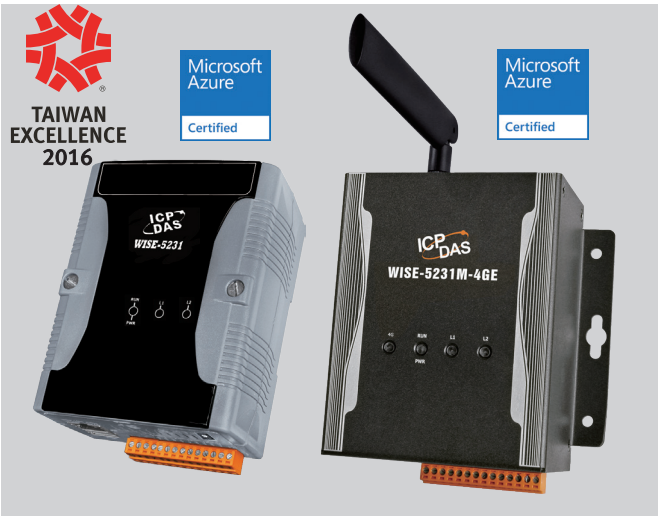


WISE-52xx

Intelligent IIoT Concentrator

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, Schedule, SSL/TLS Email sending function 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
- WISE-5231M-4GE/4GC support 4G/3G Wireless data comm. ; WISE-5231M-3GWA support 3G Wireless data comm.
- Support Connection with IoT Cloud Platform (Microsoft Azure and IBM Bluemix)
- Support IoTstar Cloud software

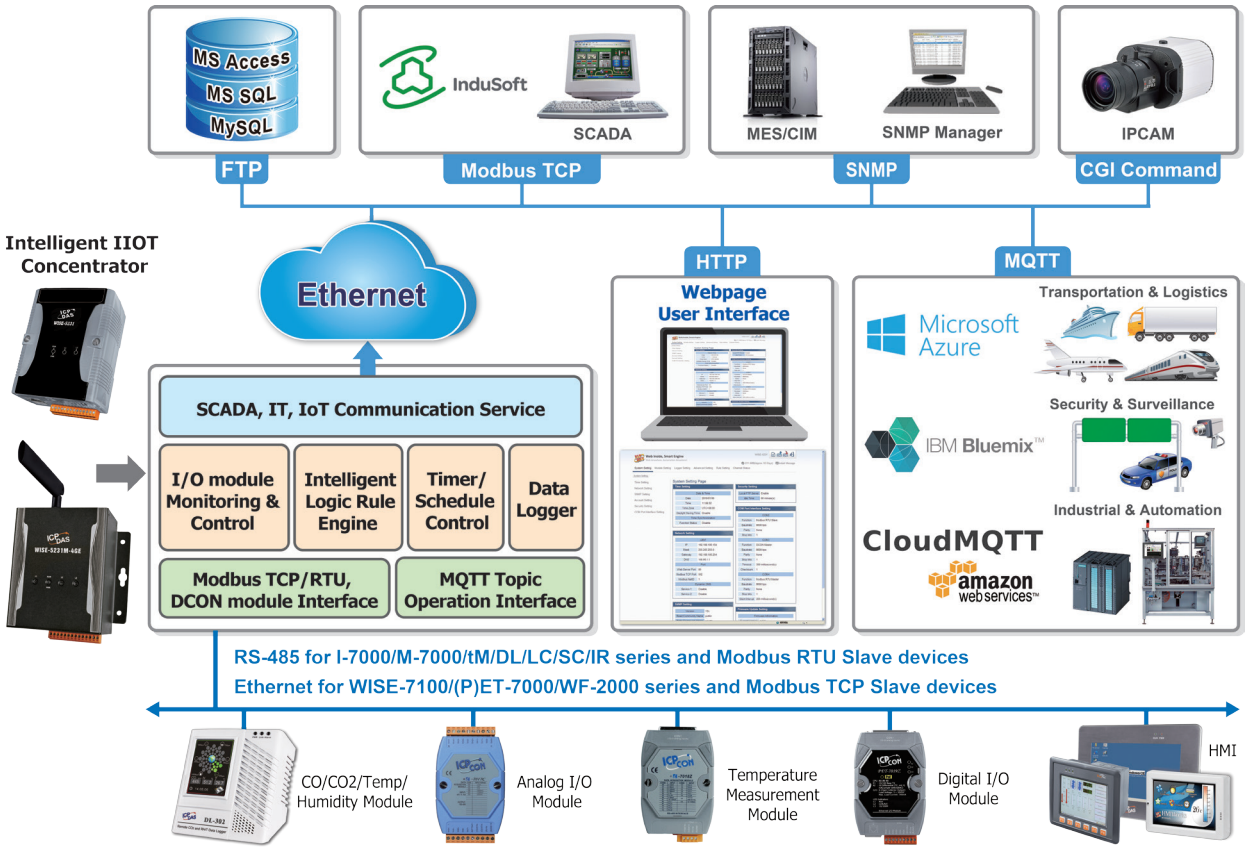
RoHS

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 the built-in IF-THEN-ELSE logic engine, WISE can execute the automation logic in a stable and efficient way, and it also provides mathematic operation, Schedule and Email alarm message sending functions.

