

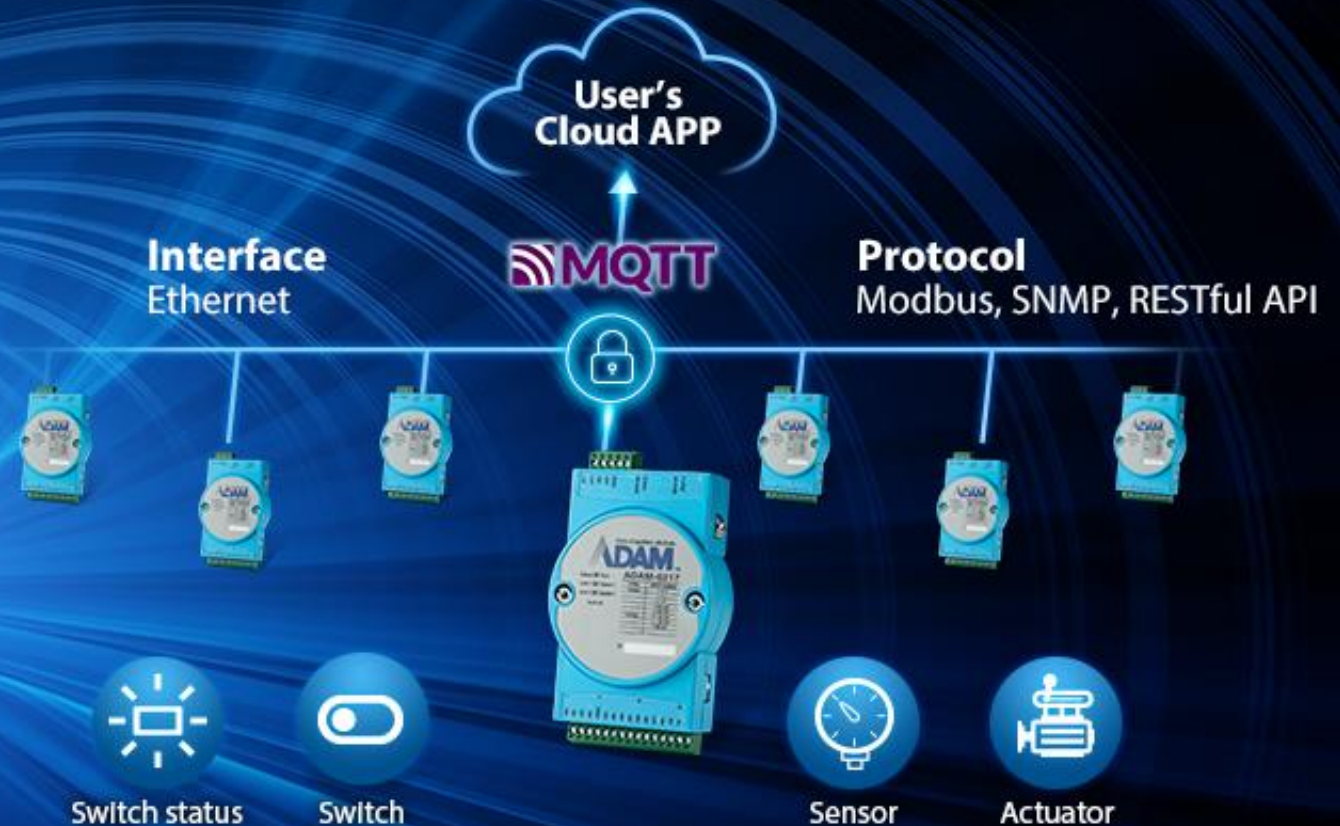
ADVANTECH

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.



AAC

ADVANTECH iAutomation

Premier Partner

Table of Contents

- ❑ [ADAM Remote I/O Overview](#)..... 03
- ❑ [Complete Remote I/O Portfolio with 40 Years of History](#)..... 04
- ❑ [Challenges of High-Volume Distributed Asset Management](#)..... 05
- ❑ [New Cloud I/O Features](#) 06
- ❑ [Cloud I/O Target Applications](#)..... 08
- ❑ [Ethernet I/O Fundamental Features](#)..... 11
- ❑ [Case Study : Environment Control for Battery Energy Storage Systems](#)..... 13
- ❑ [Case Study : Solar System Health Management](#)..... 14
- ❑ [Product Selection Guide](#)..... 15
- ❑ [Discover More \(IoT Academy Videos & Related Articles\)](#) 17
- ❑ [About Advantech](#)..... 19



