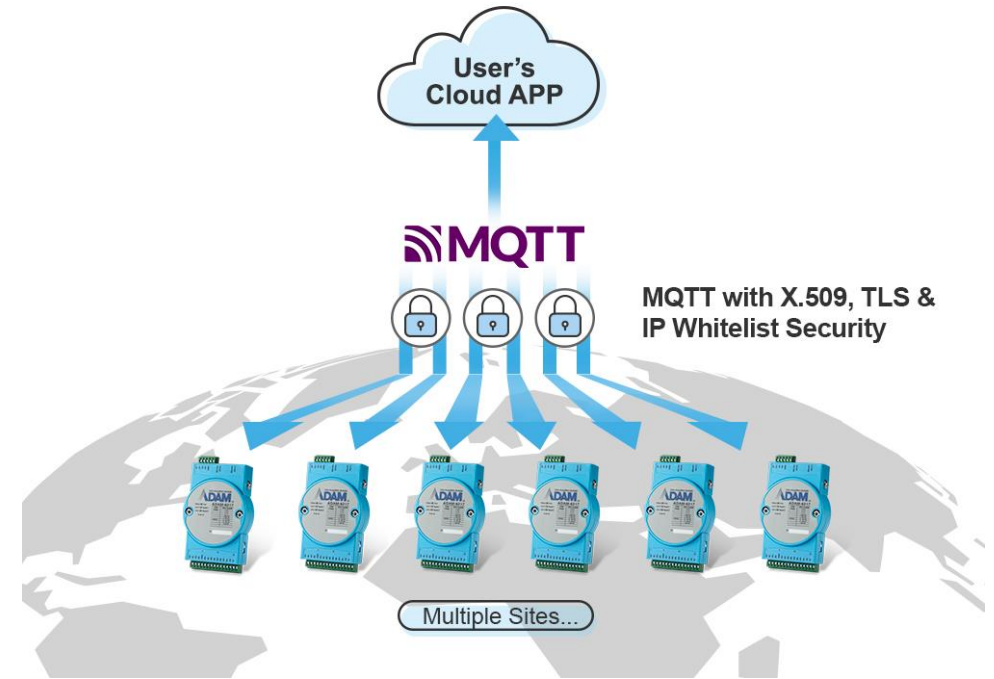
# New Cloud I/O Features

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## Cloud-based Device Management Solutions for High Density & Highly Distributed Assets

- Innovative ADAM Cloud I/O offers device management, OTA updates, security and device monitoring functions
  - ❑ Device management: UUID, networking setting, I/O channel configuration
  - ❑ OTA updates: firmware, certificate and configuration mass deployment
  - ❑ Security: TLS, X.509 certificate, cipher suites, IP whitelisting, protocol disabled
  - ❑ I/O control: digital I/O on/off, analog I/O read/write, I/O value periodically updated, alarm notification
- Benefits:
  - ❑ Improve overall equipment effectiveness (OEE)
  - ❑ Minimize downtime and maintenance cost
  - ❑ Expand device lifespan and maximize asset performance



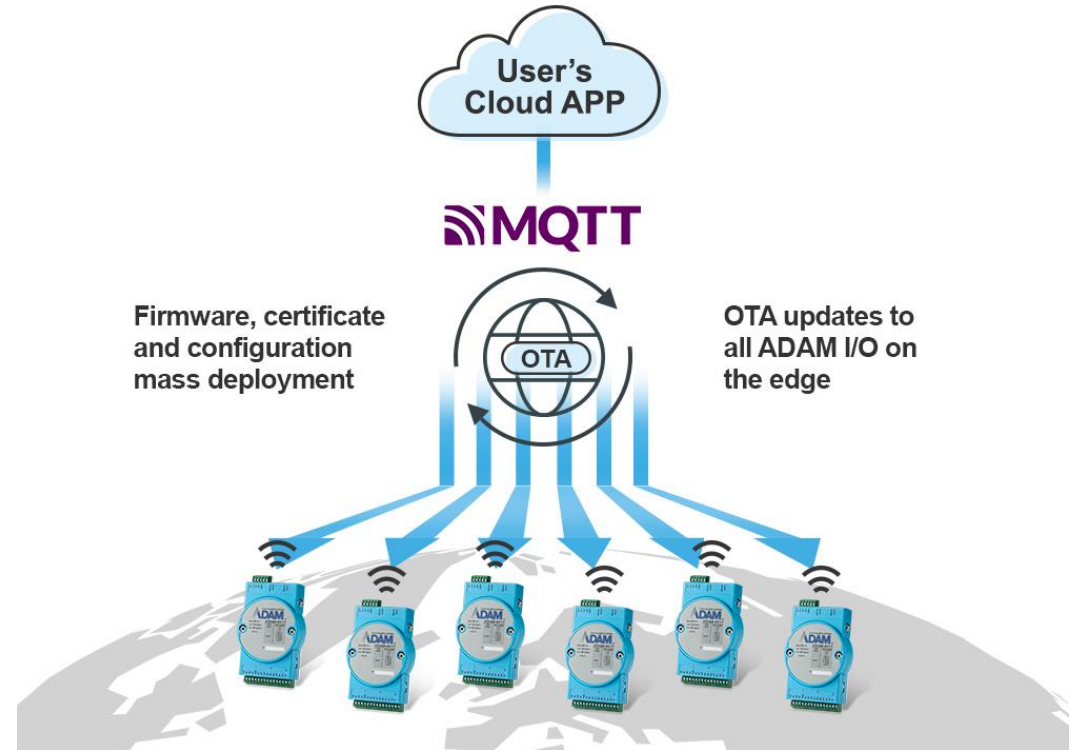
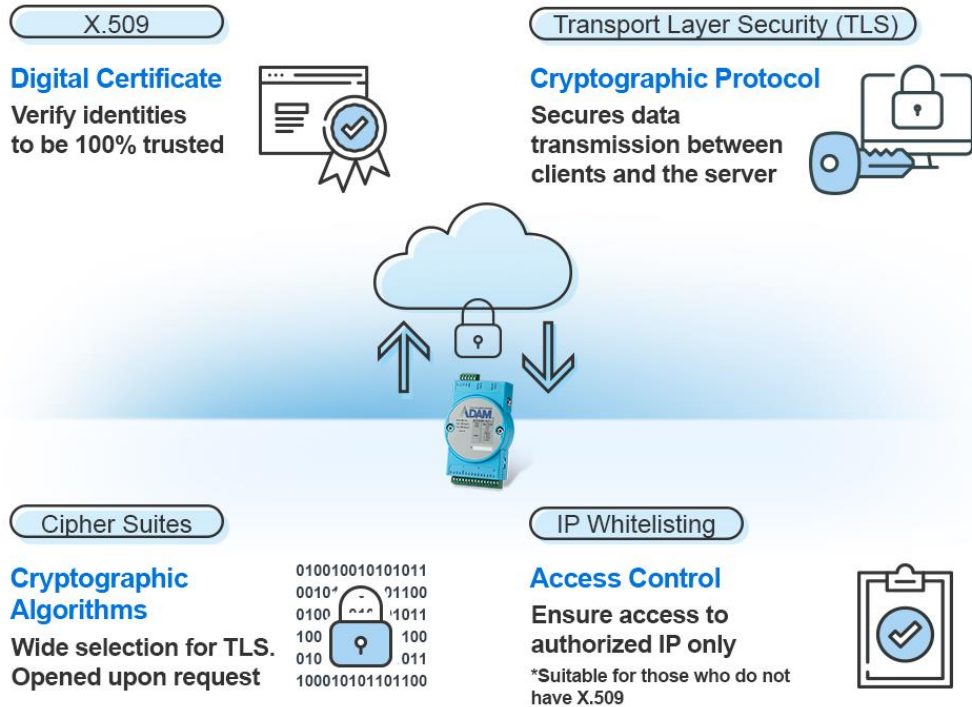
## Remote I/O Control: Direct Cloud-Based I/O Management

