Seamless IT - OT Integration
Connect Devices to the Cloud

SCADA

PLC

MES

ERP

Cloud

UA Series

IIoT Communication Server

- Support OPC UA/MQTT/SNMP/RESTful API (*)
- Direct OT Data Logging to Databases & Data Recovery
- Secure IT Data Exchange (Certificates/ Encryption)
- Flexible Connection to Cloud Platforms (JSON)
- IFTTT Logic Control & Mobile Notifications

(*): RESTful API and SNMP are supported by UA-2841M only

UA-7231M / UA-2241M Series
UA-5231Series / UA-2841M

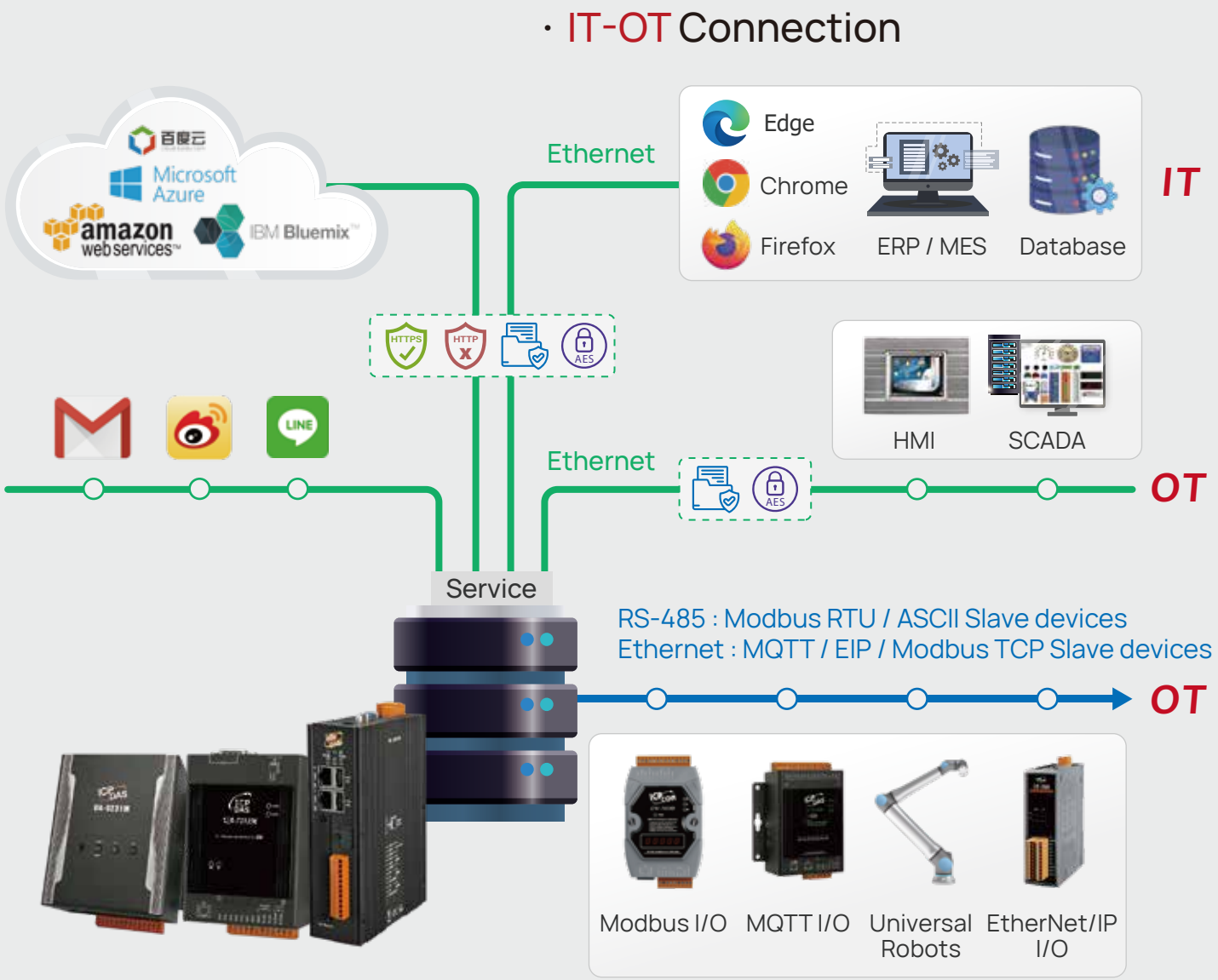
OPC UA plays a key role in industrial automation, enabling vertical data transfer from OT (e.g. manufacturing data) to IT (e.g. MES and ERP). Besides, OPC UA offers high scalability for large-scale projects, reducing overall operating costs compared to Modbus systems.

ICP DAS provides a holistic OPC UA edge-to-cloud solution, including various I/O modules and communication servers. This flyer centers around the UA Series IIoT Communication Server.

