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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

Ihr Ansprechpartner:

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Smart. Flexible. IoT-enabled.

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Premier Partner

Table of Contents

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

1992 — **ADAM-4000 Series**
RS-485 Remote I/O

2003 — **ADAM-6000 Series**
Ethernet Remote I/O

2006 — **ADAM-4100 Series**
Robust RS-485/USB I/O

2013 — **ADAM-6200 Series**
Modbus/SNMP/MQTT
Daisy-chain Ethernet Remote I/O

2019 — **ADAM-6700 Series**
IoT I/O Gateway with
Node-RED and EdgeLink

2021 — **ADAM-6300 Series**
OPC UA Ethernet
Remote I/O

2024 — **ADAM-6000/6200 Series**
Secured Cloud I/O

ADAM-200PN
IP67 M12 Machine Mount I/O
with PROFINET

Challenges of High-Volume Distributed Asset Managment

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

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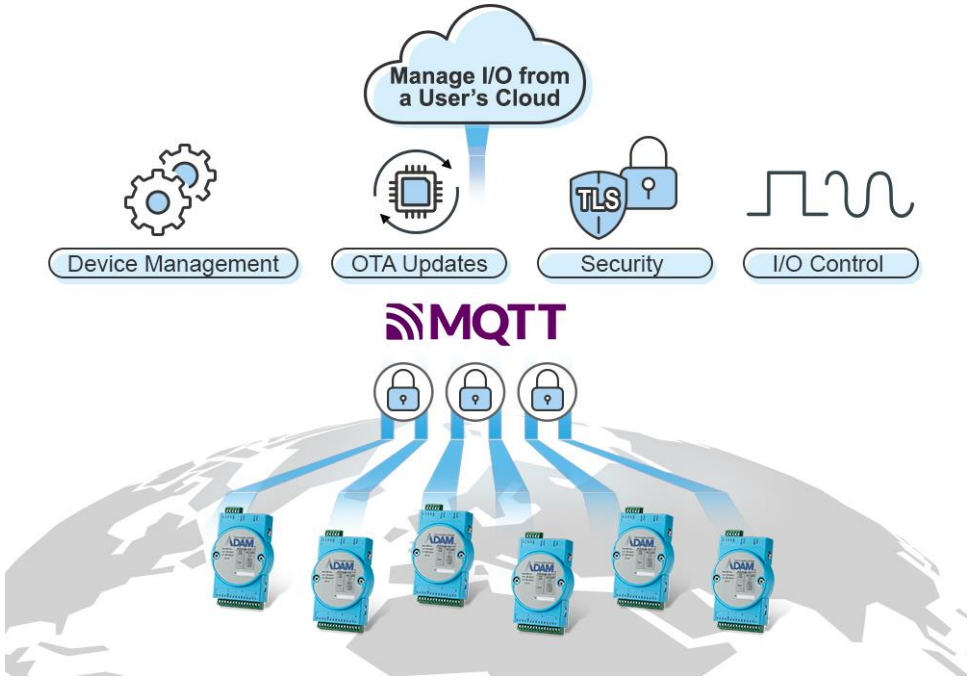
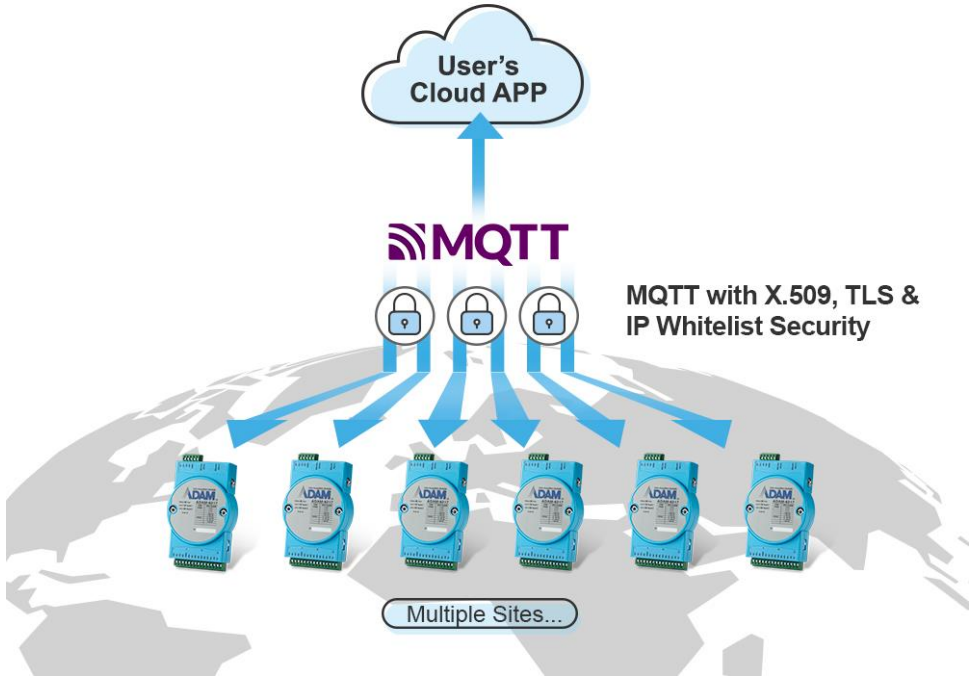
New Cloud I/O Features