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 & EMC Level 4

Daisy Chain



ADAM-4000



ADAM-4100



ADAM-6000



ADAM-6200



ADAM-6300



ADAM-5000 4/8 Slots Modular I/O

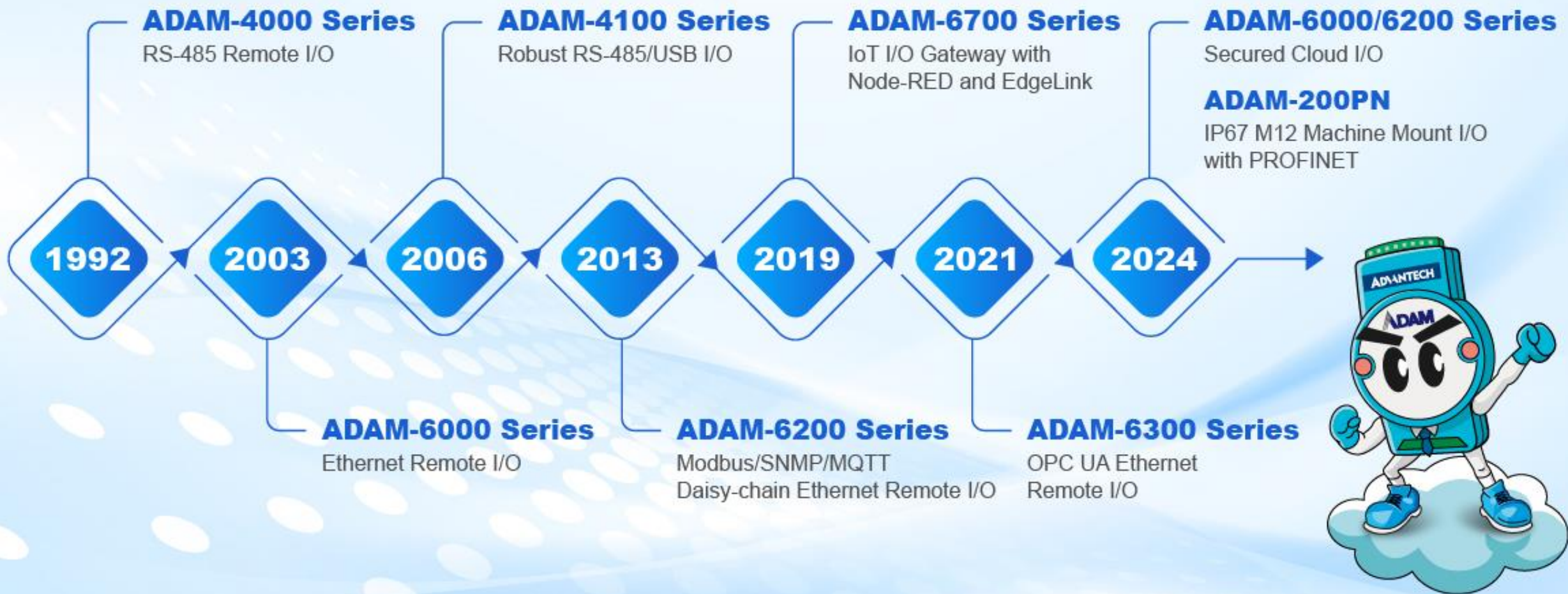
Modbus RTU

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

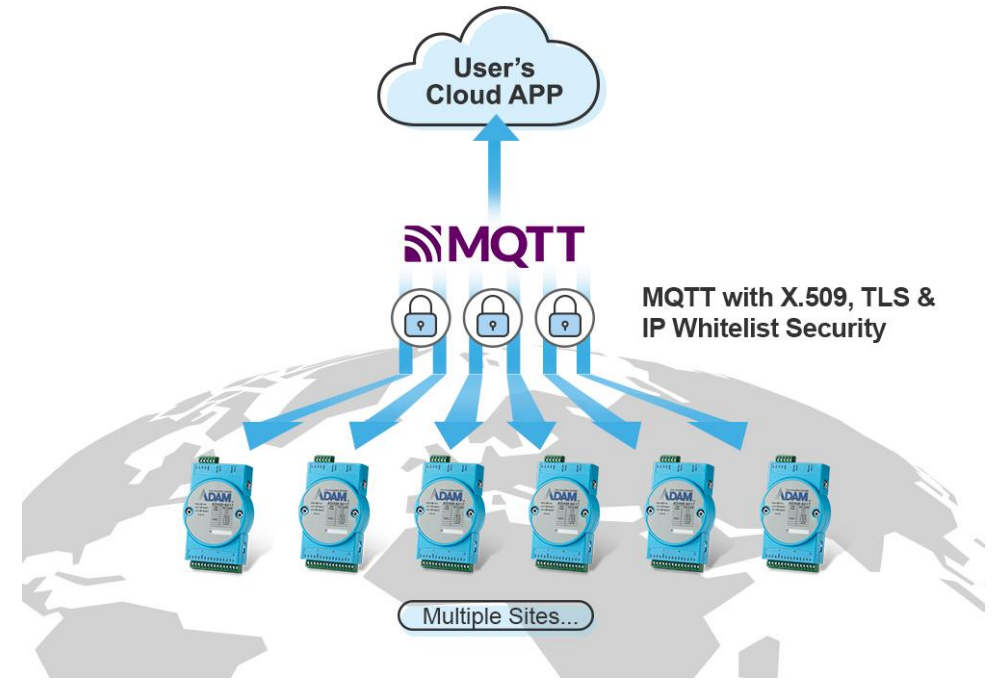
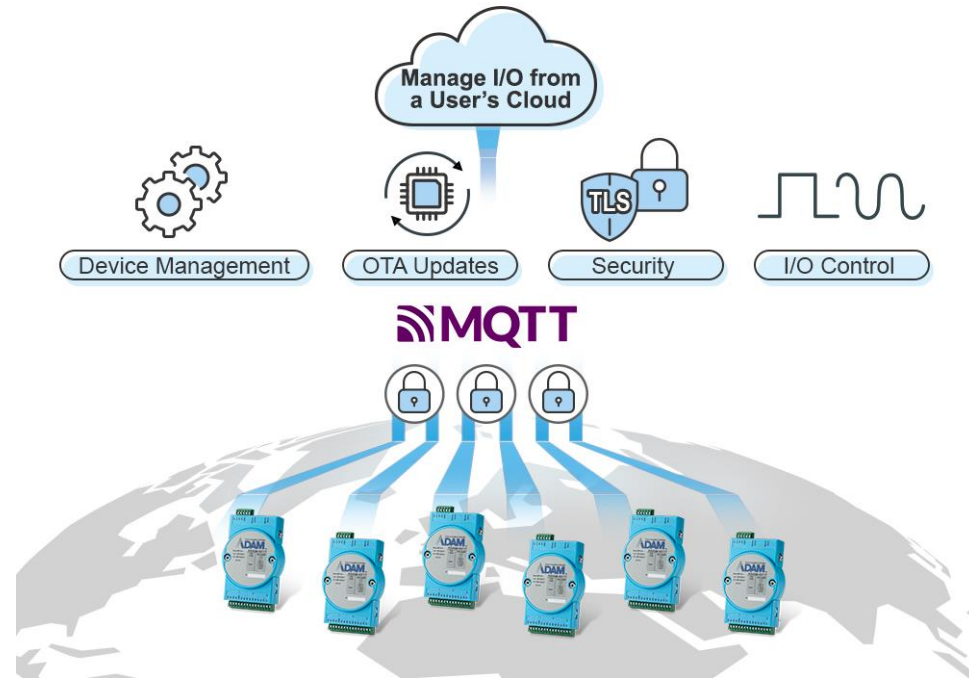


