# WISE - Intelligent IIoT Edge Controller & I/O Module

- WISE-523x/WISE-2x4xM IIoT Edge Controller
- WISE-75xxM Intelligent MQTT I/O Module
- WISE-71xx Intelligent I/O Module

**Easy to use** **No programming**

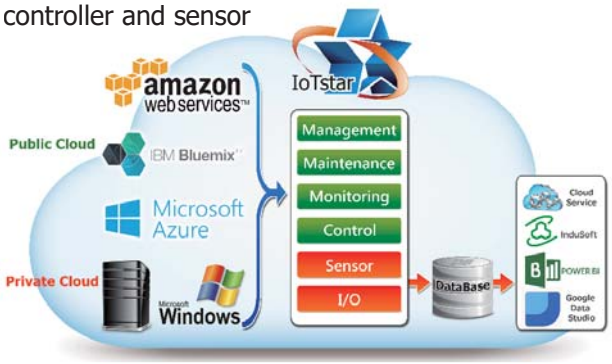
Vol. WISE_5.25.07_EN

# Ch1.WISE IIoT Edge Controller & I/O Module

The Industrial Internet of Things (IIoT) is one of the most important technology trends of Industry 4.0 application today. In addition to the Edge Computing mechanism for the field site sensors and devices, it also includes the technology of collection and sending sensor and device information to the back-end Cloud management platform. ICP DAS has developed a variety of IIoT Edge controllers, I/O modules, sensors, network equipment, and IoT Cloud management software.

## IoTstar

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




## IoTstar Bot Service

Using App on mobile phone to perform two-way monitoring and interaction with the controllers managed by IoTstar.

## WISE Edge Controller

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

## WISE I/O Module

Built-in intelligent logic operation and I/O Channel, appropriate I/O module can be selected according to application needs.

## iCAM Series

The IP camera co-work with WISE to implement the Intelligent surveillance solution.

## Sensor

Provide a variety of sensors to measure temperature, humidity, dew point, CH4 methane, CO, CO2, PM2.5, etc.

# Mobile App Solution

WISE supports mobile communication via LINE and Telegram apps.
Depending on system setup, two modes are available:

## Advanced Mode

- Supports real-time alert notifications, sensor status monitoring, output channel control, and historical alert review.
- Requires integration with the IoTstar cloud management software.
- Capable of sending messages with attached images and videos.

## Basic Mode

- Supports real-time alert notifications only.
- No extra software required—runs on WISE controller alone.
- Sends images/videos via Telegram; LINE supports text only.

| Function / Mode | | Advanced Mode | | Basic Mode | |
|---|---|---|---|---|---|
| APP | | LINE | Telegram | LINE | Telegram/WeChat |
| Alert Message Fee | | Based on message count | Currently Free | Based on message count | Currently Free |
| Real-time Alert Notification | | Yes | | Yes | |
| Media File Binding (Images/Videos) | | Yes | | NO | Yes |
| Paid Add-On (App Feature Upgrade) | | IoTstar 2025 | | Not supported | |
| Available Features | Alert History Review | Yes | | – | |
| | Real-Time Sensor Status Monitoring | Yes | | – | |
| | Output Channel Control | Yes | | – | |

As of April 2025

## LINE Official Account Subscription Plans

### Communication

Monthly Fee: **Free**

- Free Messages: 500 messages/month
- Additional Message Fee: Not available

### Light*

Monthly Fee: **50 USD**

- Free Messages: 10,000 messages/month
- Additional Message Fee: Not available

### Standard*

Monthly Fee: **150 USD**

- Free Messages: 40,000 messages/month
- Additional Message Fee: 0.05USD

* Light plan and Standard plan are not available in EU, Indonesia, Singapore and USA.
* LINE Official Account is not available in EU.

**PS: Sending messages in a group will count the number of messages based on the number of group members (one message per member).**

# 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)) | | |

# Intelligent I/O Module:

## ■ Hardware Specification

| Model | WISE-71xx | WISE-75xxM |
|---|---|---|
| System | | |
| CPU | 16 bits CPU (80MHz) | 32 bits CPU (400MHz) |
| microSD | - | |
| Communication Interface & IO Module Expansion | | |
| Ethernet | 10/100 Base-TX * 1 | 10/100 Base-TX * 2 for Daisy-Chain Topology |
| Serial Port | - | - |
| I/O Module Expansion | Built-in I/O module | |
| Mechanical/Power/Environmental | | |
| Casing | Plastic | Metal |
| DIM. (W x L x H; mm)/Installation | 72 x 123 x 35 ;<br>Wall/DIN-Rail mounting | 120 x 97 x 42;<br>Wall Mounting |
| Temperature/Humidity | Operating Temperature: -25°C to +75°C;<br>Storage Temperature: -30 °C to +80 °C;<br>10 to 90% RH, Non-condensing | Operating Temperature: -25°C to +75°C;<br>Storage Temperature: -40°C to +80°C;<br>10 ~ 90% RH, Non-condensing |
| Input Range | +12 to +48 VDC | |
| Powered from PoE | Yes (IEEE 802.3af, Class1) | |
| Consumption | Depends on the I/O channels provided | |

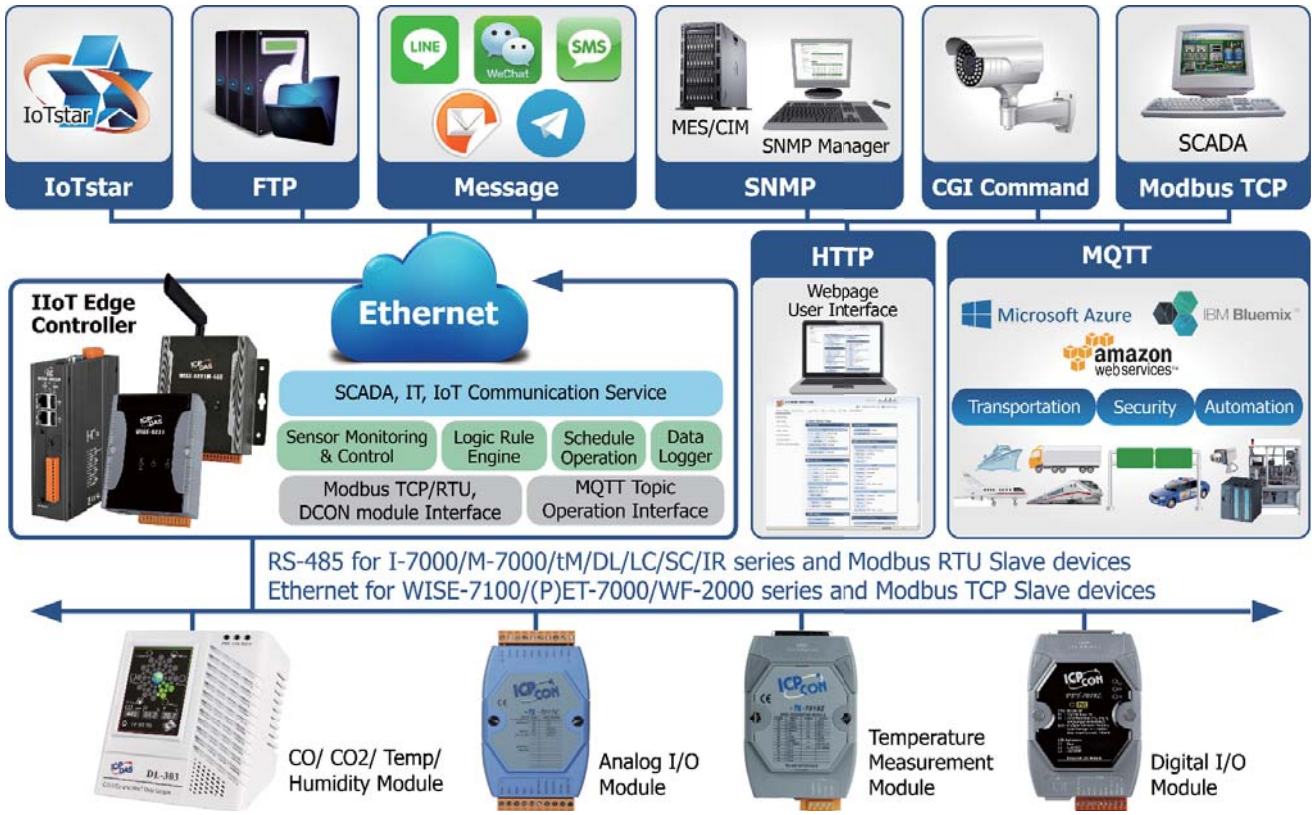
## ■ Software Function

| Model | WISE-71xx | WISE-75xxM |
|---|---|---|
| Web Page Interface | Yes | |
| IF-THEN-ELSE Logic Rule | Yes(36 Sets) | Yes(72 Sets) |
| I/O Channel Monitoring | Yes | |
| Timer Operation | Yes(12 Sets) | Yes(24 Sets) |
| Schedule Operation | - | Yes(24 Sets) |
| Internal Register | Yes | |
| Data Logger | - | |
| Communication Protocol | Modbus TCP & CGI sending | Modbus TCP, CGI sending & MQTT(non-SSL) |
| Information Security Enhancement | - | |
| Instant Message Sending | Email (non-SSL) | |
| Cloud System Connection | - | Yes (ICP DAS IoTstar) |

## Introduction

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.

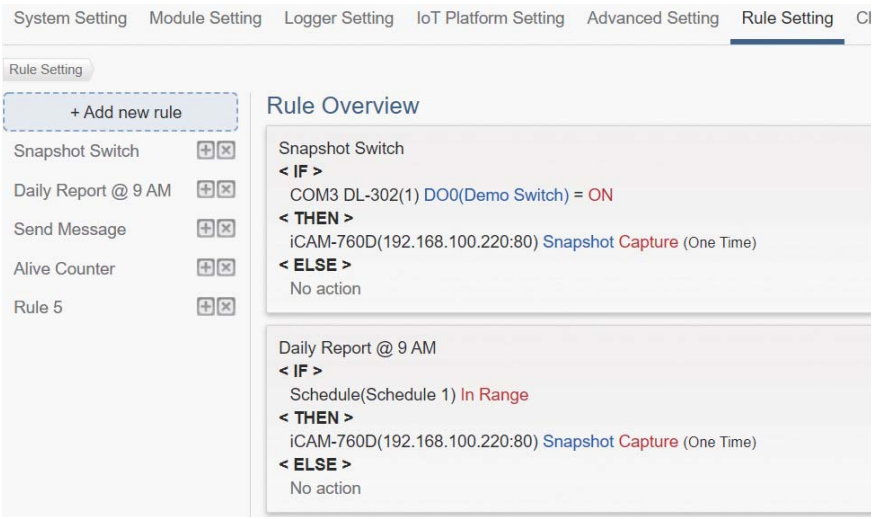
WISE-523x/WISE-2x4xM provides more supports in I/O functions. It allows to connect to a wide range of ICP DAS remote I/O modules and Modbus TCP/RTU slave modules; the users can freely choose the most suitable I/O modules for applications. With the microSD card, it provides Data Logger function to real-time 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.

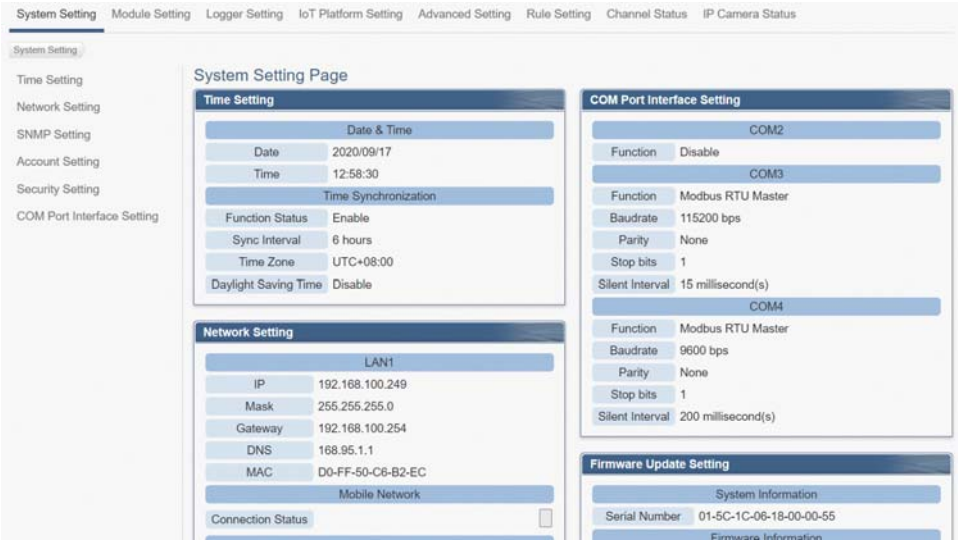
WISE-523x/WISE-2x4xM supports a variety of IoT/SCADA communication protocols (Modbus, MQTT, SNMP, CGI, FTP), which can be quickly integrated with various IoT/IT/SCADA systems. WISE-523x/WISE-2x4xM also can connect to a public IoT Cloud platform (such as Microsoft Azure, IBM Bluemix, or Amazon Web Services) 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

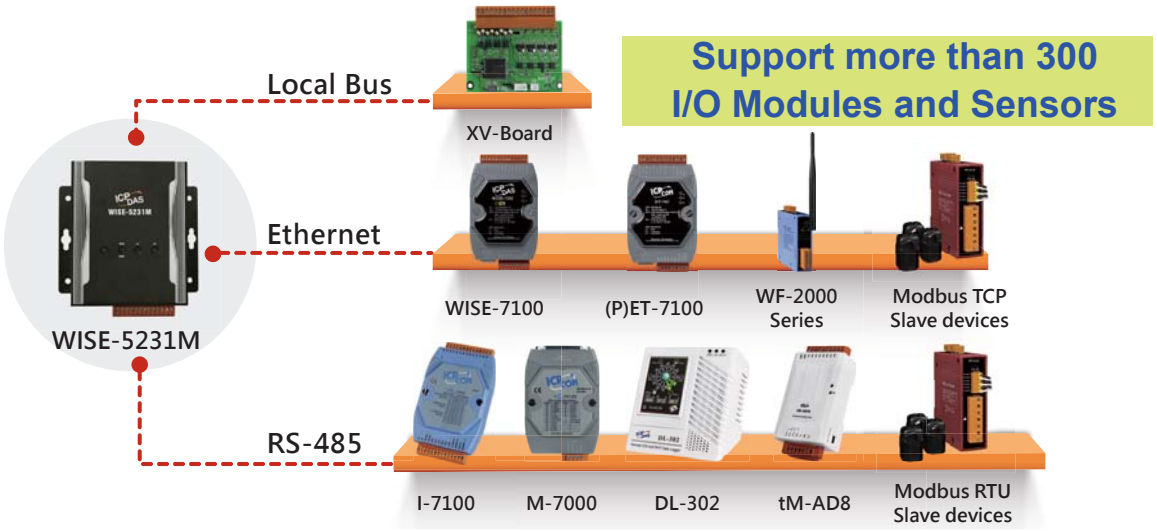
### THEN/ELSE Action

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

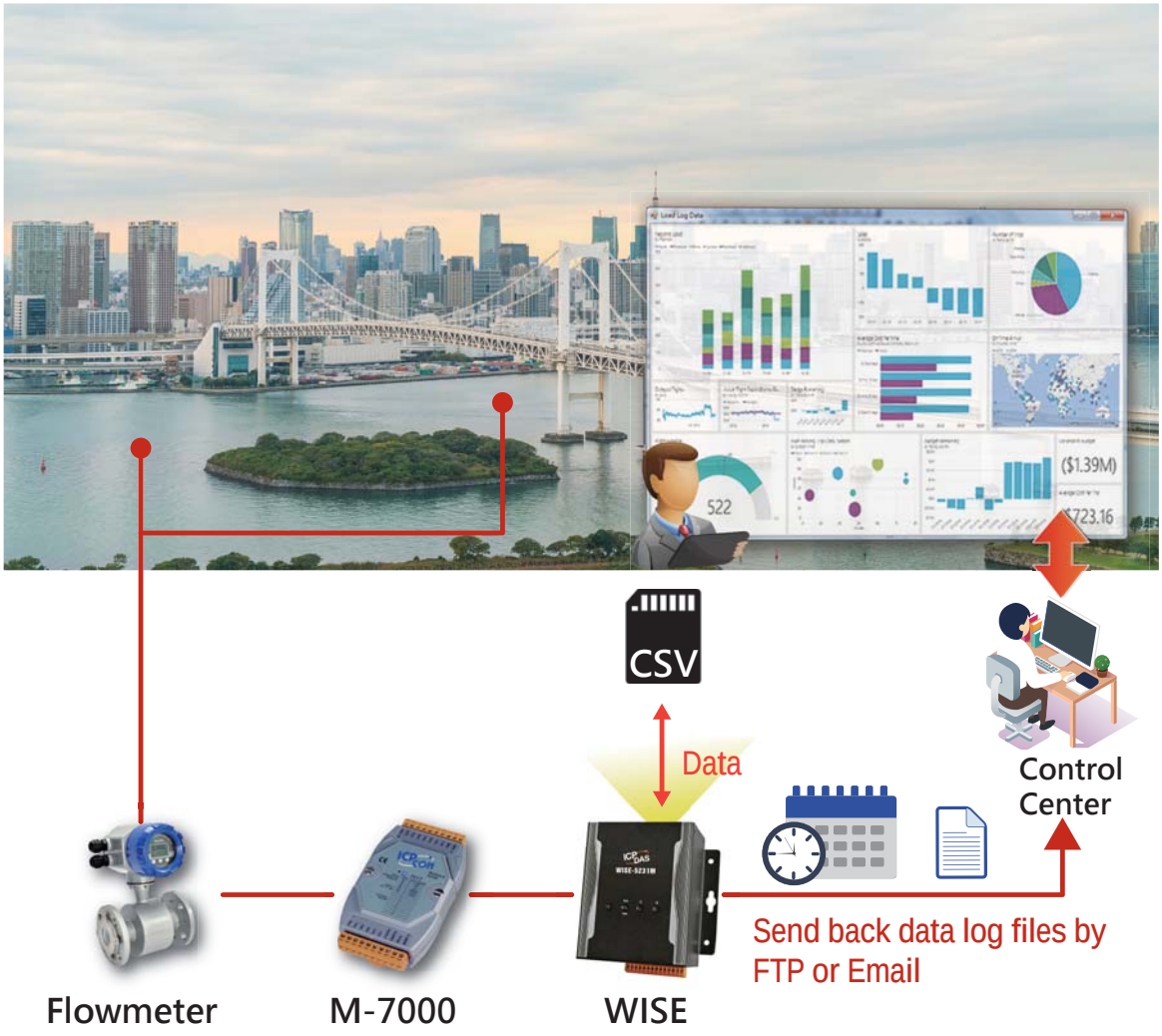
## Connection ability to a variety of sensors and devices

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.

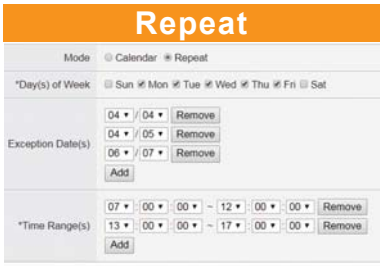


## Provide Timer and Schedule operation

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

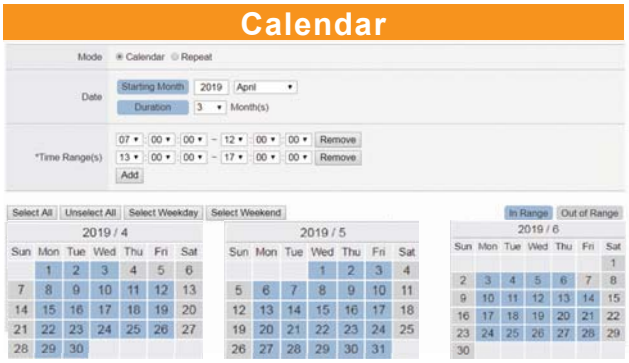
**Repeat**




**Repeat Mode of Schedule**

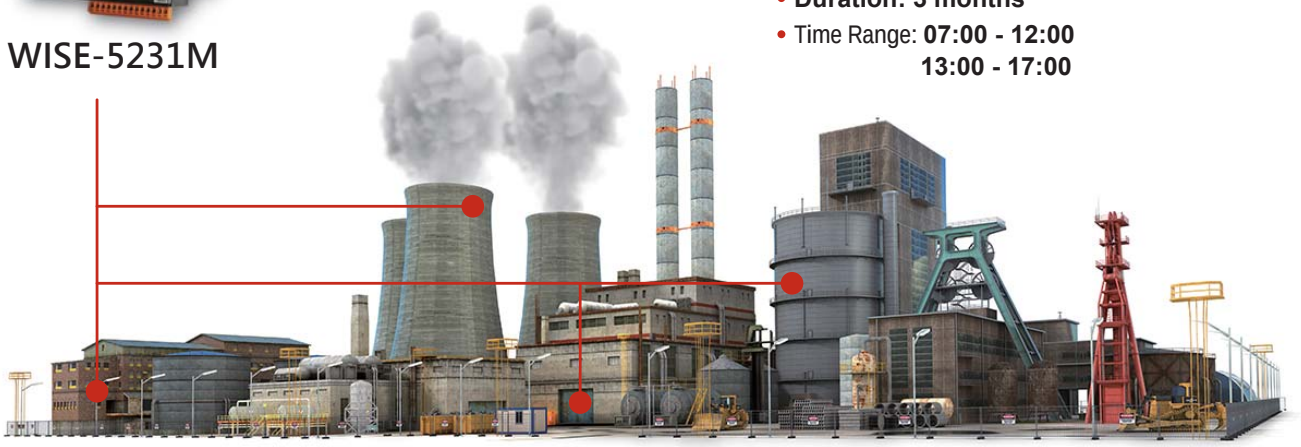
- **Weakday: Mon. to Fri.**
- Time Range: **07:00 - 12:00**
  **13:00 - 17:00**

**Calendar**



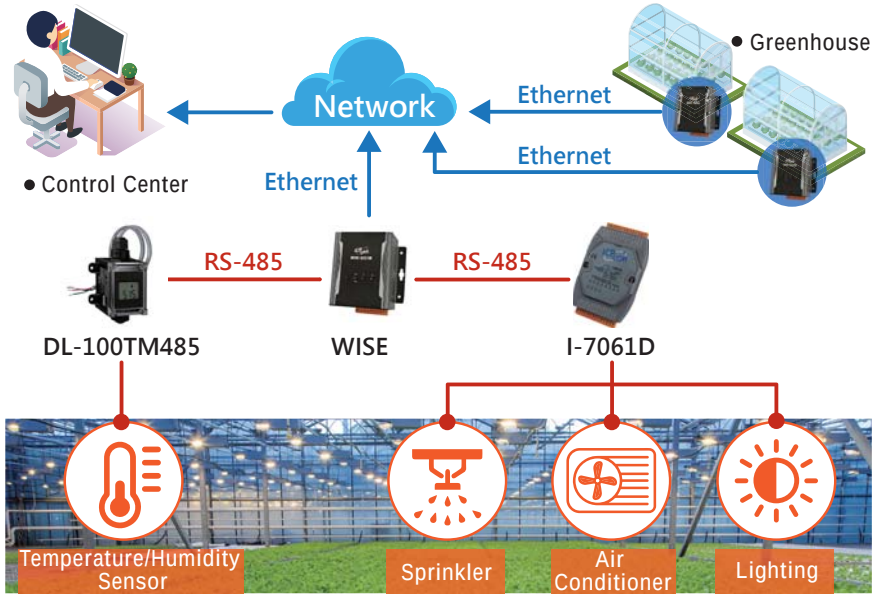

**Calendar Mode of Schedule**

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



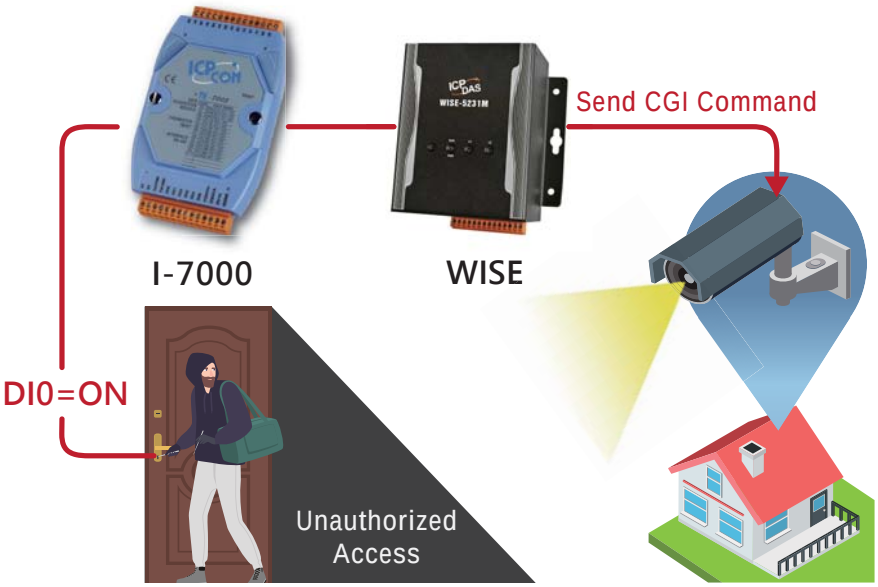
## Active I/O sending mechanism

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.