WISE-5231 provides more supports in I/O module connection, I/O data logging and IoT platform integration. It allows connection to XV-board, DCON I/O modules, and Modbus TCP/RTU Slave modules all together. The wide range of selection options enables flexibility in I/O module integration to meet the requirements from various applications. WISE-5231 provides the MQTT client, it can directly connect to the major public IoT Cloud platform (such as: Microsoft Azure or IBM Bluemix) and MQTT Broker. WISE also provide well thought-out CGI command functions to integrate with IP camera for the Access Control applications. Based on the ability as I/O module connection ability, Intelligent logic control, Data logging, and various communication protocols supported (SNMP, MQTT and Modbus TCP/RTU), WISE can help the IT/MIS/MES/SCADA system to manage the field side I/O modules and sensors efficiently in the application such as Unmanned Facility Room Monitoring, Intelligent Factory and Environment Monitoring. WISE-5231 is not just a Concentrator of I/O modules and Sensors; it is also a Gateway to transfer the sensor data to IoT Cloud platform. All of these make WISE-5231 the best choice in the IoT Age.

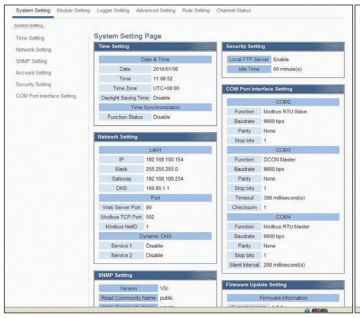
System Architecture



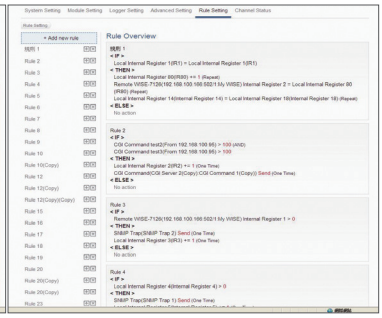
Features

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.



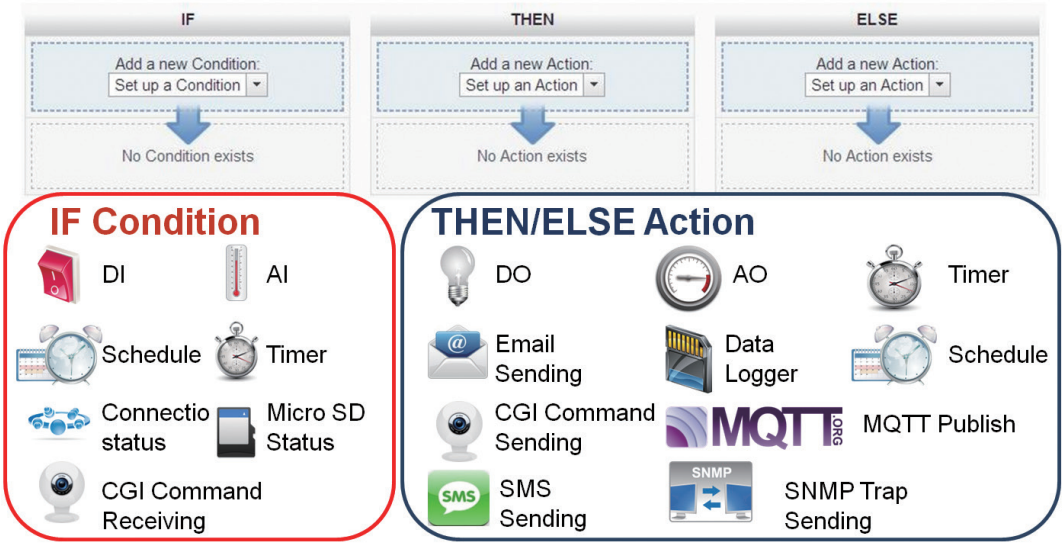
▲WISE Web User Interface



▲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.