- Integrate all utility functions into the Cloud APP through MQTT
- Simultaneously manage ADAM I/O at multiple sites from the cloud
- Quick deployment for hard-to-reach and widespread locations



# New Cloud I/O Features

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## Safeguard Your Security from I/O to the Cloud

- Benefit from four security methods through MQTT to ensure data transmission security: X.509, TLS, Cipher Suites, IP Whitelisting

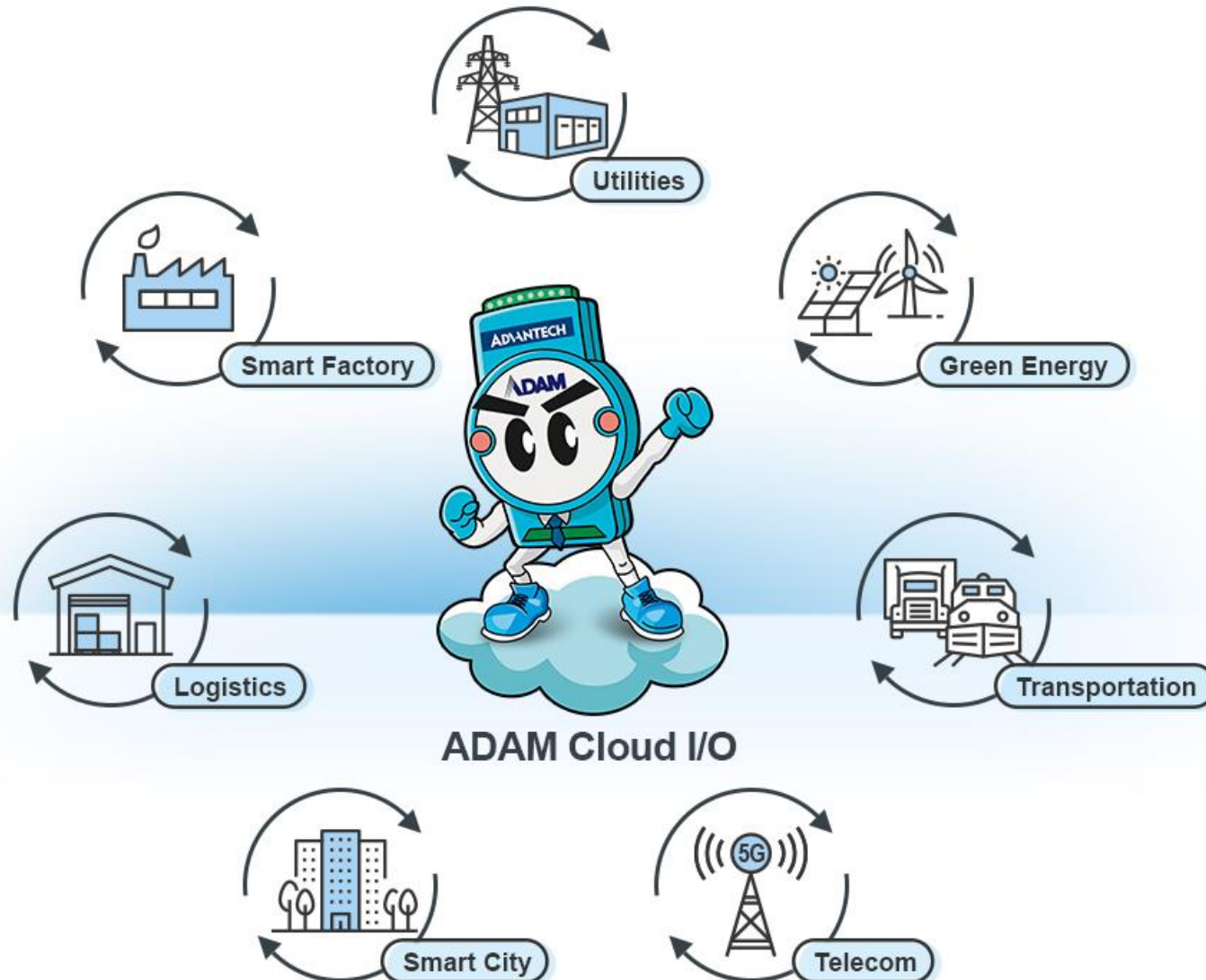
## Over-The-Air (OTA) Updates

- OTA updates for firmware, certificates, and configuration mass deployment
- Update all devices or specific modules at one time
- Reduce overheads by fixing issues remotely and streamline operations via batch updates