High Maintenance Cost

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



New Cloud I/O Features



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

X.509

Digital Certificate
Verify identities to be 100% trusted



Transport Layer Security (TLS)

Cryptographic Protocol
Secures data transmission between clients and the server



Cipher Suites

Cryptographic Algorithms
Wide selection for TLS.
Opened upon request



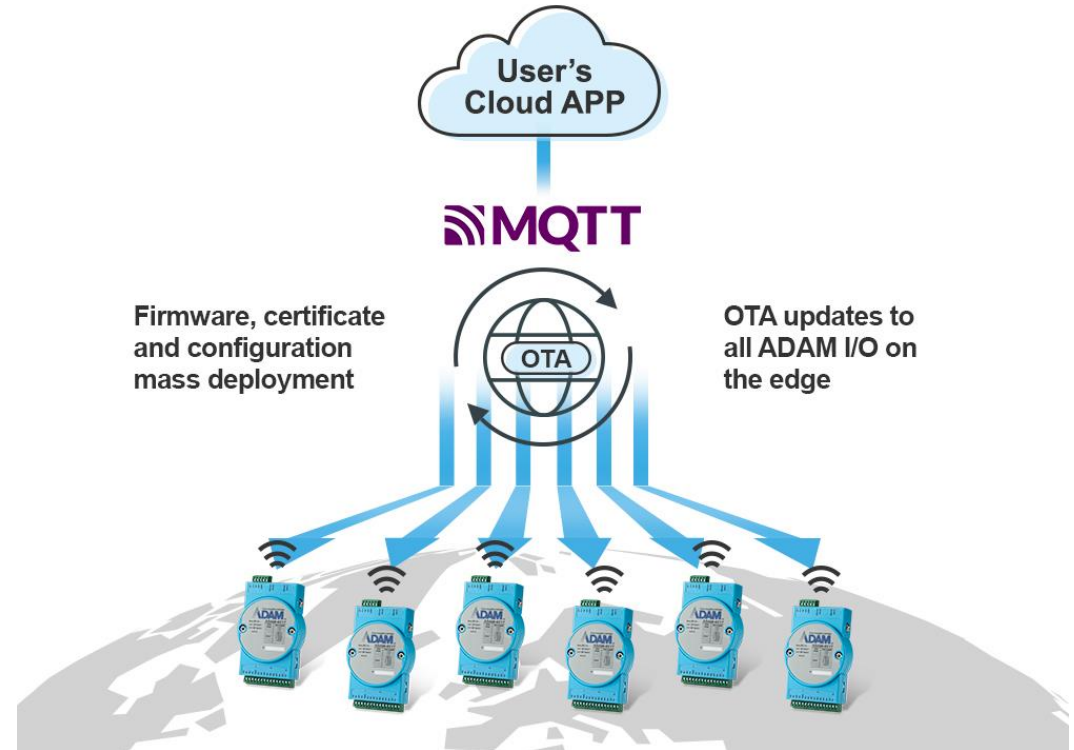
IP Whitelisting

Access Control
Ensure access to authorized IP only
*Suitable for those who do not have X.509



