



**ICP DAS**  
www.icpdas.com

Web Inside, Smart Engine

# WISE

**A Web-based  
Intelligent PAC Controller**

- WISE-523x/WISE-224xM IIoT Edge Controller
- WISE-580x Intelligent I/O Controller
- WISE-71xx/7901/7255 Intelligent I/O Module
- WISE-75xxM Intelligent MQTT I/O Module



**TAIWAN  
EXCELLENCE**



**WISE Brochure  
Vol. WISE 1.08.03-EN**



**wise.icpdas.com**

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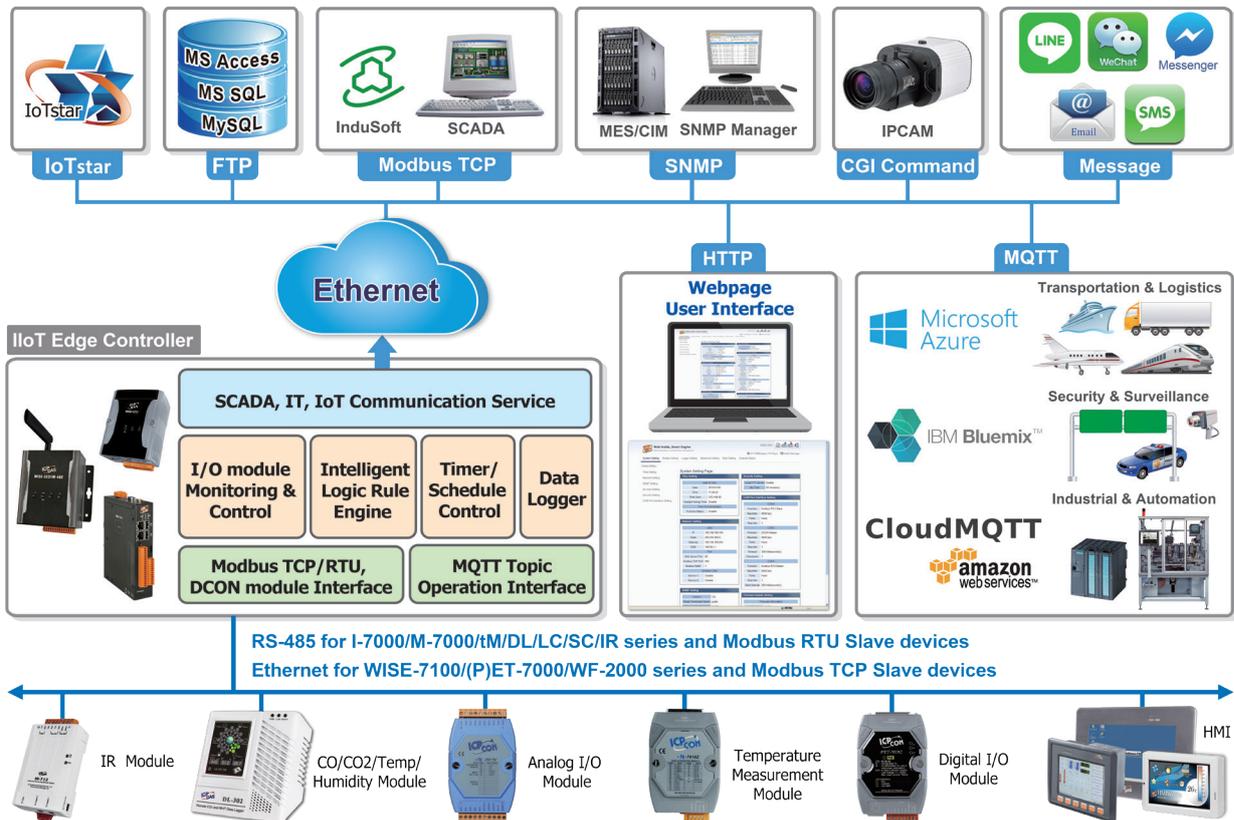
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## Introduction

WISE (Web Inside, Smart Engine) is a product series developed by ICP DAS that functions as control units for use in remote logic control and monitoring in various industrial applications. 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 system development.

## WISE Architecture



Through Web browser, users can access Web server on WISE controllers to perform tasks such as logic rule edition or download. An IF-THEN-ELSE rule engine will be set to manage and deploy the logic rules for the controllers. The rule engine will check and determine whether to perform the execution of actions under specific conditions or not, for examples: set up I/O channel values, perform Timer/Schedule tasks or sending alarm notification message under a specific condition. In addition, through Modbus TCP/RTU protocol, SCADA package is able to control or monitor I/O channel or system status on WISE controller in real time.

WISE-580x/WISE-523x/WISE-224x even 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. 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 for further administration management or data analysis.

WISE-523x/WISE-224x supports a variety of IoT communication protocols (SNMP, MQTT, CGI, FTP), which can be quickly integrated with various IoT/MIS/MES systems for applications such as Unmanned Facility Room Monitoring, Smart Factories, Smart Buildings...etc. WISE-523x/WISE-224x can also connect to a public IoT cloud platform (such as Microsoft Azure or IBM Bluemix) and ICP DAS IoTstar IoT cloud management software. Through the functions of "Well-thought-out data collection operation with sensor", "Intelligent real-time logic operation at field side", and "Easy integration with IoT/SCADA environment", WISE-523x/WISE-224x is not only a controller of IIoT edge computing for the field-side sensors in IoT applications, 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!

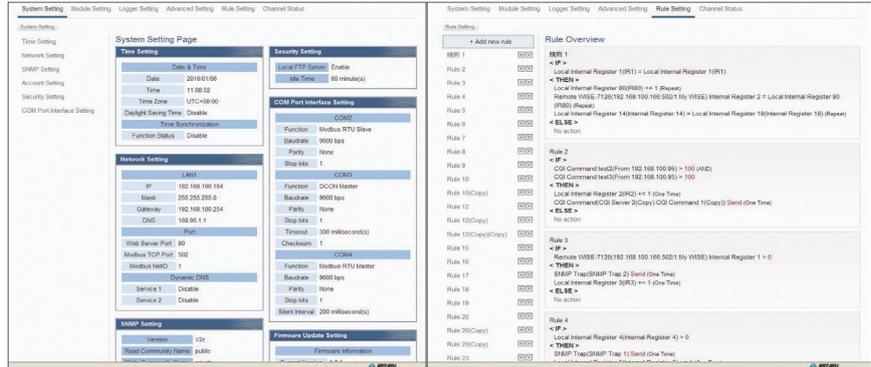
## WISE Applications

- Building Automation
- Factory Automation
- Machine Automation
- Remote Maintenance/Diagnosis
- Environment Monitoring
- Facility Management

## 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.

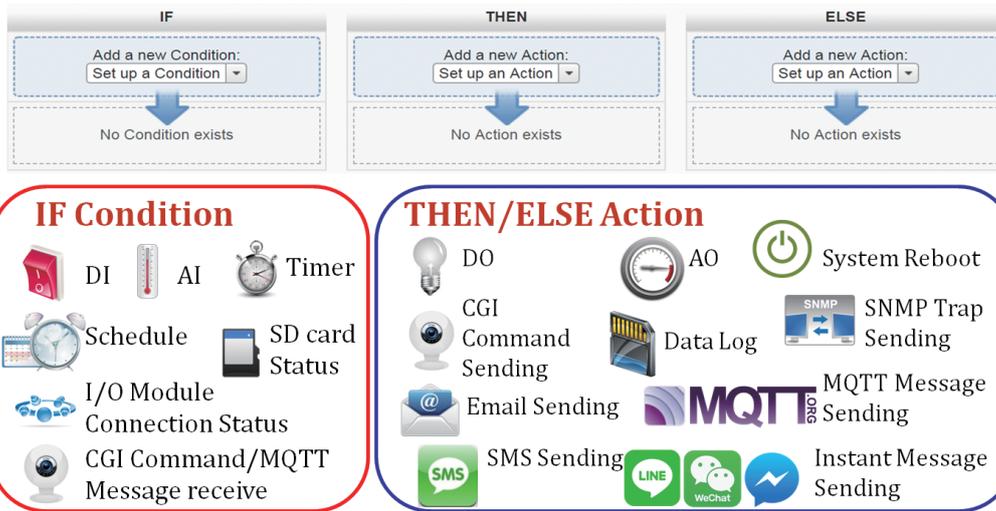


▲ WISE Web User Interface

▲ Click and get done!

### 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.



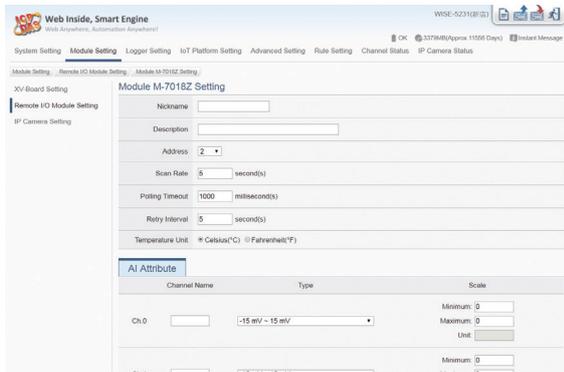
### Connection ability to a variety of sensors and devices

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.



## Offer various options for I/O channel settings

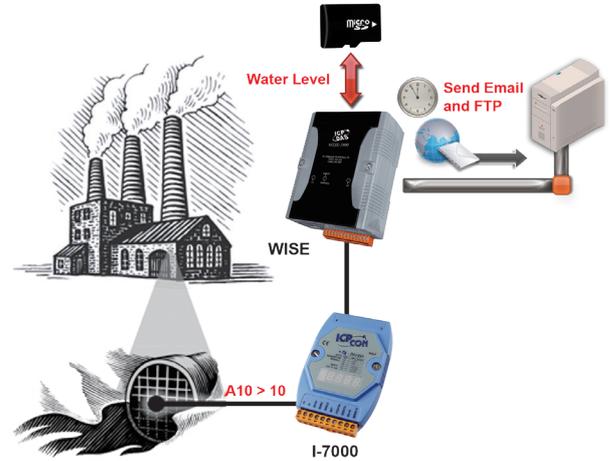
WISE offers various options for I/O channel settings; for example: noise filter for DI signals, deadband setting for AI signals, linear scale setting, temperature degree in Celsius or Fahrenheit setting, power on value setting for DO channel, pulse output setting and DI/DO counter setting, etc.



▲ AI attribute setting

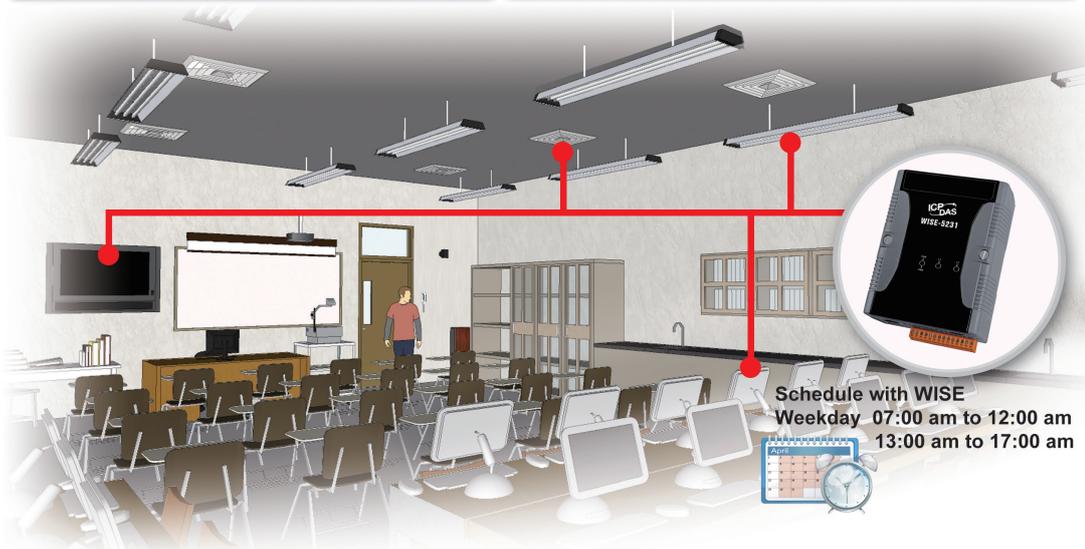
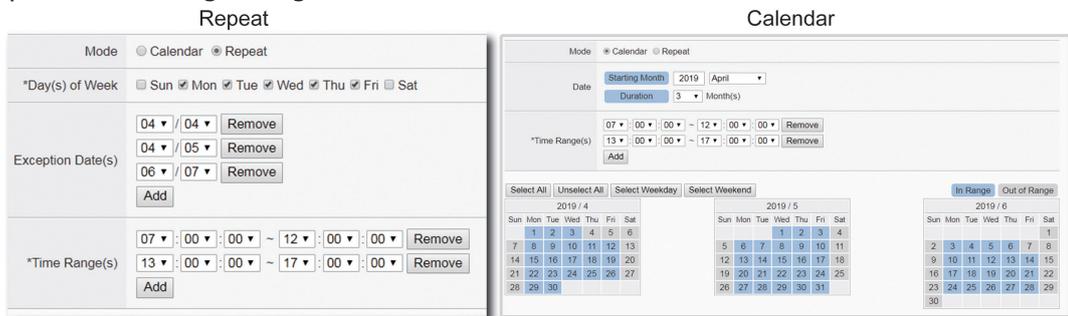
## Data Logger operation

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 to the control center for further administration management or data analysis.



## Provide Timer and Schedule operation

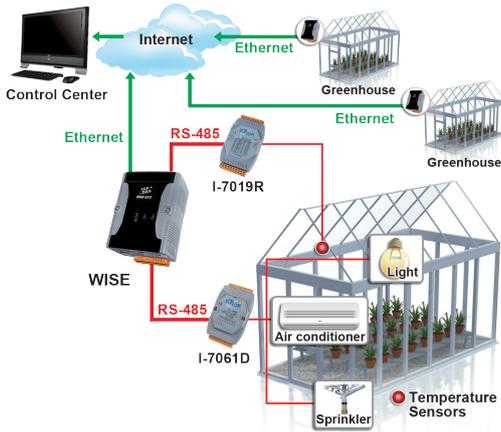
WISE features Timer function. It allows to perform the timing delay of the working logic rule. In addition, WISE also provides Schedule function to perform the prescheduled routine tasks. Through the two setting interfaces of the Calendar and Repeat (weekly) provided by the Schedule function, the administrator 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.