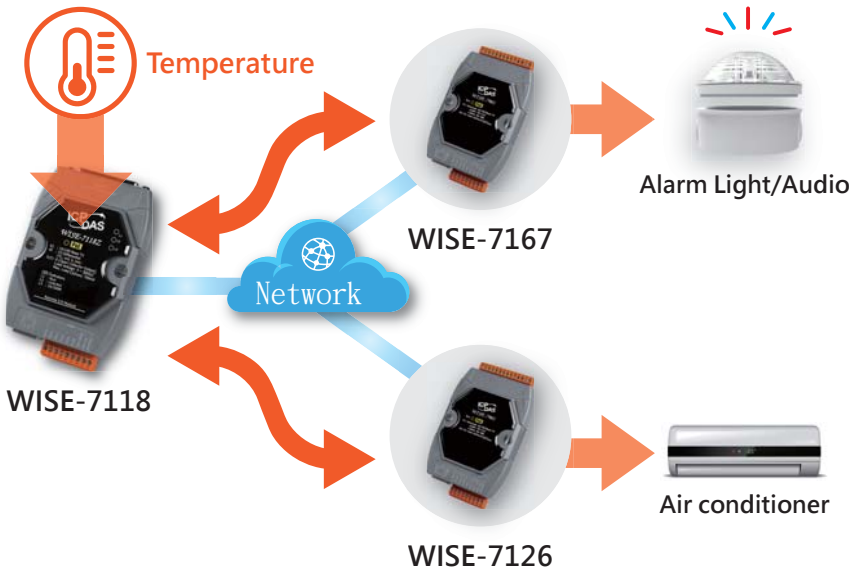
## CGI Command sending & receiving for surveillance system integration

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.



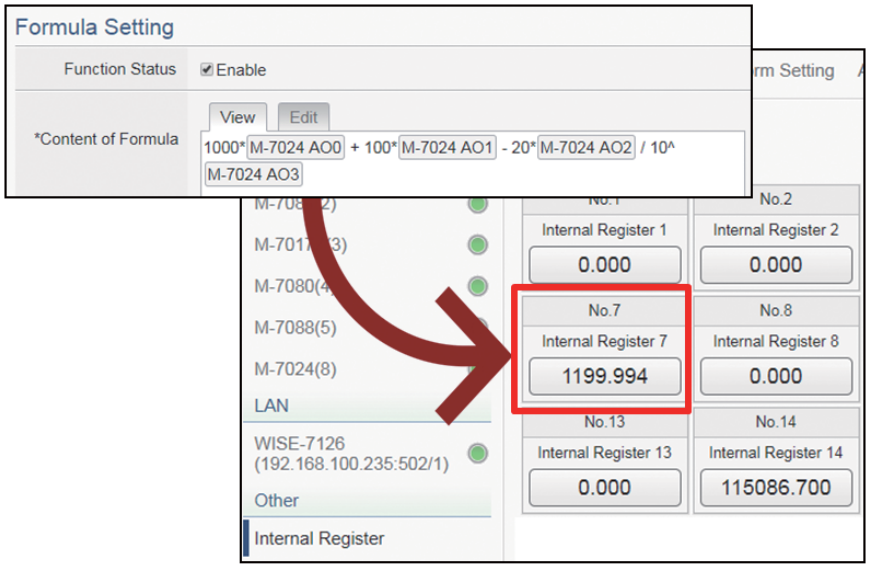

## Advanced P2P function between WISE I/O Modules

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.



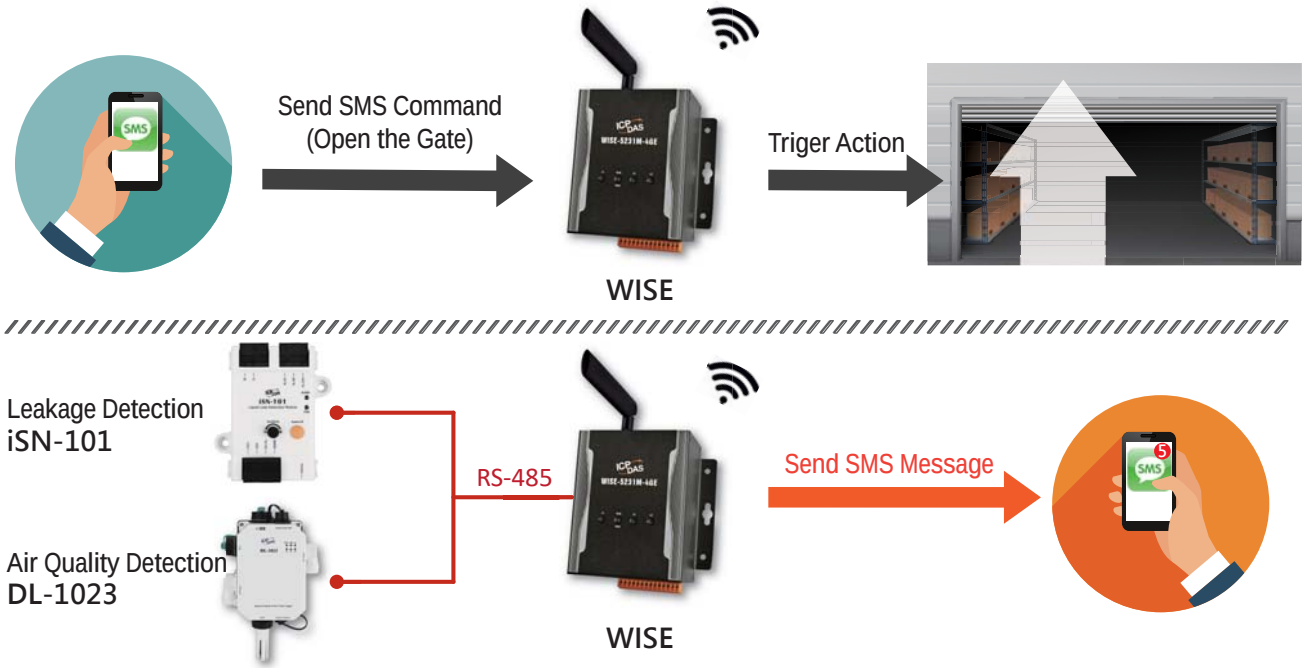
## Support Instant Message sending functions

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.

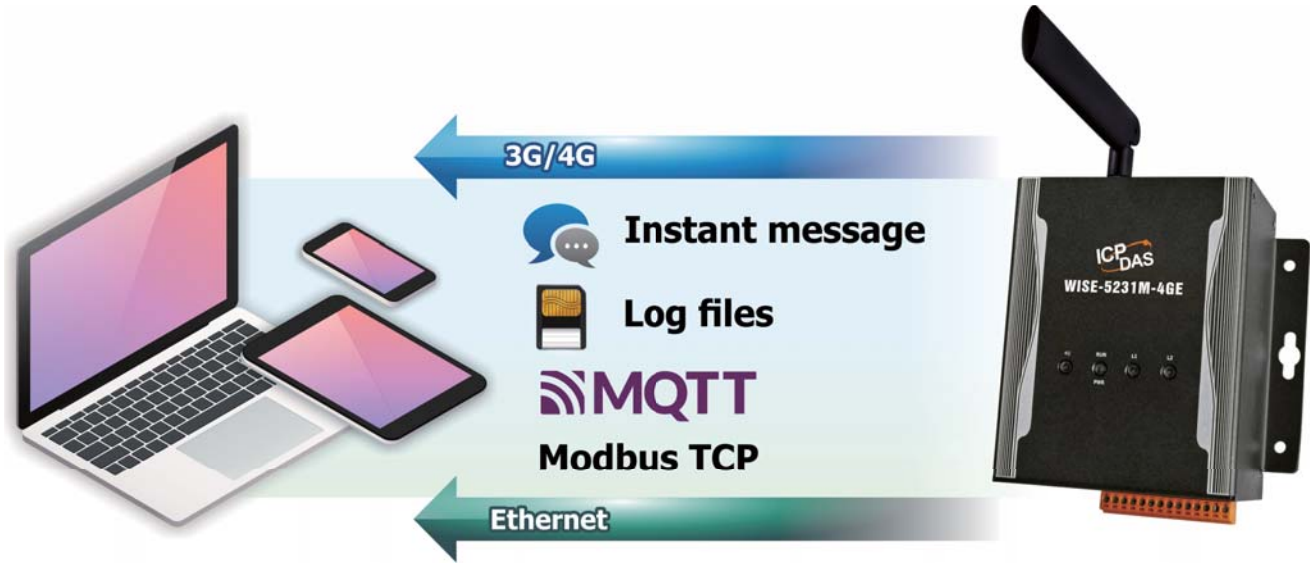
## Support SMS command receiving function

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.



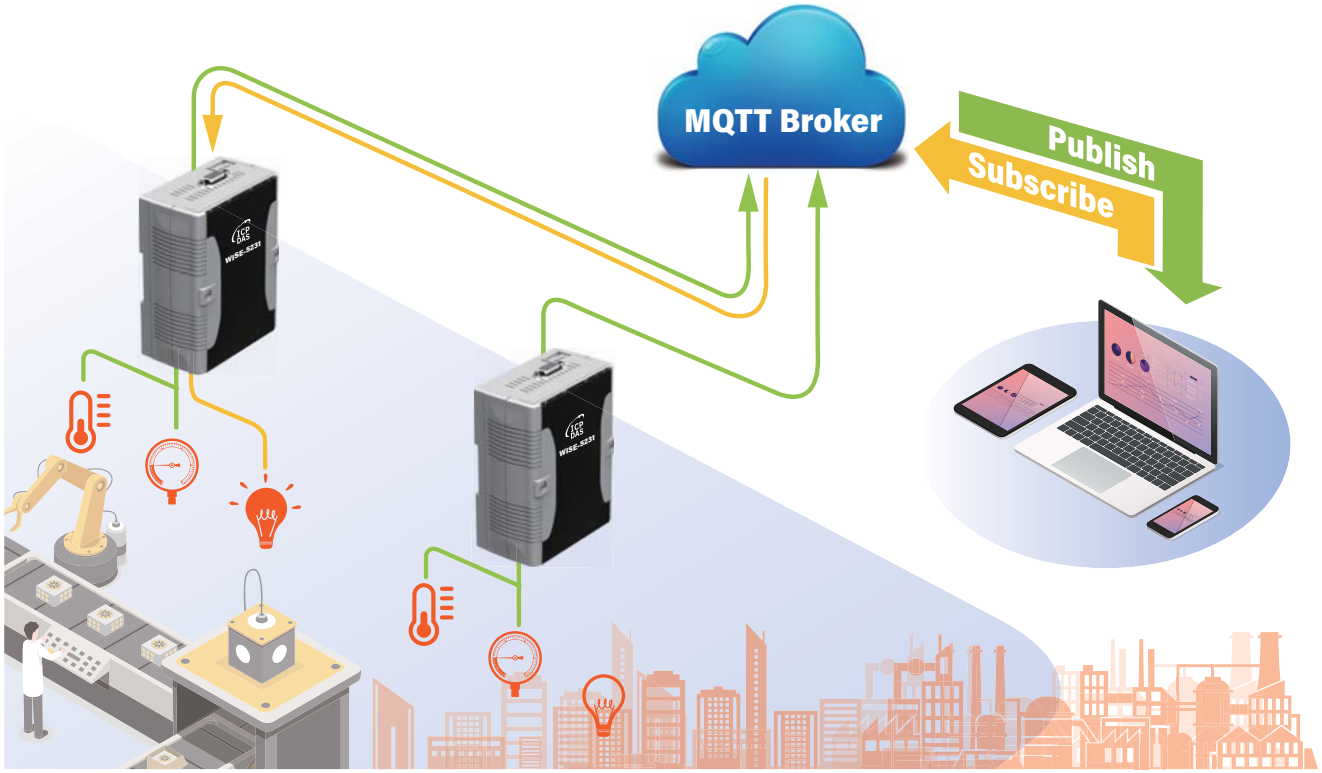
## Support 4G/3G mobile network communication

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.



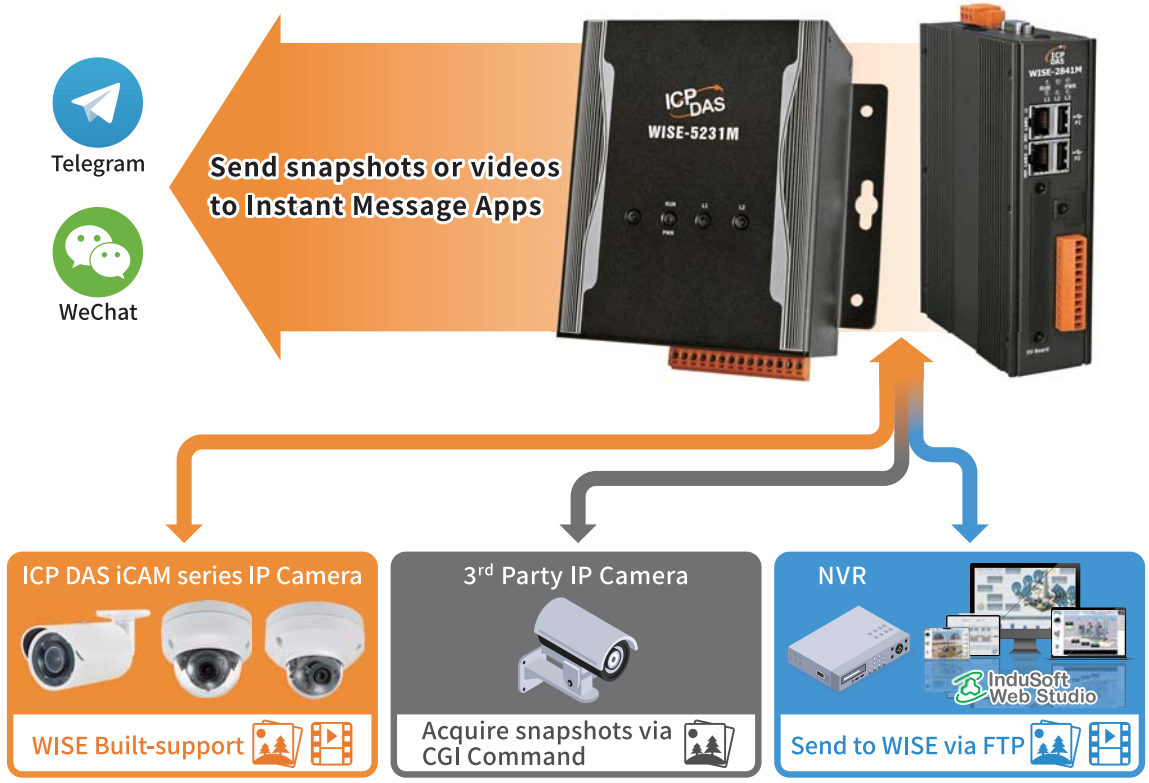

## MQTT Message Publish/Subscribe operation

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

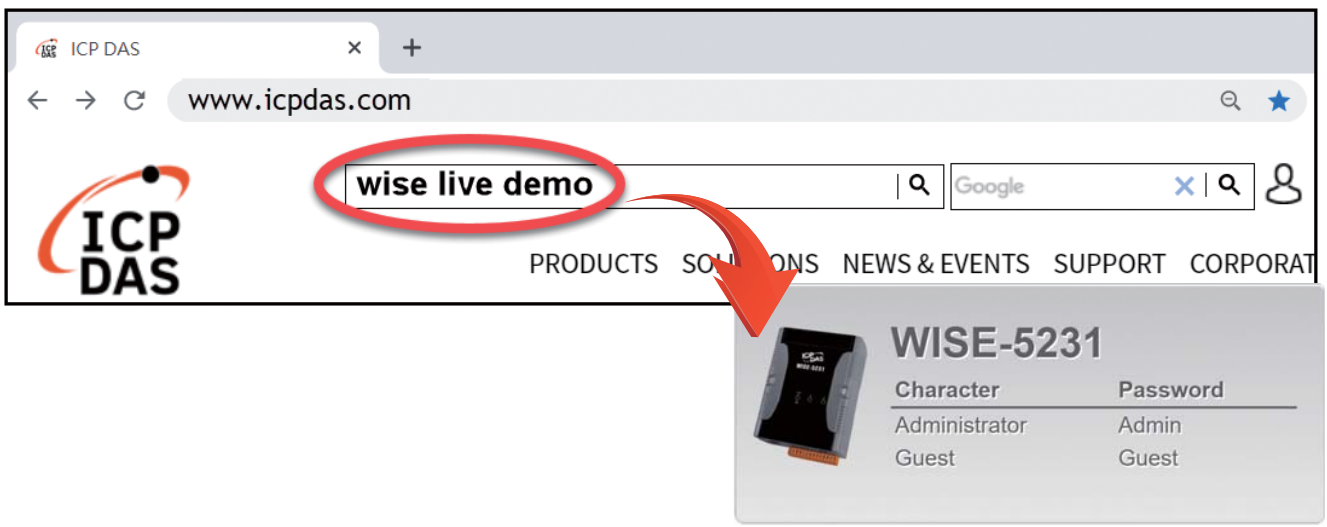
In the era of IoT and Cloud computing, sensor data transmission between the Sensor and Cloud platform is a prerequisite for maintaining an effective operation of the IoT Cloud system. And how to make the operation of "Upload Sensor data to Cloud" to be protected by the Security mechanism is also the primary task of building a IoT Cloud system.

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



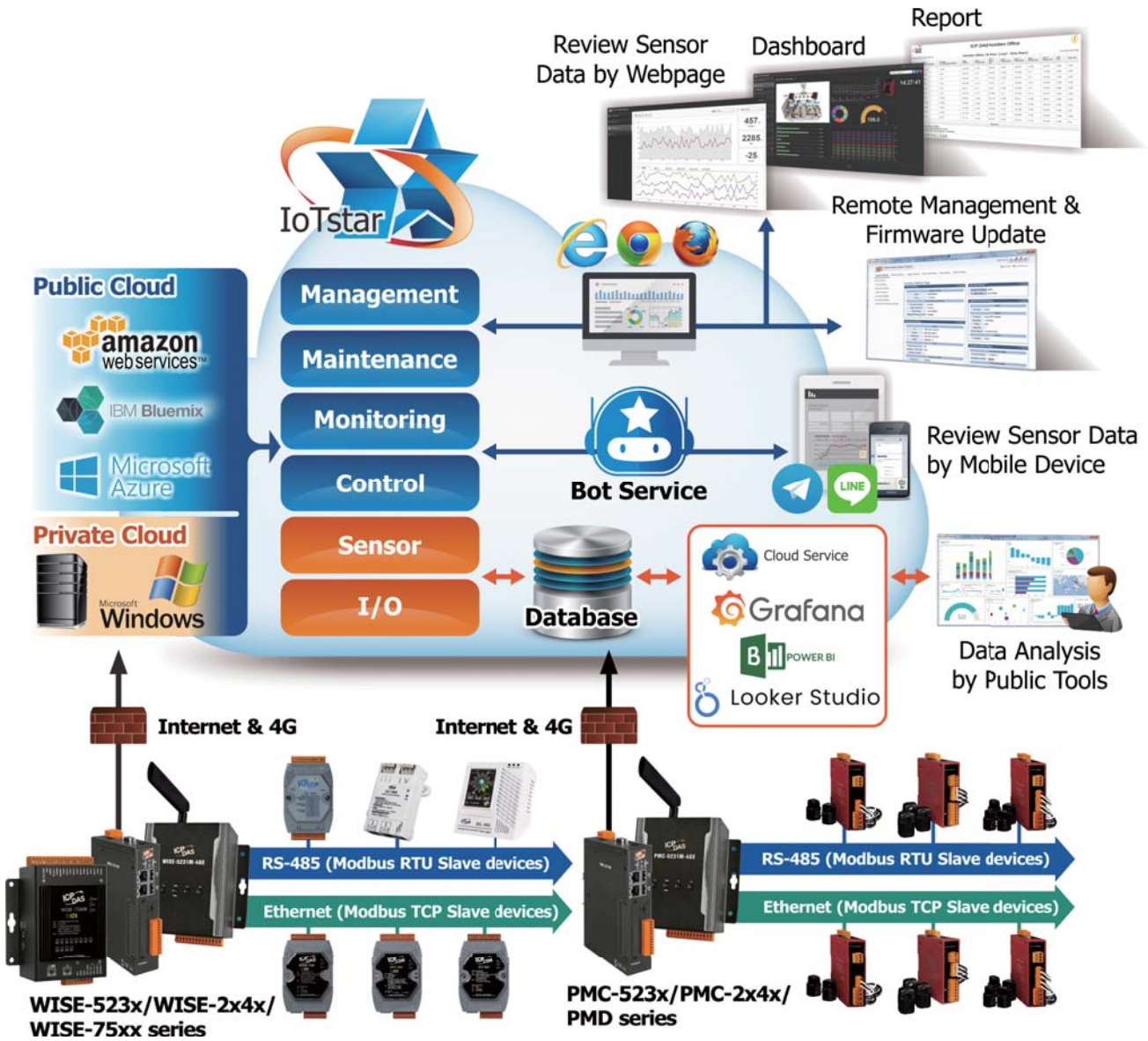
# Ch2.Cloud Management Software - IoTstar 2025

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.

