Web Inside, Smart Engine

WISE

A Web-based Intelligent PAC Controller

- WISE-5231 Intelligent Multifunction IoT Controller
- WISE-58XX Intelligent Data Logger I/O Controller (with SMS)
- WISE-79XX Intelligent I/O Controller
- WISE-71XX Intelligent I/O Module

TAIWAN EXCELLENCE

WISE-7115

WISE-5801

WISE-5231

WISE Brochure
Vol. WISE-4.05.01

wise.icpdas.com

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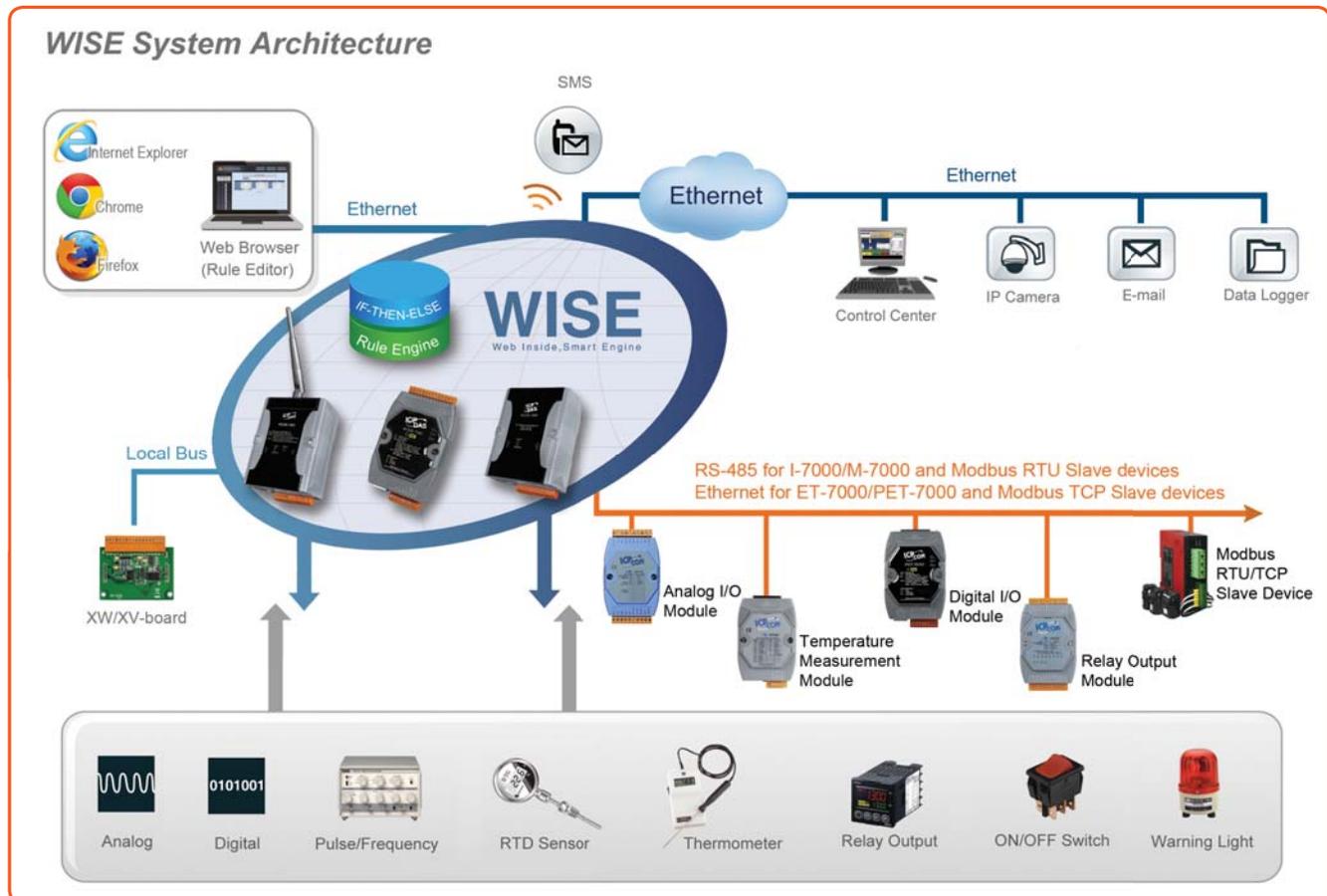
Through Web browser, users can access Web server on WISE controllers to perform tasks such as logic rule edition and download. An IF-THEN-ELSE rule engine will be set up to manage and deploy logic rules for controllers. The rule engine will check whether the rules are valid or not and determine the execution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

WISE-58XX(-MTCP)/WISE-5231 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; enables to 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 by FTP to the control center for further administration management or data analysis. In addition to the CGI command sending, WISE-5231 supports the CGI command receiving function that allows the Network devices (such as IP Camera) to trigger the operation of logic rule of WISE-5231. The well-thought-out CGI command functions make WISE-5231 being able to interact with the Network devices (such as IP Camera) flexibly. WISE- 5200 also supports SNMP V2c, SNMP Trap and DDNS. The flexible integration ability with the SCADA and IT software and the reliable ability of real-time I/O control make WISE-5231 the most cost-effective I/O controller in the IoT (Internet of Thing) Age.

■ WISE Applications

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

Features

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 controller, the rule engine will loop execute the rules in accordance with the execution order under specific conditions.

