ICP DAS WISE
User Manual
for WISE-52xx Series

[Version 1.1.0]

ICP DAS CO., LTD.

泓格科技股份有限公司

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1 Introduction

WISE-52xx (Web Inside, Smart Engine) Web-based PAC 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-52xx 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-52xx to perform tasks such as logic rule edition and download. WISE-52xx 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-52xx 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-52xx 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-52xx now supports the CGI command receiving function that allows the network devices to trigger the operation of IF-THEN-ELSE logic rule of WISE-52xx by Ethernet. The well thought-out CGI command functions make WISE-52xx being able to interact with the devices flexibly in the network environment. WISE-52xx 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. 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-52xx the most cost-effective I/O controller in the IoT (Internet of Thing) Age.

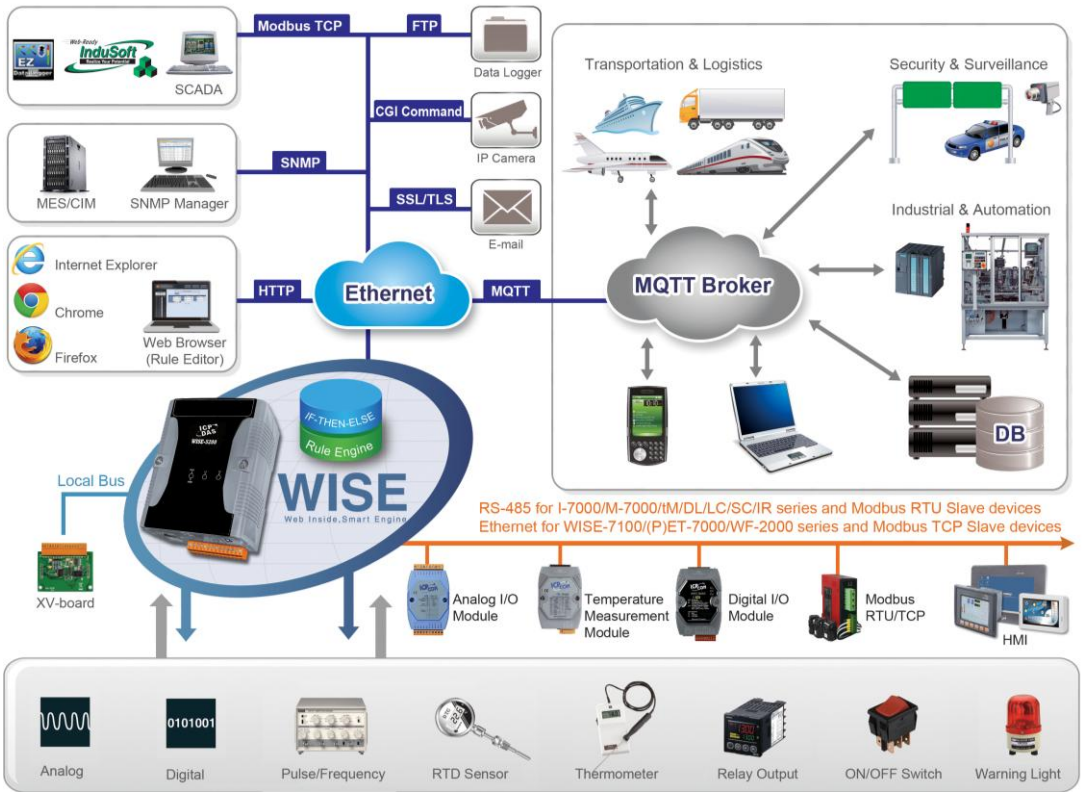


Figure 1-1：WISE System Architecture

WISE-52xx system features:

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

  WISE-52xx 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-52xx 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-52xx. No extra software tool installation is needed on the target PC.

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

WISE-52xx 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-52xx 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-52xx:

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	● **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	● **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

Figure 1-2：WISE-52xx IO module support list

◆ **Provide Timer and Schedule operation**

WISE-52xx 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-52xx 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-52xx.

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

  CGI command function is an important function for real-time message communication in network environment. WISE-52xx 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-52xx 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-52xx 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.

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

  WISE-52xx 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-52xx 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-52xx 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-52xx 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-52xx provide the function "Active I/O Sending" for users. Based on the "Active I/O Sending" function, WISE-52xx 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-52xx 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-52xx.

- **MQTT Message Publish/Subscribe operation**

  WISE-52xx supports the MQTT protocol. It can publish the I/O data of the I/O module which connect to WISE-52xx 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-52xx support the connetcion 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 channle data to the Cloud platform for future data analysis. WISE-52xx also can receive the message which is pulished from the Cloud platform for the corresponding actions at the field side.

- **Mobile network connection**

  WISE-5231M-3GWA supports 3G Wireless communication. With the 3G SIM card, it can send the data logger files and Email alarm message back to the control center by 3G Wireless Network.

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

  WISE-5231-3GWA equips 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, WISE-5231-3GWA allows 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.

This document is intended to give you a full-range instruction to WISE-52xx 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.

2 Before Installation

When WISE-52xx 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-52xx's network settings to fit current network environment settings, and the default network settings of WISE-52xx 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-52xx. For example:
   - IP：192.168.255.10
   - Subnet mask：255.255.0.0
   - Gateway address：192.168.0.1

(2) Connect WISE-52xx **LAN** to PC by network cable. (WISE-52xx 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-52xx 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-52xx to the network.

You can also modify WISE-52xx's network settings by using the WISE-52xx Utility. Please refer to WISE-52xx 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-52xx, 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-52xx 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-52xx is shown as below:

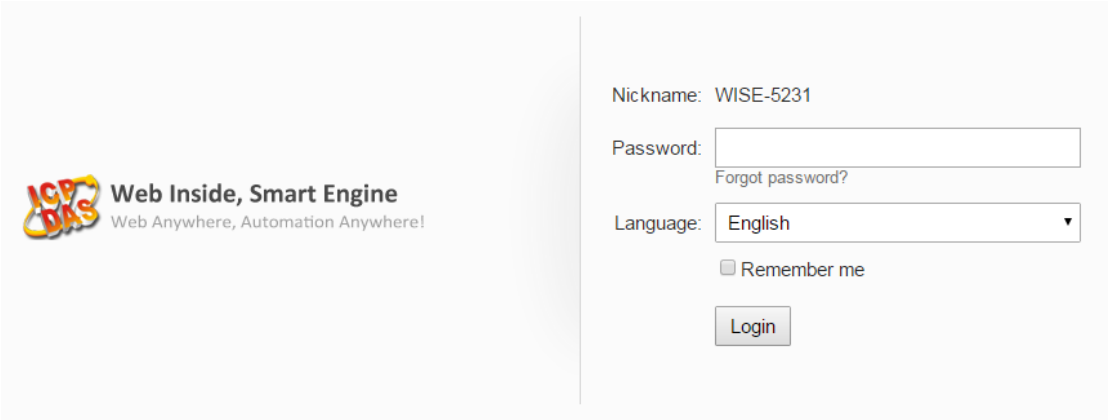


Figure 3-1：WISE-52xx Login page

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-52xx provides 5 User accounts to login. Each User can access to perform the modification or review of the WISE-52xx 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-52xx. 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：

<table>
<tr><th>Function
Login Type</th><th>System Setting、I/O Module setting、Data Logger Setting、Advanced Setting</th><th>Logic Rules Edition</th><th>Channel Status</th></tr>
<tr><td>Administrator</td><td colspan="2">Can add/delete/modify/review ALL setting</td><td rowspan="2">Can review/modify Channel Status</td></tr>
<tr><td>User</td><td>● Can’t add/delete ALL setting.
● Can modify/review setting by need the authority from administrator.</td><td>● Can’t add/delete/modify setting.
● Can review setting by need the authority from administrator.</td></tr>
<tr><td>Guest</td><td colspan="2">Can’t add/delete/modify/review ALL setting.</td><td>Can review Channel Status</td></tr>
</table>

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-52xx by using Administrator, User or Guest accounts. Different WISE-52xx default home page will be displayed based on the different login account. If Administrator login into the system, the WISE-52xx default home page will be displayed as below, and will automatically read settings of the WISE-52xx to the webpage.

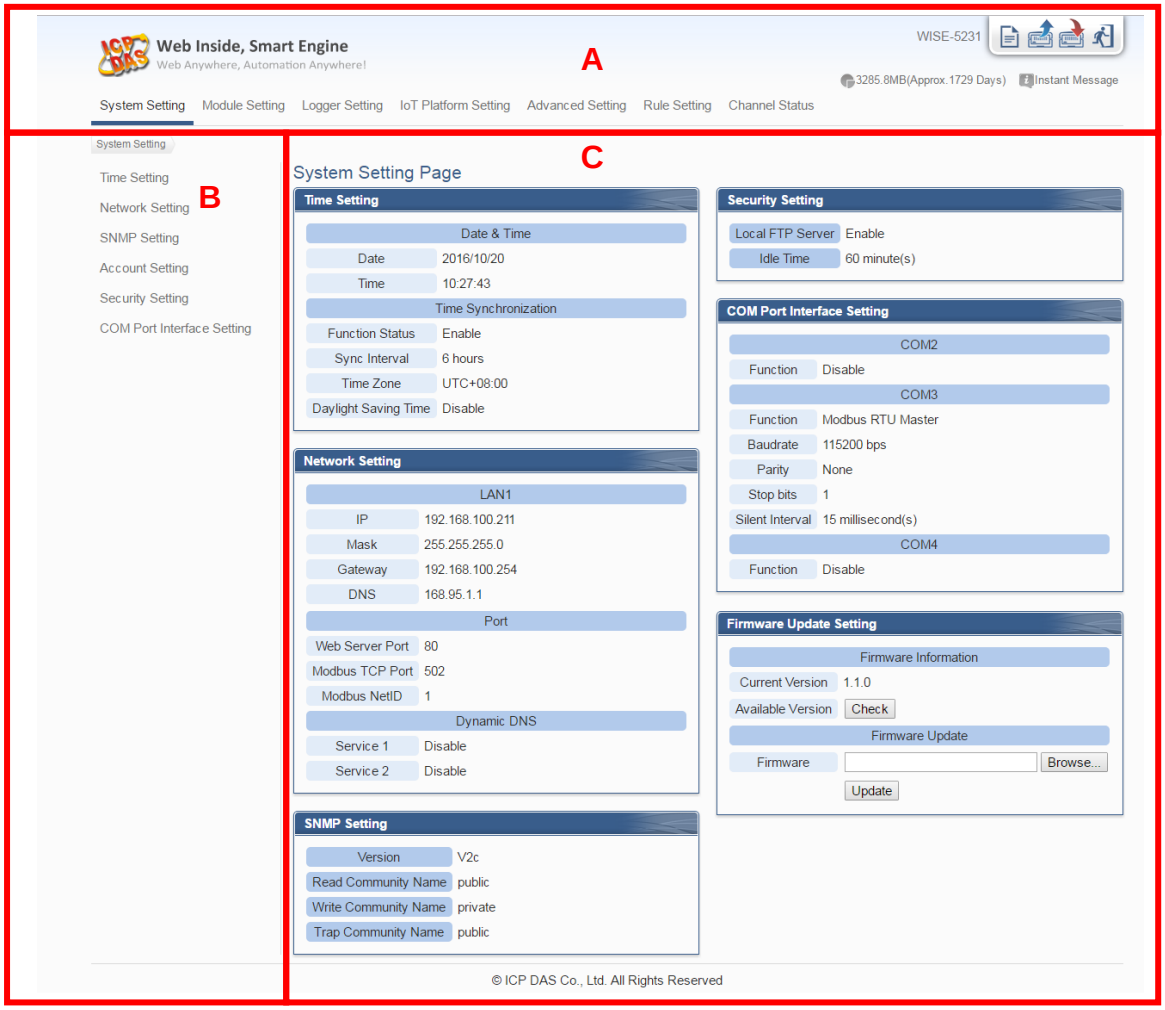


Figure 4-1：WISE-52xx home page (login as an Administrator)

WISE-52xx 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-52xx, such as: system settings, system real-time information display, rule files management, etc, shown as below:

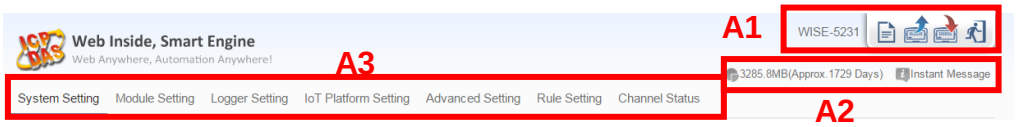


Figure 4-2：WISE-52xx System Function Area (login as an Administrator)

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 flowing:

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：WISE-52xx 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：WISE-52xx 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：WISE-52xx 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-52xx in the nickname field for easy recognition.

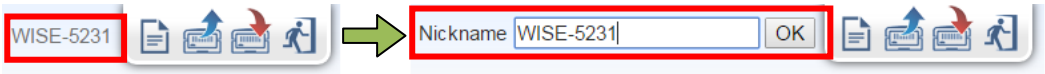


Figure 4-6：WISE-52xx Nickname setting

- "New" button allows resetting the settings of all parameters and Rules. Click on button and click on "OK", the settings on WISE-52xx webpage on the browser will be cleared. If the user would like to clear the setting on WISE-52xx, then continue to click on "Save" button to save the new settings (cleared settings) to the WISE-52xx.

  Please note: once the settings are cleared and save to the WISE-52xx, 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-52xx. Click on button and click "OK" to load all parameter settings and rules settings from WISE-52xx to the web page for further edition.

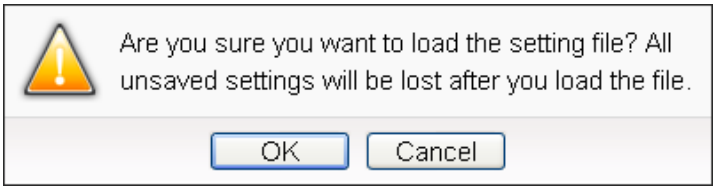


Figure 4-8：Confirm to load settings

- "Save" button allows to save all parameter settings and Rule settings to WISE-52xx. Click on button and click "OK" to save all parameter settings and Rule settings from the web page of WISE-52xx to the WISE-52xx.

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.

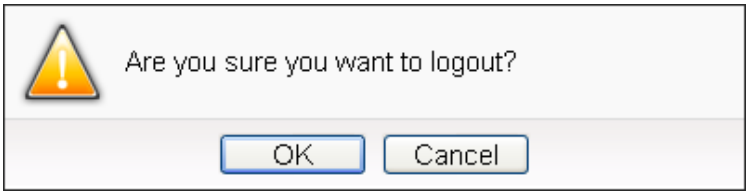


Figure 4-10：Confirm to logout (The settings are saved)

If the settings are not saved to the WISE-52xx before performing logout, a warming message will appear as below:

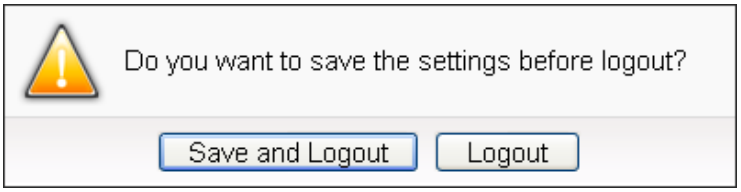


Figure 4-11：Confirm to logout (The settings are not saved)

Please note:

1. All the edited settings on the webpage have to be saved to WISE-52xx 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-52xx.
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-52xx and the real-time system information, shown as below:

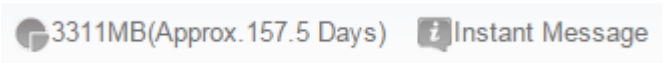
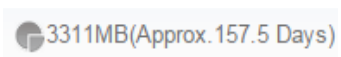


Figure 4-12：Real-time information area

◆  Allows display of the current free space of the microSD card in WISE-52xx. 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.

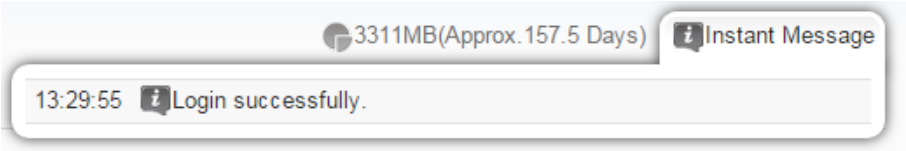


Figure 4-13：Real-time information list

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

If login as a User, WISE-52xx will enable the related function items to let User perform the modification or review of the WISE-52xx 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.

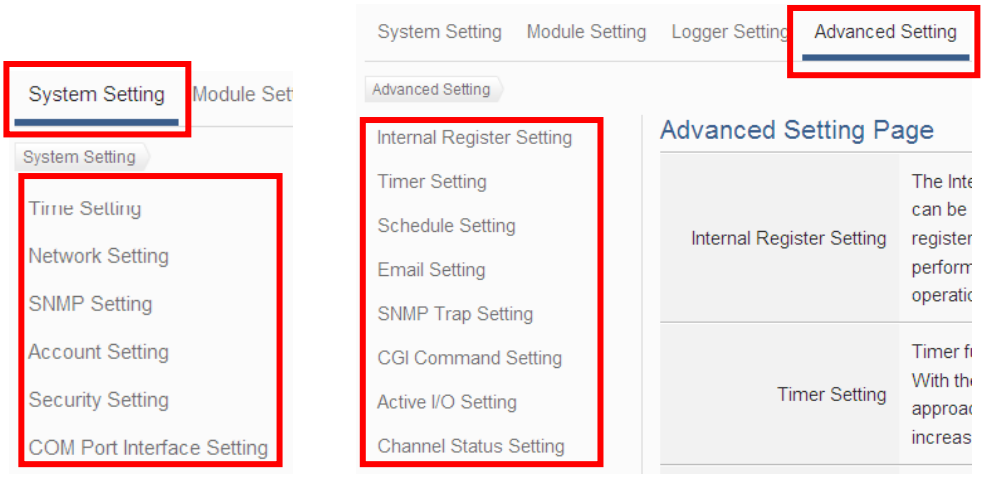


Figure 4-14：Current function path

4.3 Data review/System setting area

Data review/System setting area allows to set system parameters and data review of WISE-52xx, 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-52xx as below:

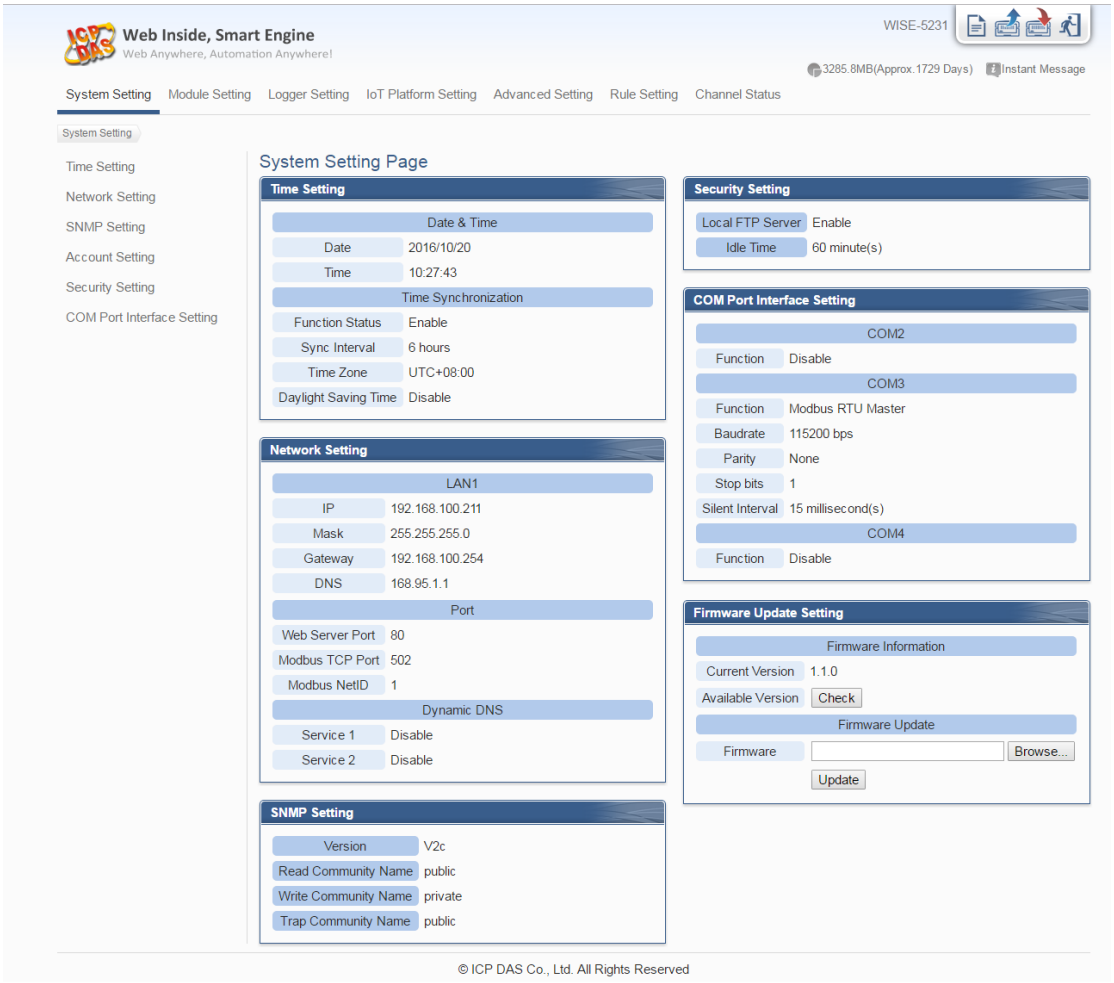


Figure 4-15：Data review/System setting area (login as an Administrator)

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-52xx, shown as below:

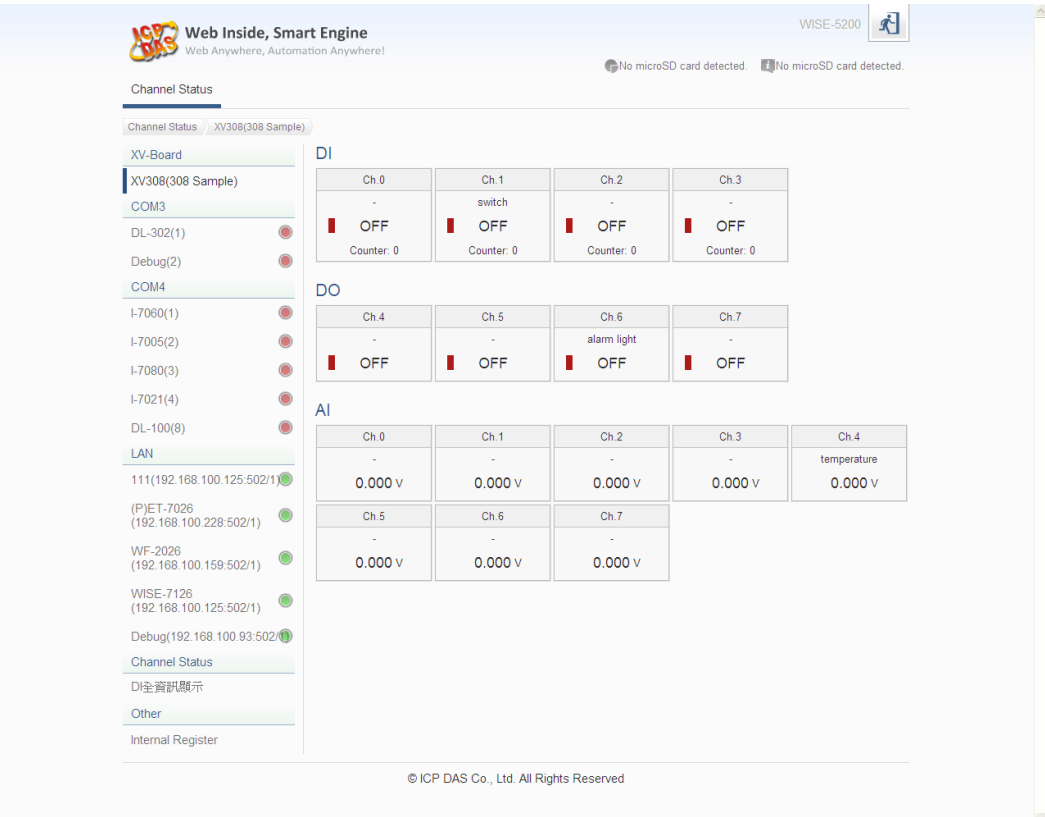


Figure 4-16：Data review/System setting area (login as User or Guest)

4.4 System and logic rule setting procedure

When the Administrator login WISE-52xx, The System function toolbar includes the following 6 function options:

- System Setting
- Module Setting
- Logger Setting
- IoT Platform Setting
- Advanced Setting
- Rule Setting
- Channel Status

The general WISE-52xx system and logic rule setting Web UI operating procedures will be displayed as follow. Please follow the steps to complete the setting.

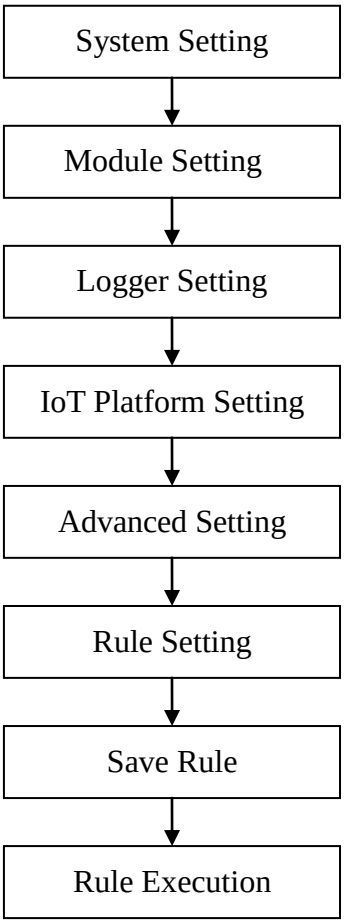


Figure 4-17：WISE-52xx System and logic rule setting procedure

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-52xx, 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-52xx will be displayed, as shown below.

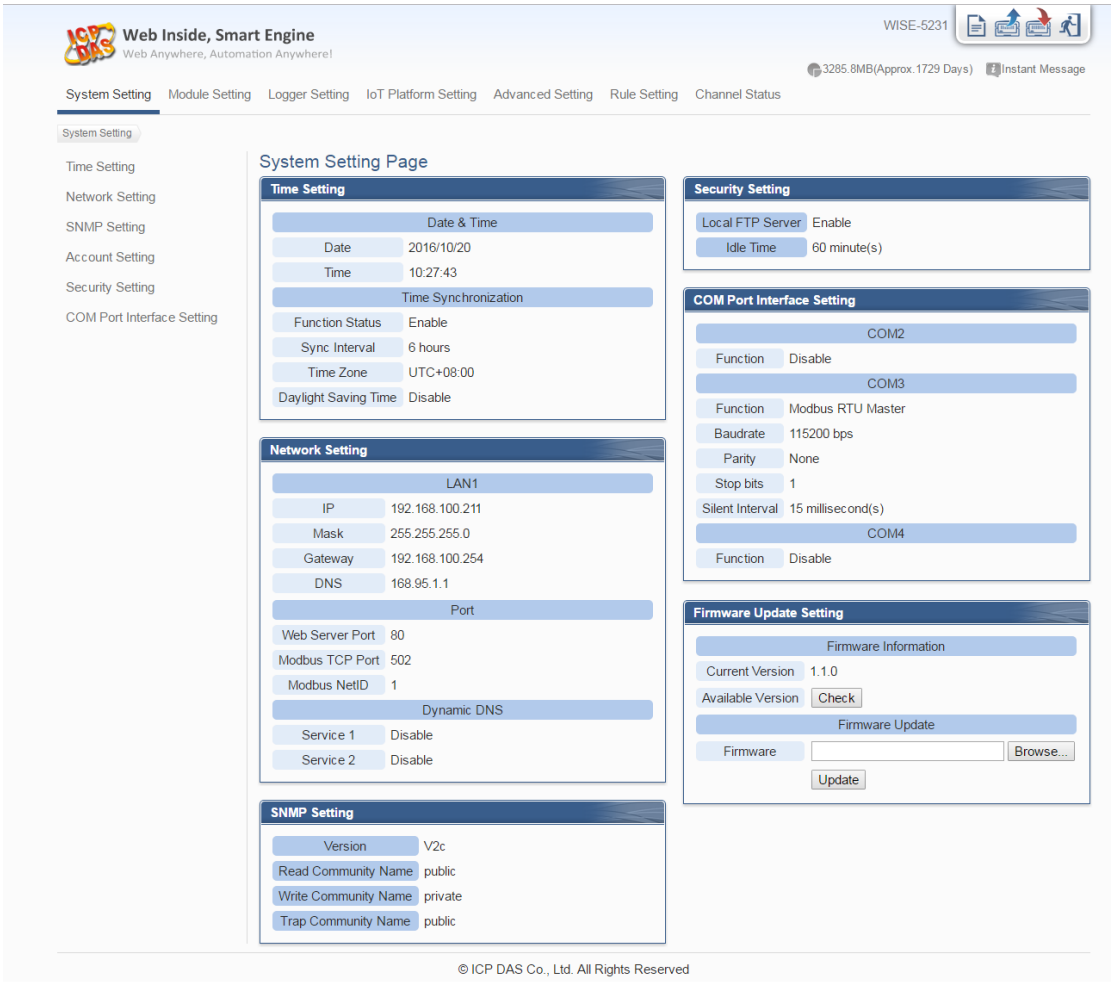


Figure 5-1：System Setting Overview Page

5.1 Time Setting

On the Time Setting page, it allows to set the time of WISE-52xx and Time Synchronization function. The setting interface is as below:

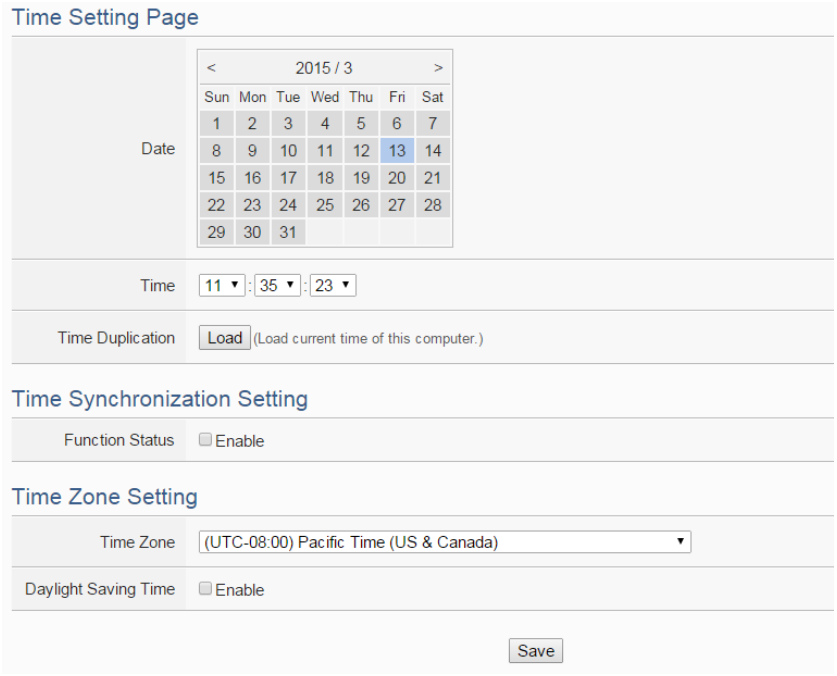


Figure 5-2：Time Setting Page

When get into this page, the system will read and display current time of the WISE-52xx. To modify the system time of WISE-52xx, 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-52xx. The WISE-52xx 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:

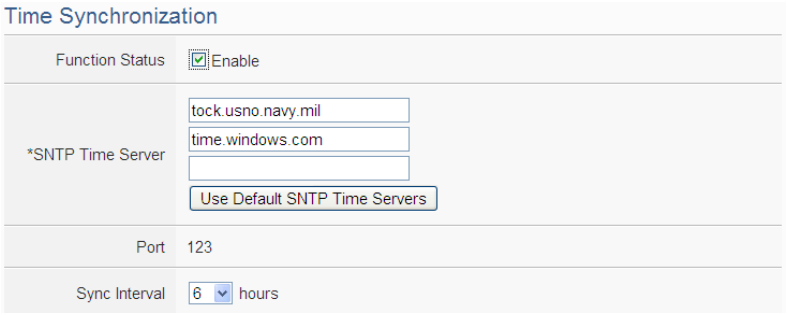


Figure 5-3：Time Synchronization Setting

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-52xx 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-52xx’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 neteork configuration, web server port or Modbus settings on the WISE-52xx. The following figure illustrates the configuration interface:

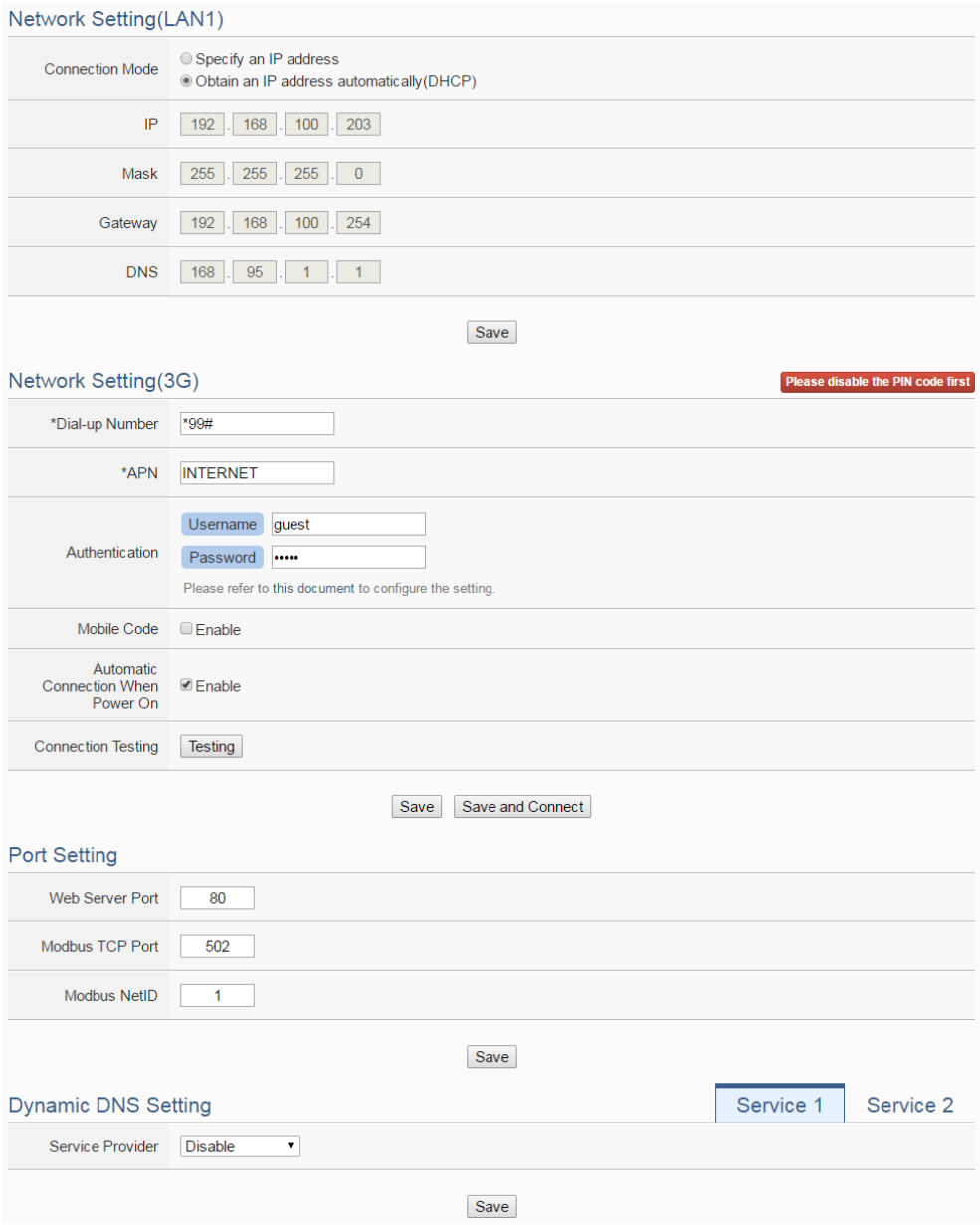


Figure 5-4：Network Setting Page

Each time when the user enters this page, it will read and display current network configuration (LAN) and port settings from the WISE-52xx. In the “Connection mode” field, please select the connection mode as “Obtain an IP address automatically (DHCP)” or “Specify an IP address”, 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-52xx webpage via LAN, and is able to retrieve data via Modbus TCP. 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.