▲ Schedule function

### Active I/O sending mechanism

In addition to the Modbus TCP/RTU slave function that enables SCADA system to poll the I/O channel data of the WISE, now WISE 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 channel data of the controller actively to SCADA/IT 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 system.



▲ Active I/O sending mechanism

### Advanced P2P function between WISE I/O Modules

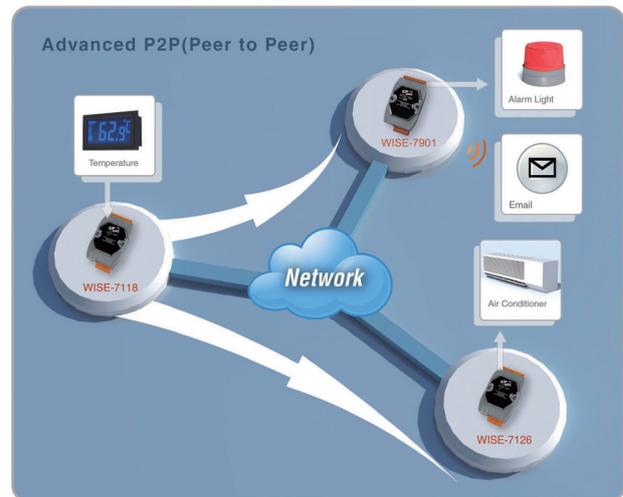
WISE-7xxx offers P2P function that enables WISE-7xxx controllers to directly communicate with other remote WISE-7xxx controllers on networks. The controllers can freely share their status information such as I/O channel value, DI/DO counter and Internal Register to each other. The P2P operations can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

### 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 edition 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.



▲ CGI Command Sending Function



### Support math formula editing function

WISE-523x/WISE-224x 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 "/", superscript "^", 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.

**Formula Setting**

Function Status  Enable

\*Content of Formula  View Edit

|                                   |                      |                      |
|-----------------------------------|----------------------|----------------------|
| M-708(2)                          | No.1                 | No.2                 |
| M-7017(3)                         | Internal Register 1  | Internal Register 2  |
| M-7080(4)                         | 0.000                | 0.000                |
| M-7088(5)                         | No.7                 | No.8                 |
| M-7024(8)                         | Internal Register 7  | Internal Register 8  |
| LAN                               | 1199.994             | 0.000                |
| WISE-7126 (192.168.100.235:502/1) | No.13                | No.14                |
| Other                             | Internal Register 13 | Internal Register 14 |
| Internal Register                 | 0.000                | 115086.700           |

## Support LINE, WeChat, Facebook Messenger, SMS and Email sending functions

WISE supports LINE, WeChat, Facebook Messenger, SMS, and Email sending function for real-time message notification. The message sending action can be added to the logic edition as part of logic control to provide real-time message notification to the related personnel when an event occurs. In addition, when WISE connects with ICP DAS iCAM series IP cameras, WISE can send the pictures and videos to the manager by LINE and WeChat.



## Support SMS command receiving function

WISE-5231M-3GWA and WISE-523xM-4GE/4GC 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, WISE-5231M-3GWA and WISE-523xM-4GE/4GC 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.



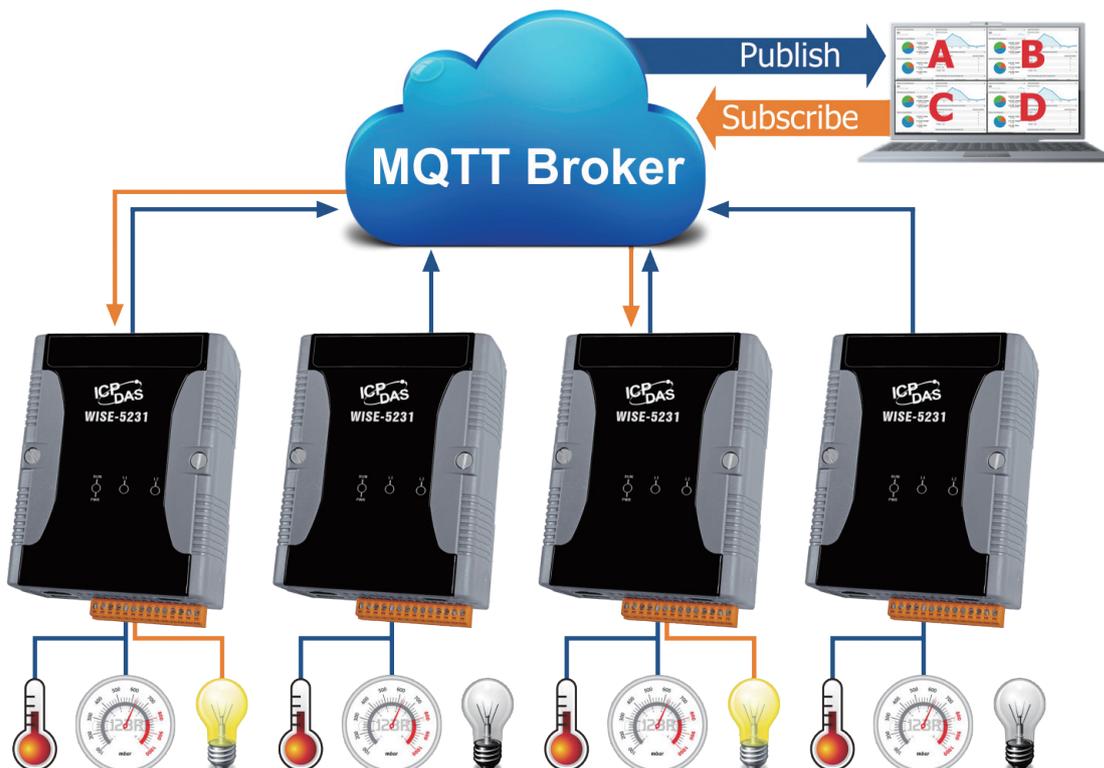
### Support 4G/3G mobile network communication

In addition to Ethernet interface, WISE also provides 4G/3G mobile communication interface. It can send the real-time data of sensors and I/O modules, data logger files and alarm messages back to the control center by 4G/3G mobile network.



### MQTT Message Publish/Subscribe operation

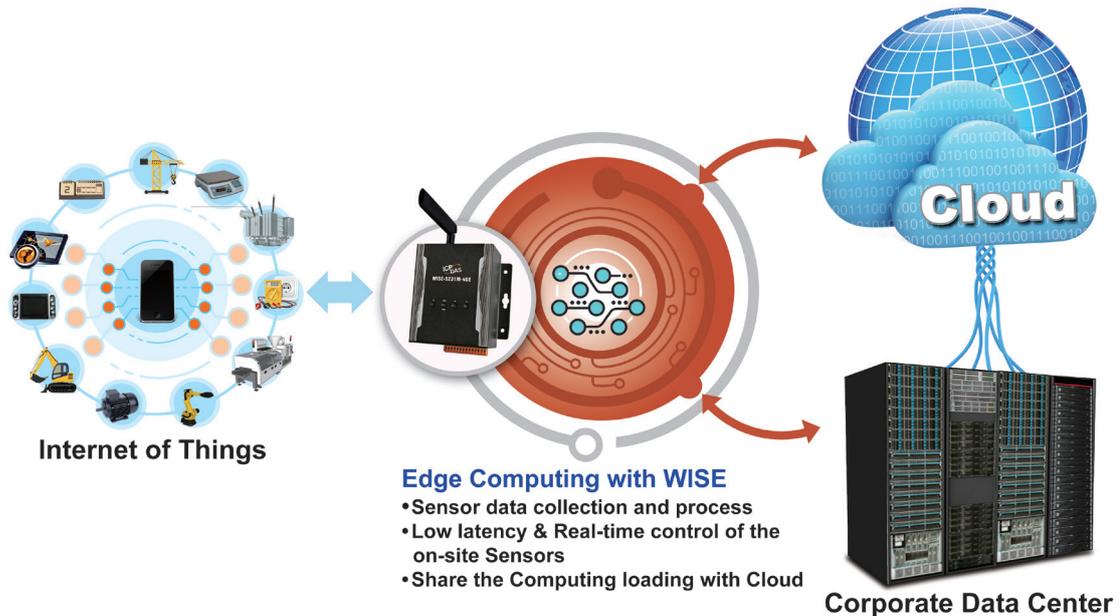
WISE-523x/WISE-224x supports the MQTT protocol. It can publish the I/O data of the I/O modules (connected to WISE-523x/WISE-224x) to the MQTT broker, and it can also receive the message content of the Subscribe MQTT Topics published by others MQTT device for the data logging operation or use it in the IF-THEN-ELSE logic rule.



## Well-thought-out Edge Computing mechanism

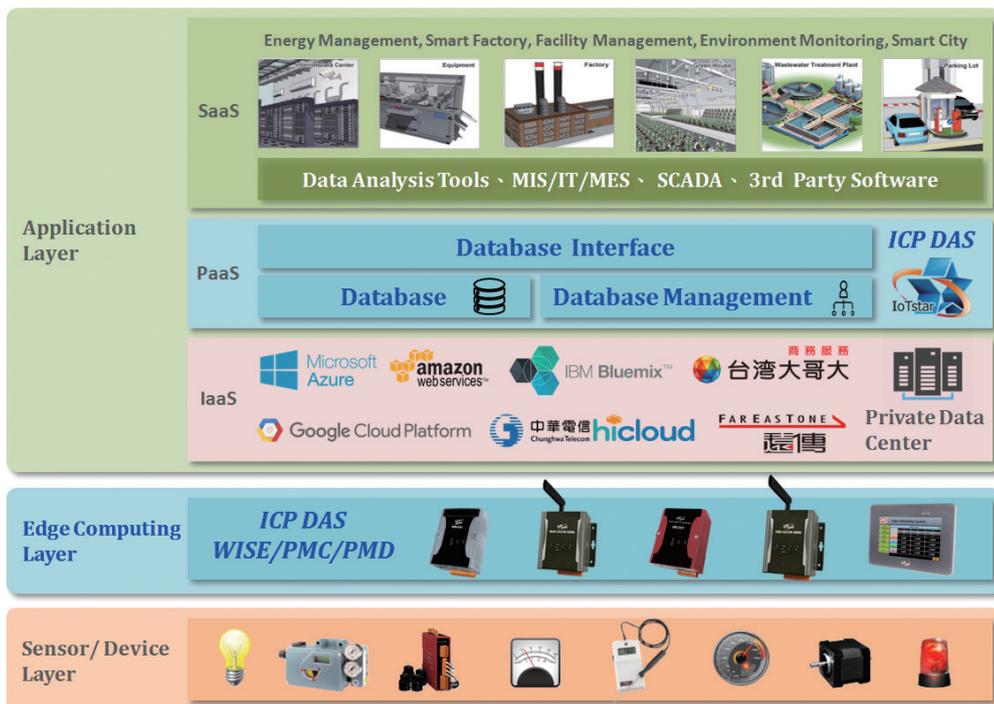
In the traditional IoT Cloud application, the cloud platform and sensors are directly connected via network. The huge amount sensors data may bring heavy burden to the Cloud Platform and network. In addition, once the network is disconnected, the Cloud Platform and sensors can no longer perform data transmission and communication.

The Edge Computing mechanism provided by WISE-523x/WISE-224x can solve this problem; WISE can pre-process and perform log operations of the sensor data, and then transmit the processed data to the Cloud Platform. For the sensor data can be processed in advance, the network load can be reduced significantly and ensure the integrity of the sensor data. In addition, WISE is equipped with intelligent logic computing capabilities, it can share the computing operations and reduce the load of the cloud platform. Meanwhile, it also performs the on-site real-time control of the sensors. By using WISE, it can meet the Edge Computing requirements for the IoT cloud application and achieve "low latency, real-time and integrity".



## Connection with IoT Cloud Platform and ICP DAS IoTstar

WISE 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 and I/O modules, collect and transfer the I/O channel data to the cloud platform for future data analysis. WISE 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 remote management service and firmware update to WISE, and the remote data service to receive the data log file of the sensors from the WISE and import the content of the data log file into the database.



**WISE Surveillance Solution**

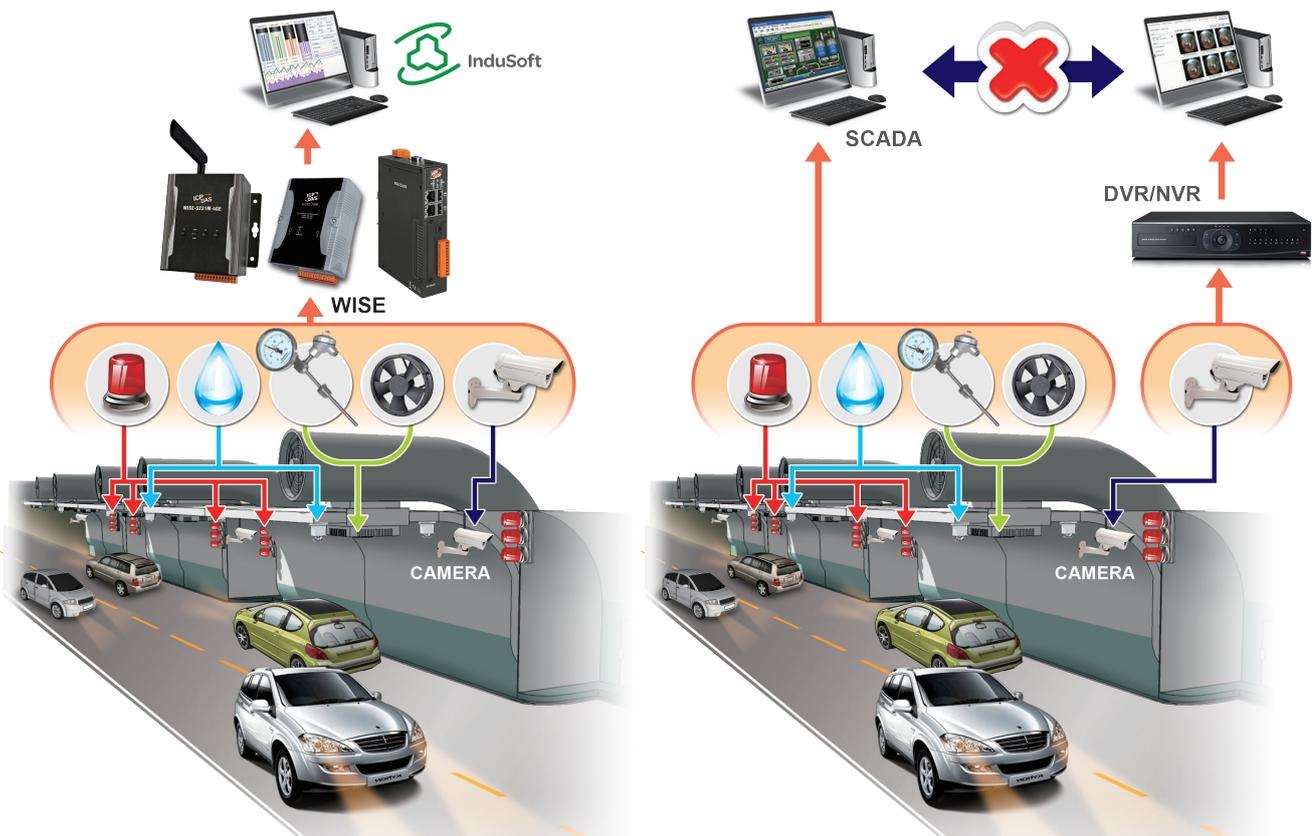
# WISE IIoT Edge Controller + iCAM IP Camera

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 modules(temperature, doors and windows switch, water level, etc.) at the same time.



