

ICP DAS WISE
User Manual for
WISE-523x / WISE-224x
Series

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泓格科技
ICP DAS CO., LTD.

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1 Introduction

WISE IIoT Edge Controller is an Intelligent Web-based Multi-functions PAC controller designed 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 HMI interface that allows you to implement control logic on controllers just a few clicks away; no programming is required. With this powerful and easy-to-use software, it will minimize the learning curve, shorten time to market and dramatically reduce the labor and cost spent on system development.

Through Web browser, you can access Web Server on WISE to perform tasks such as logic rule edition and download. WISE equips an IF-THEN-ELSE rule engine that 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 scheduled and Timer tasks, sending Email under a specific condition. In addition, through the Modbus TCP/RTU protocol and SNMP protocol, it enables SCADA software or SNMP Management software to control and monitor I/O channel or system status on controllers in real time.

WISE-523x/WISE-224x provides more supports in I/O functions in addition to merits inherited from WISE series controllers. It supports XV-board; allows connections to I-7000 I/O modules, Modbus RTU Slave modules and Modbus TCP Slave modules together. The wide range of selection options enables the flexibility in I/O module integration to meet the requirements from various applications. WISE-523x/WISE-224x 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. In addition to the CGI command sending function, WISE-523x/WISE-224x now supports the CGI command receiving function that allows the network devices to trigger the operation of IF-THEN-ELSE logic rule of WISE-523x/WISE-224x by Ethernet. The well thought-out CGI command functions make WISE-523x/WISE-224x being able to interact with the devices flexibility in the network environment. WISE-523x/WISE-224x supports SNMP V2c protocol and the SNMP Trap operation to work with the SNMP Network Management software. It also supports the MQTT protocol to connect with the MQTT broker for the message publishing and subscribing mechanism, and the connection with the IoT service which Microsoft Azure and IBM Bluemix provide. Additionally, WISE-523x/WISE-224x provides to send messages to the instant messaging APP: LINE. The flexible integration ability with the SCADA and IT software (or devices) and the reliable

ability of real-time I/O logic control make WISE-523x/WISE-224x the most cost-effective I/O controller in the IoT (Internet of Thing) Age.

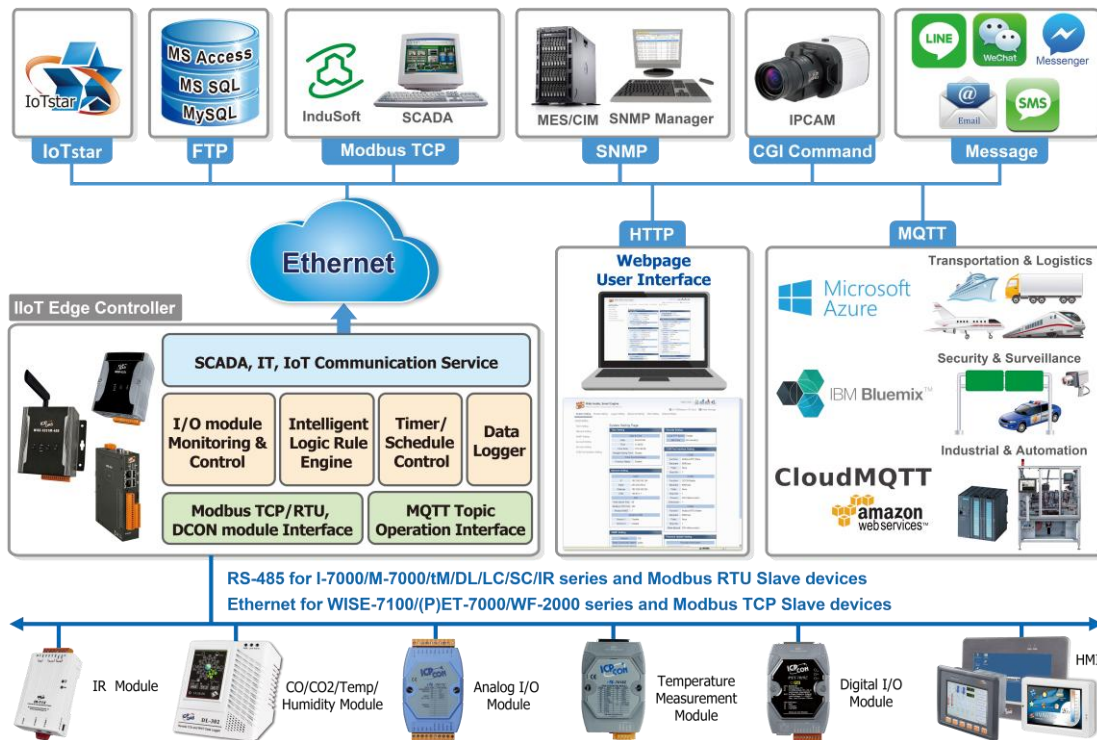


Figure 1-1 : WISE-523x/WISE-224x System Architecture

The difference between WISE-523x series and WISE-224x series are as follows:

Comparison Table	WISE-5231 Series	WISE-2241M
Hardware	117 mm x 126 mm x 58 mm LAN port x 1	33 mm x 160 mm x 129 mm LAN port x 2
Module List	WISE-5231 Series	WISE-2241M
Communication		
Ethernet	WISE-5231 WISE-5231M	WISE-2241M
Ethernet / 3G : WCDMA 850/900/1800/1900 MHz	WISE-5231M-3GWA	
Ethernet / 4G : FDD LTE: B1/B3/B5/B7/B8/B20 MHz	WISE-5231M-4GE	-
Ethernet / 4G FDD LTE: B1/B3/B8 MHz TDD LTE:	WISE-5231M-4GC	

B38/B39/B40/B41 MHz		
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WISE-523x/WISE-224x system features:

◆ **IF-THEN-ELSE logic rules execution ability**

WISE-523x/WISE-224x equips with an IF-THEN-ELSE logic Rule Engine; it offers IF-THEN-ELSE rules for you 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 order under specific conditions.

◆ **No programming is required to implement logic content on controllers**

WISE-523x/WISE-224x provides user-friendly Web UI pages for editing control logic on the controllers. It enables to implement logic edition by a few clicks on the mouse to set up and deploy logic rules without writing a single line of code.

◆ **No extra software tool is required; all operations can be done through the Web browsers**

Provides Web-based HMI interface runs on regular Web browsers. To edit control logic, it only requires a browser to connect to the Web server on WISE-523x/WISE-224x. No extra software tool installation is needed on the target PC.

◆ **Support XV-Board and various remote I/O Modules**

WISE-523x/WISE-224x allows to connecting with a wide range of the ICP DAS I/O modules as XV-Board, I-7000 modules, M-7000 modules, (P)ET-7000 modules, WISE-7100 modules, WF-2000 modules and tM/DL/LC/SC/IR series modules,. In addition to these ICP DAS modules, WISE-523x/WISE-224x also allows to connect with devices that support Modbus RTU/TCP Slave protocol for I/O monitoring. The ability to connect with various types of I/O modules enables flexibility and scalability for system implementation and allows to meet various requirements from the clients that enable to find best solutions to meet the requirements. Please refer to the following table for I/O modules support list of WISE-523x/WISE-224x:

I/O Module Support List		Description	Amount
Local I/O Module	Local Bus	ICP DAS : XV-Board series module	1
Remote I/O Module	DCON by RS-485	ICP DAS : I-7000/DL series module	Up to 16 modules (Each COM Port)
	Modbus RTU by RS-485	<ul style="list-style-type: none"> ● ICP DAS : M-7000/tM/DL/LC/SC/IR series module. ● Others : The modules which support the Modbus RTU Slave Protocol. 	
	Modbus TCP by Ethernet	<ul style="list-style-type: none"> ● ICP DAS : WISE-7100/(P)ET-7000/WF-2000 series module ● Others : The modules which support the Modbus TCP Slave Protocol. 	Up to 16 modules
IP Camera	HTTP by Ethernet	iCAM-721F, iCAM-760D, iCAM-771, iCAM-ZMR8422X, iCAM-MR6422X, iCAM-MR6322	Up to 4 cameras

Figure 1-2 : WISE-523x/WISE-224x IO module support list

◆ **Provide Timer and Schedule operation**

WISE-523x/WISE-224x features two kinds of timing functions: Timer and Schedule. It allows you to perform specific tasks such as time delay, or schedule specific date or time for control logic execution. To ensure the accuracy of the WISE controller clock, it also has the ability to sync the clock to an SNTP time server for time synchronization through the network.

◆ **Provide Email Alarm message sending function**

WISE-523x/WISE-224x supports Email alarm message sending function. Email is the important function for real-time message communication. The sending action can be added to the logic edition as part of logic control to provide real-time message transmission in response to specific events. The SSL authentication is provided by WISE-523x/WISE-224x.

◆ **Provide CGI Command Sending and Receiving functions**

CGI command function is an important function for real-time message communication in network environment. WISE-523x/WISE-224x supports fully CGI command operations as 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 let WISE-523x/WISE-224x can receive the CGI command from others network devices. The content of CGI command receiving can be used in IF condition statements to trigger the THEN/ELSE actions.

◆ **Data Logger function**

With the microSD card, WISE-523x/WISE-224x provides Data Logger function to real-time record the I/O data of the controller. The Data Log files can be sent to the FTP server or the Email address for users, or user can actively download them from the FTP client utility or Web page for further administration management or data analysis.

◆ **Math formula editing function**

WISE-523x supports 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.

◆ **Real-time monitoring system status of controllers**

WISE-523x/WISE-224x supports Modbus TCP/RTU Protocol for you to perform real-time monitoring and control of the controllers. WISE also provides an easy-to-view HMI web interface for real-time monitoring. It allows you to get important real time system information even without SCADA software. Besides Modbus TCP/RTU Protocol, WISE-523x/WISE-224x supports SNMP V2c protocol, and provides the IF-THEN-ELSE rule setting to trigger the SNMP Trap sending. It makes the integration between the Network Management software (and device) and WISE-523x/WISE-224x to be easier.

◆ **Password protection for access control**

WISE HMI web page offers password protection. After getting in the webpage, you will be required to input the password before editing logic rules. In addition, WISE-523x/WISE-224x provides monitoring web pages specifically designed for cell phone. The access control restricts the access to the webpage to prevent unauthorized modification; it allows to set up passwords for Administrator, User and Guest; only the authorized users will be allowed to review the setting,

change the setting or modify the channel data.

◆ **Active I/O Sending function**

In addition to the Modbus TCP/RTU Slave function that enables SCADA software (or HMI device) to poll the I/O channels value of the WISE controller, now WISE-523x/WISE-224x provide the function “Active I/O Sending” for users. Based on the “Active I/O Sending” function, WISE-523x/WISE-224x can send the I/O channels value of the controller actively to SCADA software (or HMI device) by event trigger (I/O channel value changed) or periodic cycle. This function will improve the efficient of the data communication between WISE-523x/WISE-224x and SCADA software (and HMI device). **Please note: The SCADA software (or HMI device) must equip the Modbus TCP Slave function to receive the I/O channels data sent by WISE-523x/WISE-224x.**

◆ **MQTT Message Publish/Subscribe operation**

WISE-523x/WISE-224x supports the MQTT protocol. It can publish the I/O data of the I/O module which connect to WISE-523x/WISE-224x to the MQTT broker, and receive the message content of the Subscribe MQTT Topics which is published by others MQTT device for the data logging operation or using it in the IF-THEN-ELSE logic rule.

◆ **Connection with IoT Cloud Platform**

WISE-523x/WISE-224x support 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-523x/WISE-224x also can receive the message which is published from the Cloud platform for the corresponding actions at the field side.

◆ **Mobile network connection**

WISE-523xM-3GWA and WISE-523xM-4GE/4GC support Mobile Network communication. With the 3G/4G SIM card, it can send the data logger files and Email alarm message back to the control center by Mobile Network.

◆ **Provides SMS command receiving function and alarm notification function**

WISE-523xM-3GWA and WISE-523xM-4GE/4GC equip SMS command receiving and alarm message notification function. It allows to include SMS alarm sending action into logic rules to send a pre-set SMS message to related

personnel when an event occurs. In addition, the controllers allow to receive the SMS commands sending by specific phones numbers to perform tasks such as real-time channel monitoring, channel data modification and logic rules execution (triggered by SMS), etc.

◆ **Connection 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 additional, WISE-523x/WISE-224x provides remote backup mechanism to upload images and videos to the remote FTP server automatically.

◆ **Provide LINE Notify message sending function**

WISE-523x/WISE-224x supports to send LINE messages to the LINE personal account or group chat room. The LINE message sending function can be triggered by IF-THEN-ELSE rules. The LINE message content could be a preset string with realtime I/O channel data, or a snapshot via the connected IP camera.

This document is intended to give you a full-range instruction to WISE-523x/WISE-224x controllers. You will be able to learn how to edit logic of the rules and how to download the rules to the controllers for conditional execution. **In the following document, we use “WISE” to represent WISE-523x and WISE-224x series modules.**

2 Before Installation

When WISE is powered on, please wait about one minute to complete the start-up procedure. When the “RUN/PWR” light starts flashing, it represents the boot is complete, the connection can be started.

Modify WISE's network settings to fit current network environment settings, and the default network settings of WISE is as follow:

- IP : 192.168.255.1
- Subnet mask : 255.255.0.0
- Gateway address : 192.168.0.1
- DNS Server address : 8.8.8.8 (default: Google DNS Server)

Steps

- (1) Modify the network settings of the PC or Notebook to be the same network segment as WISE. For example:
 - ◆ IP : 192.168.255.10
 - ◆ Subnet mask : 255.255.0.0
 - ◆ Gateway address : 192.168.0.1
- (2) Connect WISE LAN to PC by network cable. (WISE is capable of auto-crossover)
- (3) Start the browser and input <http://192.168.255.1> in the address bar.
- (4) Input default administrator password “Admin” to login into the page.
- (5) After login in WISE web page, go to “System Setting → Network Setting”, modify the network setting to fit current network environment. More detailed setting information please refers to [5.2 Network Setting](#).
- (6) Save the settings and connect WISE to the network.

You can also modify WISE's network settings by using the WISE-52xx_224x Utility. Please refer to WISE-52xx_224x Utility User Manual for detail.

Please Note: If there are the ICP DAS I/O modules or Modbus TCP/RTU Slave modules which will connect with WISE, please finish the hardware installation of the ICP DAS I/O modules or Modbus TCP/RTU Slave modules, and make sure all wiring connections are correct.

3 System Login

When connect to WISE webpage server via Web browser (**IE 8 / Firefox 3.6 / Chrome 14.0.8 version or above are recommended**), in order to get a better operation experience, 1280x1024 resolution is recommended. The Login page of WISE is shown as below:

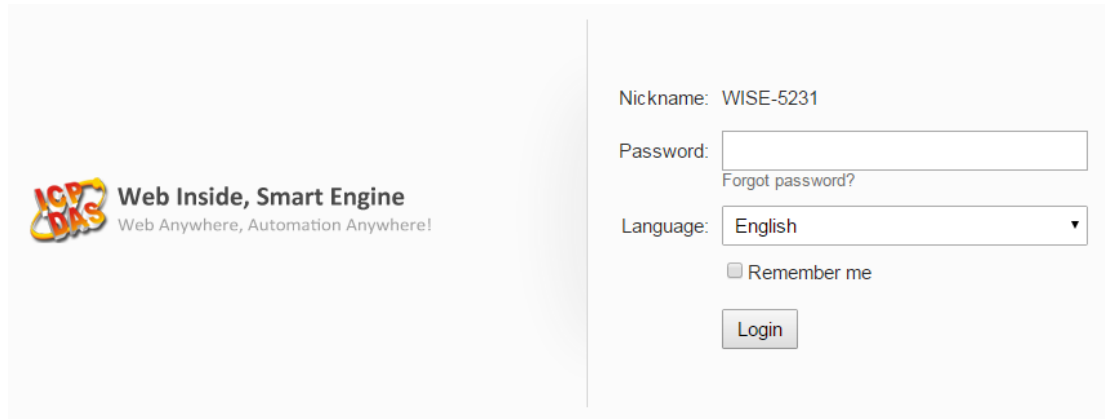


Figure 3-1 : WISE Login page

By inputting different passwords, three levels of authority are granted as follow:

◆ **Administrator (Default password: **Admin**)**

Login as an administrator allows performing settings and reviewing of system information and I/O modules information, it also allows performing Logic rule edition. Only one administrator is allowed to login into the system at the same time.

◆ **User (Password is defined by Administrator)**

WISE provides 5 User accounts to login. Each User can access to perform the modification or review of the WISE settings (based on the authority the administrator pre-assigned), however, the User does not have the right to add or delete the settings of WISE. As for the logic rules, the User can only be allowed to view the logic rules if the administrator assigns the authority to them; they do not have the right to modify/delete/add logic rules. The User can view the real-time I/O channel information.

◆ **Guest (Default password: **Guest**)**

Guest is allowed to view I/O channel information only; they are not allowed to perform any settings. It allows maximum 5 Guests to login and get into the system at the same time.

The list for three levels of authority :

Function Login Type	System Setting · I/O Module setting · Data Logger Setting · Advanced Setting	Logic Rules Edition	Channel Status
Administrator	Can add/delete/modify/review ALL setting		Can review/modify Channel Status
User	<ul style="list-style-type: none"> ● Can't add/delete ALL setting. ● Can modify/review setting by need the authority from administrator. 	<ul style="list-style-type: none"> ● Can't add/delete/modify setting. ● Can review setting by need the authority from administrator. 	
Guest	Can't add/delete/modify/review ALL setting.		Can review Channel Status

Select your preferred language from the dropdown list in the “Language” field for the Web page user interface (English, Traditional Chinese, and Simplified Chinese). After login into the system, if the user want to change the language again, logout and re-select the language on the Login page.

Please note: Before starting the system, please make sure the browser you are using already enable JavaScript support, otherwise the system will not function properly.

4 WISE Web Page Overview

Users can login WISE by using Administrator, User or Guest accounts. Different WISE default home page will be displayed based on the different login account. If Administrator login into the system, the WISE default home page will be displayed as below, and will automatically read settings of the WISE to the webpage.

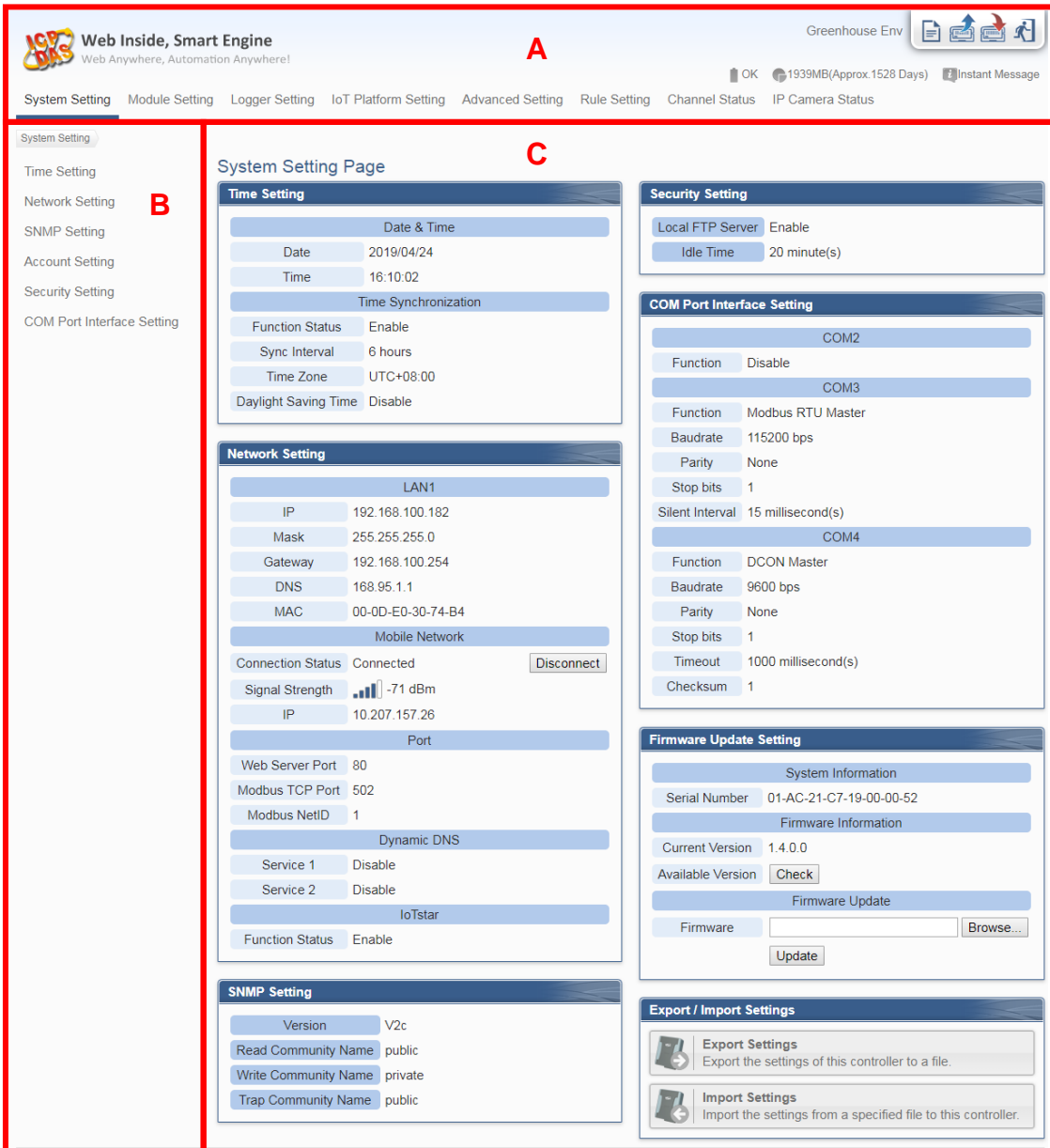


Figure 4-1 : WISE home page (login as an Administrator)

WISE main page could be divided into 3 areas:

- A. System function area
- B. Sub-function area
- C. Data review/System setting area

More detailed information for each area will be given in the following section.

4.1 System function area

System function area provides immediately access to the main functions of WISE, such as: system settings, system real-time information display, rule files management, etc, shown as below:

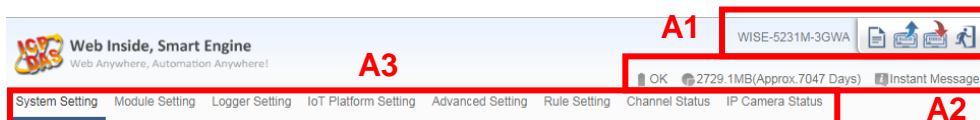


Figure 4-2 : System Function Area (login as an Administrator)

System function area includes the following areas:

- A1. Rules management toolbar
- A2. Real-time information area
- A3. System function toolbar

Each function in system function area is as the following:

4.1.1 Rules management toolbar

Rules management toolbar allows user to perform different functions. When login into the system as an Administrator, the Rules management toolbar will be shown as below:



Figure 4-3 : Rules management toolbar (login as an Administrator)

When login into the system as an User, the Rules management toolbar will be shown as below:



Figure 4-4 : Rules management toolbar (login as an User)

When login into the system as a Guest, the Rules management toolbar will be shown as below:



Figure 4-5 : Rules management toolbar (login as a Guest)

The functions of the Rules management toolbar are as follow:

- ◆ On the left side of the Rules management toolbar, the user could move the mouse to the nickname field to give a nickname for this WISE in the nickname field for easy recognition.

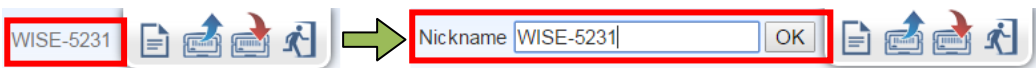







Figure 4-6 : WISE Nickname setting

- ◆  “New” button allows resetting the settings of all parameters and Rules. Click on  button and click on “OK”, the settings on WISE webpage on the browser will be cleared. If the user would like to clear the setting on WISE, then continue to click on  “Save” button to save the new settings (cleared settings) to the WISE.

Please note: once the settings are cleared and save to the WISE, the settings will be cleared permanently.



Figure 4-7 : Confirm to clear settings

- ◆  “Load” button allows to load all parameter settings and rule settings on WISE. Click on  button and click “OK” to load all parameter settings and rules settings from WISE to the web page for further edition.

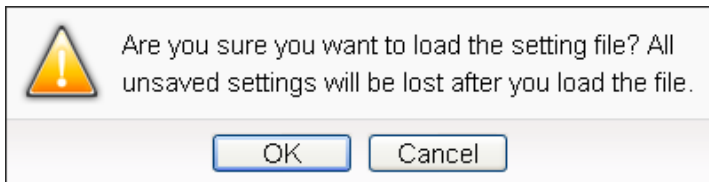




Figure 4-8 : Confirm to load settings

- ◆  “Save” button allows to save all parameter settings and Rule settings to WISE. Click on  button and click “OK” to save all

parameter settings and Rule settings from the web page of WISE to the WISE.



Figure 4-9 : Confirm to Confirm to save settings



- ◆  “Logout” button allows to log out the system, click on  button and then click “OK” to logout the system.



Figure 4-10 : Confirm to logout (The settings are saved)

If the settings are not saved to the WISE before performing logout, a warning message will appear as below:

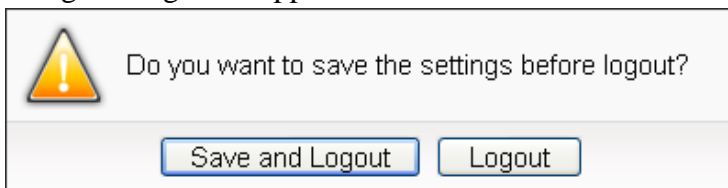



Figure 4-11 : Confirm to logout (The settings are not saved)

Please note:

1. All the edited settings on the webpage have to be saved to WISE to make all settings take effect; before click on  button, the settings will only be saved on the Web page site, not in the WISE.
2. Please DO NOT close the web page during the process of the edition, otherwise all unsaved settings on the page will be disappeared.

4.1.2 Real-time information area

Real-time information area allows display of current free space of the microSD card of the WISE and the real-time system information, shown as below:

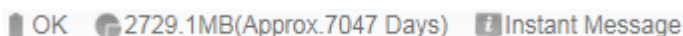





Figure 4-12 : Real-time information area

- ◆  OK Allows display of the current status of the battery in WISE. Please change the battery when it runs out. Otherwise, WISE would not keep the system time when it is powered off.
- ◆  2729.1MB(Approx.7047 Days) Allows display of the current free space of the microSD card in WISE. Based on the current settings of the data logger, an estimate of the remaining days to log with this microSD is provided.
- ◆  Instant Message Allows display of real-time system information, click on “Instant Message” to open up the list of real-time information, maximum 10 information will be kept on the list.

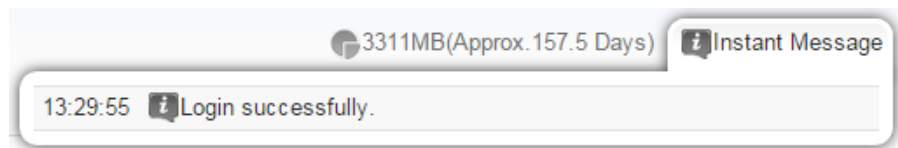


Figure 4-13 : Real-time information list

4.1.3 System function toolbar

According to the level of login permission, the System function toolbar will be different. If login as an Administrator, all parameter settings and data review function will be enabled; more detailed information of the functions will be give in the following sections.

The System function toolbar includes the following function options:

- ◆ Chapter 5: [System Setting](#)
- ◆ Chapter 6: [Module Setting](#)
- ◆ Chapter 7: [Logger Setting](#)
- ◆ Chapter 8: [IoT Platform Setting](#)
- ◆ Chapter 9: [Advanced Setting](#)
- ◆ Chapter 10: [Rule Setting](#)
- ◆ Chapter 13: [Channel Status](#)
- ◆ Chapter 14: [IP Camera Status](#)

If login as a User, WISE will enable the related function items to let User perform the modification or review of the WISE settings (based on the authority the Administrator pre-assigned). User account is allowed to view Channel Status page

If login as a Guest, they are allowed to view Channel Status page only. They do not have permission to edit the settings of the parameters and the rules.

4.2 Sub-function area

Sub-function area will display detailed functions under the selected System function. The user could edit or review detailed function options in the Sub-function area. On the upper Sub-function area, the path of current function will be displayed to show the current function path.

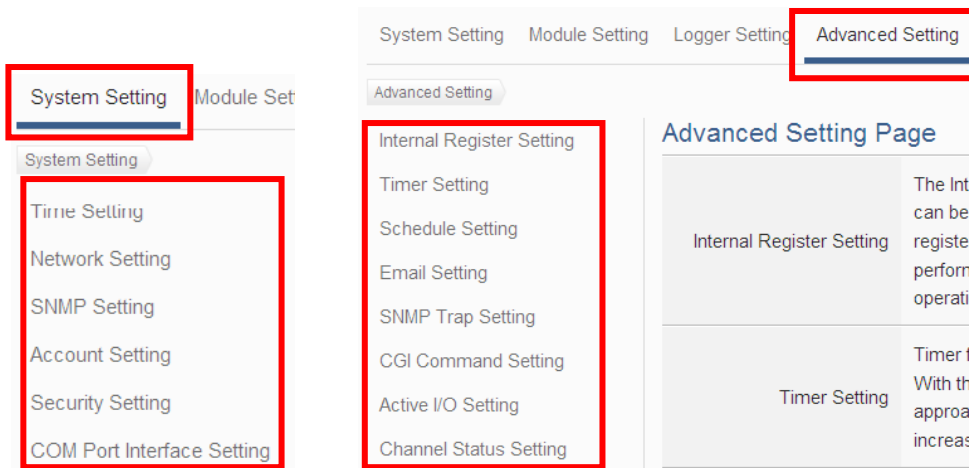


Figure 4-14 : Current function path

4.3 Data review/System setting area

Data review/System setting area allows to set system parameters and data review of WISE, the content of this area will be varied according to the selected sub-function. When the user login into the page as an Administrator, the Data review/System setting area of the Main Page will be the System Setting page, it will display all system setting information of the WISE as below:

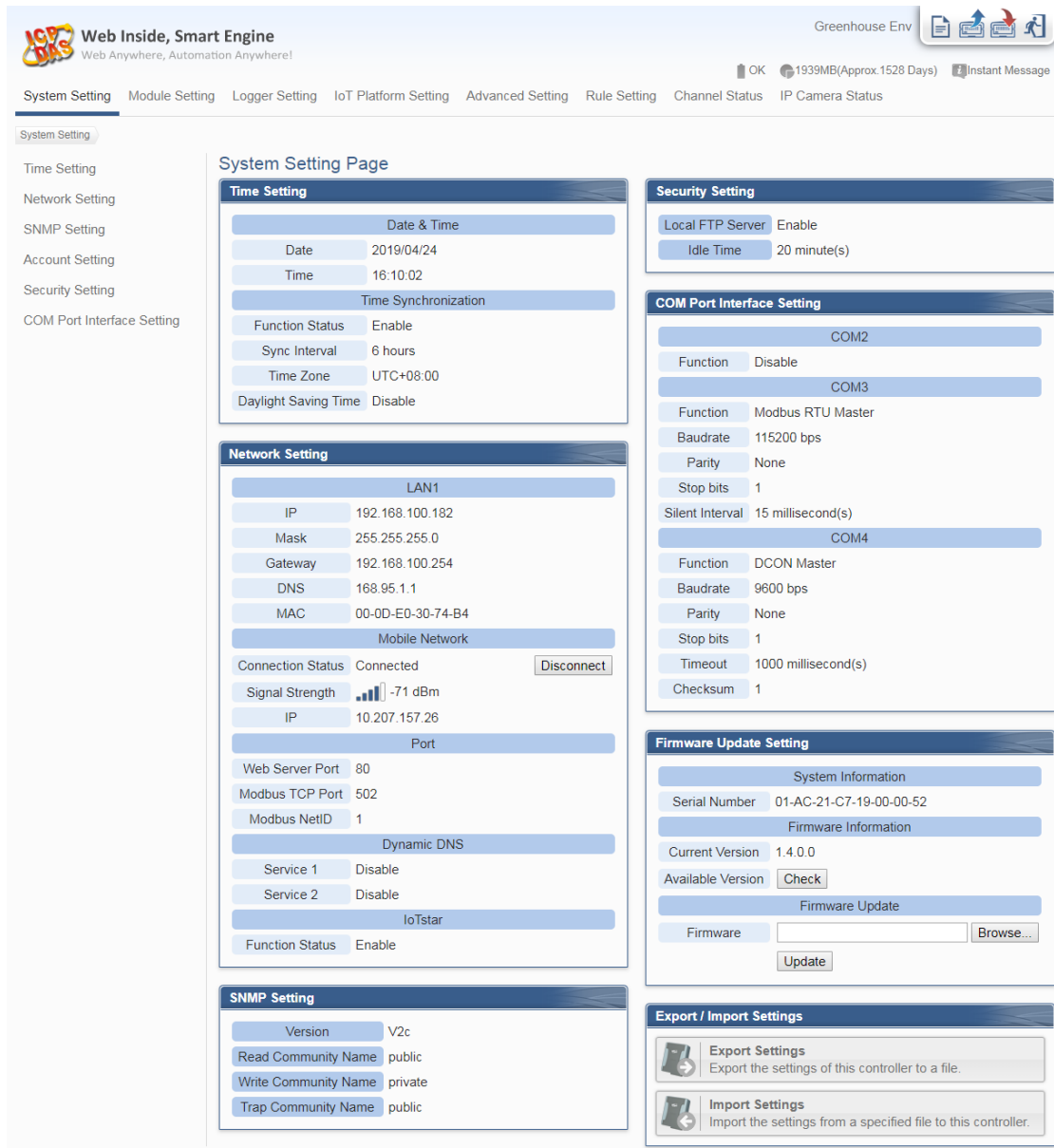


Figure 4-15 : Data review/System setting area (login as an Administrator)

When the user login into the page as User or Guest, the Data review/System setting Area of the Main Page will be the Channel status page, it will display all I/O channel information of the I/O modules that are connected to the WISE, shown as below:

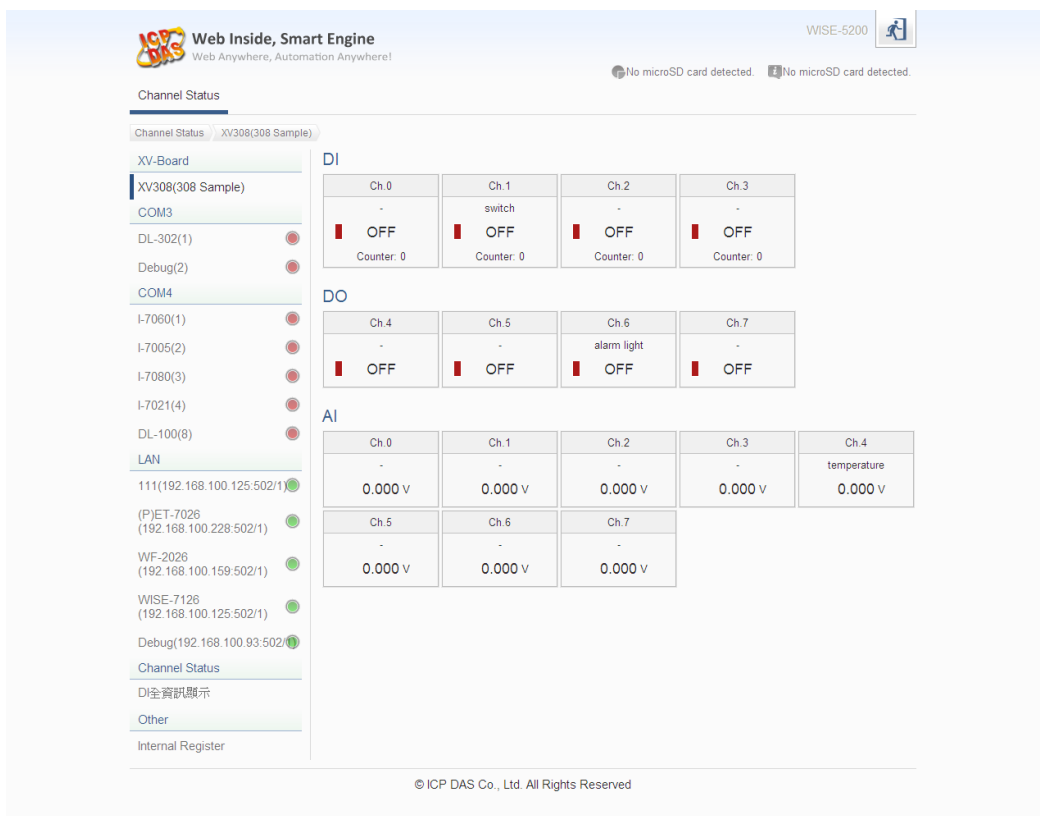


Figure 4-16 : Data review/System setting area (login as User or Guest)

4.4 System and logic rule setting procedure

When the Administrator login WISE, The System function toolbar includes the following 6 function options:

- ◆ [System Setting](#)
- ◆ [Module Setting](#)
- ◆ [Logger Setting](#)
- ◆ [IoT Platform Setting](#)
- ◆ [Advanced Setting](#)
- ◆ [Rule Setting](#)

The general WISE system and logic rule setting Web UI operating procedures will be displayed as follow. Please follow the steps to complete the setting.

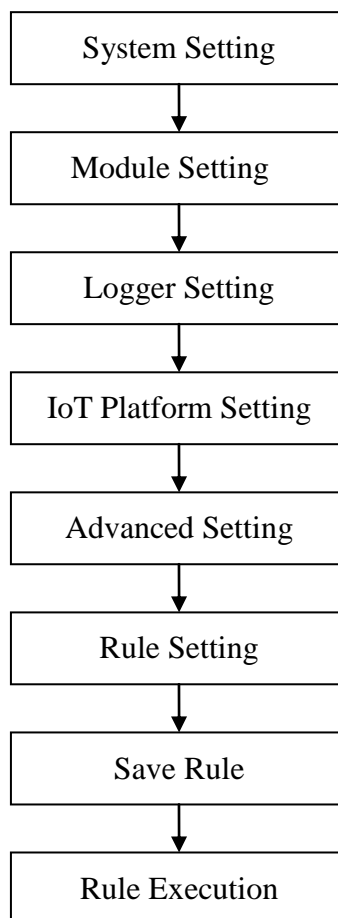


Figure 4-17 : System and logic rule setting procedure

Please note: DO NOT refresh or close the web page when you are editing the rules, otherwise the contents of all previous settings will be gone. And please remember all settings will take effect only when they have been downloaded to WISE, if you close the web page before finishing “Save”, all settings will be disappeared as well.

5 System Setting

System Setting includes 6 options: Time Setting, Network Setting, SNMP Setting, Account Setting, Security Setting and COM Port Interface Setting. When you get into the System Setting page, the system settings information of this WISE will be displayed, as shown below.

The screenshot displays the 'System Setting Page' with the following configuration details:

- Time Setting**
 - Date & Time: Date: 2019/04/24, Time: 16:10:02
 - Time Synchronization: Function Status: Enable, Sync Interval: 6 hours, Time Zone: UTC+08:00, Daylight Saving Time: Disable
- Network Setting**
 - LAN1: IP: 192.168.100.182, Mask: 255.255.255.0, Gateway: 192.168.100.254, DNS: 168.95.1.1, MAC: 00-0D-E0-30-74-B4
 - Mobile Network: Connection Status: Connected, Signal Strength: -71 dBm, IP: 10.207.157.26
 - Port: Web Server Port: 80, Modbus TCP Port: 502, Modbus NetID: 1
 - Dynamic DNS: Service 1: Disable, Service 2: Disable
 - IoTstar: Function Status: Enable
- SNMP Setting**
 - Version: V2c
 - Read Community Name: public
 - Write Community Name: private
 - Trap Community Name: public
- Security Setting**
 - Local FTP Server: Enable
 - Idle Time: 20 minute(s)
- COM Port Interface Setting**
 - COM2: Function: Disable
 - COM3: Function: Modbus RTU Master, Baudrate: 115200 bps, Parity: None, Stop bits: 1, Silent Interval: 15 millisecond(s)
 - COM4: Function: DCON Master, Baudrate: 9600 bps, Parity: None, Stop bits: 1, Timeout: 1000 millisecond(s), Checksum: 1
- Firmware Update Setting**
 - System Information: Serial Number: 01-AC-21-C7-19-00-00-52
 - Firmware Information: Current Version: 1.4.0.0, Available Version: Check
 - Firmware Update: Firmware: [Browse...], Update
- Export / Import Settings**
 - Export Settings: Export the settings of this controller to a file.
 - Import Settings: Import the settings from a specified file to this controller.

Figure 5-1 : System Setting Overview Page

5.1 Time Setting

On the Time Setting page, it allows to set the time of WISE and Time Synchronization function. The setting interface is as below:

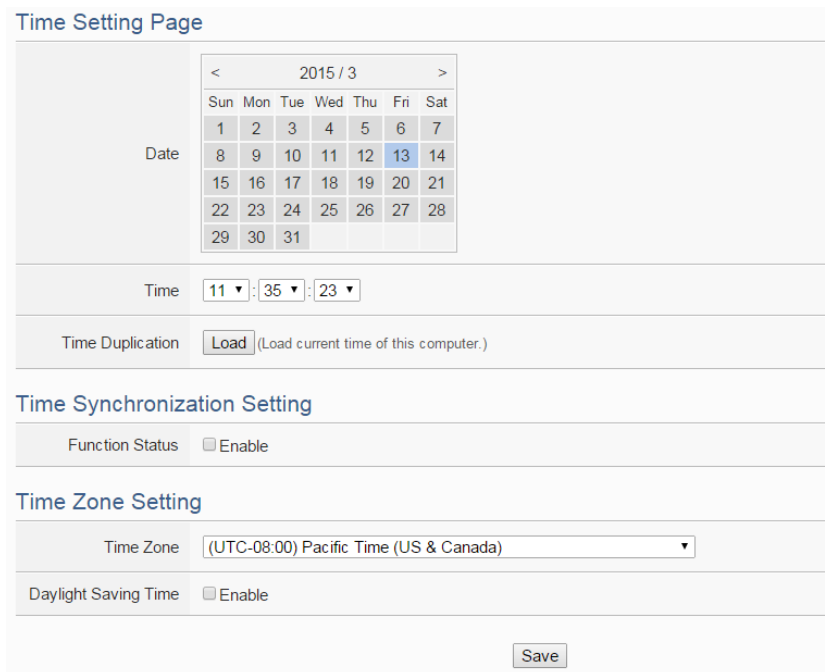


Figure 5-2 : Time Setting Page

When get into this page, the system will read and display current time of the WISE. To modify the system time of WISE, set up the date and time on the Time Setting Page and then click “Save” to complete the settings. The user could click on “Load” in the “Time Duplication” field to synchronize the system time of the computer where the browser located and the system time of the WISE. The WISE also provides SNTP Time Server function that allows to set up Time Synchronization to sync the clock through network. The following figure illustrates the set up interface:

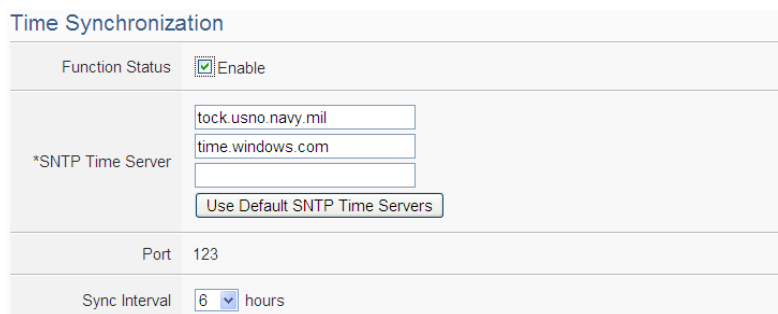


Figure 5-3 : Time Synchronization Setting

Follow the steps below to set up Time Synchronization Setting:

- i In the “Function Status” field, click “Enable” to enable the Time Synchronization function.
- ii In the “SNTP Time Server” field, input the IP address or domain name of the SNTP Time Server. There are default SNTP Time servers, the user could modify the address to use other servers. Click “Use Default SNTP Time Servers” to restore the default Time Server settings.
- iii The default Port number setting is “123”, currently it is not allowed to be modified.
- iv In the “Sync Interval” field, select the time interval to specify how often the WISE will automatically connect to SNTP time server for time synchronization through the network. The user could set the time interval to be 6, 12, or 24 hours.
- v After all settings are completed, click “Save” button to save the changes.

In addition, users can select the time zone of the WISE’s location from the dropdown list in the “Time Zone” field, and enable the daylight saving time function in the “Daylight Saving Time” field if required.

5.2 Network Setting

Network Setting allows making a change to LAN network configuration, mobile network configuration, web server port or Modbus settings, Dynamic DNS setting and IoTstar Connection setting on the WISE. The following figure illustrates the configuration interface:

Network Setting(LAN1)

Connection Mode Specify an IP address
 Obtain an IP address automatically(DHCP)

IP

Mask

Gateway

DNS

Network Setting(Mobile Network) Please disable the PIN code first

*Dial-up Number

*APN

Authentication

Please refer to this document to configure the setting.

Mobile Code Enable

Automatic Connection When Power On Enable

Connection Testing

Port Setting

Web Server Port

Modbus TCP Port

Modbus NetID

Dynamic DNS Setting

Service Provider

IoTstar Connection Setting

Function Status Enable

Figure 5-4 : Network Setting Page

- Network Setting(LAN)

Each time when the user enters this page, it will read and display current network configuration (LAN) and port settings from the WISE. In the “Network Setting (LAN)” section, user can select the connection mode as “Obtain an IP address automatically (DHCP)” or “Specify an IP address” in “Connection mode” field, then modify IP/Mask/Gateway/DNS Server IP configuration. After all settings are completed, click “Save” button to save the changes. After the network configuration is completed, the user could login into WISE webpage via LAN, and is able to retrieve data via Modbus TCP.

Please note:

1. WISE adopts Google DNS server as system default DNS server, the default IP is “8.8.8.8”, the IP can be modified to other DNS server IP if required.
2. If the connection mode is “Specify an IP address”, then you make modification to the IP address, the system will logout automatically and re-connect to the web page automatically based on the new setting. If the connection mode is “Obtain an IP address automatically (DHCP)”, the system may fail to re-connect to the web page because the IP address is changed. Please use WISE-52xx_224x Utility to search the WISE, get the new IP address of WISE, and then launch browser to connect to the WISE with the new IP address.

- Network Setting(Mobile Network)

The Network Setting(Mobile Network) section is for user to complete the setting of Mobile Network of WISE-523xM-3GWA and WISE-523xM-4GE/4GC. The default Dial-up number is “*99#”. User can change it by the proprietary number provided by the Telecommunication Service Company. To configure the setting for “APN” and “Authentication” field, please refer to the document provided on the WISE Web page. “Mobile Code” is an optional setting. It depends on the service the Telecommunication Service Company provides. If the user select the “Automatic Connection When Power On” option, it will enable the WISE-523xM-3GWA and WISE-523xM-4GE/4GC to complete the Mobile Network connection automatically when power on WISE controller. User can click the “Testing” button in the “Connection Testing” field to test the Mobile Network connection status between the WISE controller and the Mobile Network. After all settings are completed, click “Save” button to save the changes, or click “Save and Connect” button to save the settings and connect to the mobile network immediately.

Please Note: In order to complete the connection to the Mobile Network, please remember to disable the PIN code setting of the SIM used in WISE.

After completing the Mobile Network setting, the connection status between WISE and Mobile Network can be shown on the System Setting Page; and the connection status (Connect or Disconnect) can be changed manually. This section also displays the strength level of the Mobile Network Signal and the IP address that WISE occupies through Mobile Network.

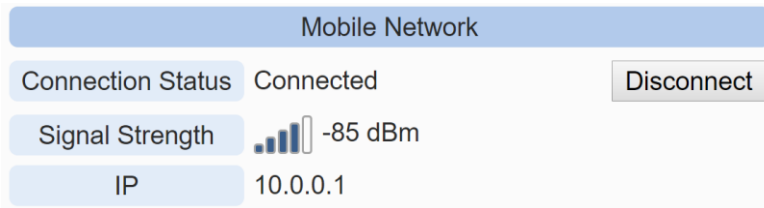


Figure 5-5 : Signal Strength level and IP address for Mobile Network

● Port Setting

In the “Port Setting” section, the user can modify the Web Server Port/Modbus TCP Port/Modbus NetID. After all settings are completed, click “Save” button to save the changes.

● Dynamic DNS Setting

WISE also provides the Dynamic DNS service. The following figure illustrates the configuration interface:

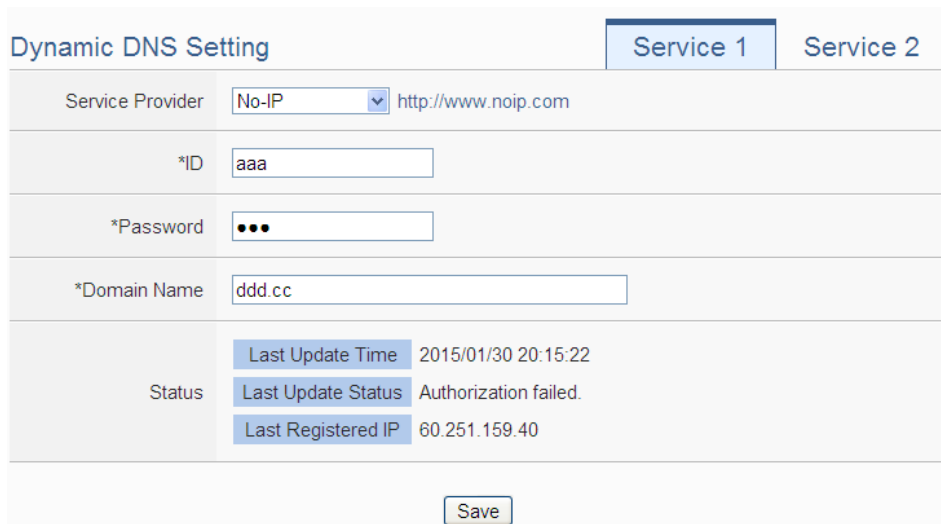


Figure 5-6 : DDNS Setting Page

Follow the steps below to set up Dynamic DNS service:

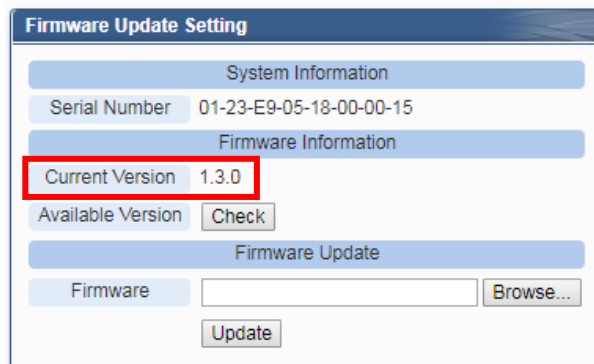
- i Click the services tabs on the right-top corner of “Dynamic DNS service”. System provides two items for selection as “Service 1” and “Service 2”. User can enable one Dynamic DNS service for normal status, or enable two Dynamic DNS services for the redundant service.
- ii In the “Service Provider” field, select the provider of Dynamic DNS services from the dropdown list. Currently system provides 5 service providers for selection as “No-IP”, “ChangeIP”, “Free DNS”, “Dyn” and “DNS-O-Matic”. User can also select “Disable” to disable the service.

- iii If user selects “No-IP”, “ChangeIP”, “Dyn” or “DNS-O-Matic”, please enter the ID, Password and Domain Name to login the service. If user selects “Free DNS”, please insert the Token to login the service.
- iv After all settings are completed, click “Save” button to save the changes.

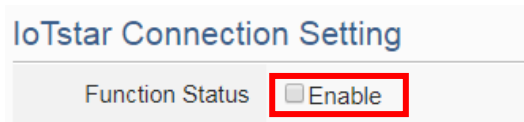
● IoTstar Connection Setting

The IoTstar Connection Setting section is for user to complete the WISE's setting for the Network connection to the IoTstar. Please follow the steps below for the settings:

- i Make sure the firmware version of the WISE is **V1.3.0** or later version. If the WISE does not install with the right firmware version. Please update the firmware before taking the next step.



- ii Click “Enable” of the “Function Status” field to enable the connection to the ICP DAS IoTstar.



- iii Select “User-defined IP address” and in the “Server Address” field, input the IP address or Domain Name of the PC or Platform (with IoTstar installed). Enter the login username and password in the “Username” and “Password” fields. WISE will login to the IoTstar by the information provided.

Please Note : The “ ICP DAS Trial Service - Create Account ” is currently disabled and the function is reserved. Please do not click on this option.

The screenshot shows the 'IoTstar Connection Setting' page. It features a table-like layout with the following elements:

- Function Status:** A checkbox labeled 'Enable' which is checked.
- *Server Address:** Two radio button options: 'ICP DAS Trial Service - Create Account' (unselected) and 'Specify an address of server' (selected). A text input field is visible next to the selected option.
- *Username:** A text input field.
- *Password:** A text input field.
- Connection Status:** A field displaying 'Disable'.
- Save:** A button located at the bottom right of the form.

Figure 5-7 : IoTstar Connection Setting Page

- iv After all settings are completed, click “Save” button to save the changes. This WISE will connect to the IoTstar immediately. The users can review the current connection status between WISE and IoTstar through the information displayed in the "Connection Status" field.

This screenshot shows the 'IoTstar Connection Setting' page after successful configuration. The fields are now populated:

- Function Status:** 'Enable' (checked).
- *Server Address:** 'ICP DAS Trial Service - Create Account' (unselected) and '192.168.100.252' (selected in the input field).
- *Username:** 'wayne1'.
- *Password:** '.....' (masked).
- Connection Status:** 'Connected.' (highlighted with a red box).
- Save:** A button (highlighted with a red box).

- v If the “Connection status” field shows the “Connected” message, it means the connection between the WISE controller and IoTstar is in normal status. The authorized users now can login to the IoTstar (with the username and password set in “Step iii”) to perform remote monitoring and maintenance of the WISE.

5.3 SNMP Setting

The WISE provides SNMP (Simple Network Management Protocol) V1 and V2c to work with the SNMP Network Management software for monitoring the system data and I/O module data. The SNMP Setting page allows you to enable or modify the settings of the SNMP function on the

WISE. The following figure illustrates the set up interface:

SNMP Setting Page

Function Status	<input checked="" type="checkbox"/> Enable
Version	<input checked="" type="radio"/> V2c <input type="radio"/> V1
*Read Community Name	<input type="text" value="public"/>
*Write Community Name	<input type="text" value="private"/>
*Trap Community Name	<input type="text" value="public"/>
Contact	<input type="text" value="Your System Contact Here"/>
Location	<input type="text" value="Your Location Here"/>

SNMP Manager List

*Address	Read/Write	Trap
<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>

No SNMP Manager exists, press this button to create one.

Figure 5-8 : SNMP Setting Page

Please follow the steps below for the SNMP settings:

- i. In the “Function Status” field, check “Enable” to enable SNMP server.
- ii. In the “Version” field, select the SNMP version that you want to use. Currently WISE supports SNMP V2c and V1 protocol,
- iii. In the “Read Community Name” field, input a string for “Read Community Name” for SNMP function. The default string is “public”.
- iv. In the “Write Community Name” field, input a string for “Write Community Name” for SNMP function. The default string is “private”.
- v. In the “Trap Community Name” field, input a string for “Trap Community Name” for the SNMP function. The default string is “public”.
- vi. In the “Contact” field, input the “Contact” string.
- vii. In the “Location” field, input the “Location” string.

The SNMP Manager List is a list for all SNMP Managers which will interact with the SNMP Agent of WISE. Please follow the steps as below to perform the setting for SNMP Managers.

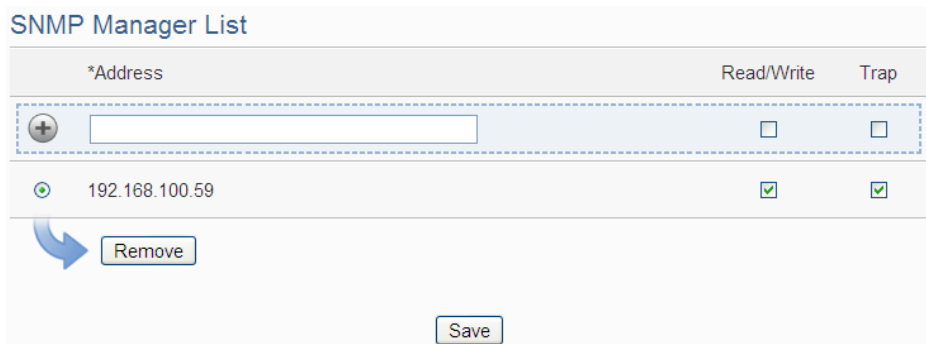


Figure 5-9 : SNMP Manager List

Please follow the steps below for the Settings:

- i Set up IP Address or domain name of the SNMP Manager that you want to add. Please set up the Address appropriately, if the settings are not the same as the settings of the SNMP Manager, the interaction between WISE and the SNMP Manager will be failed.

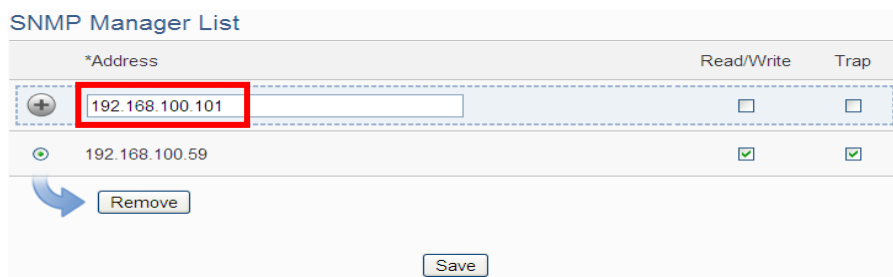


Figure 5-10 : The IP Address Setting for SNMP Manager

- ii Click to Enable (or Disable) the working model between the SNMP Manager and the SNMP Agent of WISE. Currently WISE provides two working models as Read/Write (Polling) and Trap for SNMP Manager. **Please Note: If no “Read/Write” field on the list is enabled to accept the Read/Write commands, indicating that it will allow accepting the Read/Write commands from any SNMP Manager.**
 - Read/Write model: It means the SNMP Manager can connect with the WISE SNMP Agent for the polling style data read/write operation.
 - Trap model: It means the WISE can actively send the SNMP Trap to the SNMP Manager based on the result of IF condition statement.

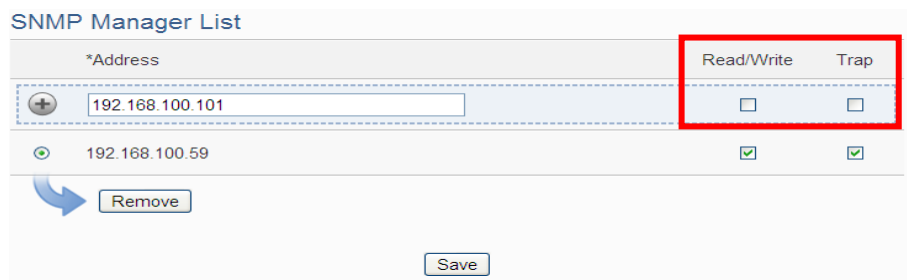



Figure 5-11 : The Working Model Setting for SNMP Manager

- iii After completing the IP address and working model setting, please click  button to add the SNMP Manager to the list. After adding the SNMP Manager, click “Save” button to save the changes.

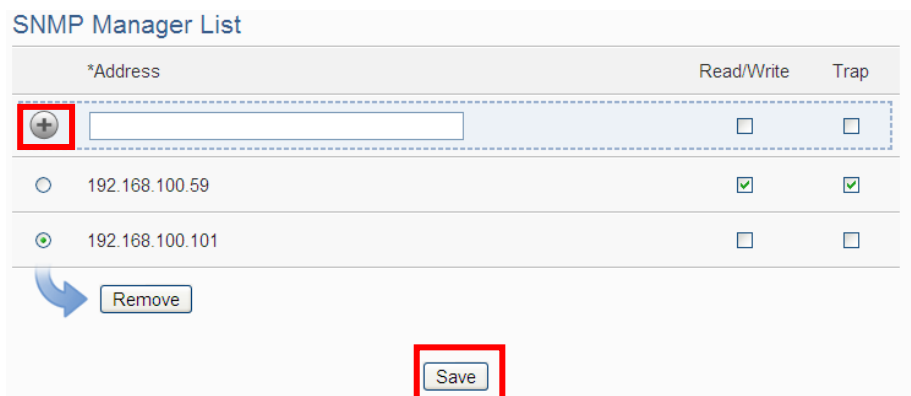


Figure 5-12 : Save the SNMP Manager Setting

5.4 Account Setting

WISE provides three levels of authority as follow:

◆ **Administrator (Default password: Admin)**

WISE provides 1 Administrator accounts. It allows only 1 Administrator to login and get into the system at the same time.

◆ **User (Password is defined by Administrator)**

WISE provides 5 User accounts. Administrator has the authority to enable/disable the User account, and assign the user name/password. Each User account allows only 1 User to login and get into the system at the same time.

◆ **Guest (Default password: Guest)**

WISE provides 1 Guest accounts. It allows maximum 5 Guests to login and get into the system at the same time.

The user can modify the password in the “Account Setting” page; the Password length is limited to 16 characters. After all settings are completed, click “Save” button to save the changes. Following is the interface for the modification of the password of Administrator account and Guest account.

Figure 5-13 : Password Setting Page for Administrator

Figure 5-14 : Password Setting Page for Guest

WISE provides 5 User accounts. Only Administrator can enable/disable the User account, and assign the password of User. Each User can access to

perform the modification or review of the WISE settings (based on the authority the Administrator pre-assigned), however, the Users do not have the right to add or delete the settings of WISE. Following is the setting page for the User account.

Account Setting Page Admin **User** Guest

User

Status Enable

*New Password

*Retype New Password

Permission Setting

Current Password	User1 qq*	User2	User3	User4	User5
System Setting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Time Setting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Network Setting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SNMP Setting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Account Setting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Security Setting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Logger Setting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Advanced Setting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Internal Register Setting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Timer Setting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Schedule Setting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Email Setting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SNMP Trap Setting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CGI Command Setting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Active I/O Setting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Channel Status Setting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rule Setting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Figure 5-15 : Password Setting Page for User

The settings steps are as below:

- i. In the “User” field, select the user which will be enabled. WISE provides 5 User account.
- ii. In the “Status” field, click the “Enable” items to enable the User account, then the Password setting field and the Permission setting field will be enabled.
- iii. Complete the password setting for the User.
- iv. Identify the permission authority which the User can own to

modify/review the WISE setting (System Setting, Logger Setting, Advanced Setting and Logic Rule Review).

- v. Repeat steps i~iv to complete settings of all User accounts.
- vi. After all settings are completed, click “Save” button to save the changes.

5.5 Security Setting

Security Setting allows users to change the Administrator Profile setting, the Local FTP Server setting, the CGI Query Authentication setting and the Idle Time setting. The Security Setting page is as follow:

Administrator Profile Setting	
*Email Address	<input type="text"/>
Alarm	<input type="checkbox"/> When the microSD card is abnormal
<input type="button" value="Save"/>	
Local FTP Server Setting	
Server Status	<input checked="" type="checkbox"/> Enable
Username	admin
*Password	<input type="text" value="FTP1_Admin"/>
<input type="button" value="Save"/>	
CGI Query Authentication Setting	
Authentication	<input checked="" type="checkbox"/> Enable
*Username	<input type="text" value="admin"/>
*Password	<input type="text" value="CGI_Admin"/>
<input type="button" value="Save"/>	
Idle Time Setting	
Idle Time	<input type="text" value="10"/> minute(s)
<input type="button" value="Save"/>	

Figure 5-16 : Security Setting Page

◆ Administrator Profile Setting

If user login as the Administrator, in the “Administrator Profile Setting” section, the users could input an email address. By checking the “Alarm” item, WISE could send an email to the administrator when the microSD card is abnormal. Once the password is forgotten or lost, the WISE could send an email with the passwords (administrator account, user account, guest account, Local FTP login and CGI Query Authentication) to this email address, for more detailed information, please refer to [Appendix II](#).

◆ Local FTP Server Setting

In this section, it allows to enable or disable the FTP Server function on the WISE side. The user could connect to WISE FTP Server via FTP software to remotely retrieve event log or data record file. To enable this function, check “Enable” in the “Server Status” field. The default password is “**FTP1_Admin**”, the user could modify the password of the FTP Server on the WISE side if required.

◆ CGI Query Authentication Setting

WISE supports fully CGI command operations as CGI command sending and CGI command receiving. In the CGI command receiving function, it needs the password mechanism to protect the WISE to receive only the CGI commands from the valid source. The default user name and password for CGI command receiving of WISE is “**admin/CGI_Admin**”, the user could modify the account if required.

◆ Idle Time Setting

After the administrator login into the WISE page, when the idle time exceeds the pre-set time interval (default is 10 minutes), the administrator will be automatically logged out. The idle time could be set as 10/20/30/60 minutes, after the setting is completed, click “Save” button to save the changes.

5.6 COM Port Interface Setting

COM Port Interface Setting allows to setup the function settings on COM2, COM3 or COM4. The setting interface is shown as below:

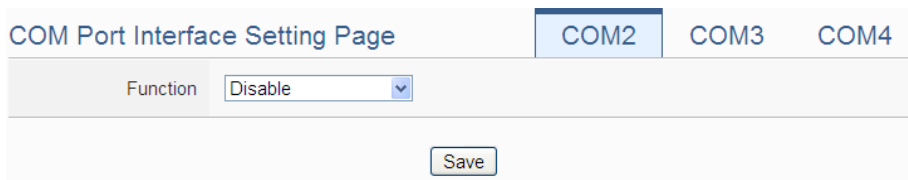


Figure 5-17 : COM Port Interface Setting Page

The COM Port interface on WISE includes:

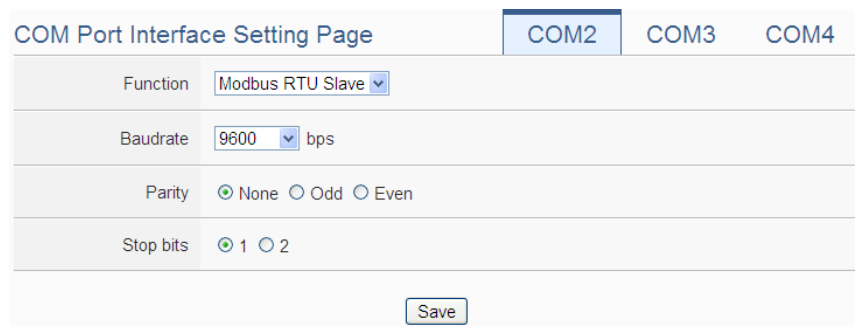
◆ COM2(RS-232)

It is reserved specifically for Modbus RTU Slave for connections to HMI or SCADA.

◆ COM3 / COM4 (RS-485)

It is reserved for DCON Master to connect ICP DAS DCON modules, Modbus RTU Master to connect Modbus RTU slave devices or for Modbus RTU Slave to connect HMI or SCADA.

The following section will introduce how to set COM Port interface for different functions:

● Modbus RTU Slave (Connect to HMI or SCADA)

The screenshot shows a web interface titled "COM Port Interface Setting Page" with three tabs: "COM2", "COM3", and "COM4". The "COM2" tab is active. The settings are as follows:

Field	Value
Function	Modbus RTU Slave
Baudrate	9600 bps
Parity	<input checked="" type="radio"/> None <input type="radio"/> Odd <input type="radio"/> Even
Stop bits	<input checked="" type="radio"/> 1 <input type="radio"/> 2

A "Save" button is located at the bottom right of the form.

Figure 5-18 : COM Port Interface Setting for Modbus RTU Slave

The settings steps are as below:

- i In the "Baudrate" field, select the Baudrate from the dropdown list, the Baudrate of WISE and HMI or SCADA have to be set the same.
- ii In the "Parity" and "Stop bits" fields, set up the Parity and Stop bits. The Parity and Stop bits of WISE and HMI or SCADA have to be set the same.
- iii After all settings are completed, click "Save" button to save the changes.

- DCON Master (Connect to DCON modules)

COM Port Interface Setting Page		COM2	COM3	COM4
Function	DCON Master			
Baudrate	9600 bps			
Parity	<input checked="" type="radio"/> None <input type="radio"/> Odd <input type="radio"/> Even			
Stop bits	<input checked="" type="radio"/> 1 <input type="radio"/> 2			
Timeout	300 millisecond(s)			
Checksum	<input checked="" type="radio"/> Disable <input type="radio"/> Enable			
<input type="button" value="Save"/>				

Figure 5-19 : COM Port Interface Setting for DCON Master

The settings steps are as below:

- i In the “Baudrate” field, select the Baudrate from the dropdown list, the Baudrate of WISE and DCON module have to be set the same.
- ii In the “Parity” and “Stop bits” fields, set up the Parity and Stop bits. The Parity and Stop bits of WISE and DCON module have to be set the same.
- iii In the “Timeout” field, input the time interval for WISE to send command to the DCON module and wait for the response, the unit will be millisecond (ms).
- iv In the “Checksum” field, specify the Checksum setting for the communication between WISE and DCON module to be enabled or disabled.
- v After all settings are completed, click “Save” button to save the changes.

Please Note: Use the DCON Utility to complete the setting of each DCON modules which will connect with the WISE first. These setting also must be the same with the setting of WISE.

● Modbus RTU Master (Connect to Modbus RTU slave devices)

COM Port Interface Setting Page		COM2	COM3	COM4
Function	Modbus RTU Master			
Baudrate	9600 bps			
Parity	<input checked="" type="radio"/> None <input type="radio"/> Odd <input type="radio"/> Even			
Stop bits	<input checked="" type="radio"/> 1 <input type="radio"/> 2			
Silent Interval	200 millisecond(s)			
<input type="button" value="Save"/>				

Figure 5-20 : COM Port Interface Setting for Modbus RTU Master

The settings steps are as below:

- i In the “Baudrate” field, select the Baudrate from the dropdown list, the Baudrate of WISE and Modbus RTU slave module have to be set the same.
- ii In the “Parity” and “Stop bits” fields, set up the Parity and Stop bits. The Parity and Stop bits of WISE and Modbus RTU slave module have to be set the same.
- iii In the “Silent Interval” field, input the time interval between successive sending of commands from the WISE to the Modbus RTU slave module, the unit will be millisecond (ms).
- iv After all settings are completed, click “Save” button to save the changes.

Please Note: After the “Baudrate” is selected, the system will automatically generate a proper value in the “Silent Interval” field. For each Modbus RTU Slave module has different Modbus command process capability, the response time for sending result from Modbus RTU Slave module to WISE might be different. The user can adjust this value to most appropriate time interval, such as: extend this value to make sure every Modbus RTU Slave module connected to the WISE has enough time to process the Modbus command, or shorten this value to improve the efficiency of the polling mechanism between Modbus RTU Slave module and WISE.

6 Module Setting

Module setting page allows to perform settings of the I/O Modules and IP Cameras that are connected to the WISE. After getting into the setting page, the overview page will display current setting of the I/O Modules and IP Cameras that are connected to the WISE, shown as below:

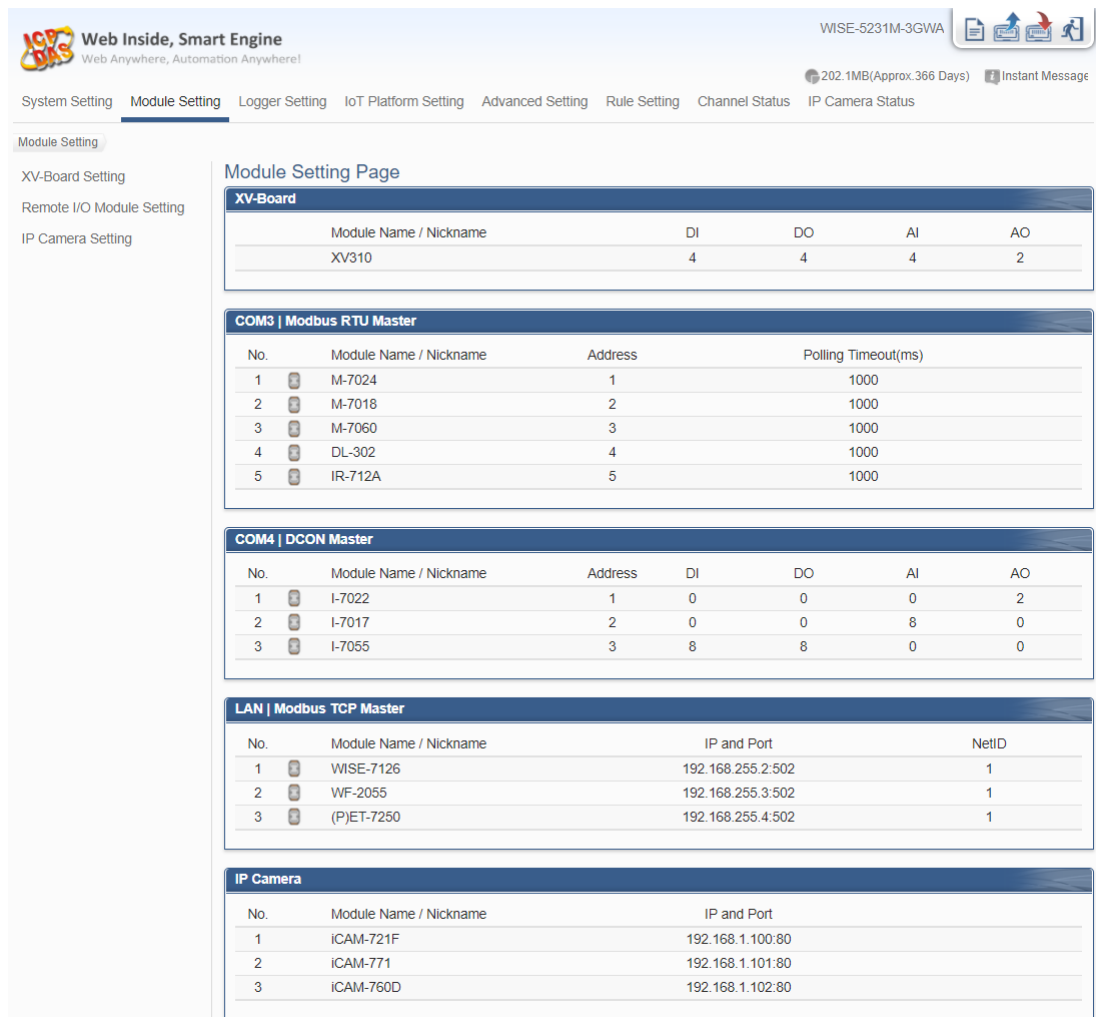


Figure 6-1 : Module Setting Page

Module Setting includes the following 3 setting options:

- XV-Board Setting
- Remote I/O Module Setting
- IP Camera Setting

More detailed information for each function setting will be given in the following sections.

6.1 XV-Board Setting

XV-Board Setting page allows the user to set up the configuration of the XV-Board that is connected to the WISE. The XV-Board Setting page is shown as follow:

Please note: Each time WISE is allowed to connect to one XV-Board module only.

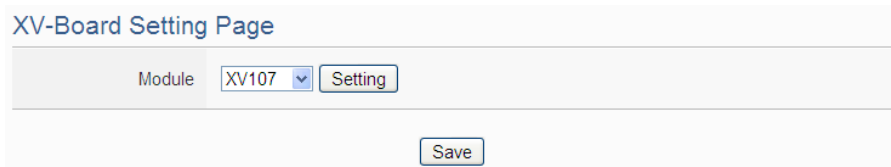


Figure 6-2 : XV-Board Setting Page

Select the XV-Board that are connected to the WISE from the drop down list and click “Setting”, a window for setting up the parameters of XV-Board and its I/O channel will appear. The setting for the module is shown as below (Figure 6-3):

1. Nickname: For user to define a nickname for the module, this nickname will be displayed on the “Channel Status” and “Rule Setting” pages.
2. Description: The Description field provides a space for the user to make a brief description of this XV-Board.

The digital I/O channels of XV308 are programmable. Each digital I/O channel of XV308 can be used as DI or DO. If the user selects the XV308 from the drop down list, the setting interface for the attribute of each digital I/O channel will be shown as below. Please identify them depend on the application.



The following section will introduce the DI, DO, AI and AO channel settings of the XV-Board. After all settings are completed, click “Save” button to save the changes.

6.1.1 XV-Board DI Channel Settings

The XV-Board DI Channel Setting page is shown as follow (using XV107 as an example):

Module XV107 Setting

Nickname

Description

DI Attribute DO Attribute

	Channel Name	Counter Name	Counter Type
Ch.0	<input type="text"/>	<input type="text"/>	Falling ▾
Ch.1	<input type="text"/>	<input type="text"/>	Falling ▾
Ch.2	<input type="text"/>	<input type="text"/>	Falling ▾
Ch.3	<input type="text"/>	<input type="text"/>	Falling ▾
Ch.4	<input type="text"/>	<input type="text"/>	Falling ▾
Ch.5	<input type="text"/>	<input type="text"/>	Falling ▾
Ch.6	<input type="text"/>	<input type="text"/>	Falling ▾
Ch.7	<input type="text"/>	<input type="text"/>	Falling ▾

OK Cancel

Figure 6-3 : XV-Board DI Channel Setting Page

The settings are as follow:

3. Channel Nickname: For user to define nicknames for each I/O channel, these nicknames will be displayed on the “Channel Status” and “Rule Setting” pages.
4. Counter Nickname: For user to define nicknames for each DI counter, these nicknames will be displayed on the “Log Header” and “Rule Setting” pages.
5. Counter Type: Specify the counter type to be “Falling” (ON-to-OFF) or “Rising” (OFF-to-ON).

After the DI channel settings are completed, continue to perform settings of other channels, after all settings are completed click “OK” button to return to XV-Board Setting page.