IIoT Communication Server

UA-2841M	Advanced	UA-2241 Series	UA-5231 Series	Standard	UA-7231M	Compact

System Architecture



- OPC UA Server / MQTT : Supported by UA-2x/52/72xx
- SNMP Agent / RESTful : Supported by UA-28xx only

Support OPC UA/MQTT/SNMP/RESTful API

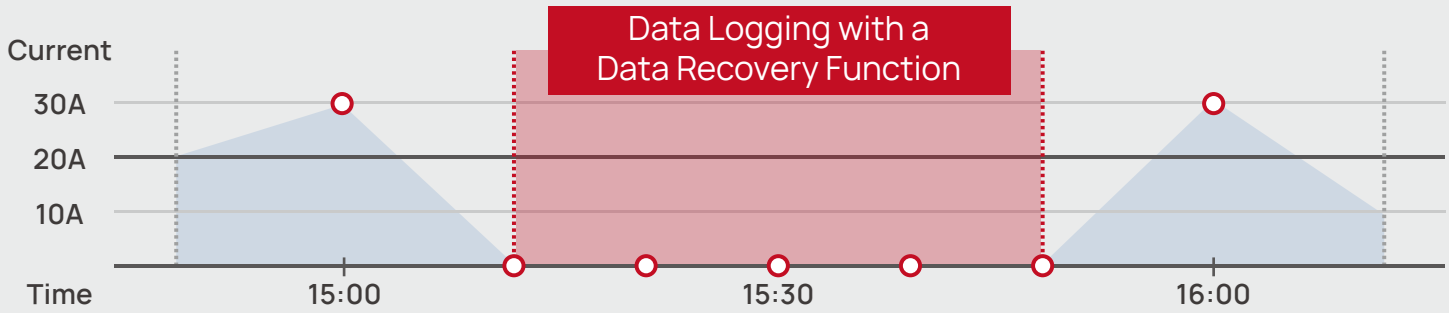
Direct OT Data Logging to Databases & Data Recovery Function

UA Series Communication Servers can log data from UA I/O modules at scheduled intervals, and then log collected data to CSV locally or to SQL DB remotely.

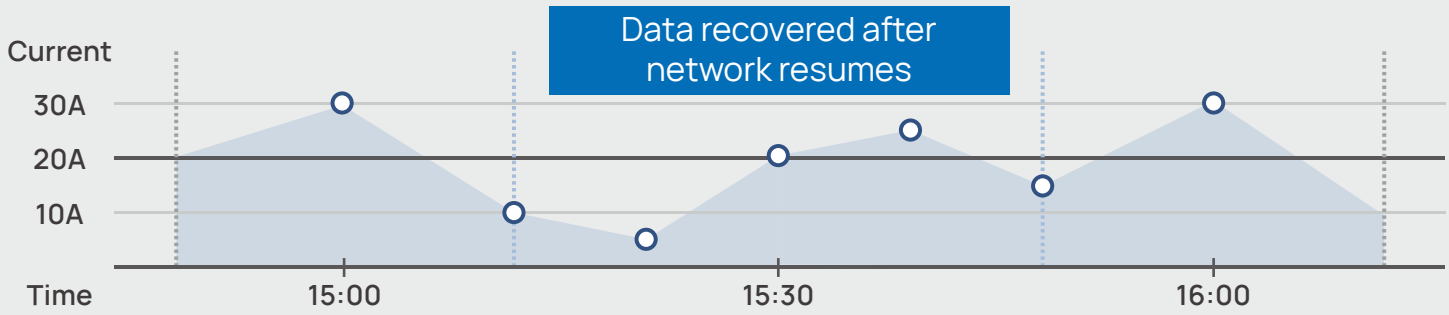
Data Recovery Function

Commonly, data logging involves the process of collecting data regularly and storing it in the database. In the event of a network failure, the obtained data is not stored and irretrievable. To address this issue, UA Series products support a data recovery function by storing all data in the SD card during network loss. When the network is restored, the UA Series products retrieve the data from the SD card and log them to the database. This function avoids historical data loss.