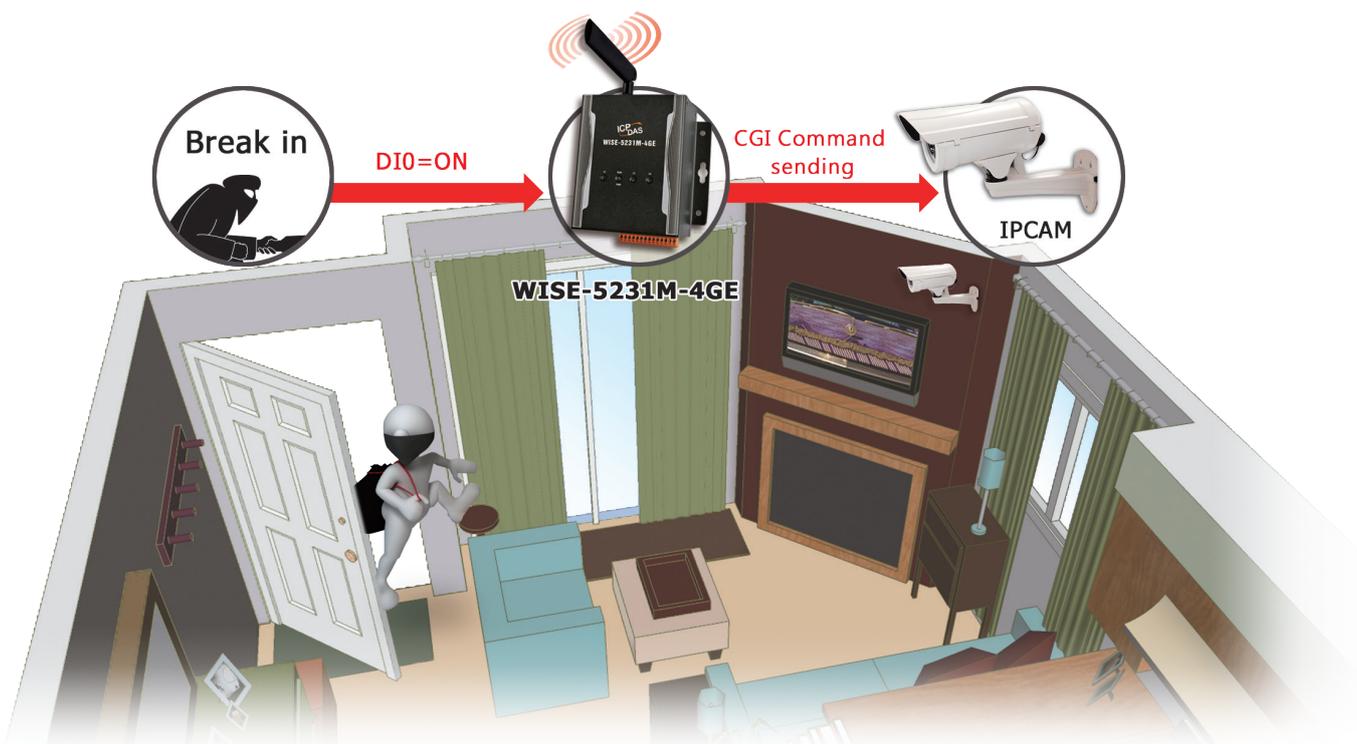
ICP DAS WISE surveillance solution integrates logic control, I/O modules, camera and data log in one single WISE controller. WISE allows two-way interactions between the I/O modules and the camera; it enables to record a piece of video or to take images when there is an event triggered by either I/O channel 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 modules   | 1. Two systems (SCADA & DVR/NVR) are independent without information exchange |
| 2. Record important security video and images only, very little storage space required   | 2. Record video 24H/7Days, needs huge storage memory                          |
| 3. Two-way interaction between I/O modules and Video/Image   | 3. I/O modules and Video/Image are independent without information exchange   |
| 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 <ul style="list-style-type: none"> <li>● Controller: WISE Series</li> <li>● I/O Module: Options for RS-485, Ethernet interfaces</li> <li>● Camera: Bullet, Fisheye, Dual Lens</li> <li>● SCADA: InduSoft</li> </ul> | 5. Buy from different venders for SCADA, I/O modules, DVR/NVR                 |



## Well-thought-out CGI command operation with IP Camera

WISE-523x/WISE-224x allows connections to 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-224x 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 addition, WISE-523x/WISE-224x provides remote backup mechanism to upload images and videos to the remote FTP server automatically.



## IoT Cloud Management Software - IoTstar

Build your IoT with ICP DAS IoTstar

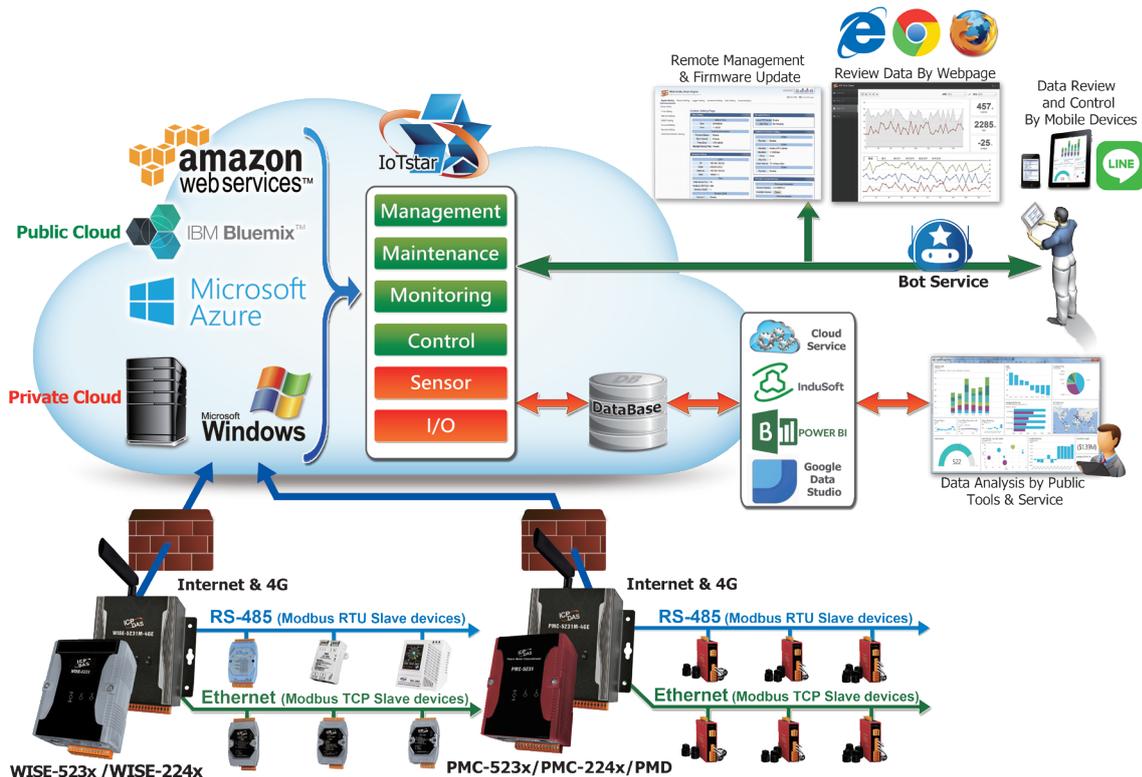


### Introduction

IoTstar is a software developed by ICP DAS for use in remote monitoring and management of the WISE/PMC/PMD controllers in a variety of Industrial IoT applications. IoTstar can be installed on a general PC platform and works as a Private Cloud management system for the WISE/PMC/PMD controllers, or on the VM (Virtual Machine) platform of Microsoft Azure, IBM Bluemix or Amazon AWS, etc. and works as a Public Cloud management system for the WISE/PMC/PMD controllers. In addition to providing remote maintenance and firmware update services on the WISE/PMC/PMD controllers, IoTstar can also collect the I/O channel data and power data from the I/O modules (or Sensor) and Power Meter connected to the WISE/PMC/PMD, and then import these data into the Database to provide the services such as status query and display on the automation control and monitoring system in the Cloud environment.

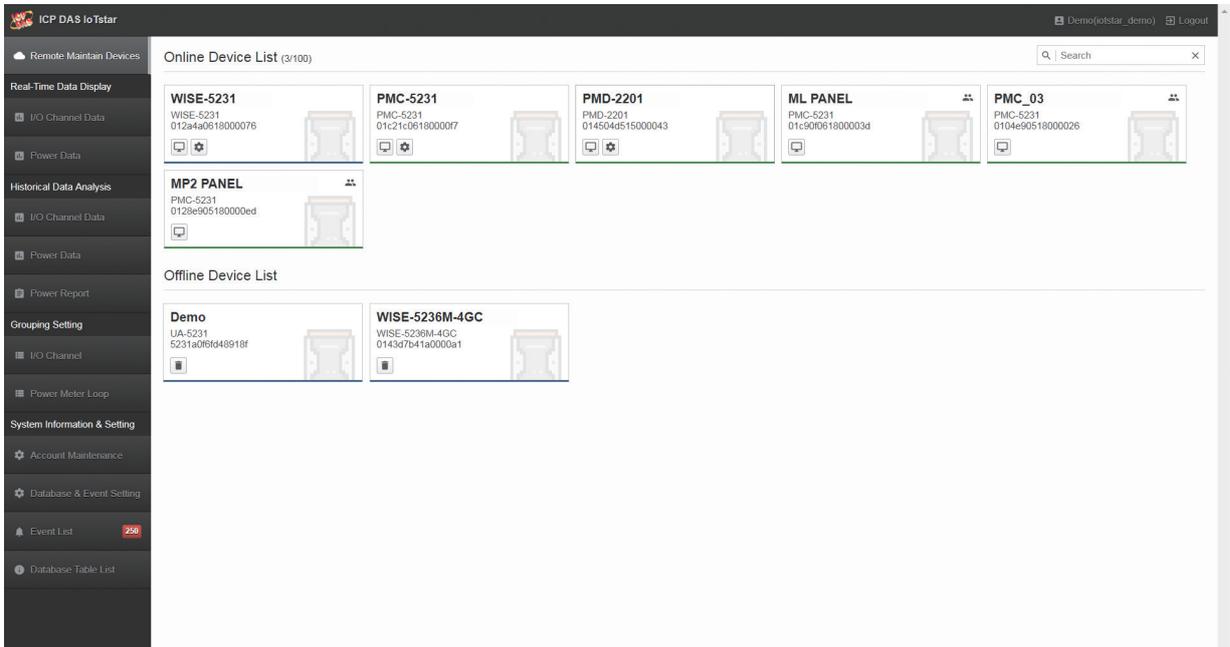
With IoTstar, users can complete the system setting only by a few clicks on Web page, and perform the Remote Access (Status Monitoring, System Setting, and Firmware Update) and Data Service (Sensor data collected and imported into Database) operations for each WISE/PMC/PMD. Through the SQL database command, IoTstar can be quickly integrated with the Cloud platforms, data analysis tools (Power BI, Google Data Studio, etc.) or SCADA systems to help users quickly build the Cloud "IoT + Big Data" application and significantly reduce the time and cost for the implementation of Cloud "IoT + Big Data" application.

### System Architecture



## Features

- No more programming! Using Browsers to perform Remote Maintenance on WISE/PMC/PMD controllers, and import the I/O channel data (and Power data) from WISE/PMC/PMD controllers into the Database.



- Can be installed on the VM (Virtual Machine) of the Public Cloud platform such as: Microsoft Azure, IBM Bluemix or Amazon AWS to implement the Public IoT Cloud solutions on the WISE/PMC/PMD controllers.