6.1.2 XV-Board DO Channel Settings

The XV-Board DO Channel Setting page is shown as follow (using XV107 as an example):

DI Attribute		DO Attribute	
Channel	Nickname	Power On Value	Advanced Function
Ch.0	<input type="text"/>	OFF ▾	Disable ▾
Ch.1	<input type="text"/>	OFF ▾	Disable ▾
Ch.2	<input type="text"/>	OFF ▾	Disable ▾
Ch.3	<input type="text"/>	OFF ▾	Disable ▾
Ch.4	<input type="text"/>	OFF ▾	Disable ▾
Ch.5	<input type="text"/>	OFF ▾	Disable ▾
Ch.6	<input type="text"/>	OFF ▾	Disable ▾
Ch.7	<input type="text"/>	OFF ▾	Disable ▾

OK Cancel

Figure 6-4 : XV-Board DO Channel Setting Page

The settings are as follow:

- **Nickname:** For user to define nicknames for each I/O channel, these nicknames will be displayed on the “Channel Status” and “Rule Setting” pages.
- **Power On Value:** Specify the initial status to be “ON” or to be “OFF” when WISE power on. Select the value from the dropdown list of “Power On Value” field. The default value is “OFF”.
- **WISE provides 3 advanced functions, select the function from the dropdown list:**
 - **Pulse Output:** If the Pulse Output is selected, it will allow this DO channel to perform pulse output and form a periodic pulse cycle. In Pulse Output mode, the selected DO channel will generate a square wave according to specified parameters (Pulse High and Pulse Low). Pulse High indicates the “ON” time duration and Pulse Low indicates the “OFF” time duration in a periodic Pulse cycle. The unit is 100ms.
 - **Auto OFF:** When “Auto OFF” is selected, it allows this DO channel to enable Auto OFF function. It is required to set up a time interval, when this DO channel is set to be “ON” and the duration of the ON status reaches the pre-set time interval,

the DO will automatically be set to OFF. The unit is second.

- **DI Status Mapping:** When “DI Status Mapping” is selected, the status of the DI channel with the same channel number on the XV-Board will be copied to the DO channel. For example, when the “DI Status Mapping” is enabled on DO0, when the DI0 status is ON, DO0 will set to be ON, and when the DI0 status is OFF, DO0 will set to be OFF as well.

After all settings of the channels are completed, click “OK” button to return to XV-Board Setting page.

6.1.3 XV-Board AI Channel Settings

The XV-Board AI Channel Setting page is shown as follow (using XV310 as an example):

DI Attribute		DO Attribute		AI Attribute		AO Attribute	
Channel	Nickname	Type		Scale			
Ch.0	<input type="text"/>	-10 V ~ 10 V		Minimum:	<input type="text" value="0"/>	Maximum:	<input type="text" value="0"/>
Ch.1	<input type="text"/>	-10 V ~ 10 V		Minimum:	<input type="text" value="0"/>	Maximum:	<input type="text" value="0"/>
Ch.2	<input type="text"/>	-10 V ~ 10 V		Minimum:	<input type="text" value="0"/>	Maximum:	<input type="text" value="0"/>
Ch.3	<input type="text"/>	-10 V ~ 10 V		Minimum:	<input type="text" value="0"/>	Maximum:	<input type="text" value="0"/>

Figure 6-5 : XV-Board AI Channel Setting Page

The settings are as follow:

6. **Nickname:** For user to define nicknames for each I/O channel, these nicknames will be displayed on the “Channel Status” and “Rule Setting” pages.
7. **Type:** Select the input signal type of the AI channel from the dropdown list.
8. **Scale:** In the “Scale” field, AI channel raw data can be set to operate with linear proportion between “Minimum” and “Maximum” values. The IF Condition will use this already-adjusted value in the evaluation operation, and the AI value retrieved from the “Channel Status” page or Modbus Table via WISE would be the adjusted value. The default value for

Maximum and Minimum is 0, it means the Scale function is disabled.

After all settings of the channels are completed, click “OK” button to return to XV-Board Setting page.

6.1.4 XV-Board AO Channel Settings

The XV-Board AO Channel Setting page is shown as follow (using XV310 as an example):

Channel	Nickname	Type	Power On Value
Ch.0	<input type="text"/>	0 V ~ 10 V	0
Ch.1	<input type="text"/>	0 V ~ 10 V	0

Figure 6-6 : XV-Board AO Channel Setting Page

The settings are as follow:

9. Nickname: For user to define nicknames for each I/O channel, these nicknames will be displayed on the “Channel Status” and “Rule Setting” pages.
10. Type: Select the output signal type of the AO channel from the dropdown list.
11. Power On Value: You can set the initial value of the AO channel in the “Power On Value” field. The default initial value is 0.

After all settings of the channels are completed, click “OK” button to return to XV-Board Setting page.

6.2 Remote I-7000/DL DCON Module Setting

WISE allows connections to ICP DAS I-7000/DL DCON modules. The I/O Module Setting page allows users to add I-7000/DL DCON modules that are connected to the WISE to the list. After the module is added, it allows to set up the configuration of the I/O module. The setting page is shown as below:

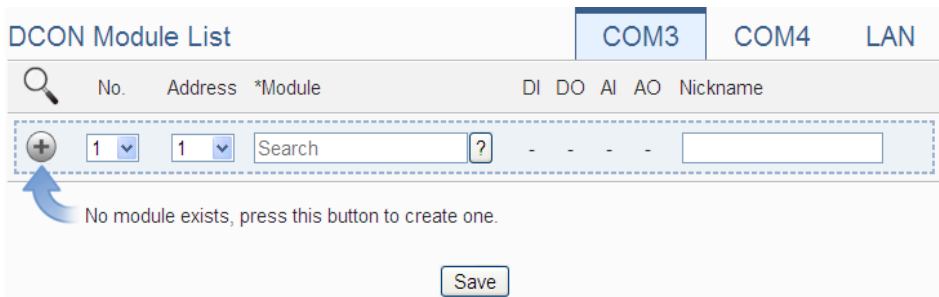


Figure 6-7 : Remote I-7000/DL Module Setting Page


The following section will give more information how to add and complete settings of I-7000/DL DCON modules. After all settings are completed, click “Save” button to save the changes.

Please note:

1. The COM3 (RS-485) and COM4 (RS-485) interfaces on WISE allows connections to I-7000/DL DCON modules or Modbus RTU modules.
2. A single COM Port interface (COM3 or COM4) allows connections to at most 16 devices (I-7000/DL DCON modules or Modbus RTU modules).

6.2.1 Scan to Add ICP DAS I-7000/DL DCON Modules

The user could use the Scan function to add ICP DAS I-7000/DL DCON modules to the WISE, the steps are as below:

- i. Click on  button to scan the I-7000/DL DCON modules that are connected to the WISE.

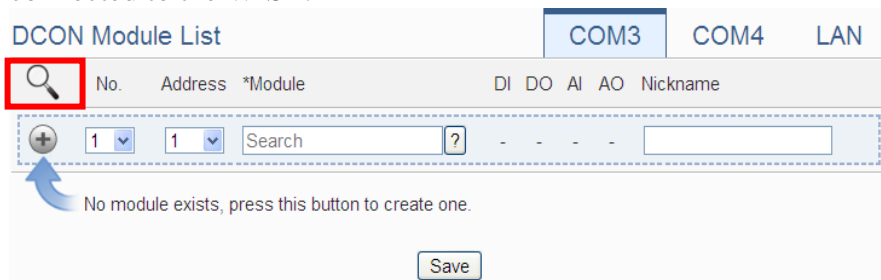


Figure 6-8 : The “Scan” button to search I-7000/DL Modules

- ii. When the Scan page appears, input the starting address and the ending address of the DCON address that are going to perform scan. Click on “Scan”, the system will start to scan the I-7000/DL DCON modules that match the settings previously set, to cancel the scan, and click on “Cancel”.

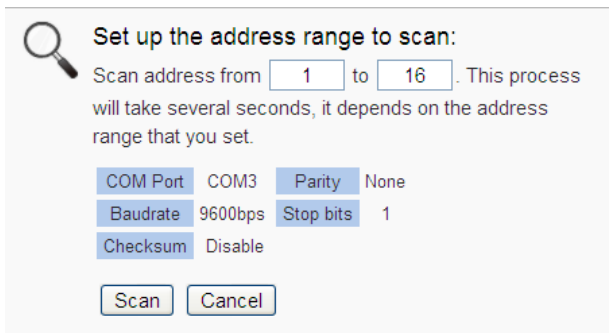


Figure 6-9 : Set up the Scanning Range for the I-7000/DL modules

- iii. When the system is performing the scan, the address that are performing scan will be dynamically shown on the upper left side, please wait till the scan operation is completed. To stop the scan operation, click on “Cancel” to terminal the scan and leave the page.

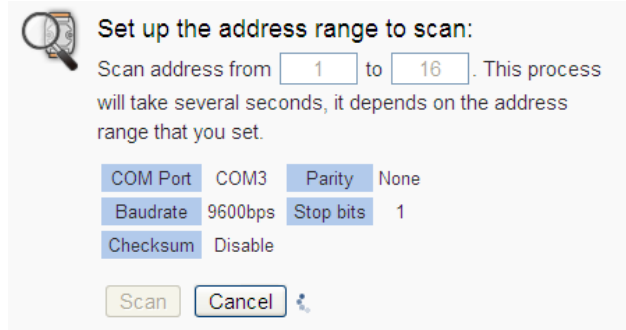


Figure 6-10 : Scanning the I-7000/DL modules

- iv. After the Scan operation is completed, an I-7000/DL DCON module list will appear. If the newly scanned module doesn't match the module previously set on the same address, a window will appear (Figure 6-12), please select the actual device that are connected to WISE. After all settings are completed, click “Save” button to save the changes.

DCON Module List										
						COM3	COM4	LAN		
No.	Address	*Module	DI	DO	AI	AO	Nickname			
6	5	Search	-	-	-	-				
1	1	I-7060	4	4	0	0				
2	2	I-7005	0	6	8	0				
3	3	I-7080	2	2	0	0				
4	4	I-7021	0	0	0	1				
5	8	DL-100	0	0	3	0				

Setting Move Up Move Down Copy Remove Save

Figure 6-11 : I-7000/DL module List after Scan operation

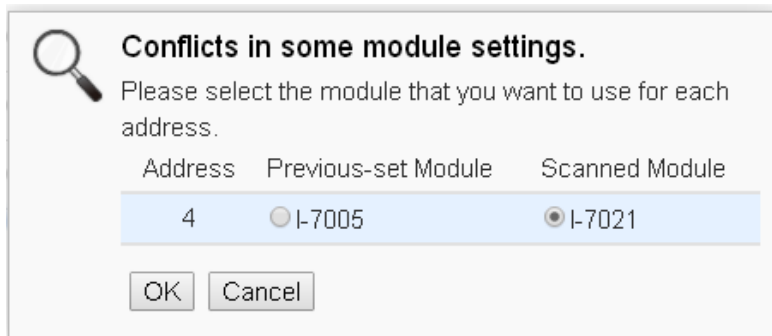


Figure 6-12 : Select the actual I-7000/DL modules connected

6.2.2 Add I-7000/DL DCON Module manually

In addition to perform Scan operation to automatically add I-7000/DL DCON modules to the list, the user could also add the I-7000/DL DCON module manually one by one, the steps are as below:

- i. No: The number will be the order that the I/O channel data of the I-7000/DL DCON module being stored in the WISE Modbus Table. The range is 1~16.
- ii. Address: The address will be the DCON address of this I-7000/DL DCON module, please make sure the address is the same as the settings of the module, if the setting is not accurate, the connection for WISE to the I-7000/DL DCON module will be failed.

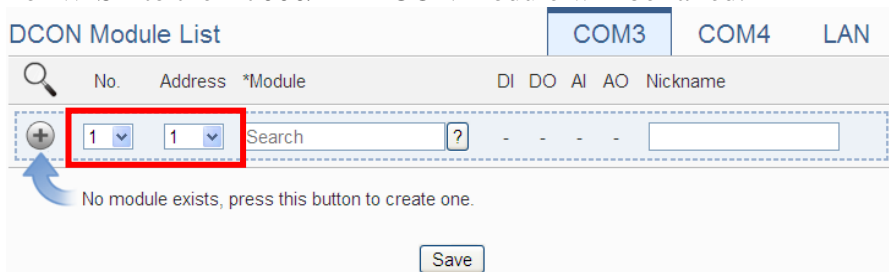


Figure 6-13 : Set up the No and Address of the I-7000/DL modules

- iii. Select the module name: For ICP DAS I-7000/DL DCON modules, the user could select the default model name from the dropdown list for further modification.

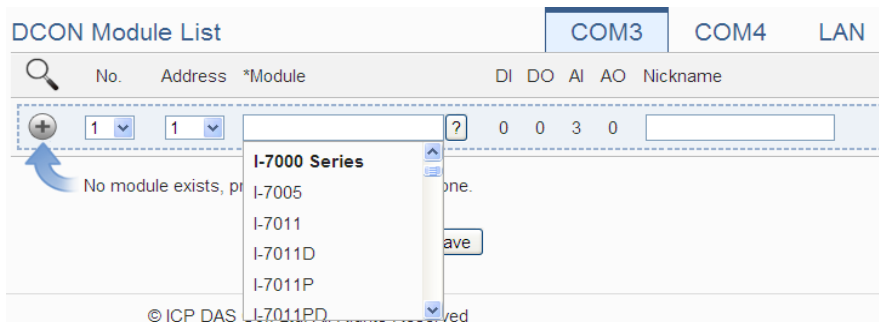



Figure 6-14 : Select the model of the I-7000/DL modules

- iv. Input the Nickname for the I-7000/DL DCON modules.
- v. Click  to add the I-7000/DL DCON module to the list. After adding the I-7000/DL DCON module, click “Save” button to save the changes.

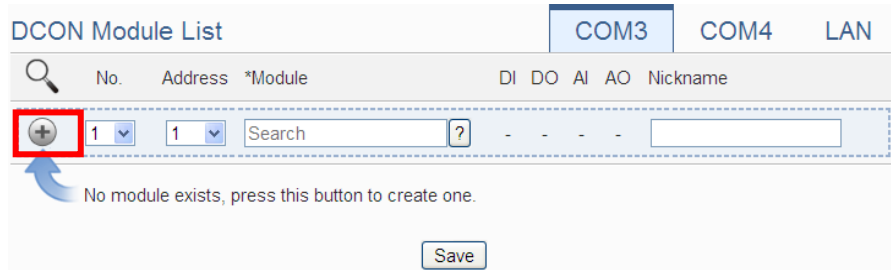


Figure 6-15 : Add the I-7000/DL Module manually

6.3 I-7000/DL DCON Module List Operation Interface

After the I-7000/DL DCON modules are added to the I/O Module list via auto scan or manual work, the I-7000/DL DCON modules will be listed as below:

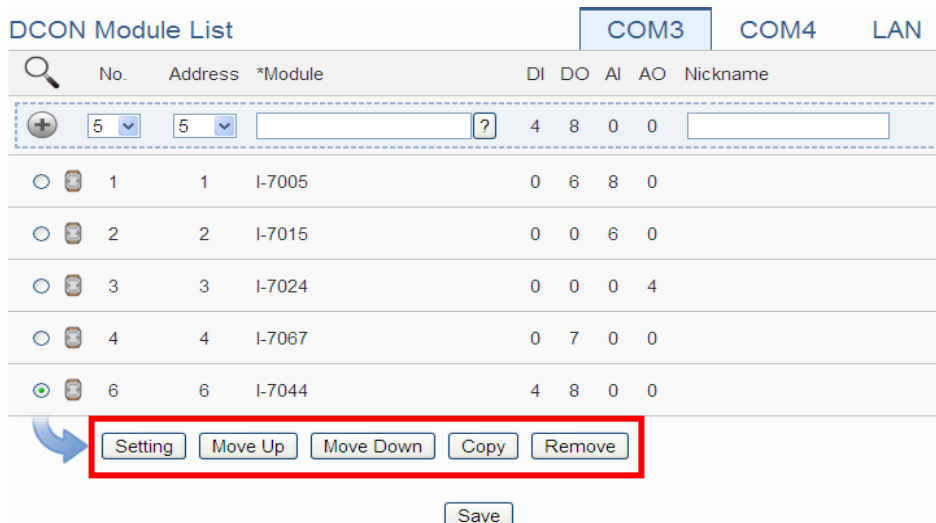


Figure 6-16 : I-7000/DL Module List Operation Interface

The following functions allow to perform settings or rearrange order of the I-7000/DL DCON modules. Please select the I-7000/DL DCON module and click on the function button to perform the operations:

- Setting: Click the radio button in front of the I-7000/DL DCON module and click on “Setting” to get into the setting page of the I-7000/DL DCON module. The settings for each I-7000/DL DCON module will be given in the following section.
- Move Up: Click the radio button in front of the I-7000/DL DCON module and click on “Move Up” to move the I-7000/DL DCON

module to upper order (decrease the index number (No)).

- **Move Down:** Click the radio button in front of the I-7000/DL DCON module and click on “Move Down” to move the I-7000/DL DCON module to lower order (increase the index number (No))
- **Copy:** To copy the settings of a pre-set I-7000/DL DCON module to the new I-7000/DL DCON module, please click the radio button in front of the pre-set I-7000/DL DCON module and then click on “Copy”, a new I-7000/DL DCON module (in sequence) will be added to the list and the settings of the old I-7000/DL DCON module will be copied to this newly added I-7000/DL DCON module.
- **Remove:** Click the radio button in front of the I-7000/DL DCON module and click on “Remove” to remove the selected I-7000/DL DCON module.

After all settings are completed, click “Save” button to save the changes. Following will describe the setting of the I/O channel of I-7000/DL DCON modules.

6.3.1 The DI channel setting for I-7000/DL DCON module

The I-7000/DL DCON module DI channel setting interface is shown as below (using I-7060 as an example)

Module I-7060 Setting

Nickname	<input type="text"/>
Description	<input type="text"/>
Address	<input type="text" value="1"/> ▾
Scan Rate	<input type="text" value="5"/> second(s)
Retry Interval	<input type="text" value="5"/> second(s)

DI Attribute	DO Attribute	
	Channel Name	Counter Name
Ch.0	<input type="text"/>	<input type="text"/>
Ch.1	<input type="text"/>	<input type="text"/>
Ch.2	<input type="text"/>	<input type="text"/>
Ch.3	<input type="text"/>	<input type="text"/>

Figure 6-17 : I-7000/DL Module DI Channel Setting page

The settings are as below:

- **Nickname:** For user to define nickname for the module and the I/O channels, these nicknames will be displayed on the “Channel Status” and “Rule Setting” pages.
- **Description:** The Description field provides a space for the user to make a brief description of this module.
- **Address:** The address will be the DCON address of this I-7000/DL DCON module, please make sure the address is the same as the settings of the module, if the setting is not accurate, the connection for WISE to the I-7000/DL DCON module will be failed.
- **Scan Rate:** Input the time interval for WISE to periodically retrieve the I/O channel data of this I-7000/DL DCON module, the setting range will be 0 ~ 65535 seconds.
- **Retry Interval:** The time interval to wait for WISE to repeatedly send command again when WISE sends command to the I-7000/DL DCON module and get no response. The unit will be second. The setting range will be 3 ~ 65535 seconds.

After all settings of the DI channels are completed, continue the configuration of other channels, and after all channel settings are completed, click “OK” button to save the changes and return to I-7000/DL DCON Module List.

Please Note: For I-7000/DL DCON modules, the counting mode of the DI channel counter is Falling. You can change the counting mode by DCON Utility

6.3.2 The DO channel setting for I-7000/DL DCON module

The I-7000/DL DCON module DO channel setting interface is shown as below (using I-7060 as an example):

Module I-7060 Setting

Nickname	<input type="text"/>
Description	<input type="text"/>
Address	7 <input type="button" value="v"/>
Scan Rate	0 second(s)
Retry Interval	5 second(s)

DI Attribute **DO Attribute**

Channel	Nickname	Advanced Function
Ch.0	<input type="text"/>	Disable <input type="button" value="v"/>
Ch.1	<input type="text"/>	Disable <input type="button" value="v"/>
Ch.2	<input type="text"/>	Disable <input type="button" value="v"/>
Ch.3	<input type="text"/>	Disable <input type="button" value="v"/>

Figure 6-18 : I-7000/DL Module DO Channel Setting page

The settings are as below:

- **Nickname:** For user to define nickname for the module and the I/O channels, these nicknames will be displayed on the “Channel Status” and “Rule Setting” pages.
- **Description:** The Description field provides a space for the user to make a brief description of this module.
- **Address:** The address will be the DCON address of this I-7000/DL DCON module, please make sure the address is the same as the settings of the module, if the setting is not accurate, the connection for WISE to the I-7000/DL DCON module will be failed.
- **Scan Rate:** Input the time interval for WISE to periodically retrieve the I/O channel data of this I-7000/DL DCON module, the setting range will be 0 ~ 65535 seconds.
- **Retry Interval:** The time interval to wait for WISE to repeatedly send command again when WISE sends command to the I-7000/DL DCON module and get no response. The unit will be second. The setting range will be 3 ~ 65535 seconds.
- For I-7000/DL DCON DO channels, WISE provides the “Auto OFF” and “DI Status Mapping” advanced functions, select the function from the dropdown list:
 - **Auto OFF:** When “Auto OFF” is selected, it allows this DO channel to enable Auto OFF function. It is required to set up a time interval, when this DO channel is set to be “ON” and the duration of the ON status reaches the pre-set time interval, the

DO channel will automatically be set to OFF. The unit is second.

- **DI Status Mapping:** When “DI Status Mapping” is selected, the status of the DI channel with the same channel number on the I-7000/DL DCON module will be copied to the DO channel. For example, when the “DI Status Mapping” is enabled on DO0, when the DI0 status is ON, DO0 will set to be ON, and when the DI0 status is OFF, DO0 will set to be OFF as well.

After all settings of the DO channels are completed, continue the configuration of other channels, and after all channel settings are completed, click “OK” button to save the changes and return to I-7000/DL DCON Module List.

Please Note:

1. To set up the Power On value of the DO channels on I-7000/DL DCON modules, please use DCON Utility to set the value.
2. The DO channels on I-7000/DL DCON modules do not offer Pulse Output function.

6.3.3 The AI channel setting for I-7000/DL DCON module

The I-7000/DL DCON module AI channel setting interface is shown as below (using I-7012 as an example):

Module I-7012 Setting

Nickname	<input type="text"/>
Description	<input type="text"/>
Address	8 <input type="button" value="v"/>
Scan Rate	0 second(s)
Retry Interval	5 second(s)

DI Attribute DO Attribute **AI Attribute**

Channel	Nickname	Type	Scale
Ch.0	<input type="text"/>	-150 mV ~ 150 mV <input type="button" value="v"/>	Minimum: <input type="text" value="0"/> Maximum: <input type="text" value="0"/>

Figure 6-19 : I-7000/DL Module AI Channel Setting page

The settings are as below:

- **Nickname:** For user to define nickname for the module and the I/O channels, these nicknames will be displayed on the “Channel Status” and “Rule Setting” pages.
- **Description:** The Description field provides a space for the user to make a brief description of this module.
- **Address:** The address will be the DCON address of this I-7000/DL DCON module, please make sure the address is the same as the settings of the module, if the setting is not accurate, the connection for WISE to the I-7000/DL DCON module will be failed.
- **Scan Rate:** Input the time interval for WISE to periodically retrieve the I/O channel data of this I-7000/DL DCON module, the setting range will be 0 ~ 65535 seconds.
- **Retry Interval:** The time interval to wait for WISE to repeatedly send command again when WISE sends command to the I-7000/DL DCON module and get no response. The unit will be second. The setting range will be 3 ~ 65535 seconds.
- **Temperature Unit:** Specify the temperature measurement unit for the modules that allows for temperature measurement, such as I-7005, I-7011, I-7013, I-7015, I-7018 and I-7019, the temperature units can be set as degree Celsius or degree Fahrenheit.



Temperature Unit Celsius(°C) Fahrenheit(°F)

- **Type:** Select the input signal type of the AI channel from the dropdown list.
- **Scale:** In the “Scale” field, AI channel raw data can be set to operate with linear proportion between “Minimum” and “Maximum” values. The IF Condition will use this already-adjusted value in the evaluation operation, and the AI value retrieved from the “Channel Status” page or Modbus Table via WISE would be the adjusted value. The default value for Maximum and Minimum is 0, it means the Scale function is disabled.

After all settings of the AI channels are completed, continue the configuration of other channels, and after all channel settings are completed, click “OK” button to save the changes and return to I-7000/DL DCON Module List.

6.3.4 The AO channel setting for I-7000/DL DCON module

The I-7000/DL DCON module AO channel setting interface is shown as below (using I-7024 as an example):

Module I-7024 Setting

Nickname	<input type="text"/>
Description	<input type="text"/>
Address	3 <input type="button" value="v"/>
Scan Rate	0 second(s)
Retry Interval	5 second(s)

AO Attribute

Channel	Nickname	Type
Ch.0	<input type="text"/>	0 V ~ 5 V <input type="button" value="v"/>
Ch.1	<input type="text"/>	0 V ~ 5 V <input type="button" value="v"/>
Ch.2	<input type="text"/>	0 V ~ 5 V <input type="button" value="v"/>
Ch.3	<input type="text"/>	0 V ~ 5 V <input type="button" value="v"/>

Figure 6-20 : I-7000/DL Module AO Channel Setting page

The settings are as below:

- Nickname: For user to define nickname for the module and the I/O channels, these nicknames will be displayed on the “Channel Status” and “Rule Setting” pages.
- Description: The Description field provides a space for the user to make a brief description of this module.
- Address: The address will be the DCON address of this I-7000/DL DCON module, please make sure the address is the same as the settings of the module, if the setting is not accurate, the connection for WISE to the I-7000/DL DCON module will be failed.
- Scan Rate: Input the time interval for WISE to periodically retrieve the I/O channel data of this I-7000/DL DCON module, the setting range will be 0 ~ 65535 seconds.
- Retry Interval: The time interval to wait for WISE to repeatedly send command again when WISE sends command to the I-7000/DL DCON module and get no response. The unit will be second. The setting range will be 3 ~ 65535 seconds.
- Type: Select the output signal type of the AO channel from the dropdown list.

After all settings of the AO channels are completed, continue the configuration of other channels, and after all channel settings are completed, click “OK” button to save the changes and return to I-7000/DL DCON Module List.

Please note: To set up the Power On value of the AO channels on I-7000/DL DCON modules, please use DCON Utility to set the value.

6.4 Remote Modbus RTU Module Setting

WISE allows connections to ICP DAS M-7000/tM/DL/LC/SC/IR modules and general Modbus RTU Modules. The I/O Module Setting page allows users to add Modbus RTU Module that are connected to the WISE to the list. After the module is added, it allows to set up the configuration of the I/O module. The setting page is shown as below:

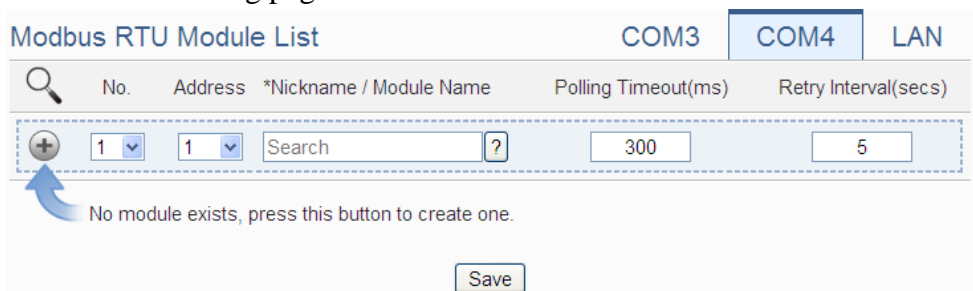


Figure 6-21 : Remote Modbus RTU Module Setting page

The following section will give more information how to add and complete settings of Modbus RTU modules. After all settings are completed, click “Save” button to save the changes.


Please note:

1. The COM3 (RS-485) and COM4 (RS-485) interfaces on WISE allows connections to I-7000/DL DCON modules or Modbus RTU modules.
2. A single COM Port interface (COM3 or COM4) allows connections to at most 16 devices (I-7000/DL DCON modules or Modbus RTU modules).

6.4.1 Scan to Add ICP DAS Modules

The user could use the Scan function to add ICP DAS M-7000 /tM/DL/LC/SC modules to the WISE, the steps are as below:

Please Note: The ICP DAS IR modules does not support the scan function, please add it manually.)

- i. Click on  button to scan the ICP DAS modules that are connected to the WISE.

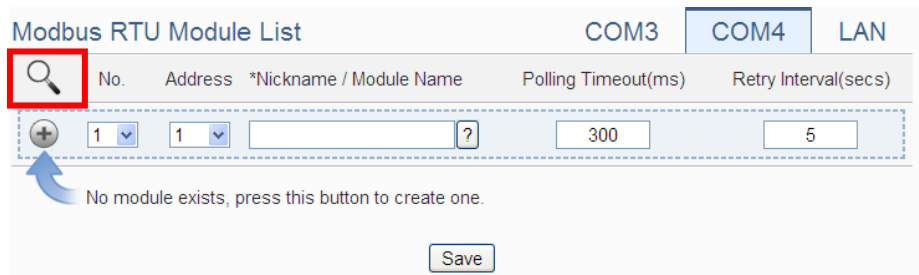


Figure 6-22 : The “Scan” button to search ICP DAS module

- ii. When the Scan page appears, input the starting address and the ending address of the Modbus address that are going to perform scan. Click on “Scan”, the system will start to scan the ICP DAS modules that match the settings previously set, to cancel the scan, and click on “Cancel”.

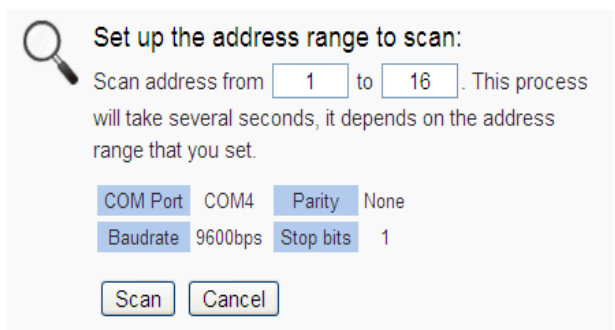


Figure 6-23 : Set up the Scanning Range for the ICP DAS module

- iii. When the system is performing the scan, the address that are performing scan will be dynamically shown on the upper left side, please wait till the scan operation is completed. To stop the scan operation, click on “Cancel” to terminal the scan and leave the page.

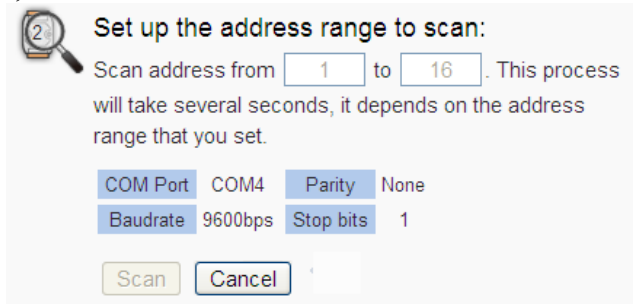


Figure 6-24 : Scanning the ICP DAS module

- iv. After the Scan operation is completed, an M-7000/tM/DL/LC/SC module list will appear. If the newly scanned module doesn’t match the module previously set on the same address, a window will

appear (Figure 6-26), please select the actual device that are connected to WISE. After all settings are completed, click “Save” button to save the changes.

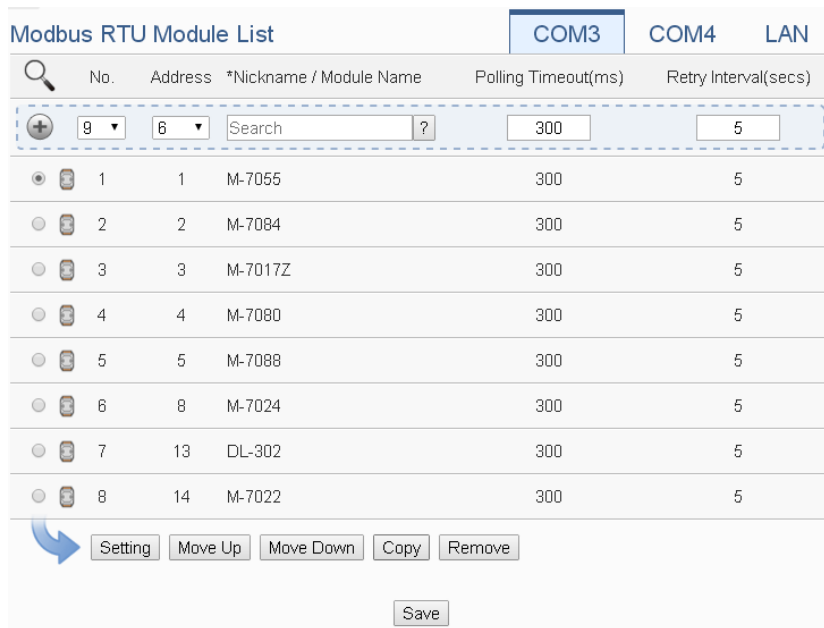


Figure 6-25 : The ICP DAS module List after Scan operation

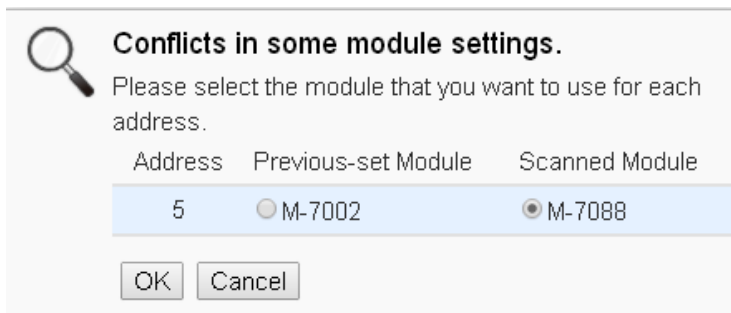


Figure 6-26 : Select the actual ICP DAS modules

6.4.2 Add ICP DAS module or Modbus RTU Module manually

In addition to perform Scan operation to automatically add M-7000/tM/DL/LC/SC modules to the list, the user could also add the ICP DAS M-7000/tM/DL/LC/SC/IR modules or Modbus RTU modules manually one by one, the steps are as below:

- i. No: The number will be the order that the I/O channel data of the Modbus RTU module being stored in the WISE Modbus Table. The range is 1~16.
- ii. Address: The address will be the Modbus address of this Modbus RTU module, please make sure the address is the same as the settings of the module, if the setting is not accurate, the connection

for WISE to the Modbus RTU module will be failed.

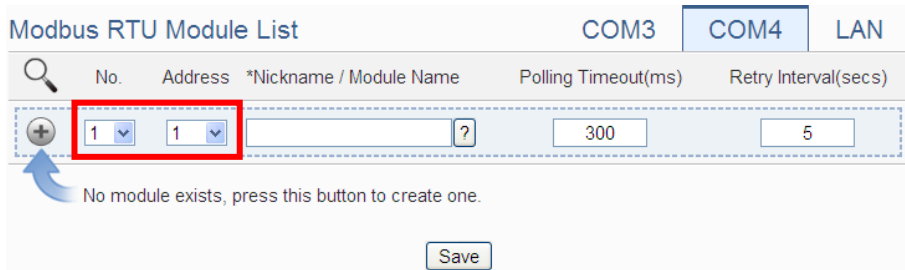


Figure 6-27 : Set up the No. and Address of the Modbus RTU modules

- iii. Select the module name: For ICP DAS modules, the user could select the default model name from the dropdown list. Please input the nickname for other Modbus RTU modules manually.

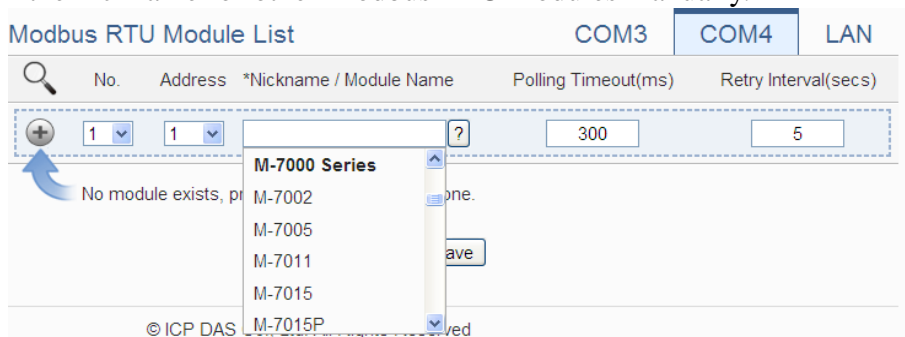



Figure 6-28 : Select the model of the Modbus RTU Module

- iv. Polling Timeout: The time interval for WISE to send command to the Modbus RTU module and wait for the response, the unit will be ms. The setting range will be 1-10000 ms.
- v. Retry Interval: The time interval to wait for WISE to repeatedly send command again when WISE sends command to the Modbus RTU module and get no response. The unit will be second. The setting range will be 3 ~ 65535 seconds.
- vi. Click  to add the Modbus RTU module to the list. After adding the Modbus RTU module, click “Save” button to save the changes.

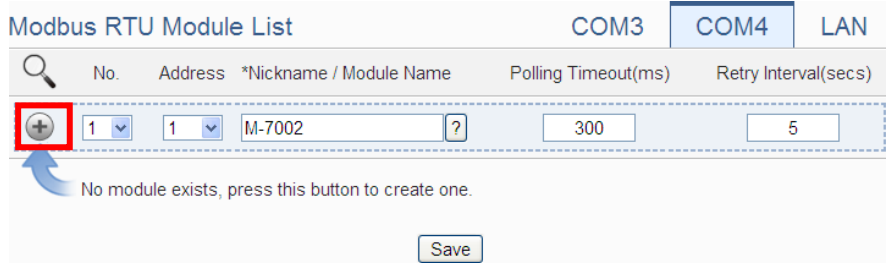


Figure 6-29 : Add the Modbus RTU Module manually

6.5 Modbus RTU Module List Operation Interface

After the Modbus RTU modules are added to the Module RTU module list

via auto scan or manual work, the Modbus RTU modules will be listed as below:

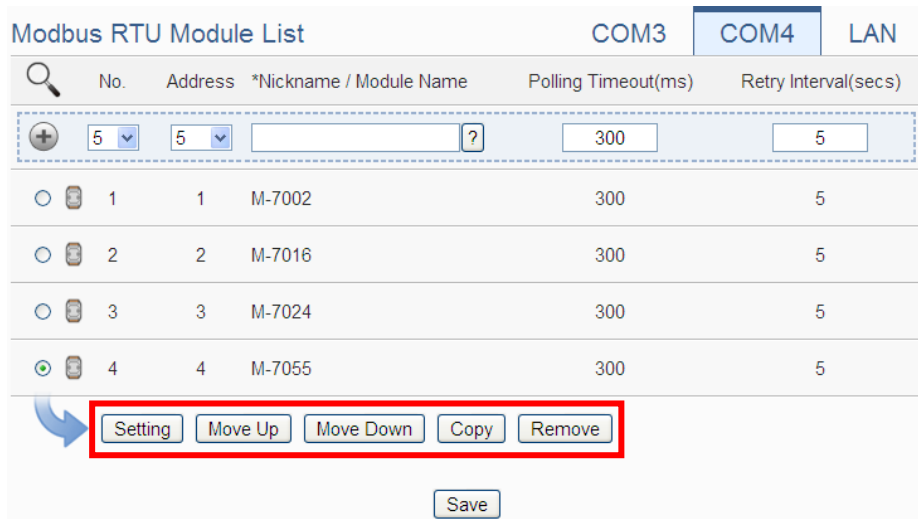


Figure 6-30 : Modbus RTU module List Operation Interface

The following functions allow to perform settings or rearrange order of the Modbus RTU modules. Please select the Modbus RTU module and click on the function button to perform the operations:

12. **Setting:** Click the radio button in front of the Modbus RTU module and click on “Setting” to get into the setting page of the Modbus RTU module. The settings for each Modbus RTU module will be given in the following section.
13. **Move Up:** Click the radio button in front of the Modbus RTU module and click on “Move Up” to move the Modbus RTU module to upper order (decrease the index number (No)).
14. **Move Down:** Click the radio button in front of the Modbus RTU module and click on “Move Down” to move the Modbus RTU module to lower order (increase the index number (No)).
15. **Copy:** To copy the settings of a pre-set Modbus RTU module to the new Modbus RTU module, please click the radio button in front of the pre-set Modbus RTU module and then click on “Copy”, a new Modbus RTU module (in sequence) will be added to the list and the settings of the old Modbus RTU module will be copied to this newly added Modbus RTU module.
16. **Remove:** Click the radio button in front of the Modbus RTU module and click on “Remove” to remove the selected Modbus RTU module.

After all settings are completed, click “Save” button to save the changes. Following will describe the setting of the DI/DO/AI/AO channel of ICP DAS M-7000/tM/DL/LC/SC/IR series modules and the setting of the Coil Output/Discrete Input/Input Register/Holding Register of Modbus RTU modules.

6.5.1 The DI channel setting for ICP DAS module

The ICP DAS M-7000/tM/DL/LC/SC/IR module DI channel setting interface is shown as below (using M-7060 as an example):

Module M-7060 Setting

Nickname	<input type="text"/>
Description	<input type="text"/>
Address	5
Scan Rate	0 second(s)
Polling Timeout	300 millisecond(s)
Retry Interval	5 second(s)

DI Attribute | DO Attribute

Channel	Nickname
Ch.0	<input type="text"/>
Ch.1	<input type="text"/>
Ch.2	<input type="text"/>
Ch.3	<input type="text"/>

OK Cancel

Figure 6-31 : ICP DAS module DI Channel Setting page

The settings are as below:

- **Nickname:** For user to define nickname for the module and the I/O channels, these nicknames will be displayed on the “Channel Status” and “Rule Setting” pages.
- **Description:** The Description field provides a space for the user to make a brief description of this module.
- **Address:** The address will be the Modbus address of this M-7000/tM/DL/LC/SC/IR module, please make sure the address is the same as the settings of the module, if the setting is not accurate, the connection for WISE to the M-7000/tM/DL/LC/SC/IR module will be failed.
- **Scan Rate:** Input the time interval for WISE to periodically

retrieve the I/O channel data of this M-7000/tM/DL/LC/SC/IR module, the setting range will be 0 ~ 65535 seconds.

- Polling Timeout: The time interval for WISE to send command to the M-7000/tM/DL/LC/SC/IR module and wait for the response, the unit will be ms. The setting range will be 1-10000 ms.
- Retry Interval: The time interval to wait for WISE to repeatedly send command again when WISE sends command to the M-7000/tM/DL/LC/SC/IR module and get no response. The unit will be second. The setting range will be 3 ~ 65535 seconds.

After all settings of the DI channels are completed, continue the configuration of other channels, and after all channel settings are completed, click “OK” button to save the changes and return to Modbus RTU Module List.

Please Note: For M-7000 modules, the counting mode of the DI channel counter is Falling. You can change the counting mode by DCON Utility

6.5.2 The DO channel setting for ICP DAS module

The ICP DAS M-7000/tM/DL/LC/SC/IR module DO channel setting interface is shown as below (using M-7060 as an example):

Module M-7060 Setting

Nickname	<input type="text"/>
Description	<input type="text"/>
Address	5 <input type="button" value="v"/>
Scan Rate	0 second(s)
Polling Timeout	300 millisecond(s)
Retry Interval	5 second(s)

DI Attribute DO Attribute

Channel	Nickname	Advanced Function
Ch.0	<input type="text"/>	Disable <input type="button" value="v"/>
Ch.1	<input type="text"/>	Disable <input type="button" value="v"/>
Ch.2	<input type="text"/>	Disable <input type="button" value="v"/>
Ch.3	<input type="text"/>	Disable <input type="button" value="v"/>

Figure 6-32 : ICP DAS module DO Channel Setting page

The settings are as below:

- **Nickname:** For user to define nickname for the module and the I/O channels, these nickname will be displayed on the “Channel Status” and “Rule Setting” pages.
- **Description:** The Description field provides a space for the user to make a brief description of this module.
- **Address:** The address will be the Modbus address of this M-7000/tM/DL/LC/SC/IR module, please make sure the address is the same as the settings of the module, if the setting is not accurate, the connection for WISE to the M-7000/tM/DL/LC/SC/IR module will be failed.
- **Scan Rate:** Input the time interval for WISE to periodically retrieve the I/O channel data of this M-7000/tM/DL/LC/SC/IR module, the setting range will be 0 ~ 65535 seconds.
- **Polling Timeout:** The time interval for WISE to send command to the M-7000/tM/DL/LC/SC/IR module and wait for the response, the unit will be ms. The setting range will be 1-10000 ms.
- **Retry Interval:** The time interval to wait for WISE to repeatedly send command again when WISE sends command to the M-7000/tM/DL/LC/SC/IR module and get no response. The unit will be second. The setting range will be 3 ~ 65535 seconds.
- For M-7000/tM/DL/LC/SC/IR DO channels, WISE provides the “Auto OFF” and “DI Status Mapping” advanced functions, please refer to [”6.3.2 The DO channel setting for I-7000/DL DCON module”](#) section for detail.

After all settings of the DO channels are completed, continue the configuration of other channels, and after all channel settings are completed, click “OK” button to save the changes and return to Modbus RTU Module List.

Please Note:

1. To set up the Power On value of the DO channels on M-7000/tM/DL/LC/SC/IR modules, please use DCON Utility to set the value.
2. The DO channels on M-7000/tM/DL/LC/SC/IR modules do not offer the Pulse Output function.

6.5.3 The AI channel setting for ICP DAS module

The ICP DAS M-7000/tM/DL/LC/SC/IR module AI channel setting interface is shown as below (using M-7002 as an example):

Module M-7002 Setting

Nickname	<input type="text"/>
Description	<input type="text"/>
Address	1 <input type="button" value="v"/>
Scan Rate	0 second(s)
Polling Timeout	300 millisecond(s)
Retry Interval	5 second(s)

DI Attribute DO Attribute **AI Attribute**

Channel	Nickname	Type	Scale
Ch.0	<input type="text"/>	-150 mV ~ 150 mV <input type="button" value="v"/>	Minimum: <input type="text" value="0"/> Maximum: <input type="text" value="0"/>
Ch.1	<input type="text"/>	-150 mV ~ 150 mV <input type="button" value="v"/>	Minimum: <input type="text" value="0"/> Maximum: <input type="text" value="0"/>
Ch.2	<input type="text"/>	-150 mV ~ 150 mV <input type="button" value="v"/>	Minimum: <input type="text" value="0"/> Maximum: <input type="text" value="0"/>
Ch.3	<input type="text"/>	-150 mV ~ 150 mV <input type="button" value="v"/>	Minimum: <input type="text" value="0"/> Maximum: <input type="text" value="0"/>

Figure 6-33 : ICP DAS module AI Channel Setting page

The settings are as below:

- **Nickname:** For user to define nickname for the module and the I/O channels, these nicknames will be displayed on the “Channel Status” and “Rule Setting” pages.
- **Description:** The Description field provides a space for the user to make a brief description of this module.
- **Address:** The address will be the Modbus address of this M-7000/tM/DL/LC/SC/IR module, please make sure the address is the same as the settings of the module, if the setting is not accurate, the connection for WISE to the M-7000/tM/DL/LC/SC/IR module will be failed.
- **Scan Rate:** Input the time interval for WISE to periodically retrieve the I/O channel data of this M-7000/tM/DL/LC/SC/IR module, the setting range will be 0 ~ 65535 seconds.
- **Polling Timeout:** The time interval for WISE to send command to the M-7000/tM/DL/LC/SC/IR module and wait for the response, the unit will be ms. The setting range will be 1-10000 ms.

- **Retry Interval:** The time interval to wait for WISE to repeatedly send command again when WISE sends command to the M-7000/tM/DL/LC/SC/IR module and get no response. The unit will be second. The setting range will be 3 ~ 65535 seconds.
- **Temperature Unit:** Specify temperature measurement unit for modules that allows for temperature measurement. The temperature units can be set as degree Celsius or degree Fahrenheit.

Temperature Unit Celsius(°C) Fahrenheit(°F)

- **Type:** Select the input signal type of the AI channel from the dropdown list.
- **Scale:** Please refer to “[6.3.3 The AI channel setting for I-7000/DL DCON module](#)” section for detail.

After all settings of the AI channels are completed, continue the configuration of other channels, and after all channel settings are completed, click “OK” button to save the changes and return to Modbus RTU Module List.

6.5.4 The AO channel setting for ICP DAS module

The ICP DAS M-7000/tM/DL/LC/SC/IR module AO channel setting interface is shown as below (using M-7024 as an example):

Module M-7024 Setting

Nickname	<input type="text"/>
Description	<input type="text"/>
Address	3 <input type="button" value="v"/>
Scan Rate	0 second(s)
Polling Timeout	300 millisecond(s)
Retry Interval	5 second(s)

AO Attribute

Channel	Nickname	Type
Ch.0	<input type="text"/>	0 V ~ 5 V <input type="button" value="v"/>
Ch.1	<input type="text"/>	0 V ~ 5 V <input type="button" value="v"/>
Ch.2	<input type="text"/>	0 V ~ 5 V <input type="button" value="v"/>
Ch.3	<input type="text"/>	0 V ~ 5 V <input type="button" value="v"/>

Figure 6-34 : ICP DAS module AO Channel Setting page

The settings are as below:

- **Nickname:** For user to define nickname for the module and the I/O channels, these nicknames will be displayed on the “Channel Status” and “Rule Setting” pages.
- **Description:** The Description field provides a space for the user to make a brief description of this module.
- **Address:** The address will be the Modbus address of this M-7000/tM/DL/LC/SC/IR module, please make sure the address is the same as the settings of the module, if the setting is not accurate, the connection for WISE to the M-7000/tM/DL/LC/SC/IR module will be failed.
- **Scan Rate:** Input the time interval for WISE to periodically retrieve the I/O channel data of this M-7000/tM/DL/LC/SC/IR module, the setting range will be 0 ~ 65535 seconds.
- **Polling Timeout:** The time interval for WISE to send command to the M-7000/tM/DL/LC/SC/IR module and wait for the response, the unit will be ms. The setting range will be 1-10000 ms.
- **Retry Interval:** The time interval to wait for WISE to repeatedly send command again when WISE sends command to the M-7000/tM/DL/LC/SC/IR module and get no response. The unit will be second. The setting range will be 3 ~ 65535 seconds.
- **Type:** Select the output signal type of the AO channel from the dropdown list.

After all settings of the AO channels are completed, continue the configuration of other channels, and after all channel settings are completed, click “OK” button to save the changes and return to Modbus RTU Module List.

Please note: To set up the Power On value of the AO channels on M-7000/tM/DL/LC/SC/IR modules, please use DCON Utility to set the value.

6.5.5 The Coil Output Setting of Modbus RTU Module

The Modbus RTU Module Coil Output Setting page is shown as follow:

Module UPS Setting	
*Nickname	<input type="text" value="UPS"/>
Description	<input type="text"/>
Address	<input type="text" value="6"/>
Scan Rate	<input type="text" value="0"/> second(s)
Polling Timeout	<input type="text" value="300"/> millisecond(s)
Retry Interval	<input type="text" value="5"/> second(s)
Modbus Mapping Table Setting	
Data Model	<input type="text" value="Coil Output (0x)"/>
Start Address	<input type="text" value="0"/>
Data Number	<input type="text" value="1"/>
<input type="button" value="Add"/>	

Figure 6-35 : Modbus RTU module Coil Output Setting page

The settings are as follow:

- **Nickname:** For user to define nickname for the module, this nickname will be displayed on the “Channel Status” and “Rule Setting” pages.
- **Description:** The Description field provides a space for the user to make a brief description of this module.
- **Address:** The address will be the Modbus address of this Modbus RTU module, please make sure the address is the same as the settings of the module, if the setting is not accurate, the connection for WISE to the Modbus RTU module will be failed.
- **Scan Rate:** Input the time interval for WISE to periodically retrieve the I/O channel data of this Modbus RTU module, the setting range will be 0 ~ 65535 seconds.
- **Polling Timeout:** The time interval for WISE to send command to the Modbus RTU module and wait for the response, the unit will be ms. The setting range will be 1-10000 ms.
- **Retry Interval:** The time interval to wait for WISE to repeatedly send command again when WISE sends command to the Modbus RTU module and get no response. The unit will be second. The setting range will be 3 ~ 65535 seconds.
- **Data Model:** WISE offers 4 Data Model selections to match the Modbus RTU module configuration. The Data Model list is as follow. In this case, please select “Coil Output (0x)”.

Data Model	The Modbus Address of Modbus RTU Modules
Coil Output	0xxxxx
Discrete Input	1xxxxx
Input Register	3xxxxx
Holding Register	4xxxxx

- Start Address: Allows setting up the starting address of Coil Output (0x) on the Modbus RTU module you would like to retrieve.
- Data Number: After finishing the Start Address setting, specify the Data Number, it is the number of Coil Output data you would like to retrieve from the Start Address. The maximum address number of each data type is 500.
- After finishing the “Start Address” and “Data Number” setting, click on “Add” button. A new Coil Output address block will be added to the Modbus address mapping table. All added address blocks will be located in sequences starting from the Starting Address of the Coil Output (The address number on the first column of the “Local Address” indicates the local Modbus address of WISE to keep the Coil Output data.).

Figure 6-36 is an example about Coil Output setting for a Modbus RTU module. The starting Modbus address of the Coil Output block is 00050(00000 + 50), it requires to set 4 continuous Coil Output data in the setting. So that the WISE can access the 00050, 00051, 00052 and 00053 Coil Output address of the module, and these retrieved Coil Output data will be kept in WISE Modbus Address 04500、04501、04502 and 04503.

Modbus Mapping Table Setting

Data Model: Coil Output (0x)

Start Address: 50

Data Number: 4

Add

Modbus Mapping Table

Local Address	Coil Output (0x)		Discrete Input (1x)	Input Register (3x)	Holding Register (4x)
	Data Address	Data Number			
4500	50				
4501		4			
4502					
4503					

Remove All Setting Expand All Collapse All

OK Cancel

Figure 6-36 : Coil Output Setting Example for Modbus RTU module

- To modify the settings of starting address, quantity or Read/Write authority, please click on the setting block and input the setting. Click “OK” for modification or click “Remove” to remove the setting. The Read/Write authority is for user to enable or disable the Read/Write capability for the address block of the module.

Modbus Mapping Table

Address Setting Nickname Setting

Local Address	Coil Output (0x)	Discrete Input (1x)	Input Register (3x)	Holding Register (4x)
3500	Data Address			
	Data Number			
3501	Read / Write Setting			
	Readable	<input checked="" type="checkbox"/>		
3502	Writable	<input checked="" type="checkbox"/>		
3503				

Remove All Setting Expand All Collapse All

OK Cancel

- If the user wants to assign a Nickname for the address blocks, the user can click on the “Nickname Setting” tab, and then input the Nickname for each address block. The Nickname will be shown in the “Channel Status” and “Rule Setting” pages.

Modbus Mapping Table

Address Setting Nickname Setting

Local Address	Coil Output (0x)	Discrete Input (1x)	Input Register (3x)	Holding Register (4x)
4500	Data Address	0050		
	Nickname			
4501	Data Address	0051		
	Nickname			
4502	Data Address	0052		
	Nickname			
4503	Data Address	0053		
	Nickname			

OK Cancel

After all settings of the Coil Output of the Modbus RTU module are completed, continue the configuration of other channel, and after all channel settings are completed, click “OK” button to save the changes and return to Modbus RTU Module List.

6.5.6 The Discrete Input Setting of Modbus RTU Module

The Modbus RTU Module Discrete Input Setting page is shown as follow:

Module UPS Setting	
*Nickname	<input type="text" value="UPS"/>
Description	<input type="text"/>
Address	<input type="text" value="6"/>
Scan Rate	<input type="text" value="0"/> second(s)
Polling Timeout	<input type="text" value="300"/> millisecond(s)
Retry Interval	<input type="text" value="5"/> second(s)
Modbus Mapping Table Setting	
Data Model	<input type="text" value="Discrete Input (1x)"/>
Start Address	<input type="text" value="50"/>
Data Number	<input type="text" value="4"/>
<input type="button" value="Add"/>	

Figure 6-37 : Modbus RTU module Discrete Input Setting page

The settings are as follow:

- **Nickname:** For user to define nickname for the module, this nickname will be displayed on the “Channel Status” and “Rule Setting” pages.
- **Description:** The Description field provides a space for the user to make a brief description of this module.
- **Address:** The address will be the Modbus address of this Modbus RTU module, please make sure the address is the same as the settings of the module, if the setting is not accurate, the connection for WISE to the Modbus RTU module will be failed.
- **Scan Rate:** Input the time interval for WISE to periodically retrieve the I/O channel data of this Modbus RTU module, the setting range will be 0 ~ 65535 seconds.
- **Polling Timeout:** The time interval for WISE to send command to the Modbus RTU module and wait for the response, the unit will be ms. The setting range will be 1-10000 ms.
- **Retry Interval:** The time interval to wait for WISE to repeatedly send command again when WISE sends command to the Modbus RTU module and get no response. The unit will be second. The setting range will be 3 ~ 65535 seconds.
- **Data Model:** WISE offers 4 Data Model selections to match the Modbus RTU module configuration. Please refer to the section [“6.5.5 The Coil Output Setting of Modbus RTU Module”](#) for detailed information. In this case please selects “Discrete Input

(1x)”.

- **Start Address:** Allows setting up the starting address of Discrete Input (1x) on the Modbus RTU module you would like to retrieve.
- **Data Number:** After finishing the Start Address setting, specify the Data Number, it is the number of Discrete Input data you would like to retrieve from the Start Address. The maximum address number of each data type is **500**.
- After finishing the “Start Address” and “Data Number” setting, click on “Add” button. A new Discrete Input address block will be added to the Modbus address mapping table. All added address blocks will be located in sequences starting from the Starting Address (The address number on the first column of the “Local Address” indicates the local Modbus address of WISE to keep the Discrete Input data.). Figure 6-38 shows an example about Discrete Input setting for a Modbus RTU module. The starting Modbus address of the Discrete Input block is 10020(10000 + 20), it requires to set 6 continuous Discrete Input data in the setting. So that the WISE can access the 10020, 10021, 10022, 10023, 10024, and 10025 Discrete Input address of the module, and these retrieved Discrete Input data will be kept in WISE Modbus Address 14500、14501、14502、14503、14504 and 14505.

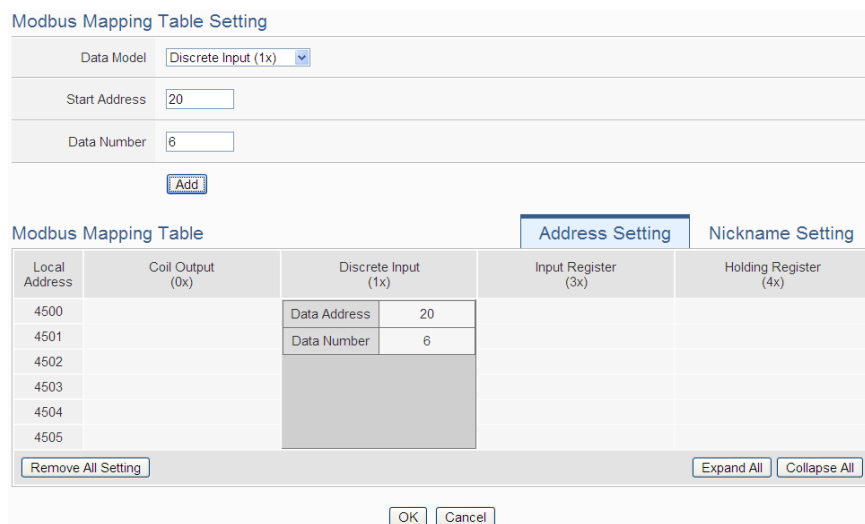


Figure 6-38 : Discrete Input Setting Example for Modbus RTU module

- To modify the starting address or quantity setting, please click on the setting block and input the setting. Click “OK” for modification or click “Remove” to remove the setting.

Local Address	Coil Output (0x)	Discrete Input		Input Register (3x)	Holding Register (4x)
		OK	Remove		
4500		Data Address	20		
4501		Data Number	6		
4502					
4503					
4504					
4505					

- If the user wants to assign a Nickname for the address blocks, the user can click on the “Nickname Setting” tab, and then input the Nickname for each address block. The Nickname will be shown in the “Channel Status” and “Rule Setting” pages.

Local Address	Coil Output (0x)	Discrete Input (1x)		Input Register (3x)	Holding Register (4x)
		Data Address	Nickname		
4500		0020			
4501		0021			
4502		0022			
4503		0023			
4504		0024			
4505		0025			

After all settings of the Discrete Input of the Modbus RTU module are completed, continue the configuration of other channel, and after all channel settings are completed, click “OK” button to save the changes and return to Modbus RTU Module List.

6.5.7 The Input Register Setting of Modbus RTU Module

The Modbus RTU Module Input Register Setting page is shown as follow:

Module UPS Setting	
*Nickname	<input type="text" value="UPS"/>
Description	<input type="text"/>
Address	<input type="text" value="6"/>
Scan Rate	<input type="text" value="0"/> second(s)
Polling Timeout	<input type="text" value="300"/> millisecond(s)
Retry Interval	<input type="text" value="5"/> second(s)

Modbus Mapping Table Setting	
Data Model	<input type="text" value="Input Register (3x)"/>
Start Address	<input type="text" value="20"/>
Data Number	<input type="text" value="6"/>
Type	<input type="text" value="16-bit Signed Integer"/>

Figure 6-39 : Modbus RTU module Input Register Setting page

The settings are as follow:

- **Nickname:** For user to define nickname for the module, this nickname will be displayed on the “Channel Status” and “Rule Setting” pages.
- **Description:** The Description field provides a space for the user to make a brief description of this module.
- **Address:** The address will be the Modbus address of this Modbus RTU module, please make sure the address is the same as the settings of the module, if the setting is not accurate, the connection for WISE to the Modbus RTU module will be failed.
- **Scan Rate:** Input the time interval for WISE to periodically retrieve the I/O channel data of this Modbus RTU module, the setting range will be 0 ~ 65535 seconds.
- **Polling Timeout:** The time interval for WISE to send command to the Modbus RTU module and wait for the response, the unit will be ms. The setting range will be 1-10000 ms.
- **Retry Interval:** The time interval to wait for WISE to repeatedly send command again when WISE sends command to the Modbus RTU module and get no response. The unit will be second. The setting range will be 3 ~ 65535 seconds.
- **Data Model:** WISE offers 4 Data Model selections to match the Modbus RTU module configuration. Please refer to the section

“[6.5.5 The Coil Output Setting of Modbus RTU Module](#)” for detailed information. In this case please select “Input Register (3x)”.

- **Start Address:** Allows setting up the starting address of Input Register (3x) on the Modbus RTU module you would like to retrieve.
- **Data Number:** After finishing the Start Address setting, specify the Data Number, it is the number of Input Register data you would like to retrieve from the Start Address. The maximum address number of each data type is **500**.
- **Type:** The system support 6 kinds of data type setting for Input Register of Modbus RTU module. The 6 Data Type options are “16-bit Signed Integer”, “16-bit Unsigned Integer”, “16-bit Hex”, “32-bit Signed Long”, “32-bit Unsigned Long”, and “32-bit Floating Point”. If the “16-bit HEX” option is selected, it is required to setup the corresponding scale parameters for linear transformation from HEX value to real value. The WISE will retrieve the HEX value and transfer it to real value in floating point format. This real value could be included in the IF-THEN-ELSE rule for edition.

Modbus Mapping Table Setting

Data Model	<input type="text" value="Input Register (3x)"/>
Start Address	<input type="text" value="20"/>
Data Number	<input type="text" value="6"/>
Type	<input type="text" value="16-bit HEX"/>
HEX Type	HEX Minimum: <input type="text" value="0000"/> ~ Maximum: <input type="text" value="0000"/>
	Real Minimum: <input type="text" value="0"/> ~ Maximum: <input type="text" value="0"/>
<input type="button" value="Add"/>	

If users select “32-bit Signed Long”, “32-bit Unsigned Long”, or “32-bit Floating Point”, the option “Inverse (Big Endian)” will appear. Enable “Inverse (Big Endian)” to receive the data in Big Endian format correctly.

Type	<input type="text" value="32-bit Floating Point"/>	<input type="checkbox"/> Inverse(Big Endian)
------	--	--

- After finishing the “Start Address”, “Data Number”, and “Type” setting, clicks on “Add” button. A new Input Register address block will be added to the Modbus address mapping table (shown as below). All added address blocks will be located in sequences starting from the Starting Address (The address number on the first column of the “Local Address” indicates the local Modbus address

of WISE to keep the Input Register data.).

Figure 6-40 shows an example about Input Register setting for a Modbus RTU module. The starting Modbus address of the Input Register block is 30010(30000 + 10), it requires to set 3 continuous Input Register data in the setting, and the data type is “32-bit Floating Point”. So that the WISE can access the 30010, 30012 and 30014 Input Register address of the module, and these retrieved Input Register data will be kept in WISE Modbus Address 34500、34502 and 34504.

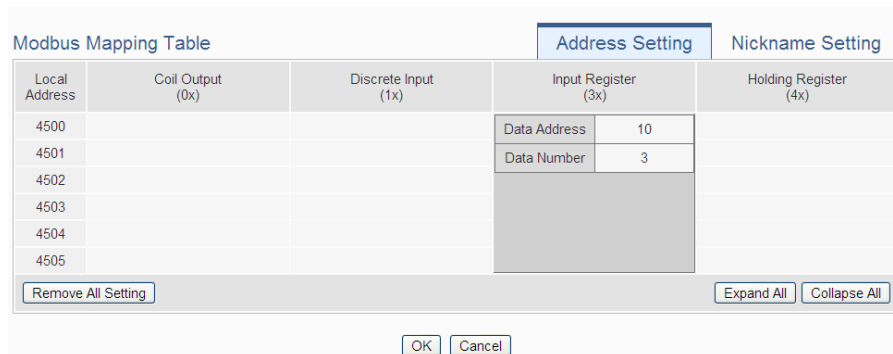


Figure 6-40 : Input Register Setting Example for Modbus RTU module

- To modify the starting address or quantity setting, please click on the setting block to perform the modification. The user could also modify Type, Scale Ratio and Offset on this interface. The Scale Ratio setting and Offset setting allows to transform the Input Register value in this block by linear transformation. The formula is as follow:

$$Transformed\ Value = Scale\ Ratio \times Input\ Register\ value + Offset$$

After the linear transformation, the Transformed Value will be saved in floating point format on the WISE (no matter what format the raw Input Register value was in the device). The default Scale Ratio will be 1 and the default Offset is 0, indicating not using linear transformation.

Modbus Mapping Table			Address Setting	Nickname Setting
Local Address	Coil Output (0x)	Discrete Input (1x)	Input Register (3x)	Holding Register (4x)
3800			<input type="button" value="OK"/> <input type="button" value="Remove"/>	
3801			Data Address <input type="text" value="10"/>	
3802			Data Number <input type="text" value="3"/>	
3803			Type 32-bit Floating Point	
3804			<input type="checkbox"/> Inverse(Big Endian)	
3805			Data Adjustment Scale Ratio <input type="text" value="1"/>	
			Offset <input type="text" value="0"/>	
<input type="button" value="Remove All Setting"/>			<input type="button" value="Expand All"/> <input type="button" value="Collapse All"/>	

- If the user wants to assign a Nickname for the address blocks, the user can click on the “Nickname Setting” tab, and then input the Nickname for each address block. The Nickname will be shown in the “Channel Status” and “Rule Setting” pages.

Modbus Mapping Table			Address Setting	Nickname Setting
Local Address	Coil Output (0x)	Discrete Input (1x)	Input Register (3x)	Holding Register (4x)
4500			Data Address <input type="text" value="0010"/>	
4501			Nickname <input type="text"/>	
			Unit <input type="text"/>	
4502			Data Address <input type="text" value="0012"/>	
4503			Nickname <input type="text"/>	
			Unit <input type="text"/>	
4504			Data Address <input type="text" value="0014"/>	
4505			Nickname <input type="text"/>	
			Unit <input type="text"/>	
			<input type="button" value="OK"/> <input type="button" value="Cancel"/>	

After all settings of the Input Register of the Modbus RTU module are completed, continue the configuration of other channel, and after all channel settings are completed, click “OK” button to save the changes and return to Modbus RTU Module List.

6.5.8 The Holding Register Setting of Modbus RTU Module

The Modbus RTU Module Holding Register Setting page is shown as follow:

Module UPS Setting	
*Nickname	UPS
Description	
Address	6
Scan Rate	0 second(s)
Polling Timeout	300 millisecond(s)
Retry Interval	5 second(s)

Modbus Mapping Table Setting	
Data Model	Holding Register (4x)
Start Address	10
Data Number	3
Type	32-bit Floating Point <input type="checkbox"/> Inverse(Big Endian)
<input type="button" value="Add"/>	

Figure 6-41 : Modbus RTU module Holding Register Setting page

The settings are as follow:

- **Nickname:** For user to define nickname for the module, this nickname will be displayed on the “Channel Status” and “Rule Setting” pages.
- **Description:** The Description field provides a space for the user to make a brief description of this module.
- **Address:** The address will be the Modbus address of this Modbus RTU module, please make sure the address is the same as the settings of the module, if the setting is not accurate, the connection for WISE to the Modbus RTU module will be failed.
- **Scan Rate:** Input the time interval for WISE to periodically retrieve the I/O channel data of this Modbus RTU module, the setting range will be 0 ~ 65535 seconds.
- **Polling Timeout:** The time interval for WISE to send command to the Modbus RTU module and wait for the response, the unit will be ms. The setting range will be 1-10000 ms.
- **Retry Interval:** The time interval to wait for WISE to repeatedly send command again when WISE sends command to the Modbus RTU module and get no response. The unit will be second. The setting range will be 3 ~ 65535 seconds.
- **Data Model:** WISE offers 4 Data Model selections to match the Modbus RTU module configuration. Please refer to the section “[6.5.5 The Coil Output Setting of Modbus RTU Module](#)” for detailed information. In this case please select “Holding Register

(4x)”.

- **Start Address:** Allows setting up the starting address of Holding Register (4x) on the Modbus RTU module you would like to retrieve.
- **Data Number:** After finishing the Start Address setting, specify the Data Number, it is the number of Holding Register data you would like to retrieve from the Start Address. The maximum address number of each data type is **500**.
- **Type:** The system support 6 kinds of data type setting for Holding Register of Modbus RTU module. The 6 Data Type options are “16-bit Signed Integer”, “16-bit Unsigned Integer”, “16-bit Hex”, “32-bit Signed Long”, “32-bit Unsigned Long”, and “32-bit Floating Point”. If the “16-bit HEX” option is selected, it is required to setup the corresponding scale parameters for linear transformation from HEX value to real value. The WISE will retrieve the HEX value and transfer it to real value in floating point format, this real value could be included in the IF-THEN-ELSE rule for edition.

Modbus Mapping Table Setting

Data Model	<input type="text" value="Holding Register (4x)"/>
Start Address	<input type="text" value="10"/>
Data Number	<input type="text" value="3"/>
Type	<input type="text" value="16-bit HEX"/>
HEX Type	HEX Minimum: <input type="text" value="0000"/> ~ Maximum: <input type="text" value="0000"/>
	Real Minimum: <input type="text" value="0"/> ~ Maximum: <input type="text" value="0"/>
<input type="button" value="Add"/>	

If users select “32-bit Signed Long”, “32-bit Unsigned Long”, or “32-bit Floating Point”, the option “Inverse (Big Endian)” will appear. Enable “Inverse (Big Endian)” to receive the data in Big Endian format correctly.

Type	<input type="text" value="32-bit Floating Point"/>	<input type="checkbox"/> Inverse(Big Endian)
------	--	--

- After finishing the “Start Address”, “Data Number”, and “Type” setting; click on “Add” button. A new Holding Register address block will be added to the Modbus address mapping table. All added address blocks will be located in sequences starting from the Starting Address (The address number on the first column of the “Local Address” indicates the local Modbus address of WISE to keep the

Holding Register data.).

Figure 6-42 shows an example about Holding Register setting for a Modbus RTU module. The starting Modbus address of the Holding Register block is 40060(40000 + 60), it requires to set 2 continuous Holding Register data in the setting, and the data type is “32-bit Floating Point”. So that the WISE can access the 40060 and 40062 Holding Register address of the module, and these retrieved Holding Register data will be kept in WISE Modbus Address 44500 and 44502.

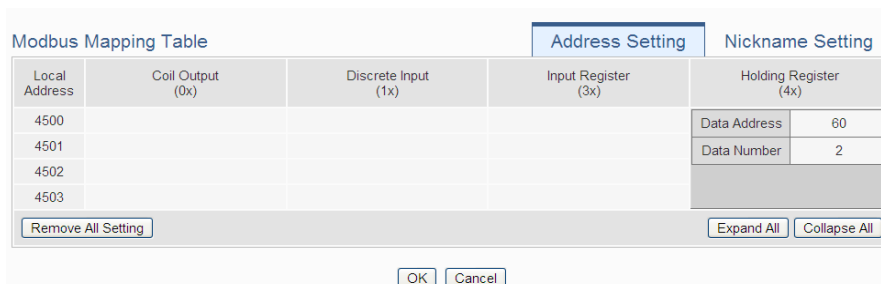


Figure 6-42 : Holding Register Setting Example for Modbus RTU module

- To modify the settings of the starting address, quantity or Read/Write authority, please click on the setting block to perform the modification. The user could also modify Type, Scale Ratio, Offset, and Read/Write authority on this interface. The Scale Ratio setting and Offset setting allows to transform the Holding Register value in this block by linear transformation. The formula is as follow:

$$Transformed\ Value = Scale\ Ratio \times Input\ Register\ value + Offset$$

After the linear transformation, the Transformed Value will be saved in floating point format on the WISE (no matter what format the raw Holding Register value was in the device). The default Scale Ratio will be 1 and the default Offset is 0, indicating not using linear transformation. The Read/Write authority is for user to enable or disable the Read/Write capability for the address block of the module.

Modbus Mapping Table				Address Setting	Nickname Setting
Local Address	Coil Output (0x)	Discrete Input (1x)	Input Register (3x)	Holding Register	
3500				OK	Remove
3501				Data Address	60
3502				Data Number	2
3503				Type	
				32-bit Floating Point	
				<input type="checkbox"/> Inverse(Big Endian)	
				Data Adjustment	
				Scale Ratio	1
				Offset	0
				Read / Write Setting	
				Readable	<input checked="" type="checkbox"/>
				Writable	<input checked="" type="checkbox"/>
Remove All Setting				Expand All	Collapse All
OK Cancel					

- If the user wants to assign a Nickname for the address blocks, the user can click on the “Nickname Setting” tab, and then input the Nickname for each address block. The Nickname will be shown in the “Channel Status” and “Rule Setting” pages.

Modbus Mapping Table				Address Setting	Nickname Setting
Local Address	Coil Output (0x)	Discrete Input (1x)	Input Register (3x)	Holding Register (4x)	
4500				Data Address	0060
4501				Nickname	
4502				Unit	
4503				Data Address	0062
				Nickname	
				Unit	
OK Cancel					

After all settings of the Holding Register of the Modbus RTU module are completed, continue the configuration of other channel, and after all channel settings are completed, click “OK” button to save the changes and return to Modbus RTU Module List.

Please note: The number of Modbus address setting blocks will affect the data update rate for the Modbus RTU/TCP module. Please minimize the number of Modbus address setting blocks; merge the conjunctive setting blocks to speed up the data update rate for the communication between WISE and Modbus RTU/TCP module.

6.6 Remote Modbus TCP Module Setting

WISE allows connections to ICP DAS (P)ET-7000/WISE-7100/WF-2000/IR modules and general Modbus TCP Modules. Through Modbus TCP protocol, it enables to read or write 4 types of Modbus data (Coil Output, Discrete Input, Input Register and Holding Register) from the Modbus TCP modules. And by WISE IF-THEN-ELSE rule engine, it allows to perform automation control operation on the modules. And with SCADA software, it also allows monitoring and control of the Modbus TCP modules which connect with the WISE. The Modbus TCP Slave Module setting page is shown as follow:

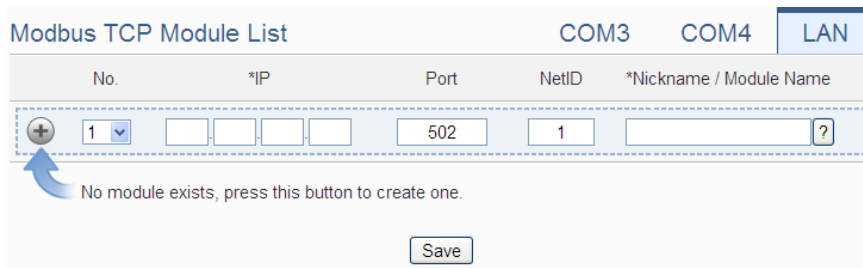


Figure 6-43 : Remote Modbus TCP I/O Module Setting page

Please Note: The LAN interface on WISE allows connections to at most 16 devices ((P)ET-7000/WISE-7100/WF-2000/IR modules or Modbus TCP modules).

6.6.1 Add ICP DAS module or Modbus TCP Module manually

The user could add the (P)ET-7000/WISE-7100/WF-2000/IR module or Modbus TCP modules manually one by one, the steps are as below:

- i. No: The number will be the order that the I/O channel data of the Modbus TCP module being stored in the WISE Modbus Table. The range is 1~16.
- ii. IP: Allows modification of the IP address, Port and NetID of this Modbus TCP module, make sure the IP, Port and NetID setting are the same as the settings of the module. If the setting is not accurate, the connection for WISE to the module will be failed.
- iii. Select the module name: For ICP DAS (P)ET-7000/WISE-7100/WF-2000/IR modules, the user could select the default model name from the dropdown list. Please input the nickname for other Modbus TCP modules manually.

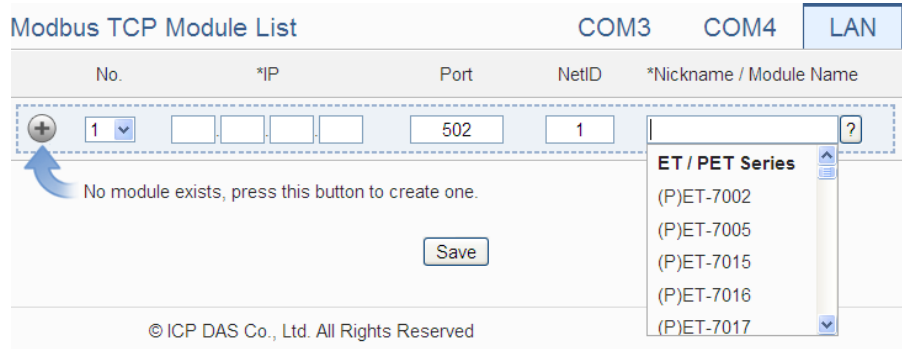


Figure 6-44 : Set up the Model/Name of the Modbus TCP Module

- iv. Click to add the Modbus TCP module to the list After adding the Modbus TCP module, click “Save” button to save the changes.