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

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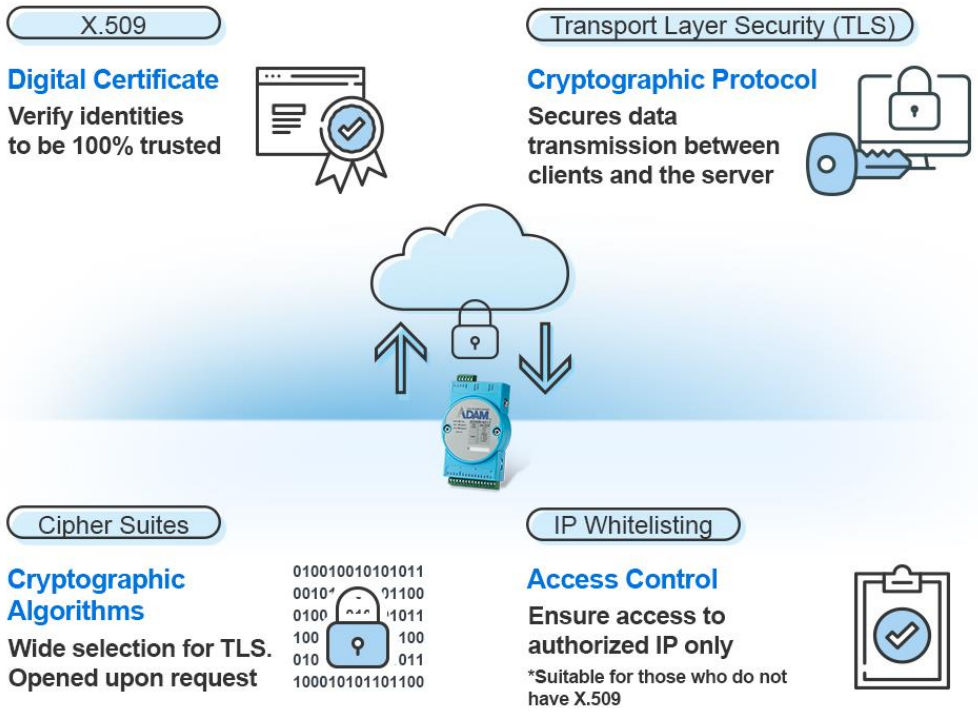
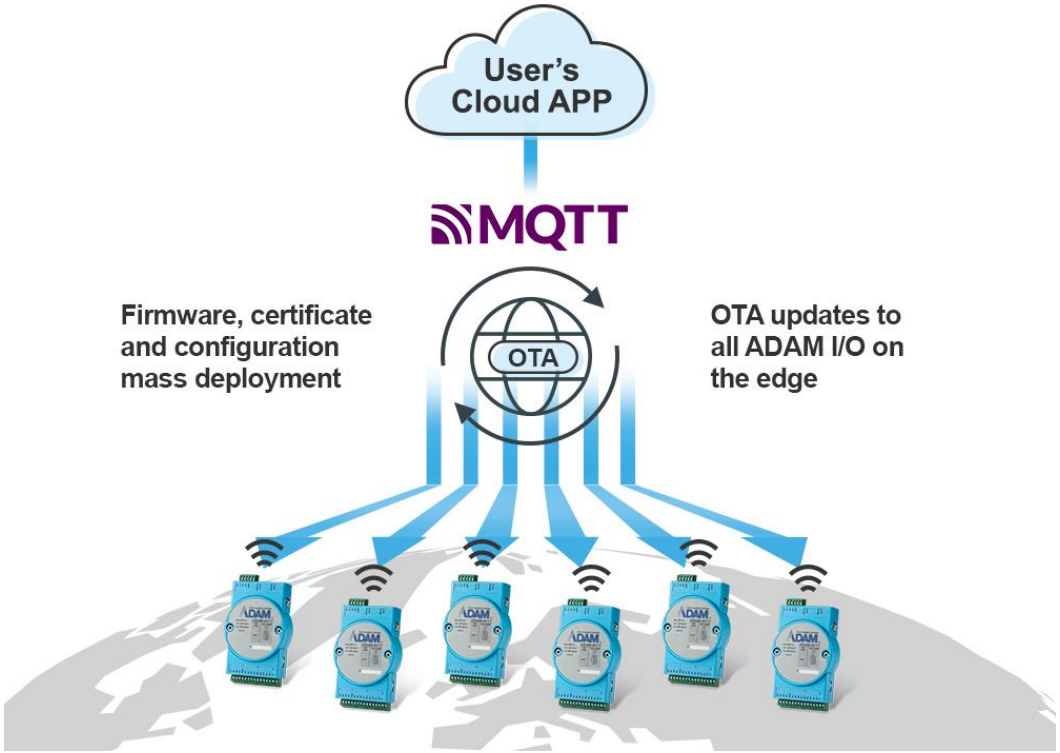
New Cloud I/O Features