# Cloud I/O Target Applications

## Cloud I/O Design for OT and IT Users across Industries

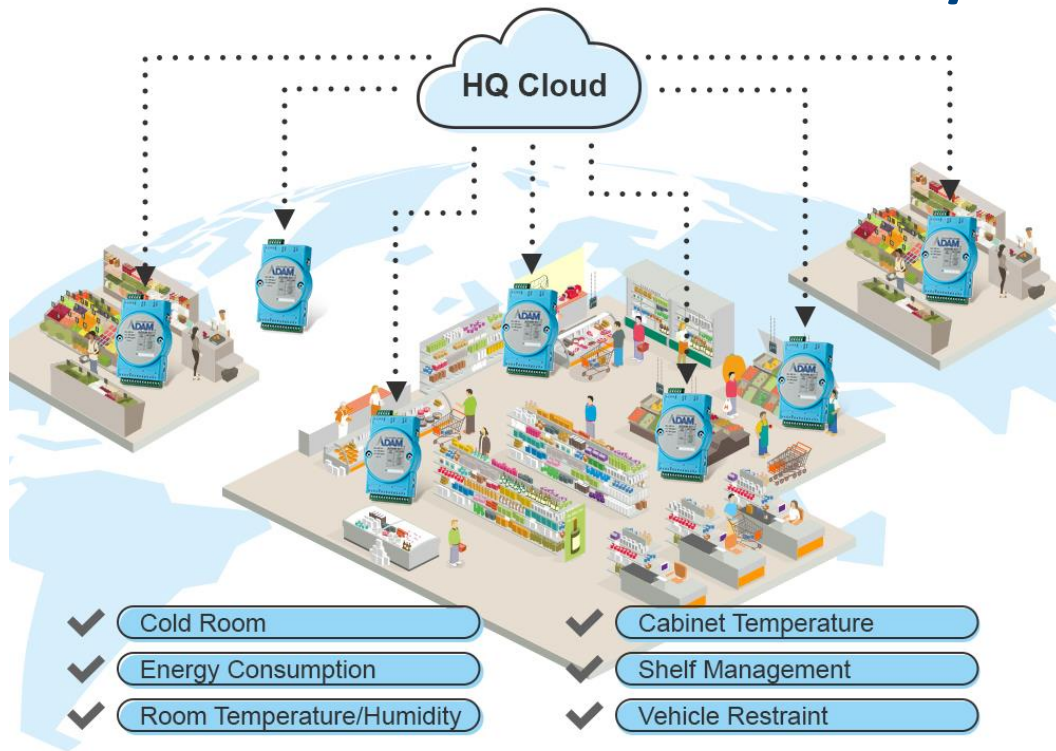
- Easily manage widespread assets across diverse applications





# Cloud I/O Target Applications

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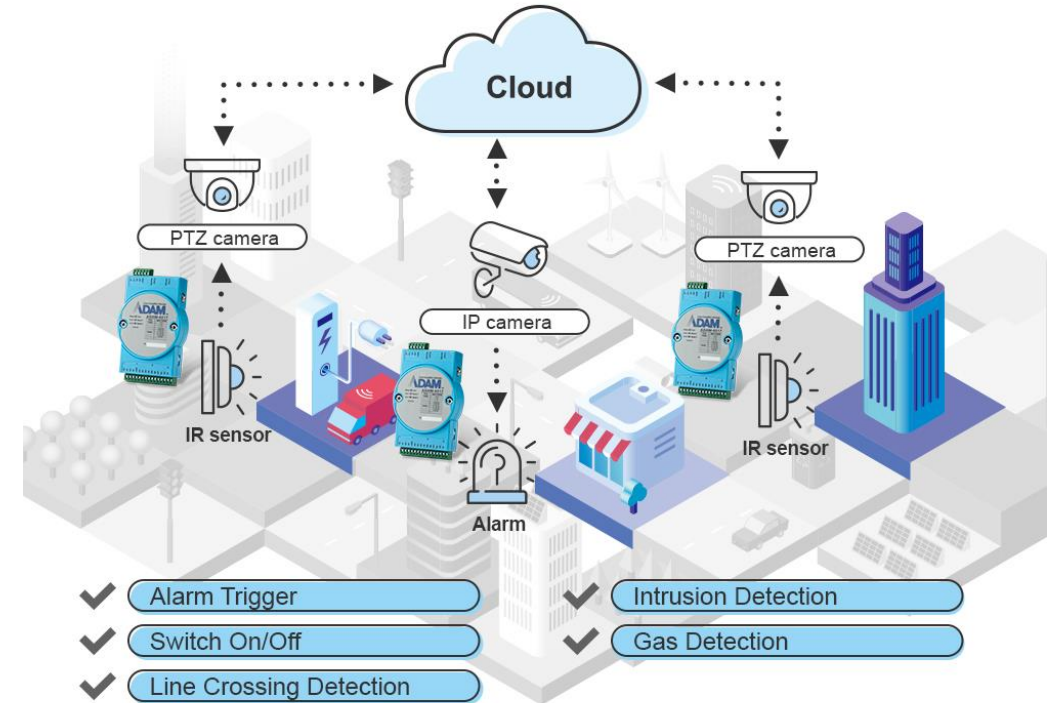
## Hyper Market Key Asset Management: Reduce On-site Service Effort & Downtime Across Global Stores

### Demand

- Monitoring for goods and operations safety
- Minimize on-site service for global locations

### Solution

- Stable remote access 24/7
- Manage devices from the HQ cloud



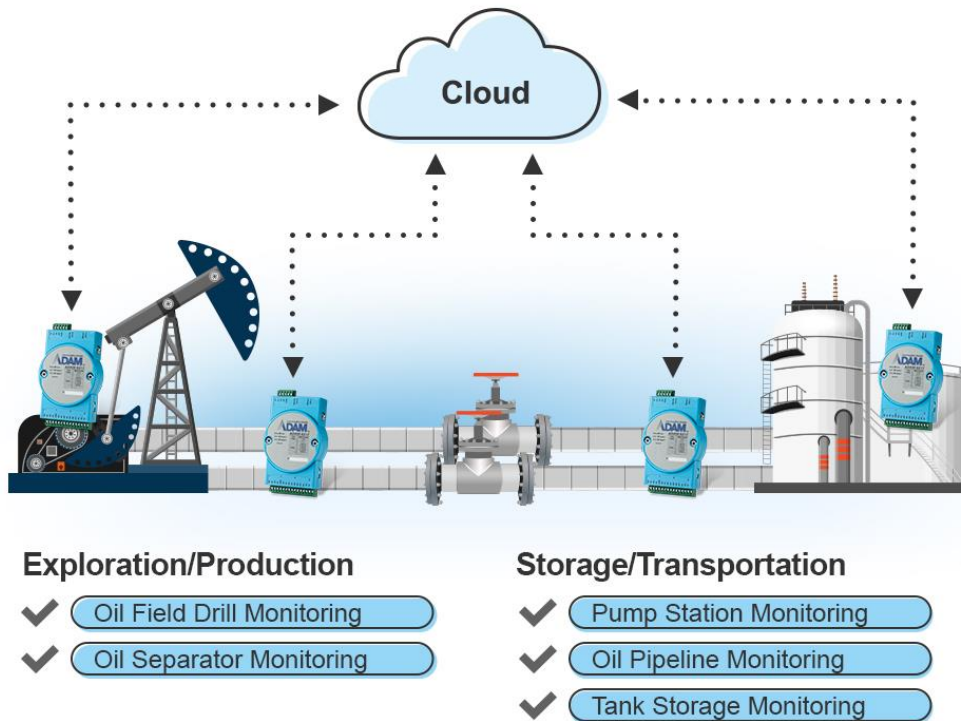
## Cloud Video Surveillance & I/O Control: Network integration, Cyber Security, Remote Maintenance