Common Data Logging

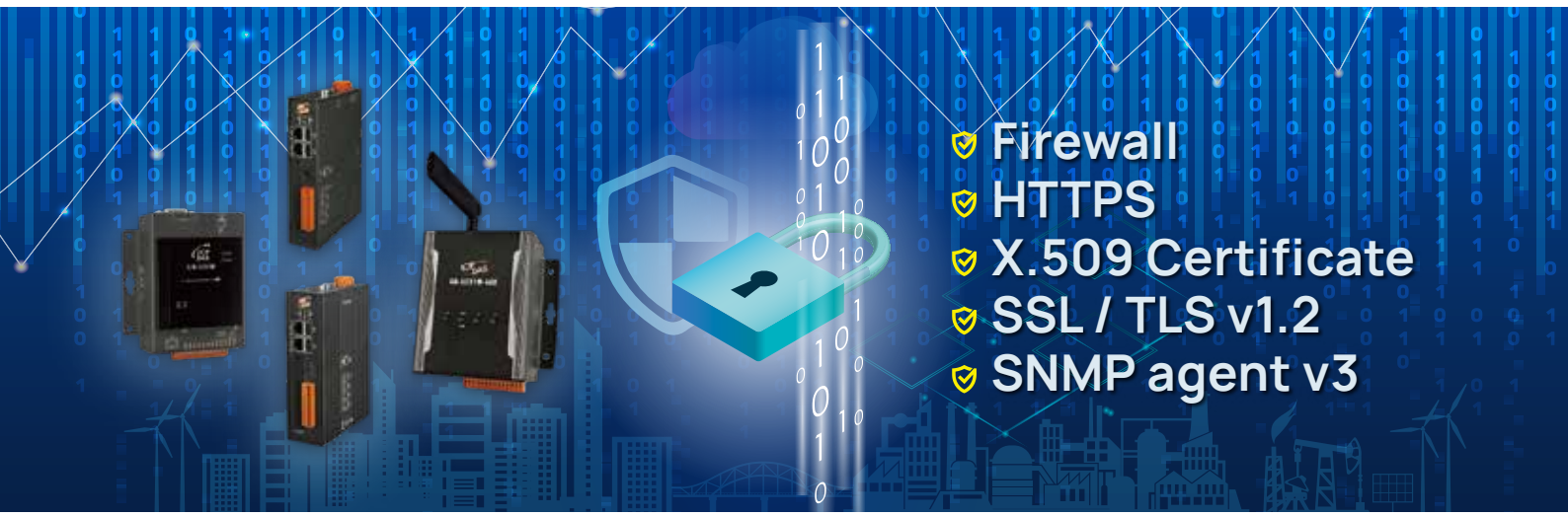


Data lost during a network failure



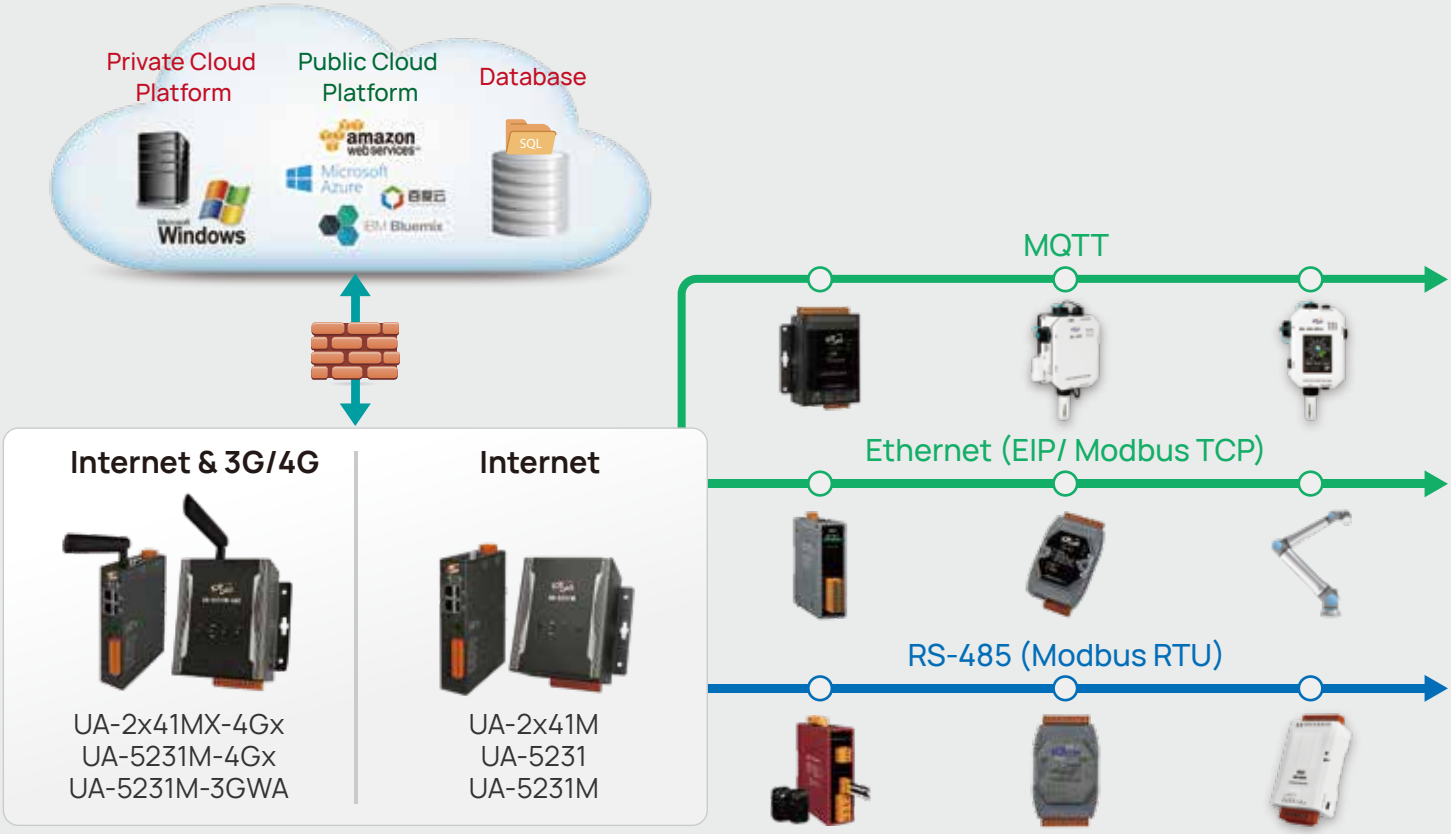
Secure IT Data Exchange (Certificates/Encryption)

To secure I/O data uploads between UA Series and platforms, UA Series supports HTTPS to safeguard information sent between a web browser and a website, as well as MQTT with SSL/TLS and OPC UA Server functions for encrypted real-time I/O data transfer and confidentiality. With the protection offered by UA — firewall settings and data encryption, the series achieves cybersecurity while building IoT systems. Besides, UA-2841M supports the SNMP (v3) agent.