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

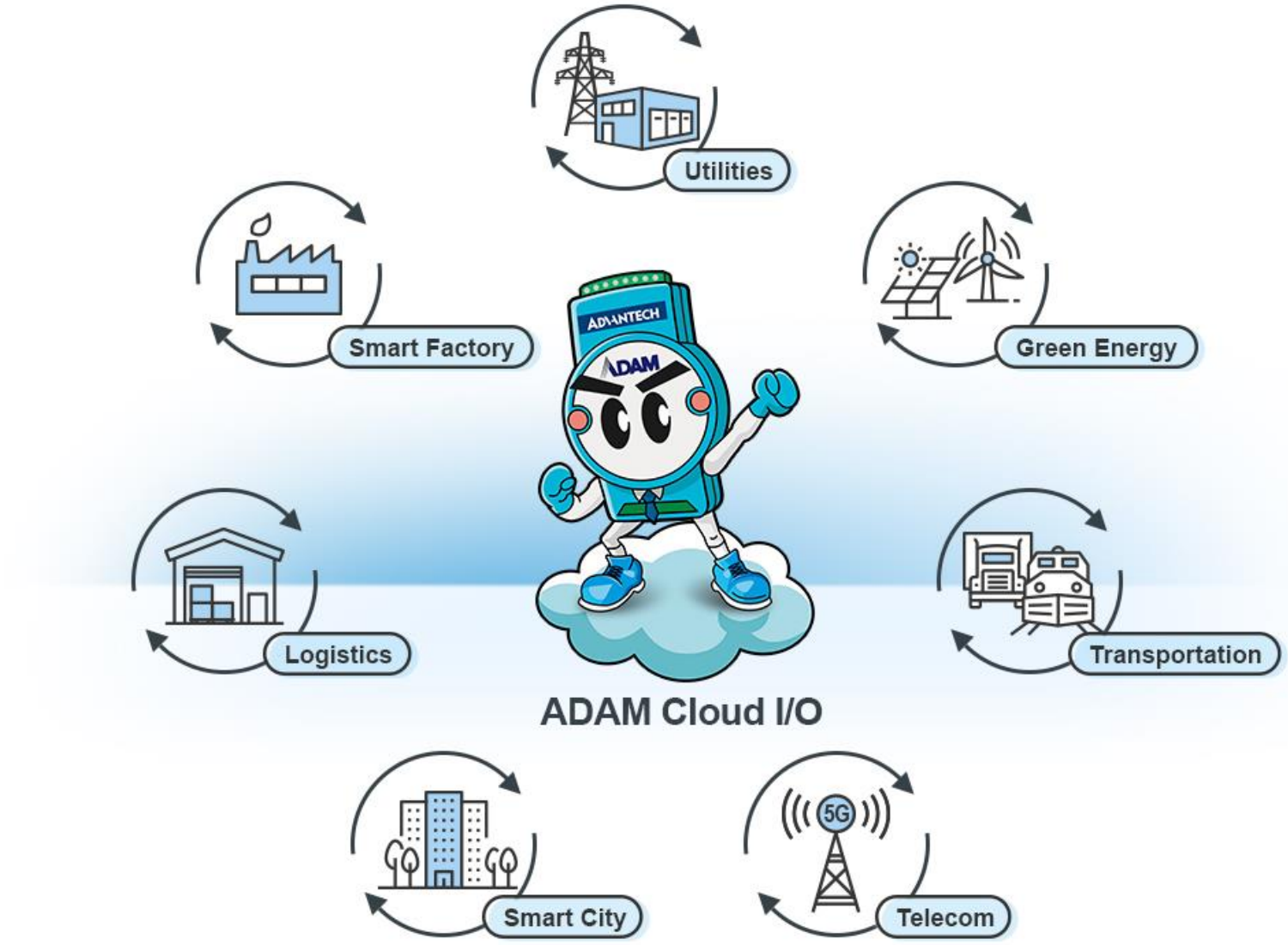
Over-The-Air (OTA) Updates

- 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