### Demand

- Alarm triggers for different events
- Easy global device configuration & maintenance
- Secure and safe data exchange

### Solution

- Rich I/O for large distributed cloud surveillance systems
- Unlimited distance access using MQTT via Internet/Intranet
- Secured network by TLS with X.509



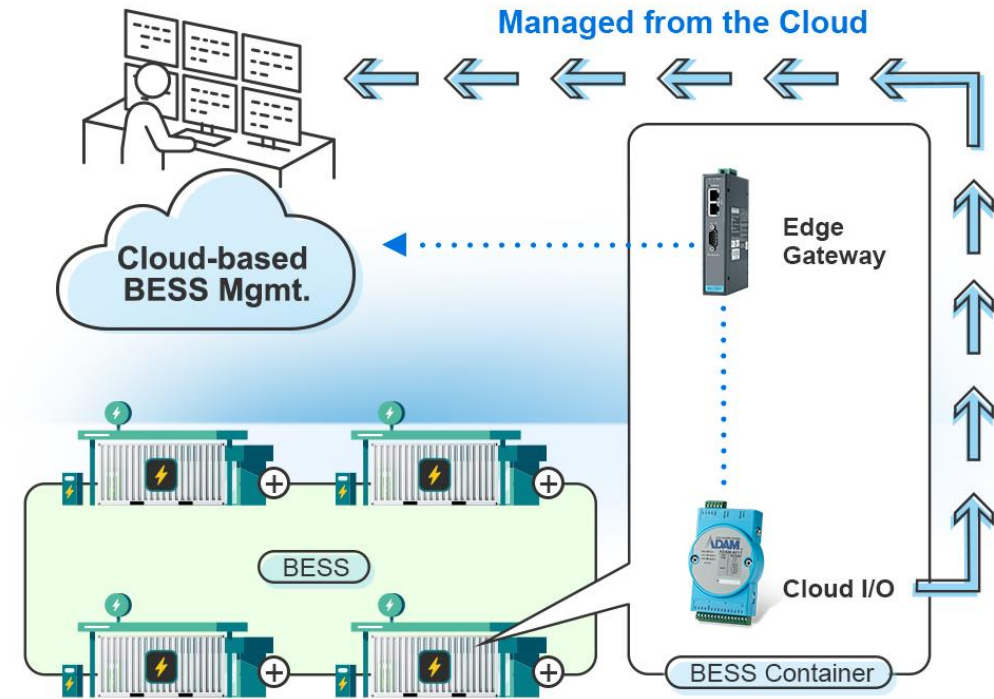
## Oil and Gas: Boost Efficiency, Safety, and Profitability

### Demand

- Reliable and secured monitoring for geographically dispersed assets
- Personal safety in hazardous environments
- Explosion proof for operations using flammable substances

### Solution

- TLS with X.509 ensures secured networks
- Easy and quick mass deployment using MQTT to reduce on-site service
- Class 1, division 2 (C1D2) certification



## Cloud-based BESS Management: Reduce Maintenance Effort for High Volume BESS Containers

### Demand

- Large scale device management
- Reliable and secure communication
- Low on-site service in hard-to-reach areas

### Solution

- Effective MQTT-based management
- TLS with X.509 ensures secured networks
- Hassle-free remote access and OTA

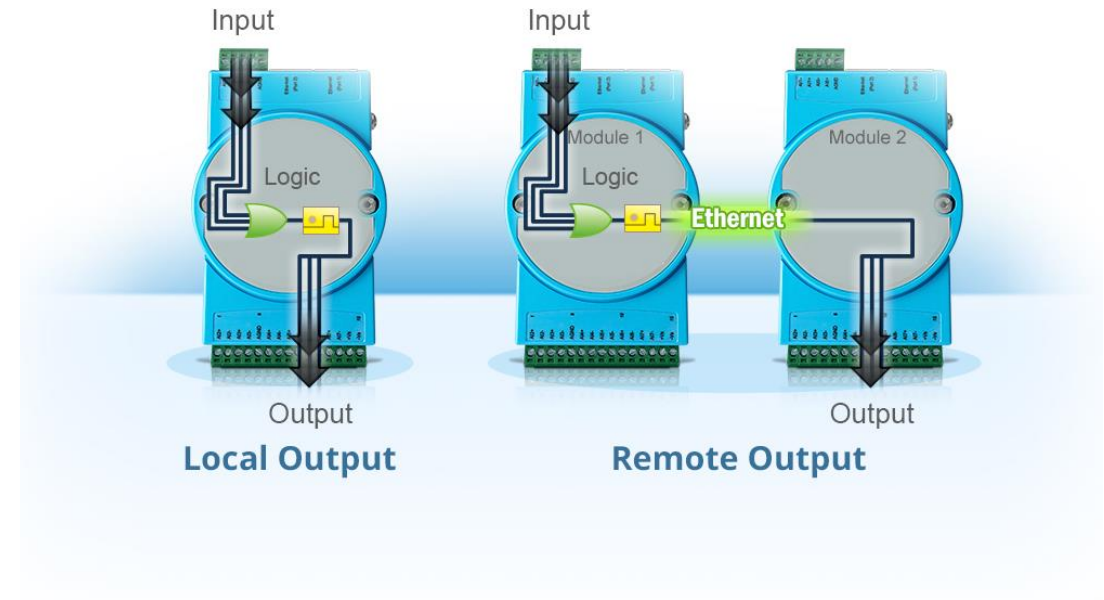
# ADAM-6000/6200 Ethernet I/O Fundamental Features