The Network Setting(3G) section is for user to complete the setting of 3G Wireless Network. The default Dial-up number is “*99#”. User can change it by the proprietary number provided by the Telecommation 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 Telecommation Service Company provides. If the user select the "Automatic Connection When Power On" option, it will enable the WISE-5231M-3GWA to complete the 3G Network connection automatically when power on WISE controller. User can click the "Connection Testing" button to test the 3G Network connection status between the WISE controller and the 3G Wireless Network.

Please Note: In order to comlete the connection to the 3G Network, please remember to disable the PIN code setting of the SIM used in WISE-5231M-3GWA.

WISE-52xx also provides the Dynamic DNS service. The following figure illustrates the configuration interface:

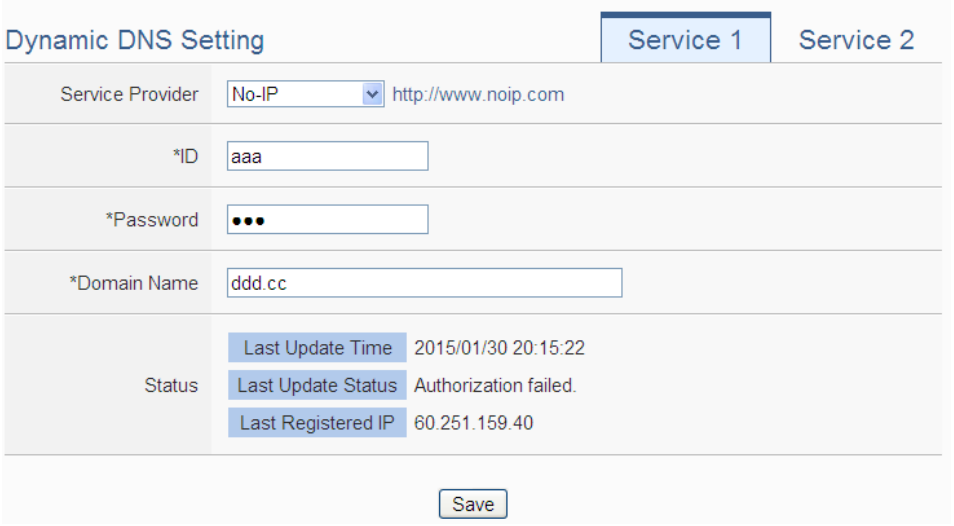


Figure 5-5：DDNS Setting Page

Follow the steps below to set up Dynamic DNS service:

- 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 4 service providers for selection as “ChangeIP.com”, “FreeDNS”, “DynDNS” and “No-IP”. User can also select “Disable” to disable the service.

iii If user selects “No-IP”, “ChangeIP.com” or “DynDNS”, please enter the ID, Password and Domain Name to login the service. If user selects “FreeDNS”, please insert the Token to login the service.

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

Please note:

1. WISE-52xx 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 Utility to search the WISE-52xx, get the new IP address of WISE-52xx, and then launch browser to connect to the WISE-52xx with the new IP address.

5.3 SNMP Setting

The WISE-52xx 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-52xx. The following figure illustrates the set up interface:

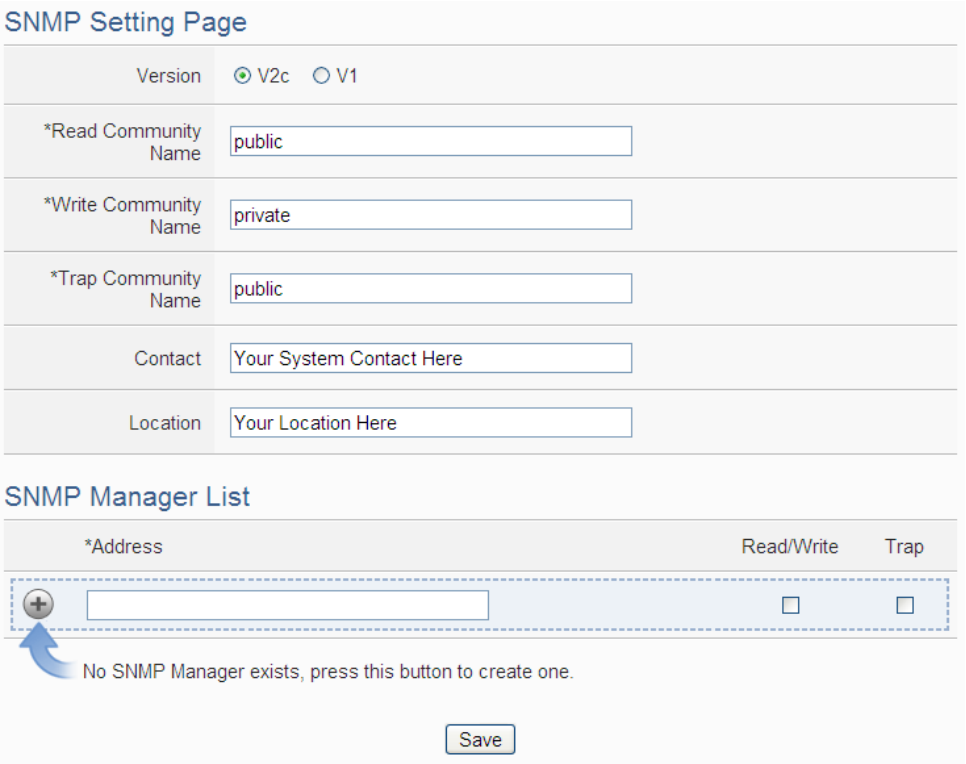


Figure 5-6：SNMP Setting Page

Please follow the steps below for the SNMP settings：

i. In the “Version” field, select the SNMP version that you want to use. Currently WISE-52xx supports SNMP V2c and V1 protocol,
ii. In the “Read Community Name” field, input a string for “Read Community Name” for SNMP function. The default string is “public”.
iii. In the “Write Community Name” field, input a string for “Write Community Name” for SNMP function. The default string is “private”.
iv. In the “Trap Community Name” field, input a string for “Trap Community Name” for the SNMP function. The default string is “public”.
v. In the “Contact” field, input the “Contact” string.
vi. 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-52xx. Please follow the steps as below to perform the setting for SNMP Managers.

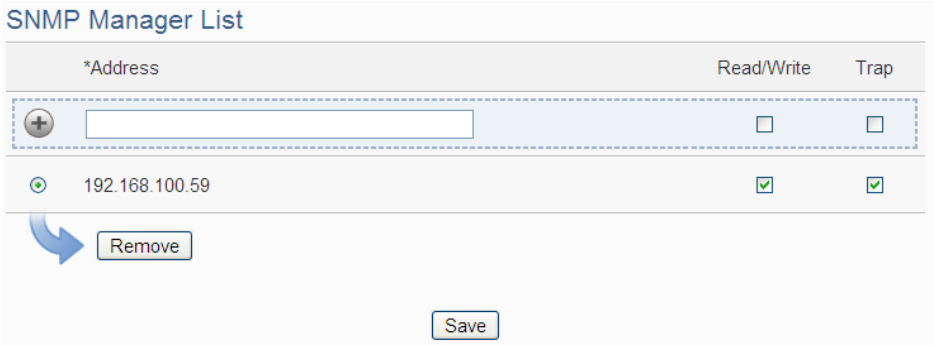


Figure 5-7：SNMP Manager List

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-52xx and the SNMP Manager will be failed.

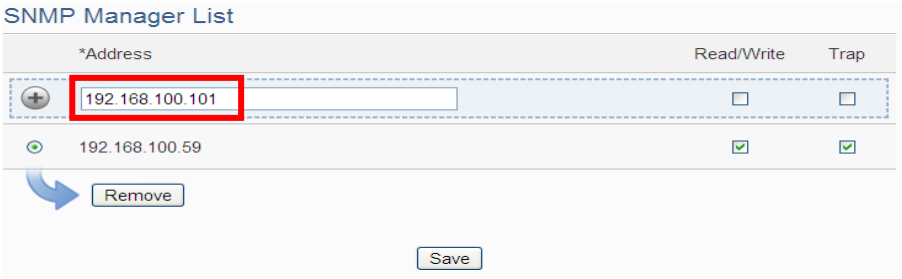


Figure 5-8：The IP Address Setting for SNMP Manager

ⅱ Click to Enable (or Disable) the working model between the SNMP Manager and the SNMP Agent of WISE-52xx. Currently WISE-52xx 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-52xx SNMP Agent for the polling style data read/write operation.
- Trap model: It means the WISE-52xx can actively send the SNMP Trap to the SNMP Manager based on the result of IF condition statement.

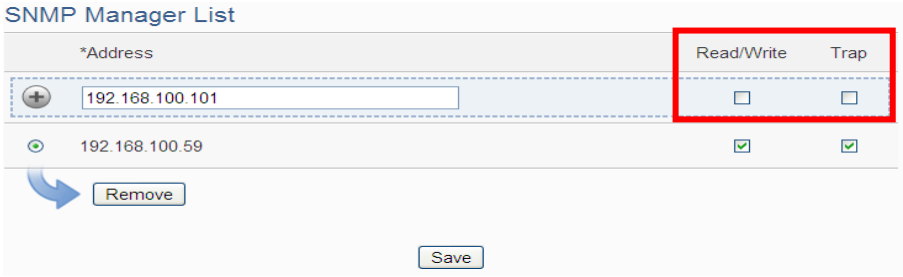


Figure 5-9：The Working Model Setting for SNMP Manager

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.

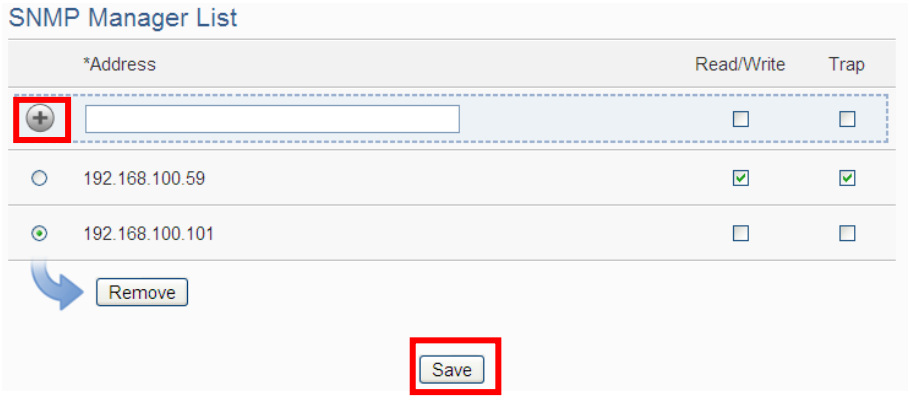


Figure 5-10：Save the SNMP Manager Setting

5.4 Account Setting

WISE-52xx provides three levels of authority as follow:

- **Administrator (Default password: Admin)**
  WISE-52xx 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-52xx 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-52xx 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.

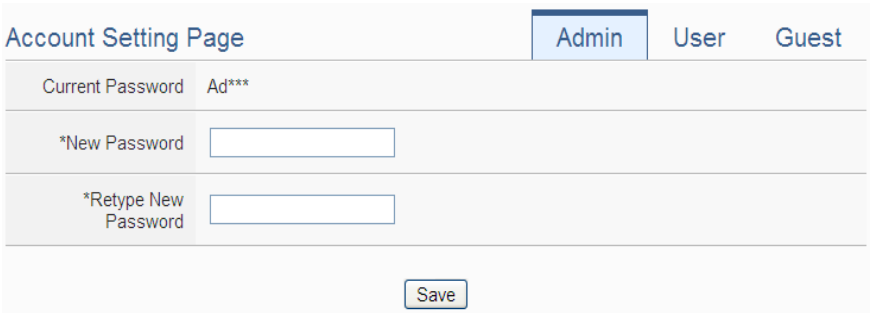


Figure 5-11：Password Setting Page for Administrator

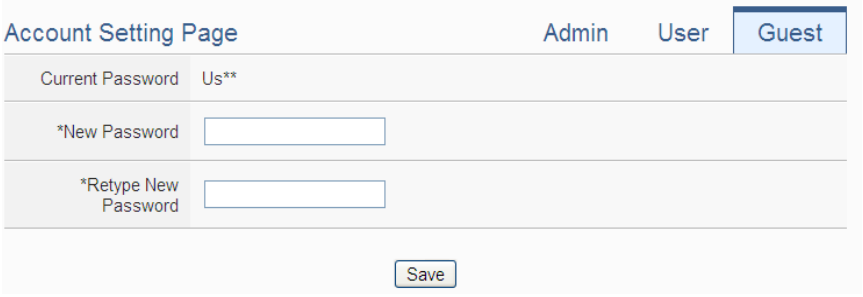


Figure 5-12：Password Setting Page for Guest

WISE-52xx 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-52xx 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-52xx. Following is the setting page for the User account.

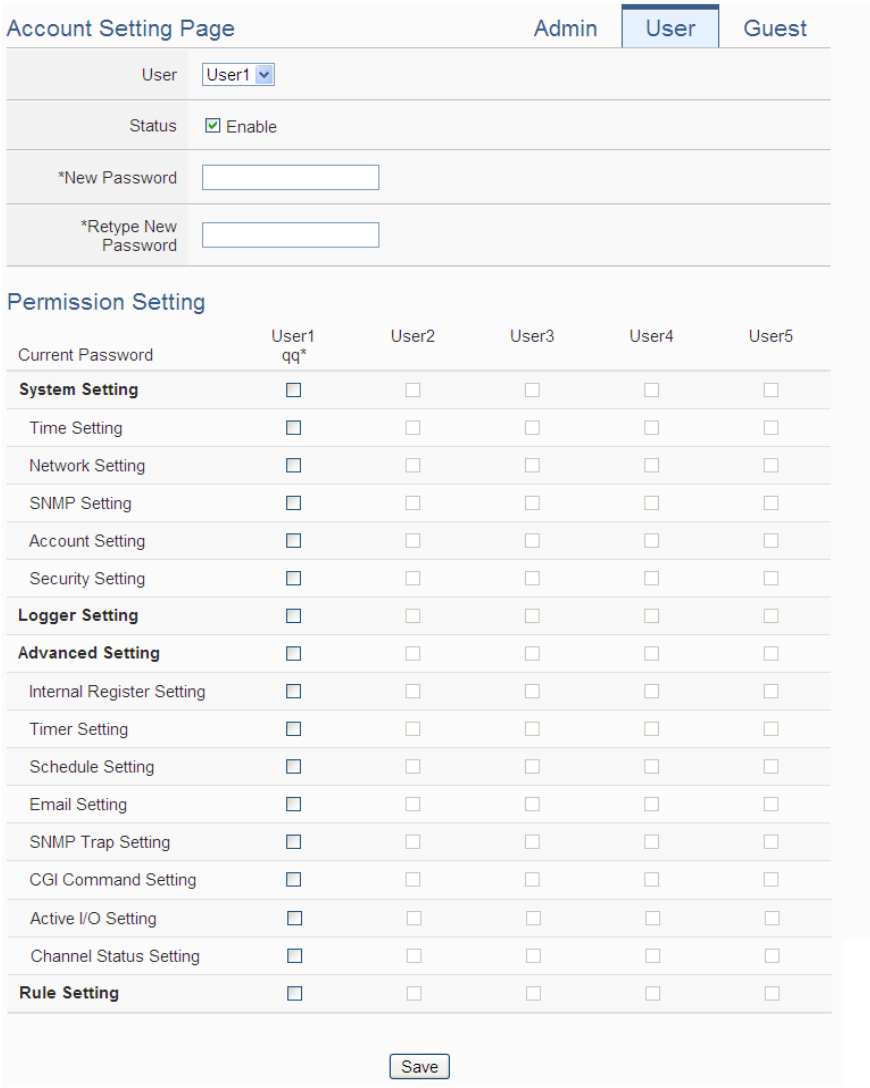


Figure 5-13：Password Setting Page for User

The settings steps are as below:

i. In the “User” filed, select the user which will be enabled. WISE-52xx 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-52xx 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:

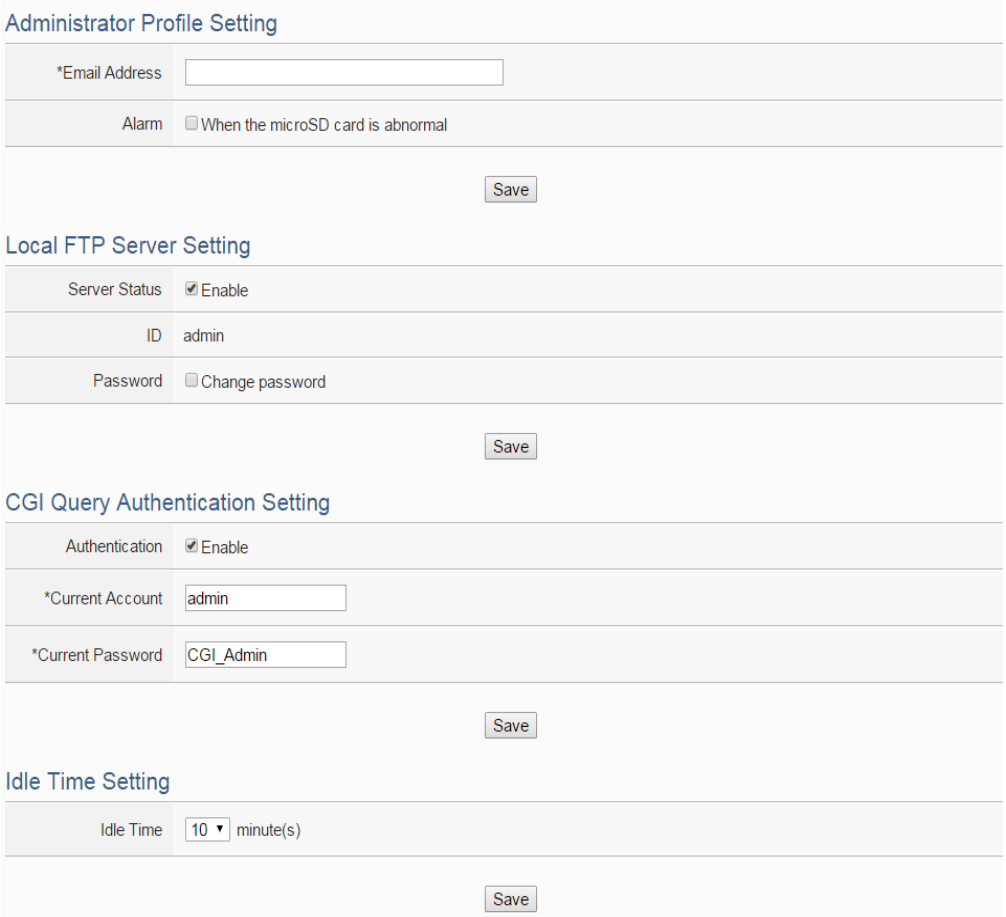


Figure 5-14：Security Setting Page

◆ 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-52xx could send an email to the adminstrator when the microSD card is abnormal. Once the password is forgotten or lost, the WISE-52xx 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-52xx side. The user could connect to WISE-52xx 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 "Admin", the user could modify the password of the FTP Server on the WISE-52xx side if required.

◆ CGI Query Authentication Setting

WISE-52xx 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-52xx to receive only the CGI commands from the valid source. The default user name and password for CGI command receiving of WISE-52xx is "admin/CGI_Admin", the user could modify the account if required.

◆ Idle Time Setting

After the administrator login into the WISE-52xx 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:

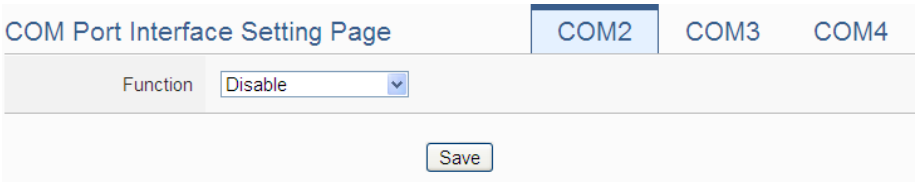


Figure 5-15：COM Port Interface Setting Page

The COM Port interface on WISE-52xx 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)

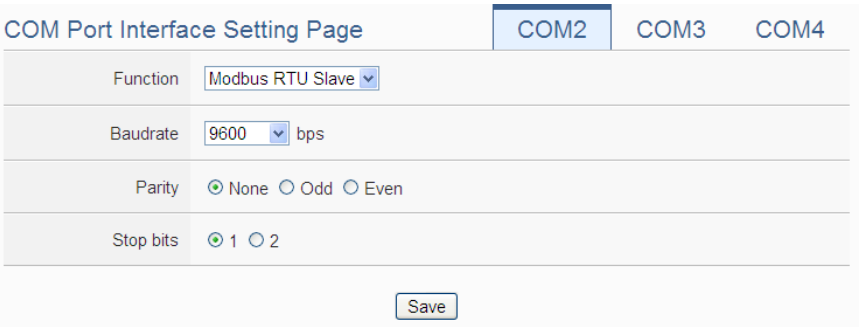


Figure 5-16：COM Port Interface Setting for Modbus RTU Slave

The settings steps are as below:

i In the “Baudrate” field, select the Baudrate from the dropdown list, the Baudrate of WISE-52xx 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-52xx 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)

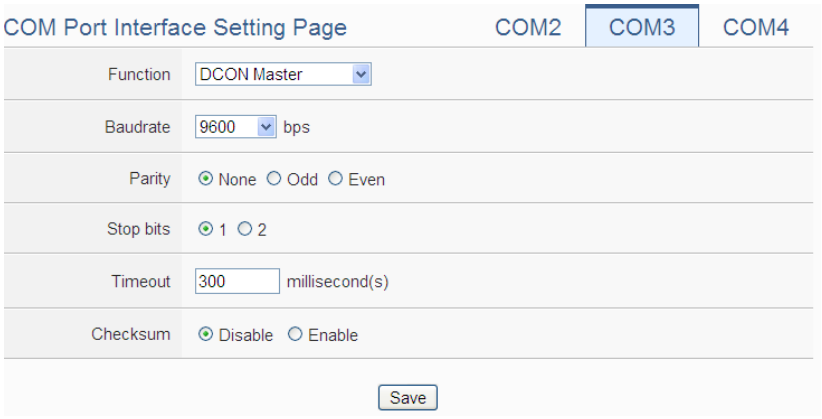


Figure 5-17：COM Port Interface Setting for DCON Master

The settings steps are as below:

i In the “Baudrate” field, select the Baudrate from the dropdown list, the Baudrate of WISE-52xx 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-52xx and DCON module have to be set the same.

iii In the “Timeout” field, input the time interval for WISE-52xx 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-52xx 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-52xx first. These setting also must be the same with the setting of WISE-52xx.

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

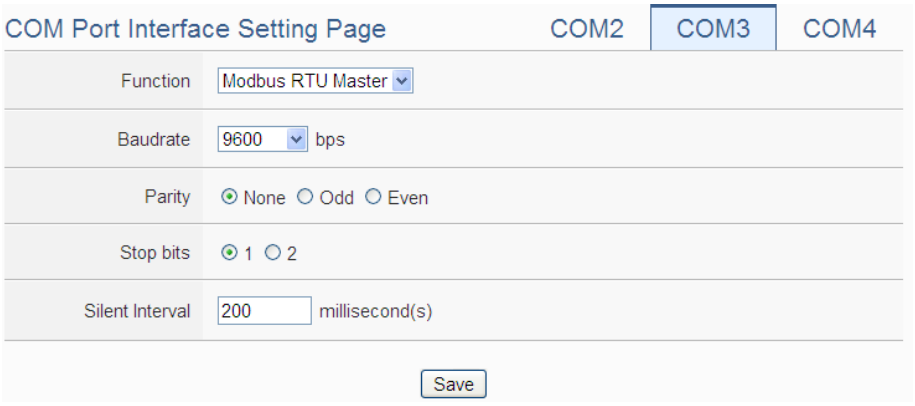


Figure 5-18：COM Port Interface Setting for Modbus RTU Master

The settings steps are as below:

i In the “Baudrate” field, select the Baudrate from the dropdown list, the Baudrate of WISE-52xx 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-52xx 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-52xx 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-52xx 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-52xx 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-52xx.

6 Module Setting

Module setting page allows to perform settings of the I/O Modules that are connected to the WISE-52xx. After getting into the setting page, the overview page will display current setting of the I/O Modules that are connected to the WISE-52xx, shown as below:

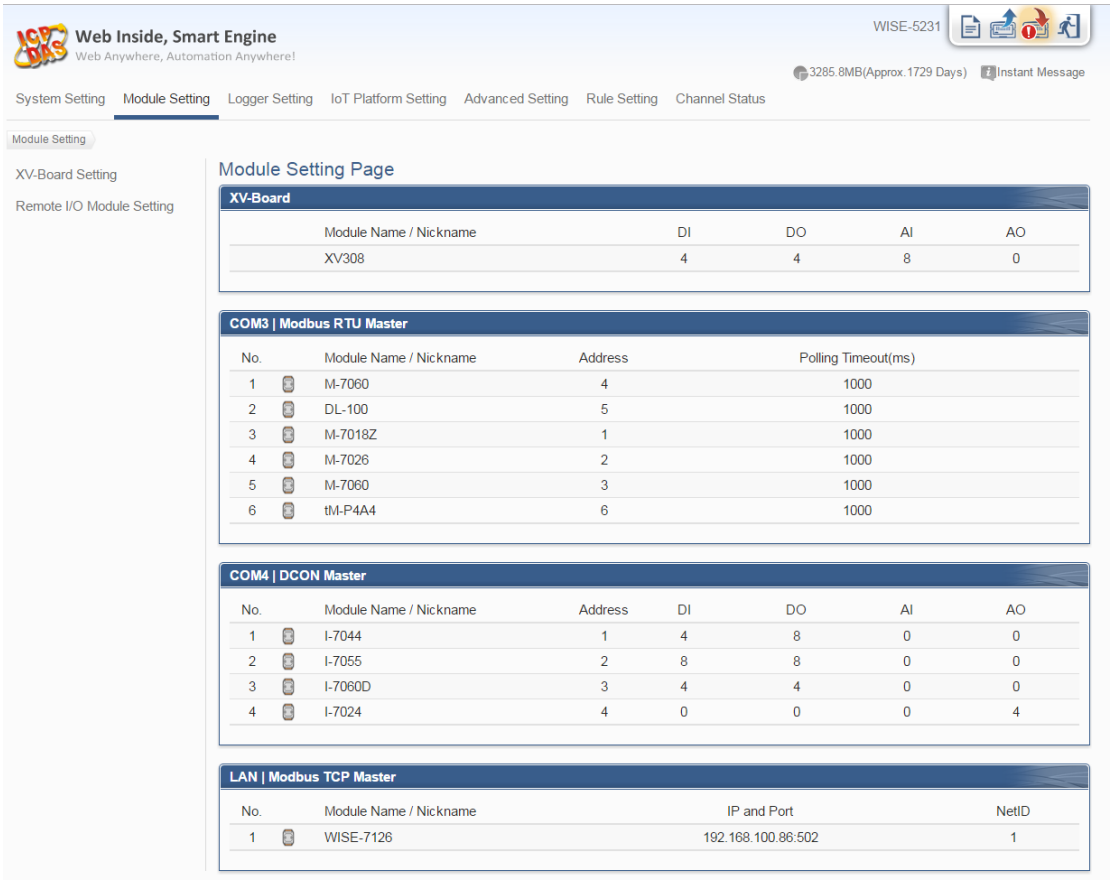


Figure 6-1：Module Setting Page

Module Setting includes the following 2 setting options:

- XV-Board Setting
- Remote I/O Module 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-52xx. The XV-Board Setting page is shown as follow:

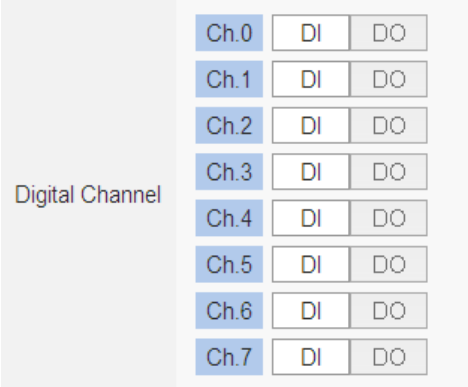
Please note: Each time WISE-52xx is allowed to connect to one XV-Board module only.

Figure 6-2：XV-Board Setting Page

Select the XV-Board that are connected to the WISE-52xx 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):

- Nickname: For user to define a 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 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):

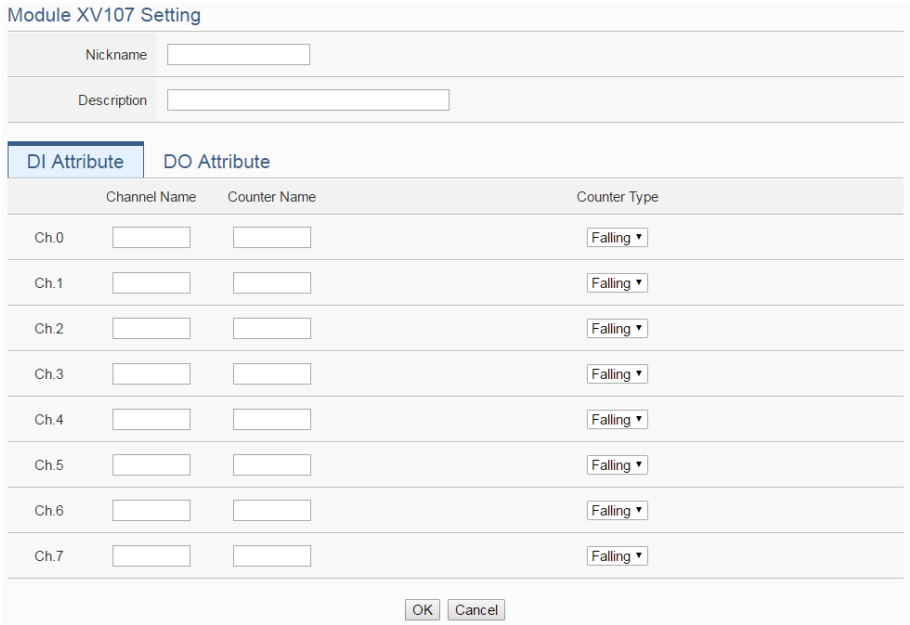


Figure 6-3：XV-Board DI Channel Setting Page

The settings are as follow:

- 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.
- Counter Nickname: For user to define nicknames for each DI counter, these nicknames will be displayed on the “Log Header” and “Rule Setting” pages.
- 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):

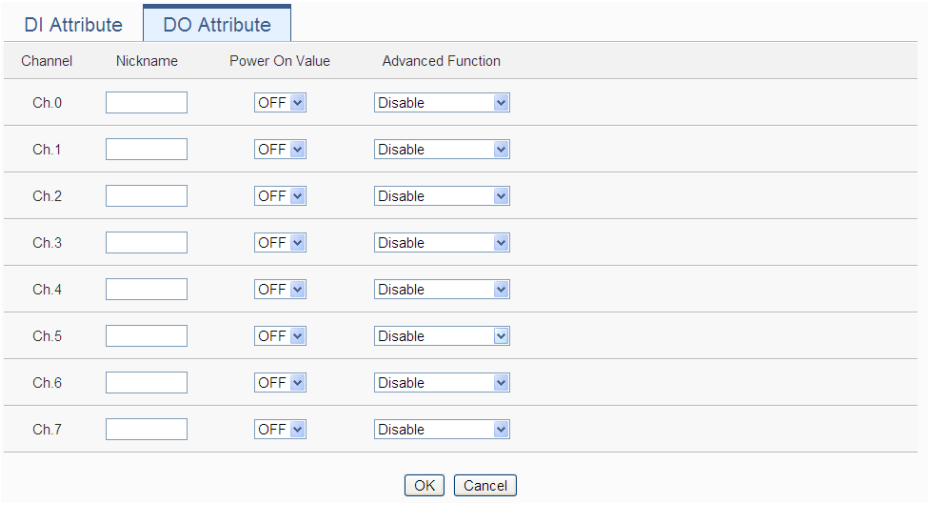


Figure 6-4：XV-Board DO Channel Setting Page

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-52xx power on. Select the value from the dropdown list of “Power On Value” field. The default value is “OFF”.
- WISE-52xx 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):

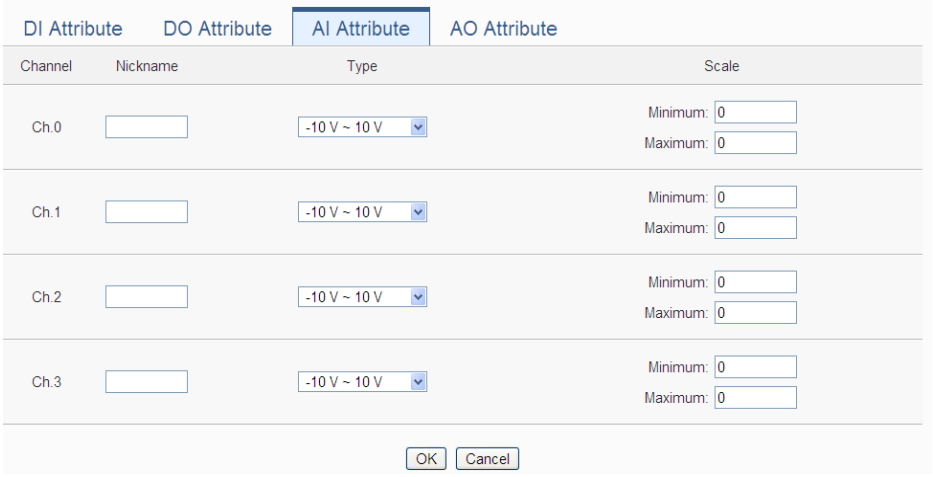


Figure 6-5：XV-Board AI Channel Setting Page

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.
- 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-52xx 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):

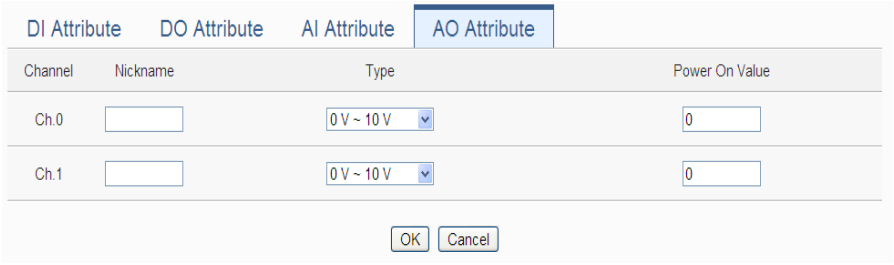


Figure 6-6：XV-Board AO Channel Setting Page

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.
- Type: Select the output signal type of the AO channel from the dropdown list.
- 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-52xx 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-52xx 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:

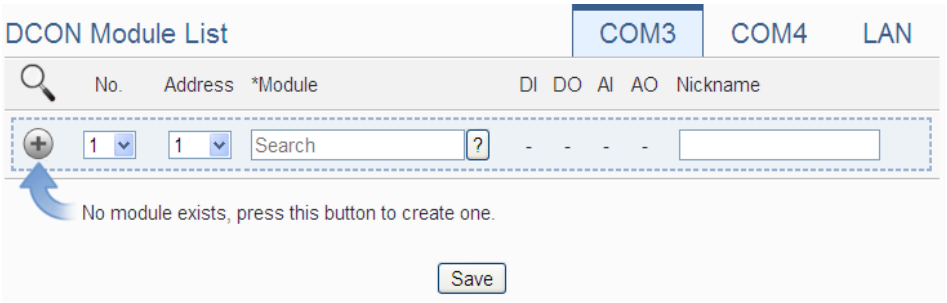


Figure 6-7：Remote I-7000/DL Module Setting Page

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-52xx 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-52xx, the steps are as below:

i. Click on button to scan the I-7000/DL DCON modules that are connected to the WISE-52xx.