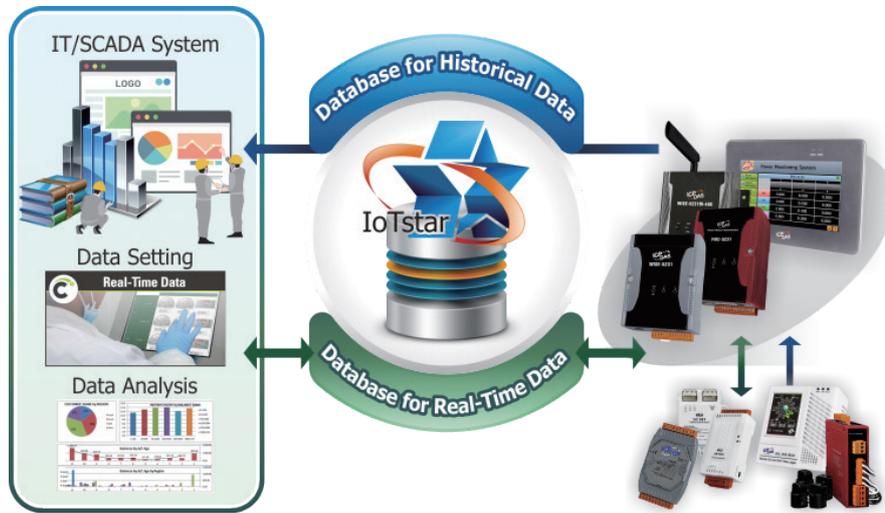
- Can be installed on Windows system (Windows 7/8/10, Windows Server) to implement the Private IoT Cloud solutions on the WISE/PMC/PMD controllers.



- Enables the remote maintenance and firmware update on the WISE/PMC/PMD controllers via user-friendly and intuitive Web page interface.



Collect the Historical and Real-Time sensor data (and Power data) from the WISE/PMC/PMD controllers, and import them into the Database. User can modify the database data to change the status of the DO/AO channel of the sensor connected to WISE/PMC/PMD through the SQL command. Please note: IoTstar currently support MS SQL.

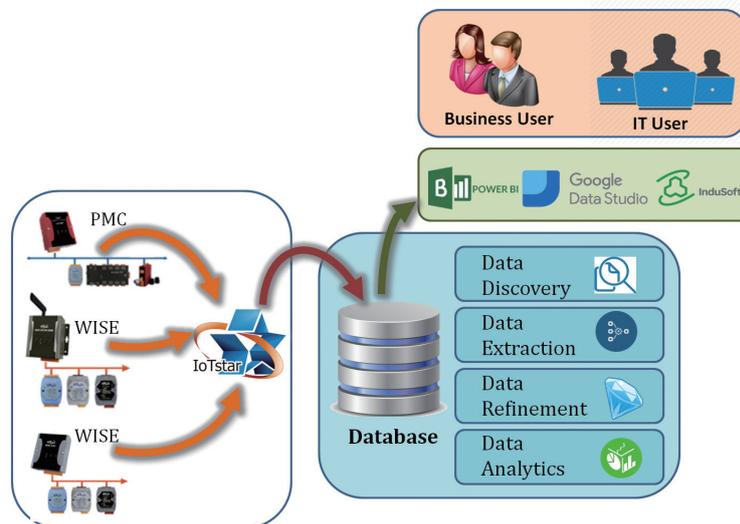


By Database interface, it is easy to integrate with SCADA, Data Analysis tools (Microsoft Power BI, Google Data Studio) or the Service of Cloud platform to retrieve the sensor data (and Power data) directly from the Database for Big Data analysis.

User can review the sensor data (and Power data) directly by the built-in IoTstar Web page interface.



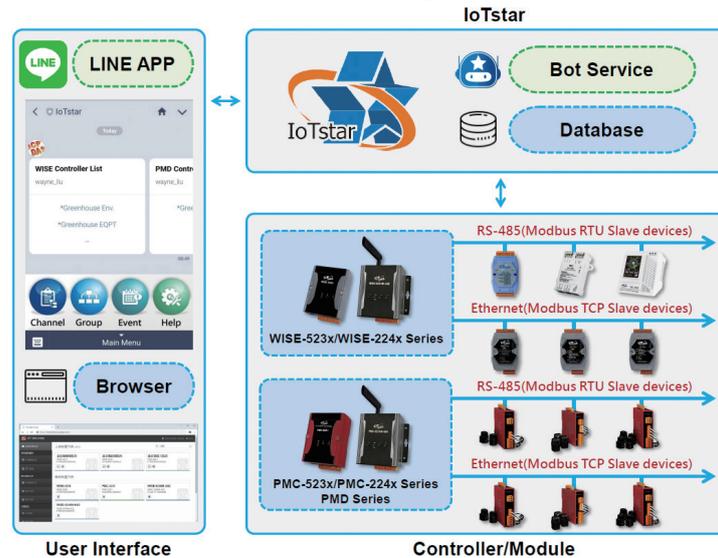
The users can quickly setup the Data pool for their IoT system by receiving and importing the sensor data into the Database through the IoTstar. User can analyze the sensor data with analysis tool, the status can be known, and the necessary actions can be taken in advance to avoid possible damage.



## IoTstar Bot Service (Supported LINE App)

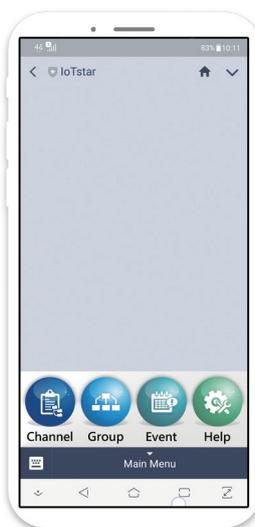
IoTstar Bot Service is an optional software package for IoTstar that provides users two-way message interactions between the WISE/PMC/PMD controller managed by IoTstar and LINE chat rooms. IoTstar Bot Service provides an easier and more convenient mechanism for user to manage his/her remote controllers with LINE App. It does not like the traditional Chatbot which get the information or service by entering the text message; it provides a friendly user interface that includes buttons and dialogue menu to perform the monitoring of remote controllers in an easy way.

With IoTstar Bot Service, users can query the real-time I/O Channel data (or power data) of the on-site I/O modules or power meters and be able to change the value of DO/AO output channels anytime and anywhere. IoTstar Bot Service also provides functions to receive, store, and query the event messages. The controllers can be triggered to send event messages to IoTstar Bot Service by IF-THEN-ELSE rules. After IoTstar Bot Service receive these event messages, it would process and send them to relative LINE users for real-time alarm notification. In addition, IoTstar Bot Service also provides the function to store and query the historical received event messages for system operation analysis.

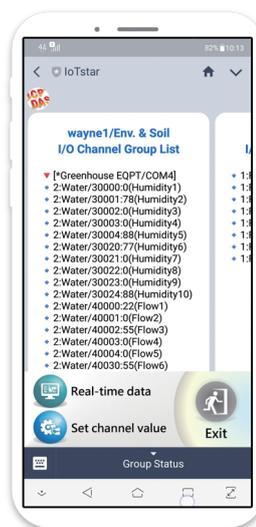


## Features

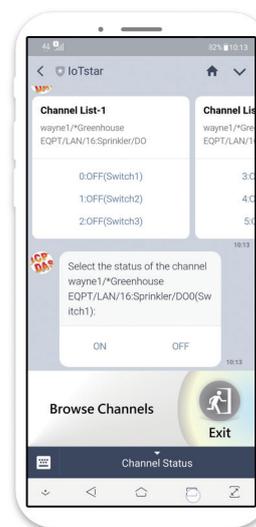
- Monitor WISE/PMC/PMD controllers anytime and anywhere by LINE App.
- Query real-time I/O channel (power meter) data and change the value of DO/AO channels..
- Quickly browse the real-time I/O channel data efficiently by Grouping data.
- Receive real-time event messages with text, pictures or videos (WISE can work with the iCAM IP camera to send the picture or video files).
- Review and query the historical event messages.
- Secure and reliable communication mechanism between LINE and controllers.
- Easy to Maintain; only need the upgrade of LINE App.



Operation  
User Interface



Query I/O channel  
(or power) data



DO/AO channel setting



Event notification  
and query

## Applications

### Monitoring System for Ranch

In the environment of the ranch, due to the ranches generally consist of large areas, it is necessary to collect the sensor information from all over the ranch through wireless technology, 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.

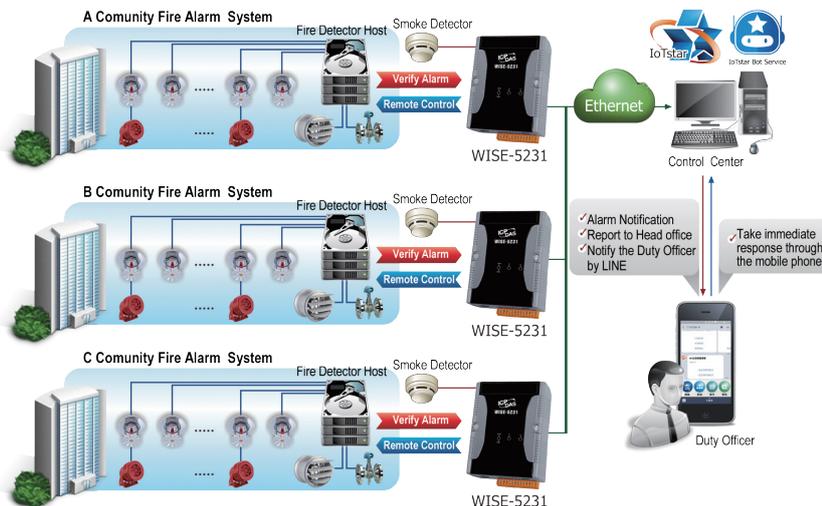
WISE-5231M-4GE can work with the ZT-2550/ZT-2551 Zigbee wireless communication module to collect the temperature and humidity information throughout the ranch and detect rain through the rain detector. If the rainfall intensity is too high or rainfall is too much, it can be covered by the electric retractable curtain automatically or manually via the WISE-5231M-4GE. WISE also supports LINE Notify message sending. It can be used with scheduled function to send messages to report the current status of the equipment and environment of the ranch, or to send the alarm notification message to the manager 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 manager of the ranch and reduce loading of the task.



### Community Fire Alarm System

Hydrant equipment is an indispensable part of the Community/Home security system. Nowadays, most communities are equipped with the Hydrant equipment. However, most of the Hydrant equipment is old version and has no Internet connection function. If we can improve the functionality of the Internet connection for these Hydrant equipment, then the real-time information of the sensor and the status of the Hydrant equipment can be sent to the Internet Cloud system, the manager of the Hydrant system can receive the real-time alarm notification through the mobile phone at anytime and anywhere, and then also can control the operation of Hydrant equipment remotely to avoid or reduce the damage. It will increase the reliability of the Community/Home security system.

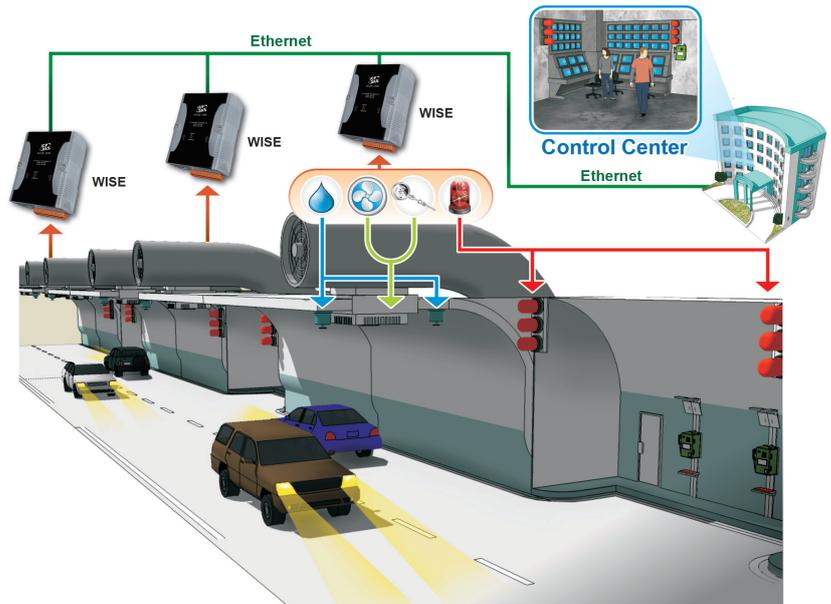
WISE-5231 supports the Modbus RTU protocol, which can be connected to the Central Control Host of the Fire Detector to get the real-time information, control the Hydrant equipment, and it can also work with a smoke detector to enhance the fire detection capability. The distributed WISE-5231 in different areas of the community can transmits the sensor data of Hydrant equipment to the IoTstar Cloud Management software for data collection and analysis. With the IoTstar Bot Service, when the fire is detected, the Bot Service will send the alarm notification message to the mobile phone of the duty officer by LINE App. The duty officer also can check via the LINE App to see if the on-site Hydrant equipment has been activated or not. If not, the Hydrant equipment can be activated through the LINE App in real time. It provides convenient and immediate community safety management mechanism.



## Tunnel Monitoring System

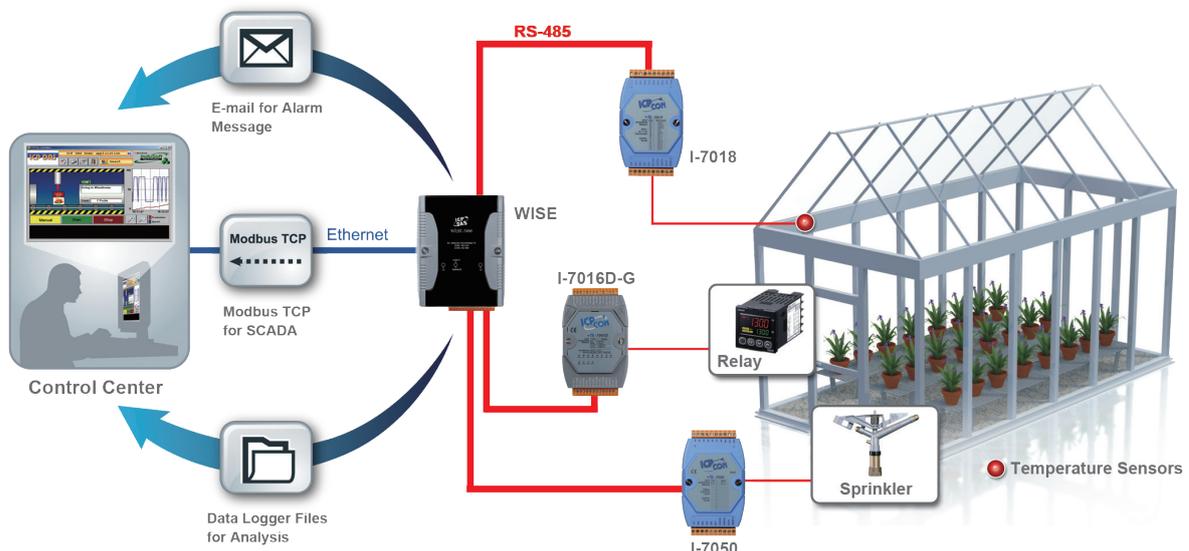
The security maintenance in a tunnel is a tough work and it is time sensitive. For it always requires to monitor a wide range of areas in the tunnel, if all monitoring jobs only rely on manual operations when a disaster happened, it might cause delays and lead to huge losses. WISE controller allows to connect to various I/O modules and is able to response to the emergency in real-time. In this case, the WISE controllers 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 controllers, 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.