Connection to IoT Cloud Platforms

UA Series products can upload I/O data to cloud platforms in real time for analysis. Additionally, the series allows users to edit MQTT messages (JSON) and publish them to a specific client.



IFTTT Logic Control & Mobile Notifications

When detecting anomalies in I/O values, IFTTT (If this, then that) performs logic control and sends real-time notifications to the management staff via LINE, Twitter, Gmail, Weibo, etc.

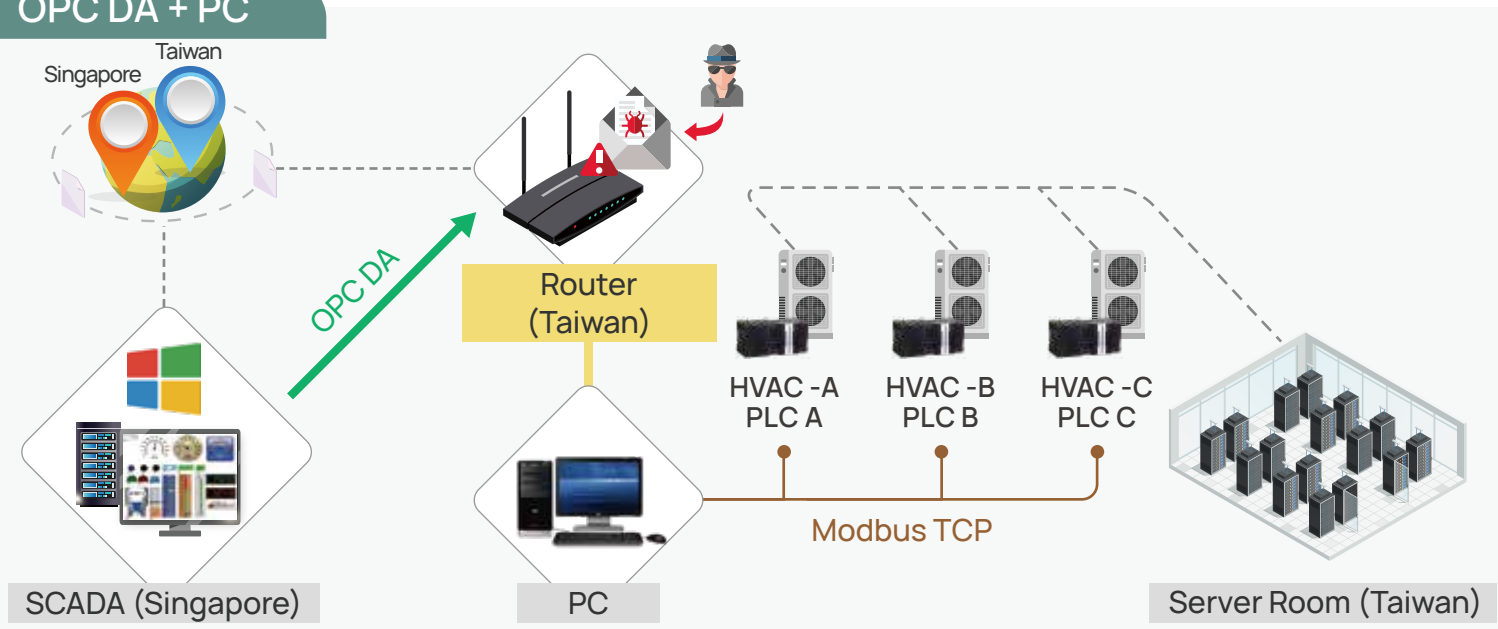
Cross-border Server Room Environmental Monitoring