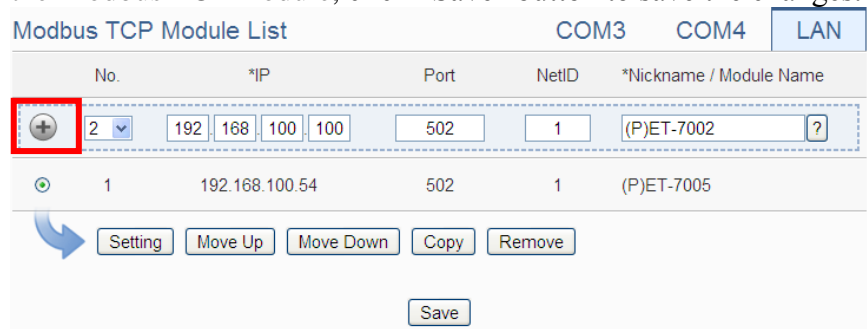


Figure 6-45 : Add the Modbus TCP Module manually

6.7 Modbus TCP Module List Operation Interface

After the (P)ET-7000/WISE-7100/WF-2000/IR modules or Modbus TCP modules are added to the I/O Module list via manual work, the Modbus TCP modules will be listed as below:

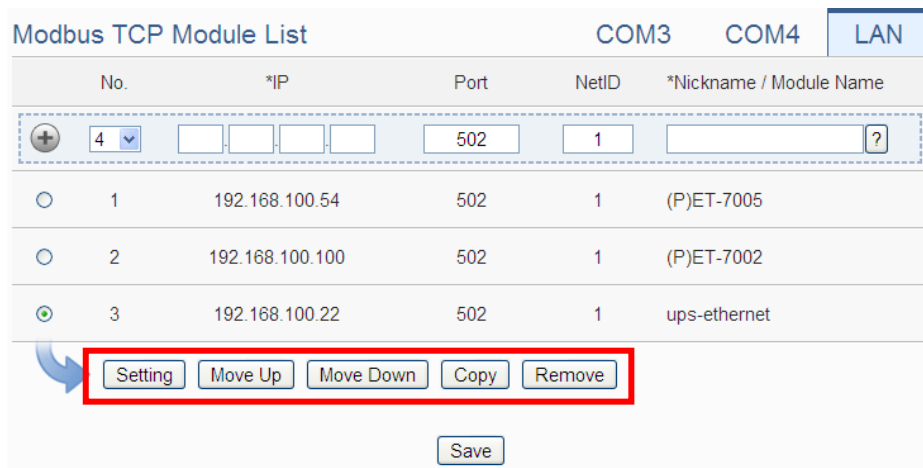


Figure 6-46 : Modbus TCP I/O module List Operation Interface

The following functions allow to perform settings or rearrange order of the Modbus TCP modules. Please select the Modbus TCP module and click on the function button to perform the operations:

17. Setting: Click the radio button in front of the Modbus TCP module and click on “Setting” to get into the setting page of the Modbus TCP module. The settings for each Modbus TCP module will be given in the following section.
18. Move Up: Click the radio button in front of the Modbus TCP module and click on “Move Up” to move the Modbus TCP module to upper order (decrease the index number (No)).
19. Move Down: Click the radio button in front of the Modbus TCP module and click on “Move Down” to move the Modbus TCP module to lower order (increase the index number (No)).
20. Copy: To copy the settings of a pre-set Modbus TCP module to the new Modbus TCP module, please click the radio button in front of the pre-set Modbus TCP module and then click on “Copy”, a new Modbus TCP module (in sequence) will be added to the list and the settings of the old Modbus TCP module will be copied to this newly added Modbus TCP module.
21. Remove: Click the radio button in front of the Modbus TCP module and click on “Remove” to remove the selected Modbus TCP module.

After all settings are completed, click “Save” button to save the changes.

About the setting of the I/O channel of ICP DAS (P)ET-7000/WISE-7100/WF-2000/IR modules and Modbus TCP modules, please input the value for the IP, Port and NetID parameters for the Modbus TCP protocol first. Because others parameter are the same as the Modbus RTU device setting, so please refer to “6.5.1 The DI channel setting for ICP DAS module” ~ “6.5.8 The Holding Register Setting of Modbus RTU Module” sections for detail.

WISE does not provide the signal type setting interface for the AI/AO channels of (P)ET-7000/WISE-7100/WF-2000/IR modules. Please use the proprietary interface of (P)ET-7000/WISE-7100/WF-2000/IR modules for the setting.

6.8 IP Camera Setting

WISE allows connections to ICP DAS iCAM IP Camera series. The IP Camera Setting page allows users to add IP Cameras that are connected to the WISE to the list. After the module is added, the user can set up the configuration of the IP Camera. The list of supported iCAM IP cameras and the detail functions are as below:

Camera Model	iCAM-721F iCAM-760D iCAM-771	iCAM-ZMR8422X iCAM-MR6422X iCAM-MR6322
Supported WISE firmware version	1.2.0 or above	1.4.0 or above
Default login account/password	admin / admin	admin / pass
Record video length	20 seconds (fixed)	10~60 seconds (configurable)
I/O channel	Yes (digital input and output)	No
OSD message setting function	No	English, Chinese
Supported Event Type	Motion Detection GPIO Period Schedule	Motion Detection Tampering Detection

The setting page is shown as below:

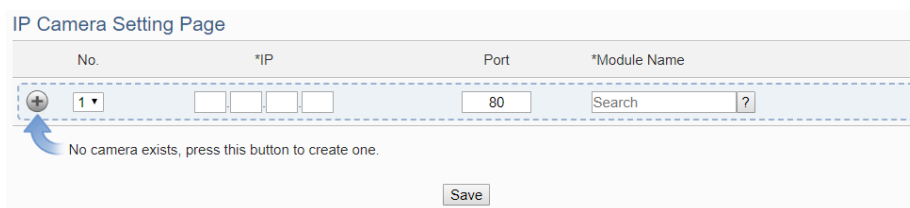


Figure 6-47 : IP Camera Setting Page

Please Note : One WISE-523x/WISE-224x controller allows connections to at most 4 IP Cameras.

6.8.1 Add iCAM IP Camera

The user could add the ICP DAS iCAM IP Cameras manually one by one, the steps are as below:

- i. No: The number will be the order of the IP Cameras. The range is 1 to 4.
- ii. "IP" & "Port": Input the IP address and Port of this IP Camera.

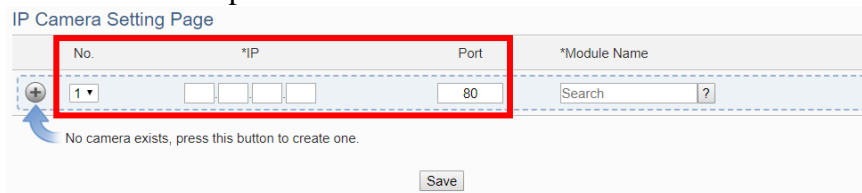


Figure 6-48 : Set up the No, IP address and Port of the IP Cameras

- iii. Select the IP Camera's module name: For ICP DAS IP Cameras, the user could select the model name from the dropdown list.

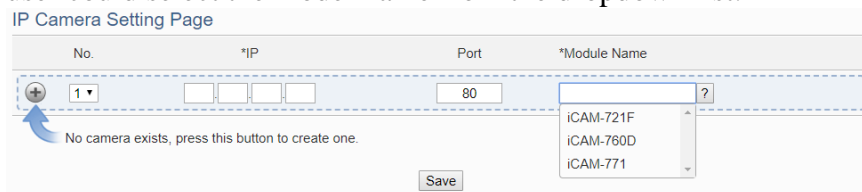


Figure 6-49 : Set up the Model Name of the IP Cameras

- iv. Click '+' to add the IP Camera to the list. After adding the IP Camera, click "Save" button to save the changes.

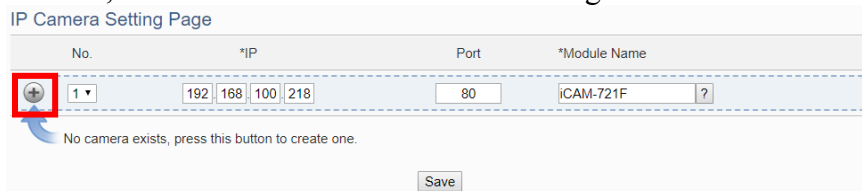


Figure 6-50 : Add the IP Cameras

6.9 IP Camera List Operation Interface

After the ICP DAS iCAM IP Cameras are added to the IP Camera list via manual work, the IP Cameras will be listed as below:

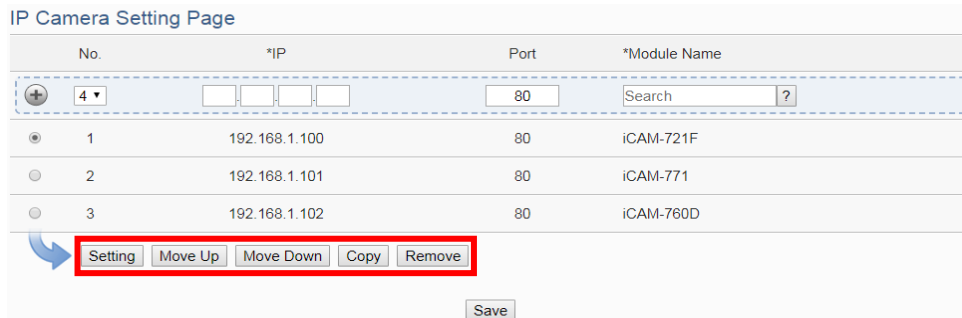


Figure 6-51 : IP Camera List Operation Interface

The following functions allow to perform settings or rearrange the orders of the IP Cameras. Please select the IP Camera and click on the function button to perform the operations:

- **Setting:** Click the radio button in front of the IP Camera and click on “Setting” to get into the setting page of the iCAM IP Camera. The settings for each iCAM IP Camera will be given in the following section.
- **Move Up:** Click the radio button in front of the iCAM IP Camera and click on “Move Up” to move the iCAM IP Camera to upper order (decrease the index number (No)).
- **Move Down:** Click the radio button in front of the iCAM IP Camera and click on “Move Down” to move the iCAM IP Camera to lower order (increase the index number (No)).
- **Copy:** To copy the settings of a pre-set iCAM IP Camera to the new iCAM IP Camera, please click the radio button in front of the pre-set iCAM IP Camera and then click on “Copy”, a new iCAM IP Camera (in sequence) will be added to the list and the settings of the old iCAM IP Camera will be copied to this newly added iCAM IP Camera.
- **Remove:** Click the radio button in front of the iCAM IP Camera and click on “Remove” to remove the selected iCAM IP Camera.

After all settings are completed, click “Save” button to save the changes. The following will describe the setting of ICP DAS iCAM IP Camera.

6.9.1 The Setting of iCAM IP Camera(WISE)

The ICP DAS iCAM IP Camera setting interface is shown as below (using iCAM-MR6322 as an example):

The image shows two parts of a web interface. The top part is the 'IP Camera iCAM-MR6322 Setting' page, which includes fields for Nickname (iCAM-MR6322), Description, IP (192.168.100.123), Port (80), Authentication (*ID: admin, *Password: ****), Time Synchronization (checkbox: Enable), File Transfer (dropdown: Do not upload to any FTP server), and Connection Testing (button: Testing). The bottom part is the 'OSD Message Setting' dialog, which has a table with columns for Nickname, Content, and Duration. A dashed box contains a '+ Add new OSD Message' button, and there are 'OK' and 'Cancel' buttons at the bottom.

Figure 6-52 : iCAM IP Camera Setting page

The settings are as below:

- **Nickname:** For user to define nickname for the IP Camera, the nickname will be displayed on the “IP Camera Status” and “Rule Setting” pages.
- **Description:** The Description field provides a space for the user to make a brief description of this IP Camera.
- **IP:** Enter the IP address of the IP Camera for the connection.
- **Port:** Enter the Port number of the IP Camera for the connection.
- **Authentication:** Because IP Camera requires account and password validation, please enter the login ID and Password of the IP Camera in the “Authentication” field. About content of the “Authentication” field, WISE will pre-input the IP Camera's default login ID and Password, if user has changed the login ID and Password, please also remember to change them in the page.
- **Time Synchronization:** if user click “Enable” to enable the Time Synchronization function. The WISE will actively connect with IP Camera to synchronize the clock of IP Camera through network. If user does not click “Enable”, then IP Camera will synchronize its clock by its original setting.
- **File Transfer:** The Image files and Video files captured by IP Camera can be uploaded to remote FTP server of the manage center via FTP protocol. User can directly select the pre-defined FTP server from the FTP server list or click on “Add new FTP Server” to

add a new FTP Server to set up parameters for FTP Upload.

- Connection Testing: The user could test if the IP Camera setting is correct or not. After clicking “Testing” button, the WISE will verify the connection status with the IP Camera and reply the result.

iCAM-ZMR8422X, iCAM-MR6422X and iCAM-MR6322 support to set OSD messages displayed on the camera stream. The user can edit the OSD messages to be displayed on the Camera stream when a special event occurs, and the content of OSD message can include the real-time I/O channel data. User can set the color of the OSD message and the length of the display time, and can set the current message to be cleared or display another message after the length of the display time is exceeded. The settings are as below:

- Click on “Add new OSD message” to add a new OSD message setting. After clicking the “Add new OSD message”, a setting page will appear as below:

The screenshot shows a web-based configuration page titled "OSD Message OSD Message 1 Setting". It contains several sections:

- OSD Message OSD Message 1 Setting**: A form with a "Nickname" field containing "OSD Message 1" and an empty "Description" field.
- Display Setting**: A section with a "View" and "Edit" button above a large empty text area labeled "*Content". Below this is a "Color" dropdown menu set to "White".
- Duration Setting**: A section with a "Time" field set to "10" seconds and a "Timeout Action" section with two radio buttons: "Clear the content" (selected) and "Change the content".

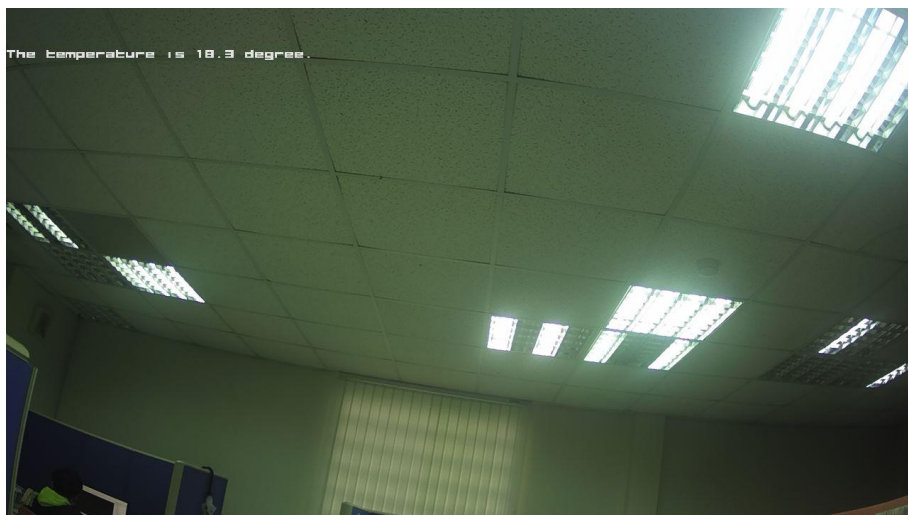
 At the bottom right of the form are "OK" and "Cancel" buttons.

Figure 6-53 : iCAM IP Camera OSD Message Setting page

- Input a name in the “Nickname” field and you could also input the description of this OSD message in the “Description” field.
- Enter the content of the OSD message in the “Content” field. WISE provides the “Real-time variable editor” for users to add current I/O channel values or Internal Register values into the content of the message.

- In the “Color” field, select the color of the OSD message. There are six options: white, black, red, green, blue and yellow.
- In the “Duration Setting” section, set the duration of the OSD message in the “Time” field. The range is from 0 to 65535 seconds.
- In “Timeout Action” field, users can set “Clear the content” to clear the OSD message when the length of the display time of the current message is exceeded the setting of "Duration"; or set “Change the content” to change the content and the color of the OSD message with the settings below. The changed OSD message would be displayed until next OSD message is triggered to display.
- After all settings are completed, click “OK” button to save the setting of OSD message, and return to the IP Camera setting page.

Please Note: The OSD message only can be entered in one line, and be displayed at the left-top corner of the camera stream. Following is example for reference.



The number of characters that can be displayed is depended on the resolution setting of the IP Camera. If the OSD message cannot be displayed completely, please reduce the character number of the message.

After all settings of the IP Camera are completed, click “OK” button to save the changes and return to IP Camera List.

6.9.2 The Setting of iCAM IP Camera(iCAM)

ICP DAS iCAM IP Camera provides Schedule, Motion Detection, GPIO, Snapshot and Video recording functions. If the user wants to

add the iCAM IP Camera's event into the WISE's IF-THEN-ESLE rule as the IF Condition or THEN/ELSE action, or requires the iCAM IP Camera to report the status of Motion detection to WISE, please remember to complete the Event setting of iCAM IP Camera in advance. About the Event setting of iCAM IP Camera, please refer to the iCAM IP Camera User Manual for detail.

In additional, after completing the settings of 6.9.1 section, WISE will automatically re-write the FTP related setting into the iCAM IP Camera, the user does not need to assign the settings of "IP Camera's FTP file sending operation by Event trigger" again.

Please Note :

- If the user wants to enable the IP Camera's image/video capture operation, please remember to complete the settings as below.
 - 1.Snapshot for periodic Recording: Please complete the iCAM IP Camera's Snapshot event setting first, enable the WISE's Timer setting later, then complete the WISE's IF-THEN-ELSE rule setting with Timer and Snapshot event for periodic recording.
 - 2.Snapshot for Motion Detection: Please complete the iCAM IP Camera's Snapshot setting first, the trigger source is Motion Detection. Complete the WISE's IF-THEN-ELSE rule setting by the THEN/ELSE action setting with Motion Detection.
- When the micro SD card's free space is less than 10% and 1GB, WISE will only keep the image/video files sent by iCAM IP Cameras today, and automatically delete all others old image/video files. WISE is equipped with one built-in 4 GB microSD card; if WISE is connected to 4 iCAM IP Cameras, the capacity of the microSD card may be able to store the image/video files for one week only (depends on the frequency of the trigger of image/video capturing operations). So about the image/video capturing application, we suggest users use the micro card with larger size (WISE supports up to 32 GB micro SDHC card).
- WISE-224x series controllers have two LAN ports, please connect to iCAM IP cameras with LAN1.

6.9.3 The Path of the files sent back by IP Camera

After completing the settings of WISE and iCAM IP Cameras, the

Image/Video files captured by iCAM IP Cameras will be sent back and stored in WISE. If the user enables the “File Transfer” function as described in section 6.9.1, the Image files and Video files will also be uploaded to remote FTP server of the manage center. The following section will explain what are the paths of the Image/Video files saved in WISE and remote FTP server, user can refer to the information to access these files directly.

- The path of the files in WISE: **Micro_SD (FTP root) \ IPCamera \ IP Camera A \ 201708 \ 20170810 \ 01**

The path format are as below:

- ◆ “**IPCamera**” is a fixed string.
 - ◆ “**IP Camera A**” is the module name of the IP Camera. If the module name of the IP Camera is iCAM-721F, and its IP address is “192.168.100.218”, then the “**IP Camera A**” string will be “**iCAM-721F_100.218**”.
 - ◆ The “201708 \ 20170810” string indicates the path of the files sorted by year, month and day. WISE will automatically create the path string for the files received from IP Cameras.
 - ◆ “01” string is the name of the sub-directory. If WISE receives too many files on the same day, WISE will create sub-directory with the name as “01”, “02”, “03”...etc to sort the files.
- The path of the files in remote FTP server: **WISE Nickname \ IPCamera \ IP Camera A \ 201708 \ 20170810**

The path format are as below:

- ◆ “**WISE Nickname**” string is the nickname of the WISE.
- ◆ “**IP Camera**” is a fixed string.
- ◆ “**IP Camera A**” is the module name of the IP Camera. If the module name of the IP Camera is iCAM-721F, and its IP address is “192.168.100.218”, then the “**IP Camera A**” string will be “**iCAM-721F_100.218**”.
- ◆ The “201708 \ 20170810” string indicates the path of the files sorted by year, month and day. The FTP server will automatically create the path string for the files received from WISE controllers.

7 Logger Setting

The Logger Setting function of the WISE provides recording of the I/O channel data from I/O modules. It includes I/O Module Data Logger and User-Defined Data Logger. The I/O Module Data Logger provides users to quickly record the data of all I/O modules and Internal Registers of WISE. Unlike the I/O module data logger function, the User-Defined Data Logger is a data logger allows users to freely select channels from I/O modules or Internal Registers for data record, and provides multiple independent settings to help users manage data logs. The data log files of these two Data Loggers are both in CSV format, and the data log files will be automatically sent to backend FTP servers or pre-defined Email addresses when the log files are closed. It enables easy integration with the backend database system. In addition, WISE also provides the MQTT Data Logger and Event Logger. The MQTT Data Logger is using to record the message content of the Subscribe MQTT Topics. The Event Logger is using to record the WISE's system event. The data log files of the two type loggers all will be automatically sent to backend FTP servers.

The Logger Setting page includes following setting options. More detailed information of these options will be given in the following section.

- I/O Module Data Logger Setting
- User-Defined Data Logger Setting
- MQTT Data Logger Setting
- Event Logger Setting
- FTP Server Setting

Please note:

1. The data logger files inside the micro SD card will be stored by month. When the micro SD card's free space is less than 10%, WISE will send an email to notice the administrator that WISE will delete the old log files, and only keeps the data logger files of the last month 24 hours later.
2. WISE provides 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.
3. WISE provides alarm notification mechanism so that when microSD card is damaged, the data log file will be stored in WISE's Flash memory to ensure zero data loss of the data logger.

7.1 I/O Module Data Logger Setting

The I/O Module Data Logger provides users to quickly record the data of all I/O modules and Internal Registers of WISE. On the I/O Module Data Logger Setting page, the user could enable the Data Logger if required. The setting page is shown as below:

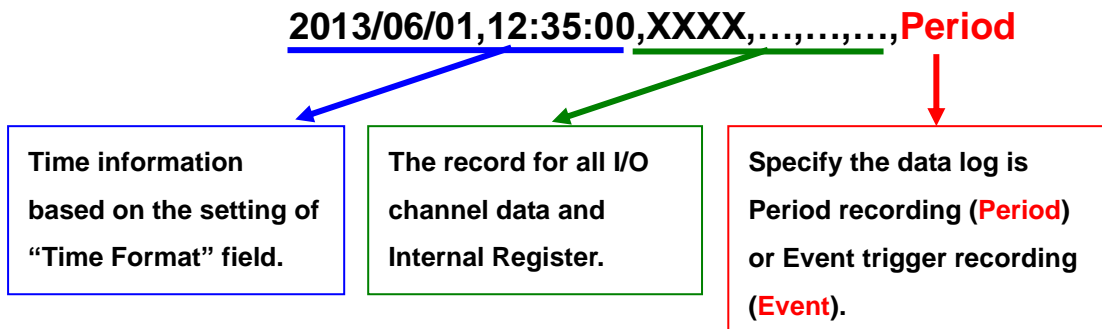
I/O Module Data Logger Setting Page	
Function Status	<input checked="" type="checkbox"/> Enable
*Folder Name	<input type="text" value="ALLDATA"/>
Log Interval	<input type="text" value="10 seconds"/>
*Time Format	<input type="text" value="yyyy/MM/dd,HH:mm:ss"/> <small>yyyy Year(four digits) HH Hour(00 to 23) MM Month(01 to 12) mm Minute(00 to 59) dd The day of the month(01 to 31) ss Second(00 to 59)</small>
File Length	<input type="text" value="1 hour"/>
CSV Header	<input type="text" value="None"/>
UTF-8 BOM	<input type="checkbox"/> Enable Enabled the support of multi-languages.
Log File Sending Setting	
FTP Server	<input type="text" value="Do not upload to any FTP server"/>
Email	<input type="text" value="Do not send via Email"/>

Figure 7-1 : I/O Module Data Logger Setting Page

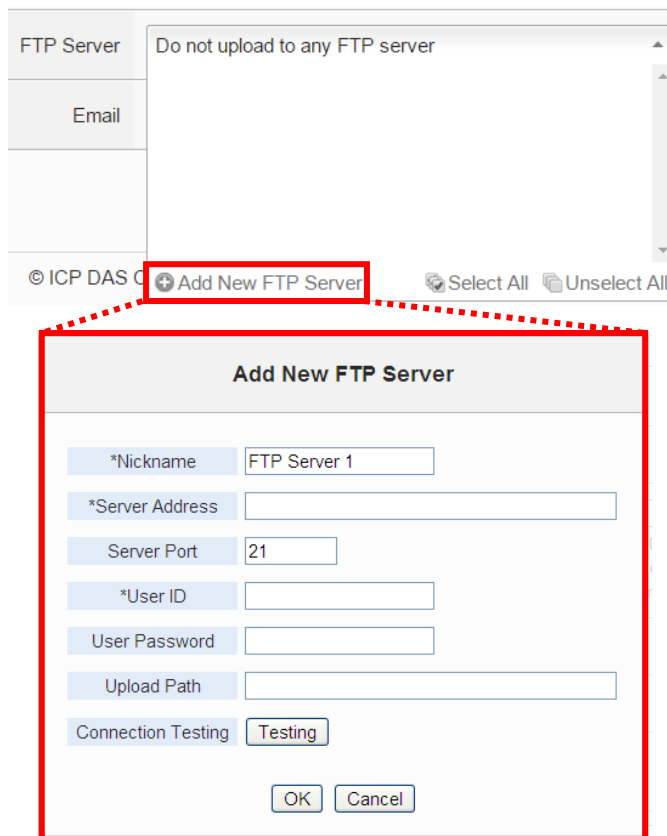
Follow the steps below:

- i. Check “Enable” in the “Function Status” field to enable the I/O Module Data Logger function.
- ii. In the “Folder Name” field, input the name of the file folder for the data logger files.
- iii. Select “Log Interval” to enable period recording function in WISE. When the time reaches the period time interval, all I/O data will be recorded once. The data recording will keep going periodically. There are ten options: 5 secs, 10 secs, 30 secs, 1 min, 2 mins, 3 mins, 5 mins, 10 min, 20 min, 30 min and 1 hour.
- iv. In the “Time Format” field, define the time format of the content of the log file from the dropdown list, “yyyy” indicates western year, “MM” indicates month, “dd” indicates date, “hh” indicates hour, “mm” indicates minute and “ss” indicates second. User can insert comma (‘,’) flexibly in the “Time Format” field to define the time format of the data log file, and let it be suitable for your database system.
- v. The Data Log file is in CSV format. In the data log file, current date, time and data log type (Period recording or Event trigger recording) will also be automatically pasted to each data log item. The final data

log content format will be like this:



- vi. In the “File Length” field, select the time interval to close a data log file. There are eight options: 1 hour, 2 hours, 3 hours, 4 hours, 6 hours, 8 hours, 12 hours and 24 hours.
For example, if the “File Length” time interval is set as 3 hours, and “Log Interval” is set as 5 mins, it means WISE will record data every 5 mins. And the log file is created at 0 o’clock, 3 o’clock, 6 o’clock, 9 o’clock, 12 o’clock, 15 o’clock, 18 o’clock, and 21 o’clock. When the system time reached these specified time, the Data Log file will be closed automatically (the time interval of this first file will be shorter than 3 hours) and create a new data log file to record another 3 hours and so on.
- vii. In the “CSV Header” field, there are four options: “None”, “Channel”, “Nickname” and “Channel + Nickname”. The module name, channel address and nickname (if any) of each field will be added to the CSV Header of the data logger file if the user select “Channel + Nickname”. Select “Nickname” to add the CSV Header with channel nickname only. Select “Channel” to add the CSV Header with the module name and channel address only. Select “None” to disable the “CSV Header” function.
- viii. Check “Enable” in the “UTF-8 BOM” field. If you enable this item, the UTF-8 BOM (Byte Order Mark) will be added at the beginning of the log file for the support of multi-languages.
- ix. In the “FTP Server” field, please specify the FTP Servers which will receive the data logger files WISE send. WISE can send the data logger files to multi-FTP Servers simultaneously. Users can directly click on the rectangle area at the right side of “FTP Server” field to configure the FTP Server.



Please refer to “[7.5 FTP Server Setting](#)” section for detail. If you select “Do not upload to any FTP Server”, WISE will not send the data logger file to any FTP Server.

- x. In the “Email” field, please specify the Email address which will receive the data logger files WISE send. The log files will be attached(Filename: “FolderName_MMdd_HH.csv”) in the email and sent to the receiver. Users can directly click on the rectangle area at the right side of “Email” field to configure the Email setting.

The image shows a software interface for configuring email settings. At the top, there is a list of email settings, each with a 'Do not send via Email' option. Below this list is a red-bordered button labeled '+ Add New Email'. This button opens a dialog box titled 'Add New Email'. The dialog box is divided into two main sections: 'SMTP Server Setting' and 'Email Address Setting'. The 'SMTP Server Setting' section includes a field for '*Nickname' (filled with 'Email 1'), a section for '*SMTP Server' with radio buttons for 'Specify an address of SMTP server' (selected) and 'Google Gmail - smtp.gmail.com', a 'Port' field (filled with '25'), and an 'Authentication' checkbox (labeled 'Enable'). The 'Email Address Setting' section includes fields for '*Sender Name', '*Sender Email Address', and '*Receiver Email Address' (with 'Add' and 'Remove' buttons). There is also an 'Email Setting Test' button with a 'Send' option. At the bottom of the dialog are 'Next' and 'Cancel' buttons.

Please refer to “[9.4 Email Setting](#)” section for detail. If you select “Do not send via Email”, WISE will not send the data logger file to any Email address.

- xi. After all settings are completed, click “Save” button to save the setting.

7.2 User-Defined Data Logger

The User-Defined Data Logger allows users to freely select channels from I/O modules or Internal Registers for data record, and provides multiple independent settings to help users manage data logs.

Follow the steps below:

- i Click on “Add new User-Defined Data Logger” to add a new User-Defined Data Logger setting.

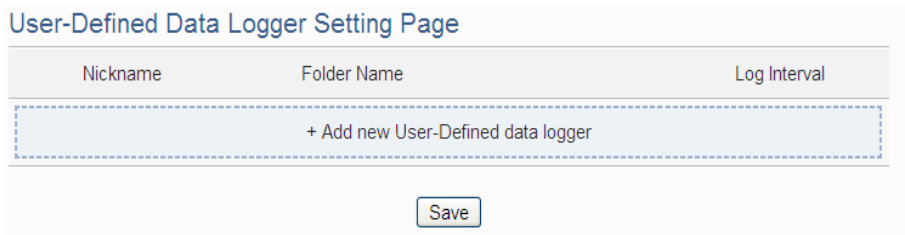


Figure 7-2 : User-Define Data Logger List Interface

- ii After clicking the “Add new User-Defined Data Logger”, a setting page of User-Defined Data Logger will appear.

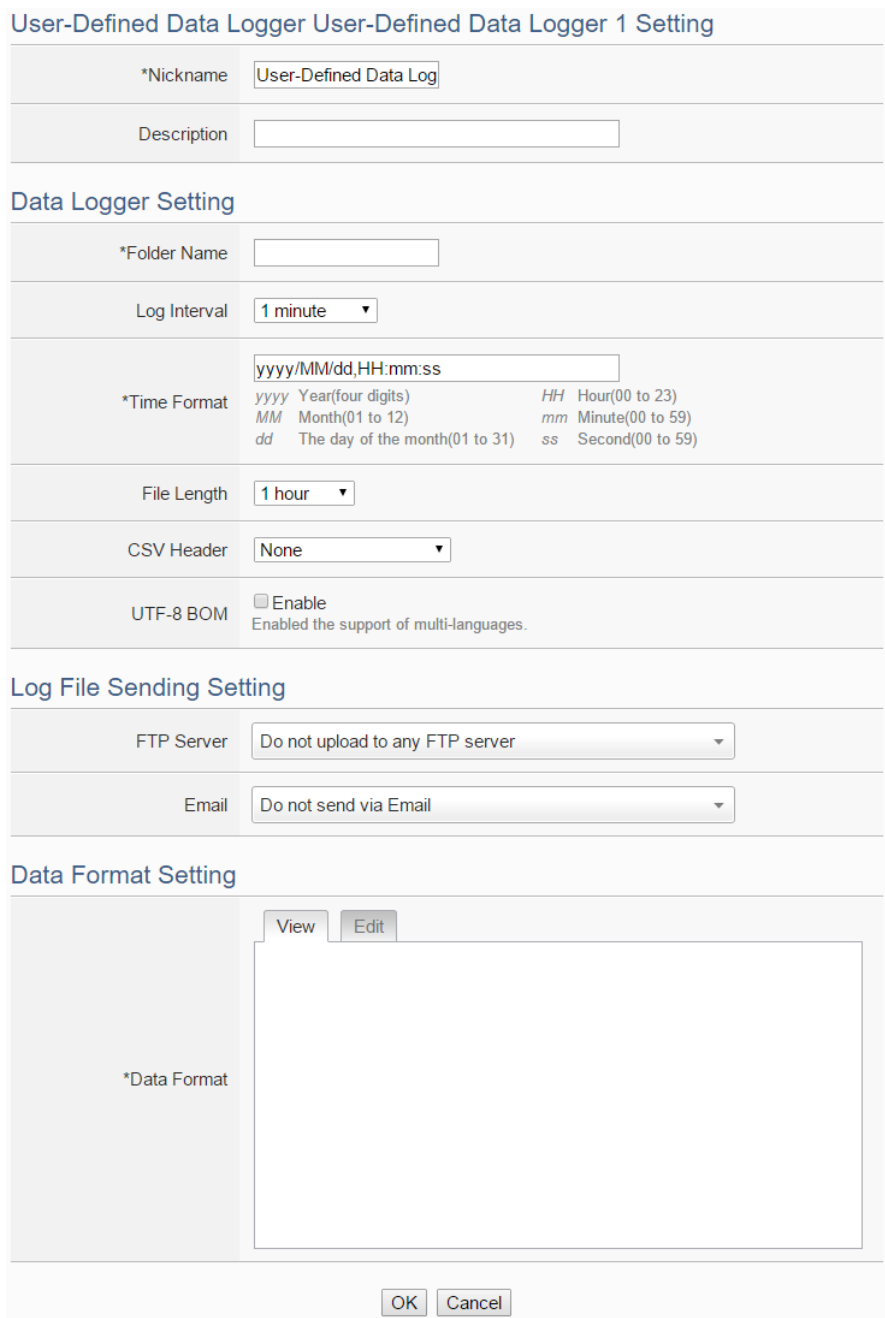
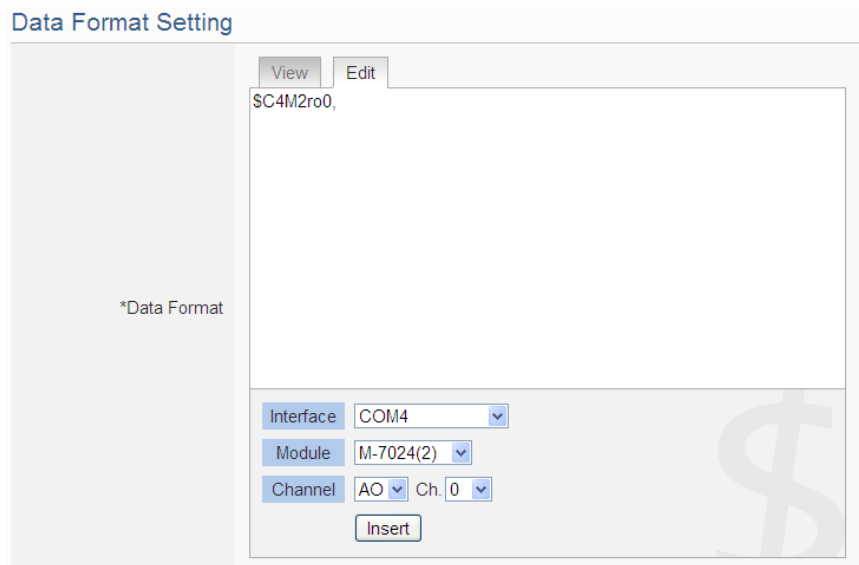


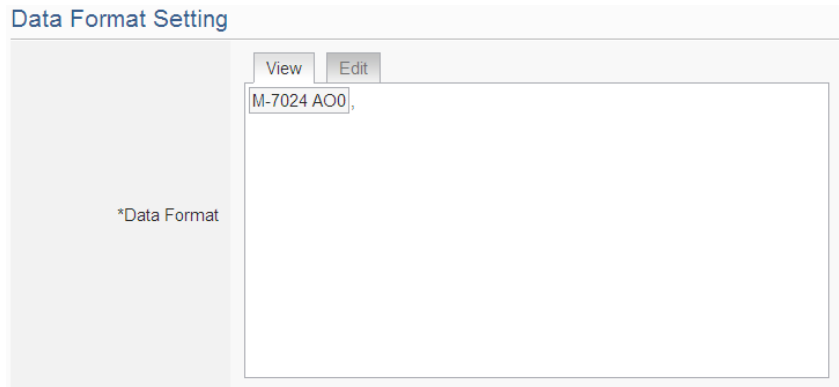
Figure 7-3 : User-Define Data Logger Setting Page

- iii Input a name in the “Nickname” field and you could also input the description of this User-Defined Data Logger in the “Description” field.
- iv About the setting of “Folder Name”, “Log Interval”, “Time Format”, “File Length”, “CSV Header”, “UTF-8 BOM”, “FTP Server” and “Email” fields, please refer [“7.1 I/O Module Data Logger Setting”](#) section for detail.
- v Set up the data format in the “Data Format” field. The User-Defined Data Logger provides encoded strings for user to add real-time I/O channel data or Internal Register data into the Data Format content. User can select the “Edit” tab or click on any blank area in the “Data Format” field, and then the “Real-time variable editor” will be shown as below.



Select the “Interface”, “Module” and “Channel” from the dropdown list and click “Insert” to add channel value encoded string into the “Data Format” content. The system will record the data the user pre-set in the Data Format, and will save the real data values in the data log file. When editing the content, the user can select the “View” tab, and then the channel encoded string will be displayed in the real index format of the channel for user to check the settings in an easy way.

The figure above shows an example of the encoded strings, the variable \$C4M2ro0 indicates the AO channel 0 value of M-7024 on the module 2 connected to COM4. When user select the “View” tab, the channel value encoded string will be displayed as below for user to check if the setting is appropriate (please refer to the figure as below).



- vi After all settings are completed, click “OK” button to return to the User-Defined Data Logger list page.
- vii Repeat steps i~vi to complete settings of all User-Defined Data Logger.
- viii To modify the settings of a pre-set User-Defined Data Logger, please click on the radio button in front of the User-Defined Data Logger, and then click on “Setting” to modify the settings.
- ix To copy the settings of a pre-set User-Defined Data Logger to the new User-Defined Data Logger, please click the radio button in front of the pre-set User-Defined Data Logger and then click “Copy”, a new User-Defined Data Logger (in sequence) will be added to the list and the settings of the old User-Defined Data Logger will be copied to this newly added User-Defined Data Logger.
- x To remove a pre-set User-Defined Data Logger, please click the radio button in front of the pre-set User-Defined Data Logger and then click “Remove”.
- xi After all User-Defined Data Logger settings are completed, click “Save” button to save the changes.

7.3 MQTT Data Logger Setting

The MQTT Data Logger allows to record the message content of the Topics which WISE subscribe from the MQTT broker, the setting page is shown as below:

MQTT Data Logger Setting Page

Function Status	<input checked="" type="checkbox"/> Enable
*Time Format	<input type="text" value="yyyy/MM/dd,HH:mm:ss"/> <small>yyyy Year(four digits) HH Hour(00 to 23) MM Month(01 to 12) mm Minute(00 to 59) dd The day of the month(01 to 31) ss Second(00 to 59)</small>
File Length	<input type="text" value="1 hour"/>
UTF-8 BOM	<input type="checkbox"/> Enable Enabled the support of multi-languages.

Log File Sending Setting

FTP Server	<input type="text" value="Do not upload to any FTP server"/>
Email	<input type="text" value="Do not send via Email"/>

Figure 7-4 : MQTT Data Logger Setting page

Follow the steps below:

- i In the “Function Status” field, click “Enable” to enable the MQTT Data Logger. °
- ii About the setting of “Time Format”, “File Length”, “UTF-8 BOM”, “FTP Server” and “Email” fields, please refer “[7.1 I/O Module Data Logger Setting](#)” section for detail.
- iii After the MQTT Data Logger settings are completed, click “Save” button to save the setting.

7.4 Event Logger Setting

The Event Logger allows to record system event of the WISE, the setting page is shown as below:

Event Logger Setting Page

Upload Frequency	<input type="text" value="Disable"/>
------------------	--------------------------------------

Figure 7-5 : Event Data Logger Setting page

Follow the steps below:

- i Select “Upload Frequency” to enable period uploads function in WISE. When the time reaches the period time interval, the event logger file will be sent to the FTP Server. The upload of the event logger file will

- keep going periodically. There are five options: “Disable”, “Once an hour”, “Once a day”, “Once a week” and “Once a month”.
- ii If user selects “Once a day”, “Once a week” or “Once a month”, please select the “Upload Timing” for the Event Logger.
- iii In the “FTP Server” field, please specify the FTP Servers which will receive the Event Logger files WISE send. WISE can send the Event Logger files to multi-FTP Servers simultaneously. User can directly click on the rectangle area at the right side of “FTP Server” field to configure the FTP Server. Please refer to “[7.5 FTP Server Setting](#)” section for detail. If you select “Do not upload to any FTP Server”, WISE will not send the Event Logger file to any FTP Server.
- iv After all settings are completed, click “Save” button to save the setting.

7.5 FTP Server Setting

I/O Module Data Logger files, User-Defined Data logger files and Event logger files all can be upload to remote FTP server of the manage center via FTP protocol. The FTP Server Setting page allows to set up parameters for FTP Upload, the setting page is shown as below:

Follow the steps below:

- i Click on “Add new FTP Server” to add a new FTP Server.

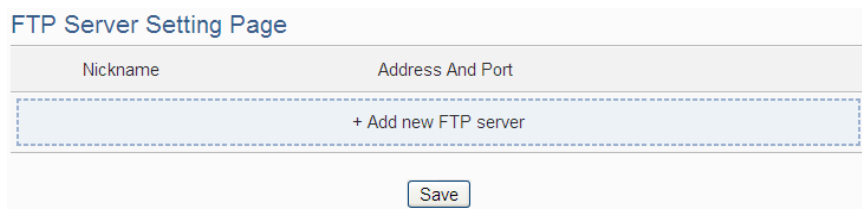


Figure 7-6 : FTP Server List page

- ii After clicking the “Add new FTP Server”, a setting page of FTP Server will appear.

FTP Server FTP Server 1 Setting

*Nickname	<input type="text" value="FTP Server 1"/>
Description	<input type="text"/>
*Server Address	ftp:// <input type="text"/>
Server Port	<input type="text" value="21"/>
*User ID	<input type="text"/>
User Password	<input type="text"/>
Upload Path	<input type="text"/>
Connection Testing	<input type="button" value="Testing"/>

Figure 7-7 : FTP Server Setting page

- iii Input a name in the “Nickname” field and you could also input the description of this FTP Server in the “Description” field.
- iv In the “Server Address” and “Server Port” field, input the IP Address (or domain name) and Port number of the remote FTP Server.
- v In the “User ID” and “User Password” field, input the login ID and the login password of the remote FTP Server.
- vi In the “Upload path” field, input the path which will be used by the remote FTP Server to store the logger files.
- vii The user could test if the FTP Server setting is correct or not. After clicking “Testing” button, the system will create a folder on the remote FTP server and will send a testing file to the remote FTP server.
- viii After all settings are completed, click “OK” button to return to the remote FTP Server list page.
- ix Repeat steps i~viii to complete settings of all remote FTP Servers.
- x To modify the settings of a pre-set remote FTP Server, please click on the radio button in front of the remote FTP Server, and then click on “Setting” to modify the settings.
- xi To copy the settings of a pre-set remote FTP Server to the new remote FTP Server, please click the radio button in front of the pre-set remote FTP Server and then click “Copy”, a new remote FTP Server (in sequence) will be added to the list and the settings of the old remote FTP Server will be copied to this newly added remote FTP Server.
- xii To remove a pre-set remote FTP Server, please click the radio button in front of the pre-set remote FTP Server and then click “Remove”.

- xiii After all remote FTP Server settings are completed, click “Save” button to save the changes.

7.6 The Path of Data Log File

The data logger files of WISE will all be saved in the microSD card. The following section will explain the path of the data logger files saved in the microSD card:

microSD

└ Log

└ Folder Name (Define in I/O Module Data Logger or User-Defined Data

| | | logger)

| └ 201502 ← Data files be sorted by year and month.

| | └ Uploaded ← Data file that are completed with upload

| | | operation will be moved into the section.

| | | └ 0208 ← Data files be sorted by day

| | | | └ 0208_00.csv

| | | | └ 0208_01.csv

| | | | ...

| | | | └ 0208_23.csv

| | | └ 0209

| | | | └ 0209_00.csv

| | | | └ 0209_01.csv

| | | | ...

| | | | └ 0209_09.csv

| | └ 0209_10.csv ← The data file which is in using currently

| | | or is waiting for the upload operation.

└ MQTTLog (The folder for MQTT Data Logger file)

| └ Broker Name (Define in Broker Setting page of MQTT Setting)

| | └ 201502 ← Data files be sorted by year and month.

| | | └ Uploaded ← Data file that are completed with upload

| | | | operation will be moved into the section.

| | | | └ 0208 ← Data files be sorted by day.

| | | | | └ 0208_00.csv

| | | | | └ 0208_01.csv

| | | | └ 0209_10.csv ← The data file which is in using

| | | | | currently or is waiting for the


```

|                                     upload operation.
|
└─ EventLog (The folder for Event Logger file)
    └─ 201502 ← Data files be sorted by year and month
        └─ Uploaded ← Data file that are completed with upload
            | |                                     operation will be moved into the section.
            | └─ 0207.csv
            | └─ 0208.csv
            └─ 0209.csv ← The data file which is in using currently or
                           is waiting for the upload operation.

```

WISE will upload the data logger files and event logger files to the remote FTP server based on the following file architecture:

Upload Path

```

└─ WISE module nickname
    └─ Folder Name (Define in I/O Module Data Logger or User-Defined Data
        logger)
        └─ 201502 ← Data files be sorted by year and month
            └─ 0208_00.csv
            └─ 0208_01.csv
            └─ ...
            └─ 0208_23.csv
            └─ 0209_00.csv
            └─ 0209_01.csv
            └─ ...
            └─ 0209_09.csv
    └─ MQTTLog (The folder for MQTT Data Logger file)
        └─ Broker Name (Define in Broker Setting page of MQTT Setting)
            └─ 201502 ← Data files be sorted by year and month.
                └─ 0208_00.csv
                └─ 0208_01.csv
                └─ ...
                └─ 0208_23.csv
                └─ 0209_00.csv
                └─ 0209_01.csv
                └─ ...
                └─ 0209_09.csv

```

└ EventLog (The folder for Event Logger file)

└ 201502 ← Data files be sorted by year and month

└ 0207.csv

└ 0208.csv

└ 0209.csv

Please note: If the remote FTP server receives log files from more than one WISE controller, please set different nickname to each WISE. If all WISE controllers were named the same, the log files from every WISE will be uploaded to the same folder, and then the log files might be overwritten. Please refer to “[4.1.1 Rules management toolbar](#)” to set the nickname of WISE.

8 IoT Platform Setting

The IoT Platform Setting function of the WISE allows to build a connection to Microsoft Azure or IBM Bluemix directly. It can also connect to MQTT Brokers like Amazon CloudMQTT. Based on the IoT Platform Setting function, WISE can publish the I/O channel data of the Sensors and I/O modules that are connected to WISE to the IoT Cloud Platform for future data analysis, and receive the command message from IoT Cloud Platform to trigger the corresponding actions of WISE at the field side. With the IoT Platform Setting function the WISE provides, it helps users to implement an IoT system in a easy way.

In additional, WISE supports to connect to the IoT cloud management software: IoTstar designed by ICP DAS. The supported functions for IoTstar includes Real-Time Data Sending Setting, Historical Data Sending Setting, and Bot Service Setting can also be set in this page. About the connection setting of IoTstar, please refer to the section “[5.2 Network Setting](#)”.

The IoT Platform Setting page includes the following setting options. More detailed information of these options will be given in the following section.

- ◆ Microsoft Azure Setting
- ◆ IBM Bluemix Setting
- ◆ MQTT Setting
- IoTstar relative functions:
 - ◆ Real-Time Data Sending Setting
 - ◆ Historical Data Sending Setting
 - ◆ Video Data Sending Setting
 - ◆ Bot Service Message Setting

8.1 Microsoft Azure Setting

On the Microsoft Azure Setting page, the connection to Microsoft Azure IoT Cloud Platform can be built if required. The setting page is shown as below:

Microsoft Azure Setting Page

Function Status Enable

*SAS Token

Keep Alive Time second(s)

Periodical Publish Interval second(s)
Input 0 represent disable periodical publish.

Connection Testing

Publish & Subscribe Setting

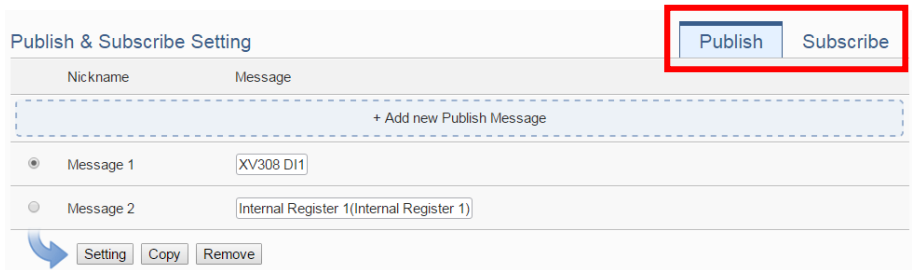
Nickname	Message
+ Add new Publish Message	
<input checked="" type="radio"/> Message 1	<input type="text" value="XV308 DI1"/>
<input type="radio"/> Message 2	<input type="text" value="Internal Register 1(Internal Register 1)"/>

Figure 8-1 : Microsoft Azure Setting page

Follow the steps below:

- i Check “Enable” in the “Function Status” field to enable the connection to Microsoft Azure IoT Cloud Platform.
- ii In the “SAS Token” field, input the SAS Token which you previously registered for this WISE from Microsoft Azure. For the procedure to generate a SAS Token, please refer to the “Documentation → Azure IoT Hub → [IoT Hub MQTT support](#)” section on the Microsoft Azure Web Site for detailed information.
- iii The value in “keep alive Time” field defines the maximum amount of time in second that pass away without communication between the WISE and Microsoft Azure. The “keep alive interval” enables Microsoft Azure to detect if the connection to the WISE is no longer available without having to wait for the long TCP/IP timeout.
- iv The value in “Periodical Publish Interval” field defines the time interval to automatically and periodically send the Publish Messages which are with the “Periodical Publish” attribute. If the value of the “Periodical Publish Interval” field is 0, it means the “Periodical Publish” operation is disabled. The unit of the value is second.
- v To verify whether the SAS Token setting is correct, click “Testing” in the “Connection Testing” section, then WISE will try to connect Microsoft Azure with the SAS Token setting, and reply the connection status.

- vi The lower half section on the Microsoft Azure Setting Page is for the Publish Message and Subscribe Topic setting. User can click the tab of “Publish” or “Subscribe” to edit the Publish Message and Subscribe Topic. The Interface will be shown as below:



- vii Click the “Publish” tab to edit the Publish Message. User can click on “Add new Publish Message” to add a new Publish Message.

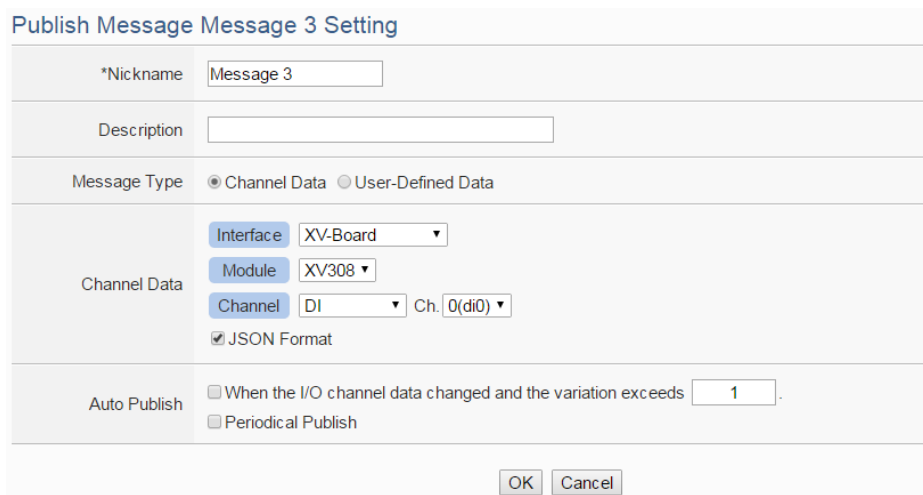


Figure 8-2 : Microsoft Azure Publish Message setting page

- viii Input a name in the “Nickname” field and you could also input the description of this Publish Message in the “Description” field.
- ix In the “Message Type” field, select the “Channel Data” to prepare a Publish Message with the I/O channel value. Based on the “Channel Data” interface, the user can select a specific I/O channel value or “All” I/O channel values for the Publish Message. If the user selects a specific I/O channel, it means the I/O channel value will be bound with the Publish Message. If user select “All” I/O channels, it mean all I/O channel values will be added in the Publish Message List. If the user click the “JSON Format” check box, the content of the Publish Message will be packaged in JSON format; if the “JSON” is not selected, the content of the Publish Message will only include the I/O channel value. (For the I/O Channel information in JSON Format,

please refer to Appendix VIII for more details.) The user can select “User-Defined Data” in “Message Type” field to edit the Publish Message on the free style editing interface. The user interface is shown as below.

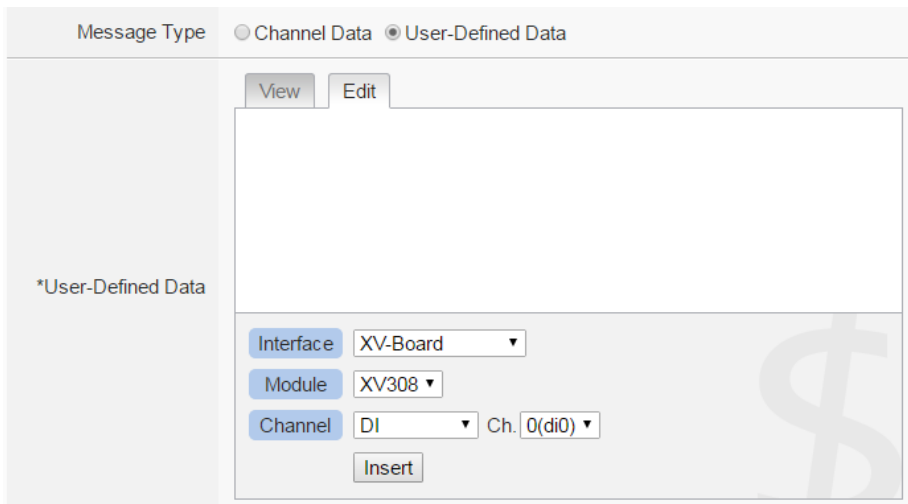


Figure 8-3 : “User-Defined Data” Setting Interface of Microsoft Azure

In additional, if user wants to publish the messages compliant with the Microsoft CDS platform, please remember to select the “CDS Data” in “Message Type” field.

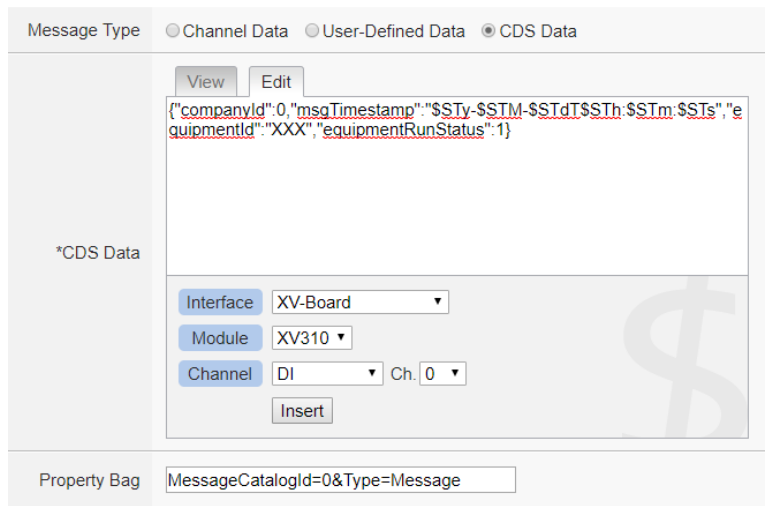


Figure 8-4 : The Message setting for Microsoft Azure CDS

The user can modify the content in the “CDS Data” and “Property Bag” fields according to the settings of the CDS project, so that the Publish Message can be received by the Microsoft CDS platform.

x The timing to publish message is set in the “Auto Publish” field, there

are two options: “When the I/O channel data changed and the variation exceeds xxx” and “Periodical Publish”. If the “When the I/O channel data changed and the variation exceeds xxx” is selected, the system will automatically publish the message when the I/O channel value is changed and exceeds the evaluation value (This option only support “Channel Data” setting in “Message Type”). If the user selects “Periodical Publish”, it means the message will be published at periodic time schedule based on the value in “Periodical Publish Interval” field at Step iv.

- xi After completing all settings of Publish Message, please click “OK” button to add the Publish Message to the Publish Message List.
- xii Click the “Subscribe” tab to edit the Subscribe Topic. The user interface is shown as below:

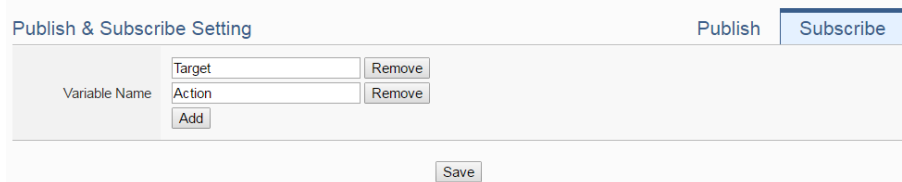


Figure 8-5 : Microsoft Azure Subscribe Topic setting page

- xiii In the “Variable Name” field, user can input the name of the variable which is defined in the message of the Subscribe Topic. After completing the settings, click the “Add” button to add the variable. For the message the WISE receives from Microsoft Azure is based on JSON format, the WISE will get the corresponding value of the variable from the received message. The following is an example of a message the WISE receives:

```
{
  "Target": "door",
  "Action": "open",
  "Timestamp": "2016/10/17 15-17-22"
}
```

In this example, the “Target” and “Action” variable setting will be performed first. Each time when the WISE receives the message, it will retrieve the corresponding value of the “Target” and “Action” variables from the message. The value of the variables can be used in the evaluation criteria of IF Condition to trigger THEN/ELSE Action for WISE logic operation.

xiv After completing all settings on the Microsoft Azure Setting Page, please click “Save” button to save the settings. After downloading the settings to WISE, WISE will initiate the connection to the Microsoft Azure, and start the data communication with the Microsoft Azure.

8.2 IBM Bluemix Setting

On the IBM Bluemix Setting page, the user could enable the connection to IBM Bluemix IoT Cloud Platform if required. The setting page is shown as below:

IBM Bluemix Setting Page

Function Status Enable

*Organization ID

*Device Type

*Device ID

*Device Authentication Token

Keep Alive Time second(s)

Periodical Publish Interval second(s)
Input 0 represent disable periodical publish.

Connection Testing

Publish & Subscribe Setting

Nickname	Message
+ Add new Publish Message	
<input type="radio"/> 訊息 1	<input type="text" value="XV308 DI0(di0)"/>
<input type="radio"/> 訊息 2	<input type="text" value="XV308 DI1"/>
<input type="radio"/> 訊息 3	<input type="text" value="XV308 DI2"/>
<input type="radio"/> 訊息 4	<input type="text" value="XV308 DI3"/>
<input type="radio"/> 訊息 5	<input type="text" value="DL-100 Humidity"/>
<input type="radio"/> 訊息 6	<input type="text" value="DL-100 Temperature(°C)"/>
<input checked="" type="radio"/> 訊息 7	<input type="text" value="DL-100 Temperature(°F)"/>

Figure 8-6 : IBM Bluemix Setting page

Follow the steps below:

- i Check “Enable” in the “Function Status” field to enable the connection to IBM Bluemix IoT Cloud Platform.
- ii In the “Organization ID”, “Device Type”, “Device ID” and “Device Authentication Token” fields, input the data you previously registered for this WISE from IBM Bluemix. After you completing the device settings on IBM Bluemix for the WISE, IBM Bluemix will reply you the

device information similar as below.

組織 ID	pg2yw1
裝置類型	WISE-5231
裝置 ID	WISE-5231_3
鑑別方法	token
鑑別記號	7k&vxm9J[REDACTED]

Just refer to the information and complete the setting at WISE Web page.

- iii The value in “keep alive Time” field defines the maximum amount of time in second that pass away without communication between the WISE and IBM Bluemix. The “keep alive interval” enables IBM Bluemix to detect if the connection to the WISE is no longer available without having to wait for the long TCP/IP timeout.
- iv The value in “Periodical Publish Interval” field defines the time interval to automatically and periodically send the Publish Messages which are with the “Periodical Publish” attribute. If the value of the “Periodical Publish Interval” field is 0, it means the “Periodical Publish” operation is disabled. The unit of the value is second.
- v Click “Testing” in the “Connection Testing” section, then WISE will try to connect IBM Bluemix, and reply the connection status to verify the setting is correct, or not.
- vi The lower half section on the IBM Bluemix Setting Page is for the Publish Message and Subscribe Message setting. User can click the tab of “Publish” or “Subscribe” to edit the Publish Message and Subscribe Message. For the settings of the Publish Message, please refer to “[8.1 Microsoft Azure Setting](#)” section.
- vii Click the “Subscribe” tab to edit the Subscribe Message. The user interface is shown as below:

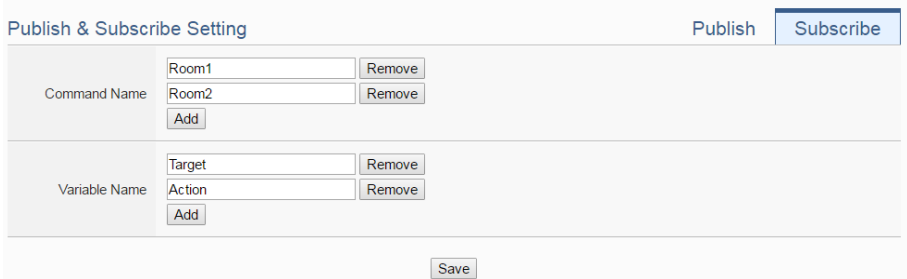


Figure 8-7 : IBM Bluemix Subscribe Message setting page

- viii In the “Command Name” field, the user can specify the command strings to be sent from the IBM Bluemix to the WISE-521xx. The content of “Command Name” setting can be used as the IF Condition

of IF-THEN-ELSE logic rule to filter the commands sent from IBM Bluemix. WISE can be set to only receive the commands that are pre-defined in the field, the other commands will be ignored by WISE.

- ix In the “Variable Name” field, user can input the name of the variable which is defined in the message of the Subscribe Topic. After completing the setting, click the “Add” button to add the variable. For the message the WISE receives from IBM Bluemix is based on JSON format, the WISE can also get the corresponding value of the variable from the received message. Following is an example of the message which WISE receives:

```
{
  "Target": "door",
  "Action": "open",
  "Timestamp": "2016/10/17 15-17-22"
}
```

In this example, the “Target” and “Action” variable setting will be performed first. Each time when the WISE receives the message, it will retrieve the corresponding value for the “Target” and “Action” variables from the message. The value of the variables can be used in the evaluation criteria of IF Condition to trigger THEN/ELSE Action for WISE logic operation.

- x After completing all settings on the IBM Bluemix Setting Page, please click “Save” button to save the settings. After downloading the settings to the WISE, the WISE will initiate the connection to IBM Bluemix, and start the Publish Message/Subscribe Message mechanism with IBM Bluemix.

8.3 MQTT Setting

WISE provides complete MQTT Client function. The MQTT Client can connect with two (Maximum) MQTT Brokers concurrently. In order to enable the MQTT Client function, user has to complete the setting of the WISE’s Publish Topic and its message content with the MQTT Brokers, and also the setting of the WISE’s Subscribe Topics. In addition, WISE provides the “Topic Import/Export” function. It will help user to organize the MQTT topics from different MQTT devices in an easy way. The configuration page for MQTT setting is shown as below.

8.3.1 Broker Setting

WISE provides the setting for two (Maximum) MQTT Brokers. It can Publish/Subscribe the Topic with the two MQTT Brokers at the same time, and the Topic setting for the two Brokers is also independent. The configuration page of MQTT Broker setting is shown as below:

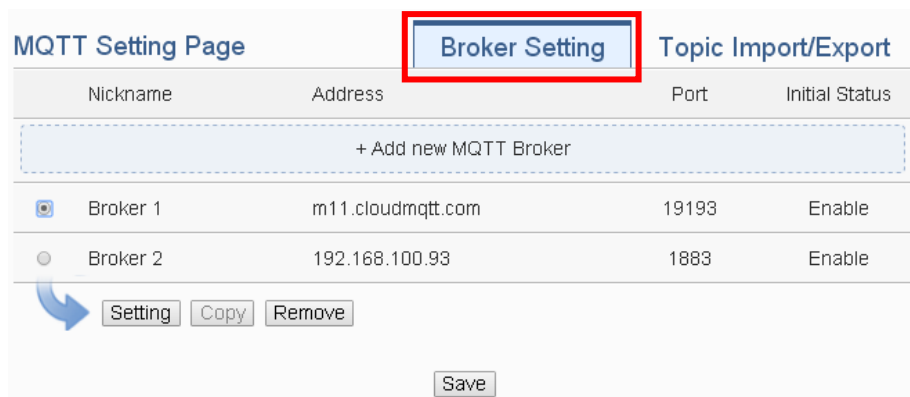


Figure 8-8 : MQTT setting page (Broker)

The settings steps are as below:

- i Click the “Broker Setting” tab on the right-top corner of “MQTT Setting Page”.
- ii Click on “Add new MQTT Broker” to add the new MQTT Broker. After clicking the “Add new MQTT Broker”, the MQTT Broker Setting Page will appear. The upper half area of the setting page is about the Broker parameters setting. It will be shown as below:

Broker Broker 1 Setting	
*Nickname	Broker 1
Description	
Broker Attribute Setting	
Initial Status	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
*Address	
Port	1883
Authentication	<input type="checkbox"/> Enable
Client ID	
Encryption	<input type="radio"/> Enable(SSL/TLS) <input checked="" type="radio"/> Disable
Keep Alive Time	60 second(s)
Connection Testing	Testing
Message Setting	
Last Will	<input type="checkbox"/> Enable
Periodical Publish Interval	5 second(s) <small>Input 0 represent disable periodical publish.</small>
Topic Prefix	WISE-5231

Figure 8-9 : MQTT Broker Parameter setting page

- iii In the Broker parameters setting page, you can input the name of the Broker in the “Nickname” field and you could also input the description of this Broker in the “Description” field.
- iv Check “Enable” or “Disable” in the “Initial Status” field to enable the initial connection status with the Broker. If the user clicks “Enable”, it means the WISE will start the communication with the Broker after it is powered on.
- v Enter the Broker IP address (or domain name) in the “Address” field.
- vi Enter the Broker Port number in the “Port” field.
- vii If the Broker requires account and password validation, please select the “Enable” checkbox in the “Authentication” field, and enter the login ID and password in the “ID” and “Password” fields to login into the Broker. If the Broker doesn’t need account and password validation, uncheck the “Enable” checkbox and go directly to next step.
- viii Enter the Client ID information in the “Client ID” field. The Client ID is used for Broker to verify if the MQTT Client is allowed to

- connect to the Broker or not. If the Broker does not require Client ID for the connection, this field can be ignored.
- ix If the SSL/TLS encryption mechanism is required for the connection between the Broker and the WISE via MQTT, click the “Enable” checkbox of the “Encryption” field to enable this function.
 - x The value in “keep alive Time” field defines the maximum time that should pass without communication between the WISE and the Broker. The WISE will ensure that at least one message travels across the network within each keep alive period. In the absence of a data-related message during the time period, the WISE sends a very small MQTT “ping” message, which the Broker will acknowledge. The keep “alive interval” enables the WISE to detect when the Broker is no longer available without having to wait for the long TCP/IP timeout. The unit of the value is second.
 - xi To verify whether your Broker setting is correct, click “Testing” in the “Connection Test” section, then WISE will try to connect to the Broker and reply the connection status.
 - xii Click the “Enable” checkbox in the “Last Will” field to allow the Broker to send the alarm Topic to other MQTT client devices when WISE lost connection to the Broker. After clicking the “Enable” checkbox, the setting of Last Will Topic, Message content and QoS will be brought up.



The screenshot shows a configuration panel for 'Last Will'. It includes a checked 'Enable' checkbox. Below it are three input fields: '*Topic', '*Message', and 'QoS'. The 'QoS' field has three radio buttons labeled 0, 1, and 2, with the '0' button selected.

- xiii The value in “Periodical Publish Interval” field defines the time interval (in second) to send all Publish Topics with the “Periodical Publish” attribute automatically and periodically. If the value of the “Periodical Publish Interval” field is 0, it means the “Periodical Publish” operation is disabled.
- xiv The “Topic Prefix” field is for setting up a string as Topic Prefix. The prefix can be used in the Publish Topic or Subscribe Topic to simply the Topic editing. The default string of the “Topic Prefix” will be the model name of the WISE. If there are more than one WISE controllers in a system for MQTT connection, please remember to change the “Topic Prefix” setting to distinguish the

Publish Topic/Subscribe Topic setting of each WISE controllers.

- xv The lower half area of the MQTT Broker Setting Page is for the Publish Message and Subscribe Topic setting. User can click the “Publish” tab or “Subscribe” tab on the right-top corner of “Publish & Subscribe Setting” to edit the Publish Message and Subscribe Topic. The Interface will be shown as below:

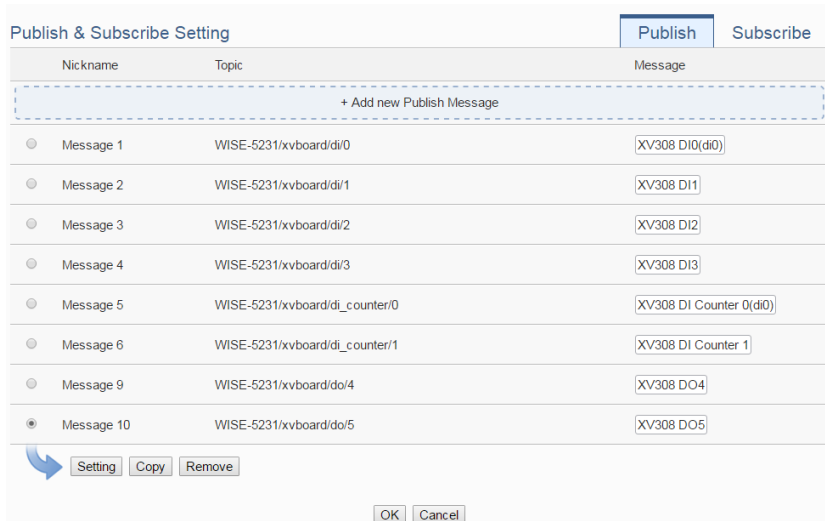


Figure 8-10 : Publish Message and Subscribe Topic setting page

- xvi Click the “Publish” tab to edit the Publish Message. Click on “Add new Publish Message” to add a new Publish Message. The Interface will be shown as below:

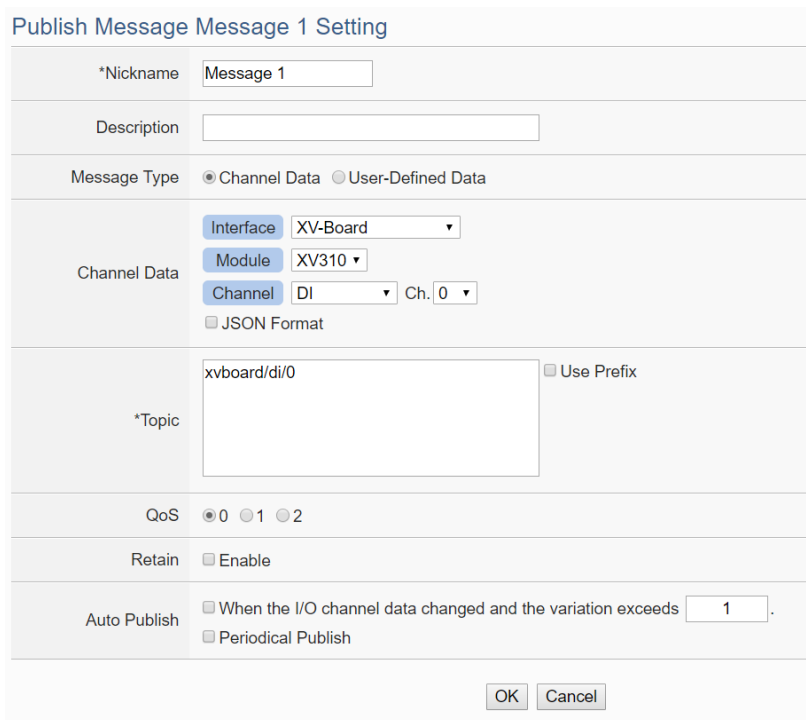
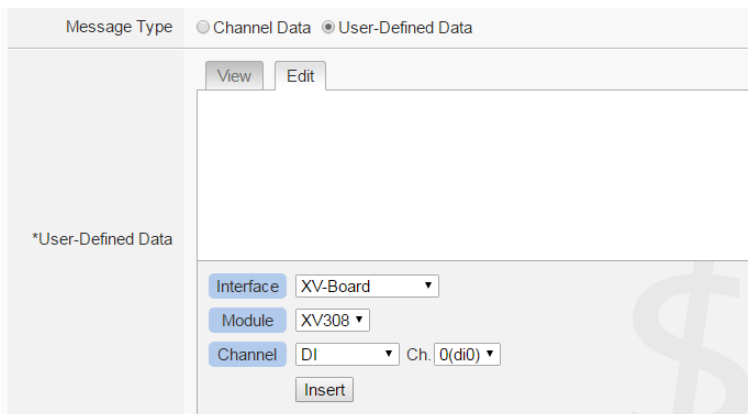


Figure 8-11 : Publish Message Setting Page

- xvii Input a name in the “Nickname” field and you could also input the description of this Publish Message in the “Description” field.
- xviii In the “Message Type” field, select the “Channel Data” to prepare a Publish Message with the I/O channel value. Based on the “Channel Data” interface, user can select a specific I/O channel value or “All” I/O channel value for the Publish Message. If the user selects a specific I/O channel, it means the I/O channel value will be bound with the Publish Message. If the user select “All” I/O channels, it mean all I/O channel values will be added into the Publish Message List. If the user click the “JSON Format” check box, the content of the Publish Message will be packaged in JSON format; if the “JSON” is not selected, the content of the Publish Message will only include the I/O channel value. (For the I/O Channel information in JSON Format, please refer to Appendix VIII for more details.). After completing the “Channel Data” setting, the system will automatically generate the default Topic content in the “Topic” field. User can modify the content of the “Topic” field if require. If the “Use Prefix” checkbox is enabled, the string in the “Topic Prefix” field will be used as the prefix of the Publish Topic.

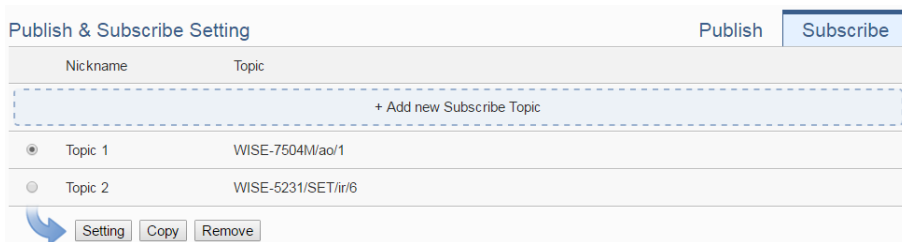


The user can select “User-Defined Data” in “Message Type” field to edit the Publish Topic and its binding message on the free style editing interface. The user interface is shown as below.



- xix In the “QoS” field, user can select 0, 1, 2 for the QoS(Quality of Service) setting for the Publish Message.

- xx In the “Retain” field, user can click the “Enable” checkbox to keep the Publish Message in the Broker.
- xxi The timing to publish message is set in the “Auto Publish” field, there are two options: “When the I/O channel data changed and the variation exceeds xxx” and “Periodical Publish”. If the “When the I/O channel data changed and the variation exceeds xxx” is selected, the system will automatically publish the topic when the I/O channel value is changed and exceeds the evaluation value (This option only support “Channel Data” setting in “Message Type”). If user selects “Periodical Publish”, it mean the topic will be published at periodic time schedule base on the value in “Periodical Publish Interval” field.
- xxii After completing all settings of Publish Topic, please click “OK” button to add the Publish Topic to the Publish Message List.
- xxiii Click the “Subscribe” tab to edit the Subscribe Topic. The user interface is shown as below.