## Greenhouse Automation Solution

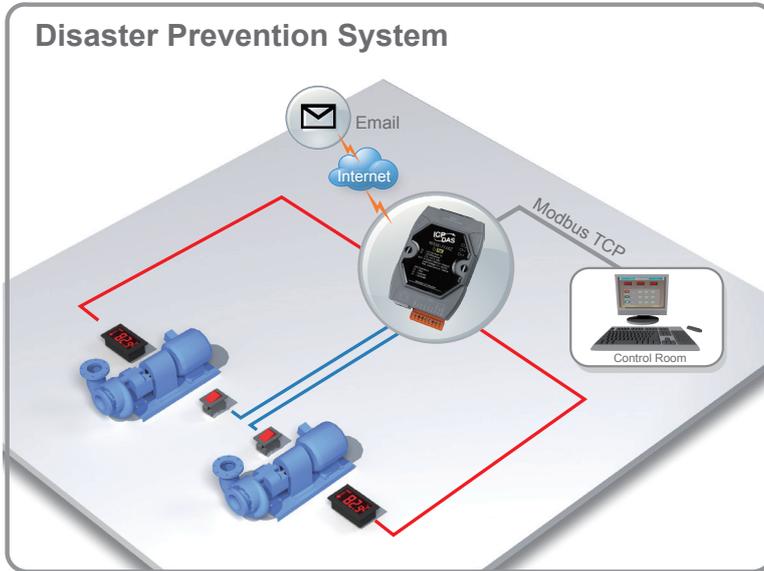
Greenhouse cultivation represents a very important role in modern agriculture. As the greenhouse usually is equipped with various high-tech equipment, management tend to be very complex. A fully automated greenhouse control systems bring obvious benefit such as labor saving, but far more importantly, it enables improved quality of produce and information gathering that will make difference between earning a profit or suffering substantial losses.



WISE allows to connect to various I/O modules for thermocouple inputs that allow real-time monitoring of the temperature and humidity in the greenhouse; the DO module can be connected to various greenhouse facilities. It will real-time detect the greenhouse status and in response to sensors connected; the control system will automatically adjust vent position, fans, heating, fogging, shading, lighting, irrigation frequency, irrigation nutrient levels and CO2 levels, etc. WISE controller will tirelessly monitor the key environmental factors that affect crop quality and will make constant changes that a grower could not possibly achieve the same consistency level. In addition, WISE controller also support Modbus and IIoT protocols so that information can be instantly transmitted to the control center and makes real time monitoring of the overall status for each greenhouse more efficiently.

## Disaster Prevention System

In factories, most facilities and devices involved are all subject to overheating damage. From improper site wiring, lightning strikes, to overrun motors, a wide variety of overheating issues threaten systems and peripherals constantly. To ensure the safety of personals/devices, eliminate unnecessary machine downtime and achieve maximum productivity, it is necessary to build an automated system that enables real-time monitoring and disaster prevention.



WISE controller provides a total solution for disaster prevention/monitoring system that will detect temperature for various devices in the factory in real time. It also enables communication between devices that will initiate immediately actions in response to emergencies. For example, in response to pre-set critical temperature threshold, the system will take actions such as auto-stop the devices, turn on the temperature reduction devices, and send alarm notification to the related personnel. WISE controller also support Modbus and IoT protocols so that information can be instantly transmitted to the control center and makes response to emergencies and real time monitoring of the overall factory operation more efficiently.

## Unmanned Facility Room Monitoring System

As the advance in science and technology development, the power system and the network system have become essential parts of modern life. No matter in the buildings, factories, or even outdoors, there are always control rooms with devices installed for power and network management and control. Due to the control rooms are always filled with all kinds of expensive devices and usually under high loading operations; the monitoring of temperature and humidity, and power consumption management become important issues for the whole system. WISE can be used for monitoring the unmanned facility room. WISE allows to connect to ICP DAS I/O modules and Modbus slave modules; therefore it is able to connect with thermometer, hygrometer, air conditioner, warning devices and power meters. Logic rules for daily regular maintenance in the control room can be set on WISE controller, such as:

- ▶ When the room temperature is getting too high and being detected, the air conditioning equipment will be turned on and a real-time alarm message will be sent to related personnel.
- ▶ Set up the rotation schedule for air conditioning devices to take turns operating to ensure the air conditioning devices won't be damaged due to prolonged operation.
- ▶ If an air conditioning device is detected to be damaged, the back-up air conditioning will be turned on for redundant operation and a real-time alarm message will be sent to related personnel.



In addition, it allows to connect to WISE controller by SCADA software to perform the control, monitoring and collection of the I/O channel data of the facilities. And the power consumption of facilities in the control room can be statistically calculated in order to manage the electricity usage and cost as well.

## Environment 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 for it involves complicated process and considerable number of devices needed during operations. In order to achieve reliable, high-performance, efficient and cost-effective result, automation approaches are essential to wastewater treatment solutions.

ICP DAS WISE controllers 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 response immediately based on the wastewater level.

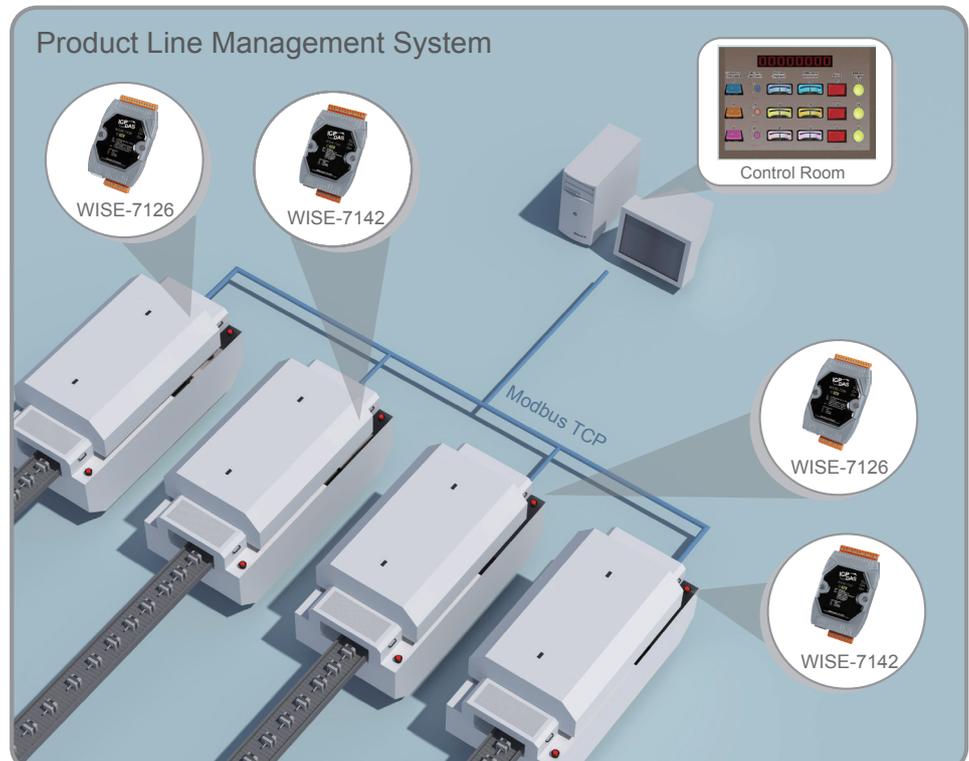
For example, when the wastewater level drops, the floodgate will be opened to load wastewater to desired level; and if the wastewater accumulates in the tank reaches a certain level, it will start the pumps to process treatment until the level decreases. In addition, WISE controller also allows sending Alarm notification message regarding current water level to the related personnel for immediately response.



## Production Line Management

Eliminating unnecessary machine downtime, ensuring maximum productivity and maintaining appropriate stock are keys to successful product line management. WISE controller features flexible logic functions and is an easy-to-learn and easy-to-use tool for creating cutting edge applications that makes it easy to take full control of your product line management. ICP DAS offers full-range I/O modules that works with WISE controller that enables to connect with product line devices in various applications. The logic engine on controllers make it possible to set up different automation process by just a few clicks, for example: by connecting conveyer to WISE controllers,

it allows to hold the conveying of semi-finished product during the manufacturing process for further processing; measure productivities statistics, or notify the operators ready for next steps. In addition, WISE controller can also be set to detect and response immediately when an error occurs during the manufacturing process to avoid the waste of raw materials or equipment damage. WISE controller also support Modbus and IoT protocols so that information can be instantly transmitted to the control center and makes real time monitoring the overall production line status more efficiently.



## WISE Selection Guide

### IIoT Edge Controller

| Product Model   |          | WISE-523x   | WISE-224xM              |
|---|----------|---|-------------------------|
| Picture   |          |   |                         |
| Hardware Specification                                    |          |   |                         |
| MicroSD Interface   |          | Built-in 4 GB microSD (support up to 32 GB microSD)   |                         |
| I/O Module Support  | Local    | With XV-board   |                         |
|   | Remote   | <ul style="list-style-type: none"> <li>RS-485: DCON module or Modbus RTU module</li> <li>Ethernet: Modbus TCP module</li> </ul>   |                         |
| Communication Interface                                   | Ethernet | 10/100/1000 Base-TX * 1   | 10/100/1000 Base-TX * 2 |
|   | 3G       | WISE-5231M-3GWA   | -                       |
|   | 4G       | WISE-523xM-4GE, WISE-523xM-4GC  | -                       |
| Software Function - Basic Operation                       |          |   |                         |
| Web page Interface  |          | Yes   |                         |
| IF-THEN-ELSE Logic Rule                                   |          | Yes (Unlimited)   |                         |
| I/O channel monitoring and control                        |          | Yes   |                         |
| Timer   |          | Yes (Unlimited)   |                         |
| Schedule  |          | Yes (Unlimited; More powerful)  |                         |
| Internal Register   |          | Yes (100 set; 20 of them provide "Retain Variable" mechanism)   |                         |
| Data Logger   |          | Yes (More sets)   |                         |
| SNTP Time Synchronization                                 |          | Yes   |                         |
| Software Function - Integration with SCADA/IT/IoT Systems |          |   |                         |
| Connect to SCADA  |          | Yes (Modbus TCP & Modbus RTU)   |                         |
| Message Notification                                      |          | <ul style="list-style-type: none"> <li>Email Sending (non-SSL &amp; SSL)</li> <li>SMS Message Sending (WISE-5231M-3GWA, WISE-523xM-4GE and WISE-523xM-4GC)</li> <li>LINE Notify Message Sending</li> <li>Facebook Messenger Message Sending</li> <li>WeChat Message Sending( apply to WISE-5236 series only)</li> </ul> |                         |
| CGI Command   |          | Yes (CGI Command Sending & Receiving)   |                         |
| FTP Operation   |          | Yes (FTP Client & FTP Server)   |                         |
| SNMP Agent  |          | Yes   |                         |
| MQTT Client   |          | Yes (non-SSL & SSL)   |                         |
| DDNS  |          | Yes   |                         |
| IoTstar supported   |          | Yes   |                         |
| Connect to public Cloud platform                          |          | Yes (Microsoft Azure & IBM Bluemix)   |                         |

## WISE Selection Guide

### Intelligent I/O Module

| Product Model | WISE-580x   | WISE-7901   | WISE-71xx  | WISE-7255   | WISE-75xxM  |
|---------------|---|---|--|---|---|
| Picture       |  |  |  |  |  |

| Hardware Specification  |          |  |         |                       |  |   |
|-------------------------|----------|--|---------|-----------------------|--|---|
| MicroSD Interface       |          | <ul style="list-style-type: none"> <li>WISE-580x: Built-in 4 GB microSD (up to 32 GB microSD)</li> </ul>                                   |         |                       |  |   |
| I/O Module Support      | Local    | XW-board   | X-board | Built-in I/O function |  |   |
|                         | Remote   | <ul style="list-style-type: none"> <li>WISE-580x: I-7000 module or Modbus RTU module</li> <li>WISE-580x-MTCP: Modbus TCP module</li> </ul> |         |                       |  |   |
| Communication Interface | Ethernet | 10/100 Base-TX * 1   |         |                       | 10/100 Base-TX * 2<br>Ethernet Switch for Daisy-Chain Topology |   |
|                         | 3G & 4G  | -  | -       | -                     | -  | - |

| Software Function - Basic Operation |  |              |  |              |  |
|-------------------------------------|--|--------------|--|--------------|--|
| Web page Interface                  |  | Yes          |  | Yes          |  |
| IF-THEN-ELSE Logic Rule             |  | Yes(36 Set)  |  | Yes(36 Set)  |  |
| I/O channel monitoring and control  |  | Yes          |  | Yes          |  |
| Timer                               |  | Yes (12 Set) |  | Yes (12 Set) |  |
| Schedule                            |  | Yes (12 Set) |  | -            |  |
| Internal Register                   |  | Yes (48 Set) |  | Yes (48 Set) |  |
| Data Logger                         |  | Yes (1 Set)  |  | -            |  |
| SNTP Time Synchronization           |  | Yes          |  | -            |  |

| Software Function - Integration with SCADA/IT/IoT Systems |  |   |  |   |  |
|---|--|---|--|---|--|
| Connect with SCADA  |  | <ul style="list-style-type: none"> <li>WISE-580x: Modbus TCP &amp; Modbus RTU</li> <li>WISE-7xxx: Modbus TCP</li> </ul>                   |  |   |  |
| Message Notification                                      |  | <ul style="list-style-type: none"> <li>Email Sending (non-SSL)</li> <li>2G SMS Message Sending(WISE-5801 &amp; WISE-5801-MTCP)</li> </ul> |  |   |  |
| CGI Command   |  | Yes (CGI Command Sending)   |  |   |  |
| FTP Operation   |  | Yes (FTP Client)  |  | - |  |
| SNMP Agent  |  | -   |  | - |  |
| MQTT Client   |  | -   |  | - |  |
| DDNS  |  | -   |  | - |  |
| IoTstar supported   |  | -   |  | - |  |
| Connect with public Cloud platform                        |  | -   |  | - |  |