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. With IoTstar 2025, users can create IoT cloud systems that deliver the following services:

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 Looker Studio, or Grafana), 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



# Features

## Support Flexible Installation Environment for Quick IoT Cloud System Setup

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

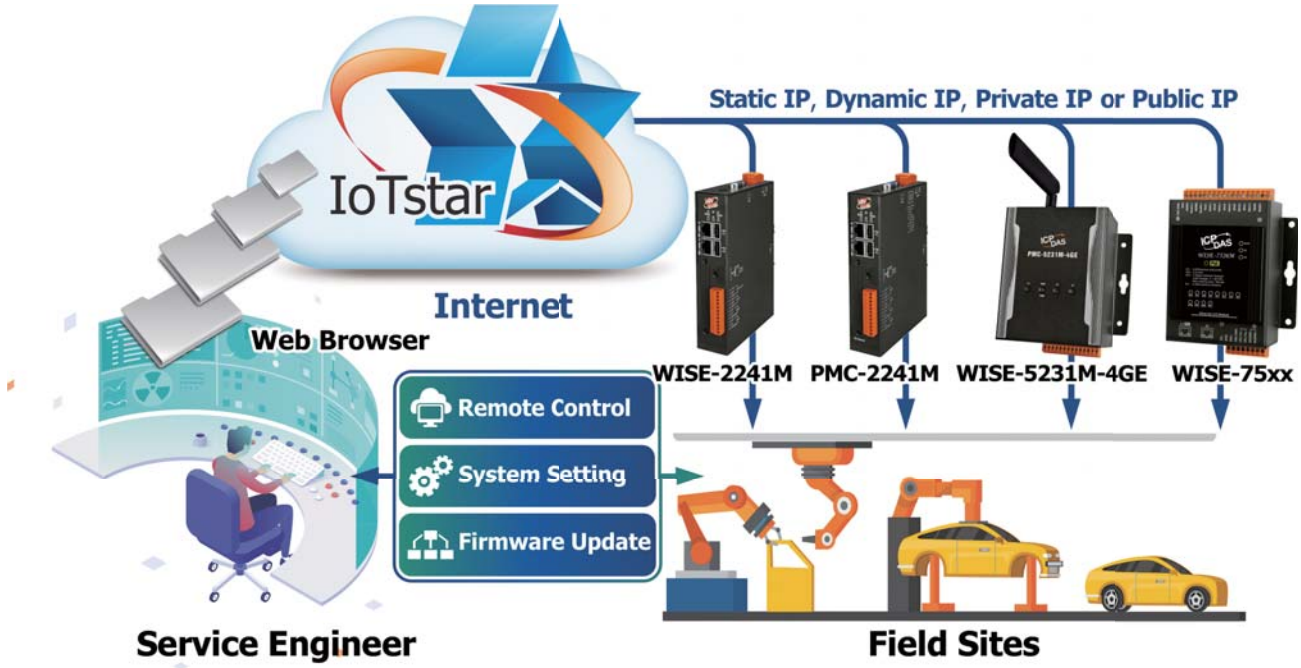
● **Public IoT Cloud Solution:**
IoTstar 2025 can be installed on VMs(virtual machine) within public cloud platforms such as Microsoft Azure, IBM Bluemix, Google Cloud, or Amazon AWS. This setup supports WISE, PMC, and PMD controllers while reducing the burden of maintaining the IoT cloud infrastructure.

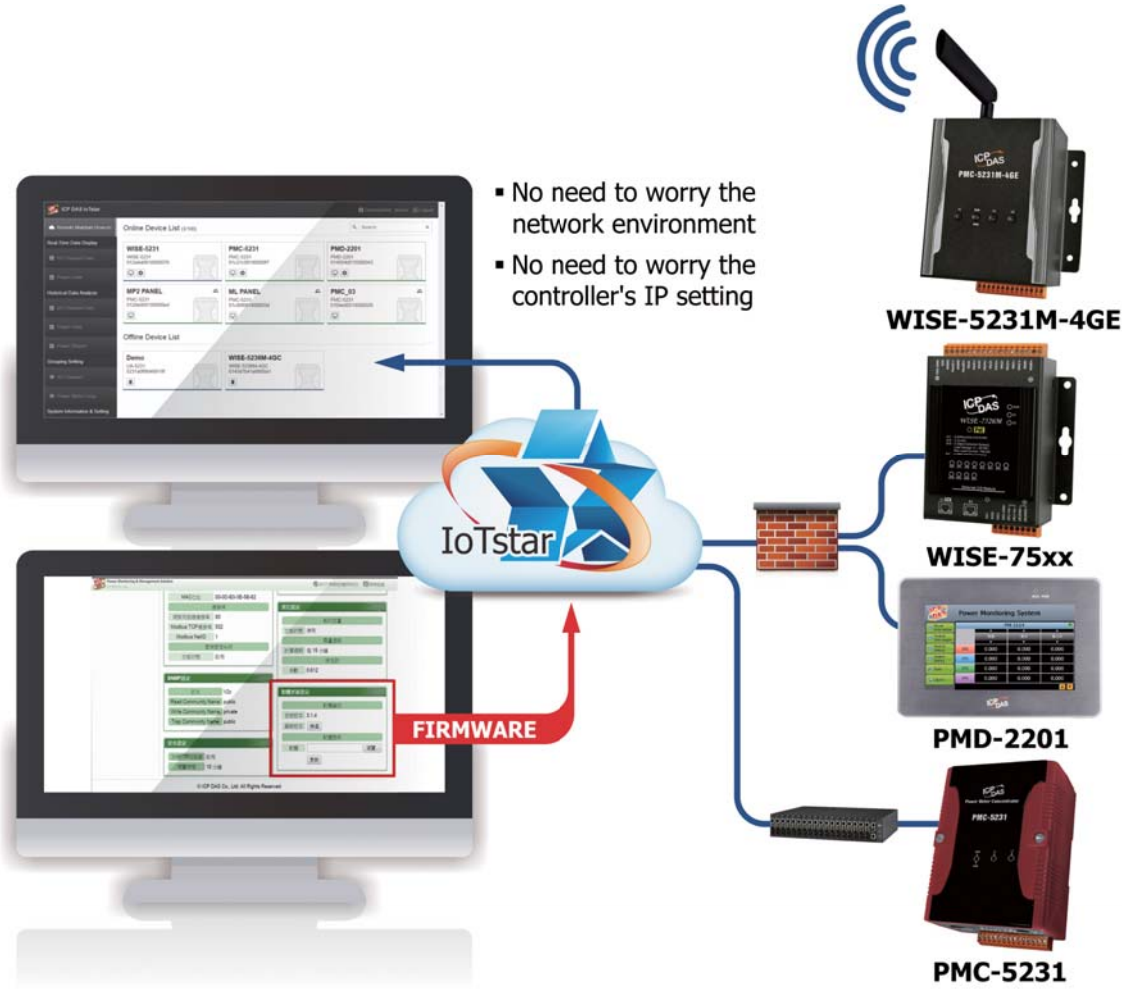
● **Private IoT Cloud Solution:**
If users are concerned about system operation or data storage environments, IoTstar 2025 can be installed on a private Windows PC (Windows 7/8/10 or Windows Server) to implement a private IoT cloud solution for WISE, PMC, and PMD controllers. This allows users to manage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

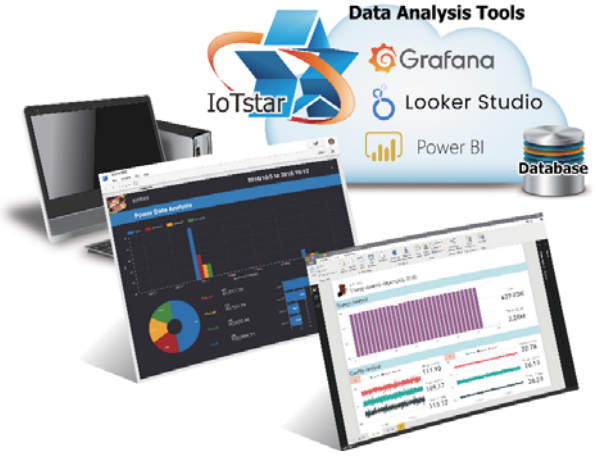
With IoTstar 2025, users no longer need to worry about the network environment of WISE, PMC, or PMD controllers—whether they use static, dynamic, virtual, or physical IP addresses. Through the web interface provided by IoTstar 2025, users can remotely monitor status, adjust system settings, and update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



## ■ Sensor Data Collection Service

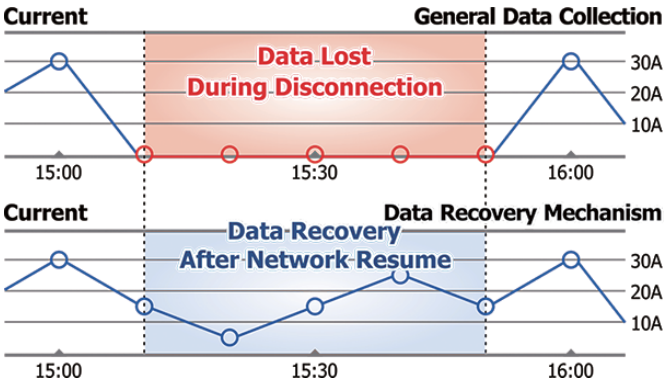
With IoTstar 2025, sensor data collection can efficiently gather both historical and real-time data from sensors or power meters connected to WISE, PMC, or PMD controllers. This data is imported into a cloud database, quickly establishing a data lake for "IoT and Big Data" applications. Users can also 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 Grafana) 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.

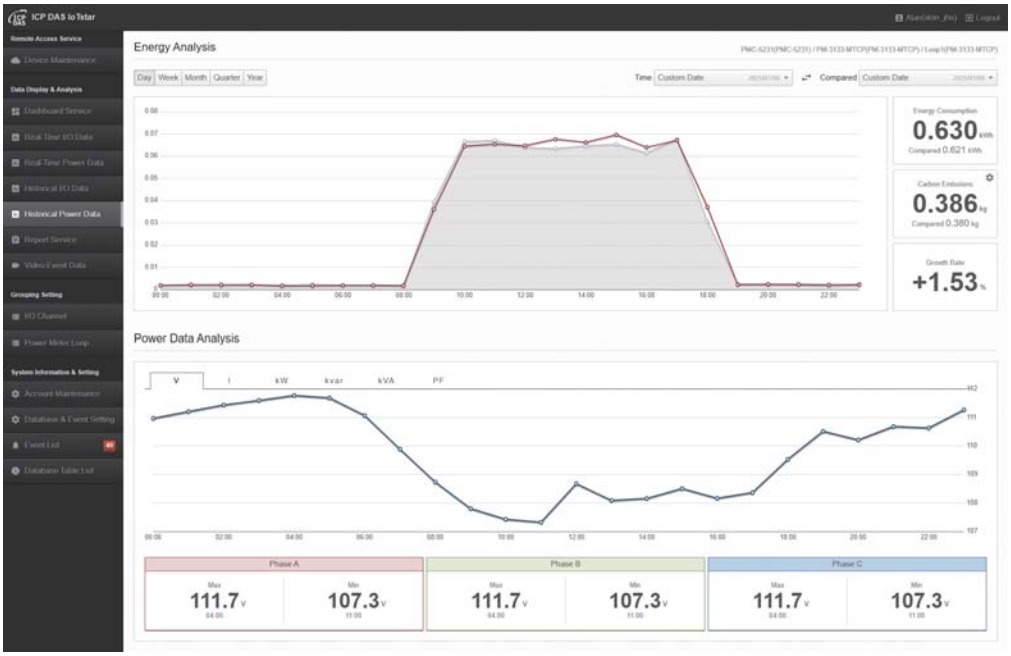
### Sensor Data Recovery Mechanism

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 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.

## ■ 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.

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 |

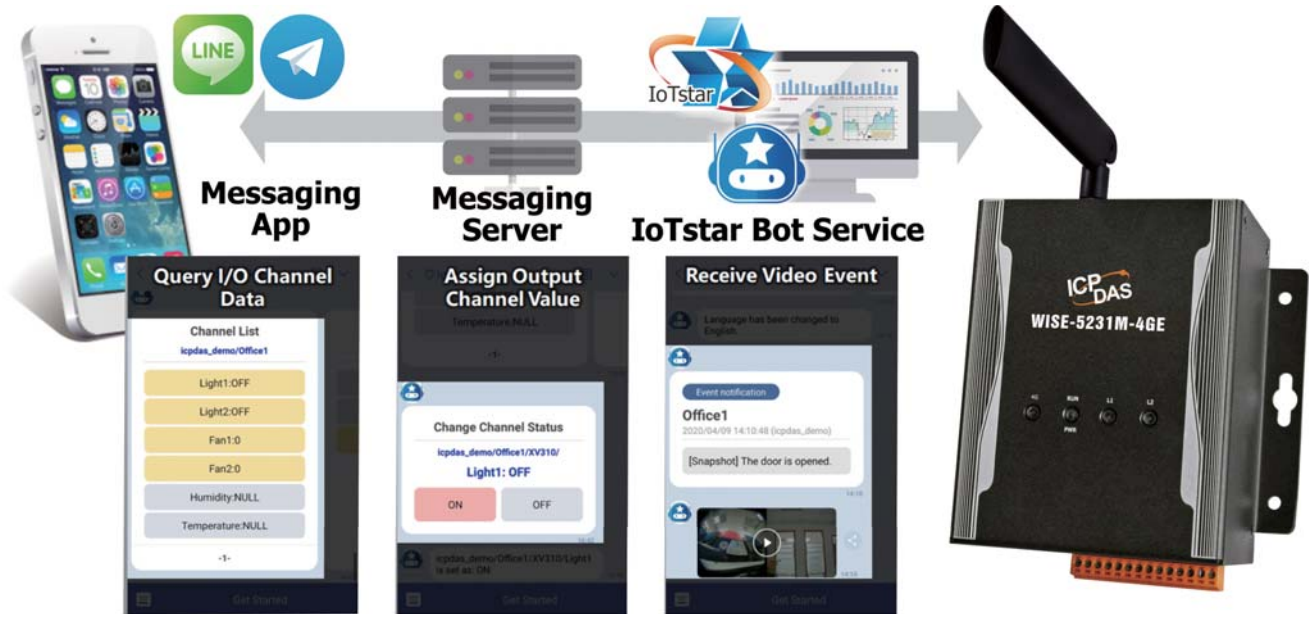
Summary

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

## ■ Bot Service on Controller by using Mobile Device

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.



## ■ 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 2025, you can log in to controllers directly for remote configuration and maintenance without needing their IP addresses or login passwords.

# Applications

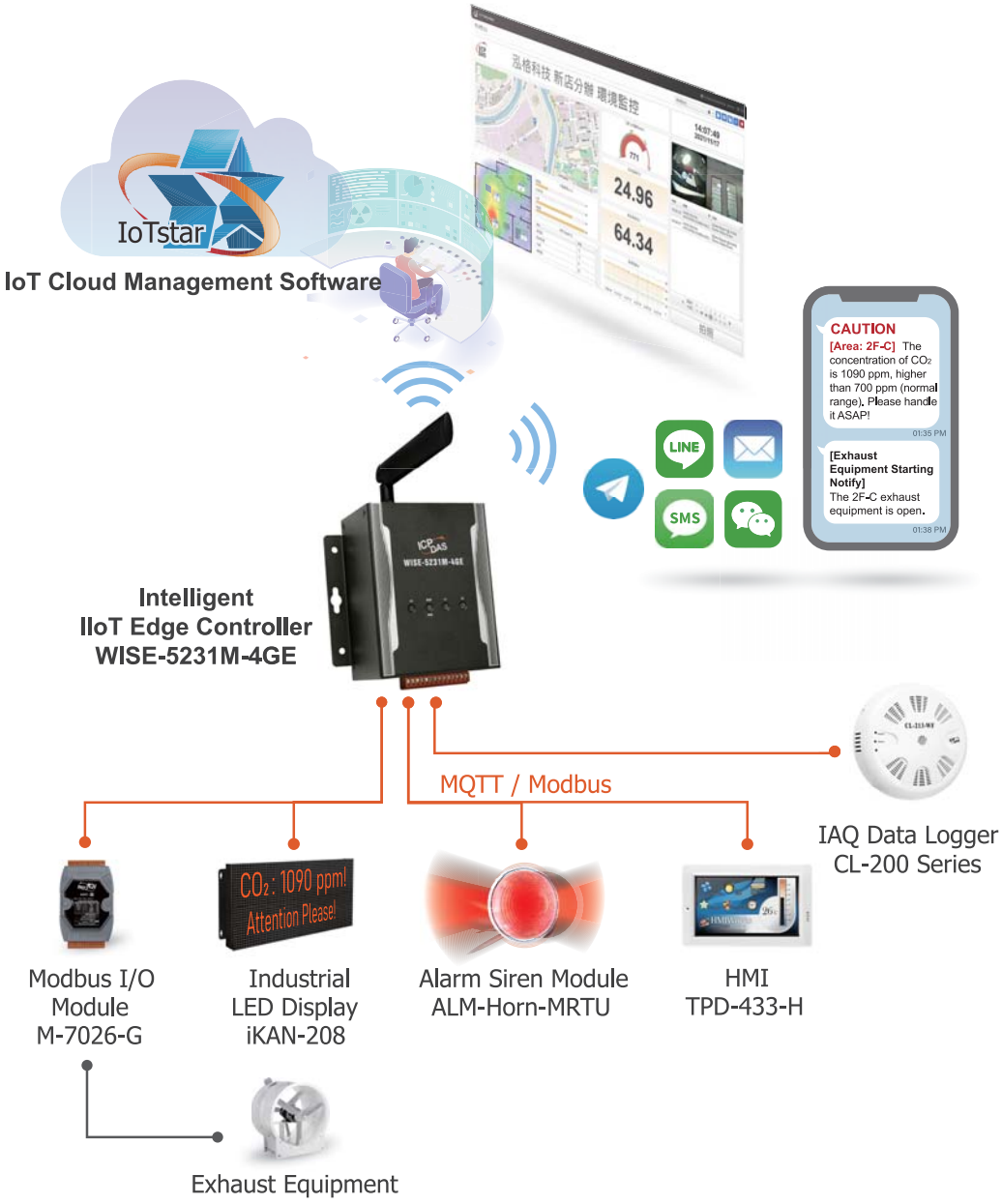
## Cloud-based Environment Monitoring Application

Using ICP DAS "IoTstar + WISE" solution, user can quickly build a Cloud-based environment monitoring system. In the solution, WISE IIoT edge controller can connect with the Modbus TCP/RTU sensors to collect, organize and record the information of the environemnt. In addition to sending the collected environemnt information back to IoTstar, WISE can also monitor the operation of environemnt facilities to perform the corresponding actions, and immediately send LINE/Telegram/WeChat/Email/SMS alarm message according to the pre-set edge computing mechanism (IF-THEN-ELSE logic rules). After IoTstar receives the environemnt information sent by WISE, it can provide services such as: "Controller Remote Access Service", "Sensor Data Collection Service", "Sensor Data Visualization Service", "Sensor Data Report Service" and "Bot Service with Mobile Phone" services, as well as the following benefits:

- No need to write programs in the whole process, environment information can be collected and stored in the cloud database automatcially.
- Through SQL Database interface, quickly integrate the IT system to understand the trend and change of the environment status comprehensively.
- Perform remote monitoring and maintenance of the environment facilities, take corresponding actions proactively to ensure operational optimization.
- Provide status monitoring, system setting and firmware update for the WISE controllers from Cloud. It can reduce the time and cost of personnel travel due to performing maintenance of the facilities.

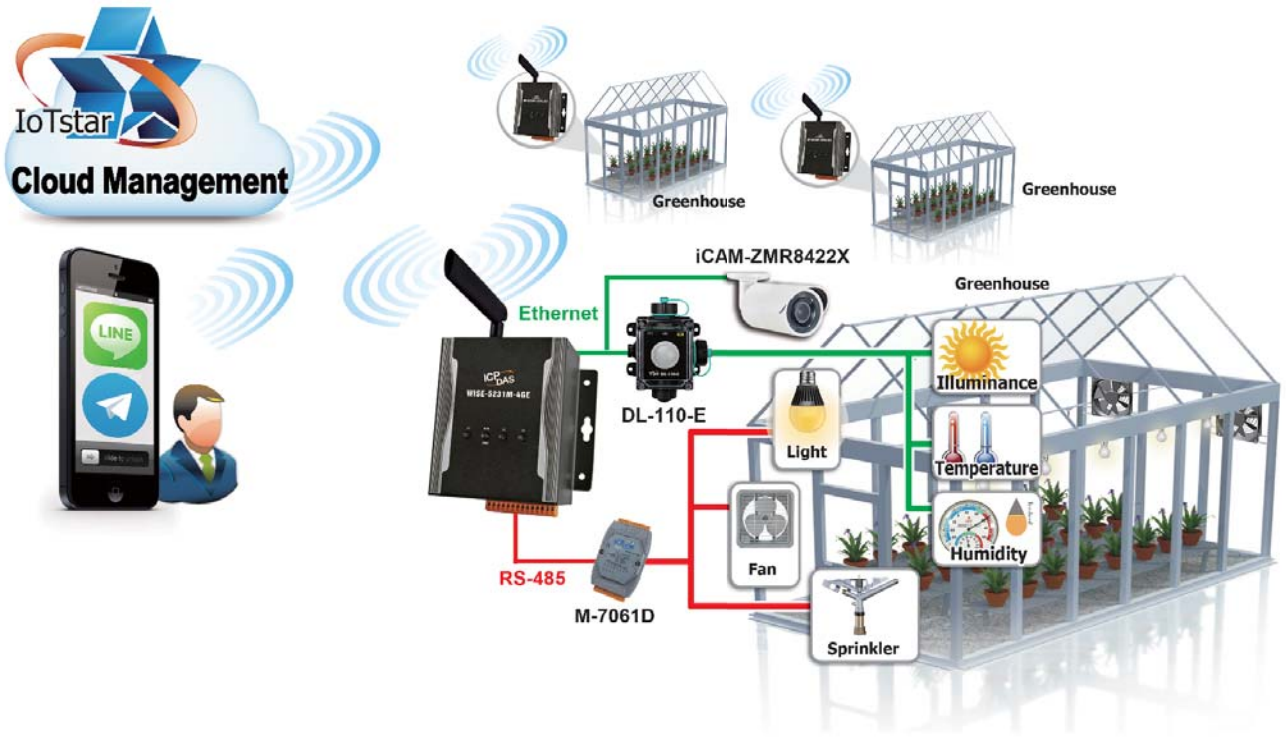
## ■ Cloud-based Indoor Air Quality Monitoring Application

Using ICP DAS "IoTstar+WISE+DL/CL module" solution, user can quickly build a Cloud-based air quality monitoring system. In the solution, DL/CL series modules can be used to measure the concentration of aerosols in the air (Such as: PM2.5, PM1, PM10 and the number of particles (0.3μm, 0.5μm, 1μm, 2.5μm, 5μm, 10μm), as well as the fume concentrations related to human health (Such as: CO/CO2/HCHO/NH3/H2S/TVOC), and then transmit the measurement of air quality information to WISE IIoT edge controller. WISE is used to collect the air quality information from DL/CL modules and send back the information to the IoTstar. To response to any unusual situation and to maintain the safety of personnel in the field, WISE also can take the corresponding actions (Such as: turn on the exhaust fan and warning light, activate the access control equipment, send LINE/Telegram/WeChat/Email/SMS alarm messages, etc.) automatically in real time according to the status of the air quality by the pre-set edge computing mechanism (IF-THEN-ELSE logic rules). After IoTstar receives the air quality information sent by WISE, it can provide services such as: "Controller Remote Access Service", "Sensor Data Collection Service", "Sensor Data Visualization Service", "Sensor Data Report Service" and "Bot Service with Mobile Phone" services, and help users quickly build a Cloud-based air quality monitoring system.