Simplified Architecture | OPC UA Security

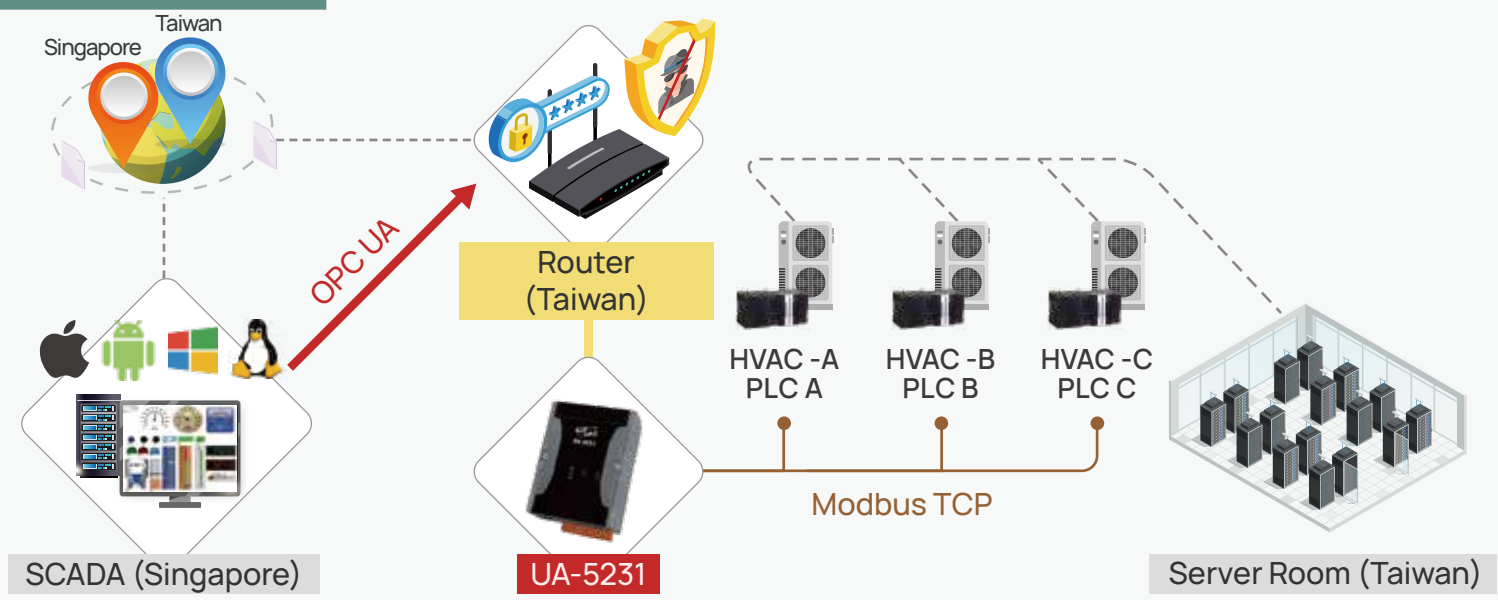
A transnational tech firm employed a PC+OPC DA server architecture to monitor PLCs used for HVAC Controls in the Taiwan server room. The headquarters in Singapore could access the data via VPN while incurring higher overall system costs.The new architecture, with UA-5231 OPC UA Server, replaces the PC+OPC DA. Benefits are as follows.

1. Low power consumption, long-term stability, less manual inspections for maintenance.
2. OPC UA offers secure connections, eliminating the need for a VPN previously used to enhance OPC DA security.
3. Staff at headquarters can quickly convert OPC DA to OPC UA with easy and quick setup using SCADA.

OPC DA + PC



OPC UA



Water Filtration Systems of Chemical Plants

Obtain Data from Field PLC Easily

Reduce Time and Effort for IT-OT Integration

Before analyzing industrial discharge, chemical plants must record data on water flow, pressure, quality, etc. obtained from water filtration systems. Challenges include reading critical data from PLCs in the control panel and integrating it into the IT system. ICP DAS UA-5231M can transmit PLC data to the IT system using the OPC UA protocol, allowing data visualization, real-time analysis, and decision-making for IT. The data is also remotely logged to databases for future reference.

Information Display on Campuses

Display Weather Data, Announcements, and Emergency Instructions

Data Encryption Strengthens Cybersecurity

Digital displays offer convenience and accessibility and thus are widely placed on campuses to disseminate information. In this application, ICP DAS DL-300 Series Industrial Gas Sensors are installed to collect environmental information. The UA-2241M communication servers, with a built-in MQTT Broker, then automatically publish the information to the corresponding iKAN Series LED displays. Meanwhile, the data is encrypted and can be logged into databases using an information management platform. The architecture is more secure and reliable.

Large-Scale Automated Farming System Environmental Control & Feed Management

Real-time Data Collection | Unified Management

Conducive pig farming environments enhance pork quality, while unhealthy environments lead to stunted growth and death. Managing feeding on large farms is laborious, and improper feed quantities can result in feed waste and health problems for pigs.