▲ The function overview of IF-THEN-ELSE rule engine

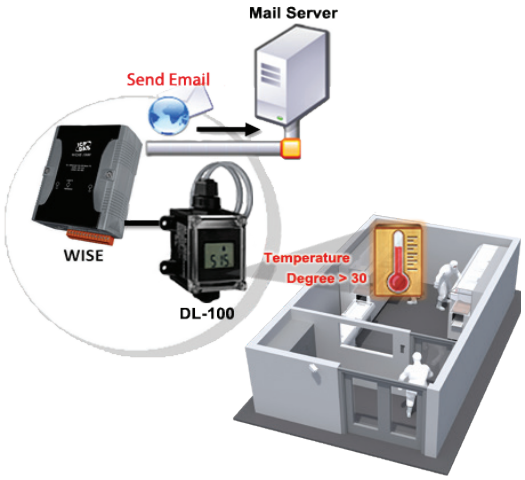
Connection ability to a variety of sensors and devices

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.

▲ Connect to a variety of sensors and devices

Real-time alarm notification via SSL Email

WISE supports SSL Email sending function for real-time message notification operation. 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.



▲ SSL Email Sending function

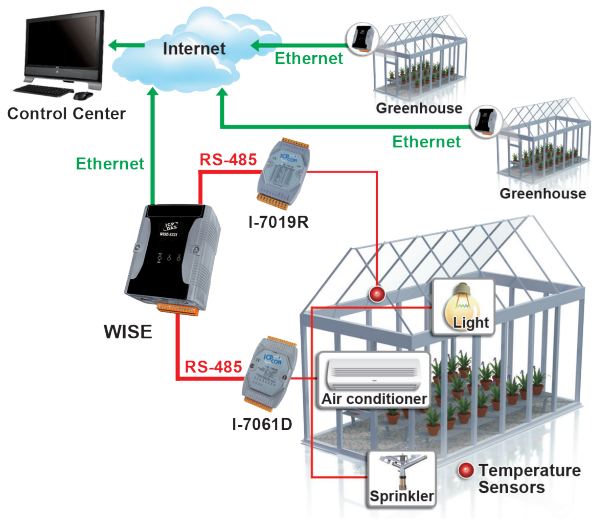
CGI Command sending & receiving for surveillance system integration

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

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.



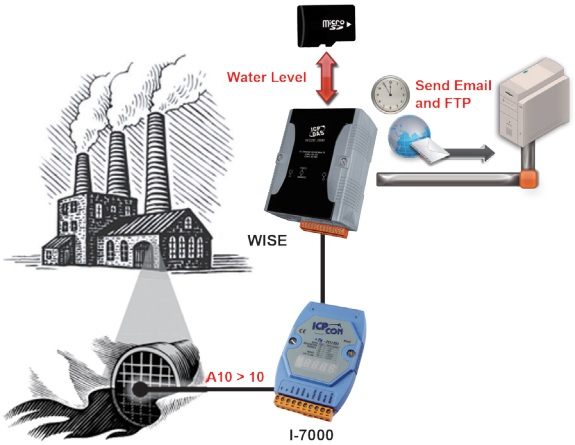
▲ Active I/O sending mechanism

Provide Timer and Schedule operation

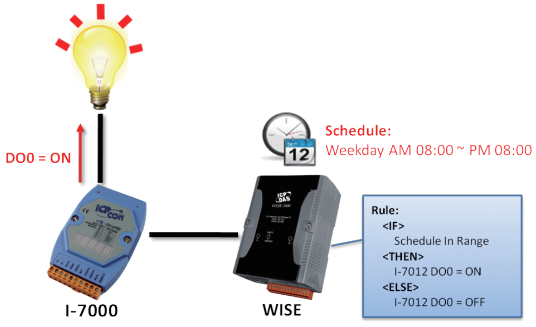
WISE features Timer and Schedule functions: It allows user to schedule specific date or time for control logic execution, or perform specific tasks such as time delay. With calendar user interface provided, Schedule setting can be more efficient and flexible.

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.