Microsoft Azure Certified



Microsoft Azure Certified

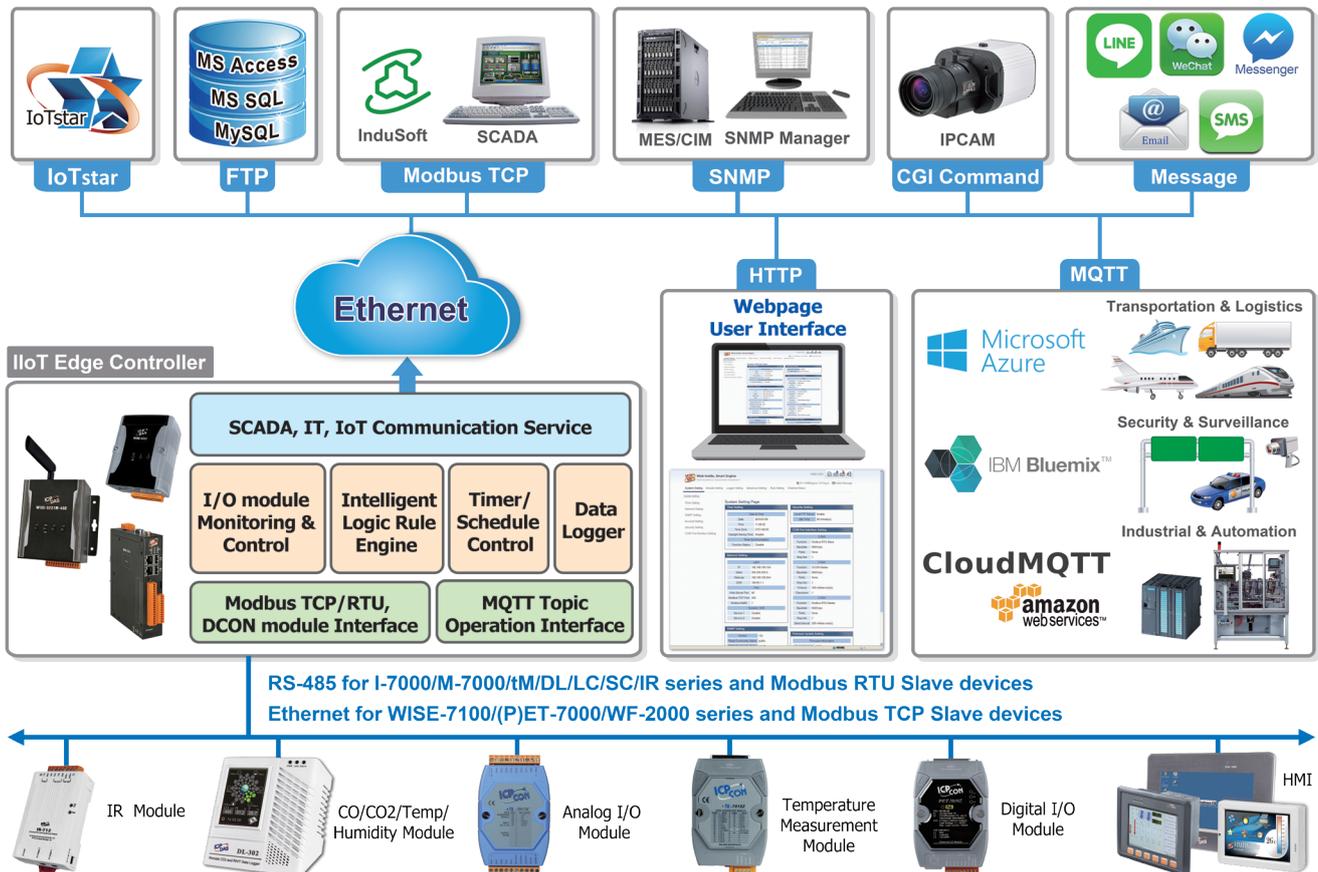


## IICoT Edge Controller: WISE-523x & WISE-224xM Series

### Features

- Runs on browsers, no extra software tool is required
- No more programming, Web pages provided for control logic editing
- IF-THEN-ELSE logic rules execution ability
- Support XV-board
- 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)
- Timer and Schedule functions supported
- Data logger and data files send back function supported
- Active I/O sending function for real-time data transfer
- CGI Command sending and receiving function supported for IP Camera and Network device
- Support Modbus TCP/RTU, SNMP, FTP and MQTT protocols
- Support Line, Messenger, WeChat, SMS and Email real-time message transmission
- Support Connection with IoT Cloud Platform (Microsoft Azure and IBM Bluemix); Support IoTstar Cloud Management Software
- Support 4G/3G wireless data communication

### System Architecture



## Hardware Specifications

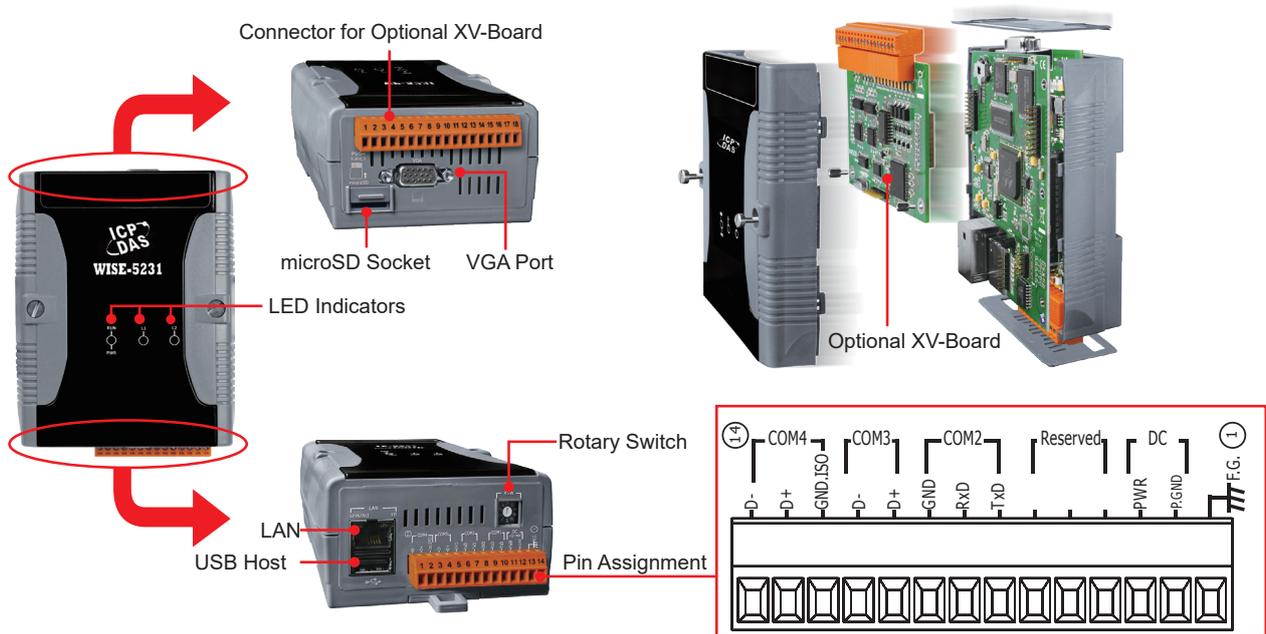
| Model                                | WISE-523x  | WISE-5231M-3GWA   | WISE-523xM-4GE/4GC | WISE-224xM                                       |
|--------------------------------------|--|---|--------------------|--|
| System                               | 32-bit ARM CPU   |   |                    |  |
| CPU                                  | Built-in one 4 GB microSD card (support up to 32 GB microSDHC card)  |   |                    |  |
| microSD                              |  |   |                    |  |
| Communication                        |  |   |                    |  |
| Ethernet                             | WISE-523x: RJ-45 x 1, 10/100/1000 Base-TX (Auto-negotiating, Auto MDI/MDI-X)<br>WISE-224xM: 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. COM 4 provides 2500 VDC isolation.   |   |                    |  |
| I/O Module Support                   |  |   |                    |  |
| Local side                           | Yes, one XV-board  |   |                    |  |
| Remote side                          | COM3 can connect to Max.16 DCON or Modbus RTU Slave modules;<br>COM4 can connect to Max.16 DCON or Modbus RTU Slave modules;<br>LAN interface can connect to Max. 16 Modbus TCP Slave modules. |   |                    |  |
| Power Requirements                   |  |   |                    |  |
| Input Range                          | 12 to 48 VDC   |   |                    |  |
| Consumption                          | 4.8 W  | 6.5W  |                    | 4.8 W  |
| Mechanical                           |  |   |                    |  |
| Dimensions(W x L x H) / Installation | 91 mm x 132 mm x 52 mm/<br>DIN-Rail Installation   | 117 mm x 126 mm x 58 mm/<br>Wall Mounting / DIN-Rail Installation |                    | 33 mm x 160 mm x 129mm/<br>DIN-Rail Installation |
| Environmental                        |  |   |                    |  |
| Temperature/<br>Humidity             | Operating Temperature: -25 °C to +75 °C; Storage Temperature: -40 °C to +80 °C;<br>10 to 90% RH, Non-condensing  |   |                    |  |
| 3G System                            |  |   |                    |  |
| Frequency Band                       | WISE-5231M-3GWA: WCDMA 850/900/1900/2100 MHz<br>WISE-523xM-4GE: WCDMA 850/900/2100 MHz<br>WISE-523xM-4GC: WCDMA 900/2100 MHz;TD-SCDMA 1900/2100 MHz; CDMA2000 (BC0) 800 MHz                    |   |                    |  |
| 4G System                            |  |   |                    |  |
| Frequency Band                       | WISE-523xM-4GE: FDD LTE: B1/B3/B5/B7/B8/B20 MHz.<br>WISE-523xM-4GC: FDD LTE: B1/B3/B8 MHz; TDD LTE: B38/B39/B40/B41 MHz.   |   |                    |  |

## Software Specifications

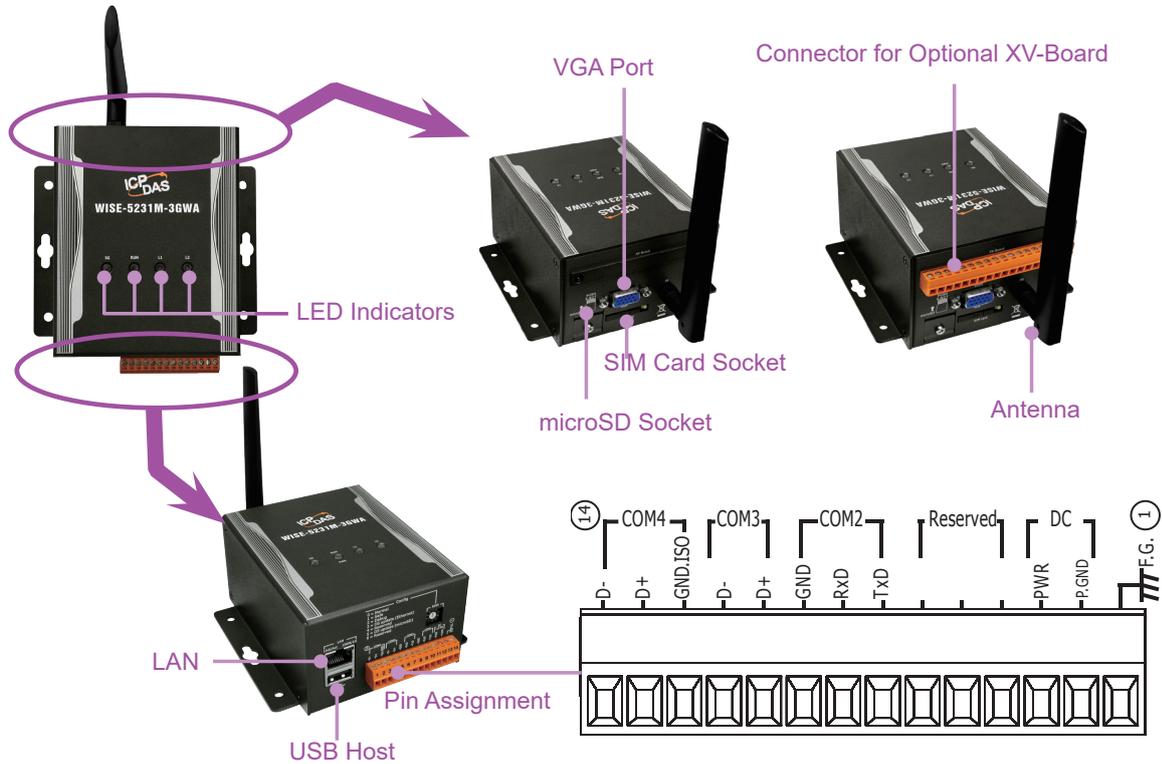
| Function   | Description   |  |
|--|---|--|
| User-friendly and intuitive web site interface                     | <ul style="list-style-type: none"> <li>Runs on browsers, no extra software tool is required.</li> <li>No more programming, Web pages provided for control logic editing and system parameters setting.</li> </ul> |  |
| Various options for easy I/O module integration                    | Local side I/O Interface  | <ul style="list-style-type: none"> <li>Support XV-board. (XV107, XV107A, XV110, XV111, XV111A, XV116, XV306, XV307, XV308, XV310)</li> </ul>   |
|  | Remote side I/O Interface (RS-485)  | <ul style="list-style-type: none"> <li>Support ICP DAS I-7000/M-7000/tm/DL/LC/SC/IR series module.</li> <li>Support Modbus RTU Slave module.</li> </ul>  |
|  | Remote side I/O Interface (Ethernet)  | <ul style="list-style-type: none"> <li>Support ICP DAS WISE-7100/(P)ET-7000/WF-2000 series module.</li> <li>Support Modbus TCP Slave module.</li> </ul>  |
| Intelligent Logic operation and data logger ability at field sites | IF-THEN-ELSE Logic operation  | <ul style="list-style-type: none"> <li>Provide IF-THEN-ELSE logic rule editing, and the ability for IF-THEN-ELSE logic rules execution.</li> </ul>   |
|  | I/O channel monitoring and control  | <ul style="list-style-type: none"> <li>Offers various options for I/O channel settings; for example: deadband setting for AI signals, linear scale setting, temperature degree in Celsius or Fahrenheit setting, power on value setting for DO channel, pulseoutput setting and DI counter setting, etc.</li> </ul>  |
|  | Timer   | <ul style="list-style-type: none"> <li>Perform the timing function. The status of Timer can be included in IF condition statements to trigger the THEN/ ELSE actions.</li> </ul>   |
|  | Schedule  | <ul style="list-style-type: none"> <li>Perform the prescheduled routine tasks. The status of Schedule can be included in IF condition statements to trigger the THEN/ELSE actions. "Calendar" and "Weekly repeat" schedule setting UI are provided.</li> </ul>   |
|  | Realtime message sending function   | <ul style="list-style-type: none"> <li>Support LINE, SMS, Email for realtime message sending.</li> <li>WISE-5236 &amp; WISE-2246 support WeChat instant message sending function.</li> </ul>   |
|  | CGI Command   | <ul style="list-style-type: none"> <li>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.</li> </ul>   |
|  | Data Logger   | <ul style="list-style-type: none"> <li>Perform Data Logger function to real-time record the I/O channel data of the controller by Period or Event Trigger operation.</li> </ul>  |
| Various protocols for seamless integration with SCADA/IoT systems  | Internal Register   | <ul style="list-style-type: none"> <li>Work as a variable to hold the temporary value, and provide the basic mathematical operation.</li> </ul>  |
|  | Real-Time I/O channel data  | <ul style="list-style-type: none"> <li>Support Modbus TCP/RTU protocol for SCADA system.</li> <li>Support SNMP and MQTT protocols for the integration with MIS/MES/IT/Network Management systems.</li> <li>CGI Command sending and receiving function supported for the integration with IP Camera and Network devices.</li> <li>Active I/O sending mechanism supported.</li> </ul>  |
|  | Historical I/O channel data files   | <ul style="list-style-type: none"> <li>FTP Server/Client ability for the maintenance of data logger files and the data logger files automatically send back operation.</li> <li>Provide data recovery mechanism so that when experiences network disconnection, the data log files will be kept in WISE, and be recovered after the network is resumed.</li> <li>Provide alarm notification mechanism so that when microSD card is damaged, the data log file will be stored in WISE to ensure zero data loss of the data logger.</li> </ul> |
|  | Communication Service   | <ul style="list-style-type: none"> <li>DDNS (Dynamic DNS) service supported.</li> <li>WISE-523xM-4GE/4GC support 4G Wireless data comm.; WISE-5231M-3GWA support 3G Wireless data comm.</li> </ul>   |
|  | IoT Gateway Capability  | <ul style="list-style-type: none"> <li>Connection with Microsoft Azure and IBM Bluemix IoT Cloud platform.</li> <li>Connection with ICP DAS IoTStar IoT Cloud Management Software.</li> </ul>  |

