ICP DAS

IIoT -1-

Software
Server | Controller IIoT




Vol. IIoT1_5.25.06_EN

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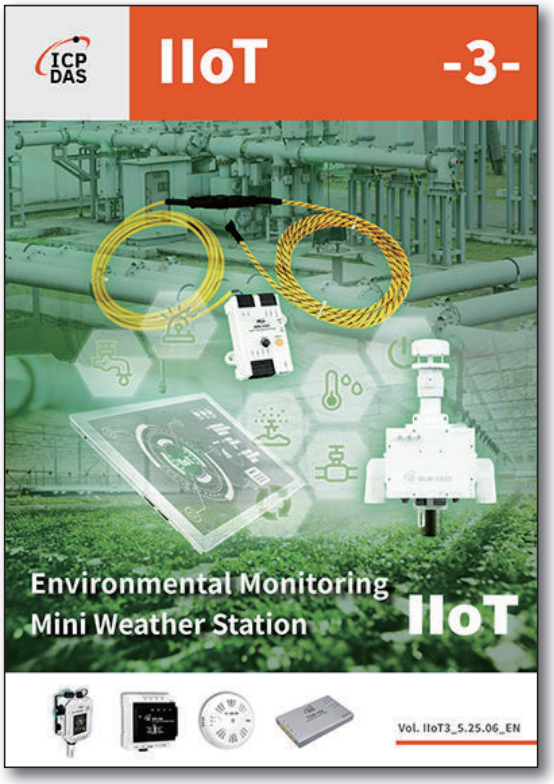


IIoT1 Software, Controller/Server Overview

Industrial Internet of Things (IIoT) is the new cloud trend, and the IoT technology which makes all the devices communicated with each other is the first jigsaw puzzle of the entire cloud vision. To meet the demand for industry, ICP DAS offers software, controllers, Servers, etc. Our goal is to take the data to the cloud and make the whole system very easy to monitor, manage and maintain.

Software

1 IoTstar Cloud Software

The IIoT cloud management software for the remote monitoring and management of the controller and sensor.

2 AVEVA Edge SCADA Software

The develop software to for SCADA, HMI systems, and embedded instrumentation and control applications.

Controller / Server

1 WISE Edge Controller

Built-in edge computing mechanism, Instant message notification, cloud system connection and other functions.

2 UA Communication Sever

The IIoT communication severs connect IT with OT, upgrade the devices to the Cloud.

3 BRK MQTT Broker Server

The MQTT Broker communication server provides Cluster, Bridge, Load Balancing, and High Availability functions. The BRK products can achieve the multi-redundant system.

Chapter 1. IIoT Software

1-1 IIoT Cloud Management Software IoTstar 2025

Introduction

IoTstar 2025 is the latest version of ICP DAS's IoT cloud management software. It integrates the original IoTstar software and service packages (Dashboard Service, Report Service, Bot Service, etc.) into a single product, streamlining IoTstar's purchasing and installation process while making the system more intuitive and convenient to use. In addition to retaining all features and service packages from the previous version, IoTstar 2025 introduces several new user-centric functions and significantly enhances the overall user experience. With IoTstar 2025, users can create IoT cloud systems that deliver the following services:

IoTstar 2025 can be installed on private PCs or VM (Virtual Machine) systems hosted on cloud platforms such as Microsoft Azure, IBM Bluemix, Amazon AWS and Google Cloud. This enables users to quickly establish their own IoT cloud monitoring systems.

During the development of an IoT cloud system, no programming is required, system configuration can be completed through a web interface. Additionally, with SQL commands, IoTstar 2025 seamlessly integrates with cloud platforms and data analysis tools (such as Power BI, Google Data Studio, or SCADA systems), enabling users to efficiently build "IoT + Big Data" cloud applications. This significantly reduces both the time and cost associated with implementing "IoT + Big Data" cloud solutions.

System Architecture

Controller Supported List

Model	WISE-284xM	WISE-224xM	WISE-523x(M)	WISE-75xxM
System				
CPU	Quad-core ARM CPU, 1.6 GHz/Core	ARM CPU, 1.0 GHz		32 bits CPU (400MHz)
microSD	Yes (Built-in one 4 GB microSD card)			-
Ethernet	10/100/1000 Base-TX * 2		10/100/1000 Base-TX * 1	10/100 Base-TX * 2 (for Daisy-Chain Topology)
Casing	Metal(WISE-523x is Plastic)			Metal
Mobile Network	Support 3G/4G Mobile Network(*1)			-
I/O Module Support				
Local Side	Support ICP DAS XV-board			Built-in I/O module
Remote Side	Support at most 48 I/O modules			-
iCAM IP Camera	up to 12	up to 4		-
Software function				
Intelligent logic operation	Yes (Full Function)			Yes (Basic function)
Information Security Enhancement	Yes	-		-

Model	PMC-284xM	PMC-224xM	PMC-523x(M)	PMD
System				
CPU	Quad-core ARM CPU, 1.6 GHz/Core	ARM CPU, 1.0 GHz		
microSD	Yes (Built-in one 4 GB microSD card)			
Ethernet	10/100/1000 Base-TX * 2		10/100/1000 Base-TX * 1	
TFT LCD (with Touch Panel)	-			PMD-220x: 7" Display PMD-420x: 10" Display
Casing	Metal (PMC-523x is Plastic)			Metal
Mobile Network	Support 3G/4G Mobile Network (*1)			-
Power Meter & I/O Module Support				
Local Side	Supports ICP DAS XV-board (PMC-2241M-iWSN not supported)			-
Remote Side	Support at most 48 modules (Include ICP DAS Modbus Power Meters and Modbus I/O modules)	Support at most "24 ICP DAS Modbus Power Meter + 8 Modbus I/O modules" (PMC-2241M-iWSN supports up to 93 ICP DAS iWSN wireless modules)		
Software function				
Intelligent logic operation	Yes (Full Function)			
Information Security Enhancement	Yes	-		

Note 1:

3G/4G version of WISE-523xM, WISE-224xM, WISE-284xM, PMC-523xM, PMC-224xM & PMC-284xM	
3G system (-3GWA)	WCDMA: 850/900/1900/2100 MHz
3G/4G system (-4GE)	FDD LTE: B1/B3/B5/B7/B8/B20 bands (Frequency Band for EMEA, Korea, Thailand, India and Taiwan) WCDMA: 850/900/2100 MHz
3G/4G system (-4GC)	FDD LTE: B1/B3/B8 bands (Frequency Band for China) TDD LTE: B38/B39/B40/B41 bands (Frequency Band for China) WCDMA: 900/2100 MHz, TD-SCDMA 1900/2100 MHz, CDMA2000 (BC0) 800 MHz

Features

Support Flexible Installation Environment for Quick IoT Cloud System Setup

The installation environment can be flexibly chosen based on site requirements.

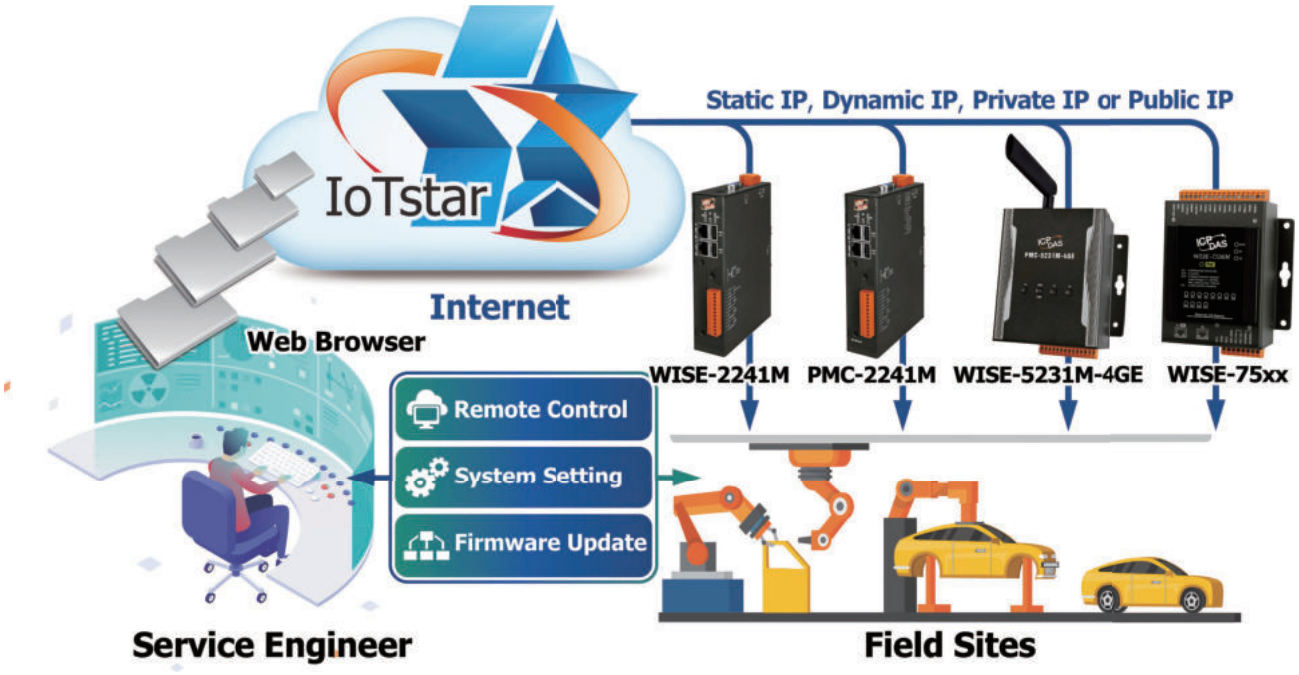
● **Public IoT Cloud Solution:**
IoTstar 2025 can be installed on VMs(virtual machine) within public cloud platforms such as Microsoft Azure, IBM Bluemix, Google Cloud, or Amazon AWS. This setup supports WISE, PMC, and PMD controllers while reducing the burden of maintaining the IoT cloud infrastructure.

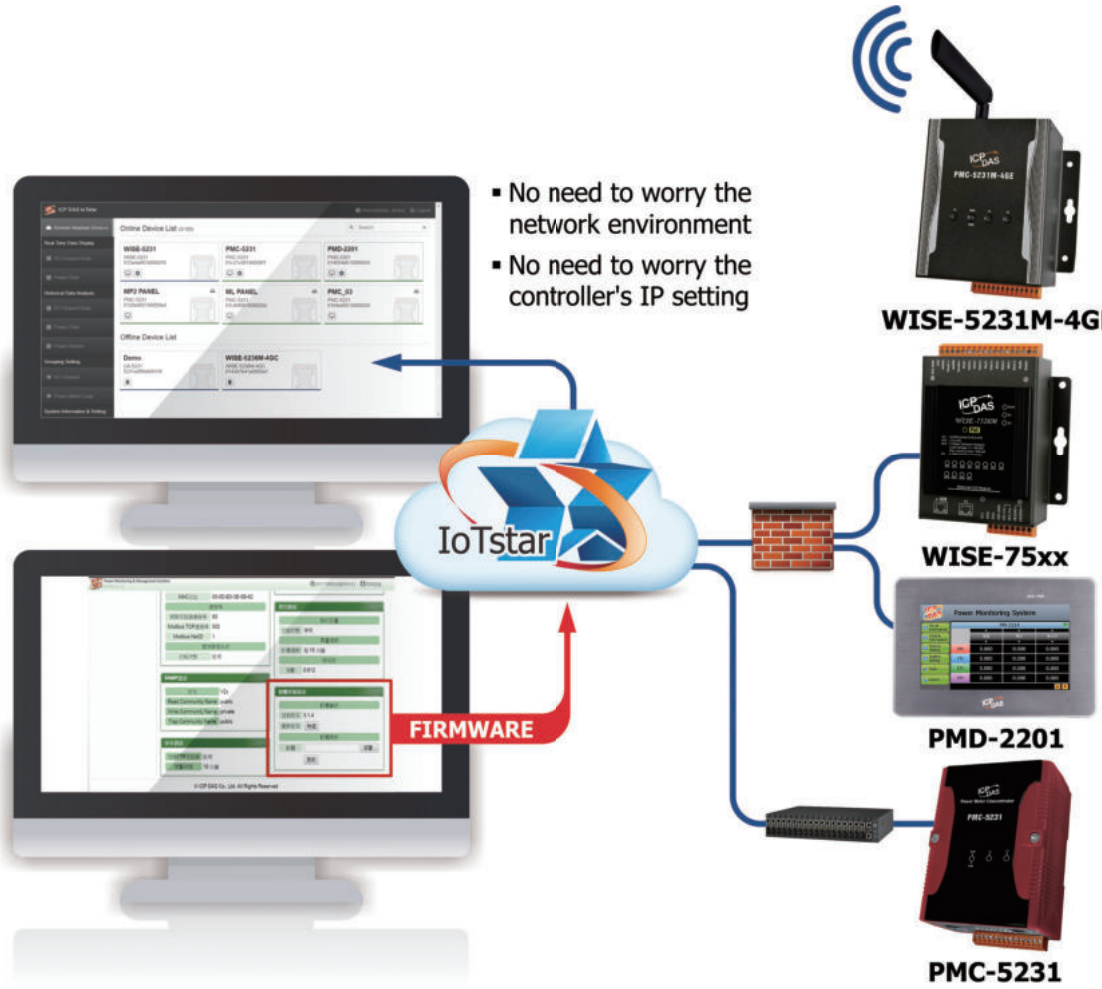
● **Private IoT Cloud Solution:**
If users are concerned about system operation or data storage environments, IoTstar 2025 can be installed on a private Windows PC (Windows 7/8/10 or Windows Server) to implement a private IoT cloud solution for WISE, PMC, and PMD controllers. This allows users to manage and control their own IoT cloud environment, ensuring complete oversight of operations.

No programming required! Set up the IoT Cloud system with a browser.
Setting up the IoT cloud system is as simple as a few clicks on the IoTstar and WISE/PMC/PMD controller web interfaces. With no need for coding, users can quickly configure the system through a browser and have it running in no time.

Controller Remote Access Service

With IoTstar 2025, users no longer need to worry about the network environment of WISE, PMC, or PMD controllers—whether they use static, dynamic, virtual, or physical IP addresses. Through the web interface provided by IoTstar 2025, users can remotely monitor status, adjust system settings, and update firmware, minimizing the time and cost required for personnel to travel for on-site maintenance operations.





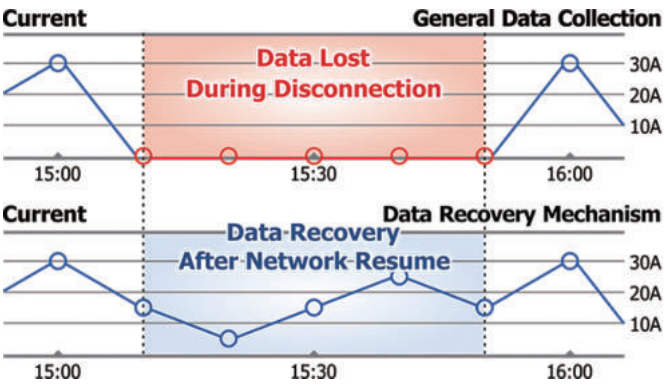
Sensor Data Collection Service

With IoTstar 2025, sensor data collection can efficiently gather both historical and real-time data from sensors or power meters connected to WISE, PMC, or PMD controllers. This data is imported into a cloud database, quickly establishing a data lake for "IoT and Big Data" applications. Users can also modify the database data via SQL commands to control the DO/AO channels of sensors connected to the controllers.

The SQL command interface makes it easy to integrate the sensor data stored by IoTstar 2025 with third-party data analysis tools (such as Power BI, Looker Studio, and SCADA systems) as well as ERP/MES systems. This seamless integration of OT (Operational Technology) and IT (Information Technology) systems enables comprehensive, real-time insights into system operations, supporting better decision-making and operational efficiency.

Sensor Data Recovery Mechanism

In typical cloud data collection processes, sensor data is gathered and sent to the cloud for storage in a database. However, if a network disconnection occurs, any data transmitted during that period may be lost. IoTstar 2025 addresses this issue with a built-in sensor data recovery mechanism. During a network disruption, WISE, PMC, or PMD controllers temporarily store all data on their SD cards. Once the network connection is restored, the stored data is automatically retransmitted to IoTstar 2025 and imported into the database, ensuring the completeness and integrity of historical sensor data.



■ Sensor Data Report Service

IoTstar 2025 offers a powerful statistical report generation feature, enabling users to create reports from data collected by sensors or power meters connected to WISE, PMC, or PMD controllers. This feature transforms raw data into meaningful reports, providing insights into the operational status of machines, equipment, and facilities. These reports serve as an essential basis for informed decision-making, helping to eliminate bias and avoid blind spots.

Features

- Generate a variety of statistical reports for sensors and power meters.
- Create reports for individual I/O channels (or power meter loops) or groups of channels/loops.
- Support queries for "Daily, Weekly, Monthly, Quarterly, or Yearly" reports with customizable date ranges.
- Provide data comparison to analyze values across I/O channels or power meter loops.
- Built-in editor allows flexible customization of report content, including headers and footers, to suit specific needs.
- Export reports in PDF or Excel format for easy sharing and analysis.

Power meter loop report

PMC-5231(Xindian office) / PM-4324-MTCP(Power meter of Area A) / Loop1(wall socket 1)

Day | Week | Month | Quarter | Year | Single Mode | Today 2021/10/19 | Data Shown | Template Management | Download PDF | Download Excel

Time	Max. Demand(kW)	Energy Consumption(kWh)	Avg. PF(%)	Avg. I Phase A(A)	Avg. V Phase A(V)	Avg. I Phase B(A)	Avg. V Phase B(V)	Avg. I Phase C(A)	Avg. V Phase C(V)	Avg. kVA	Avg. kvar
0	0.05	0.05	89.713	0.169	110.354	0.169	110.35	0.17	110.358	0.055	0.024
1	0.05	0.05	89.566	0.169	110.557	0.168	110.553	0.169	110.562	0.056	0.025
2	0.05	0.05	89.562	0.169	110.776	0.169	110.771	0.17	110.78	0.056	0.025
3	0.05	0.05	89.628	0.17	110.975	0.17	110.972	0.17	110.982	0.056	0.025
4	0.051	0.05	89.375	0.17	111.112	0.169	111.108	0.17	111.118	0.056	0.025

Summary

Daily Highest Usage: 0.051kW
Occurrence Time: 2021-10-19 04:59:00
Daily Total Electricity Consumption: 0.41kWh

▲ Report for "Power Meter Loop"

I/O Channel report

PMC-5231(Xindian office) / DL-1023(Air quality for factory) / AI2(PM2.5)

Day | Week | Month | Quarter | Year | Single Mode | Today 2021/10/19 | Data Shown | Template Management | Download PDF | Download Excel

Time	Maximum(ug/m3)	Minimum(ug/m3)	Average(ug/m3)	Final Value(ug/m3)	Total Value(ug/m3)
0	1	0	0.283	0	17
1	1	0	0.116	0	7
2	1	0	0.118	1	7
3	1	0	0.066	0	4
4	1	0	0.083	0	5

Summary

Daily maximum: 1 ug/m3
Time of maximum daily value occurs: 2021-10-19 00:01:00

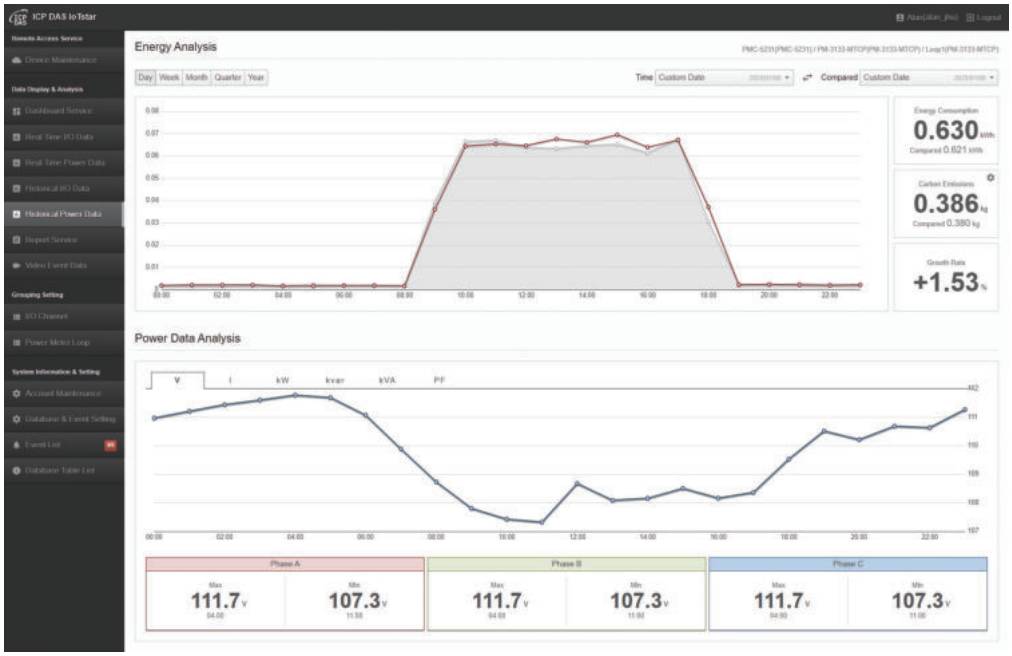
Daily minimum: 0 ug/m3
Time of minimum daily value occurs: 2021-10-19 00:00:00

Daily average: 0.098 ug/m3
Daily total value: 49 ug/m3

▲ Report for "I/O Channel"

Sensor Data Visualization Service

IoTstar 2025 provides real-time and historical data queries for sensors and power meters connected to remote WISE/PMC/PMD controllers. It features dedicated power analysis pages that help users query and compare power consumption across different time periods, analyze usage trends, and identify potential energy-saving opportunities. At the same time, it helps reduce carbon footprints and contributes to environmental sustainability.



IoTstar 2025 offers a dashboard editor and various widget components, enabling users to create customized dashboards for viewing real-time data from sensors or power meters connected to WISE, PMC, or PMD controllers. Users can quickly build the dashboards needed for IoT cloud monitoring, monitor sensor or power meter status in real-time, and interact with them directly.

Features

- Offers a dashboard editor for users to easily customize specific dashboard pages.
- Includes a variety of built-in widgets to present sensor or power meter data in multiple formats.
- Displays real-time sensor or power meter data with the ability to modify output channel statuses.
- Provides a rich content widget (WYSIWYG editor), allowing users to edit widget content by importing HTML code, text, web pages, images, videos, and more.
- Supports 'Dark Mode' for improved visibility during nighttime use.
- Receives on-site snapshots or video files from controllers, enabling users to browse and review them through IoTstar (to send snapshots or videos, use WISE with an iCAM IP camera).

Example of Air quality monitoring (Using Line Chart, Gauge, Plot Bar, Value Table, Value Label Overlay widgets).

Example of Power monitoring (Using Line Chart, Value, Value Output and Rich Content widgets).

Widget provided:

Line Chart

Bar Chart

Pie Chart

Gauge

Plot Bar

Alarm Event List

Value

Value Table

Value Label Overlay

Value Output (Slider)

Value Output (Button)

Video Event List

Time Clock

Countdown Timer

Map

Rich Content

Example of Environmental monitoring (Using Line Chart, Value, Value Output, Map and Video Event List widgets).

Bot Service with Mobile Phone

IoTstar 2025 offers a built-in chat room feature that allows users to interact with WISE, PMC, or PMD controllers via the LINE or Telegram app, providing a fast and convenient way to manage equipment. Unlike traditional chatbots that rely solely on text commands, it features a user-friendly interface with buttons and dialog menus for easy access to information.

With this functionality, users can query real-time data from on-site I/O modules or power meters and adjust DO/AO channel values anytime, anywhere. Additionally, IoTstar 2025 can receive alarm events proactively sent by WISE, PMC, or PMD controllers and forward them to relevant LINE or Telegram users for real-time notifications. All alarm events are logged within IoTstar 2025, allowing users to review historical events using its event query feature.

Features

- Monitor WISE, PMC, and PMD controllers anytime, anywhere using the LINE or Telegram app.
- Query real-time sensor or power meter data and adjust output channels.
- Receive alarm events with text, snapshots, or videos (WISE can integrate with iCAM IP cameras to send snapshots or video files).
- View and query the history of alarm events.
- Ensure secure and reliable communication between LINE/Telegram and the controllers.
- Easy maintenance with only the LINE or Telegram app requiring updates.

***The following interface is operated via the LINE App.

Applications

Cloud-based Power Monitoring Solution for Factories

ICP DAS "IoTstar + PMC/PMD" Intelligent Power Monitoring Solution, combining PMC/PMD Power Meter Concentrators with the IoTstar Cloud Platform, enables rapid deployment of a cloud-based power monitoring system for factories.