11



## Peer-to-Peer (P2P) Connection

- Easy channel mapping from different I/O modules without extra programming effort or additional controllers
- Utilizes Peer-to-Peer modules, just configure settings through ADAM.NET utility



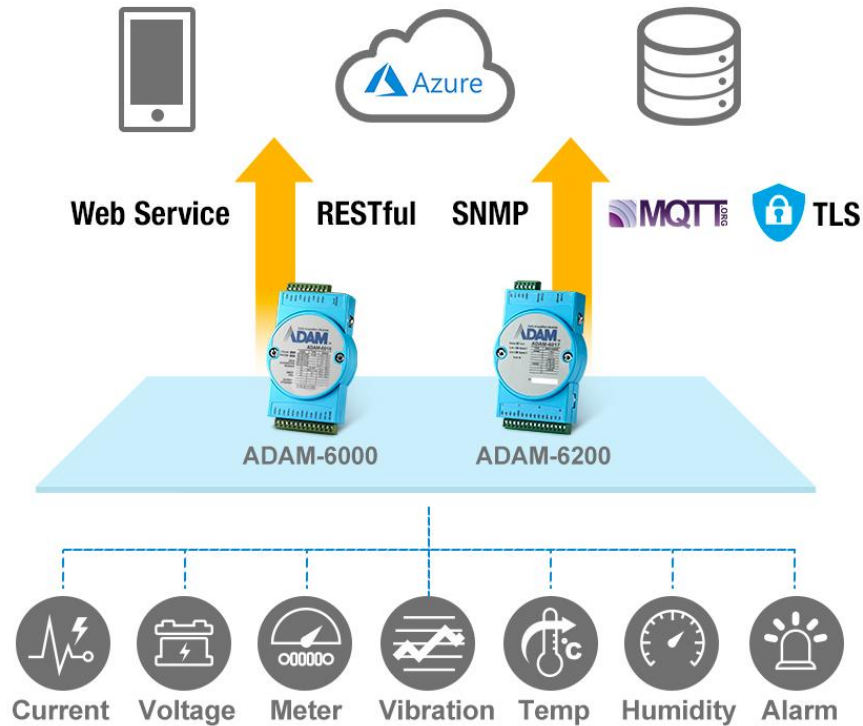
## Graphic Condition Logic (GCL)

- GCL function is built in ADAM-6000/6200 modules for users to easily set up logic rules in any application
- User defined logic rules through graphical configuration environment in ADAM.NET Utility
- No additional controllers or programming is needed



# ADAM-6000/6200 Ethernet I/O Fundamental Features

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## Easy Communication with Multiple IoT Protocols: MQTT, SNMP, RESTful, TLS

- Cloud: supports Azure IoT Hub
- MQTT:
  - ❑ Actively publish MQTT message with user defined interval
  - ❑ Shortens downtime with alarm event notification
- SNMP: simple way to monitor I/O data on Network Management System



## Flexible Deployment with Daisy Chain Networking and Auto-Bypass Protection

Daisy chain connectivity offers flexible cabling and space saving capabilities. With Ethernet auto-bypass function supported to prevent accidental power failures if one of the modules unexpectedly shuts down.

# Building a Connected IoT Infrastructure to Achieve Battery Energy Storage System (BESS) Efficiency

## Case Study | Environment Control for BESS



### Overview

BESS helps store excess energy from renewable sources like solar and wind power, enabling peak shaving, load shifting, and smart energy management. A leading energy storage system provider in the United States utilized Advantech solutions to integrate IoT technologies into BESS, enhancing efficiency and achieving balanced energy utilization

### Challenges / Requirements:

The BESS requires sustainable IoT solutions to prevent battery unit damage and optimize BESS performance, as well as delivering stable operating conditions for BESS by monitoring and controlling the ECS.

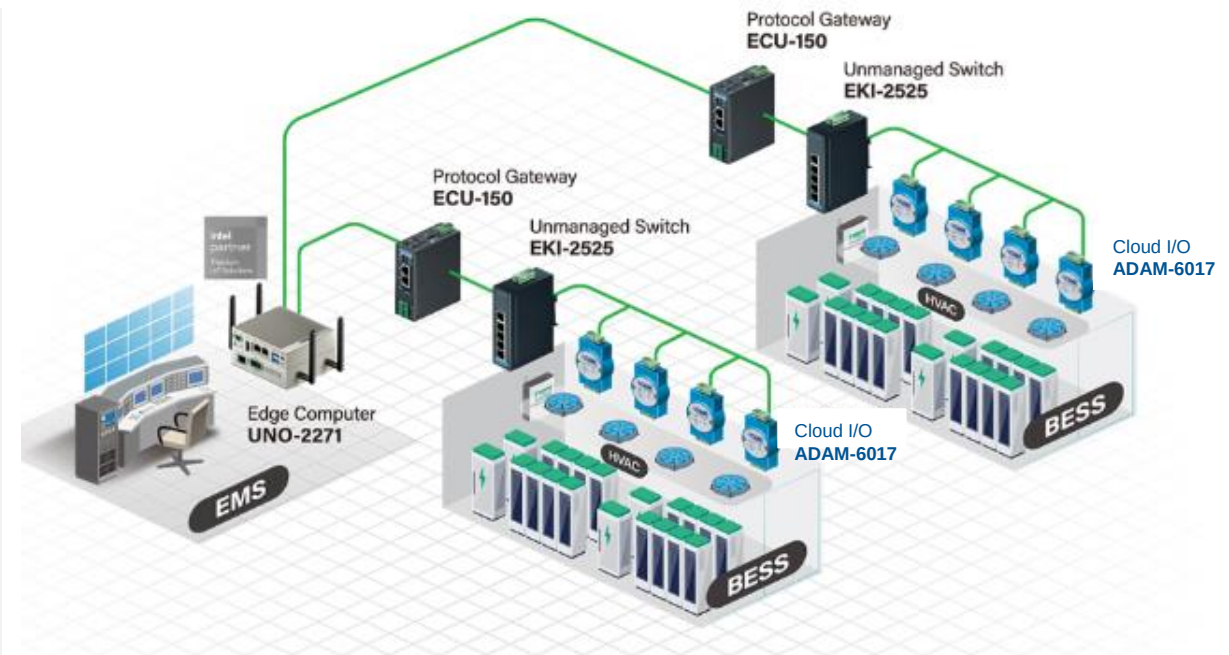
### Solutions:

HVAC systems play a crucial role in the ECS as it determines temperature control, humidity regulation, ventilation and alarms for BESS. To effectively control a HVAC system in BESS, we leveraged ADAM-6017 (alternatively can be ADAM-6200/6700 series) cloud I/O modules to handle I/O control processes and alarm/event notifications.