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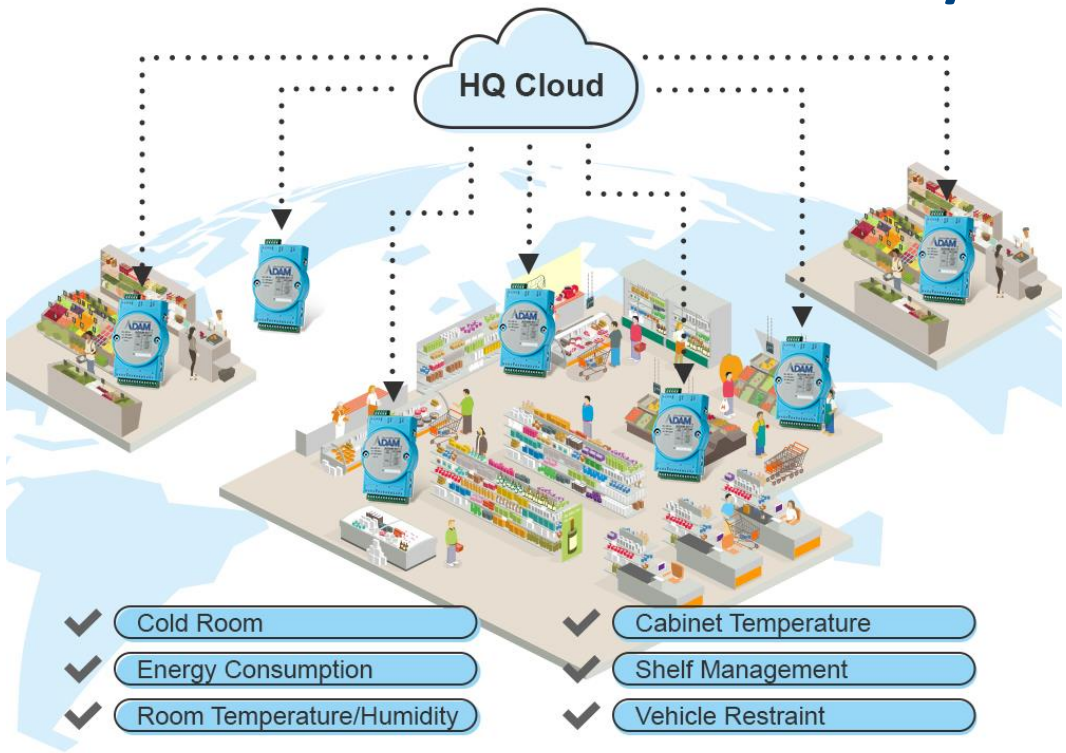
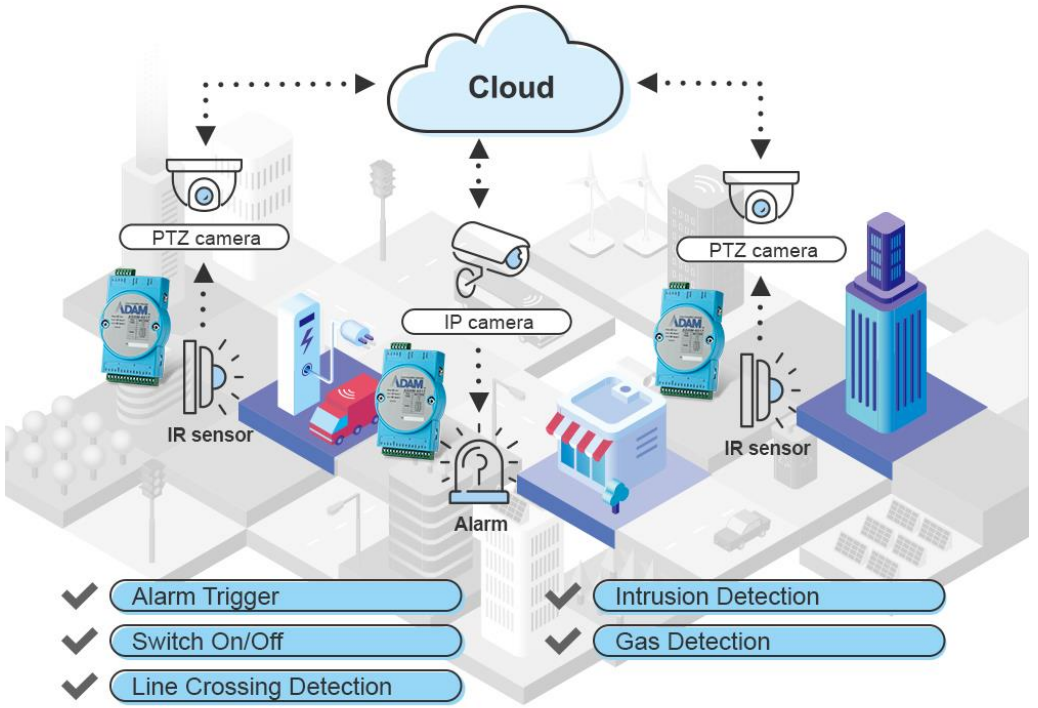
Cloud I/O Target Applications