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



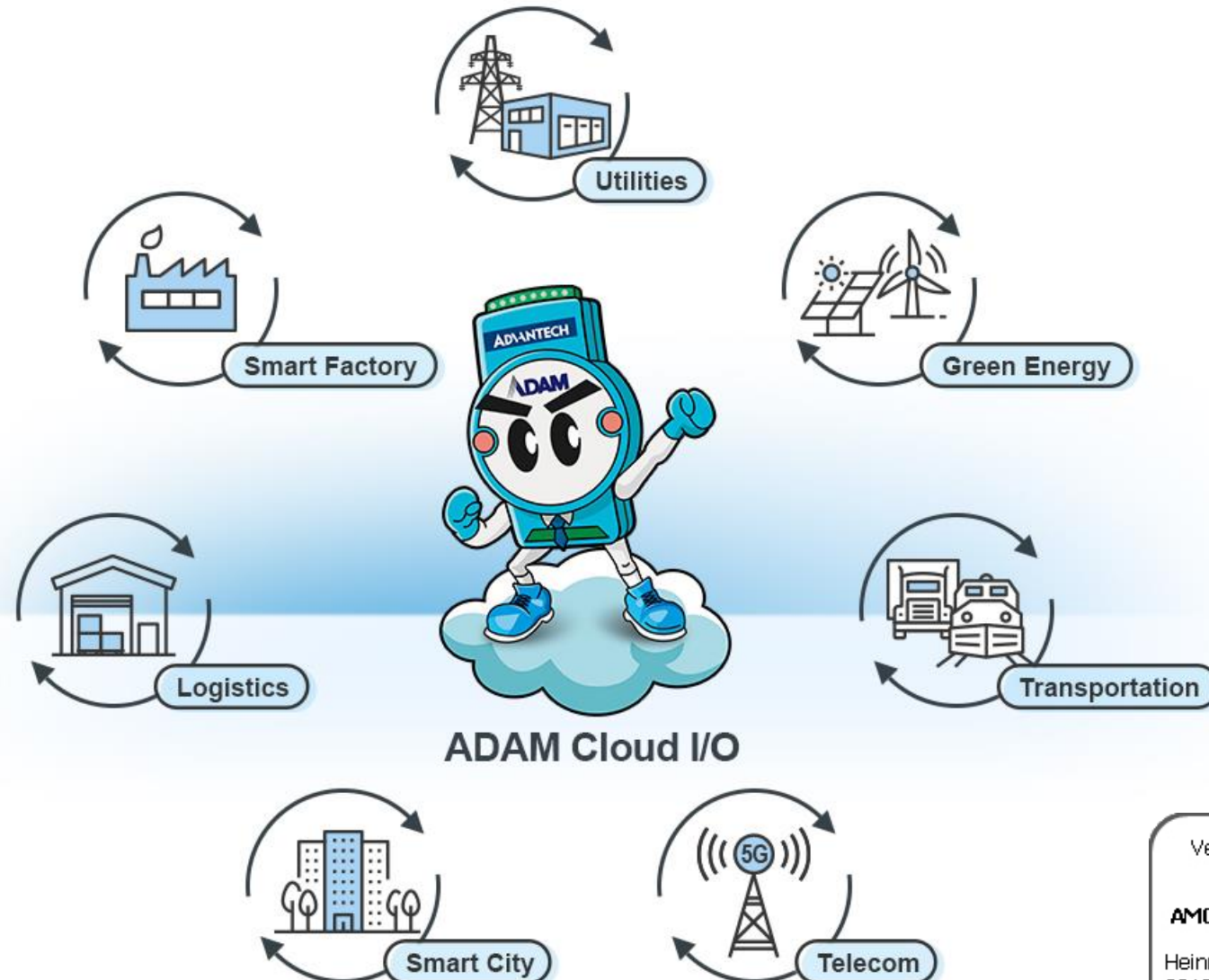
Over-The-Air (OTA) Updates

- 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



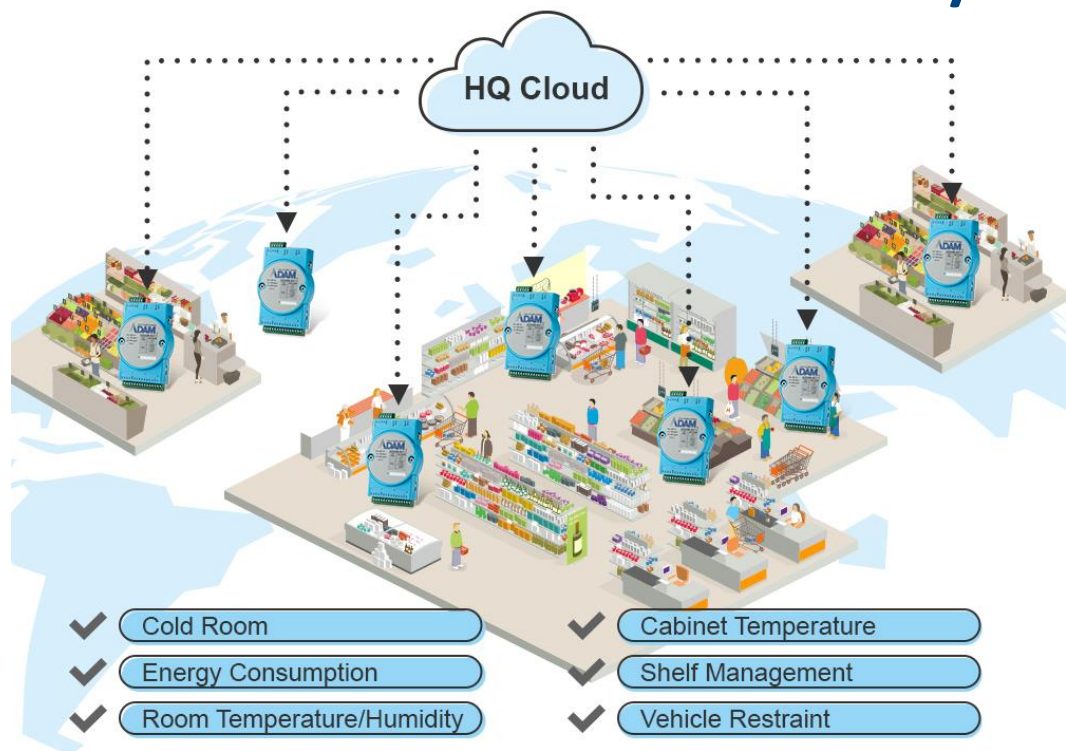
Vertrieb durch



AMC – Analytik & Messtechnik GmbH Chemnitz

Heinrich-Lorenz-Str. 55 Tel.: +49/371/38388-0
09120 Chemnitz Fax: +49/371/38388-99
E-Mail: info@amc-systeme.de Web: www.amc-systeme.de