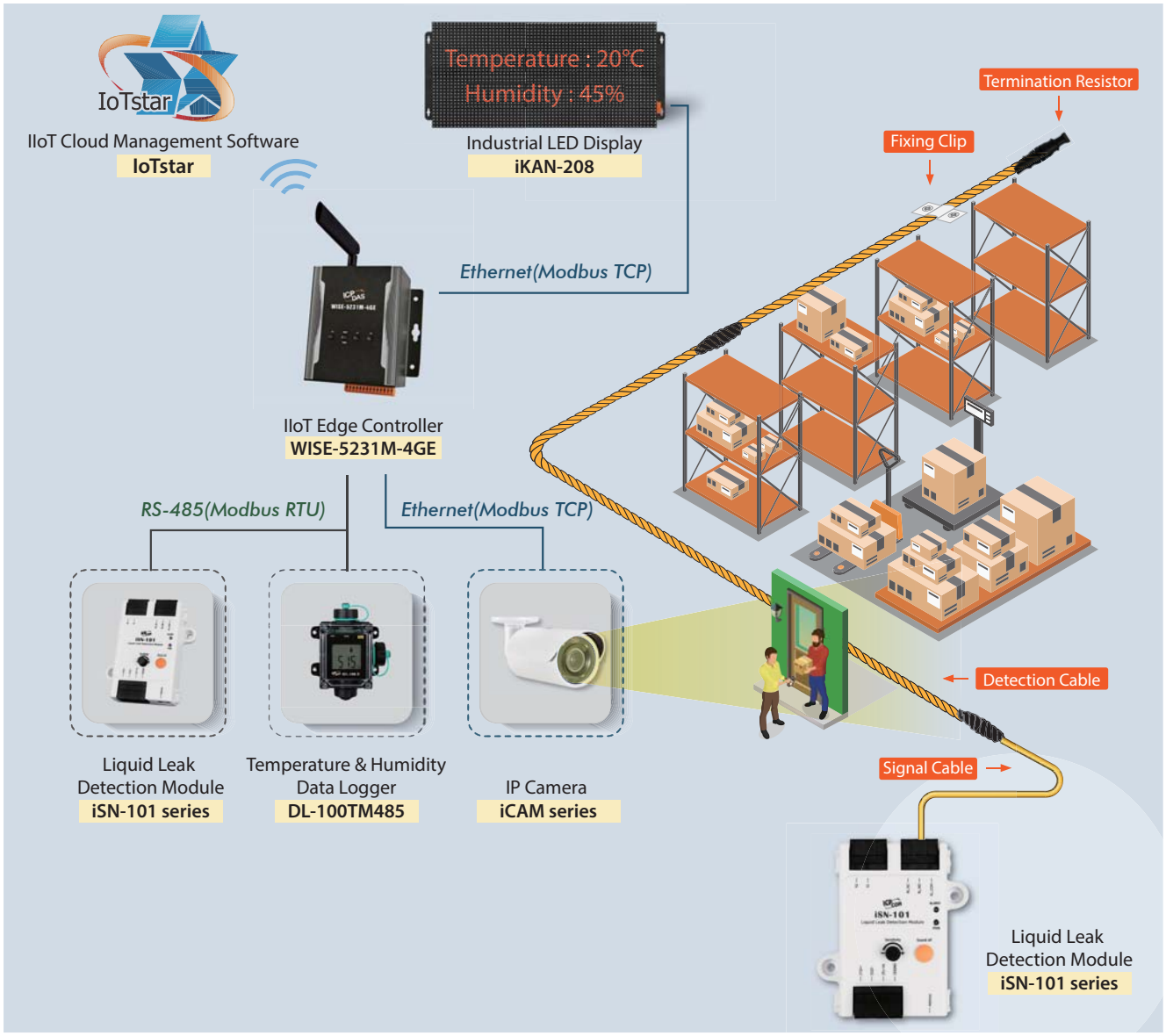
## Cloud-based Greenhouse Monitoring Application

In the development trend of agricultural refinement and technology, intelligent greenhouse planting has always played an important role. The ICP DAS "IoTstar+WISE+DL module" solution work as an automated intelligent greenhouse monitoring system, it can perform real-time cloud monitoring of illuminance/temperature/humidity for the greenhouse, and automatically execute the corresponding scheduled tasks (such as: turning on the air conditioner, adjusting lighting, activating sprinklers, fertilizing etc.), or send LINE/Telegram/WeChat/Email/SMS alarm messages to related personnel to take immediate actions in response to abnormal status notification. WISE can also connect to ICP DAS iCAM series IP cameras to perform real-time video monitoring of the greenhouse. When an unusual intrusion is detected, WISE will automatically send text and video messages to the security personnel through LINE/Telegram/WeChat to take immediate actions. In addition, with the services provided by IoTstar such as "Controller Remote Access Service", "Sensor Data Collection Service", "Sensor Data Visualization Service", "Sensor Data Report Service" and "Bot Service with Mobile Phone", user can easily build a cloud-based greenhouse monitoring system to grasp the environmental status of each greenhouse anytime, anywhere and take actions accordingly, so as to move towards the era of intelligent agriculture with high efficiency, high productivity, safety and low operating risks.



## ■ Cloud-based Building, Warehouse, Factory Monitoring Application

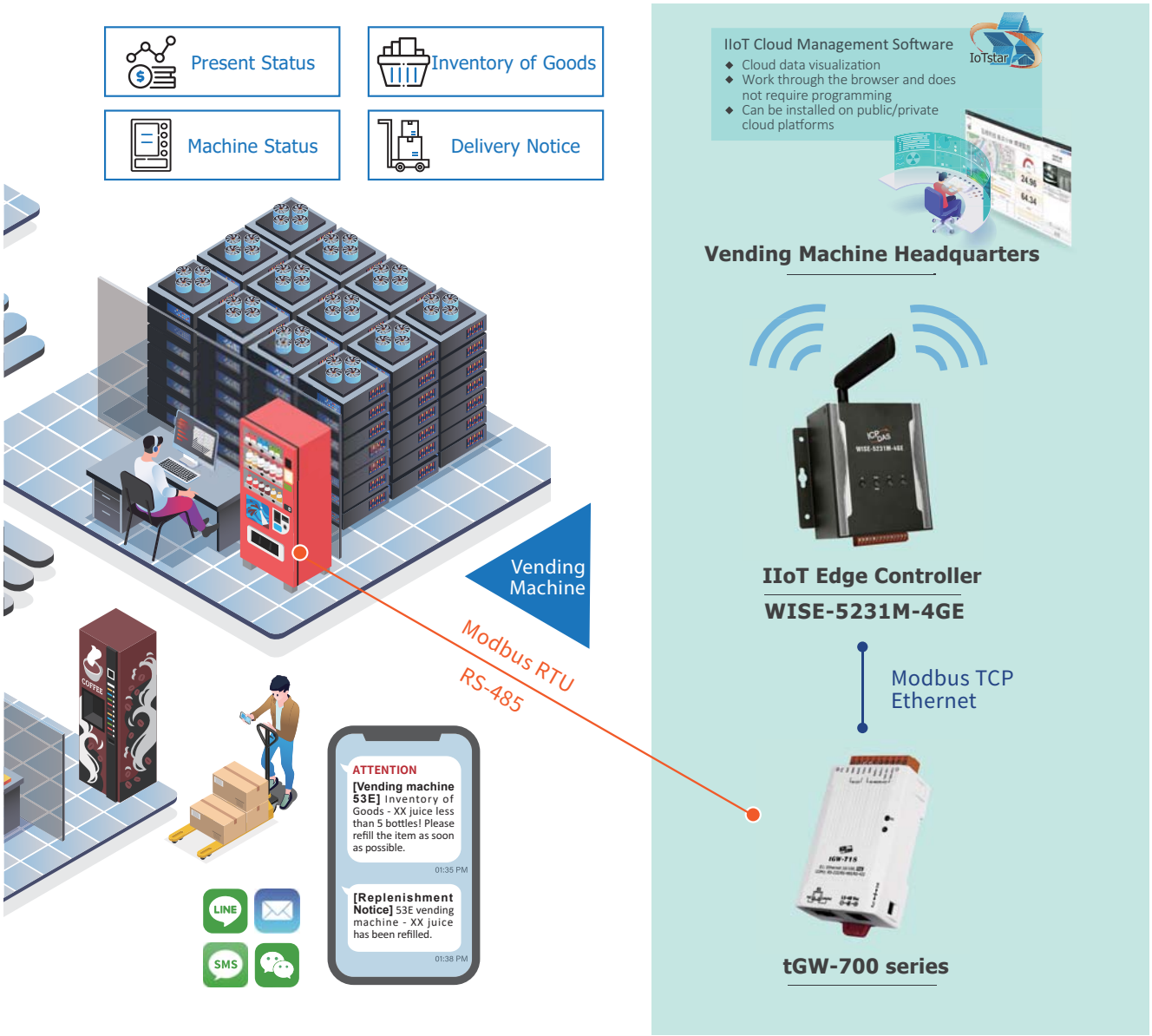
Using ICP DAS "IoTstar+WISE+iSN/DL/CL module" solution, it can help enterprises quickly establish a Cloud-based monitoring system for Building, Warehouse, and Factory facilities. The iSN modules can assist in the detection of liquid leakage, and the DL modules can measure the temperature and humidity data of the environment. After the iSN and DL modules transmit the measured data to the WISE IIoT edge controller for sorting and recording, WISE can transmit the collected data to IoTstar, and perform the preset edge computing mechanism (IF -THEN-ELSE logic rules), and then automatically take real-time actions in response to status of liquid leakage/ temperature/humidity in the environment(such: turn on the exhaust fan, turn on the warning light). It can also send LINE/Telegram/WeChat/Email/SMS alarm messages to related personnel for the unusual status notification, and work as an automated intelligent warehouse monitoring system. WISE can also connect with ICP DAS iCAM series IP cameras to perform real-time video monitoring of the warehouse. When an unusual intrusion is detected, WISE will automatically send text and video messages to the security personnel through LINE/Telegram/WeChat, to take immediate actions. In addition, with the services provided by IoTstar such as "Controller Remote Access Service", "Sensor Data Collection Service", "Sensor Data Visualization Service", "Sensor Data Report Service" and "Bot Service with Mobile Phone", user can easily build a cloud-based warehouse monitoring system to grasp the environmental suatus of each warehouse anytime, anywhere and take actions accordingly.



## ■ Cloud-based Monitoring Application for Traditional Devices

Using ICP DAS "IoTstar+WISE+tGW module" solution, it can assist users to quickly build an Cloud-based IoT monitoring system for traditional devices that cannot connect to Network. Users can use tGW-700(Modbus RTU/ASCII to TCP converter) to connect to traditional devices via RS-485 interface, and convert the Modbus RTU/ASCII protocol on the traditional devices to Modbus TCP protocol, and the device status can be sent to WISE IIoT edge controller through Ethernet for data sorting and recording, and then send back to IoTstar to quickly build the cloud-based IoT monitoring system for the traditional equipment.

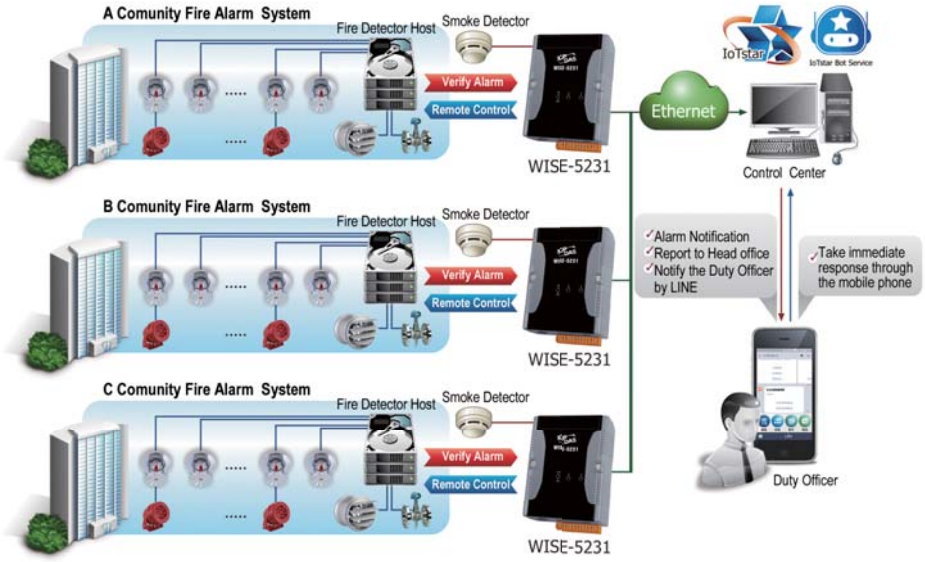
Take the traditional vending machines that are common on the street as an example, for these device lack the networking capability, the replenishment and equipment maintenance operations usually need to rely on inspection (replenishment) personnel to check regularly according to a fixed route. It is time-consuming, labor-intensive and causes additional cost. Through the solution provided by ICP DAS, information such as inventory and device status in the vending machine can be sent to the headquarter in real time for statistical analysis, and headquarter can timely dispatch the inspection (replenishment) personnel to the vending machine in need to adjust the device status of the vending machine so that the burden of inspection (replenishment) personnel can be reduced and then the manpower and transportation costs can be saved.



# Ch3. Applications

## Community Fire Alarm System

Hydrant equipment is an indispensable part of the Community/Home security system. However, most of the Hydrant equipment is old version and has no Internet connection capability. If we can improve the functionality of the Internet connection for these Hydrant equipment, then the real-time status of Hydrant equipment can be sent to the Cloud system, the manager of the Hydrant system can receive the real-time alarm notification through the mobile phone and take corresponding actions. It will increase the reliability of the Community/Home security system.
WISE-5231 supports the Modbus protocol, it can be connected to the Fire Detector to get the real-time status and perform the control operation of the Hydrant equipment, and it can also work with a smoke detector to enhance the fire detection capability. The WISE-5231 can transmits the status of Hydrant equipment to the IoTstar Cloud Management software for data collection and analysis. With the IoTstar Bot Service, when the abnormal event is detected, the Bot Service will send the alarm notification message to the mobile phone of the duty officer by LINE App for the corresponding actions in real time. The solution provides convenient and immediate community safety management mechanism.




## Leakage Monitoring Application

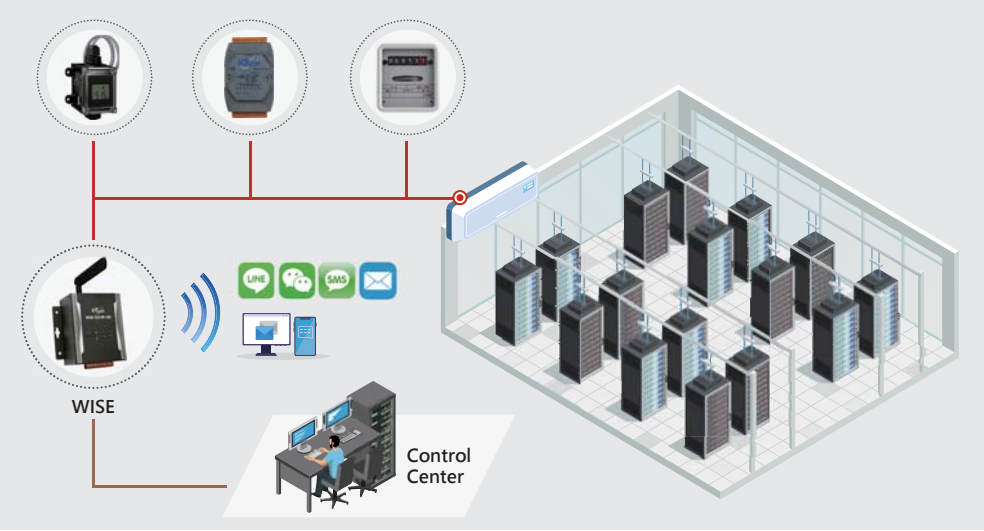
ICP DAS '"WISE-5231 + iSN-101 " solution can be used to detect leakage on tap water pipes, fire pipes and sewage pipes of the buildings, as well as the domestic water, drainage and electric equipment When there is unusual status happens on the pipelines or equipment, WISE will send the alert message immediately to the LINE App on manager's mobile phone through LINE service, and notify the manager to take further action. It will effectively save the water and ensure the safety of the building.

## Emergency Alert Notification System

In the public spaces such as shopping malls, playgrounds, office buildings, or factories, the Alert Notification System is a must when emergency occurs. The emergency Alert notification system built by ICP DAS "WISE-5231 + iWSN-SOS-PB / iWSN-SOS-PB-IP65 with iWSN-2200" can meet the requirement. When an emergency event occurs, the person only needs to press the button on iWSN-SOS-PB, and the module will immediately send a high frequency signal to the iWSN-2200, and WISE will send the alert message immediately through LINE service and SMS messages to the manager's mobile phone, so that the distress alert will be processed immediately, increasing the chance of successful rescue.

## Unmanned Facility Room Monitoring System

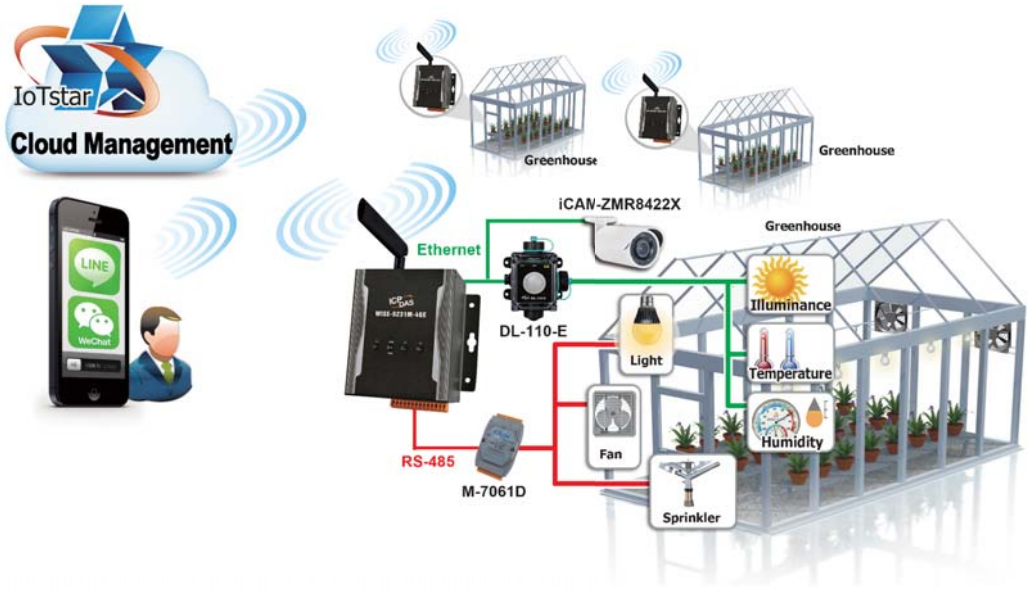
With the demand for stable operation of Power and Network systems, whether it is an office building, community, factory or suburb, a managed facility room needs to be set up to control the operation of the Power and Network equipment in the area. However, due to the increasing cost of manual management, the demand for Unmanned Facility Room Monitoring System is increasing. Through the ICP DAS WISE controllers, it can get the real-time sensor data such as temperature and humidity of the Facility Room and equipment status. When the abnormal event occurs, the corresponding actions can be triggered through WISE's IF-THEN-ELSE logic rule. In addition, WISE also work with ICP DAS iCAM cameras to perform the real-time image monitoring of the Facility Room. When an abnormal event occurs, WISE will automatically send alert messages with image to related personnel through LINE/WeChat to take corresponding actions. In addition, through the Modbus and IoT communication protocol, the back-end management system can work with WISE for the monitoring and data collection of the Facility Room environment.



## Greenhouse Monitoring Solution

The greenhouse monitoring solution include WISE-5231M-4GE, DL-110-E and DL-300/DL-100 series. It provides environmental monitoring of illuminance, temperature and humidity. Based on the built-in edge computing engine of WISE, the solution can automatically control the operation of sprinkler, lamp and curtain to help the plants grow well, increase crop yield and improve quality.

Based on the functions provided by WISE-523xM-4GE with iCAM camera, it can perform the personnel access control operation for greenhouse, and send the alarm message by SMS, Email, LINE/WeChat to the related personnel for the emergency event notification. WISE can connect to the IoTstar cloud management software to help user to build the IoT cloud solutions in an easy way, and monitor the situation of the greenhouse remotely.




## Mushroom Farming Solution

The growth process of Mushroom often requires long-term environmental monitoring (CO2, temperature and humidity). The operations usually needs to be performed under high humidity conditions, however, for most measurement equipment, they may not be able to function properly under this kind of environments. By using the "WISE-5231 + DL-302-IP65", it can perform the real-time data measurement and recording of CO2, temperature and humidity in the environment. In addition, WISE-5231 has the built-in IF-THEN-ELSE Edge computing engine and schedule function, which can help the administrator to set up the automatic operation logic of the farm equipment through the web interface. The process does not need to write a program at all, which also makes the operation and management of farm equipment more flexible and efficient.

## Urban Air Quality Monitoring

Air quality monitoring system has always been a very important part in the construction of a smart city, and the key for the system is how to establish the air quality monitoring system in an easy way. Through the combination of ICP DAS "WISE-5231+DL-1000", it can be seamlessly integrated with street lights, and through the characteristics of high-density deployment of the street lights, the city's air quality monitoring system can be quickly established.