PMC/PMD Power Meter Concentrator

- Connect with power meters to collect and record power data
- Edge computing (IF-THEN-ELSE logic rules) to manage power demand & event alerts
- Sent alarms instantly via LINE, Telegram, WeChat, email, or SMS without additional development required

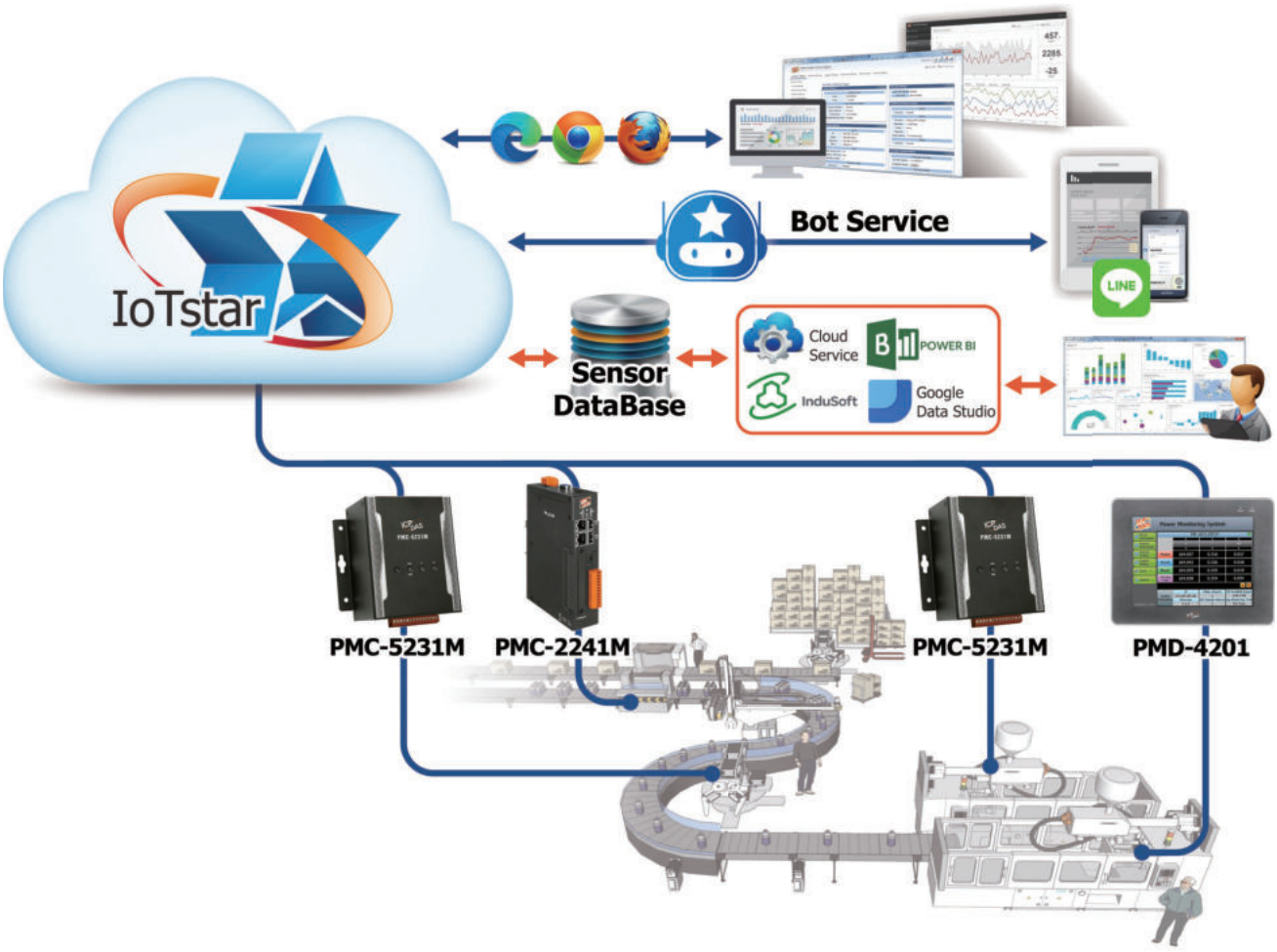
IoTstar Cloud Platform

Receives and stores power data transmitted from PMC/PMD devices. Once data is received, IoTstar offers:

- Web-based monitoring and control
- Real-time data collection and visualization
- Data reporting services
- Mobile-friendly Bot notifications & interaction

Key Benefits

- **No Programming Required**: Collect and store power data in the cloud
- **SQL Database Integration**: Seamless IT Integration
- **Cloud-based Management**: Enhance response time & factory equipment efficiency
- **Cloud-based Maintenance**: Setup and update PMC/PMD devices remotely, cutting maintenance costs



Smart Urban Water Supply Solution

ICP DAS "IoTstar + WISE" Smart Water Supply Solution quickly deploys an intelligent water supply monitoring system.

IoTstar Cloud Platform

- Real-time sensor data visualization
- Auto alerts & reports for pressure/flow
- Mobile-friendly bidirectional control
- SQL database for system integration
- Remote WISE firmware management and updates

WISE-5231M-4GE Edge Controller

- Connect Modbus TCP/RTU sensors for flow, pressure, and water quality
- Built-in IF-THEN-ELSE logic to control and trigger alerts
- Mobile alerts via LINE, Telegram, WeChat, Email and SMS
- Sends data to IoTstar for cloud integration

Key Benefits

- **Real-Time Monitoring**: Cloud-based alerts from live water system data
- **Efficient Maintenance**: Remote logs reduce manual inspections
- **Flexible Connectivity**: Supports various sensors
- **No Coding Needed**: Fast deployment for public and private water sectors
- **Scalable & Compatible**: Integrates with SCADA, GIS, and water management systems

■ Cloud-based Indoor Air Quality Monitoring Solution

ICP DAS IoTstar + WISE + DL/CL Air Quality Monitoring Solution

DL/CL Series Air Quality Sensors

- Measure PM1/PM2.5/PM10, CO, CO2, HCHO, NH3, H2S, etc.
- Indoor and waterproof outdoor models

IoTstar Cloud Platform

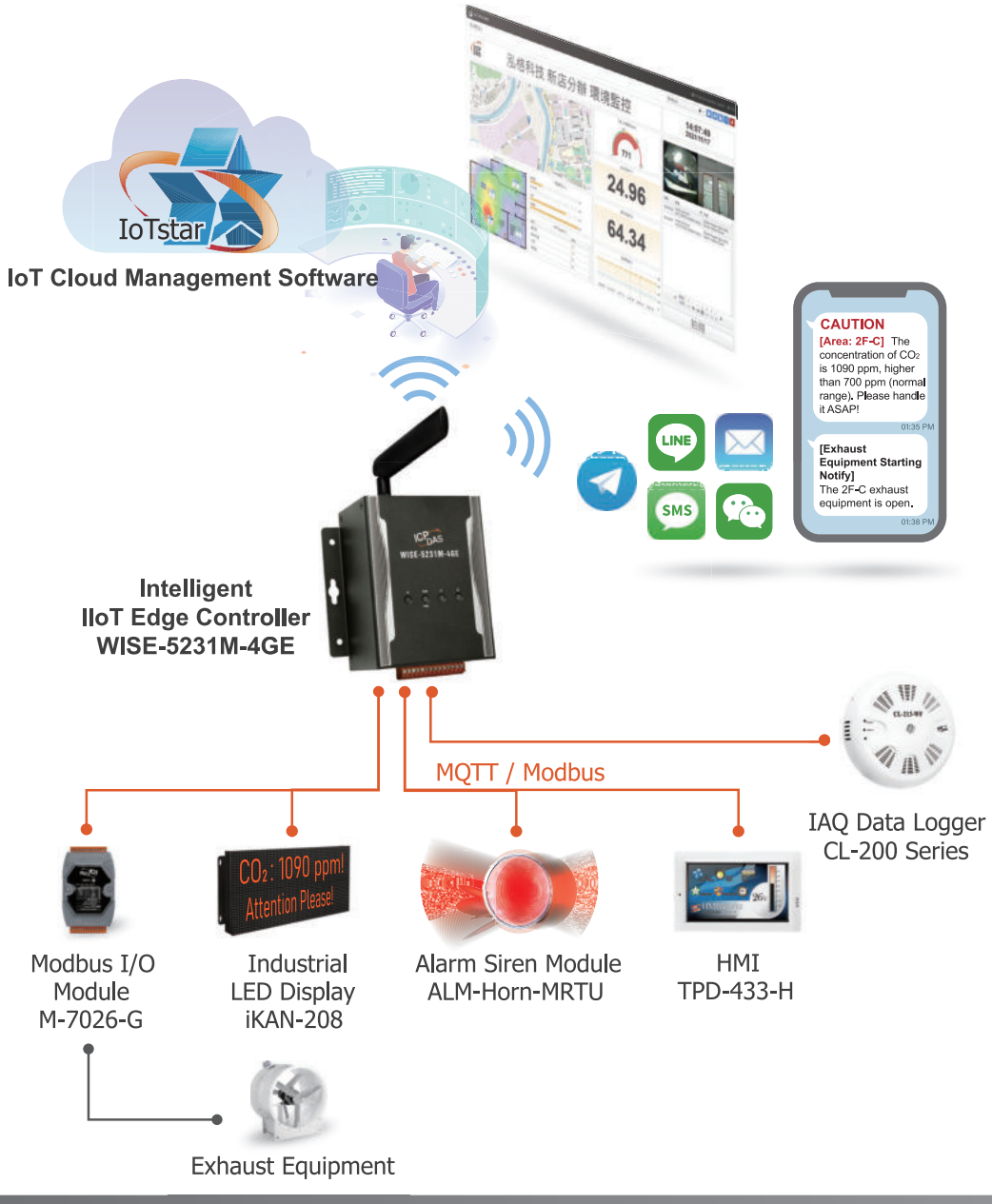
- Auto-imports sensor data to cloud database
- Visual dashboards & analysis reports Mobile access with bidirectional control
- Remote controller maintenance

WISE Edge Controller

- Collects and logs air quality data
- Built-in IF-THEN-ELSE logic enables automated control of devices such as fans, sprinklers, and alarms based on user-defined conditions.
- Sends alerts via LINE/Telegram/WeChat/SMS
- Uploads data to the IoTstar cloud platform

Application Field

- Indoor spaces: offices, hospitals, libraries
- Harsh/wet environments: greenhouses, pig & poultry farms
- Strictly regulated areas: chemical plants, laboratories



■ Cloud-based Greenhouse Monitoring Solution

IoTstar + WISE-5231M-4GE + DL Sensors + I/O Modules + iCAM

ICP DAS offers a smart greenhouse solution that integrates **environmental sensing, automatic control, real-time alerts, image monitoring, and cloud-based remote management.**

Cloud Layer	**IoTstar** Cloud Platform	For device management, report generation, and historical data query
Control Layer	**WISE-5231M-4GE** Edge Controller	IF-THEN-ELSE logic for automated actions. Controls irrigation, ventilation, lighting, and sends alerts to mobile phones.
Sensing Layer	**DL Series** Sensors	Measures temperature, humidity, and light level (lux) for intelligent lighting and climate regulation.
I/O Layer	**I/O Modules** M-7017, M-7061D...	Controls actuators such as sprinklers, fans, grow lights, curtain motors
Image Layer	**iCAM** IP Camera	Provides live monitoring and intrusion detection. Sends images and alerts via LINE / Telegram / WeChat.

WISE Logic Applications & Examples

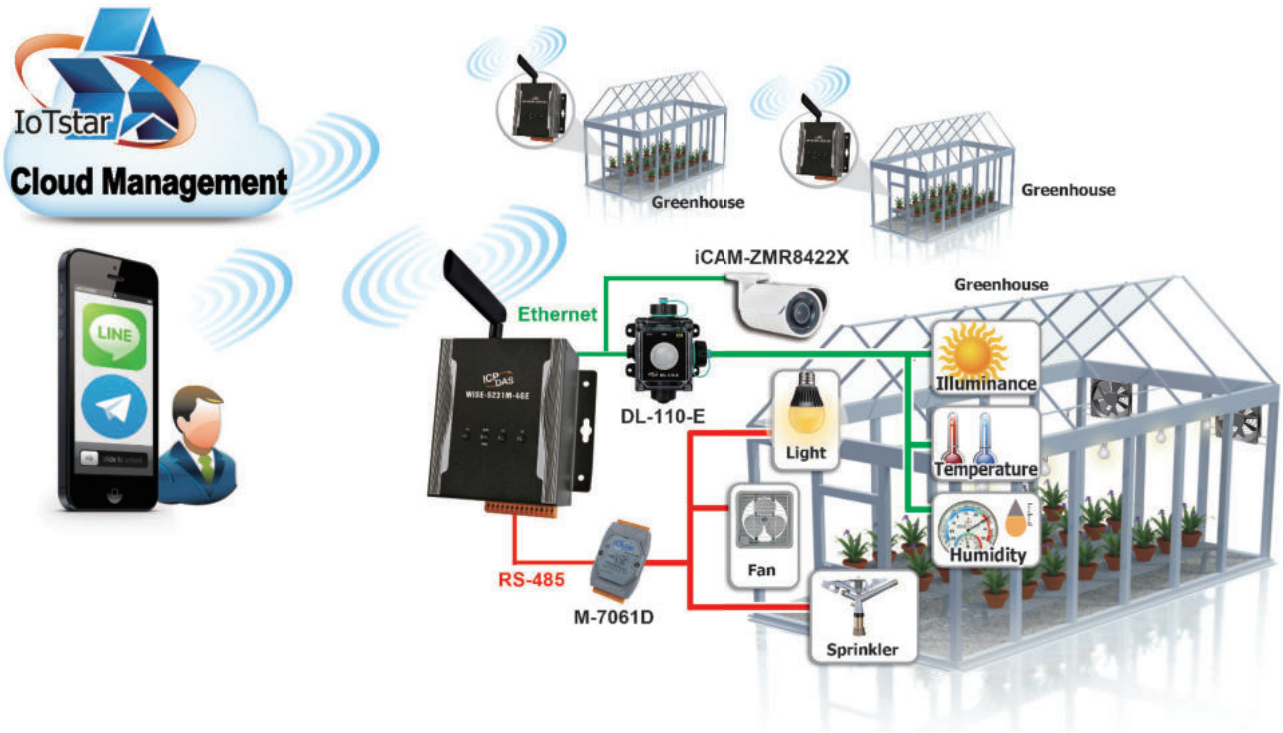
- If light < 300 lux → turn on grow lights automatically
- If humidity < 60% → activate misting system and send LINE alert
- Schedule-based irrigation/fertilization via DL sensor + timer
- iCAM detects movement during off-hours → auto-capture and send alert

IoTstar Cloud Features & Highlights

- Real-time dashboards and trend charts
- Sensor data reports and analysis
- Remote maintenance of WISE

Key Benefits

- No coding required – automation
- Instant alerts & image reporting – safety
- Easy multi-greenhouse monitoring & control
- Higher crop yield, lower risk



■ Cloud-based Building, Warehouse, Factory Monitoring Solution

IoTstar + WISE + iSN + DL + iCAM Solution for Buildings/Warehouses/Factories

iSN/DL Sensors + iCAM IP Camera

- **iSN Leak Detection Module:**
  Detects water leakage or flooding
- **DL Environmental Sensor Module:**
  Measures temperature & humidity
- **iCAM IP Camera:**
  Real-time video + intrusion alert

IoTstar Cloud Platform

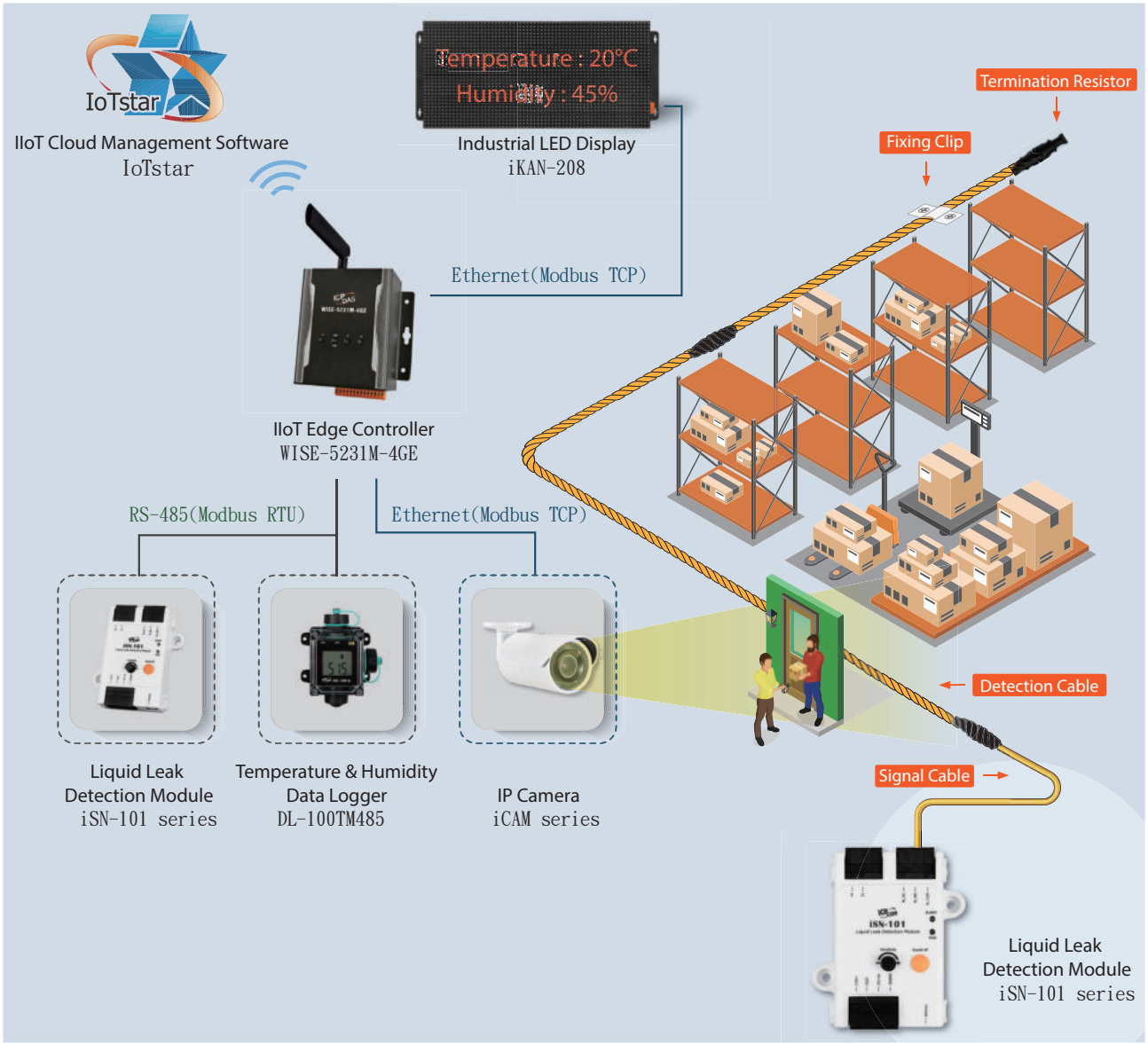
- Auto data import & visualization
- Real-time monitoring & reports
- Mobile control & notifications
- Remote device maintenance

WISE Edge Controller

- Collects and records data from iSN/DL sensors
- Executes auto control via IF-THEN-ELSE logic (ventilation, drainage, alarms...)
- Send alerts based on iSN/DL data conditions (LINE, Telegram, WeChat, Email, SMS)
- Detects intrusions and sends alerts with iCAM's image-based monitoring
- Transmits all data to the IoTstar cloud platform

Application Field

- Basement & equipment room leak alerts
- Warehouse temp/humidity & leak monitoring
- Factory environment & safety control



IoTstar 2025 Live Demo (iotstar.icpdas.com)

The IoTstar 2025 Live Demo enables users to explore its full range of features, including:

- Cloud-based monitoring and configuration of onsite WISE, PMC, and PMD controllers.
- Access to data from sensors or power meters connected to the controllers.
- Interactive data visualization dashboards for sensor or power meter data.
- Generation of statistical reports for sensor or power meter data.
- Viewing image events captured by iCAM series network cameras integrated with WISE controllers.

With IoTstar, you can log in to controllers directly for remote configuration and maintenance without needing their IP addresses or login passwords.

Installation Platform Requirement

	Specification Suggestions
CPU	64-bit (x64); 3.0 GHz or higher GHz Processor
RAM	Minimum 8 GB for RAM. When the number of controllers or sensors, or the size of Database is increased, upgrade the RAM space as needed to ensure the best performance of the system.
Hard Disk	Minimum 64GB for Hard Disk space. When the number of controllers or sensors, or the size of Database is increased, upgrade the Hard Disk space as needed to ensure the best performance of the system.
OS System	Windows 7, Windows 8,Windows 10, Windows Server 2012 or later OS system (64-bit Windows required).
Notes	• Support WISE-523x/2x4x/75xx, PMC-523x/2x4x and PMD controllers. • Need to work with IIS Web Server. • Need to work with Database system such as Microsoft SQL Server, MySQL Server or Oracle Database. (For detailed version information, please refer to IoTstar user manual)

Ordering Information

■ IoTstar 2025 (built-in "Controller Remote Access Service", "Sensor Data Collection Service", "Sensor Data Visualization Service", "Sensor Data Report Service", "Bot Service with Mobile Phone")

Model	Description
IoTstar2025-RC050	IoTstar 2025 - IoT Cloud Management Software (Max. 50 controllers can be connected.)
IoTstar2025-RC200	IoTstar 2025 - IoT Cloud Management Software (Max. 200 controllers can be connected.)
IoTstar2025-RC500	IoTstar 2025 - IoT Cloud Management Software (Max. 500 controllers can be connected.)

■ IoTstar 2025 Upgrade Package (Optional package for IoTstar 2025)

Model	Description
IoTstar2025-UC050-200	IoTstar 2025 Upgrade Package (Upgrade the maximum number of controllers connected to IoTstar from 50 to 200.)
IoTstar2025-UC200-500	IoTstar 2025 Upgrade Package (Upgrade the maximum number of controllers connected to IoTstar from 200 to 500.)

Note: For IoTstar versions released before 2025, no new features will be added. However, essential bug fixes will continue to be provided. If you need to expand the number of controllers or purchase additional software features, please contact our sales team.

1-2 SCADA System Software: AVEVA Edge

AVEVA Edge is a comprehensive platform that includes all the tools you'll need to make SCADA and HMI applications that have real power behind them. The development environment allows you to develop once and deploy anywhere. AVEVA Edge supports all Windows runtime platforms (including 32 and 64 bit), ranging from Windows Embedded Compact, Windows Embedded Standard, Windows 8.1/10 and Windows Server Editions, along with built-in support for local or remote (web) based visualization.

- **AVEVA™ Edge** Studio is a development system of AVEVA Edge on Windows. It provides a complete development environment, allowing designing once and deploying anywhere.
- **AVEVA™ Edge** SCADA – The full Windows based runtime offers all the tools you need for advanced SCADA applications.
- **AVEVA™ Edge** HMI – AVEVA Edge for embedded systems such as Windows Embedded operating systems. The small footprint makes AVEVA Edge HMI ideal for embedded and edge machines.
- **AVEVA™ Edge** Compact HMI – Compact HMI is designed especially for Windows CE operating systems.

AVEVA Edge Creates Advantages For You

1. Combining message and automation to increase productivity
2. Studio Moblie Access implements IoT
3. Complete integration of embedded platforms
4. Real-time and rapid technical supports

AVEVA Edge Features

★ SCADA/HMI and templates
★ Easy communication and integration
★ Protection of development cost
★ Design once - Deploy anywhere
★ FDA traceability
★ Redundant mechanism
★ Database
★ Recipes and reports
★ Trend chart
★ Drivers and OPC
★ Solid security
★ Perfect development tool
★ Graphic design tools shorten the development time
★ Advanced alarm system controls the on-site status in real-time.

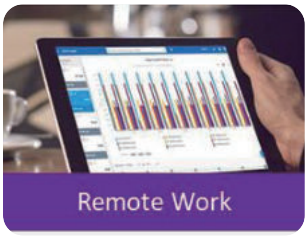
AVEVA™ Edge HMI - 2023 R2 what's new

The most world's portable, small-footprint HMI

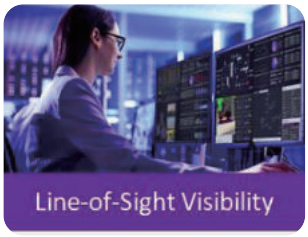
AVEVA Edge HMI provides a complete tool to assist in the development of embedded devices, Panel PCs and advanced HMI applications.

The new features in the 2023 R2 release offer more connectivity for small footprint Linux-based runtime, enabling smarter IIoT solutions.


Collaboration


Remote Work


Standardization


Line-of-Sight Visibility

Main update features

- **Python scripting support**
  Support a common, popular, platform-agnostic scripting language for IoT View (Linux Runtime), SCADA (Windows Runtime) and IDE (Editor).

- **Standard driver sheets (IoT View)**
  Ported support for standard driver sheets (in addition to main driver sheets) for IoT view for more flexibility and control

- **Tag integration (IoT View)**
  Ported support for tag integration to IoT View for Drivers and OPC.

- **Consume industrial graphics libraries**
  Maintain compatibility and coexistence with AVEVA™ System Platform 2023 R2.

- **MQTT**
  Enhance main driver sheet to allow easier address of topics.

- **COSYS driver**
  Driver encryption and certificate management.

- **History lifetime days**
  Ported, automatic trend log housekeeping, so you don't fill up your hard drive or database

- **Grid pagination on Mobile Access**
  Improved grid object performance by adding pagination support.

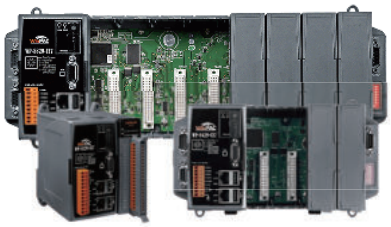
Support Platforms

- **Linux (with 16 Linux communication drivers)**
- **Windows Embedded**
- **Microsoft Windows**

AVEVA™ Edge

Easy Step to Meet Your Satisfaction

ViewPAC



WinPAC

XPAC

AVEVA Edge builds powerful graphical displays and takes advantage of the 250+ available communication drivers for all major PLC products. AVEVA Edge includes OPC UA and OPC Classic (HDA and DA), trends, alarms, reports, recipes and built-in SQL database support as standard features.