- xxiv Click on “Add new Subscribe Topic” to add a new Subscribe Topic. The Interface will be shown as below:

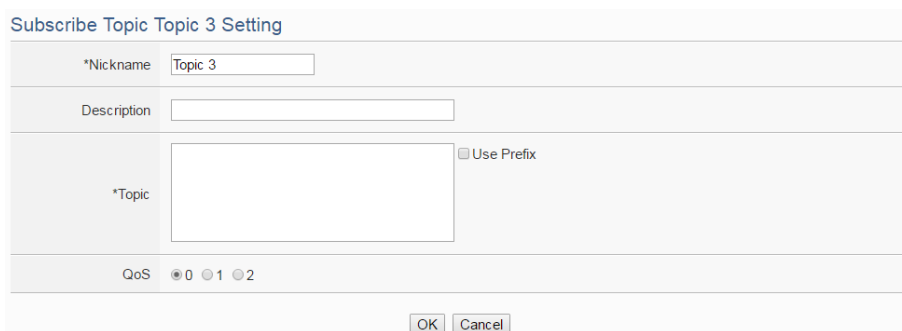


Figure 8-12 : Subscribe Topic Setting Page

- xxv Input a name of the Subscribe Topic in the “Nickname” field, and you could also input the description of this Subscribe Topic in the “Description” field. In the “Topic” field, user can input the content of the Subscribe Topic. After completing all settings of Subscribe Topic, please click “Add” button to add the Subscribe Topic to the

Subscribe Topic List.

The value of the Subscribe Topic can be used in the IF-THEN-ELSE logic evaluation, and also be recorded in the MQTT Data Logger. In addition, all Internal Registers and the I/O modules connected to WISE have their own default definition of Subscribe Topic. It allows user to change the value of the Internal Register and the value of the output channel of I/O module by MQTT protocol. Please refer to [Appendix VII](#) for detailed information.

xxvi After completing all settings of the Broker, please click “OK” button to return to add the MQTT Setting Page. And then click “Save” button to save all MQTT Broker settings.

8.3.2 Topic Import/Export Setting

WISE provides the Topic Import function so the users can import the MQTT Topics settings from other MQTT client devices easily. Click on “Topic Import/Export” tab, and click “+ Import Topic” to add new MQTT Topic setting into the WISE. And select the topics to be imported. The Topic Export function allows to export the MQTT Topics that the WISE is using to a document file, and it can be a reference for integration with the back-end Server. The Topic Import/Export Setting page is shown as below.

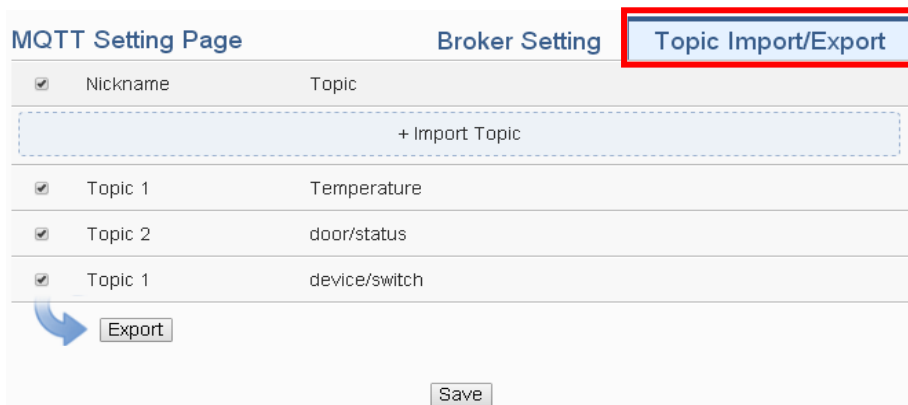


Figure 8-13 : MQTT Topic Import/Export setting page

All MQTT Publish Topics and Subscribe Topics that the WISE is using now will be shown in the setting page. Click the “Export” button will collect all topics into the “topics.csv” file. The format of the “topics.csv” file is “The_nickname_of_Topic, Topic message”. Please refer to the following figure:



Figure 8-14 : The Export of MQTT Topic

To use the Topic Import function, please prepare a document with the same format as “The_nickname_of_Topic, Topic message”. Click the “+ Import Topic” button, then browse through to select the document which includes the MQTT Topic and click “Open”. If the format is correct and the import process is successful, the system will show an “Import successfully” message box.

After importing the MQTT Topic successfully, there the Imported Topic list will be shown in the “Topic” field of the Publish & Subscribe Setting page. The user can select a specific topic from the Imported Topic list, and click “Use” button to use this imported topic.

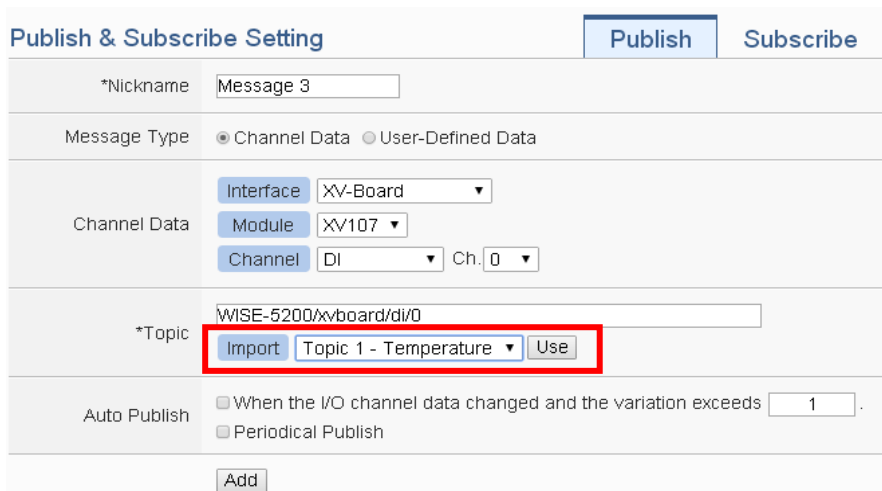


Figure 8-15 : The Import of MQTT Topic

8.4 IoTstar Real-Time Data Sending Setting

IoTstar can receive the real-time I/O data uploaded by WISE, and import the data into the database it created. The setting page is shown as below:

Real-Time Data Sending Setting Page

Function Status Enable

Add Channel

Interface: COM3

Module: DL-100(5:H/T Meter)

Channel: AI Ch. All

Insert

Channel List

Channel	*Name
<input type="radio"/> COM3 DL-100(5:H/T Meter) Humidity(RH)	COM3-N2-AI0
<input type="radio"/> COM3 DL-100(5:H/T Meter) Temperature(°C)(°C)	COM3-N2-AI1
<input checked="" type="radio"/> COM3 DL-100(5:H/T Meter) Temperature(°F)(°F)	COM3-N2-AI2

Remove

Save

Figure 8-16 : IoTstar Real-Time Data Sending Setting page

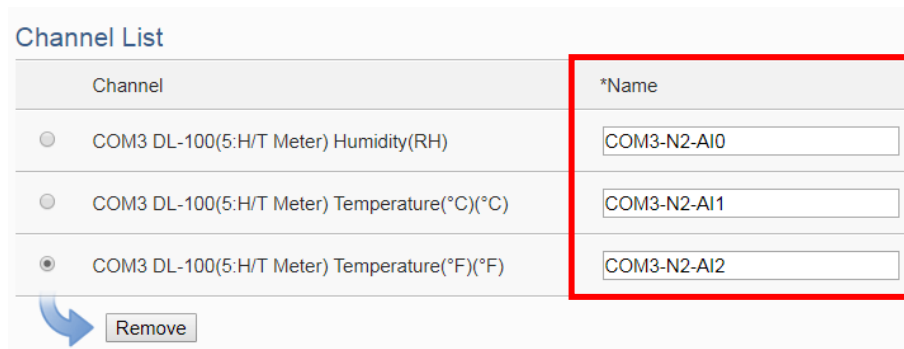
Follow the steps below:

- i In the “Function Status” field, check “Enable” to enable the Real-Time I/O data upload operation.
- ii In the “Add Channel” section, select the “Interface”, “Module” and “Channel” from the dropdown list and click “Insert” to add the I/O channel into the “Channel List” section. User can select “All” in “Channel” field to insert all I/O channels of the module at once.
- iii WISE will actively send the Real-Time I/O channel data which is located in the “Channel List” section to IoTstar. User can modify the database field name of the I/O channel data in the “*Name” field. To remove a pre-set I/O channel, please click the radio button in front of the pre-set I/O channel and then click “Remove” button.

Please Note:

- ◆ The name inputted in the “*Name” field must be a unique name.
- ◆ The name set in the “*Name” field will be saved in the “Name” field of

the Real-Time Data Table that IoTstar creates for the WISE (Please refer to Appendix VI of IoTstar User Manual). These names can be used later for further query operations of the Database.



iv After all settings are completed, click “Save” button to save the setting.

8.5 IoTstar Historical Data Sending Setting

IoTstar can receive the history I/O data uploaded by WISE, and import the data into the database it created. The setting page is shown as below:

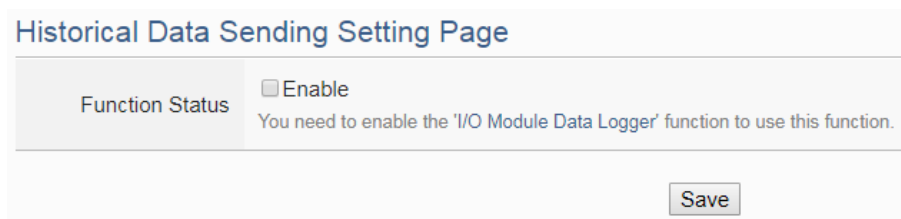


Figure 8-17 : IoTstar Historical Data Sending Setting page

Follow the steps below:

- i To enable WISE's historical I/O data upload operation, users need to enable “I/O Module Data Logger” function first. More detailed setting information please refers to the section “[7.1 I/O Module Data Logger Setting](#)”.
- ii Check “Enable” to enable the Historical Data Sending function, and click “Save” button to save the setting.

8.6 IoTstar Video Data Sending Setting

WISE with v1.5.3 firmware (or later version) supports to send the snapshots or video files captured by iCAM cameras or other devices to IoTstar. After upgrade to v1.5.3 firmware (or later version), IoTstar would save the uploaded files and perform the following actions:

- Save the event to trigger image/video recording, the event time, and the path to store image/video files into the database for further use.
- With IoTstar Dashboard Service package, users can build their own dashboard, and use “Video Event List” widget to display the event list and event image/video files.
- With IoTstar Bot Service package, IoTstar can forward the uploaded image/video files to the LINE accounts that bind with the IoTstar server.

About the detail of IoTstar Dashboard Service and IoTstar Bot Service, please check the [IoTstar web page](#). Video Data Sending Setting page shows as the following. When the setting is completed, WISE would upload the images and videos from the specific resource to IoTstar. The source of the image or video files includes following types:

- IP Camera: If the WISE controller connected with ICP DAS iCAM series IP cameras, it is able to collect the snapshot or video files captured by iCAM cameras.
- Sandbox: Upload files to the specific path (/Sandbox/IoTstar) of the FTP server on the WISE.
- CGI server: Connect to CGI servers and get the image files with CGI commands. (For example, users can use WISE controllers to connect with general IP cameras, and get snapshot files with CGI commands.)

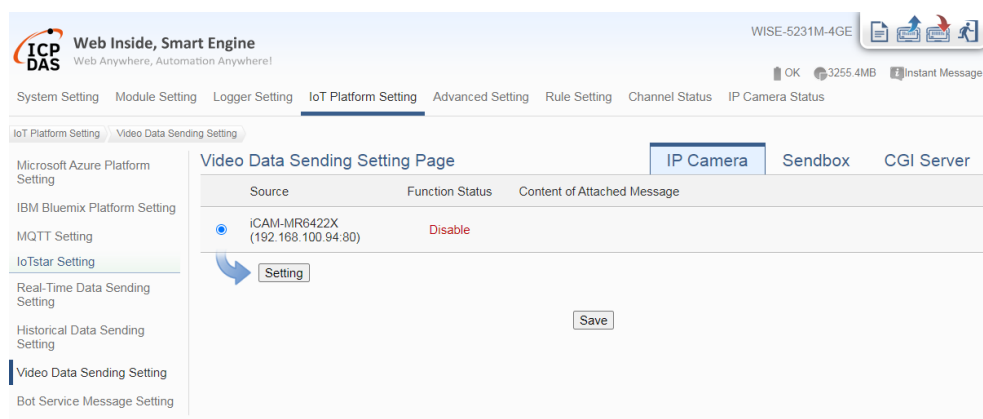


Figure 8-18 : IoTstar Video Data Sending Setting page (1)

Follow the steps below:

- i To select the data resource for image/video data sending, click on one of the tabs: “IP Camera”, “Sandbox” and “CGI Server” at the

right-upper corner of the Video Data Sending Setting page.

- ii To send the desired files, please specify and click on the radio button of the file source, and click the “Setting” button to enter the setting page.
- iii Check the “Enable” function, and then the message setting interface will be shown as below. Enter the message content in the “Content of Attached Message” field to describe the video data resource. WISE provides an “Real-time variable editor” to add current I/O channel data or Internal Register data into the messages.

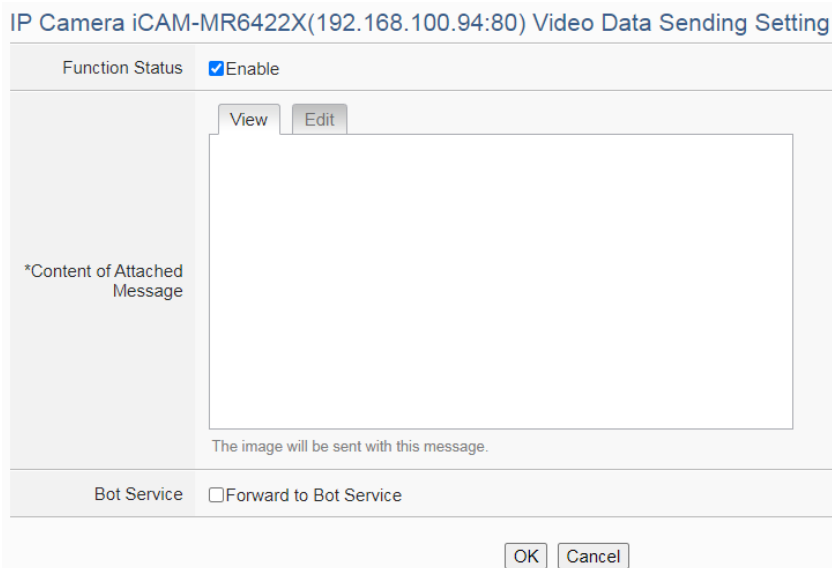
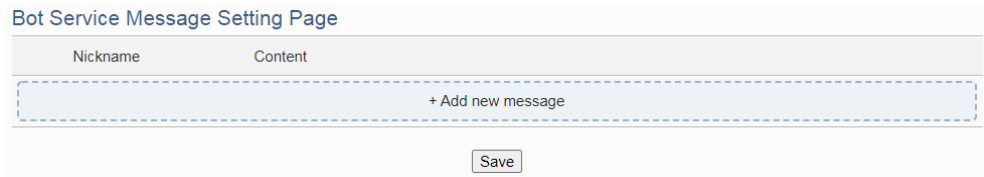


Figure 8-19 : IoTstar Video Data Sending Setting page (2)

- iv If the IoTstar enabled Bot Service package, check “Forward to Bot Service” to send the image/video data of the data resource to the specific LINE account.
- v Click the “OK” button to save the setting of the data resource.
- vi After you finish all the “Video Data Sending” settings, click “Save” button to save the settings.

8.7 IoTstar Bot Service Message Setting

When WISE is set to connect to an IoTstar server and the IoTstar server enables Bot Service function, WISE can send message or forward image/video data to the LINE accounts that bind with the IoTstar server. In the Message setting page, users can edit the messages which would be sent to IoTstar Bot Service with pre-input strings and realtime I/O channel data. The configuration page is shown as below:



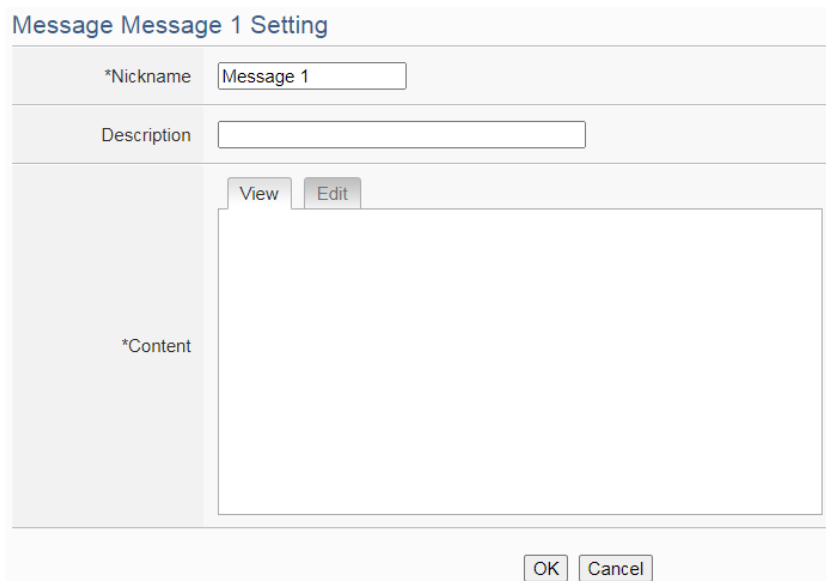
Nickname	Content
+ Add new message	

Save

Figure 8-20 : IoTstar Bot Service Message Setting page (1)

Follow the steps below:

- i Click “Add new message”, the Bot Service Message Setting page will appear as following:



Message Message 1 Setting

*Nickname

Description

*Content

View Edit

OK Cancel

Figure 8-21 : IoTstar Bot Service Message Setting page (2)

- ii Input name in the “Name” field and you could also input the description of this LINE message in the “Description” field.
- iii Enter the message content in the “Content” field. WISE provides an “Real-time variable editor” to add current I/O channel data or Internal Register data into the messages.
- iv After complete all settings, click the “OK” button to confirm the message setting, and return to the Message Setting page.
- v Repeat steps i ~ iv to complete settings of all messages for IoTstar Bot Service.
- vi After you finish all the Message settings, click “Save” button to save the settings.

9 Advanced Setting

Advanced Setting provides additional features and allows you to perform more setting on the WISE. Click on the Advanced Setting button, a column of buttons will appear on the left of the page:

- ◆ Internal Register Setting (Include **Math Formula Editing Function**)
- ◆ Timer Setting
- ◆ Schedule Setting
- ◆ Email Setting
- ◆ SMS Setting
- ◆ SNMP Trap Setting
- ◆ CGI Command Setting
- ◆ LINE Notify Setting
- ◆ Active I/O Setting
- ◆ Channel Status Setting
- ◆ Ping Setting

After complete the Advanced Setting, all the setting you define in the section will be the property in the IF-THEN-ELSE rule setting page. **Please note: In order to avoid possible error when performing rule definition (IF-THEN-ELSE), please always finish configuration in Advanced Setting before starting to define Rules. Avoid unnecessary change in Advanced Setting after you finish rule definition. Unexpected errors might occur if you violate this sequence: Advanced Setting→ Rule Setting. In case you make any modification, please double check your settings and Rules definition to make sure no errors are present.** The following sections will describe more detailed information for these configurations.

9.1 Internal Register Setting

WISE provides 100 Internal Registers; they can be used to hold temporary variables. The supported format type of Internal Register are as follows:

- 16-bits Signed Integer
- 16-bits Unsigned Integer
- 32-bits Signed Long
- 32-bits Unsigned Long
- 32-bits Floating Point


The data on the registers or each bit of the data can be read and evaluated in IF Condition, and be written or calculated after performing a THEN/ELSE Action. The data can also be read/written on the Registers via Modbus command. **The Internal Registers of No.81 to No.100 provide the “Retain Variable” mechanism.** It means that the data inside these Internal Registers will be retained even the WISE is in Power Off status.

In addition. WISE supports math formula editing function after the firmware upgrade version 1.3.0. Users can set I/O channels to be the variables, and use the following operators to edit the formula:

- plus“+”
- minus“-”
- times“*”
- divide“/”
- superscript“^”
- left parenthesis“(” and right parenthesis“)”

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.

The settings are as following steps:

- i Select the No of the Internal Register from the dropdown list and input “Name”. If the nickname of the register is not inputted, the name will be automatically set as “Internal Register#” (#is the number of the register).
- ii In the “Type” field, select the data type of the Internal Register. There are five options: “16-bits Signed Integer”, “16-bits Unsigned Integer”, “32-bits Signed Long”, “32-bits Unsigned Long” and “32-bits Floating Point”. The default data type is “16-bits Signed Integer”.
- iii In the “Initial value” field, assign the initial value of the Internal Register, then click  to create a new Internal Register, and add to the list. The default initial value is 0.
- iv Repeat steps i~iii to complete settings of all Internal Register.

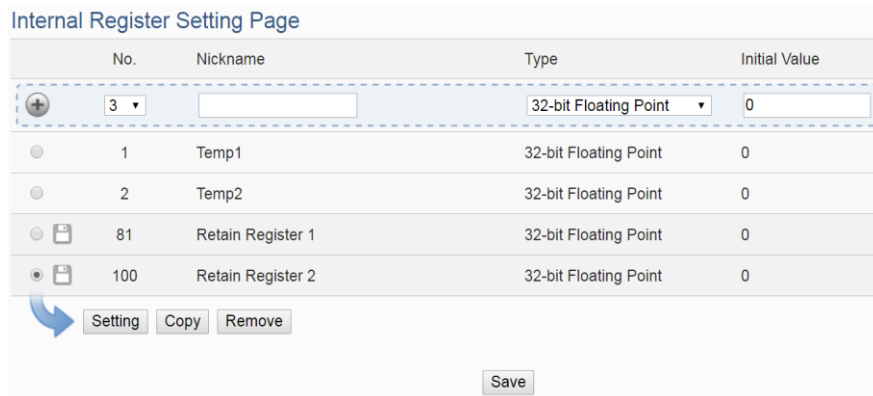


Figure 9-1 : Internal Register List Page

- v To modify the settings of a pre-set Internal Register, please click on the radio button in front of the Internal Register, and then click on “Setting” to modify the settings.
- vi In the Internal Register Setting Page, user can modify the setting of ”Nickname”, “Type” and “Initial Value” of Internal Register in the Internal Register Setting page, and input the description of this Internal Register in the “Description” field. If users want to use the bit value of the Internal Register in the IF condition setting, then please click on the rectangle at the right-side of “Bit Nickname” field to set up the nickname for each bit of the Internal Register.

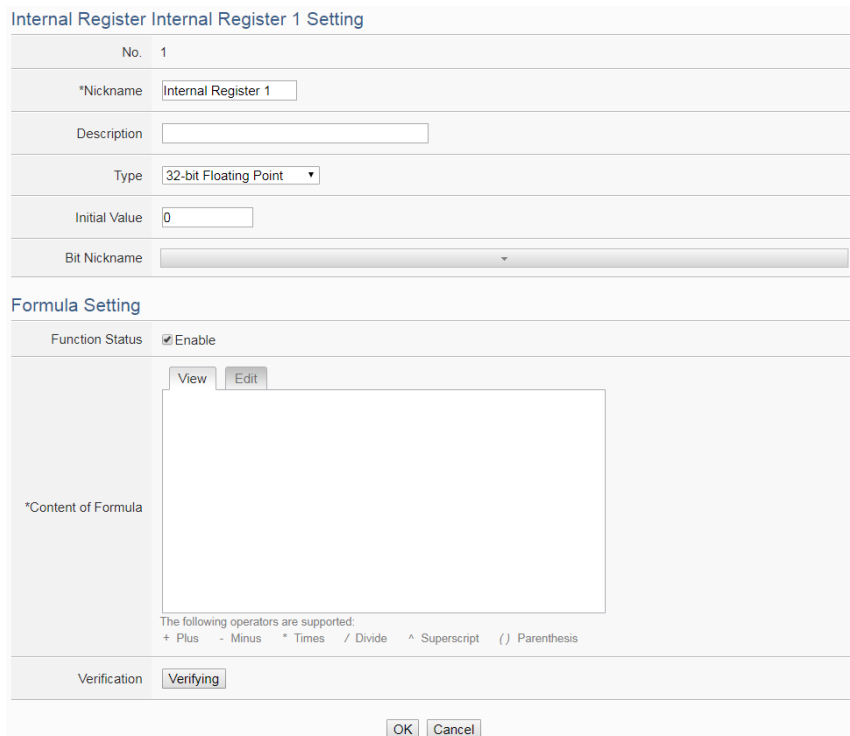


Figure 9-2 : Internal Register Setting page

- vii If users need to perform math operations, check “Enable” in the Formula Setting section and edit math formula in the “Content of Formula” field. Users can select the “Interface”, “Module” and “Channel” from the dropdown list and click “Insert” to add a channel value encoded string into the formula, and use the operators as “+”, “-”, “*”, “/”, “^”, “(” and “)” to edit the formula. For example, if user edit a formula as below:

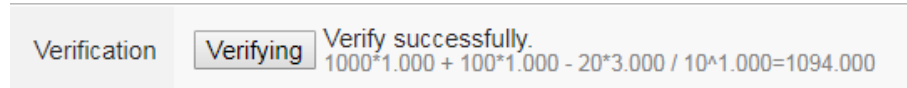
$$1000*\$C4M6ro0 + 100*\$C4M6ro1 - 20*\$C4M6ro2 / 10^{\$C4M6ro3}$$

In the “View” tab, it would be displayed in the real index format of the channel as:

$$1000*\text{M-7024 AO0} + 100*\text{M-7024 AO1} - 20*\text{M-7024 AO2} / 10^{\text{M-7024 AO3}}$$

Please note: Do not modify the channel value encoded string when you are editing the formula. It may cause failures when WISE reads the channel value.

In addition, click the “Verifying” button could check the result of the formula.



Please note: Before you click the “Verifying” button, please confirm that the I/O module setting is saved to WISE if you use the I/O channels in the formula. Otherwise, the test result would be error because the I/O module is not found.

- viii Click on “OK” to confirm the setting and return to the Internal Register list page.
- ix After return to Internal Register list page, if user want to copy the settings of a pre-set Internal Register to the new Internal Register, please click the radio button in front of the pre-set Internal Register and then click “Copy”, a new Internal Register (in sequence) will be added to the list and the settings of the old Internal Register will be copied to this newly added Internal Register.
- x To remove a pre-set Internal Register, please click the radio button in front of the pre-set Internal Register and then click “Remove”.
- xi After all Internal Register settings are completed, click “Save” button to save the changes.

9.2 Timer Setting

WISE provides “Timer” for timing functions. The Timer status can be “Stop”, “Not Timeout” or “Timeout”. They can be included in the IF Condition statements. The Timer Action can be “Start”, “Reset”, “Pause” or “Resume”. The Start Action will start to run the Timer and if the Start Action is triggered one more time when the Timer is running, the Timer will restart again. The Reset action will reset the Timer and stop running the Timer. The “Pause” action will pause the Timer counting temporarily. The “Resume” action is to let the Timer to leave the “Pause” mode, and continue the Timer counting for the rest second of the Timer.

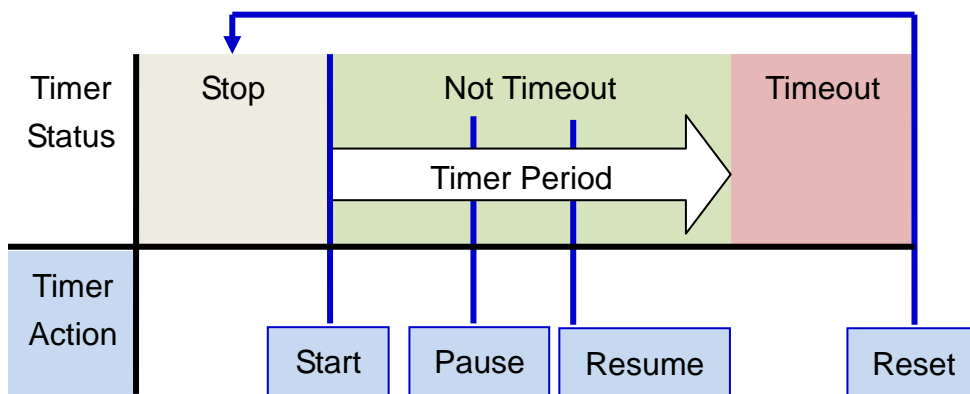


Figure 9-3 : Timer Status and Actions

Follow the following steps :

- i Input the nickname of the timer in the “Nickname” field.
- ii Specify the initial status of the timer from the dropdown list of the “Initial Status” field. The “Initial Status” could be “Stop” or “Start” status.
- iii Specify the period interval in units of seconds. There are two options to setup the period interval:
 - Assign Period: Input the period interval in units of seconds manually.

+

Stop ▾
Assign Period ▾

second(s)

- Internal Register: Assign the period interval as the value of the selected Internal Register.

+

Stop ▾
Internal Register ▾
No. 1(IR1) ▾

Please note: The user must setup Internal Register before using Internal Register as timer period. Please refer to “[9.1 Internal Register](#)” to setup Internal Register.

- iv Click  button to create a new Timer, and add to the Timer list.

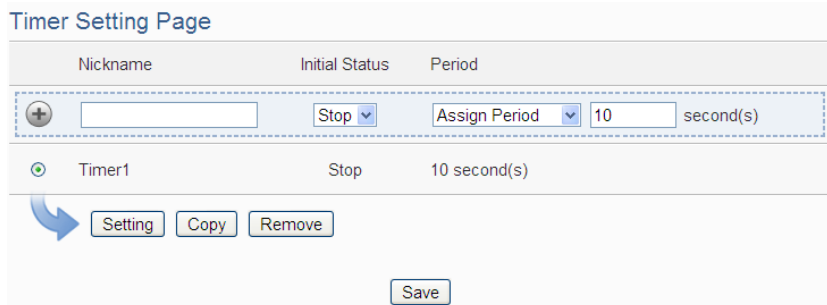


Figure 9-4 : Timer List Page

- v Repeat steps i~iv to complete settings of all Timers.
- vi To modify the settings of a pre-set timer, please click on the radio button in front of the timer, and then click on “Setting” to modify the settings. The setting user interface is as following:

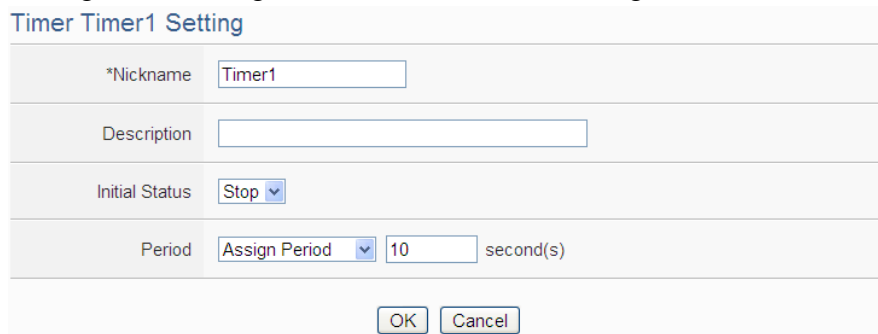


Figure 9-5 : Timer Setting page (by assign value)

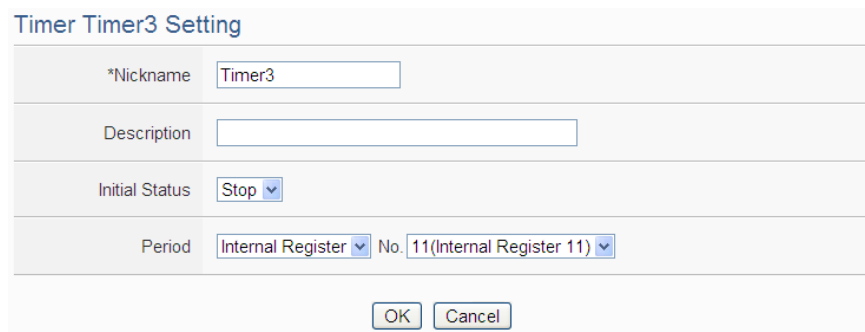


Figure 9-6 : Timer Setting page (by Internal Register)

- vii User can modify the setting of “Nickname”, “Initial Status” and “Period” in the Timer Setting page, and input the description of this Timer in the “Description” field.
- viii Click on “OK” to confirm the setting and return to the Timer list page.
- ix After return to Timer list page, if user want to copy the settings of a pre-set Timer to the new Timer, please click the radio button in front of the pre-set Timer and then click “Copy”, a new Timer (in sequence) will be added to the list and the settings of the old Timer will be copied to this newly added Timer.
- x To remove a pre-set Timer, please click the radio button in front of the pre-set Timer and then click “Remove”.
- xi After all Timer settings are completed, click “Save” button to save the changes.

9.3 Schedule Setting

WISE provides Schedules to setup prescheduled routine tasks. The setting of Schedule can be used to check if the system time of the WISE is in the range of date/time setting of the schedule or not. The checking status can be included in the IF Condition statements. Schedule setting page is shown as below:

Nickname	Mode
+ Add new schedule	
<input type="radio"/> Schedule 3	Calendar
<input checked="" type="radio"/> Schedule 4	Repeat

Figure 9-7 : Schedule List Page

The settings steps are as below:

- i Click on “Add new schedule” to add a new schedule.
- ii After clicking the “Add new schedule”, a setting page will appear. Input a name in the “Nickname” field and you could also input the description of this schedule in the “Description” field.
- iii Select Mode to be “Calendar” or “Repeat”.

22. Calendar :

- (a.) In the “Date” field, select the “Starting Month” and “Duration”

from the dropdown list. The maximum duration can be set is **120 months**. After you specify the Year and Month in the Date section, the calendars corresponding to the Year and Month you specified will appear as shown below:

Schedule Schedule 5 Setting

*Nickname:

Description:

Schedule Content Setting

Mode: Calendar Repeat

Date: Starting Month: 2015 February

Duration: 3 Month(s)

*Time Range(s):

08:00:00 ~ 12:00:00

13:00:00 ~ 17:00:00

2015 / 2							2015 / 3							2015 / 4						
Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7	1	2	3	4	5	6	7				1	2	3	4
8	9	10	11	12	13	14	8	9	10	11	12	13	14	5	6	7	8	9	10	11
15	16	17	18	19	20	21	15	16	17	18	19	20	21	12	13	14	15	16	17	18
22	23	24	25	26	27	28	22	23	24	25	26	27	28	19	20	21	22	23	24	25
							29	30	31					26	27	28	29	30		

Figure 9-8 : Calendar mode of Schedule setting

- (b.) In the “Time Range(s)” section, click “Add” to add new Time Range of this schedule. Select the start time and the end time from the dropdown list. Each Schedule is required to set at least one Time Range; click on “Add” to add more Time Range. **Please note: the time zones you specified can’t be overlapped. If you specify an end time that is earlier than the start time, such as 20:00:00 ~ 06:00:00, it indicates the end time will be set one day after the start date.** Click “Remove” to remove a pre-set Time Range.
- (c.) On the calendars, click to toggle highlight on the dates you’d like to execute or not execute the operations for this Schedule. **If the date shows a light blue background, it indicates the date is “In Range” of the schedule, that is, that date falls into the range that will execute the operations. On the contrary, if the date shows a light grey background, it indicates that date is “Out of**

Range” of the schedule, that is, that date falls out of the range and will not execute the operations. By default, all dates will be “In Range”, that is, during the date range you select, the operation will be executed every day. “Select All” button is used to set all dates to be “In Range”; whereas “Unselect All” button is for marking all dates to be “Out of Range”. The Weekday button is for you to select all Mondays to Fridays to be “In Range”, and Saturdays and Sundays to be “Out of Range”, that is, the operations will be executed during weekdays only. On the contrary, the Weekend button is for you to set all Saturdays and Sundays to be “In Range”, and all Mondays to Fridays to be “Out of Range”, that is, the operations will be executed during weekends only.

23. Repeat:

- (a.) In the “Day(s) of week” section, click on the day(s) in a week that is going to execute the schedule; shown as below:

Schedule Schedule 5 Setting

*Nickname	Schedule 5
Description	

Schedule Content Setting

Mode Calendar Repeat

*Day(s) of Week Sun Mon Tue Wed Thu Fri Sat

Exception Date(s)

01	/	01	Remove
12	/	25	Remove
Add			

*Time Range(s)

08	:	00	:	00	~	12	:	00	:	00	Remove
13	:	00	:	00	~	17	:	00	:	00	Remove
Add											

OK Cancel

Figure 9-9 : Repeat mode of Schedule setting

- (b.) In the “Exception Date(s)” selection, click on “Add” to add the date(s) that is/are not in the schedule. Click “Remove” to remove a pre-set Exception Date.
- (c.) In the “Time Range(s)” section, click “Add” to add new Time Range of this schedule. Select the start time and the end time from the dropdown list. Each Schedule is required to set at least one Time Range; click on “Add” to add more Time Range.

Please note: the time zones you specified can't be overlapped. If you specify an end time that is earlier than the start time, such as 20:00:00 ~ 06:00:00, it indicates the end time will be set one day after the start date. Click "Remove" to remove a pre-set Time Range.

- iv Click on "OK" to confirm the setting and leave the setting page.
- v Repeat steps i~iv to complete settings of all Schedules.
- vi To modify the settings of a pre-set Schedule, please click on the radio button in front of the Schedule, and then click on "Setting" to modify the settings.
- vii To copy the settings of a pre-set Schedule to the new Schedule, please click the radio button in front of the pre-set Schedule and then click "Copy", a new Schedule (in sequence) will be added to the list and the settings of the old Schedule will be copied to this newly added Schedule.
- viii To remove a pre-set Schedule, please click the radio button in front of the pre-set Schedule and then click "Remove".
- ix After all schedule settings are completed, click "Save" button to save the changes.

9.4 Email Setting

WISE support Email messages sending function. This function allows sending pre-input Email message(s) to pre-set Email receiver(s) under certain conditions. The configuration page is shown as below:

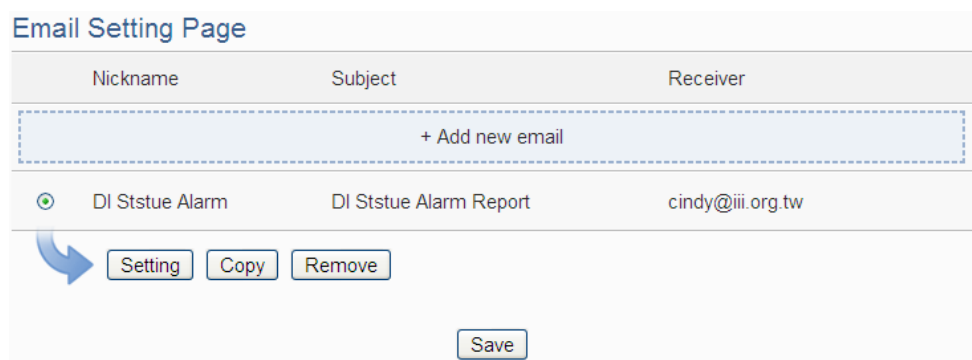


Figure 9-10 : Email List Page

The settings steps are as below:

- i Click on "Add new email" to add a new email setting.
- ii After clicking the "Add new email", a setting page will appear, input a

name in the “Nickname” field and you could also input the description of this email in the “Description” field; shown as below:

Email Email 2 Setting

*Nickname	<input type="text" value="Email 2"/>
Description	<input type="text"/>

Figure 9-11 : Email setting page (Name & Description)

iii In the “SMTP Server” field, enter the IP or the domain name of the SMTP server; or select the SMTP server from the dropdown list. In the dropdown list, WISE provide four public SMTP servers for selection as below:

- Google Gmail
- Yahoo Mail
- Microsoft Outlook / Hotmail
- AOL Mail

After select SMTP server from the dropdown list, WISE will automatically complete the “Port Number” and “Security” setting related to the SMTP server you select. The SMTP Setting page is shown as below:

SMTP Server Setting

*SMTP Server	<input checked="" type="radio"/> Specify an address of SMTP server <input type="radio"/> Google Gmail - smtp.gmail.com
Port	<input type="text" value="25"/>
Authentication	<input type="checkbox"/> Enable

Figure 9-12 : Email setting page (SMTP Server)

- iv Input the Port number, the default port number is set as 25.
- v If the SMTP server requires account and password validation, please select the “Enable” checkbox in the “Authentication” field, and continue steps vi~viii to login into the SMTP server. If the SMTP server doesn’t need account and password validation, uncheck the “Enable” checkbox and go directly to step ix.
- vi Enter the SMTP server login ID in the “ID” field.
- vii Enter the SMTP server password in the “Password” field.
- viii In the “Security” field, select the security setting to be “No Security”, “TLS”, or “SSL” from the dropdown list.

- ix After complete SMTP server setting, continue to input Email address setting. In the “Sender Name” field, input the name of the sender.
- x Enter the sender’s email address in the “Sender Email Address” field.
- xi In the “Receiver Email Address” section, click on “Add” to add the receiver’s email address. At least one email address has to be entered. The number of the receiver's email addresses is unlimited.
- xii To verify whether your email setting is correct to send the Email, click “Send” in the “Email Setting Test” section, then WISE will send a test Email to the receiver’s email address.

Figure 9-13 : Email setting page (Email Address)

- xiii After complete Email Address setting, continue to input Email Content setting. Enter the email subject in the “Subject” field. The Email Content Setting page is shown as below:

Figure 9-14 : Email setting page (Email Content)

- xiv Enter the content in the “Content” section. In addition, it provides encoded strings for users to add current I/O channel value or Internal Register value into the Email content. To make it easy to add the encoded string, WISE provides “Real-time variable editor”. Please refer to "[7.2 User-Defined Data Logger](#)“ for more detailed information of the “Real-time variable editor”.
- xv Click on “OK” to confirm the setting and return to the Email list page.
- xvi Repeat steps i~ xv to complete settings of all Emails
- xvii To modify the settings of a pre-set Email, please click on the radio button in front of the Email, and then click on “Setting” to modify the settings.
- xviii To copy the settings of a pre-set Email to the new Email, please click the radio button in front of the pre-set Email and then click “Copy”, a new Email will be added to the list and the settings of the old Email will be copied to this newly added Email.
- xix To remove a pre-set Email, please click the radio button in front of the pre-set Email and then click “Remove”.
- xx After you finish all the Email settings, click “Save” button to save the settings.

9.5 SMS Setting

WISE-523xM-3GWA and WISE-523xM-4GE/4GC offer SMS Alarm message sending and SMS Command receiving functions. For SMS Alarm function; it allows to send pre-set SMS alarm message to specific phone numbers. For SMS command function; it allows to set up authorized phone numbers to receive SMS commands. WISE will execute the commands received from authorized phone numbers only. There are 2 types of SMS commands:

- **Retrieve channel data (GET):** The user can retrieve specific channel real-time data. The user could add the encoded string to the message to retrieve the related channel data. One SMS Command message can require many channel data values, it only depends on the length of the content limit (160 characters). The message content that exceeds 160 characters would be dropped.
- **Modify channel data (SET):** The user could modify channel data by SMS command. Each SMS command message allows to modify one channel value.

9.5.1 SMS Alarm Setting

The SMS Alarm Setting page is shown as below:

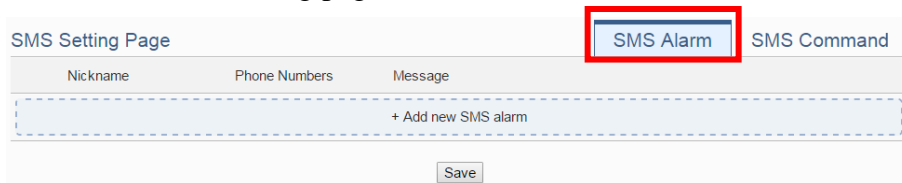


Figure 9-15 : SMS setting page (1)

Please follow the steps below:

- i Make sure the “SMS Alarm” Tab is selected.
- ii Click “Add new SMS alarm”, the SMS Alarm Setting page will appear as follow:

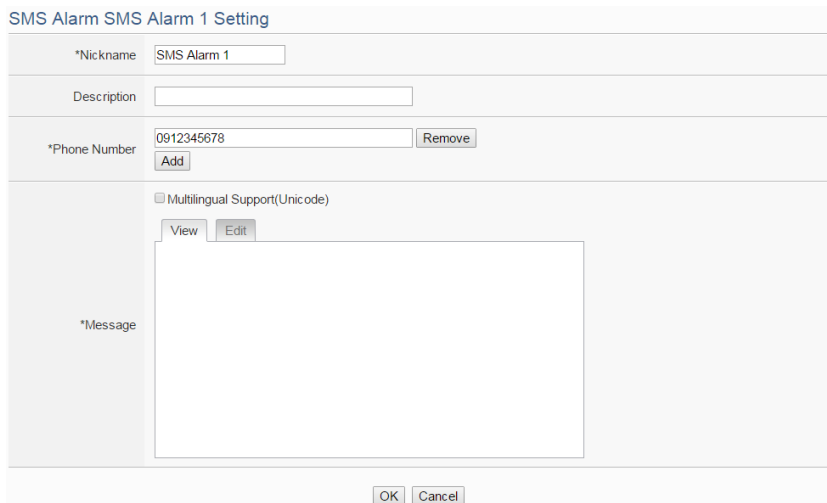


Figure 9-16 : SMS setting page (2)

- iii Input name in the “Name” field and you could also input the description of this SMS Alarm in the “Description” field.
- iv In the “Phone Number” section, click on “Add” to input the phone numbers to receive the SMS Alarm messages. The SMS can be sent to multiple receivers. Keep on clicking “Add” to add all phone numbers to receive the Alarm message, click “Remove” to remove the phone numbers you want to delete. The number of the SMS alarm receivers is unlimited.
- v Enter the content in the “Message” field. If the Unicode mode is adopted, the length of the content cannot exceed 70 characters. If the Unicode mode is not selected (will support English characters only), the length of the content limit is 160 characters.

The content that exceeds the content limit would be dropped. SMS Alarm provides an encoded string for you to add current I/O channel data or Internal Register data into SMS Alarm message. To make it easy to add the encoded string, WISE provides “Real-time variable editor”. Please refer to “[7.2 User-Defined Data Logger](#)” for more detailed information of the “Real-time variable editor”.

- vi Click on “OK” to confirm the setting and leave the setting page.
- vii Repeat steps ii~vi to complete settings of all SMS Alarm setting.
- viii To modify the settings of a pre-set SMS Alarm, please click on the radio button in front of the SMS Alarm, and then click on “Setting” to modify the settings.
- ix To copy the settings of a pre-set SMS Alarm to the new SMS Alarm, please click the radio button in front of the pre-set SMS Alarm and then click “Copy”, a new SMS Alarm will be added to the list and the settings of the old SMS Alarm will be copied to this newly added SMS Alarm.
- x To remove a pre-set SMS Alarm, please click the radio button in front of the pre-set SMS Alarm and then click “Remove”.
- xi After you finish all the SMS Alarm selections and settings, click “Save” button to save the settings.

9.5.2 SMS Command Setting

The SMS Command Setting page is shown as below:

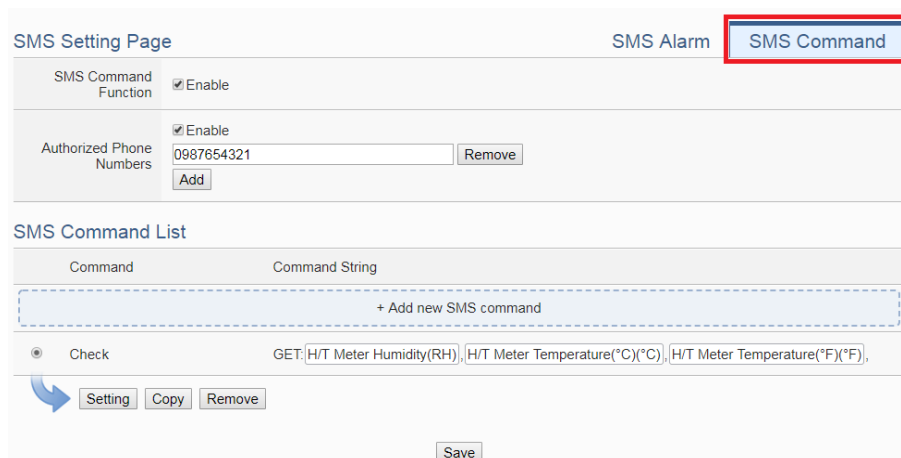
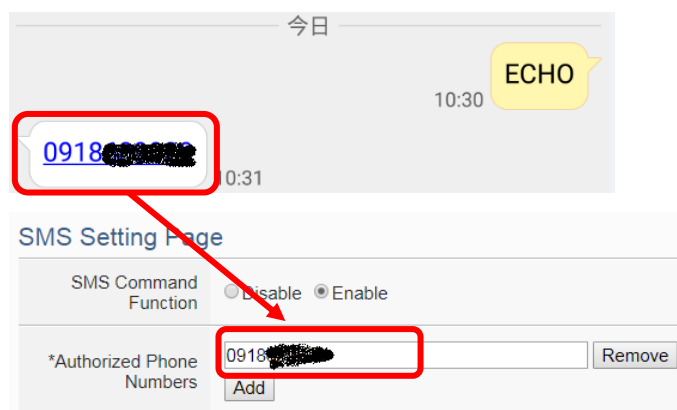


Figure 9-17 : SMS command setting page (1)

Please follow the steps below:

- i Make sure the “SMS Command” Tab is selected.
- ii In the “SMS Command Function” section, click on “Enable” to enable SMS Command function. The SMS Command list will be displayed. If “Disable” is selected, the SMS Command list will be disabled.
- iii In the “Authorized Phone Number” field, click on “Enable” to set the phone numbers you would like to authorize to send SMS commands to WISE-523xM-3GWA or WISE-523xM-4GE/4GC. If this field is not enabled, this WISE controller would receive SMS commands from any cell phone. Click on “Enable” and keep on clicking “Add” to add all phone numbers to send the SMS commands to WISE, click “Remove” to remove the phone numbers you want to delete. **Please note: the Authorized Phone Number has to be input in the normal format. For example, if the Authorized Phone Number is a cell phone number 0987654321 in Taiwan area, Just input the Authorized Phone Number as “0987654321”.** If you cannot send the command to WISE successfully, you can use the cellular phone to send the SMS command “**ECHO**” to the WISE module. When WISE receives the command, it will reply a SMS message to the cellular phone you use. The SMS message will include the phone number that WISE received. After getting the information, you can enter the exact phone number of the SMS message sender in the 'Authorized Phone Number' field of the WISE module.



- iv Click “Add new SMS command”, the SMS Command Setting page will appear.
- v Input a command string in the “Command” field as the

nickname for the original corresponding command in the “Command String Editor” section. In the “Command String Editor” section, select the command type to be “GET” (retrieve real-time channel data) or “SET” (modify channel data) from the dropdown list. For “GET” command (shown as Figure 8-17); It provides an encoded string for you to add current I/O channel data, power data or Internal Register data into SMS command. To make it easy to add the encoded string, WISE provides “Real-time variable editor”. For “SET” command (shown as Figure 8-18), select “Source”, “Module” and “Channel” from the dropdown list, and then set the “Value” to be modified (you can also leave the “Value” field blank, and input the value later according to requirement in real-time when send back the SMS Command). Take Figure 8-17 as an example, you can leave the “Value” field blank and input the SMS Command AI/2.3 to modify the AI channel value to be 2.3.

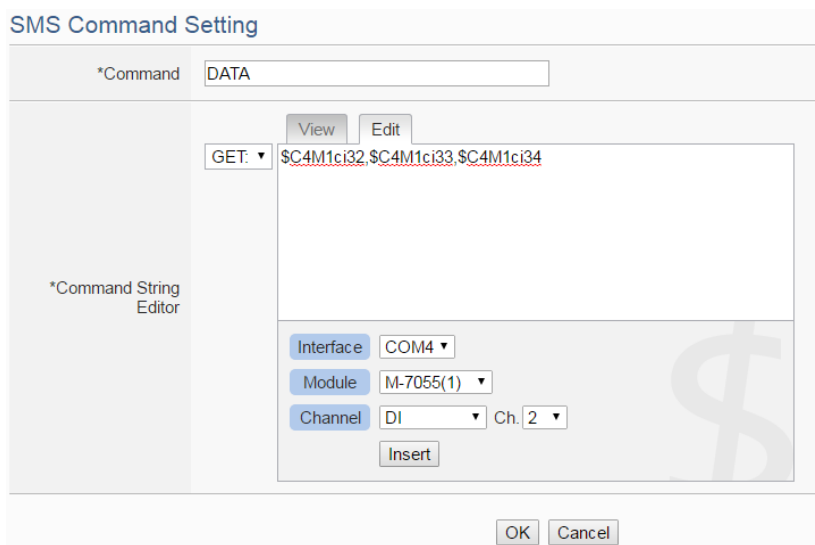


Figure 9-18 : SMS command setting for GET command

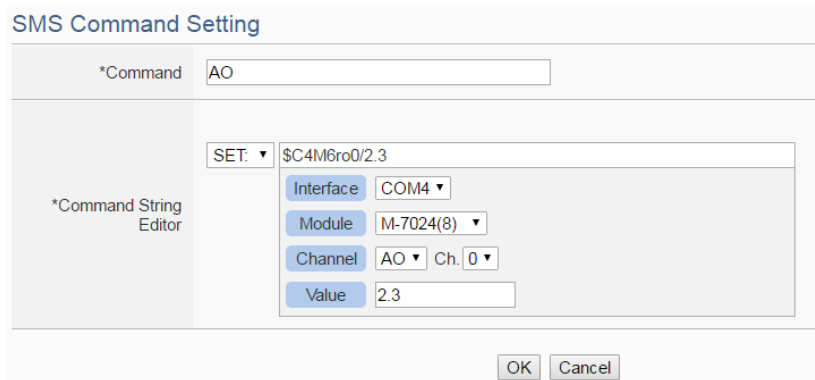


Figure 9-19 : SMS command setting for SET command

- vi Click on “OK” to confirm the setting and leave the setting page.
- vii Repeat steps iv~vi to complete settings of all SMS Command setting. The SMS Command (and its original corresponding command) will be listed in the SMS Command List on the SMS Command setting page.

SMS Setting Page SMS Alarm **SMS Command**

SMS Command Function Disable Enable

*Authorized Phone Numbers

SMS Command List

Command	Command String
+ Add new SMS command	
<input type="radio"/> status	GET: M-7017Z AI0, M-7017Z AI1, M-7017Z AI2
<input type="radio"/> DATA	GET: M-7055 DI0, M-7055 DI1, M-7055 DI2
<input checked="" type="radio"/> AO	SET: M-7024 AOO/2.3

Figure 9-20 : SMS command list

On Figure 8-18, taking the second SMS Command on the list as an example, when user send SMS message “DATA” to WISE, WISE will send back the data of DI0, DI1, & DI2 of the M-7055 to the command sender.

Taking the third SMS Command on the list as an example, when user send SMS message “AO” to WISE, WISE will set the value of AOO on M-7024 to be 2.3 after receiving the message.

- viii To modify the settings of a pre-set SMS Command, please click on the radio button in front of the SMS Command, and then click on “Setting” to modify the settings.
- ix To copy the settings of a pre-set SMS Command to the new SMS Command, please click the radio button in front of the pre-set SMS Command and then click “Copy”, a new SMS Command will be added to the list and the settings of the old SMS Command will be copied to this newly added SMS Command.
- x To remove a pre-set SMS Command, please click the radio button in front of the pre-set SMS Command and then click “Remove”.

- xi After you finish all the SMS Command selections and settings, click “Save” button to save the settings.

9.6 SNMP Trap Setting

SNMP Trap function allows WISE to initiative sending of the system data and IO channel data to the SNMP Manager (pre-defined in the SNMP Setting of System Setting section) in real time automatically when unusual events occur; so that the SNMP Manager can respond immediately with corresponding operations. The configuration page for SNMP Trap setting is shown as below:

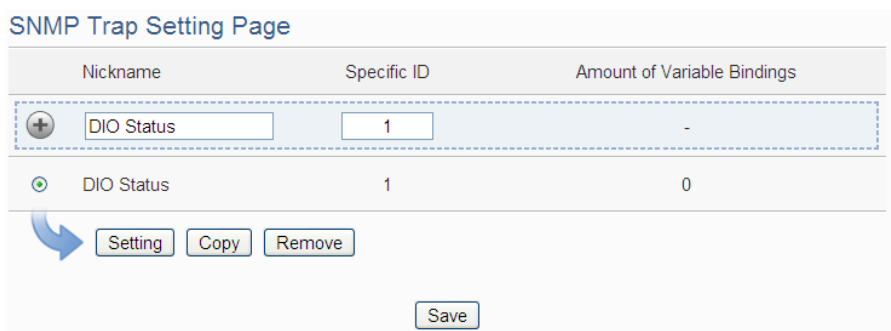



Figure 9-21 : SNMP Trap List Page

The settings steps are as below:

- i Input “Nickname” and “Specific ID” and then click  button to create a new SNMP Trap.
- ii To modify the settings of a pre-set SNMP Trap, please click on the radio button in front of the SNMP Trap, and then click on “Setting”, then the SNMP Trap Setting page will be shown as below. You can modify the settings of the SNMP Trap you selected if required.

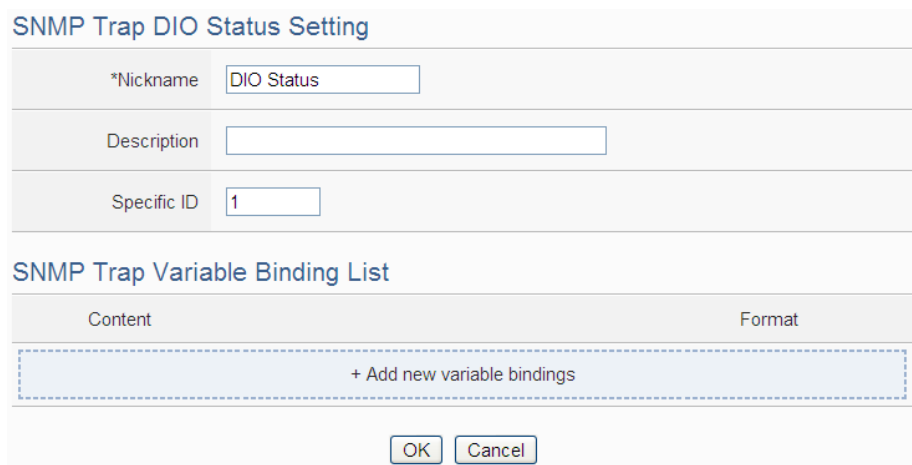


Figure 9-22 : SNMP Trap Setting page

- iii In the SNMP Trap Setting page, you can input or modify the nickname of the SNMP Trap in the “Nickname” field and you could also input the description of this SNMP Trap in the “Description” field.
- iv Input the Specified ID value of the SNMP Trap in the “Specified ID” field.
- v Click on “Add new variable bindings” to add the new variable bindings for the SNMP Trap.
- vi After clicking the “Add new variable bindings”, the Variable Binding Setting Page will appear. Select the variable type first. WISE provides two variable types as “Channel Data” and “User-Defined Data” for selection. If you select the variable type as “Channel Data” , The setting page interface will be shown as below:

■ “Channel Data” type

The screenshot shows the 'SNMP Trap Variable Binding Setting Page'. At the top, there are two radio buttons: 'Channel Data' (which is selected) and 'User-Defined Data'. Below this, under the 'Channel Data' section, there are four dropdown menus: 'Interface' (set to 'XV-Board'), 'Module' (set to 'XV308(308 Sample)'), 'Channel' (set to 'DI'), and 'Ch.' (set to '0'). Below these is a 'Format' dropdown menu set to 'Opaque(Float)'. At the bottom of the form are two buttons: 'OK' and 'Cancel'.

Figure 9-23 : “Channel Data” Type Setting Page

Based on the “Channel Data” type interface, it provides the encoded string for users to easily add one real-time I/O channel data as the variable binding in SNMP Trap each time. Select the “Interface”, “Module”, “Channel” and “Format” from the dropdown list, and click the “OK” button to add the I/O channel data to the variable bindings list of the SNMP Trap.

The following figure shows an example with three variable bindings of the SNMP Trap. The first variable binding is the XV308 DI0 data. The second variable binding is the DI2 channel data of the I-7060 that is connected to COM4. The third variable binding is the AI3 channel data of the I-7005 that is connected to COM4.

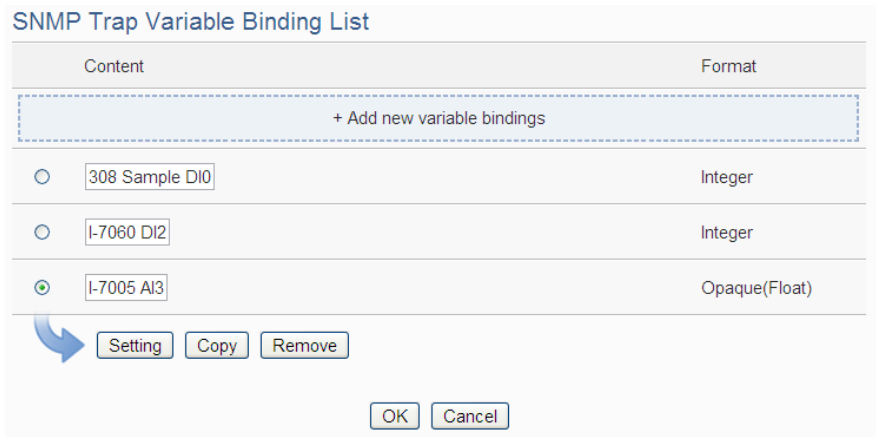


Figure 9-24 : Example of “Channel Data” Type Variable Binding List

■ “User-Defined Data” type

You can select the “User-Defined Data” as the variable type. The setting page interface will be shown as below:

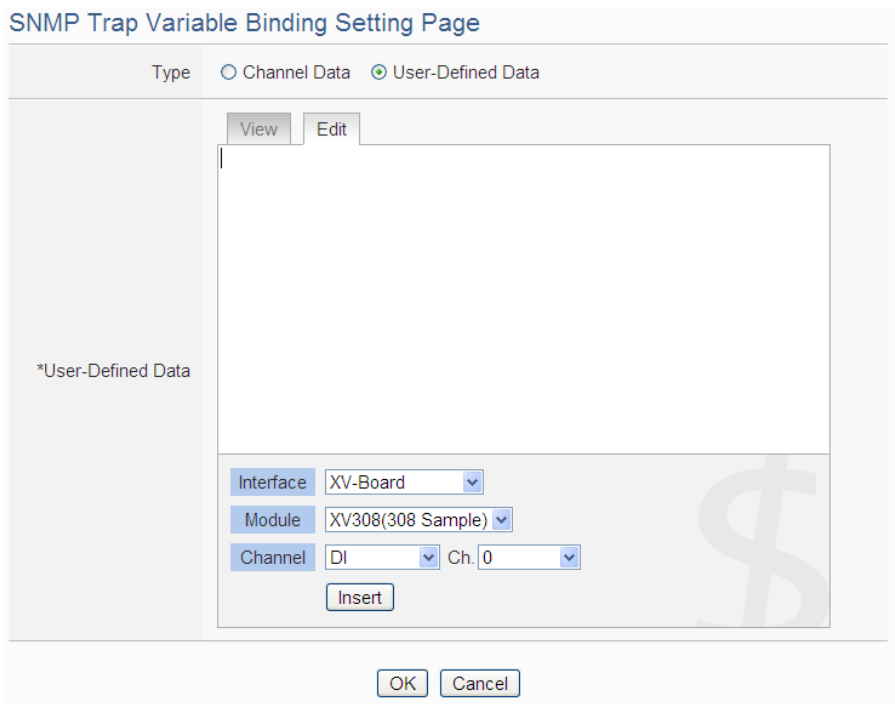


Figure 9-25 : “User-Defined Data” Type Setting Page

Set up the content in the “User-Defined Data” field. The User-Defined Data provides encoded strings for users to add real-time I/O channel data to the content easily. User can select the “Edit” tab or click on any blank area in the “User-Defined Data” field, and then the “Real-time variable editor” will be shown as

below. Input your message in the “User-Defined Data” field, and then select the “Interface”, “Module” and “Channel” from the dropdown list and click “Insert” to add channel value encoded string into the “User-Defined Data” content. The system will record the data the user pre-set in the User-Defined Data, and save the real data values in the SNMP Trap Variable Bindings. When editing the content, the user can select the “View” tab, and then the channel encoded string will be displayed in the real index format of the channel for user to check the settings in an easy way.

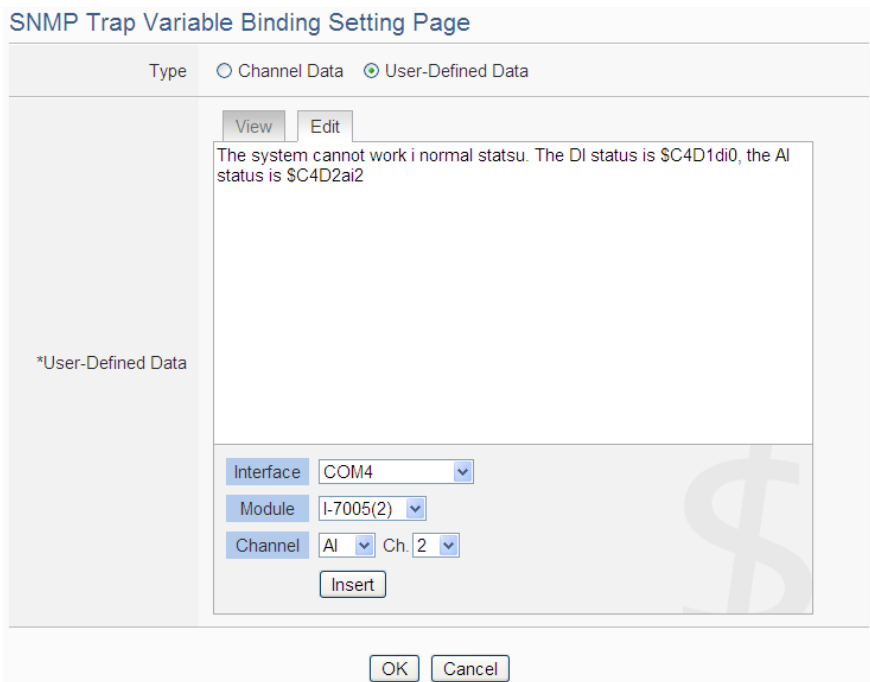


Figure 9-26 : “User-Defined Data” Interface in Edit Mode

The figure above (Figure 8-19) shows an example of the encoded strings, the variable \$C4D1di0 indicates the DI0 data of I-7060 on the module 1 that is connected to COM4, the variable \$C4D2ai2 indicates the AI2 data of I-7005 on the module 2 that is connected to COM4. When users select the “View” tab, the channel value encoded string will be displayed as below for user to check if the setting is appropriate.

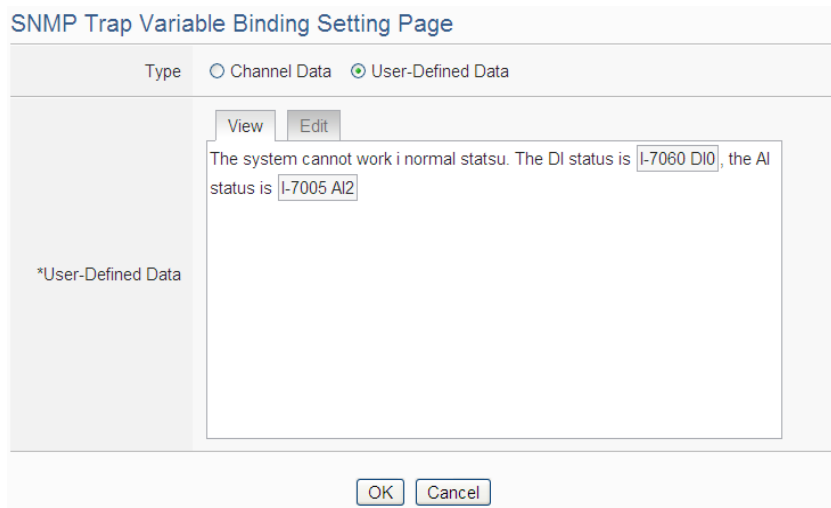


Figure 9-27 : “User-Defined Data” Interface in View Mode

- vii Click the “OK” button to confirm the variable binding setting, and return to the SNMP Trap Setting page.

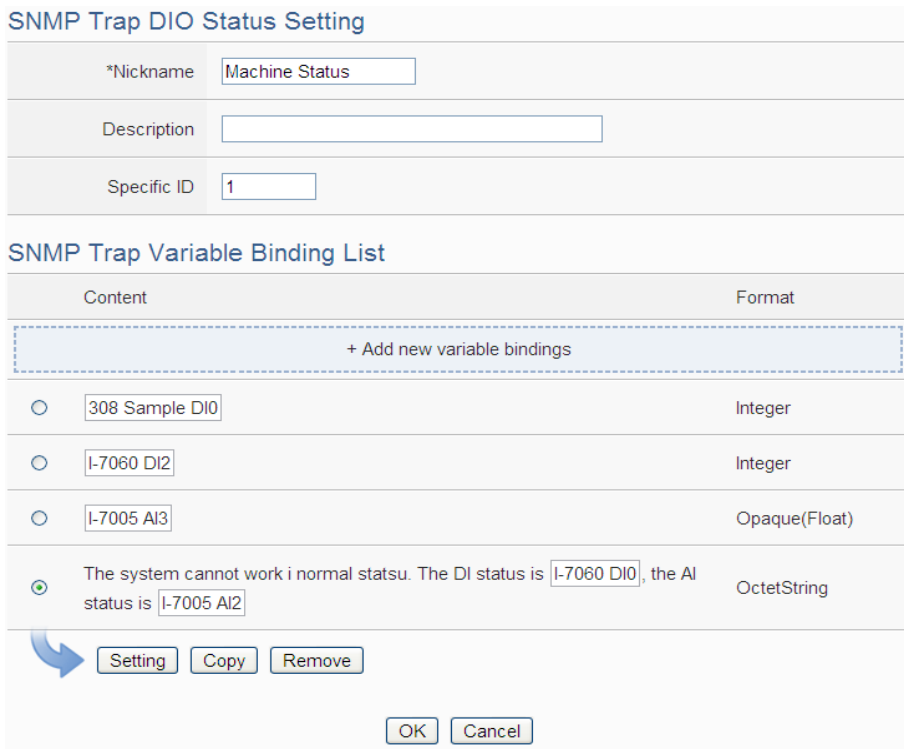


Figure 9-28 : SNMP Trap setting with variable bindings list

- viii Repeat steps v~ vii to complete settings of all variable bindings.
- ix To modify the settings of a pre-set variable binding, please click on the radio button in front of the variable binding, and then click on “Setting” to modify the settings.
- x To copy the settings of a pre-set variable binding to the new variable

binding, please click the radio button in front of the pre-set variable binding and then click “Copy”, a new variable binding will be added to the list and the settings of the old variable binding will be copied to this newly added variable binding.

- xi To remove a pre-set variable binding, please click the radio button in front of the pre-set variable binding and then click “Remove”.
- xii After you finish all the SNMP Trap settings, click “OK” button to confirm the settings, and return to SNMP Trap list.
- xiii Repeat steps i~ xii to complete settings of all SNMP Traps.
- xiv To modify the settings of a pre-set SNMP Trap, please click on the radio button in front of the SNMP Trap, and then click on “Setting” to modify the settings.
- xv To copy the settings of a pre-set SNMP Trap to the new SNMP Trap, please click the radio button in front of the pre-set SNMP Trap and then click “Copy”, a new SNMP Trap will be added to the list and the settings of the old SNMP Trap will be copied to this newly added SNMP Trap.
- xvi To remove a pre-set SNMP Trap, please click the radio button in front of the pre-set SNMP Trap and then click “Remove”.
- xvii After you finish all the SNMP Trap settings, click “Save” button to save the settings.

9.7 CGI Command Setting

CGI command function is the important function for real-time message communication. WISE supports fully CGI command operations as CGI command sending and CGI command receiving. The CGI command sending function can be added to the logic edition as part of logic control in response to specific events. The CGI command receiving function let WISE can receive CGI commands from others network devices. The content of CGI command receiving can be used in IF condition statements to trigger the THEN/ELSE actions.

After the user completing the settings of a CGI Server, WISE will automatically create a mapping folder under the CGI directory in the microSD card. The new folder will use the nickname of the CGI Server as the folder name, however, if the CGI Server's nickname is not in English format or numbers; the new folder will use the IP address of the CGI Server as the folder name. After the CGI command receiving function is enabled and requires the response of CGI Server to be saved; the response from the

CGI Server will be saved as files in its mapping CGI Server folder. The files inside the folder will be classified automatically by date. User can also enable the file transfer operation, then the WISE will send back all files inside the folder to the remote FTP Server. The configuration page for CGI command sending and CGI command receiving setting is shown as below.

9.7.1 The setting of CGI command sending

WISE supports the CGI command sending function. This function allows sending pre-input CGI Commands to pre-set Remote CGI Server devices under certain conditions. The configuration page is shown as below:



Figure 9-29 : CGI Command Server List Page

The settings steps are as below:

- i Click the “CGI Sending” Tab on the right-top corner of the CGI command Setting page.
- ii Click on “Add new CGI Servers” to add the new CGI servers which will receive the CGI commands.
- iii After clicking the “Add new CGI Servers”, the CGI Server Setting Page will appear. The setting page interface will be shown as below:

CGI Server CGI Server 2 Setting

*Nickname	CGI Server 2
Description	
*CGI Server Address	
Port	80
Authentication	<input type="checkbox"/> Enable
Retry Count	0 times
File Transfer	Do not upload to any FTP server

CGI Command Setting

Nickname	CGI Command
+ Add new CGI command	

OK Cancel

Figure 9-30 : CGI Command Server Setting page

- iv In the CGI Server Setting Page, you can input the name of the remote CGI Server in the “Nickname” field and you could also input the description of this CGI Server in the “Description” field.
- v Enter the remote CGI Server IP address (or domain name) and Port number in the related fields.
- vi If the remote CGI Server requires account and password validation, please select the “Enable” checkbox in the Authentication field, and continue steps vii~ix to login into the remote CGI Server. If the remote CGI Server doesn’t need account and password validation, uncheck the “Enable” checkbox and go directly to step x.

Authentication

Enable

Method Basic

*ID

Password

- vii In the “Method” field, select the Authentication method from the dropdown list. It will be “Basic” or “Digest”.
- viii Enter the CGI Server login ID in the “ID” field.
- ix Enter the CGI Server login password in the “Password” field.
- x Enter the number in the “Retry Count” field. It means the retry number WISE will try when it can’t connect to the remote CGI

- Server device.
- xi In the “FTP Transfer” field, please specify the FTP Servers to receive the CGI Server files that sent by the WISE. The content on the “FTP Transfer” dropdown list will be the same as the content on the “FTP Server” dropdown list of Data Logger. Please refer to “7.5 FTP Server Setting” section for detailed settings.
 - xii After the setting of remote CGI Server, please continue the steps as below for the CGI Command setting. The setting page interface will be shown as below:

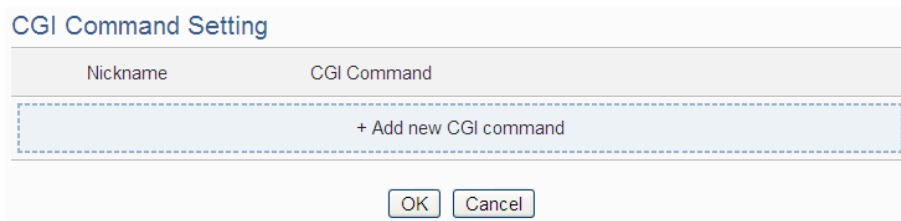


Figure 9-31 : CGI Command List Page

- xiii Click on “Add new CGI Command” to add the new CGI Command which will be sent by WISE to the remote CGI Server. The setting page interface will be shown as below:

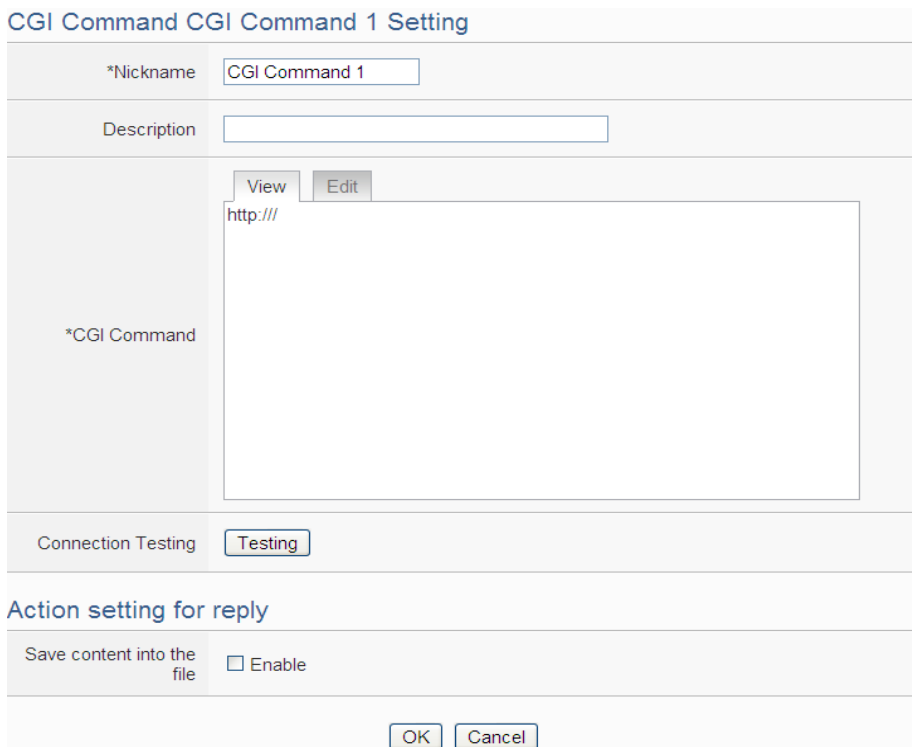


Figure 9-32 : CGI Command (Sending) Setting page

- xiv In the CGI Command Setting Page, you can input the name of the CGI Command in the “Nickname” field and you could also input the description of this CGI Command in the “Description” field.
- xv Enter the content of the CGI Command in the “CGI Command” field. In addition, it provides encoded strings for users to add current I/O channel value or Internal Register value into the CGI Command content. To make it easy to add the encoded string, WISE provides “Real-time variable editor” for operation. Please refer to “7.2 User-Defined Data Logger” for more detailed information of the “Real-time variable editor”.
- xvi To verify if the setting of the CGI Server and the CGI Command is correct or not, please click “Testing” in the “Connection Testing” field, then WISE will send the CGI Command the user entered to the remote CGI Server for testing.
- xvii If the CGI Command send by WISE will trigger the CGI Server to send back a reply to WISE, users can select the “Enable” checkbox in the “Save content into the file” field to enable WISE to save the content of the reply of the CGI command into a file. The file can be sent as the attached file by the WISE Email function.
- xviii After complete all settings, click the “OK” button to confirm the CGI Command setting, and return to the CGI Server Setting page.
- xix Repeat steps xii~ xvii to complete settings of all CGI Commands.
- xx To modify the settings of a pre-set CGI Command, please click on the radio button in front of the CGI Command, and then click on “Setting” to modify the settings.
- xxi To copy the settings of a pre-set CGI Command to the new CGI Command, please click the radio button in front of the pre-set CGI Command and then click “Copy”, a new CGI Command will be added to the list and the settings of the old CGI Command will be copied to this newly added CGI Command.
- xxii To remove a pre-set CGI Command, please click the radio button in front of the pre-set CGI Command and then click “Remove”.
- xxiii After you finish all the CGI Command settings, click “OK” button to confirm the settings, and return to CGI Server List page.
- xxiv Repeat steps i~ xxii to complete settings of all CGI Servers.
- xxv To modify the settings of a pre-set CGI Server, please click on the radio button in front of the CGI Server, and then click on “Setting” to modify the settings.