▲ Data Logger function



▲ Schedule function

Support 4G/3G Wireless data communication, and SMS message sending/receiving

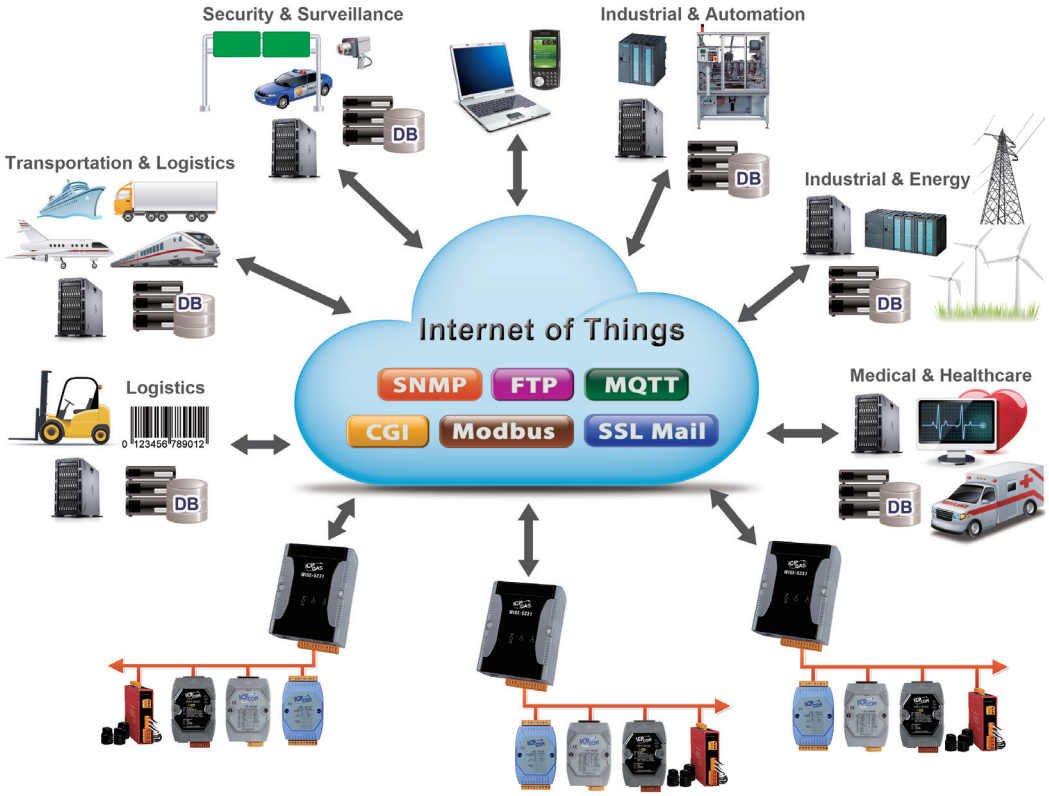
In addition to Ethernet interface, WISE also provides 4G/3G Wireless communication interface. It can send the real-time data of sensors and I/O modules, data logger files and Email alarm message back to the control center by 4G/3G Wireless Network. WISE also supports SMS message sending function for 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. WISE also is equipped with SMS command receiving function. It allows to receive the SMS commands sent by specific phone numbers to perform tasks such as real-time I/O channel value monitoring, I/O channel value modification and logic rules execution (triggered by SMS), etc.

▲ 4G/3G Data Communication and SMS Message Notification

A variety of protocols supported for integration with SCADA/IT/IoT System

Industry 4.0 is based on Internet of Things (IoT) that incorporates the technological concept of communicating and exchanging information between all facilities which brought manufacturing industry to a new era. The WISE-5231 Intelligent IoT Controller developed by ICP DAS is a perfect start point to facilitate the vision of the Smart Factory.

WISE-5231 provides powerful and flexible integration with the I/O modules and sensors at the field side, and also supports various IoT protocols for seamless integration with the SCADA/MIS/MES/IT/Network Management systems to transfer the real-time I/O information from the front-end modules (or sensors) to the back-end management systems. It also features reliable real-time I/O logic control and data logger functions. All of these features make WISE-5231 a perfect concentrator of sensor and I/O modules in the IoT age.