### Benefits:

ADAM-6017, equipped with new cloud I/O functions, is optimal for minimizing maintenance efforts in highly distributed BESS containers. Its MQTT-based cloud management feature, along with X.509, TLS, and IP whitelist security, combined with remote access and OTA capabilities, enables users to efficiently manage ADAM I/O across multiple sites from the cloud. This facilitates monitoring of HVAC status to ensure the performance and safety of grid-scale BESS.

## ADAM-6000/6200 Cloud-based BESS Management: Reduce Maintenance Effort for High Volume BESS Containers



# Commercial Solar System Health Management Solutions



**Location:**  
Nordics, Europe

**Company:**  
Large Retail Company

## Overview:

Due to the Ukraine-Russia conflict and global trends toward green energy, energy costs have become an important topic in Europe. For large corporations in Europe, installing additional commercial solar systems to generate electricity can not only offset utility bills but also create a side business by selling excess green energy to suppliers.

## Challenges / Requirements:

Our retailer customer has over 1000 commercial buildings in Europe that have installed solar systems, and each solar system in the respective building requires several sensors to read the signals. All the data will be monitored in the control room at the Nordic headquarters. Managing over 1000 sites remotely with minimal effort is the most challenging part.

## Solutions:

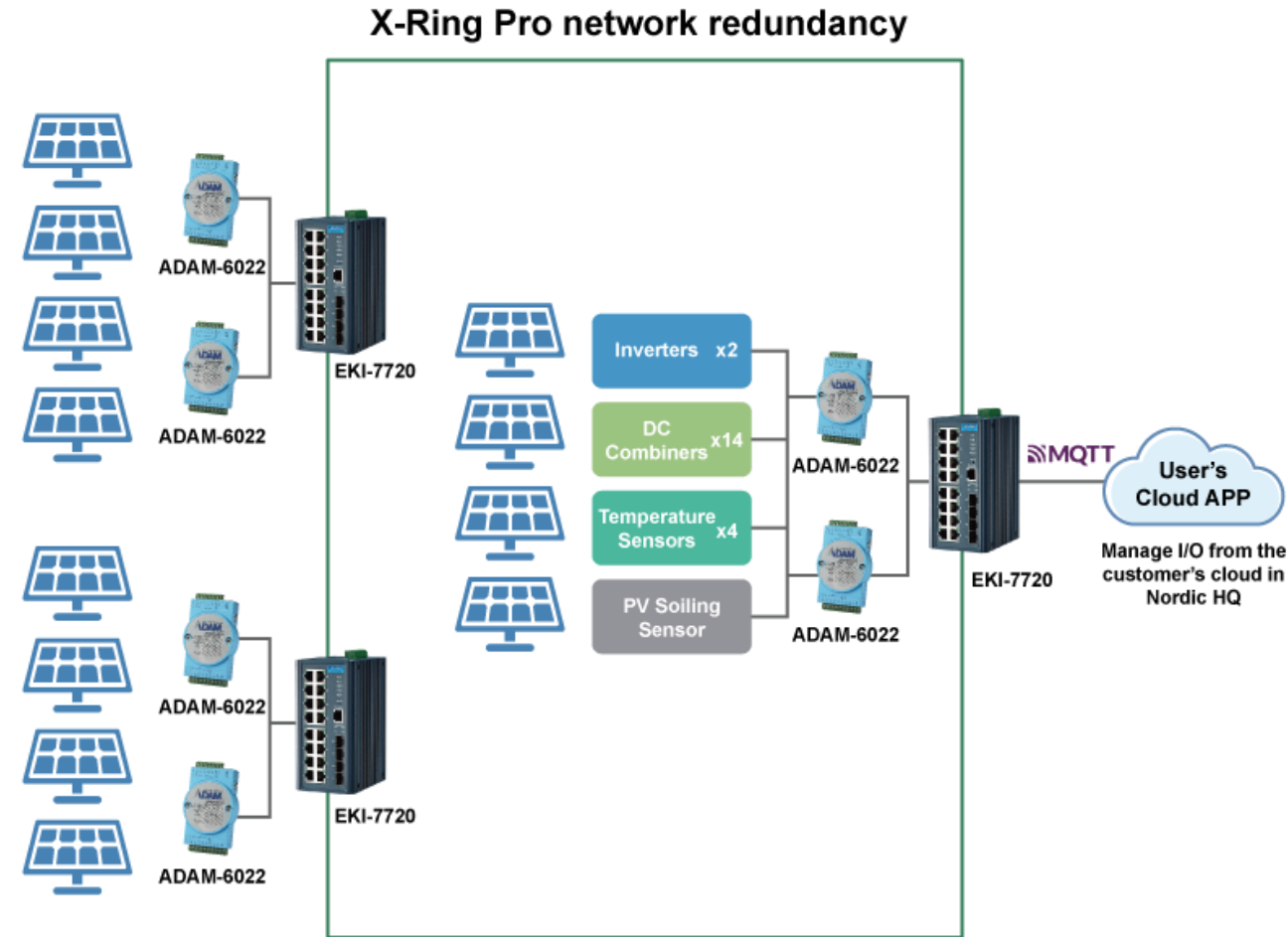
Advantech offers customized ADAM-6022 modules based on the customer's requirements:

- Optimal I/O: The module combines analog input (current and voltage), thermocouple (temperature), and digital I/O in a single unit.
- Quick deployment: It features standard secure Cloud I/O capabilities along with pre-configured factory settings for I/O parameters and IP addresses.

## Benefits:

In the past, the customer needed an additional gateway with protocol-converting software to allow the remote I/O modules to send data to the cloud platform. However, with the ADAM cloud I/O feature, the customer can reduce the cost of an extra gateway and still be capable of remotely managing the configuration process on remote I/O modules directly via the customer's cloud platform.