AVEVA Edge Controllers

AVEVA™ Edge Compact HMI and **AVEVA™ Edge HMI** can integrate with ICP DAS's professional PACs, including WinPAC, ViewPAC, and XPAC-IoT.

	Product Features
AE-WinPAC	A Stable and cost-effective compact SCADA system. Builds a graphic monitoring system of I/O rapidly and easily.
AEV-PAC	Provides HMI/ SCADA system solution with an all-in-one touch panel. Suitable for machine control systems with a narrow space.
AE-XPAC-IoT	XPAC-IoT is a PAC based on Windows 10 IoT Enterprise. It integrates operation, I/O, and operator interface, providing a perfect solution for combining HMI, data acquisition and control into one PAC.

Features of PAC equipped with AVEVA Edge

- Graphic interface as an operation tool
- Supports various ICP DAS's I/O modules with slots
- Saves physical spaces for implementing a system
- Real-time and history alarm/ incidents and trend charts
- Various communication protocols (DCON, Modbus, OPC, TCP/IP...)
- Remote Web monitoring and security
- Redundant system application
- Others (VBScript, E-mail, FTP...)

Application of the Railway Signal Monitoring System

With the help of the Internet, hardware and software, controlled by the graphic control system, users can efficiently collect and manage important data, analyze the causes of failures, thereby improving the quality of maintenance, increasing efficiency, and reducing the number of equipment failures.

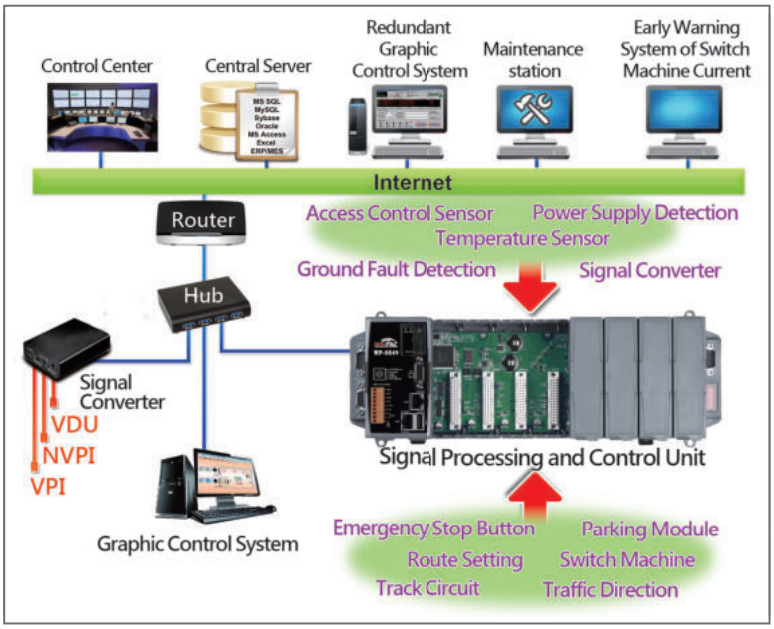
Effective use of the railway signal monitoring system and maintenance mechanism can reduce the troubleshooting time of signaling equipment, ensure road safety, and achieve the goal of punctuality in rail transport, thereby enhancing the reliability and stability of signaling equipment.

The railway signal monitoring system is divided into three parts:

1. Signal converter

2. Signal processing and control unit

3. AVEVA™ Edge graphic control system



AVEVA™ Edge uses graphics to display the signal converter and the signal control unit. There are three main categories: real-time data screen, accumulated data screen, and graph analytics chart. Other pages include alarm management (real-time and historical data query), statistics and analysis reports, threshold parameter settings, database management, setting modification of system operation parameters, and the track operation replay. With the access control function, management personnel can use the AVEVA™ Edge graphic control system in the control room at the station, or use it remotely. The real-time data display shows the following information on the route chart: real-time connectivity status of individual stations, real-time status of monitoring points at each station, speed of track circuit, operating current of track circuit, and switch taming current of each track circuit.

Application of Water Plant Monitoring System

Users can adopt AVEVA Edge as the major data integration platform to collect data and provide a complete database. In addition to the central monitoring system in the control center, other sites can also use AVEVA Edge as an on-site graphic control interface.

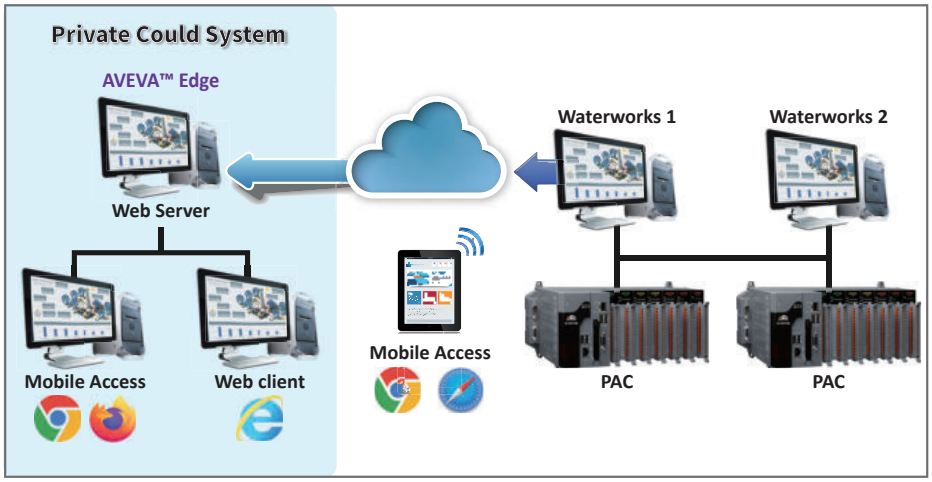
Major Features on the sites

★ Collects information for all sites

★ Provides redundant system for major sites

★ Provides web page and mobile user interface for all sites

★ Provides automatic data recovery function



Benefits of the Monitoring System

AVEVA Edge provides a perfect system structure to connect the control center and the other sites seamlessly.

Major sites can adopt dual modular redundancy to avoid a single system missing important information due to external factors.

The communication between a single site and the control center may be interrupted due to external factors. AVEVA Edge is capable of conducting data recovery after the communication recovers.

It sends all the on-site data to the cloud system, allowing the management personnel of a water plant to browse all the information, thereby conducting analysis and making decisions.

Application of Gas Pressure Regulation Station Monitoring

Users can integrate information about pressure, flow, leakage, temperature, earthquake, access control, and on-site image at gas pressure regulation stations via wire or wireless communication, and send the data back to the control center instantaneously for management. When an anomaly occurs, the control center can remotely activate an emergency shut-off valve to stop the gas supply, thereby avoiding accidents occurring.

Conducting remote unified monitoring for all gas equipment can increase the benefits of overall gas monitoring system, reduce labor and time costs of gas providers, and ensure people's safety.

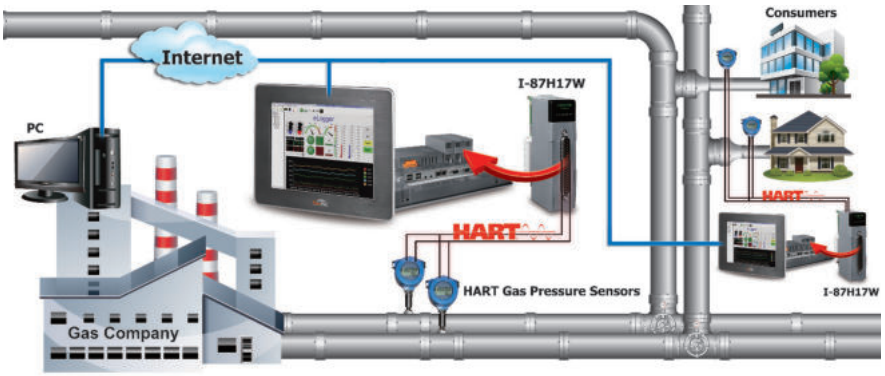
Gas Pressure Regulation Station Monitoring System in Taiwan- AVEVA™ Edge Solution

Overall Monitoring System Structure

About twenty pressure regulation stations in total. Every station requires to monitor pressure and switch status of the control valves of gas lines, and on-site real-time images.

Pressure regulation stations- Monitoring system structure

Users can use a PAC controller, together with AI/DI modules, to monitor pressure of on-site gas lines and the switch status of control valves, and use the graphic control software AVEVA Edge to display and record the data of a pressure regulation station. Together with the seismograph for earthquake detection, when an earthquake occurs, users can immediately stop the gas supply remotely.



Control center- Structure of the monitoring system

AVEVA Edge, a graphic control software running on the monitoring server, can exchange and integrate information of gas pressure rapidly with the tag variables of the pressure regulation stations through TCP/IP worksheet. The exchanged data includes the real-time information, (for example, inlet/outlet pressure, differential pressure across filters, earthquake monitoring,) the gas pipeline map with gas pressure in each section of pipeline, and the real-time image display on the site.

AVEVA Edge is equipped with the warning function. When the alarm is triggered, it will flash and make a warning sound to notify the management personnel in the control center. AVEVA Edge can be used in conjunction with the GTM-201 modem to send SMS to inform related personnel about the on-site status. Managers being granted permission can remotely monitor the real-time information of equipment at the pressure regulation station through the browser of a computer or smartphone. All the monitoring values will be saved in the database of a server for data analysis or report.

Overall benefits of the monitoring system

Combining AVEVA™ Edge and ICP DAS' s PAC controller and I/O modules in the gas pressure regulation station monitoring system can rapidly achieve the goal of data integration at the pressure regulation station.

The overall benefits of the monitoring system are as follows:

1. Control Center Monitoring:

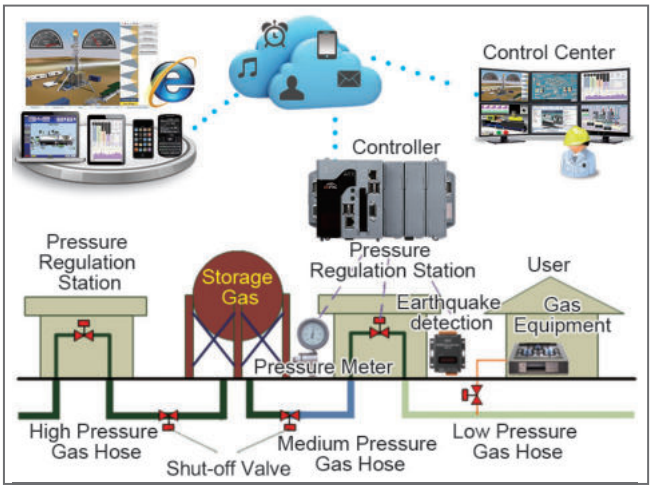
Users can monitor pressure regulation stations distributed in different places through the Internet, tremendously lowering the difficulties of management.

2. Traceability:

AVEVA Edge can record messages in its database, which allows the management personnel to track the trigger time for an alarm, find out the cause of the problem, and clarify the responsibility.

3. Real-time Data Redundancy:

In the event of Internet outage, all the pressure regulation stations can still operate. Messages will be stored in the on-site controller without causing data loss or the idle time of pressure regulation stations.



4. Real-time Information Monitoring:

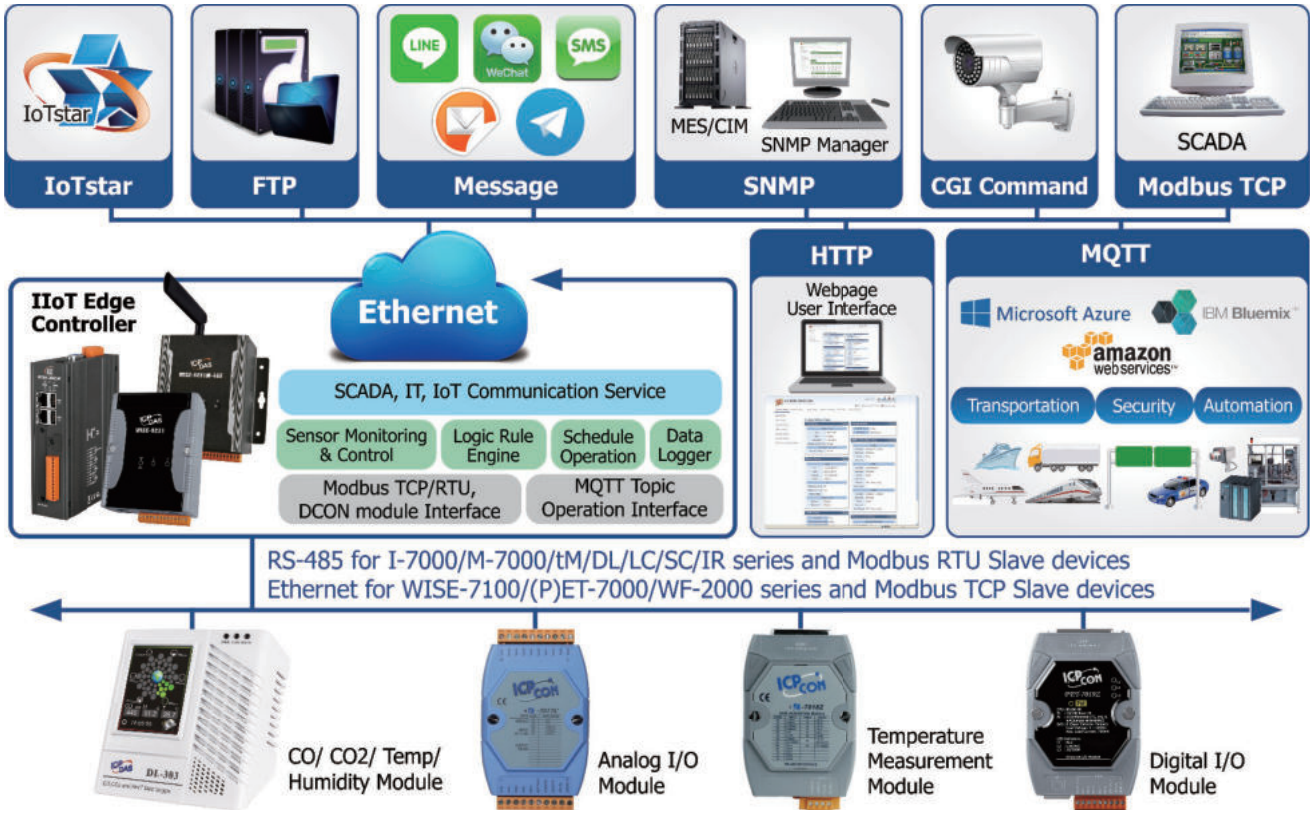
Real-time on-site information and image display. In the event of an alarm occurring, users can obtain the cause for the alarm through warning messages, thereby saving the troubleshooting time. The system can be combined with a modem, allowing management personnel to obtain firsthand information immediately. AVEVA Edge provides a remote monitoring function. Via browser and handheld devices, users won't miss the warning messages, and can monitor the pressure status of pressure regulation stations remotely.

Chapter 2. IIoT Controller/Server

2-1 IIoT Edge Controller: WISE Series

WISE (Web Inside, Smart Engine) is a product series developed by ICP DAS. WISE offers a user-friendly and intuitive web site interface that allows users to implement IF-THEN-ELSE control logic on controllers just a few clicks away; no programming is required. With its powerful and easy-to-use features, it will minimize the learning curve, shorten time to market and dramatically reduce the labor and cost spent on IIoT system development.

WISE Architecture



Based on the built-in Edge Computing Engine WISE provide, users can access Web server on WISE through browser to perform the tasks such as logic rule edition, download and execution to meet the requirement of real-time Edge Computing operation at the field site.

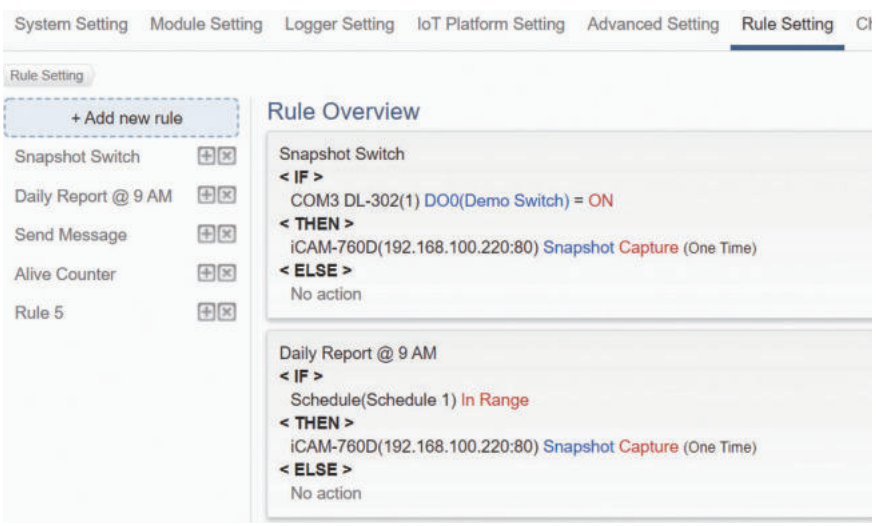
WISE-523x/WISE-2x4xM provides more supports in I/O functions. It allows to connect to a wide range of ICP DAS remote I/O modules and Modbus TCP/RTU slave modules; the users can freely choose the most suitable I/O modules for applications. With the microSD card, it provides Data Logger function to real-time record the I/O channel data of the controller and allows to send the data log files to the control center by FTP (or Email) for further administration management or data analysis.

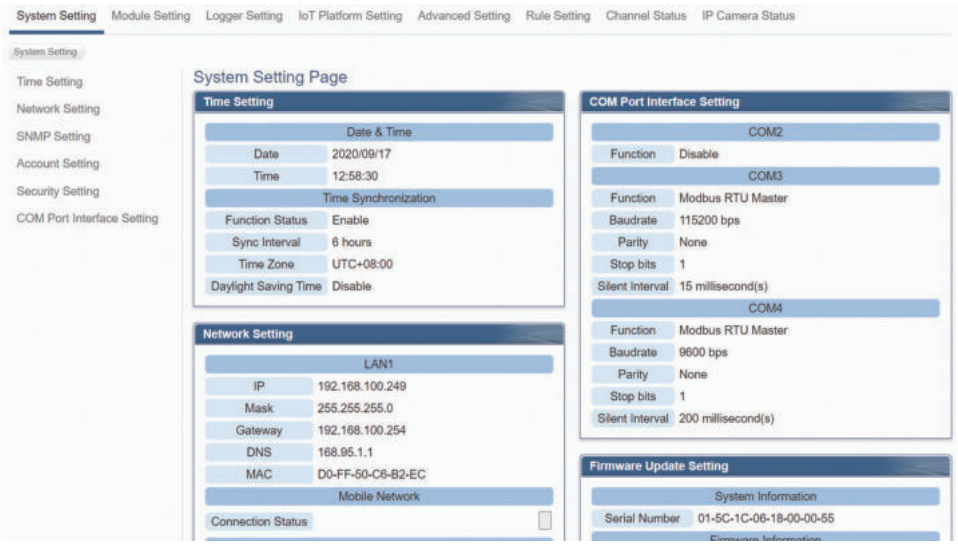
WISE-523x/WISE-2x4xM supports a variety of IoT/SCADA communication protocols (Modbus, MQTT, SNMP, CGI, FTP), which can be quickly integrated with various IoT/IT/SCADA systems. WISE-523x/WISE-2x4xM also can connect to a public IoT Cloud platform (such as Microsoft Azure, IBM Bluemix, or Amazon Web Services) and ICP DAS IoTstar IoT cloud management software. Through the functions of "Well-thought-out sensor data collection", "Real-Time Edge Computing operation", and "Easy integration with IoT/SCADA system", WISE-523x/WISE-2x4xM is not only a controller of IIoT edge computing for the field-side sensors but also a IoT Gateway for uploading the sensor data to the IoT cloud system. It is definitely your best choice for building your IoT applications!

Features

Simple, easy-to-use, no-programming-required for system development

WISE provides user-friendly Web UI pages for editing control logic on the controllers. To edit control logic, it only requires a browser to connect to the Web server on WISE. No extra software tool installation is needed. WISE enables implementation of logic edition by a few clicks on the mouse to set up and deploy logic rules without writing a single line of code.





IF-THEN-ELSE logic rules execution ability

WISE controller features an IF-THEN-ELSE logic rule engine; it offers IF-THEN-ELSE rules for users to set up the logic content. After completing rule edition and downloading rules to the WISE, the rule engine will loop execute the rules in accordance with the execution order under specific conditions.

IF Condition

Add a new condition: Set up a condition

- ○ AI Value
- ○ DI Status
- ○ DI Counter Value
- ○ Internal Register Value
- ○ Motion Detection Status of Camera
- ○ Timer Status
- ○ Schedule Status
- ○ I/O Module Connection Status
- ○ SD Card Status
- ○ Receive MQTT Message
- ○ Receive AWS/Azure/Bluemix Message
- ○ Receive CGI Command
- ○ Mobile Network Signal Strength

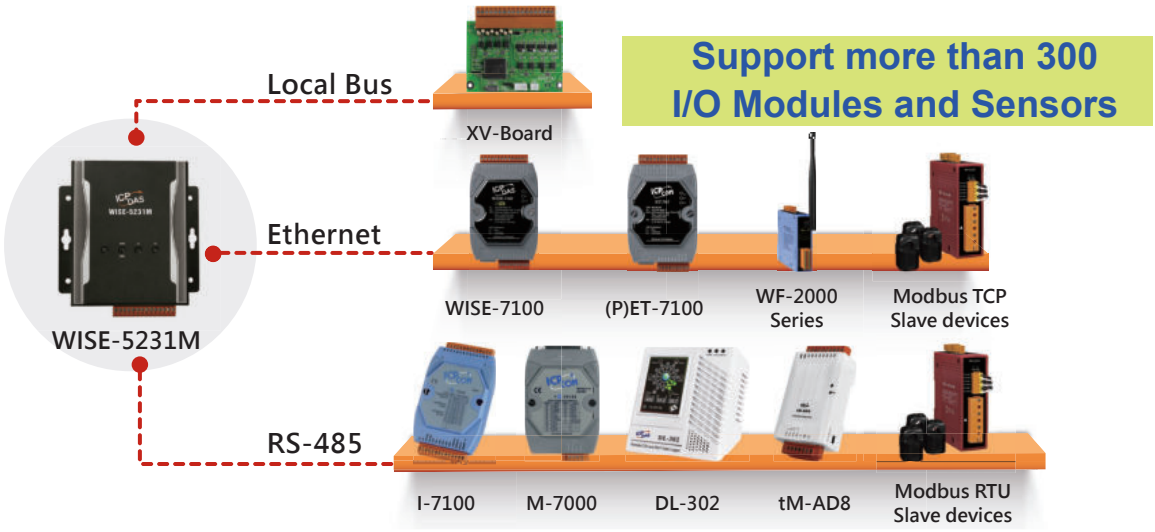
THEN/ELSE Action

Add a new action: Set up an action

- ○ Assign AO Value
- ○ Assign DO Value
- ○ Assign Internal Register Value
- ○ Change Timer Operation
- ○ Record Video/Snapshot by Camera
- ○ Data Log
- ○ Reboot System
- ○ Assign Rule Status
- ○ Send Email
- ○ Send SMS Message
- ○ Send MQTT Message
- ○ Send AWS/Azure/Bluemix Message
- ○ Send CGI Command
- ○ Send SNMP Trap
- ○ Send LINE Message
- ○ Send WeChat Message
- ○ Send Telegram Message

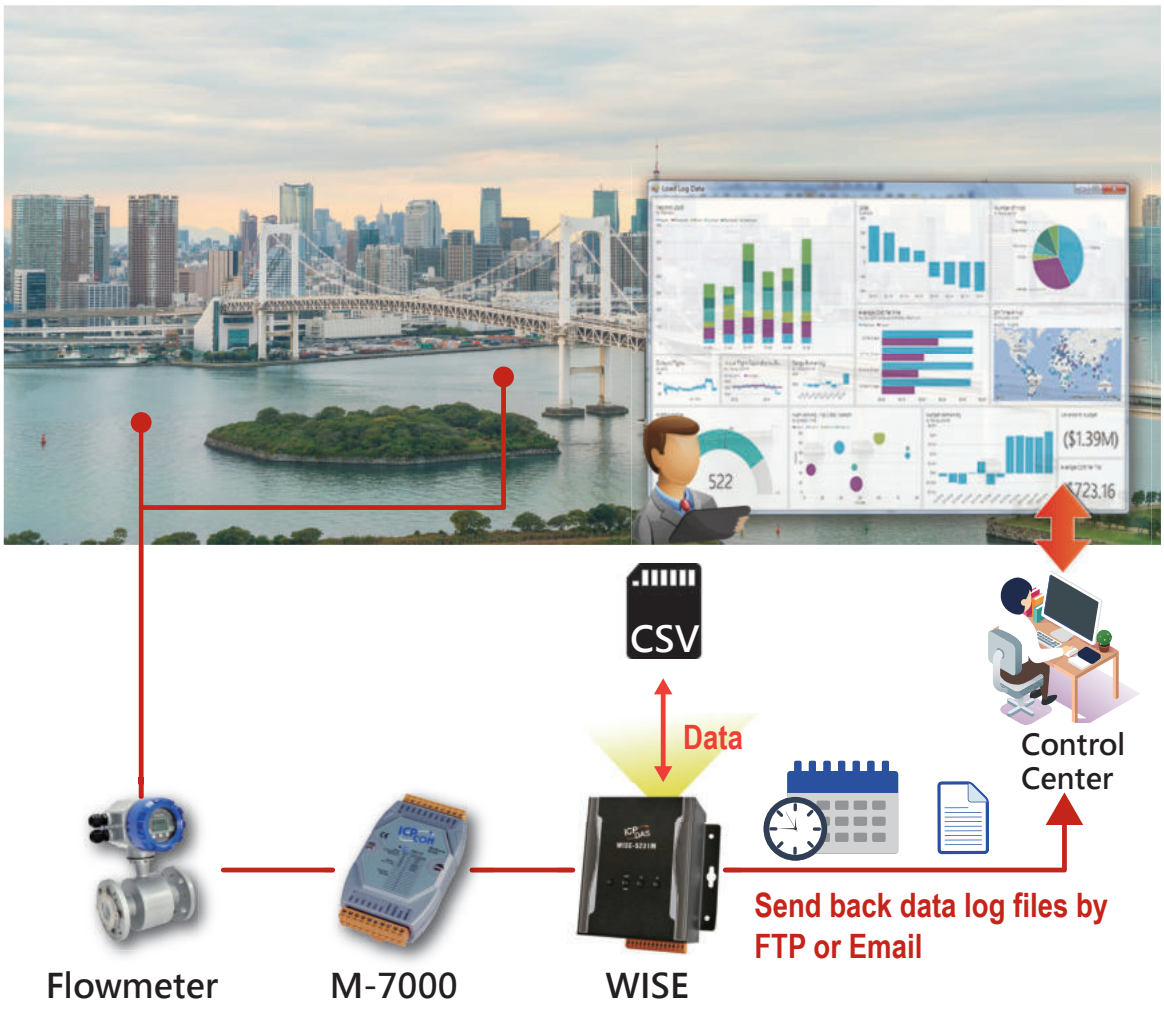
Connection ability to a variety of sensors and devices

WISE Controller allows to connect with sensors and devices that support Modbus TCP/RTU protocol for I/O monitoring. The ability to connect with Modbus TCP/RTU slave devices enables the flexibility and scalability for system implementation and allows to meet various requirements of the applications from the clients.