▲ A variety of protocols supported for SCADA/IT/IoT System

IoTstar: IoT Cloud Management Software

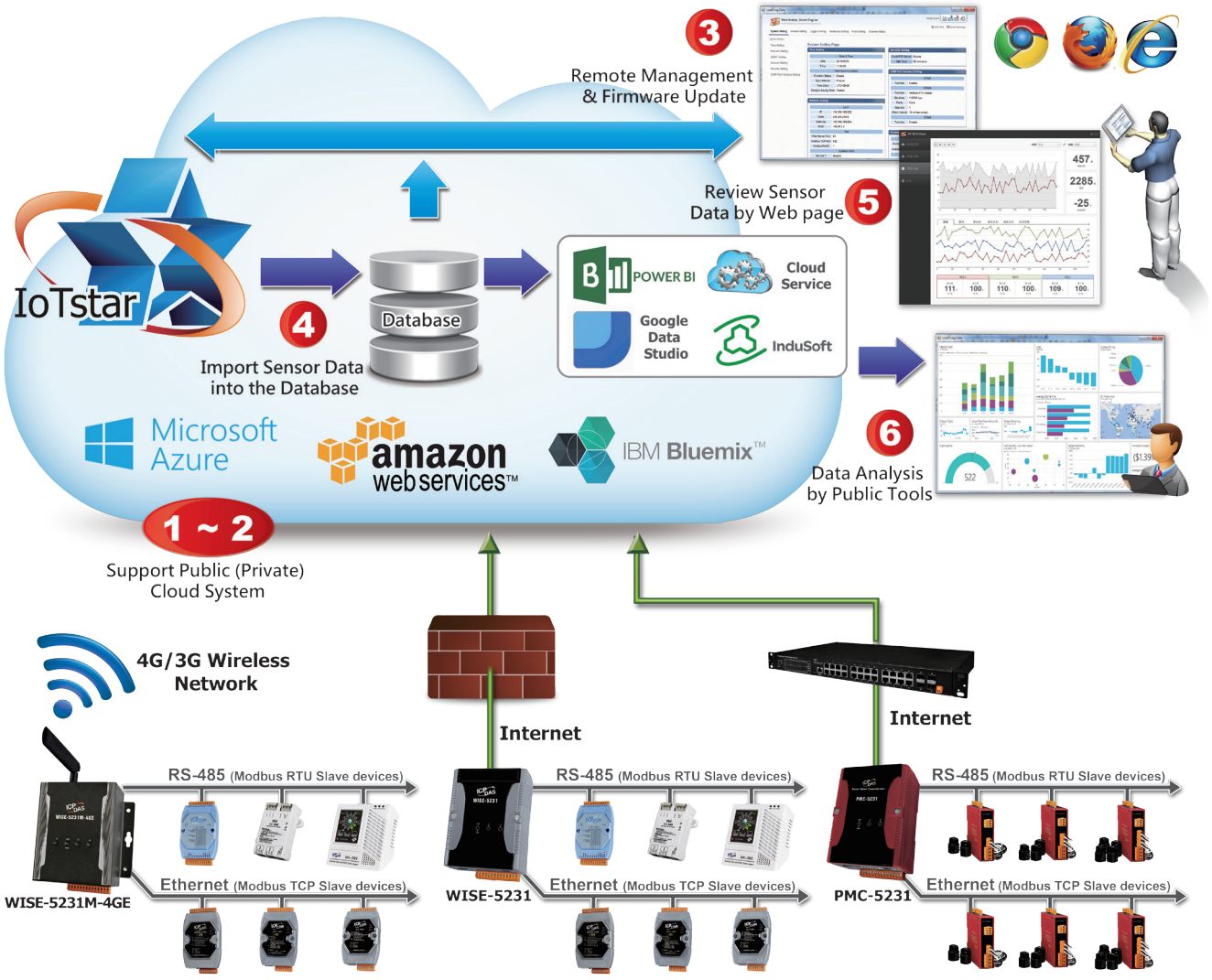
IoTstar is software developed by ICP DAS for use in remote monitoring and management of the controllers in a variety of industrial applications. IoTstar offers a user-friendly and intuitive Web interface that allows users to implement system settings and monitoring on the remote controllers by a few clicks; no programming is required.

After the Network connection is built between the remote controllers and the IoTstar via the Ethernet/3G Network, the IoTstar can then communicate with the remote controllers to implement the System Setting /Status Monitoring (it works even the controller is in a Private IP Domain configuration environment, for example : Locate behind the Firewall or use a Dynamic Virtual IP).

With the microSD card, the controller can provide the Data Logger function to real-time record data of the Sensors and I/O modules and send the data log files back to the IoTstar via FTP protocol. When the IoTstar receives the data log files from the remote controllers, it will import the content of these files into the Database. And then these recorded data can be directly retrieved from the Database for future information analysis by the SCADA software, Data analysis tool (for example: Microsoft Power BI, Google Data Studio) or Cloud Service.

IoTstar can be installed on a general PC platform as a Private Cloud system. It also can be installed on the Microsoft Azure, IBM Bluemix or Amazon AWS, etc. as a Public Cloud system. By using IoTstar, it is easy to build a Remote Monitoring and Management IoT Cloud system, and during the whole process of system development; no programming is required; just makes a few settings on the controller and IoTstar; the user could quickly integrate the sensor and I/O module data with the IoT Cloud system. It is an easy-to-use and easy-to-build IoT Cloud solution for the IoT and Industry 4.0 applications.

p.s. Currently support WISE-5231, WISE-5231M-3GWA, WISE-5231M-4GE/4GC, PMC-5231, PMC-5231M-3GWA, PMC-5231M-4GE/4GC, PMD-2201 and PMD-4201.