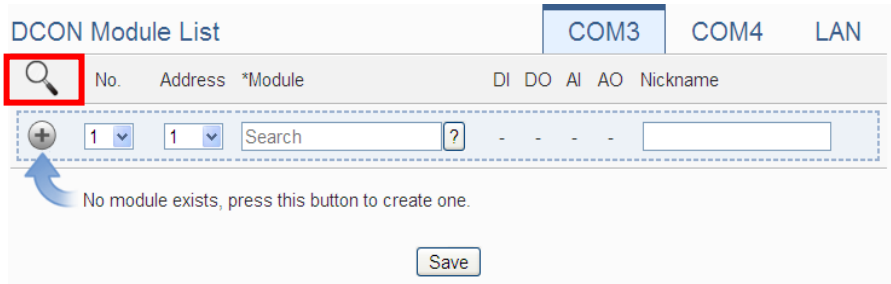


Figure 6-8：The "Scan" button to search I-7000/DL Modules

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".

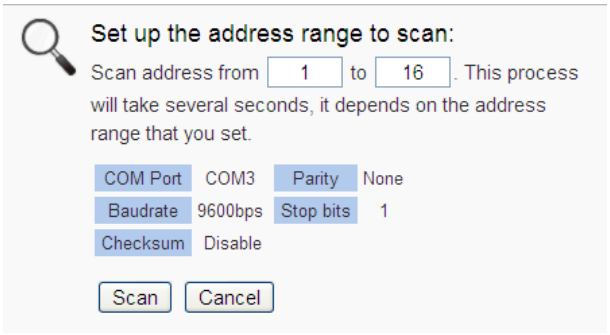


Figure 6-9：Set up the Scanning Range for the I-7000/DL modules

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.

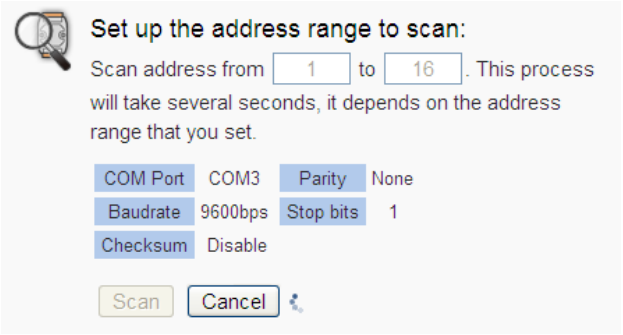


Figure 6-10：Scanning the I-7000/DL modules

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-52xx. After all settings are completed, click "Save" button to save the changes.

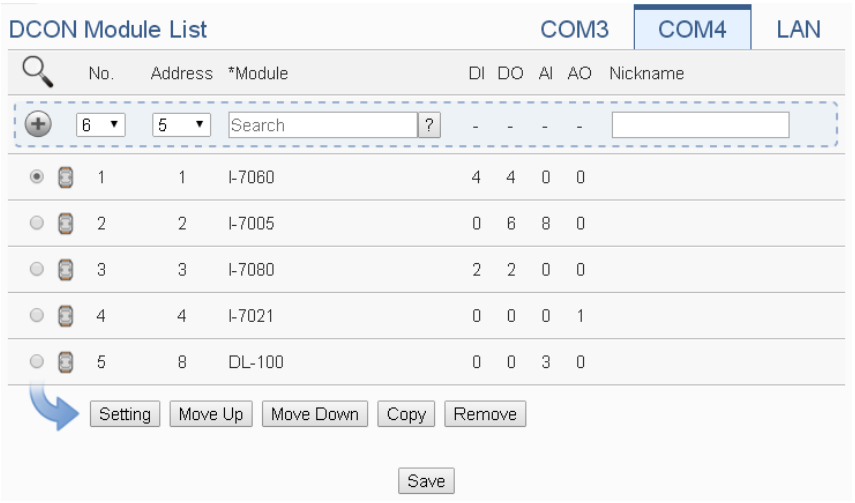


Figure 6-11：I-7000/DL module List after Scan operation

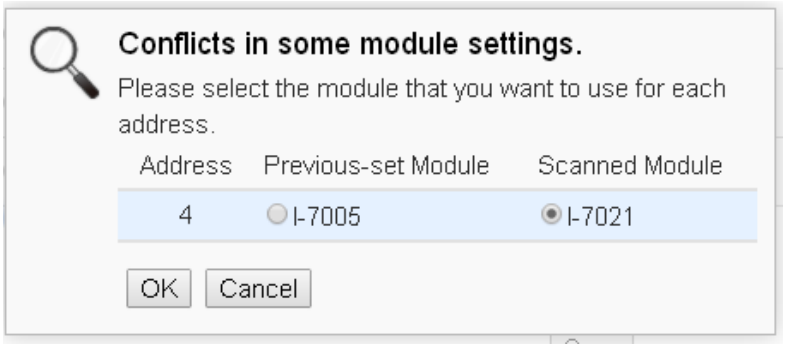


Figure 6-12：Select the actual I-7000/DL modules connected

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-52xx 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-52xx to the I-7000/DL DCON module will be failed.

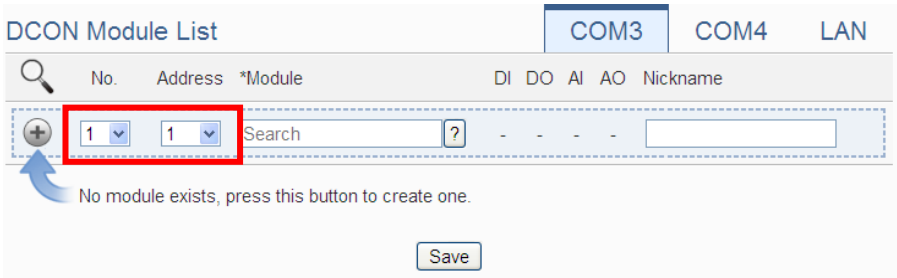


Figure 6-13：Set up the No and Address of the I-7000/DL modules

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.

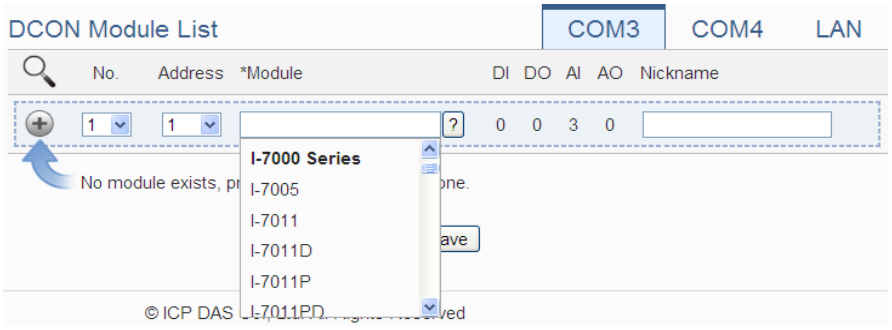


Figure 6-14：Select the model of the I-7000/DL modules

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.

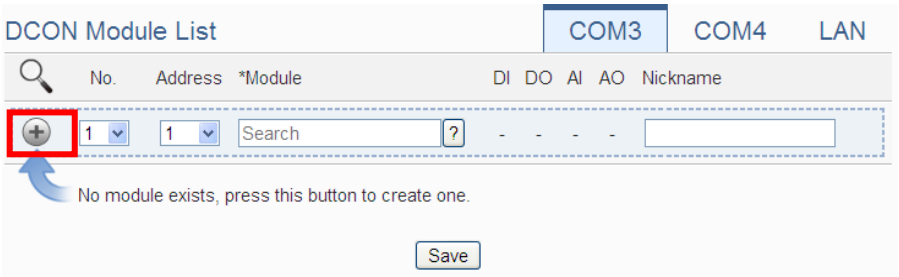


Figure 6-15：Add the I-7000/DL Module manually

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:

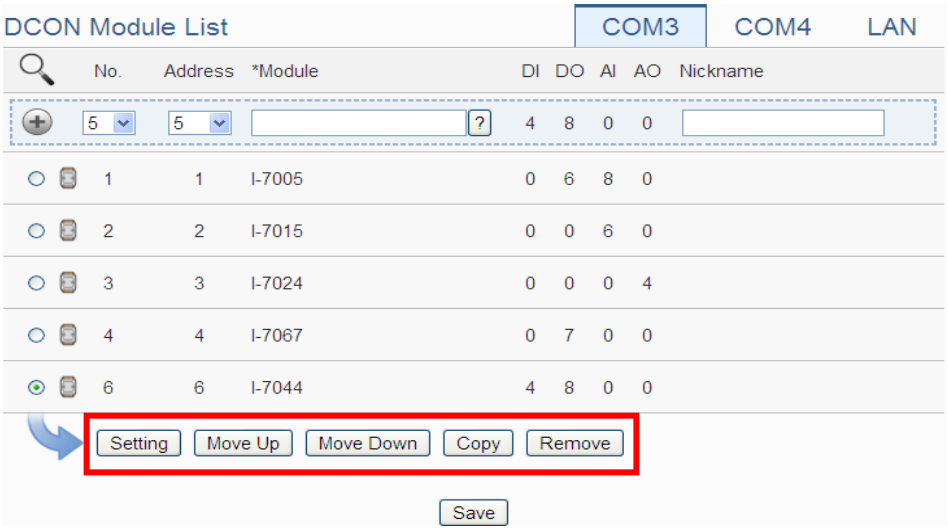


Figure 6-16：I-7000/DL Module List Operation Interface

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)

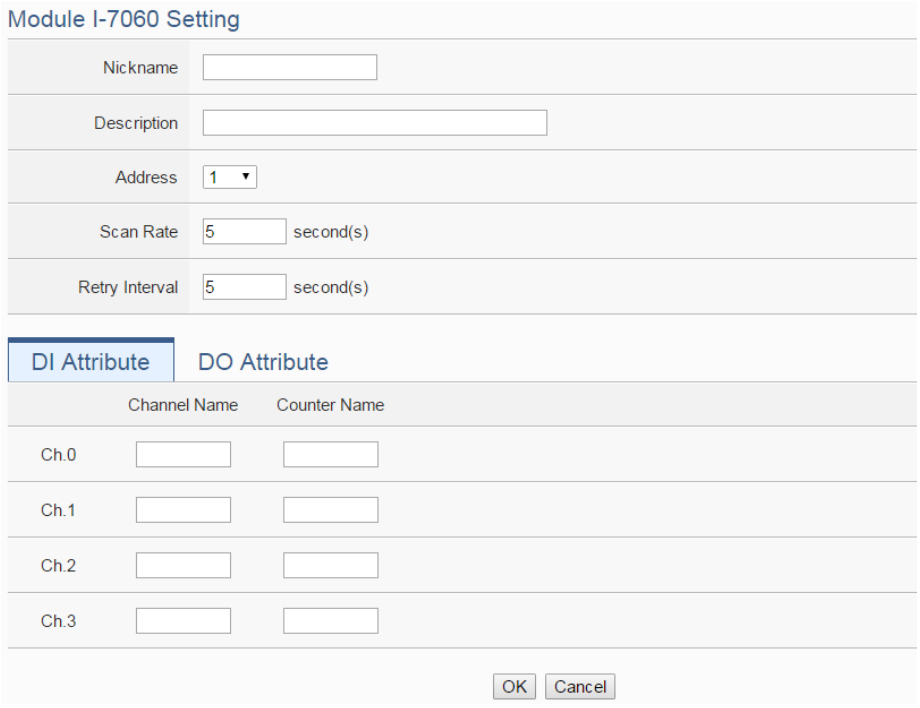


Figure 6-17：I-7000/DL Module DI Channel Setting page

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-52xx to the I-7000/DL DCON module will be failed.
- Scan Rate: Input the time interval for WISE-52xx 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-52xx to repeatedly send command again when WISE-52xx 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):

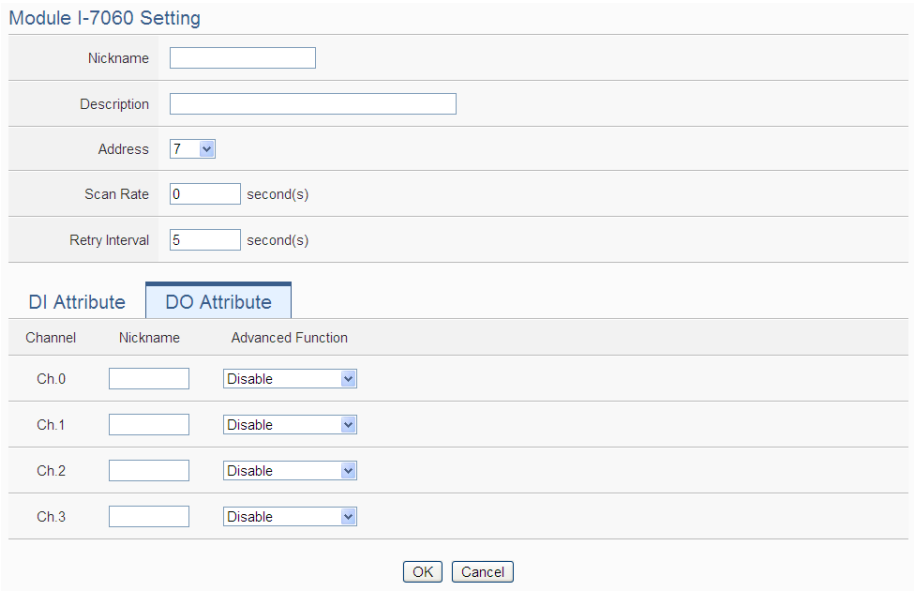


Figure 6-18：I-7000/DL Module DO Channel Setting page

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-52xx to the I-7000/DL DCON module will be failed.
- Scan Rate: Input the time interval for WISE-52xx 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-52xx to repeatedly send command again when WISE-52xx 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-52xx 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):

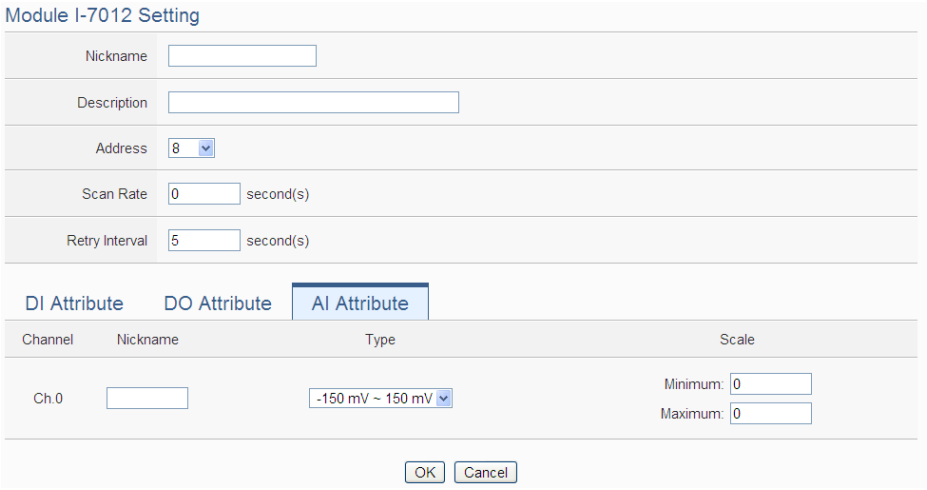
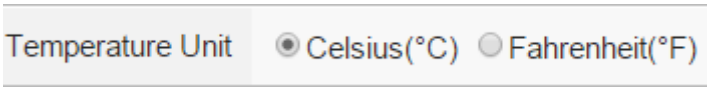


Figure 6-19：I-7000/DL Module AI Channel Setting page

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-52xx to the I-7000/DL DCON module will be failed.
- Scan Rate: Input the time interval for WISE-52xx 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-52xx to repeatedly send command again when WISE-52xx 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.



- 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-52xx 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):

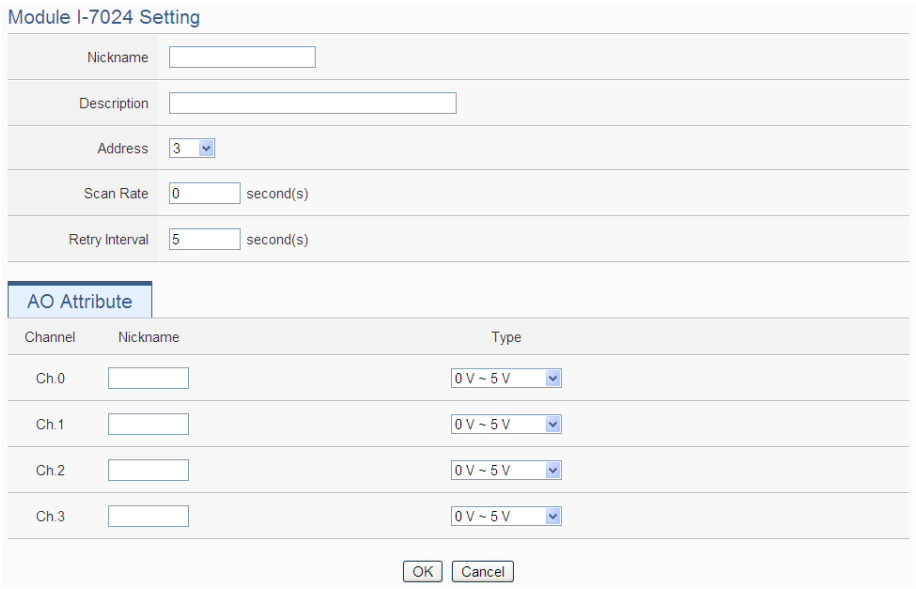


Figure 6-20：I-7000/DL Module AO Channel Setting page

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-52xx to the I-7000/DL DCON module will be failed.
- Scan Rate: Input the time interval for WISE-52xx 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-52xx to repeatedly send command again when WISE-52xx 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-52xx 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-52xx 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:

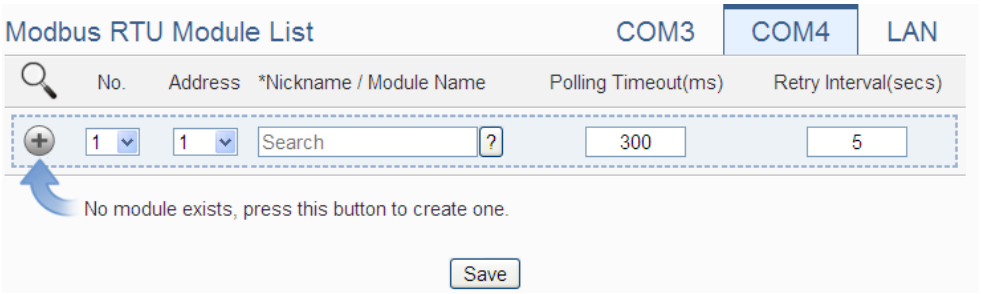


Figure 6-21：Remote Modbus RTU Module Setting page

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-52xx 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-52xx, 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-52xx.

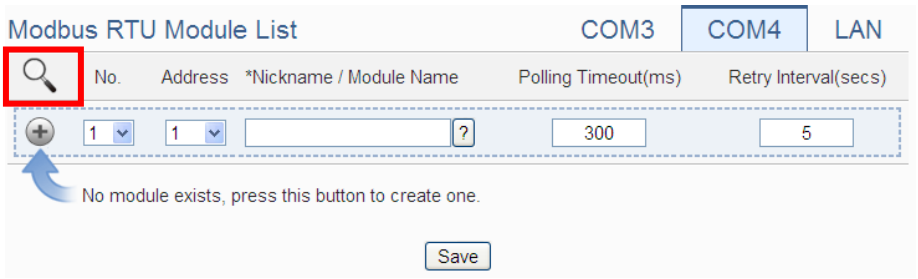


Figure 6-22：The "Scan" button to search ICP DAS module

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".

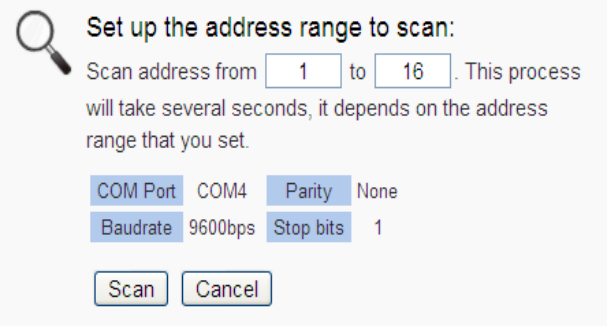


Figure 6-23：Set up the Scanning Range for the ICP DAS module

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.

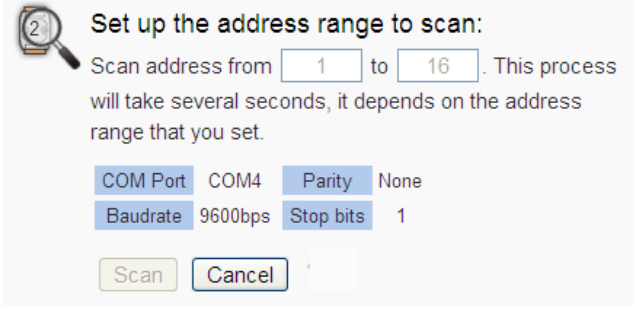


Figure 6-24：Scanning the ICP DAS module

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-52xx. After all settings are completed, click "Save" button to save the changes.

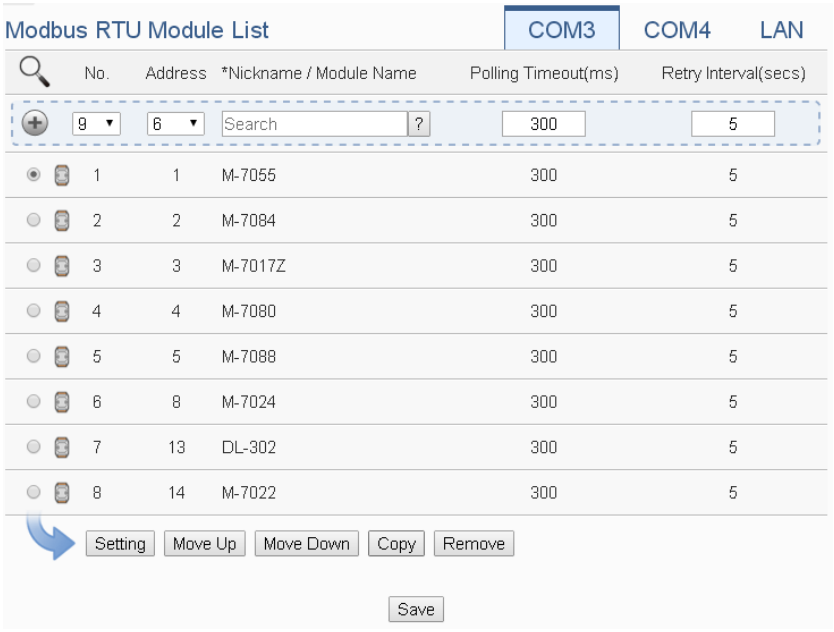


Figure 6-25：The ICP DAS module List after Scan operation

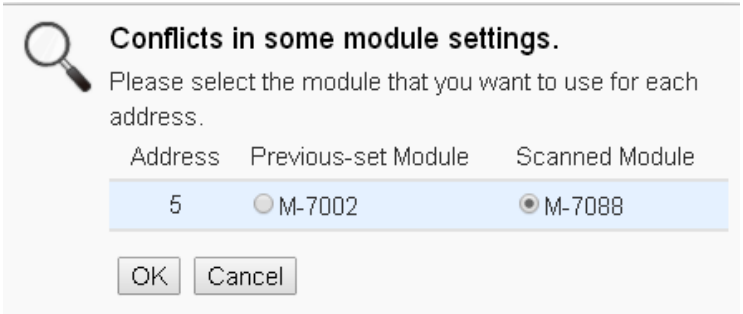


Figure 6-26：Select the actual ICP DAS modules

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-52xx 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-52xx to the Modbus RTU module will be failed.

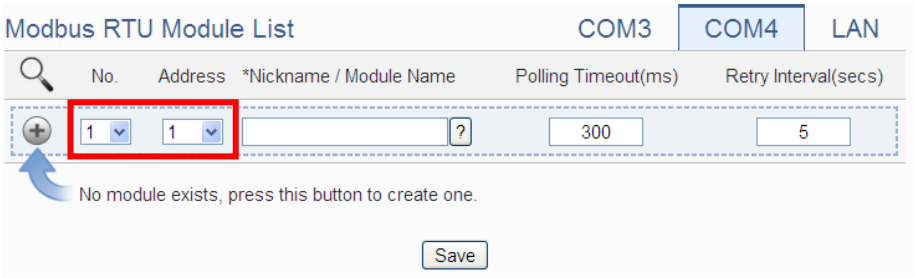


Figure 6-27：Set up the No. and Address of the Modbus RTU modules

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.

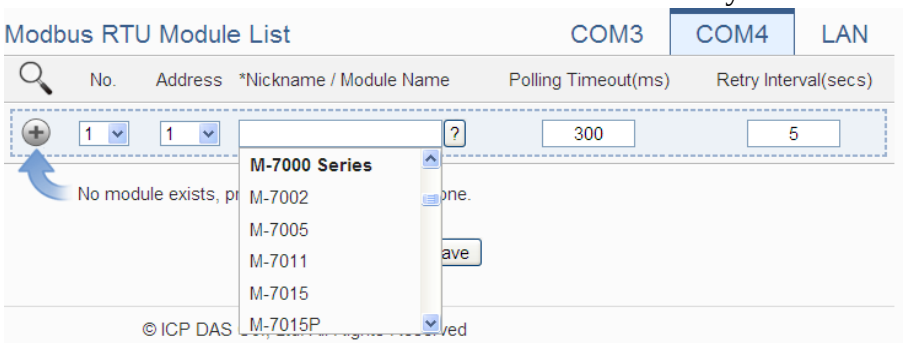


Figure 6-28：Select the model of the Modbus RTU Module

iv. Polling Timeout: The time interval for WISE-52xx 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-52xx to repeatedly send command again when WISE-52xx 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.

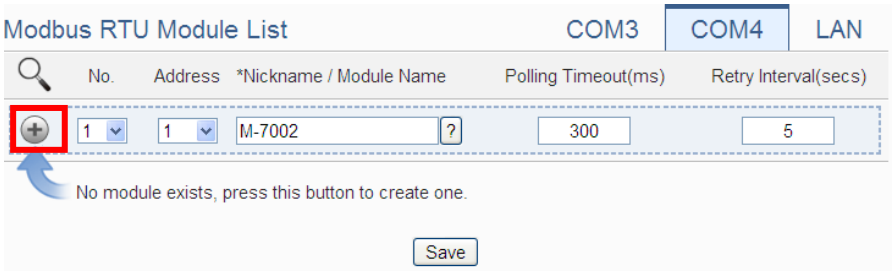


Figure 6-29：Add the Modbus RTU Module manually

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:

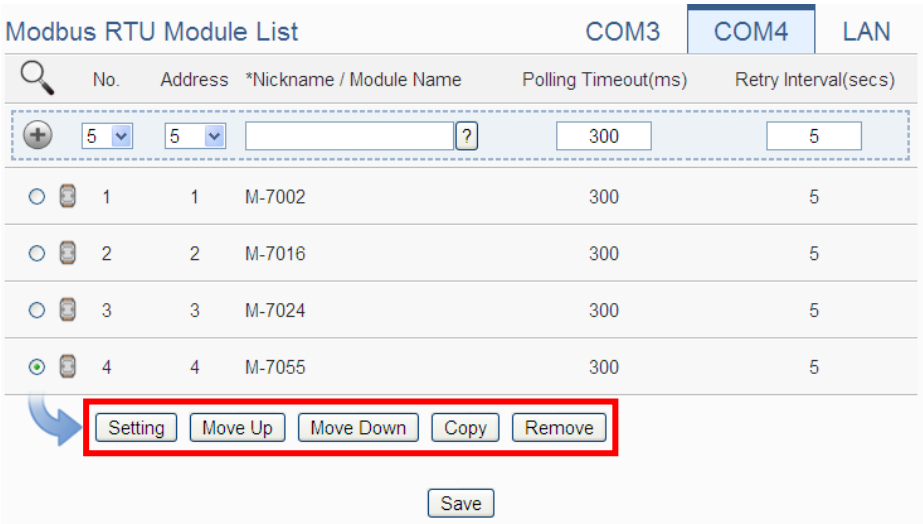


Figure 6-30：Modbus RTU module List Operation Interface

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:

- 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.
- 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)).
- 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)).
- 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.
- 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):

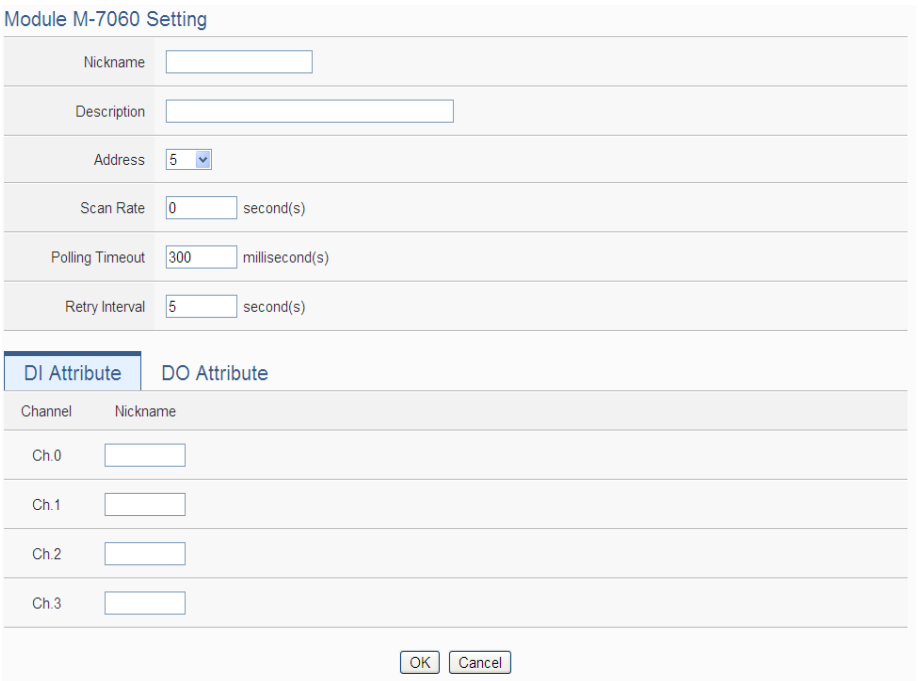


Figure 6-31：ICP DAS module DI Channel Setting page

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-52xx to the M-7000/tM/DL/LC/SC/IR module will be failed.