IF Conditions	
DI Channel	ON, OFF, ON to OFF, OFF to ON, Change
AI Channel	=, >, <, >=, <= (value)
Internal Register	
CGI Variable	
DI Counter	=, >, <, >=, <= (value), Change
DO Counter	
Timer	Timeout, Not Timeout
Schedule	In Range, Out of Range
Rule Status	Enable, Disable

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

WISE
IF-THEN-ELSE
Rule Engine
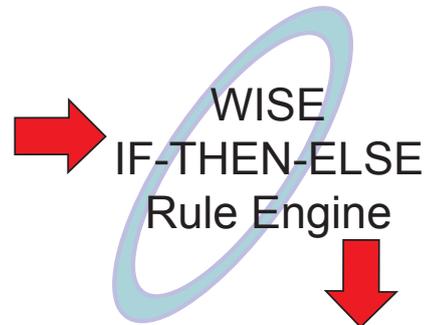
THEN / ELSE Actions	
DO Channel	ON, OFF, Pulse Output
AO Channel	Change the value
Internal Register	
DI Counter	Reset
DO Counter	
Timer	Start, Reset
SMS	Send
Email	
CGI Command	
SNMP Trap	
Data Logger	Start, Stop, One-Time Log
Rule Status	Enable, Disable

No extra software tool is required

WISE HMI interface runs on regular Web browsers. To edit control logic, it only requires a browser to connect to the Web server on WISE controller. No extra software tool installation is needed on the target PC.
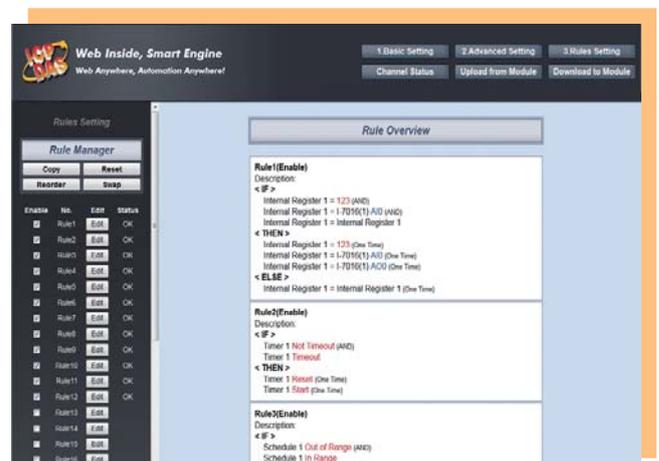
No more programming

WISE provides user-friendly Web UI pages for editing control logic on the controllers. It 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.

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.
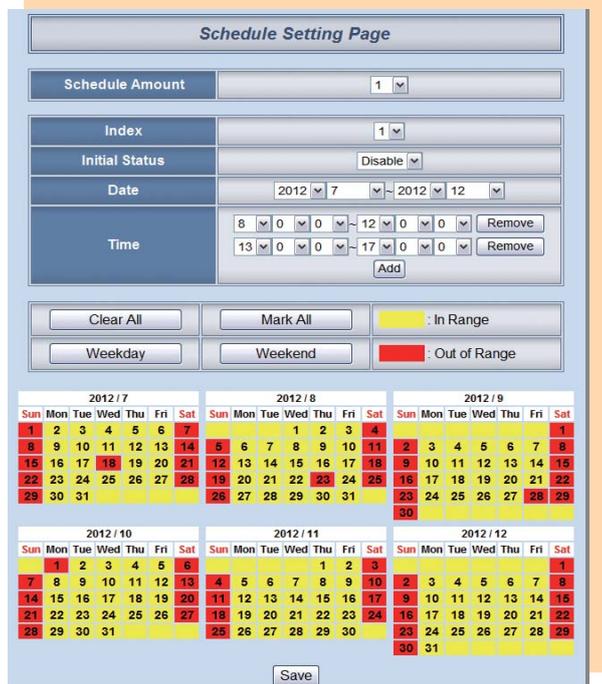
▲ WISE Web User Interface   ▲ Click and get done!

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.

▲ WISE Schedule setting page

Advanced P2P function between WISE controllers

WISE-71XX offers P2P function that enables WISE-71XX controllers to directly communicate with other remote WISE-71XX 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.
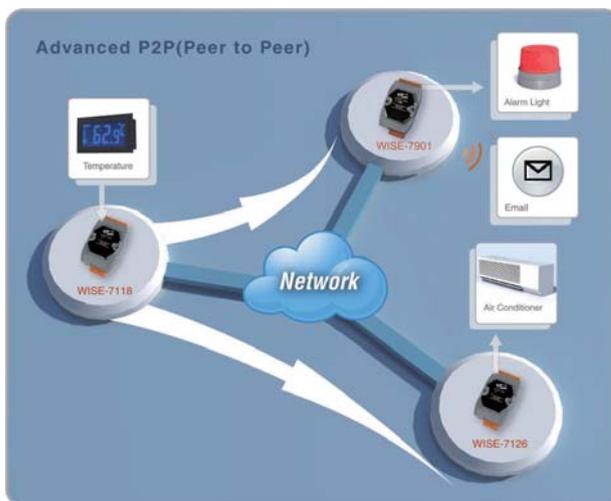
Real-time alarm notification & remote monitoring via SMS or Email

WISE supports SMS and Email functions for real-time message notification function. 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.

Support various protocols for seamless integration with SCADA and IT system

WISE controller supports various communication protocols to perform real-time monitoring and control of the controllers. The Modbus TCP/RTU protocol of WISE allows sharing I/O channel and system data with the SCADA system. WISE also support the SNMP V2c, SNMP Trap and MQTT protocol function for easy integration with the MIS system/Facility management system/Network management system. The flexible integration ability with the SCADA and IT system make WISE the most cost-effective I/O controller in the IoT (Internet of Thing) applications.

CGI Command sending & receiving for surveillance system integration

WISE-5231 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-5231 to receive the CGI commands from others network devices. The content of CGI command received can be used in IF condition statements to trigger the THEN/ELSE actions.

▲ Advanced P2P function

▲ Email function

Real-time receive and execute SMS command

WISE-5801(-MTCP) controller 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.
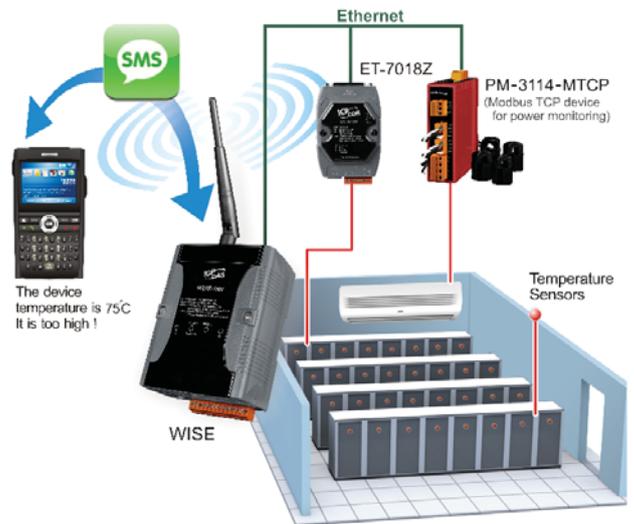
Support Modbus TCP/RTU slave module

WISE Controller allows to connect with 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.