DL-1000 can perform the measurement of air quality (such as: O3, PM2.5, PM10, CO, SO2 and NO2(TVOC, HCHO), and WISE-5231 can collect the sensor data from DL-1000 and the data will be also transmitted to the back-end management center. The pre-set IF-THEN-ELSE logic rules of WISE can automatically take different corresponding actions according to the air quality. When a special event occurs, WISE can also send an alarm message to notify the administrator for immediate actions.

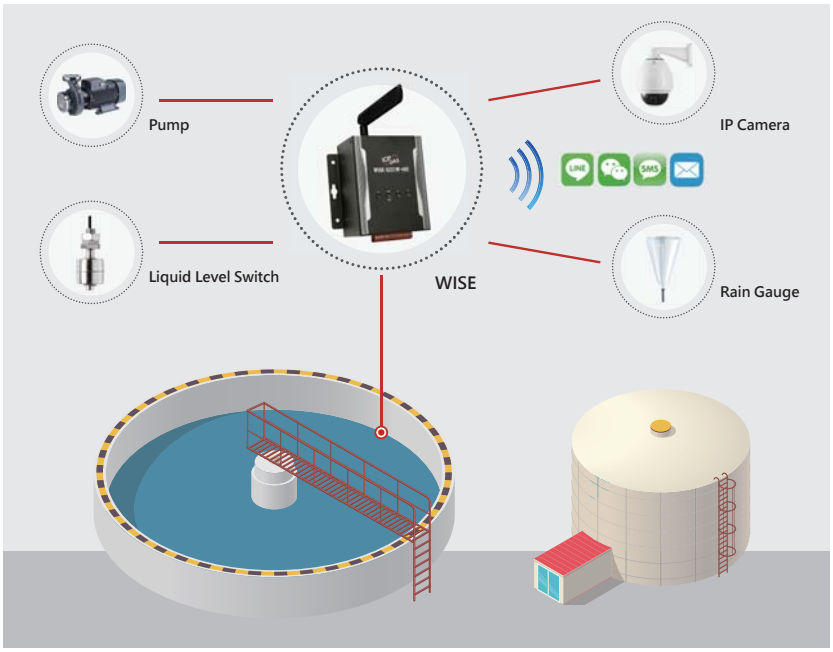
## Factory Air Quality Monitoring

In the factory, H2S is one of a harmful gas, due to the characteristics of colorless and odorless, making it is difficult to detect. And once an industrial accident occurs, it may cause injuries to the personnel in the factory.

Through the combination of "WISE-5231+DL-1026", it can be installed on site for real-time detection of H2S concentration, and the measured data can be transmitted to the back-end management center. The pre-set IF-THEN-ELSE logic rules of WISE can automatically take different actions according to the gas concentration detected. When an unusual event occurs, WISE will also send an alarm message to notify the administrator to avoid loss of life or property in the plant.

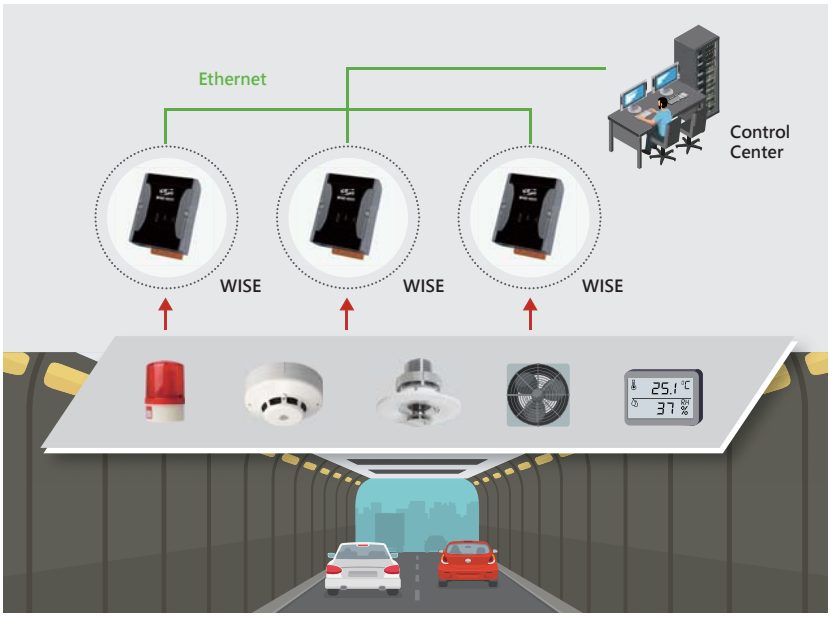
## Wastewater Monitoring System

As the advance of civilization causing heavy industrial and commercial activities, there are growing concerns about environmental issues; among them, wastewater treatment is one of the most emphasized areas. In order to achieve reliable, high-performance and efficient result, automation approaches are essential to wastewater treatment solutions.
WISE features real-time monitoring and reliable Alarm notification function that is perfect for use in wastewater treatment applications. It takes only a few clicks to configure logic control that enables automation and optimization of wastewater treatment operations, such as: auto-detect the level of the sedimentation tank and perform the corresponding action immediately based on the wastewater level. In addition, WISE also allows sending alarm notification message regarding the abnormal event to the related personnel for immediate response.




## Tunnel Monitoring System

The security maintenance in a tunnel is a tough work and it is time sensitive. For it always requires to monitor a wide range of areas in the tunnel, if all monitoring jobs only rely on manual operations when a disaster happens, it might cause delays and lead to huge losses. WISE allows to connect to various I/O modules and is able to response to the emergency in real-time. In this case, the WISE are installed in various segments in the tunnel and are connected to smoke/temperature sensors, warning lights, sprinklers, ventilation fans and other equipment. The logic rules that in response to emergency situations could be pre-set in WISE, and when smoke and high temperature are detected, the fire fighting procedures will be triggered; the sprinklers will be automatically turned on to put out the fire; the ventilation fans will be started to take away the smoke; and will turn on the warning lights and open the security doors to guide people in the tunnel away from the emergency scene. The related information will be gathered in back-end control center, and will send out notification to all controllers in all segments of the tunnel for traffic control and management.

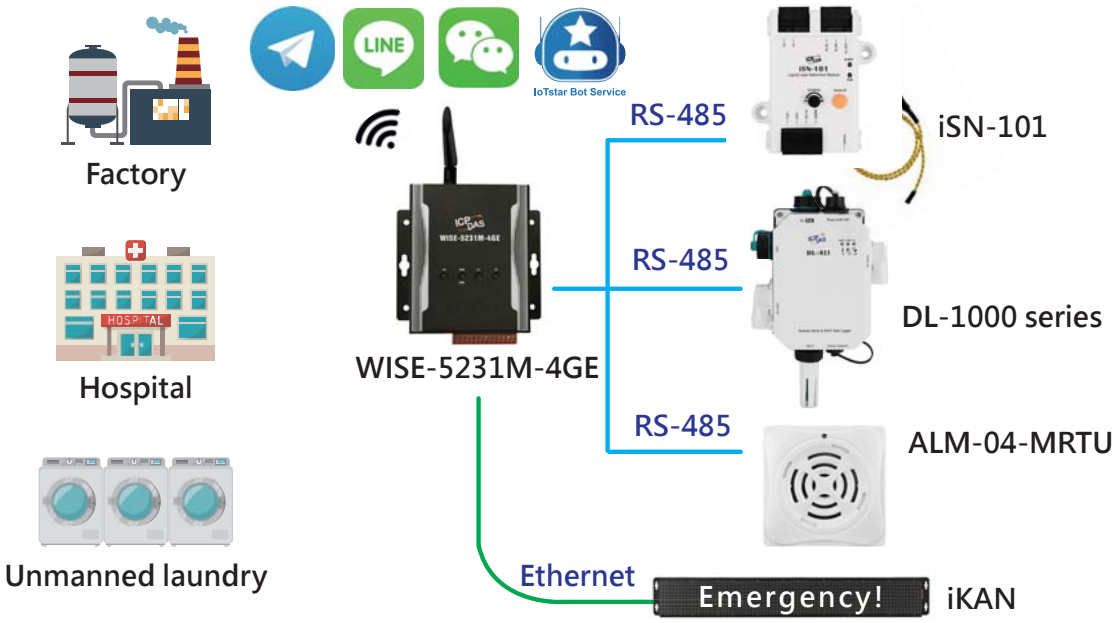


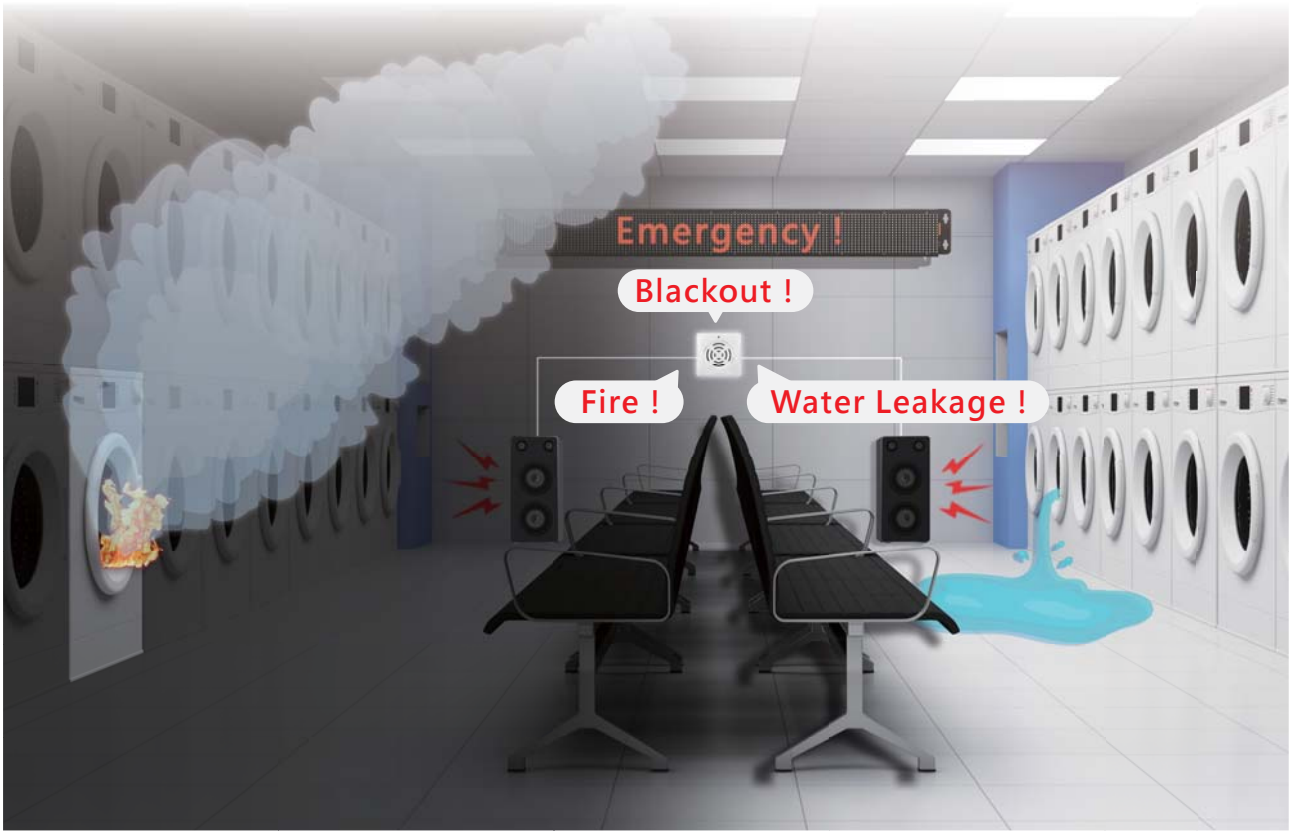
## Environmental Alert Notification System for Public Area

When an emergency event occurs in the public area where people is moving, how to immediately warn these people in the area and notify the security personnel to deal with it immediately is an important issue for maintaining the safety of public areas. Using the solution of ICP DAS "WISE-5231 + ALM-06-WF/ALM-04-MRTU + iSN-101 + DL-1020" can implement the public area Environmental alert notification system in a easy way.

Based on the combination of "WISE-5231M-4GE + DL-1020 (temperature and humidity measurement module) + iSN-101 (pipeline leakage monitoring module)", it can be used to detect the status of temperature, and pipeline leakage, and according to the preset IF-THEN-ELSE logic rule of WISE to perform corresponding actions on abnormal events, and automatically send alarm messages to the security personnel's mobile phone via LINE/Telegram/WeChat, and take corresponding actions in real time to protect the Life and property safety of the public area.

In addition, WISE-5231M-4GE can work with ALM-06-WF/ALM-04-MRTU (the intelligent buzzer module). Through the 99db high volume output and eight sound alarm output setting modes of ALM-06-WF/ALM-04-MRTU, a voice alarm will be issued immediately when the abnormal event occurs, even when it is in a noisy environment, it can still work effectively.



## Ranch Monitoring System

In the environment of the ranch, due to the ranches generally consist of large areas, it is necessary to collect the sensor status from all over the ranch through wireless network, and it also requires to remotely control the equipment located everywhere of the ranch, so that the operator can adjust the suitable environment parameters according to the factors such as weather, temperature and humidity to help the growth of the livestock and the crop. WISE-5231M-4GE can work with the ZT-2550/ZT-2551 Zigbee module to collect the temperature and humidity data throughout the ranch and detect rain through the rain detector. If the rainfall intensity is too high or rainfall is too much, it can be covered by the electric retractable curtain automatically via the WISE-5231M-4GE. WISE also supports LINE message sending. It can be used to send the alarm notification message to the related personnel for immediate response when a special event occurs. Based on the function WISE-5231M-4GE provided, it can provide convenient and real-time management mechanisms for the ranch and reduce loading of the task.

## Pig Farming Solution

Ammonia (NH3) and hydrogen sulfide (H2S) are among the most signification pollutant gases in Pig Farming relating to animal. Large quantities of NH3 and H2S emissions can have negative impacts on growth and immunity of the animals. Therefore, it requires long term environmental monitoring. However, a general device on market may not function properly under such environment. By using "WISE-5231M-4GE and DL-305-IP65", it can monitor/record the concentration of NH3 & H2S, temperature, and humidity information with date and timestamps . The WISE-5231M-4GE features schedule functions. It allows user to schedule specific date or time for control logic execution of equipments. WISE also supports SMS message and LINE message sending. It can be used to send messages to report the current status of the equipment and environment or to send the alarm notification message to the related personnel for immediate response when a special event occurs.

# Ch4.Product Specification

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

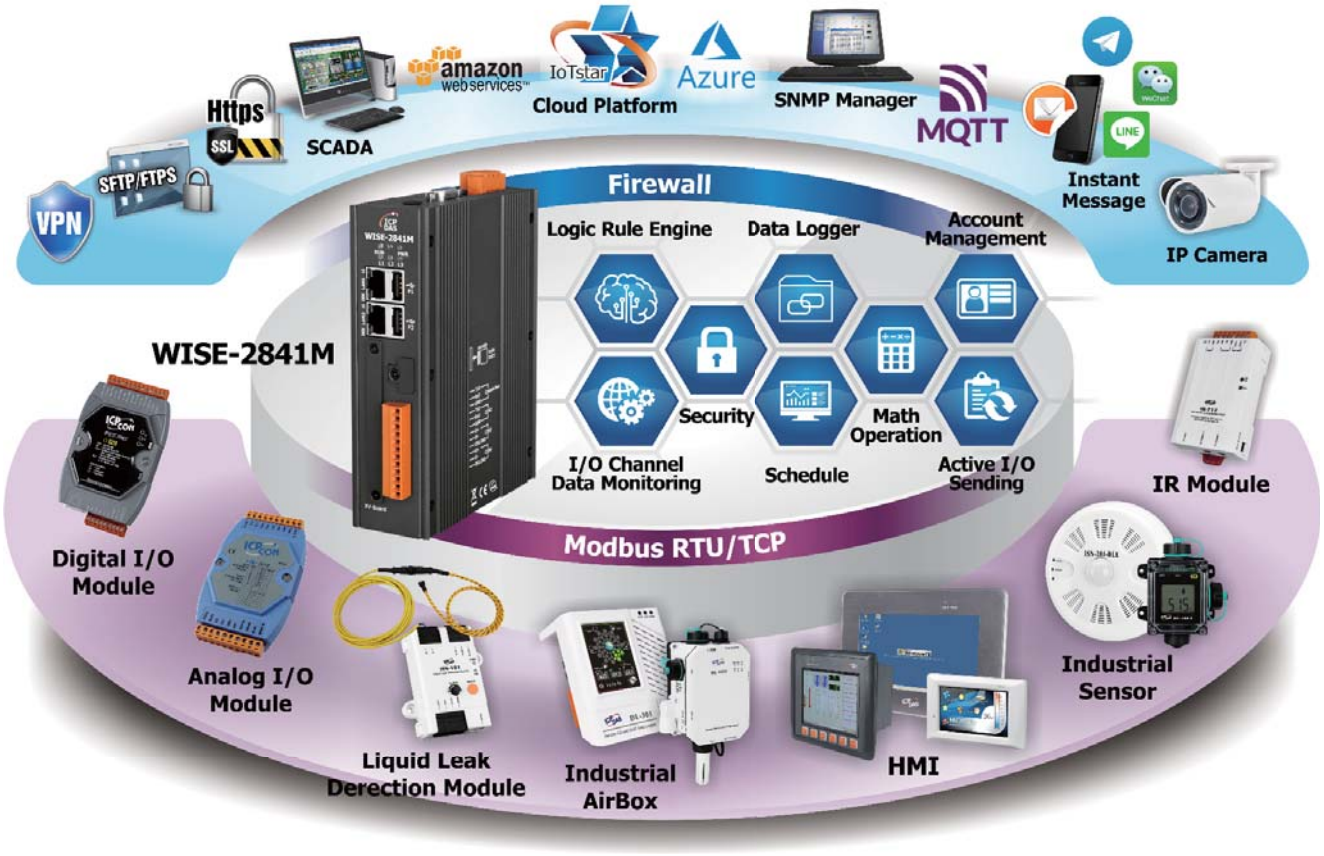
### Advanced IIoT Edge Controller: WISE-284xM

**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.

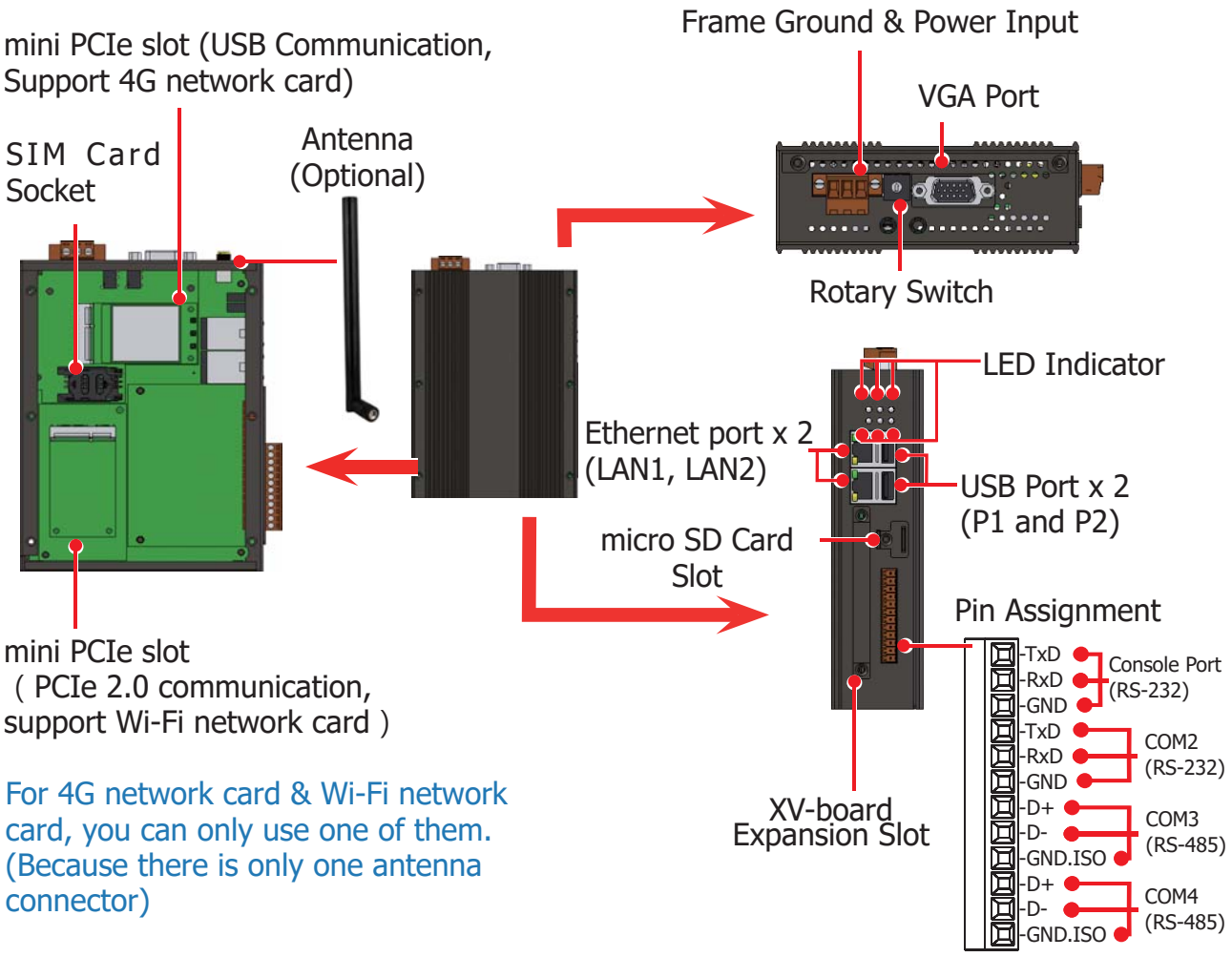
## Hardware Specifications

| Model | WISE-284xM Series |
|---|---|
| **System** | |
| CPU | Quad-core ARM CPU, 1.6 GHz/Core |
| VGA port | Yes (Only for system diagnostic and recovery operations) |
| SDRAM/Flash | DDR3 2 GB / 8 GB |
| microSD | Built-in one 4 GB microSD card<br>(support up to 32 GB microSDHC card or 2 TB microSDXC card ) |
| **Communication Interface** | |
| Ethernet | RJ-45 x 2, 10/100/1000 Base-TX (Auto-negotiating, Auto MDI/MDI-X) |
| COM 2 | RS-232 (TxD, RxD, GND), non-isolated, Speed: 115200 bps max |
| COM 3/COM 4 | RS-485 (Data+, Data-), Speed: 115200 bps max. Support 2500 VDC isolation. |
| **I/O Module Support** | |
| Local Side | Support ICP DAS XV-board |
| Remote Side | * Support DCON or Modbus RTU Slave modules<br>(Up to 32, COM3 and COM4 can connect to Max. 16 modules individually.)<br>* Support Modbus TCP Slave modules (Up to 16) |
| iCAM IP Camera | up to 12 |
| **Power Requirements** | |
| Input Range | 12 to 48 VDC |
| Consumption | WISE-2841M: 10 W, WISE-2841M-4GE/4GC: 15 W |
| **Mechanical** | |
| Casing | Metal |
| Dimensions<br>(W x L x H; mm) | 42 x 164 x 129 |
| Installation | Wall Mounting Installation or DIN-Rail Installation (Optional) |
| **Environmental** | |
| Temperature/ Humidity | Operating Temperature: -25 °C to +75 °C; Storage Temperature: -40 °C to +80 °C;<br>10 to 90% RH, Non-condensing |
| **Mobile Network Communication** | |
| WISE-284xM-4GE | FDD LTE: B1/B3/B5/B7/B8/B20 bands<br>(Frequency Band for EMEA, Korea, Thailand, India and Taiwan)<br>WCDMA: 850/900/2100 MHz |
| WISE-284xM-4GC | FDD LTE: B1/B3/B8 bands (Frequency Band for China)<br>TDD LTE: B38/B39/B40/B41 bands (Frequency Band for China)<br>WCDMA: 900/2100 MHz, TD-SCDMA 1900/2100 MHz, CDMA2000 (BC0) 800 MHz |