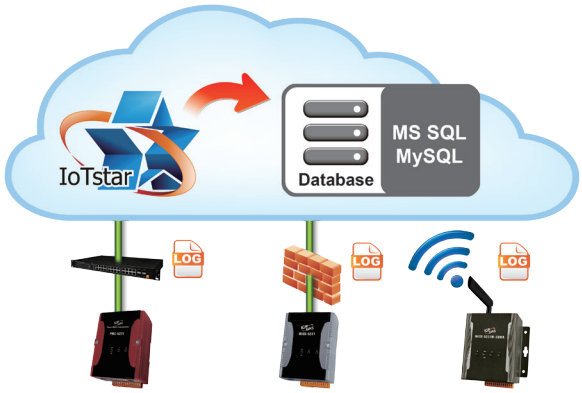
Features:

1. Can be installed on Microsoft Azure, IBM Bluemix or Amazon AWS to implement the Public IoT Cloud Solution on the controllers.

2. Support Windows system (Windows 7/8/10, Windows Server) to implement the Private IoT Cloud Solution on the controllers.

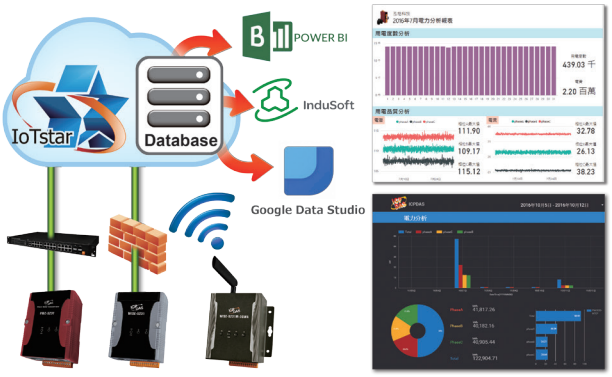
3. Enables the remote management and firmware update on the controllers via user-friendly and intuitive Web page interface.

4. Receive the data log file of the sensors from the remote controllers and import the content of the data log file into the Database (MySQL or MS SQL).



5. User can retrieve and review the data of the Sensors directly by the built-in Web page interface.

6. By Database interface, it is easy to integrate with SCADA, Microsoft Power BI, Google Data Studio or Cloud Service to retrieve the data of the Sensors directly from the Database for future data analysis.