Appearance

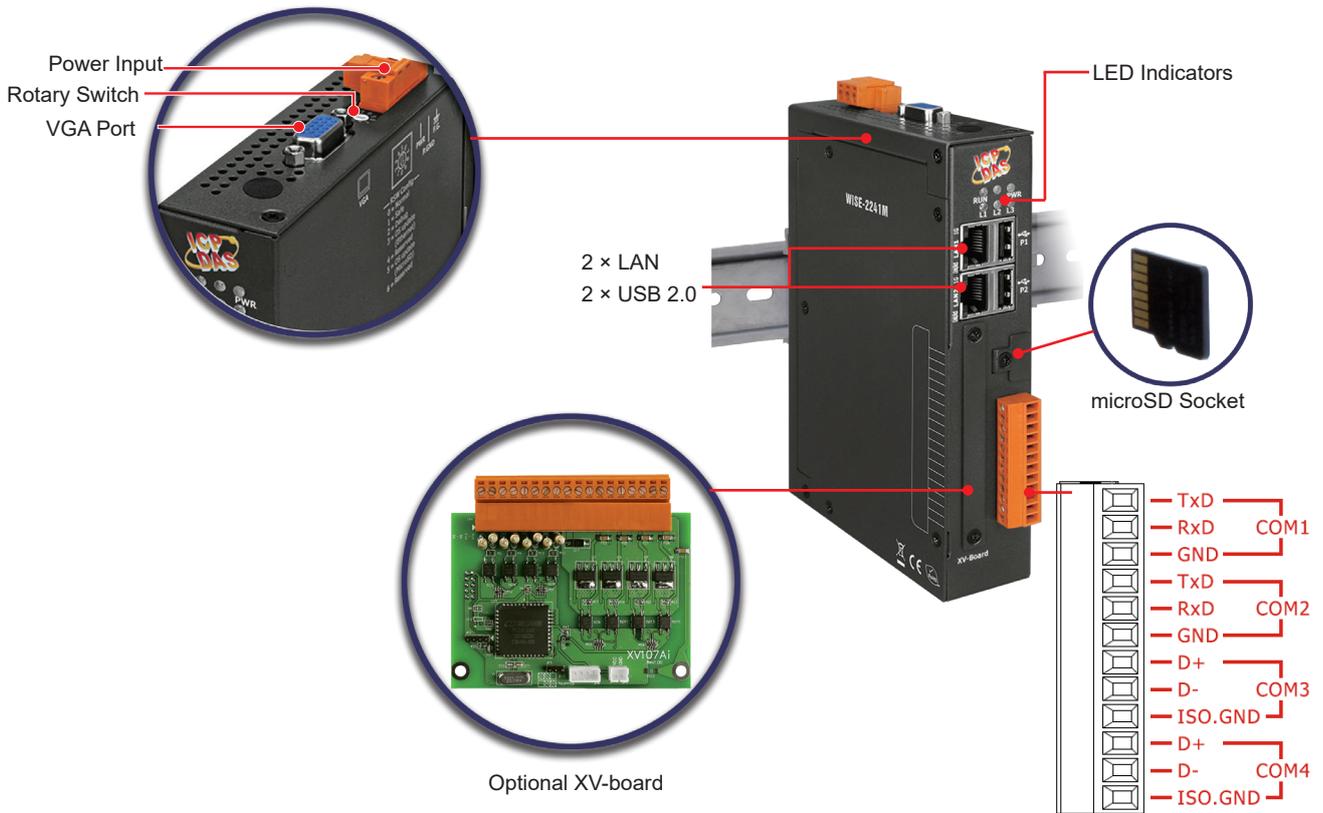
**WISE-5231**



**WISE-5231M-4GE/4GC & WISE-5231M-3GWA**



## WISE-224xM



### Ordering Information

| Module                   | Description   |
|--------------------------|---|
| <b>Standard Function</b> |   |
| WISE-5231 CR             | IIoT Edge Controller  |
| WISE-5231M-3GWA CR       | IIoT Edge Controller (Support 3G Wireless data communication)   |
| WISE-5231M-4GE CR        | IIoT Edge Controller (Support 4G Wireless data communication; Frequency Band for EMEA, Korea, Thailand, India and Taiwan) |
| WISE-5231M-4GC CR        | IIoT Edge Controller (Support 4G Wireless data communication; Frequency Band for China)                                   |
| WISE-2241M CR            | IIoT Edge Controller  |

| Module  | Description   |
|---|---|
| <b>Standard Function + Support WeChat Message Sending</b> |   |
| WISE-5236 CR  | IIoT Edge Controller (For China only)   |
| WISE-5236M-4GC CR   | IIoT Edge Controller (Support 4G Wireless data communication; For China only) |
| WISE-2246M CR   | IIoT Edge Controller (For 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.**

### Accessories

|              |  |
|--------------|--|
| NS-205 CR    | Unmanaged 5-Port Industrial Ethernet Switch (RoHS)         |
| MDR-20-24 CR | 24V/1A, 24 W Power Supply with DIN-Rail Mounting (RoHS)    |
| DIN-KA52F CR | 24V/1.04A, 25 W Power Supply with DIN-Rail Mounting (RoHS) |

## WISE-580x- Intelligent I/O Controller



### Features

- Runs on browsers, no extra software tool is required
- IF-THEN-ELSE logic rules execution ability
- Support XW-board I/O
- WISE-58xx supports I-7000 or Modbus RTU Slave devices
- WISE-58xx-MTCP supports Modbus TCP Slave devices
- Provide non-SSL Email/CGI command sending, Recipe functions
- Timer and Schedule functions supported
- Data logger and data files send back function supported
- Support Modbus TCP/RTU protocol for SCADA software integration
- WISE-5801(-MTCP) supports SMS message sending and SMS command receiving



### Introduction

**WISE (Web Inside, Smart Engine)** is a product series developed by ICP DAS that functions as control units for use in remote logic control and monitoring in various industrial applications. 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 system development.

**WISE-580x** series provides more supports in I/O functions in addition to merits inherited from WISE-71xx. All WISE-580x allows connections to XW-board; WISE-580x supports I-7000 I/O modules and Modbus RTU Slave modules, meanwhile WISE-580x-MTCP supports Modbus TCP Slave modules; the wide range of selection options enables flexibility in I/O module integration. WISE-580x provides Data Logger function to record the I/O channel data by periodic cycle or event trigger. And it allows to send the data files by FTP or Email to the control center at scheduled time. WISE-5801(-MTCP) also supports the SMS alarm message sending and SMS command receiving functions.

### System Specifications

| Model                     | WISE-5800   | WISE-5800-MTCP | WISE-5801  | WISE-5801-MTCP |
|---------------------------|---|----------------|--|----------------|
| <b>System</b>             |   |                |  |                |
| CPU                       | 16-bit CPU  |                |  |                |
| Software                  | Built-in WISE Firmware  |                |  |                |
| microSD Expansion         | Built-in one 4 GB microSD card (support up to 32 GB microSDHC card)   |                |  |                |
| RTC (Real Time Clock)     | Yes   |                |  |                |
| <b>Communication</b>      |   |                |  |                |
| Ethernet                  | RJ-45 x 1, 10/100 Base-TX (Auto-negotiating, Auto MDI/MDI-X)  |                |  |                |
| COM 1                     | RS-232 (TxD, RxD, RTS, CTS, GND), non-isolated, Speed: 115200 bps max.  |                |  |                |
| COM 2                     | RS-485 (D2+, D2-), self-tuner ASIC inside, non-isolated, Speed: 115200 bps max.   |                |  |                |
| <b>LED Indicators</b>     |   |                |  |                |
| System LED                | Yes (Red)   |                |  |                |
| Ethernet Link LED         | Yes (Yellow: Ethernet link detected, Flashing Yellow: Ethernet packet received)   |                |  |                |
| <b>I/O Module Support</b> |   |                |  |                |
| Local I/O Module          | Yes, one XW-board   |                |  |                |
| Remote I/O Module         | WISE-58xx: I-7000 modules (up to 16) or Modbus RTU Slave modules (up to 10)<br>WISE-58xx-MTCP: Modbus TCP Slave modules (up to 7) |                |  |                |
| <b>SMS Function</b>       |   |                |  |                |
| Frequency Band            | -   |                | Quad-band 850/900/1800/1900 MHz                      |                |
| Mode                      | -   |                | Text and Unicode mode                                |                |
| <b>Power Requirements</b> |   |                |  |                |
| Protection                | Power Reverse Polarity Protection   |                |  |                |
| Frame Ground              | Yes (for ESD Protection)  |                |  |                |
| Input Range               | 12 to 48 VDC  |                |  |                |
| Redundant Power Input     | Yes   |                |  |                |
| Power Consumption         | 2.0 W   |                | Idle: 2.0 W; Data Link: 150 ~ 400 mA (peak) @ 24 VDC |                |
| <b>Mechanical</b>         |   |                |  |                |
| Dimensions/Installation   | 91 mm x 132 mm x 52 mm (W x H x D) / DIN-Rail Installation  |                |  |                |
| <b>Environmental</b>      |   |                |  |                |
| Temperature               | Operating Temperature: -25 °C to +75 °C ; Storage Temperature: -30 °C to +80 °C   |                |  |                |
| Humidity                  | 10 to 90% RH, Non-condensing  |                |  |                |

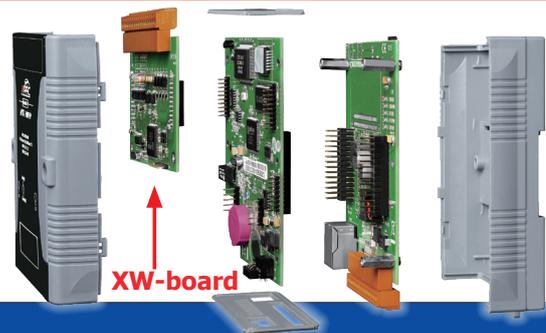
## Software Functions

| Function                | Max. No. | Description  |
|-------------------------|----------|--|
| Web Operation Interface | -        | Access built-in webpage interface on WISE controllers to set up system parameters and edit logic rules through web browser.  |
| IF-THEN-ELSE Rule       | 36       | <ul style="list-style-type: none"> <li>Each rule supports 3 IF conditions that can be combined by AND or OR operators for evaluation.</li> <li>Each IF-THEN-ELSE rule supports 3 THEN actions and 3 ELSE actions.</li> </ul> |
| Internal Register       | 48       | As a variable to hold the temporary value. SCADA software can Read/write the value via Modbus TCP/RTU Protocol remotely.   |
| Timer                   | 12       | Perform the timing function. The status of Timer can be included in IF condition statements to trigger the THEN/ELSE actions.  |
| Schedule                | 12       | Perform the prescheduled routine tasks. The status of Schedule can be included in IF condition statements to trigger the THEN/ELSE actions.  |
| Email                   | 12       | Execute Email message sending. Each Email can be sent to up to 5 receivers.  |
| SMS Message Sending     | 12       | Execute SMS message sending. Each SMS message can be sent to up to 30 phone numbers (receivers).   |
| SMS Command Receiving   | -        | When WISE receives the SMS commands from authorized phone numbers (up to 3), it will execute the corresponding Actions.  |
| 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.  |
| Data Logger             | 1        | Enable WISE to record I/O channel data in Data Log file. The Data Log files can be sent to the operators by FTP or Email.  |
| Active I/O Sending      | -        | Actively send I/O channel data to the receivers (require Modbus TCP Slave function).   |
| Modbus TCP/RTU Protocol | -        | Perform real time control and monitoring of I/O channels and system status via SCADA software or HMI devices.  |