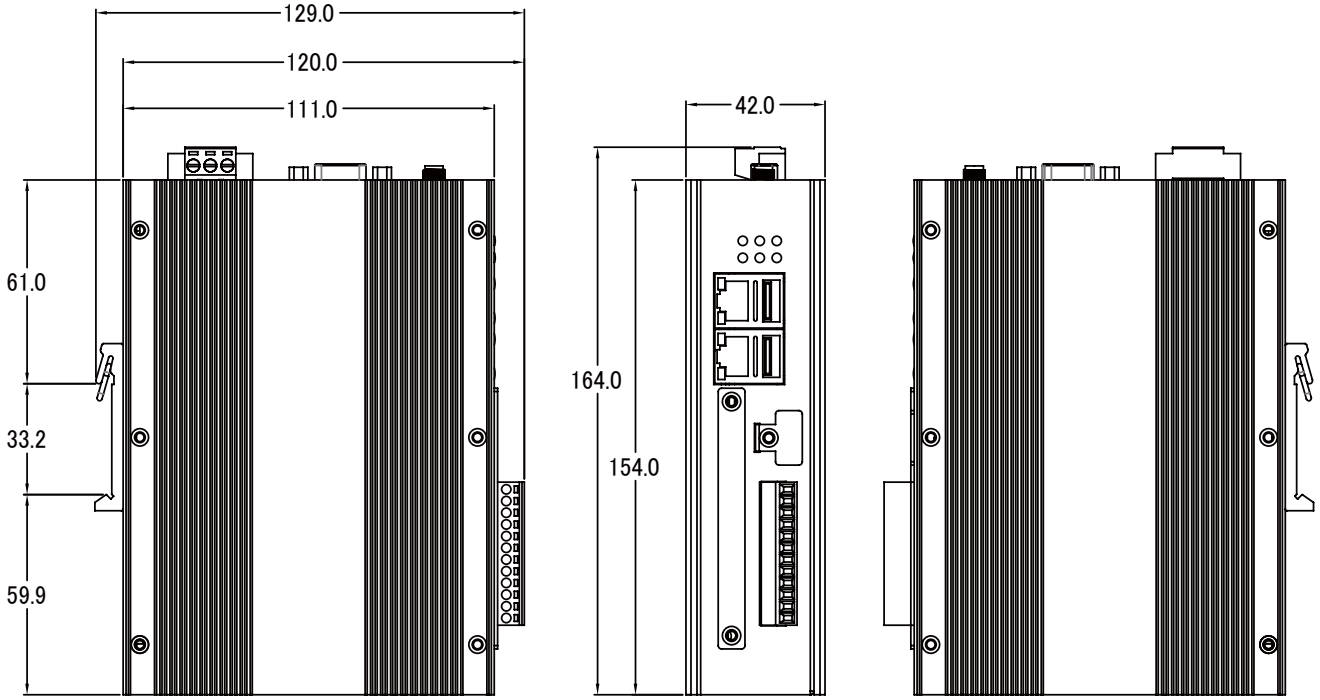
## Software Specifications

| Function | | Description |
|---|---|---|
| **Easy to use** | Web Page Interface | ● No more programming ! Runs on browsers for system and logic rule setting. ( Supports HTTPS Protocol) |
| **Options for Sensor Integration** | Local Side | ● Support XV-board(XV107, XV107A, XV110, XV111, XV111A, XV116, XV306, XV307, XV308, XV310). |
| | Remote Side (RS-485) | ● Support ICP DAS I-7000/M-7000/tM/DL/LC/IR/iSN and Modbus RTU Slave module. |
| | Remote Side (Ethernet) | ● Support ICP DAS WISE-7100/(P)ET-7000/WF-2000 and Modbus TCP Slave module. |
| **Edge Computing Ability at Field Sites** | IF-THEN-ELSE Logic Operation | ● Built-in advanced IF-THEN-ELSE logic engine provides for the execution of logic rules. |
| | I/O Channel Monitoring & Control | ● Provides real-time monitoring and setting of I/O channel of sensor. |
| | Timer | ● Perform the timing function. The status of Timer can be included in IF condition statements to trigger the THEN/ELSE actions. |
| | Schedule | ● Perform the prescheduled tasks. The status of Schedule can be included in IF condition statements to trigger the THEN/ELSE actions. “Calendar” and “Weekly repeat” setting UI are provided. |
| | Instant Message Sending | ● Support LINE, WeChat, Telegram, SMS, and Email message sending function. |
| | CGI Command | ● Perform CGI command sending and receiving functions. The content of CGI command receiving can be used in IF condition statements to trigger the THEN/ELSE actions. |
| | Data Logger | ● Perform Data Logger function to real-time record the sensor data by Period or Event Trigger operation. |
| | Internal Register | ● Work as a variable to hold the temporary value, and provide the basic mathematical operation. (Supports "Retain Variable" function for all Internal Registers) |
| **Seamless Integration with SCADA/ IT/IoT Systems** | Real-Time Sensor Data | ● Support Modbus TCP/RTU, CGI, SNMP(v1, v2c & v3) and MQTT protocols for the integration with SCADA/IT/IoT systems. Active I/O sending mechanism supported. |
| | Historical Sensor Data Files | ● FTP, SFTP & FTPS protocols supported for the maintenance of data log files and the data files automatically send back & recovery when disconnected network is resumed.<br>● Provide alarm notification mechanism so that when microSD card is damaged, the data log file will be stored in WISE to prevent data loss. |
| | Communication Service | ● DDNS (Dynamic DNS) service supported.<br>● Supports VPN Client operation.<br>● 4G version WISE-284xM controller support 4G wireless data communication. |
| | IoT Gateway Capability | ● Support connection with IoT Cloud Platform (Microsoft Azure, IBM Bluemix & Amazon Web Services) and IoTstar Cloud Management Software. |

## WISE-284xM




For 4G network card & Wi-Fi network card, you can only use one of them. (Because there is only one antenna connector)



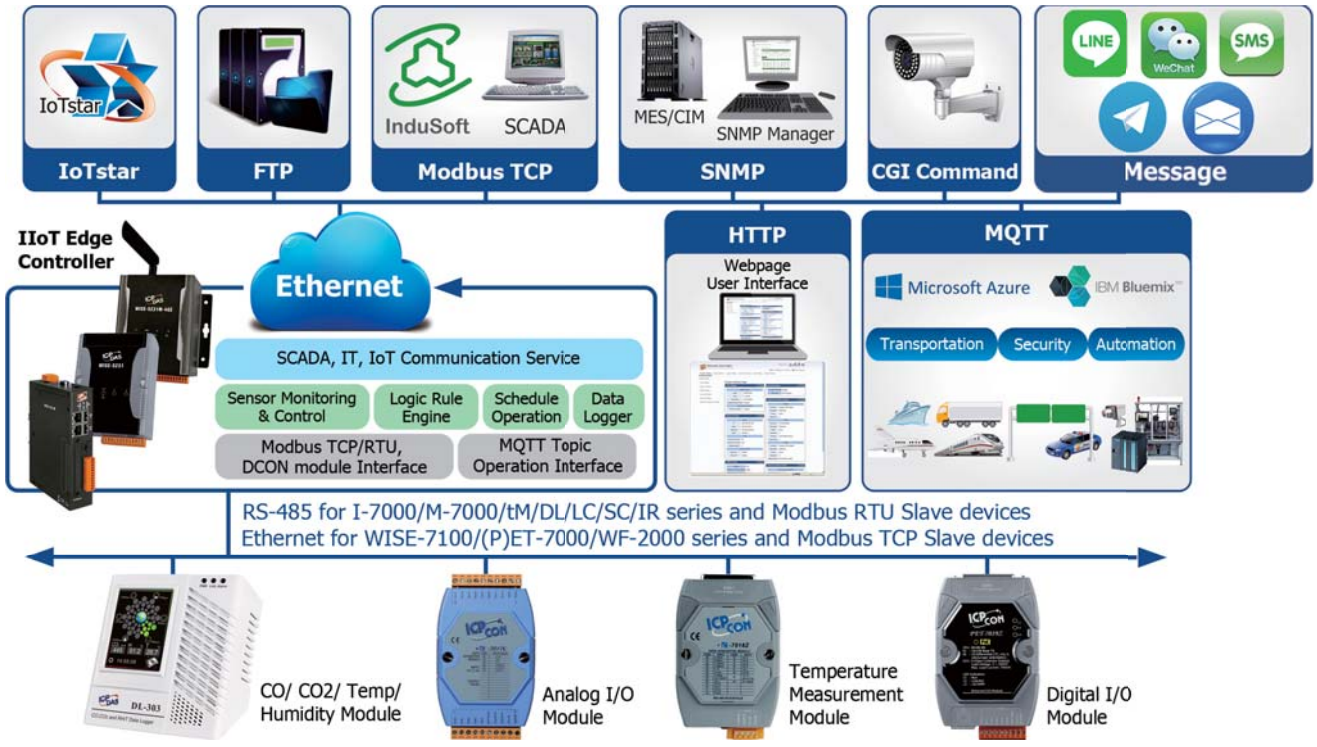

Left Side View | Front View | Right Side View

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

### Features

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

## System Architecture



## Hardware Specifications

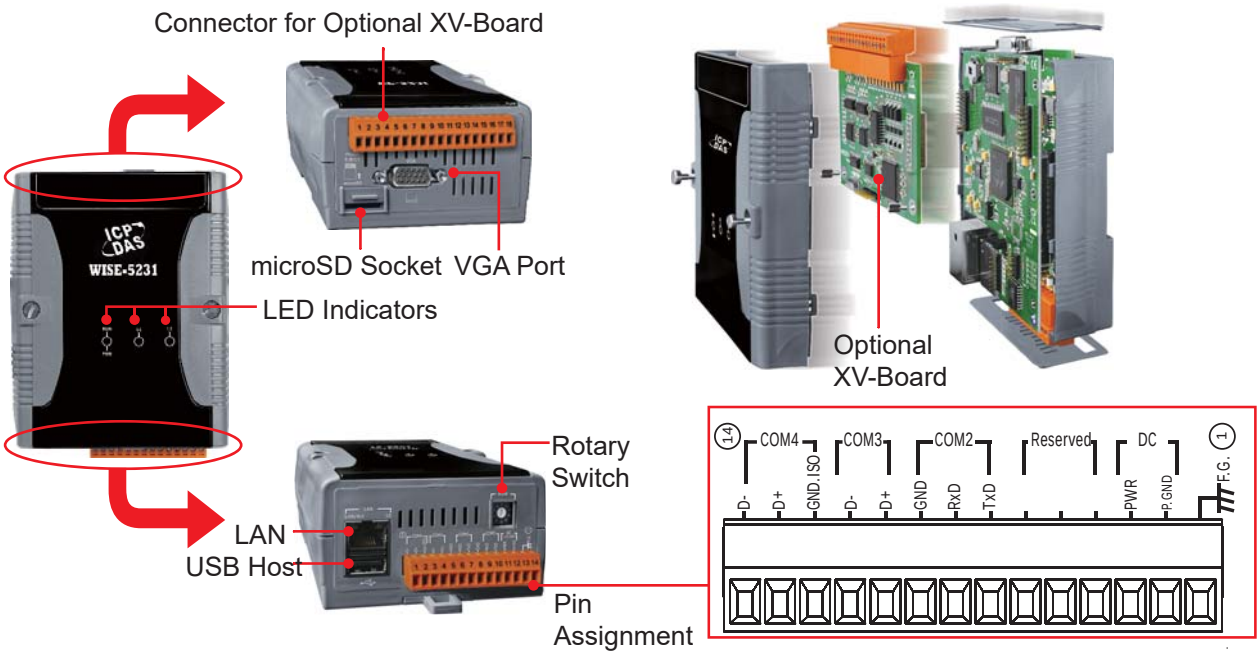
| Model | WISE-224xM Series | WISE-523x Series | WISE-523xM Series |
|---|---|---|---|
| **System** | | | |
| **CPU** | ARM CPU, 1.0 GHz | | |
| **VGA port** | Yes (Only for system diagnostic and recovery operations) | | |
| **SDRAM/Flash** | DDR3 512 MB / 256 MB | | |
| **microSD** | Built-in one 4 GB microSD card (support up to 32 GB microSDHC card ) | | |
| **Communication Interface** | | | |
| **Ethernet** | RJ-45 x 2, 10/100/1000 Base-TX (Auto-negotiating, Auto MDI/MDI-X) | RJ-45 x 1, 10/100/1000 Base-TX (Auto-negotiating, Auto MDI/MDI-X) | |
| **COM 2** | RS-232 (TxD, RxD, GND), non-isolated, Speed: 115200 bps max | | |
| **COM 3/COM 4** | RS-485 (Data+, Data-), Speed: 115200 bps max. Support 2500 VDC isolation. | RS-485 (Data+, Data-), Speed: 115200 bps max. COM 4 provides 2500 VDC isolation. | |
| **I/O Module Support** | | | |
| **Local Side** | Support ICP DAS XV-board | | |
| **Remote Side** | * Support DCON or Modbus RTU Slave modules (Up to 32, COM3 and COM4 can connect to Max. 16 modules individually.) * Support Modbus TCP Slave modules (Up to 16) | | |
| **iCAM IP Camera** | up to 4 | | |
| **Power Requirements** | | | |
| **Input Range** | 12 to 48 VDC | | |
| **Consumption** | Ethernet version: 4.8 W; -4GE/4GC version: 6.5 W | | |
| **Mechanical** | | | |
| **Casing** | Metal | Plastic | Metal |
| **Dimensions (W x L x H; mm)** | 35 × 167 × 119 | 91 x 132 x 52 | 117 x 126 x 58 |
| **Installation** | Wall Mounting Installation or DIN-Rail Installation (Optional) | DIN-Rail Installation | Wall Mounting/ DIN-Rail Installation |
| **Environmental** | | | |
| **Temperature/ Humidity** | Operating Temperature: -25 °C to +75 °C; Storage Temperature: -40 °C to +80 °C; 10 to 90% RH, Non-condensing | | |
| **Mobile Network Communication** | | | |
| **WISE-523xM-4GE, WISE-224xM-4GE** | FDD LTE: B1/B3/B5/B7/B8/B20 bands (Frequency Band for EMEA, Korea, Thailand, India and Taiwan) WCDMA: 850/900/2100 MHz | | |
| **WISE-523xM-4GC, WISE-224xM-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 Specifications

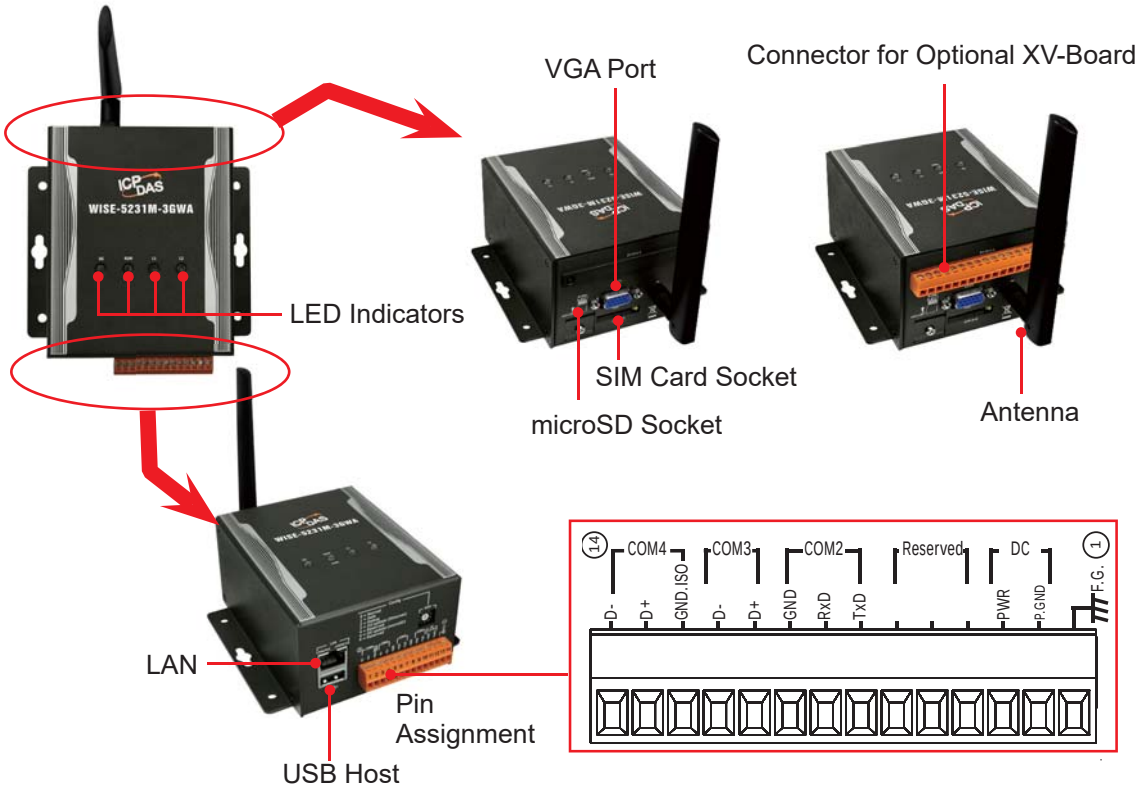
| Function | | Description |
|---|---|---|
| **Easy to use** | Web Page Interface | ● No more programming ! Runs on browsers for system and logic rule setting. |
| **Options for Sensor Integration** | Local Side | ● Support XV-board(XV107, XV107A, XV110, XV111, XV111A, XV116, XV306, XV307, XV308, XV310). |
| | Remote Side (RS-485) | ● Support ICP DAS I-7000/M-7000/tM/DL/LC/IR and Modbus RTU Slave module. |
| | Remote Side (Ethernet) | ● Support ICP DAS WISE-7100/(P)ET-7000/WF-2000 and Modbus TCP Slave module. |
| **Edge Computing Ability at Field Sites** | IF-THEN-ELSE Logic Operation | ● Built-in advanced IF-THEN-ELSE logic engine provides for the execution of logic rules. |
| | I/O Channel Monitoring & Control | ● Provides real-time monitoring and setting of I/O channel of sensor. |
| | Timer | ● Perform the timing function. The status of Timer can be included in IF condition statements to trigger the THEN/ELSE actions. |
| | Schedule | ● Perform the prescheduled tasks. The status of Schedule can be included in IF condition statements to trigger the THEN/ELSE actions. “Calendar” and “Weekly repeat” setting UI are provided. |
| | Instant Message Sending | ● Support LINE, Telegram, Email and SMS for instant message sending. (WISE-5236/WISE-2246M support WeChat message sending function.) |
| | CGI Command | ● Perform CGI command sending and receiving functions. The content of CGI command receiving can be used in IF condition statements to trigger the THEN/ELSE actions. |
| | Data Logger | ● Perform Data Logger function to real-time record the sensor data by Period or Event Trigger operation. |
| | Internal Register | ● Work as a variable to hold the temporary value, and provide the basic mathematical operation. |
| **Seamless Integration with SCADA/ IT/IoT Systems** | Real-Time Sensor Data | ● Support Modbus TCP/RTU, CGI, SNMP(v1 & v2c) and MQTT protocols for the integration with SCADA/IT/IoT systems. Active I/O sending mechanism supported. |
| | Historical Sensor Data Files | ● FTP protocol supported for the maintenance of data log files and the data files automatically send back & recovery when disconnected network is resumed.<br>● Provide alarm notification mechanism so that when microSD card is damaged, the data log file will be stored in WISE to prevent data loss. |
| | Communication Service | ● DDNS (Dynamic DNS) service supported.<br>● 3G/4G version WISE-523xM/224xM controller support 3G/4G wireless data communication. |
| | IoT Gateway Capability | ● Support connection with IoT Cloud Platform (Microsoft Azure and IBM Bluemix) and IoTstar Cloud Management Software. |