- xxvi To copy the settings of a pre-set CGI Server to the new CGI Server, please click the radio button in front of the pre-set CGI Server and then click “Copy”, a new CGI Server will be added to the list and the settings of the old CGI Server will be copied to this newly added CGI Server.
- xxvii To remove a pre-set CGI Server, please click the radio button in front of the pre-set CGI Server and then click “Remove”.
- xxviii After you finish all the CGI Server settings, click “Save” button to save the settings.

9.7.2 The setting of CGI command receiving

WISE supports the CGI command receiving function. This function allows WISE to receive the CGI command from other network devices. The content of CGI command can be used in IF condition statements to trigger the THEN/ELSE actions. The configuration page for CGI command receiving setting is shown as below:

The screenshot shows the 'CGI Command Setting Page' with three tabs: 'CGI Sending' and 'CGI Receiving' (highlighted with a red box). Below the tabs are two rows, each with a label ('Variable Name' and 'Source Address') and an 'Add' button. A text area labeled 'CGI Query Example' contains the URL 'http://192.168.100.102/dll/cgi.dll'. A 'Save' button is located at the bottom center of the page.

Figure 9-33 : CGI Command (Receiving) Setting page (1)

The settings steps are as below:

- i Click the “CGI Receiving” Tab on the right-top corner of the CGI Command Setting page.
- ii Click on “Add” button in the “Variable Name” field to add variables which will be used in the CGI command. After add the variables, the system will display the usage of the variables in the receiving CGI command in the red rectangle area as below for reference. Following is an example.

User creates two variables “DO” and “AO” in the variable adding process, the system will show the usage format of the CGI command as “<http://192.168.100.102/dll/cgi.dll?DO=value&AO=value>”. It means the remote network devices can send the CGI command to

WISE (with IP address 192.168.100.102). After WISE receives the CGI command, it will immediately update the value of “DO” and “AO” variables in WISE kernel engine. If the “DO” or “AO” variables are used in the IF condition statements of WISE logic rules, WISE will also evaluate the result of the IF condition and trigger the related the THEN/ELSE actions.

The screenshot shows the 'CGI Command Setting Page' with three tabs: 'CGI Command Setting Page', 'CGI Sending', and 'CGI Receiving'. Under 'Variable Name', there are input fields for 'DO' and 'AO', each with a 'Remove' button, and an 'Add' button below. Under 'Source Address', there is an 'Add' button. A 'CGI Query Example' field is highlighted with a red border, containing the text: `http://192.168.100.102/dll/cgi.dll?DO=value&AO=value`. A 'Save' button is located at the bottom.

Figure 9-34 : CGI Command (Receiving) Setting page (2)

Please Note: If you have enabled CGI Query Authentication Setting in the “[Security Setting](#)” page, you have to add the parameters (&id=“current_account”&password=“current_password”) into the CGI command.

- iii Click on “Add” button in the “Source Address” field. It means WISE can recognize the received CGI commands from the IP address which user defines. User can use the “Source Address” of CGI command in the IF condition setting.

The screenshot shows the 'CGI Command Setting Page' with three tabs: 'CGI Command Setting Page', 'CGI Sending', and 'CGI Receiving'. Under 'Variable Name', there are input fields for 'DO' and 'AO', each with a 'Remove' button, and an 'Add' button below. Under 'Source Address', there are two rows of IP address input fields: the first row contains '192', '168', '100', '23' with a 'Remove' button; the second row contains '192', '168', '100', '43' with a 'Remove' button. An 'Add' button is below the second row. A 'CGI Query Example' field contains the text: `http://192.168.100.102/dll/cgi.dll?DO=value&AO=value`. A 'Save' button is located at the bottom.

Figure 9-35 : CGI Command (Receiving) Setting page (3)

- iv After you finish all the CGI command receiving settings, click “Save” button to save the settings.

9.8 LINE Notify Setting

WISE provides LINE Notify message sending function. With this function, WISE can send the text messages, send messages with snapshots from iCAM series IP cameras, and forward image files captured by other devices to LINE personal account or group chat rooms via LINE Notify official account. To send the LINE Notify message, users have to apply a LINE Notify service first and connect the service with the personal account or chat room to be sent. Please refer to the LINE Notify guide webpage on WISE official webpage for the application and connection of LINE Notify service. The configuration page for LINE Notify message setting, “Forward” setting, and chat room setting is shown as below.

9.8.1 Message Setting

In the Message setting page, users can edit the LINE messages with pre-input strings and realtime I/O channel data. The configuration page is shown as below:

LINE Notify Message Setting Page		
Message Forward Chat Room		
Nickname	Content	Amount of Chat Room
+ Add new message		
Save		

Figure 9-36 : LINE Notify Message Setting page (1)

The settings steps are as below:

- i Make sure the “Message” Tab is selected.
- ii Click “Add new message”, the LINE Notify Message Setting page will appear as following:

The screenshot shows a web form titled "Message Message 1 Setting". It has several sections:

- *Nickname: A text input field containing "Message 1".
- Description: An empty text input field.
- *Content: A large text area with "View" and "Edit" buttons above it.
- *Chat Room: A dropdown menu with the selected option "Do not upload to any chat room".

 At the bottom right, there are "OK" and "Cancel" buttons.

Figure 9-37 : LINE Notify Message Setting page (2)

- iii Input name in the “Name” field and you could also input the description of this LINE message in the “Description” field.
- iv Enter the message content in the “Content” field. LINE message provides an encoded string for you to add current I/O channel data or Internal Register data into LINE messages. To make it easy to add the encoded string, WISE provides “Real-time variable editor”. Please refer to “[7.2 User-Defined Data Logger](#)” for more detailed information of the “Real-time variable editor”.

This screenshot shows the same form as Figure 9-37, but with the *Content field populated. The content is:


```
LINE Notify
$$Ty$$STM/$$STd. $$Th $$STm:$$STs
```

 Below the text area, there is a sub-interface with:

- Interface: A dropdown menu showing "System Information".
- Item: A dropdown menu showing "Time(Second)".
- Insert: A button.

 The *Chat Room dropdown remains "Do not upload to any chat room". "OK" and "Cancel" buttons are at the bottom.

Figure 9-38 : LINE Notify Message Setting page (3)

- v In the “Chat Room” field, please specify the Chat rooms which will receive the message WISE send. WISE can send the messages to multi-chat rooms simultaneously. Users can directly click on the “Add new Chat Room” to connect with a new chat room, please refer to the section “9.8.3 Chat Room Setting”.

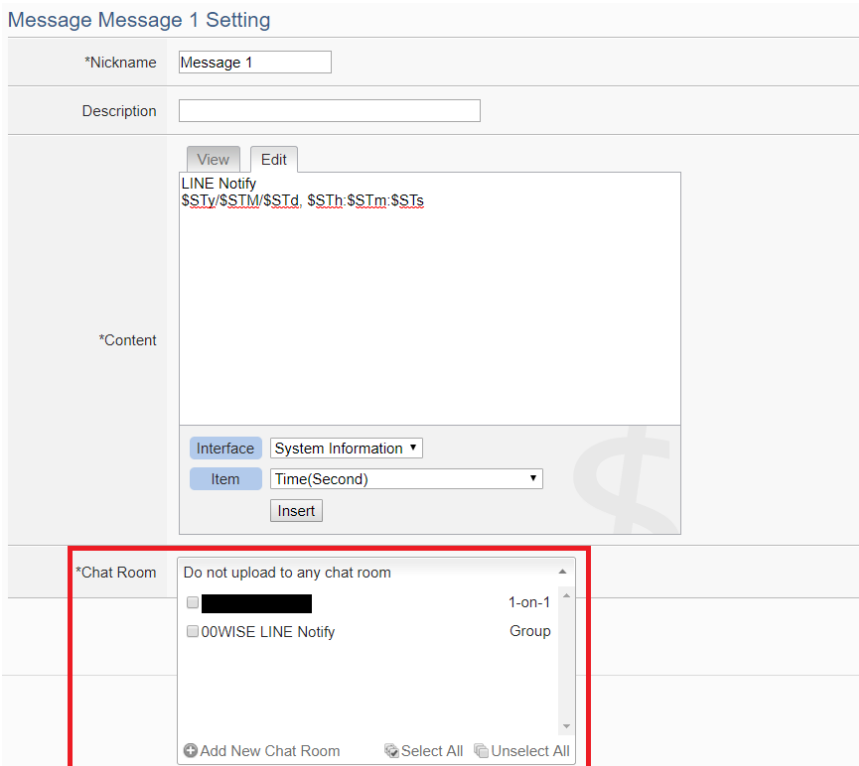


Figure 9-39 : LINE Notify Message Setting page (4)

- vi After complete all settings, click the “OK” button to confirm the LINE Notify message setting, and return to the Message Setting page.
- vii Repeat steps ii~vi to complete settings of all LINE Notify messages.
- viii After you finish all the LINE Notify Message settings, click “Save” button to save the settings.

9.8.2 Forward Setting

WISE supports the message forward function to send the image files with LINE Notify service after version 1.5.0 firmware upgrade. It can send messages with image in JPG or PNG format. The source of the image files includes following type:

- Upload files to the specific path (/Sendbox/LINE) of the FTP

server on the WISE, and then WISE would forward messages with the files automatically.

- Connect to iCAM series IP cameras. WISE can collect the snapshots captured by iCAM cameras.
- Connect to CGI servers and get the images with CGI commands. (For example, users can use WISE controllers to connect with general IP cameras, and get snapshots with CGI commands.)

The Forward Setting page is as below:

LINE Notify Forward Setting Page			
Sendbox	Function Status	Content of Attached Message	Amount of Chat Room
<input checked="" type="radio"/> Local FTP Server /Sendbox/LINE	Disable		0
<input type="radio"/> IP Camera	Function Status	Content of Attached Message	Amount of Chat Room
<input type="radio"/> iCAM-771 (192.168.100.219:80)	Disable		0
<input type="radio"/> CGI Server	Function Status	Content of Attached Message	Amount of Chat Room
<input type="radio"/> Test (192.168.100.179:80)	Disable		0

Setting Save

Figure 9-40 : LINE Notify Forward Setting page(1)

Users can upload image files to the FTP server of the WISE controller (the path is /Sendbox/LINE), and WISE would send LINE messages with the image files to the specified LINE chat room. When users connect WISE with iCAM series IP Cameras, the “Forward” setting page will show the list of connected IP cameras. Users can enable the “Forward” function to let WISE automatically send the image files of the IP camera to the specified LINE chat room when the IP camera triggered by the following actions:

- Use IF-THEN-ELSE rule to trigger a snapshot action of the connected IP Camera.
- The events of IP Camera (Motion Detection, Schedule Snapshot, GPIO) are triggered and the pictures are sent to the WISE controller.

In addition, when the WISE controller connect with a CGI server (ex. IP camera), and get the snapshots from the CGI server through CGI commands. These files also can be forwarded to the specified LINE chat rooms.

The forward setting of each file source is independent. When the forward function is enabled, you have to edit an message which will be sent with the image. The settings steps are as below:

- i Click on the “Forward” tab at the right-upper corner of the LINE Notify setting page.
- ii To forward the desired files, please specify and click on the radio button of the file source, and click the “Setting” button to enter the setting page.
- iii Check the “Enable” function, and then the message setting interface will be shown as below. Please refer to the section “9.8.1 Message Setting” to complete the setting.

Sendbox Local FTP Server(/Sendbox/LINE) Forward Setting

Function Status Enable

*Content of Attached Message

View Edit

The image will be sent to the chat room with this message.

*Chat Room Do not upload to any chat room

OK Cancel

Figure 9-41 : LINE Notify Forward Setting page(2)

- iv After you finish all the forward settings, click “Save” button to save the settings. After enable the “Forward” function and complete the message settings, the snapshots and event pictures will be sent to the LINE chat room which is assigned in the message setting.

9.8.3 Chat Room Setting

WISE send LINE messages to the chat room which is connected to the service. Users can add or manage chat rooms via the Chat Room setting page. The setting interface is as below:

LINE Notify Chat Room Setting Page			Message	Forward	Chat Room
Nickname	Type	Access Token			
+ Add new chat room					
Save					

Figure 9-42 : LINE Notify Chat Room Setting page (1)

The settings steps are as below:

- i Click “Add new chat room”, the LINE Notify Connection Setting page will appear as below. Input the Client ID and Client Secret of the applied service and click the “Send” button, the LINE login interface will appear if the client data was correct. If you do not apply the service before, click the link of “No Client ID and Client Secret?” at the lower area of the windows. It will lead you to the LINE Notify teaching website on the WISE official webpage.

LINE × **ICP DAS**

Submit

No Client ID and Client Secret?

Figure 9-43 : LINE Notify Chat Room Setting page (2)

- ii When the LINE login interface appears, login with the account which will receive the messages from WISE.

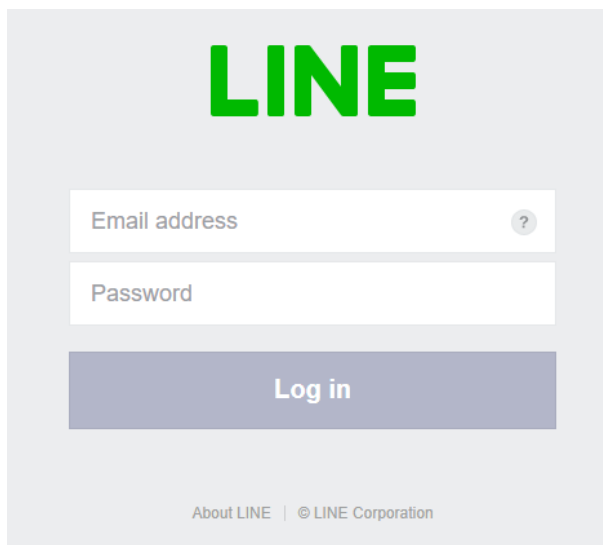


Figure 9-44 : LINE Notify Chat Room Setting page (3)

- iii After login, select this account(one-to-one) or a group under this account which WISE will connect to.

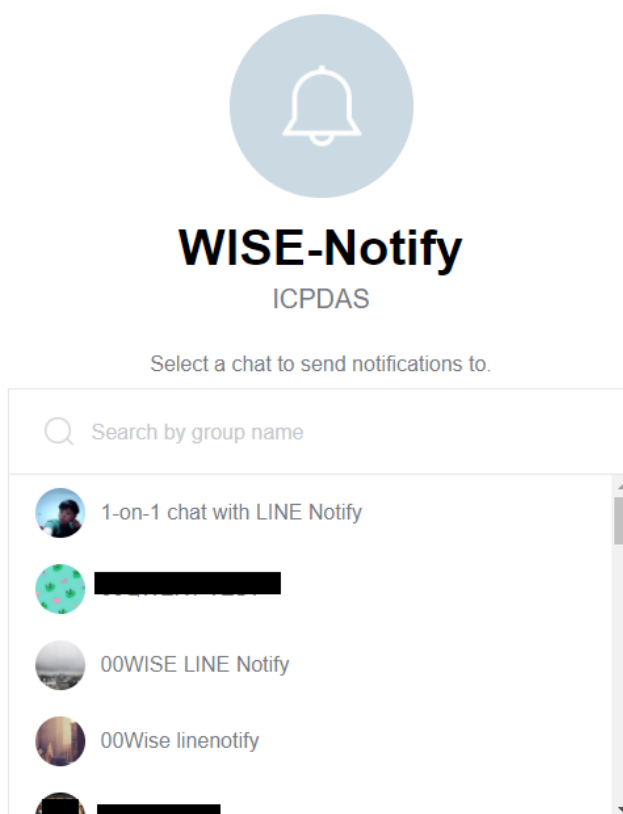


Figure 9-45 : LINE Notify Chat Room Setting page (4)

- iv After the connection procedure is complete, the new chat room

will appear in the list, and it can be selected in the message setting page.

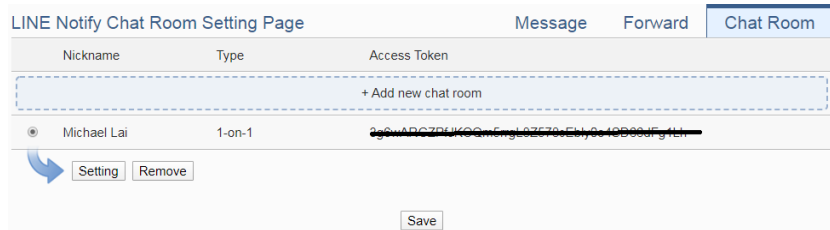


Figure 9-46 : LINE Notify Chat Room Setting page (5)

- v After you finish all the LINE Notify Chat Room settings, click “Save” button to save the settings.

Please Note:

- The limit of LINE Notify service to each chat room:
 - **The number of text message: 1000 per hour.**
 - **The number of image message: 50 per hour.**
 - WISE would not calculate the number of messages sent. The message sending operation would be fail if the number of message sent is over the limitation.
 - If you copy the WISE rule file from one WISE controller to another, they would share the quota of messages. You can re-connect the chat room to avoid this problem.
 - WISE can only send:
 - ◆ Text message
 - ◆ image(JPG or PNG format, 1024*1024, smaller than 1MB)
 - ◆ **Not allow to send videos**
- To send LINE messages to multi-LINE accounts with WISE series modules, we suggest you can create a group with LINE APP first, and connect this group with the LINE Notify service, then you can invite the other LINE accounts to join the group to receive the messages from WISE.
- **To perform the chat room setting, please confirm that the WISE controller is connected with internet. The setting could only be done by connecting with LINE Notify server.**
- **LINE Notify sending function sends messages to the port 443 of LINE Notify server. If the WISE controller is located behind a firewall, please confirm the sending would not be blocked.**

9.9 Active I/O Sending Setting

WISE equips the “Active I/O sending” function. There are two parts in this function: “I/O Data Table Setting” and “Active Sending of I/O Data Table”. Even though WISE allows to connect with multiple I/O modules at the same time, however, the channel data of each I/O module that WISE received is located in the different Modbus Address memory block of WISE. Therefore, when using SCADA software to retrieve the data, the SCADA software must poll each I/O module’s channel data separately. It is impossible to poll all WISE I/O modules’ channels data at one time. In order to improve the efficient of the data communication between WISE and SCADA software, WISE provides “Active I/O Sending” function. It allows to copy the I/O channels data from different I/O modules and puts them into a continuous Modbus address memory block, and then SCADA software can retrieve all I/O channel data from different modules by using one single Modbus command. Comparing to traditional polling mechanism, it will greatly save time and polling attempts.

Please note: The SCADA software must equip the Modbus TCP Slave function to receive the content of I/O Data Table that sent by WISE.

9.9.1 I/O Data Table Setting

The settings steps are as below:

- i Click on the “Table Setting” tab at the right-upper corner of the Active I/O Sending setting page.

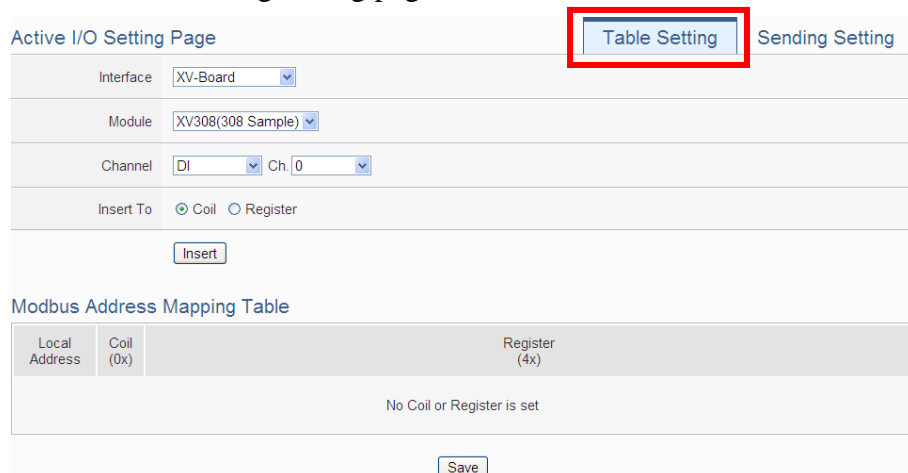


Figure 9-47 : I/O Data Table Setting page (1)

- ii Select the “Interface”, “Module” and “Channel” from the dropdown list to identify the I/O channel which will be inserted into the I/O Data Table.
- iii Please select the area which the I/O channel will be inserted into.
 There are two data types for the I/O Data Table: “Coil” and “Register”. The I/O module’s DI/DO/Coil Output/Discrete Input channel data can be saved in the “Coil” area of the I/O Data Table or be saved in the Register area of the I/O Data Table in binary format. Each Register can store 16 Coil data. The I/O module’s AI/AO/Input Register/Holding Register channel data and Internal Register data can be saved in the “Register” area of the I/O Data Table.

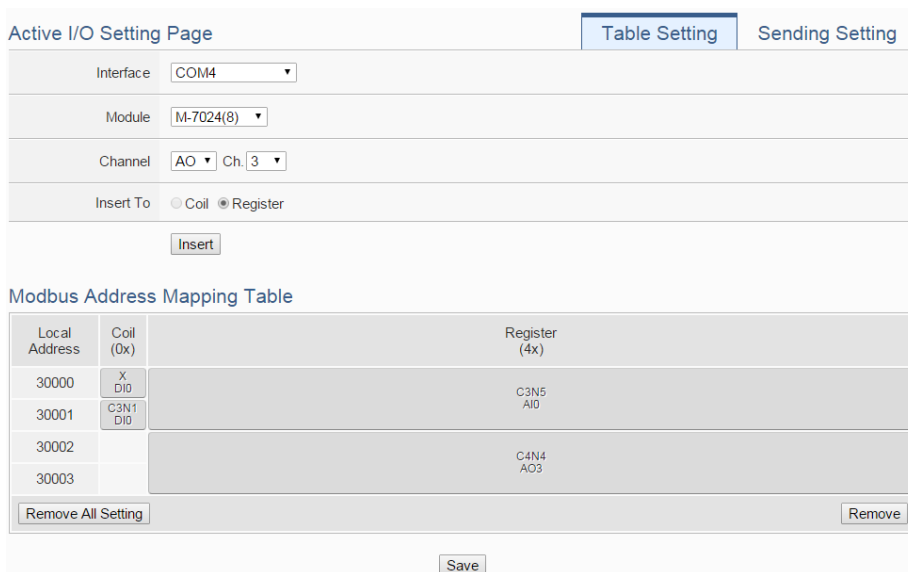


Figure 9-48 : I/O Data Table Setting page (2)

- iv When you complete the setting of Interface, Module and Channel, please click the “Insert” button to add the channel of the I/O module into the I/O Data Table.
- v If you want to change the position of the I/O channel in the I/O Data Table, please left-click the I/O channel by mouse, and drag it up or down to arrange the new position of the I/O channel. When the I/O channel arrive the right position, release the mouse left-button to let the I/O channel be at the new location.
- vi If you want to remove one I/O channel of the I/O Data Table, please click the I/O channel by mouse, then click the “Remove” button which is located at the right-lower corner of the I/O Data Table to remove the I/O channel.
- vii If you want to remove all I/O channel of the I/O Data Table, please

directly click the “Remove All Setting” button which is located at the left-lower corner of the I/O Data Table to remove all I/O channels.

viii After you finish the I/O Data Table settings, click “Save” button to save the settings.

9.9.2 Active Sending of I/O Data Table

The settings steps are as below:

- i Click on the “Sending Setting” tab at the right-upper corner of the Active I/O Sending setting page.

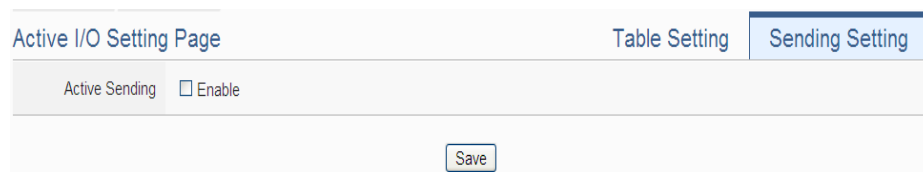


Figure 9-49 : “Active Sending of I/O Data Table” Setting page (1)

- ii Enable the “Active Sending” function, and then the setting interface will be shown as below.

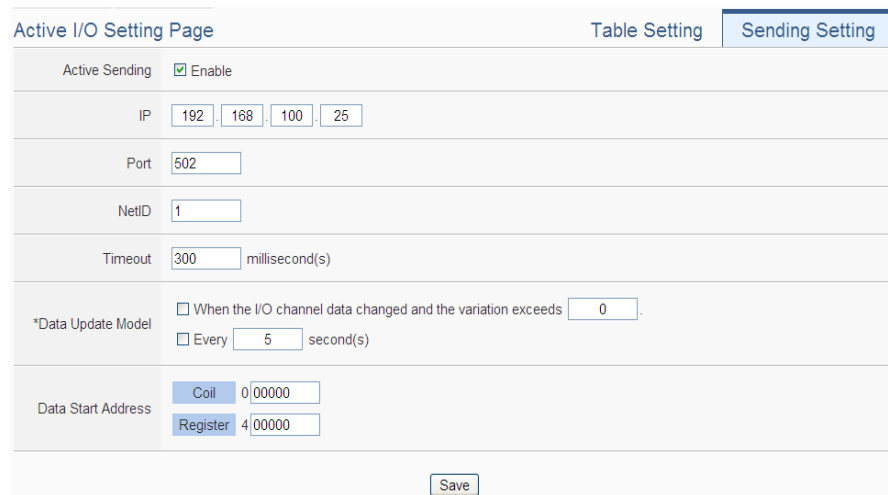


Figure 9-50 : “Active Sending of I/O Data Table” Setting page (2)

- iii Complete the receiver’s (SCADA software) IP address, the Modbus TCP Slave’s Port number, NetID and Timeout value setting. Make sure all the setting is the same as the settings of the receiver (SCADA software). If the setting is not accurate, the connection for WISE to the receiver (SCADA software) will be failed.
- iv Please select the timing to send back the data of I/O Data Table.

There are two options for the “Data Update Model”, one option is to send out the data when the I/O channel data change takes place, the other is to send out the data at periodic time schedule. The two options can be enabled concurrently.

Please note. If the “Data Update Model” you select is “I/O channel data change takes place”, please remember to input the variation value. It mean if the Analog I/O channel data change takes place, and exceed the variation value, then WISE will send back the data of I/O Data Table. This setting will be helpful to avoid signal oscillation that may result in instability to the status changes and let WISE send the data of I/O Data Table too frequently.

- v In the “Start Address” field, set up the start address which the receiver (SCADA software) will use to save the data of I/O Data Table from WISE.
- vi After you finish the “Active I/O sending” settings, click “Save” button to save the settings.

9.10 Channel Status Setting

Channel Status function offers all WISE login account an easy way to view monitoring page that allows users to view important controller information (Internal Register value, I/O module list and I/O channel value) in real time without SCADA software. In addition, the Administrator login account can update the value of Internal Register or I/O output channel (DO/AO/Coil Output/Holding Register) by the interface WISE provide.

In order to let users browse the I/O channel value in a flexible and efficient way, WISE provide two I/O value display interfaces as below.

- Default Channel Status page: It displays all I/O channel status based on the sorting of all I/O Module (Default style).
- User-defined Channel Status page: It displays the I/O channel status based on the user-defined arrangement.

The settings steps for User-defined Channel Status page are as below:

- i Click on “Add new Channel Status page” to add the new Channel Status page which will be used to display the I/O channel data.

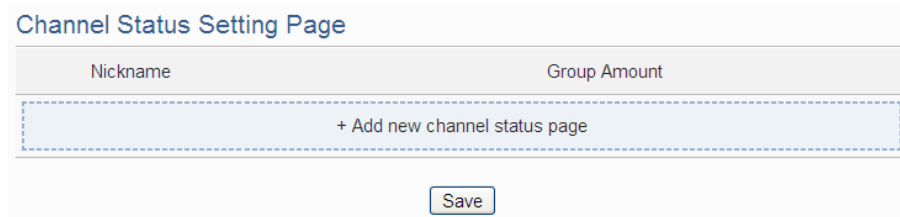


Figure 9-51 : Channel Status List Page

- ii After clicking the “Add new Channel Status page”, the Channel Status setting page will appear. The setting page interface will be shown as below:
- iii In the Channel Status setting page, please input the name of the page in the “Nickname” field and you could also input the description of this page in the “Description” field.

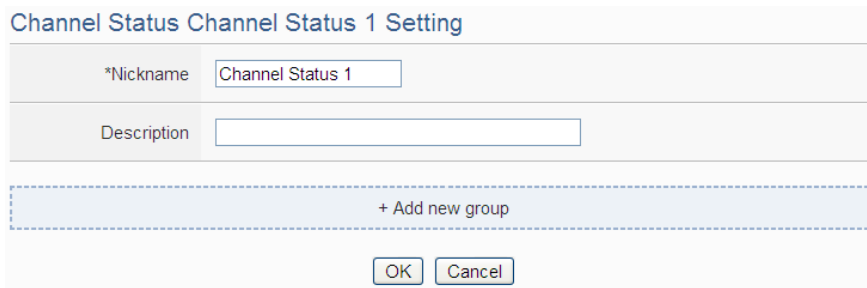


Figure 9-52 : Channel Status Setting Page

- iv Click on “Add new Group” to add a new group which will be included in the User-defined Channel Status page.

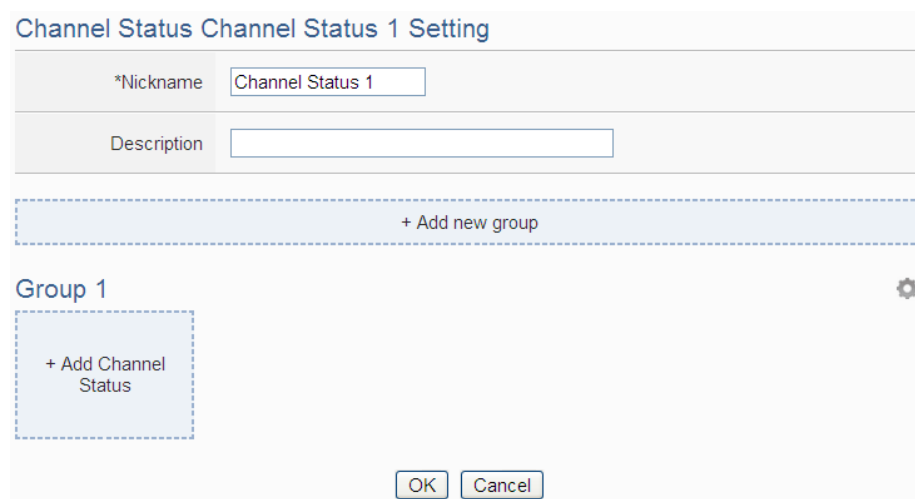


Figure 9-53 : Add a new group


- v Click on “Add Channel Status” to add a new I/O channel into the group.



Select the “Interface”, “Module” and “Channel” from the dropdown list and click “Add” to add the new I/O channel into the group.

Figure 9-54 : Add I/O Channels into Group

- vi Repeat steps iv~ v to complete the I/O channel settings for all groups.

Figure 9-55 : Multi-Groups Setting in User-defined Channel Status page

- vii If the User-defined Channel Status page includes many groups, users can click on the  icon on the right-top corner of each group, and

then the system will display the tool bar . Now user can click on the icon of the tool bar  to arrange the order of the group, remove the group or change the name of the group. After complete all setting, please click on the I/O channel data area to return to the normal status.

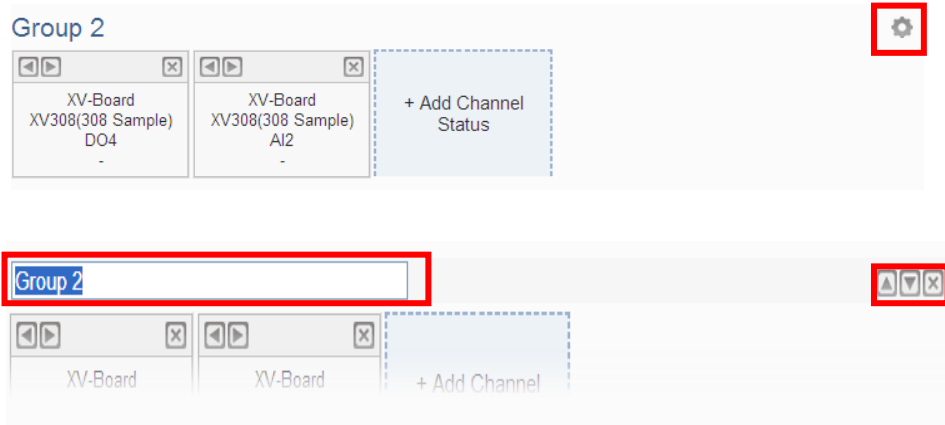


Figure 9-56 : Tool bar of User-defined Channel Status page

- viii Click the “OK” button to confirm the setting for the User-defined Channel Status page, and return to the User-defined Channel Status page list interface.
- ix Repeat steps i~ viii to complete the setting for all User-defined Channel Status pages.
- x To modify the settings of a pre-set User-defined Channel Status page, please click on the radio button in front of the User-defined Channel Status page, and then click on “Setting” to modify the settings.
- xi To copy the settings of a pre-set User-defined Channel Status page to the new User-defined Channel Status page, please click the radio button in front of the pre-set User-defined Channel Status page and then click “Copy”, a new User-defined Channel Status page will be added to the list and the settings of the old User-defined Channel Status page will be copied to this newly added User-defined Channel Status page.
- xii To remove a pre-set User-defined Channel Status page, please click the radio button in front of the pre-set User-defined Channel Status page and then click “Remove”.
- xiii After you finish all the User-defined Channel Status page settings, click “Save” button to save the settings.

9.11 Ping Setting

WISE provides the Ping function to detect the connection status between the WISE controller and specified Ethernet devices. The results of Ping function can be used as IF conditions. The settings steps are as below:

- i Click on “Add new Ping” to add a new Ping target.

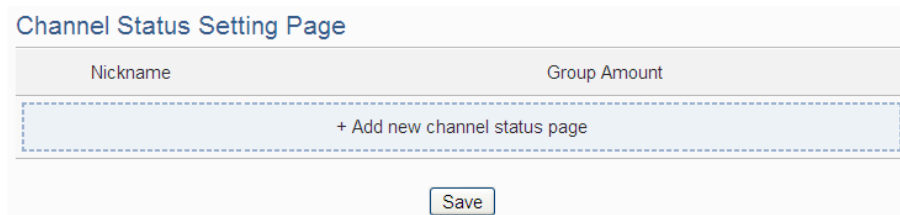


Figure 9-57 : Ping List Page

- ii After clicking the “Add new Ping”, a setting page will appear, input a name in the “Nickname” field and you could also input the description of this email in the “Description” field; shown as below:

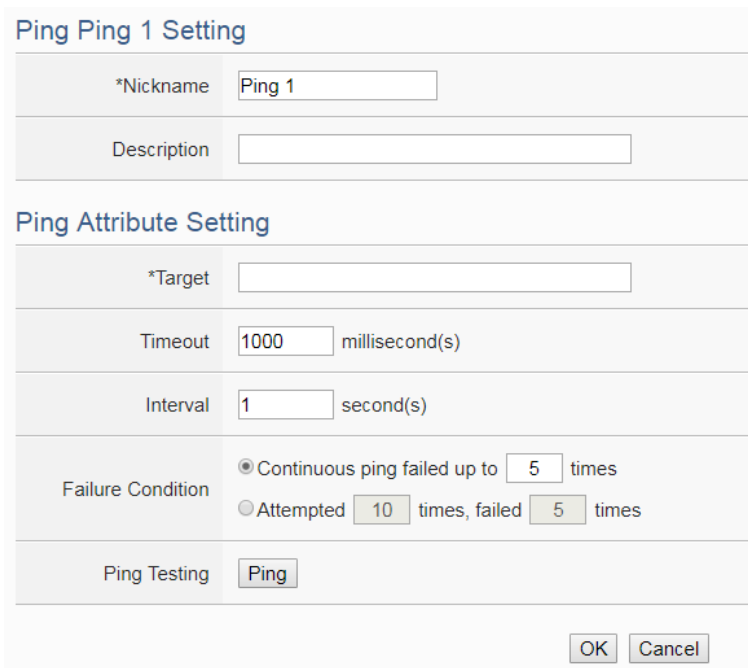


Figure 9-58 : Ping Setting Page

- iii In the “Target” field, enter the IP or the domain name of the target to be pinged.
- iv In the “Timeout” field, enter the timeout value of the Ping function for waiting the response. The unit will be millisecond (ms).
- v In the “Interval” field, set the time interval to specify how often the

- WISE will automatically ping the target. The unit will be second (sec).
- vi In the “Failure Condition” field, select the judgment method to check the Ping IF condition. If you select “Continuous ping failed up to X times”, you can set the continuous failed times with a number between 1 to 60. The Ping status would become failure when the ping action failed continuously and the failed number exceeds the number you set. If you select “Attempted X times, failed Y times”, WISE would check the latest X ping results, if the failed number exceeds the number Y, the Ping status would become failure.
 - vii User can click the “Ping” button in the “Ping Testing” field to test the Ping status between the WISE controller and the target.
 - viii Click on “OK” to confirm the setting and return to the Ping list page.
 - ix Repeat steps ii~ vi to complete settings of all Pings.
 - x After you finish all the Ping settings, click “Save” button to save the settings.

10 Rules Setting

After finishing all Advanced Setting configurations, you can start to edit IF-THEN-ELSE rules. Click the “Rules Setting” button, a list of rules will be displayed on the left side of the page, and at the right side of the page will show detailed content of each rule that was previously defined. The rule setting page is shown as below:

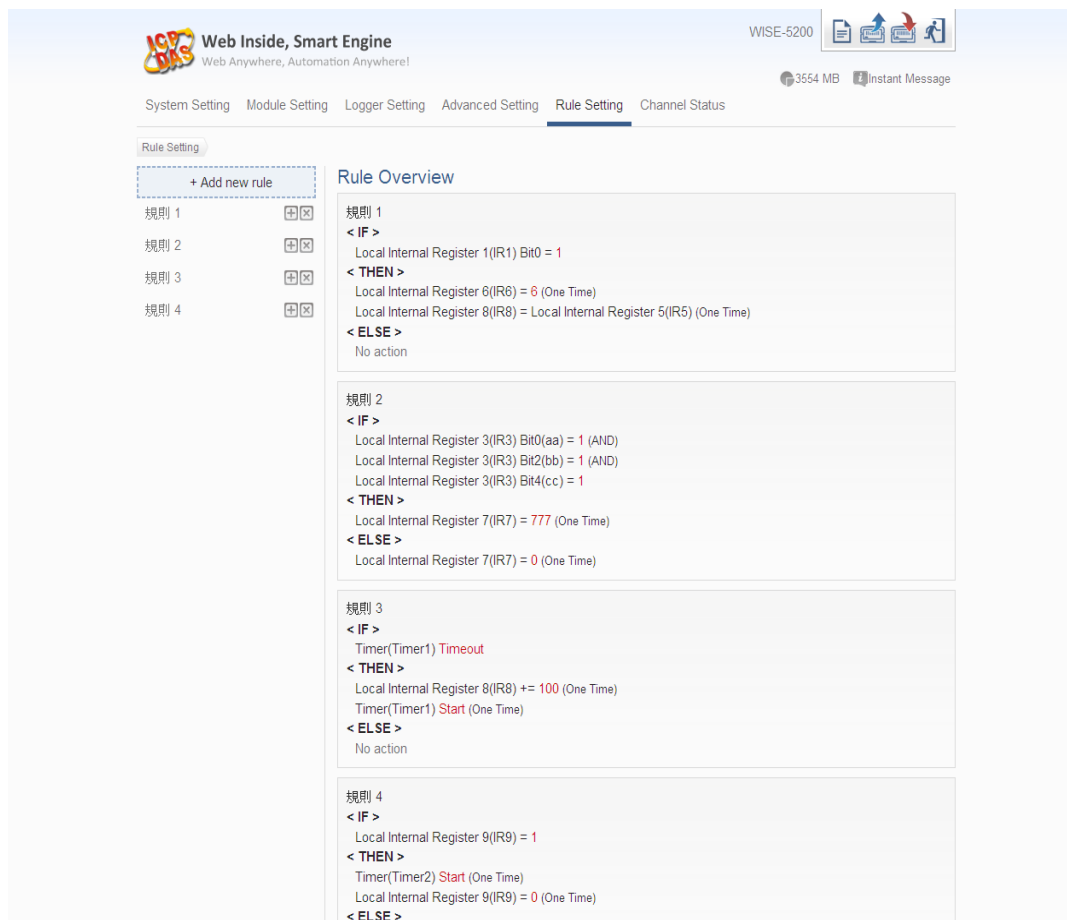




Figure 10-1 : Rules overview page

In addition to the list of the rules, Rule Management interface will also be shown on the left side of the page. Detailed description is as below:

- **Add new rule:** To add a new rule, please click “Add new rule”.
- **Copy:** To copy the settings of an old rule to the new rule, please click on the  button on the right side of the old rule, a new rule will be added to the list and the settings of the old rule will be copied to this newly added rule.
- **Remove:** To remove a pre-set rule, please click on the  button on the right side of the pre-set rule.
- **Arrange the order:** Left click on the pre-set rule and drag them up or down to arrange the rules into the proper order.

Click “Add new rule” to get into the “Rule Information Setting” page for logic rule edition (shown as below).

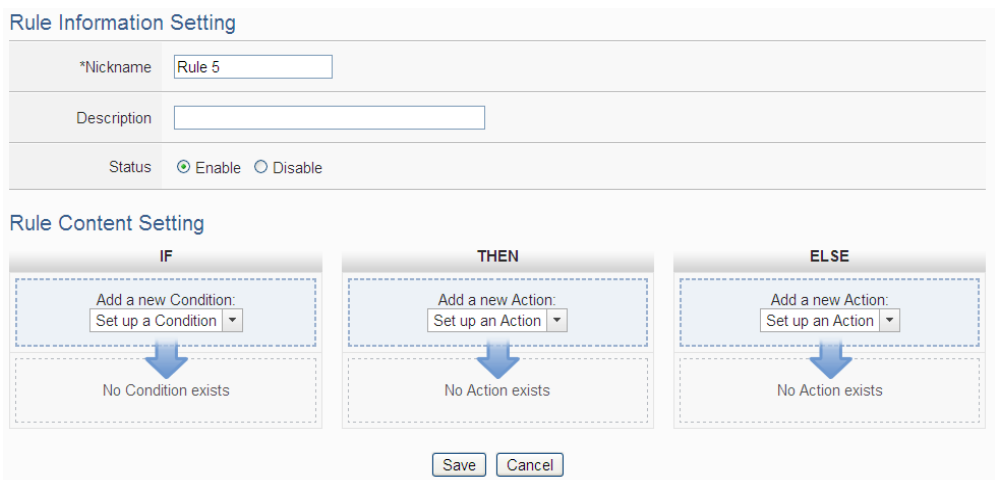
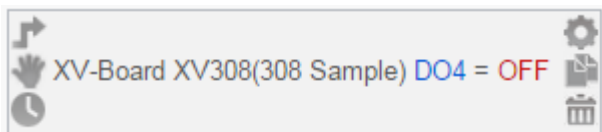


Figure 10-2 : Rules Setting page








- **Nickname:** Input a name in the “Nickname” field and you could also input the description of this Rule in the “Description” field.
- **Status:** Select “Enable” or “Disable”. If you select “Enable”, the rule will be executed after being downloaded. If you select “Disable” the rule will only be stored temporarily and will not be executed after being downloaded.
- **IF Condition Setting:** More detailed information, please refer to “[10.1 IF Condition Setting](#)” section.
- **THEN/ELSE Action Setting:** More detailed information, please refer to “[10.2 THEN/ELSE Action Setting](#)” section.
- **Save:** After finish all IF Condition and THEN/ELSE Action setting, click on “Save” to save the settings.

Please note: if you make modification in I/O module setting or in Advanced Setting after finish defining the rules, it might cause unexpected error due to the changes cause some variables no longer exist. Therefore, in case you make any modification, please double check your settings and Rules definition to make sure no errors are present.

When users finish settings of an IF Condition or a THEN/ELSE Action, after going back to the Rule Content Setting page, a function component will be displayed under the IF Condition or the THEN/ELSE Action section (shown as below), the function component will display the settings information of the IF-THEN-ELSE logic rule.



The function component (IF Condition, THEN Action or ELSE Action) provides various functions such as:

- **Setting:** to edit a pre-set function component, click on  to get in to the setting page of the function component.
- **Copy:** to copy a pre-set function component, click on  to generate a new component with the same pre-set component settings. The new function component will be listed under the pre-set component.
- **Remove:** to remove a pre-set function component, click on  to remove the component.
- **Action Operation mode :** If the function component is Action and operation mode is “One-Time”, the  icon will be shown at the left-top corner of the component; otherwise, the  icon for “Repeat” operation mode will be shown at the left-top corner of the function component.
- **Arrange order:** the order of the function component might result in different outcomes of IF-THEN- ELSE rule execution, therefore, user could click on  and drag the component to arrange the components into appropriate order.
- **Delay Time:** If the function component is Action and is assigned the “Waiting Time” value, then the  icon for “Waiting Time” will be shown at the left-bottom corner of the function component. (This function is removed after version 1.4.2. It is replaced by Delay action. Please refer to Section [10.2.20 Delay](#).)

The IF-THEN-ELSE logic engine operates according to following rules:

- All rules are checked and the actions are executed by the top-down order.
- When the evaluation result of the IF statement is “true”, the action with “One-Time” operation mode would be executed only once; the action with “Repeat” operation mode would be loop executed.
- Only the actions of output channel setting of ICP DAS Module and Modbus Module could be set to the “Repeat” operation mode. To execute the other actions repeatedly, you can use the Timer function to perform it.
- If you want the action to be triggered “One-Time” again, the evaluation result of the IF statement should return to “false” first, and then the action will be executed when the evaluation result of the IF statement become “true” again.

The following section will give more detailed information of IF Condition and THEN/ELSE Action settings.

10.1 IF Condition Setting

To add an IF Condition, please select and set the Condition from the dropdown list in the “Add a new Condition” field under the IF Condition setting section. IF Condition provides the following Condition setting options:

- ICP DAS Module
- Modbus Module
- IP Camera
- CGI Command
- Microsoft Azure
- IBM Bluemix
- MQTT
- Connection Status
- Timer
- Schedule
- Mobile Network Signal Strength
- SD Card Status
- Internal Register
- Rule Status
- Ping

If the WISE is connected to ICP DAS I/O modules or Modbus TCP/RTU modules, the setting options for I/O channel information (DI, DO, AI, AO, Discrete Input, Coil Output, Input Register and Holding Register) on these modules will be automatically displayed on the dropdown list. To include subjects other than modules mentioned above in the IF Condition statement (CGI Command, MQTT, IoT Platform, Timer, Schedule and Internal Register); they have to be pre-defined in Advanced Setting first. The setting options of the subjects that already being defined in Advanced Setting will appear on the dropdown list of IF Condition. Select the Condition option from the dropdown list in the “Add a new Condition” field under the IF Condition setting section, a window will pop up for you to edit detailed information. The setting options of IF Condition are as follow:

10.1.1 ICP DAS Module

Click on ICP DAS I/O Module, 6 options will appear as the following: DI, DI Counter, DO, DO Counter, AI, and AO.

10.1.1.1 DI

DI channel value from ICP DAS I/O Module can be used as evaluation criteria for IF condition statement; the setting page for DI Condition Setting is shown as below:

Figure 10-3 : DI condition setting page

Follow the steps below:

- i Specify the module and the channel from the dropdown list of the “Module & Channel” section that you are going to include its value in the IF condition statements.
- ii Define the evaluation criteria of the status in IF statement to be “OFF”, “ON”, “ON to OFF”, “OFF to ON” or “Change”. Once the DI channel value matches the evaluation criteria, the result of this condition evaluation will be “true”. **Please note: If the statement involves state transitions: “ON to OFF”, “OFF to ON” and “Change”, the action will be executed only once and only at the moment when the state transition occurs.**
- iii Click “OK” button to confirm the settings and return to the Rule settings page.

10.1.1.2 DI Counter

DI counter value from ICP DAS I/O Module can be used as evaluation criteria for IF condition statement; the editing page for DI Counter Condition Setting is shown as follow:

Figure 10-4 : DI Counter condition setting page

Follow the steps below:

- i Specify the module and the channel from the dropdown list of the “Module & Channel” section that you are going to include its value in the IF condition statements.
- ii Set up the expression statement for this counter value. Select an operator from “=”, “>”, “<”, “>=”, “<=” or “Change”.
- iii Specify the evaluation value. If this DI counter value match the evaluation criteria, the result of this condition evaluation will be “true”. WISE provides the following 11 values options; you can compare them with the DI counter value for condition evaluation. **Please note: If the statement involves state transitions: “Change”, user doesn’t need to set up the evaluation value. The action will be executed only at the moment when the state transition occurs.**
 - User-Defined: The “User-Defined” value could be used as evaluation criteria; input the “User-Defined” value under the “Value” field.

The screenshot shows a form titled "Value". It contains a dropdown menu with "User-Defined" selected. Below the dropdown is a text input field containing the number "5".

- Internal Register: The “Internal Register” value could be used as evaluation criteria; select the “Source” and the number of the Internal Register from the dropdown list. The “Local” in the “Source” field mean the Internal Register is from the Host controller (WISE). The “Remote” in the “Source” field mean the Internal Register is from the remote WISE controller.

The screenshot shows a form titled "Value". It contains a dropdown menu with "Internal Register" selected. Below it is a "Source" dropdown menu with "Local" selected. At the bottom is a "No." dropdown menu with "1(IR1)" selected.

- DI Counter: The DI channel counter value from other ICP DAS I/O modules could be used as evaluation criteria; select the module and the channel from the dropdown list to specify which channel value will be used.

Value

Interface

Module

Channel

- DO Counter: The DO channel counter value from other ICP DAS WISE-71xx modules could be used as evaluation criteria; select the module and the channel from the dropdown list to specify which channel value will be used.

Value

Interface

Module

Channel

- AI: The AI channel value from other ICP DAS I/O modules could be used as evaluation criteria; select the module and the channel from the dropdown list to specify which channel value will be used.

Value

Channel

- AO: The AO channel value from other ICP DAS I/O modules could be used as evaluation criteria; select the module and the channel from the dropdown list to specify which channel value will be used.

Value

Channel

- Input Register: The Input Register value from other Modbus RTU/TCP Slave modules could be used as evaluation criteria; select the module and the address from the dropdown list to specify which channel value will be used.

Value	
Input Register ▼	
COM3 ▼	Debug(2) ▼
Address 100 ▼	

- **Holding Register:** The Holding Register value from other Modbus RTU/TCP Slave modules could be used as evaluation criteria; select the module and the address from the dropdown list to specify which channel value will be used.

Value	
Holding Register ▼	
COM3 ▼	Debug(2) ▼
Address 1006 ▼	

- **MQTT:** The value of the MQTT subscribe topic could be used as evaluation criteria; select the broker and the subscribe topic from the dropdown list to specify which topic will be used.

Value	
MQTT Subscribe Topic ▼	
Broker	Broker 1 ▼
Topic	Topic 1 ▼

- **Azure:** The value of the Azure received parameter could be used as evaluation criteria; select the variable name from the dropdown list to specify which variable will be used.

Value	
Microsoft Azure Subscribe Message ▼	
Variable Name	aaa ▼

- **Bluemix:** The value of the Bluemix received parameter could be used as evaluation criteria; select the command and the variable name from the dropdown list to specify which variable will be used.

Value	
IBM Bluemix Subscribe Message ▼	
Command Name	c1 ▼
Variable Name	aaa ▼

Please Note: The content of received MQTT subscribe topic or Azure / Bluemix parameter must be a number, otherwise 0 will be assigned.

- iv Click “OK” button to confirm the settings and return to the Rule settings page.

10.1.1.3 DO

DO channel value from ICP DAS I/O Module can be used as evaluation criteria for IF condition statement; the setting page for DO Condition Setting is shown as below:



DO Condition Setting		
Module & Channel	I/O Interface	COM4
	Module	I-7080(1)
	Channel	2
Status	OFF	

OK Cancel

Figure 10-5 : DO condition setting page

Follow the steps below:

- i Specify the module and the channel from the dropdown list of the “Module & Channel” section that you are going to include its value in the IF condition statements.
- ii Define the evaluation criteria of the status in IF statement to be “OFF”, “ON”, “ON to OFF”, “OFF to ON” or “Change”. Once the DO channel value matches the evaluation criteria, the result of this condition evaluation will be “true”. **Please note: If the statement involves state transitions: “ON to OFF”, “OFF to ON” and “Change”, the action will be executed only once and only at the moment when the state transition occurs.**
- iii Click “OK” button to confirm the settings and return to the Rule settings page.

10.1.1.4 DO Counter

DO counter values from remote ICP DAS WISE-71xx series modules can be used as evaluation criteria for IF condition statement; the editing page for DO Counter Condition Setting is shown as follow:

Figure 10-6 : DO Counter condition setting page

Follow the steps below:

- i Specify the module and the channel from the dropdown list of the “Module & Channel” section that you are going to include its value in the IF condition statements.
- ii Set up the expression statement for this counter value. Select an operator from “=”, “>”, “<”, “>=”, “<=” or “Change”.
- iii Specify the evaluation value. If this DO counter value match the evaluation criteria, the result of this condition evaluation will be “true”. WISE provides 11 values options; you can compare them with the DO counter value for condition evaluation. Please refer to “[10.1.1.2 DI Counter](#)” for detail. **Please note: If the statement involves state transitions: “Change”, user doesn’t need to set up the evaluation value. The action will be executed only at the moment when the state transition occurs.**
- iv Click “OK” button to confirm the settings and return to the Rule settings page.

10.1.1.5 AI

AI channel value from ICP DAS I/O Module can be included in the IF condition statements; the editing page for AI Condition Setting is shown as below:

Figure 10-7 : AI condition setting page

Follow the steps below:

- i Specify the module and the channel from the dropdown list of the “Module & Channel” section that you are going to include its value in the IF condition statements.
- ii Set up the expression statement for this channel value. Select an operator from “=”, “>”, “<”, “>=” or “<=”.
- iii Specify the evaluation value. If this AI channel value match the evaluation criteria, the result of this condition evaluation will be “true”. WISE provides 11 values options; you can compare them with the AI channel value for condition evaluation. Please refer to “[10.1.1.2 DI Counter](#)” for detail.
- iv In order to avoid signal oscillation that may result in instability to the measurement of the Analog channel value or system operations, the user can set up a Deadband value for the Analog channel to reduce the oscillation effect to the channel value. The detailed description of Deadband operation is as below:

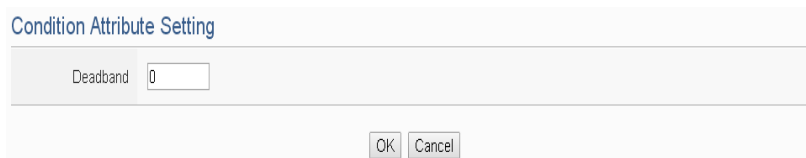


Figure 10-8 : Deadband parameter setting

There are three operation styles for Deadband. The AI Channel setting in following examples is 0mA ~ 20mA.

(a) In the IF Condition, when AI > or >= a numerical value:

Assuming the Deadband value is set to be 2 mA, and the following statements are defined in the related logic Rule: IF AI>10mA, THEN DO=ON, ELSE DO=OFF, that means, when AI receives a signal that exceed 10mA, the DO channel will change to ON immediately, however, when the AI channel value drops and becomes lower than 10mA, the DO channel will not change back to OFF immediately until the value reaches 8mA (10mA minus the Deadband value 2mA), as shown in the following figure.

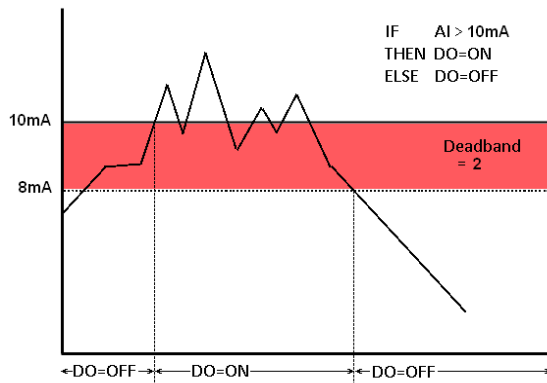


Figure 10-9 : AI Deadband Operation (> or >= a numerical value)

(b) In the IF Condition, when AI < or <= a numerical value:

Assuming the Deadband value is set to be 2 mA, and the following statements are defined in the related logic Rule: IF AI<10mA, THEN DO=ON, ELSE DO=OFF, that means, when AI receives a signal which is lower than 10mA, the DO channel will change to ON immediately, however, when the AI channel value exceed 10mA, the DO channel will not change back to OFF immediately until the value reaches 12mA (10mA plus the Deadband value 2mA), as shown in the following figure.

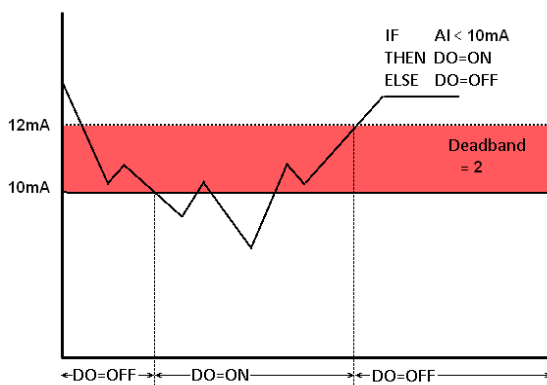


Figure 10-10 : AI Deadband Operation (< or <= a numerical value)

(c) In the IF Condition, when AI = a numerical value:

Assuming the Deadband value is set to be 1 mA, and the following statements are defined in the related logic Rule: IF AI=9mA, THEN DO=ON, ELSE DO=OFF, that means, when AI receives a signal between 8mA (9mA minus the

deadband value 1mA) and 10mA (9mA plus the Deadband value 1mA), the DO channel will change to ON immediately. However, when the AI channel value exceed 10mA, or is lower than 8mA, the DO channel will change to OFF, as shown in the following figure.

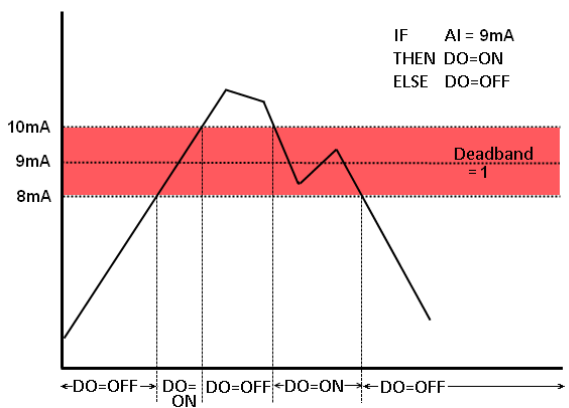


Figure 10-11 : AI Deadband Operation (= a numerical value)

- v Click “OK” button to confirm the settings and return to the Rule settings page.

10.1.1.6 AO

AO channel value from ICP DAS I/O Module can be included in the IF condition statements; the editing page for AO Condition Setting is shown as below:

AO Condition Setting

Module & Channel	Operator	Value
COM4 I-7021(4) Channel 0	=	User-Defined 0

Condition Attribute Setting

Deadband 0

OK Cancel

Figure 10-12 : AO condition setting page

Follow the steps below:

- i Specify the module and the channel from the dropdown list of the “Module & Channel” section that you are going to include its value in the IF condition statements.
- ii Set up the expression statement for this channel value. Select an operator from “=”, “>”, “<”, “>=” or “<=”.

- iii Specify the evaluation value. If this AO channel value match the evaluation criteria, the result of this condition evaluation will be “true”. WISE provides 11 values options; you can compare them with the AO channel value for condition evaluation. Please refer to “[10.1.1.2 DI Counter](#)” for detail.
- iv In order to avoid signal oscillation that may result in instability to the measurement of the AO channel value or system operations, the user can set up a Deadband value for the AO channel to reduce the oscillation effect to the channel value. Please refer to “[10.1.1.5 AI](#)” for more detailed information.
- v Click “OK” button to confirm the settings and return to the Rule settings page.

10.1.2 Modbus Module

Click on “Modbus Module”, 4 options will appear as the following: Discrete Input, Coil Output, Input Register and Holding Register.

10.1.2.1 Discrete Input

Discrete Input value from Modbus TCP/RTU Slave module can be included in the IF condition statements; the editing page for Discrete Input Condition Setting is shown as below:

Discrete Input Condition Setting

Module & Address	I/O Interface	COM3	Module	Debug(2)	Address	0
Status	OFF					

OK Cancel

Figure 10-13 : Discrete Input condition setting page

Follow the steps below:

- i Specify the module and the address of the Modbus TCP/RTU Slave module from the dropdown list of the “Module & Address” section that you are going to include its value in the IF condition statements.
- ii Define the evaluation criteria of the status in IF statement to be “OFF”, “ON”, “ON to OFF”, “OFF to ON” or “Change”. Once the Discrete Input value matches the evaluation criteria, the result of this condition evaluation will be “true”. **Please note: If the statement involves state transitions: “ON to OFF”, “OFF to**

ON” and “Change”, the action will be executed only once and only at the moment when the state transition occurs.

- iii Click “OK” button to confirm the settings and return to the Rule settings page.

10.1.2.2 Coil Output

Coil Output value from Modbus TCP/RTU Slave module can be included in the IF condition statements; the editing page for Coil Output Condition Setting is shown as below:



Coil Output Condition Setting		
Module & Address	I/O Interface	COM3 ▼
	Module	Debug(2) ▼
	Address	14 ▼
Status	OFF ▼	
<input type="button" value="OK"/> <input type="button" value="Cancel"/>		

Figure 10-14 : Coil Output condition setting page

Follow the steps below:

- i Specify the module and the address of the Modbus TCP/RTU Slave module from the dropdown list of the “Module & Address” section that you are going to include its value in the IF condition statements.
- ii Define the evaluation criteria of the status in IF statement to be “OFF”, “ON”, “ON to OFF”, “OFF to ON” or “Change”. Once the Coil Output value matches the evaluation criteria, the result of this condition evaluation will be “true”. **Please note: If the statement involves state transitions: “ON to OFF”, “OFF to ON” and “Change”, the action will be executed only once and only at the moment when the state transition occurs.**
- iii Click “OK” button to confirm the settings and return to the Rule settings page.

10.1.2.3 Input Register

Input Register value from Modbus TCP/RTU Slave module can be included in the IF condition statements; the editing page for Input Register Condition Setting is shown as below:

Input Register Condition Setting		
Module & Address	Operator	Value
COM3 ▾ Debug(2) ▾ Address 100 ▾	= ▾	User-Defined ▾ 0
Condition Attribute Setting		
Deadband 0		
<input type="button" value="OK"/> <input type="button" value="Cancel"/>		

Figure 10-15 : Input Register condition setting page

Follow the steps below:

- i Specify the module and the address of the Modbus TCP/RTU Slave module from the dropdown list of the “Module & Address” section that you are going to include its value in the IF condition statements.
- ii Set up the expression statement for this Input Register address value. Select an operator from “=”, “>”, “<”, “>=” or “<=”.
- iii Specify the evaluation value. If this Input Register value match the evaluation criteria, the result of this condition evaluation will be “true”. WISE provides 11 values options; you can compare them with the Input Register value for condition evaluation. Please refer to “[10.1.1.2 DI Counter](#)” for detail.
- iv In order to avoid signal oscillation that may result in instability to the measurement of the Input Register value or system operations, the user can set up a Deadband value for the Input Register to reduce the oscillation effect to the channel value. Please refer “[10.1.1.5 AI](#)” for detail.
- v Click “OK” button to confirm the settings and return to the Rule settings page.

10.1.2.4 Holding Register

Holding Register value from Modbus TCP/RTU Slave module can be included in the IF condition statements; the editing page for Holding Register Condition Setting is shown as below:

Figure 10-16 : Holding Register condition setting page

Follow the steps below:

- i Specify the module and the address of the Modbus TCP/RTU Slave module from the dropdown list of the “Module & Address” section that you are going to include its value in the IF condition statements.
- ii Set up the expression statement for this Holding Register address value. Select an operator from “=”, “>”, “<”, “>=” or “<=”.
- iii Specify the evaluation value. If this Holding Register value match the evaluation criteria, the result of this condition evaluation will be “true”. WISE provides 11 values options; you can compare them with the Holding Register value for condition evaluation. Please refer to “[10.1.1.2 DI Counter](#)” for detail.
- iv In order to avoid signal oscillation that may result in instability to the measurement of the Holding Register value or system operations, the user can set up a Deadband value for the Holding Register to reduce the oscillation effect to the channel value. Please refer to “[10.1.1.5 AI](#)” for more detail information.
- v Click “OK” button to confirm the settings and return to the Rule settings page.

10.1.3 IP Camera

Click on “IP Camera”, 3 options will appear as the following: DI, DO and Event.

10.1.3.1 DI

DI channel value from IP Camera can be used as evaluation criteria

for IF condition statement; the setting page for DI Condition Setting is shown as below:

DI Condition Setting	
IP Camera & Channel	IP Camera <input type="text" value="iCAM-721F(192.168.1.100:80)"/> Channel <input type="text" value="0"/>
Status	<input type="text" value="OFF"/>
<input type="button" value="OK"/> <input type="button" value="Cancel"/>	

Figure 10-17 : IP Camera's DI channel status condition setting page

Follow the steps below:

- i Specify the IP Camera and the channel from the dropdown list of the “IP Camera & channel” section that you are going to include its value in the IF condition statements.
- ii Define the evaluation criteria of the status in IF statement to be “OFF”, “ON”, “ON to OFF”, “OFF to ON” or “Change”. Once the DI channel value matches the evaluation criteria, the result of this condition evaluation will be “true”. **Please note: If the statement involves state transitions: “ON to OFF”, “OFF to ON” and “Change”, the action will be executed only once and only at the moment when the state transition occurs.**
- iii Click “OK” button to confirm the settings and return to the Rule settings page.

10.1.3.2 DO

DO channel value from IP Camera can be used as evaluation criteria for IF condition statement; the setting page for DO Condition Setting is shown as below:

DO Condition Setting	
IP Camera & Channel	IP Camera <input type="text" value="iCAM-721F(192.168.1.100:80)"/> Channel <input type="text" value="0"/>
Status	<input type="text" value="OFF"/>
<input type="button" value="OK"/> <input type="button" value="Cancel"/>	

Figure 10-18 : IP Camera's DO channel status condition setting page

Follow the steps below:

- i Specify the IP Camera and the channel from the dropdown list of the “IP Camera & channel” section that you are going to include its value in the IF condition statements.
- ii Define the evaluation criteria of the status in IF statement to be “OFF”, “ON”, “ON to OFF”, “OFF to ON” or “Change”. Once the DO channel value matches the evaluation criteria, the result of this condition evaluation will be “true”. **Please note: If the statement involves state transitions: “ON to OFF”, “OFF to ON” and “Change”, the action will be executed only once and only at the moment when the state transition occurs.**
- iii Click “OK” button to confirm the settings and return to the Rule settings page.

10.1.3.3 Event

Event from IP Camera can be used as evaluation criteria for IF condition statement; the setting page for Event Condition Setting is shown as below:

IP Camera & Event	Status
IP Camera: iCAM-721F(192.168.1.100:80) Event: Motion Detection	Trigger

OK Cancel

Figure 10-19 : IP Camera's Event condition setting page

Follow the steps below:

- i Specify the IP Camera and the Event type from the dropdown list of the “IP Camera & Event” section that you are going to include its value in the IF condition statements. iCAM IP Camera provides 5 Event options as Motion Detection, Tampering Detection, GPIO, Schedule and Period for settings. If the IP Camera's Event is triggered and WISE receives the notification from IP Camera, then the result of this condition evaluation will be “true”.
- ii Click “OK” button to confirm the settings and return to the Rule settings page.

10.1.4 CGI Command

The parameters (Variable & Source) of CGI Receiving Command can be included in the IF condition statements; the editing page for CGI Command variable and source condition setting is shown as below:

Name & Address	Operator	Value
Variable Name: <input type="text" value="Temperature"/>	=	User-Defined
Source Address: <input type="text" value="192.168.100.30"/>		<input type="text" value="0"/>

Figure 10-20 : CGI Receiving Command condition setting page

Follow the steps below:

- i Specify the CGI Command variable and CGI Command source from the dropdown list of “Variable Name” field and “Source Address” field that you are going to include them in the IF condition statements. When the source of the CGI Receiving Command consists with the “Source Address” setting, the evaluation of CGI Command variable will be continued. If user selects “Anywhere” from the dropdown list of “Source Address”, it means the evaluation of CGI Receiving Command will ignore the “Source Address” setting.
- ii Set up the expression statement for this CGI Command variable value. Select an operator from “=”, “>”, “<”, “>=” or “<=”.
- iii Specify the user-defined evaluation value or user-defined string. If this CGI Command variable value match the evaluation criteria or equal to the user-defined string, the result of this condition evaluation will be “true”. WISE provides 11 values options; you can compare them with the CGI Command variable value for condition evaluation. Please refer to “[10.1.1.2 DI Counter](#)” for detail.
- iv Click “OK” button to confirm the settings and return to the Rule settings page.

10.1.5 Microsoft Azure

Click on Microsoft Azure, 2 options will appear as the following: “Connection Status” and “Subscribe Message”.

10.1.5.1 Connection Status

The Connection Status between WISE and Microsoft Azure can be

used as evaluation criteria for IF condition statement. The editing page for Microsoft Azure Connection Status Condition Setting is shown as below:

Figure 10-21 : Microsoft Azure Connection Status condition setting page

Follow the steps below:

- i Specify the connection status to be “Offline” or “Online”. If the connection status of Microsoft Azure match the evaluation criteria, the result of this condition evaluation will be “true”.
- ii Click “OK” button to confirm the settings and return to the Rule settings page.

10.1.5.2 Subscribe Message

The Variable in the Subscribe Message from Microsoft Azure can be used in the IF condition statements; the editing page for Microsoft Azure Subscribe Message condition setting is shown as below:

Figure 10-22 : Microsoft Azure Subscribe Message condition setting page

Follow the steps below:

- i Specify the variable from the dropdown list of “Variable Name” field that you are going to include it in the IF condition statements.
- ii Set up the expression statement for the content of this Subscribe Topic. Select an operator from “=”, “>”, “<”, “>=” or “<=”.
- iii Specify the user-defined evaluation value. If the content of this variable match the evaluation criteria, the result of this condition evaluation will be “true”. WISE provides 11 values options; you can compare them with the content of this Subscribe Topic for condition evaluation. Please refer to [“10.1.1.2 DI Counter”](#) for detail.

- iv Click “OK” button to confirm the settings and return to the Rule settings page.

10.1.6 IBM Bluemix

Click on IBM Bluemix, 2 options will appear as the following: “Connection Status” and “Subscribe Message”.

10.1.6.1 Connection Status

The Connection Status between WISE and IBM Bluemix can be used as evaluation criteria for IF condition statement. The editing page for IBM Bluemix Connection Status Condition Setting is shown as below:

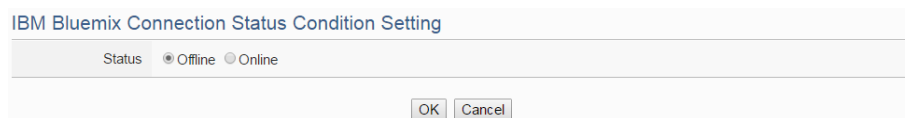


Figure 10-23 : IBM Bluemix Connection Status condition setting page

Follow the steps below:

- i Specify the connection status to be “Offline” or “Online”. If the connection status of IBM Bluemix match the evaluation criteria, the result of this condition evaluation will be “true”.
- ii Click “OK” button to confirm the settings and return to the Rule settings page.

10.1.6.2 Subscribe Message

The Command and Variable in the Subscribe Message from IBM Bluemix can be used in the IF condition statements; the editing page for IBM Bluemix Subscribe Message condition setting is shown as below:

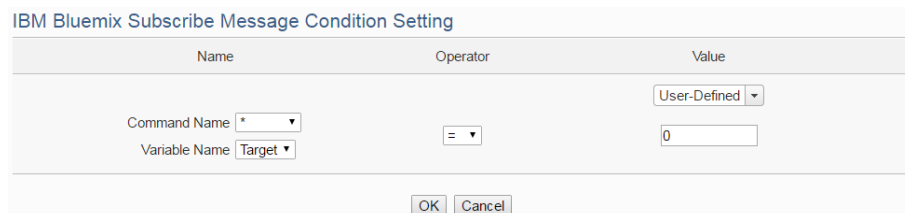


Figure 10-24 : IBM Bluemix Subscribe Message condition setting page

Follow the steps below:

- i Specify the Command and Variable from the dropdown list of

“Command Name” and “Variable Name” fields that you are going to include them in the IF condition statements. Only when the Subscribe Message is bound with the setting of the “Command Name”, then the IF condition statements will be processed. User can select “*” to ignore the criteria.

- ii Set up the expression statement for the content of this Subscribe Topic. Select an operator from “=”, “>”, “<”, “>=”, or “<=”.
- iii Specify the user-defined evaluation value. If the content of this Subscribe Topic match the evaluation criteria, the result of this condition evaluation will be “true”. WISE provides 11 values options; you can compare them with the content of this Subscribe Topic for condition evaluation. Please refer to [“10.1.1.2 DI Counter”](#) for detail.
- iv Click “OK” button to confirm the settings and return to the Rule settings page.

10.1.7 MQTT

The parameters of MQTT Broker connection status and Subscribe Topic can be included in the IF condition statements; the editing pages for MQTT Broker connection status and Subscribe Topic condition setting are shown as below:

10.1.7.1 Broker Connection Status

The Broker connection status can be included in the IF condition statements; the editing page is shown as below:

MQTT Broker Connection Status Condition Setting

Broker	Broker 1 ▼
Status	<input checked="" type="radio"/> Offline <input type="radio"/> Online
<input type="button" value="OK"/> <input type="button" value="Cancel"/>	

Figure 10-25 : Broker Connection Status condition setting page

Follow the steps below:

- i Specify the Broker from the dropdown list of “Broker” field that you are going to include its connection status in the IF

condition statements.

- ii And then specify the connection status to be “Offline” or “Online”. If the connection status of the Broker match the evaluation criteria, the result of this condition evaluation will be “true”.
- iii Click “OK” button to confirm the settings and return to the Rule settings page.

10.1.7.2 Subscribe Topic

The content of the Subscribe Topic can be included in the IF condition statements; the editing page is shown as below:

MQTT Subscribe Topic Condition Setting

Topic	Operator	Value
Broker <input type="text" value="Broker 1"/> Topic <input type="text" value="Topic 1"/>	<input type="text" value="="/>	<input type="text" value="0"/>

Figure 10-26 : Subscribe Topic condition setting page

Follow the steps below:

- i Specify the Broker and Subscribe Topic from the dropdown list of “Broker” field and “Topic” field that you are going to include them in the IF condition statements.
- ii Set up the expression statement for the content of this Subscribe Topic. Select an operator from “=”, “>”, “<”, “>=” or “<=”.
- iii Specify the user-defined evaluation value. If the content of this Subscribe Topic match the evaluation criteria, the result of this condition evaluation will be “true”. WISE provides 11 values options; you can compare them with the content of this Subscribe Topic for condition evaluation. Please refer to “[10.1.1.2 DI Counter](#)” for detail.
- iv Click “OK” button to confirm the settings and return to the Rule settings page.

10.1.8 Connection Status

Connection Status can be included in the IF condition statements; the editing page for Connection Status Condition Setting is shown as below:

Module Connection Status Condition Setting

Module	I/O Interface	COM3	Module	DL-302(1)
Status	<input checked="" type="radio"/> Offline <input type="radio"/> Online			

OK Cancel

Figure 10-27 : Connection Status condition setting page

Follow the steps below:

- i Specify the module from the dropdown list of the “Module” section that you are going to include its Connection Status in the IF condition statements.
- ii And then specify the Connection Status to be “Offline” or “Online”. If the Connection Status of the module match the evaluation criteria, the result of this condition evaluation will be “true”.
- iii Click “OK” button to confirm the settings and return to the Rule settings page.

10.1.9 Timer

Timer condition can be used as evaluation criteria for IF condition statement; the editing page for timer condition setting is shown as follow:

Timer Condition Setting

Timer	Timer1
Status	Timeout

OK Cancel

Figure 10-28 : Timer condition setting page

Follow the following steps:

- i Select the timer that you are going to use its status as evaluation criteria for IF condition statement. Specify the timer from the dropdown list of the “Timer” field.
- ii Define the evaluation criteria of the timer status in IF statement to be “Not timeout”, “Timeout” or “Stop”. If the timer status match the evaluation criteria, the result of this condition evaluation will be “true”.
- iii Click “OK” button to save the settings. The popup window will be closed and return to the Rule settings page.

10.1.10 Schedule

The Schedule can be used as evaluation criteria for IF condition statement; the editing page for Schedule Condition Setting is shown as follow:

Figure 10-29 : Schedule condition setting page

Follow the steps below:

- i Select the Schedule that you are going to use for IF condition statement from the dropdown list of “Schedule” field.
- ii Define the evaluation criteria of the schedule status in IF statement to be “In Range” or “Out of Range”. If the schedule status match the evaluation criteria, the result of this condition evaluation will be “true”.
- iii Click “OK” button to confirm the settings and return to the Rule settings page.