Data Logger operation

With the microSD card, WISE provides Data Logger function to real-time record the I/O channel data of the controller and sends the data files automatically by FTP (or Email) to the control center for further administration management or data analysis.

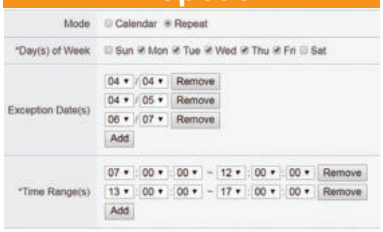


Provide Timer and Schedule operation

WISE features Timer function. It allows to perform the timing delay of the working logic rule. In addition, WISE also provides Schedule function to perform the prescheduled routine tasks. Through the two setting interfaces of the Calendar and Repeat (weekly) provided by the Schedule function, the administrator can quickly assign the weekly schedule operation, or flexibly arrange the annual schedule operation for the on-site equipment. The Schedule function will be helpful to user to handle the applications such as factories or schools that require specific equipment scheduling management mechanism.

WISE-5231M

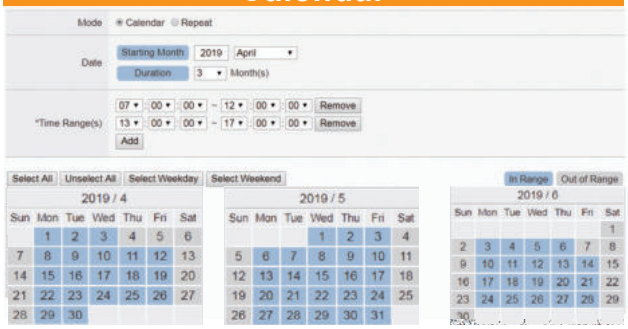
Repeat



Repeat Mode of Schedule

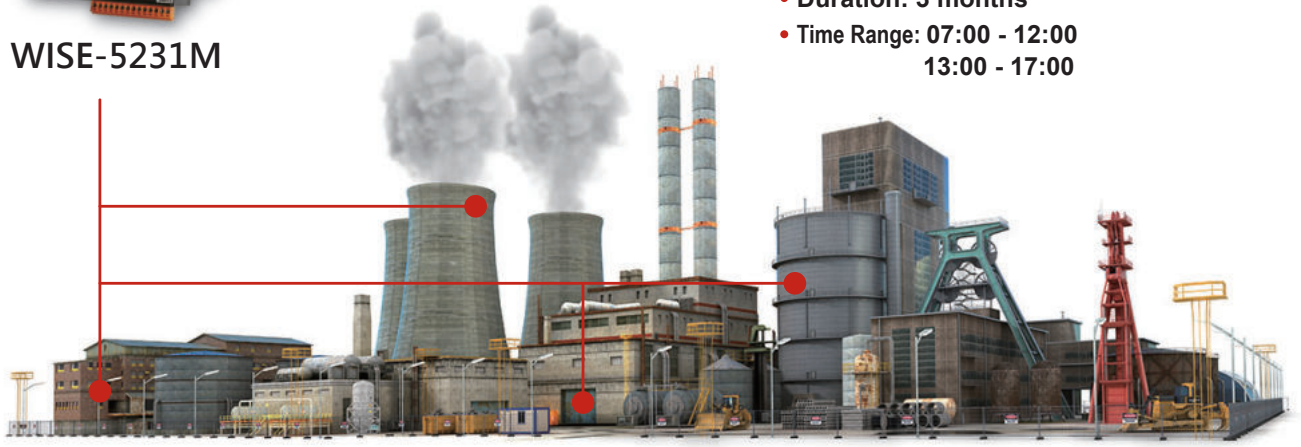
- **Weakday: Mon. to Fri.**
- **Time Range: 07:00 - 12:00**
  13:00 - 17:00

Calendar



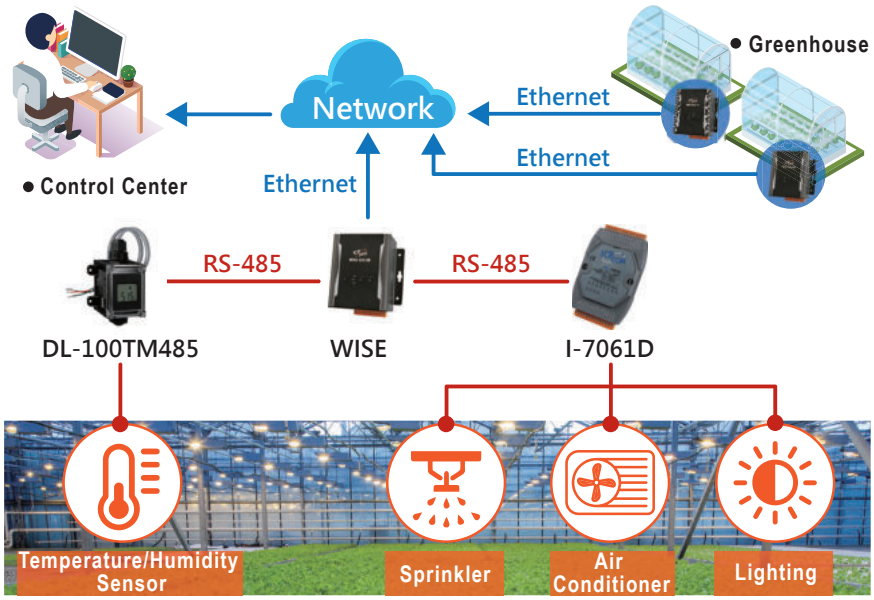
Calendar Mode of Schedule

- **Starting Date: 2020/04**
- **Duration: 3 months**
- **Time Range: 07:00 - 12:00**
  13:00 - 17:00



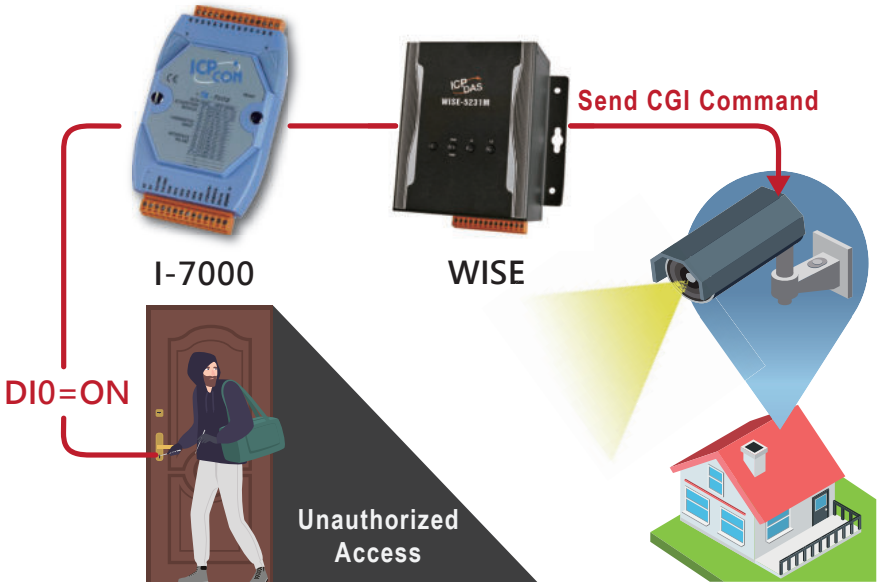
Active I/O sending mechanism

In addition to the Modbus TCP/RTU slave function that enables SCADA to poll the I/O data of the WISE, WISE also provides "Active I/O sending" mechanism (Modbus TCP master, SNMP Trap and MQTT publish). Based on the "Active I/O sending", WISE allows to send the I/O data of the controller actively to SCADA/IT/IoT system by event trigger (change of the I/O channel data) or periodic cycle. This function will improve the efficiency of the data communication between WISE and SCADA/IT/IoT system.



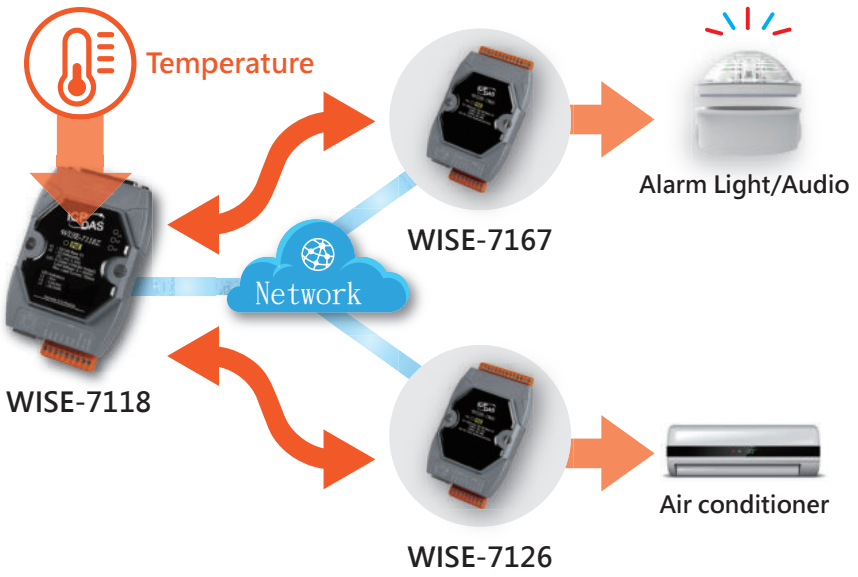
CGI Command sending & receiving for surveillance system integration

WISE supports full CGI command operations - CGI command sending and CGI command receiving. The CGI command sending action can be added to the logic rule as part of logic control in response to specific events. The CGI command receiving function enables WISE to receive the CGI commands from others network devices. The content of CGI command received can be used in IF condition statements to trigger the THEN/ELSE actions.



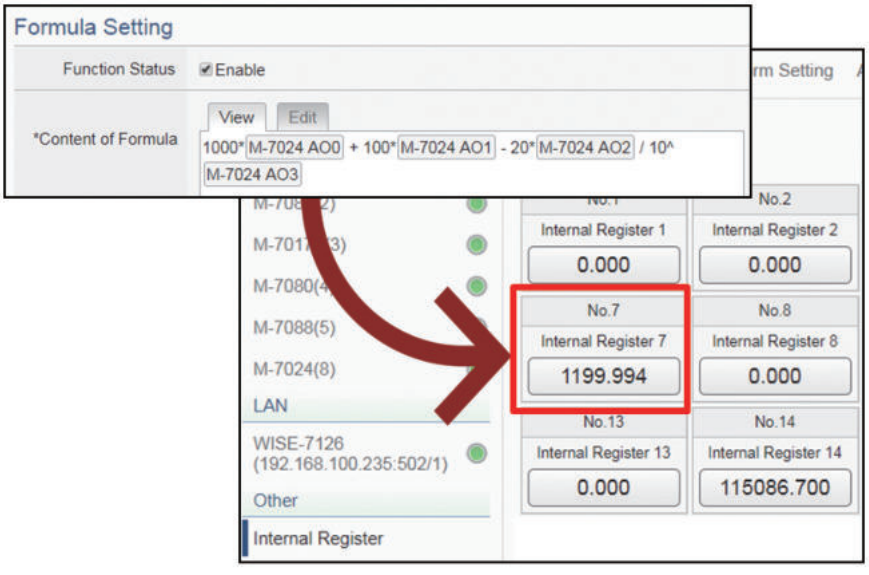
Advanced P2P function between WISE I/O Modules

WISE-7xxx offers P2P function that enables WISE-7xxx modules to directly communicate with other remote WISE-7xxx modules on networks. The modules can freely share the information such as I/O channel value, DI/DO counter and Internal Register to each other. The P2P operations can be incorporated into WISE logic rules as condition statements or action statements for condition evaluation criteria or action executions.



Support math formula editing function

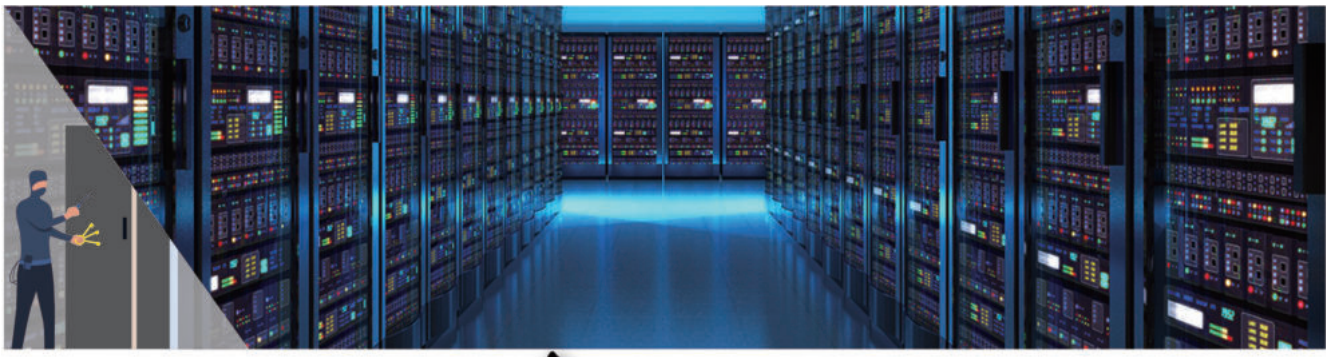
WISE-523x/WISE-2x4x support math formula editing function in Internal Register. This function supports to insert I/O channels to be the variables, and use the operators such as plus "+", minus "-", times "*", divide "/", power "^", left parenthesis "(" and right parenthesis")" to complete the editing of formula. Users can edit different formula in each Internal Register. WISE will calculate the results of all formulas repeatedly, and save the results into the corresponding Internal Registers for IF-THEN-ELSE rule checking or data logging.



Support Instant Message sending functions

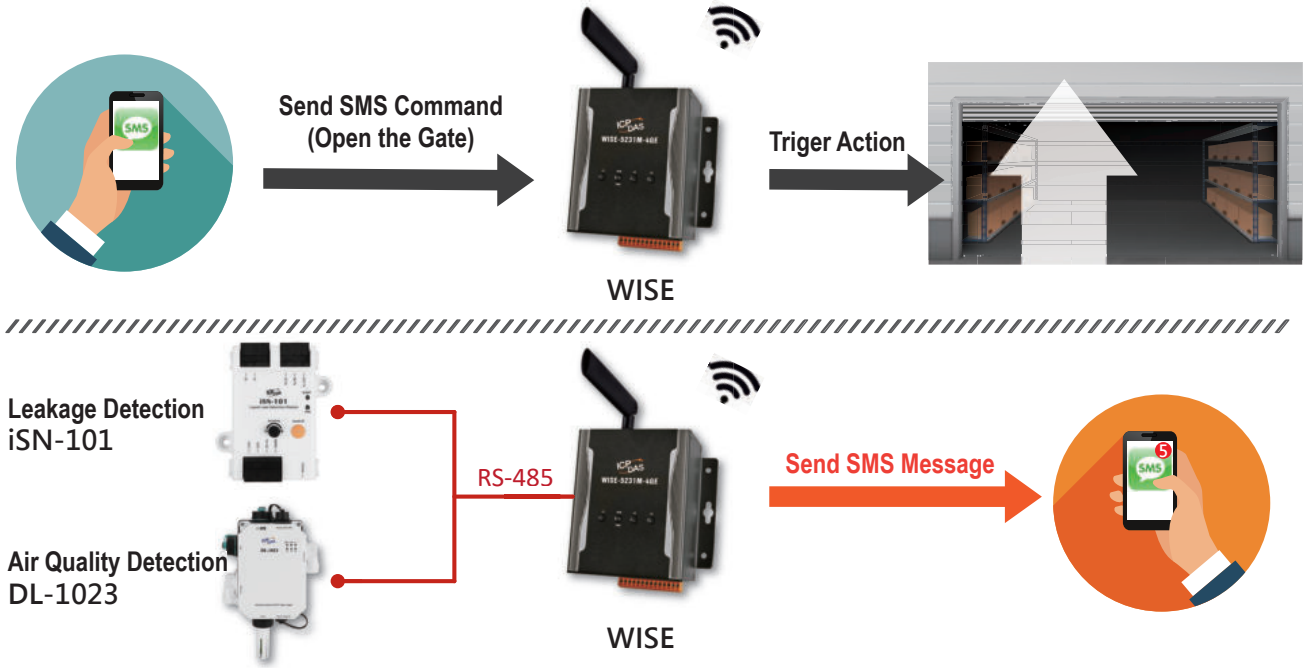
WISE controllers support real-time messaging services such as LINE, Telegram, WeChat, SMS, and Email to send instant alerts to administrators. Message-sending actions can be embedded in IF-THEN-ELSE logic rules, enabling automatic notifications when specific events occur. When paired with ICP DAS iCAM series IP cameras, WISE can also send event images or videos via Telegram and WeChat.

Please note: LINE chatrooms only support receiving text messages.



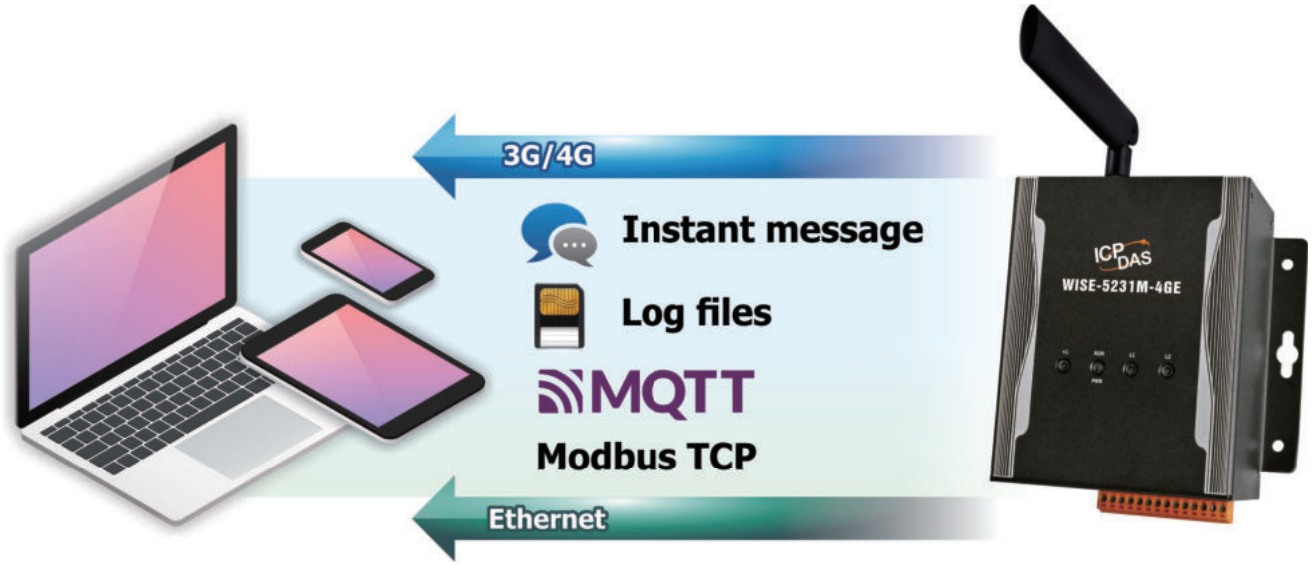
Support SMS command receiving function

The 3G/4G version of WISE-523x/WISE-2x4xM is equipped with SMS alarm message notification function. It allows to include SMS alarm sending action into logic rules to send a pre-set SMS message to related personnel when an event occurs. In addition, The WISE controller also allows to receive the SMS commands sending by specific phones numbers to perform tasks such as real-time I/O channel status monitoring, DO/AO channel value modification and logic rules execution (triggered by SMS), etc.



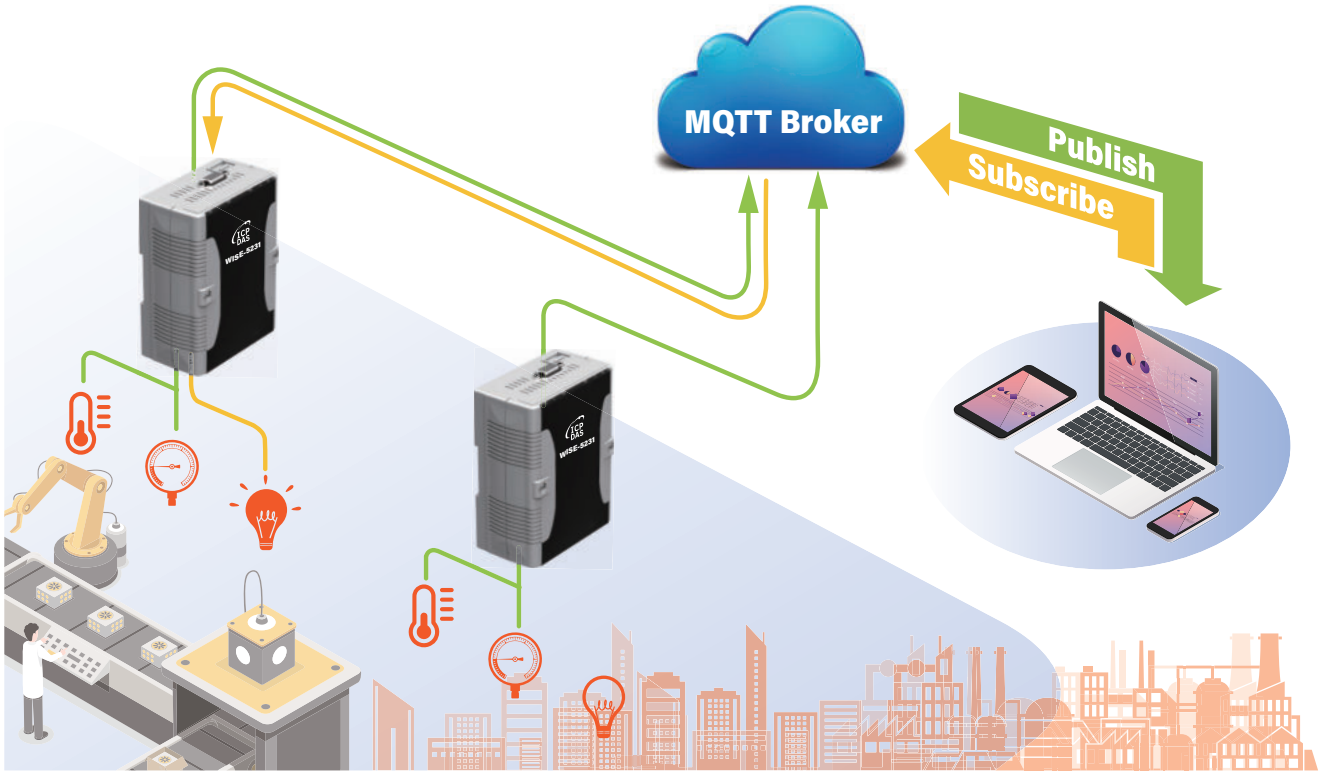
Support 4G/3G mobile network communication

In addition to Ethernet communication, WISE-523xM-4GE/4GC & WISE-2x4xM(X)-4GE/4GC also supports 4G/3G mobile network communication. It can send the real-time I/O data of sensors and modules, data logger files and alarm messages back to the control center by 4G/3G mobile network.