- Scan Rate: Input the time interval for WISE-52xx 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-52xx 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-52xx to repeatedly send command again when WISE-52xx 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):

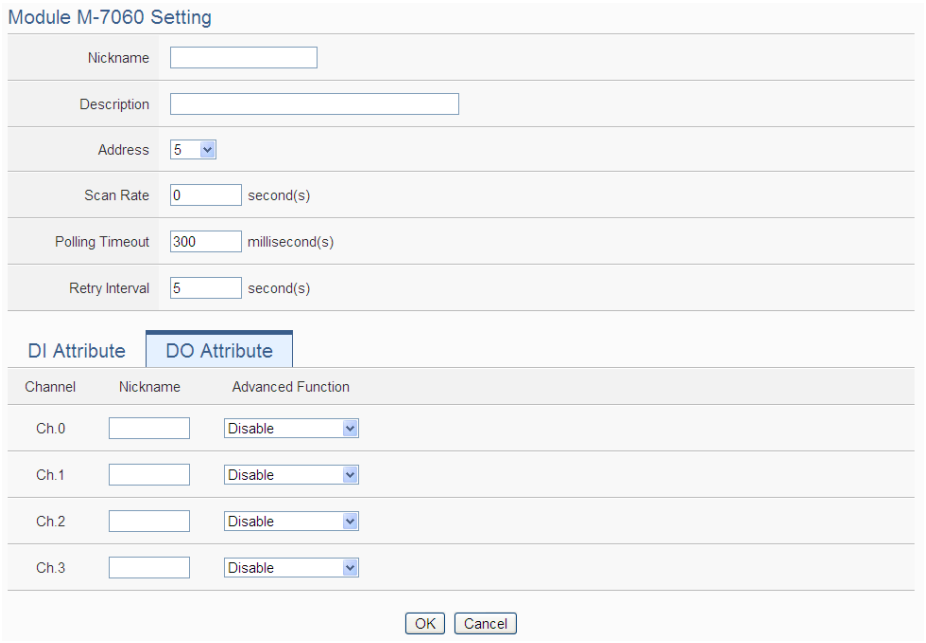


Figure 6-32：ICP DAS module DO Channel Setting page

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-52xx to the M-7000/tM/DL/LC/SC/IR module will be failed.
- Scan Rate: Input the time interval for WISE-52xx 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-52xx 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-52xx to repeatedly send command again when WISE-52xx 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-52xx 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):

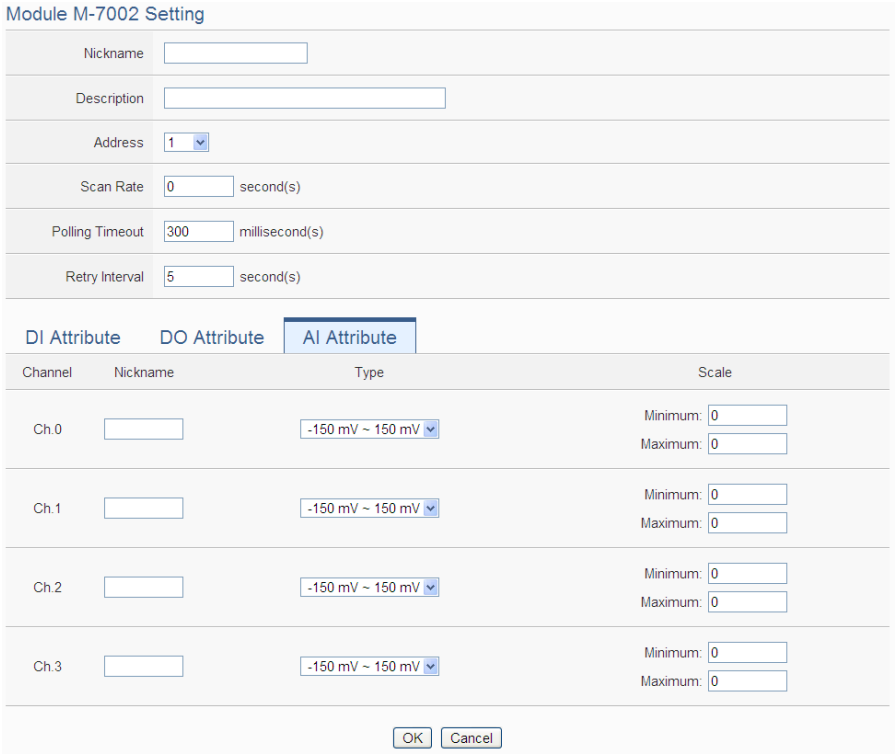


Figure 6-33：ICP DAS module AI Channel Setting page

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-52xx to the M-7000/tM/DL/LC/SC/IR module will be failed.
- Scan Rate: Input the time interval for WISE-52xx 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-52xx 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-52xx to repeatedly send command again when WISE-52xx 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.

- 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):

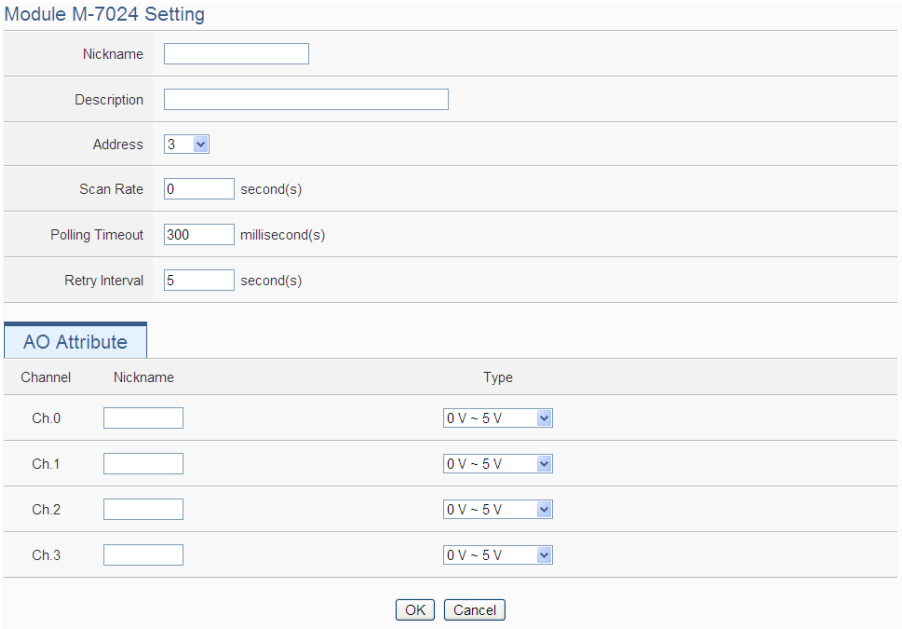


Figure 6-34：ICP DAS module AO Channel Setting page

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-52xx to the M-7000/tM/DL/LC/SC/IR module will be failed.
- Scan Rate: Input the time interval for WISE-52xx 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-52xx 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-52xx to repeatedly send command again when WISE-52xx 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:

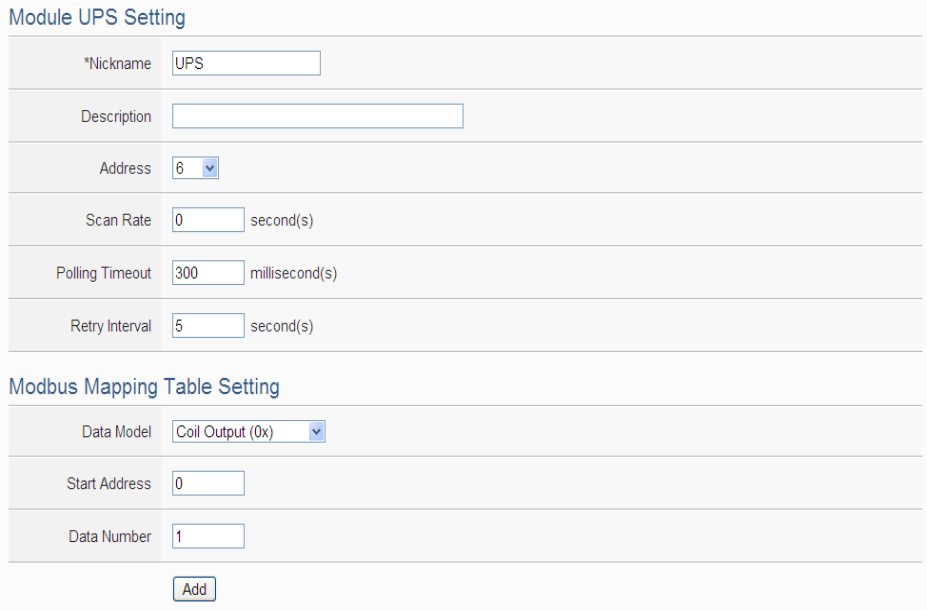


Figure 6-35：Modbus RTU module Coil Output Setting page

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-52xx to the Modbus RTU module will be failed.
- Scan Rate: Input the time interval for WISE-52xx 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-52xx 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-52xx to repeatedly send command again when WISE-52xx 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-52xx 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.
- 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 staring 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-52xx 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-52xx 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-52xx Modbus Address 04500、04501、04502 and 04503.

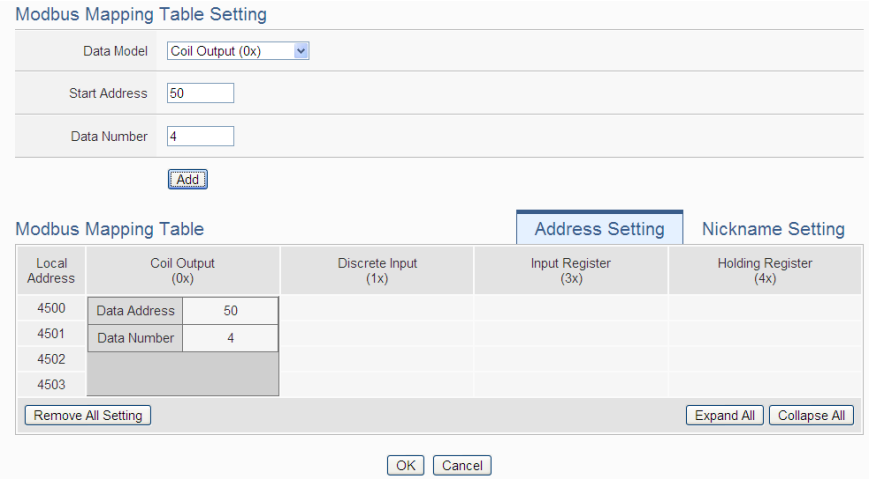
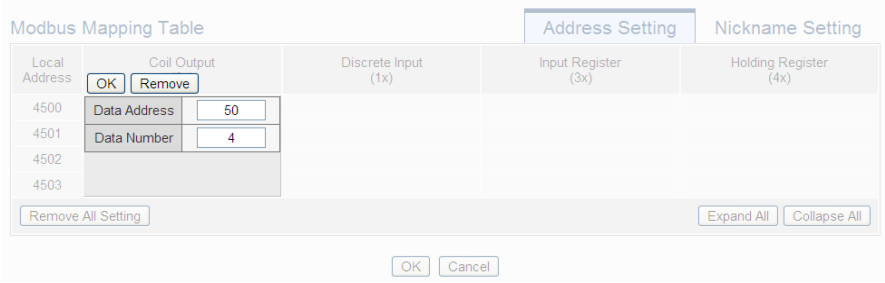
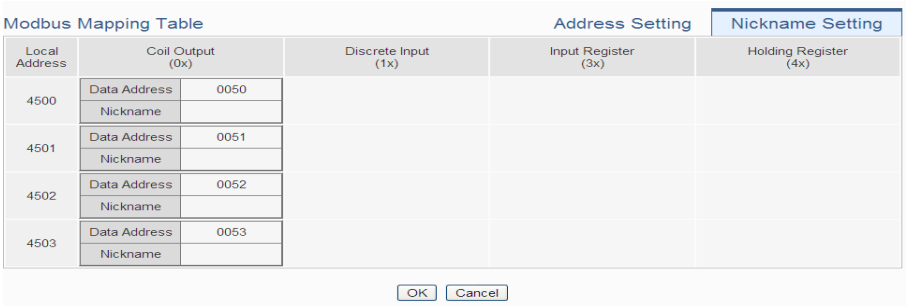


Figure 6-36：Coil Output Setting Example for Modbus RTU module

- 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.



- 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.



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:

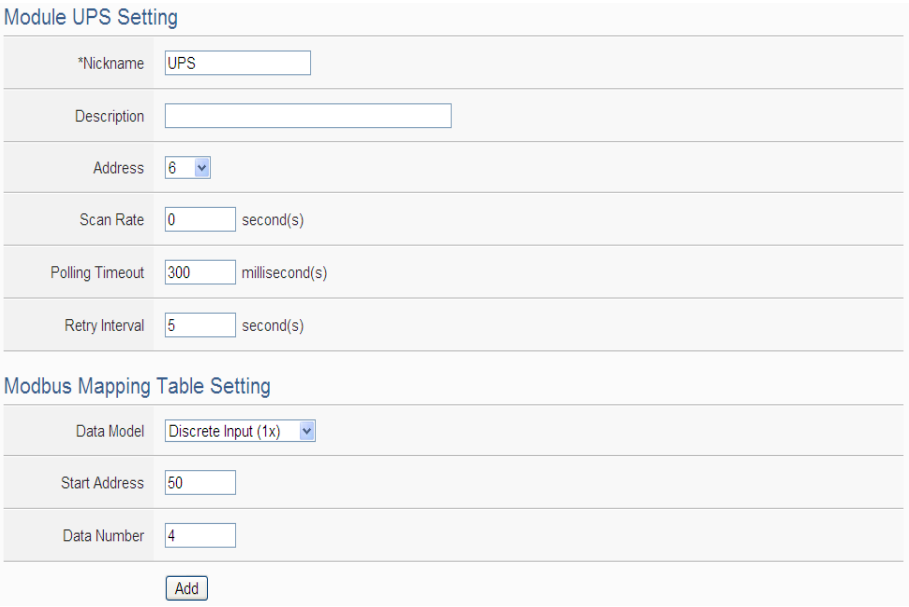


Figure 6-37：Modbus RTU module Discrete Input Setting page

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-52xx to the Modbus RTU module will be failed.

- Scan Rate: Input the time interval for WISE-52xx 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-52xx 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-52xx to repeatedly send command again when WISE-52xx 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-52xx 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.
- 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 staring from the Starting Address (The address number on the first column of the "Local Address" indicates the local Modbus address of WISE-52xx 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-52xx 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-52xx Modbus Address 14500、14501、14502、14503、14504 and 14505.

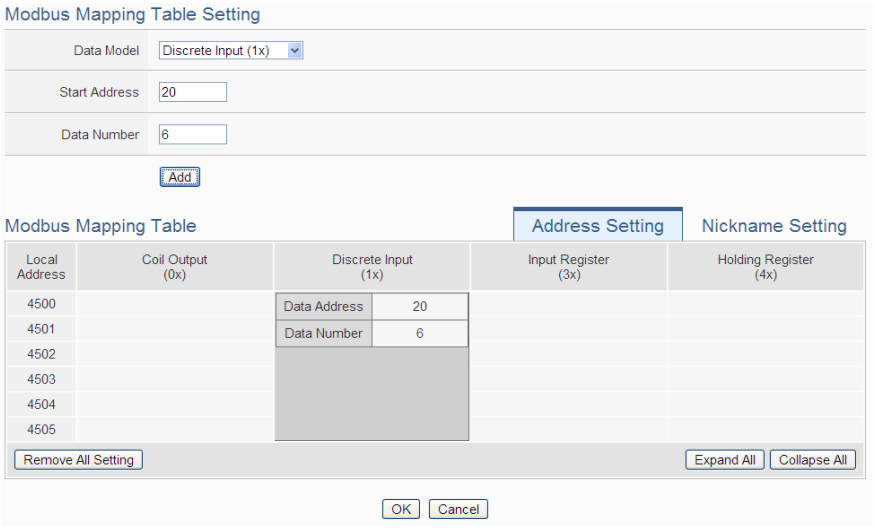
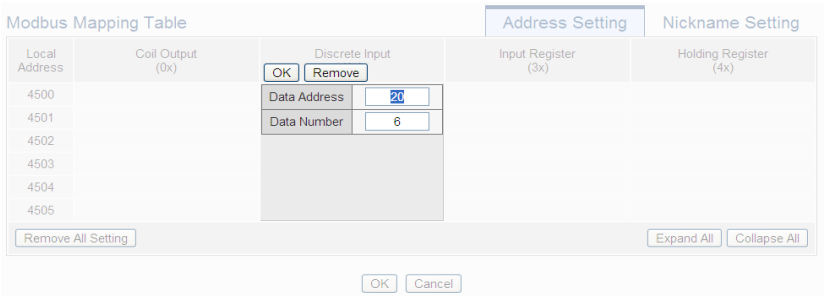
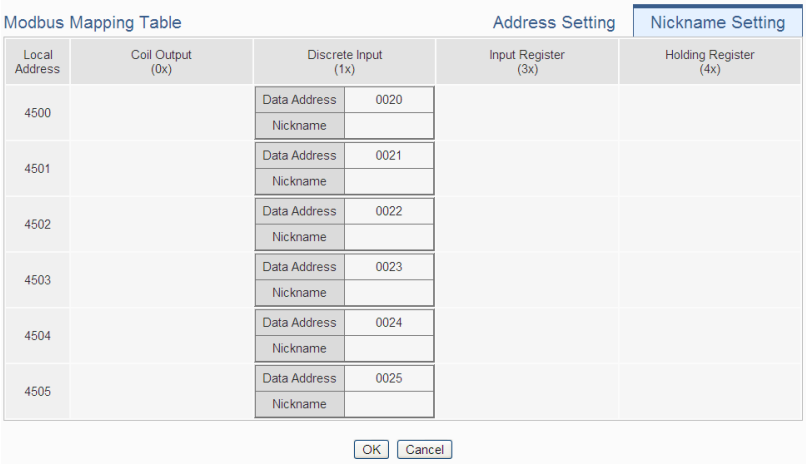


Figure 6-38：Discrete Input Setting Example for Modbus RTU module

- 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.



- 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.



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:

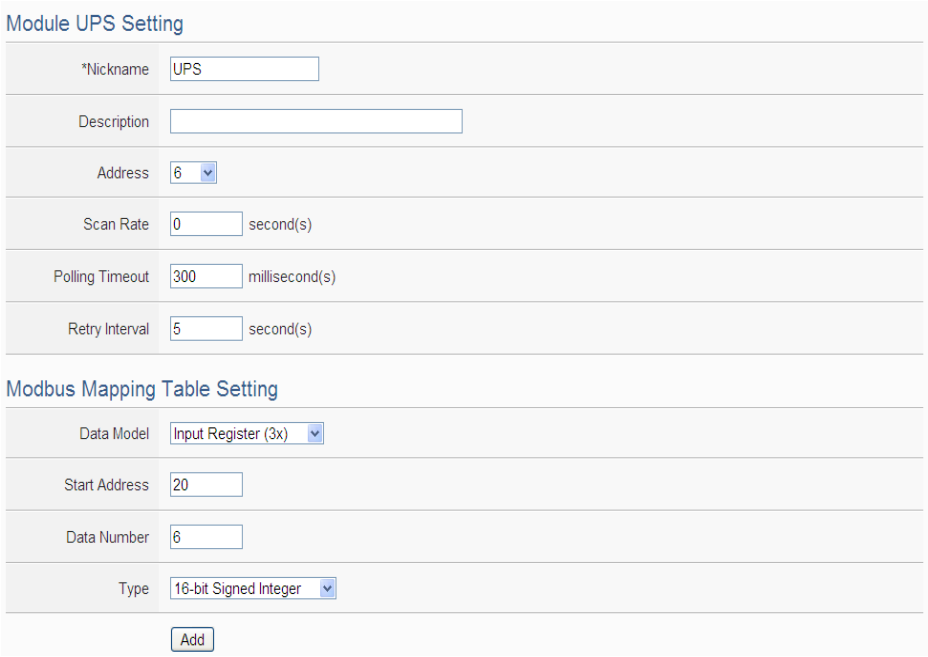


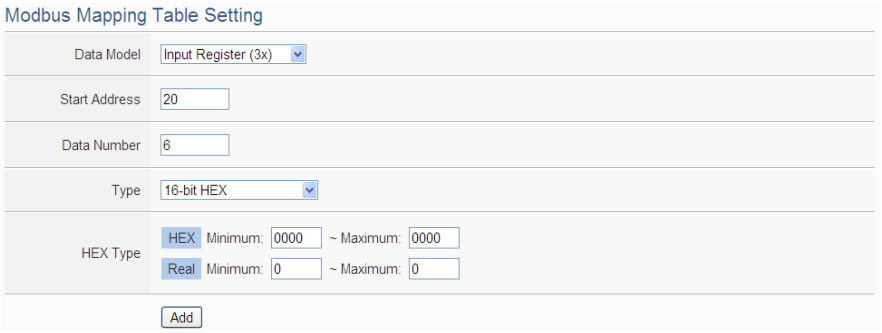
Figure 6-39：Modbus RTU module Input Register Setting page

The settings are as follow:

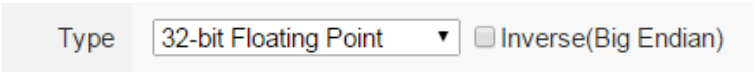
- Nickname: For user to define nickname for the module, this nickname will be displayed on the “Channel Status” and “Rule Setting” pages.
- Description: The Description field provides a space for the user to make a brief description of this module.
- Address: The address will be the Modbus address of 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-52xx to the Modbus RTU module will be failed.
- Scan Rate: Input the time interval for WISE-52xx 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-52xx 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-52xx to repeatedly send command again when WISE-52xx 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-52xx 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.
- 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-52xx 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.



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.



- 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 staring from the Starting Address (The address number on the first column of the “Local Address” indicates the local Modbus address of WISE-52xx 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-52xx can access the 30010, 30012 and 30014 Input Register address of the module, and these retrieved Input Register data will be kept in WISE-52xx Modbus Address 34500、34502 and 34504.

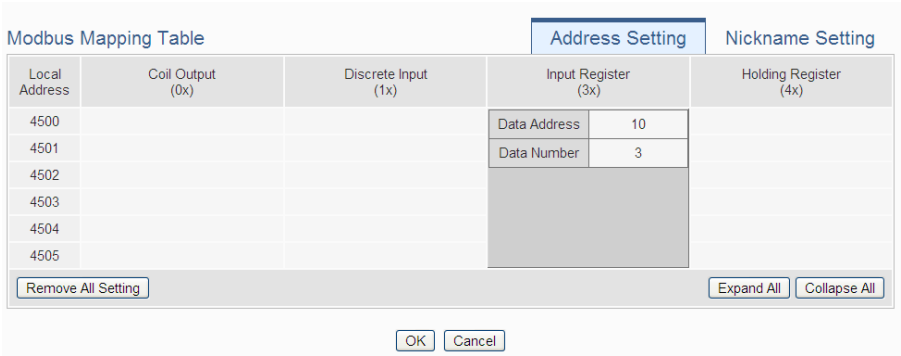
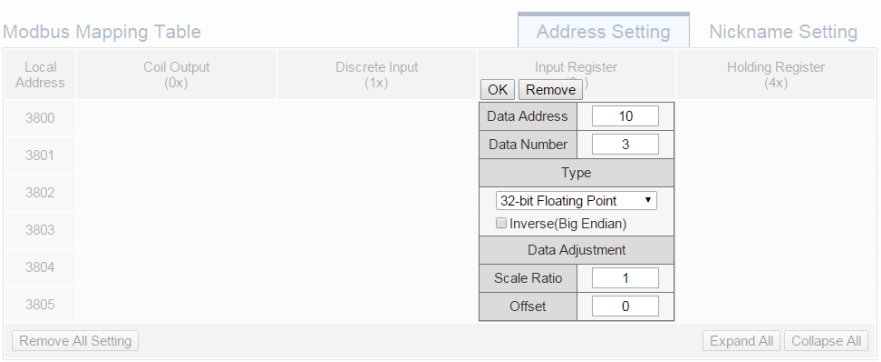


Figure 6-40：Input Register Setting Example for Modbus RTU module

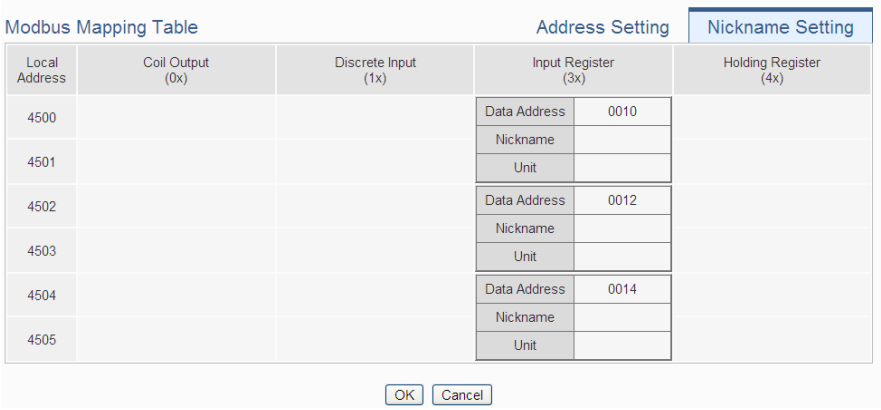
- To modify the starting address or quantity setting, please click on the setting block to perform the modification. The user could also modify Type, Scale Ratio and Offset on this interface. The Scale Ratio setting and Offset setting allows to transform the Input Register value in this block by linear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

  Transformed Value = Scale Ratio x Input Register value + Offset

  After the linear transformation, the Transformed Value will be saved in floating point format on the WISE-52xx (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.



- 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.



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:

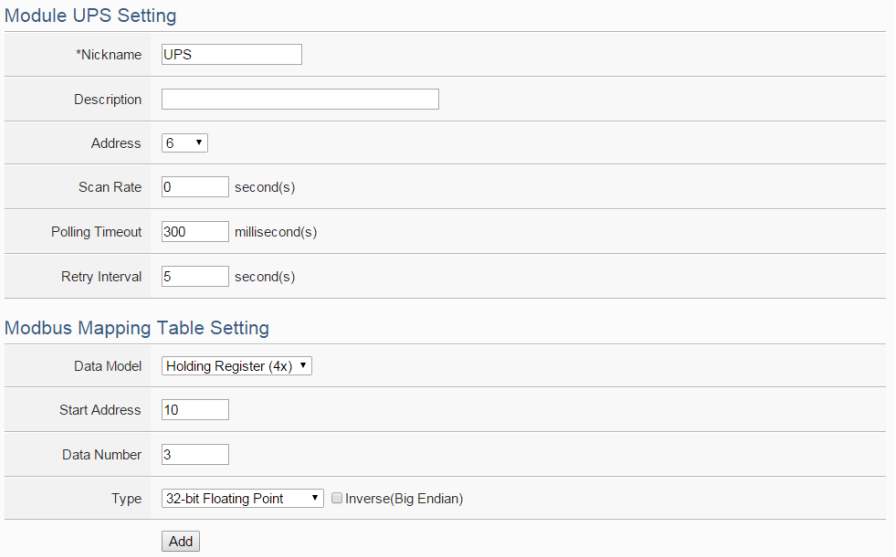


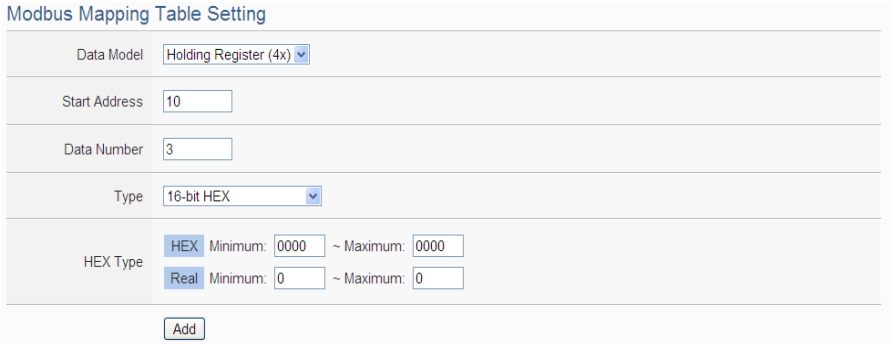
Figure 6-41：Modbus RTU module Holding Register Setting page

The settings are as follow:

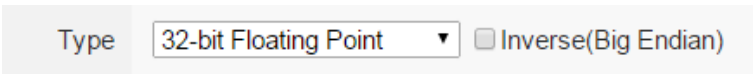
- Nickname: For user to define nickname for the module, this nickname will be displayed on the “Channel Status” and “Rule Setting” pages.
- Description: The Description field provides a space for the user to make a brief description of this module.
- Address: The address will be the Modbus address of 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-52xx to the Modbus RTU module will be failed.
- Scan Rate: Input the time interval for WISE-52xx 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-52xx 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-52xx to repeatedly send command again when WISE-52xx 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-52xx 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.
- 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-52xx 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.



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.



- 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 staring from the Starting Address (The address number on the first column of the "Local Address" indicates the local Modbus address of WISE-52xx 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-52xx can access the 40060 and 40062 Holding Register address of the module, and these retrieved Holding Register data will be kept in WISE-52xx Modbus Address 44500 and 44502.

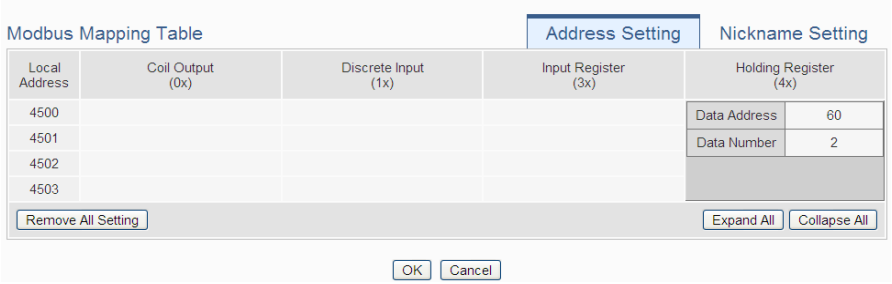
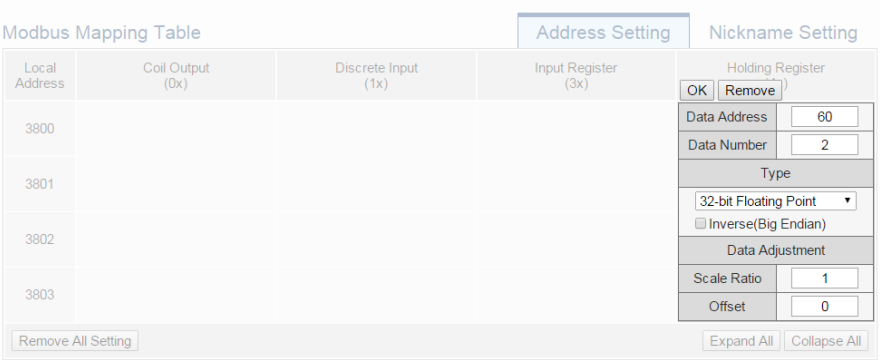


Figure 6-42：Holding Register Setting Example for Modbus RTU module

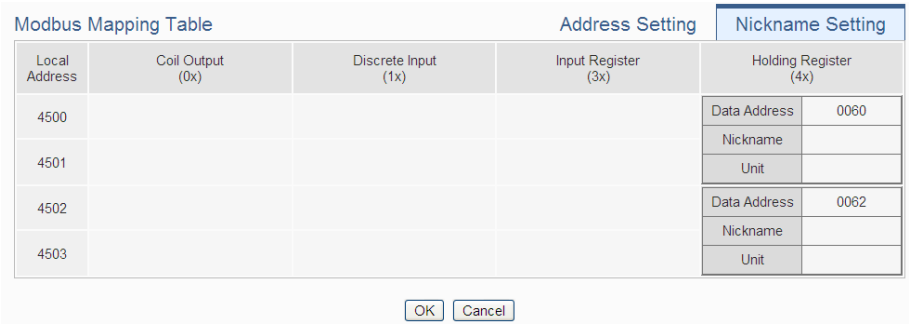
- To modify the starting address or quantity setting, please click on the setting block to perform the modification. The user could also modify Type, Scale Ratio and Offset on this interface. The Scale Ratio setting and Offset setting allows to transform the Holding Register value in this block by linear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

  Transformed Value = Scale Ratio x Input Register value + Offset

  After the linear transformation, the Transformed Value will be saved in floating point format on the WISE-52xx (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.



- 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.



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-52xx and Modbus RTU/TCP module.

6.6 Remote Modbus TCP Module Setting

WISE-52xx 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-52xx 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-52xx. The Modbus TCP Slave Module setting page is shown as follow:

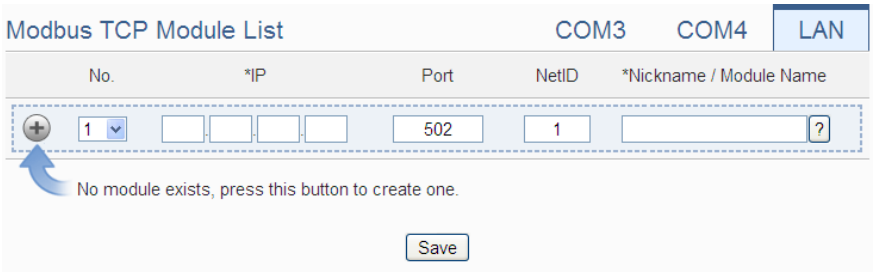


Figure 6-43：Remote Modbus TCP I/O Module Setting page

Please Note: The LAN interface on WISE-52xx 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-52xx 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-52xx 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.

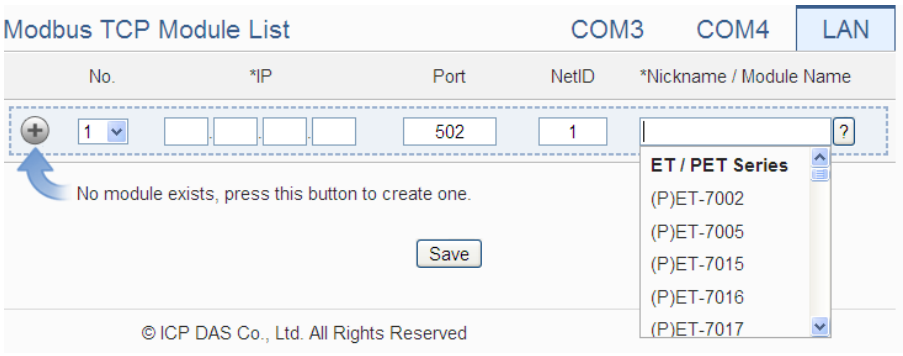


Figure 6-44：Set up the Model/Name of the Modbus TCP Module

iv. Click ⊕ to add the Modbus TCP module to the list After adding the Modbus TCP module, click "Save" button to save the changes.