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

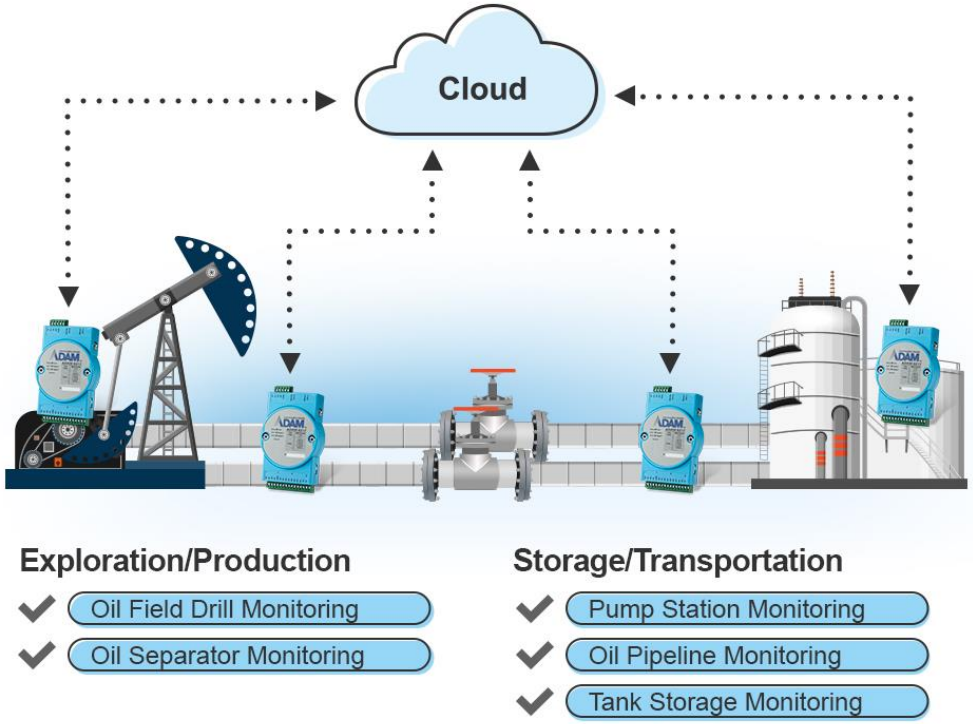


Cloud Video Surveillance & I/O Control: Network integration, Cyber Security, Remote Maintenance