10.1.11 Mobile Network Signal Strength

The Mobile Network Signal Strength can be used as evaluation criteria for IF condition statement; the editing page for Mobile Network Signal Strength Condition Setting is shown as follow:

Figure 10-30 : Mobile Network Signal Strength condition setting page

Follow the steps below:

- i Select the unit that you are going to use for IF condition statement. The interface provides dBm and Percent(%) for selection.
- ii Set up the expression statement for the Mobile Network Signal Strength value. Select an operator from “=”, “>”, “<”, “>=” or “<=”.
- iii Specify the evaluation value. If the Mobile Network Signal Strength value match the evaluation criteria, the result of this condition

evaluation will be “true”.

- iv Click “OK” button to confirm the settings and return to the Rule settings page.

10.1.12 SD Card Status

The status of SD Card can be used as evaluation criteria for IF condition statement; the editing page for SD Card Status Condition Setting is shown as follow:



Figure 10-31 : SD Card Status condition setting page

Follow the steps below:

- i When the status of micro SD Card appears abnormal (micro SD Card is not detected or the space is less than 100MB), the result of this condition evaluation will be “true”.
- ii Click “OK” button to confirm the settings and return to the Rule settings page.

10.1.13 Internal Register

Internal Register value can be used as evaluation criteria for IF condition statement; the editing page for Internal Register Condition Setting is shown as follow:

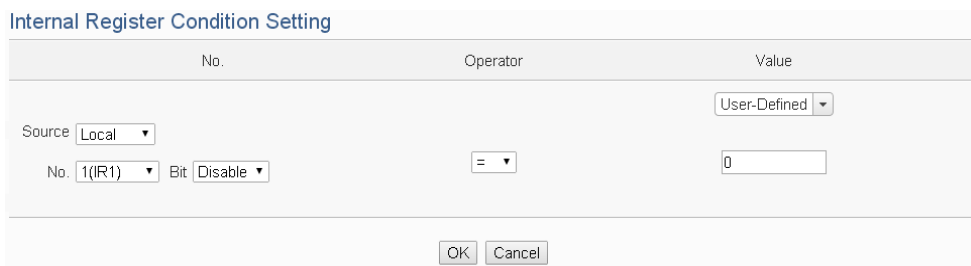


Figure 10-32 : Internal Register condition setting page

Follow the steps below:

- i Select the Internal Register that you are going to use the value as evaluation criteria for IF condition statement. Specify the data source of the Internal Register from the dropdown list of “Source” field. The “Local” mean the Internal Register is from the Host controller

- (WISE). The “Remote” mean the Internal Register is from the others remote WISE-71xx controller.
- ii Specify the number of Internal Register from the dropdown list of “No.” field.
 - iii Specify the bit index of the Internal Register from the dropdown list of “Bit” field if required. “Disable” in “Bit” field mean user disable the bit operation, and use Internal Register value for operation.
 - iv Set up the expression statement for this Internal Register value. Select an operator from “=”, “>”, “<”, “>=” or “<=”.
 - v Specify the evaluation value. If this Internal Register value match the evaluation criteria, the result of this condition evaluation will be “true”. WISE provides 11 values options; you can compare them with the Internal Register value for condition evaluation. Please refer to [“10.1.1.2 DI Counter”](#) for detail.
 - vi Click “OK” button to confirm the settings and return to the Rule settings page.

10.1.14 Rule Status

The Rule Status (if the Rule is disabled or enabled) can be used as evaluation criteria for IF condition statement. **Please note: there must be at least one edited rule on WSIE-52xx for setting up Rule Status in the IF Condition Setting page.** The editing page for Rule Status Condition Setting is shown as below:

The screenshot shows a dialog box titled "Rule Status Condition Setting". It has two rows of controls. The first row has a label "Rule" and a dropdown menu showing "Rule 1". The second row has a label "Status" and a dropdown menu showing "Disable". At the bottom of the dialog, there are two buttons: "OK" and "Cancel".

Figure 10-33 : Rule Status condition setting page

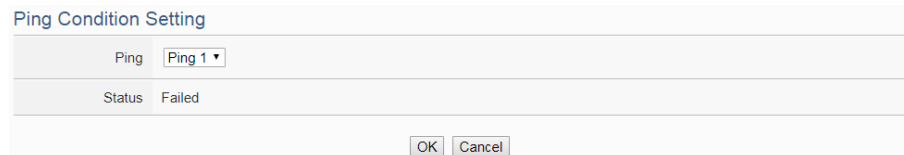
Follow the steps below:

- i Specify the Rule that is going to be used in the IF Condition statement from the dropdown list of the “Rule” field.
- ii Specify the Rule status to be “Disable” or “Enable” from the dropdown list of the “Status” field. When the Rule status matches the specified status, the evaluation result will be “true”.
- iii Click “OK” button to confirm the settings and return to the Rule settings page.

10.1.15 Ping

The Ping Status can be used as evaluation criteria for IF condition statement.

The editing page for Ping Condition Setting is shown as below:



Ping Condition Setting	
Ping	Ping 1 ▾
Status	Failed

OK Cancel

Figure 10-34 : Ping condition setting page

Follow the steps below:

- i Specify the Ping that is going to be used in the IF Condition statement from the dropdown list of the “Ping” field. When the Ping status was failure, the evaluation result will be “true”.
- ii Click “OK” button to confirm the settings and return to the Rule settings page.

10.2 THEN/ELSE Action Setting

To add a THEN/ELSE Action, please select and set the Action from the dropdown list in the “Add a new Action” field under the THEN/ELSE Action setting section. THEN/ELSE Action provides the following Action setting options:

- ICP DAS Module
- Modbus Module
- IP Camera
- Microsoft Azure
- IBM Bluemix
- MQTT
- Timer
- Email
- SMS Alarm
- CGI Command
- Data Logger
- SNMP Trap
- LINE Notify
- Bot Service
- Re-boot System
- Reset modem
- Internal Register
- Rule Status
- Delay

If the WISE is connected to ICP DAS I/O modules or Modbus TCP/RTU modules, the setting options for I/O channel information (DI Counter, DO, AO, Coil Output and Holding Register) will be automatically displayed on the dropdown list.

To include subjects other than modules mentioned above in the THEN/ELSE Action statement; they have to be pre-defined in Advanced Setting first. The setting options of the subjects that already being defined in Advanced Setting will appear on the dropdown list of THEN/ELSE Action. Select the Action option from the dropdown list in the “Add a new Action” field under the THEN/ELSE Action setting section, a window will pop up for you to edit detailed information. The THEN Action statement will be executed only when the result of IF condition statement is found “true”; otherwise the ELSE Action statement will be executed. In order to

meet application requirement, for some Actions, **WISE offers options to execute the Action one-time or repeatedly.** The setting options of THEN/ELSE Action are as follow:

- One-Time: when the IF Condition is TRUE, this Action will be executed once and only once. This Action will not be executed again until the IF Condition turns to be TRUE again.
- Repeat: when the IF Condition is TRUE, this Action will be executed repeatedly until the IF Condition turns to be FALSE.

The setting options of THEN/ELSE Action are as follow:

10.2.1 ICP DAS Module

Click on ICP DAS Module, 3 options will appear as the following: DI Counter, DO, and AO.

10.2.1.1 DI Counter

You can reset DI counter of ICP DAS I/O Module, in the THEN/ELSE Action statement; the editing page for DI counter Action is shown as follow:

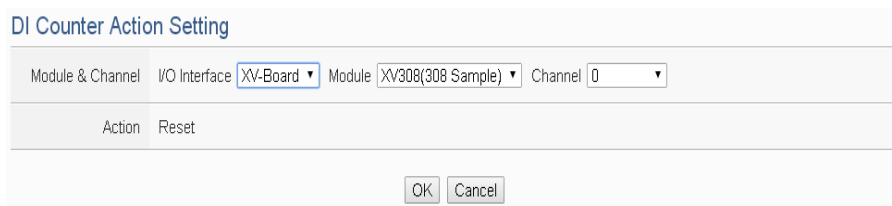


Figure 10-34 : DI Counter action setting page

Follow the steps below:

- i Select the DI channel to reset DI counter from the dropdown list of channel field in the “Module & Channel” section.
- ii Click “OK” button to confirm the settings and return to the Rule settings page.

10.2.1.2 DO

You can execute an action in DO channel of ICP DAS I/O Module in the THEN/ELSE Action statement; the editing page for DO Action is shown as follow:

DO Action Setting		
Module & Channel	I/O Interface	COM4
	Module	I-7080(1)
	Channel	2
Status	OFF	

Action Attribute Setting	
Execution Frequency	<input checked="" type="radio"/> One Time <input type="radio"/> Repeat
Waiting Time	0 second(s)

OK Cancel

Figure 10-35 : DO action setting page

Follow the steps below:

- i Specify the module and the channel from the dropdown list of the “Module & Channel” section.
- ii Specify the output value of DO Channel from the dropdown list of the “Status” field. The output value can be “OFF”, “ON” or “Pulse Output” (**Pulse Output applies to XV-Board only**). **For M-7088 belongs to PWM (Pulse width modulation) modules, the DO channel Action will be “Start PWM” or “Stop PWM”.**
- iii Specify the “Execution Frequency” to be “One Time” or “Repeat”. Please refer to [“10.2 THEN/ELSE Action Setting”](#) for detail.
- iv Specify the value in the “Waiting Time” field, it means after the action be executed, how long the system will delay to execute the next Action. The unit will be second(s). (This function is removed after version 1.4.2. It is replaced by Delay action. Please refer to Section [10.2.20 Delay.](#))
- v Click “OK” button to confirm the settings and return to the Rule settings page.

10.2.1.3 AO

You can execute an action in AO channel of ICP DAS I/O Module in THEN/ELSE Action statement; the editing page for AO Action is shown as follow:

AO Action Setting

Module & Channel	Operator	Value
COM4 I-7021(4) Channel 0	=	User-Defined 0

Action Attribute Setting

Execution Frequency: One Time Repeat

Waiting Time: 0 second(s)

OK Cancel

Figure 10-36 : AO action setting page

Follow the steps below:

- i From the dropdown list of the “Module & Channel” field, select the AO channel to execute actions.
- ii Specify the Operator to be “=”, “+=”, or “-=” from the dropdown list in the “Operator” field. The 3 operators are as follow :
 - “=” : Indicate assign the new AO channel value as the value in “Value” field
 - “+=” : Indicate assign the new AO channel value as the original AO channel value plus the value in “Value” field.
 - “-=” : Indicate assign the new AO channel value as the original AO channel value minus the value in “Value” field.
- iii Set up the value in the “Value” field, WISE provides the following 11 value options to be used in the “Value” field:
 - User-Defined: Input a User-Defined value under the “Value” field.

Value

User-Defined

0

- Internal Register: Select the source and the number of the Internal Register from the dropdown list. About the “Source” field, the “Local” mean the Internal Register is from the Host controller (WISE). The “Remote” mean

the Internal Register is from the others remote WISE controller.

The screenshot shows a configuration window titled "Value". It contains three dropdown menus: "Internal Register", "Source" (set to "Local"), and "No." (set to "1(IR1)").

- **DI Counter:** Using DI channel counter values from ICP DAS I/O Module, select the module and channel from the dropdown list to specify which channel value will be used.

The screenshot shows a configuration window titled "Value". It contains four dropdown menus: "DI Counter", "Interface" (set to "COM4"), "Module" (set to "M-7084(2)"), and "Channel" (set to "0").

- **DO Counter:** Using DO channel counter values from ICP DAS WISE-71xx Module, select the module and channel from the dropdown list to specify which channel value will be used.

The screenshot shows a configuration window titled "Value". It contains four dropdown menus: "DO Counter", "Interface" (set to "LAN"), "Module" (set to "WISE-7126(192.168.100.235:502/1)"), and "Channel" (set to "0").

- **AI:** Using AI channel values from ICP DAS I/O Module, select the module and channel from the dropdown list to specify which channel value will be used.

The screenshot shows a configuration window titled "Value". It contains three dropdown menus: "AI", "XV-Board" (set to "XV308(308 Sample)"), and "Channel" (set to "0").

- **AO:** using AO channel values from ICP DAS I/O Module, select the module and channel from the dropdown list to specify which channel value will be

used.

Value	
AO ▾	
COM4 ▾	I-7021(4) ▾
Channel 0 ▾	

- **Input Register:** using the Input Register values from Modbus RTU/TCP Slave modules, select the module and the address from the dropdown list to specify which channel value will be used.

Value	
Input Register ▾	
COM3 ▾	Debug(2) ▾
Address 100 ▾	

- **Holding Register:** using the Holding Register values from Modbus RTU/TCP Slave modules, select the module and the address from the dropdown list to specify which channel value will be used.

Value	
Holding Register ▾	
COM3 ▾	Debug(2) ▾
Address 1000 ▾	

- **MQTT:** using the value of MQTT subscribe topic, select the broker and the subscribe topic from the dropdown list to specify which value will be used.

Value	
MQTT Subscribe Topic ▾	
Broker	Broker 1 ▾
Topic	Topic 1 ▾

- **Azure:** using the value of Azure received parameter, select the parameter from the dropdown list to specify which value will be used.

Value	
Microsoft Azure Subscribe Message ▾	
Variable Name	aaa ▾

- Bluemix: using the value of Bluemix received parameter, select the command and the parameter from the dropdown list to specify which value will be used.

Value	
IBM Bluemix Subscribe Message ▾	
Command Name	c1 ▾
Variable Name	aaa ▾

Please Note: The content of received MQTT subscribe topic or Azure / Bluemix parameter must be a number, otherwise 0 will be assigned.

- iv Specify the “Execution Frequency” to be “One Time” or “Repeat”. Please refer to “[10.2 THEN/ELSE Action Setting](#)” for detail.
- v Specify the value in the “Waiting Time” field, it means after the action be executed, how long the system will delay to execute the next Action. The unit will be second(s). (This function is removed after version 1.4.2. It is replaced by Delay action. Please refer to Section [10.2.20 Delay](#).)
- vi Click “OK” button to confirm the settings and return to the Rule settings page.

10.2.2 Modbus Module

Click on “Modbus Module”, 2 options will appear as the following: Coil Output and Holding Register.

10.2.2.1 Coil Output

User can execute an action to change the status of Coil Output of Modbus TCP/RTU module in the THEN/ELSE Action statement; the editing page for Coil Output Action is shown as follow:

Coil Output Action Setting		
Module & Address	I/O Interface <input type="text" value="COM3"/> ▾	Module <input type="text" value="Debug(2)"/> ▾
	Channel <input type="text" value="10"/> ▾	
Status	<input type="text" value="OFF"/> ▾	
Action Attribute Setting		
Execution Frequency	<input checked="" type="radio"/> One Time <input type="radio"/> Repeat	
Waiting Time	<input type="text" value="0"/> second(s)	

Figure 10-37 : Coil Output action setting page

Follow the steps below:

- i Select the module and the address of the Coil Output from the dropdown list of the “Module & Address” section.
- ii Specify the output value of Coil Output from the dropdown list of the “Status” field. The output value can be “OFF” or “ON”.
- iii Specify the “Execution Frequency” to be “One Time” or “Repeat”. Please refer to “[10.2 THEN/ELSE Action Setting](#)” for detail.
- iv Specify the value in the “Waiting Time” field, it means after the action be executed, how long the system will delay to execute the next Action. The unit will be second(s). (This function is removed after version 1.4.2. It is replaced by Delay action. Please refer to Section [10.2.20 Delay](#).)
- v Click “OK” button to confirm the settings and return to the Rule settings page.

10.2.2.2 Holding Register

You can execute an action to change the value of Holding Register in the THEN/ELSE Action statement; the editing page for Holding Register Action is shown as follow:

Holding Register Action Setting

Module & Address	Operator	Value
COM3 ▾ Debug(2) ▾ Address 1000 ▾	= ▾	User-Defined ▾ 0

Action Attribute Setting

Execution Frequency	<input checked="" type="radio"/> One Time <input type="radio"/> Repeat
Waiting Time	<input type="text" value="0"/> second(s)

Figure 10-38 : Holding Register action setting page

Follow the steps below:

- i Select the module and the address of the Holding Register from the dropdown list of the “Module & Address” section.
- ii Specify the Operator in the “Operator” field. The 3 operators are as follow :
 - “=” : Indicate assign the new Holding Register value as

- the value in “Value” field.
- “+=” : Indicate assign the new Holding Register value as the original Holding Register value plus the value in “Value” field.
 - “-=” : Indicate assign the new Holding Register value as the original Holding Register value minus the value in “Value” field.
- iii Set up the value in the “Value” field, WISE provides 6 value options. Please refer to “[10.2.1.3 AO](#)” section for more detail.
 - iv Specify the “Execution Frequency” to be “One Time” or “Repeat”. Please refer to “[10.2 THEN/ELSE Action Setting](#)” for detail.
 - v Specify the value in the “Waiting Time” field, it means after the action be executed, how long the system will delay to execute the next Action. The unit will be second(s). (This function is removed after version 1.4.2. It is replaced by Delay action. Please refer to Section [10.2.20 Delay](#).)
 - vi Click “OK” button to confirm the settings and return to the Rule settings page.

10.2.3 IP Camera

Click on IP Camera, 3 options will appear as the following: DO, Snapshot and Video.

10.2.3.1 DO

User can execute an action in DO channel of IP Camera in the THEN/ELSE Action statement; the editing page for DO Action is shown as follow:

DO Action Setting	
IP Camera & Channel	IP Camera <input type="text" value="iCAM-721F(192.168.1.100:80)"/> Channel <input type="text" value="0"/>
Status	<input type="text" value="OFF"/>

Figure 10-39 : IP Camera's DO action setting page

Follow the steps below:

- i Specify the IP Camera and the channel from the dropdown list

- of the “IP Camera & Channel” section.
- ii Specify the output value of DO Channel from the dropdown list of the “Status” field. The output value can be “OFF” or “ON”.
 - iii Click “OK” button to confirm the settings and return to the Rule settings page.

10.2.3.2 Snapshot

User can trigger the IP Camera for the Snapshot operation in the THEN/ELSE Action statement; the editing page for Snapshot Action is shown as follow:

Snapshot Action Setting	
IP Camera & Snapshot	iCAM-MR6322(192.168.100.123:80:iCAM-MR6322) ▼
Action	Capture
OSD Message Setting	
OSD Message	None ▼
<input type="button" value="OK"/> <input type="button" value="Cancel"/>	

Figure 10-40 : IP Camera's Snapshot action setting page

Follow the steps below:

- i Specify the IP Camera from the dropdown list of the “IP Camera & Snapshot” section. If the WISE's action is executed, the WISE will trigger the IP Camera to capture a snapshot and save it.
- ii If the IP Camera supports OSD message function and user has completed the setting, then a pre-set OSD message could be selected from the dropdown list of the “OSD message” field. The snapshot which the IP Camera captures will bind the OSD message and save it.
- iii Click “OK” button to confirm the settings and return to the Rule settings page.

10.2.3.3 Video

User can trigger the IP Camera for the Video Recording operation in the THEN/ELSE Action statement; the editing page for Video Action is shown as follow:

Figure 10-41 : IP Camera's Event action setting page

Follow the steps below:

- i Specify the IP Camera from the dropdown list of the “IP Camera & Video” section. If the WISE's action is executed, the WISE will trigger the IP Camera to record a video and save it. Some IP Cameras can set the length of time for video recording (10~60 seconds). The video file will be automatically uploaded to WISE after the video recording is finished.
- ii If the IP Camera supports OSD message function and user has completed the setting, then a pre-set OSD message could be selected from the dropdown list of the “OSD message” field. The video which the IP Camera records will bind the OSD message.
- iii Click “OK” button to confirm the settings and return to the Rule settings page.

10.2.3.4 OSD Message

User can trigger the IP Camera to enable the OSD message display operation in the THEN/ELSE Action statement; the editing page for OSD Message Action is shown as follow:

Figure 10-42 : IP Camera's OSD Message action setting page

Follow the steps below:

- i Specify the IP Camera and OSD message from the dropdown

lists of the “IP Camera” and “OSD message” sections. If the WISE’s action is executed, the WISE will trigger the IP Camera to show the content of the selected OSD message.

- ii Click “OK” button to confirm the settings and return to the Rule settings page.

10.2.4 Microsoft Azure

Click on “Microsoft Azure”, 3 options will appear as the following: “Function Status”, “Publish Message” and “Reset Variable”.

10.2.4.1 Function Status

User can execute an action to change the connection operation between Microsoft Azure and WISE in the THEN/ELSE Action statement; the editing page is shown as follow:

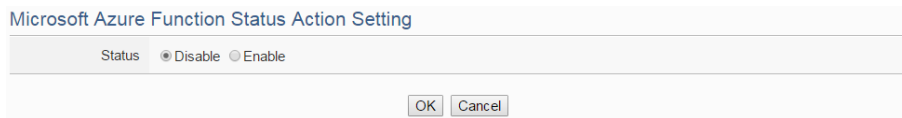


Figure 10-43 : Microsoft Azure Function Status action setting page

Follow the steps below:

- i Specify the connection operation between Microsoft Azure and WISE to be “Disable” or “Enable” from the dropdown list of the “Status” field.
- ii Click “OK” button to confirm the settings and return to the Rule settings page.

10.2.4.2 Publish Message

You can publish messages to Microsoft Azure when executing a THEN/ELSE Action statement; the editing page is shown as below:

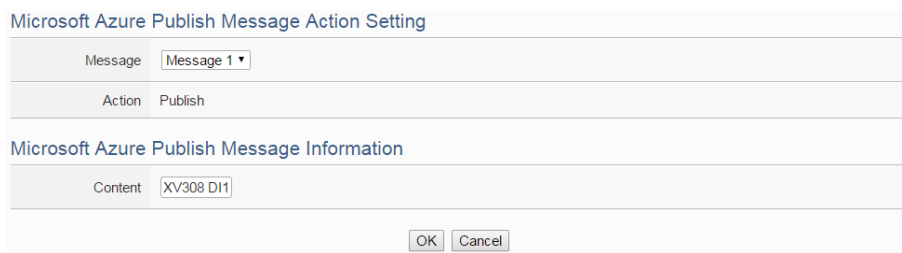


Figure 10-44 : Microsoft Azure Publish Message action setting page

Follow the steps below:

- i Select a pre-set Publish message from the dropdown list of the “Message” field. The Publish message will be displayed for you to verify if this is the message you are going to send to.
- ii Click “OK” button to confirm the settings and return to the Rule settings page.

10.2.4.3 Reset Variable

You can reset the saved content of the subscribe variable from Microsoft Azure when executing a THEN/ELSE Action statement; the editing page is shown as below:

Microsoft Azure Reset Variable Action Setting

Variable Name	a01 ▼
Action	Reset

Figure 10-45 : Microsoft Azure Reset Variable action setting page

Follow the steps below:

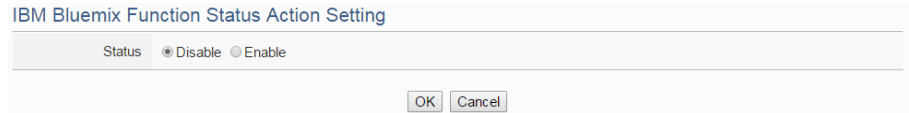
- i Select a pre-set Subscribe variable from the dropdown list of the “Variable Name” field. When this action is executed, WISE would reset the content of the variable, and the evaluation result of the IF statement which is associated with the variable will be verified again.
- ii Click “OK” button to confirm the settings and return to the Rule settings page.

10.2.5 IBM Bluemix

Click on “IBM Bluemix”, 3 options will appear as the following: “Function Status”, “Publish Message” and “Reset Variable”.

10.2.5.1 Function Status

User can execute an action to change the connection operation between IBM Bluemix and WISE in the THEN/ELSE Action statement; the editing page is shown as follow:



IBM Bluemix Function Status Action Setting

Status Disable Enable

OK Cancel

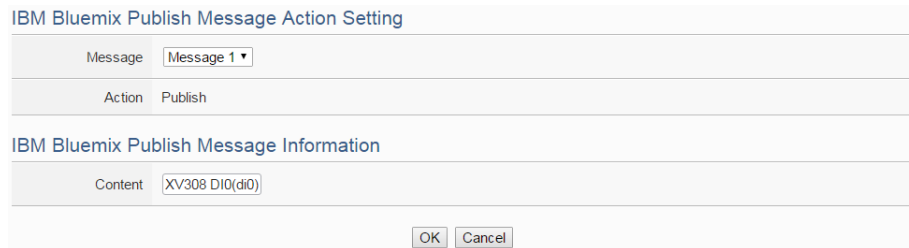
Figure 10-46 : IBM Bluemix Function Status action setting page

Follow the steps below:

- i Specify the connection operation between IBM Bluemix and WISE to be “Disable” or “Enable” from the dropdown list of the “Status” field.
- ii Click “OK” button to confirm the settings and return to the Rule settings page.

10.2.5.2 Publish Message

You can publish messages to IBM Bluemix when executing a THEN/ELSE Action statement; the editing page is shown as below:



IBM Bluemix Publish Message Action Setting

Message Message 1 ▾

Action Publish

IBM Bluemix Publish Message Information

Content XV308 DI0(di0)

OK Cancel

Figure 10-47 : IBM Bluemix Publish Message action setting page

Follow the steps below:

- i Select a pre-set Publish message from the dropdown list of the “Message” field. The Publish message will be displayed for you to verify if this is the message you are going to send to.
- ii Click “OK” button to confirm the settings and return to the Rule settings page.

10.2.5.3 Reset Variable

You can reset the saved content of the subscribe variable from IBM Bluemix when executing a THEN/ELSE Action statement; the editing page is shown as below:

IBM Bluemix Reset Variable Action Setting	
Name	Command Name <input type="text" value="bc1"/> Variable Name <input type="text" value="b01"/>
Action	Reset
<input type="button" value="OK"/> <input type="button" value="Cancel"/>	

Figure 10-48 : IBM Bluemix Reset Variable action setting page

Follow the steps below:

- i Select a Command and a Variable from the dropdown list of the “Name” field. When this action is executed, WISE would reset the content of the variable, and the evaluation result of the IF statement which is associated with the variable will be verified again.
- ii Click “OK” button to confirm the settings and return to the Rule settings page.

10.2.6 MQTT

Click on “MQTT”, 3 options will appear as the following: “Broker Function”, “Publish Message” and “Reset Topic”.

10.2.6.1 Broker Function

User can execute an action to change the function status of MQTT Broker in the THEN/ELSE Action statement; the editing page is shown as follow:

MQTT Broker Function Action Setting	
Broker	<input type="text" value="Broker 1"/>
Status	<input checked="" type="radio"/> Disable <input type="radio"/> Enable
<input type="button" value="OK"/> <input type="button" value="Cancel"/>	

Figure 10-49 : MQTT Broker Function action setting page

Follow the steps below:

- i Select the specific Broker from the dropdown list of the “Broker” field.
- ii Specify the Broker Function status to be “Disable” or “Enable”

from the dropdown list of the “Status” field. When the Action being executed, the Broker Function status will be changed to specified status.

- iii Click “OK” button to confirm the settings and return to the Rule settings page.

10.2.6.2 Publish Message

You can publish a MQTT Topic to the Broker when executing a THEN/ELSE Action statement; the editing page is shown as below:

MQTT Publish Message Action Setting

Message	Broker	Broker 1 ▼	Message	Message 3 ▼
Action	Publish			

MQTT Publish Message Information

Topic	WISE-5200/xvboard/di0			
Content	XV107 DIO			

Figure 10-50 : MQTT Publish Message action setting page

Follow the steps below:

- i Select a pre-set MQTT Publish Topic message from the dropdown list of the “Broker” and “Message” fields. The MQTT Publish Topic message will be displayed for you to verify if this is the MQTT Publish Topic message you are going to send to.
- ii Click “OK” button to confirm the settings and return to the Rule settings page.

10.2.6.3 Reset Topic

You can reset the saved content of the subscribe topic when executing a THEN/ELSE Action statement; the editing page is shown as below:

MQTT Reset Topic Action Setting

Topic	Broker	Broker 1 ▼	Topic	Topic 1 ▼
Action	Reset			

Figure 10-51 : MQTT Reset Topic action setting page

Follow the steps below:

- i Select a pre-set MQTT Subscribe Topic from the dropdown list of the “Broker” and “Topic” fields. When this action is executed, WISE would reset the message of the topic, and the evaluation result of the IF statement which is associated with the topic will be verified again.
- ii Click “OK” button to confirm the settings and return to the Rule settings page.

10.2.7 Timer

You can change the Timer status in the THEN/ELSE Action statement; the editing page for Timer Action Setting is shown as below:



Timer Action Setting	
Timer	Timer1 ▾
Action	Reset ▾
<input type="button" value="OK"/> <input type="button" value="Cancel"/>	

Figure 10-52 : Timer action setting page

Follow the following steps:

- i Select the pre-defined Timer from the dropdown list of the “Timer” field.
- ii Specify you want to “Reset”, “Start”, “Pause” or “Resume” this Timer when this THEN/ELSE Action statement is executed. The “Start” Action will start to run the Timer and if the “Start” Action is triggered one more time when the Timer is running, the Timer will restart again. The “Pause” action will pause the Timer counting temporarily. The “Resume” action is to let the Timer to leave the “Pause” mode, and continue the Timer counting for the rest second of the Timer. The “Reset” action will reset the Timer and stop running the Timer.
- iii Click “OK” button to save the settings. The popup window will be closed and return to the Rule settings page.

10.2.8 Email

You can send an Email message to an Email group when executing a THEN/ELSE Action statement; the editing page is as below:

Email Action Setting	
Email	Email ▾
Action	Send
Email Information	
Receiver Email Address	Doris@iii.org.tw
Subject	DIO Status
Content	DIO = \$Xdi0, DI1 = \$Xdi1
<input type="button" value="OK"/> <input type="button" value="Cancel"/>	

Figure 10-53 : Email action setting page

Follow the steps below:

- i Select a pre-set Email group from the dropdown list of the “Email” field. The Email group information will be displayed for you to verify if this is the Email group you are going to send the message to.
- ii Click “OK” button to confirm the settings and return to the Rule settings page.

10.2.9 SMS Alarm

You can send a specific SMS Alarm message when executing a THEN/ELSE Action statement. The setting page is show as below:

SMS Alarm Action Setting	
SMS Alarm	SMS Alarm 1 ▾
Action	Send
SMS Alarm Information	
Phone Numbers	0912345678
Message	Please note: the temperature of the engine is too high: <input type="text" value="M-7017Z AIO"/>
<input type="button" value="OK"/> <input type="button" value="Cancel"/>	

Figure 10-54 : SMS Alarm action setting page

Follow the steps below:

- i In the “SMS Alarm” field, specify the SMS Alarm you want to execute in Action from the dropdown list. **Please note: the SMS Alarm you select has to be enabled in Advanced Setting. The selected SMS Alarm message such as phone numbers and message content will be displayed for you to verify if this is the SMS Alarm you want to send.**

- ii Click “OK” button to confirm the settings and return to the Rule settings page.

10.2.10 CGI Command

Click on “CGI Command”, 2 options will appear as the following: “Send” and “Reset Variable”.

10.2.10.1 Send

You can send a CGI Command to a Remote CGI Server device when executing a THEN/ELSE Action statement; the editing page is shown as below:

CGI Command Send Action Setting	
CGI Command	Server CGI Server 1 ▼ Command CGI Command 1 ▼
Action	http://192.168.100.222:80/aaa
<input type="button" value="OK"/> <input type="button" value="Cancel"/>	

Figure 10-55 : CGI Command Send action setting page

Follow the steps below:

- i Select a pre-set CGI Command from the dropdown list of the “Server” and “Command” field of the CGI Command section. The CGI Command information will be displayed for you to verify if this is the CGI Command you are going to send to.
- ii Click “OK” button to confirm the settings and return to the Rule settings page.

10.2.10.2 Reset Variable

You can reset the saved content of the CGI Command variable when executing a THEN/ELSE Action statement; the editing page is shown as below:

CGI Command Reset Variable Action Setting		
Name & Address	Variable Name CGI_p1 ▼	Source Address Anywhere ▼
Action	Reset	
<input type="button" value="OK"/> <input type="button" value="Cancel"/>		

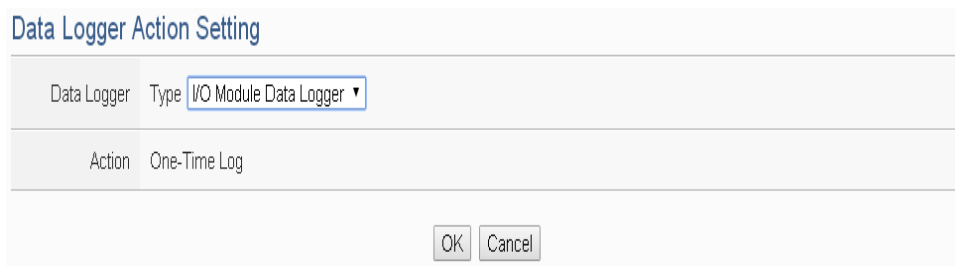
Figure 10-56 : CGI Command Reset Variable action setting page

Follow the steps below:

- i Specify the CGI Command variable and CGI Command source from the dropdown list of “Variable Name” field and “Source Address” field. When this action is executed, WISE would reset the content of the variable, and the evaluation result of the IF statement which is associated with the variable will be verified again.
- ii Click “OK” button to confirm the settings and return to the Rule settings page.

10.2.11 Data Logger

You can execute “One-Time Log” in the Action statements to perform data recording one-time only when an event is triggered. The setting page is show as below:



Data Logger Action Setting	
Data Logger	Type <input type="text" value="I/O Module Data Logger"/>
Action	One-Time Log

Figure 10-57 : Data Logger action setting page

Follow the steps below:

- i In the “Data Logger” field, specify the data logger you want to execute in Action (one-time data recording) from the dropdown list.
- ii Click “OK” button to confirm the settings and return to the Rule settings page.

10.2.12 SNMP Trap

You can send a specific SNMP Trap when executing a THEN/ELSE Action statement. The setting page is show as below:

SNMP Trap Action Setting	
Trap	Alarm ▾
Action	Send
SNMP Trap Information	
Variable Bindings	• 308 Sample DIO
Action Attribute Setting	
Execution Frequency	<input checked="" type="radio"/> One Time <input type="radio"/> Repeat
Waiting Time	<input type="text" value="0"/> second(s)
<input type="button" value="OK"/> <input type="button" value="Cancel"/>	

Figure 10-58 : SNMP Trap action setting page

Follow the steps below:

- i In the “Trap” field, specify the SNMP Trap you want to execute in Action from the dropdown list. The selected SNMP Trap message such as “Variable Bindings” and message content will be displayed for you to verify if this is the SNMP Trap you want to send.
- ii Click “OK” button to confirm the settings and return to the Rule settings page.

10.2.13 LINE Notify

You can send a specific LINE Notify message to LINE personal account or group chat rooms when executing a THEN/ELSE Action statement. The setting page is show as below:

LINE Notify Action Setting	
Message	Message 1 ▾
Action	Send
Message Information	
Chat Room	00WISE LINE Notify
Content	LINE Test <input type="text" value="System Information Date(Year)"/> / <input type="text" value="System Information Date(Month)"/> / <input type="text" value="System Information Date(Day)"/> , <input type="text" value="System Information Time(Hour)"/> : <input type="text" value="System Information Time(Minute)"/> : <input type="text" value="System Information Time(Second)"/>
<input type="button" value="OK"/> <input type="button" value="Cancel"/>	

Figure 10-59 : LINE Notify action setting page

Follow the steps below:

- i In the “Message” field, specify the LINE message you want to send in Action from the dropdown list. The selected LINE Notify message

such as “Chat Room” and message content will be displayed for you to verify if this is the LINE message you want to send.

- ii Click “OK” button to confirm the settings and return to the Rule settings page.

10.2.14 Bot Service

You can send a specific IoTstar Bot Service message to the LINE personal account which is bound with IoTstar when executing a THEN/ELSE Action statement. The setting page is show as below:

Figure 10-60 : IoTstar Bot Service action setting page

Follow the steps below:

- i In the “Message” field, specify the message you want to send in Action from the dropdown list. The content of the selected Bot Service message will be displayed for you to verify if this is the message you want to send.
- ii Click “OK” button to confirm the settings and return to the Rule settings page.

10.2.15 Re-boot System

You can reboot the WISE system when executing a THEN/ELSE Action statement. The setting page is show as below:

Figure 10-61 : Reboot system action setting page

Follow the steps below:

- i Click “OK” button to confirm the settings and return to the Rule settings page.

10.2.16 Reset Modem

The Reset modem action would power off and then power on the modem again to force the modem back to the initial status, and then the mobile connection would be re-started if the mobile network connection is enabled. The setting page is show as below:

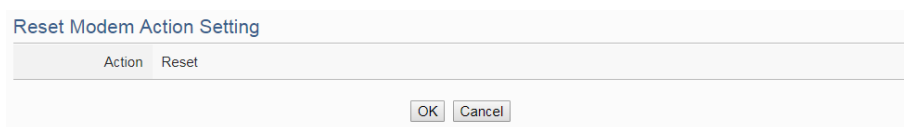


Figure 10-62 : Reset modem action setting page

Follow the steps below:

- i Click “OK” button to confirm the settings and return to the Rule settings page.

10.2.17 Internal Register

You can modify the value of Internal Register in the THEN/ELSE Action statement; the editing page for Internal Register Action Setting is shown as below:

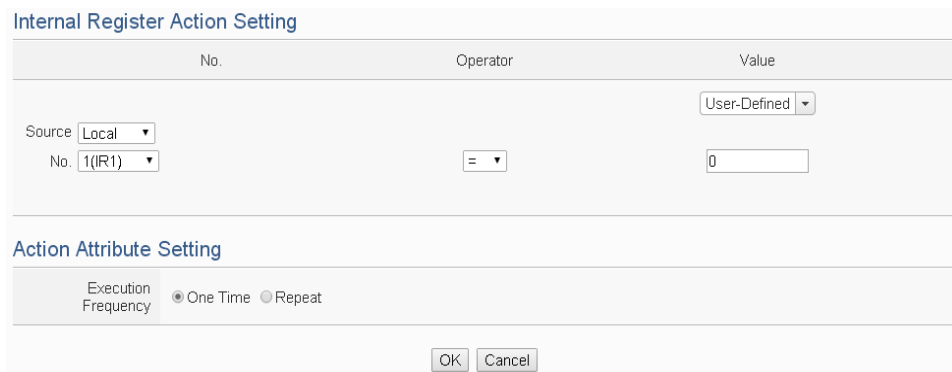


Figure 10-63 : Internal Register action setting page

Follow the steps below:

- i Select the pre-defined Internal Register from the dropdown lists of the “Source” and “No” field. The “Local” in the “Source” field mean the

Internal Register is from the Host controller (WISE). The “Remote” in the “Source” field mean the Internal Register is from the remote WISE-71xx controller. **Please note: the Internal Register you select has to be enabled in Advanced Setting.**

- ii Specify the Operator in the “Operator” field. The 6 operators are as follow:
 - “=” : Indicate assign the new Internal Register value as the value in “Value” field.
 - “+=” : Indicate assign the new Internal Register value as the original Internal Register value plus the value in “Value” field.
 - “-=” : Indicate assign the new Internal Register value as the original Internal Register value minus the value in “Value” field.
 - “*=” : Indicate assign the new Internal Register value as the original Internal Register value times the value in “Value” field.
 - “/=” : Indicate assign the new Internal Register value as the original Internal Register value is divided by the value in “Value” field.
 - “%=” : Indicate assign the new Internal Register value as the original Internal Register value divide the value in “Value” field and return the remainder.
- iii Set up the value in the “Value” field, WISE provides 6 value options. Please refer to “[10.2.1.3 AO](#)” section for detail.
- iv Specify the “Execution Frequency” to be “One Time” or “Repeat”. Please refer to “[10.2 THEN/ELSE Action Setting](#)” for detail.
- v Click “OK” button to confirm the settings and return to the Rule settings page.

10.2.18 Rule Status

The Rule Status can be modified to be Disable or Enable in the Action. The editing page for Rule Status Action Setting is shown as below:

Rule Status Action Setting

Rule	Rule 1 ▾
Action	Disable ▾

Figure 10-64 : Rule Status action setting page

Follow the steps below:

- i Specify the Rule (It has to be a previously saved Rule) that is going to be changed in the Action Condition statement from the dropdown list of the “Rule” field.
- ii Specify the Rule status to be “Disable” or “Enable” from the dropdown list of the “Action” field. When the Action being executed, the Rule status will be changed to specified status.
- iii Click “OK” button to confirm the settings and return to the Rule settings page.

10.2.19 Delay

Users can add the Delay action to define the delay time before the execution of next actions. The editing page for Delay Action Setting is shown as below:



The screenshot shows a dialog box titled "Delay Action Setting". It is divided into two main sections. The top section, "Delay Action Setting", has a label "Action" and a text input field containing the number "5", followed by the text "second(s)". The bottom section, "Action Attribute Setting", has a label "Execution Frequency" and two radio buttons: "One Time" (which is selected) and "Repeat". At the bottom right of the dialog, there are two buttons: "OK" and "Cancel".

Figure 10-65 : Delay action setting page

Follow the steps below:

- i In the “Action” field, set the delay time (unit: second) before the execution of next actions. The counting of the delay time would start when the previous action starts, rather than when the previous action is done.
- ii Specify the “Execution Frequency” to be “One Time” or “Repeat”. Please refer to “[10.2 THEN/ELSE Action Setting](#)” for detail.
- iii Click “OK” button to confirm the settings and return to the Rule settings page.

11 Download to Module

The  “Save” button on the right upper of WISE Web page allows to save all parameter settings and Rule settings to WISE. When there is a change being made on the WISE, such as add new logic or modify the settings, Click on the  “Save” button to start the process.

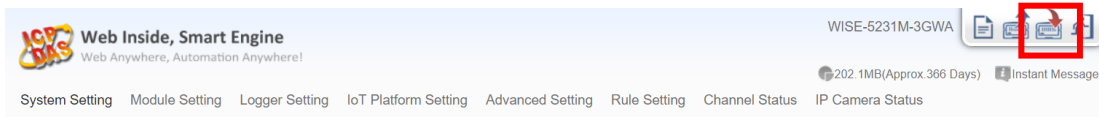


Figure 11-1 : “Save” button of Rules management toolbar

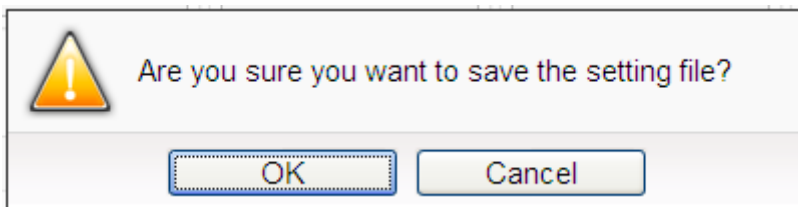


Figure 11-2 : Confirm to save settings

Click “OK” button to complete the process and save all parameter settings and Rule settings from the web page of WISE to the WISE hardware. **Now WISE will start to run the rules that have been downloaded.** At this time, you can still edit or modify the content of the rules.

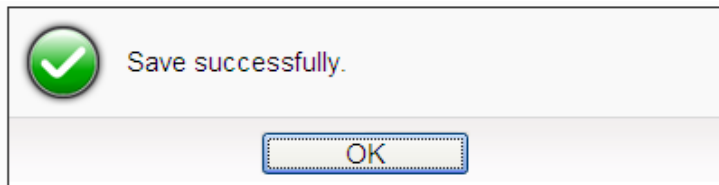



Figure 11-3 : Save settings successfully

12 Upload from Module

The  “Load” button on the right upper of WISE Web page allows you to retrieve the setting and rules information from the WISE hardware to the Web page of WISE.

Click on the  “Load” to start the process.

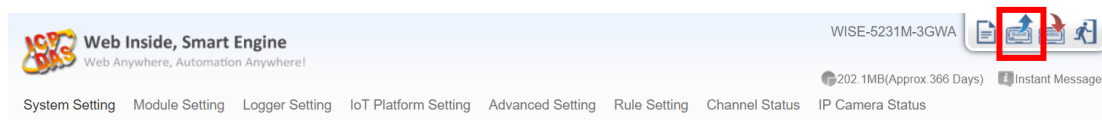


Figure 12-1 : “Load” button of Rules management toolbar

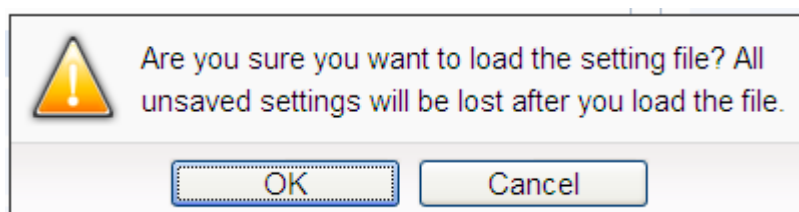


Figure 12-2 : Confirm to load settings

Click “OK” button to complete the process and load all parameter settings and Rule settings from the WISE hardware to the web page of WISE. Now you can modify and download the edited rules to the hardware devices later again.

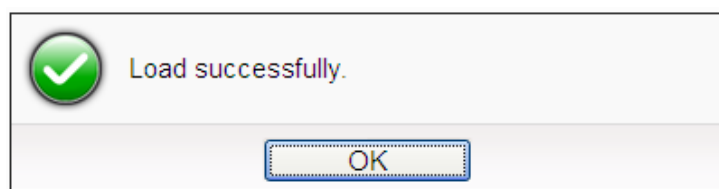


Figure 12-3 : Load settings successfully

13 Channel Status

Channel Status page offers an easy way to view monitoring page that allows you to view important controller information in real time without SCADA software. **This page will be updated once every 5 seconds, showing the latest data of the controllers.**

The Channel Status page includes the following information.

- Default Channel Status page: It displays the all I/O channel information based on the sorting of all I/O Modules.
- User-defined Channel Status page: It displays the I/O channel status based on the user-defined arrangement. Please refer “[8.8 I/O Channel Status setting](#)” section for detail.
- Internal Register Status Page: It displays the WISE’s Internal Register status.

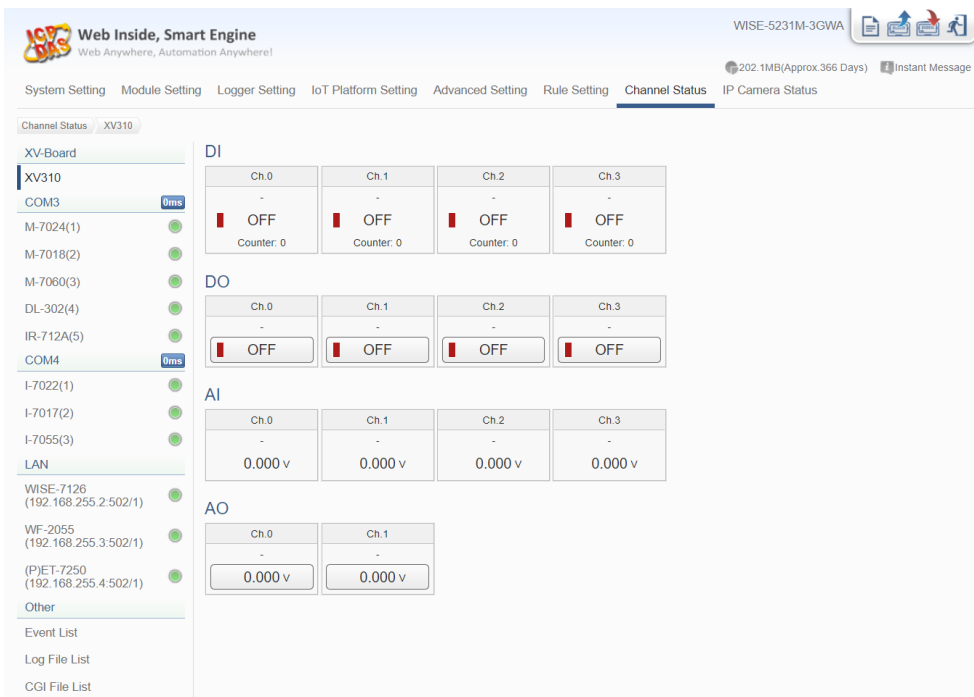


Figure 13-1 : Channel Status page

- **Event List:** It displays the system event list of WISE.

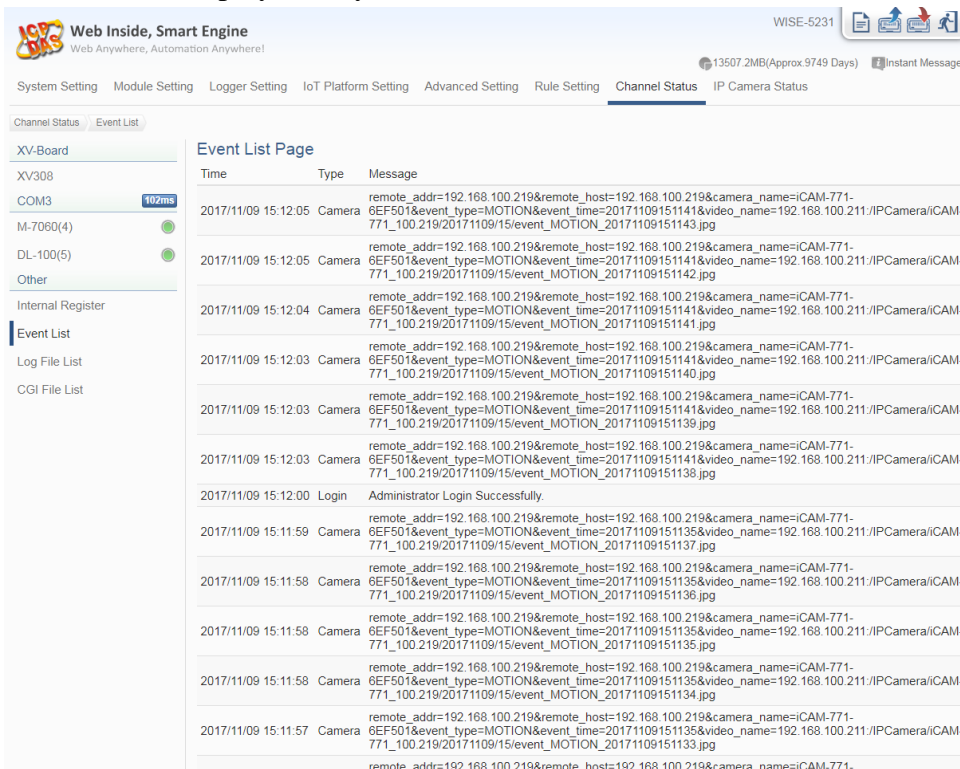


Figure 13-2 : Event List page

- **Log File List:** It displays the WISE’s Data Logger file list. It includes the logger file from I/O Module Data Logger, User-Defined Data Logger, Event Logger and MQTT Logger. Click on the desired single item to download the file.

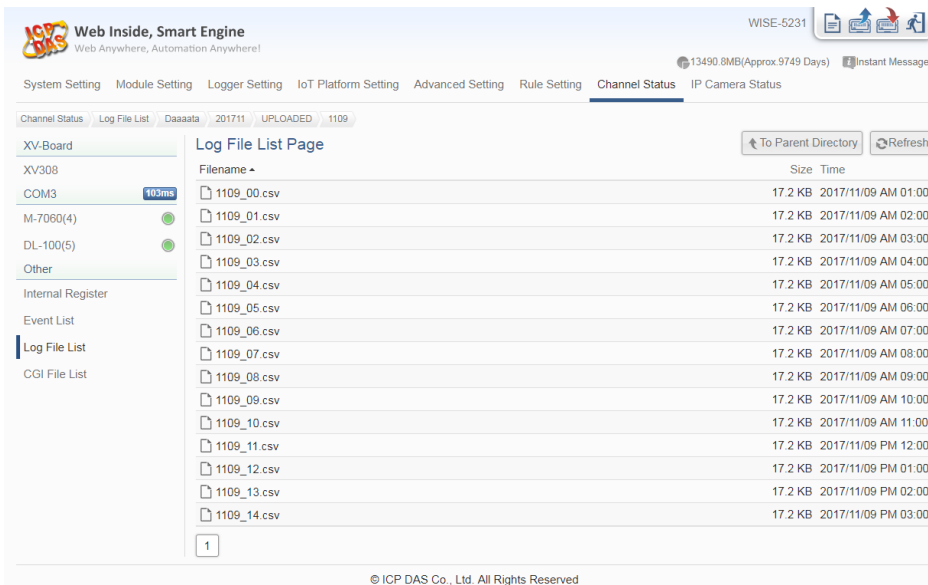


Figure 13-3 : Log File List page

- **CGI file list:** It displays the file list which WISE creates and save the reply content from the remote CGI Servers. If the CGI file is an Image or Video file, the users can click on it directly to display the content of the file by Browser. The users can choose to view the file list in “List” or “Thumbnail” format by clicking the button on the Right-Top corner of the page. The user can also click on the “Refresh” button to refresh the file list of the folder.

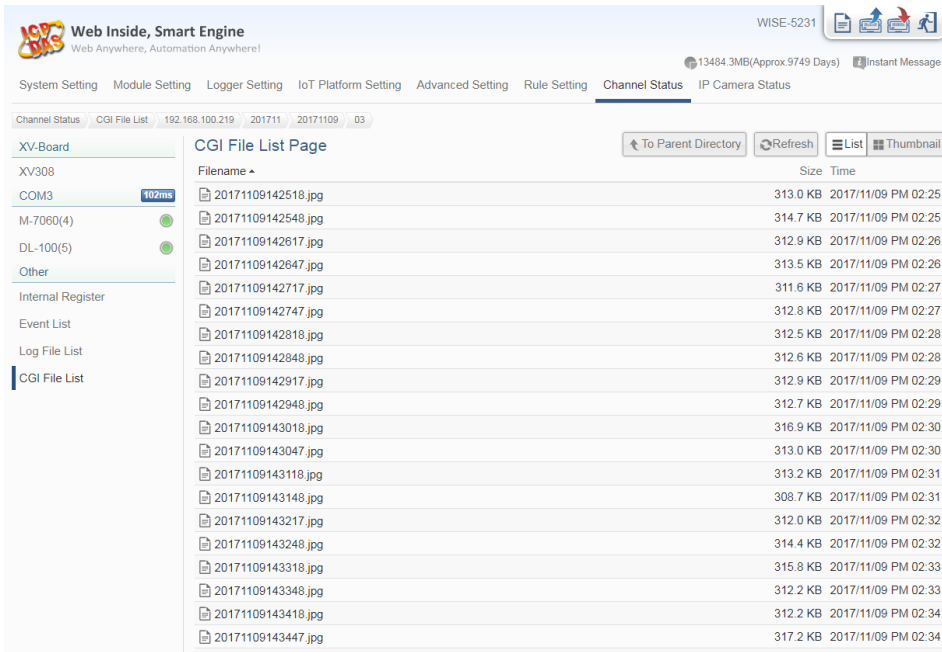


Figure 13-4 : CGI file list page by “List” format

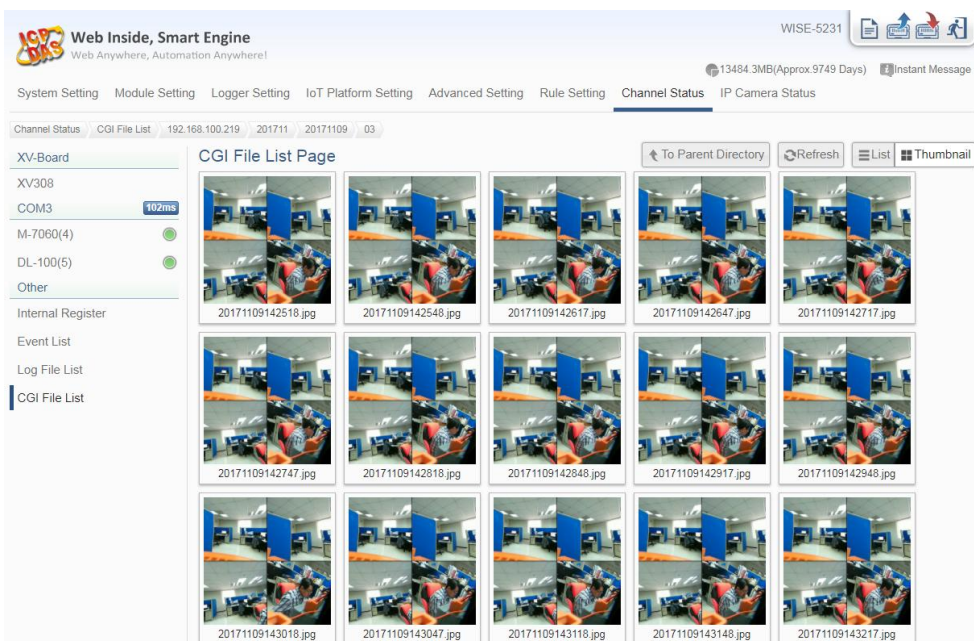


Figure 13-5 : CGI file list page by “Thumbnail” format

- **Ping Status Page:** It displays the latest Ping results of all Ping targets. The latest ping result is displayed in the “Result” column, and the response time is displayed in the “Response Time” column. In the “Failed Times/Ratio” column, it displays the continuous failed times or the failed ratio that depends on the Failed Condition. The “Last Success Time” column displays the timestamp of the latest successful ping.

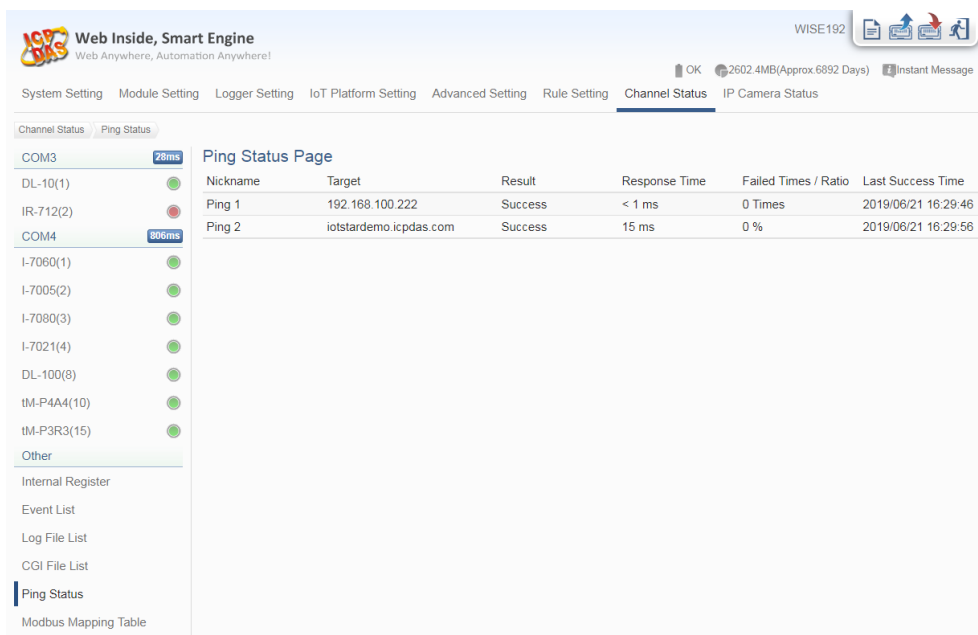


Figure 13-6 : Ping Status page

- **Modbus Mapping Table:** It displays the Modbus address of all I/O channels on the I/O modules which are connected to WISE. With the help of this page, users do not have to calculate the Modbus address of the I/O channels with the formula described in Appendix I by themselves.

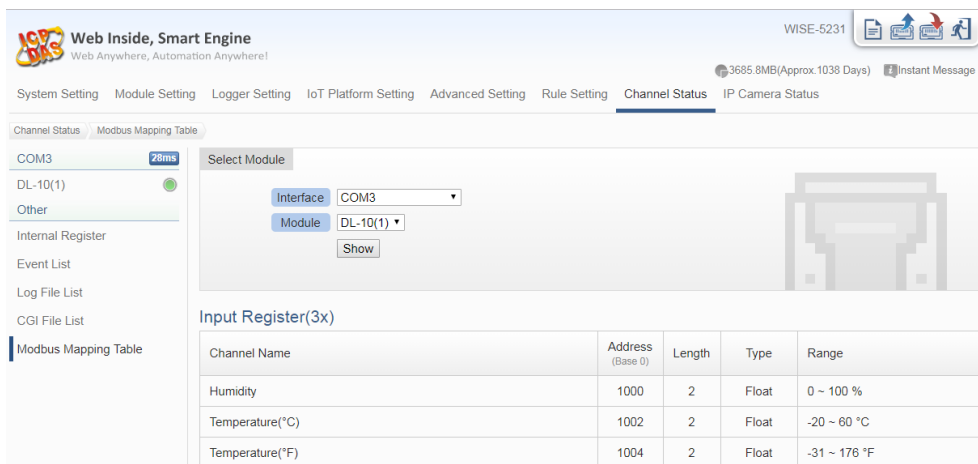



Figure 13-7 : Modbus Mapping Table page

14 IP Camera Status

Click on the “IP Camera Status page”, it shows the Image/Video files captured by the IP Camera and sent back to the WISE; and displays the Event List and the I/O Channel value of the IP Cameras. The user can directly click and review the Image/Video file on this page. The IP Camera Status page could be divided into 3 sections:

- i. The IP Camera List: On the left side of the page, it will show the list of the IP Cameras which are connected to the WISE. It will also show the connection status between the IP Camera and the WISE.
- ii. Event List:
 - The Calendar interface will show the Time range by month for the dates if there is an Event happened. The date will be marked with a Blue triangle on the left upper corner .
 - Click on the Date marked with the Blue triangle, the lower area of the page will show a list of all events happened in that date with all Image/Video files corresponding to these events. The Name of Event will be the same as the name of the IF-THEN-ELSE rule that triggered the IP Camera operation or the pre-defined Event's name of the IP Camera. All Image/Video files of the same Event will be sorted in the same folder of the Image List.
 - Click on the icon of the Image/Video file to directly review the original Image file or the content of the Video file.

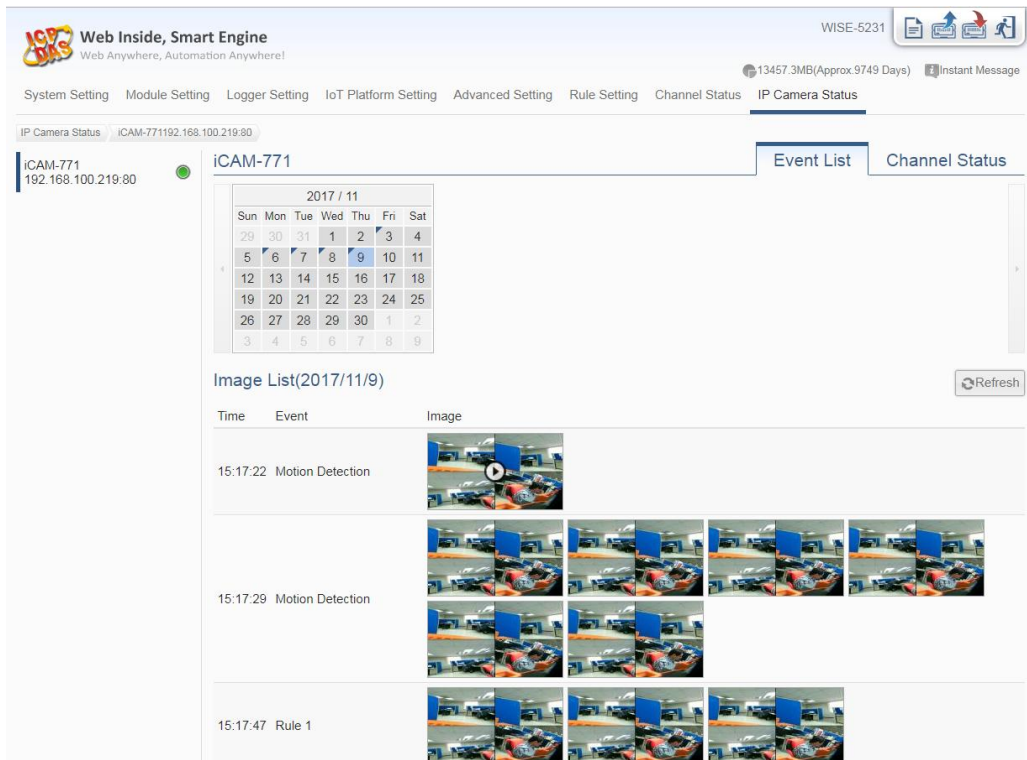


Figure 14-1 : IP Camera Status and Event List page

- iii. Channel Status page: It displays the I/O channel status of the selected IP Camera. User can change the DO channel value of the selected IP Camera directly.

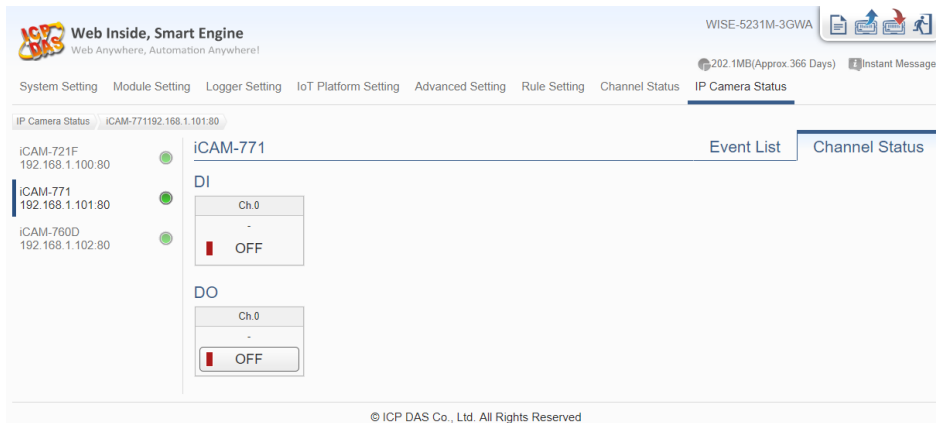


Figure 14-2 : IP Camera Status and Channel Status page

15 Firmware Update

WISE allows to update firmware via browser, after the update is completed; the WISE doesn't require to reboot. Please follow the steps below:

- i. Before update
 - Please visit WISE product web site (<http://wise.icpdas.com/>) or contact ICP DAS service to obtain the latest version of the WISE firmware program. Copy the file to the computer that you will use to connect with WISE via browser.
 - Connect the WISE (the one you are going to update WISE firmware) to the network. Please verify and make a note of the WISE -52xx IP address, you will need it later in the process.
- ii. Launch the browser from the computer which owns the latest version of the WISE firmware. Connect the browser with the IP address of the WISE Web page.
- iii. Login in the WISE as the Administrator.
- iv. Go to “System Setting” page, under the “Firmware Update Setting” section, click on “Browse”.

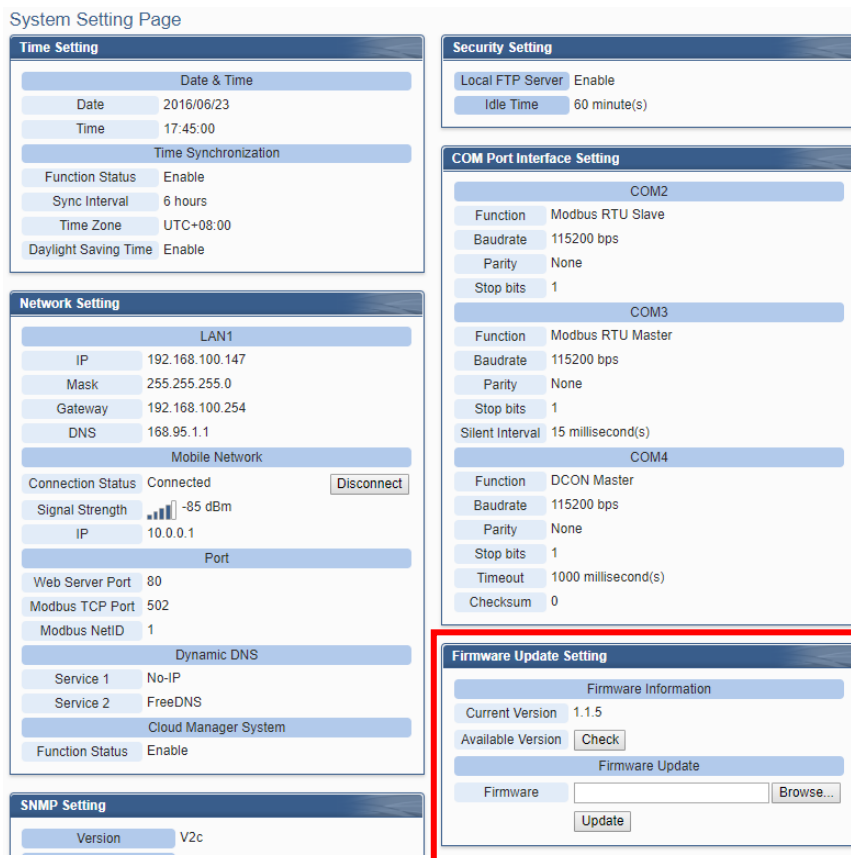


Figure 15-1 : Firmware Update Setting page

- v. Browse through to select the new firmware file and click “Open”.

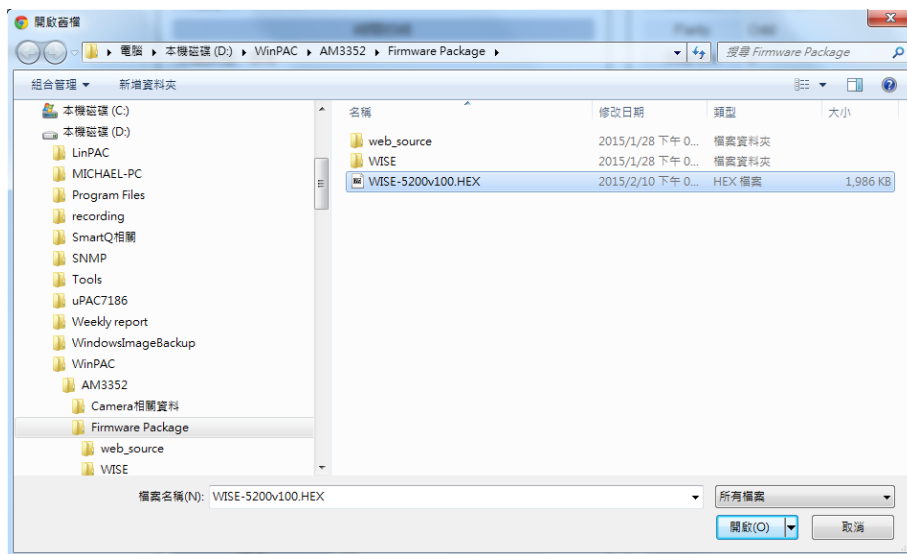


Figure 15-2 : Firmware Update (1)

- vi. Click “Update” to update the firmware.

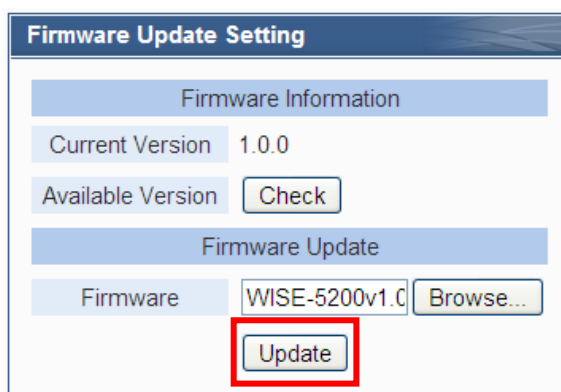


Figure 15-3 : Firmware Update (2)

- vii. Click “OK” to start the firmware update process, to cancel the firmware update, click “Cancel”.

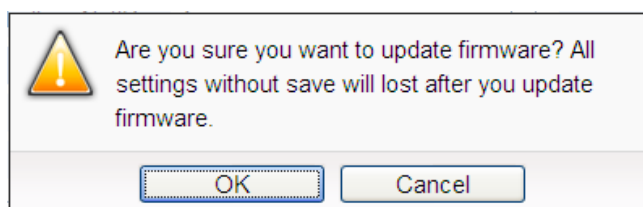


Figure 15-4 : Firmware Update (3)

viii. Updating the firmware.

Please note: when the firmware update process is started, please **DO NOT** close the update window or perform any system modification, or may result in unexpected failures.

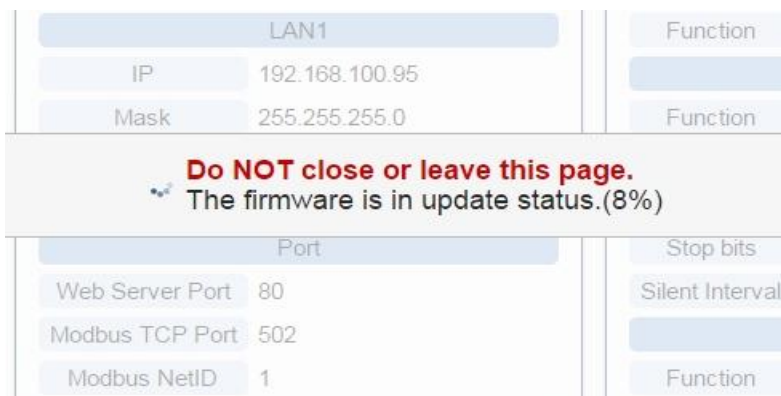


Figure 15-5 : Firmware Update (4)

- ix. Click “OK” to complete the update process. After the update is completed, please clear the cache and cookies on your browser. If the update process is failed, please perform the update again.

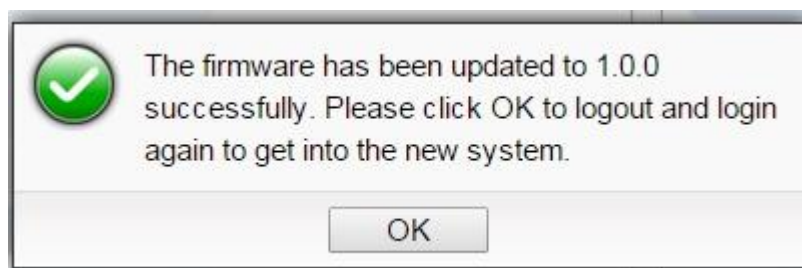


Figure 15-6 : Firmware Update (5)

16 Rule File Import & Export

WISE can directly perform the WISE's Rule file import and export operations through the Browser to complete the update and backup of the WISE's setting. The “Export / Import Settings” operation can back up all WISE settings, but does **NOT** include the “Time Setting”, “Network Setting”, “SNMP Setting”, “Account Setting” and “Security Setting”. The items of the backup setting is the same as the file backup using WISE-52xx_224x Utility, but the files backed up by the two interfaces are not compatible.

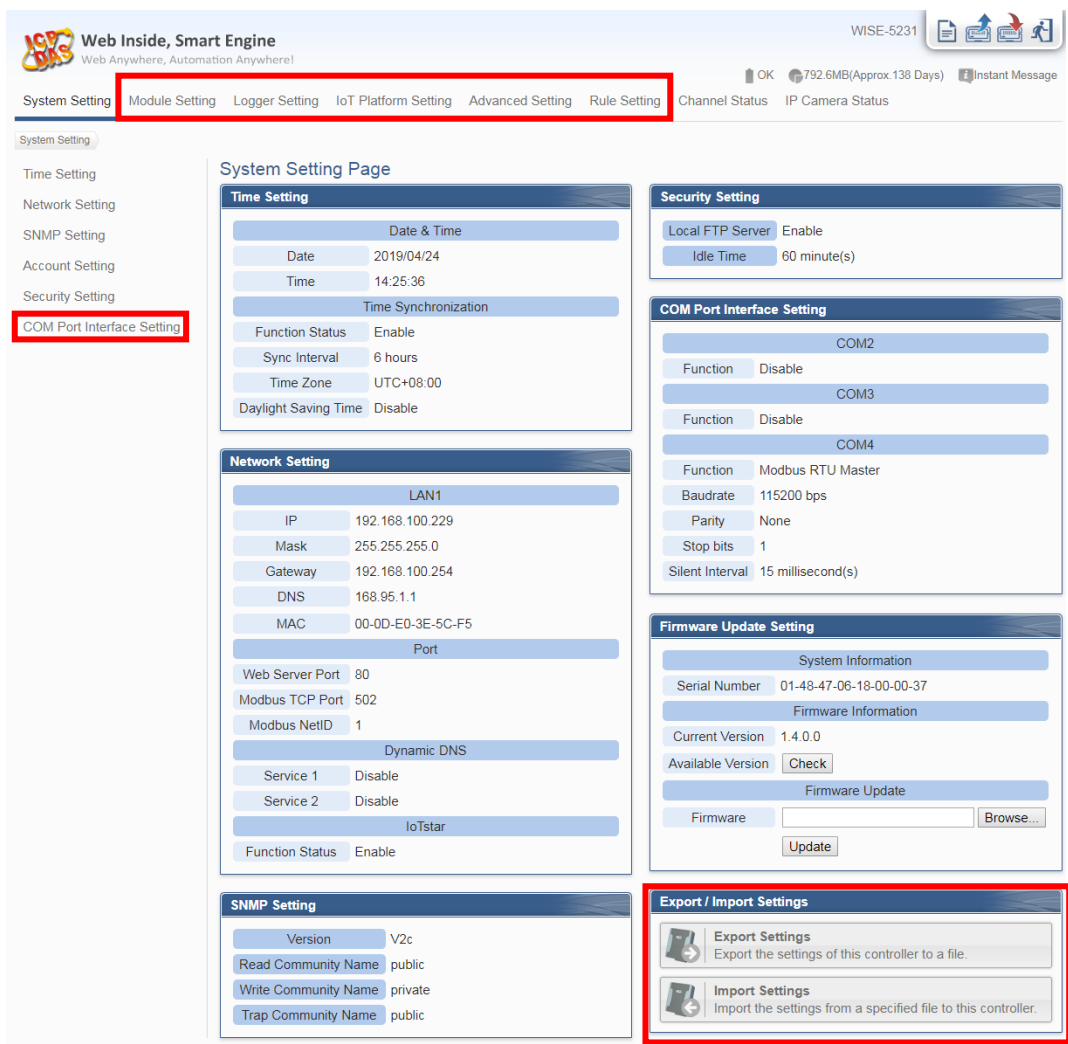


Figure 16-1 : Export/Import Setting page and the settings to be backed up

- Export WISE's Rule file:
 1. After click the “Export Settings” button, the rule file would be stored in the default download path according to the browser's setting. If there was setting of WISE has not been saved before the export operation, it will ask if you want to save the setting before the export operation .