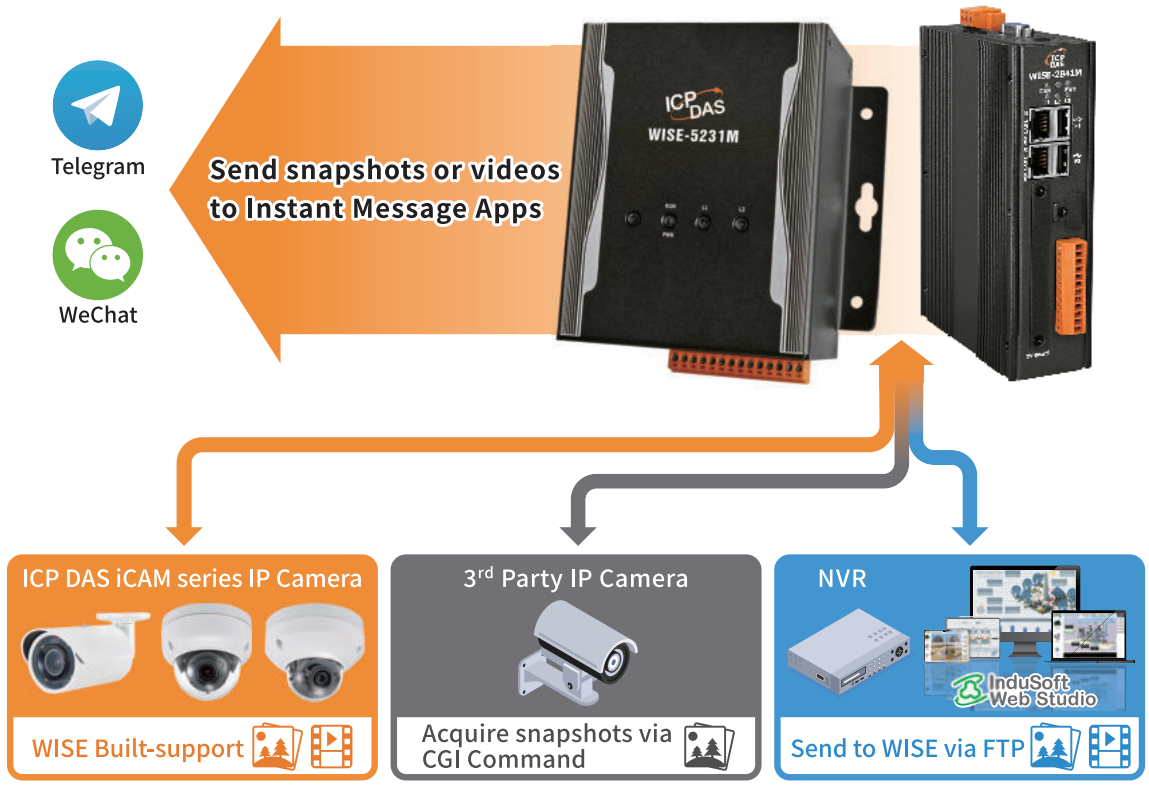
MQTT Message Publish/Subscribe operation

WISE-523x/WISE-2x4xM supports the MQTT protocol. It can publish the I/O data of the I/O modules (connected to WISE-523x/WISE-2x4xM) to the MQTT broker, and it can also receive the message content of the Subscribe MQTT Topics published by others MQTT device for the data logging operation or use it in the IF-THEN-ELSE logic rule.



Provide image forwarding operation with Instant Message sending

WISE-523x/WISE-2x4xM supports the forwarding operation of image/video files captured by other devices, and send them with the text messages to the WeChat/Telegram apps. The image forwarding function enables WISE being a real-time message transmitter in a monitoring system. It can send text messages with the images/ videos automatically to the WeChat/Telegram accounts. With the rich media like images & videos added, it will greatly enhance the alarm notification efficiency and user experience.



Sensor data upload operation with Security mechanism

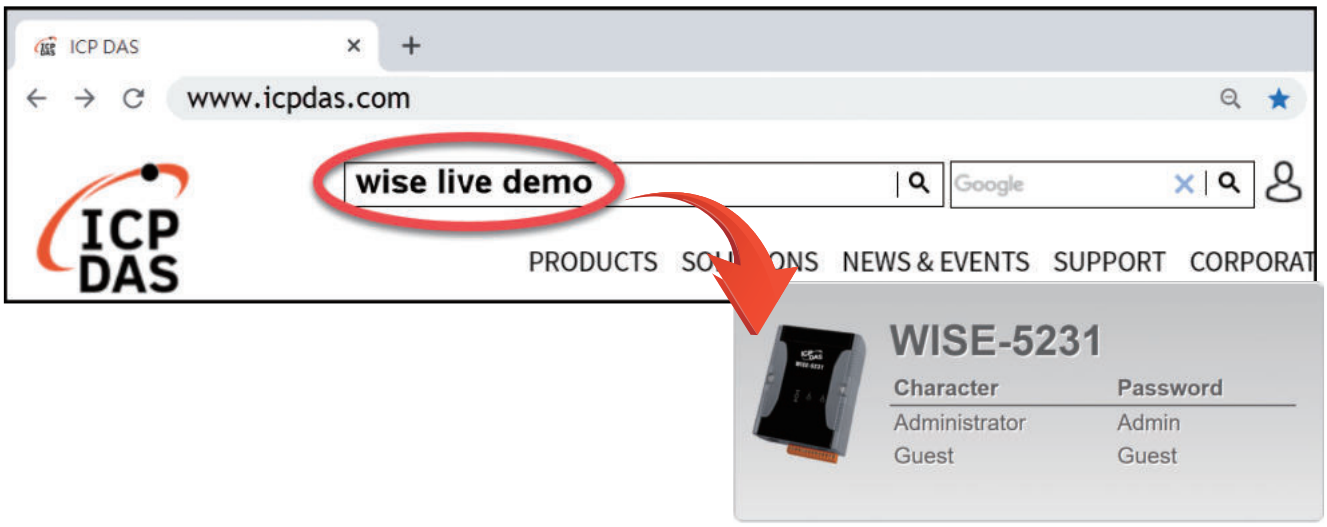
To ensure the operations of sensor data uploading from WISE to Cloud platform to meet the requirements of Security mechanism, WISE-523x/2x4xM supports Security mechanism such as "MQTT with SSL/TLS" to perform the encryption of real-time Sensor data during the data transmission operation.

In addition, WISE-284xM also supports the Security mechanism such as VPN Client (Virtual Private Network), SNMP agent v3 (Enhanced security for SNMP protocol), SFTP(Secure File Transfer Protocol), FTPS(FTP over SSL) and HTTPS. With a variety of Security mechanism and protocols provided by WISE, it can meet the requirements of information Security when building an IoT Cloud system.

Connection with IoT Cloud Platform and ICP DAS IoTstar

WISE-523x/WISE-2x4xM supports the connection ability with the IoT Cloud Platform as Microsoft Azure, IBM Bluemix, etc. It work as the concentrator in the IoT application to connect with sensors, collect and transfer the sensor data to the cloud platform for future data analysis. WISE-523x/WISE-2x4xM/WISE-75xxM also can receive the message which is published from the cloud platform for the corresponding actions at the field side. And besides, WISE supports to connect with ICP DAS IoTstar cloud management software. IoTstar enables the Controller Remote Access Service, Sensor Data Collection Service, Sensor Data Visualization Service, Sensor Data Report Service, Bot Service with Mobile Phone on WISE.

WISE Demo Site



IIoT Edge Controller:

■ Hardware Specification

Model	WISE-284xM	WISE-224xM	WISE-523x	WISE-523xM
System				
CPU	Quad-core ARM CPU, 1.6 GHz/Core	ARM CPU, 1.0 GHz		
SDRAM/Flash	DDR3 2 GB / 8 GB	DDR3 512 MB / 256 MB		
microSD	Built-in one 4 GB microSD card (support up to 32 GB microSD card or 2 TB microSDXC card(WISE-284xM Only))			
Communication Interface & IO Module Expansion				
Ethernet	10/100/1000 Base-TX * 2		10/100/1000 Base-TX * 1	
Serial Port	2 x RS-232 / 2 x RS-485 (2 x isolated)		2 x RS-232 / 2 x RS-485 (1 x isolated)	
I/O Module Expansion	XV-board, RS-485, Ethernet			
Mechanical/Power/Environmental				
Casing	Metal	Metal	Plastic	Metal
Dimension (W x L x H; mm)	42 x 164 x 129	35 × 167 × 119	91 x 132 x 52	117 x 126 x 58
Installation	Wall/DIN-Rail mounting (optional)		DIN-Rail mounting	Wall/DIN-Rail mounting
Temperature/ Humidity	Operating Temperature: -25°C to +75°C ; Storage Temperature: -40°C to +80°C ; 10 to 90% RH, Non-condensing			
Input Range	+12 to +48 VDC			
Consumption	Ethernet: 10 W; -4GE/4GC: 15 W	Ethernet: 4.8 W; -4GE/4GC: 6.5 W		
Wireless Communication (Applied to 3G/4G version WISE-523xM, WISE-224xM & WISE-284xM series controllers)				
3G/4G System (-4GE)	FDD LTE: B1/B3/B5/B7/B8/B20 bands (Frequency Band for EMEA, Korea, Thailand, India and Taiwan) WCDMA: 850/900/2100 MHz			
3G/4G System (-4GC)	FDD LTE: B1/B3/B8 bands (Frequency Band for China) TDD LTE: B38/B39/B40/B41 bands (Frequency Band for China) WCDMA: 900/2100 MHz, TD-SCDMA 1900/2100 MHz, CDMA2000 (BC0) 800 MHz			

■ Software Function

Model	WISE-284xM Series	WISE-224xM Series	WISE-523x(M) Series
Web Page Interface	Yes		
IF-THEN-ELSE Logic Rule	Yes (Unlimited sets)		
I/O Channel Monitoring	Yes		
Timer Operation	Yes (Unlimited sets)		
Schedule Operation	Yes (Support Calender and Weekly modes; Unlimited sets)		
Internal Register	Yes (Support "Retain Variable" operation)		
Data Logger	Yes		
Communication Protocol	Modbus TCP/RTU, FTP Client/ Server, CGI sending/receiving, SNMP & MQTT (non-SSL & SSL)		
Information Security Enhancement	Yes	-	
Instant Message Sending	SSL/TLS Email, LINE Messaging API, WeChat(WISE-284xM, WISE-2246M/5236), Telegram, SMS (3G/4G version of WISE-523xM/224xM/284xM)		
Cloud System Connection	Yes (ICP DAS IoTstar, Microsoft Azure, IBM Bluemix, Amazon Web Service(WISE-284xM Only))		

Product Specification

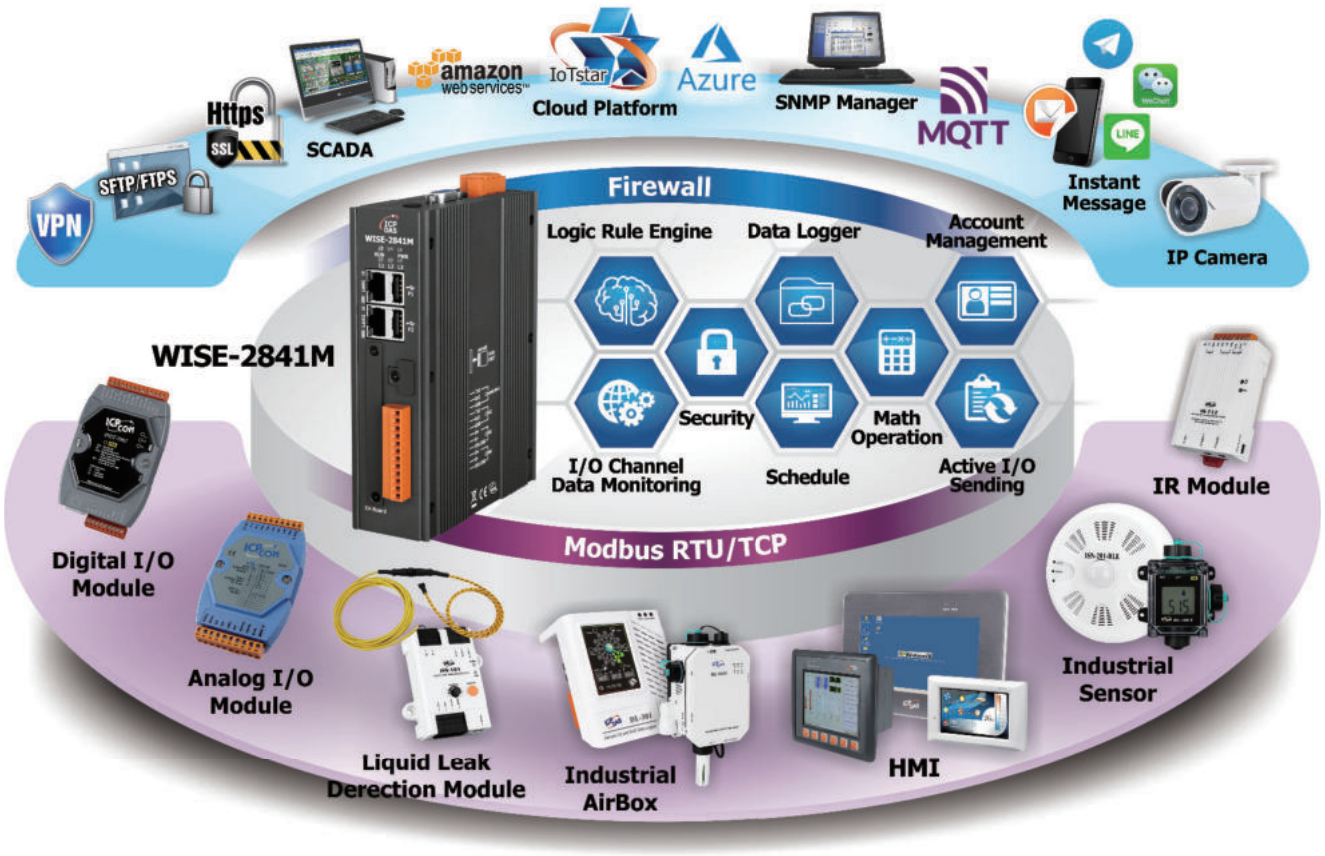
IIoT Edge Controller : WISE-284xM/224xM/523x

Advanced IIoT Edge Controller: WISE-284xM

Features

- No more programming, Web pages provided for system and logic rule setting
- Support XV-board, DCON, & Modbus TCP/RTU Slave modules
- IF-THEN-ELSE logic rules execution ability
- Data logger and data files send back function supported
- Timer and Schedule functions supported
- Support Line, Telegram, WeChat, SMS and Email message notification
- Support Modbus TCP/RTU, SNMP, MQTT, FTP and CGI protocols
- Support connection with IoT Cloud Platform (Microsoft Azure, IBM Bluemix, Amazon Web Services) and IoTstar Cloud Management Software
- Support 4G wireless data communication
- Complete information security protection mechanism - HTTPS, VPN, SNMP v3, SFTP, FTPS, and Blacklist/Whitelist

System Architecture



In the era of the Internet of Things (IoT), information security has become a critical concern for Industrial IoT (IIoT) systems—one that can no longer be ignored. In the past, it was often assumed that "hackers only target PCs or enterprise networks," or that "older industrial equipment is safe because it's not connected to the internet." These beliefs no longer hold true. As industrial systems become increasingly connected, even legacy equipment is exposed—frequently without sufficient protection—making them attractive and vulnerable targets for cyberattacks.

Once compromised, an industrial system may face serious and costly consequences: data breaches, system lockouts, financial extortion, or even full-scale shutdowns of operations. Strengthening cybersecurity and ensuring reliable and secure cloud connectivity are now essential components in building a modern, resilient IIoT infrastructure.

To meet these challenges, ICP DAS developed the WISE-284xM series—an advanced IIoT Edge Controller built with a comprehensive set of security features. It supports multiple layers of protection and encrypted communication protocols, offering flexible solutions to address various levels of cybersecurity needs.

Network Security

The WISE-284xM series features VPN communication capabilities (supports 4 VPN protocols: PPTP, L2TP, OpenVPN, and SoftEther), allowing users to establish a secure communication tunnel between the controller and external networks. By operating within a protected VPN environment, WISE-284xM and its connected I/O modules are effectively shielded from unauthorized access and external cybersecurity threats.

System Security

As the web interface serves as the main entry point for configuring the system and monitoring connected sensors, its protection is critical. WISE-284xM supports the HTTPS encrypted communication protocol to ensure that all data exchanged between the browser and the controller is secure, preventing sensitive settings and operational commands from being intercepted or tampered with. In addition, it implements SNMP v3 for secure communication and includes a user authentication mechanism to safeguard connections between the WISE-284xM and IT systems, reinforcing access control and system integrity.

Data Security

To support secure data handling, WISE-284xM is equipped with a microSD card that enables both periodic and event-driven data logging for connected I/O modules. Logged data can be automatically transmitted to the back-office via FTPS, or manually retrieved by users through SFTP, FTPS, or a standard web interface. All data transfers are safeguarded using TLS encryption, ensuring the log files remain protected from interception or tampering during transmission.

Identity Authentication Security

To further enhance access security, WISE-284xM implements password authentication for each communication interface. Only administrators who enter the correct credentials can configure and operate the device. Additionally, WISE-284xM supports both blacklist and whitelist settings, allowing users to control which domains or IPs are permitted or denied access. A dynamic blacklist mechanism is also available, which automatically blocks IP addresses that exceed a predefined number of failed login attempts—providing effective defense against brute-force password attacks.

Cloud Backup Mechanism

Despite the robust security mechanisms in place, the possibility of a breach can never be completely eliminated. Therefore, system recovery plays a crucial role in ensuring operational resilience. WISE-284xM supports automatic backup and recovery by connecting to ICP DAS's IoTstar Cloud Management Software. In addition to collecting sensor data and uploading it to a database, IoTstar can also perform automatic backups of the system settings for all connected WISE controllers. If a device is compromised or damaged due to a cyberattack, the original system configuration can be quickly restored to a replacement WISE controller. This minimizes downtime and ensures that system operations can return to normal with minimal disruption or data loss.

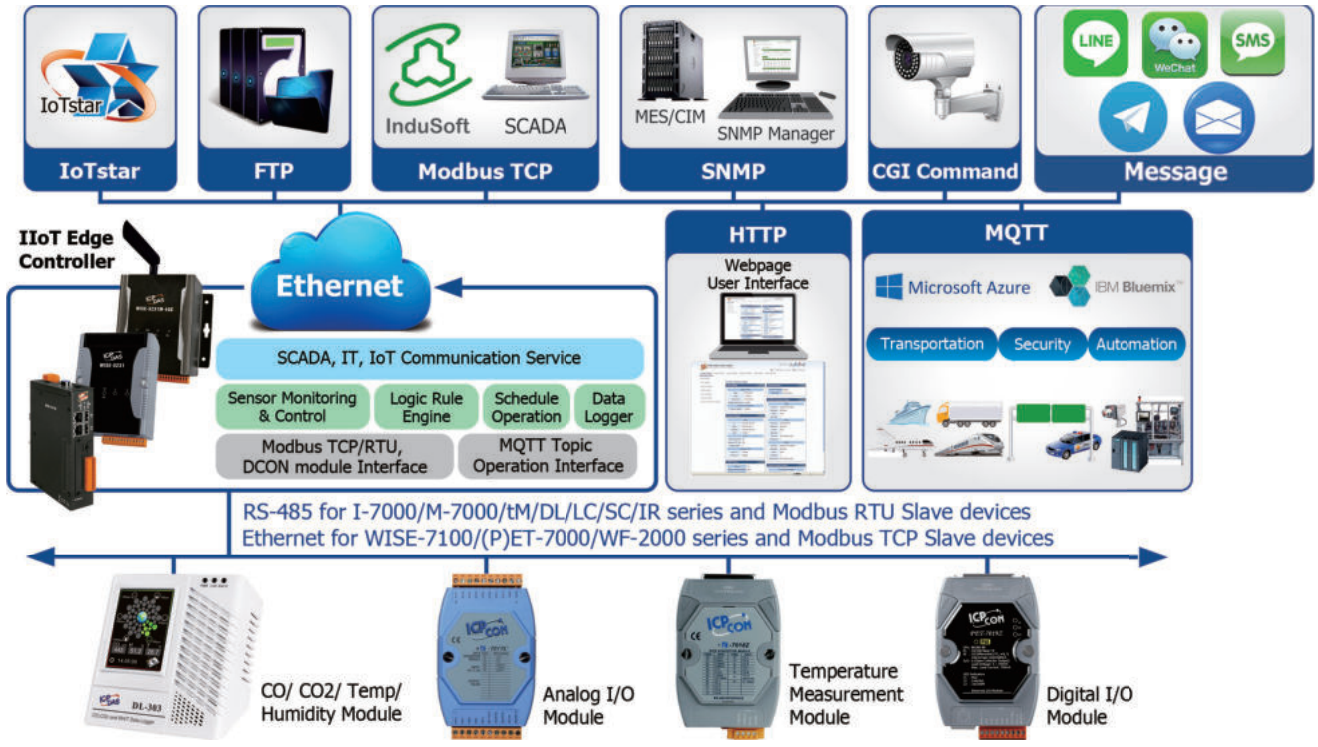
The Advanced IIoT Edge Controller – WISE-284xM builds upon the proven foundation of the WISE series, combining core control capabilities with significantly enhanced security features. Its comprehensive protection mechanisms, seamless cloud integration, and intelligent automation functions make it a powerful and reliable solution—well suited to serve as the secure and resilient core of today's Industrial IoT environments.

IIoT Edge Controller: WISE-224xM/WISE-523x

Features

- No more programming, Web pages provided for system and logic rule setting
- Support XV-board, DCON, & Modbus TCP/RTU Slave modules
- IF-THEN-ELSE logic rules execution ability
- Data logger and data files send back function support
- Timer and Schedule functions supported
- Support Line, Telegram, WeChat, SMS and Email message notification
- Support Modbus TCP/RTU, SNMP, MQTT, FTP and CGI protocols
- Support connection with IoT Cloud Platform (Microsoft Azure, IBM Bluemix) and IoTstar Cloud Management Software
- Support 4G/3G wireless data communication

System Architecture



Ordering Information

■ IIoT Edge Controller

Module	Description
Standard Function	
WISE-5231 CR	IIoT Edge Controller(Plastic casing)
WISE-5231M CR	IIoT Edge Controller(Metal casing)
WISE-5231M-4GE CR	IIoT Edge Controller (Metal casing; Built-in 4G Wireless module; Frequency Band for EMEA, Korea, Thailand, India and Taiwan)
WISE-5231M-4GC CR	IIoT Edge Controller (Metal casing; Built-in 4G Wireless module; Frequency Band for China)
WISE-2241M CR	IIoT Edge Controller (Metal casing)
WISE-2241M-4GE CR	IIoT Edge Controller (Metal casing; Built-in 4G Wireless module; Frequency Band for EMEA, Korea, Thailand, India and Taiwan; **Asia only)**
WISE-2241M-4GC CR	IIoT Edge Controller (Metal casing; Built-in 4G Wireless module; Frequency Band for China; **Asia only**)
Standard Function + WeChat Message Sending	
WISE-5236 CR	IIoT Edge Controller (Plastic casing; China only)
WISE-5236M CR	IIoT Edge Controller (Metal casing; China only)
WISE-5236M-4GC CR	IIoT Edge Controller (Metal casing; Built-in 4G Wireless module; Frequency Band for China; China only)
WISE-2246M CR	IIoT Edge Controller (Metal casing; China only)
WISE-2246M-4GC CR	IIoT Edge Controller (Metal casing; Built-in 4G Wireless module; Frequency Band for China; China only)

Please note: An Enterprise WeChat account in China is required for WISE to send the messages to the members under the enterprise WeChat account.

■ Advanced IIoT Edge Controller

Module	Description
Standard Function + WeChat Message Sending + Information Security Protection Mechanism	
WISE-2841M CR	Advanced IIoT Edge Controller (Metal casing)
WISE-2841M-4GE CR	Advanced IIoT Edge Controller (Metal casing; Built-in 4G Wireless module;; Frequency Band for EMEA, Korea, Thailand, India and Taiwan; **Asia only**)
WISE-2841M-4GC CR	Advanced IIoT Edge Controller (Metal casing; Built-in 4G Wireless module; Frequency Band for China; **Asia only**)

Please note: An Enterprise WeChat account in China is required for WISE to send the messages to the members under the enterprise WeChat account.