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

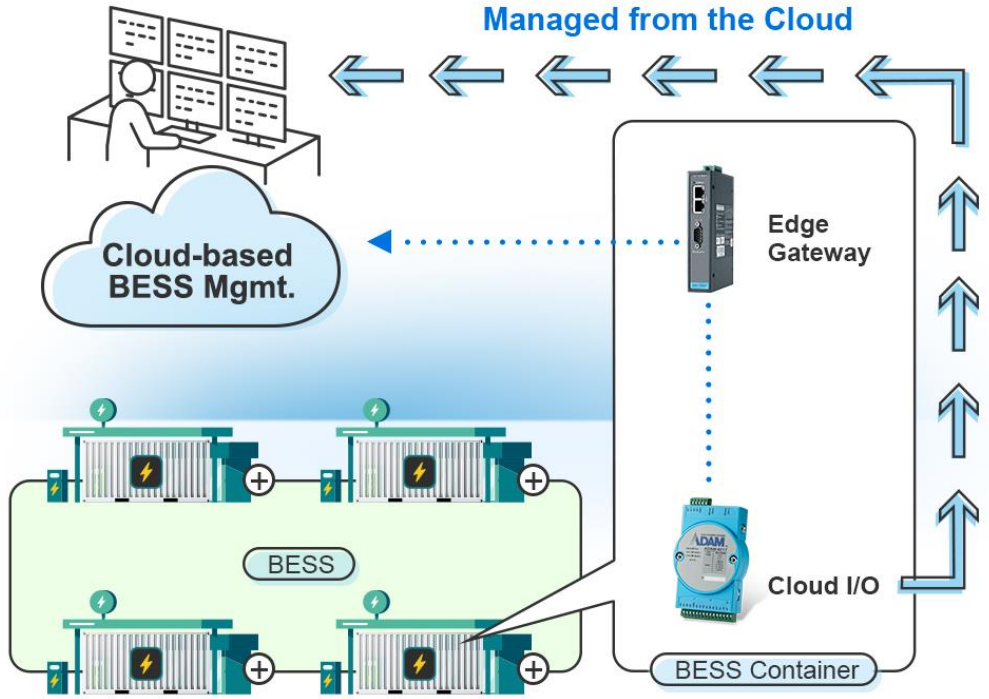
Cloud I/O Target Applications



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

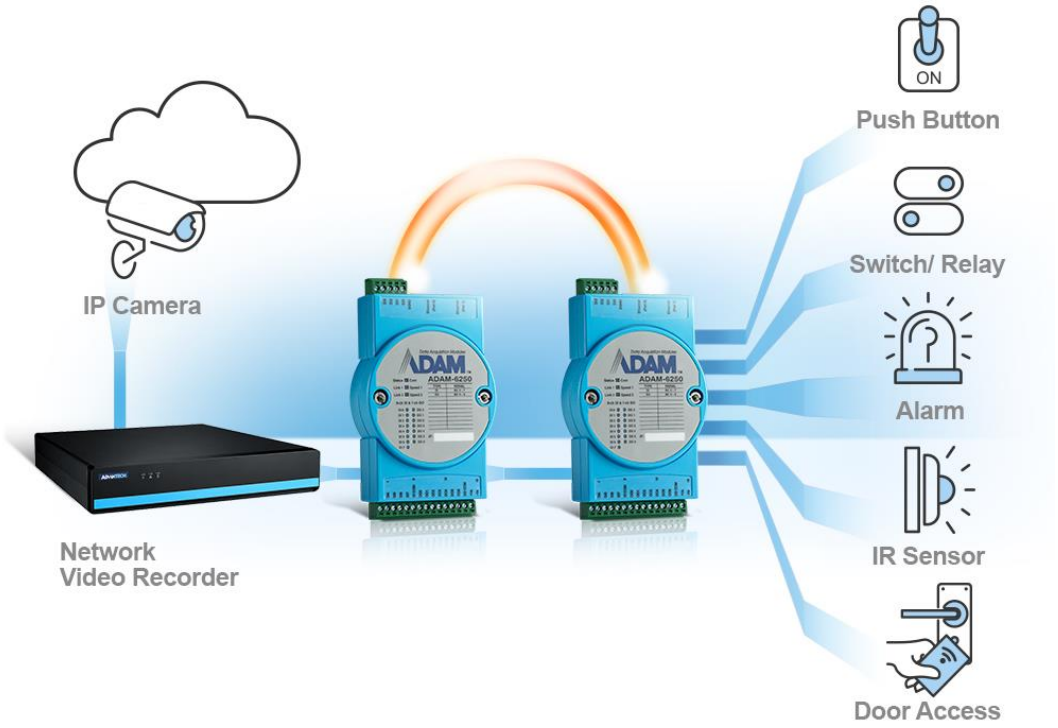


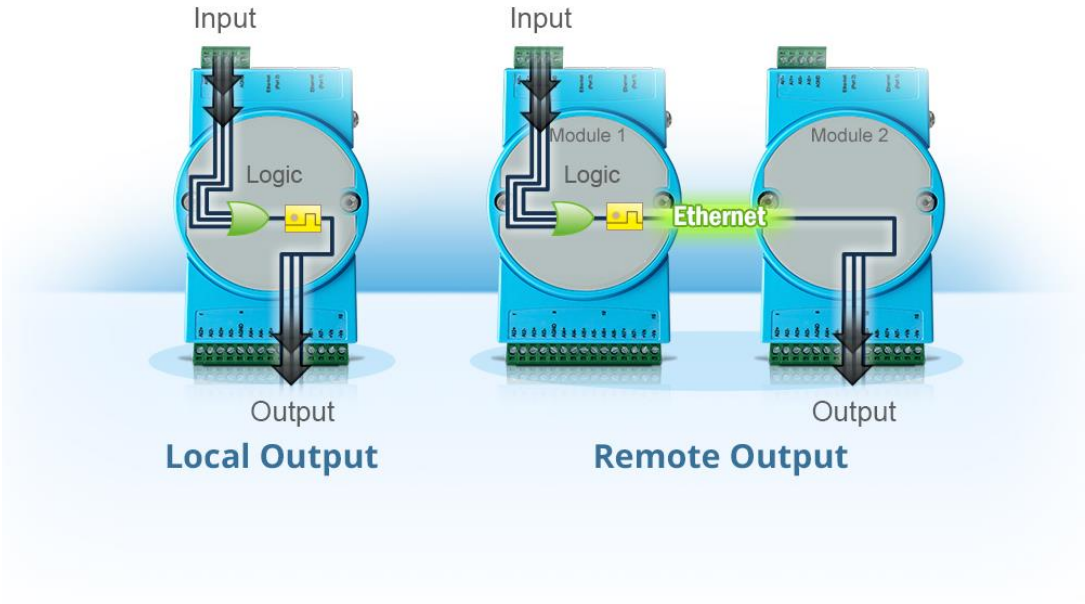
Cloud-based BESS Management:
Reduce Maintenance Effort for High Volume BESS Containers