On-site Pig Farm

M-7060PD-G
I/O Module

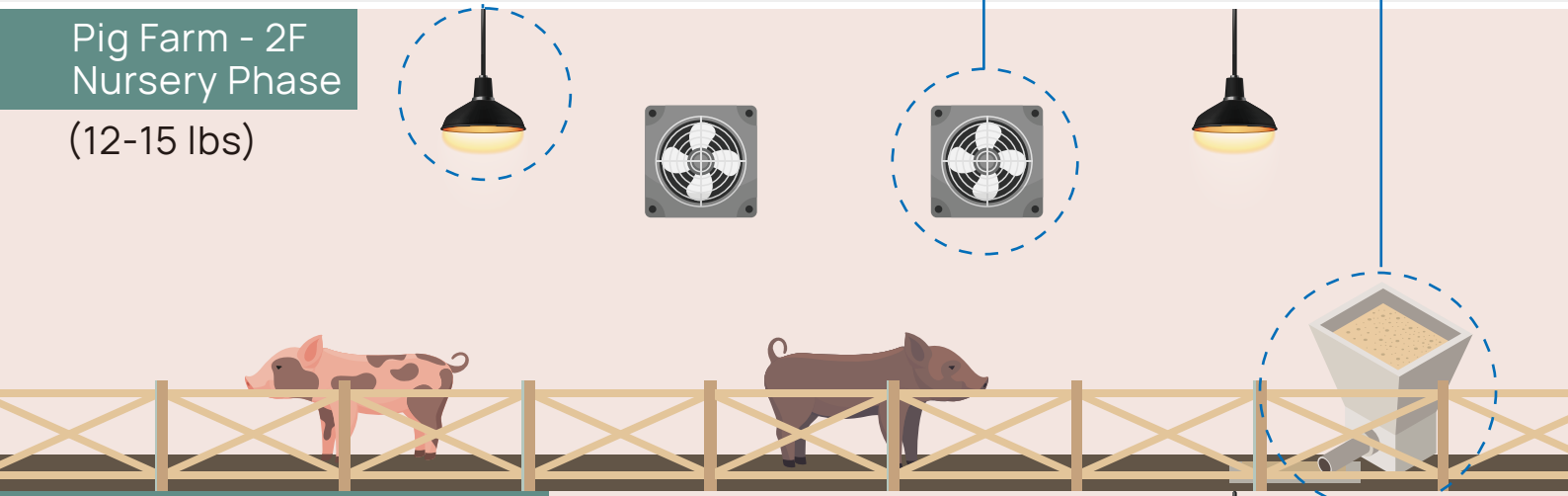
RS-485
Modbus RTU

Relay Output

Lighting Equipment | HVAC | Automatic Feeder

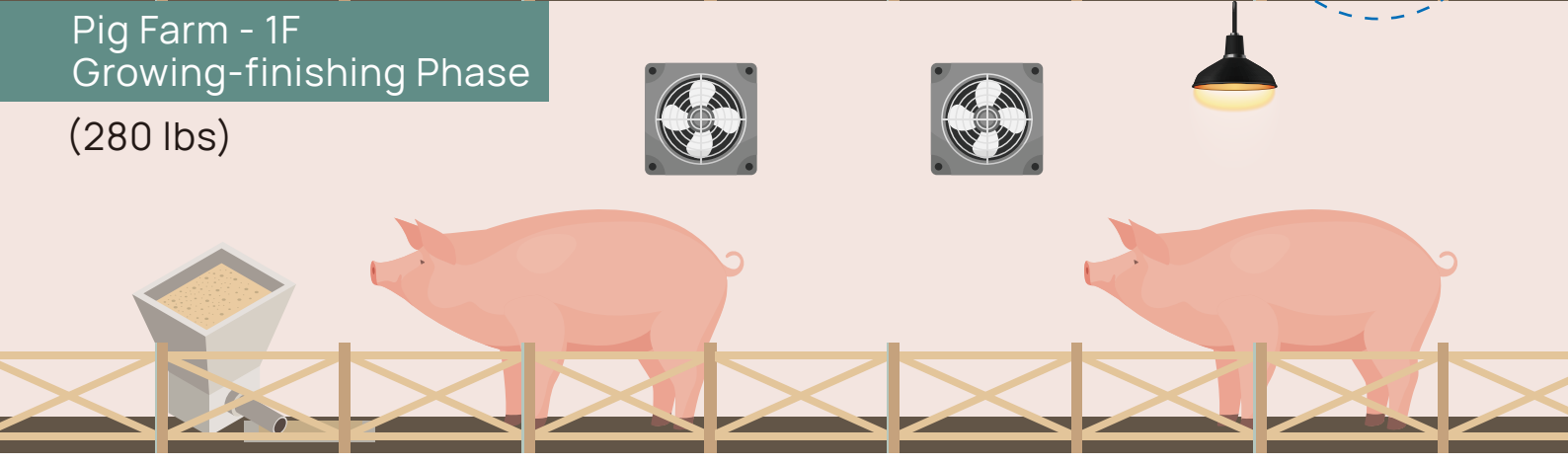
Pig Farm - 2F Nursery Phase

(12-15 lbs)