Accessories

ANT-Base-01	5 dBi 4G External Antenna Base (1.5 Meter) 	**3S001-2**	RG58A/U (1 Meter; SMA male to SMA Female) 
EC25-E	4G IoT LTE Category 4 Module ; Frequency Band for EMEA, Korea, Thailand, India and Taiwan 	**EC20-CE**	4G IoT LTE Category 4 Module; Frequency Band for China 

2-2 IIoT Communication Server: UA Series

UA-2800/2200/5200/7200, U-7500

UA Series

IIoT Communication Server

- Supports OPC UA, MQTT, SNMP, and RESTful API Communication
- Direct OT Data Logging to Databases with Data Recovery
- Mobile Notifications

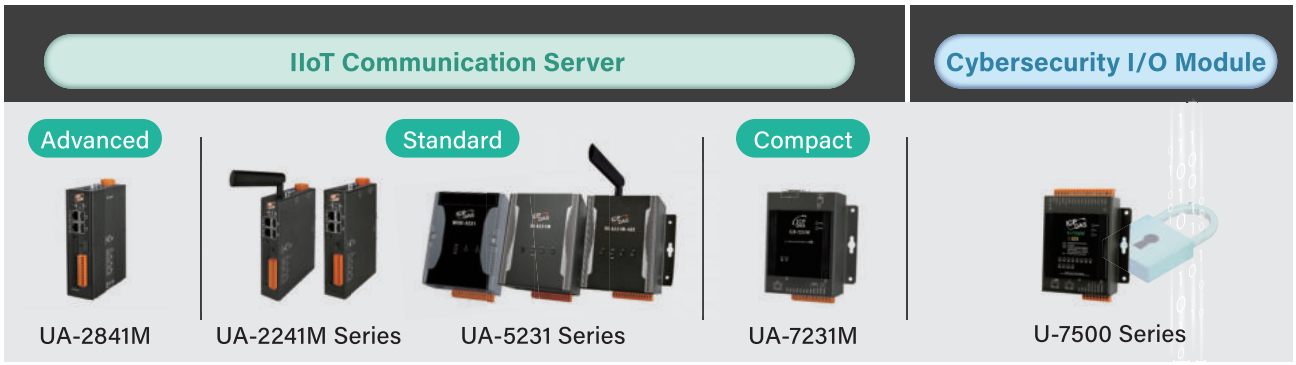
Cybersecurity I/O Module

- Supports OPC UA, MQTT, and RESTful API Communication
- Mobile Notifications

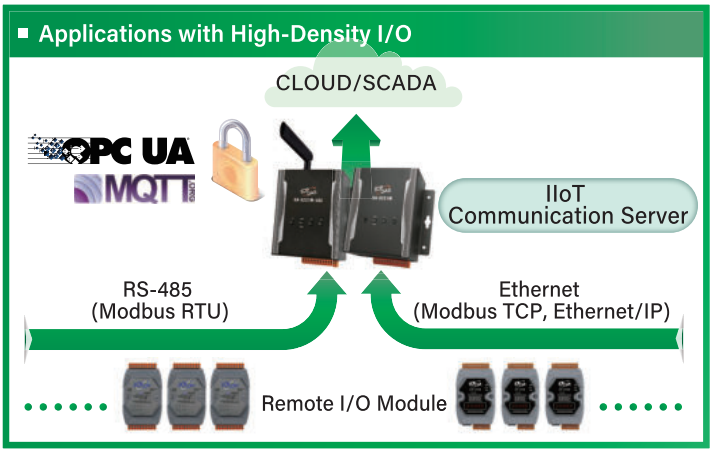
Seamless Integration of IT & OT Connect Devices to the Cloud

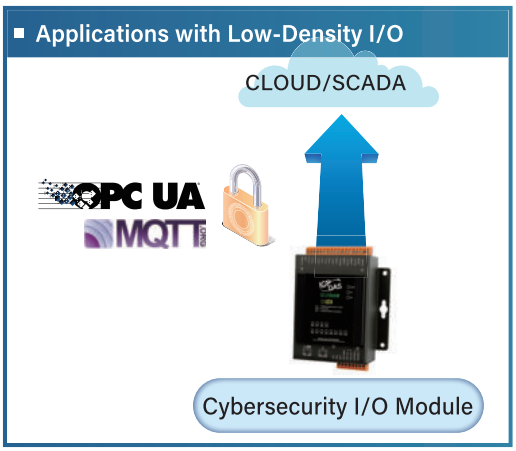
IIoT Cybersecurity

Introduction



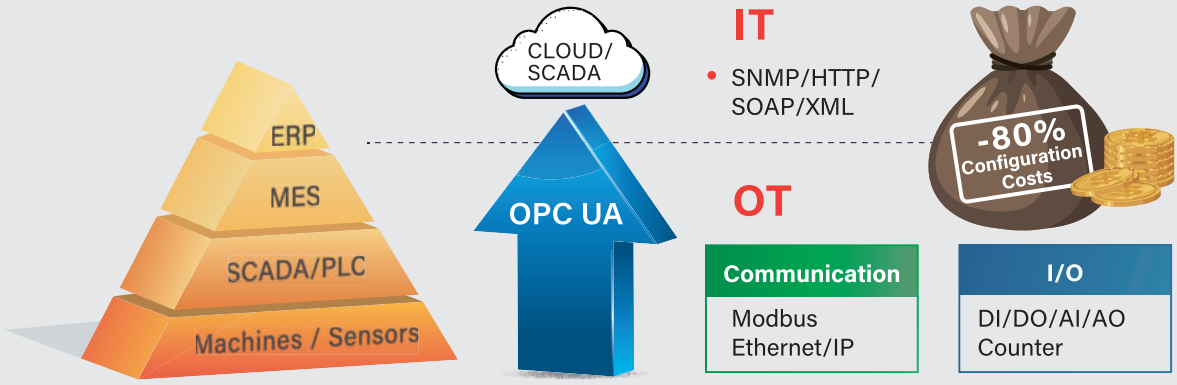
Product Selection Based on Application Needs





OPC UA vs Modbus

Reduce up to 80% of configuration costs with the OPC UA communication protocol—helping MES and software engineers work more efficiently, and giving your company a significant competitive advantage.



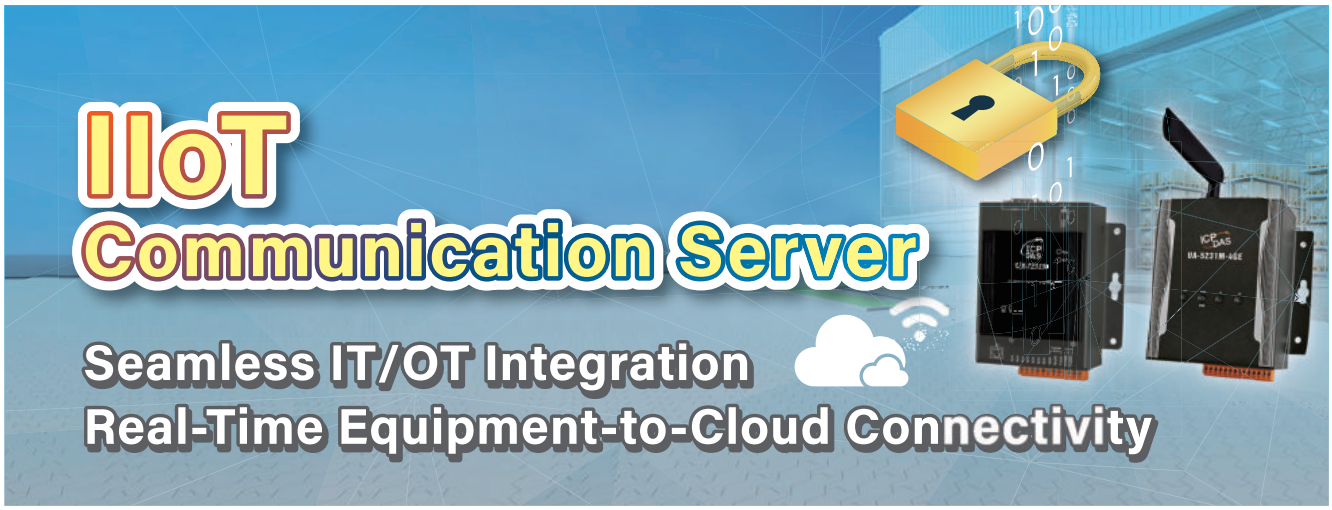
OPC UA Easy Configuration

- Step 1: Obtain the OPC UA Server URL
- Step 2: Connect to the Server via the OPC UA Client
- Step 3: Browse or subscribe to tags and information on the Server — displayed in a tree structure

Modbus Complicated Configuration

- Step 1: Check the device IP list to obtain the IP address of the connected device
- Step 2: Configure the Modbus Master software to establish an IP connection
- Step 3: Refer to the device register map to get supported function codes and address ranges
- Step 4: Set up the Modbus Master software to acquire data from the device
- Step 5: Create a tag list in the software and assign identifiable tag names
- Step 6: Convert device data into real engineering values and map them to tags

Comparison Table



	Advanced	Standard		Compact
	UA-2841M	UA-2241 Series	UA-5231 Series	UA-7231M
Model				
Hardware Specifications				
Ethernet Interface	10/100/1000 Base-TX × 2	10/100/1000 Base-TX × 2	10/100/1000 Base-TX × 1	10/100 Base-TX × 1 PoE
RS-232/RS-485	1 x RS-232 (console) 1 x RS-232 2 x RS-485 (2500 VDC Isolation)			1 x RS-232 (console) 1 x 5-wire RS-232/485 (2500 VDC Isolation)
XV Expansion Board Slot	Optional: Add one XV511i to expand 4 RS-485 ports or Optional: Add one XV107 / 107A / 110 / 111 / 111A / 116 / 119 / 303 / 306 / 307 / 310 to expand I/O channels			-
Wireless Communication	-	4G Model Available	4G Model Available	-
Dimensions (mm)	42 x 164 x 130	35 x 167 x 119	117 x 126 x 58	97 x 114 x 38
IT Communication Protocols				
OPC UA Server	Up to 50 Sessions Up to 8000 Tags	Up to 20 Sessions Up to 8000 Tags		
MQTT Broker	non-SSL & SSL / WebSocket			
	Up to 2100 Connections	Up to 400 Connections		
MQTT Client	non-SSL & SSL			
	Up to 500 Connections	Up to 200 Connections		
SNMP v3 Agent	Read 10 Commands & Write 10 Commands	-		
RESTful	Read 20 Commands & Write 1 Command	-		
OT Communication Protocols				
Modbus RTU/ASCII Master	32x3 Ports=96 Devices			32x1 Ports=32 Devices
Modbus TCP Master	Up to 250 Devices	Up to 100 Devices		
EtherNet/IP	Up to 125 Devices	Up to 50 Devices		
	Support EIP-2000 Series and Universal Robots Products			

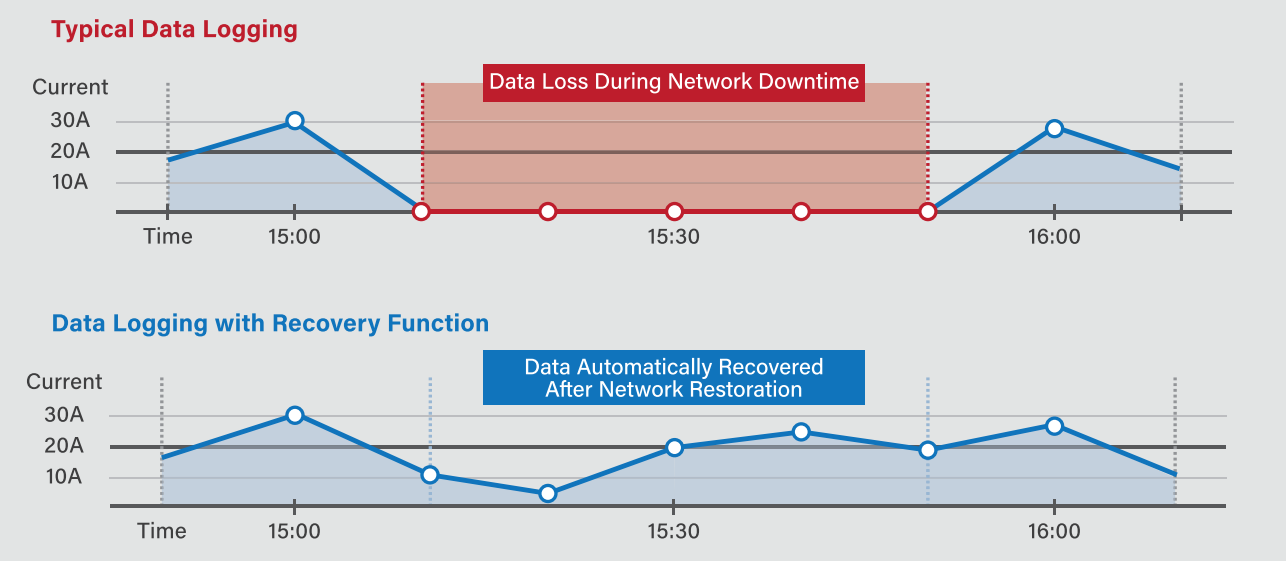
Features

Direct OT Data Logging to Databases with Data Recovery Function

The UA Series Communication Servers support data logging, allowing collected data to be periodically saved in CSV format on a local microSD card and written to a remote database.

Data Recovery Function

In typical data logging, values are collected at fixed intervals and stored in a database. However, if a network disconnection occurs, all data during the downtime is lost and cannot be recovered.
The IIoT Communication Server addresses this issue with a data recovery function. During a network outage, all collected data is saved to the server's SD card. Once the connection is restored, the server retrieves the stored data and uploads it to the database, ensuring no historical data is lost.



Supports OPC UA, MQTT, SNMP, and RESTful API Communication Protocols

OPC UA

Designed for integrating SCADA, MES, and ERP in industrial automation systems.

HMI / SCADA

OPC UA Client

MQTT

Designed for IoT environments, especially for devices with low bandwidth or without a static IP address.Suitable for mobile and web application development.

Mobile/Portable Devices

RESTful API

Designed for data exchange between front-end and back-end in web applications. Ideal for web application development.

Third-party Software Integration

SNMP

Ideal for IT personnel to remotely monitor, diagnose, and manage network devices using SNMP tools.

SNMP Manager

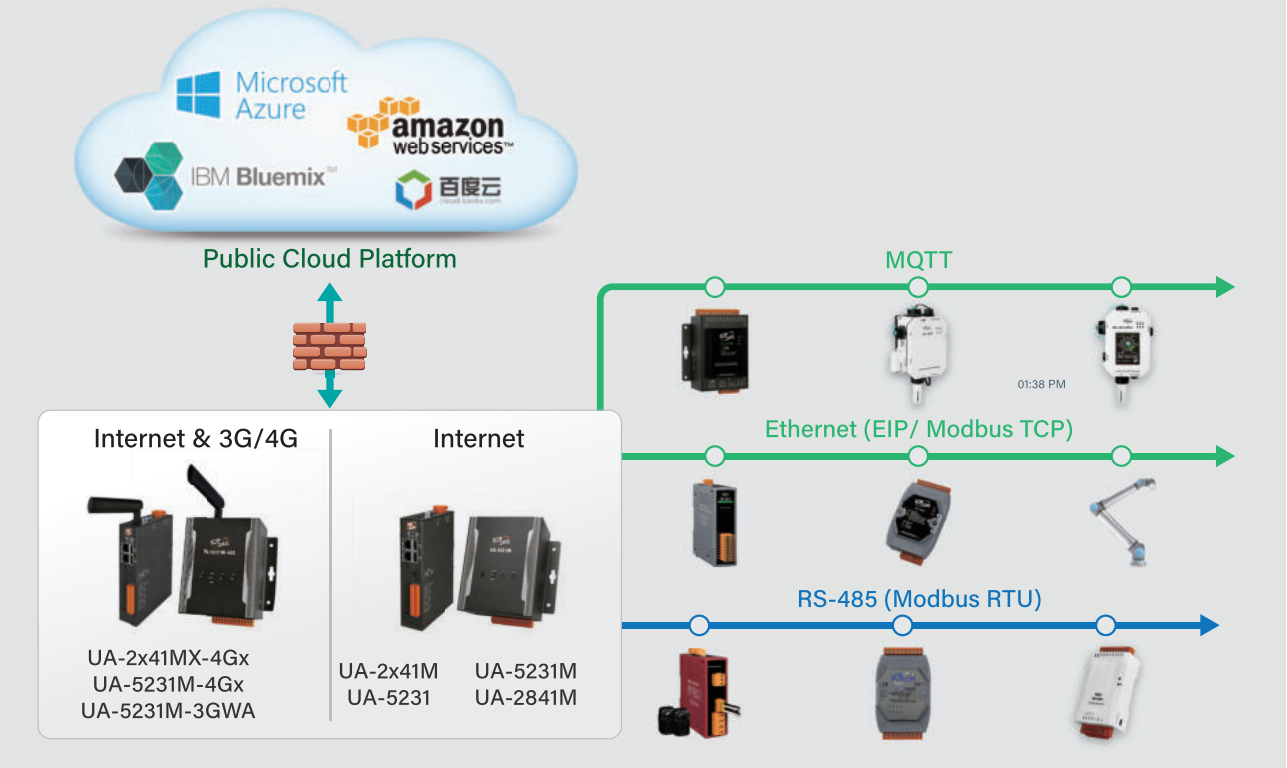
IIoT Security (Certificates and Encryption)

Communication Methods	Data Security Measures	Preventable Security Risks
OPC UA	X.509 User Authentication AES, RSA Message Encryption Message Signing and Encryption	Man-in-the-middle Attacks, Unencrypted Transmissions, and Privilege Abuse
MQTT	Username/Password Authentication AES Message Encryption	Man-in-the-Middle Attacks, Unencrypted Transmissions, Weak Authentication, and Topic Hijacking
RESTful API	TLS 1.2 Message Encryption	Man-in-the-Middle Attacks, API Misuse, and Sensitive Data Leakage
SNMP V3	MD5 User Authentication DES/AES Message Encryption	Unencrypted Community Strings and Outdated Protocol Vulnerabilities

Note: Man-in-the-Middle Attacks include IP Spoofing, DNS Spoofing, ARP Spoofing, and Wi-Fi Sniffing.

Connection to IoT Cloud Platforms

The IIoT Communication Servers can upload I/O data to cloud platforms in real time for analysis. Additionally, the Communication Servers allow users to edit MQTT messages (JSON) and publish them to a specific Broker.



Mobile Notifications

When anomalies in I/O values are detected, IFTTT (If This, Then That) logic control sends real-time notifications to management personnel via over 100 apps, such as LINE, Twitter, Gmail, Weibo, etc.

Applications

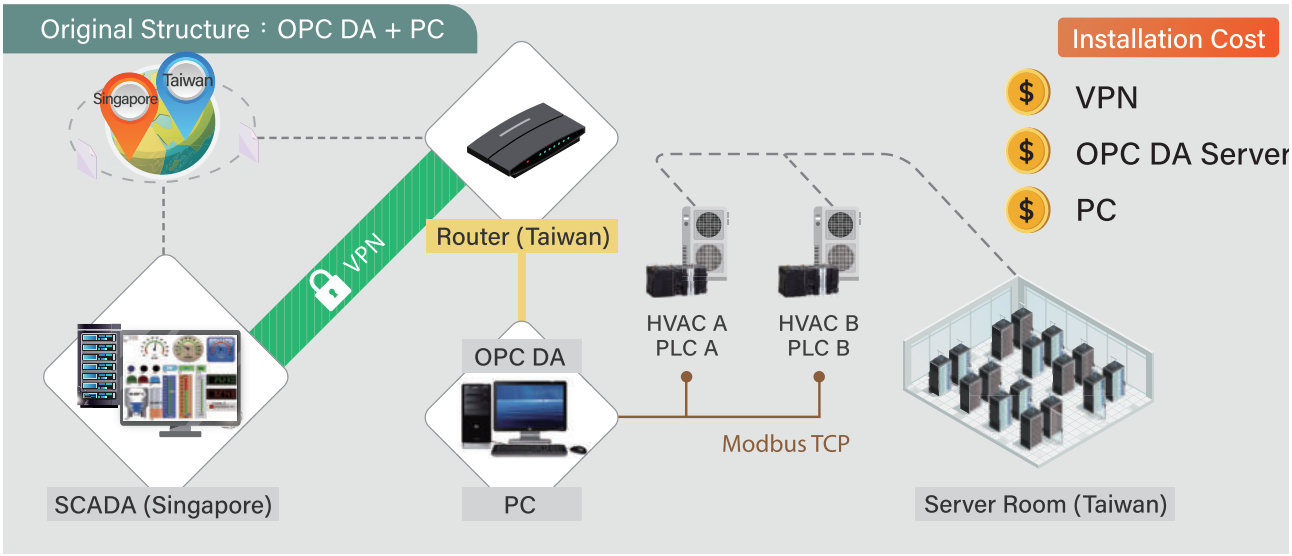
Cross-border Server Room Environmental Monitoring

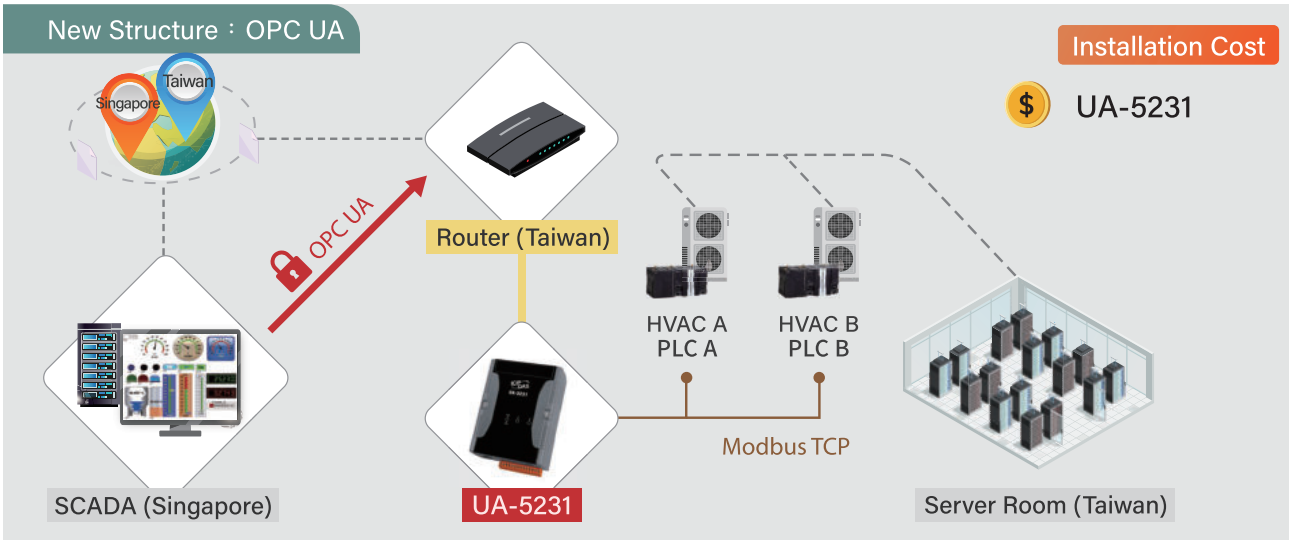
Simplified Architecture

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.





Urban Drainage System Monitoring & Control

Flexible Deployment via 4G Wireless Communication

Cloud Integration with Azure, AWS, and Other Platforms

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.