## I/O Module Support

### Local I/O Expansion (XW-board)

| DI, DO XW-board |    |    |           |
|-----------------|----|----|-----------|
| Model Name      | DI | DO | Isolation |
| XW107           | 8  | 8  | -         |
| XW107i          |    |    | 3750 Vrms |
| XW110i          | 16 | -  | 3750 Vrms |



| AI, AO, DI, DO XW-board |    |    |           |             |           |             |           |
|-------------------------|----|----|-----------|-------------|-----------|-------------|-----------|
| Model Name              | DI | DO | Isolation | AI (12-bit) |           | AO (12-bit) |           |
|                         |    |    |           | Ch.         | Range     | Ch.         | Range     |
| XW304                   | 4  | 4  | -         | 6           | ±5 V      | 1           | ±5 V      |
| XW310                   | 3  | 3  |           | 4           | ±10 V     | 2           | ±10 V     |
| XW310C                  | 3  | 3  |           | 4           | 0 ~ 20 mA | 2           | 0 ~ 20 mA |

### Remote I/O Expansion Modules

|   |                                       |
|---|---------------------------------------|
| <b>I-7000 or Modbus RTU Slave Modules</b> | Support WISE-5800/WISE-5801           |
| <b>Modbus TCP Slave Modules</b>           | Support WISE-5800-MTCP/WISE-5801-MTCP |

## Ordering Information

|                       |   |
|-----------------------|---|
| <b>WISE-5800</b>      | WISE Intelligent I/O Controller (For I-7000 modules or Modbus RTU Devices)          |
| <b>WISE-5800-MTCP</b> | WISE Intelligent I/O Controller (For Modbus TCP Devices)                            |
| <b>WISE-5801</b>      | WISE Intelligent I/O Controller with SMS (For I-7000 modules or Modbus RTU Devices) |
| <b>WISE-5801-MTCP</b> | WISE Intelligent I/O Controller with SMS (For Modbus TCP Devices)                   |

## Accessories

|                      |  |
|----------------------|--|
| <b>NS-205 CR</b>     | Unmanaged 5-Port Industrial Ethernet Switch (RoHS)           |
| <b>MDR-20-24 CR</b>  | 24 V/1 A, 24 W Power Supply with DIN-Rail Mounting (RoHS)    |
| <b>DIN-KA52F CR</b>  | 24 V/1.04 A, 25 W Power Supply with DIN-Rail Mounting (RoHS) |
| <b>3LMSD-4000 CR</b> | 4 GB microSD card (RoHS)                                     |
| <b>ANT-421-01</b>    | Quad-band 2G GSM/GPRS and Tri-band 3G WCDMA External Antenna |

## WISE-71xx/72xx/79xx - Intelligent I/O Module



**WISE-71xx/7901/7255**

### Features

- Runs on browsers, no extra software tool is required
- IF-THEN-ELSE logic rules execution ability
- WISE-71xx/WISE-7255 with built-in I/O module; WISE-7901 supports X-board
- Provide CGI Command/non-SSL Email sending and Recipe functions
- Timer function supported; WISE-7901 also supports Schedule function
- Support Modbus TCP Protocol for SCADA Software Integration
- Support PoE (Power over Ethernet) function
- WISE-7255M supports 2-port Ethernet Switch for Daisy-Chain Topology.



### Introduction

WISE-71xx module is a series of WISE AIO & DIO 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. In addition, all WISE-71xx modules support PoE (Power over Ethernet) function that simplifies the wiring deployment of the applications.

WISE-7255 is a WISE modules with 8 DO (isolated open collector) channels and 8 DI (Dry/Wet contact) channels, in addition to merits inherited from WISE-71xx series. WISE-7255 supports 2-port Ethernet Switch for Daisy-Chain Topology and PoE (Power over Ethernet) function that simplifies the wiring deployment of the applications.

WISE-7901 provides more supports in exchangeable I/O functions, in addition to merits inherited from previous WISE-71xx series. A wide range of X-board I/O module is available for user to choose from to meet specific requirements in DI, DO, A/D, D/A operations for various applications. In addition to Timer function, WISE-7901 also provides Schedule function to setup logical rules for prescheduled routine tasks. Meanwhile, WISE-7901 supports PoE (Power over Ethernet) function that simplifies the wiring deployment of applications.

### System Specifications

| Model                          | WISE-71xx  | WISE-7901                  | WISE-7255   |
|--------------------------------|--|----------------------------|---|
| <b>System</b>                  |  |                            |   |
| CPU                            | 16-bit CPU   |                            |   |
| I/O module Support             | Built-in I/O Module  | X-Board                    | Built-in I/O Module                                       |
| Software                       | WISE firmware  |                            |   |
| <b>Communication Interface</b> |  |                            |   |
| PoE Ethernet Port              | 10/100 Base-TX * 1   |                            | 10/100 Base-TX * 2; Switch Ports for Daisy-Chain Topology |
| <b>LED Indicators</b>          |  |                            |   |
| PoE Power                      | PoE On   |                            |   |
| Others                         | <ul style="list-style-type: none"> <li>• System Running (WISE-71xx/7901);</li> <li>• Ethernet Link/Act/Speed (WISE-71xx)</li> </ul>  |                            | System Running; DI/DO; Status; Ethernet Link/Act          |
| <b>Power Requirements</b>      |  |                            |   |
| Reverse Polarity Protection    | Yes  |                            |   |
| 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  | 1.5 W(Not include X-Board) | 4.0 W   |
| <b>Mechanical</b>              |  |                            |   |
| Dimensions (L x W x D)         | 72 mm x 123 mm x 35 mm   |                            | 76 mm x 120 mm x 38 mm                                    |
| Installation                   | DIN-Rail or Wall Mounting Installation   |                            |   |
| <b>Environment</b>             |  |                            |   |
| Temperature                    | <ul style="list-style-type: none"> <li>• Operating Temperature : -25 °C to +75 °C</li> <li>• Storage Temperature : -30°C to +80°C (WISE-71xx/7255); -40°C to +80°C (WISE-7901);</li> </ul> |                            |   |
| Humidity                       | <ul style="list-style-type: none"> <li>• WISE-71xx/7255: 10 to 90% RH, Non-condensing</li> <li>• WISE-7901: 5 to 90% RH, Non-condensing</li> </ul>   |                            |   |

## Software Functions

| Function                | Max. No. | Description  |
|-------------------------|----------|--|
| Web Operation Interface | -        | Access built-in webpage interface on WISE controllers to set up system parameters and edit logic rules through web browser.  |
| IF-THEN-ELSE Rules      | 36       | <ul style="list-style-type: none"> <li>Each rule supports 3 IF conditions that can be combined by AND or OR operators for evaluation.</li> <li>Each IF-THEN-ELSE rule supports 3 THEN actions and 3 ELSE actions.</li> </ul> |
| Internal Register       | 48       | As a variable to hold the temporary value. SCADA software can Read/write the value via Modbus TCP/RTU Protocol remotely.   |
| Timer                   | 12       | Perform the timing function. The status of Timer can be included in IF condition statements to trigger the THEN/ELSE actions.  |
| Schedule                | 12       | Perform the prescheduled routine tasks. The status of Schedule can be included in IF condition statements to trigger the THEN/ELSE actions. (Apply to WISE-7901.)  |
| Email                   | 12       | Execute 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     | -        | Perform real time control and monitoring of I/O channels and system status via SCADA software or HMI devices.  |

## 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-7119  | -                 | 4  | 8  | -  | 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-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.)   |
| WISE-7255  | 8                 | 8  | -  | -  | DI : 8 Dry/Wet Contact (Sink/Source)<br>DO : 8 Isolated Open Collectors (Source Type)   |
| WISE-7901  | -                 | -  | -  | -  | Support X-Boards: X107, X109, X110, X111, X202, X203, X303, X304, X305, X308, X310, X324  |

## Ordering Information

|            |  |
|------------|--|
| WISE-71xx  | WISE Intelligent I/O Module with PoE (Please refer to "I/O Channel Specifications" for the model number) |
| WISE-7255  | WISE Intelligent 8 DO/8 DI Module with PoE and 2-port Ethernet Switch for Daisy-Chain Topology           |
| WISE-7901  | WISE Intelligent I/O Module with PoE (Support X-board)   |
| WISE-7901D | WISE Intelligent I/O Module with PoE and LED display (Support X-board)                                   |

## Accessories

|              |  |
|--------------|--|
| GPSU06U-6    | 24V/0.25A, 6W Power Supply                             |
| NS-205PSE CR | Unmanaged 5-Port Industrial PoE Ethernet Switch (RoHS) |

# WISE-75xxM - Intelligent MQTT I/O Module



**WISE-75xxM**

## Features

- Runs on browsers, no extra software tool is required
- IF-THEN-ELSE logic rules execution ability
- Built-in I/O module
- Support non-SSL Email/CGI Command sending and Recipe functions
- Support Timer and Schedule operation
- Support PoE (Power over Ethernet) function and 2-port Ethernet Switch for Daisy-Chain Topology
- Modbus TCP Protocol for SCADA System Integration.
- Support non-SSL MQTT Protocol for IT & IoT (Internet of Things) System



## 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. WISE-75xxM follows IEEE 802.3af-compliant Power over Ethernet (PoE) specification. It allows receiving power from PoE enabled network by Ethernet pairs. In addition to this, WISE-75xxM also has a built-in two port Ethernet switch to implement daisy-chain topology. The cabling is much easier and total costs of cable and switch are significantly reduced.

In addition to merits inherited from previous WISE-71xx series; WISE-75xxM also provides Schedule function to setup logical rules for prescheduled routine tasks. Meanwhile, WISE-75xxM supports Modbus T CP and MQTT protocol to make seamless integration with SCADA, IT and IoT (Internet of Things) system.

## System Specifications

|                                       |  |
|---------------------------------------|--|
| <b>System</b>                         |  |
| CPU                                   | 16-bit CPU   |
| Software                              | WISE Firmware  |
| <b>Communication</b>                  |  |
| PoE Ethernet Port                     | 2 x RJ-45, 10/100 Base-TX, Switch Ports for Daisy-Chain Topology               |
| <b>Isolation Protection</b>           |  |
| I/O 2-Way Isolation                   | 2500 VDC   |
| <b>EMS Protection</b>                 |  |
| 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  |
| <b>LED Indicators</b>                 |  |
| System Running                        | Yes  |
| Ethernet Link/Act                     | Yes  |
| I/O Channel Status                    | Yes  |
| PoE Power                             | Yes  |
| <b>Power Requirements</b>             |  |
| Reverse Polarity Protection           | Yes  |
| Powered from Terminal Block           | Yes, 12 to 48 VDC  |
| Powered from PoE                      | Yes, IEEE 802.3af, Class1  |
| <b>Mechanical</b>                     |  |
| Dimensions (L x W x H) / Installation | 120mm x 97mm x 42mm / Wall Mounting Installation                               |
| <b>Environment</b>                    |  |
| 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 | -        | Access built-in webpage interface on WISE controllers to set up system parameters and edit logic rules through web browser.  |
| IF-THEN-ELSE Rules      | 72       | <ul style="list-style-type: none"> <li>Each rule supports 3 IF conditions that can be combined by AND or OR operators for evaluation.</li> <li>Each IF-THEN-ELSE rule supports 3 THEN actions and 3 ELSE actions.</li> </ul> |
| Internal Register       | 48       | As a variable to hold the temporary value. SCADA software can Read/write the value via Modbus TCP/RTU Protocol remotely.   |
| 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 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)  |
| Modbus TCP Protocol     | -        | Perform real time control and monitoring of I/O channels and system status via SCADA software or HMI devices.  |
| MQTT Protocol           | -        | Perform real time control and monitoring of I/O channels and system status via IT or IoT system  |

## 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/<br>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 Specifications" for the model number) |
|------------|---|

## Accessories

|           |                               |
|-----------|-------------------------------|
| GPSU06U-6 | 24 V/0.25 A, 6 W Power Supply |
|-----------|-------------------------------|

# Cloud and Edge Computing Solution

Complementary Technologies Powering your IIoT System



**Application Layer**

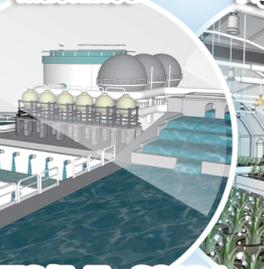
Energy Management



Smart Factory



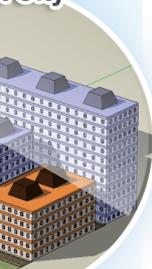
Internet of Machines



Smart Agriculture



Smart City



**Data Analysis Tools, MIS/IT/MES/IoT, SCADA and 3rd Party Software**



**Cloud Layer**



**RemoteAccess**

- ✦ Remote Access & Setting to/on WISE/PMC at any time & any place.
- ✦ Import Sensor Data to the Database
- ✦ Setup Sensor Data Pool for easy-use in Cloud Service & IoT System.



**IoTstar**

Remote Access & Setting to/on WISE/PMC

Remote Data Service On Cloud Platform

**INTERNET**



**Edge Computing Layer**





Low Latency    Intelligent Logic

- ✦ Sensor data processing, filtering, buffering, log & upload.
- ✦ Equipped with intelligent logic capabilities, share the loading of the cloud platform.
- ✦ Enhance the Real-time control performance of the on-site Sensors.

WISE series



PMC series



PMD series



**4G/LAN/WAN**



**Sensor Layer**



RS-485 & Ethernet Power Meter



PM-4324 Multi-Channel Power Meter



I/O Modules



Temp & Humidity Module



M-7017RMS



DN-831I-100V-50A










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