Cloud I/O Target Applications



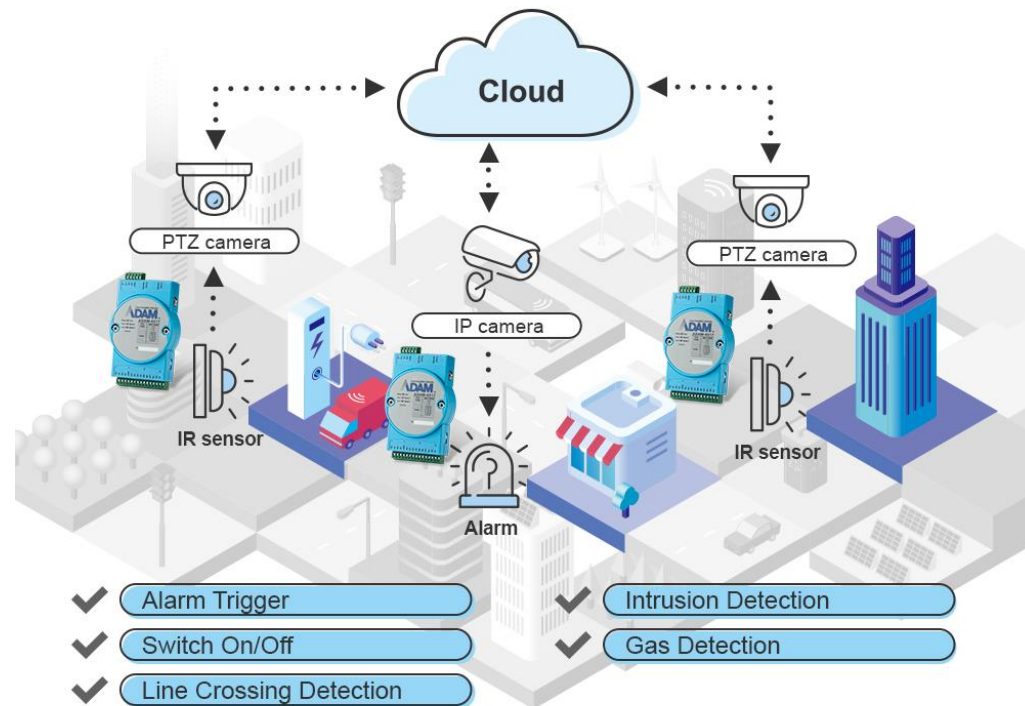
Hyper Market Key Asset Management: Reduce On-site Service Effort & Downtime Across Global Stores

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



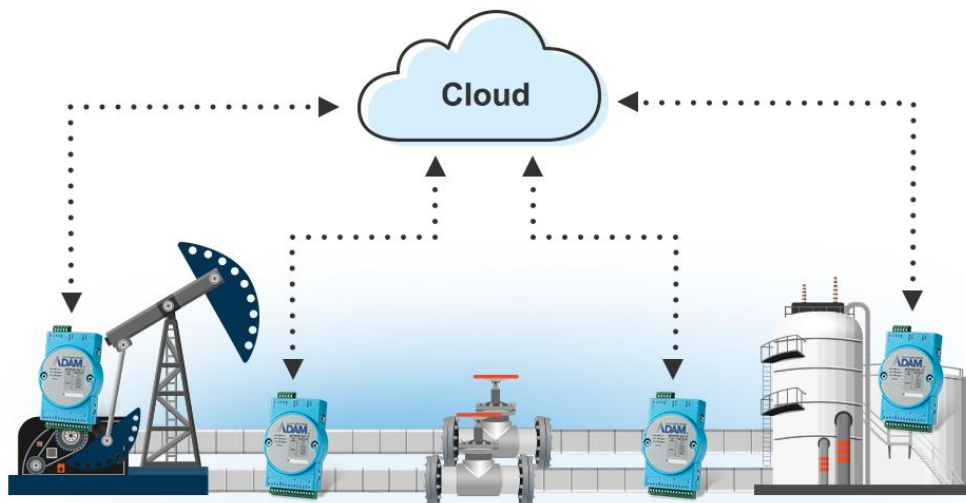
Cloud Video Surveillance & I/O Control: Network integration, Cyber Security, Remote Maintenance

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



Exploration/Production

- ✓ Oil Field Drill Monitoring
- ✓ Oil Separator Monitoring

Storage/Transportation

- ✓ Pump Station Monitoring
- ✓ Oil Pipeline Monitoring
- ✓ Tank Storage Monitoring