Note:

1. WISE-58XX can connect to ICP DAS XW-board, I-7000/M-7000 series modules, DL series modules or Modbus RTU slave modules.
2. WISE-58XX-MTCP can connect to ICP DAS XW-board, ET-7000/PET-7000 series modules, WISE-71xx series modules or Modbus TCP slave modules.
3. WISE-5231 can connect to ICP DAS XV-board, I-7000/DL modules, M-7000/tM/DL/LC/SC/IR modules, WISE-7100/(P)ET-7000/WF-2000 modules and Modbus TCP/RTU slave modules.
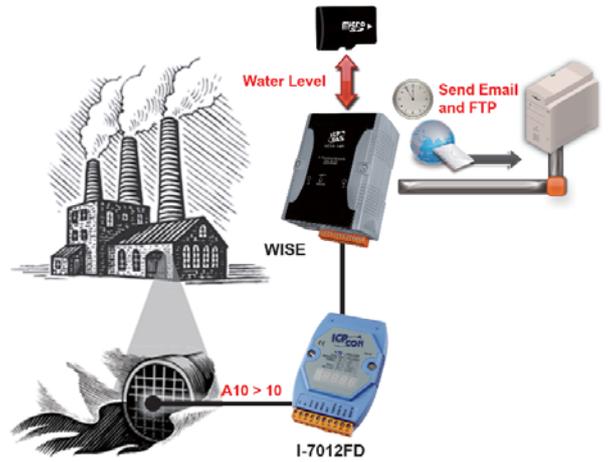
Data Logger operation

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

▲ SMS alarm notification

▲ Data Logger function
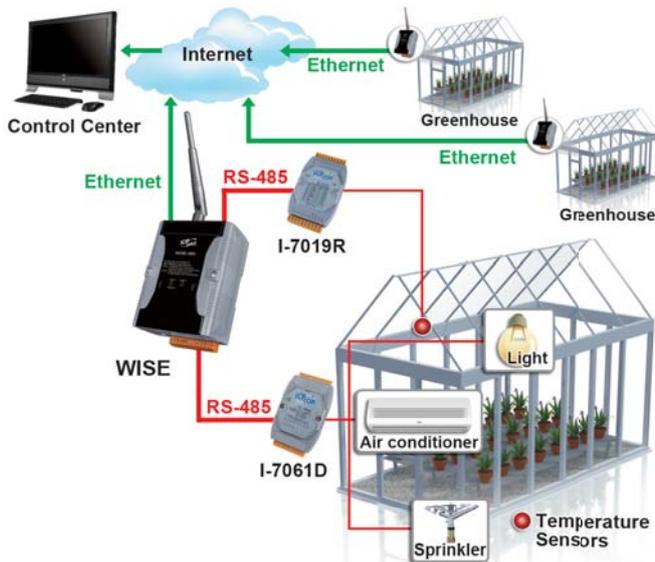
▲ Active I/O sending mechanism

Active I/O sending mechanism

In addition to the Modbus TCP/RTU slave function that enables SCADA software to poll the I/O channel data of the WISE controller, now WISE provides "Active I/O sending" mechanism (Modbus TCP master and SNMP Trap). Based on the "Active I/O sending", WISE allows to send the I/O channel data of the controller actively to SCADA/MIS/Facility Management/Network Management 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 IT/SCADA software.

Note:

Based on Modbus TCP protocol, the SCADA software must be able to provide Modbus TCP slave function to receive the I/O channel data sent by WISE-58XX(-MTCP) or WISE-5231.

WISE-5231 : A perfect concentrator of sensor and I/O modules in the IoT age

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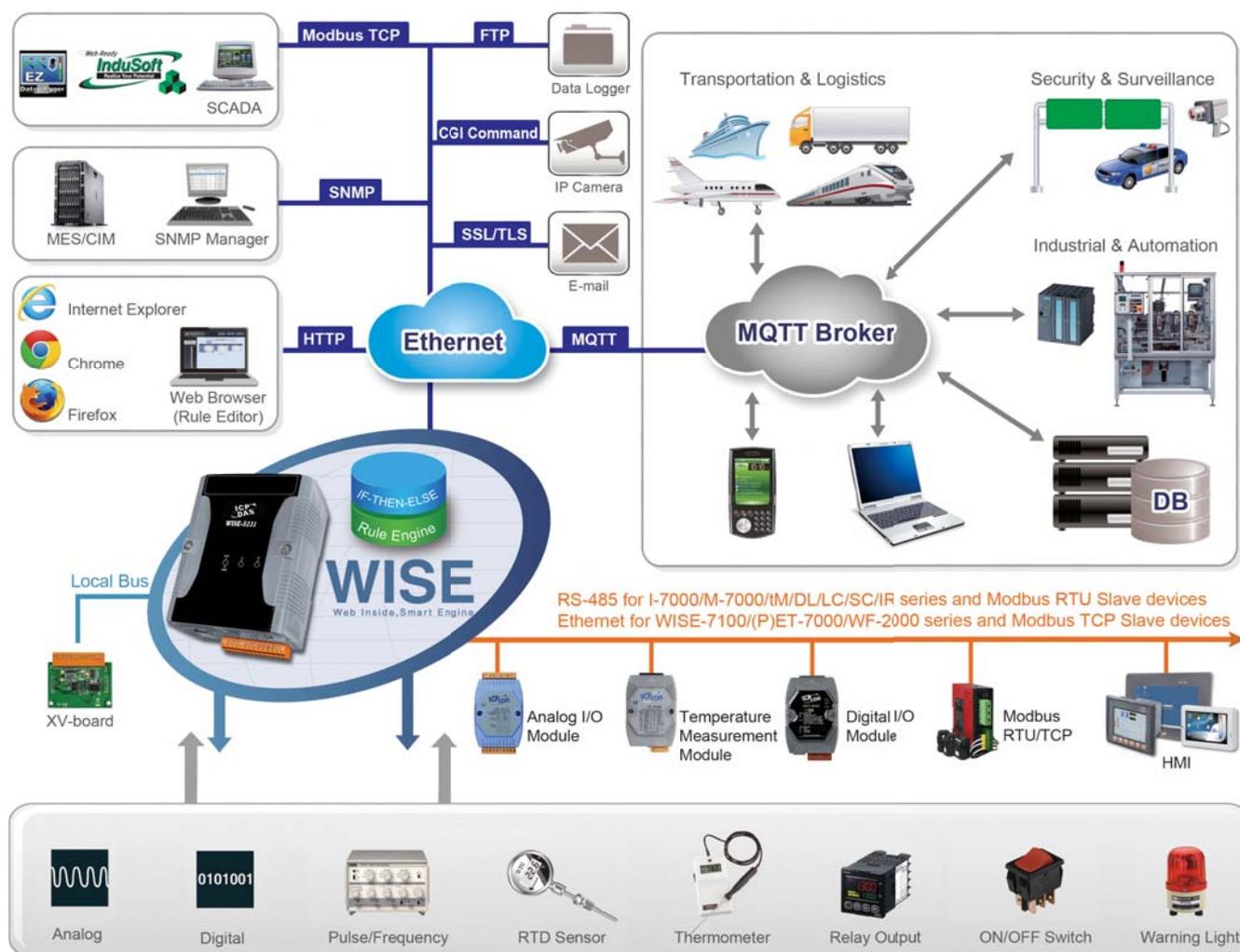
Industry 4.0 is based on Internet of Things (IoT) that incorporates the technological concept of communicating and exchanging information between all facilities which brought manufacturing industry to a new era. The WISE-5231 Intelligent IoT Controller developed by ICP DAS is a perfect start point to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