## ADAM-6000/6200 Cloud-based Energy Management





## Ethernet I/O Modules: ADAM-6000 Series

|                                  | ADAM<br>-6015                                                                                                       | ADAM<br>-6017 | ADAM<br>-6018+ | ADAM<br>-6024 | ADAM<br>-6050 | ADAM<br>-6052 | ADAM<br>-6060 | ADAM<br>-6066 |
|----------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------|----------------|---------------|---------------|---------------|---------------|---------------|
| Analog Input                     | 7 RTD                                                                                                               | 8             | 8 TC           | 6             |               |               |               |               |
| Analog Output                    |                                                                                                                     |               |                | 2             |               |               |               |               |
| Digital Input                    |                                                                                                                     |               |                | 2             | 12            | 8             | 6             | 6             |
| Digital Output                   |                                                                                                                     | 2             |                | 2             | 6             | 8             |               |               |
| Counter<br>(Shared with DI)      |                                                                                                                     |               |                |               | 12            | 8             | 6             | 6             |
| Relay                            |                                                                                                                     |               |                |               |               |               | 6             | 6             |
| Protocols                        | Modbus TCP, RESTful API, MQTT, SNMP,ASCII                                                                           |               |                |               |               |               |               |               |
| Software &<br>Fireware Functions | P2P, GCL, DHCP, Access control, Web Java runtime, Data streaming,<br>Group configuration, Web server, Azure IoT hub |               |                |               |               |               |               |               |
| Certification                    | C1D2, UL, CE, FCC                                                                                                   |               |                |               |               |               | UL, CE, FCC   |               |
| Cloud IO Features                | Device Management, Security, OTA Updates, I/O Control                                                               |               |                |               |               |               |               |               |

### Ethernet I/O Modules with Daisy Chain: ADAM-6200 Series

|                                  | ADAM<br>-6217                                                                                                                    | ADAM<br>-6224 | ADAM<br>-6250 | ADAM<br>-6251 | ADAM<br>-6256 | ADAM<br>-6260 | ADAM<br>-6266 |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Analog Input                     | 8                                                                                                                                |               |               |               |               |               |               |
| Analog Output                    |                                                                                                                                  | 4             |               |               |               |               |               |
| Digital Input                    |                                                                                                                                  | 4             | 8             | 16            |               |               | 4             |
| Digital Output                   |                                                                                                                                  |               | 7             |               | 16            |               |               |
| Counter<br>(Shared with DI)      |                                                                                                                                  |               |               | 16            |               |               | 4             |
| Relay                            |                                                                                                                                  |               |               |               |               | 6             | 4             |
| Protocols                        | Modbus TCP, RESTful API, MQTT, SNMP, ASCII                                                                                       |               |               |               |               |               |               |
| Software &<br>Fireware Functions | Auto-bypass, P2P, GCL, DHCP, Access control, Web Java runtime,<br>Data streaming, Group configuration, Web server, Azure IoT hub |               |               |               |               |               |               |
| Certification                    | UL, CE, FCC                                                                                                                      |               |               |               |               |               |               |
| Cloud IO Features                | Device Management, Security, OTA Updates, I/O Control                                                                            |               |               |               |               |               |               |

# Discover More

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**NEW**



## 【Mega Trend Forum Video】

[Secured Cloud I/O: Maximizing Distributed Asset Management Efficiency in IoT | 2023 IIoT WPC](#)

8 mins  
Basic product feature training



## 【IoT Academy Video】

[Maximizing Distributed Asset Management with ADAM- Secured Cloud I/O: ADAM-6000/6200 Series](#)

10 mins  
Basic product feature training



## 【IoT Academy Video】

[Intelligent Ethernet remote I/O empowers IT/OT convergence: ADAM-6000/6200 Series](#)

10 mins  
Basic product feature training



## 【IoT Academy Video】

[Connecting the cloud through MQTT with Advantech ADAM remote I/O](#)

9 mins  
Basic product feature training



# Discover More

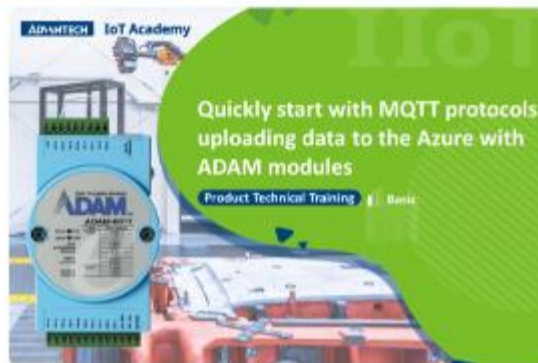
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【IoT Academy Video】

[Software Setup Skills for ADAM Ethernet Remote I/O Modules | Graphic Condition Logic](#)

11 mins  
Basic product technical training



【IoT Academy Video】

[Quickly start with MQTT protocols uploading data to the Azure with ADAM modules](#)

11 mins  
Basic product technical training



【IoT Academy Video】

[How to configure ADAM remote I/O modules](#)

240 mins  
Basic product technical training



【FAQ article】

[How to Select the Right Remote I/O for Your Industrial Applications?](#)

**ADVANTECH**

Enabling an Intelligent Planet

Est. **1983**

Headquarters: **Taipei, Taiwan**

## INDUSTRIES SERVED

Industry 4.0, Industrial IoT,  
Embedded Computing,  
Medical, Retail, Logistics



**\$10.61B** MARKET  
CAP (USD)  
(Feb., 2024)



## HONORS & AWARDS

- No.5 in Best Taiwan Global Brands
- No.17 in Top 50 Global Automation Vendors
- No.9 in Top 100 Industrial IoT Companies
- Red Dot Product Design Award
- iF Product Design Award

**Interbrand**

**CONTROL**



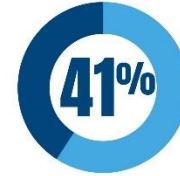
# About Advantech

## WORLD'S LARGEST IPC COMPANY

Advantech IPC WW Market Share

● Advantech ● Other IPC Companies

Source: OMDIA – Market Share estimates for Industrial PCs: World, 2022 Edition



**\$2.07B** 2023  
REVENUE  
(USD)

## KEY ECO-SYSTEM PARTNERS

intel.

Microsoft



Micron

AMD

Canonical  
Ubuntu

TEXAS  
INSTRUMENTS

arm

NXP

Qualcomm

MEDIATEK

and more...