## Appearance

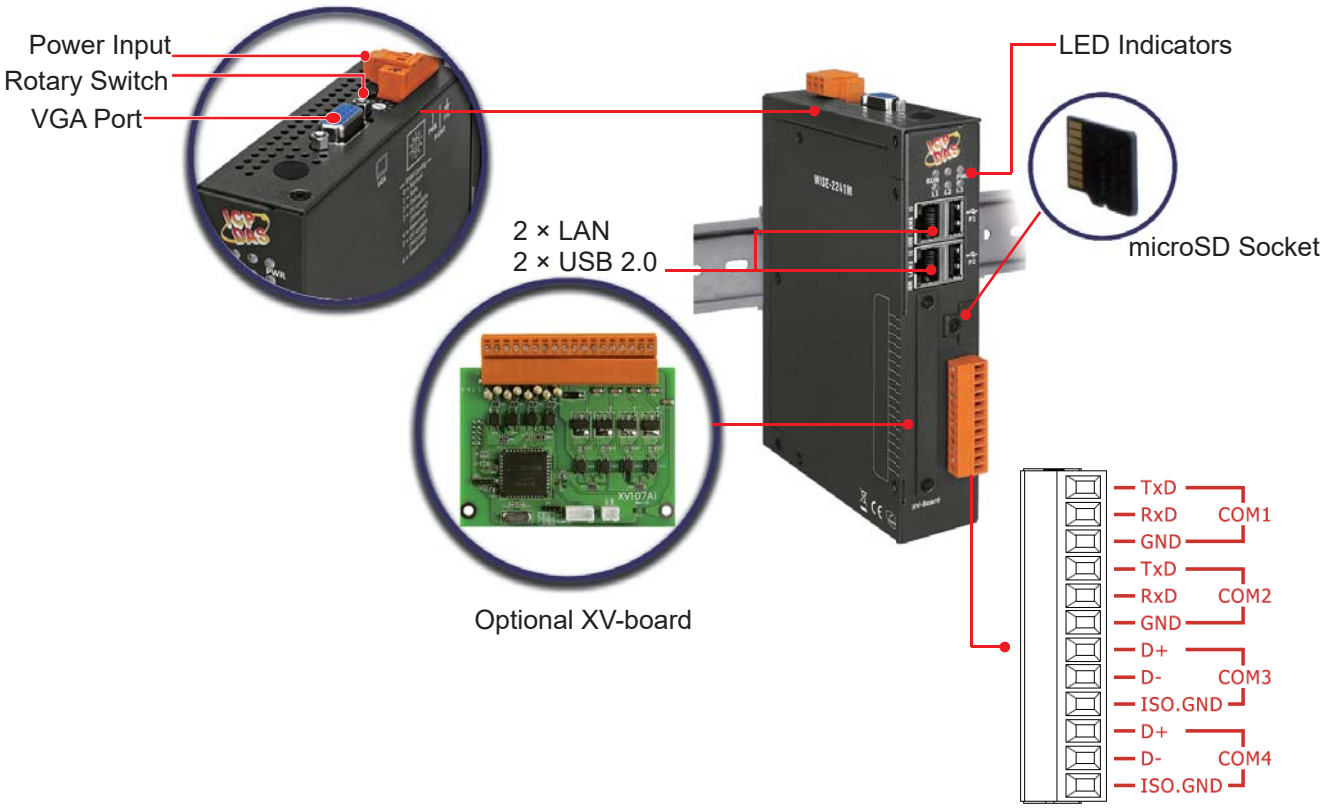
### WISE-523x



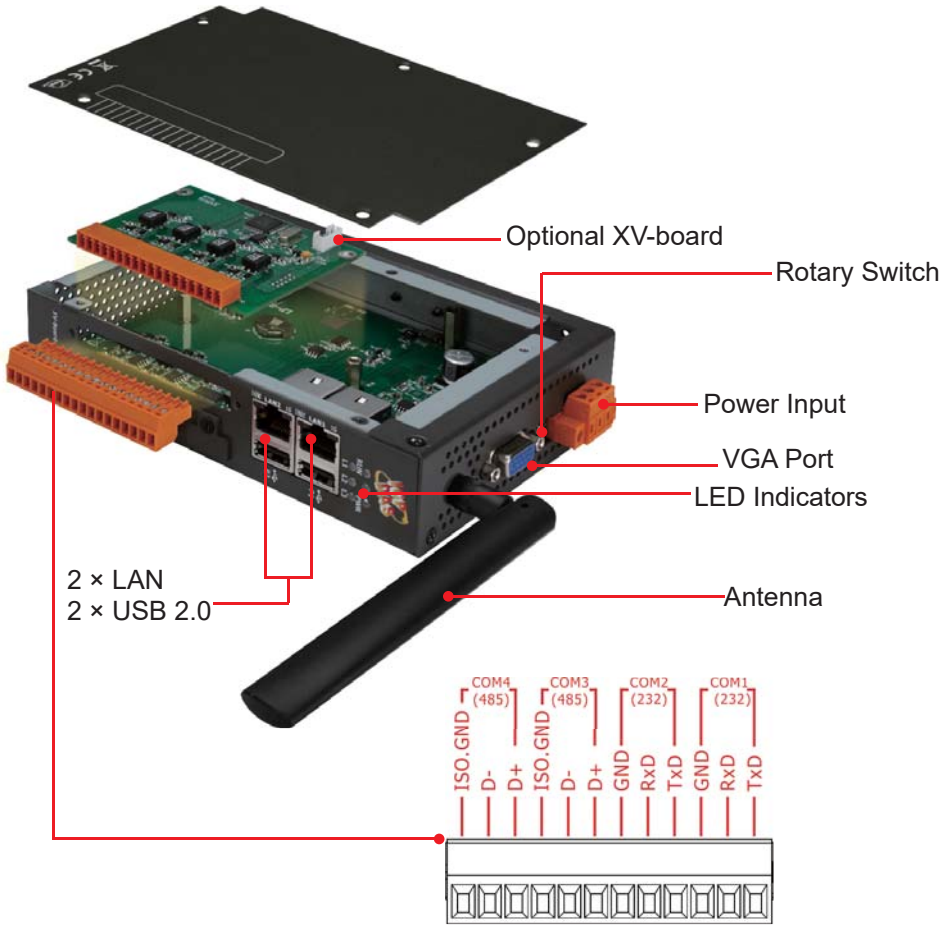

### WISE-523xM-4GE/4GC



## WISE-224xM




## WISE-224xM-4GE/4GC



## Supported I/O Module

### ► Module Specification

| I/O Module Specification | | Description | Max. Connection Allowed |
|---|---|---|---|
| I/O Module for Local site | Local Bus | ICP DAS: XV-Board series module | 1 |
| I/O Module for Remote site | DCON by RS-485 | ICP DAS : I-7000/DL series module | COM3 and COM4 can connect up to 16 modules individually. |
| | Modbus RTU by RS-485 | ICP DAS : M-7000/tM/DL/LC/IR series module<br>Others : modules that support Modbus RTU Slave Protocol | |
| | Modbus TCP by Ethernet | ICP DAS : WISE-7100/(P)ET-7000/ DL/WF-2000 series module<br>Others : modules that support Modbus TCP Slave Protocol | LAN interface can connect up to 16 modules. |
| IP Camera | | ICP DAS : iCAM series module | LAN interface can connect up to 4 cameras (WISE-523x/224x) or 12 cameras (WISE-284x). |

### ► List of Supported Modules

| Function | | Model List |
|---|---|---|
| I-7000 Module | | |
| AI/AO | Voltage & Current | I-7012, I-7012D, I-7012F, I-7012FD, I-7017, I-7017F, I-7017R, I-7017C, I-7017FC, I-7017RC, I-7017R-A5, I-7017Z |
| | Thermocouple | I-7011, I-7011D, I-7011P, I-7011PD, I-7018, I-7018P, I-7018R, I-7018Z, I-7019R |
| | RTD | I-7013, I-7013D, I-7015, I-7015P, I-7033, I-7033D |
| | Thermistor | I-7005 |
| | Transmitter | I-7014D |
| | Strain Gauge | I-7016, I-7016D, I-7016P, I-7016PD |
| | Analog Output | I-7021, I-7021P, I-7022, I-7024, I-7024R |
| DI/DO | DC Digital Input | I-7041, I-7041D, I-7041P, I-7041PD, I-7051, I-7051D, I-7052, I-7052D, I-7053-FG, I-7053D-FG |
| | AC Digital Input | I-7058, I-7058D, I-7059, I-7059D |
| | DC Digital Output | I-7042, I-7042D, I-7043, I-7043D, I-7045, I-7045D, I-7045-NPN, I-7045D-NPN |
| | DC Digital Input & Output | I-7044, I-7044D, I-7050, I-7050D, I-7050A, I-7050AD, I-7055, I-7055D, I-7055-NPN, I-7055D-NPN |
| Relay Output | Power Relay Output | I-7060, I-7060D, I-7061, I-7061D, I-7063, I-7063D, I-7065, I-7065D, I-7067, I-7067D |
| | Solid State Relay Output | I-7063A, I-7063AD, I-7063B, I-7063BD, I-7065A, I-7065AD, I-7065B, I-7065BD |
| | Photomos Relay Output | I-7066, I-7066D |
| Others | Counter/Frequency | I-7080, I-7080D, I-7080B, I-7080BD, I-7088, I-7088D |

| Function | | Model List |
|---|---|---|
| **M-7000 Module** | | |
| AI/AO | Voltage & Current | M-7017, M-7017C, M-7017R, M-7017R-A5,M-7017RC, M-7017Z |
| | Thermocouple | M-7011, M-7011D, M-7018, M-7018R, M-7018Z, M-7019R,M-7019Z |
| | RTD | M-7015, M-7015P |
| | Thermistor | M-7005 |
| | Strain Gauge | M-7016, M-7016D |
| | Analog Output | M-7022, M-7024, M-7024R, M-7024L, M-7028, M-7028D |
| | RMS Input | M-7017RMS |
| DI/DO | DC Digital Input | M-7041, M-7041D, M-7041P, M-7041PD, M-7041-A5, M-7041D-A5, M-7046, M-7046D, M-7051, M-7051D, M-7052, M-7052D, M-7053, M-7053D |
| | AC Digital Input | M-7058, M-7058D, M-7059, M-7059D |
| | DC Digital Output | M-7043, M-7043D, M-7045, M-7045D, M-7045-NPN, M-7045D-NPN |
| | DC Digital Input & Output | M-7050, M-7050D, M-7055, M-7055D, M-7055-NPN, M-7055D-NPN |
| Relay Output | Power Relay Output | M-7060, M-7060D, M-7060P, M-7060PD, M-7061, M-7061D, M-7064, M-7064D, M-7065, M-7065D, M-7067, M-7067D, M-7068, M-7068D, M-7069, M-7069D |
| | Solid State Relay Output | M-7065B, M-7065BD |
| | Photomos Relay Output | M-7066P, M-7066PD |
| Others | Counter/Frequency | M-7080, M-7080D, M-7080B, M-7080BD, M-7084, M-7088, M-7088D |
| | Multi-Function | M-7002, M-7003, M-7024U, M-7024UD, M-7026 |
| **tM Module** | | |
| AI/AO | Voltage & Current | tM-AD2, tM-AD5, tM-AD5C, tM-AD8, tM-AD8C |
| | Thermistor | tM-TH8 |
| DI/DO | DC Digital Input | tM-P8 |
| | DC Digital Output | tM-C8 |
| | DC Digital Input & Output | tM-P4A4, tM-P4C4 |
| Relay Output | Power Relay Output | tM-P3R3, tM-R5 |
| | Photomos Relay Output | tM-P3POR3 |
| Others | Multi-Function | tM-DA1P1R1, tM-AD4P2C2 |
| **(P)ET-7000 Module** | | |
| AI/AO | Voltage & Current | (P)ET-7017, (P)ET-7217, (P)ET-7017-10, (P)ET-7217-10, (P)ET-7217-A5 |
| | Thermocouple | (P)ET-7018Z, (P)ET-7019Z, (P)ET-7218Z, (P)ET-7219Z |
| | RTD | (P)ET-7015, (P)ET-7215 |
| | Thermistor | (P)ET-7005 |
| DI/DO | DC Digital Input | (P)ET-7051, (P)ET-7053, (P)ET-7251, (P)ET-7253 |
| | DC Digital Output | (P)ET-7042, (P)ET-7242 |
| | DC Digital Input & Output | (P)ET-7044, (P)ET-7050, (P)ET-7052, (P)ET-7244, (P)ET-7250A, (P)ET-7252, (P)ET-7255 |
| Relay Output | Power Relay Output | (P)ET-7060, (P)ET-7067, (P)ET-7260, (P)ET-7261, (P)ET-7267 |
| | Photomos Relay Output | (P)ET-7065, (P)ET-7066 |
| Others | Multi-Function | (P)ET-7002, (P)ET-7016, (P)ET-7024, (P)ET-7026, (P)ET-7202, (P)ET-7224, (P)ET-7226 |

| Function | | Module List |
|---|---|---|
| **t(P)ET Module** | | |
| DI/DO | DC Digital Input | t(P)ET-P6, t(P)ET-PD6 |
| | DC Digital Output | t(P)ET-C4, t(P)ET-A4 |
| | DC Digital Input & Output | t(P)ET-P2C2, t(P)ET-P2A2 |
| Digital Input & Relay Output | Digital Input & Power Relay Output | t(P)ET-P2R2, t(P)ET-PD2R1 |
| | Digital Input & Photomos Relay Output | t(P)ET-P2POR2, t(P)ET-PD2POR2 |
| **WISE-7000 Module** | | |
| AI/AO | Voltage & Current | WISE-7117 |
| | Thermocouple | WISE-7118Z |
| | RTD | WISE-7115 |
| | Thermistor | WISE-7105 |
| DI/DO | DC Digital Input | WISE-7151, WISE-7153 |
| | DC Digital Output | WISE-7142 |
| | DC Digital Input & Output | WISE-7144, WISE-7150, WISE-7152, WISE-7255 |
| Relay Output | Power Relay Output | WISE-7160, WISE-7167 |
| Others | Multi-Function | WISE-7102, WISE-7126 |
| **WF-2000 Module** | | |
| AI/AO | Voltage & Current, Thermocouple | WF-2017,WF-2019/S |
| DI/DO | DC Digital Input, DC Digital Output | WF-2051, WF-2042 |
| | DC Digital Input & Output | WF-2055 |
| Relay Output | Power Relay Output | WF-2060 |
| Others | Multi-Function | WF-2026 |
| **iSN Module** | | |
| Liquid Leakage Detection Module | | iSN-101, iSN-104 |
| **LC Module** | | |
| DI/DO | AC Digital Input | LC-101H, LC-103H |
| | DC Digital Output | LC-131 |
| **DL Module** | | |
| Temperature / Humidity | | DL-10, DL-100 |
| CO / CO2 / Temperature / Humidity | | DL-301, DL-302, DL-303 |
| PM1 / PM2.5 / PM10 / CO / CO2 / Temperature / Humidity | | DL-1020, DL-1021, DL-1022, DL-1023, DL-1038, DL-1050 |
| **IR Module** | | |
| IR Learning Remote Module | | IR-210, IR-712A, IR-712-MTCP |
| **XV-Board Module** | | |
| DI/DO | DC Digital Input | XV110 |
| | DC Digital Output | XV111, XV111A |
| | DC Digital Input & Output | XV107, XV107A |
| Relay Output | Power Relay Output | XV116 |
| Others | Multi-Function | XV306, XV307, XV308, XV310 |
| **Modbus RTU/TCP Slave Module** | | |
| Coil Output / Discrete Input / Input Register / Holding Register | | |

## 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 |

# 4.2 Intelligent I/O Module : WISE-75xxM/71xx

**WISE-75xxM**

## Features

- No more programming, Web pages provided for system and logic rule setting
- IF-THEN-ELSE logic rules execution ability
- Built-in I/O module
- Support I/O monitoring/control, non-SSL Email/CGI command sending
- Support Timer and Schedule operation
- Support PoE (Power over Ethernet) function and 2-port Ethernet Switch for Daisy-Chain Topology
- Support Modbus TCP Protocol for SCADA System
- Support non-SSL MQTT Protocol for IT & IoT (Internet of Things) System
- Support connection with IoTstar Cloud Management Software

## Introduction

WISE-75xxM is a series of AIO & DIO WISE modules. Each module features specific built-in I/O combination, the user could select the module with most appropriate I/O combination according to the requirements of the applications. After connect to the built-in web page interface of WISE-75xxM through web browser, user can edit the system settings and IF-THEN-ELSE control logic rules of WISE efficiently. The process is easy and fast, and the total cost of control system development will be significantly reduced. WISE-75xxM also supports Modbus TCP and MQTT communication protocols and can connect with ICP DAS IoTstar IoT cloud management software to build a complete industrial IoT control system.

## System Specifications

| | |
|---|---|
| **System** | |
| **CPU** | 32 bits CPU (400MHz) |
| **Communication** | |
| **PoE Ethernet Port** | 2 x RJ-45, 10/100 Base-TX, Switch Ports for Daisy-Chain Topology |
| **Isolation Protection** | |
| **I/O 2-Way Isolation** | 2500 VDC |
| **EMS Protection** | |
| **ESD (IEC 61000-4-2)** | ±4 kV Contact for each terminal, ±8 kV Air for random point |
| **EFT (IEC 61000-4-4)** | ±2 kV for Power |
| **LED Indicators** | |
| **System Running** | Yes |
| **Ethernet Link/Act** | Yes |
| **I/O Channel Status** | Yes |
| **PoE Power** | Yes |
| **Power Requirements** | |
| **Reverse Polarity Protection** | Yes |
| **Powered from Terminal Block** | Yes, 12 to 48 VDC |
| **Powered from PoE** | Yes, IEEE 802.3af, Class1 |
| **Mechanical** | |
| **Dimensions (L x W x H) / Installation** | 120mm x 97mm x 42mm / Wall Mounting Installation |
| **Environment** | |
| **Temperature** | Operating Temperature: -25 °C to +75 °C; Storage Temperature: -30 °C to +80 °C |
| **Humidity** | 10 to 90% RH, Non-condensing |

## Software Functions

| Function | Max. No. | Description |
|---|---|---|
| **Web Operation Interface** | Yes | Access built-in webpage on WISE to set up system parameters and logic rules through browser. |
| **IF-THEN-ELSE Rules** | 72 | • Each rule supports 3 IF conditions that can be combined by AND or OR operators for evaluation.<br>• Each IF-THEN-ELSE rule supports 3 THEN actions and 3 ELSE actions. |
| **Internal Register** | 48 | As a variable to hold the temporary value. SCADA can Read/write the value via Modbus Protocol. |
| **Timer** | 24 | Perform the timing function. The status of Timer can be included in IF condition statements to trigger the THEN/ELSE actions. |
| **Schedule** | 24 | Perform the prescheduled routine tasks. The status of Schedule can be included in IF condition statements to trigger the THEN/ELSE actions. |
| **Email** | 24 | Execute non-SSL Email message sending. Each Email can be sent to up to 5 receivers. |
| **CGI Command** | 24 | Execute CGI command sending. Each CGI command can be sent to one receiver (web server). |
| **Recipe** | 24 | The evaluation result of IF condition can trigger the Recipe (contains a sequence of actions) in the THEN/ELSE actions. |
| **P2P Controller** | 8 | Enable local WISE to read/write I/O data of other remote WISE; the data can be used in the rules (Apply to WISE-7xxx) |
| **Integration with SCADA/IT/IoT Systems** | Yes | • Support Modbus TCP and MQTT protocols for the integration with SCADA/IT/IoT systems.<br>• Support connection with ICP DAS IoTstar Cloud Management Software. |

## I/O Channel Specifications

| Model | Local I/O Channel | | | | Specifications |
|---|---|---|---|---|---|
| | DI | DO | AI | AO | |
| **WISE-7502M** | 6 | 3 | 3 | - | AI :+/- 150 mV, +/- 500 mV, +/- 1V, +/- 5 V, +/- 10 V, +0 ~ +20 mA,+/- 20 mA, 4 ~ 20mA<br>DO : Power Relay (Form A); DI : Wet (Sink,Source) |
| **WISE-7504M** | 4 | - | 4 | 4 | AI : +/- 500 mV, +/- 1V, +/- 5 V, +/- 10 V, +0 ~ +20 mA, +/- 20 mA, 4 ~ 20mA<br>AO : 0 ~ 5 V, +/- 5 V, 0 ~ 10 V, +/- 10 V, 0 ~ 20 mA, 4 ~ 20 mA<br>DI : Dry (Source), Wet (Sink) |
| **WISE-7515M** | - | - | 7 | - | RTD (AI) : Pt100, Pt1000, Ni120, Cu100, Cu1000 |
| **WISE-7517M** | - | 4 | 8 | - | AI : +/-150 mV, +/-500 mV, +/-1 V, +/-5 V, +/-10 V, +/-20 mA, 0 ~ 20 mA, 4 ~ 2 0mA<br>DO : Open Collector (Sink) |
| **WISE-7517M-10** | - | - | 10/20 | - | AI : +/-150 mV, +/-500 mV, +/-1 V, +/-5 V, +/-10 V, +/-20 mA, 0 ~ 20 mA, 4 ~ 20 mA |
| **WISE-7518ZM** | - | 3 | 10 | - | AI : +/-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)<br>DO : Open Collector (Sink) |
| **WISE-7519ZM** | - | 3 | 10 | - | AI : +/-15 mV, +/-50 mV, +/-100 mV, +/-150 mV, +/-500 mV, +/-1 V, +/-5 V, +/-10 V, +/-20 mA, 0~20 mA, 4~20 mA, Thermocouple (J, K, T, E, R, S, B, N, C, L, M, LDIN43710)<br>DO : Open Collector (Sink) |
| **WISE-7524M** | 5 | 5 | - | 4 | AO : 0 ~ 5 V, +/- 5 V, 0 ~ 10 V, +/- 10 V, 0 ~ 20 mA, 4 ~ 20 mA<br>DI : Dry (Source), Wet (Sink,Source); DO : Open Collector (Sink) |
| **WISE-7526M** | 2 | 2 | 6 | 2 | AI : +/- 500 mV, +/- 1 V, +/- 5 V, +/-10 V, 0 ~ 20 mA, +/- 20 mA, 4~20mA<br>AO : 0 ~ 5 V, +/- 5 V, 0 ~ 10 V, +/- 10 V, 0 ~ 20 mA, 4 ~ 20 mA<br>DI : Dry (Source), Wet (Sink,Source); DO : Open Collector (Sink) |
| **WISE-7528M** | - | - | - | 8 | AO : 0 ~ 5 V, +/- 5 V, 0 ~ 10 V, +/- 10 V, 0 ~ 20 mA, 4 ~ 20 mA |
| **WISE-7542M** | - | 16 | - | - | DO : Open Collector (Sink) |
| **WISE-7544M** | 8 | 8 | - | - | DI : Wet (Sink,Source); DO : Open Collector (Sink) |
| **WISE-7551M** | 16 | - | - | - | DI : Wet (Sink,Source) |
| **WISE-7552M** | 8 | 8 | - | - | DI : Wet (Sink,Source); DO : Open Collector (Source) |
| **WISE-7553M** | 16 | - | - | - | DI : Dry (Source) |
| **WISE-7555M** | 8 | 8 | - | - | DI : Dry (Source), Wet (Sink,Source); DO : Open Collector (Source) |
| **WISE-7560M** | 6 | 6 | - | - | DI : Wet (Sink,Source); DO : Power Relay Form A (SPST N.O.) |
| **WISE-7561M** | - | 11 | - | - | DO : Power Relay Form A (SPST N.O.) |
| **WISE-7567M** | - | 8 | - | - | DO : Power Relay Form A (SPST N.O.) |

## Ordering Information

| | |
|---|---|
| **WISE-75xxM** | WISE Intelligent MQTT I/O Module With PoE (Please refer to "I/O Channel Specifcations" for the model number) |

**WISE-71xx**

## Features

- No more programming, Web pages provided for system and logic rule setting
- IF-THEN-ELSE logic rules execution ability
- Built-in I/O module
- Support I/O monitoring/control, non-SSL Email/CGI command sending
- Timer function supported
- Support Modbus TCP Protocol for SCADA Software Integration
- Support PoE (Power over Ethernet) function

## Introduction

WISE-71xx 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. WISE-71xx also features specific built-in I/O combination, the user could select the module with most appropriate I/O combination according to the requirements of the applications.

WISE-71xx follows IEEE 802.3af-compliant (classification, Class 1) Power over Ethernet (PoE) specification. It allows receiving power from PoE enabled network by Ethernet pairs (Category 5 Ethernet cable). This feature provides greater flexibility and higher efficiency therefore simplifying systems design, saving space, reducing cables and eliminating the requirement for dedicated electrical outlets. Meanwhile, in case under a non-PoE environment, WISE-71xx will still be able to receive power from auxiliary power sources like AC adapters or battery, etc. WISE-71xx also supports Modbus TCP protocol to make seamless integration with SCADA software.