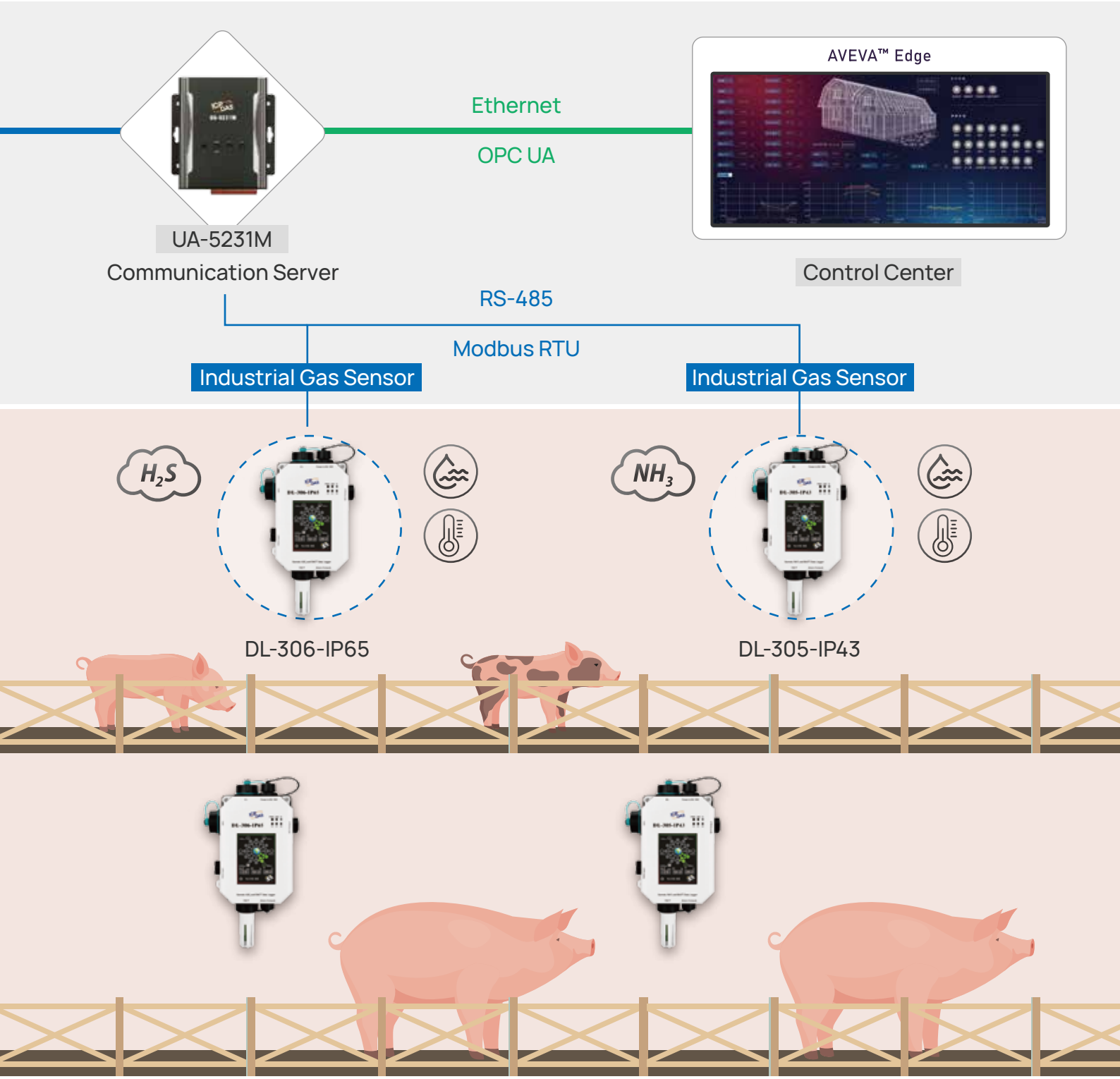
Pig Farm - 1F Growing-finishing Phase

(280 lbs)



DL-305-IP43 and DL-306-IP65 Industrial Gas Sensors monitor temperature, humidity, NH_3, and H_2S levels on the large farm. When detecting anomalies, UA-5231M Communication Server, featuring multi-site control, adjusts ventilation and lighting equipment via M-7060PD-G I/O module. UA-5231M and M-7060PD-G also activate the feeder system at regular intervals, enabling precise environmental control and feeding. AVEVA Edge facilitates data analysis and unified management.

AVEVA Edge HMI/SCADA offers essential tools, allowing users to develop full-featured HMI and SCADA applications. The platform supports data collection and charting for analysis and creates reports in CSV, PDF, and Excel. Besides, AVEVA Edge also notifies the management personnel promptly upon anomaly detection.



Urban Drainage System Monitoring & Control

Support 4G Wireless Communication for Flexible Deployment

Connection to Cloud Platforms such as Azure, AWS, etc.

Downpours often cause urban flooding, posing risks to life and property. Hence, governments increasingly prioritize integrating and monitoring urban drainage systems. The customer installs UA-5231M-4GE Communication Servers at pumping stations where internet deployment is difficult. The servers collect data on temperature, vibration, and flow of the drainage system via a 4G wireless network. The data is securely sent to the cloud using the MQTT protocol. This ensures secure and real-time data monitoring while reducing manual inspection costs.