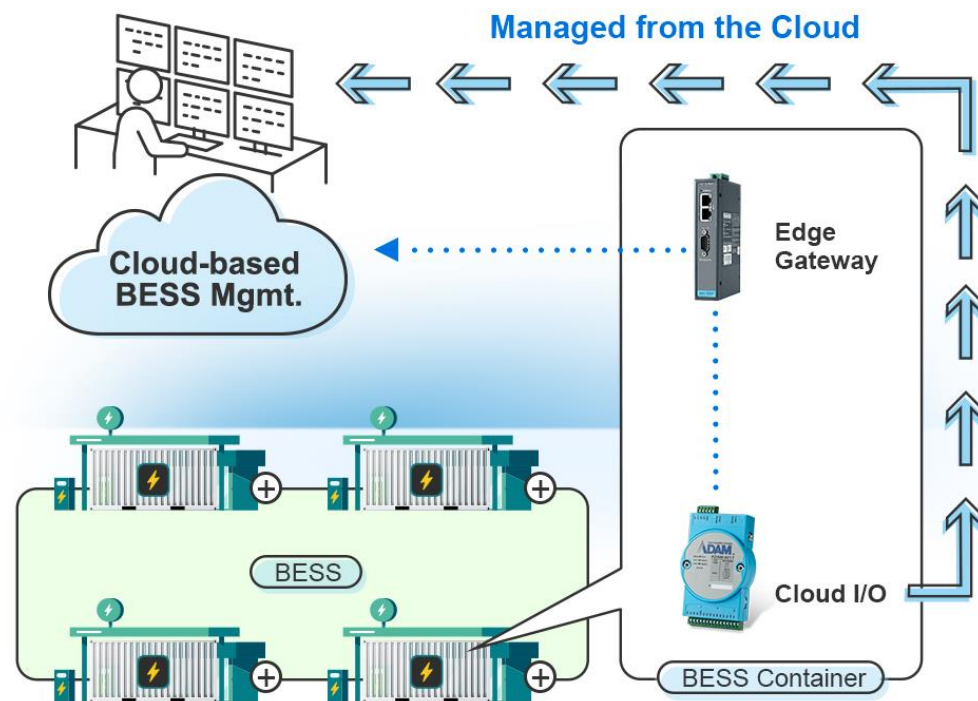
Oil and Gas: Boost Efficiency, Safety, and Profitability

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

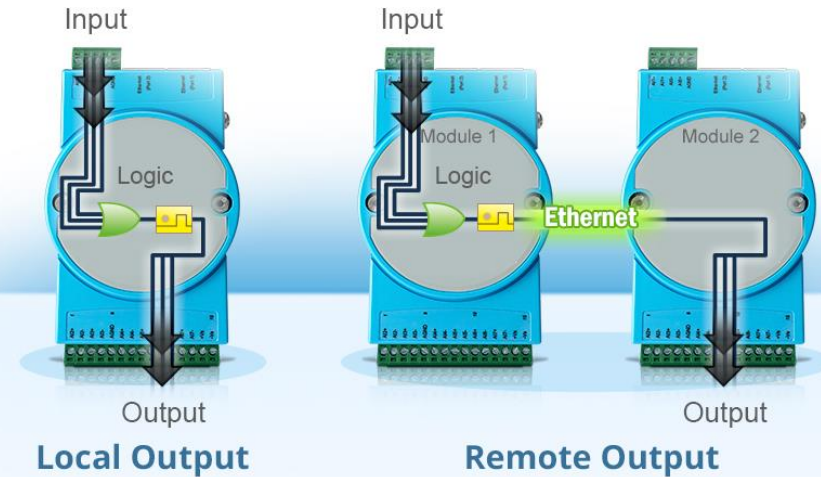
Demand

- 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



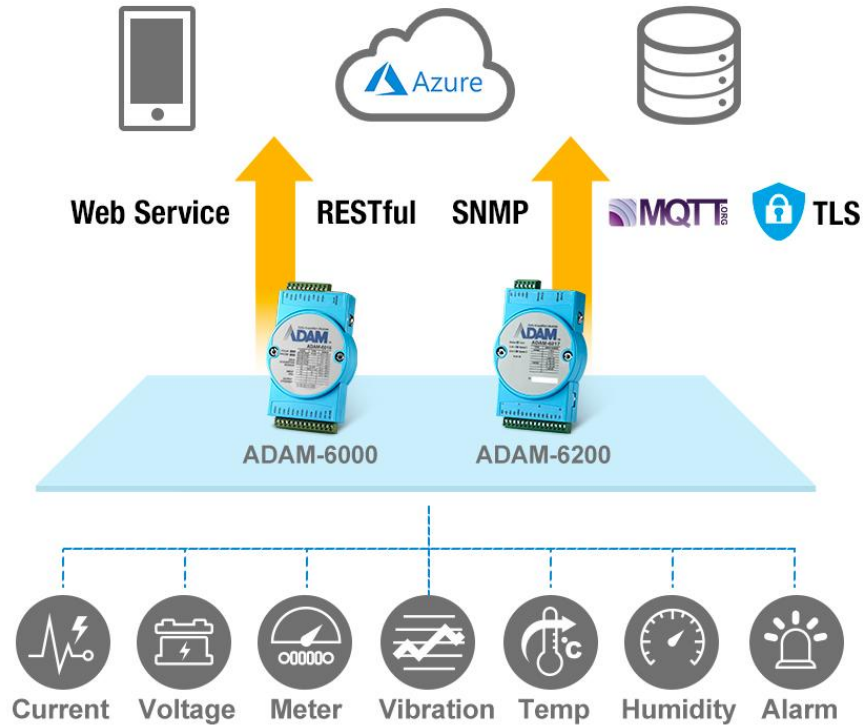
Peer-to-Peer (P2P) Connection

- 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



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.



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.