- Support Modbus TCP/RTU Protocol
- Support SNMP (Simple Network Management Protocol)
- Support MQTT (MQ Telemetry Transport) for message publish/subscribe mechanism
- Support FTP Server/Client for the maintenance of data logger files
- Support SSL/TLS authentication Email sending for alarm notification
- Support full CGI command operations - CGI command sending and CGI command receiving
- Support DDNS (Dynamic DNS) service

Applications

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 WI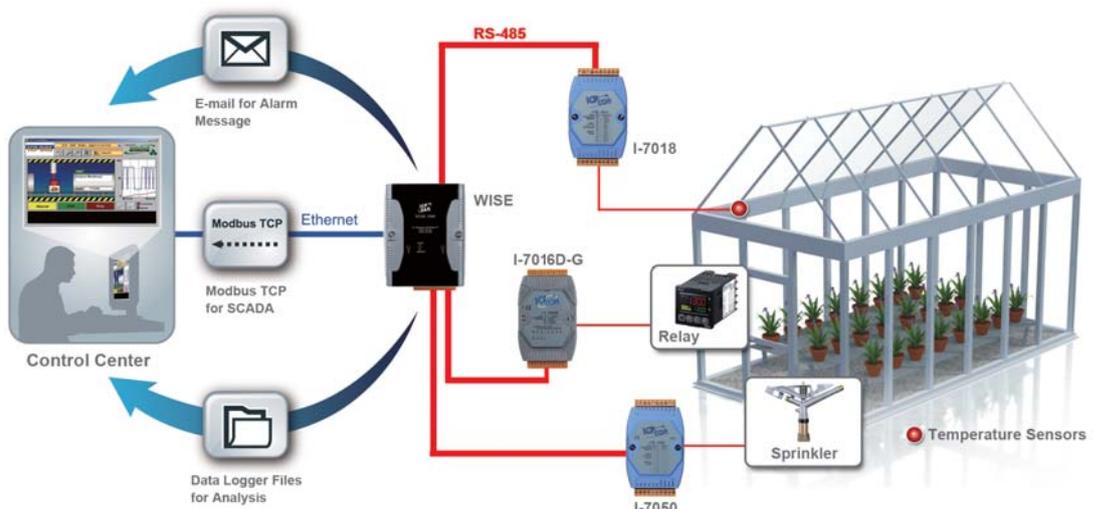SE controllers, and when smoke and high temperature are detected, the fire fighting procedures will be triggered; the sprinklers will be automatically turned on to put out the fire; the ventilation fans will be started to take away the smoke; and will turn on the warning lights and open the security 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.
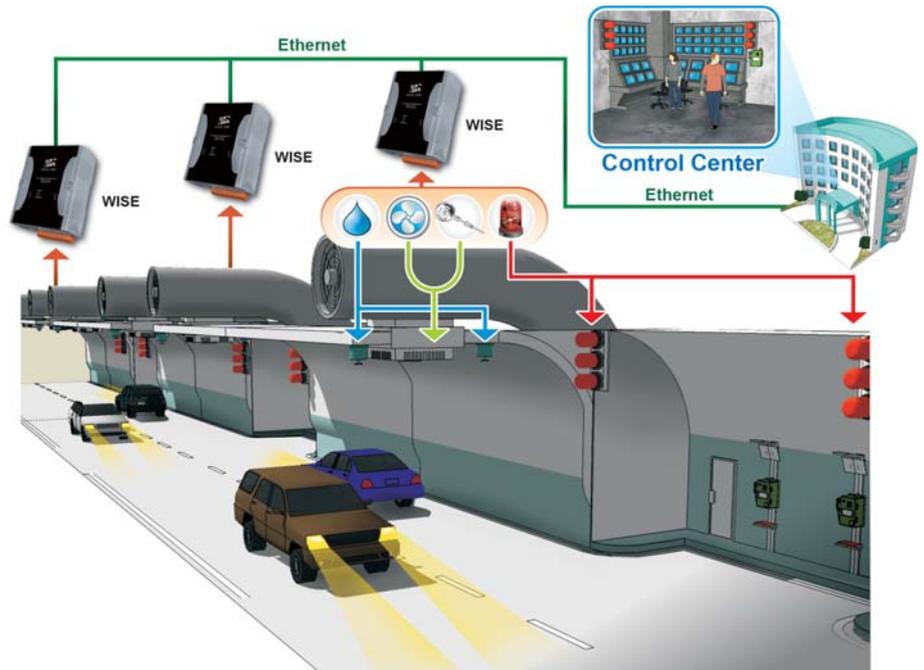
Greenhouse Automation Solution