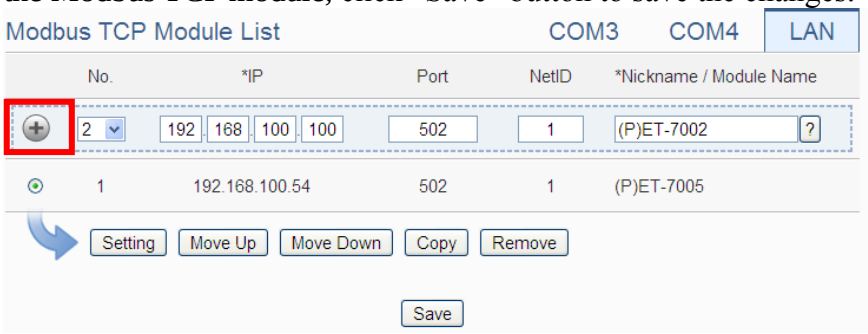


Figure 6-45：Add the Modbus TCP Module manually

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:

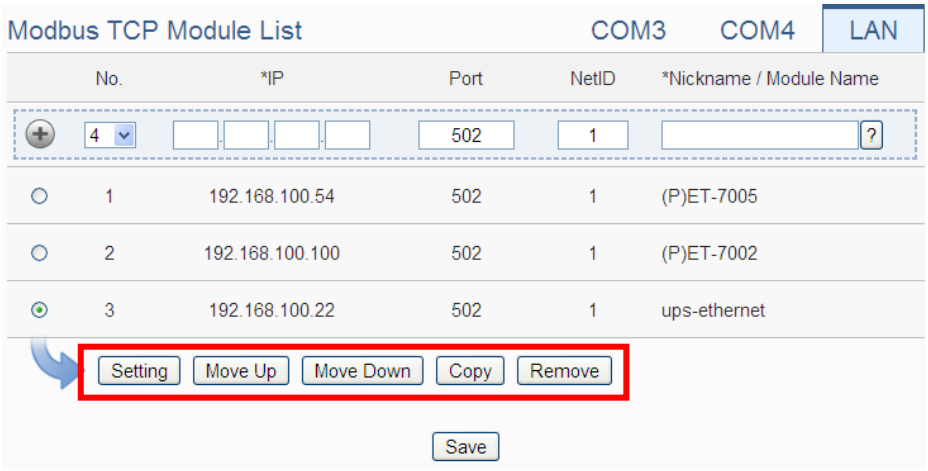


Figure 6-46：Modbus TCP I/O module List Operation Interface

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:

- 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.
- 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)).
- 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)).
- 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.
- 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-52xx 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.

7 Logger Setting

The Logger Setting function of the WISE-52xx 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-52xx. 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-52xx 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-52xx'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-52xx 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-52xx provides data recovery mechanism so that when experiences network disconnection, the data log files will be kept in WISE-52xx, and be recovered after the network is resumed.
3. WISE-52xx 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-52xx. 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:

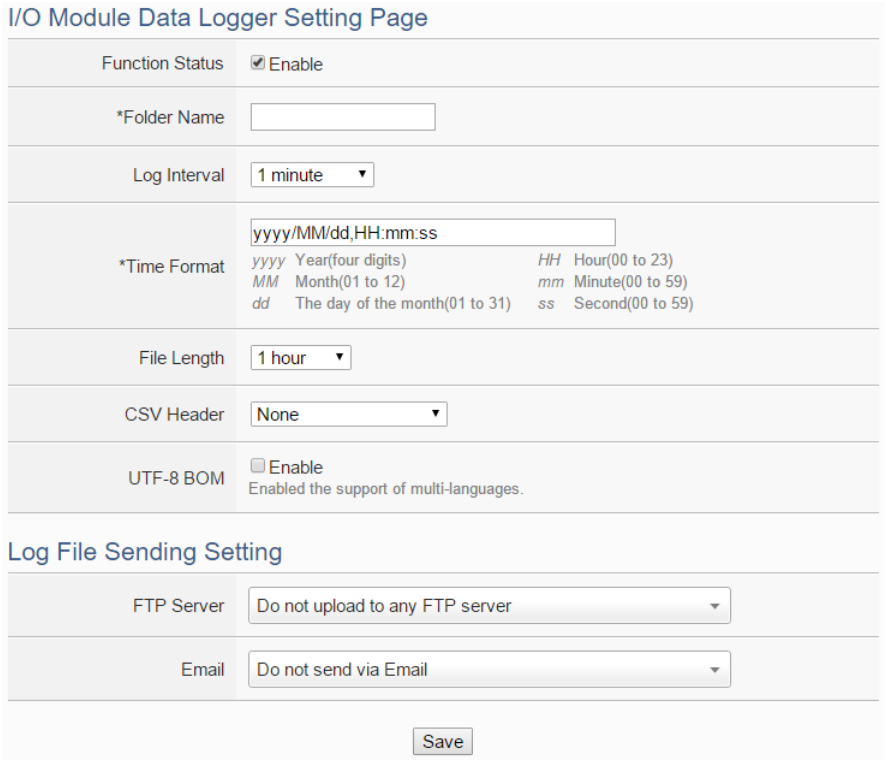


Figure 7-1：I/O Module Data Logger Setting Page

Follow the steps below:

i. Check “Enable” in the “Function Status” field to enable the I/O Module Data Logger function.

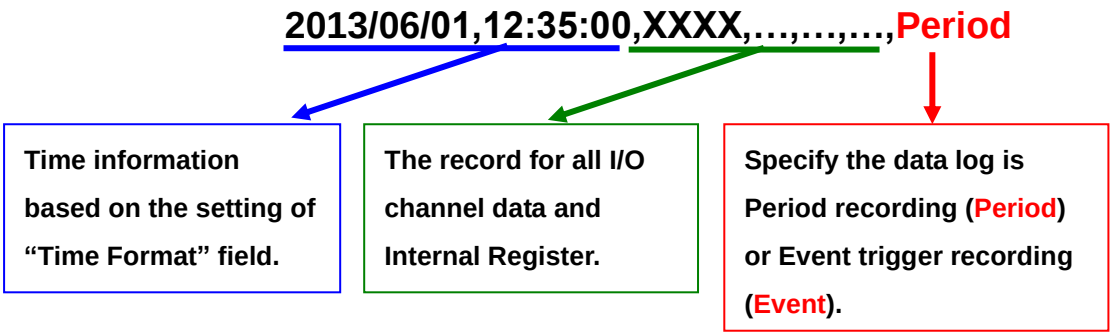
ii. In the “Folder Name” field, input the name of the file folder for the data logger files.

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: 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.

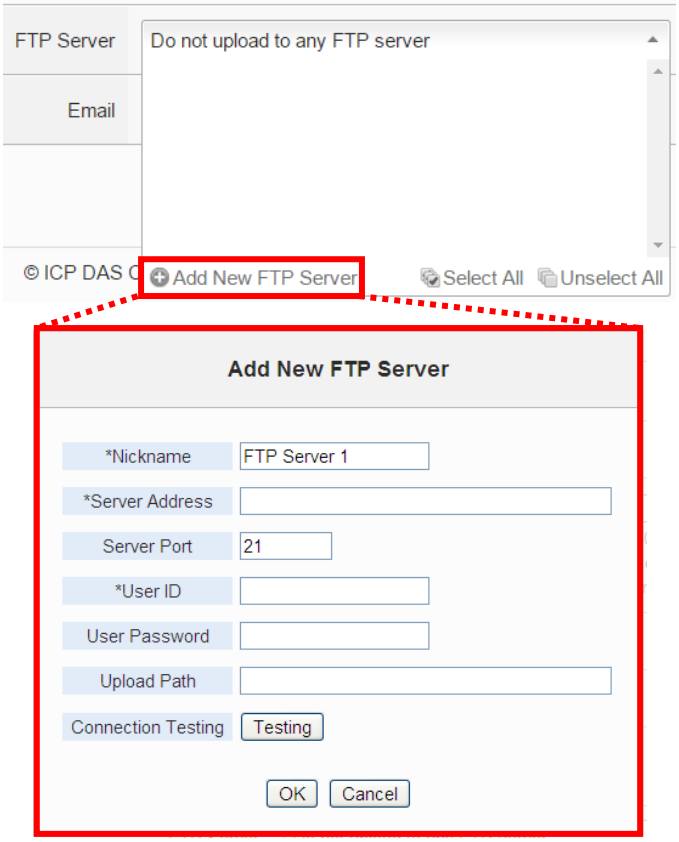
For example, if the "File Length" time interval is set as 3 hours, and "Log Interval" is set as 5 mins, it means WISE-52xx will record data every 5 mins. And the log file is created at 0 o'clock, 3 o'clock, 6 o'clock, 9 o'clock, 12 o'clock, 15 o'clock, 18 o'clock, and 21 o'clock. When the system time 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.

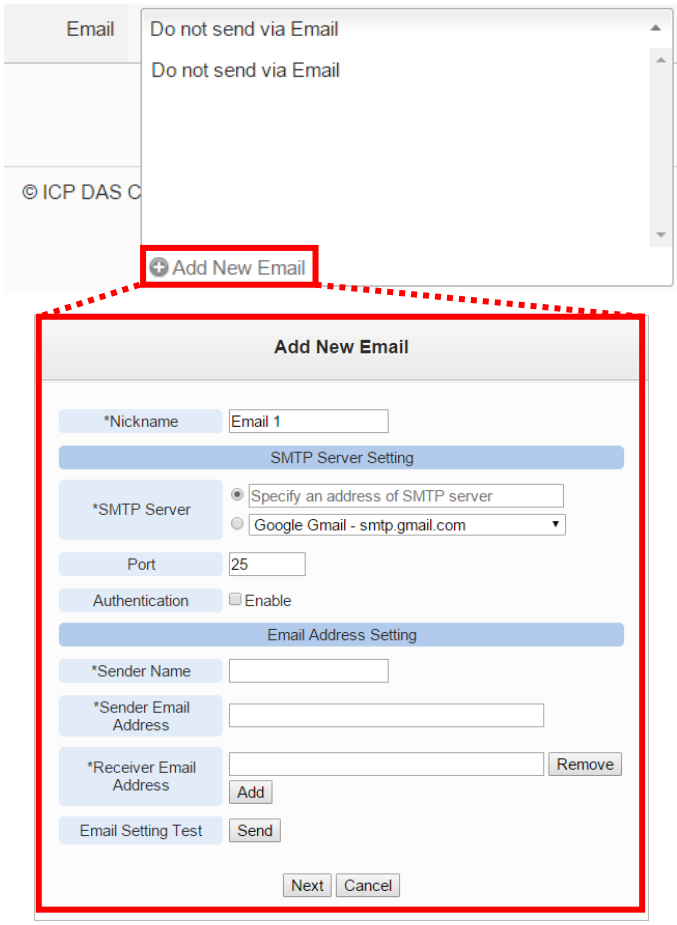
ix. In the "FTP Server" field, please specify the FTP Servers which will receive the data logger files WISE-52xx send. WISE-52xx can send the data logger files to multi-FTP Servers simultaneously. Users can

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-52xx 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-52xx 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.



Please refer to "9.4 Email Setting" section for detail. If you select "Do not send via Email", WISE-52xx 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.

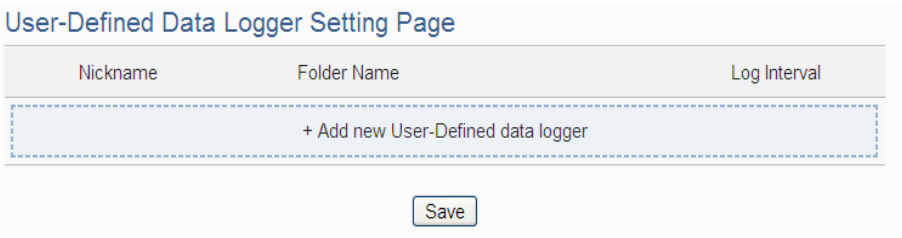


Figure 7-2：User-Define Data Logger List Interface

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

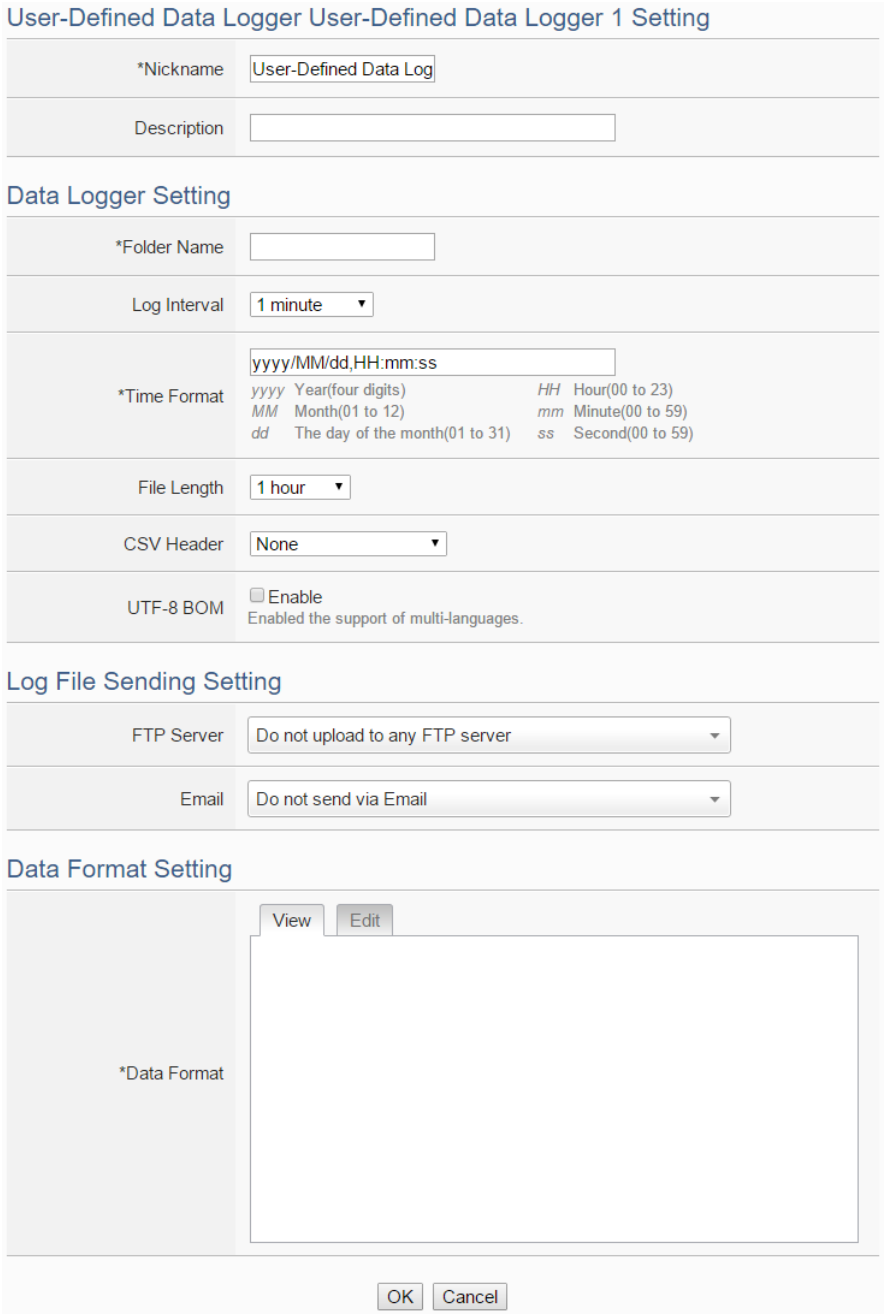
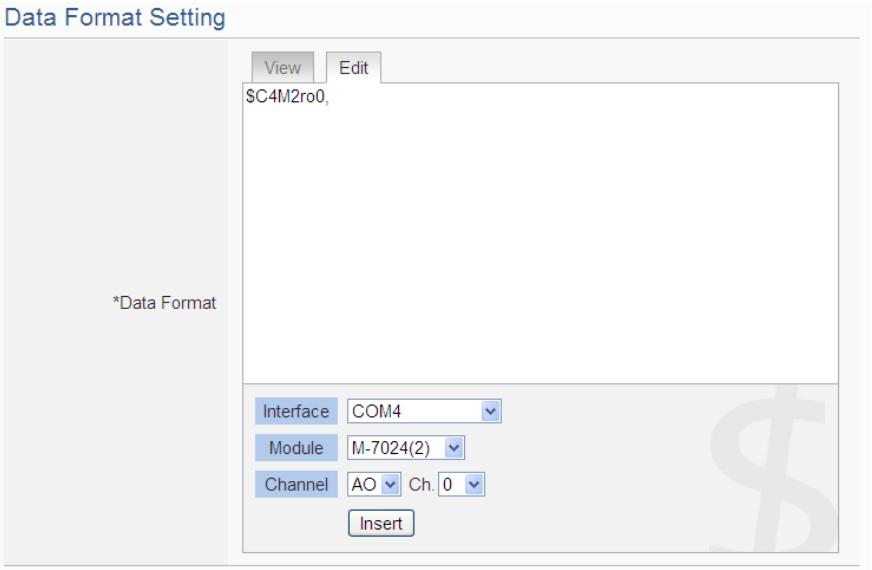


Figure 7-3：User-Define Data Logger Setting Page

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.

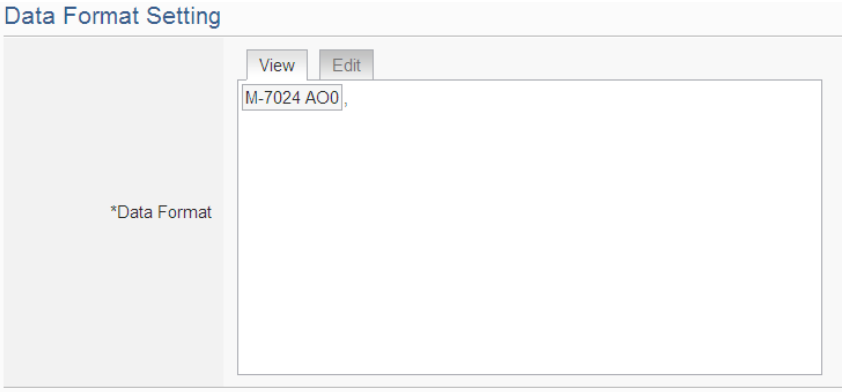
iv About the setting of “Folder Name”, “Log Interval”, “Time Format”, “File Length”, “CSV Header”, “UTF-8 BOM”, “FTP Server” and “Email” fields, please refer “7.1 I/O Module Data Logger Setting” section for detail.

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-52xx subscribe from the MQTT broker, the setting page is shown as below:

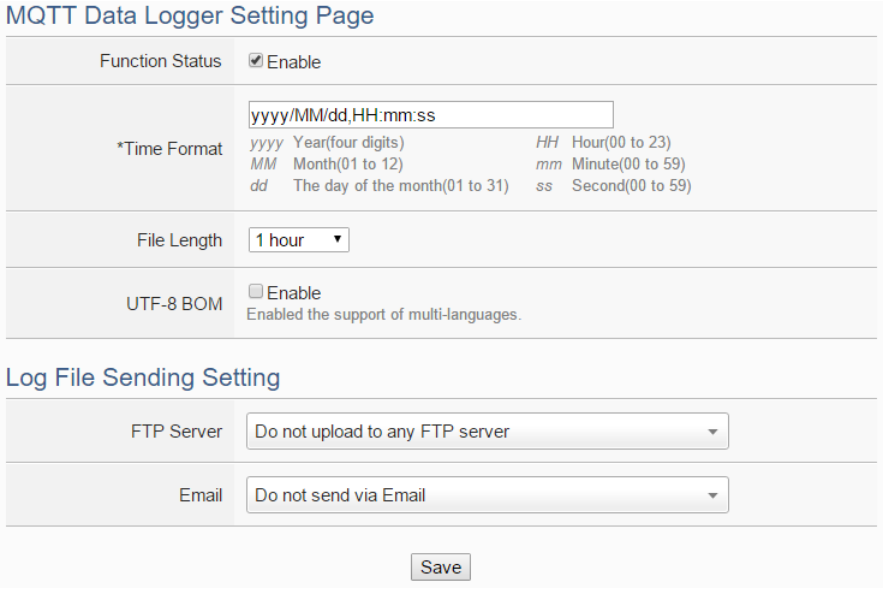


Figure 7-4：MQTT Data Logger Setting page

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-52xx, the setting page is shown as below:

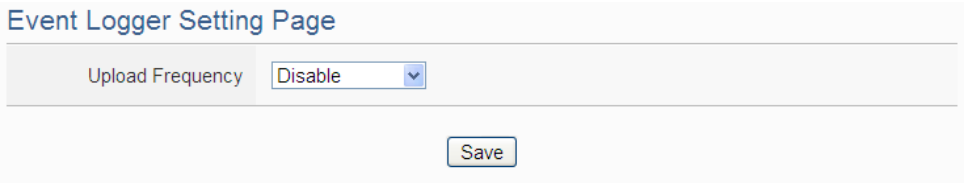


Figure 7-5：Event Data Logger Setting page

Follow the steps below:

i Select “Upload Frequency” to enable period uploads function in WISE-52xx. 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 four options: “Disable”, “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-52xx send. WISE-52xx 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-52xx 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.