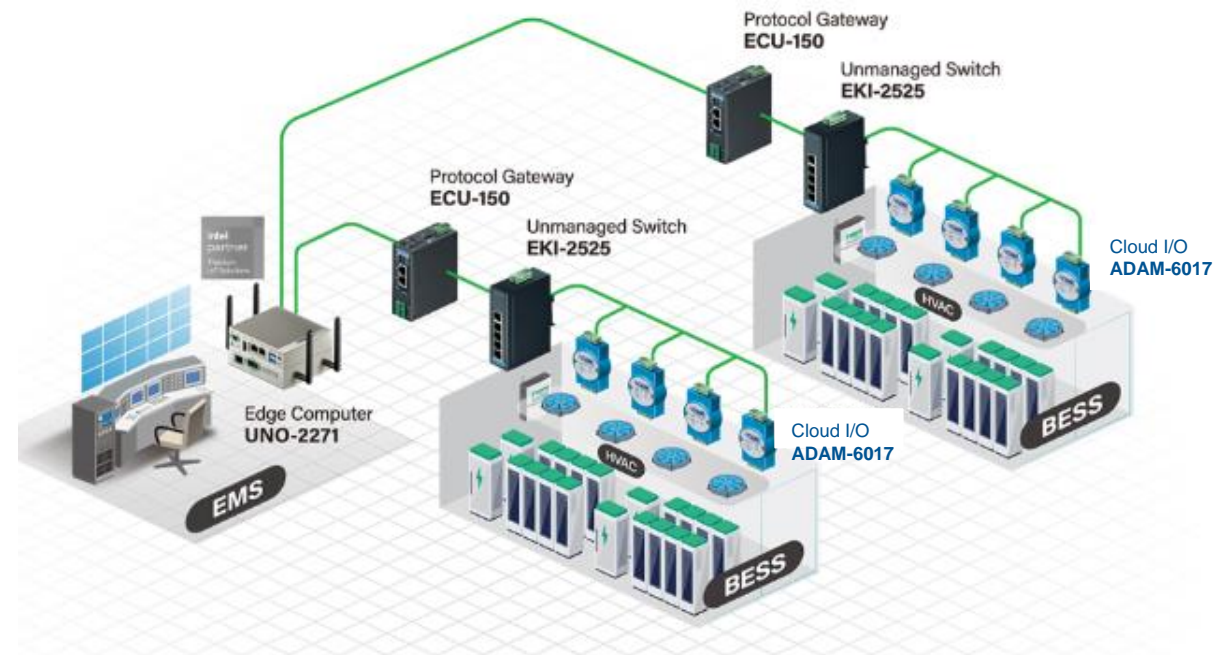
Solutions:

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:

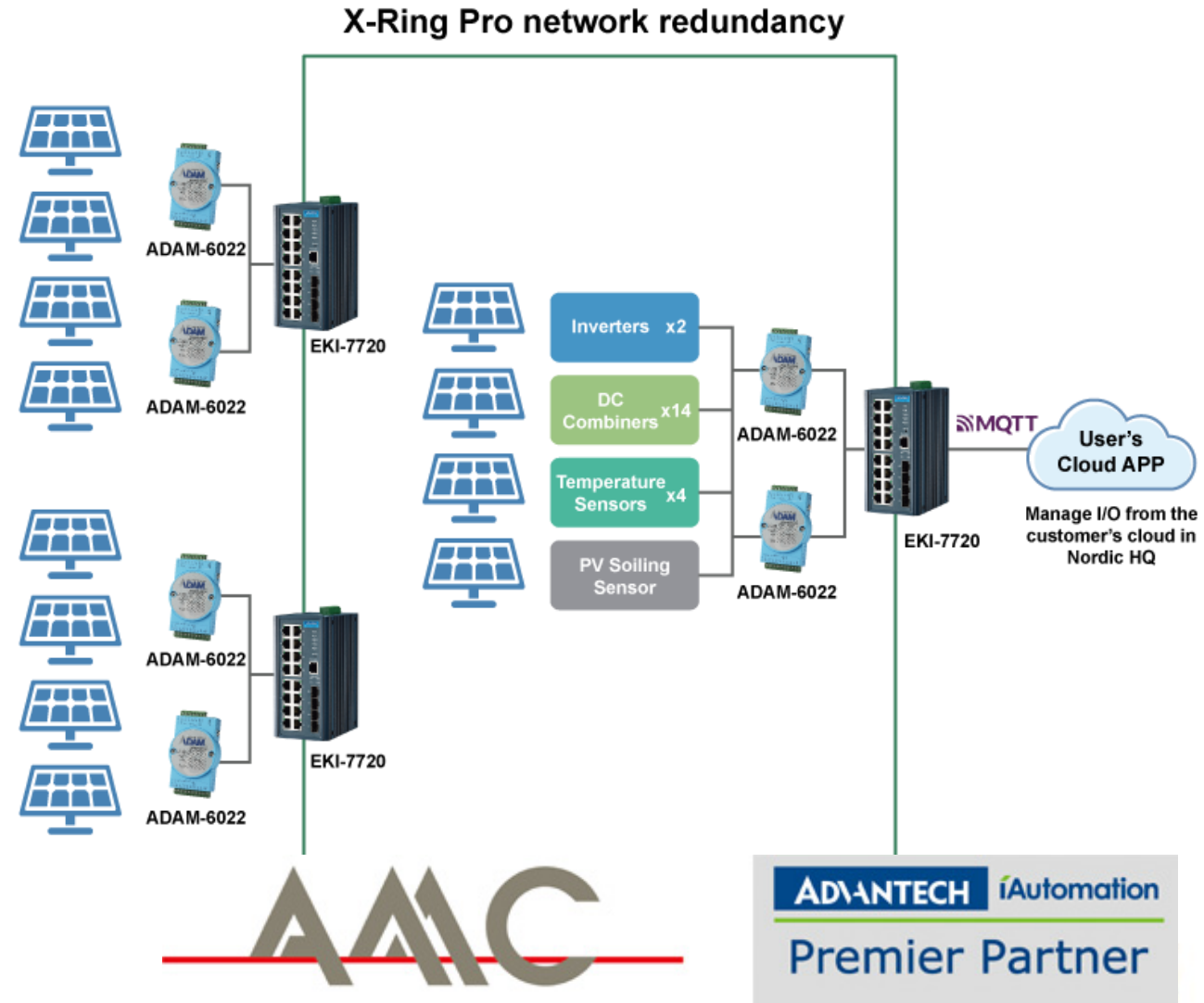
Advantech offers customized ADAM-6022 modules based on the customer's requirements:

- 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 -6015	ADAM -6017	ADAM -6018+	ADAM -6024	ADAM -6050	ADAM -6052	ADAM -6060	ADAM -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 (Shared with DI)					12	8	6	6
Relay							6	6
Protocols	Modbus TCP, RESTful API, MQTT, SNMP, ASCII							
Software & Fireware Functions	P2P, GCL, DHCP, Access control, Web Java runtime, Data streaming, 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-6217	ADAM-6224	ADAM-6250	ADAM-6251	ADAM-6256	ADAM-6260	ADAM-6266
Analog Input	8						
Analog Output		4					
Digital Input		4	8	16			4
Digital Output			7		16		
Counter (Shared with DI)				16			4
Relay						6	4
Protocols	Modbus TCP, RESTful API, MQTT, SNMP, ASCII						
Software & Fireware Functions	Auto-bypass, P2P, GCL, DHCP, Access control, Web Java runtime, 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

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



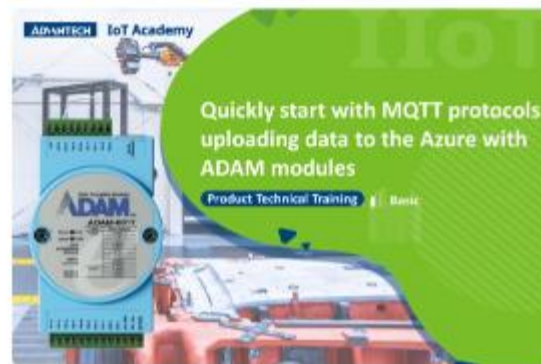
Discover More



【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?](#)





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

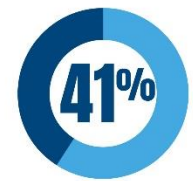
- No.5 in Best Taiwan Global Brands
- No.17 in Top 50 Global Automation Vendors
- No.9 in Top 100 Industrial IoT Companies
- Red Dot Product Design Award
- iF Product Design Award



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



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

China | Kunshan
86-512-5777-5666

Taiwan | Taipei
886-2-2792-7818

Netherlands | Eindhoven
31-40-267-7000

Poland | Warsaw
00800-2426-8080

USA | Milpitas, CA
1-408-519-3898

Worldwide Offices

Asia Pacific

Taiwan

Toll Free 0800-777-111
Taipei & IoT Campus 886-2-2792-7818
Taichung 886-4-2372-5058
Kaohsiung 886-7-392-3600

China

Toll Free 800-810-0345
Beijing 86-10-6298-4346
Shanghai 86-21-3632-1616
Shenzhen 86-755-8212-4222
Chengdu 86-28-8545-0198
Hong Kong 852-2720-5118

Japan

Toll Free 0800-500-1055
Tokyo 81-3-6802-1021
Osaka 81-6-6267-1887
Nagoya 81-0800-500-1055
Nogata 81-949-22-2890

Korea

Toll Free 080-363-9494/5
Seoul 82-2-3660-9255

Singapore

Singapore 65-6442-1000

Malaysia

Kuala Lumpur 60-3-7725-4188
Penang 60-4-537-9188

Thailand

Bangkok 66-02-2488306-9

Vietnam

Hanoi 84-24-3399-1155
Hochiminh 84-28-3836-5856

Indonesia

Jakarta 62-21-751-1939

Australia

Toll Free 1300-308-531
Melbourne 61-3-9797-0100

India

Bangalore 91-94-4839-7300
Pune 91-94-2260-2349

Americas

North America

Toll Free 1-888-576-9668
Cincinnati 1-513-742-8895
Milpitas 1-408-519-3898
Irvine 1-949-420-2500
Ottawa 1-815-433-5100
Chicago 1-888-576-9668

Brazil

Toll Free 0800-770-5355
São Paulo 55-11-5592-5367

Mexico

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

Europe

Vertrieb durch



AMC – Analytik & Messtechnik GmbH Chemnitz

Heinrich-Lorenz-Str. 55

09120 Chemnitz

E-Mail: info@amc-systeme.de

Tel.: +49/371/38388-0

Fax: +49/371/38388-99

Web: www.amc-systeme.de

UK

Newcastle 44-0-191-262-4844
London 44-0-870-493-1433

Spain

Madrid 34-91-668-86-76

Sweden

Stockholm 46-0-864-60-500

Poland

Warsaw 48-22-31-51-100

Middle East and Africa

Israel 072-2410527
Turkey 90-212-222-0422
Turkey-Bursa 90-224-413-3134

ADVANTECH

Enabling an Intelligent Planet

www.advantech.com

Please verify specifications before ordering. This guide is intended for reference purposes only. All product specifications are subject to change without notice.

No part of this publication may be reproduced in any form or by any means, electronic, photocopying, recording or otherwise, without the prior written permission of the publisher.

All brand and product names are trademarks or registered trademarks of their respective companies.

© Advantech Co., Ltd. 2024