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-5xxx 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 CO_2 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 TCP protocol 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

Disaster Prevention System
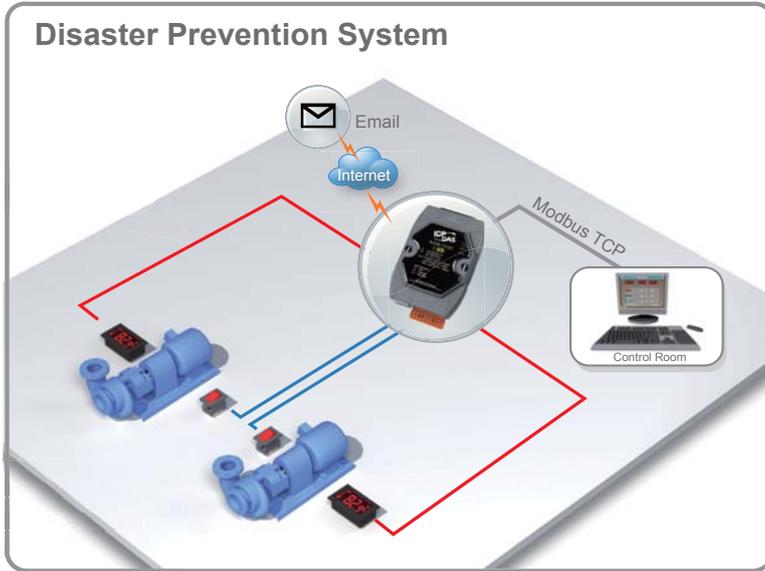
to build an automated system that enables real-time monitoring and disaster prevention. WISE controller provides a total solution for disaster prevention/monitoring system that will detect temperature for various devices in the factory in real time. It also enables communication between devices that 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 or email to the related personnel. WISE controller also support Modbus TCP protocol 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-7000 and Modbus RTU 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 SMS 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 SMS alarm message regarding current water level to the related personnel for immediately response.

Environment Management System

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

Product Line Management System

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 TCP protocol so that information can be instantly transmitted to the control center and makes real time monitoring the overall production line status more efficiently.
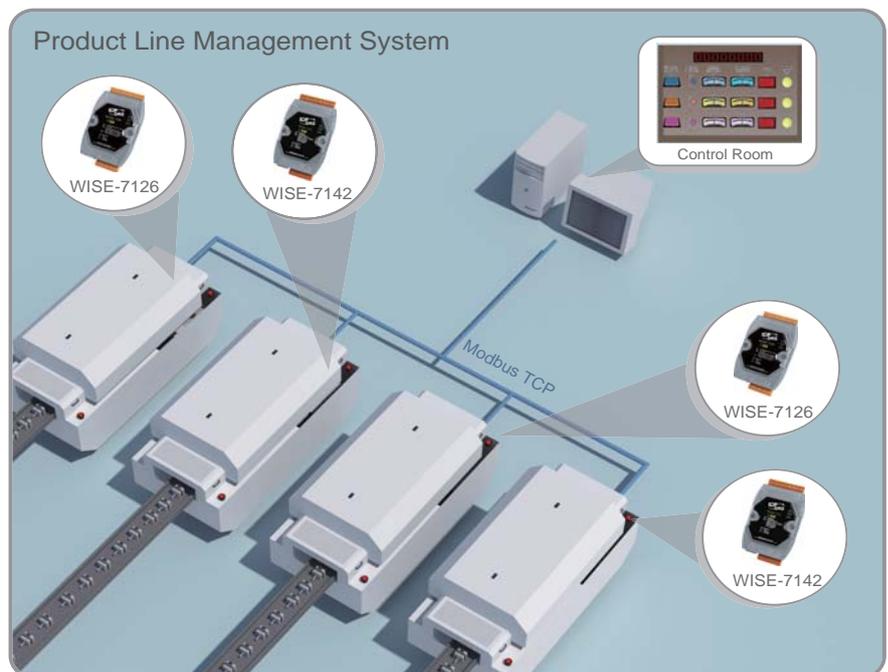
WISE Advantages and Selection Guide

■ Why WISE ?

✓ No extra software tool is required; all operations can be done through the Web browser
✓ No programming is required. Dramatically reduce the labor and cost spent on system development
✓ Provide various hardware platforms and wide range of I/O modules that allows users to find best solutions
✓ IF-THEN-ELSE logic rules execution ability
✓ Fully automation functions supported
- I/O channel monitoring and control
- Timer/Schedule operation
- SMS/Email message sending
- CGI Command sending and receiving function supported for IP Camera and Network device
- SMS command receiving to perform the tasks triggered by SMS.
- Seamless integration with SCADA through Modbus TCP/RTU protocol
- Automatically perform data logger operation and send back data files
- Active I/O operation for efficient data communication
- SNMP V2c protocol, SNMP Trap and DDNS function supported

■ WISE Selection Guide

Item\Product Series		WISE-71XX		WISE-7901	WISE-58XX(-MTCP)	WISE-5231
Hardware	CPU	16-Bit CPU				32-Bit CPU
	Network Interface	10/100 Base-TX with PoE			10/100 Base-TX	10/100 Base-TX
	Micro SD Interface	-			Yes	Yes
	I/O Module Support — Local I/O	Built-in		with X-board	with XW-board	with XV-board
	I/O Module Support — Remote I/O	-			I-7000 or Modbus RTU Slave or Modbus TCP Slave Device	DCON & Modbus RTU Slave & Modbus TCP Slave Device
Software Function	Rule Configuration Website	Yes			Yes	Yes
	IF-THEN-ELSE Logic Rule	Yes			Yes	Yes
	I/O Channel Operation	Yes			Yes	Yes
	Timer Operation	Yes			Yes	Yes
	Connect with SCADA Software	Yes (Support Modbus TCP)			Yes (Support Modbus TCP/RTU)	Yes (Support Modbus TCP/RTU)
	Email Message Sending	Yes (non-SSL)			Yes (non-SSL)	Yes (non-SSL & SSL)
	Schedule Operation	-		Yes	Yes	Yes (more powerful)
	Active I/O Operation	-			Yes	Yes
	Data Logger Operation	-			Yes (one set)	Yes (more sets)
	FTP — Client	-			Yes	Yes
	FTP — Server	-			-	Yes
	CGI Command — Sending	Yes			Yes	Yes (more powerful)
	CGI Command — Receiving	-			-	Yes
	SNMP v2c & SNMP Trap	-			-	Yes
	DDNS	-			-	Yes
	MQTT	-			-	Yes
	P2P Supported	Yes			-	-
	SMS Operation	-			Yes, by WISE-5801(-MTCP)	-

WISE-5231 - Intelligent Multifunction IoT Controller

NEW!