● Import WISE's Rule file:

1. Click the “Import Settings” button and select the WISE's rule file to be imported from local PC to WISE.
2. After selecting the file to be imported, the user will be asked whether to abandon the current settings, or not. If user select “Import”, the current settings of WISE will be cleared after the import operation.
3. After the import process is done, WISE would run with the imported rule automatically. If the imported file is incomplete or is not produced via the "Export WISE's Rule file" operation of WISE web interface, the import operation will be failed.

Appendix I : Modbus Address Table

WISE allows SCADA software or HMI device to retrieve the I/O channel data and system information via Modbus TCP/RTU protocol. WISE register addresses are specified according to Modbus register mapping tables (more detailed information will follow).

Please Note:

- The addresses are in **Base 0** format
- The addresses are in **Decimal** format
- The **default value of NetID is 1**, and you can modify the NetID value in the Ethernet Setting page. (Please refer to “[5.2 Network Setting](#)” section).
- If the data is displayed in Floating format or 32 bits format (AI/AO Channel value·Internal Register value·Input Register value and Holding Register value), each record of data will take two registers to hold the data. The following code example demonstrates how to join the two Registers into one floating point value.

```
float register_to_float(short r1, short r2)
{
    float f;
    int *a = &f;
    *a = r1;
    a++;
    *a = r2;
    return f;
}
```

For the compilers are different (Big Endian or Little Endian) the floating point composing order might be different. For example: if r1 represent the address of 30100 Register and r2 represent the address of 30101 Register, to join r1 and r2 to a floating point, if the system is Big Endian system you will need to call:

```
float value = register_to_float(r1, r2);
```

On the other hand, if the system is Little Endian system, you will need to call:

```
float value = register_to_float(r2, r1);
```

Please Note:

1. If you are not sure your compiler belongs to which system, try both ways to find the accurate one.
2. The way to join the two registers value into DWORD is similar to Floating point; change the return value to DWORD or Unsigned Long.

Modbus Address Table

Modbus Address	Coil Output (0x)	Discrete Input (1x)	Input Register (3x)	Holding Register (4x)
0~59	System Data ₍₁₎			
60~75	/	COM3 module connection status ₍₂₎	COM3 module Information ₍₃₎	Internal Register Data ₍₄₎
76~91		COM4 module connection status ₍₂₎	COM4 module Information ₍₃₎	
92~107		LAN _(Modbus TCP) module connection status ₍₂₎	LAN _(Modbus TCP) module Information ₍₃₎	
108~259		/	/	
300~349	XV Board Data ₍₅₎			
1000~1499	Module Data _(Index=1) of COM3 ₍₆₎			
1500~1999	Module Data _(Index=2) of COM3 ₍₆₎			
2000~2499	Module Data _(Index=3) of COM3 ₍₆₎			
2500~2999	Module Data _(Index=4) of COM3 ₍₆₎			
3000~3499	Module Data _(Index=5) of COM3 ₍₆₎			
3500~3999	Module Data _(Index=6) of COM3 ₍₆₎			
4000~4499	Module Data _(Index=7) of COM3 ₍₆₎			
4500~4999	Module Data _(Index=8) of COM3 ₍₆₎			
5000~5499	Module Data _(Index=9) of COM3 ₍₆₎			
5500~5999	Module Data _(Index=10) of COM3 ₍₆₎			
6000~6499	Module Data _(Index=11) of COM3 ₍₆₎			
6500~6999	Module Data _(Index=12) of COM3 ₍₆₎			
7000~7499	Module Data _(Index=13) of COM3 ₍₆₎			
7500~7999	Module Data _(Index=14) of COM3 ₍₆₎			
8000~8499	Module Data _(Index=15) of COM3 ₍₆₎			

8500~8999	Module Data _(Index=16) of COM3 ₍₆₎			
9000~9499	Module Data _(Index=1) of COM4 ₍₆₎			
9500~9999	Module Data _(Index=2) of COM4 ₍₆₎			
10000~10499	Module Data _(Index=3) of COM4 ₍₆₎			
10500~10999	Module Data _(Index=4) of COM4 ₍₆₎			
11000~11499	Module Data _(Index=5) of COM4 ₍₆₎			
11500~11999	Module Data _(Index=6) of COM4 ₍₆₎			
12000~12499	Module Data _(Index=7) of COM4 ₍₆₎			
12500~12999	Module Data _(Index=8) of COM4 ₍₆₎			
13000~13499	Module Data _(Index=9) of COM4 ₍₆₎			
13500~13999	Module Data _(Index=10) of COM4 ₍₆₎			
14000~14499	Module Data _(Index=11) of COM4 ₍₆₎			
14500~14999	Module Data _(Index=12) of COM4 ₍₆₎			
15000~15499	Module Data _(Index=13) of COM4 ₍₆₎			
15500~15999	Module Data _(Index=14) of COM4 ₍₆₎			
16000~16499	Module Data _(Index=15) of COM4 ₍₆₎			
16500~16999	Module Data _(Index=16) of COM4 ₍₆₎			
17000~17499	LAN _(Modbus TCP) Module Data _(Index=1) (6)			
17500~17999	LAN _(Modbus TCP) Module Data _(Index=2) (6)			
18000~18499	LAN _(Modbus TCP) Module Data _(Index=3) (6)			
18500~18999	LAN _(Modbus TCP) Module Data _(Index=4) (6)			
19000~19499	LAN _(Modbus TCP) Module Data _(Index=5) (6)			
19500~19999	LAN _(Modbus TCP) Module Data _(Index=6) (6)			
20000~20499	LAN _(Modbus TCP) Module Data _(Index=7) (6)			
20500~20999	LAN _(Modbus TCP) Module Data _(Index=8) (6)			
21000~21499	LAN _(Modbus TCP) Module Data _(Index=9) (6)			
21500~21999	LAN _(Modbus TCP) Module Data _(Index=10) (6)			
22000~22499	LAN _(Modbus TCP) Module Data _(Index=11) (6)			
22500~22999	LAN _(Modbus TCP) Module Data _(Index=12) (6)			
23000~23499	LAN _(Modbus TCP) Module Data _(Index=13) (6)			
23500~23999	LAN _(Modbus TCP) Module Data _(Index=14) (6)			
24000~24499	LAN _(Modbus TCP) Module Data _(Index=15) (6)			
24500~24999	LAN _(Modbus TCP) Module Data _(Index=16) (6)			
50000~52999	Active I/O Table Data for Coil data type(7)			Active I/O Table Data for Register data type(7)

More detailed information for each block please refers to the number in quotes and finds the related information in the following section.

(1) System Data

This block stores the system information of WISE, shown as below:

Parameter Name	Modbus Address	Length	Data Type	Range
Discrete Input (1x), Unit : Coil(8 Bits)				
Local FTP Server	10000	1	Byte	0=Disable 1=Enable
Active I/O Connection	10001	1	Byte	0=Disconnected 1=Connected
MQTT Broker 1 Status	10002	1	Byte	
MQTT Broker 2 Status	10003	1	Byte	
Azure Connection Status	10004	1	Byte	
Bluemix Connection Status	10005	1	Byte	
Input Register (3x), Unit : Register(16 Bits)				
Module Name	30000	1	UInt16	0~65535
Firmware Version	30002	1	UInt16	100~
Serial Number 1	30004	1	UInt16	0~65535
Serial Number 2	30005	1	UInt16	0~65535
Serial Number 3	30006	1	UInt16	0~65535
Serial Number 4	30007	1	UInt16	0~65535
Serial Number 5	30008	1	UInt16	0~65535
Serial Number 6	30009	1	UInt16	0~65535
Serial Number 7	30010	1	UInt16	0~65535
Serial Number 8	30011	1	UInt16	0~65535
Boot Date(Year)	30012	1	UInt16	1752~
Boot Date(Month)	30013	1	UInt16	1~12
Boot Date(Day)	30014	1	UInt16	1~31
Boot Time(Hour)	30015	1	UInt16	0~23
Boot Time(Minute)	30016	1	UInt16	0~59
Boot Time(Second)	30017	1	UInt16	0~59
Alive Count	30018	1	UInt16	0~65535
Cycle Time	30019	1	UInt16	0~65535(ms)
XV Board Name	30020	1	UInt16	0~65535
COM3 Connection Status	30021	1	UInt16	0=Offline, 1=Online

COM4 Connection Status	30022	1	UInt16	Each bit represents a module.
LAN Connection Status	30023	1	UInt16	
XV Board Update Rate	30024	1	UInt16	0~65535(ms)
COM3 Update Rate	30025	1	UInt16	0~65535(ms)
COM4 Update Rate	30026	1	UInt16	0~65535(ms)
Modbus Slave NetID	30028	1	UInt16	1~247
Modbus TCP Port	30029	1	UInt16	1~65535
Web Port	30030	1	UInt16	1~65535
SMS Modem Status	30031	1	UInt16	1~65535
SMS Register Status	30032	1	UInt16	1~65535
Mobile Network Signal Strength	30033	1	Int16	-32768~32767(dbm)
Mobile Network Signal Strength (Percent)	30034	1	Int16	0, 20, 40, 60, 80, 100
micro SD Free Space	30035	1	UInt16	0~65535(MB)

(2) COM3 / COM4 / LAN Modules Connection Status

This block stores the connection status of ICP DAS I/O modules and Modbus TCP/RTU modules that are connected to the WISE, detailed information is shown as below:

Parameter Name	Modbus Address	Length	Data Type	Range
Discrete Input (1x), Unit : Coil(8 Bits)				
The connection status of ICP DAS I/O modules and Modbus RTU modules that are connected to COM3.	10060-10075	1	Byte	0=Offline 1=Online
The connection status of ICP DAS I/O modules and Modbus RTU modules that are connected to COM4.	10076-10091	1	Byte	0=Offline 1=Online
The connection status of CP DAS I/O modules and Modbus TCP modules that are connected to LAN.	10092-10107	1	Byte	0=Offline 1=Online

(3) COM3 / COM4 / LAN Modules Information

This block stores the module type or address information of ICP DAS I/O modules and Modbus TCP/RTU modules that are connected to the WISE. If the module is ICP DAS I/O module, it will show the module type. If it is the Modbus TCP/RTU module, it will show the Address or NetID of the module. Detailed information is shown as below:

Parameter Name	Modbus Address	Length	Data Type	Range
Input Register (3x), Unit : Register(16 Bits)				
The module type or address of ICP DAS I/O module or Modbus RTU modules that are connected to COM3.	30060-30075	1	UInt16	Module type or Module Address(1~128)
The module type or address of ICP DAS I/O module or Modbus RTU modules that are connected to COM4.	30076-30091	1	UInt16	Module type or Module Address(1~128)
The module type or NetID of ICP DAS I/O module or Modbus TCP modules that are connected to LAN.	30092-30107	1	UInt16	Module type or Module NetID(1~247)

(4) Internal Register Data

This block stores 100 sets of Internal Register data provided by WISE.

Parameter Name	Modbus Address	Length	Data Type	Range
Holding Register (4x), Unit : Register(16 Bits)				
Internal Register 1	40060	By setting in “8.1 Internal Register Setting” section.		
Internal Register 2	40062			
Internal Register 3	40064			
Internal Register 4	40066			
Internal Register 5	40068			
Internal Register 6	40070			
Internal Register 7	40072			
Internal Register 8	40074			
⋮				
Internal Register 97	40242	By setting in “8.1 Internal Register		

Internal Register 98	40244	Setting” section.
Internal Register 99	40246	
Internal Register 100	40248	

Please Note: The Modbus Address of Internal Register is fixed. Others parameters (Length, Data Type and Range) is depended on the setting of “[8.1 Internal Register Setting](#)” section.

(5) XV Board Data

This block stores information of XV Board. For different XV Board modules, the data will be store in different address, the following section shows corresponding address information for different modules.

● XV107、XV107A

Parameter Name	Modbus Address	Length	Data Type	Range
Coil Output (0x), Unit : Coil(8 Bits)				
DO Ch.0	00300	1	Byte	0=OFF, 1=ON
DO Ch.1	00301	1	Byte	0=OFF, 1=ON
DO Ch.2	00302	1	Byte	0=OFF, 1=ON
DO Ch.3	00303	1	Byte	0=OFF, 1=ON
DO Ch.4	00304	1	Byte	0=OFF, 1=ON
DO Ch.5	00305	1	Byte	0=OFF, 1=ON
DO Ch.6	00306	1	Byte	0=OFF, 1=ON
DO Ch.7	00307	1	Byte	0=OFF, 1=ON
Discrete Input (1x), Unit : Coil(8 Bits)				
DI Ch.0	10300	1	Byte	0=OFF, 1=ON
DI Ch.1	10301	1	Byte	0=OFF, 1=ON
DI Ch.2	10302	1	Byte	0=OFF, 1=ON
DI Ch.3	10303	1	Byte	0=OFF, 1=ON
DI Ch.4	10304	1	Byte	0=OFF, 1=ON
DI Ch.5	10305	1	Byte	0=OFF, 1=ON
DI Ch.6	10306	1	Byte	0=OFF, 1=ON
DI Ch.7	10307	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
DI Counter 0	30300	2	UInt32	0~4294967295
DI Counter 1	30302	2	UInt32	0~4294967295
DI Counter 2	30304	2	UInt32	0~4294967295

DI Counter 3	30306	2	UInt32	0~4294967295
DI Counter 4	30308	2	UInt32	0~4294967295
DI Counter 5	30310	2	UInt32	0~4294967295
DI Counter 6	30312	2	UInt32	0~4294967295
DI Counter 7	30314	2	UInt32	0~4294967295

● **XW110**

Parameter Name	Modbus Address	Length	Data Type	Range
Discrete Input (1x), Unit : Coil(8 Bits)				
DI Ch.0	10300	1	Byte	0=OFF, 1=ON
DI Ch.1	10301	1	Byte	0=OFF, 1=ON
DI Ch.2	10302	1	Byte	0=OFF, 1=ON
DI Ch.3	10303	1	Byte	0=OFF, 1=ON
DI Ch.4	10304	1	Byte	0=OFF, 1=ON
DI Ch.5	10305	1	Byte	0=OFF, 1=ON
DI Ch.6	10306	1	Byte	0=OFF, 1=ON
DI Ch.7	10307	1	Byte	0=OFF, 1=ON
DI Ch.8	10308	1	Byte	0=OFF, 1=ON
DI Ch.9	10309	1	Byte	0=OFF, 1=ON
DI Ch.10	10310	1	Byte	0=OFF, 1=ON
DI Ch.11	10311	1	Byte	0=OFF, 1=ON
DI Ch.12	10312	1	Byte	0=OFF, 1=ON
DI Ch.13	10313	1	Byte	0=OFF, 1=ON
DI Ch.14	10314	1	Byte	0=OFF, 1=ON
DI Ch.15	10315	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
DI Counter 0	30300	2	UInt32	0~4294967295
DI Counter 1	30302	2	UInt32	0~4294967295
DI Counter 2	30304	2	UInt32	0~4294967295
DI Counter 3	30306	2	UInt32	0~4294967295
DI Counter 4	30308	2	UInt32	0~4294967295
DI Counter 5	30310	2	UInt32	0~4294967295
DI Counter 6	30312	2	UInt32	0~4294967295
DI Counter 7	30314	2	UInt32	0~4294967295
DI Counter 8	30316	2	UInt32	0~4294967295

DI Counter 9	30318	2	UInt32	0~4294967295
DI Counter 10	30320	2	UInt32	0~4294967295
DI Counter 11	30322	2	UInt32	0~4294967295
DI Counter 12	30324	2	UInt32	0~4294967295
DI Counter 13	30326	2	UInt32	0~4294967295
DI Counter 14	30328	2	UInt32	0~4294967295
DI Counter 15	30330	2	UInt32	0~4294967295

● **XV111、XV111A**

Parameter Name	Modbus Address	Length	Data Type	Range
Coil Output (0x), Unit : Coil(8 Bits)				
DO Ch.0	00300	1	Byte	0=OFF, 1=ON
DO Ch.1	00301	1	Byte	0=OFF, 1=ON
DO Ch.2	00302	1	Byte	0=OFF, 1=ON
DO Ch.3	00303	1	Byte	0=OFF, 1=ON
DO Ch.4	00304	1	Byte	0=OFF, 1=ON
DO Ch.5	00305	1	Byte	0=OFF, 1=ON
DO Ch.6	00306	1	Byte	0=OFF, 1=ON
DO Ch.7	00307	1	Byte	0=OFF, 1=ON
DO Ch.8	00308	1	Byte	0=OFF, 1=ON
DO Ch.9	00309	1	Byte	0=OFF, 1=ON
DO Ch.10	00310	1	Byte	0=OFF, 1=ON
DO Ch.11	00311	1	Byte	0=OFF, 1=ON
DO Ch.12	00312	1	Byte	0=OFF, 1=ON
DO Ch.13	00313	1	Byte	0=OFF, 1=ON
DO Ch.14	00314	1	Byte	0=OFF, 1=ON
DO Ch.15	00315	1	Byte	0=OFF, 1=ON

● **XV116**

Parameter Name	Modbus Address	Length	Data Type	Range
Coil Output (0x), Unit : Coil(8 Bits)				
DO Ch.0	00300	1	Byte	0=OFF, 1=ON
DO Ch.1	00301	1	Byte	0=OFF, 1=ON
DO Ch.2	00302	1	Byte	0=OFF, 1=ON

DO Ch.3	00303	1	Byte	0=OFF, 1=ON
DO Ch.4	00304	1	Byte	0=OFF, 1=ON
DO Ch.5	00305	1	Byte	0=OFF, 1=ON
Discrete Input (1x), Unit : Coil(8 Bits)				
DI Ch.0	10300	1	Byte	0=OFF, 1=ON
DI Ch.1	10301	1	Byte	0=OFF, 1=ON
DI Ch.2	10302	1	Byte	0=OFF, 1=ON
DI Ch.3	10303	1	Byte	0=OFF, 1=ON
DI Ch.4	10304	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
DI Counter 0	30300	2	UInt32	0~4294967295
DI Counter 1	30302	2	UInt32	0~4294967295
DI Counter 2	30304	2	UInt32	0~4294967295
DI Counter 3	30306	2	UInt32	0~4294967295
DI Counter 4	30308	2	UInt32	0~4294967295

- **XV306**

Parameter Name	Modbus Address	Length	Data Type	Range
Coil Output (0x), Unit : Coil(8 Bits)				
DO Ch.0	00300	1	Byte	0=OFF, 1=ON
DO Ch.1	00301	1	Byte	0=OFF, 1=ON
DO Ch.2	00302	1	Byte	0=OFF, 1=ON
DO Ch.3	00303	1	Byte	0=OFF, 1=ON
Discrete Input (1x), Unit : Coil(8 Bits)				
DI Ch.0	10300	1	Byte	0=OFF, 1=ON
DI Ch.1	10301	1	Byte	0=OFF, 1=ON
DI Ch.2	10302	1	Byte	0=OFF, 1=ON
DI Ch.3	10303	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
AI Ch.0	30300	2	Float	Floating Point
AI Ch.1	30302	2	Float	Floating Point
AI Ch.2	30304	2	Float	Floating Point
AI Ch.3	30306	2	Float	Floating Point
DI Counter 0	30308	2	UInt32	0~4294967295
DI Counter 1	30310	2	UInt32	0~4294967295
DI Counter 2	30312	2	UInt32	0~4294967295

DI Counter 3	30314	2	UInt32	0~4294967295
--------------	-------	---	--------	--------------

● **XV307**

Parameter Name	Modbus Address	Length	Data Type	Range
Coil Output (0x), Unit : Coil(8 Bits)				
DO Ch.0	00300	1	Byte	0=OFF, 1=ON
DO Ch.1	00301	1	Byte	0=OFF, 1=ON
DO Ch.2	00302	1	Byte	0=OFF, 1=ON
DO Ch.3	00303	1	Byte	0=OFF, 1=ON
Discrete Input (1x), Unit : Coil(8 Bits)				
DI Ch.0	10300	1	Byte	0=OFF, 1=ON
DI Ch.1	10301	1	Byte	0=OFF, 1=ON
DI Ch.2	10302	1	Byte	0=OFF, 1=ON
DI Ch.3	10303	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
DI Counter 0	30300	2	UInt32	0~4294967295
DI Counter 1	30302	2	UInt32	0~4294967295
DI Counter 2	30304	2	UInt32	0~4294967295
DI Counter 3	30306	2	UInt32	0~4294967295
Holding Register (4x), Unit : Register(16 Bits)				
AO Ch.0	40300	2	Float	Floating Point
AO Ch.1	40302	2	Float	Floating Point

● **XV308**

Parameter Name	Modbus Address	Length	Data Type	Range
Coil Output (0x), Unit : Coil(8 Bits)				
DO Ch.0	00300	1	Byte	0=OFF, 1=ON
DO Ch.1	00301	1	Byte	0=OFF, 1=ON
DO Ch.2	00302	1	Byte	0=OFF, 1=ON
DO Ch.3	00303	1	Byte	0=OFF, 1=ON
DO Ch.4	00304	1	Byte	0=OFF, 1=ON
DO Ch.5	00305	1	Byte	0=OFF, 1=ON
DO Ch.6	00306	1	Byte	0=OFF, 1=ON
DO Ch.7	00307	1	Byte	0=OFF, 1=ON

Discrete Input (1x), Unit : Coil(8 Bits)				
DI Ch.0	10300	1	Byte	0=OFF, 1=ON
DI Ch.1	10301	1	Byte	0=OFF, 1=ON
DI Ch.2	10302	1	Byte	0=OFF, 1=ON
DI Ch.3	10303	1	Byte	0=OFF, 1=ON
DI Ch.4	10304	1	Byte	0=OFF, 1=ON
DI Ch.5	10305	1	Byte	0=OFF, 1=ON
DI Ch.6	10306	1	Byte	0=OFF, 1=ON
DI Ch.7	10307	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
AI Ch.0	30300	2	Float	Floating Point
AI Ch.1	30302	2	Float	Floating Point
AI Ch.2	30304	2	Float	Floating Point
AI Ch.3	30306	2	Float	Floating Point
AI Ch.4	30308	2	Float	Floating Point
AI Ch.5	30310	2	Float	Floating Point
AI Ch.6	30312	2	Float	Floating Point
AI Ch.7	30314	2	Float	Floating Point
DI Counter 0	30316	2	UInt32	0~4294967295
DI Counter 1	30318	2	UInt32	0~4294967295
DI Counter 2	30320	2	UInt32	0~4294967295
DI Counter 3	30322	2	UInt32	0~4294967295
DI Counter 4	30324	2	UInt32	0~4294967295
DI Counter 5	30326	2	UInt32	0~4294967295
DI Counter 6	30328	2	UInt32	0~4294967295
DI Counter 7	30330	2	UInt32	0~4294967295

● **XV310**

Parameter Name	Modbus Address	Length	Data Type	Range
Coil Output (0x), Unit : Coil(8 Bits)				
DO Ch.0	00300	1	Byte	0=OFF, 1=ON
DO Ch.1	00301	1	Byte	0=OFF, 1=ON
DO Ch.2	00302	1	Byte	0=OFF, 1=ON
DO Ch.3	00303	1	Byte	0=OFF, 1=ON
Discrete Input (1x), Unit : Coil(8 Bits)				
DI Ch.0	10300	1	Byte	0=OFF, 1=ON

DI Ch.1	10301	1	Byte	0=OFF, 1=ON
DI Ch.2	10302	1	Byte	0=OFF, 1=ON
DI Ch.3	10303	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
AI Ch.0	30300	2	Float	Floating Point
AI Ch.1	30302	2	Float	Floating Point
AI Ch.2	30304	2	Float	Floating Point
AI Ch.3	30306	2	Float	Floating Point
DI Counter 0	30308	2	UInt32	0~4294967295
DI Counter 1	30310	2	UInt32	0~4294967295
DI Counter 2	30312	2	UInt32	0~4294967295
DI Counter 3	30314	2	UInt32	0~4294967295
Holding Register (4x), Unit : Register(16 Bits)				
AO Ch.0	40300	2	Float	Floating Point
AO Ch.1	40302	2	Float	Floating Point

(6) Remote Module Data

This block stores all I/O channel data of ICP DAS I/O modules and Modbus TCP/RTU modules. Depend on different configuration of I/O modules, the arrangement of data block will be different. Users can find the Starting Modbus Address from the "[WISE Modbus Address Table](#)" according the module's connection port and the index number, or calculate the Starting Modbus Address. Detailed information is shown as below:

1. Make sure which connection port (COM3, COM4 or LAN), and which index number the module is.
2. Calculate the value of SA (The **S**tarting **M**odbus **A**ddress of the data block of the module) based on the type of the connection port and the index number.

SA = The starting Modbus address of the connection port + (Module Index number - 1) x 500

The starting Modbus address of each connection port is shown as below:

Connection port	Starting Modbus address
COM3	1000
COM4	9000

LAN	17000
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Check the Modbus Address Table of each type module (shown as below), to calculate the real I/O channel Modbus Address with SA value for the ICP DAS I/O module and Modbus TCP/RTU module that are connected to WISE. For example: Assume there is an M-7024 module connected to the COM4 of WISE. Its module index number is 3. So the SA value of the M-7024 is $9000 + (3 - 1) \times 500 = 10000$. The Modbus Address of the AO channel 2 of the module is $10000 + 400004 = 410004$.

The ICP DAS I/O module Modbus Address Table is shown as below:

● M-7002		(5 DI、4 DO、4 AI Channel)		
Parameter Name	Modbus Address	Length	Data Type	Range
Coil Output (0x), Unit : Coil(8 Bits)				
DO Ch.0	SA + 000000	1	Byte	0=OFF, 1=ON
DO Ch.1	SA + 000001	1	Byte	0=OFF, 1=ON
DO Ch.2	SA + 000002	1	Byte	0=OFF, 1=ON
DO Ch.3	SA + 000003	1	Byte	0=OFF, 1=ON
Discrete Input (1x), Unit : Coil(8 Bits)				
DI Ch.0	SA + 100000	1	Byte	0=OFF, 1=ON
DI Ch.1	SA + 100001	1	Byte	0=OFF, 1=ON
DI Ch.2	SA + 100002	1	Byte	0=OFF, 1=ON
DI Ch.3	SA + 100003	1	Byte	0=OFF, 1=ON
DI Ch.4	SA + 100004	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
AI Ch.0	SA + 300000	2	Float	Floating Point
AI Ch.1	SA + 300002	2	Float	Floating Point
AI Ch.2	SA + 300004	2	Float	Floating Point
AI Ch.3	SA + 300006	2	Float	Floating Point
DI Counter 0	SA + 300008	1	UInt16	0~65535
DI Counter 1	SA + 300009	1	UInt16	0~65535
DI Counter 2	SA + 300010	1	UInt16	0~65535
DI Counter 3	SA + 300011	1	UInt16	0~65535
DI Counter 4	SA + 300012	1	UInt16	0~65535

● I-7005		(6 DO、8 AI Channel)		
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● M-7005				
Parameter Name	Modbus Address	Length	Data Type	Range
Coil Output (0x), Unit : Coil(8 Bits)				
DO Ch.0	SA + 000000	1	Byte	0=OFF, 1=ON
DO Ch.1	SA + 000001	1	Byte	0=OFF, 1=ON
DO Ch.2	SA + 000002	1	Byte	0=OFF, 1=ON
DO Ch.3	SA + 000003	1	Byte	0=OFF, 1=ON
DO Ch.4	SA + 000004	1	Byte	0=OFF, 1=ON
DO Ch.5	SA + 000005	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
AI Ch.0	SA + 300000	2	Float	Floating Point
AI Ch.1	SA + 300002	2	Float	Floating Point
AI Ch.2	SA + 300004	2	Float	Floating Point
AI Ch.3	SA + 300006	2	Float	Floating Point
AI Ch.4	SA + 300008	2	Float	Floating Point
AI Ch.5	SA + 300010	2	Float	Floating Point
AI Ch.6	SA + 300012	2	Float	Floating Point
AI Ch.7	SA + 300014	2	Float	Floating Point

● I-7011(D) 、 I-7011P(D) 、 I-7012(D) 、 I-7012F(D) 、 I-7014D		(1 DI 、 2 DO 、 1 AI Channel)		
● M-7011				
Parameter Name	Modbus Address	Length	Data Type	Range
Coil Output (0x), Unit : Coil(8 Bits)				
DO Ch.0	SA + 000000	1	Byte	0=OFF, 1=ON
DO Ch.1	SA + 000001	1	Byte	0=OFF, 1=ON
Discrete Input (1x), Unit : Coil(8 Bits)				
DI Ch.0	SA + 100000	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
AI Ch.0	SA + 300000	2	Float	Floating Point
DI Counter 0	SA + 300002	1	UInt16	0~65535

● I-7013(D)		(1 AI Channel)		
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Parameter Name	Modbus Address	Length	Data Type	Range
Input Register (3x), Unit : Register(16 Bits)				
AI Ch.0	SA + 300000	2	Float	Floating Point

<ul style="list-style-type: none"> ● I-7015 、 I-7015P ● M-7015 、 M-7015P 		(6 AI Channel)		
Parameter Name	Modbus Address	Length	Data Type	Range
Input Register (3x), Unit : Register(16 Bits)				
AI Ch.0	SA + 300000	2	Float	Floating Point
AI Ch.1	SA + 300002	2	Float	Floating Point
AI Ch.2	SA + 300004	2	Float	Floating Point
AI Ch.3	SA + 300006	2	Float	Floating Point
AI Ch.4	SA + 300008	2	Float	Floating Point
AI Ch.5	SA + 300010	2	Float	Floating Point

<ul style="list-style-type: none"> ● I-7016(D) ● M-7016 		(1 DI 、 4 DO 、 2 AI 、 1 AO Channel)		
Parameter Name	Modbus Address	Length	Data Type	Range
Coil Output (0x), Unit : Coil(8 Bits)				
DO Ch.0	SA + 000000	1	Byte	0=OFF, 1=ON
DO Ch.1	SA + 000001	1	Byte	0=OFF, 1=ON
DO Ch.2	SA + 000002	1	Byte	0=OFF, 1=ON
DO Ch.3	SA + 000003	1	Byte	0=OFF, 1=ON
Discrete Input (1x), Unit : Coil(8 Bits)				
DI Ch.0	SA + 100000	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
AI Ch.0	SA + 300000	2	Float	Floating Point
AI Ch.1	SA + 300002	2	Float	Floating Point
DI Counter 0	SA + 300004	1	UInt16	0~65535
Holding Register (4x), Unit : Register(16 Bits)				
AO Ch.0	SA + 400000	2	Float	Floating Point

● I-7016P(D)		(1 DI、4 DO、1 AI、1 AO Channel)		
Parameter Name	Modbus Address	Length	Data Type	Range
Coil Output (0x), Unit : Coil(8 Bits)				
DO Ch.0	SA + 000000	1	Byte	0=OFF, 1=ON
DO Ch.1	SA + 000001	1	Byte	0=OFF, 1=ON
DO Ch.2	SA + 000002	1	Byte	0=OFF, 1=ON
DO Ch.3	SA + 000003	1	Byte	0=OFF, 1=ON
Discrete Input (1x), Unit : Coil(8 Bits)				
DI Ch.0	SA + 100000	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
AI Ch.0	SA + 300000	2	Float	Floating Point
DI Counter 0	SA + 300002	1	UInt16	0~65535
Holding Register (4x), Unit : Register(16 Bits)				
AO Ch.0	SA + 400000	2	Float	Floating Point

● I-7017、I-7017F、I-7017R、I-7017C、I-7017FC、I-7017RC、I-7017R-A5、I-7018、I-7018BL、I-7018P、I-7018R、I-7019R		(8 AI Channel)		
● M-7017、M-7017R、M-7017C、M-7017RC、M-7017R-A5、M-7018、M-7018R、M-7019R				
● tM-AD8、tM-AD8C、tM-TH8				
● WF-2017				
Parameter Name	Modbus Address	Length	Data Type	Range
Input Register (3x), Unit : Register(16 Bits)				
AI Ch.0	SA + 300000	2	Float	Floating Point
AI Ch.1	SA + 300002	2	Float	Floating Point
AI Ch.2	SA + 300004	2	Float	Floating Point
AI Ch.3	SA + 300006	2	Float	Floating Point
AI Ch.4	SA + 300008	2	Float	Floating Point
AI Ch.5	SA + 300010	2	Float	Floating Point
AI Ch.6	SA + 300012	2	Float	Floating Point
AI Ch.7	SA + 300014	2	Float	Floating Point

● I-7017Z		(10 Differential AI Channel)		
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<ul style="list-style-type: none"> ● M-7017Z ● (P)ET-7017-10、(P)ET-7217-10 		(20 Single-Ended AI Channel)		
Parameter Name	Modbus Address	Length	Data Type	Range
Input Register (3x), Unit : Register(16 Bits)				
AI Ch.0	SA + 300000	2	Float	Floating Point
AI Ch.1	SA + 300002	2	Float	Floating Point
AI Ch.2	SA + 300004	2	Float	Floating Point
AI Ch.3	SA + 300006	2	Float	Floating Point
AI Ch.4	SA + 300008	2	Float	Floating Point
AI Ch.5	SA + 300010	2	Float	Floating Point
AI Ch.6	SA + 300012	2	Float	Floating Point
AI Ch.7	SA + 300014	2	Float	Floating Point
AI Ch.8	SA + 300016	2	Float	Floating Point
AI Ch.9	SA + 300018	2	Float	Floating Point
AI Ch.10	SA + 300020	2	Float	Floating Point
AI Ch.11	SA + 300022	2	Float	Floating Point
AI Ch.12	SA + 300024	2	Float	Floating Point
AI Ch.13	SA + 300026	2	Float	Floating Point
AI Ch.14	SA + 300028	2	Float	Floating Point
AI Ch.15	SA + 300030	2	Float	Floating Point
AI Ch.16	SA + 300032	2	Float	Floating Point
AI Ch.17	SA + 300034	2	Float	Floating Point
AI Ch.18	SA + 300036	2	Float	Floating Point
AI Ch.19	SA + 300038	2	Float	Floating Point

<ul style="list-style-type: none"> ● I-7018Z ● M-7018Z、M-7019Z ● WF-2019 		(10 AI Channel)		
Parameter Name	Modbus Address	Length	Data Type	Range
Input Register (3x), Unit : Register(16 Bits)				
AI Ch.0	SA + 300000	2	Float	Floating Point
AI Ch.1	SA + 300002	2	Float	Floating Point
AI Ch.2	SA + 300004	2	Float	Floating Point
AI Ch.3	SA + 300006	2	Float	Floating Point

AI Ch.4	SA + 300008	2	Float	Floating Point
AI Ch.5	SA + 300010	2	Float	Floating Point
AI Ch.6	SA + 300012	2	Float	Floating Point
AI Ch.7	SA + 300014	2	Float	Floating Point
AI Ch.8	SA + 300016	2	Float	Floating Point
AI Ch.9	SA + 300018	2	Float	Floating Point

● I-7021、I-7021P		(1 AO Channel)		
Parameter Name	Modbus Address	Length	Data Type	Range
Holding Register (4x), Unit : Register(16 Bits)				
AO Ch.0	SA + 400000	2	Float	Floating Point

● I-7022		(2 AO Channel)		
● M-7022				
Parameter Name	Modbus Address	Length	Data Type	Range
Holding Register (4x), Unit : Register(16 Bits)				
AO Ch.0	SA + 400000	2	Float	Floating Point
AO Ch.1	SA + 400002	2	Float	Floating Point

● I-7024		(4 AO Channel)		
● M-7024				
Parameter Name	Modbus Address	Length	Data Type	Range
Holding Register (4x), Unit : Register(16 Bits)				
AO Ch.0	SA + 400000	2	Float	Floating Point
AO Ch.1	SA + 400002	2	Float	Floating Point
AO Ch.2	SA + 400004	2	Float	Floating Point
AO Ch.3	SA + 400006	2	Float	Floating Point

● I-7024R		(5 DI、4 AO Channel)		
● M-7024R				
Parameter Name	Modbus	Length	Data	Range

	Address		Type	
Discrete Input (1x), Unit : Coil(8 Bits)				
DI Ch.0	SA + 100000	1	Byte	0=OFF, 1=ON
DI Ch.1	SA + 100001	1	Byte	0=OFF, 1=ON
DI Ch.2	SA + 100002	1	Byte	0=OFF, 1=ON
DI Ch.3	SA + 100003	1	Byte	0=OFF, 1=ON
DI Ch.4	SA + 100004	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
DI Counter 0	SA + 300000	1	UInt16	0~65535
DI Counter 1	SA + 300001	1	UInt16	0~65535
DI Counter 2	SA + 300002	1	UInt16	0~65535
DI Counter 3	SA + 300003	1	UInt16	0~65535
DI Counter 4	SA + 300004	1	UInt16	0~65535
Holding Register (4x), Unit : Register(16 Bits)				
AO Ch.0	SA + 400000	2	Float	Floating Point
AO Ch.1	SA + 400002	2	Float	Floating Point
AO Ch.2	SA + 400004	2	Float	Floating Point
AO Ch.3	SA + 400006	2	Float	Floating Point

● I-7033		(3 AI Channel)		
Parameter Name	Modbus Address	Length	Data Type	Range
Input Register (3x), Unit : Register(16 Bits)				
AI Ch.0	SA + 300000	2	Float	Floating Point
AI Ch.1	SA + 300002	2	Float	Floating Point
AI Ch.2	SA + 300004	2	Float	Floating Point

● I-7000 DI/DO Module		(Maximum 16 DI Channel / 16 DO Channel)		
● M-7000 DI/DO Module		(Maximum 16 DI Channel / 16 DO Channel)		
According to the channel numbers of DI/DO Module, you can look up the Modbus address of the DI/DO module from the following table:				
Parameter Name	Modbus Address	Length	Data Type	Range
Coil Output (0x), Unit : Coil(8 Bits)				
DO Ch.0	SA + 000000	1	Byte	0=OFF, 1=ON

DO Ch.1	SA + 000001	1	Byte	0=OFF, 1=ON
DO Ch.2	SA + 000002	1	Byte	0=OFF, 1=ON
DO Ch.3	SA + 000003	1	Byte	0=OFF, 1=ON
DO Ch.4	SA + 000004	1	Byte	0=OFF, 1=ON
DO Ch.5	SA + 000005	1	Byte	0=OFF, 1=ON
DO Ch.6	SA + 000006	1	Byte	0=OFF, 1=ON
DO Ch.7	SA + 000007	1	Byte	0=OFF, 1=ON
DO Ch.8	SA + 000008	1	Byte	0=OFF, 1=ON
DO Ch.9	SA + 000009	1	Byte	0=OFF, 1=ON
DO Ch.10	SA + 000010	1	Byte	0=OFF, 1=ON
DO Ch.11	SA + 000011	1	Byte	0=OFF, 1=ON
DO Ch.12	SA + 000012	1	Byte	0=OFF, 1=ON
DO Ch.13	SA + 000013	1	Byte	0=OFF, 1=ON
DO Ch.14	SA + 000014	1	Byte	0=OFF, 1=ON
DO Ch.15	SA + 000015	1	Byte	0=OFF, 1=ON
Discrete Input (1x), Unit : Coil(8 Bits)				
DI Ch.0	SA + 100000	1	Byte	0=OFF, 1=ON
DI Ch.1	SA + 100001	1	Byte	0=OFF, 1=ON
DI Ch.2	SA + 100002	1	Byte	0=OFF, 1=ON
DI Ch.3	SA + 100003	1	Byte	0=OFF, 1=ON
DI Ch.4	SA + 100004	1	Byte	0=OFF, 1=ON
DI Ch.5	SA + 100005	1	Byte	0=OFF, 1=ON
DI Ch.6	SA + 100006	1	Byte	0=OFF, 1=ON
DI Ch.7	SA + 100007	1	Byte	0=OFF, 1=ON
DI Ch.8	SA + 100008	1	Byte	0=OFF, 1=ON
DI Ch.9	SA + 100009	1	Byte	0=OFF, 1=ON
DI Ch.10	SA + 100010	1	Byte	0=OFF, 1=ON
DI Ch.11	SA + 100011	1	Byte	0=OFF, 1=ON
DI Ch.12	SA + 100012	1	Byte	0=OFF, 1=ON
DI Ch.13	SA + 100013	1	Byte	0=OFF, 1=ON
DI Ch.14	SA + 100014	1	Byte	0=OFF, 1=ON
DI Ch.15	SA + 100015	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
DI Counter 0	SA + 300000	1	UInt16	0~65535
DI Counter 1	SA + 300001	1	UInt16	0~65535
DI Counter 2	SA + 300002	1	UInt16	0~65535
DI Counter 3	SA + 300003	1	UInt16	0~65535

DI Counter 4	SA + 300004	1	UInt16	0~65535
DI Counter 5	SA + 300005	1	UInt16	0~65535
DI Counter 6	SA + 300006	1	UInt16	0~65535
DI Counter 7	SA + 300007	1	UInt16	0~65535
DI Counter 8	SA + 300008	1	UInt16	0~65535
DI Counter 9	SA + 300009	1	UInt16	0~65535
DI Counter 10	SA + 300010	1	UInt16	0~65535
DI Counter 11	SA + 300011	1	UInt16	0~65535
DI Counter 12	SA + 300012	1	UInt16	0~65535
DI Counter 13	SA + 300013	1	UInt16	0~65535
DI Counter 14	SA + 300014	1	UInt16	0~65535
DI Counter 15	SA + 300015	1	UInt16	0~65535

<ul style="list-style-type: none"> ● I-7080(D) 、 I-7080B(D) ● M-7080 、 M-7080B 		(2 Counter/Frequency 、 2 DO Channel)		
Parameter Name	Modbus Address	Length	Data Type	Range
Coil Output (0x), Unit : Coil(8 Bits)				
DO Ch.0	SA + 000000	1	Byte	0=OFF, 1=ON
DO Ch.1	SA + 000001	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
DI Counter 0	SA + 300000	2	UInt32	0~4294967295
DI Counter 1	SA + 300002	2	UInt32	0~4294967295

<ul style="list-style-type: none"> ● I-7088 ● M-7088 		(8 DI 、 8 PWM Output Channel)		
Parameter Name	Modbus Address	Length	Data Type	Range
Coil Output (0x), Unit : Coil(8 Bits)				
PWM Output Ch.0	SA + 000000	1	Byte	0=OFF, 1=ON
PWM Output Ch.1	SA + 000001	1	Byte	0=OFF, 1=ON
PWM Output Ch.2	SA + 000002	1	Byte	0=OFF, 1=ON
PWM Output Ch.3	SA + 000003	1	Byte	0=OFF, 1=ON
PWM Output Ch.4	SA + 000004	1	Byte	0=OFF, 1=ON
PWM Output Ch.5	SA + 000005	1	Byte	0=OFF, 1=ON
PWM Output Ch.6	SA + 000006	1	Byte	0=OFF, 1=ON

PWM Output Ch.7	SA + 000007	1	Byte	0=OFF, 1=ON
Discrete Input (1x), Unit : Coil(8 Bits)				
DI Ch.0	SA + 100000	1	Byte	0=OFF, 1=ON
DI Ch.1	SA + 100001	1	Byte	0=OFF, 1=ON
DI Ch.2	SA + 100002	1	Byte	0=OFF, 1=ON
DI Ch.3	SA + 100003	1	Byte	0=OFF, 1=ON
DI Ch.4	SA + 100004	1	Byte	0=OFF, 1=ON
DI Ch.5	SA + 100005	1	Byte	0=OFF, 1=ON
DI Ch.6	SA + 100006	1	Byte	0=OFF, 1=ON
DI Ch.7	SA + 100007	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
DI Counter 0	SA + 300000	2	UInt32	0~4294967295
DI Counter 1	SA + 300002	2	UInt32	0~4294967295
DI Counter 2	SA + 300004	2	UInt32	0~4294967295
DI Counter 3	SA + 300006	2	UInt32	0~4294967295
DI Counter 4	SA + 300008	2	UInt32	0~4294967295
DI Counter 5	SA + 300010	2	UInt32	0~4294967295
DI Counter 6	SA + 300012	2	UInt32	0~4294967295
DI Counter 7	SA + 300014	2	UInt32	0~4294967295

● M-7084		(8 Counter/Frequency Channel)		
Parameter Name	Modbus Address	Length	Data Type	Range
Input Register (3x), Unit : Register(16 Bits)				
DI Counter 0	SA + 300000	2	UInt32	0~4294967295
DI Counter 1	SA + 300002	2	UInt32	0~4294967295
DI Counter 2	SA + 300004	2	UInt32	0~4294967295
DI Counter 3	SA + 300006	2	UInt32	0~4294967295
DI Counter 4	SA + 300008	2	UInt32	0~4294967295
DI Counter 5	SA + 300010	2	UInt32	0~4294967295
DI Counter 6	SA + 300012	2	UInt32	0~4294967295
DI Counter 7	SA + 300014	2	UInt32	0~4294967295

● tM-AD5、tM-AD5C		(5 AI Channel)		
Parameter Name	Modbus Address	Length	Data Type	Range

Input Register (3x), Unit : Register(16 Bits)				
AI Ch.0	SA + 300000	2	Float	Floating Point
AI Ch.1	SA + 300002	2	Float	Floating Point
AI Ch.2	SA + 300004	2	Float	Floating Point
AI Ch.3	SA + 300006	2	Float	Floating Point
AI Ch.4	SA + 300008	2	Float	Floating Point

● tM-DA1P1R1		(1 DI、1 DO、1 AO Channel)		
● LC-221				
Parameter Name	Modbus Address	Length	Data Type	Range
Coil Output (0x), Unit : Coil(8 Bits)				
DO Ch.0	SA + 000000	1	Byte	0=OFF, 1=ON
Discrete Input (1x), Unit : Coil(8 Bits)				
DI Ch.0	SA + 100000	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
DI Counter 0	SA + 300000	1	UInt16	0~65535
Holding Register (4x), Unit : Register(16 Bits)				
AO Ch.0	SA + 400000	2	Float	Floating Point

● tM-AD4P2C2		(2 DI、2 DO、2 AI Channel)		
Parameter Name	Modbus Address	Length	Data Type	Range
Coil Output (0x), Unit : Coil(8 Bits)				
DO Ch.0	SA + 000000	1	Byte	0=OFF, 1=ON
DO Ch.1	SA + 000001	1	Byte	0=OFF, 1=ON
Discrete Input (1x), Unit : Coil(8 Bits)				
DI Ch.0	SA + 100000	1	Byte	0=OFF, 1=ON
DI Ch.1	SA + 100001	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
AI Ch.0	SA + 300000	2	Float	Floating Point
AI Ch.1	SA + 300002	2	Float	Floating Point
DI Counter 0	SA + 300004	1	UInt16	0~65535
DI Counter 1	SA + 300005	1	UInt16	0~65535

● tM DI/DO Module		(Maximum 8 DI Channel / 8 DO)		
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		Channel)		
According to the channel numbers of DI/DO Module, you can look up the Modbus address of the DI/DO module from the following table:				
Parameter Name	Modbus Address	Length	Data Type	Range
Coil Output (0x), Unit : Coil(8 Bits)				
DO Ch.0	SA + 000000	1	Byte	0=OFF, 1=ON
DO Ch.1	SA + 000001	1	Byte	0=OFF, 1=ON
DO Ch.2	SA + 000002	1	Byte	0=OFF, 1=ON
DO Ch.3	SA + 000003	1	Byte	0=OFF, 1=ON
DO Ch.4	SA + 000004	1	Byte	0=OFF, 1=ON
DO Ch.5	SA + 000005	1	Byte	0=OFF, 1=ON
DO Ch.6	SA + 000006	1	Byte	0=OFF, 1=ON
DO Ch.7	SA + 000007	1	Byte	0=OFF, 1=ON
Discrete Input (1x), Unit : Coil(8 Bits)				
DI Ch.0	SA + 100000	1	Byte	0=OFF, 1=ON
DI Ch.1	SA + 100001	1	Byte	0=OFF, 1=ON
DI Ch.2	SA + 100002	1	Byte	0=OFF, 1=ON
DI Ch.3	SA + 100003	1	Byte	0=OFF, 1=ON
DI Ch.4	SA + 100004	1	Byte	0=OFF, 1=ON
DI Ch.5	SA + 100005	1	Byte	0=OFF, 1=ON
DI Ch.6	SA + 100006	1	Byte	0=OFF, 1=ON
DI Ch.7	SA + 100007	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
DI Counter 0	SA + 300000	1	UInt16	0~65535
DI Counter 1	SA + 300001	1	UInt16	0~65535
DI Counter 2	SA + 300002	1	UInt16	0~65535
DI Counter 3	SA + 300003	1	UInt16	0~65535
DI Counter 4	SA + 300004	1	UInt16	0~65535
DI Counter 5	SA + 300005	1	UInt16	0~65535
DI Counter 6	SA + 300006	1	UInt16	0~65535
DI Counter 7	SA + 300007	1	UInt16	0~65535

● LC DI/DO Module	(Maximum 3 DI Channel / 3 DO Channel)
According to the channel numbers of DI/DO Module, you can look up the Modbus	

address of the DI/DO module from the following table:				
Parameter Name	Modbus Address	Length	Data Type	Range
Coil Output (0x), Unit : Coil(8 Bits)				
DO Ch.0	SA + 000000	1	Byte	0=OFF, 1=ON
DO Ch.1	SA + 000001	1	Byte	0=OFF, 1=ON
DO Ch.2	SA + 000002	1	Byte	0=OFF, 1=ON
Discrete Input (1x), Unit : Coil(8 Bits)				
DI Ch.0	SA + 100000	1	Byte	0=OFF, 1=ON
DI Ch.1	SA + 100001	1	Byte	0=OFF, 1=ON
DI Ch.2	SA + 100002	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
DI Counter 0	SA + 300000	1	UInt16	0~65535
DI Counter 1	SA + 300001	1	UInt16	0~65535
DI Counter 2	SA + 300002	1	UInt16	0~65535

● (P)ET-7002、(P)ET-7202		(6 DI、3 DO、3 AI Channel)		
Parameter Name	Modbus Address	Length	Data Type	Range
Coil Output (0x), Unit : Coil(8 Bits)				
DO Ch.0	SA + 000000	1	Byte	0=OFF, 1=ON
DO Ch.1	SA + 000001	1	Byte	0=OFF, 1=ON
DO Ch.2	SA + 000002	1	Byte	0=OFF, 1=ON
Discrete Input (1x), Unit : Coil(8 Bits)				
DI Ch.0	SA + 100000	1	Byte	0=OFF, 1=ON
DI Ch.1	SA + 100001	1	Byte	0=OFF, 1=ON
DI Ch.2	SA + 100002	1	Byte	0=OFF, 1=ON
DI Ch.3	SA + 100003	1	Byte	0=OFF, 1=ON
DI Ch.4	SA + 100004	1	Byte	0=OFF, 1=ON
DI Ch.5	SA + 100005	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
AI Ch.0	SA + 300000	2	Float	Floating Point
AI Ch.1	SA + 300002	2	Float	Floating Point
AI Ch.2	SA + 300004	2	Float	Floating Point
DI Counter 0	SA + 300006	2	UInt32	0~4294967295
DI Counter 1	SA + 300008	2	UInt32	0~4294967295

DI Counter 2	SA + 300010	2	UInt32	0~4294967295
DI Counter 3	SA + 300012	2	UInt32	0~4294967295
DI Counter 4	SA + 300014	2	UInt32	0~4294967295
DI Counter 5	SA + 300016	2	UInt32	0~4294967295

● (P)ET-7005、(P)ET-7017、 (P)ET-7019、(P)ET-7217		(4 DO、8 AI Channel)		
Parameter Name	Modbus Address	Length	Data Type	Range
Coil Output (0x), Unit : Coil(8 Bits)				
DO Ch.0	SA + 000000	1	Byte	0=OFF, 1=ON
DO Ch.1	SA + 000001	1	Byte	0=OFF, 1=ON
DO Ch.2	SA + 000002	1	Byte	0=OFF, 1=ON
DO Ch.3	SA + 000003	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
AI Ch.0	SA + 300000	2	Float	Floating Point
AI Ch.1	SA + 300002	2	Float	Floating Point
AI Ch.2	SA + 300004	2	Float	Floating Point
AI Ch.3	SA + 300006	2	Float	Floating Point
AI Ch.4	SA + 300008	2	Float	Floating Point
AI Ch.5	SA + 300010	2	Float	Floating Point
AI Ch.6	SA + 300012	2	Float	Floating Point
AI Ch.7	SA + 300014	2	Float	Floating Point

● (P)ET-7015、(P)ET-7215		(7 AI Channel)		
Parameter Name	Modbus Address	Length	Data Type	Range
Input Register (3x), Unit : Register(16 Bits)				
AI Ch.0	SA + 300000	2	Float	Floating Point
AI Ch.1	SA + 300002	2	Float	Floating Point
AI Ch.2	SA + 300004	2	Float	Floating Point
AI Ch.3	SA + 300006	2	Float	Floating Point
AI Ch.4	SA + 300008	2	Float	Floating Point
AI Ch.5	SA + 300010	2	Float	Floating Point
AI Ch.6	SA + 300012	2	Float	Floating Point

● (P)ET-7016		(2 DI、2 DO、2 AI、1 AO Channel)		
Parameter Name	Modbus Address	Length	Data Type	Range
Coil Output (0x), Unit : Coil(8 Bits)				
DO Ch.0	SA + 000000	1	Byte	0=OFF, 1=ON
DO Ch.1	SA + 000001	1	Byte	0=OFF, 1=ON
Discrete Input (1x), Unit : Coil(8 Bits)				
DI Ch.0	SA + 100000	1	Byte	0=OFF, 1=ON
DI Ch.1	SA + 100001	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
AI Ch.0	SA + 300000	2	Float	Floating Point
AI Ch.1	SA + 300002	2	Float	Floating Point
DI Counter 0	SA + 300004	2	UInt32	0~4294967295
DI Counter 1	SA + 300006	2	UInt32	0~4294967295
Holding Register (4x), Unit : Register(16 Bits)				
AO Ch.0	SA + 400000	2	Float	Floating Point

● (P)ET-7018Z、(P)ET-7019Z		(6 DO、10 AI Channel)		
Parameter Name	Modbus Address	Length	Data Type	Range
Coil Output (0x), Unit : Coil(8 Bits)				
DO Ch.0	SA + 000000	1	Byte	0=OFF, 1=ON
DO Ch.1	SA + 000001	1	Byte	0=OFF, 1=ON
DO Ch.2	SA + 000002	1	Byte	0=OFF, 1=ON
DO Ch.3	SA + 000003	1	Byte	0=OFF, 1=ON
DO Ch.4	SA + 000004	1	Byte	0=OFF, 1=ON
DO Ch.5	SA + 000005	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
AI Ch.0	SA + 300000	2	Float	Floating Point
AI Ch.1	SA + 300002	2	Float	Floating Point
AI Ch.2	SA + 300004	2	Float	Floating Point
AI Ch.3	SA + 300006	2	Float	Floating Point
AI Ch.4	SA + 300008	2	Float	Floating Point
AI Ch.5	SA + 300010	2	Float	Floating Point
AI Ch.6	SA + 300012	2	Float	Floating Point
AI Ch.7	SA + 300014	2	Float	Floating Point

AI Ch.8	SA + 300016	2	Float	Floating Point
AI Ch.9	SA + 300018	2	Float	Floating Point

● (P)ET-7218Z、(P)ET-7219Z		(3 DO、10 AI Channel)		
Parameter Name	Modbus Address	Length	Data Type	Range
Coil Output (0x), Unit : Coil(8 Bits)				
DO Ch.0	SA + 000000	1	Byte	0=OFF, 1=ON
DO Ch.1	SA + 000001	1	Byte	0=OFF, 1=ON
DO Ch.2	SA + 000002	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
AI Ch.0	SA + 300000	2	Float	Floating Point
AI Ch.1	SA + 300002	2	Float	Floating Point
AI Ch.2	SA + 300004	2	Float	Floating Point
AI Ch.3	SA + 300006	2	Float	Floating Point
AI Ch.4	SA + 300008	2	Float	Floating Point
AI Ch.5	SA + 300010	2	Float	Floating Point
AI Ch.6	SA + 300012	2	Float	Floating Point
AI Ch.7	SA + 300014	2	Float	Floating Point
AI Ch.8	SA + 300016	2	Float	Floating Point
AI Ch.9	SA + 300018	2	Float	Floating Point

● (P)ET-7024、(P)ET-7224		(5 DI、5 DO、4AO Channel)		
Parameter Name	Modbus Address	Length	Data Type	Range
Coil Output (0x), Unit : Coil(8 Bits)				
DO Ch.0	SA + 000000	1	Byte	0=OFF, 1=ON
DO Ch.1	SA + 000001	1	Byte	0=OFF, 1=ON
DO Ch.2	SA + 000002	1	Byte	0=OFF, 1=ON
DO Ch.3	SA + 000003	1	Byte	0=OFF, 1=ON
DO Ch.4	SA + 000004	1	Byte	0=OFF, 1=ON
Discrete Input (1x), Unit : Coil(8 Bits)				
DI Ch.0	SA + 100000	1	Byte	0=OFF, 1=ON
DI Ch.1	SA + 100001	1	Byte	0=OFF, 1=ON
DI Ch.2	SA + 100002	1	Byte	0=OFF, 1=ON
DI Ch.3	SA + 100003	1	Byte	0=OFF, 1=ON

DI Ch.4	SA + 100004	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
DI Counter 0	SA + 300000	2	UInt32	0~4294967295
DI Counter 1	SA + 300002	2	UInt32	0~4294967295
DI Counter 2	SA + 300004	2	UInt32	0~4294967295
DI Counter 3	SA + 300006	2	UInt32	0~4294967295
DI Counter 4	SA + 300008	2	UInt32	0~4294967295
Holding Register (4x), Unit : Register(16 Bits)				
AO Ch.0	SA + 400000	2	Float	Floating Point
AO Ch.1	SA + 400002	2	Float	Floating Point
AO Ch.2	SA + 400004	2	Float	Floating Point
AO Ch.3	SA + 400006	2	Float	Floating Point

● (P)ET-7026、(P)ET-7226		(2 DI、2 DO、6 AI、2 AO Channel)		
Parameter Name	Modbus Address	Length	Data Type	Range
Coil Output (0x), Unit : Coil(8 Bits)				
DO Ch.0	SA + 000000	1	Byte	0=OFF, 1=ON
DO Ch.1	SA + 000001	1	Byte	0=OFF, 1=ON
Discrete Input (1x), Unit : Coil(8 Bits)				
DI Ch.0	SA + 100000	1	Byte	0=OFF, 1=ON
DI Ch.1	SA + 100001	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
AI Ch.0	SA + 300000	2	Float	Floating Point
AI Ch.1	SA + 300002	2	Float	Floating Point
AI Ch.2	SA + 300004	2	Float	Floating Point
AI Ch.3	SA + 300006	2	Float	Floating Point
AI Ch.4	SA + 300008	2	Float	Floating Point
AI Ch.5	SA + 300010	2	Float	Floating Point
DI Counter 0	SA + 300012	2	UInt32	0~4294967295
DI Counter 1	SA + 300014	2	UInt32	0~4294967295
Holding Register (4x), Unit : Register(16 Bits)				
AO Ch.0	SA + 400000	2	Float	Floating Point
AO Ch.1	SA + 400002	2	Float	Floating Point

● (P)ET-7000 DI/DO Module	(Maximum 16 DI Channel / 16 DO)
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● WF-2000 DI/DO Module		Channel)		
According to the channel numbers of DI/DO Module, you can look up the Modbus address of the DI/DO module from the following table:				
Parameter Name	Modbus Address	Length	Data Type	Range
Coil Output (0x), Unit : Coil(8 Bits)				
DO Ch.0	SA + 000000	1	Byte	0=OFF, 1=ON
DO Ch.1	SA + 000001	1	Byte	0=OFF, 1=ON
DO Ch.2	SA + 000002	1	Byte	0=OFF, 1=ON
DO Ch.3	SA + 000003	1	Byte	0=OFF, 1=ON
DO Ch.4	SA + 000004	1	Byte	0=OFF, 1=ON
DO Ch.5	SA + 000005	1	Byte	0=OFF, 1=ON
DO Ch.6	SA + 000006	1	Byte	0=OFF, 1=ON
DO Ch.7	SA + 000007	1	Byte	0=OFF, 1=ON
DO Ch.8	SA + 000008	1	Byte	0=OFF, 1=ON
DO Ch.9	SA + 000009	1	Byte	0=OFF, 1=ON
DO Ch.10	SA + 000010	1	Byte	0=OFF, 1=ON
DO Ch.11	SA + 000011	1	Byte	0=OFF, 1=ON
DO Ch.12	SA + 000012	1	Byte	0=OFF, 1=ON
DO Ch.13	SA + 000013	1	Byte	0=OFF, 1=ON
DO Ch.14	SA + 000014	1	Byte	0=OFF, 1=ON
DO Ch.15	SA + 000015	1	Byte	0=OFF, 1=ON
Discrete Input (1x), Unit : Coil(8 Bits)				
DI Ch.0	SA + 100000	1	Byte	0=OFF, 1=ON
DI Ch.1	SA + 100001	1	Byte	0=OFF, 1=ON
DI Ch.2	SA + 100002	1	Byte	0=OFF, 1=ON
DI Ch.3	SA + 100003	1	Byte	0=OFF, 1=ON
DI Ch.4	SA + 100004	1	Byte	0=OFF, 1=ON
DI Ch.5	SA + 100005	1	Byte	0=OFF, 1=ON
DI Ch.6	SA + 100006	1	Byte	0=OFF, 1=ON
DI Ch.7	SA + 100007	1	Byte	0=OFF, 1=ON
DI Ch.8	SA + 100008	1	Byte	0=OFF, 1=ON
DI Ch.9	SA + 100009	1	Byte	0=OFF, 1=ON
DI Ch.10	SA + 100010	1	Byte	0=OFF, 1=ON
DI Ch.11	SA + 100011	1	Byte	0=OFF, 1=ON
DI Ch.12	SA + 100012	1	Byte	0=OFF, 1=ON

DI Ch.13	SA + 100013	1	Byte	0=OFF, 1=ON
DI Ch.14	SA + 100014	1	Byte	0=OFF, 1=ON
DI Ch.15	SA + 100015	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
DI Counter 0	SA + 300000	2	UInt32	0~4294967295
DI Counter 1	SA + 300002	2	UInt32	0~4294967295
DI Counter 2	SA + 300004	2	UInt32	0~4294967295
DI Counter 3	SA + 300006	2	UInt32	0~4294967295
DI Counter 4	SA + 300008	2	UInt32	0~4294967295
DI Counter 5	SA + 300010	2	UInt32	0~4294967295
DI Counter 6	SA + 300012	2	UInt32	0~4294967295
DI Counter 7	SA + 300014	2	UInt32	0~4294967295
DI Counter 8	SA + 300016	2	UInt32	0~4294967295
DI Counter 9	SA + 300018	2	UInt32	0~4294967295
DI Counter 10	SA + 300020	2	UInt32	0~4294967295
DI Counter 11	SA + 300022	2	UInt32	0~4294967295
DI Counter 12	SA + 300024	2	UInt32	0~4294967295
DI Counter 13	SA + 300026	2	UInt32	0~4294967295
DI Counter 14	SA + 300028	2	UInt32	0~4294967295
DI Counter 15	SA + 300030	2	UInt32	0~4294967295

● WF-2026		(2 DI、3 DO、5 AI、2 AO Channel)		
Parameter Name	Modbus Address	Length	Data Type	Range
Coil Output (0x), Unit : Coil(8 Bits)				
DO Ch.0	SA + 000000	1	Byte	0=OFF, 1=ON
DO Ch.1	SA + 000001	1	Byte	0=OFF, 1=ON
DO Ch.2	SA + 000002	1	Byte	0=OFF, 1=ON
Discrete Input (1x), Unit : Coil(8 Bits)				
DI Ch.0	SA + 100000	1	Byte	0=OFF, 1=ON
DI Ch.1	SA + 100001	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
AI Ch.0	SA + 300000	2	Float	Floating Point
AI Ch.1	SA + 300002	2	Float	Floating Point
AI Ch.2	SA + 300004	2	Float	Floating Point
AI Ch.3	SA + 300006	2	Float	Floating Point

AI Ch.4	SA + 300008	2	Float	Floating Point
DI Counter 0	SA + 300010	2	UInt32	0~4294967295
DI Counter 1	SA + 300012	2	UInt32	0~4294967295
Holding Register (4x), Unit : Register(16 Bits)				
AO Ch.0	SA + 400000	2	Float	Floating Point
AO Ch.1	SA + 400002	2	Float	Floating Point

● WISE-7102		(6 DI、3 DO、3 AI Channel)		
Parameter Name	Modbus Address	Length	Data Type	Range
Coil Output (0x), Unit : Coil(8 Bits)				
DO Ch.0	SA + 000000	1	Byte	0=OFF, 1=ON
DO Ch.1	SA + 000001	1	Byte	0=OFF, 1=ON
DO Ch.2	SA + 000002	1	Byte	0=OFF, 1=ON
Discrete Input (1x), Unit : Coil(8 Bits)				
DI Ch.0	SA + 100000	1	Byte	0=OFF, 1=ON
DI Ch.1	SA + 100001	1	Byte	0=OFF, 1=ON
DI Ch.2	SA + 100002	1	Byte	0=OFF, 1=ON
DI Ch.3	SA + 100003	1	Byte	0=OFF, 1=ON
DI Ch.4	SA + 100004	1	Byte	0=OFF, 1=ON
DI Ch.5	SA + 100005	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
AI Ch.0	SA + 300000	2	Float	Floating Point
AI Ch.1	SA + 300002	2	Float	Floating Point
AI Ch.2	SA + 300004	2	Float	Floating Point
DI Counter 0	SA + 300006	1	UInt16	0~65535
DI Counter 1	SA + 300007	1	UInt16	0~65535
DI Counter 2	SA + 300008	1	UInt16	0~65535
DI Counter 3	SA + 300009	1	UInt16	0~65535
DI Counter 4	SA + 300010	1	UInt16	0~65535
DI Counter 5	SA + 300011	1	UInt16	0~65535
DO Counter 0	SA + 300012	1	UInt16	0~65535
DO Counter 1	SA + 300013	1	UInt16	0~65535
DO Counter 2	SA + 300014	1	UInt16	0~65535
Holding Register (4x), Unit : Register(16 Bits)				
Internal Register 1	SA + 400000	2	Float	Floating Point

Internal Register 2	SA + 400002	2	Float	Floating Point
Internal Register 3	SA + 400004	2	Float	Floating Point
⋮				
Internal Register 46	SA + 400090	2	Float	Floating Point
Internal Register 47	SA + 400092	2	Float	Floating Point
Internal Register 48	SA + 400094	2	Float	Floating Point

● WISE-7105、WISE-7117、WISE-7119			(4 DO、8 AI Channel)	
Parameter Name	Modbus Address	Length	Data Type	Range
Coil Output (0x), Unit : Coil(8 Bits)				
DO Ch.0	SA + 000000	1	Byte	0=OFF, 1=ON
DO Ch.1	SA + 000001	1	Byte	0=OFF, 1=ON
DO Ch.2	SA + 000002	1	Byte	0=OFF, 1=ON
DO Ch.3	SA + 000003	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
AI Ch.0	SA + 300000	2	Float	Floating Point
AI Ch.1	SA + 300002	2	Float	Floating Point
AI Ch.2	SA + 300004	2	Float	Floating Point
AI Ch.3	SA + 300006	2	Float	Floating Point
AI Ch.4	SA + 300008	2	Float	Floating Point
AI Ch.5	SA + 300010	2	Float	Floating Point
AI Ch.6	SA + 300012	2	Float	Floating Point
AI Ch.7	SA + 300014	2	Float	Floating Point
DO Counter 0	SA + 300016	1	UInt16	0~65535
DO Counter 1	SA + 300017	1	UInt16	0~65535
DO Counter 2	SA + 300018	1	UInt16	0~65535
DO Counter 3	SA + 300019	1	UInt16	0~65535
Holding Register (4x), Unit : Register(16 Bits)				
Internal Register 1	SA + 400000	2	Float	Floating Point
Internal Register 2	SA + 400002	2	Float	Floating Point
Internal Register 3	SA + 400004	2	Float	Floating Point
⋮				
Internal Register 46	SA + 400090	2	Float	Floating Point
Internal Register 47	SA + 400092	2	Float	Floating Point
Internal Register 48	SA + 400094	2	Float	Floating Point

● WISE-7115		(7 AI Channel)		
Parameter Name	Modbus Address	Length	Data Type	Range
Input Register (3x), Unit : Register(16 Bits)				
AI Ch.0	SA + 300000	2	Float	Floating Point
AI Ch.1	SA + 300002	2	Float	Floating Point
AI Ch.2	SA + 300004	2	Float	Floating Point
AI Ch.3	SA + 300006	2	Float	Floating Point
AI Ch.4	SA + 300008	2	Float	Floating Point
AI Ch.5	SA + 300010	2	Float	Floating Point
AI Ch.6	SA + 300012	2	Float	Floating Point
Holding Register (4x), Unit : Register(16 Bits)				
Internal Register 1	SA + 400000	2	Float	Floating Point
Internal Register 2	SA + 400002	2	Float	Floating Point
Internal Register 3	SA + 400004	2	Float	Floating Point
⋮				
Internal Register 46	SA + 400090	2	Float	Floating Point
Internal Register 47	SA + 400092	2	Float	Floating Point
Internal Register 48	SA + 400094	2	Float	Floating Point

● WISE-7118Z		(6 DO 、 10 AI Channel)		
Parameter Name	Modbus Address	Length	Data Type	Range
Coil Output (0x), Unit : Coil(8 Bits)				
DO Ch.0	SA + 000000	1	Byte	0=OFF, 1=ON
DO Ch.1	SA + 000001	1	Byte	0=OFF, 1=ON
DO Ch.2	SA + 000002	1	Byte	0=OFF, 1=ON
DO Ch.3	SA + 000003	1	Byte	0=OFF, 1=ON
DO Ch.4	SA + 000004	1	Byte	0=OFF, 1=ON
DO Ch.5	SA + 000005	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
AI Ch.0	SA + 300000	2	Float	Floating Point
AI Ch.1	SA + 300002	2	Float	Floating Point
AI Ch.2	SA + 300004	2	Float	Floating Point
AI Ch.3	SA + 300006	2	Float	Floating Point

AI Ch.4	SA + 300008	2	Float	Floating Point
AI Ch.5	SA + 300010	2	Float	Floating Point
AI Ch.6	SA + 300012	2	Float	Floating Point
AI Ch.7	SA + 300014	2	Float	Floating Point
AI Ch.8	SA + 300016	2	Float	Floating Point
AI Ch.9	SA + 300018	2	Float	Floating Point
DO Counter 0	SA + 300020	1	UInt16	0~65535
DO Counter 1	SA + 300021	1	UInt16	0~65535
DO Counter 2	SA + 300022	1	UInt16	0~65535
DO Counter 3	SA + 300023	1	UInt16	0~65535
DO Counter 4	SA + 300024	1	UInt16	0~65535
DO Counter 5	SA + 300025	1	UInt16	0~65535
Holding Register (4x), Unit : Register(16 Bits)				
Internal Register 1	SA + 400000	2	Float	Floating Point
Internal Register 2	SA + 400002	2	Float	Floating Point
Internal Register 3	SA + 400004	2	Float	Floating Point
⋮				
Internal Register 46	SA + 400090	2	Float	Floating Point
Internal Register 47	SA + 400092	2	Float	Floating Point
Internal Register 48	SA + 400094	2	Float	Floating Point

● WISE-7126		(2 DI、2 DO、6 AI、2 AO Channel)		
Parameter Name	Modbus Address	Length	Data Type	Range
Coil Output (0x), Unit : Coil(8 Bits)				
DO Ch.0	SA + 000000	1	Byte	0=OFF, 1=ON
DO Ch.1	SA + 000001	1	Byte	0=OFF, 1=ON
Discrete Input (1x), Unit : Coil(8 Bits)				
DI Ch.0	SA + 100000	1	Byte	0=OFF, 1=ON
DI Ch.1	SA + 100001	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
AI Ch.0	SA + 300000	2	Float	Floating Point
AI Ch.1	SA + 300002	2	Float	Floating Point
AI Ch.2	SA + 300004	2	Float	Floating Point
AI Ch.3	SA + 300006	2	Float	Floating Point
AI Ch.4	SA + 300008	2	Float	Floating Point

AI Ch.5	SA + 300010	2	Float	Floating Point
DI Counter 0	SA + 300012	1	UInt16	0~65535
DI Counter 1	SA + 300013	1	UInt16	0~65535
DO Counter 0	SA + 300014	1	UInt16	0~65535
DO Counter 1	SA + 300015	1	UInt16	0~65535
Holding Register (4x), Unit : Register(16 Bits)				
AO Ch.0	SA + 400000	2	Float	Floating Point
AO Ch.1	SA + 400002	2	Float	Floating Point
Internal Register 1	SA + 400004	2	Float	Floating Point
Internal Register 2	SA + 400006	2	Float	Floating Point
Internal Register 3	SA + 400008	2	Float	Floating Point
⋮				
Internal Register 46	SA + 400094	2	Float	Floating Point
Internal Register 47	SA + 400096	2	Float	Floating Point
Internal Register 48	SA + 400098	2	Float	Floating Point

● WISE-7142、WISE-7167		(Maximum 16 DO Channel)		
According to the channel numbers of DO Module, you can look up the Modbus address of the DO module from the following table:				
Parameter Name	Modbus Address	Length	Data Type	Range
Coil Output (0x), Unit : Coil(8 Bits)				
DO Ch.0	SA + 000000	1	Byte	0=OFF, 1=ON
DO Ch.1	SA + 000001	1	Byte	0=OFF, 1=ON
DO Ch.2	SA + 000002	1	Byte	0=OFF, 1=ON
DO Ch.3	SA + 000003	1	Byte	0=OFF, 1=ON
DO Ch.4	SA + 000004	1	Byte	0=OFF, 1=ON
DO Ch.5	SA + 000005	1	Byte	0=OFF, 1=ON
DO Ch.6	SA + 000006	1	Byte	0=OFF, 1=ON
DO Ch.7	SA + 000007	1	Byte	0=OFF, 1=ON
DO Ch.8	SA + 000008	1	Byte	0=OFF, 1=ON
DO Ch.9	SA + 000009	1	Byte	0=OFF, 1=ON
DO Ch.10	SA + 000010	1	Byte	0=OFF, 1=ON
DO Ch.11	SA + 000011	1	Byte	0=OFF, 1=ON
DO Ch.12	SA + 000012	1	Byte	0=OFF, 1=ON
DO Ch.13	SA + 000013	1	Byte	0=OFF, 1=ON

DO Ch.14	SA + 000014	1	Byte	0=OFF, 1=ON
DO Ch.15	SA + 000015	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
DO Counter 0	SA + 300000	1	UInt16	0~65535
DO Counter 1	SA + 300001	1	UInt16	0~65535
DO Counter 2	SA + 300002	1	UInt16	0~65535
DO Counter 3	SA + 300003	1	UInt16	0~65535
DO Counter 4	SA + 300004	1	UInt16	0~65535
DO Counter 5	SA + 300005	1	UInt16	0~65535
DO Counter 6	SA + 300006	1	UInt16	0~65535
DO Counter 7	SA + 300007	1	UInt16	0~65535
DO Counter 8	SA + 300008	1	UInt16	0~65535
DO Counter 9	SA + 300009	1	UInt16	0~65535
DO Counter 10	SA + 300010	1	UInt16	0~65535
DO Counter 11	SA + 300011	1	UInt16	0~65535
DO Counter 12	SA + 300012	1	UInt16	0~65535
DO Counter 13	SA + 300013	1	UInt16	0~65535
DO Counter 14	SA + 300014	1	UInt16	0~65535
DO Counter 15	SA + 300015	1	UInt16	0~65535
Holding Register (4x), Unit : Register(16 Bits)				
Internal Register 1	SA + 400000	2	Float	Floating Point
Internal Register 2	SA + 400002	2	Float	Floating Point
Internal Register 3	SA + 400004	2	Float	Floating Point
⋮				
Internal Register 46	SA + 400090	2	Float	Floating Point
Internal Register 47	SA + 400092	2	Float	Floating Point
Internal Register 48	SA + 400094	2	Float	Floating Point

● WISE-7144 、 WISE-7152		(8 DI 、 8 DO Channel)		
Parameter Name	Modbus Address	Length	Data Type	Range
Coil Output (0x), Unit : Coil(8 Bits)				
DO Ch.0	SA + 000000	1	Byte	0=OFF, 1=ON
DO Ch.1	SA + 000001	1	Byte	0=OFF, 1=ON
DO Ch.2	SA + 000002	1	Byte	0=OFF, 1=ON
DO Ch.3	SA + 000003	1	Byte	0=OFF, 1=ON

DO Ch.4	SA + 000004	1	Byte	0=OFF, 1=ON
DO Ch.5	SA + 000005	1	Byte	0=OFF, 1=ON
DO Ch.6	SA + 000006	1	Byte	0=OFF, 1=ON
DO Ch.7	SA + 000007	1	Byte	0=OFF, 1=ON
Discrete Input (1x), Unit : Coil(8 Bits)				
DI Ch.0	SA + 100000	1	Byte	0=OFF, 1=ON
DI Ch.1	SA + 100001	1	Byte	0=OFF, 1=ON
DI Ch.2	SA + 100002	1	Byte	0=OFF, 1=ON
DI Ch.3	SA + 100003	1	Byte	0=OFF, 1=ON
DI Ch.4	SA + 100004	1	Byte	0=OFF, 1=ON
DI Ch.5	SA + 100005	1	Byte	0=OFF, 1=ON
DI Ch.6	SA + 100006	1	Byte	0=OFF, 1=ON
DI Ch.7	SA + 100007	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
DI Counter 0	SA + 300000	1	UInt16	0~65535
DI Counter 1	SA + 300001	1	UInt16	0~65535
DI Counter 2	SA + 300002	1	UInt16	0~65535
DI Counter 3	SA + 300003	1	UInt16	0~65535
DI Counter 4	SA + 300004	1	UInt16	0~65535
DI Counter 5	SA + 300005	1	UInt16	0~65535
DI Counter 6	SA + 300006	1	UInt16	0~65535
DI Counter 7	SA + 300007	1	UInt16	0~65535
DO Counter 0	SA + 300008	1	UInt16	0~65535
DO Counter 1	SA + 300009	1	UInt16	0~65535
DO Counter 2	SA + 300010	1	UInt16	0~65535
DO Counter 3	SA + 300011	1	UInt16	0~65535
DO Counter 4	SA + 300012	1	UInt16	0~65535
DO Counter 5	SA + 300013	1	UInt16	0~65535
DO Counter 6	SA + 300014	1	UInt16	0~65535
DO Counter 7	SA + 300015	1	UInt16	0~65535
Holding Register (4x), Unit : Register(16 Bits)				
Internal Register 1	SA + 400000	2	Float	Floating Point
Internal Register 2	SA + 400002	2	Float	Floating Point
Internal Register 3	SA + 400004	2	Float	Floating Point
⋮				
Internal Register 46	SA + 400090	2	Float	Floating Point
Internal Register 47	SA + 400092	2	Float	Floating Point