## System Specifications

| Model | WISE-71xx |
|---|---|
| **System** | |
| **CPU** | 16 bits CPU (80MHz) |
| **I/O module Support** | Built-in I/O Module |
| **Communication Interface** | |
| **PoE Ethernet Port** | 10/100 Base-TX * 1 |
| **LED Indicators** | |
| **PoE Power** | PoE On |
| **Others** | System Running;<br>Ethernet Link/Act/Speed; |
| **Power Requirements** | |
| **Powered from Terminal Block** | Yes, 12 to 48 VDC |
| **Powered from PoE** | Yes, IEEE 802.3af, Class1 |
| **Consumption** | Depend on the I/O function provided |
| **Mechanical** | |
| **Dimensions (L x W x D)** | 72 mm x 123 mm x 35 mm |
| **Installation** | DIN-Rail or Wall Mounting Installation |
| **Environment** | |
| **Temperature** | Operating Temperature : -25 °C to +75 °C<br>Storage Temperature : -30°C to +80°C |
| **Humidity** | 10 to 90% RH, Non-condensing |

## Software Functions

| Function | Max. No. | Description |
|---|---|---|
| **Web Operation Interface** | Yes | Access built-in webpage on WISE to set up system parameters and logic rules through browser. |
| **IF-THEN-ELSE Rules** | 36 | • Each rule supports 3 IF conditions that can be combined by AND or OR operators for evaluation.<br>• Each IF-THEN-ELSE rule supports 3 THEN actions and 3 ELSE actions. |
| **Internal Register** | 48 | As a variable to hold the temporary value. SCADA can Read/write the value via Modbus Protocol. |
| **Timer** | 12 | Perform the timing function. The status of Timer can be included in IF condition statements to trigger the THEN/ELSE actions. |
| **Email** | 12 | Execute non-SSL Email message sending. Each Email can be sent to up to 5 receivers. |
| **CGI Command** | 12 | Execute CGI command sending. Each CGI command can be sent to one receiver (web server). |
| **Recipe** | 12 | The evaluation result of IF condition can trigger the Recipe (contains a sequence of actions) in the THEN/ELSE actions. |
| **P2P Controller** | 8 | Enable local WISE to read/write I/O data of other remote WISE; the data can be used in the rules (Apply to WISE-7xxx) |
| **Modbus TCP Protocol** | Yes | Perform control and monitoring of I/O channels and system status via SCADA. |

## I/O Channel Specifications

| Model | Local I/O Channel | | | | Specifications |
|---|---|---|---|---|---|
| | DI | DO | AI | AO | |
| **WISE-7102** | 6 | 3 | 3 | - | AI :+/- 150 mV, +/- 500 mV, +/- 1V, +/- 5 V, +/- 10 V, +0 ~ +20 mA,+/- 20 mA, 4 ~ 20mA<br>DO : Power Relay (Form A); DI : Wet (Sink,Source) |
| **WISE-7105** | - | 4 | 8 | - | AI : Thermistor<br>DO : Open Collector (Sink) |
| **WISE-7115** | - | - | 7 | - | RTD (AI) : Pt100, Pt1000, Ni120, Cu100, Cu1000 |
| **WISE-7117** | - | 4 | 8 | - | AI : +/-150 mV, +/-500 mV, +/-1 V, +/-5 V, +/-10 V, +/-20 mA, 0 ~ 20 mA, 4 ~ 20mA<br>DO : Open Collector (Sink) |
| **WISE-7118Z** | - | 6 | 10 | - | AI : +/-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)<br>DO : Open Collector (Sink) |
| **WISE-7126** | 2 | 2 | 6 | 2 | AI : +/- 500 mV, +/- 1 V, +/- 5 V, +/-10 V, 0 ~ 20 mA, +/- 20 mA, 4~20mA<br>AO : 0 ~ 5 V, +/- 5 V, 0 ~ 10 V, +/- 10 V, 0 ~ 20 mA, 4 ~ 20 mA<br>DI : Dry (Source), Wet (Sink,Source); DO : Open Collector (Sink) |
| **WISE-7142** | - | 16 | - | - | DO : Open Collector (Sink) |
| **WISE-7144** | 8 | 8 | - | - | DI : Wet (Sink,Source); DO : Open Collector (Sink) |
| **WISE-7150** | 12 | 6 | - | - | DI : Wet (Sink,Source); DO : Open Collector (Sink) |
| **WISE-7151** | 16 | - | - | - | DI : Wet (Sink,Source) |
| **WISE-7152** | 8 | 8 | - | - | DI : Wet (Sink,Source); DO : Open Collector (Source) |
| **WISE-7153** | 16 | - | - | - | DI : Dry (Source) |
| **WISE-7160** | 6 | 6 | - | - | DI : Wet (Sink,Source); DO : Power Relay Form A (SPST N.O.) |
| **WISE-7167** | - | 8 | - | - | DO : Power Relay Form A (SPST N.O.) |

## Ordering Information

| | |
|---|---|
| **WISE-71xx** | WISE Intelligent I/O Module with PoE (Please refer to "I/O Channel Specifcations" for the model number) |

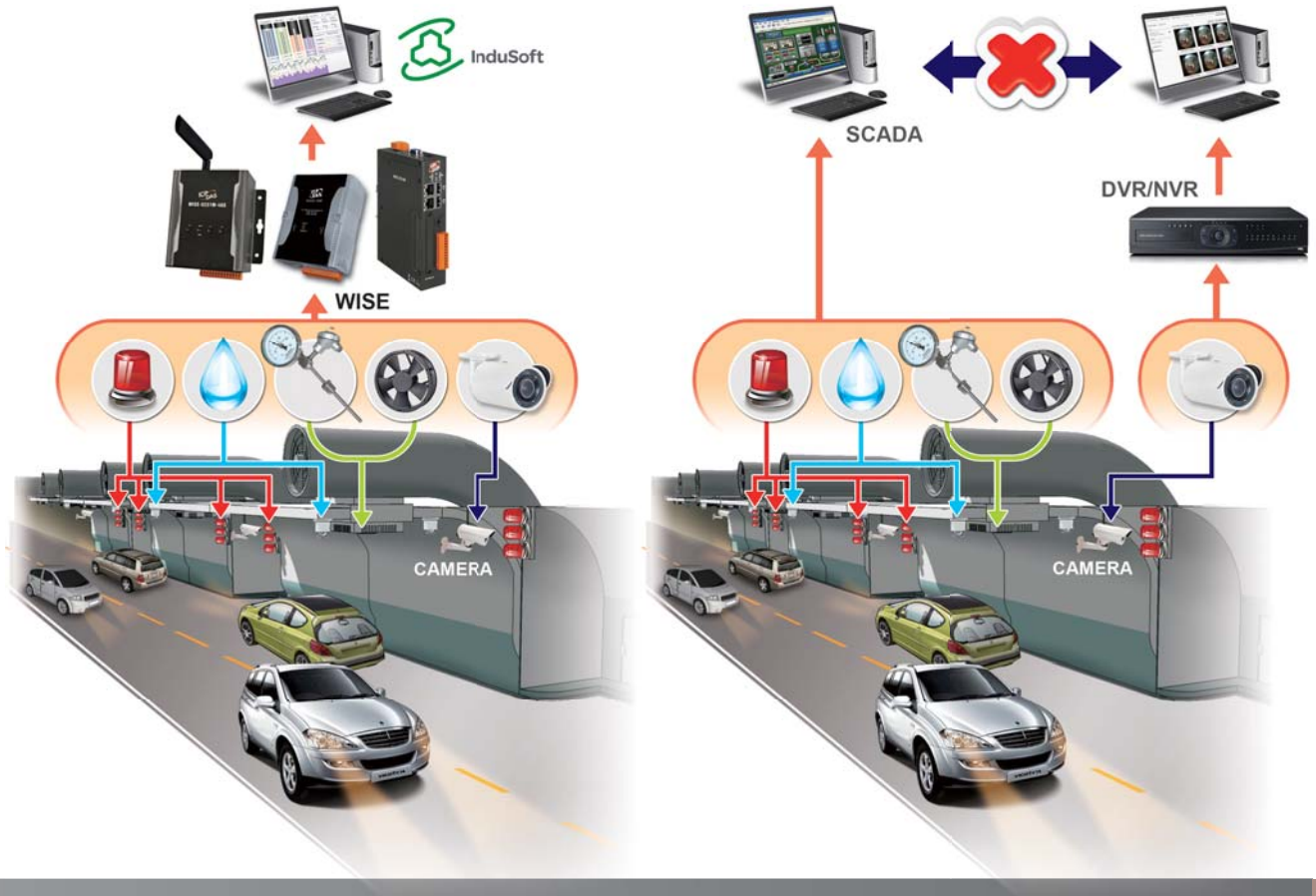
# Ch5. Solution Integration

## Intelligent Surveillance Solution: WISE + iCAM IP Camera

A general surveillance system on current market usually features separated systems: the camera DVR/NVR as a system, and the I/O monitoring as another system; each system operates independently. For now the DVR/NVR system of the camera usually records video for 24H/7Day without interruption, it requires huge storage space and sufficient network bandwidth; therefore the system implementation fee is usually high. In addition, when playback a certain video, it does not allow to search the suspicious activities of related I/O (temperature, doors and windows switch, water level, etc.) at the same time.

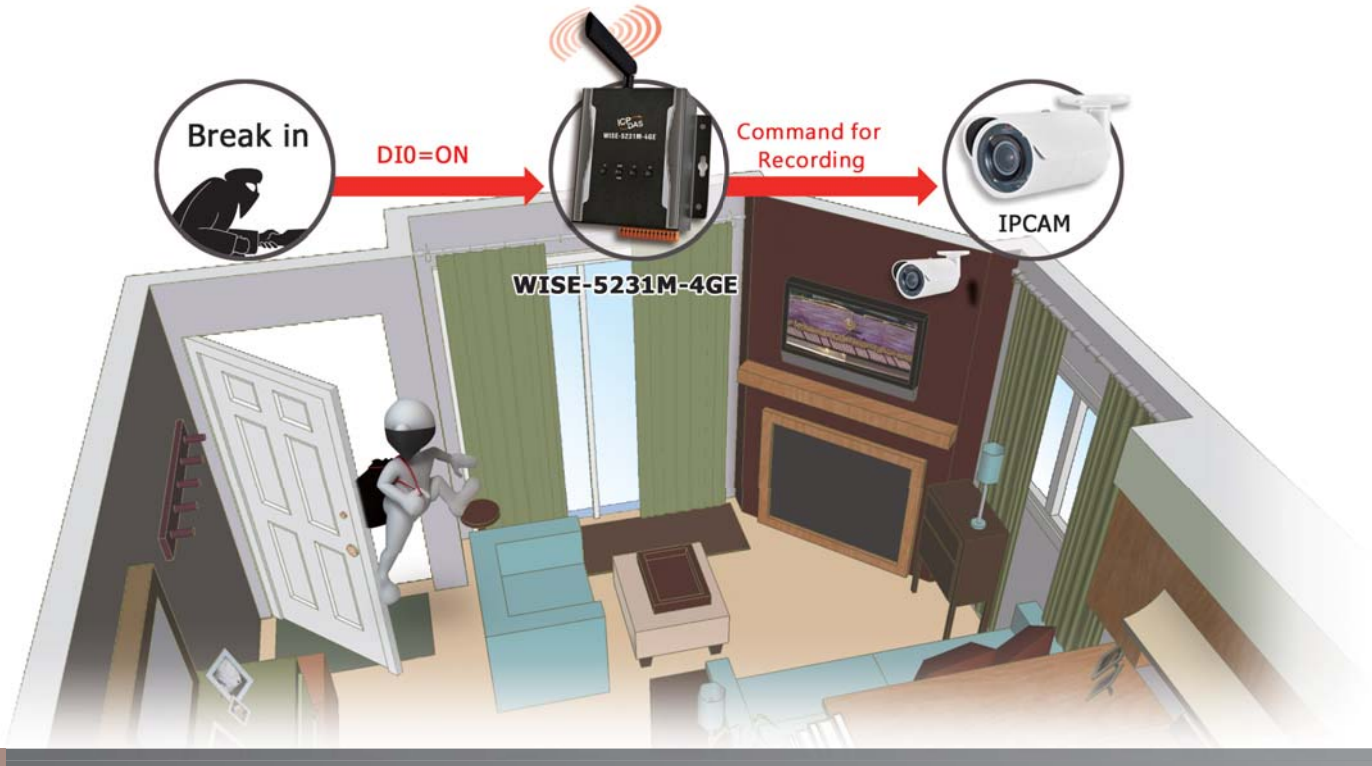
ICP DAS WISE surveillance solution integrates logic control, I/O, camera and data log in one single WISE controller. WISE allows two-way interactions between the I/O and the camera; it enables to record a piece of video or to take images when there is an event triggered by either I/O condition or ROI (Region of Interest) by camera. In this way, the storage size can be reduced significantly and the connection between I/O event and Video/Image can be built for easy query.

| ICP DAS WISE Surveillance Solution | Regular Surveillance Solution |
|---|---|
| 1. One WISE controller to integrate camera and I/O | 1. Two independent systems: SCADA & DVR/NVR |
| 2. Records key video and image, only needs a few storage memory. | 2. Record video 24H/7Days, needs huge storage memory. |
| 3. Two-way interaction between I/O and Video/Image | 3. I/O and Video/Image are independent |
| 4. Can work stand along or be integrated into a SCADA system | 4. Needs a host PC to run the SCADA |
| 5. One stop shopping/service for<br>● Controller: WISE Series<br>● I/O Modules: Various options for RS-485, Ethernet interfaces<br>● Camera: iCAM Series IP Camera<br>● SCADA: InduSoft | 5. Buy from different venders for SCADA, I/O Modules, DVR/NVR |



## Perform Interlocking Operations of I/O & Video Recording by IP Camera

WISE-523x/WISE-2x4xM supports ICP DAS iCAM IP Camera series. Users can trigger the connected IP camera to perform snapshot or video recording with IF-THEN-ELSE logic rules. WISE-523x/WISE-2x4xM provides the IP Camera Status webpage to display the event list ordered by time, and you can just click and play the images or videos on the browser. In additional, WISE-523x/WISE-2x4xM provides remote backup mechanism to upload images and videos to the remote FTP server automatically.



## OSD (On Screen Display)

WISE-523x/2x4xM can connect with iCAM series IP cameras. There are two methods to get images and videos:

(1) If-Then-Else rule sends commands to trigger camera to take snapshots and/or a video.

(2) Camera takes snapshots and/or a video when senses motion event. And then sends the snapshots and/or video to the WISE controller.

iCAM-ZMR8422X

iCAM-MR6422X

iCAM-MR6322

| | |
|---|---|
| Camera Name on OSD | Yes |
| Time Stamp on OSD | Yes |
| Text Message on OSD | Yes, user defined (Chinese and English fonts) |

## OSD with camera name, time stamp and user's defined text message.

DI#0 triggers camera
From WISE#1
**<IF>**
XV-Board XV310 DI0=Status Change
**<THEN>**
iCAM-MR6322(192.168.255.2:80) Snapshot Capture(One Time)
**<ELSE>**
No action

◄ If-Then-Else rule

▼ Telegram APP chat room

# IP Camera : iCAM Series

## Auto Focus IR IP Bullet Camera

### iCAM-ZMR8422X

**Bullet Type/**
**Auto focus with zoom**

2MP | 1080P Full HD | IP67 | ONVIF | PoE 802.3af

### Features

- Full HD 2.0 megapixel CMOS image sensor
- 1080P True H.264 AVC High Profile video compression
- H.264 and Motion JPEG multi-profile video streaming
- Auto focus with zoom / focus motorized lens
- 3D noise reduction (MCTF), 2D WDR function
- HDR function up to 100dB
- Digital PTZ and ROI (Region of Interest) supported
- Day and Night IR-cut removable LED, radiant distance up to 30m
- Built-in 4GB MicroSD Card
- ONVIF Profile S supported
- IP67-rated Housing

**iCAM-ZMR8422X** is a day & night 2MP auto-focused vandal resistant bullet IR IP camera. It features a full HD 2.0 megapixel CMOS image sensor. The camera has built-in IR-cut filter which allows clearer images at day and night operations even in the low lux condition.
The high efficiency IR LED radiant distance can extend up to 30 meters. Its auto-focus feature allows users to automatically focus the camera from a distant location. With motorized lens, all you need to do with zoom/focus adjustments is simply a click on browsers. Support with privacy mask, 3D noise reduction, 2D WDR function, and HDR function up to 100dB, it's easier implement iCAM-ZMR8422X into a range of environments such as retail, home, office, residential premises and hotel security.

## Vari-Focal IR IP Dome Camera

### iCAM-MR6422X

**Dome Type/Vari-Focal**

### iCAM-MR6322

**Dome Type / Fixed**

2MP | 1080P Full HD | IP67 | ONVIF | PoE 802.3af

### Features

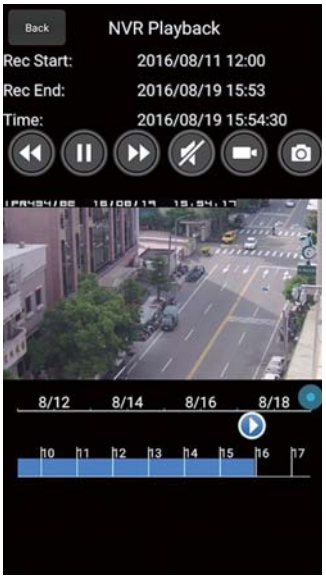
- Full HD 2 megapixel CMOS image sensor
- 1080P High Profile video compression
- H.264/MJPEG multi-profile video streaming
- HDR function up to 100dB
- IR cut filter for day/night operations, radiant distance up to 30m
- Built-in 4GB MicroSD Memory Card
- ONVIF Profile S supported
- IP67-rated Housing
- Lens: iCAM-MR6322 4mm; iCAM-MR6422X 2.8 – 12mm
- Aperture: iCAM-MR6322 F1.4; iCAM-MR6422X F2.0
- IR Angle: iCAM-MR6322 60°; iCAM-MR6422X 60° /90°

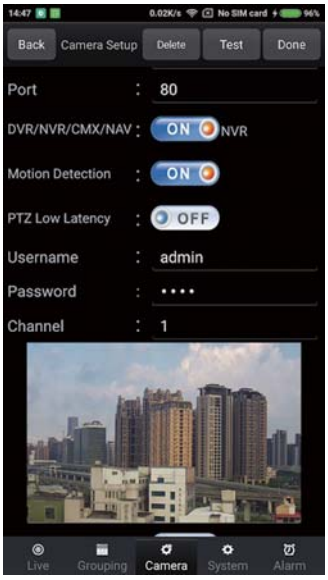
**iCAM-MR6422X/iCAM-MR6322** is an HD 30M-Rage IR Varifocal/Fixed Dome IP Camera in the M features 1080p at 30 frames per second, built-in Sense up+ technology to deliver stunning video in low-light conditions, and intelligent video surveillance (IVS) functions. Utilizing intelligent image signal processing, HDR, AGC control, and 3D Noise Reduction, the combination successfully delivers the ultimate low-light image without motion blur. The support of PoE, 4 privacy masking, white balance, as well as the minimum illumination 0.117 Lux at F1.4 for iCAM-MR6422X and the minimum illumination 0.13 Lux at F2.0 for iCAM-MR6322.

| Model | iCAM-ZMR8422X | iCAM-MR6422X | iCAM-MR6322 |
|---|---|---|---|
| **Lens/Night vision (infrared LED)** | | | |
| Focal Length | Vari-Focal: 2.8 to 8 mm | Vari-Focal: 2.8 – 8 mm | Fixed-Focal: 4 mm |
| Aperture | F1.6, Bullet | F1.4, Dome | F2.0, Dome |
| Angle of View | Horizontal: 102.3° W–51.6° T<br>Vertical: 51.3° W–24.9° T<br>Diagonal: 128.2° W–57.3° T | Horizontal: 102° W–34° T<br>Vertical: 54° W–20° T<br>Diagonal: 122° W–39° T | Horizontal: 90°<br>Vertical: 45°<br>Diagonal: 107° |
| Beam Spread | 60° | 60° , 90° | 60° |
| Radiant Distance | 30 M | | |
| Infrared Cut Filter | Auto/Day(Color)/Night (Mono)/Schedule | | |
| Image Sensor | 1/2.7" CMOS image sensor | | |
| **Video Streaming** | | | |
| Protocol/<br>Video Compression/<br>Number of streams | RTSP, RTCP, ONVIF Profile S,<br>H2.64 & MJPEG,<br>4 configurable streams, configurable frame rate and bandwidth, multi-profile video streaming | | |
| OSD<br>(On Screen Display) | Text overlay for date, time, camera name and user defined text | | |
| **General** | | | |
| IP Rating | IP67 | | |
| Certifications | CE, FCC(EMI CLASS B) | | |
| Encryption | Base64 HTTP encryption, HTTPS encryption | | |
| Dimension(mm) | 68(W) × 69(H) × 214(D) mm | Ø 120 × 106(H) mm | Ø110 × 89(H) mm |

## Support Android & iOS Mobile APP: IPCAMPlus

**iCAM-ZMR8422X/iCAM-MR6422X / iCAM-MR6322** provide smart phone APP for Android and iOS platform. Apps allow you to catch the firsthand notifications and to take over all event situations in real-time. Furthermore, using the App can also allow you to reward the recorded video remotely. While the alarm is triggerred, App will send a notification message to the user immediately.





## IIoT 1

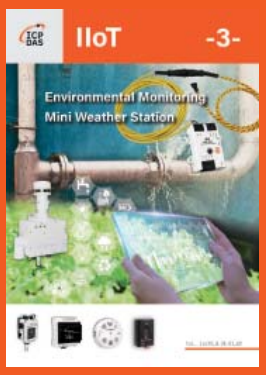
### Software . Controller/Server

- Cloud Management Software: IoTstar
- SCADA System Software: AVEVA Edge
- Condition Monitoring Solution: ExoWISE
- Edge Controller WISE Series
- Communication Server: UA Series
- MQTT Communication Server: BRK Series

## 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

- Energy Management Solutions
- Energy Management Applications
- InduSoft
- Power Meter Concentrator
- Smart Power Meter
- True RMS Input Module
- DN-800 Series
- iWSN/iXN Solution
- Infrared Thermography Temperature Monitoring
- Portable Power Monitoring Suitcase
- RPS-4M Redundant Power Supply

## IoT Cloud Software - IoTstar 2025

- Introduction
- Features
- Applications
- Controller Supported List
- Other Information

## 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

## PC-based I/O Boards

- PCI Express Bus Data Acquisition Boards
- PCI Bus Data Acquisition Boards
- ISA Bus Data Acquisition Boards

## TouchPAD HMI Solutions

- Introduction
- TPD/VPD Products Series
- Video Intercom & Access Control Series
- TPD/VPD Application

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