WISE-5231
Intelligent Multifunction IoT Controller

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 devices (Up to 32)
- Support Modbus TCP Slave devices (Up to 16)
- SSL/TLS Email sending function supported
- 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 protocol for SCADA software integration
- SNMP, SNMP Trap, MQTT and DDNS function supported

Introduction

WISE(Web **I**nside, **S**mart **E**ngine) 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-5231 provides more supports in I/O functions. It allows connections to XV-board; supports DCON I/O modules, Modbus RTU Slave modules and Modbus TCP Slave modules together. The wide range of selection options enables flexibility in I/O module integration to meet the requirements from various applications. WISE-5231 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 to the control center. In addition to the CGI command sending function, WISE-5231 now supports the CGI command receiving function that allows the devices (such as IP camera) connected to the network to trigger the operation of IF-THEN-ELSE logic rule of WISE-5231. The well thought-out CGI command functions make WISE-5231 being able to interact with the devices flexibly in the network environment. WISE-5231 also supports SNMP, SNMP Trap, MQTT and DDNS protocols and services. The flexible integration ability with the SCADA and IT software or devices and the reliable ability of real-time I/O logic control and data logger make WISE-5231 the most cost-effective I/O controller in the IoT (Internet of Thing) Age.

System Specifications

Model	WISE-5231
System	
CPU	32-bit ARM 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
VGA	Yes
Communication	
Ethernet	RJ-45 x 1, 10/100/1000 Base-TX (Auto-negotiating, Auto MDI/MDI-X)
COM 1	RS-232 (TxD, RxD, GND), non-isolated, Speed: 115200 bps max
COM 2	RS-232 (TxD, RxD, GND), non-isolated, Speed: 115200 bps max.
COM 3	RS-485 (Data+, Data-), non-isolated, Speed: 115200 bps max.
COM 4	RS-485 (Data+, Data-), 2500 V_{DC} isolated, Speed: 115200 bps max.
LED Indicators	
Power LED	Yes (Red)
System LED	Yes (Red, Green)
I/O Module Support	
Local I/O Module	Yes, one XV-board
Remote I/O Module	DCON modules (up to 32) or Modbus RTU Slave modules (up to 32), Modbus TCP Slave modules (up to 16)
Power Requirements	
Input Range	12 to 48 V_{DC}
Power Consumption	4.8 W
Mechanical	
Dimensions/Installation	91 mm x 132 mm x 52 mm (W x L x H) / DIN-Rail Installation
Environmental	
Temperature	Operating Temperature: -25 °C to +75 °C; Storage Temperature: -30 °C to +80 °C
Humidity	10 to 90% RH, Non-condensing

■ Software Specifications

Function		Description
User-friendly and intuitive web site interface	Browser	● 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	● Support XV-board
	Remote side	● Support DCON or Modbus RTU Slave devices (Up to 32) ● Support Modbus TCP Slave devices (Up to 16)
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, pulse output 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

Facility Room Monitoring Solution

- No more programming, Web pages for control logic editing
- Ability for IF-THEN-ELSE logic rules execution
- Modbus protocol supported for easy integration with I/O modules
  - Access and lighting status monitoring and control
  - Temperature and humidity monitoring
  - Air conditioning device monitoring and control
  - UPS monitoring for power status
- CGI command sending and receiving for interaction with IP camera
- Modbus, SNMP and MQTT protocols for integration with SCADA/MIS/MES/IT/Network Management systems.

WISE-5231   IP Camera   UPS   M-7055D   IR-712A   DL-302

ICP DAS. CO., LTD.

WISE-5231

■ I/O Module Support

☑ Local I/O Expansion (XV-board)

AI, AO, DI, DO XV-board						
Model Name	DI	DO	AI (16-bit)		AO (12-bit)	
			Ch	Range	Ch	Range
XV107, XV107A	8	8	-	-	-	-
XV110	16	-	-	-	-	-
XV111, XV111A	-	16	-	-	-	-
XV116	5	2 Signal Relay 4 Power Relay	-	-	-	-
XV306	4	4(Relay)	4	±1 V, ±2.5 V, ±5 V, ±10 V, ±20 mA, 0 ~ 20 mA, 4 ~ 20 mA	-	-
XV307	4	4(Relay)	-	-	2	0 V ~ +5 V, ±5 V, 0 V ~ +10 V, ±10 V, 0 mA ~ +20 mA, +4 mA ~ +20 mA
XV308	DI+DO=8		8	±1 V, ±2.5 V, ±5 V, ±10 V, ±20 mA, 0 ~ 20 mA, 4 ~ 20 mA	-	-
XV310	4	4	4	±1 V, ±2.5 V, ±5 V, ±10 V, ±20 mA, 0 ~ 20 mA, 4 ~ 20 mA	2	0 V ~ +5 V, ±5 V, 0 V ~ +10 V, ±10 V, 0 mA ~ +20 mA, +4 mA ~ +20 mA

☑ Remote I/O Expansion Modules

DCON Module	ICP DAS I-7000/DL series module
Modbus RTU Slave Module	ICP DAS M-7000/tM/DL/LC/SC/IR series module and Modbus RTU Slave module
Modbus TCP Slave Module	ICP DAS WISE-7100/(P)ET-7000/WF-2000 series module and Modbus TCP Slave module