Hardware Specifications

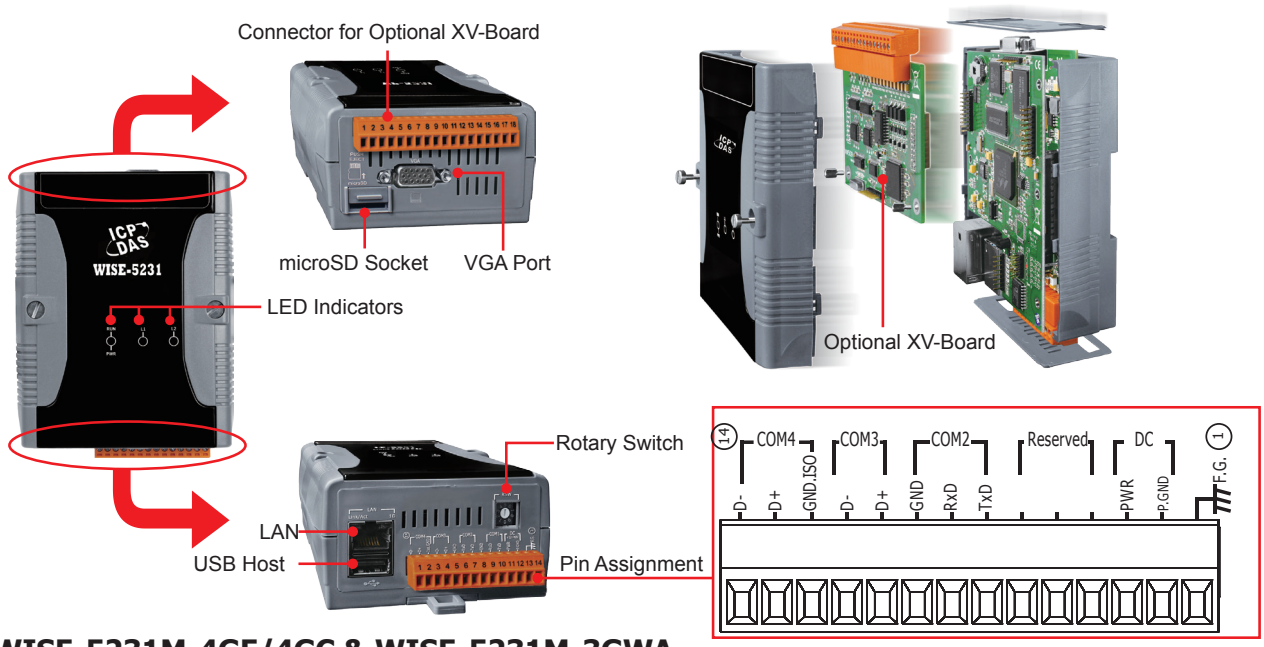
Model	WISE-5231	WISE-5231M-3GWA	WISE-5231M-4GE/4GC
System			
CPU	32-bit ARM CPU		
microSD Expansion	Built-in one 4 GB microSD card (support up to 32 GB microSDHC card)		
Communication			
Ethernet	RJ-45 x 1, 10/100/1000 Base-TX (Auto-negotiating, Auto MDI/MDI-X)		
COM 2	RS-232 (TxD, RxD, GND), non-isolated, Speed: 115200 bps max.		
COM 3/COM 4	RS-485 (Data+, Data-), Speed: 115200 bps max. COM 4 provides 2500 V_{DC} isolation		
LED Indicators			
Indicators	Power LED (Red), System LED (Red, Green)		
I/O Module Support			
Local I/O Module	Yes, one XV-board		
Remote I/O Module	COM3 can connect to Max.16 DCON or Modbus RTU Slave modules;COM4 can connect to Max.16 DCON or Modbus RTU Slave modules; LAN interface can connect to Max. 16 Modbus TCP Slave modules.		
Power Requirements			
Input Range	12 to 48 V_{DC}		
Power Consumption	4.8 W	6.5W	
Mechanical			
Dimensions/Installation (W x L x H)	91 mm x 132 mm x 52 mm/ DIN-Rail Installation	117 mm x 126 mm x 58 mm / Wall Mounting Installation	
Environmental			
Temperature/Humidity	Operating Temperature: -25 °C to +75 °C; Storage Temperature: -40 °C to +80 °C; 10 to 90% RH, Non-condensing		
3G System			
Frequency Band	-	WCDMA 850/900/1800/1900 MHz	4GE : WCDMA 850/900/2100 MHz 4GC : WCDMA 900/2100 MHz;TD-SCDMA 1900/2100 MHz; CDMA2000 (BC0) 800 MHz
Data Transmission	-	WCDMA / HSPA+; Download: Max. 14.4Mbps; Upload: Max 5.76Mbps	DC-HSPA+ Download: Max. 42 Mbps; Upload: Max 5.76 Mbps TD-SCDMA Download: Max. 4.2 Mbps; Upload: Max 2.2 Mbps CDMA2000 EVDO Download: Max. 14.7 Mbps; Upload: Max 5.4 Mbps
4G System			
Frequency Band	-		4GE : FDD LTE: B1/B3/B5/B7/B8/B20 MHz. 4GC : FDD LTE: B1/B3/B8 MHz; TDD LTE: B38/B39/B40/B41 MHz.
Data Transmission	-		Download Max 100 Mbps/Upload Max 50 Mbps
Certification			
CE/FCC	Ready		Applying