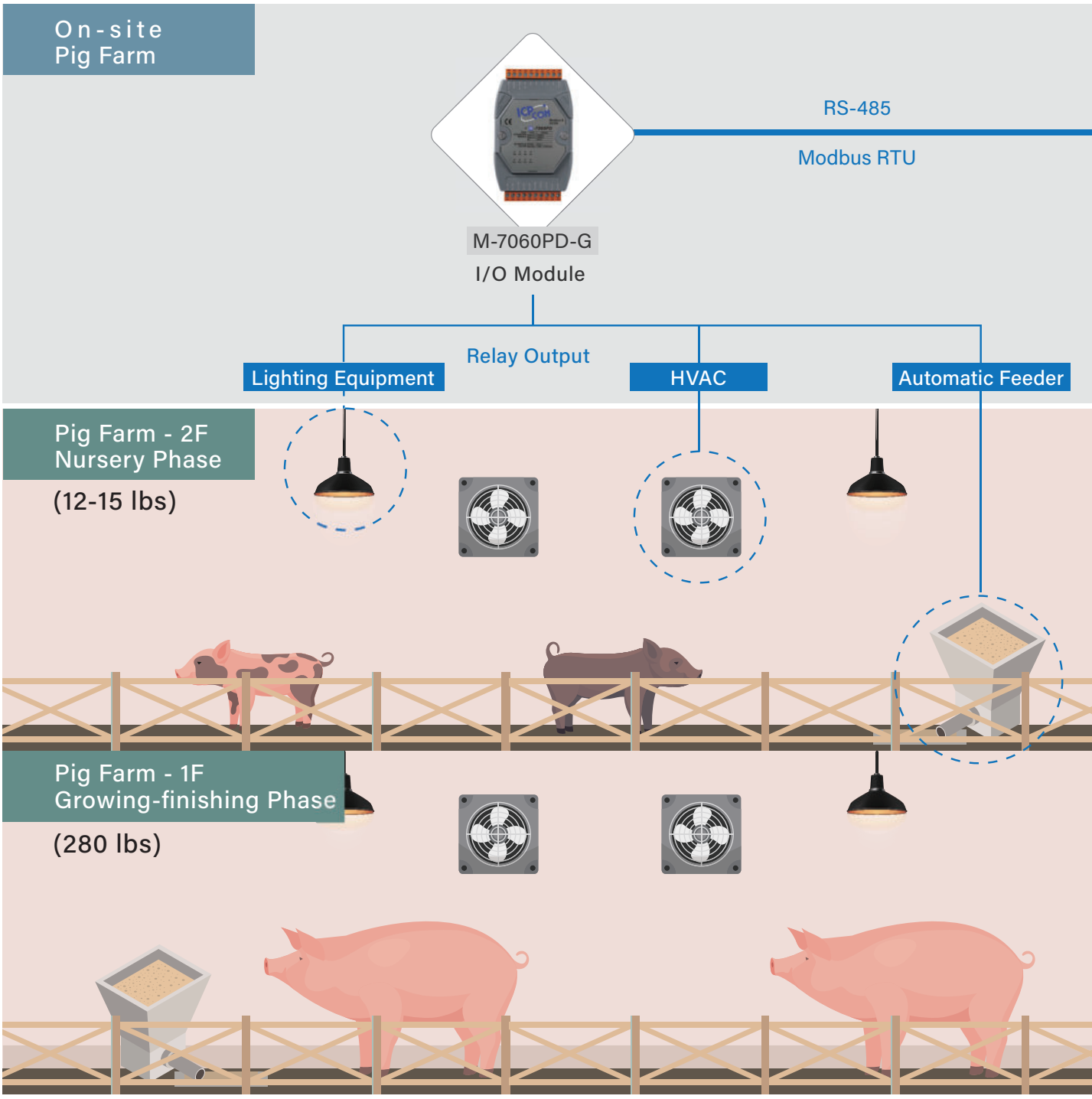
Urban Water Management System

Large-Scale Automated Farming System Environmental Control & Feed Management

Real-time Data Collection

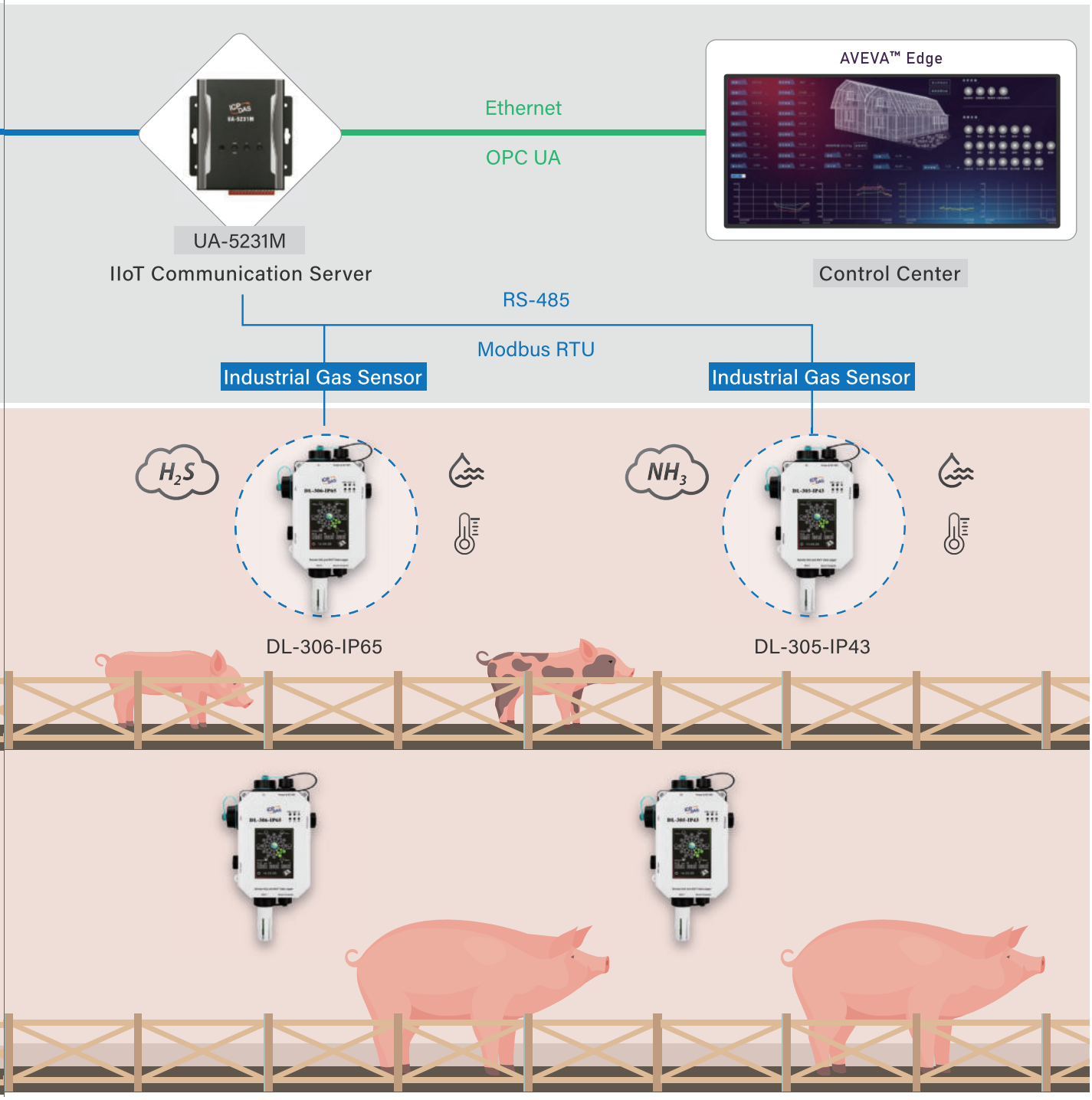
Unified Management

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.



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.

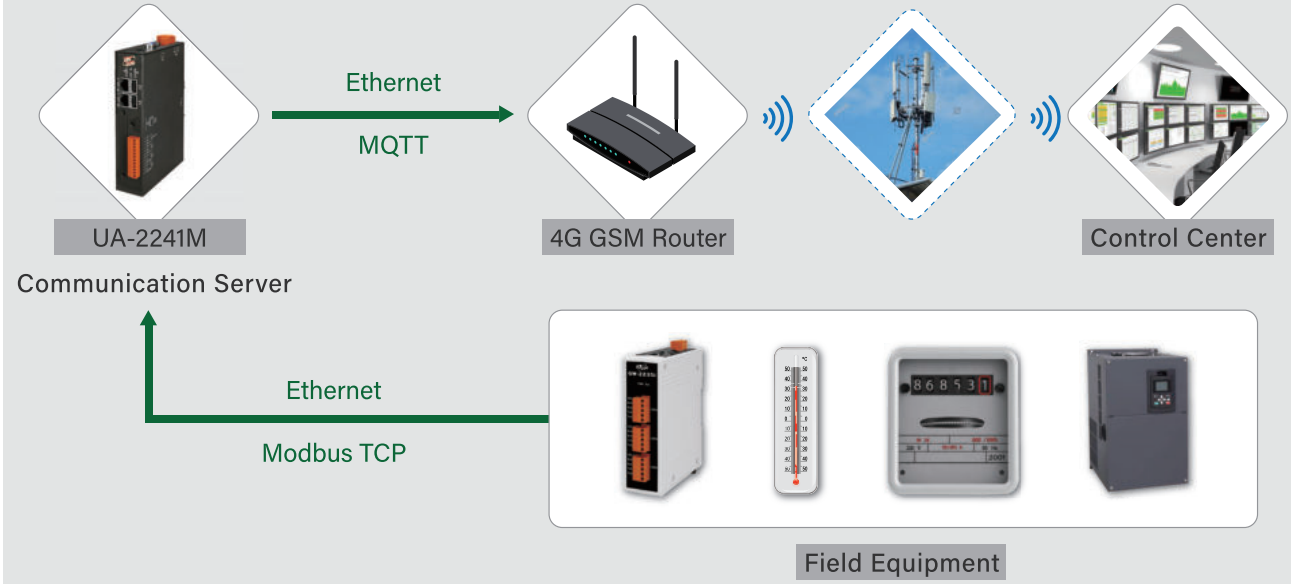


Photovoltaic Power Plant

Cross-Network Segment Communication

Secure Field-to-Cloud Data Exchange & Recovery

The Indian government has actively developed solar energy to tackle the energy crisis. However, the scattered locations of solar power plants make equipment monitoring and maintenance labor-intensive. For smooth operation of the power plants, ICP DAS adopts IIoT technologies to collect equipment data via Modbus TCP and sends it to the UA-2241M communication server. With secure MQTT transmission, the data is delivered to the control center for real-time visualization and analysis, enabling preventive maintenance and reducing unexpected downtime costs. The UA-2241M also supports data recovery, ensuring complete data transfer.



Water Filtration Systems in Chemical Plants

Easy Access to Field PLC Data

Save Time and Effort on IT-OT Integration

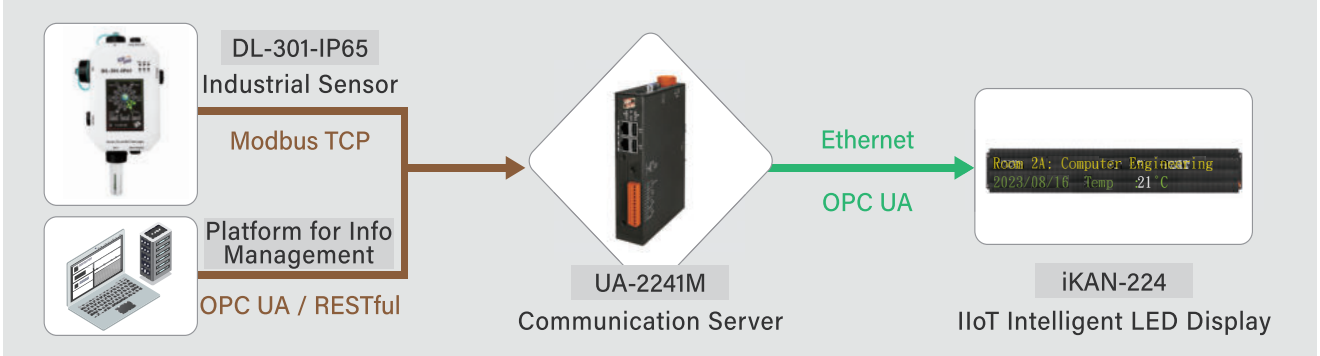
Before analyzing industrial discharge, chemical plants must record data on water flow, pressure, quality, etc. obtained from water filtration systems. Challenges include reading critical data from PLCs in the control panel and integrating it into the IT system. ICP DAS UA-5231M can transmit PLC data 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.

Campus Information Displays

Display Weather Data, Announcements & Emergency Instructions

Data Encryption for Enhanced Cybersecurity

Digital displays are widely used on campuses due to their convenience and accessibility for transmitting information. In this case, ICP DAS utilizes the DL-300 Series Industrial Gas Sensors to collect environmental data. The UA-2241M communication servers, with built-in OPC UA protocol, then publish the data to the corresponding iKAN Series LED displays. The system provides encryption for enhanced security and reliability compared to traditional architectures. Additionally, data can be integrated into databases through an information management platform.

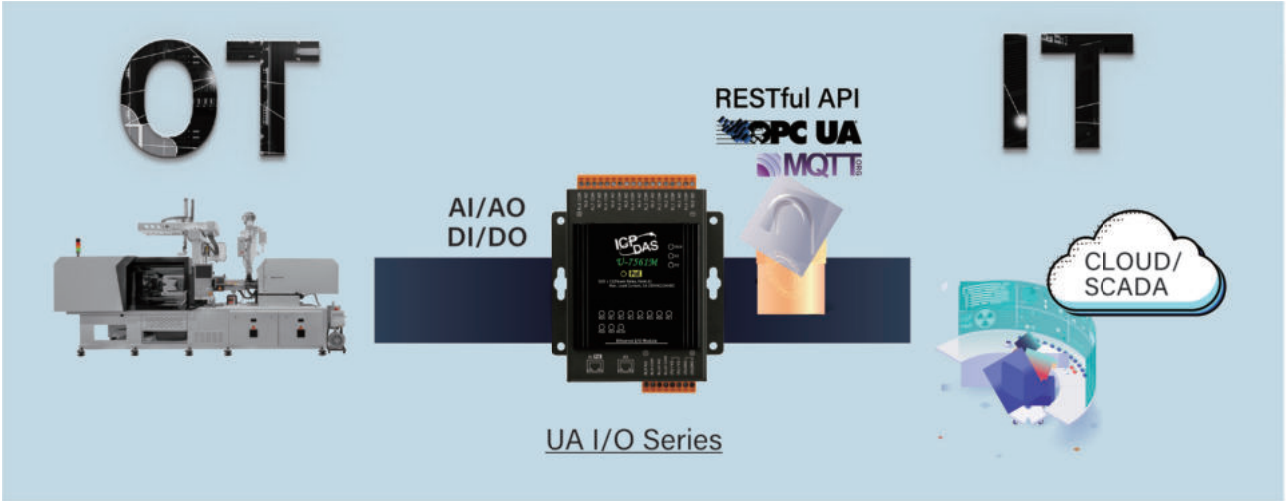


Cybersecurity UA I/O Module: U-7000 Series

Comparison Item	Cybersecurity I/O Module (U-7500 Series)			Traditional I/O Module
Communication Protocol	OPC UA	MQTT	RESTful API	Modbus TCP
Communication Method	Publish / Subscribe (No Additional Broker Required)	Publish / Subscribe (Requires Additional Broker)	Request / Response	Request / Response
Network Traffic	Low (Data sent only on change)	Low (Data sent only on change)	High (Scheduled Polling)	High (Scheduled Polling)
Data Format	Converted Values (Directly usable by the host system)			Hexadecimal (Requires conversion on the host system)
User Authentication	Account Password & Certificates	Account Password & Certificates	Certificates	N/A
Communication Encryption	Yes	Yes	Yes	N/A
Anti-Snooping / Man-in-the-Middle Attacks	Yes	Yes	Yes	N/A
Application	Open Networks, Cloud Environments, or Multi-site Operations			Closed OT Networks or VPN-protected Internal/External Communication

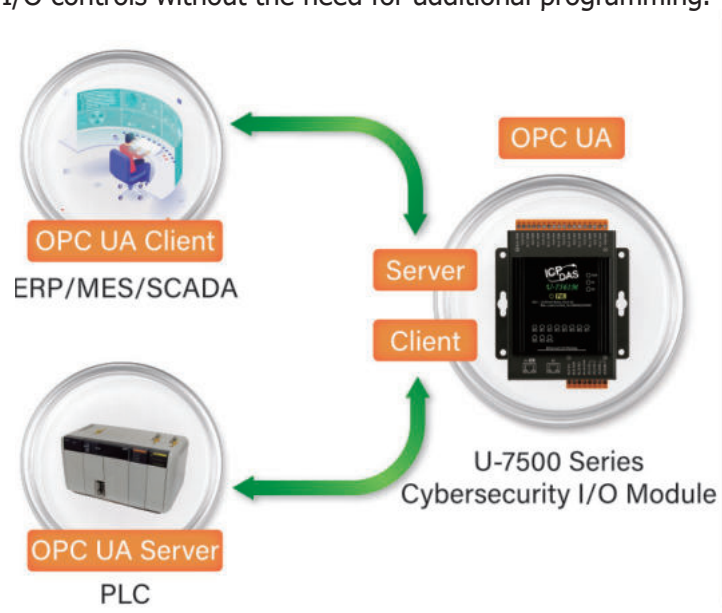
Features

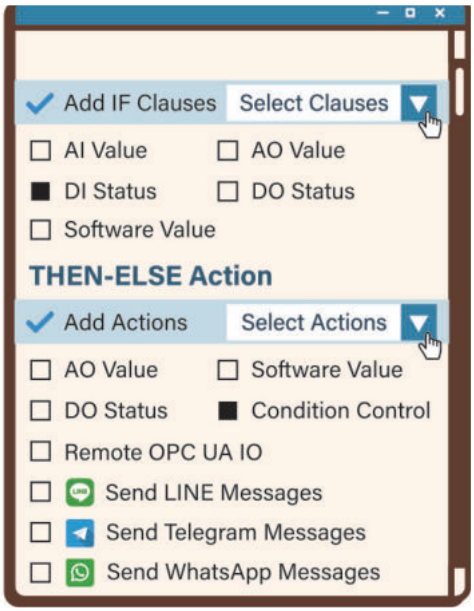
Support OPC UA (Server/Client) , MQTT (Client), & RESTful AP



Built-in OPC UA Client/Server & IF-THEN-ELSE Logic Capability

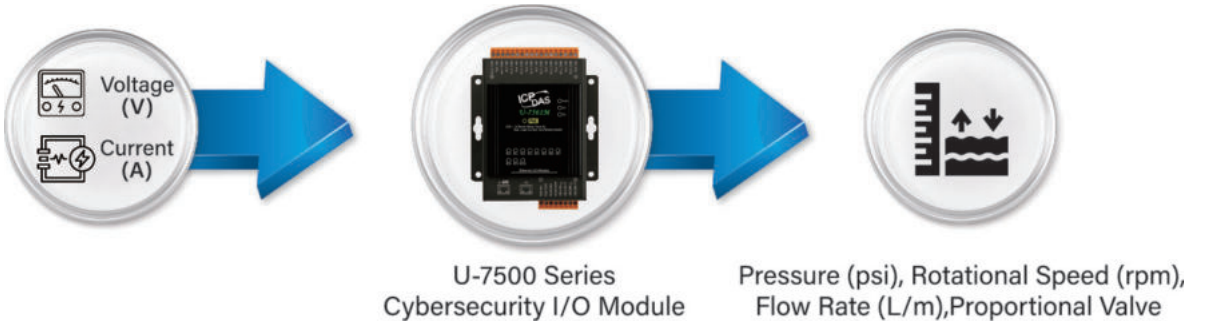
The U-7500 Series Cybersecurity I/O Module enables fast configuration of I/O control logic with just a few clicks on the web interface. The logic is automatically executed in a loop, allowing both remote and local I/O controls without the need for additional programming.





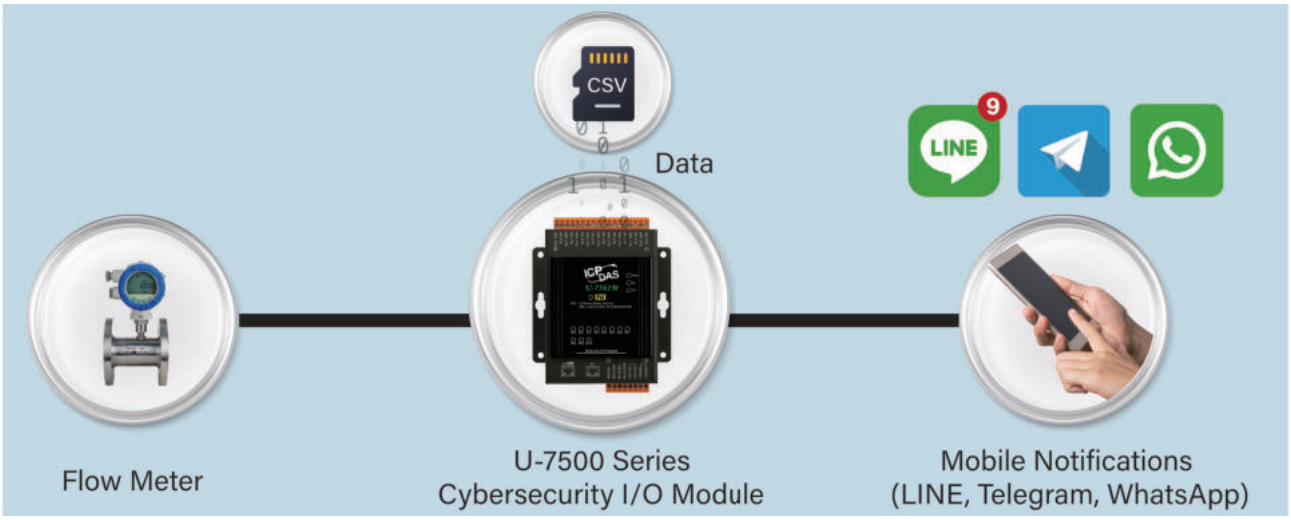
Support for Scaling

The AI/AO modules support the scaling function, converting analog signals into more easily interpretable values.



Support Event Log Function

When I/O values change, the U-7500 Series Cybersecurity I/O Module records the real-time I/O data, making it easier to track device status over time.



Applications

Receive Special Motor Output Current On Factory Floors

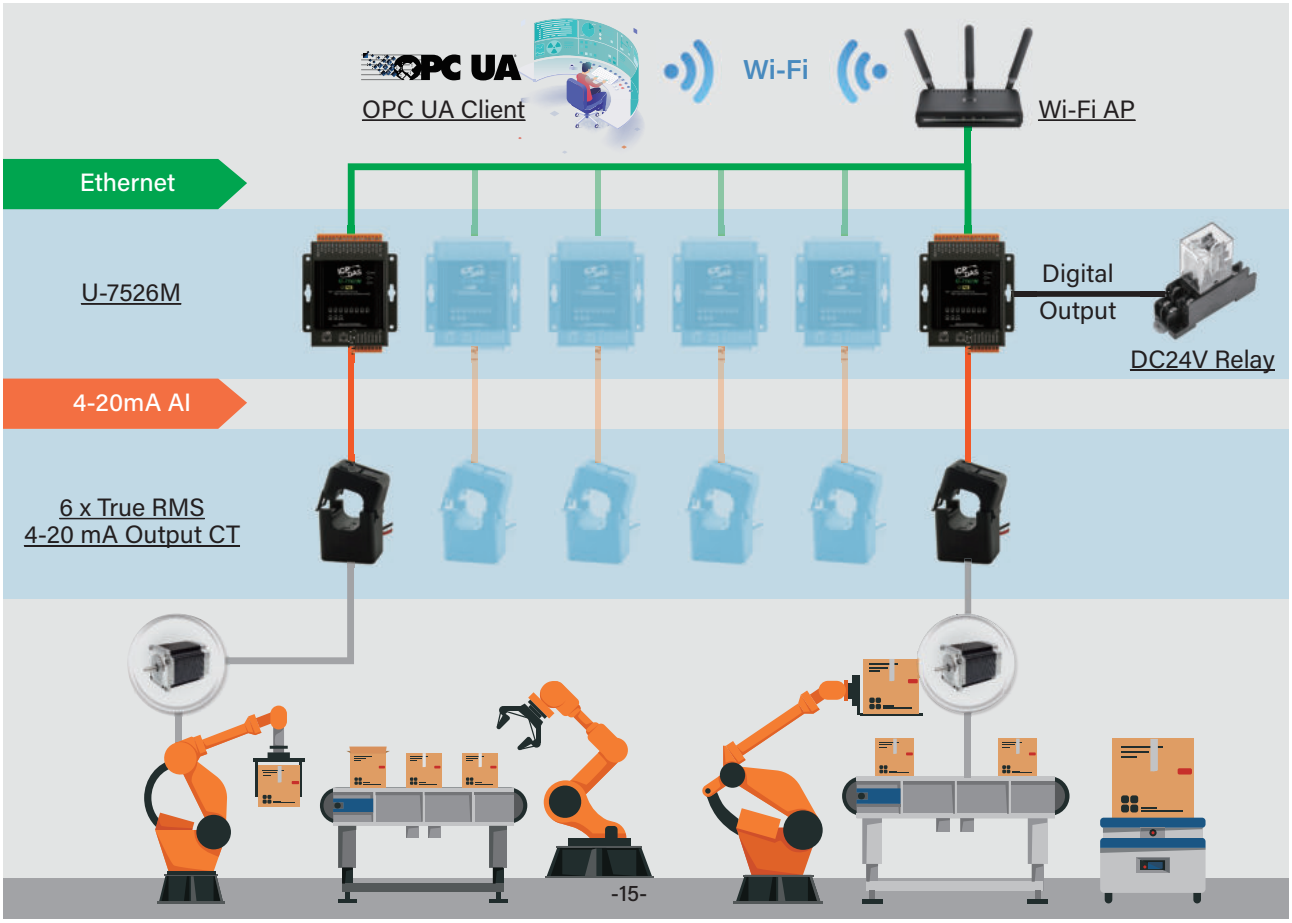
The standard power meter input frequency is 50/60Hz, while the motor output frequency on-site ranges from 50Hz to 6000Hz. Using a standard power meter to monitor the motor would result in insufficient precision. Therefore, high-frequency CTs are employed to monitor the motor's output current.

Enhance Data Transmission Security

The U-7500 Series Cybersecurity I/O Modules transmit motor current data using the secure OPC UA and MQTT communication protocols, enhancing data security on the factory floor.

Implement Wireless Factory Site Monitoring

By using a Wi-Fi AP, wired signals are converted into wireless ones, allowing personnel to monitor motor operations from anywhere on the factory floor.



Selection Guide

Cybersecurity I/O Module

Supports OPC UA, MQTT and RESTful API Communication

Mobile Notifications (LINE, Telegram, WhatsApp)

	AI		AO		DI		DO	
	Ch.	Type	Ch.	Type	Ch.	Type	Ch.	Type
U-7502M	3	±150 mV, ±500 mV, ±1 V, ±5V, ±10 V, +0 mA ~ +20 mA,±20 mA, 4 ~ 20 mA	-	-	6	Wet (Sink/Source)	3	Power Relay Form A (SPST N.O.)
U-7504M	4	±500mV, ±1V, ±5V, ±10V,0~20mA, ±20mA, 4~20mA	4	0~5V, ±5V, 0~10V, ±10V,0~20mA, 4~20mA	4	Dry (Source), Wet (Sink)	-	-
U-7515M	7	Pt100, Pt1000, Ni120, Cu100, Cu1000	-	-	-	-	-	-
U-7517M	8	±150 mV, ±500 mV, ±1 V, ±5 V, ±10 V, ±20 mA, 0 ~ 20 mA, 4 ~ 20 mA	-	-	-	-	4	Isolated Open Collector (Sink)
U-7517M-10	10/20	±150mV, ±500mV, ±1V, ±5V, ±10V, ±20mA, 0~20mA, 4~20mA	-	-	-	-	-	-
U-7518ZM/S U-7518ZM/S2	10	±15 mV, ±50 mV, ±100 mV, ±500 mV, ±1 V, ±2.5 V, ±20 mA, 0 ~ 20 mA, 4 ~ 20 mA Thermocouple: J, K, T, E, R, S, B, N, C, L, M, LDIN43710	-	-	-	-	3	Isolated Open Collector (Sink)
U-7519ZM/S U-7519ZM/S2	10	±15mV, ±50mV, ±100mV, ±150mV, ±500mV, ±1V, ±2.5V, ±5V, ±10V, ±20mA, 0~20mA, 4~20mA, Thermocouple: J, K, T, E, R, S, B, N, C, L, M, LDIN43710	-	-	-	-	3	Isolated Open Collector (Sink)
U-7524M	-	-	4	0~5V, ±5V, 0~10V, ±10V, 0~20mA, 4~20mAipsum	5	Dry (Source), Wet (Sink)	5	Isolated Open Collector (Sink)
U-7526M	6	±500 mV, ±1V, ±5V, ±10V, 0~20mA, ±20mA, 4~20mA	2	0~5V, ±5V, 0~10V, ±10V, 0~20mA, 4~20mA	2	Dry (Source), Wet (Sink)	2	Isolated Open Collector (Sink)
U-7528M	-	-	8	0~5V, ±5V, 0~10V, ±10V, 0~20mA, 4~20mA	-	-	-	-
U-7542M	-	-	-	-	-	-	16	Isolated Open Collector (Sink)
U-7544M	-	-	-	-	8	Wet (Sink,Source)	8	Isolated Open Collector (Sink)
U-7545M	-	-	-	-	-	-	16	Isolated Open Collector (Source)
U-7550AM	-	-	-	-	12	Dry (Source), Wet (Sink)	6	Isolated Open Collector (Sink)
U-7551M	-	-	-	-	16	Wet (Sink,Source)	-	-
U-7552M	-	-	-	-	8	Wet (Sink,Source)	8	Isolated Open Collector (Source)
U-7553M	-	-	-	-	16	Dry (Source)	-	-
U-7555M	-	-	-	-	8	Dry (Source), Wet (Sink,Source)	8	Dry (Source), Wet (Sink,Source)
U-7558M	-	-	-	-	8	Wet (Sink/Source)	-	-
U-7559M	-	-	-	-	8	Wet (Sink/Source)	-	-
U-7560M	-	-	-	-	6	Wet (Sink/Source)	6	Power Relay Form A (SPST N.O.)
U-7561M	-	-	-	-	-	-	11	Power Relay Form A (SPST N.O.)
U-7567M	-	-	-	-	-	-	8	Power Relay Form A (SPST N.O.)