Internal Register 48	SA + 400094	2	Float	Floating Point
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● WISE-7150		(12 DI 、 6 DO Channel)		
Parameter Name	Modbus Address	Length	Data Type	Range
Coil Output (0x), Unit : Coil(8 Bits)				
DO Ch.0	SA + 000000	1	Byte	0=OFF, 1=ON
DO Ch.1	SA + 000001	1	Byte	0=OFF, 1=ON
DO Ch.2	SA + 000002	1	Byte	0=OFF, 1=ON
DO Ch.3	SA + 000003	1	Byte	0=OFF, 1=ON
DO Ch.4	SA + 000004	1	Byte	0=OFF, 1=ON
DO Ch.5	SA + 000005	1	Byte	0=OFF, 1=ON
Discrete Input (1x), Unit : Coil(8 Bits)				
DI Ch.0	SA + 100000	1	Byte	0=OFF, 1=ON
DI Ch.1	SA + 100001	1	Byte	0=OFF, 1=ON
DI Ch.2	SA + 100002	1	Byte	0=OFF, 1=ON
DI Ch.3	SA + 100003	1	Byte	0=OFF, 1=ON
DI Ch.4	SA + 100004	1	Byte	0=OFF, 1=ON
DI Ch.5	SA + 100005	1	Byte	0=OFF, 1=ON
DI Ch.6	SA + 100006	1	Byte	0=OFF, 1=ON
DI Ch.7	SA + 100007	1	Byte	0=OFF, 1=ON
DI Ch.8	SA + 100008	1	Byte	0=OFF, 1=ON
DI Ch.9	SA + 100009	1	Byte	0=OFF, 1=ON
DI Ch.10	SA + 100010	1	Byte	0=OFF, 1=ON
DI Ch.11	SA + 100011	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
DI Counter 0	SA + 300000	1	UInt16	0~65535
DI Counter 1	SA + 300001	1	UInt16	0~65535
DI Counter 2	SA + 300002	1	UInt16	0~65535
DI Counter 3	SA + 300003	1	UInt16	0~65535
DI Counter 4	SA + 300004	1	UInt16	0~65535
DI Counter 5	SA + 300005	1	UInt16	0~65535
DI Counter 6	SA + 300006	1	UInt16	0~65535
DI Counter 7	SA + 300007	1	UInt16	0~65535
DI Counter 8	SA + 300008	1	UInt16	0~65535
DI Counter 9	SA + 300009	1	UInt16	0~65535

DI Counter 10	SA + 300010	1	UInt16	0~65535
DI Counter 11	SA + 300011	1	UInt16	0~65535
DO Counter 0	SA + 300012	1	UInt16	0~65535
DO Counter 1	SA + 300013	1	UInt16	0~65535
DO Counter 2	SA + 300014	1	UInt16	0~65535
DO Counter 3	SA + 300015	1	UInt16	0~65535
DO Counter 4	SA + 300016	1	UInt16	0~65535
DO Counter 5	SA + 300017	1	UInt16	0~65535
Holding Register (4x), Unit : Register(16 Bits)				
Internal Register 1	SA + 400000	2	Float	Floating Point
Internal Register 2	SA + 400002	2	Float	Floating Point
Internal Register 3	SA + 400004	2	Float	Floating Point
⋮				
Internal Register 46	SA + 400090	2	Float	Floating Point
Internal Register 47	SA + 400092	2	Float	Floating Point
Internal Register 48	SA + 400094	2	Float	Floating Point

● WISE-7151、WISE-7153		(Maximum 16 DI Channel)		
According to the channel numbers of DI Module, you can look up the Modbus address of the DI module from the following table:				
Parameter Name	Modbus Address	Length	Data Type	Range
Discrete Input (1x), Unit : Coil(8 Bits)				
DI Ch.0	SA + 100000	1	Byte	0=OFF, 1=ON
DI Ch.1	SA + 100001	1	Byte	0=OFF, 1=ON
DI Ch.2	SA + 100002	1	Byte	0=OFF, 1=ON
DI Ch.3	SA + 100003	1	Byte	0=OFF, 1=ON
DI Ch.4	SA + 100004	1	Byte	0=OFF, 1=ON
DI Ch.5	SA + 100005	1	Byte	0=OFF, 1=ON
DI Ch.6	SA + 100006	1	Byte	0=OFF, 1=ON
DI Ch.7	SA + 100007	1	Byte	0=OFF, 1=ON
DI Ch.8	SA + 100008	1	Byte	0=OFF, 1=ON
DI Ch.9	SA + 100009	1	Byte	0=OFF, 1=ON
DI Ch.10	SA + 100010	1	Byte	0=OFF, 1=ON
DI Ch.11	SA + 100011	1	Byte	0=OFF, 1=ON
DI Ch.12	SA + 100012	1	Byte	0=OFF, 1=ON

DI Ch.13	SA + 100013	1	Byte	0=OFF, 1=ON
DI Ch.14	SA + 100014	1	Byte	0=OFF, 1=ON
DI Ch.15	SA + 100015	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
DI Counter 0	SA + 300000	1	UInt16	0~65535
DI Counter 1	SA + 300001	1	UInt16	0~65535
DI Counter 2	SA + 300002	1	UInt16	0~65535
DI Counter 3	SA + 300003	1	UInt16	0~65535
DI Counter 4	SA + 300004	1	UInt16	0~65535
DI Counter 5	SA + 300005	1	UInt16	0~65535
DI Counter 6	SA + 300006	1	UInt16	0~65535
DI Counter 7	SA + 300007	1	UInt16	0~65535
DI Counter 8	SA + 300008	1	UInt16	0~65535
DI Counter 9	SA + 300009	1	UInt16	0~65535
DI Counter 10	SA + 300010	1	UInt16	0~65535
DI Counter 11	SA + 300011	1	UInt16	0~65535
DI Counter 12	SA + 300012	1	UInt16	0~65535
DI Counter 13	SA + 300013	1	UInt16	0~65535
DI Counter 14	SA + 300014	1	UInt16	0~65535
DI Counter 15	SA + 300015	1	UInt16	0~65535
Holding Register (4x), Unit : Register(16 Bits)				
Internal Register 1	SA + 400000	2	Float	Floating Point
Internal Register 2	SA + 400002	2	Float	Floating Point
Internal Register 3	SA + 400004	2	Float	Floating Point
⋮				
Internal Register 46	SA + 400090	2	Float	Floating Point
Internal Register 47	SA + 400092	2	Float	Floating Point
Internal Register 48	SA + 400094	2	Float	Floating Point

● WISE-7160		(6 DI · 6 DO Channel)		
Parameter Name	Modbus Address	Length	Data Type	Range
Coil Output (0x), Unit : Coil(8 Bits)				
DO Ch.0	SA + 000000	1	Byte	0=OFF, 1=ON
DO Ch.1	SA + 000001	1	Byte	0=OFF, 1=ON
DO Ch.2	SA + 000002	1	Byte	0=OFF, 1=ON

DO Ch.3	SA + 000003	1	Byte	0=OFF, 1=ON
DO Ch.4	SA + 000004	1	Byte	0=OFF, 1=ON
DO Ch.5	SA + 000005	1	Byte	0=OFF, 1=ON
Discrete Input (1x), Unit : Coil(8 Bits)				
DI Ch.0	SA + 100000	1	Byte	0=OFF, 1=ON
DI Ch.1	SA + 100001	1	Byte	0=OFF, 1=ON
DI Ch.2	SA + 100002	1	Byte	0=OFF, 1=ON
DI Ch.3	SA + 100003	1	Byte	0=OFF, 1=ON
DI Ch.4	SA + 100004	1	Byte	0=OFF, 1=ON
DI Ch.5	SA + 100005	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
DI Counter 0	SA + 300000	1	UInt16	0~65535
DI Counter 1	SA + 300001	1	UInt16	0~65535
DI Counter 2	SA + 300002	1	UInt16	0~65535
DI Counter 3	SA + 300003	1	UInt16	0~65535
DI Counter 4	SA + 300004	1	UInt16	0~65535
DI Counter 5	SA + 300005	1	UInt16	0~65535
DO Counter 0	SA + 300006	1	UInt16	0~65535
DO Counter 1	SA + 300007	1	UInt16	0~65535
DO Counter 2	SA + 300008	1	UInt16	0~65535
DO Counter 3	SA + 300009	1	UInt16	0~65535
DO Counter 4	SA + 300010	1	UInt16	0~65535
DO Counter 5	SA + 300011	1	UInt16	0~65535
Holding Register (4x), Unit : Register(16 Bits)				
Internal Register 1	SA + 400000	2	Float	Floating Point
Internal Register 2	SA + 400002	2	Float	Floating Point
Internal Register 3	SA + 400004	2	Float	Floating Point
⋮				
Internal Register 46	SA + 400090	2	Float	Floating Point
Internal Register 47	SA + 400092	2	Float	Floating Point
Internal Register 48	SA + 400094	2	Float	Floating Point

● DL-10, DL-100		(Temperature 、 Humidity)		
Parameter Name	Modbus Address	Length	Data Type	Range
Input Register (3x), Unit : Register(16 Bits)				

Humidity	SA + 300000	2	Float	Floating Point
Temperature(°C)	SA + 300002	2	Float	Floating Point
Temperature(°F)	SA + 300004	2	Float	Floating Point

DL-301		(CO、Temperature、Humidity、1 DO Channel)		
Parameter Name	Modbus Address	Length	Data Type	Range
Coil Output (0x), Unit : Coil(8 Bits)				
DO Ch.0	SA + 000000	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
CO	SA + 300000	1	UInt16	0 ~ 1000 ppm
Humidity	SA + 300001	2	Float	Floating Point
Temperature(°C)	SA + 300003	2	Float	Floating Point
Temperature(°F)	SA + 300005	2	Float	Floating Point
Dew Point(°C)	SA + 300007	2	Float	Floating Point
Dew Point(°F)	SA + 300009	2	Float	Floating Point

DL-302		(CO2、Temperature、Humidity、1 DO Channel)		
Parameter Name	Modbus Address	Length	Data Type	Range
Coil Output (0x), Unit : Coil(8 Bits)				
DO Ch.0	SA + 000000	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
CO2	SA + 300000	1	UInt16	0 ~ 9999 ppm
Humidity	SA + 300001	2	Float	Floating Point
Temperature(°C)	SA + 300003	2	Float	Floating Point
Temperature(°F)	SA + 300005	2	Float	Floating Point
Dew Point(°C)	SA + 300007	2	Float	Floating Point
Dew Point(°F)	SA + 300009	2	Float	Floating Point

DL-303		(CO、CO2、Temperature、Humidity、1 DO Channel)		
Parameter Name	Modbus Address	Length	Data Type	Range
Coil Output (0x), Unit : Coil(8 Bits)				
DO Ch.0	SA + 000000	1	Byte	0=OFF, 1=ON

Input Register (3x), Unit : Register(16 Bits)				
CO	SA + 300000	1	UInt16	0 ~ 1000 ppm
CO2	SA + 300001	1	UInt16	0 ~ 9999 ppm
Humidity	SA + 300002	2	Float	Floating Point
Temperature(°C)	SA + 300004	2	Float	Floating Point
Temperature(°F)	SA + 300006	2	Float	Floating Point
Dew Point(°C)	SA + 300008	2	Float	Floating Point
Dew Point(°F)	SA + 300010	2	Float	Floating Point

● DL-1020		(PM1/PM2.5/PM10/CO/CO2/Temperature/Humidity)		
Parameter Name	Modbus Address	Length	Data Type	Range
Coil Output (0x), Unit : Coil(8 Bits)				
DO Ch.0	SA + 000000	1	Byte	0=OFF, 1=ON
DO Ch.1	SA + 000001	1	Byte	0=OFF, 1=ON
DO Ch.2	SA + 000002	1	Byte	0=OFF, 1=ON
DO Ch.3	SA + 000003	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
PM2.5	SA + 300000	1	UInt16	0 ~ 1000 µg/m3
Humidity	SA + 300001	2	Float	Floating Point
Temperature(°C)	SA + 300003	2	Float	Floating Point
Temperature(°F)	SA + 300005	2	Float	Floating Point
Dew Point(°C)	SA + 300007	2	Float	Floating Point
Dew Point(°F)	SA + 300009	2	Float	Floating Point
PM1.0	SA + 300011	1	UInt16	0 ~ 1000 µg/m3
PM10	SA + 300012	1	UInt16	0 ~ 1000 µg/m3
particle count (0.3 - 0.5µm)	SA + 300013	1	UInt16	0 ~ 1000 µg/m3
particle count (0.5 - 1.0µm)	SA + 300014	1	UInt16	0 ~ 1000 µg/m3
particle count (1.0 - 2.5µm)	SA + 300015	1	UInt16	0 ~ 1000 µg/m3
particle count (2.5 - 5.0µm)	SA + 300016	1	UInt16	0 ~ 1000 µg/m3
particle count (5.0 - 7.5µm)	SA + 300017	1	UInt16	0 ~ 1000 µg/m3

particle count (7.5 - 10.0um)	SA + 300018	1	UInt16	0 ~ 1000 µg/m3
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DL-1021		(PM1/PM2.5/PM10/CO/CO2/Temperature/Humidity)		
Parameter Name	Modbus Address	Length	Data Type	Range
Coil Output (0x), Unit : Coil(8 Bits)				
DO Ch.0	SA + 000000	1	Byte	0=OFF, 1=ON
DO Ch.1	SA + 000001	1	Byte	0=OFF, 1=ON
DO Ch.2	SA + 000002	1	Byte	0=OFF, 1=ON
DO Ch.3	SA + 000003	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
CO	SA + 300000	1	UInt16	0 ~ 1000 ppm
PM2.5	SA + 300001	1	UInt16	0 ~ 1000 µg/m3
Humidity	SA + 300002	2	Float	Floating Point
Temperature(°C)	SA + 300004	2	Float	Floating Point
Temperature(°F)	SA + 300006	2	Float	Floating Point
Dew Point(°C)	SA + 300008	2	Float	Floating Point
Dew Point(°F)	SA + 300010	2	Float	Floating Point
PM1.0	SA + 300012	1	UInt16	0 ~ 1000 µg/m3
PM10	SA + 300013	1	UInt16	0 ~ 1000 µg/m3
particle count (0.3 - 0.5um)	SA + 300014	1	UInt16	0 ~ 1000 µg/m3
particle count (0.5 - 1.0um)	SA + 300015	1	UInt16	0 ~ 1000 µg/m3
particle count (1.0 - 2.5um)	SA + 300016	1	UInt16	0 ~ 1000 µg/m3
particle count (2.5 - 5.0um)	SA + 300017	1	UInt16	0 ~ 1000 µg/m3
particle count (5.0 - 7.5um)	SA + 300018	1	UInt16	0 ~ 1000 µg/m3
particle count (7.5 - 10.0um)	SA + 300019	1	UInt16	0 ~ 1000 µg/m3

DL-1022		(PM1/PM2.5/PM10/CO/CO2/Temperature/Humidity)		
Parameter Name	Modbus Address	Length	Data Type	Range

	Address		Type	
Coil Output (0x), Unit : Coil(8 Bits)				
DO Ch.0	SA + 000000	1	Byte	0=OFF, 1=ON
DO Ch.1	SA + 000001	1	Byte	0=OFF, 1=ON
DO Ch.2	SA + 000002	1	Byte	0=OFF, 1=ON
DO Ch.3	SA + 000003	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
CO2	SA + 300000	1	UInt16	0 ~ 9999 ppm
PM2.5	SA + 300001	1	UInt16	0 ~ 1000 µg/m3
Humidity	SA + 300002	2	Float	Floating Point
Temperature(°C)	SA + 300004	2	Float	Floating Point
Temperature(°F)	SA + 300006	2	Float	Floating Point
Dew Point(°C)	SA + 300008	2	Float	Floating Point
Dew Point(°F)	SA + 300010	2	Float	Floating Point
PM1.0	SA + 300012	1	UInt16	0 ~ 1000 µg/m3
PM10	SA + 300013	1	UInt16	0 ~ 1000 µg/m3
particle count (0.3 - 0.5µm)	SA + 300014	1	UInt16	0 ~ 1000 µg/m3
particle count (0.5 - 1.0µm)	SA + 300015	1	UInt16	0 ~ 1000 µg/m3
particle count (1.0 - 2.5µm)	SA + 300016	1	UInt16	0 ~ 1000 µg/m3
particle count (2.5 - 5.0µm)	SA + 300017	1	UInt16	0 ~ 1000 µg/m3
particle count (5.0 - 7.5µm)	SA + 300018	1	UInt16	0 ~ 1000 µg/m3
particle count (7.5 - 10.0µm)	SA + 300019	1	UInt16	0 ~ 1000 µg/m3

● DL-1023		(PM1/PM2.5/PM10/CO/CO2/Temperature/Humidity)		
Parameter Name	Modbus Address	Length	Data Type	Range
Coil Output (0x), Unit : Coil(8 Bits)				
DO Ch.0	SA + 000000	1	Byte	0=OFF, 1=ON
DO Ch.1	SA + 000001	1	Byte	0=OFF, 1=ON
DO Ch.2	SA + 000002	1	Byte	0=OFF, 1=ON

DO Ch.3	SA + 000003	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
CO	SA + 300000	1	UInt16	0 ~ 1000 ppm
CO2	SA + 300001	1	UInt16	0 ~ 9999 ppm
PM2.5	SA + 300002	1	UInt16	0 ~ 1000 µg/m3
Humidity	SA + 300003	2	Float	Floating Point
Temperature(°C)	SA + 300005	2	Float	Floating Point
Temperature(°F)	SA + 300007	2	Float	Floating Point
Dew Point(°C)	SA + 300009	2	Float	Floating Point
Dew Point(°F)	SA + 300011	2	Float	Floating Point
PM1.0	SA + 300013	1	UInt16	0 ~ 1000 µg/m3
PM10	SA + 300014	1	UInt16	0 ~ 1000 µg/m3
particle count (0.3 - 0.5µm)	SA + 300015	1	UInt16	0 ~ 1000 µg/m3
particle count (0.5 - 1.0µm)	SA + 300016	1	UInt16	0 ~ 1000 µg/m3
particle count (1.0 - 2.5µm)	SA + 300017	1	UInt16	0 ~ 1000 µg/m3
particle count (2.5 - 5.0µm)	SA + 300018	1	UInt16	0 ~ 1000 µg/m3
particle count (5.0 - 7.5µm)	SA + 300019	1	UInt16	0 ~ 1000 µg/m3
particle count (7.5 - 10.0µm)	SA + 300020	1	UInt16	0 ~ 1000 µg/m3

DL-1038	(PM1/PM2.5/PM10/CO/CO2/TVOC/Temperature/Humidity)			
Parameter Name	Modbus Address	Length	Data Type	Range
Coil Output (0x), Unit : Coil(8 Bits)				
DO Ch.0	SA + 000000	1	Byte	0=OFF, 1=ON
DO Ch.1	SA + 000001	1	Byte	0=OFF, 1=ON
DO Ch.2	SA + 000002	1	Byte	0=OFF, 1=ON
DO Ch.3	SA + 000003	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
CO	SA + 300000	1	UInt16	0 ~ 1000 ppm
CO2	SA + 300001	1	UInt16	0 ~ 9999 ppm

TVOC	SA + 300002	1	UInt16	0 ~ 60000 ppb
PM2.5	SA + 300003	1	UInt16	0 ~ 1000 µg/m3
Humidity	SA + 300004	2	Float	Floating Point
Temperature(°C)	SA + 300006	2	Float	Floating Point
Temperature(°F)	SA + 300008	2	Float	Floating Point
Dew Point(°C)	SA + 300010	2	Float	Floating Point
Dew Point(°F)	SA + 300012	2	Float	Floating Point
PM1.0	SA + 300014	1	UInt16	0 ~ 1000 µg/m3
PM10	SA + 300015	1	UInt16	0 ~ 1000 µg/m3
particle count (0.3 - 0.5µm)	SA + 300016	1	UInt16	0 ~ 1000 µg/m3
particle count (0.5 - 1.0µm)	SA + 300017	1	UInt16	0 ~ 1000 µg/m3
particle count (1.0 - 2.5µm)	SA + 300018	1	UInt16	0 ~ 1000 µg/m3
particle count (2.5 - 5.0µm)	SA + 300019	1	UInt16	0 ~ 1000 µg/m3
particle count (5.0 - 7.5µm)	SA + 300020	1	UInt16	0 ~ 1000 µg/m3
particle count (7.5 - 10.0µm)	SA + 300021	1	UInt16	0 ~ 1000 µg/m3

● DL-1050		(O2、Temperature、Humidity、4 DO Channel)		
Parameter Name	Modbus Address	Length	Data Type	Range
Coil Output (0x), Unit : Coil(8 Bits)				
DO Ch.0	SA + 000000	1	Byte	0=OFF, 1=ON
DO Ch.1	SA + 000001	1	Byte	0=OFF, 1=ON
DO Ch.2	SA + 000002	1	Byte	0=OFF, 1=ON
DO Ch.3	SA + 000003	1	Byte	0=OFF, 1=ON
Input Register (3x), Unit : Register(16 Bits)				
O2	SA + 300000	2	Float	Floating Point
Humidity	SA + 300002	2	Float	Floating Point
Temperature(°C)	SA + 300004	2	Float	Floating Point
Temperature(°F)	SA + 300006	2	Float	Floating Point
Dew Point(°C)	SA + 300008	2	Float	Floating Point

Dew Point(°F)	SA + 300010	2	Float	Floating Point
---------------	-------------	---	-------	----------------

● IR-210		(6 Infrared Output)		
Parameter Name	Modbus Address	Length	Data Type	Range
Holding Register (4x), Unit : Register(16 Bits)				
IR Command	SA + 400000	1	UInt16	1~224
IR Output Channels	SA + 400001	1	UInt16	1~63 <i>The LSB represents ch.1.</i>

● IR-712、IR-712A、IR-712-MTCP		(2 Infrared Output)		
Parameter Name	Modbus Address	Length	Data Type	Range
Holding Register (4x), Unit : Register(16 Bits)				
IR Command	SA + 400000	1	UInt16	IR-712: 1~36 IR-712A: 1~224 IR-712-MTCP:1~512
IR Output Channels	SA + 400001	1	UInt16	1~3 <i>The LSB represents ch.1.</i>

● Modbus Module

This block stores the Modbus TCP/RTU module I/O channel data in WISE. The start address of the block is from the **SA** value. The allocation of the Modbus address of I/O channel for each Modbus TCP/RTU module is in sequence arrangement from the module starting address (SA). Please refer to the following example.

The Modbus RTU module is connected to COM3 of WISE. Its module index number is 3. So the SA value of the Modbus RTU module in WISE is $1000 + (3 - 1) \times 500 = 2000$. The Modbus address of the I/O channel of the module is in sequence arrangement from the module starting address 2000.

Modbus Mapping Table					Address Setting		Nickname Setting	
Local Address	Coil Output (0x)		Discrete Input (1x)		Input Register (3x)		Holding Register (4x)	
	2000	Data Address	11	Data Address	0	Data Address	7	Data Address
2001	Data Number	7	Data Number	10	Data Number	4	Data Number	3
2002								
2003								
2004								
2005								
2006								
2007								
2008								
2009								

Remove All Setting Expand All Collapse All

The detailed I/O channel information of the module :

Modbus Data Model	The Starting Address of Modbus RTU Module	Continuous Data Number
Coil Output	11	7
Discrete Input	0	10
Input Register	7	4(32-bit Floating Point)
Holding Register	20	3(32-bit Floating Point)

The allocation of the Modbus Address in WISE for the Coil Output setting of this Modbus RTU module is shown as below :

Coil Output Index	The Modbus Address in Modbus RTU Module	The mapping Modbus Address in WISE
1	00011	02000
2	00012	02001
3	00013	02002
4	00014	02003
5	00015	02004
6	00016	02005
7	00017	02006

The allocation of the Modbus Address in WISE for the Discrete Input setting of this Modbus RTU module is shown as below :

Discrete Input Index	The Modbus Address in Modbus RTU Module	The mapping Modbus Address in WISE
1	10000	12000

2	10001	12001
3	10002	12002
4	10003	12003
5	10004	12004
6	10005	12005
7	10006	12006
8	10007	12007
9	10008	12008
10	10009	12009

The allocation of the Modbus Address in WISE for the Input Register setting of this Modbus RTU module is shown as below :

Input Register Index	The Modbus Address in Modbus RTU Module	The mapping Modbus Address in WISE
1	30007	32000
2	30009	32002
3	30011	32004
4	30013	32006

The allocation of the Modbus Address in WISE for the Holding Register setting of this Modbus RTU module is shown as below :

Holding Register Index	The Modbus Address in Modbus RTU Module	The mapping Modbus Address in WISE
1	40020	42000
2	40022	42002
3	40024	42004

(7) I/O Data Table for “Active I/O sending” function

WISE equips the “Active I/O sending” function. This “I/O Data Table” area is used to store the I/O channel data and Internal Register data which user defines in the “Active I/O Sending” of “Advanced Setting” of WISE. “Active I/O sending” function allows to rearrange the I/O channels data from different I/O modules and puts them into a continuous Modbus address memory block, and then SCADA software can retrieve all I/O channels data from different modules by using one single Modbus command. Comparing to traditional polling mechanism, it will greatly save time and polling attempts.

Based on different setting, the data which is stored in this area is also different. Please refer to the following example.

Modbus Address Mapping Table

Local Address	Coil (0x)	Register (4x)
30000	X DI0	X AI0
30001	C3N1 DI0	
30002	C3N6 DI0	IR1
30003		C3N6 DI0 C3N6 DI1 C3N6 DI2 C3N6 DI3 C3N6 DI4 C3N6 DI5 C3N6 DI6 C3N6 DI7 C3N6 DO0 C3N6 DO1 C3N6 DO2 C3N6 DO3 C3N6 DO4 C3N6 DO5 C3N6 DO6 C3N6 DO7

Remove All Setting Remove

In this example, we store following I/O channel data in the I/O Data Table.

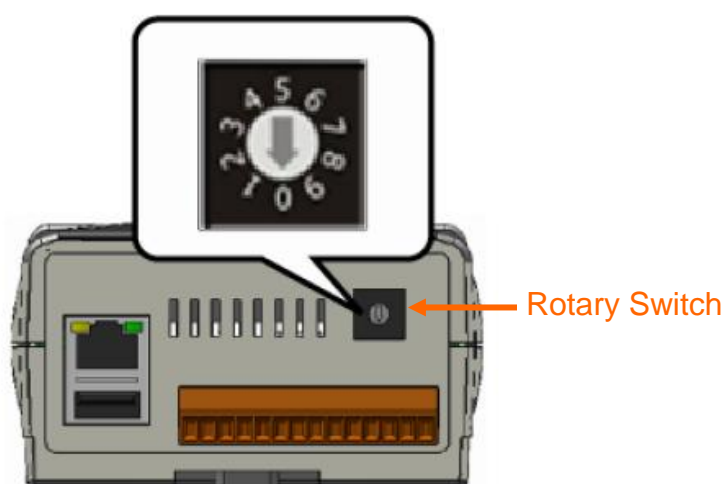
- I/O channel value of XV Board
- I/O channel value of the module which is connected to COM3 of WISE. Its module index number is 1.
- I/O channel value of the module which is connected to COM3 of WISE. Its module index number is 6.
- The Internal Register with index number 1. Its data type is 16-bit Signed Integer

In the I/O Data Table, the “Local Address” in the left side is the address for saving I/O Data Table in the WISE Modbus Address Table.


Parameter Name	Modbus Address	Length	Data Type	Range
Coils Output, Unit : Coil(8 Bits)				
X(XV-Board) DI0	030000	1	Byte	0=OFF, 1=ON
C3N1(COM3 Module1) DI0	030001	1	Byte	0=OFF, 1=ON
C3N6(COM3 Module6) DI0	030002	1	Byte	0=OFF, 1=ON
Holding Register (4x), Unit : Register(16 Bits)				
X(XV-Board) AI0	430000	2	Float	Floating Point
IR1(Internal Register 1)	430002	1	Int16	-32768 ~ 32767
C3N6(COM3 Module6) DI0~DI7 + DO0~DO7	430003	1	UInt16	0 ~ 65535 <i>Each bit represents a channel.</i>

Appendix II : Reset to Factory Default Setting and send password to Administrator

During the operation of WISE, if the hardware system setting data is lost or encounters any abnormal problem that you would like to reset the system to factory default, please switch the Rotary Switch to specific positions to restore factory settings or to ask WISE to send the login password to the Email account of the Administrator. The following figure shows the location of the Rotary Switch of the WISE.



The function of the position of the Rotary Switch :

	Rotary Switch	Functions
	7	Restore network settings to factory default.
	8	Send the passwords to the Email account of the Administrator.
	9	Reset to factory default, includes: <ul style="list-style-type: none"> ● Restore network settings ● Reset all password settings ● Delete the parameter and rule settings, and remove all log files in the microSD card.

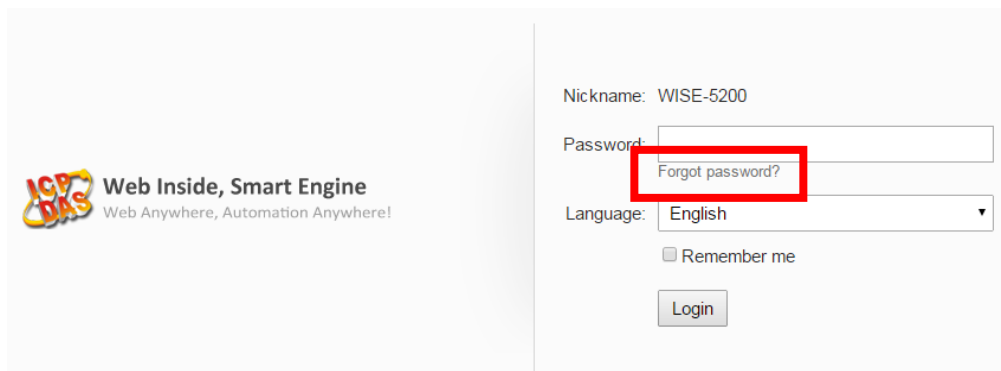
Please follow the steps below to restore network settings to factory default or send the passwords to the Email account of the Administrator:

- Restore network settings to factory default
 1. Power off the WISE.
 2. Switch the Rotary Switch to position 7.
 3. Power on the WISE and complete the booting process. When the booting process is complete, the network settings will be set as the factory default as below.

IP Address	192.168.255.1
Subnet Mask	255.255.0.0
Gateway	192.168.0.1
DNS	8.8.8.8
Port for Web Server	80
Port for Modbus TCP	502
Modbus TCP NetID	1

4. Switch the Rotary Switch to position 0

- Send the passwords to the Email account of the Administrator
 1. Switch the Rotary Switch to position 8.
 2. Connect to WISE Login webpage via Web browser. Now a “Forget password” message will be displayed under the password field. Click the “Forget password” message, then the system will send an email with the passwords (administrator account, user account, guest account, Local FTP login and CGI Query Authentication) to the Email account of the administrator that was previously set by the user in “[5.5 Security Setting](#)” section.



The following figure illustrate an example of the Email the WISE sends to the Email account of the Administrator. The Email content will include the following information.

Administrator password is "Admin".
User1 password is "User1".
User2 password is "User2".
User3 password is "User3".
User4 password is "User4".
User5 password is "User5".
Guest password is "Guest".
Local FTP password is "FTP1_Admin".
CGI password is "CGI_Admin".

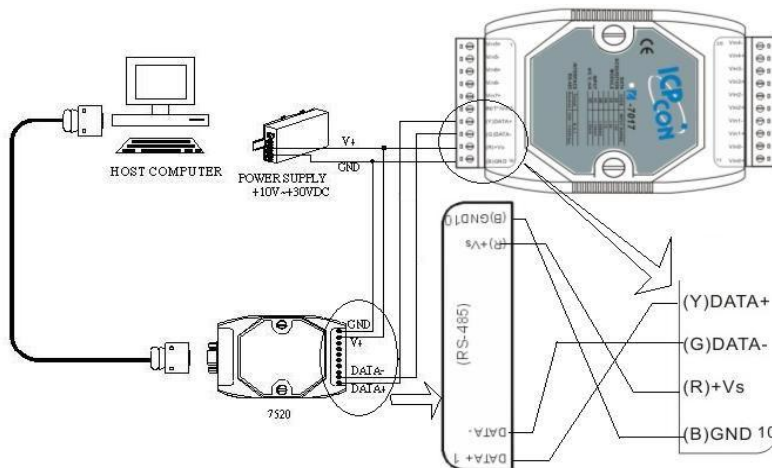
3. Switch the Rotary Switch to position 0.

Appendix III : The configuration setting of ICP DAS modules

WISE allows connection to ICP DAS I/O modules for the I/O channel data retrieve. However, for other configuration of the ICP DAS I/O modules must be completed via related utility (For example: DCON Utility) in advance, so that the WISE can accurately connect to ICP DAS I/O module. The procedures for ICP DAS I/O module parameter settings are as follow:

1. Make sure the ICP DAS I/O module can accurately connect to PC. If the ICP DAS I/O modules connect to PC via RS-485 cable makes sure the RS-485 cable is properly connected. For PC to receive RS-485 signals, a RS-232 to RS-485 or a USB to RS-485 converter is required. For more converter information, please refer to ICP DAS converter product page:

http://www.icpdas.com/root/product/solutions/industrial_communication/converter/converter_selection.html

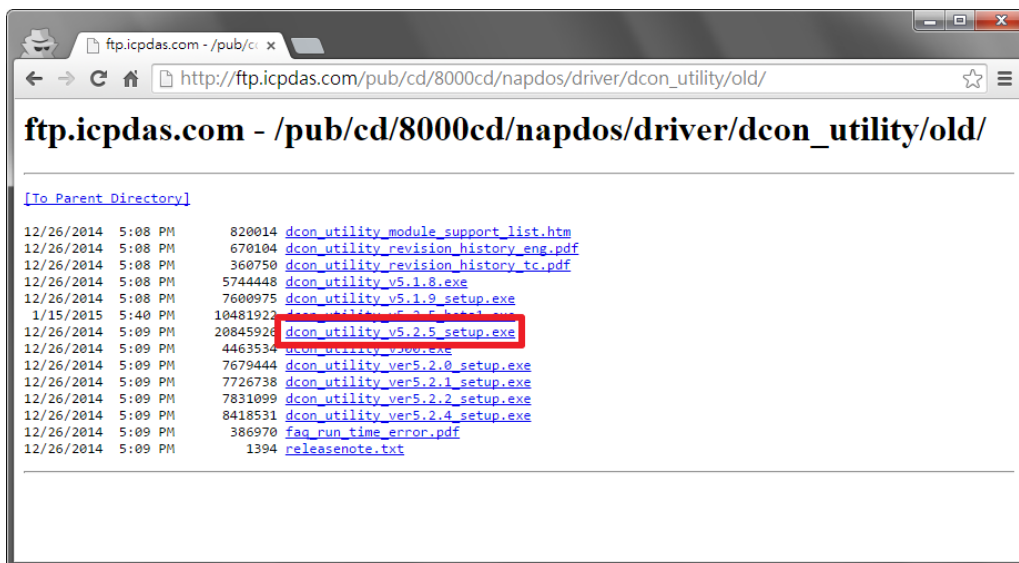


If the communication interface between ICP DAS I/O modules and PC is Ethernet, make sure the Ethernet is properly connected through Hub between PC and ICP DAS I/O modules or directly connect PC and ICP DAS I/O modules with Ethernet cable.

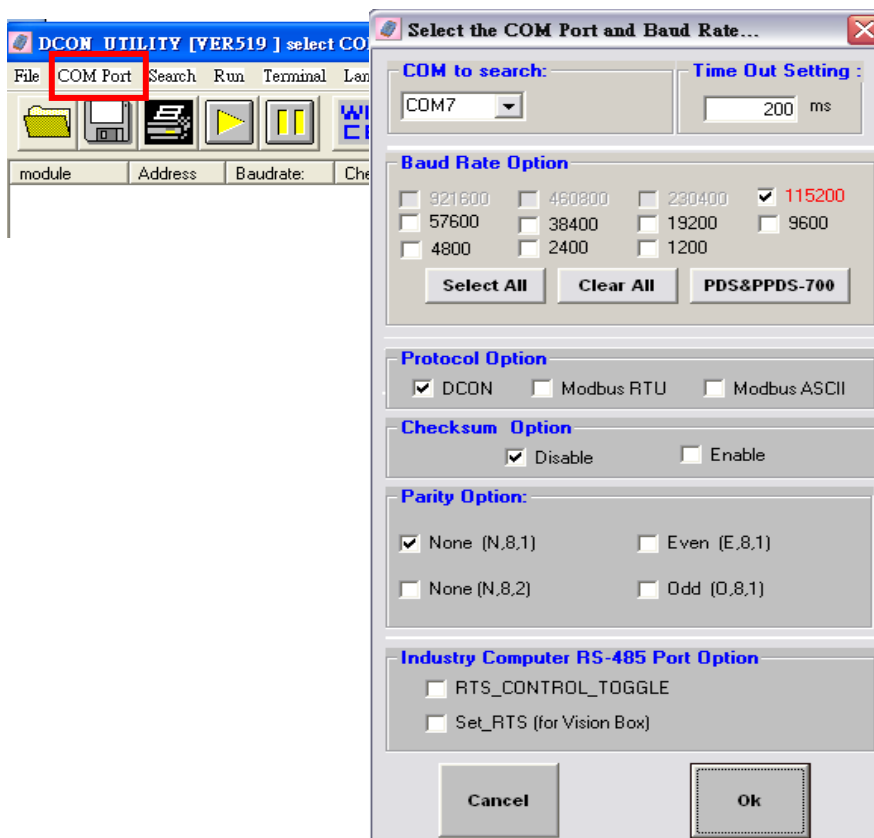
2. If the ICP DAS I/O module is I-7000、M-7000、tM series, please follow the steps as below for the configuration setting.

- A. Download DCON Utility from the link below, and Install the DCON Utility on PC.

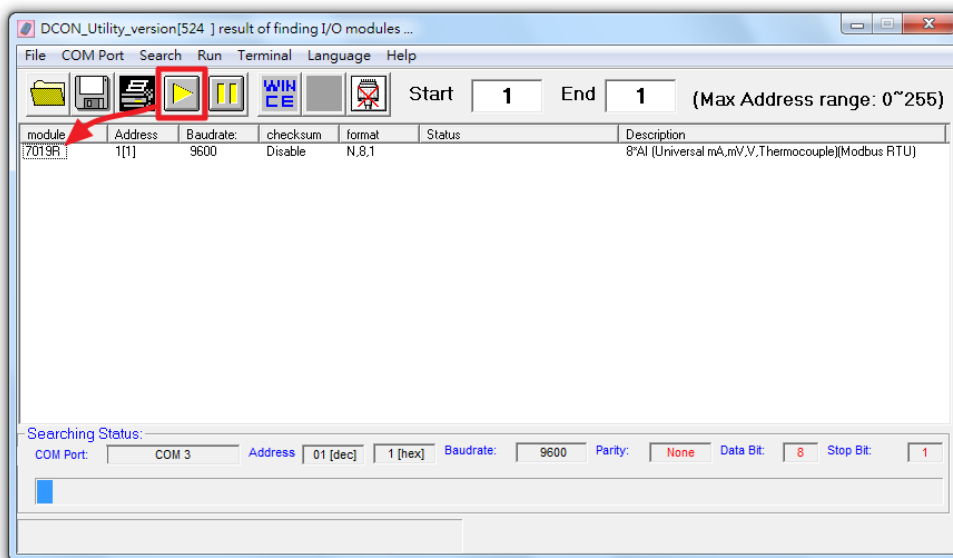
http://ftp.icpdas.com/pub/cd/8000cd/napdos/driver/dcon_utility/old



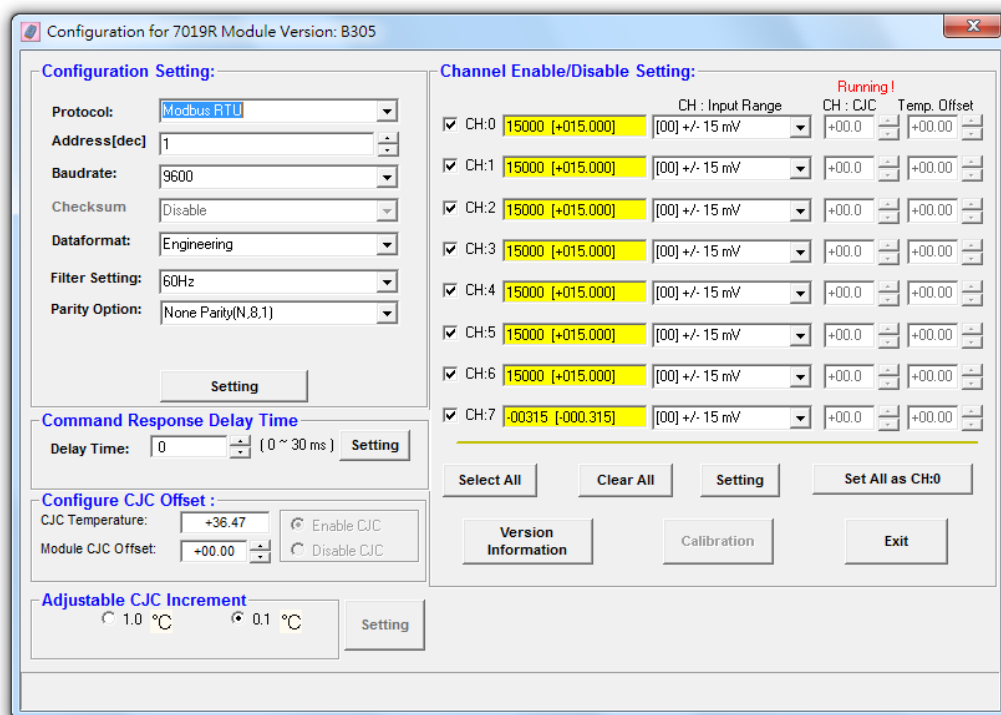
B. Start the DCON Utility and verify if the COM Port parameters are accurate.



C. Perform “Search” to find all I-7000、M-7000、tM series modules that are connected to the PC.



D. Click on the module to bring up the “Configuration Window” and setup the parameters (such as Address, Baudrate) for the module. The “Configuration Window” will be shown as follow (using M-7019R as an example):



Please note: The following parameters has to be accurate to connect with WISE properly:

- Communication Protocol: M-7000 and tM series modules have to be set as Modbus RTU
- Address: the address has to be set between 1~128, please note: the

configuration of I/O module address on WISE has to be set exactly the same.

- Baudrate: the Baudrate has to be set the same as the Baudrate of WISE COM Port which the module will connect. All I/O modules' Baudrate have to be set the same as well.
- Data format: set to be "Engineering" format.
- Parity : the Parity has to be set the same as the Parity of WISE COM Port which the module will connect. All I/O modules' Parity has to be set the same as well.

Please complete others setting of I-7000/M-7000/tM modules according to system's requirement. For more detailed information, please refer to DCON Utility manual as below.

http://ftp.icpdas.com/pub/cd/8000cd/napdos/driver/dcon_utility/manual/

3. For others ICP DAS I/O module, please refer to related user manual for the configuration setting. In order to accurately connect with WISE, please make sure of the COM port setting (Module address (1~128), Baudrate, Parity) or Ethernet setting (IP address, Connection Port (1~65535), NetID (1~247)). Please follow the links as below for the user manual of the related ICP DAS I/O modules.

a. (P)ET series module

link	http://ftp.icpdas.com/pub/cd/6000cd/napdos/et7000_et7200/document/
File name	et7000_et7200_user_manual_vXXX.pdf

b. WISE-7000 series module

link	http://wise.icpdas.com/downloads/manual/
File name	ICP DAS WISE User Manual_vX.XXen_71xx.pdf

c. WF-2000 series module

link	http://ftp.icpdas.com/pub/cd/usbcd/napdos/wifi/
File name	wf-20XX/manual/wf_2000_aio_usermanual_en_vX.X.pdf or wf-20XX/manual/wf_2000_usermanual_en_vX.X.pdf

d. LC series module

<http://wise.icpdas.com>

link	http://ftp.icpdas.com.tw/pub/cd/8000cd/napdos/lc/
File name	lc-XXX/lc_XXX_usermanual_vXXX.pdf

e. DL-100 module

link	http://ftp.icpdas.com.tw/pub/cd/usbcd/napdos/dl_100/dl100tm485/documents/
File name	dl_100tm485_vXXX.pdf

f. DL-302 module

link	http://ftp.icpdas.com.tw/pub/cd/usbcd/napdos/dl-302/document/
File name	dl302_user_manial_chinese_vXXX.pdf

g. IR series module

link	http://ftp.icpdas.com.tw/pub/cd/usbcd/napdos/ir/
File name	ir-XXX/manual/ ir-XXX_usermanual_en_vX_X.pdf

Appendix IV : The SNMP Variables for WISE

The WISE provides SNMP (Simple Network Management Protocol) Agent to work with the SNMP Network Management software for monitoring the system data and I/O module data. The following table lists the SNMP variables for the WISE.

● RFC1213 MIB II Supported SNMP Variables

The following SNMP variables are built into the WISE SNMP Agent and are compliant with RFC1213 MIB II.

system	sysDescr	sysObjectID	sysUpTime
	sysContact	sysName	sysLocation
	sysServices		
interfaces	ifNumber	ifIndex	ifDescr
	ifType	ifMtu	ifSpeed
	ifPhysAddress	ifAdminStatus	ifOperStatus
	ifLastChange	ifInOctets	ifInUcastPkts
	ifInNUcastPkts	ifInDiscards	ifInErrors
	ifInUnknownProtos	ifOutOctets	ifOutUcastPkts
	ifOutNUcastPkts	ifOutDiscards	ifOutErrors
	ifOutQLen	ifSpecific	
ip	ipForwarding	ipDefaultTTL	ipInReceives
	ipInHdrErrors	ipInAddrErrors	ipForwDatagrams
	ipInUnknownProtos	ipInDiscards	ipInDelivers
	ipOutRequests	ipOutDiscards	ipOutNoRoutes
	ipReasmTimeout	ipReasmReqds	ipReasmOKs
	ipReasmFails	ipFragOKs	ipFragFails
	ipFragCreates	ipAdEntAddr	ipAdEntIfIndex
	ipAdEntNetMask	ipAdEntBcastAddr	ipAdEntReasmMaxSize
	ipRouteDest	ipRouteIfIndex	ipRouteMetric1
	ipRouteMetric2	ipRouteMetric3	ipRouteMetric4
	ipRouteNextHop	ipRouteType	ipRouteProto
	ipRouteAge	ipRouteMask	ipRouteMetric5
	ipRouteInfo	ipRoutingDiscards	
icmp	icmpInMsgs	icmpInErrors	icmpInDestUnreaches

	icmpInTimeExcds	icmpInParmProbs	icmpInSrcQuenchs
	icmpInRedirects	icmpInEchos	icmpInEchoReps
	icmpInTimestamps	icmpInTimestampReps	icmpInAddrMasks
	icmpInAddrMaskReps	icmpOutMsgs	icmpOutErrors
	icmpOutDestUnreachs	icmpOutTimeExcds	icmpOutParmProbs
	icmpSrcQuenchs	icmpRedirects	icmpOutEchos
	icmpOutEchoReps	icmpOutTimestamps	icmpOutTimestampReps
	icmpOutAddrMasks	icmpOutAddrMaskReps	
tcp	tcpRtoAlgorithm	tcpRtoMin	tcpRtoMax
	tcpMaxConn	tcpActiveOpens	tcpPassiveOpens
	tcpAttempFails	tcpEstabResets	tcpCurrEstab
	tcpInSegs	tcpOutSegs	tcpRetransSegs
	tcpConnState	tcpConnLocalAddress	tcpConnLocalPort
	tcpConnRemAddress	tcpConnRemPort	tcpInErrs
	tcpOutRsts		
udp	udpInDatagrams	udpNoPorts	udpInErrors
	udpOutDatagrams	udpLocalAddress	udpLocalPort
snmp	snmpInPkts	snmpOutPkts	snmpInBadVersions
	snmpInBadCommunityNames		snmpInBadCommunityUses
	snmpInASNParseErrs	snmpInTooBigs	snmpInNoSuchNames
	snmpInBadValues	snmpInReadOnlys	snmpInGenErrs
	snmpInTotalReqVars	snmpInTotalSetVars	snmpInGetRequests
	snmpInGetNexts	snmpInSetRequests	snmpInGetResponses
	snmpInTraps	snmpOutTooBigs	snmpOutNoSuchNames
	snmpOutBadValues	snmpOutGenErrs	snmpOutGetRequests
	snmpOutGetNexts	snmpOutSetRequests	snmpOutGetResponses
snmpOutTraps	snmpEnableAuthenTraps		

● **Private MIB File and SNMP Variables**

The following are the Private MIB SNMP variables are built into the WISE SNMP Agent. About the detailed information, please refer to the description file in the WISE CD or from the ICP DAS WISE product Web page.

System	serialNumber	firmwareVersion	nickname
	systemCurrentTime	webserverPort	modbusTcpPort
	modbusTcpNetID	serviceIndex	serverName
	domainName	updateStatus	updateTime
	cellularIP	cellularSignal	cellularSignalPercent
	microSDFreeSpace	xvBoardName	com2Function
	com2Baudrate	com2Parity	com2Stopbits
	com3Function	com3Baudrate	com3Parity
	com3Stopbits	com3Checksum	com3Timeout
	com3SilentInterval	com3ModuleAmount	com4Function
	com4Baudrate	com4Parity	com4Stopbits
	com4Checksum	com4Timeout	com4SilentInterval
	com4ModuleAmount	tcpModuleAmount	
XV-Board	xvBoardNickname	xvBoardDIAmount	xvBoardDOAmount
	xvBoardAIAmount	xvBoardAOAmount	xvBoardDIIndex
	xvBoardDIName	xvBoardDIValue	xvBoardDICounterType
	xvBoardDICounterValue	xvBoardDOIndex	xvBoardDOName
	xvBoardDOValue	xvBoardDOPowerOnValue	xvBoardDOAdvFunction
	xvBoardAIIndex	xvBoardAIName	xvBoardAIValue
	xvBoardAIType	xvBoardAIScaleMin	xvBoardAIScaleMax
	xvBoardAOIndex	xvBoardAOName	xvBoardAOValue
	xvBoardAOType	xvBoardAOPowerOnValue	
Remote I/O Module	<i>IioN</i> Index	<i>IioN</i> Interface	
	<i>IioN</i> ModbusID	<i>IioN</i> ModuleName	
	<i>IioN</i> ConnectionStatus	<i>IioN</i> DiscInputAmount	
	<i>IioN</i> CoilOutputAmount	<i>IioN</i> InputRegAmount	
	<i>IioN</i> HoldingRegAmount	<i>IioN</i> DiscInputIndex	
	<i>IioN</i> DiscInputName	<i>IioN</i> DiscInputValue	
	<i>IioN</i> DiscInputModbusAdd	<i>IioN</i> DiscInputCounterValue	
	<i>IioN</i> CoilOutputIndex	<i>IioN</i> CoilOutputName	
	<i>IioN</i> CoilOutputValue	<i>IioN</i> CoilOutputModbusAdd	
	<i>IioN</i> CoilOutputAdvFunction	<i>IioN</i> InputRegIndex	

	<i>IioN</i> InputRegName	<i>IioN</i> InputRegValue
	<i>IioN</i> InputRegModbusAdd	<i>IioN</i> InputRegType
	<i>IioN</i> InputRegScaleRatio	<i>IioN</i> InputRegOffset
	<i>IioN</i> InputRegScaleMin	<i>IioN</i> InputRegScaleMax
	<i>IioN</i> HoldingRegIndex	<i>IioN</i> HoldingRegName
	<i>IioN</i> HoldingRegValue	<i>IioN</i> HoldingRegModbusAdd
	<i>IioN</i> HoldingRegType	<i>IioN</i> HoldingRegScaleRatio
	<i>IioN</i> HoldingRegOffset	

The SNMP Variables naming rule of the remote I/O modules that are connected to WISE.

Every I/O module that is connected to WISE provides the SNMP Variables as above (with its specific prefix denoted).

- **The SNMP Variables naming rule of the I/O modules on Com3**

The I/O Module1 SNMP Variables are shown as above (with prefix **com3io1**), the I/O Module2 SNMP Variables are similar to listed information above but with prefix **com3io2** instead, and the I/O Module16 SNMP Variables are also similar to the listed information above but with prefix **com3io16** instead.

- **The SNMP Variables naming rule of the I/O modules on Com4**

The I/O Module1 SNMP Variables are similar as listed information above but with prefix **com4io1**, the I/O Module2 SNMP Variables are similar to listed information above but with prefix **com4io2** instead, and the I/O Module16 SNMP Variables are also similar to the listed information above but with prefix **com4io16** instead.

- **The SNMP Variables naming rule of the I/O modules on LAN**

The I/O Module1 SNMP Variables are similar as listed information above but with prefix **lanio1**, the I/O Module2 SNMP Variables are similar to listed information above but with prefix **lanio2** instead, and the I/O Module16 SNMP Variables are also similar to the listed information above but with prefix **lanio16** instead.

Internal Register	irIndex	irName	irType
	irValue		

Appendix V : The support list of ICP DAS I/O modules

Please refer to the support list of ICP DAS I/O modules as below.

● XV-Board support list

Function		Model
DI / DO	DC Digital Input	XV110
	DC Digital Output	XV111 、XV111A
	DC Digital Input & Output	XV107 、XV107A
Relay Output	Power Relay Output	XV116
Others	Multi-Function	XV306 、XV307 、XV308 、XV310

● I-7000 series module support list

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

- **M-7000 series module support list**

Function		Model
AI / AO	Voltage & Current	M-7017、M-7017C、M-7017R、 M-7017R-A5、M-7017RC、M-7017Z
	Thermocouple	M-7011、M-7018、M-7018R M-7018Z、M-7019R、M-7019Z
	RTD	M-7015、M-7015P
	Thermistor	M-7005
	Strain Gauge	M-7016
	Analog Output	M-7022、M-7024、M-7024R
DI / DO	DC Digital Input	M-7041、M-7041P、M-7041-A5、 M-7051、M-7052、M-7053
	AC Digital Input	M-7058、M-7059
	DC Digital Output	M-7045、M-7045-NPN
	DC Digital Input & Output	M-7050、M-7055、M-7055-NPN
Relay Output	Power Relay Output	M-7060、M-7060P、M-7061、M-7065、 M-7067、M-7068、M-7069
	Solid State Relay Output	M-7065B
	Photomos Relay Output	M-7066P
Others	Counter / Frequency	M-7080、M-7080B、M-7084、M-7088
	Multi-Function	M-7002

- **tM series module support list**

Function		Model
AI	Voltage & Current	tM-AD5、tM-AD5C、tM-AD8、tM-AD8C
	Thermistor	tM-TH8
DI / DO	DC Digital Input	tM-P8
	DC Digital Output	tM-C8
	DC Digital Input & Output	tM-P4A4、tM-P4C4
Relay Output	Power Relay Output	tM-P3R3、tM-R5
	Photomos Relay Output	tM-P3POR3
Others	Multi-Function	tM-DA1P1R1、tM-AD4P2C2

- **(P)ET-7000 series module support list**

Function		Model
AI / AO	Voltage & Current	(P)ET-7017、(P)ET-7217、 (P)ET-7017-10、(P)ET-7217-10

	Thermocouple	(P)ET-7018Z、(P)ET-7019、 (P)ET-7019Z、(P)ET-7218Z、 (P)ET-7219Z
	RTD	(P)ET-7015、(P)ET-7215
	Thermistor	(P)ET-7005
	Analog Output	(P)ET-7028、(P)ET-7228
DI/DO	DC Digital Input	(P)ET-7051、(P)ET-7053、 (P)ET-7251、(P)ET-7253
	DC Digital Output	(P)ET-7042、(P)ET-7242
	DC Digital Input & Output	(P)ET-7044、(P)ET-7050、 (P)ET-7052、(P)ET-7244、 (P)ET-7252、(P)ET-7255
Relay Output	Power Relay Output	(P)ET-7060、(P)ET-7067、 (P)ET-7260、(P)ET-7261、(P)ET-7267
	Photomos Relay Output	(P)ET-7065、(P)ET-7066
Others	Counter / Frequency	(P)ET-7083、(P)ET-7283
	Multi-Function	(P)ET-7002、(P)ET-7016、 (P)ET-7024、(P)ET-7026、 (P)ET-7202、(P)ET-7204、 (P)ET-7224、(P)ET-7226

● **WISE-7000 series module support list**

Function		Model
AI / AO	Voltage & Current	WISE-7117
	Thermocouple	WISE-7118Z、WISE-7119
	RTD	WISE-7115
	Transmitter	WISE-7105
DI / DO	DC Digital Input	WISE-7151、WISE-7153
	DC Digital Output	WISE-7142
	DC Digital Input & Output	WISE-7144、WISE-7150、WISE-7152
Relay Output	Power Relay Output	WISE-7160、WISE-7167
Others	Multi-Function	WISE-7102、WISE-7126

● **WF-2000 series module support list**

Function		Model
AI / AO	Voltage & Current	WF-2017
	Thermocouple	WF-2019

	RTD	WF-2015
DI / DO	DC Digital Input	WF-2051
	DC Digital Output	WF-2042
	DC Digital Input & Output	WF-2055
Relay Output	Power Relay Output	WF-2060
Others	Multi-Function	WF-2026

- **LC series module support list**

Function		Model
DI / DO	AC Digital Input	LC-101、LC-103
	DC Digital Input	LC-131
Others	Multi-Function	LC-221

- **SC series module support list**

Function		Model
Others	Multi-Function	SC-4104-W1

- **DL series module support list**

Function		Model
Temperature / Humidity		DL-10, DL-100
CO / Temperature / Humidity		DL-301
CO2 / Temperature / Humidity		DL-302
CO / CO2 / Temperature / Humidity		DL-303
PM1 / PM2.5 / PM10 / CO / CO2 / Temperature / Humidity		DL-1020, DL-1021, DL-1022, DL-1023
PM1 / PM2.5 / PM10 / CO / CO2 / TVOC / Temperature / Humidity		DL-1038
O2 / Temperature / Humidity		DL-1050

- **IR series module support list**

Function		Model
IR Learning Remote Module		IR-210、IR-712、IR-712A、 IR-712-MTCP

Appendix VI : The format of CGI Query command

WISE supports the HTTP protocol to set up and retrieve the I/O channel value, Internal Register value or system information. In addition, WISE also supports the JSON format for message exchange. JSON is a popular format; it can reduce the loading of data transfer, and is easy to be integrated with other Network system.

● CGI Query command

The following is the format of CGI Query command:

```
http://IP address:port/dll/query.dll?command
```

The “IP address” is the actual IP address that the WISE is using now. The default IP address of WISE is “192.168.255.1”. The “Port” is the port number of Web server port of WISE. The default IP address of WISE is “80”. If the port number is 80, you can skip it in the setting.

The Command consist a set of parameters. Each parameter consist one name and one value. The name and the value of a parameter are linked by symbol “=”. The parameters are linked by symbol “&”. Depended on the query items, follow the format to include the corresponding parameters in each CGI command.

The following an example of CGI Query command shows querying the value of the Internal Register 1 of WISE.

```
http://192.168.255.1/dll/query.dll?job=get_ir_val&ir_no=1
```

In the above CGI Query command, it consist two parameters: “job=get_ir_val” and “ir_no=1”. For “job=get_ir_val”, “job” is the name of the first parameter, “get_ir_val” is the value of the first parameter. The first parameter is used to query the value of Internal Register of WISE. And then for “ir_no=1”, “ir_no” is the name of the second parameter, “1” is the value of the second parameter. The combination of first parameter and second parameter indicates to query the value of Internal Register 1 of WISE. When WISE receives the CGI Query command, it will reply the following message to the command sender.

```
{
  "status": "OK",
  "result": {
    "value": 2.3
  }
}
```

The returned value will be shown in the JSON format. In the above example, the value of Internal Register 1 is 2.3. It is located in “value” section of the “result” area.

● CGI Query Authentication

After enabling the CGI Query Authentication in the Security Setting section, two extra parameters - “id” and “password” have to be added to the CGI command. The value of “id” is for the user account, and the value of “password” is for the password. The following is an example to enable the CGI Query Authentication.

```
http://192.168.255.1/dll/query.dll?job=get_ir_val&ir_no=1
&id=icpdas&password=wise
```

In this example, “icpdas” is the user account, “wise” is the password. If the user account or password is in error status, then the system will return the following status message.

```
{
  "status": "PASSWORD_ERROR"
}
```

● JSONP Supported

If user wants to enable the JSONP, he/she can add an extra parameter “callback” to the original CGI command, and then assign the value of the “callback” parameter to the function which is used to receive the returned values. The following is an example to enable the JSONP.

```
http://192.168.255.1/dll/query.dll?job=get_ir_val&ir_no=1
&callback=foo
```

In this example, the function named “foo” is used to receive the returned values. The returned values are as below.

```
foo({
  "status": "OK",
  "result": {
    "value": 2.3
  }
});
```


The following table gives detailed information of the query command, command parameters and returned values. For parameters “id”, “password” and “callback”, please refer to the examples in section above.

● **Set up the I/O channel value.**

Command	job=set_channel_val& if_type=val&com_port=val&module_no=val& ch_type=val&ch_addr=val&ch_value=val	
Parameters	Name	if_type
	Description	The I/O module Interface
	Value	0: XV-Board 1: COM Port 2: Network
	Name	com_port
	Description	If the I/O interface is XV-Board or Ethernet, skip this parameter. If the I/O interface is COM Port, it is the COM Port number.
	Value	0: COM0 1: COM1 ...and so on.
	Name	module_no
	Description	The index number of the module.
	Value	Integer; start from 1.
	Name	ch_type
	Description	The channel type
	Value	Modbus Module : co, ro ICP DAS I/O Module : do, ao Infrared Module : ir
	Name	ch_addr
	Description	Channel Address
	Value	The ch_addr is Modbus Data Address

		<p>for the Modbus module. For ICP DAS I/O module, the ch_addr is the channel sequence number starting from 0.</p> <p>For infrared module, the ch_addr is the output channels in binary format. The first bit (LSB) of the value represents the 1st channel. The 2th bit represents the 2th channel. For example: The 1st and 2nd output channels: 0x03 == 0011 (binary)</p>
	Name	ch_value
	Description	The value you want to assign to the output channel.
	Value	Digital type channel: 0 or 1. Analog type channel: Number Infrared module: command index
Response	The channel is existed.	
	<pre>{ "status": "OK" }</pre>	
	The module or channel does not exist.	
	<pre>{ "status": "CHANNEL_NOT_EXIST" }</pre>	
	Password error	
<pre>{ "status": "PASSWORD_ERROR" }</pre>		

- **Get the specific channel value of the remote I/O module.**

Command	job=get_channel_val&
----------------	----------------------

	<code>if_type=val&com_port=val&module_no=val&ch_type=val&ch_addr=val</code>		
Parameters	Name	<code>if_type</code>	
	Description	The type of I/O Interface	
	Value	0: XV-Board 1: COM Port 2: Ethernet	
	Name	<code>com_port</code>	
	Description	If the I/O interface is XV-Board or Ethernet, skip this parameter. If the I/O interface is COM Port, it is for the COM Port number.	
	Value	0: COM0 1: COM1 ...so on.	
	Name	<code>module_no</code>	
	Description	The index number of the module.	
	Value	Integer; start from 1.	
	Name	<code>ch_type</code>	
	Description	The channel type	
	Value	Modbus Module : ci, co, ri, ro Other Modules : di, dic, do, ai, ao	
	Name	<code>ch_addr</code>	
	Description	The channel address	
	Value	The ch_addr is Modbus Data Address for the Modbus module. For other module, the ch_addr is the channel sequence number starting from 0.	
	Response	The channel is existed.	
		<pre>{ "status": "OK", "result": {</pre>	

	<pre>"value": 2.5, "connection": "ONLINE" //or "OFFLINE" } }</pre>
	The module or channel does not exist.
	<pre>{ "status": "CHANNEL_NOT_EXIST" }</pre>
	Password error
	<pre>{ "status": "PASSWORD_ERROR" }</pre>

- **Get all channel value of the remote I/O module.**

Command	job=get_module_val& if_type=val&com_port=val&module_no=val							
Parameters	<table border="1"> <tr> <td>Name</td> <td>if_type</td> </tr> <tr> <td>Description</td> <td>The type of I/O Interface</td> </tr> <tr> <td>Value</td> <td>0: XV-Board 1: COM Port 2: Ethernet</td> </tr> </table>		Name	if_type	Description	The type of I/O Interface	Value	0: XV-Board 1: COM Port 2: Ethernet
Name	if_type							
Description	The type of I/O Interface							
Value	0: XV-Board 1: COM Port 2: Ethernet							
Parameters	<table border="1"> <tr> <td>Name</td> <td>com_port</td> </tr> <tr> <td>Description</td> <td>If the I/O interface is XV-Board or Ethernet, skip this parameter. If the I/O interface is COM Port, it is the COM Port number.</td> </tr> <tr> <td>Value</td> <td>0: COM0 1: COM1 ...so on.</td> </tr> </table>		Name	com_port	Description	If the I/O interface is XV-Board or Ethernet, skip this parameter. If the I/O interface is COM Port, it is the COM Port number.	Value	0: COM0 1: COM1 ...so on.
Name	com_port							
Description	If the I/O interface is XV-Board or Ethernet, skip this parameter. If the I/O interface is COM Port, it is the COM Port number.							
Value	0: COM0 1: COM1 ...so on.							
Parameters	<table border="1"> <tr> <td>Name</td> <td>module_no</td> </tr> <tr> <td>Description</td> <td>The index number of the module.</td> </tr> <tr> <td>Value</td> <td>Integer; start from 1.</td> </tr> </table>		Name	module_no	Description	The index number of the module.	Value	Integer; start from 1.
Name	module_no							
Description	The index number of the module.							
Value	Integer; start from 1.							
Response	The module is existed.							

```
If it is a Modbus module :
{
  "status": "OK",
  "result": {
    "ci": [
      {
        "address": "32"
        "value": 0
      },
      ...
    ],
    "co": [], //if there is no channel of this type.
    "ri": [
      {
        "address": "10"
        "value": 1.3
      },
      ...
    ],
    "ro": [
      {
        "address": "22"
        "value": 2.5
      },
      ...
    ],
    "connection": "ONLINE" //or "OFFLINE"
  }
}
```

```
For other modules:
{
  "status": "OK",
  "result": {
    "di": [0, 1, ...],
    "dic": [0 , 2, ...],
    "do": [], //if there is no channel of this type.
    "ai": [0.2, 1.5, ...],
    "ao": [4.5, 1.1, 2.2, ...],
    "connection": "ONLINE" //or "OFFLINE"
  }
}
```

The module does not exist.

```
{
  "status": "MODULE_NOT_EXIST"
}
```

	Password error
	{ "status": "PASSWORD_ERROR" }

- **Get the connection status of all remote I/O modules.**

Command	job=get_module_status
Parameters	None
Response	Normal
	{ "status": "OK", "result": { "com2": [{ "no": 1, "connection": "ONLINE" //or "OFFLINE" }, ...], "com3": [], //No modules or is in disabled status. "network": [{ "no": 3, "connection": "OFFLINE" }, ...] } }
	Password error
	{ "status": "PASSWORD_ERROR" }

- **Set up the value of a specific Internal Register.**

Command	job=set_ir_val& ir_no=val&ir_value=val
----------------	---

Parameters	Name	ir_no
	Description	The index number of the Internal Register.
	Value	Integer; start from 1.
	Name	ir_value
	Description	The value you want to assign to the Internal Register.
	Value	Number
Response	The Internal Register is enabled.	
	<pre>{ "status": "OK" }</pre>	
	The Internal Register is disabled.	
	<pre>{ "status": "INTERNAL_REGISTER_NOT_EXIST" }</pre>	
	Password error	
	<pre>{ "status": "PASSWORD_ERROR" }</pre>	

- **Get the value of a specific Internal Register.**

Command	job=get_ir_val& ir_no=val	
Parameters	Name	ir_no
	Description	The index number of the Internal Register
	Value	Integer; start from 1.
Response	The Internal Register is enabled.	
	<pre>{ "status": "OK", "result": { "value": 12.5 } }</pre>	

	} }
	The Internal Register is disabled.
	{ "status": "INTERNAL_REGISTER_NOT_EXIST" }
	Password error
	{ "status": "PASSWORD_ERROR" }

- **Get the value of all Internal Registers which are enabled.**

Command	job=get_irs_val
Parameters	None
Response	Normal Status
	{ "status": "OK", "result": [{ "no": 1, "value": 100 }, "] }
	Password error
	{ "status": "PASSWORD_ERROR" }

- **Get the system information log recorded in the last one day.**

Command	job=get_event_log
Parameters	None

Response	Normal Status
	<pre>{ "status": "OK", "result": [{ "time": "2014/07/24 14:11:28", "type": "Login", "message": "Administrator Login Successfully." }, ...] }</pre>
	Password error
	<pre>{ "status": "PASSWORD_ERROR" }</pre>

- **Get the system time.**

Command	job=get_system_time
Parameters	None
Response	Normal Status
	<pre>{ "status": "OK", "result": { "time": "2014/07/24 14:11:28" } }</pre>
	Password error
	<pre>{ "status": "PASSWORD_ERROR" }</pre>

- **Get the current firmware version.**

Command	job=get_firmware_version
----------------	--------------------------

Parameters	None
Response	Normal Status
	<pre>{ "status": "OK", "result": { "version": "3.0.0" } }</pre>
	Password error
	<pre>{ "status": "PASSWORD_ERROR" }</pre>

- **Get the current free space of the micro SD card.**

Command	job=get_sdcard_space
Parameters	None
Response	Normal Status
	<pre>{ "status": "OK", "result": { "free_space": 1560 //Free space. Unit is MB. } }</pre>
	No microSD card detected.
	<pre>{ "status": "SDCARD_NOT_EXIST" }</pre>
	Password error
<pre>{ "status": "PASSWORD_ERROR" }</pre>	

Appendix VII : Change the value of output channel of I/O module or Internal Register by MQTT protocol

WISE supports the MQTT protocol. User can use it to change the value of the Internal Register of WISE or the value of the output channel of I/O module which connect to WISE. Based on MQTT, user just needs to publish the specific topics to Broker, and WISE will automatically subscribe and receive the specific topics to complete the action. Following will list the format of Public topic to the related output channel of I/O module and Internal Register.

- **DO channel of ICP DAS XV-Board**

Topic	<i>Prefix/SET/xvboard/do/channel_no</i>	
	Prefix	Please refer to 8.3 MQTT Setting
	channel_no	0~15
Message	0 or 1	

- **AO channel of ICP DAS XV-Board**

Topic	<i>Prefix/SET/xvboard/ao/channel_no</i>	
	Prefix	Please refer to 8.3 MQTT Setting
	channel_no	0~15
Message	Floating value	

- **The DO channel of ICP DAS I/O module**

Topic	<i>Prefix/SET/interface/module_no/do/channel_no</i>	
	Prefix	Please refer to 8.3 MQTT Setting
	interface	com3, com4 or lan
	module_no	1~16
	channel_no	0~15
Message	0 or 1	

● **The AO channel of ICP DAS I/O module**

Topic	<i>Prefix/SET/interface/module_no/ao/channel_no</i>	
	Prefix	Please refer to 8.3 MQTT Setting
	interface	com3, com4 or lan
	module_no	1~16
	channel_no	0~15
Message	Floating value	

● **The Internal Register of ICP DAS WISE-71xx module**

Topic	<i>Prefix/SET/lan/module_no/ir/ir_no</i>	
	Prefix	Please refer to 8.3 MQTT Setting
	module_no	1~16
	ir_no	1~48
Message	Floating value	

● **The Coil Output channel of others I/O module**

Topic	<i>Prefix/SET/interface/module_no/coil_output/channel_address</i>	
	Prefix	Please refer to 8.3 MQTT Setting
	interface	com3 、 com4 or lan
	module_no	1~16
	channel_address	0~99999
Message	0 or 1	

● **The Holding Register channel of others I/O module**

Topic	<i>Prefix/SET/interface/module_no/holding_register/channel_address</i>	
	Prefix	Please refer to 8.3 MQTT Setting
	interface	com3 、 com4 or lan
	module_no	1~16
	channel_address	0~99999
Message	Floating value	

● The Internal Register

Topic	<i>Prefix/SET/ir/ir_no</i>	
	Prefix	Please refer to 8.3 MQTT Setting
	ir_no	1~80
Message	Floating value	

Appendix VIII : The JSON format for the communication with IoT Platform

WISE supports the functions to publish the JSON format messages to Microsoft Azure and IBM Bluemix IoT Cloud platforms, and also subscribe/receive the JSON format messages from IoT Cloud platform to change the value of the output channel of I/O modules that are connected to WISE. The following lists the detailed information of JSON format message with WISE.

- **Message format**

```
{
```

"msg_type"	:	"CHANNEL_UPDATE"	The "CHANNEL_UPDATE" type of message indicates the message published by WISE to inform IoT Cloud platform the update of the I/O channel status.
		"CHANNEL_OUTPUT"	If WISE receives the message in the type of "CHANNEL_OUTPUT", then WISE will perform the task to change the value of the output channel.
"if_type"	:	It indicates the connection interface between WISE and the I/O module where the I/O channel resides. The following table shows the code and the interface it represents.	
		0	XV-Board
		1	COM Port
		2	Ethernet
"com_port"	:	"3" indicates the connection interface between WISE and the I/O module is COM port 3. "4" indicates the connection interface between WISE and the I/O module is COM port 4. If the connection interface is XV-Board or Ethernet, please ignore this field.	
"module_no"	:	The number indicates the order that the I/O channel data of the module being stored in the WISE Modbus Table. The range is	

	1~16. If the connection interface is XV-Board, please ignore this field.																			
"ch_type"	: It indicates the type of the I/O channel. The following table shows the code and the I/O channel type it represents.																			
	<table border="1"> <tr> <td>di</td> <td>DI Channel</td> </tr> <tr> <td>di_counter</td> <td>The counter of the DI Channel</td> </tr> <tr> <td>do</td> <td>DO Channel</td> </tr> <tr> <td>do_counter</td> <td>The counter of the DO Channel</td> </tr> <tr> <td>ai</td> <td>AI Channel</td> </tr> <tr> <td>ao</td> <td>AO Channel</td> </tr> <tr> <td>discrete_input</td> <td rowspan="4">The data type of the Modbus module</td> </tr> <tr> <td>coil_output</td> </tr> <tr> <td>input_register</td> </tr> <tr> <td>holding_register</td> </tr> <tr> <td>ir</td> <td>Internal Register</td> </tr> </table>	di	DI Channel	di_counter	The counter of the DI Channel	do	DO Channel	do_counter	The counter of the DO Channel	ai	AI Channel	ao	AO Channel	discrete_input	The data type of the Modbus module	coil_output	input_register	holding_register	ir	Internal Register
di	DI Channel																			
di_counter	The counter of the DI Channel																			
do	DO Channel																			
do_counter	The counter of the DO Channel																			
ai	AI Channel																			
ao	AO Channel																			
discrete_input	The data type of the Modbus module																			
coil_output																				
input_register																				
holding_register																				
ir	Internal Register																			
"ch_addr"	: It indicates the I/O channel index, Modbus address or Internal Register number.																			
"nickname"	: It indicates the nickname of the I/O channel.																			
"value"	: It indicates the real-time value of the I/O channel.																			
}																				

- **Example**

The following is the format to publish a message with the value of DI channel 2 which resides at the I/O module with module number 5 to IoT Cloud platform. The I/O module is connected to the COM3 of WISE.

```
{
  "msg_type":"CHANNEL_UPDATE",
  "if_type":1,
  "com_port":3,
  "module_no":5,
  "ch_type":"di",
  "ch_addr":2,
  "nickname":"door sensor",
  "value":"1"
}
```

The following is a format to publish the message with the value of Internal Register 13 to IoT Cloud platform.

```
{
  "msg_type":"CHANNEL_UPDATE",
  "ch_type":"ir",
  "ch_addr":13,
  "nickname":"function result 1",
  "value":"63.87"
}
```

The following is a format of the received message from IoT Cloud platform, it is used to change the value of AO channel 1 of XV-Board of WISE to 3.6.

```
{
  "msg_type":"CHANNEL_OUTPUT",
  "if_type":0,
  "ch_type":"ao",
  "ch_addr":1,
  "value":"3.6"
}
```

The following is a format of the received message from IoT Cloud platform, it is used to change the value of AO channel 2 which resides at the I/O module with module number 3 to 5.0. The I/O module is connected to the COM4 of WISE.

```
{
  "msg_type":" CHANNEL_OUTPUT ",
  "if_type":1,
  "com_port":4,
  "module_no":3,
  "ch_type":"ao",
  "ch_addr":2,
  "nickname":"fan speed",
  "value":"5.0"
}
```


Appendix IX : WISE-523x / WISE-224x LED Indicators

LED indicators of WISE-523x / WISE-224x provide a very convenient way of status indications for faster, easier diagnostics.



LED	LED Status	Module Status
PWR (Green)	ON	The module is powered on.
RUN (Red)	Blinking Red (one flash per second)	The module is functioning normally. PS: When WISE is powered on, please wait about one minute to complete the start-up procedure, until the “RUN” led starts flashing.
3G / 4G	OFF and one flash per 2 seconds	The modem is not functioning, or no SIM card inside.
	ON and one flash per 2 seconds	The modem is functioning normally.
	Flashing	Data Transferring.
L1	ON	The mobile network is connected.
L2	Reserved	
L3	Reserved	