Software Specifications

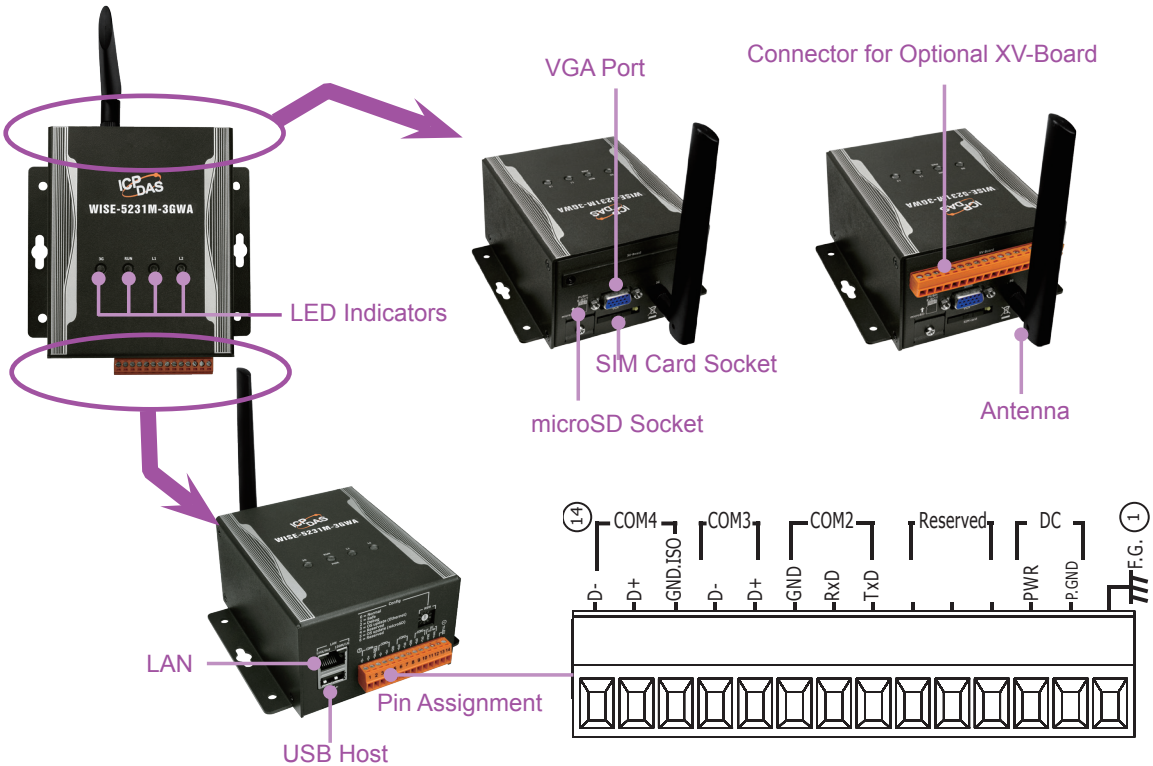
Function		Description
User-friendly and intuitive web site interface	Browser Interface	• Runs on browsers, no extra software tool is required • No more programming, Web pages provided for control logic editing and system parameters setting.
Various options for easy I/O module integration	Local side I/O Interface	• Support XV-board (XV107, XV107A, XV110, XV111, XV111A, XV116, XV306, XV307, XV308, XV310)
	Remote side I/O Interface (RS-485)	• Support ICP DAS I-7000/M-7000/tM/DL/LC/SC/IR series module • Support Modbus RTU Slave module
	Remote side I/O Interface (Ethernet)	• Support ICP DAS WISE-7100/(P)ET-7000/WF-2000 series module. • Support Modbus TCP Slave module.
Intelligent Logic operation and data logger ability at field sites	IF-THEN-ELSE Logic operation	• Provide IF-THEN-ELSE logic rule editing, and the ability for IF-THEN-ELSE logic rules execution.
	I/O channel monitoring and control	• 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.
	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 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.
	Email	• Execute Email message sending. The SSL/TLS authentication is provided
	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 I/O channel data of the controller by Period or Event Trigger operation.
	Internal Register	• Work as a variable to hold the temporary value, and provide the basic mathematical operation.
Various protocols for seamless integration with SCADA/MIS/ MES/IT/ Network Management systems	Real-Time I/O channel data	• Support Modbus TCP/RTU protocol for SCADA system. • Support SNMP and MQTT protocols for the integration with MIS/MES/IT/Network Management systems. • CGI Command sending and receiving function supported for the integration with IP Camera and Network devices. • Active I/O sending mechanism supported.
	Historical I/O channel data files	• FTP Server/Client ability for the maintenance of data logger files and the data logger files automatically send back operation. • 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. • 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.
	Communication Service	• DDNS (Dynamic DNS) service supported • WISE-5231M-4GE/4GC support 4G Wireless data comm.; WISE-5231M-3GWA support 3G Wireless data comm.
	IoT Gateway Capability	• Connection with Microsoft Azure and IBM Bluemix IoT Cloud platform. • Connection with ICP DAS IoTstar IoT Cloud Management Software

Appearance

WISE-5231



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



Ordering Information

WISE-5231 CR	Intelligent IIoT Concentrator
WISE-5231M-3GWA CR	Intelligent IIoT Concentrator (Support 3G Wireless data communication)
WISE-5231M-4GE CR	Intelligent IIoT Concentrator (Support 4G Wireless data communication; Frequency Band for EMEA, Korea, Thailand, India and Taiwan)
WISE-5231M-4GC CR	Intelligent IIoT Concentrator (Support 4G Wireless data communication; Frequency Band for China)

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)