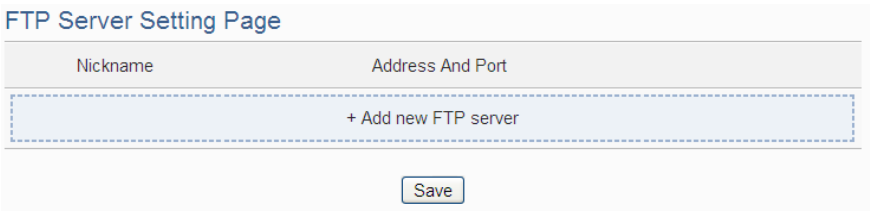


Figure 7-6：FTP Server List page

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

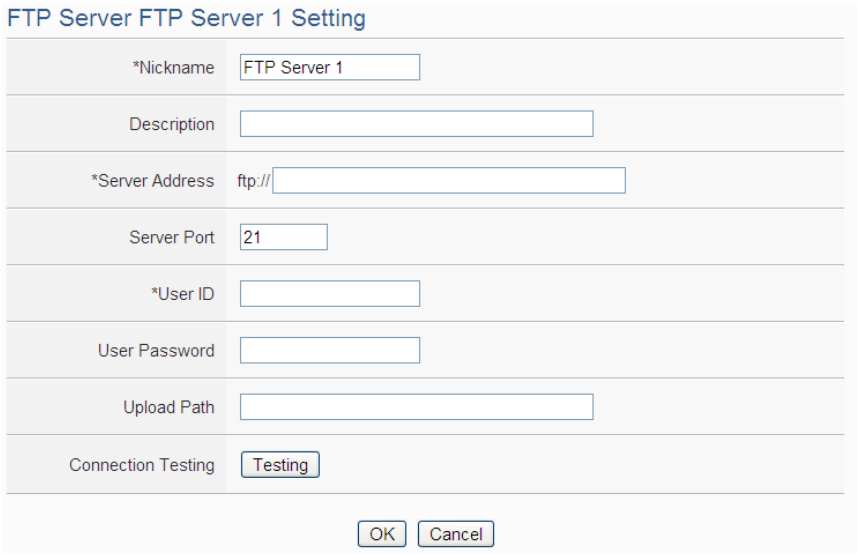


Figure 7-7：FTP Server Setting page

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-52xx 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-52xx will upload the data logger files and event logger files to the remote FTP server based on the following file architecture:

```
Upload Path
    └ WISE-52xx 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-52xx controller, please set different nickname to each WISE-52xx. If all WISE-52xx controllers were named the same, the log files from every WISE-52xx 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-52xx.

8 IoT Platform Setting

The IoT Platform Setting function of the WISE-52xx 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-52xx can publish the I/O channel data of the Sensors and I/O modules that are connected to WISE-52xx 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-52xx at the field side. With the IoT Platform Setting function the WISE-52xx provides, it helps users to implement an IoT system in a easy way.

The IoT Platform Settingg 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

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:

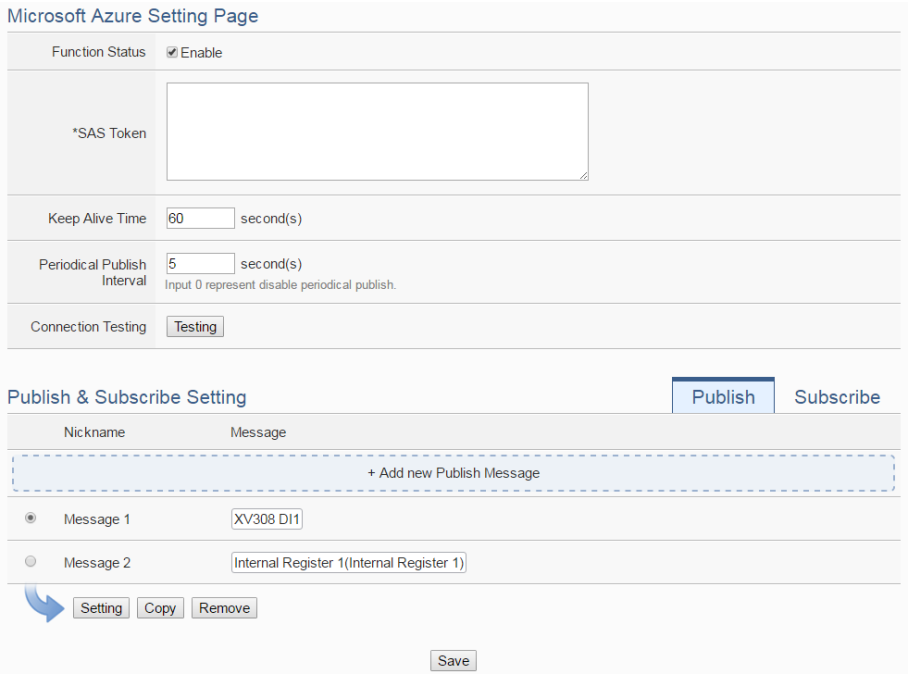


Figure 8-1：Microsoft Azure Setting page

Follow the steps below:

i Check “Enable” in the “Function Status” field to enable the connection to Microsoft Azure IoT Cloud Platform.

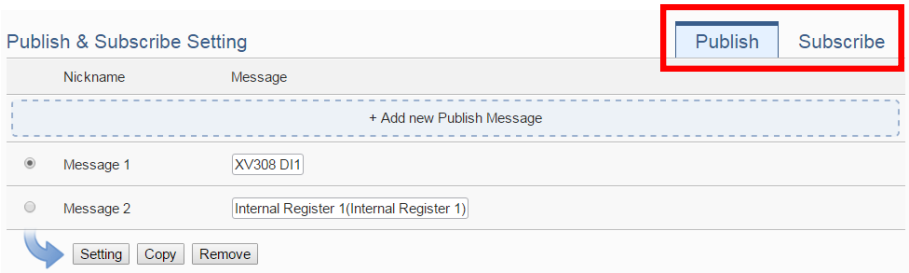
ii In the “SAS Token” field, input the SAS Token which you previously generate for this WISE-52xx from Microsoft Azure. For the procedure to generate a SAS Token, please refer to the “Documentation →Azure IoT Hub→IoT Hub MQTT support” section on the Microsoft Azure Web Site for detailed information.

iii The value in “keep alive Time” field defines the maximum amount of time in second that pass away without communication between the WISE-52xx and Microsoft Azure. The “keep alive interval” enables Microsoft Azure to detect if the connection to the WISE-52xx 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-52xx 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.

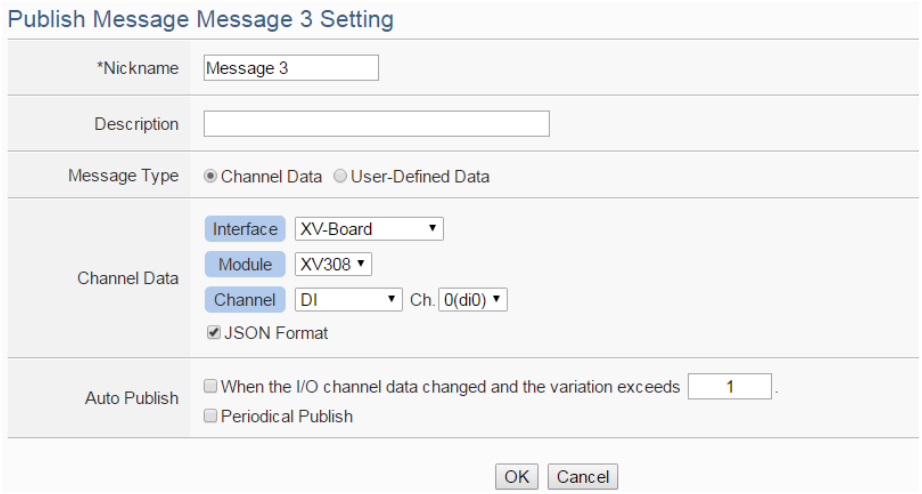


Figure 8-2：Microsoft Azure Publish Message setting page

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.

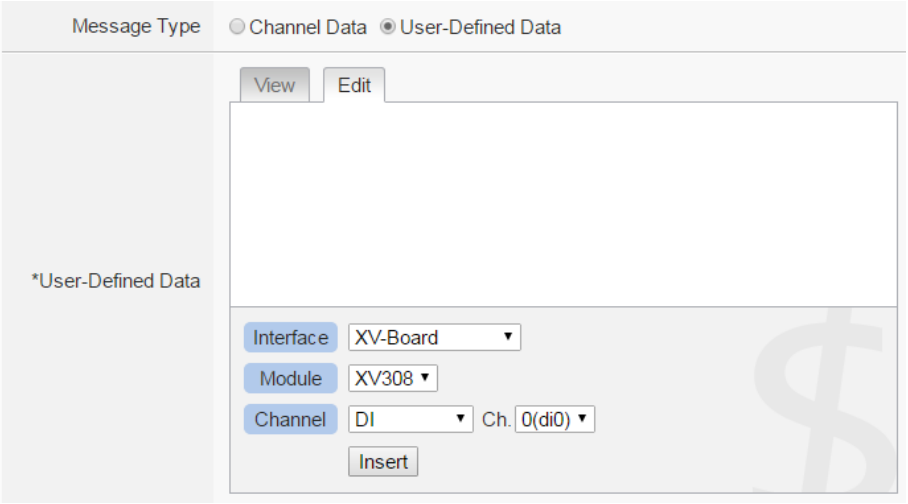


Figure 8-3：“User-Defined Data” Setting Interface of IoT Platform

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:

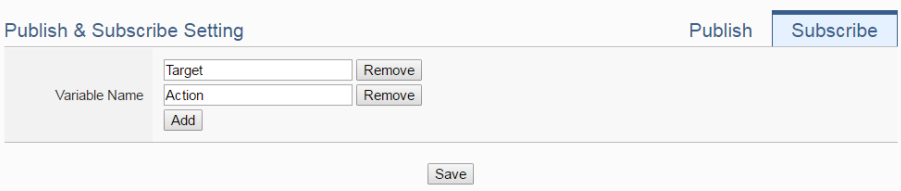


Figure 8-4：Microsoft Azure Subscribe Topic setting page

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-52xx receives from Microsoft Azure is based on JSON format, the WISE-52xx will get the corresponding value of the

variable from the received message. The following is an example of a message the WISE-52xx 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-52xx 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-52xx, WISE-52xx 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:

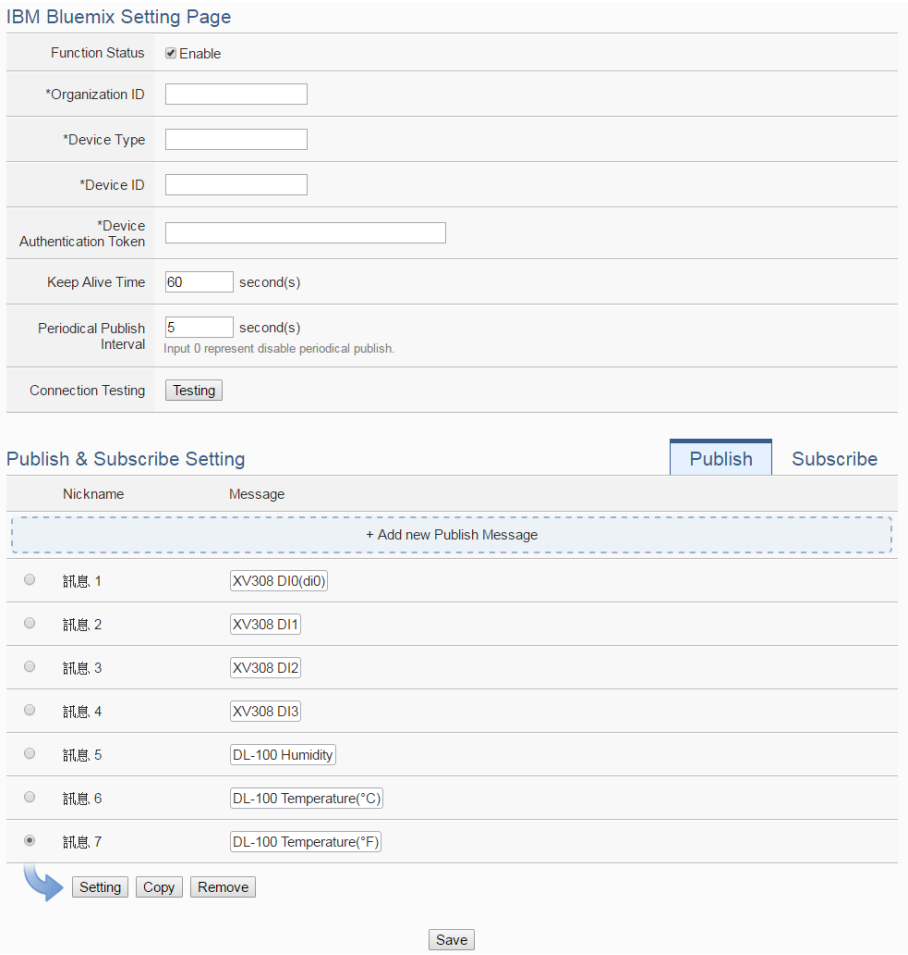


Figure 8-5：IBM Bluemix Setting page

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 previouisly generate for this WISE-52xx from IBM Bluemix. After you completing the device settings on IBM Bluemix for the WISE-52xx, IBM Bluemix will reply you the device information similar as below.

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-52xx and IBM Bluemix. The “keep alive interval” enables IBM Bluemix to detect if the connection to the WISE-52xx 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-52xx 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:

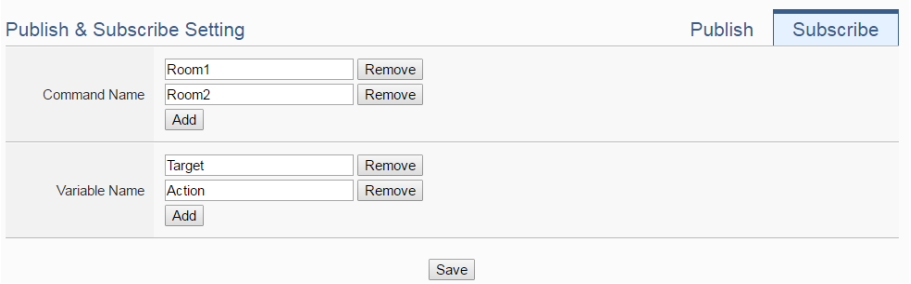


Figure 8-6：IBM Bluemix Subscribe Message setting page

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-52xx can be set to only receive the commands that are pre-defined in the field, the other commands will be ignored by WISE-52xx.

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-52xx receives from IBM Bluemix is based on JSON format, the WISE-52xx can also get the corresponding value of the variable from the received message. Following is an example of the message which WISE-52xx 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-52xx 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-52xx, the WISE-52xx will initiate the connection to IBM Bluemix, and start the Publish Message/Subscribe Message mechanism with IBM Bluemix.

8.3 MQTT Setting

WISE-52xx 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-52xx's Publish Topic and its message content with the MQTT Brokers, and also the setting of the WISE-52xx's Subscribe Topics. In addition, WISE-52xx 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-52xx 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:

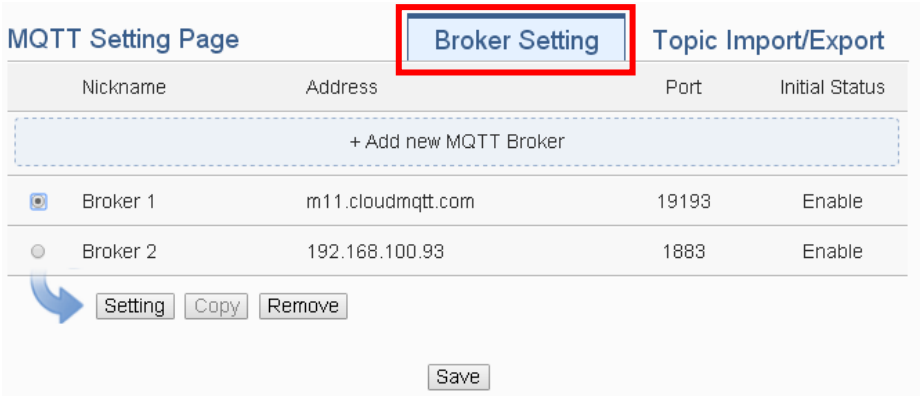


Figure 8-7：MQTT setting page (Broker)

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:

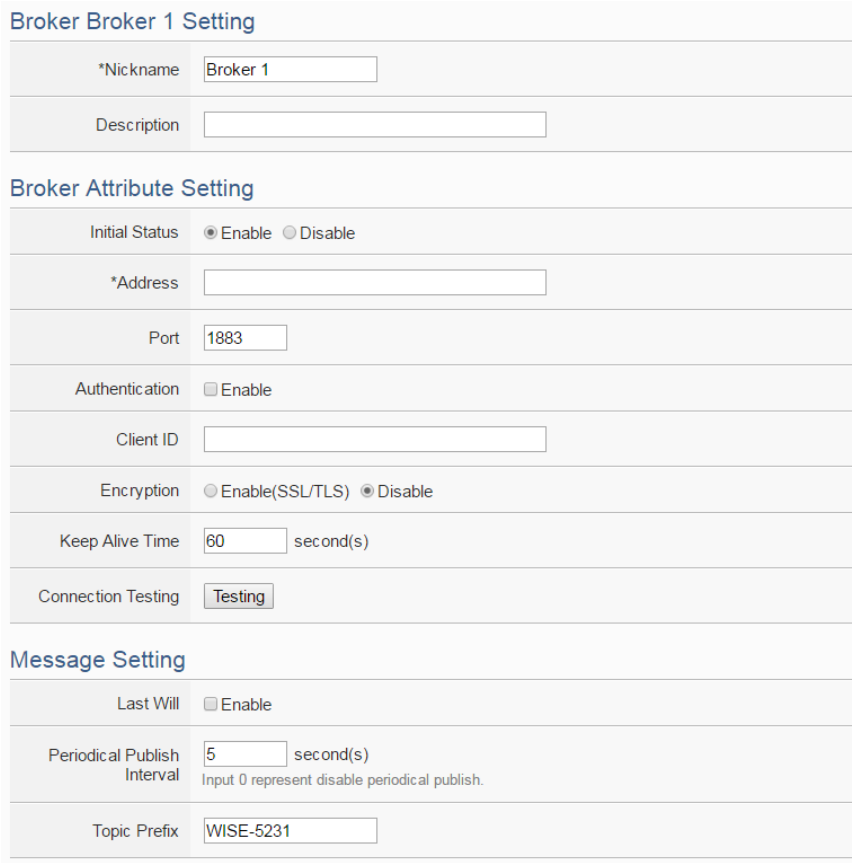


Figure 8-8：MQTT Broker Parameter setting page

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-52xx 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 the SSL/TLS encryption mechanism is required for the connection between the Broker and the WISE-52xx 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-52xx and the Broker. The WISE-52xx 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-52xx sends a very small MQTT "ping" message, which the Broker will acknowledge. The keep “alive interval” enables the WISE-52xx 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-52xx 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-52xx lost connection to the Broker. After clicking the “Enable” checkbox, the setting of Last Will Topic, Message content and QoS will be brought up.

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-52xx. If there are more than one WISE-52xx 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-52xx 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:

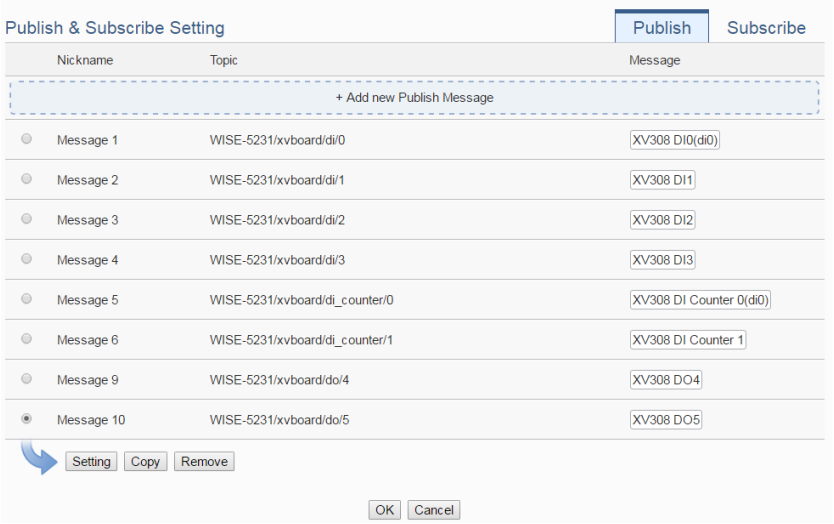


Figure 8-9：Publish Message and Subscribe Topic setting page

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:

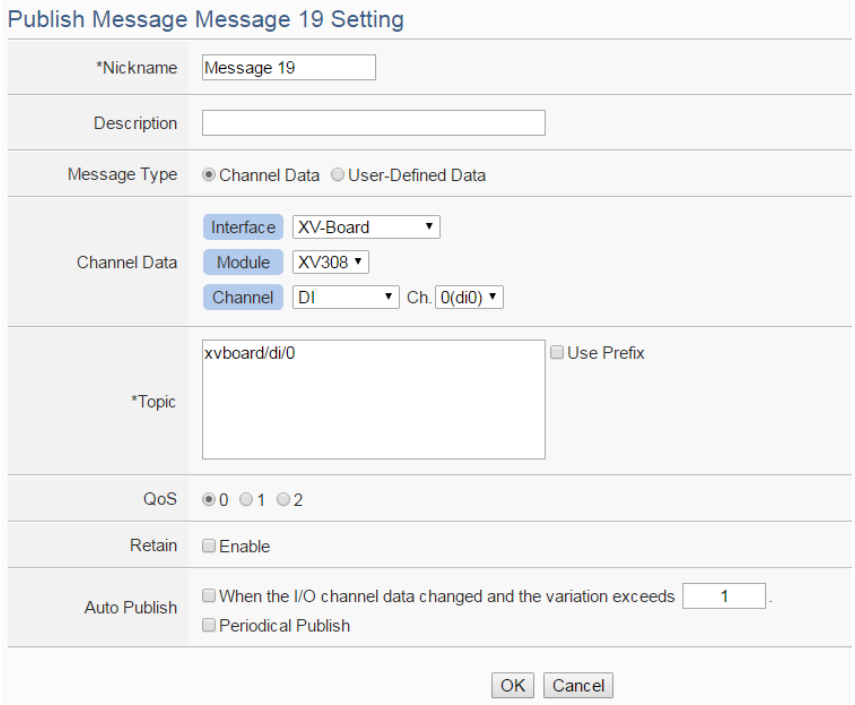
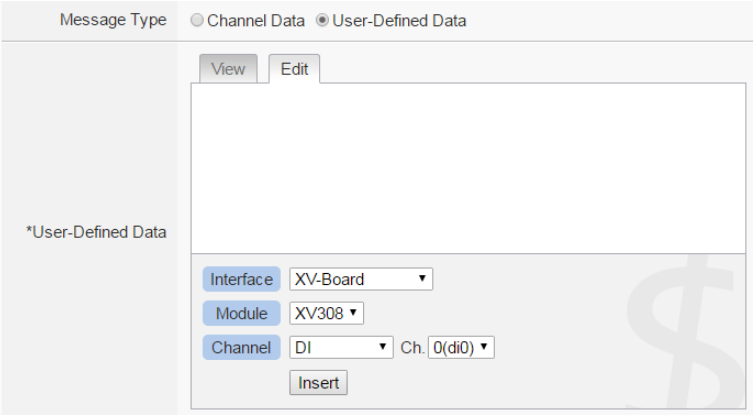


Figure 8-10：Publish Message Setting Page

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. 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.



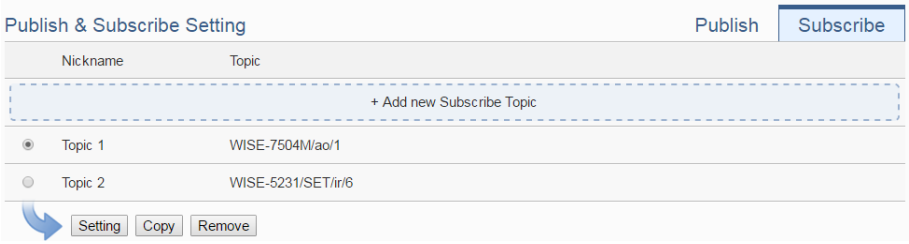
xix In the "QoS" field, user can select 0, 1, 2 for the QoS(Quality of Service) setting for the Publish Message.

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:

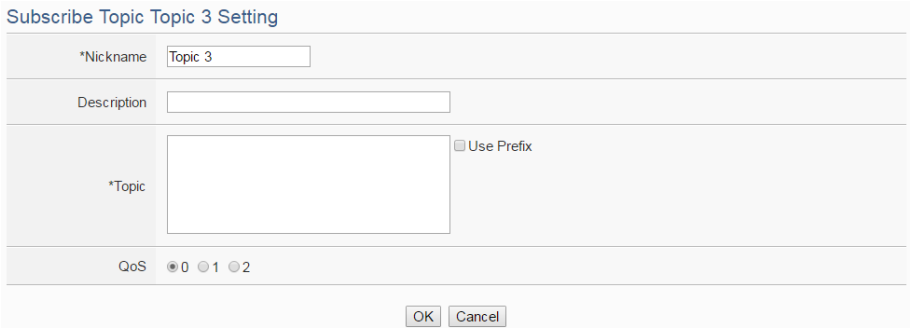


Figure 8-11：Subscribe Topic Setting Page

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-52xx 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-52xx 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-52xx. And select the topics to be imported. The Topic Export function allows to export the MQTT Topics that the WISE-52xx 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.

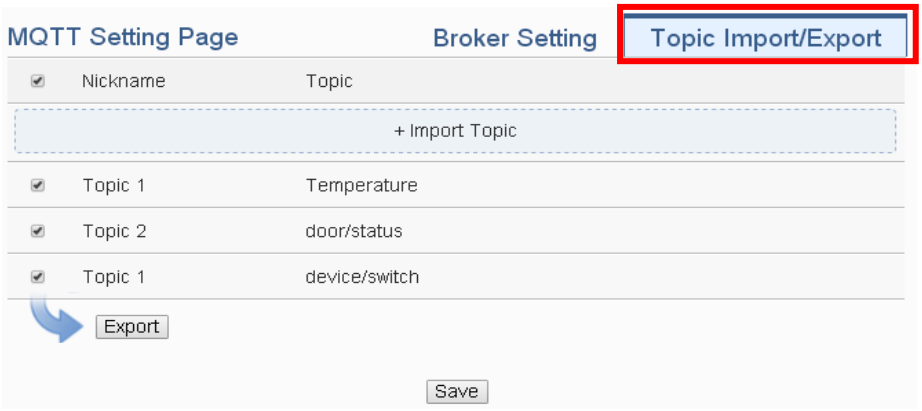


Figure 8-12：MQTT Topic Import/Export setting page

All MQTT Publish Topics and Subscribe Topics that the WISE-52xx 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:

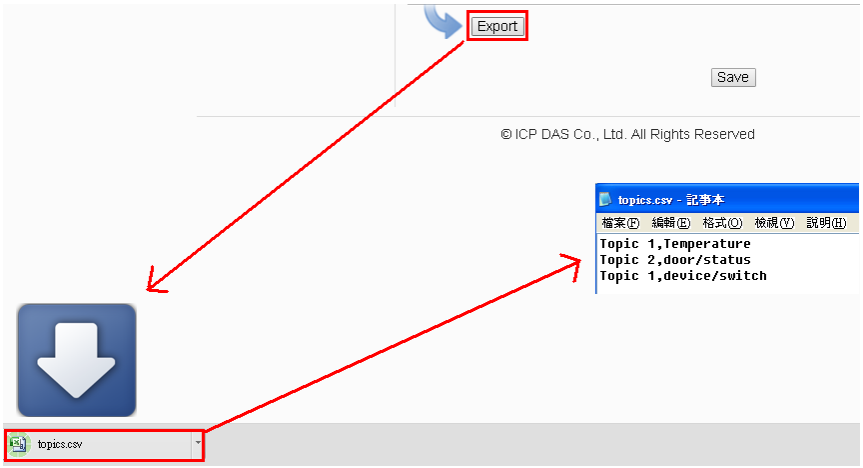


Figure 8-13：The Export of MQTT Topic

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.

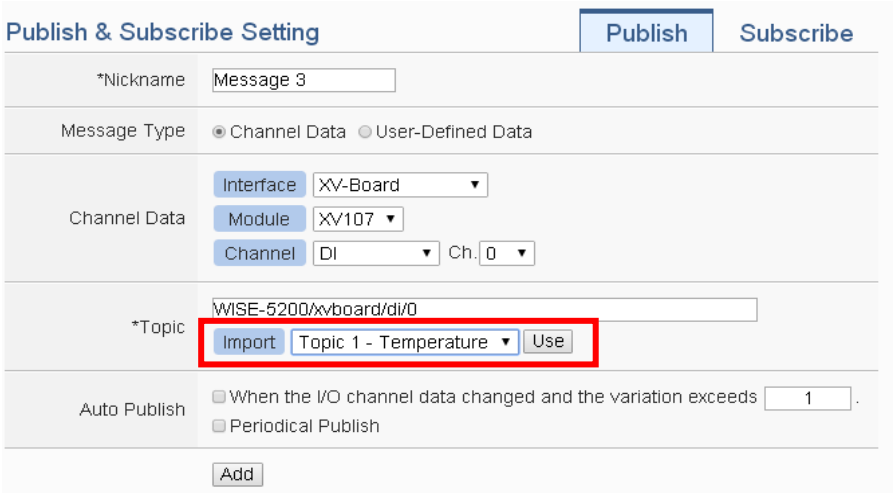


Figure 8-14：The Import of MQTT Topic

9 Advanced Setting

Advanced Setting provides additional features and allows you to perform more setting on the WISE-52xx. Click on the Advanced Setting button, a column of buttons will appear on the left of the page:

- ◆ Internal Register Setting
- ◆ Timer Setting
- ◆ Schedule Setting
- ◆ Email Setting
- ◆ SMS Setting
- ◆ SNMP Trap Setting
- ◆ CGI Command Setting
- ◆ Active I/O Setting
- ◆ Channel Status 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 and the data can be read/written on the Registers via Modbus command. The data on the registers can also be read and evaluated in IF Condition and be written after performing a THEN/ELSE Action. And it can perform the four fundamental operations of arithmetic: plus, minus, multiply and divide.

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.

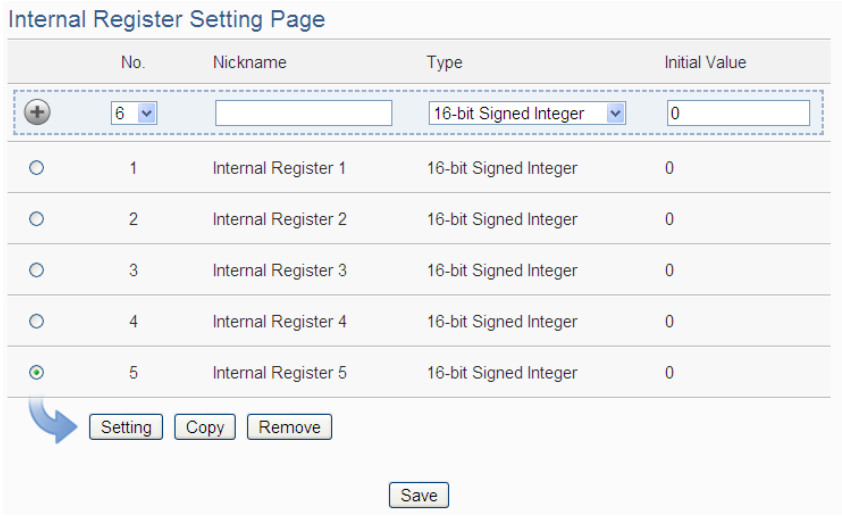


Figure 9-1：Internal Register List Page

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.

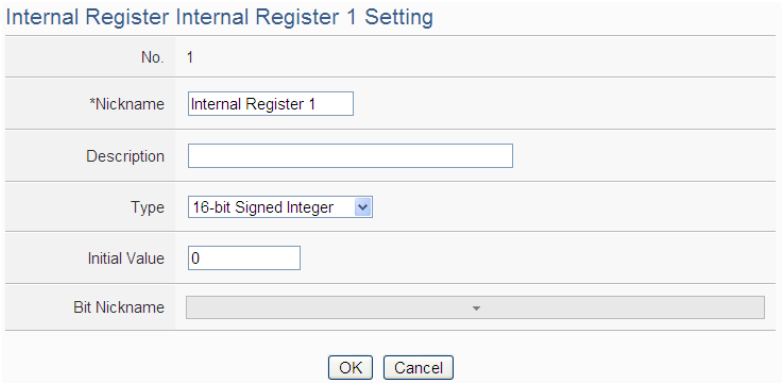


Figure 9-2：Internal Register Setting page

vii Click on “OK” to confirm the setting and return to the Internal Register list page.

viii 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.

ix To remove a pre-set Internal Register, please click the radio button in front of the pre-set Internal Register and then click “Remove”.

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

9.2 Timer Setting

WISE-52xx 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.

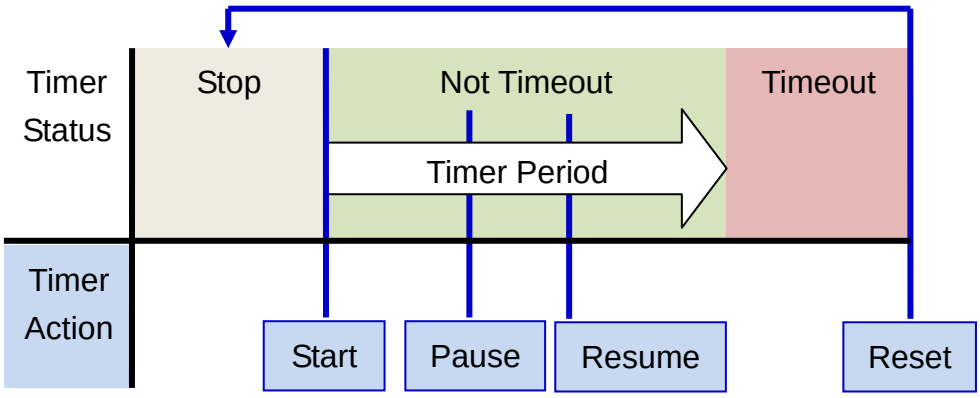


Figure 9-3：Timer Status and Actions

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.

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

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.

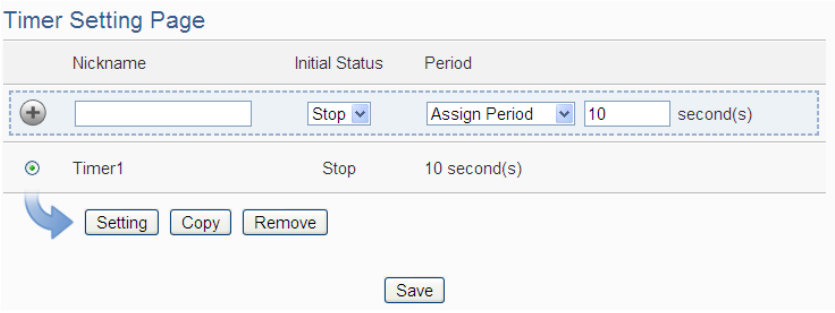


Figure 9-4：Timer List Page

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:

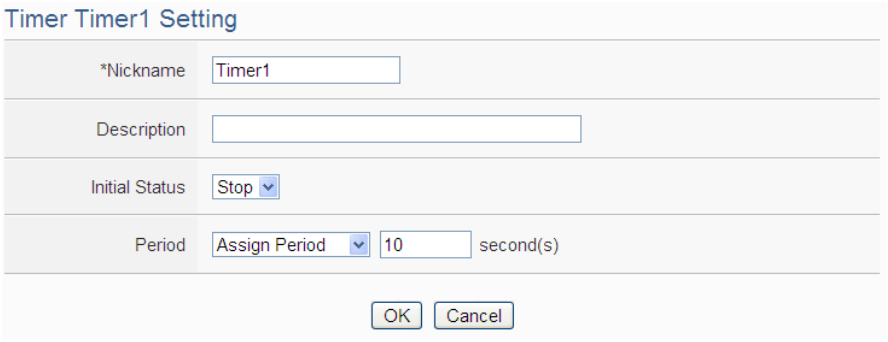


Figure 9-5：Timer Setting page (by assign value)

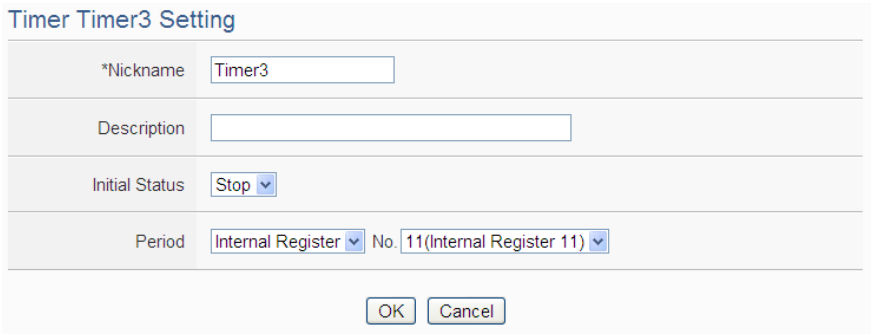


Figure 9-6：Timer Setting page (by Internal Register)

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-52xx provides Schedules to setup prescheduled routine tasks. The setting of Schedule can be used to check if the system time of the WISE-52xx 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:

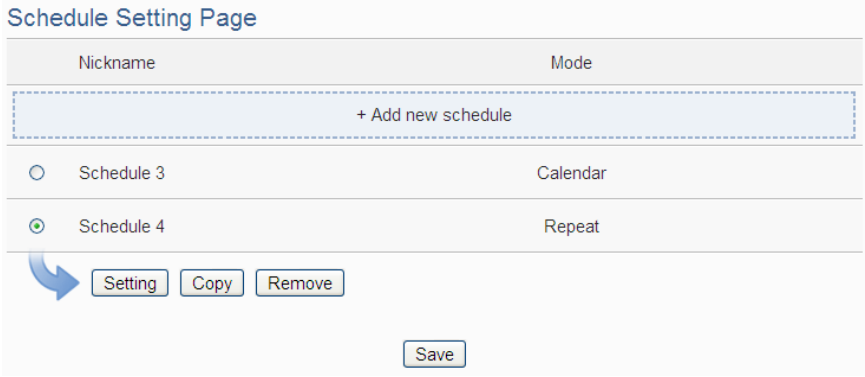


Figure 9-7：Schedule List Page

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”.

- 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:

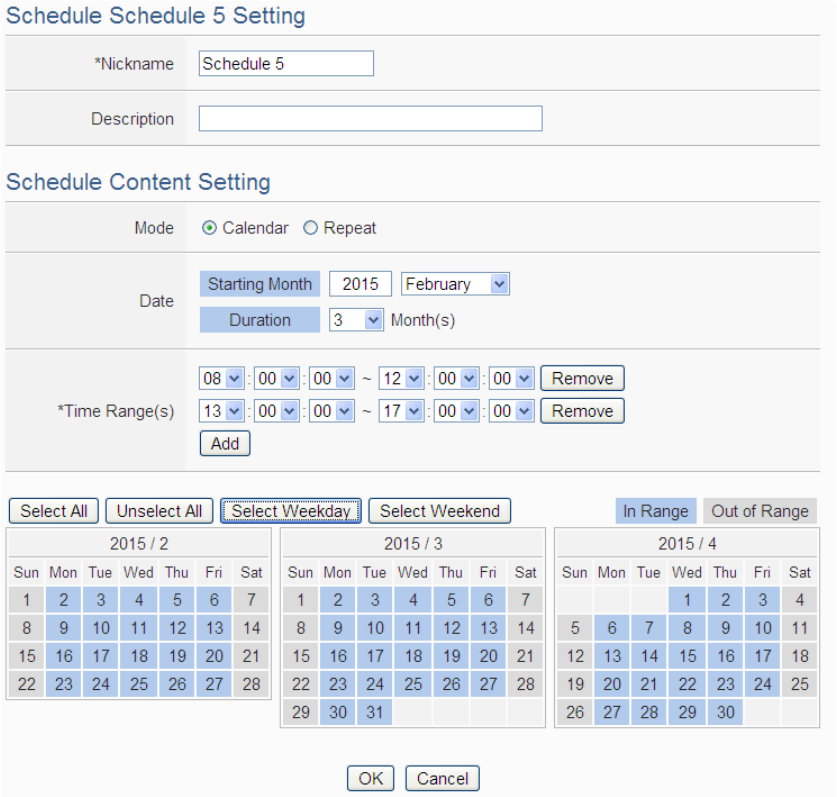


Figure 9-8：Calendar mode of Schedule setting

(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.

- 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:

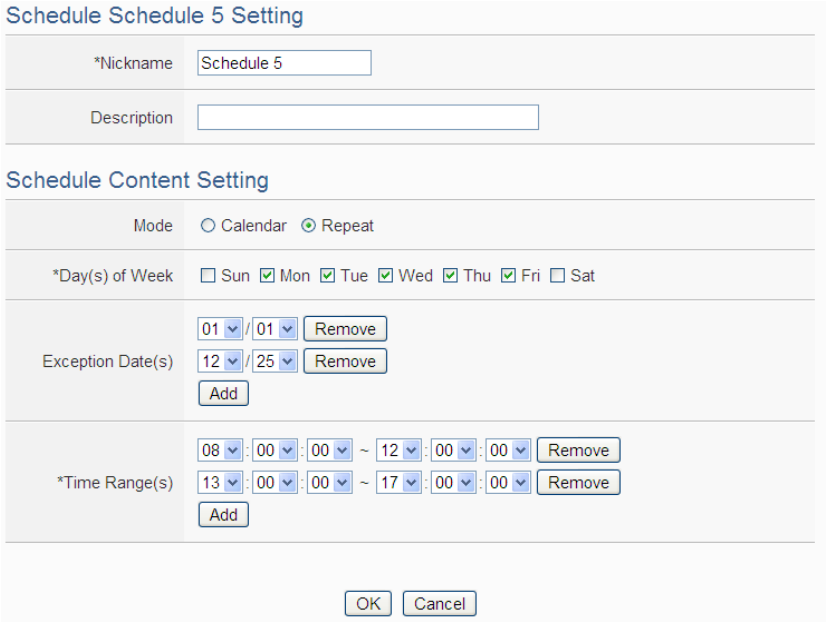


Figure 9-9：Repeat mode of Schedule setting

(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-52xx 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:

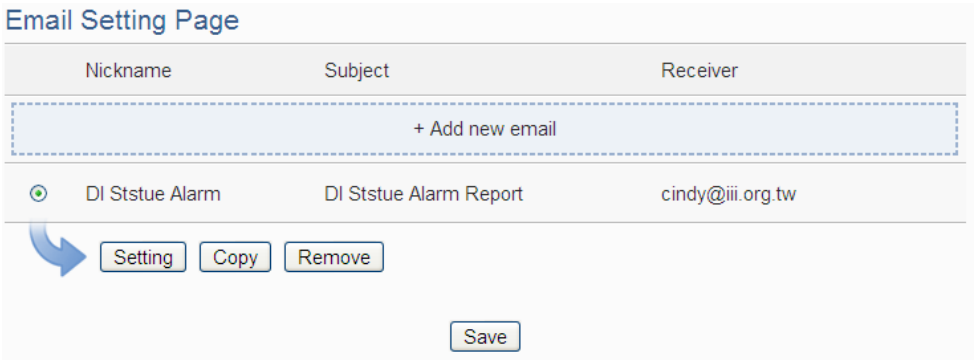


Figure 9-10：Email List Page

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:

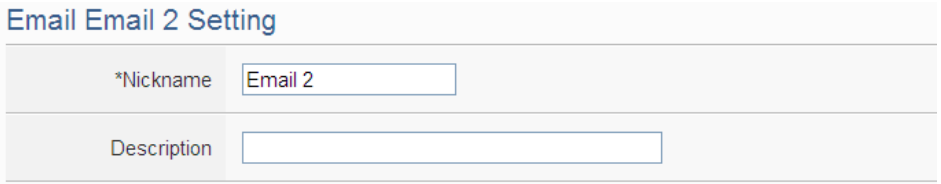


Figure 9-11：Email setting page (Name & Description)

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-52xx 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:

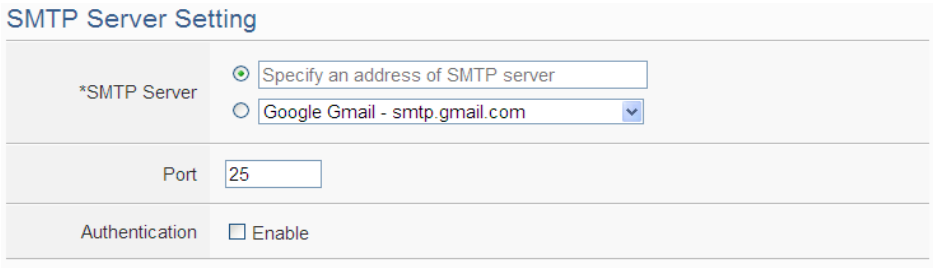


Figure 9-12：Email setting page (SMTP Server)

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.

xii To verify whether your email setting is correct to send the Email, click "Send" in the "Email Setting Test" section, then WISE-52xx will send a test Email to the receiver's email address.

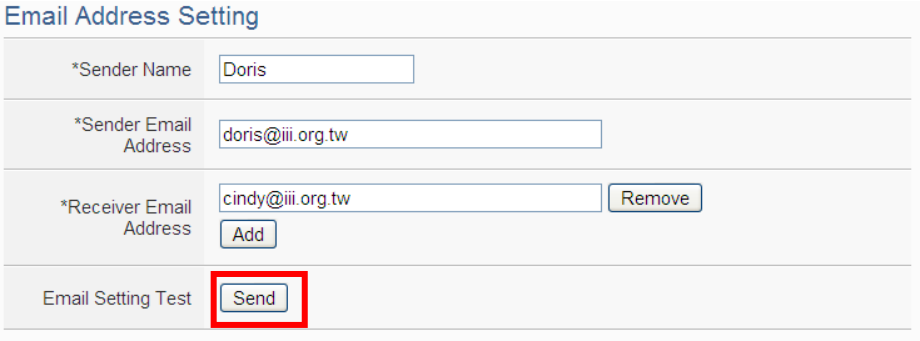


Figure 9-13：Email setting page (Email Address)

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:

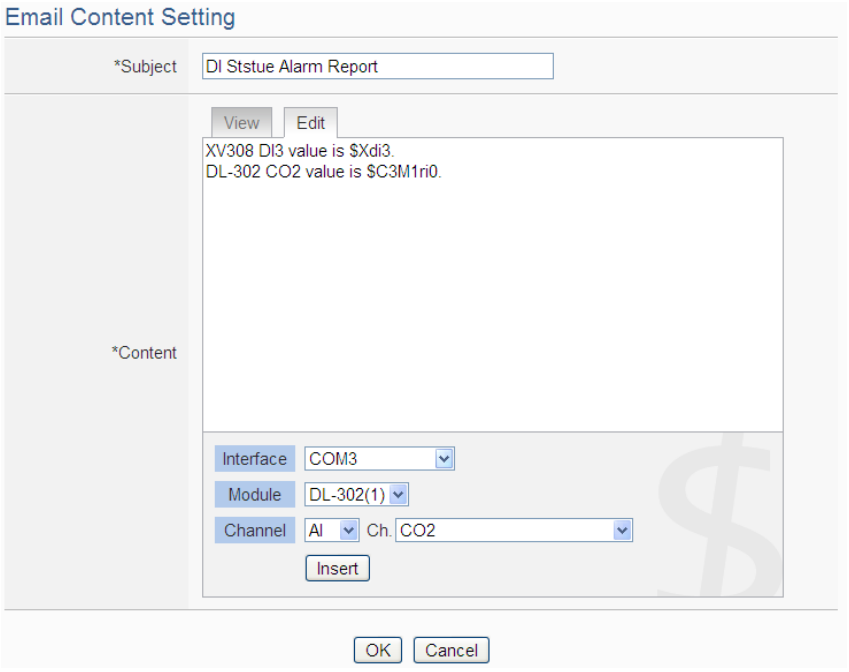


Figure 9-14：Email setting page (Email Content)

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-5231-3GWA offers 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-5231-3GWA 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. One SMS Command message can require up to 10 channel data values. The user could add the encoded string to the message to retrieve the related channel data.
- **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:

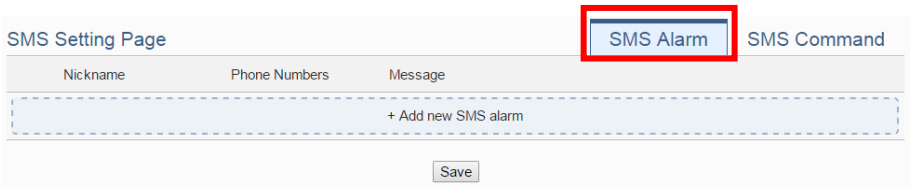


Figure 9-15：SMS setting page (1)

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:

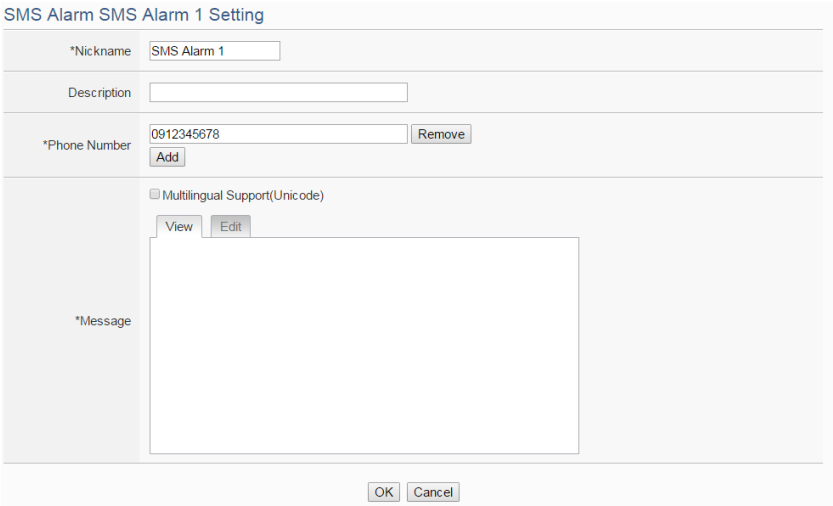


Figure 9-16：SMS setting page (2)

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.

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. 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:

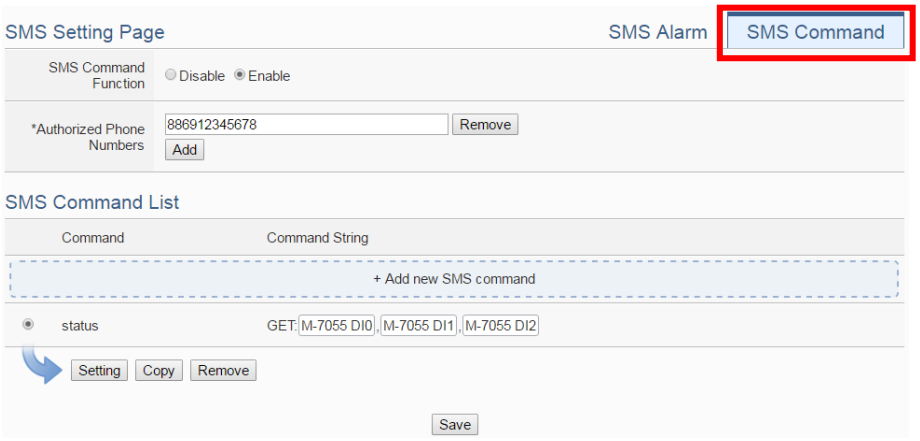


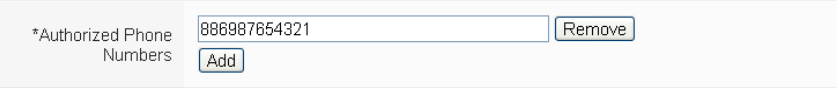
Figure 9-17：SMS command setting page (1)

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 “Add” to input the phone numbers you would like to authorize to send SMS commands to WISE-5231-3GWA. Keep on clicking “Add” to add all phone numbers to send the SMS commands to WISE-5231-3GWA, click “Remove” to remove the phone numbers you want to delete. Please note: the Authorized Phone Number has to be input in the format: “Country code, a*rea code and* number”. For example, if the Authorized Phone Number is a cell phone number 0987654321 in Taiwan area, please input the Authorized Phone Number as “886987654321”.



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.

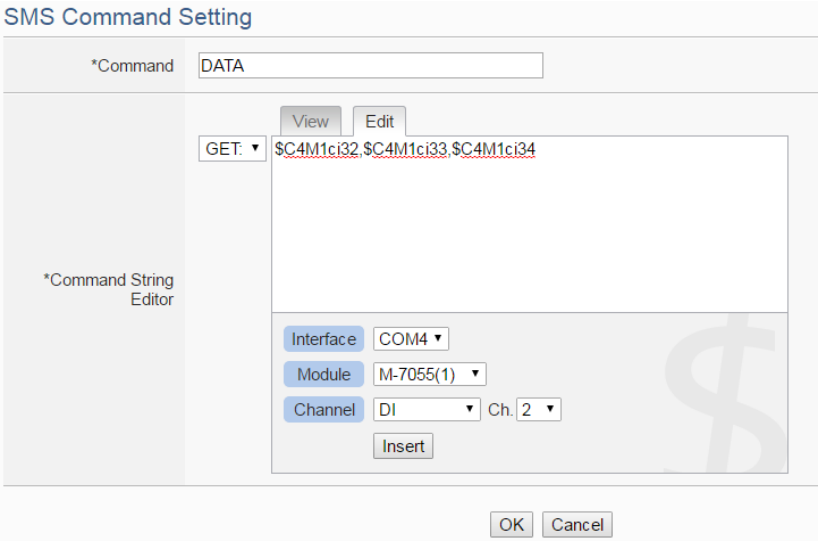


Figure 9-18：SMS command setting for GET command

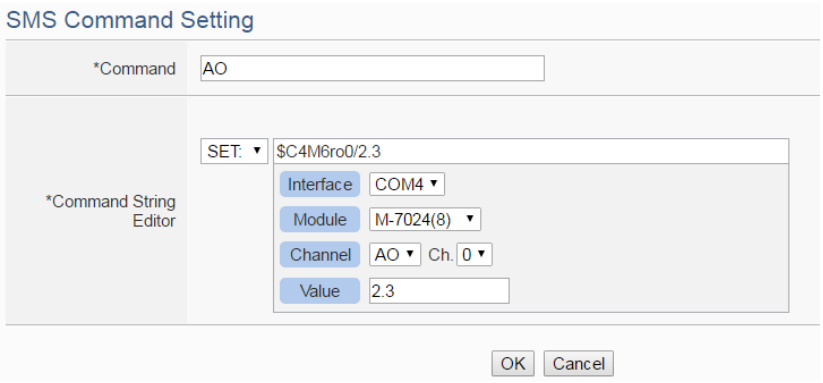


Figure 9-19：SMS command setting for SET command

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.

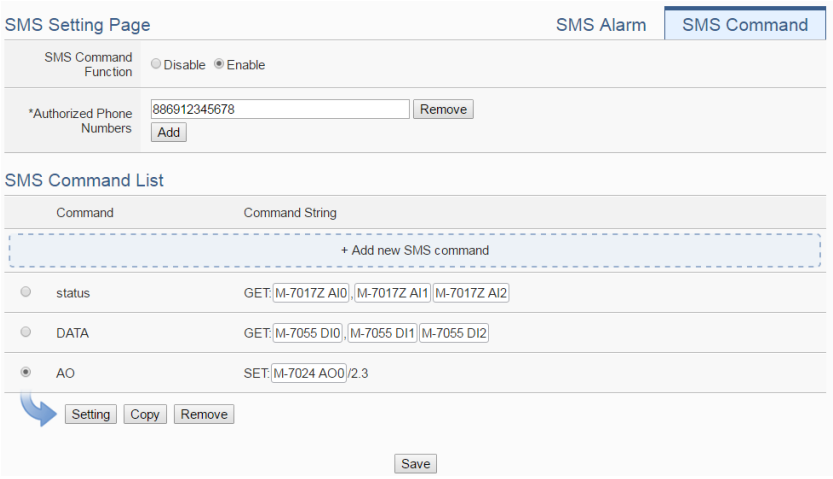


Figure 9-20：SMS command list

On Figure 8-18, taking the second SMS Command on the list as an example, when user send SMS message “DATA” to WISE-5231-3GWA, WISE-5231-3GWA 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-5231-3GWA, WISE-5231-3GWA will set the value of AO0 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-52xx 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:

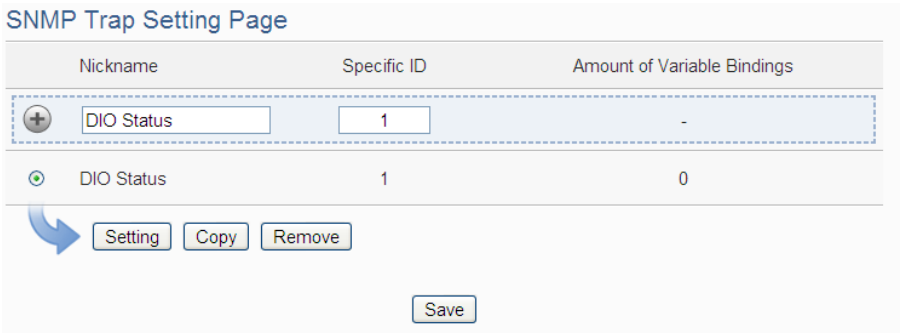


Figure 9-21：SNMP Trap List Page

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.

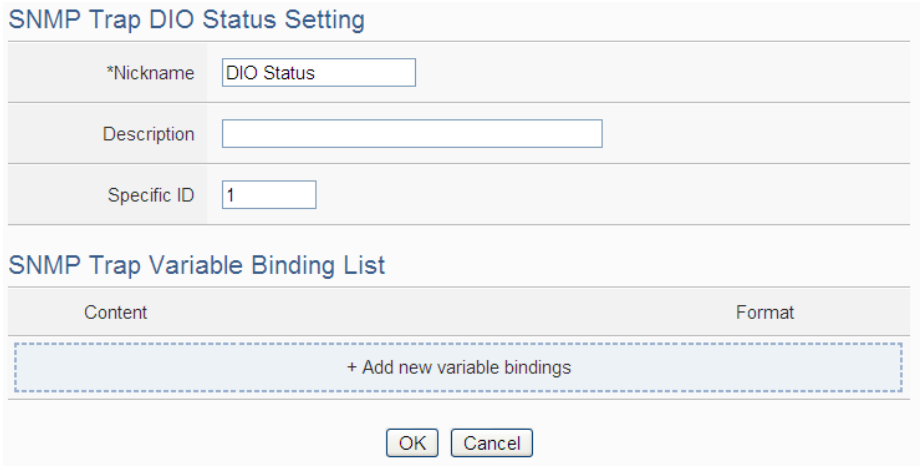


Figure 9-22：SNMP Trap Setting page

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-52xx 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

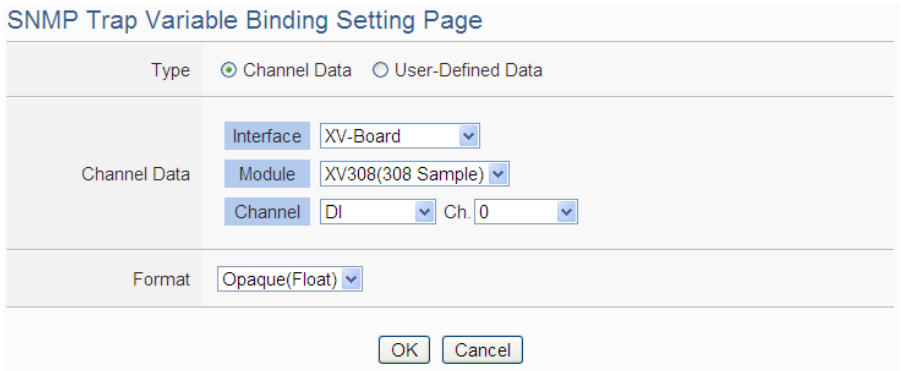


Figure 9-23：“Channel Data” Type Setting Page

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.

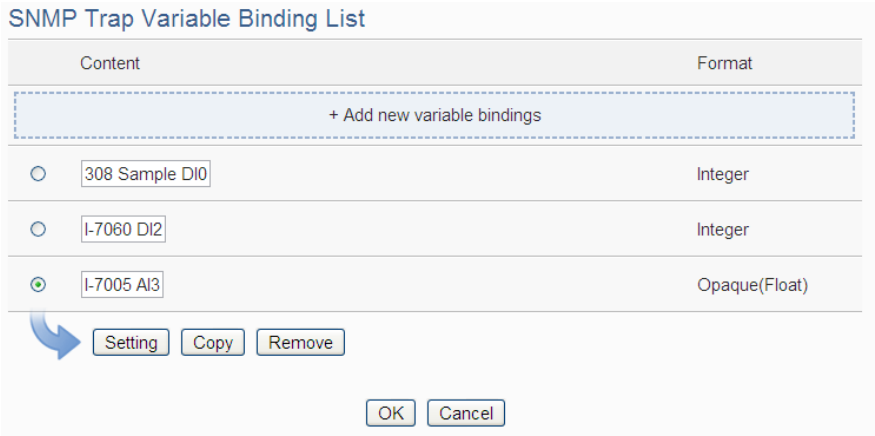


Figure 9-24：Example of "Channel Data" Type Variable Binding List

- "User-Defined Data" type

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

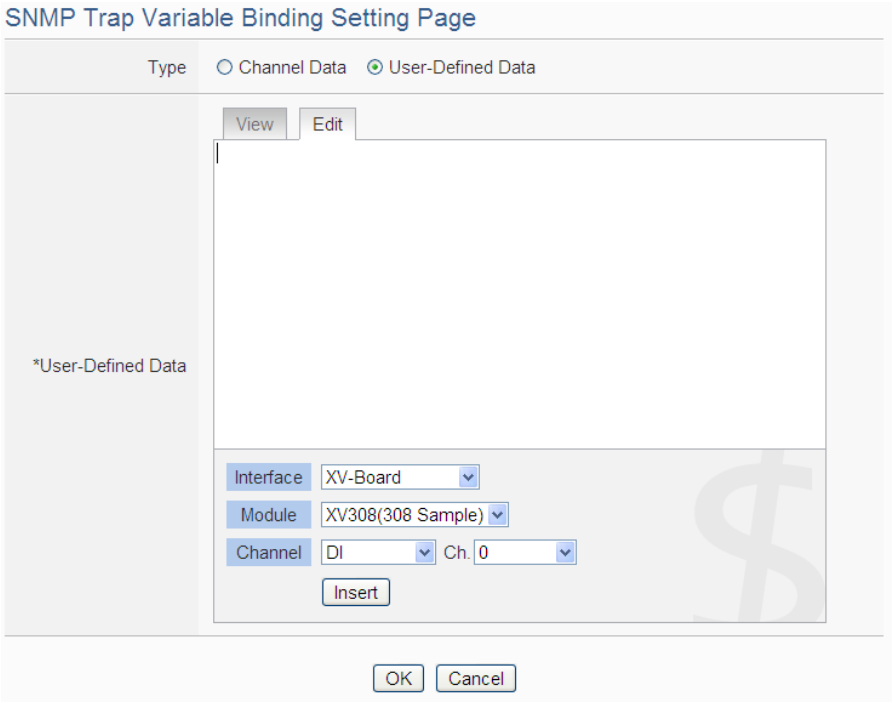


Figure 9-25："User-Defined Data" Type Setting Page

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.

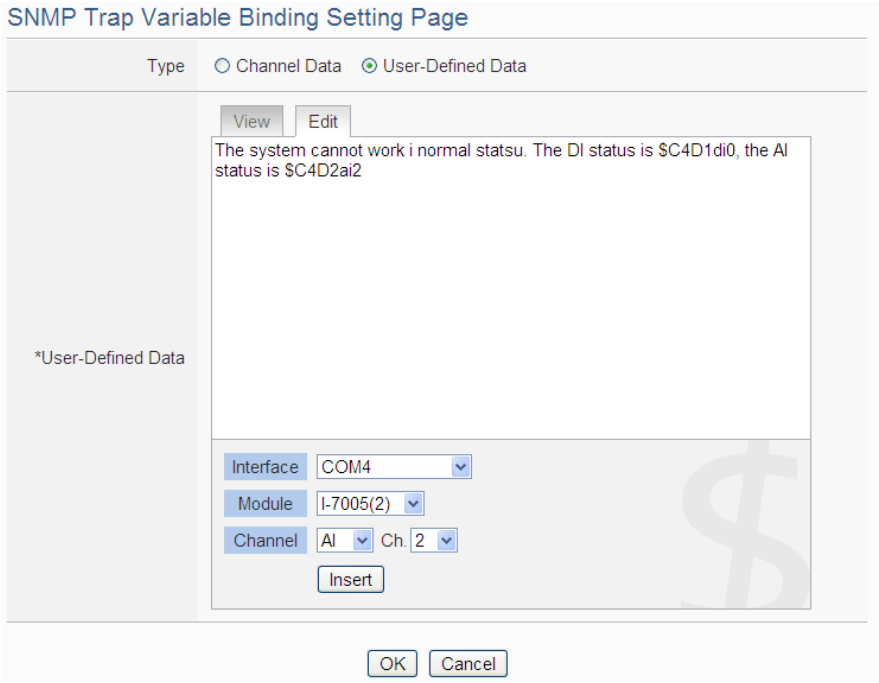


Figure 9-26：“User-Defined Data” Interface in Edit Mode

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.

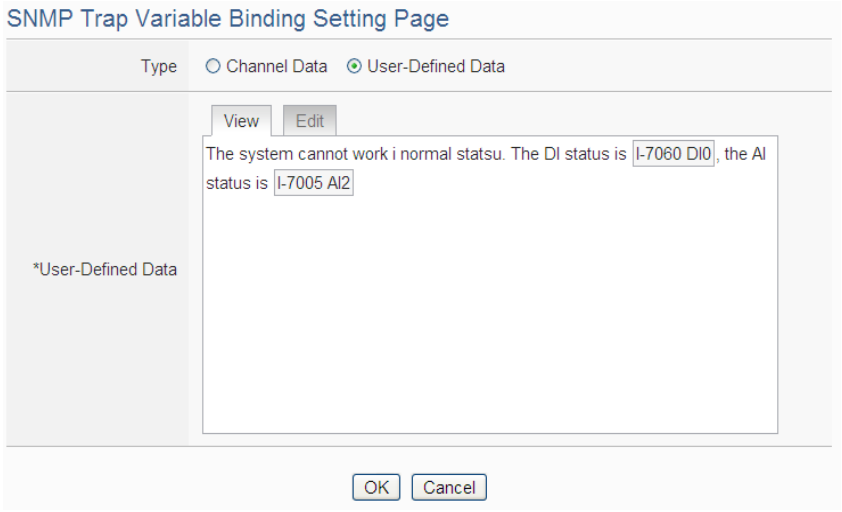


Figure 9-27：“User-Defined Data” Interface in View Mode

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

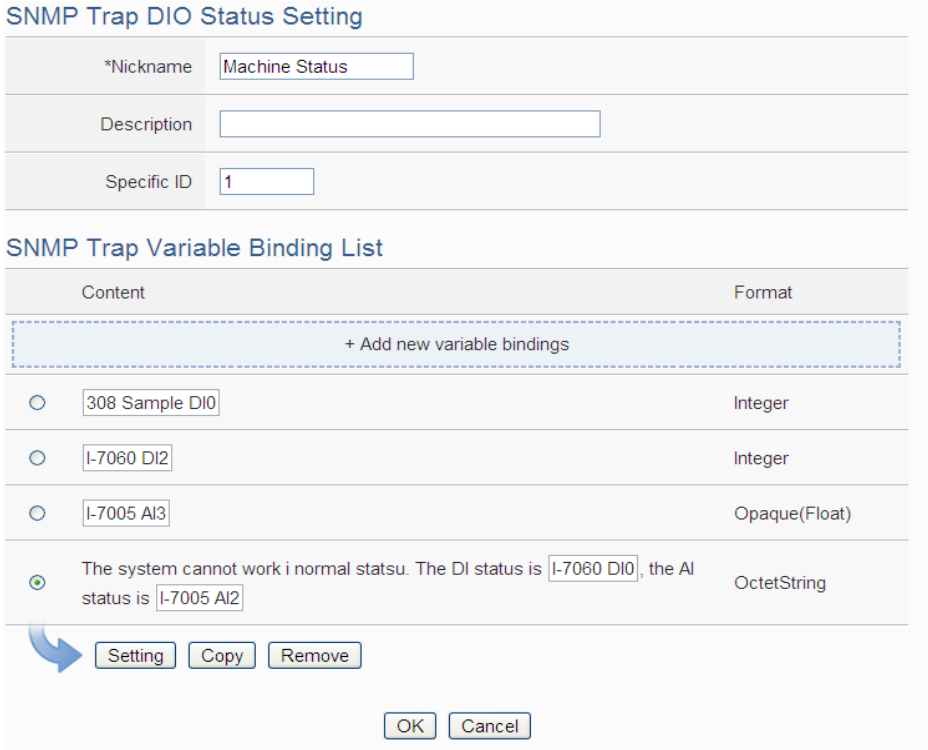


Figure 9-28：SNMP Trap setting with variable bindings list

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-52xx 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-52xx 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. 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-52xx 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:

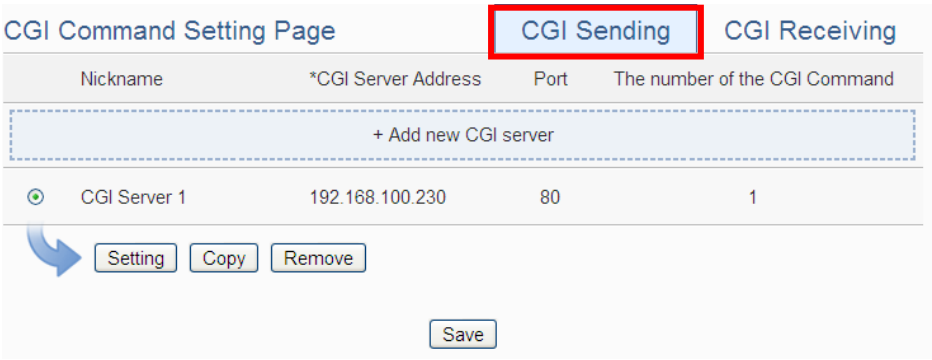


Figure 9-29：CGI Command Server List Page

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:

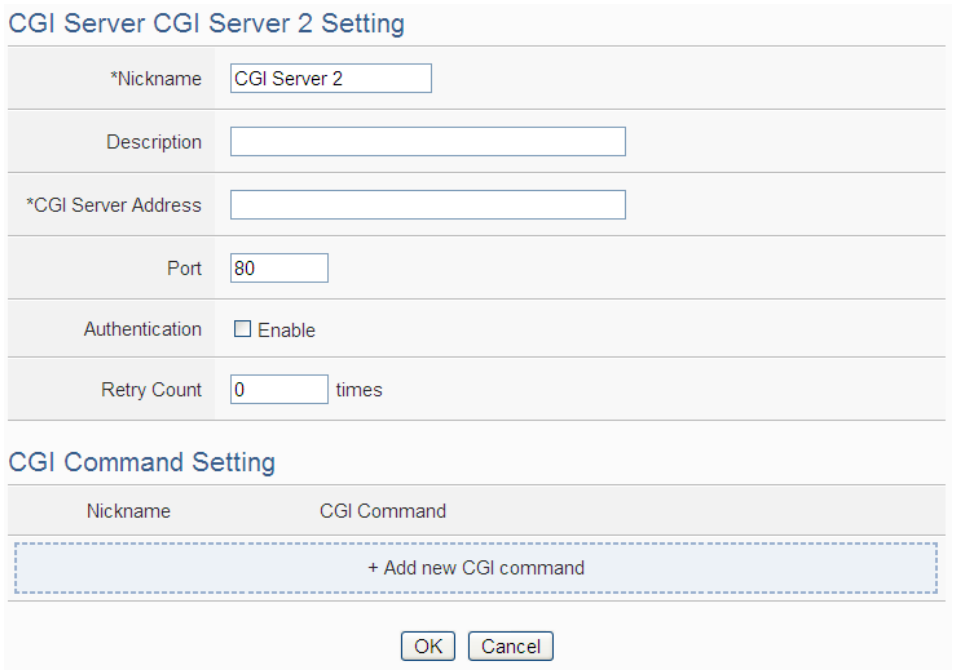


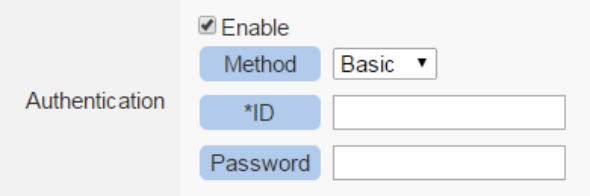
Figure 9-30：CGI Command Server Setting page

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.



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-52xx will try when it can’t connect to the remote CGI Server device.

xi 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:

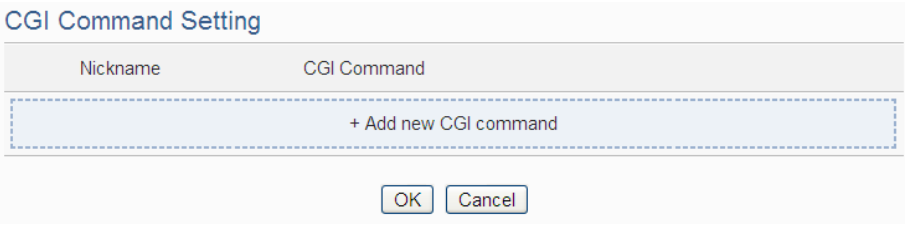


Figure 9-31：CGI Command List Page

xii Click on “Add new CGI Command” to add the new CGI Command which will be sent by WISE-52xx to the remote CGI Server. The setting page interface will be shown as below:

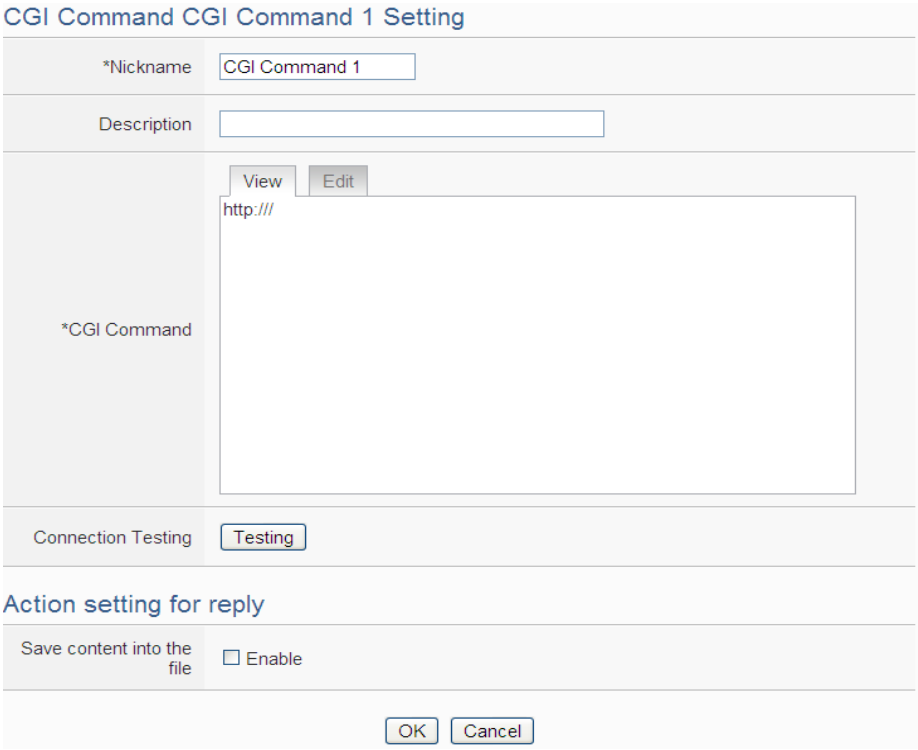


Figure 9-32：CGI Command (Sending) Setting page

xiii 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.

xiv 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".

xv 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-52xx will send the CGI Command the user entered to the remote CGI Server for testing.

xvi If the CGI Command send by WISE-52xx will trigger the CGI Server to send back a reply to WISE-52xx, users can select the "Enable" checkbox in the "Save content into the file" filed to enable WISE-52xx 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.

xvii After complete all settings, click the “OK” button to confirm the CGI Command setting, and return to the CGI Server Setting page.

xviii Repeat steps xii~ xvii to complete settings of all CGI Commands.

xix 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.

xx 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.

xxi To remove a pre-set CGI Command, please click the radio button in front of the pre-set CGI Command and then click “Remove”.

xxii After you finish all the CGI Command settings, click “OK” button to confirm the settings, and return to CGI Server List page.

xxiii Repeat steps i~ xxii to complete settings of all CGI Servers.

xxiv 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.

xxv 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.

xxvi To remove a pre-set CGI Server, please click the radio button in front of the pre-set CGI Server and then click “Remove”.

xxvii 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-52xx supports the CGI command receiving function. This function allows WISE-52xx 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:

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-52xx (with IP address 192.168.100.102). After WISE-52xx 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.

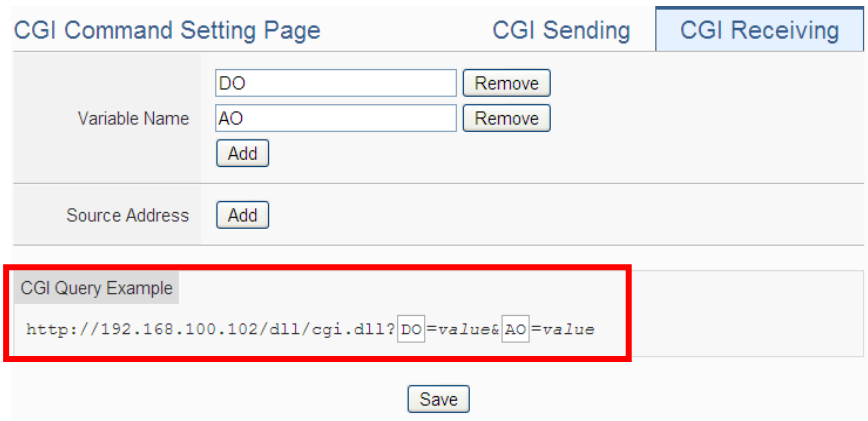


Figure 9-34：CGI Command (Receiving) Setting page (2)

iii Click on “Add” button in the “Source Address” field. It means WISE-52xx 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.

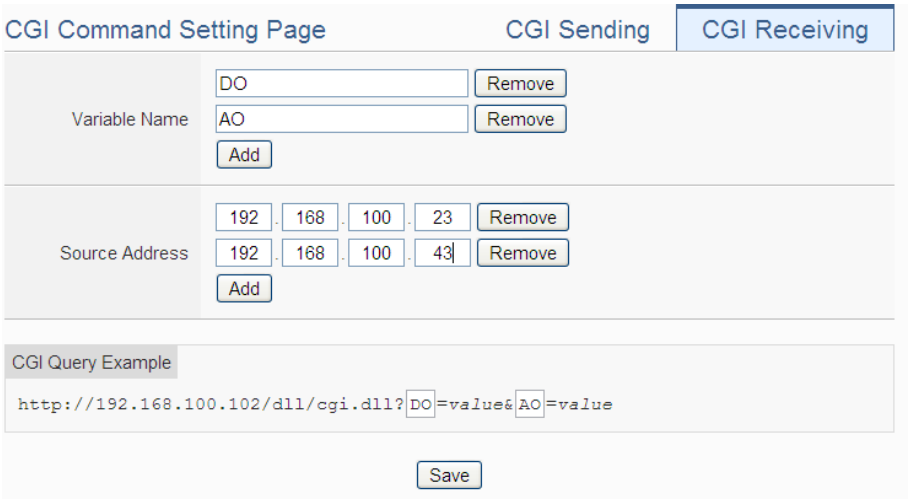


Figure 9-35：CGI Command (Receiving) Setting page (3)

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

9.8 Active I/O Sending Setting

WISE-52xx 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-52xx allows to connect with multiple I/O modules at the same time, however, the channel data of each I/O module that WISE-52xx received is located in the different Modbus Address memory block of WISE-52xx. 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-52xx I/O modules’ channels data at one time. In order to improve the efficient of the data communication between WISE-52xx and SCADA software, WISE-52xx 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-52xx.

9.8.1 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.

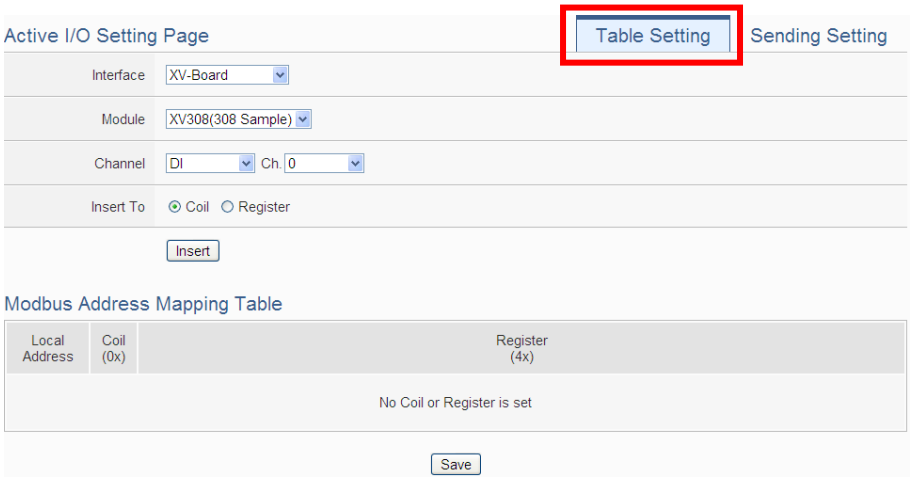


Figure 9-36：I/O Data Table Setting page (1)

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.

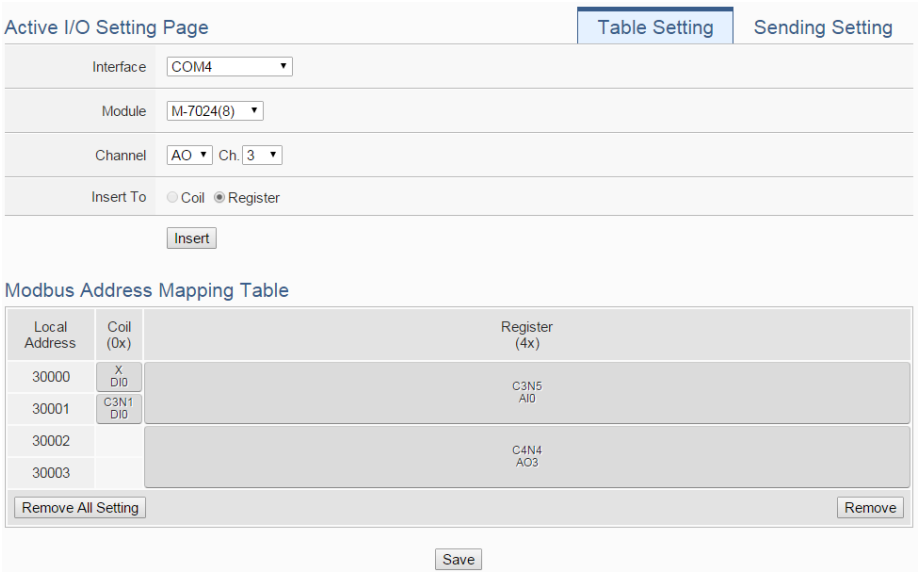


Figure 9-37：I/O Data Table Setting page (2)

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.

9.8.2 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.

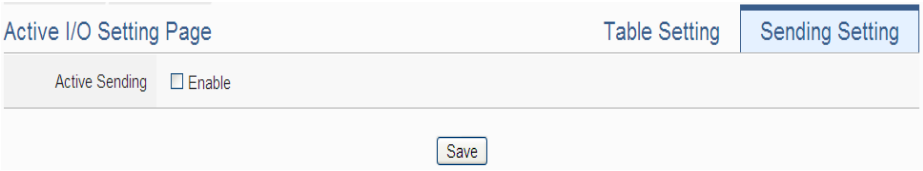


Figure 9-38：“Active Sending of I/O Data Table” Setting page (1)

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

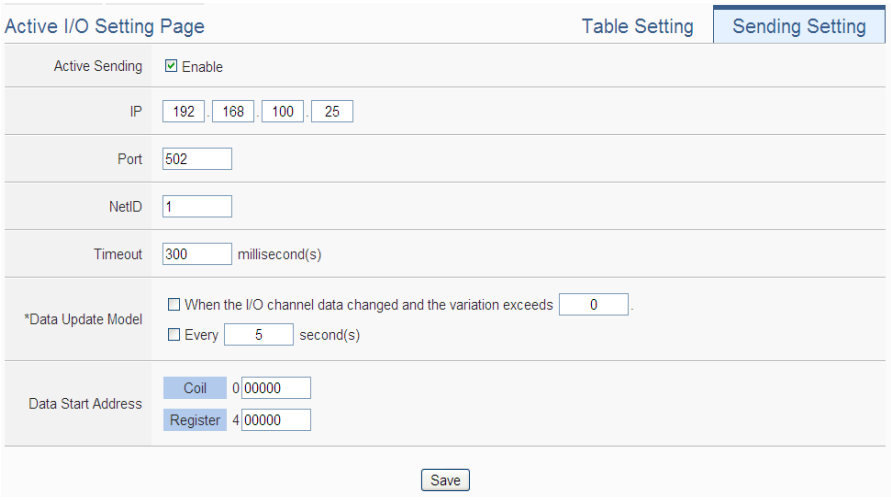


Figure 9-39：“Active Sending of I/O Data Table” Setting page (2)

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-52xx 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-52xx.

vi After you finish the “Active I/O sending” settings, click “Save” button to save the settings.