■ Appearance

Connector for Optional XV-Board
microSD Socket
VGA Port
LED Indicators
Optional XV-Board
Rotary Switch
LAN
USB Host
Pin Assignment

■ Dimensions (Unit:mm)

Front View | Rear View | Top View | Bottom View | Left Side View | Right Side View

■ Ordering Information

WISE-5231	Intelligent Multifunction IoT Controller

■ 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-5231

WISE-58XX - Intelligent Data Logger 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 I/O monitoring, 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

WISE-5801
WISE-5801-MTCP

WISE-5800
WISE-5800-MTCP

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-58XX series provides more supports in I/O functions in addition to merits inherited from WISE-71XX. All WISE-58XX allows connections to XW-board; WISE-58XX supports I-7000 I/O modules and Modbus RTU Slave modules, meanwhile WISE-58XX-MTCP supports Modbus TCP Slave modules; the wide range of selection options enables flexibility in I/O module integration. WISE-58XX 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
System				
CPU	16-bit CPU			
Software	Built-in WISE Firmware			
microSD Expansion	Support 1/2/4 GB microSD			
RTC (Real Time Clock)	Yes			
Communication				
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.			
LED Indicators				
System LED	Yes (Red)			
Ethernet Link LED	Yes (Yellow: Ethernet link detected, Flashing Yellow: Ethernet packet received)			
I/O Module Support				
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) WISE-58XX-MTCP: Modbus TCP Slave modules (up to 7)			
SMS Function				
Frequency Band	-		Quad-band 850/900/1800/1900 MHz	
Mode	-		Text and Unicode mode	
Power Requirements				
Protection	Power Reverse Polarity Protection			
Frame Ground	Yes (for ESD Protection)			
Input Range	12 ~ 48 VDC			
Redundant Power Input	Yes			
Power Consumption	2.0 W		Idle: 2.0 W; Data Link: 150 ~ 400 mA (peak) @ 24 VDC	
Mechanical				
Dimensions/Installation	91 mm x 132 mm x 52 mm (W x H x D) / DIN-Rail Installation			
Environmental				
Temperature	Operating Temperature: -25 °C ~ +75 °C ; Storage Temperature: -30 °C ~ +80 °C			
Humidity	10 ~ 90% RH, Non-condensing			

WISE-58XX

■ 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	• Each rule supports 3 IF conditions that can be combined by AND or OR operators for evaluation. • Each IF-THEN-ELSE rule supports 3 THEN actions and 3 ELSE actions.
Internal Register	48	As a variable to hold the temporary value. SCADA 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
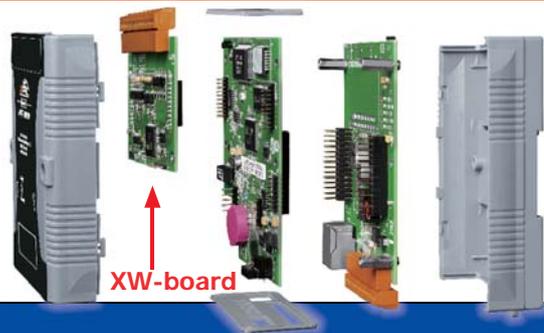
XW-board

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

I-7000 or Modbus RTU Slave Modules	Support WISE-5800/WISE-5801
Modbus TCP Slave Modules	Support WISE-5800-MTCP/WISE-5801-MTCP

■ Ordering Information

WISE-5800	WISE Intelligent Data Logger I/O Controller (For I-7000 modules or Modbus RTU Devices)
WISE-5800-MTCP	WISE Intelligent Data Logger I/O Controller (For Modbus TCP Devices)
WISE-5801	WISE Intelligent Data Logger I/O Controller with SMS (For I-7000 modules or Modbus RTU Devices)
WISE-5801-MTCP	WISE Intelligent Data Logger I/O Controller with SMS (For Modbus TCP Devices)

■ Accessories

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

WISE-58XX

WISE-79XX - Intelligent I/O Controller

WISE-7901/WISE-7901D

▣ Features

■ Runs on browsers, no extra software tool is required

■ IF-THEN-ELSE logic rules execution ability

■ Support X-board I/O

■ Provide I/O monitoring, email/CGI command sending, Recipe functions

■ Timer and Schedule functions supported

■ Support Modbus TCP Protocol for SCADA Software Integration

■ Support PoE (Power over Ethernet) function

■ 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-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

| Models	WISE-7901	WISE-7901D
System		
CPU	16-bit CPU	
Software	Built-in WISE Firmware	
RTC (Real Time Clock)	Yes	
Communication		
Ethernet	RJ-45 x 1, 10/100 Base-TX (Auto-negotiating, Auto MDI/MDI-X, LED indicators)	
COM 1	Reserved	
COM 2	Reserved	
LED Indicators		
System LED	Yes (Red)	
LED Display	-	5-digit 7-segment LED display
Special Indicator	PoE LED (Green)	
I/O Module Support		
Local I/O Module	Yes, one X-board	
Power Requirements		
Protection	Power Reverse Polarity Protection	
Frame Ground	Yes (for ESD Protection)	
Input Range	12 ~ 48 V$_{DC}$	
Power over Ethernet (PoE)	IEEE 802.3af Class 1	
Power Consumption	1.5 W	2.5 W
Mechanical		
Dimensions	72 mm x 123 mm x 35 mm (W x H x D) / DIN-Rail or Wall Mounting	
Environmental		
Temperature	Operating Temperature: -25 °C ~ +75 °C; Storage Temperature: -40 °C ~ +80 °C	
Humidity	5 ~ 90% RH, non-condensing	

WISE-7901

■ 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	• Each rule supports 3 IF conditions that can be combined by AND or OR operators for evaluation. • Each IF-THEN-ELSE rule supports 3 THEN actions and 3 ELSE actions.
Internal Register	48	As a variable to hold the temporary value. SCADA 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.
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-71XX or WISE-79XX only.).
Modbus TCP 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 (X-board)