2-3 MQTT Communication Server: BRK Series

Redundancy/Distributed MQTT Communication Server

BRK-2841M

MQTT

BRK Series

MQTT Broker Communication Server

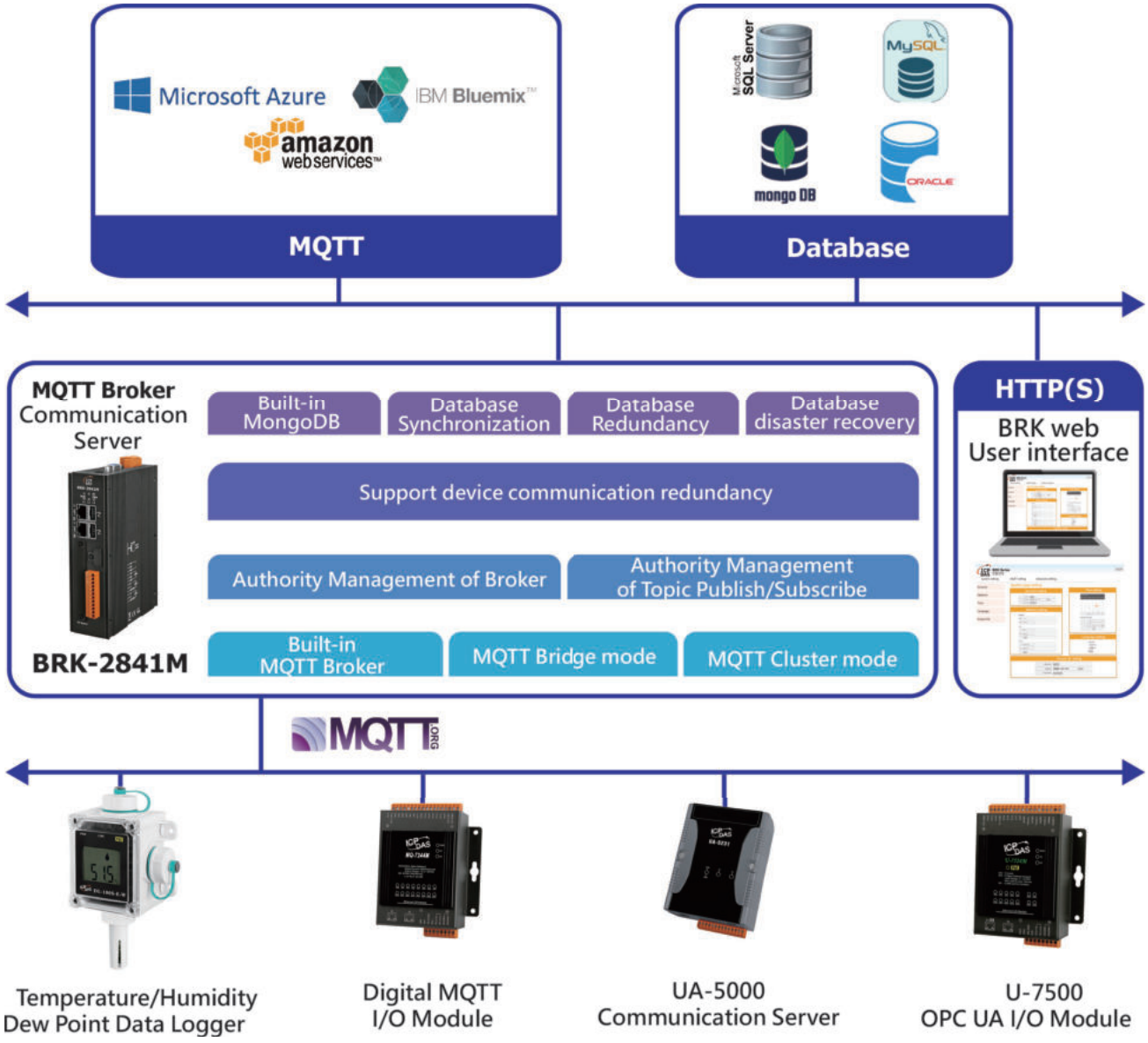
- **Built-in MongoDB**
- **Data Redundancy – Rapid Setup**
- **Security Multiple Mechanisms**
- **MQTT Broker – Bridge and Cluster**

Introduction

BRK Series is a Communication Server that specially provides the Broker function of MQTT protocol for MQTT message distribution and concentrator in M2M and Industrial Internet of Things environments. The BRK Series is compatible with the MQTT version V.3.1, V.3.1.1 and V.5.0 protocol. It supports many functions such as QoS message quality mechanism, retains mechanism, identity authentication, communication encryption, last message (Last Will), and bridge.

The method of Web UI settings can quickly set up BRK functions. This reduce the burden of setting up the broker by user oneself and the maintenance cost. Besides, BRK Series provides Bridge, Cluster, Load Balancer, and High Availability functions. By forming multiple BRK Series a group to a better Redundancy system can prevent field systems from stopping services due to hardware or network failures.

System Architecture



BRK Communication Redundancy Architecture

Redundancy

If the Main Broker fails, the Backup Broker will take over the service automatically.

If the Main Broker goes online again, the Backup Broker will return the service.

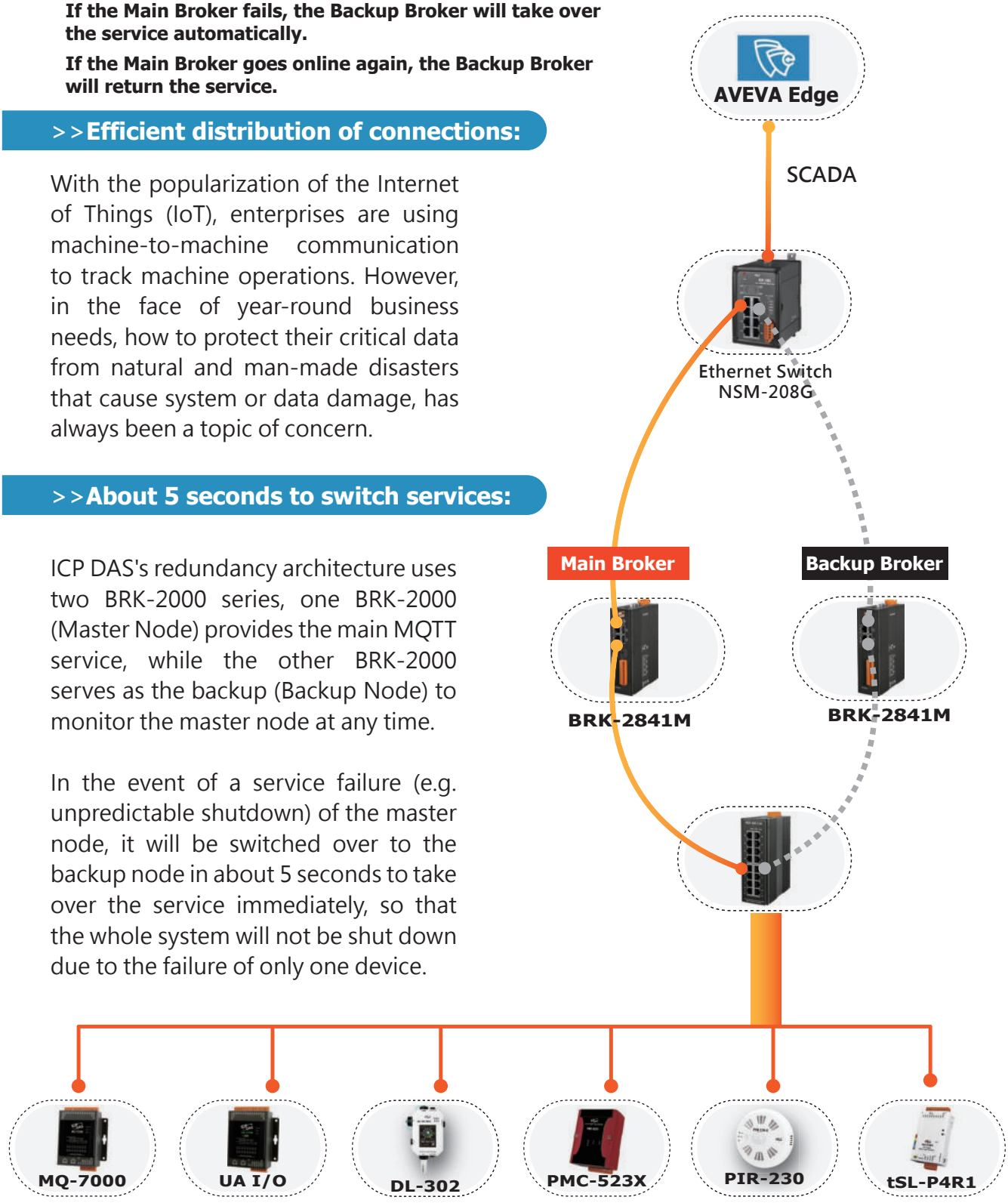
>>Efficient distribution of connections:

With the popularization of the Internet of Things (IoT), enterprises are using machine-to-machine communication to track machine operations. However, in the face of year-round business needs, how to protect their critical data from natural and man-made disasters that cause system or data damage, has always been a topic of concern.

>>About 5 seconds to switch services:

ICP DAS's redundancy architecture uses two BRK-2000 series, one BRK-2000 (Master Node) provides the main MQTT service, while the other BRK-2000 serves as the backup (Backup Node) to monitor the master node at any time.

In the event of a service failure (e.g. unpredictable shutdown) of the master node, it will be switched over to the backup node in about 5 seconds to take over the service immediately, so that the whole system will not be shut down due to the failure of only one device.



Specifications

Software

Hardware Specifications		
Main Unit	CPU	Quad-core ARM CPU, 1.6 GHz/Core
	SDRAM	DDR3 SDRAM 2 GB
	Storage	Flash 8 GB
	Non-Volatile Memory	FRAM 64 KB, MRAM 128 KB
LED Indicators	Status	1 x PWR, 1 x RUN, 3 x User Defined LED
HMI	Rotary Switch	1 x 10 Position (0~9)
Ethernet	Ports	RJ-45 x 2, 10/100/1000 Base-TX (Auto-negotiating, Auto MDI/MDI-X)
USB	Ports	2 x 2.0 host
Power	Input Range	+12 ~ +48 VDC
	Consumption	4.8 W

Hardware

Software Specifications		
Function		Description
Built-in Database	Support MongoDB	Data can be recorded into the built-in database, no extra database setup is required.
	Data Redundancy	Two or more BRK-2841M consist of a redundancy group in which all databases are synchronized to achieve data redundancy
	Database Failover	Two BRK- 2841M will monitor each other and in case of failure, the other device will take over to ensure that the database recording is not interrupted.
	Writing Speed	20 times/second
Rapid Setup	Redundancy System	Two or more BRK-2841M form a redundancy group and monitor each other, when the host that mainly provides MQTT service fails, the redundant device will take over to continue providing MQTT service to achieve Broker redundancy.
Information Security Protection	HTTPS	The built-in web server supports HTTPS to ensure the communication is secure.
	Broker permissions	Allow/prohibit connection requests to the Broker from specific IP addresses, filtering from the connection to enhance the stability and security of the Broker.
	Topic Publish/ Subscribe	Allow/prohibit publish/subscrib to the Topics, define the Client authority that has been filtered, and prevent important Topics from being falsified or read by others.
Built-in MQTT Broker	Max. Number of Clients	100000 connections
	Max. Number of Topics	100000 records
	Support MQTT Bridge	In Bridge mode, you can transfer data between multiple Brokers to each other, forward the data to a specified Broker to subscribe to a topic on a bridge node, and then publish the data locally or to a Broker at another location.
	Support MQTT Cluster	The continuity and availability of MQTT service is guaranteed by two BRK-2841M working together, it is very important for enterprises that cannot afford downtime.

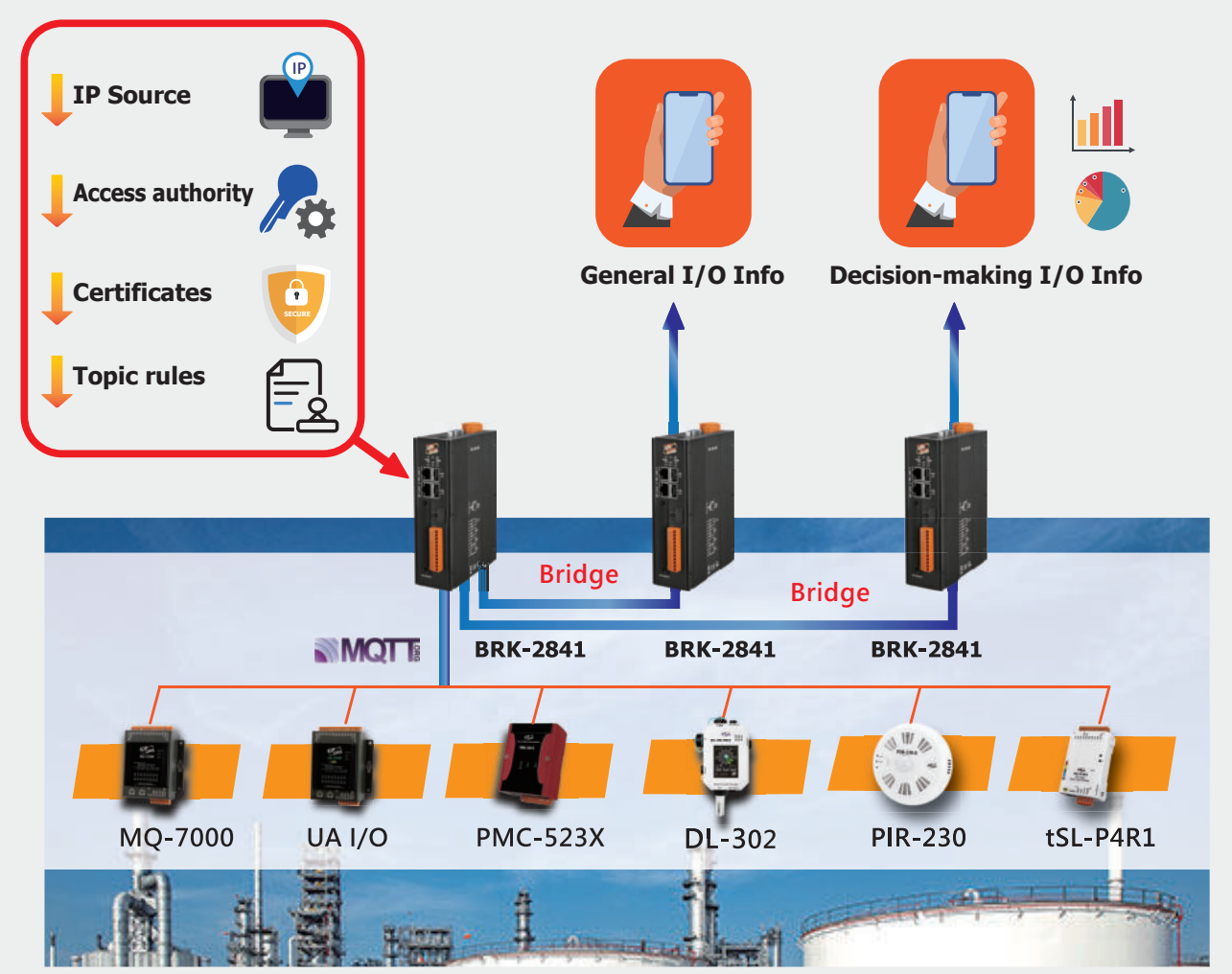
Applications

Data Security Management Applications

- **Monitoring Segmentation, enhance data security**
- **Network Segmentation, defense in depth**

In many enterprises, due to the large size of the plant, part of the area will control the access of the personnel, and spend a long time to solve the problem, so the enterprises will solve the problem by remote control system. However, remote monitoring will expose all the devices to the external network environment, if any one device in the system has a security problem, the operation of the whole system may be paralyzed.

BRK-2000 series can send the transmitted topics to the remote broker through the MQTT bridge mechanism, and the access authority can increase security. When remote monitoring is required, the plant's internal devices network environment can be segmented from the external network, so that the plant's internal system can continue to operate without being affected by the external network.



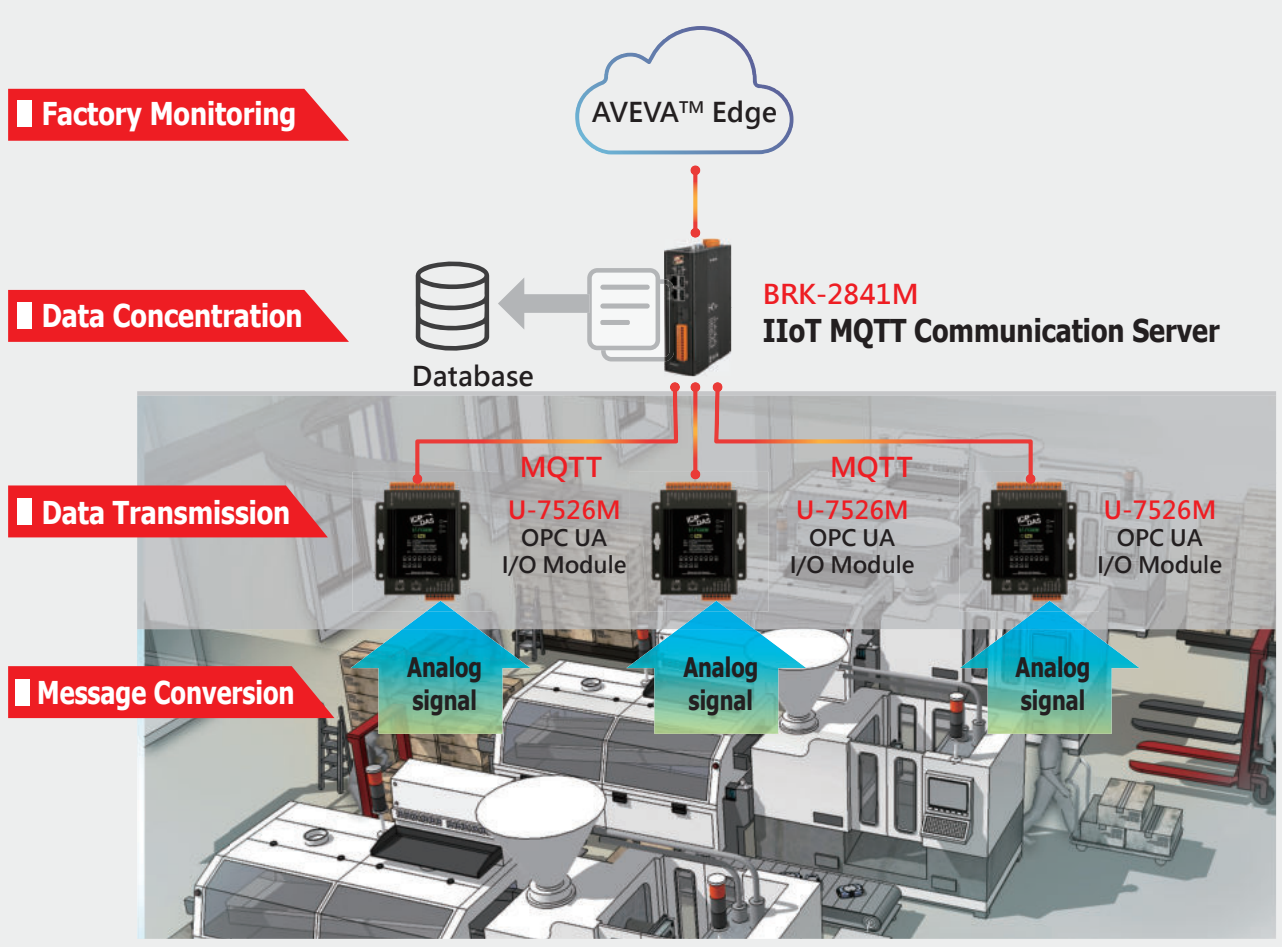
Plastic Injection Molding Machine Monitoring Applications

- **Digitalization for recording**
- **Centralized message**
- **Data Graphing**

Due to labor costs increasing and manpower shortages in the manufacturing industry, how to digitize information is an important issue, companies have trouble integrating IT and OT staff because they have different perceptions, and eventually have to abandon the project. The difficulties, in this case, can be divided into the following items:
Hard to record Sensor value / Machine messages scattered / No Data Graphing

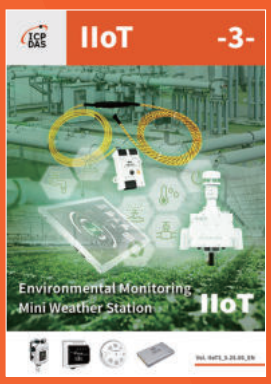
ICP DAS uses the U-7526M to convert analog signals into RESTful API / MQTT data to achieve the goal of "information digitization".

Projects	Before	After
Meter	Manual meter reading	Record in database
Machine Status	Manual inspection	Screen Monitoring
Quality	Manual adjustment	Data analysis
Management	Error-prone	Not error-prone
Communication	Difficult	Easy
KPI managing	According to experience	According to data



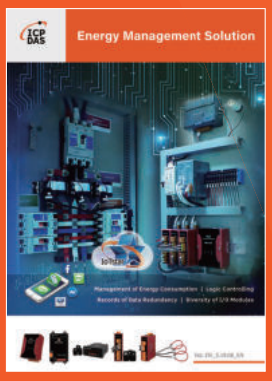
IIoT 2
Access Control Security / Factory Automation

- WISE Surveillance Solution
- IP Camera iCAM Series
- Smart Access Control
- IIoT and Smart Phone Integration
- MQTT I/O Module MQ Series
- Stack Light Monitoring Module
- Emergency Voice/Visual Alert Module
- Industrial LED Message Display
- Bluetooth LE Gauge Master
- Temperature Data Logger
- Signal Conditioning Modules
- No-touch Infrared Sensor Switch



IIoT 3
Environmental Monitoring / Mini Weather Station

- Smart Environmental Monitoring: CL Series
- Air Box: DL Series
- Mini Weather StationMotion: DLW Series
- Detector: PIR Series
- Industrial Sensor Network Detection: iSN Series
- Wireless Environmental Solution: iWSN/iXN/iSOS Series



Energy Management Solution

- InduSoft SCADA Software
- Smart Power Meter Concentrator
- Smart Power Meter
- True RMS Input Module
- TouchPAD Devices - VPD Series

Industrial Fieldbus Product

- RS-485
- Industrial Ethernet
- Profinet
- CAN bus
- CANopen
- Devicenet
- J1939
- PROFIBUS
- HART
- Ethernet/IP
- BACnet

ZigBee Wireless Product Solutions

- ZigBee Wireless Network
- Applications
- ZigBee Converters
- ZigBee Repeater
- ZigBee Bridge
- ZigBee I/O Group Module
- ZigBee I/O Module
- ZigBee Modbus Data Concentrator
- Accessories

UA Series / BRK Series: IIoT Cloud Solution

- IIoT Cloud Solution Products
- IIoT Communication Server: UA-2000 /5000/7000 SeriesSupport Logic Control IFTTT
- MQTT Communication Server: BRK-2000 Series
- OPC UA I/O Module: U-7000 Series

WISE - Intelligent IIoT Edge Controller & I/O Module

- WISE IIoT Edge Controller & I/O Module
- Cloud Management
- Applications
- Product Specification
- Solution Integration

Smart Building, Smart Home Automation

- Video Intercom & Access Control
- Touch HMI - TouchPAD Series
- Smart Lighting Control
- Energy Saving - PM/PMC Series
- Environmental - DL/CL Series
- Motion Detector - PIR Series
- Wi-Fi Wireless - WF Series
- Infrared Wireless - IR Series
- ZigBee Wireless - ZT Series
- IIoT Server & Concentrator
- LED Display - iKAN Series

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