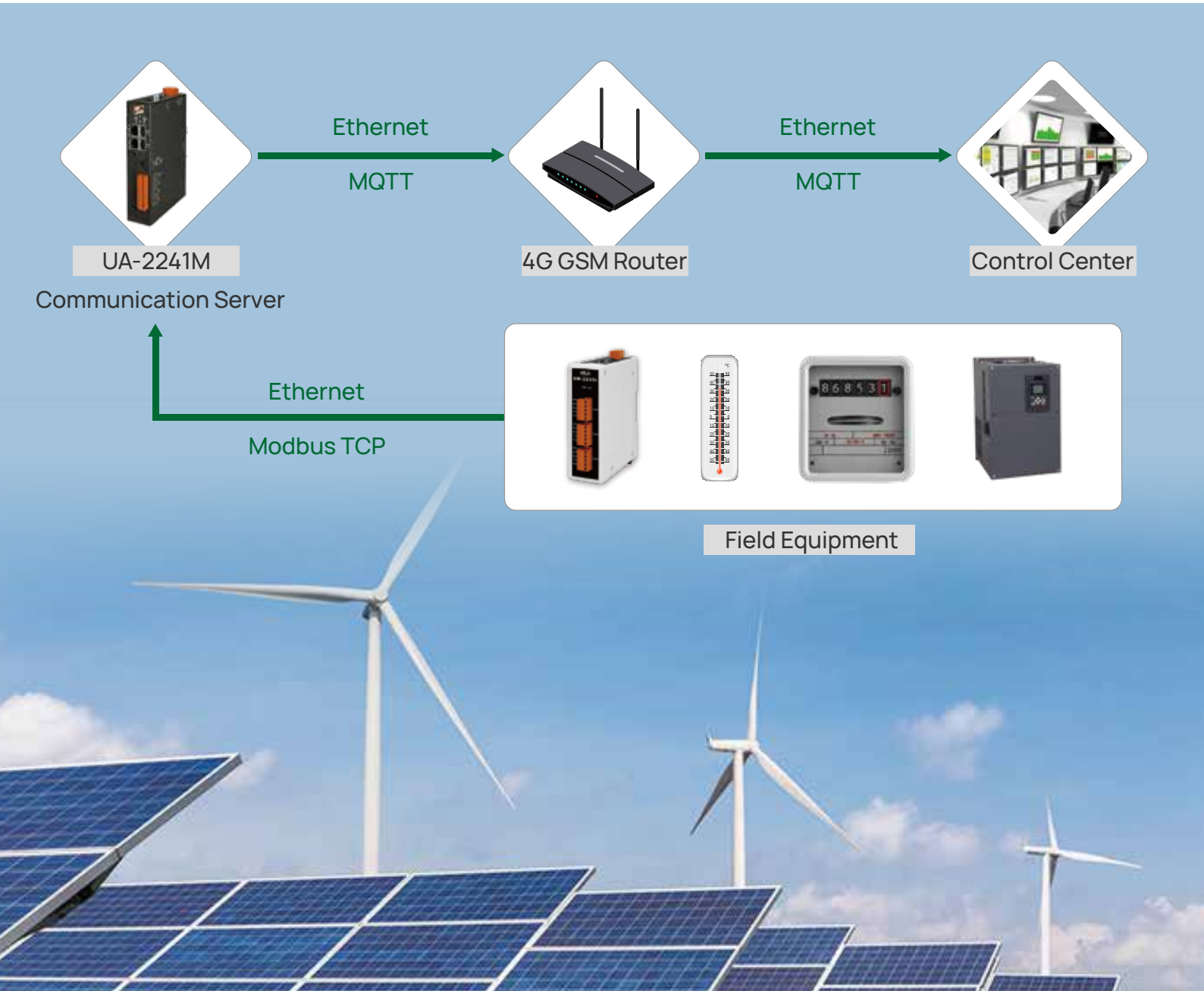
Urban Water Management System

Photovoltaic Power Plant

Data Transmission between Network Segments

Secure Data Exchange & Data Recovery – from the Field to the Cloud

The India government has actively ramped up solar energy development to address the energy crisis. Since local photovoltaic power plants are scattered across the country, equipment monitoring and maintenance become laborious. For smooth operation of the power plants, ICP DAS deploys GW-2235i Gateway to receive data from field equipment using Modbus RTU and transmit the data collected to UA-2241M Communication Server via Modbus TCP protocol. The data is then securely sent to the control center for data visualization and analysis using the MQTT protocol. The solution facilitates preventive maintenance, reduces costs associated with unplanned downtimes, and ensures complete data transfer with UA-2241M' s data recovery function.



Selection Guide

	OS	CPU	SDRAM	Flash	Micro SD Card	Ethernet	RS-232 RS-485	Expansion Port	Wireless Communication
UA-2841M	Linux Kernel 5.10.72	Quad-Core 1.6 GHz/Core	DDR4 2 GB	8 GB	4 GB (Max. 32 GB microSDHC or 2 TB microSDXC)	2	1 x RS-232 (console) 1 x RS-232 2 x RS-485 (2500VDC Isolation)	1	–
UA-2241M	Linux Kernel 3.2.14	Single-Core 1.0 GHz	DDR3 512 MB	512 MB	4 GB (Max. 32 GB microSDHC)				4G
UA-2241MX-4GE									
UA-2241MX-4GC									
UA-5231				8 GB		1		–	–
UA-5231M									
UA-5231M-3GWA									3G
UA-5231M-4GE									4G
UA-5231M-4GC									
UA-7231M						1 PoE	1 x RS-232 (console) 1 x 5-wire RS-232/485 (2500VDC Isolation)		–

Related Products

DL-300 Series — Data Logger

DL-300 Series Data Logger Modules measure CO, CO_2, T&H, dew point, etc.

iKAN Series — IIoT LED Display

iKAN Series offers industrial-grade protection against interference for high stability and reliability. It supports ASCII and Unicode to display multilingual characters.

M-7000 Series — I/O Module

M-7000 Series supports Modbus RTU and DCON protocols for data acquisition and industrial control systems. Via Modbus RTU, it can integrate with SCADA, HMI, and PLC.

GW-2200 Series — Gateway

The module features Modbus TCP to RTU/ASCII gateway function, extending the communication distance of devices using serial communication.

U-7000 Series — OPC UA I/O Module

OPC UA I/O Module is a series of Ethernet I/O modules that offer IIoT communication service.

BRK Series — MQTT Broker

BRK Series is a communication server designed for M2M and IIoT applications. It has a robust metal casing for long-term stability.

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