DI, DO X-baord		
Model Name	DI	DO
X107	6	7
X109	-	7
X110	14	-
X111	-	13
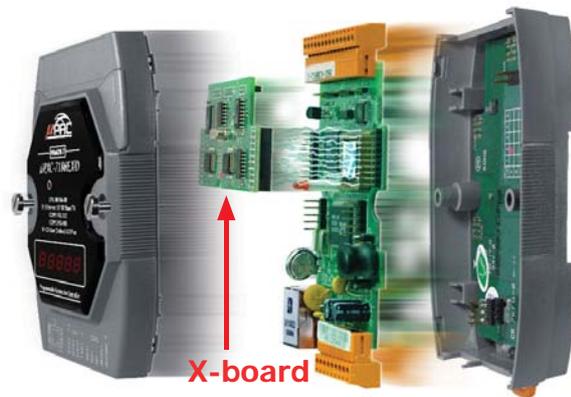
X-board

AI, AO, DI, DO X-baord						
Model Name	DI	DO	AI (12-bit)		AO (12-bit)	
			Ch.	Range	Ch.	Range
X202	-	-	7	0 ~ 20 mA	-	-
X203	2	6	2	0 ~ 20 mA	-	-
X303	4	6	1	±5 VDC	1	±5 VDC
X304	4	4	3	±5 VDC	1	±5 VDC
X305	2	2	7	±5 VDC	1	±5 VDC
X308	-	6	4	0 ~ 10 VDC	-	-
X310	3	3	2	Ch0 : 0 ~ 20 mA Ch1 : 0 ~ 10 VDC	2	0 ~ 10 VDC
X324	-	4	-	-	4	0 ~ 5 VDC

■ Ordering Information

WISE-7901	WISE Intelligent I/O Controller with PoE (Support X-board)
WISE-7901D	WISE Intelligent I/O Controller with PoE and LED display (Support X-board)

■ Accessories

GPSU06U-6	24V/0.25A, 6W Power Supply
MDR-20-24	24V/1A, 24W Power Supply with DIN-Rail Mounting
NS-205 CR	Unmanaged 5-Port Industrial Ethernet Switch (RoHS)
NS-205PSE CR	Unmanaged 5-Port Industrial PoE Ethernet Switch (RoHS)

WISE-7901

WISE-71XX - Intelligent I/O Module

WISE-71XX Series

Features

- Runs on browsers, no extra software tool is required
- IF-THEN-ELSE logic rules execution ability
- Built-in I/O module
- Provide I/O monitoring, CGI Command/Email sending and Recipe functions
- Timer function supported
- Support Modbus TCP Protocol for SCADA Software Integration
- Support PoE (Power over Ethernet) function

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-71XX module 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. In addition, all WISE-71XX modules support PoE (Power over Ethernet) function that simplifies the wiring deployment of the applications.

System Specifications

System	
CPU	16-bit CPU
Software	Built-in WISE Firmware
Communication	
PoE Ethernet Port	10/100 Base-TX (Auto MDI/MDI-X)
Isolation Protection	
I/O 2-Way Isolation	2500 VDC
EMS Protection	
ESD (IEC 61000-4-2)	±4 kV Contact for each terminal, ±8 kV Air for random point
EFT (IEC 61000-4-4)	±4 kV for Power (WISE-7102, WISE-7105, WISE-7115, WISE-7117, WISE-7118Z, WISE-7119, WISE-7126, WISE-7142, WISE-7144, WISE-7150, WISE-7151, WISE-7152, WISE-7153) ±2 kV for Power (WISE-7160, WISE-7167)
LED Indicators	
PoE Power	PoE On
L1	System Running
L2	Ethernet Link/Act
L3	Ethernet 10/100 M Speed
Power Requirements	
Reverse Polarity Protection	Yes
Powered from Terminal Block	Yes, 12 ~ 48 VDC
Powered from PoE	Yes, IEEE 802.3af, Class1
Consumption	4.2 W
Mechanical	
Dimensions/Installation	72 mm x 123 mm x 35 mm (W x L x D) / DIN-Rail or Wall Mounting Installation
Environment	
Operating Temperature	Operating Temperature: -25 °C ~ +75 °C; Storage Temperature: -30 °C ~ +80 °C
Humidity	10 ~ 90% RH, Non-condensing

WISE-71XX

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■ 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	• Each rule supports 3 IF conditions that can be combined by AND or OR operators for evaluation. • Each IF-THEN-ELSE rule supports 3 THEN actions and 3 ELSE actions.
Internal Register	48	As a variable to hold the temporary value. SCADA 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.
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-71XX or WISE-79XX only.).
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

WISE-71XX	Local I/O Channel				Property	Over Voltage Protection	2-Way Isolation Protection	EMS Protection	
	DI	DO	AI	AO				ESD (IEC 61000-4-2)	EFT (IEC 61000-4-4)
WISE-7102	6	3 (Power Relay)	3	-	-	240 Vrms	2500 VDC	±4 kV Contact for each terminal and ±8 kV Air for random point	±4 kV for Power
WISE-7105	-	4	8	-	Support Thermistor	110 VDC/VAC			
WISE-7115	-	-	7	-	Support RTD	-			
WISE-7117	-	4	8	-	-	240 Vrms			
WISE-7118Z	-	6	10	-	Support Thermocouple Input				
WISE-7119	-	4	8	-	Support Thermocouple Input				
WISE-7126	2	2	6	2	-				
WISE-7142	-	16 (Sink Type)	-	-	-				
WISE-7144	8	8 (Sink Type)	-	-	DI Input Type WISE-7153: Dry Contact (Source) Other Models: Wet Contact (Sink, Source)	-			
WISE-7150	12	6 (Sink Type)	-	-					
WISE-7151	16	-	-	-					
WISE-7152	8	8 (Source Type)	-	-					
WISE-7153	16	-	-	-					
WISE-7160	6	6 (Power Relay)	-	-					±2 kV for Power
WISE-7167	-	8 (Power Relay)	-	-	-				

■ Ordering Information

WISE-71XX	WISE Intelligent 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
MDR-20-24 CR	24 V/1 A, 24 W Power Supply with DIN-Rail Mounting
NS-205 CR	Unmanaged 5-Port Industrial Ethernet Switch (RoHS)
NS-205PSE CR	Unmanaged 5-Port Industrial PoE Ethernet Switch (RoHS)

WISE-71XX