## QUALITY SYSTEMS IN PLACE

- ISO9001
- ISO14001
- ISO13485
- ISO17025
- ISO27001
- ISO45001
- TL9000
- ISO50001
- RoHS
- WEEE
- SONY GP
- REACH

**1.8 MILLION+** sq. ft.

## MANUFACTURING PLANTS

Linkou, Taiwan



- 9 SMT lines, 16 system lines
- Engineering sample services
- Complex product lines
- Flexible & quick production

Kunshan, China



- 12 SMT lines, 13 system lines, 6 chassis lines
- Chassis design & production
- Mature product lines
- Cost-effective production



Nogata, Japan

- 4 SMT lines, 1 system line
- Japan design center, CTOS service, logistics center, repair center

## WORLDWIDE OFFICES



Manufacturing 3  
On-site service 4  
Design centers 11  
CTOS centers 16  
Repair centers 17  
Logistics centers 20

More than 90 offices globally!

**8800+**  
EMPLOYEES



Regional Service and Customization Centers

|              |                             |               |                           |                    |                             |               |                           |            |                                |
|--------------|-----------------------------|---------------|---------------------------|--------------------|-----------------------------|---------------|---------------------------|------------|--------------------------------|
| <b>China</b> | Kunshan<br>86-512-5777-5666 | <b>Taiwan</b> | Taipei<br>886-2-2792-7818 | <b>Netherlands</b> | Eindhoven<br>31-40-267-7000 | <b>Poland</b> | Warsaw<br>00800-2426-8080 | <b>USA</b> | Milpitas, CA<br>1-408-519-3898 |
|--------------|-----------------------------|---------------|---------------------------|--------------------|-----------------------------|---------------|---------------------------|------------|--------------------------------|

Worldwide Offices

| Asia Pacific        |  |                  |  | Americas         |  |                 |  | Europe             |  |                    |  |                               |  |                 |
|---------------------|--|------------------|--|------------------|--|-----------------|--|--------------------|--|--------------------|--|-------------------------------|--|-----------------|
| <b>Taiwan</b>       |  |                  |  | <b>Singapore</b> |  |                 |  | <b>Netherlands</b> |  |                    |  |                               |  |                 |
| Toll Free           |  | 0800-777-111     |  | Singapore        |  | 65-6442-1000    |  | Eindhoven          |  | 31-40-267-7000     |  |                               |  |                 |
| Taipei & IoT Campus |  | 886-2-2792-7818  |  |                  |  |                 |  | Breda              |  | 31-76-523-3100     |  |                               |  |                 |
| Taichung            |  | 886-4-2372-5058  |  | <b>Malaysia</b>  |  |                 |  | <b>Russia</b>      |  |                    |  |                               |  |                 |
| Kaohsiung           |  | 886-7-392-3600   |  | Kuala Lumpur     |  | 60-3-7725-4188  |  |                    |  | Moscow             |  | 8-800-555-01-50               |  |                 |
|                     |  |                  |  | Penang           |  | 60-4-537-9188   |  |                    |  | St. Petersburg     |  | 8-812-332-57-27               |  |                 |
|                     |  |                  |  |                  |  |                 |  |                    |  |                    |  | 8-921-575-13-59               |  |                 |
| <b>China</b>        |  |                  |  | <b>Thailand</b>  |  |                 |  | <b>Germany</b>     |  |                    |  | <b>Czech Republic</b>         |  |                 |
| Toll Free           |  | 800-810-0345     |  | Bangkok          |  | 66-02-2488306-9 |  | Toll Free          |  | 00800-2426-8080/81 |  | Ústí nad Orlicí               |  | 420-465-524-421 |
| Beijing             |  | 86-10-6298-4346  |  |                  |  |                 |  | Munich             |  | 49-89-12599-0      |  |                               |  |                 |
| Shanghai            |  | 86-21-3632-1616  |  |                  |  |                 |  | Düsseldorf         |  | 49-2103-97-855-0   |  |                               |  |                 |
| Shenzhen            |  | 86-755-8212-4222 |  | <b>Vietnam</b>   |  |                 |  | <b>France</b>      |  |                    |  | <b>Ireland</b>                |  |                 |
| Chengdu             |  | 86-28-8545-0198  |  | Hanoi            |  | 84-24-3399-1155 |  | Paris              |  |                    |  | Galway                        |  | 353-91-792444   |
| Hong Kong           |  | 852-2720-5118    |  | Hochiminh        |  | 84-28-3836-5856 |  |                    |  |                    |  |                               |  |                 |
|                     |  |                  |  | <b>Indonesia</b> |  |                 |  | <b>Italy</b>       |  |                    |  |                               |  |                 |
|                     |  |                  |  | Jakarta          |  | 62-21-751-1939  |  | Milan              |  |                    |  |                               |  |                 |
| <b>Japan</b>        |  |                  |  | <b>Australia</b> |  |                 |  | <b>UK</b>          |  |                    |  | <b>Middle East and Africa</b> |  |                 |
| Toll Free           |  | 0800-500-1055    |  | Toll Free        |  | 1300-308-531    |  | Newcastle          |  | 44-0-191-262-4844  |  | Israel                        |  | 072-2410527     |
| Tokyo               |  | 81-3-6802-1021   |  | Melbourne        |  | 61-3-9797-0100  |  | London             |  | 44-0-870-493-1433  |  | Turkey                        |  | 90-212-222-0422 |
| Osaka               |  | 81-6-6267-1887   |  |                  |  |                 |  |                    |  |                    |  | Turkey-Bursa                  |  | 90-224-413-3134 |
| Nagoya              |  | 81-0800-500-1055 |  |                  |  |                 |  | <b>Spain</b>       |  |                    |  |                               |  |                 |
| Nogata              |  | 81-949-22-2890   |  |                  |  |                 |  | Madrid             |  |                    |  |                               |  |                 |
|                     |  |                  |  |                  |  |                 |  | <b>Sweden</b>      |  |                    |  |                               |  |                 |
|                     |  |                  |  |                  |  |                 |  | Stockholm          |  |                    |  |                               |  |                 |
| <b>Korea</b>        |  |                  |  | <b>India</b>     |  |                 |  | <b>Poland</b>      |  |                    |  |                               |  |                 |
| Toll Free           |  | 080-363-9494/5   |  | Bangalore        |  | 91-94-4839-7300 |  | Warsaw             |  | 48-22-31-51-100    |  |                               |  |                 |
| Seoul               |  | 82-2-3660-9255   |  | Pune             |  | 91-94-2260-2349 |  |                    |  |                    |  |                               |  |                 |
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