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





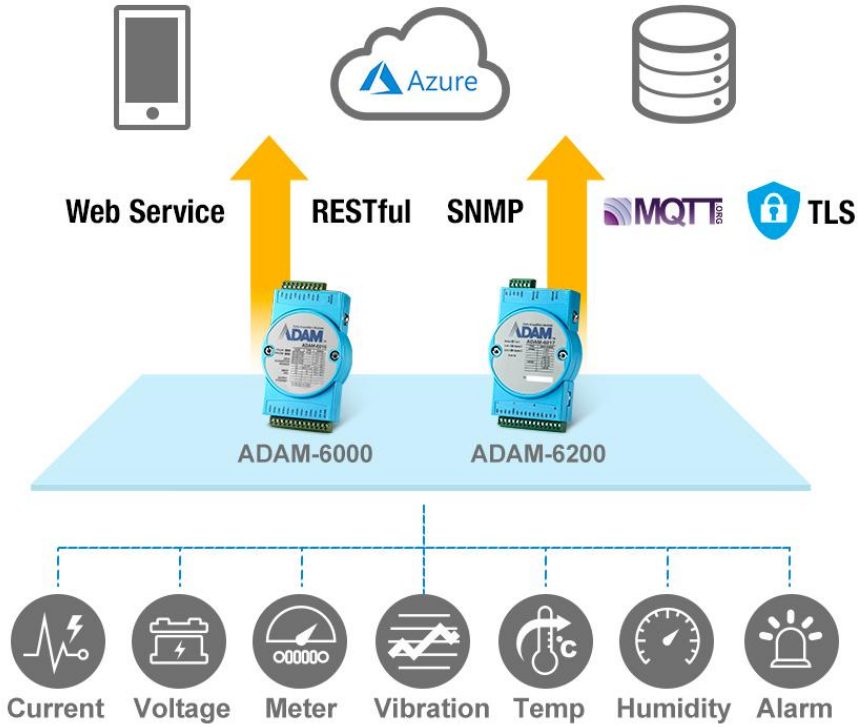
Peer-to-Peer (P2P) Connection

- 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.

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

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.

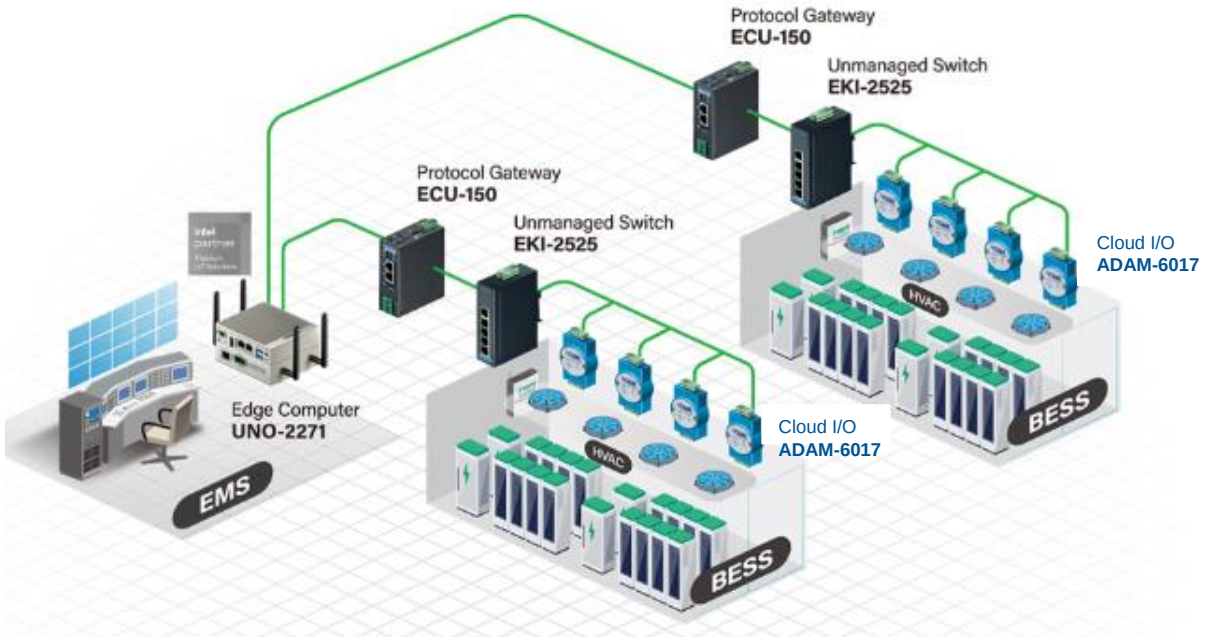
Solutions:

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



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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:

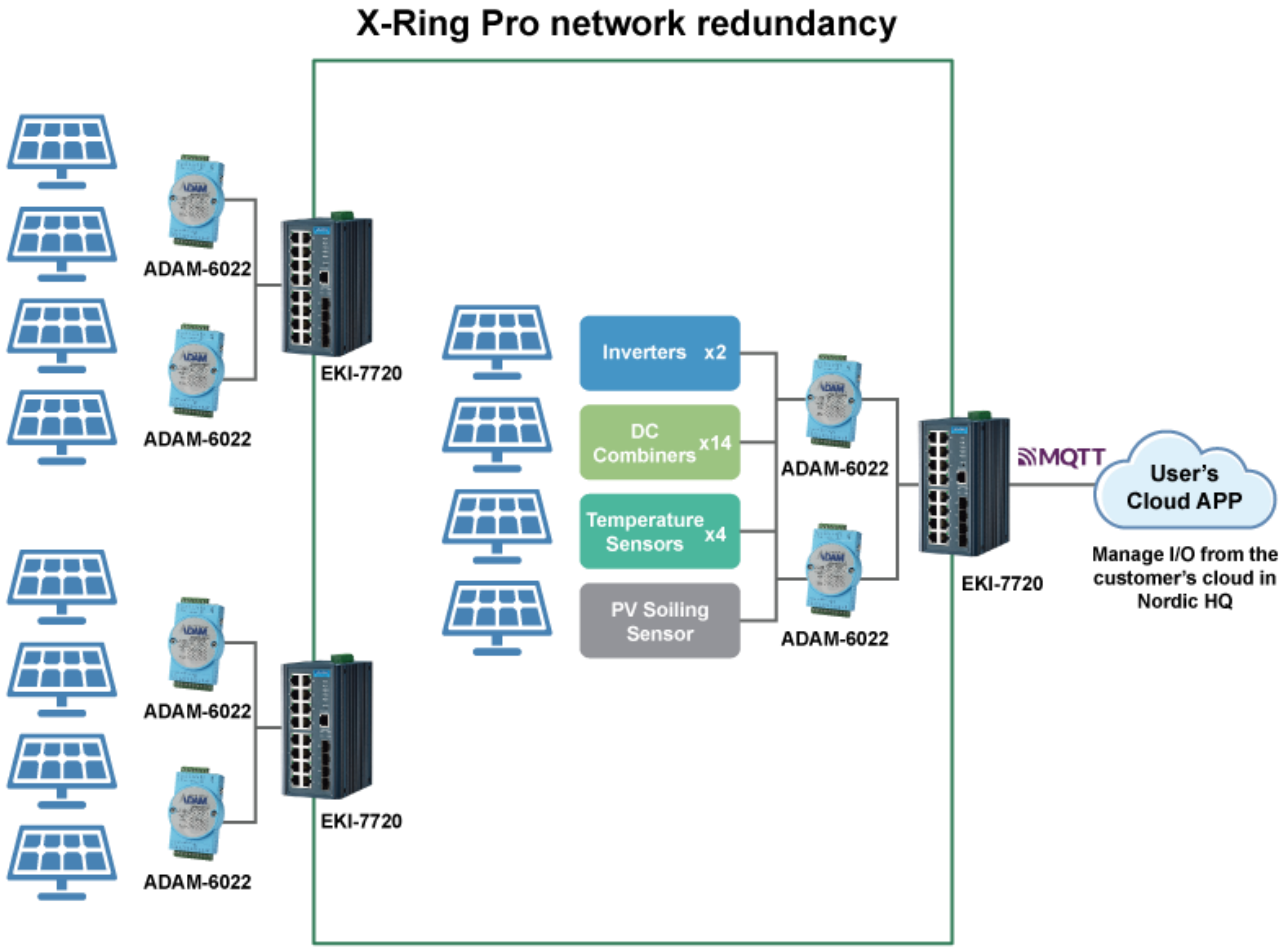
Advantech offers customized ADAM-6022 modules based on the customer's requirements:

- 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



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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

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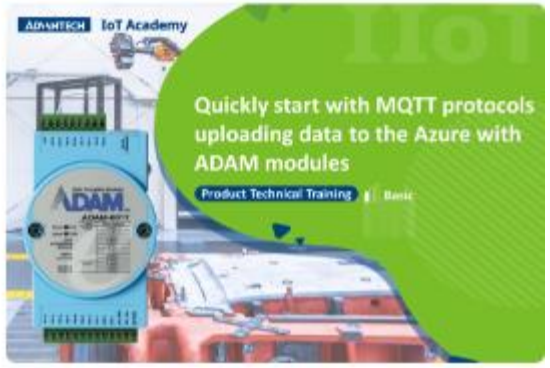
【IoT Academy Video】

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?

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About Advantech

ADVANTECH
Enabling an Intelligent Planet

Est. 1983

Headquarters: **Taipei, Taiwan**

INDUSTRIES SERVED

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

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)

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

KEY ECO-SYSTEM PARTNERS

intel. Microsoft NVIDIA. Micron

AMD Canonical Ubuntu Texas Instruments

arm NXP Qualcomm MEDIATEK

and more...

HONORS & AWARDS

- No.5 in Best Taiwan Global Brands — Interbrand
- No.17 in Top 50 Global Automation Vendors — CONTROL
- No.9 in Top 100 Industrial IoT Companies — IoT ONE
- Red Dot Product Design Award — reddot design award
- iF Product Design Award — iF

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

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