9.9 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-52xx 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.

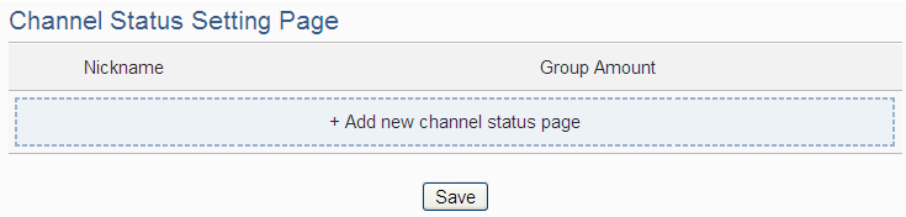


Figure 9-40：Channel Status List Page

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.

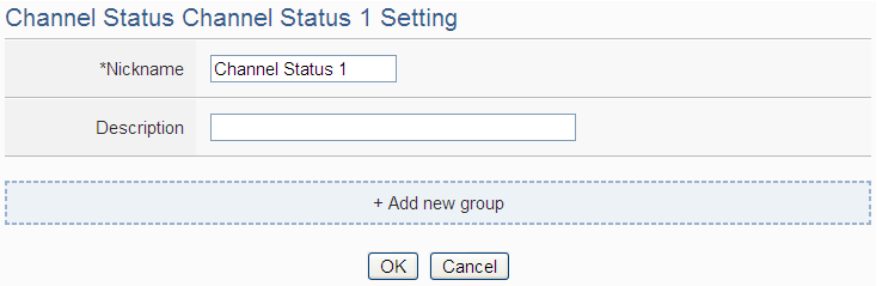


Figure 9-41：Channel Status Setting Page

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

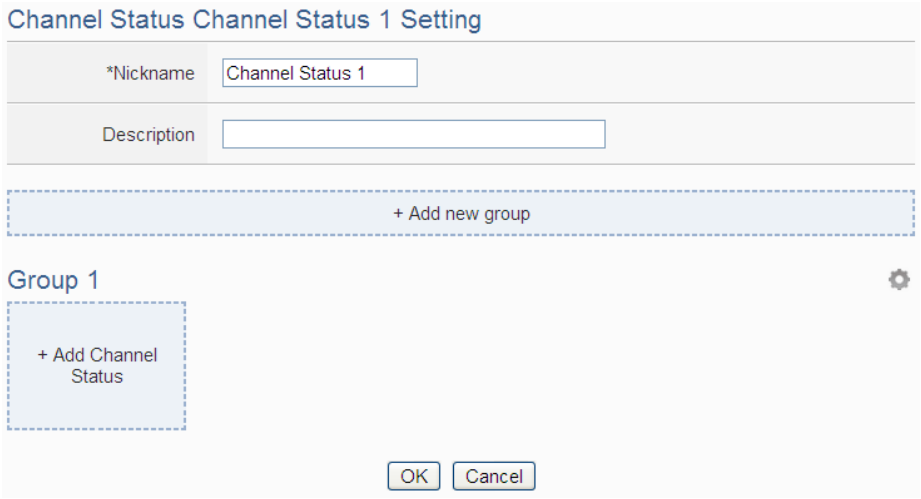


Figure 9-42：Add a new group

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.

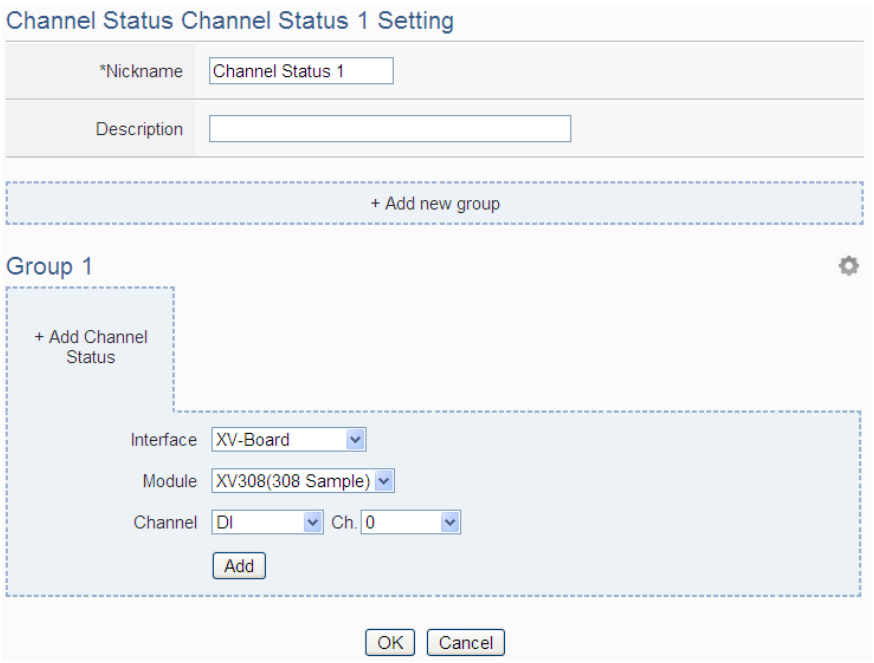


Figure 9-43：Add I/O Channels into Group

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

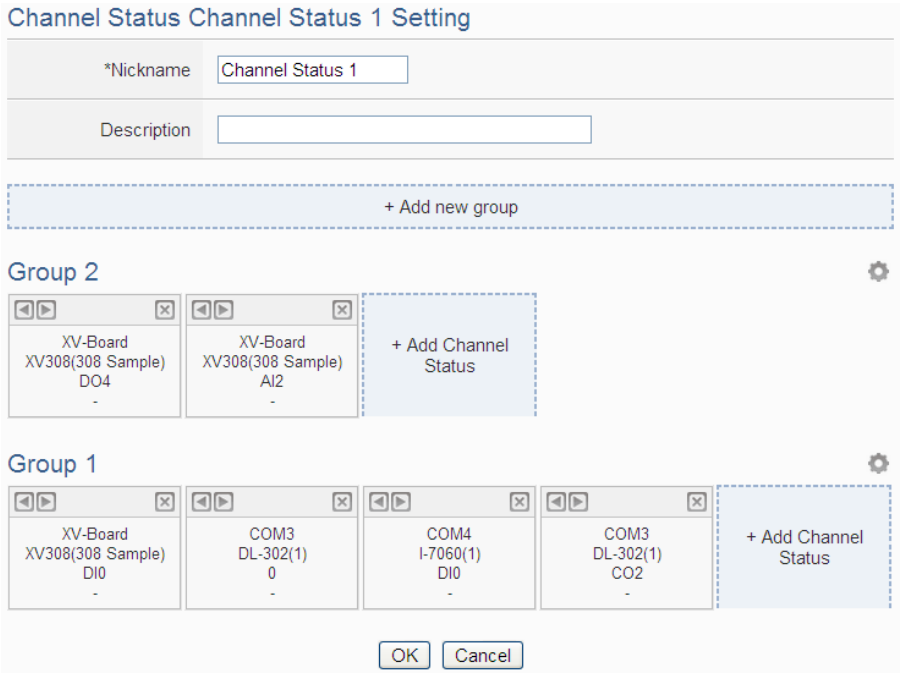


Figure 9-44：Multi-Groups Setting in User-defined Channel Status page

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.

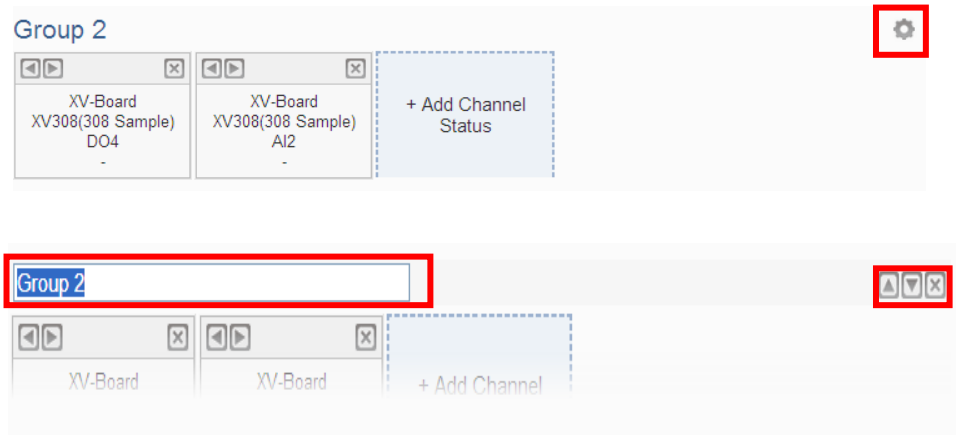


Figure 9-45：Tool bar of User-defined Channel Status page

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.

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:

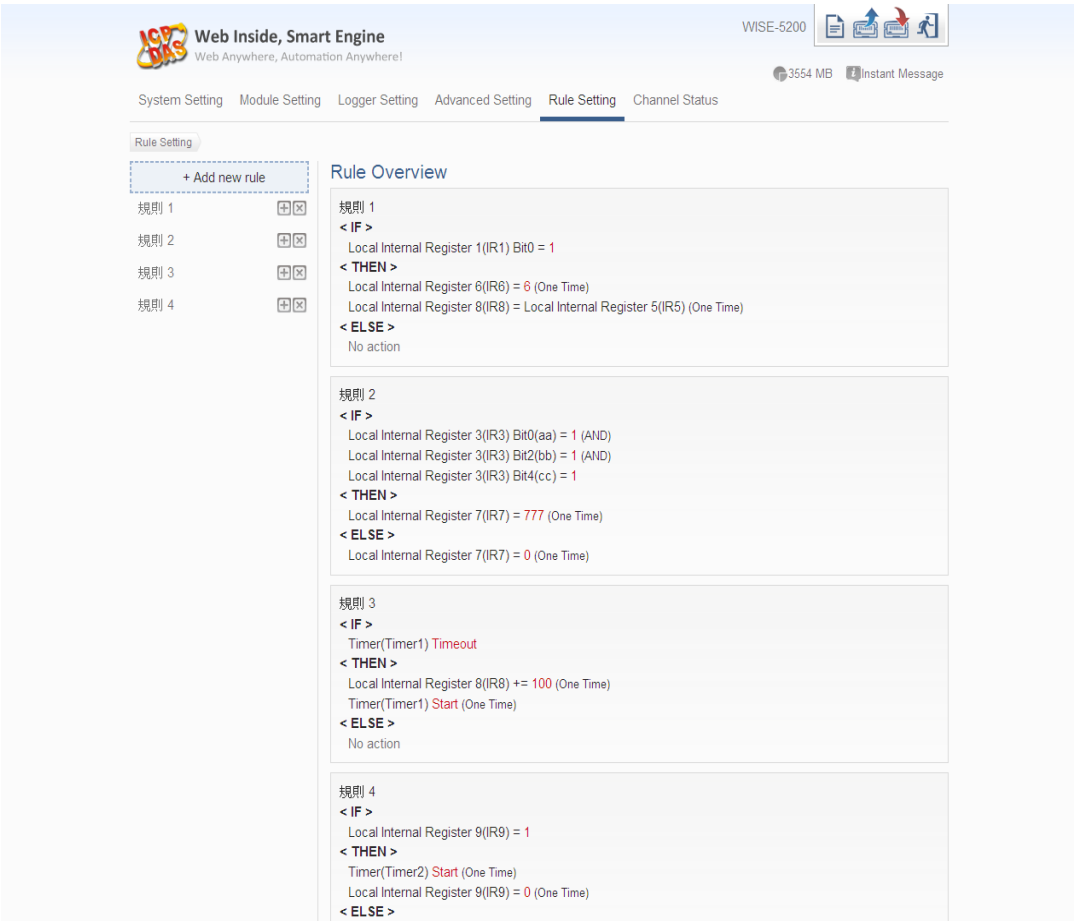


Figure 10-1：Rules overview page

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).

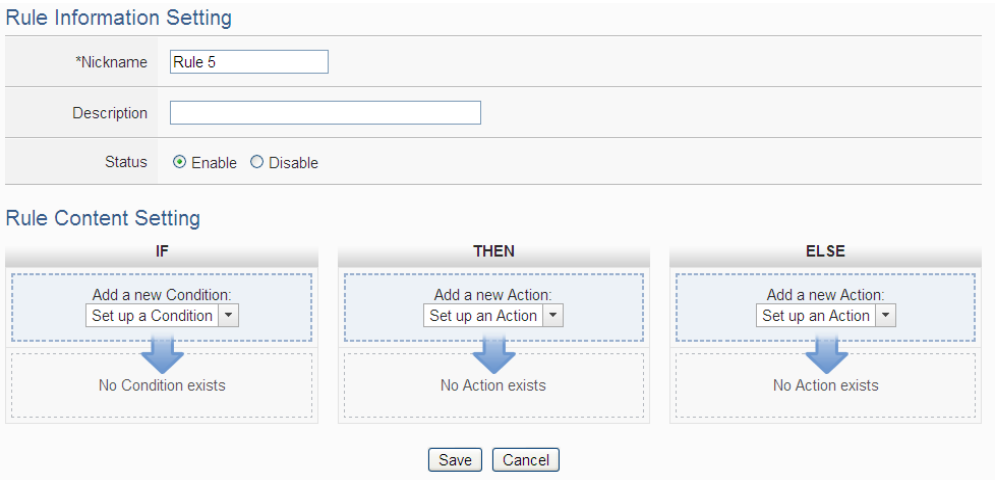
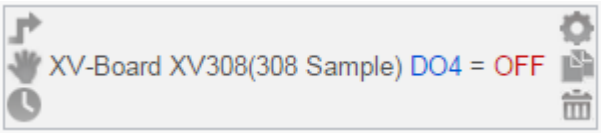


Figure 10-2：Rules Setting page

- **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.

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
- CGI Command
- Microsoft Azure
- IBM Bluemix
- MQTT
- Connection Status
- Timer
- Schedule
- SD Card Status
- Internal Register
- Rule Status

If the WISE-52xx 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:

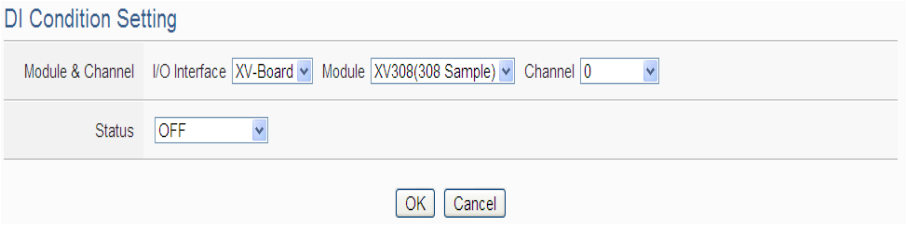


Figure 10-3：DI condition setting page

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:

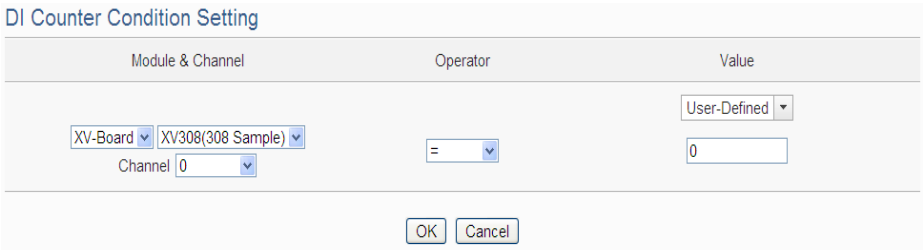


Figure 10-4：DI Counter condition setting page

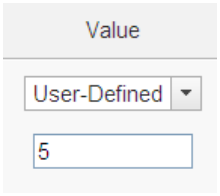
Follow the steps below:

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".

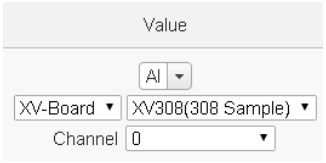
iii Specify the evaluation value. If this DI counter value match the evaluation criteria, the result of this condition evaluation will be "true". WISE-52xx provides the following 6 values options; you can compare them with the DI counter value for condition evaluation. Please note: If the statement involves 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.

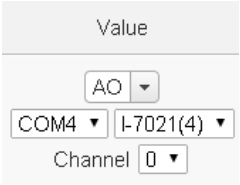


- Internal Register: The "Internal Register" value could be used as evaluation criteria; select the "Source" and the number of the Internal Register from the dropdown list. The "Local" in the "Source" field mean the Internal Register is from the Host controller (WISE-52xx). The "Remote" in the "Source" field mean the Internal Register is from the remote WISE controller.

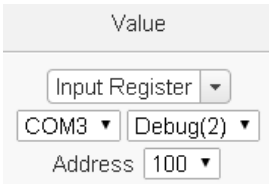
- AI: The AI channel value from other ICP DAS I/O modules could be used as evaluation criteria; select the module and the channel from the dropdown list to specify which channel value will be used.



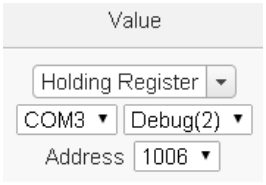
- AO: The AO channel value from other ICP DAS I/O modules could be used as evaluation criteria; select the module and the channel from the dropdown list to specify which channel value will be used.



- 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.



- 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.



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:

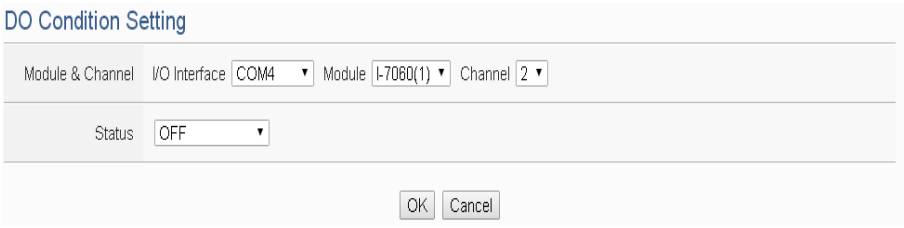


Figure 10-5：DO condition setting page

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:

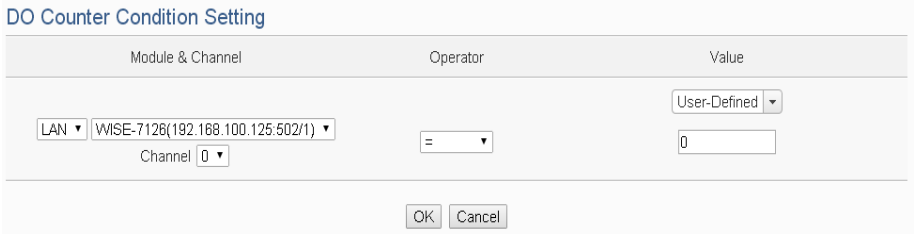


Figure 10-6：DO Counter condition setting page

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-52xx provides 6 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:

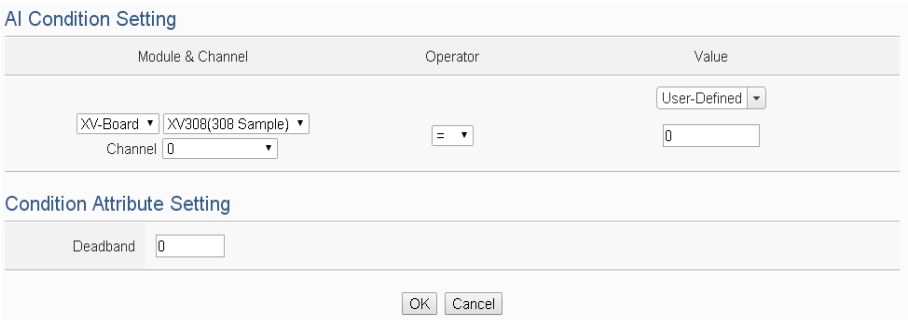


Figure 10-7：AI condition setting page

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-52xx provides 6 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.

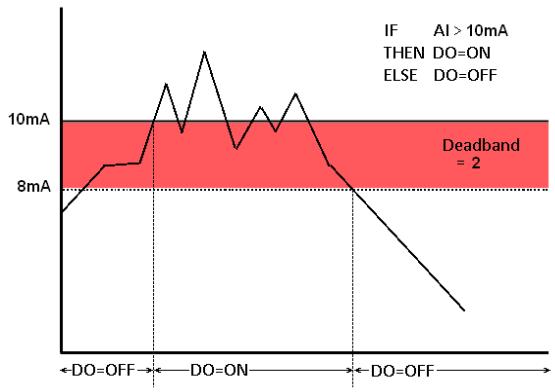


Figure 10-9：AI Deadband Operation (> or >= a numerical value)

(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.

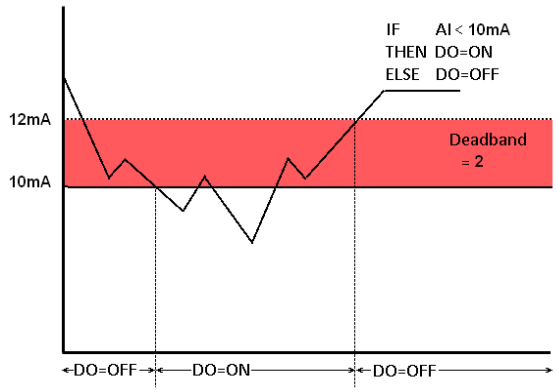


Figure 10-10：AI Deadband Operation (< or <= a numerical value)

(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.

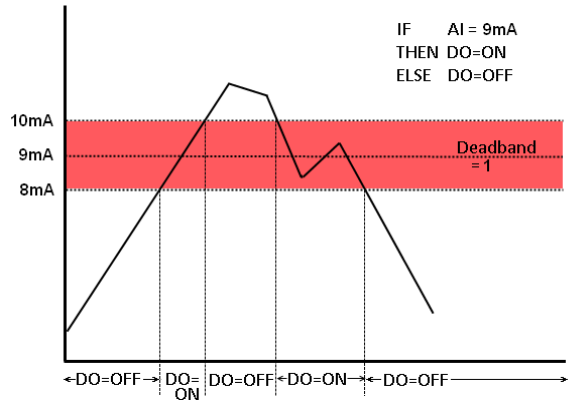


Figure 10-11：AI Deadband Operation (= a numerical value)

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:

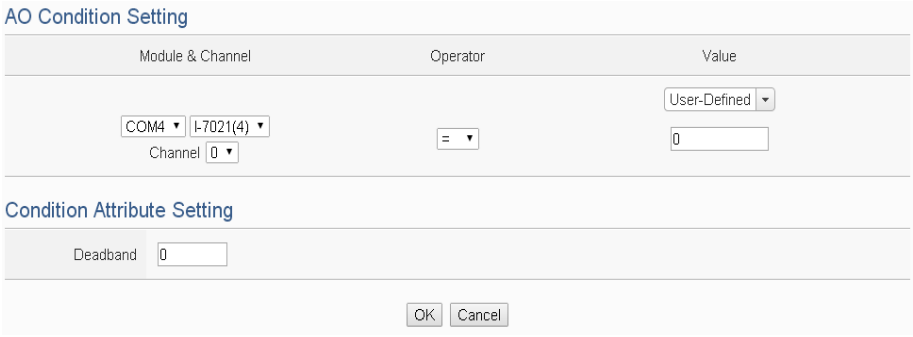


Figure 10-12：AO condition setting page

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-52xx provides 6 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:

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" or "ON".

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:

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" or "ON".

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:

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-52xx provides 6 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-52xx provides 6 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 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:

Figure 10-17：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-52xx provides 6 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.

10.1.4 Microsoft Azure

Click on Microsoft Azure, 2 options will appear as the following: " Connection Status" and " Subscribe Message".

10.1.4.1 Connection Status

The Connection Status between WISE-52xx 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:

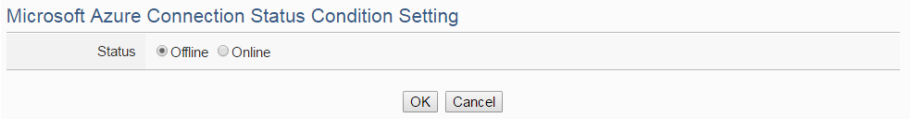


Figure 10-18：Microsoft Azure Connection Status condition setting page

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.

10.1.4.2 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:

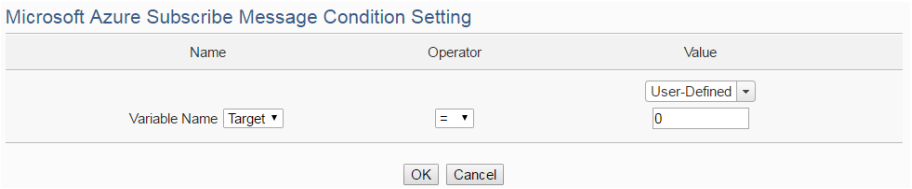


Figure 10-19：Microsoft Azure Subscribe Message condition setting page

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-52xx provides 6 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.

10.1.5 IBM Bluemix

Click on IBM Bluemix, 2 options will appear as the following: " Connection Status" and " Subscribe Message".

10.1.5.1 Connection Status

The Connection Status between WISE-52xx 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:

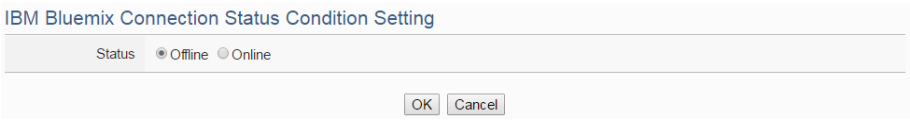


Figure 10-20：IBM Bluemix Connection Status condition setting page

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.

10.1.5.2 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:

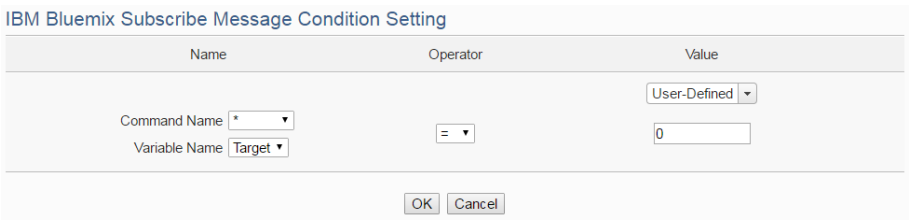


Figure 10-21：IBM Bluemix Subscribe Message condition setting page

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-52xx provides 6 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 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:

10.1.6.1 Broker Connection Status

The Broker connection status can be included in the IF condition statements; the editing page is shown as below:

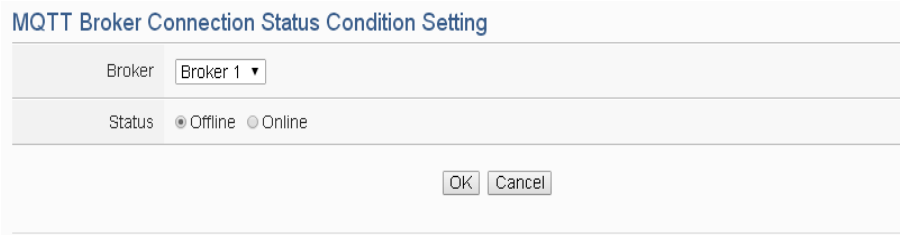


Figure 10-22：Broker Connection Status condition setting page

Follow the steps below:

iii Specify the Broker from the dropdown list of "Broker" field that you are going to include its connection status in the IF condition statements.

iv 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".

v Click “OK” button to confirm the settings and return to the Rule settings page.

10.1.6.2 Subscribe Topic

The content of the Subscribe Topic can be included in the IF condition statements; the editing page is shown as below:

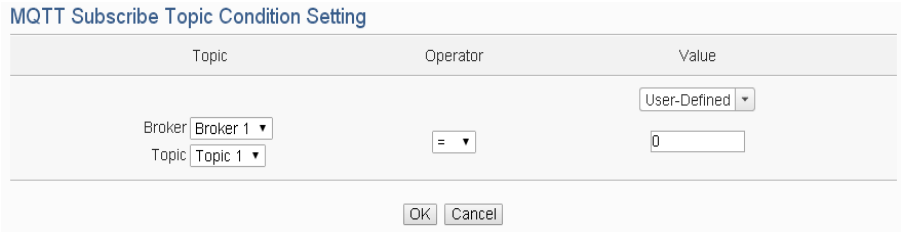


Figure 10-23：Subscribe Topic condition setting page

Follow the steps below:

v 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.

vi Set up the expression statement for the content of this Subscribe Topic. Select an operator from “=”, “>”, “<”, “>=” or “<=”.

vii 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-52xx provides 6 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.

viii Click “OK” button to confirm the settings and return to the Rule settings page.

10.1.7 Connection Status

Connection Status can be included in the IF condition statements; the editing page for Connection Status Condition Setting is shown as below:

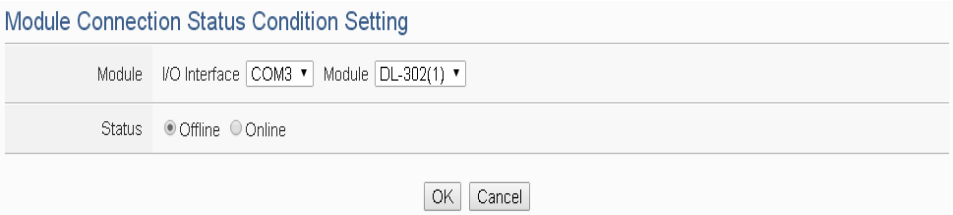


Figure 10-24：Connection Status condition setting page

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.

10.1.8 Timer

Timer condition can be used as evaluation criteria for IF condition statement; the editing page for timer condition setting is shown as follow:

Figure 10-25：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.

10.1.9 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 10-26：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.

10.1.10 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:

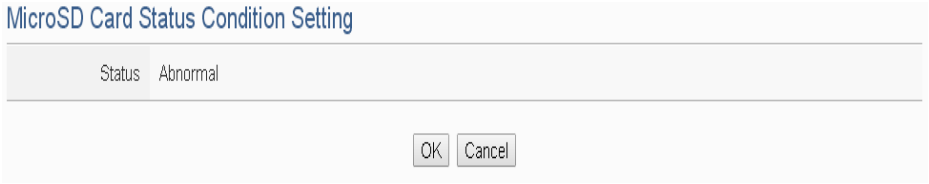


Figure 10-27：SD Card Status condition setting page

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.

10.1.11 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:

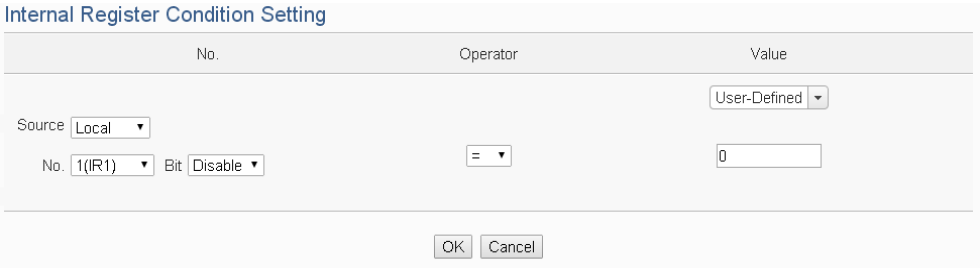


Figure 10-28：Internal Register condition setting page

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-52xx). 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-52xx provides 6 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.

10.1.12 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:

Figure 10-29：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.

10.2 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
- Microsoft Azure
- IBM Bluemix
- MQTT
- Timer
- Email
- SMS Alarm
- CGI Command
- Data Logger
- SNMP Trap
- Re-boot System
- Internal Register
- Rule Status

If the WISE-52xx 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-52xx 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:

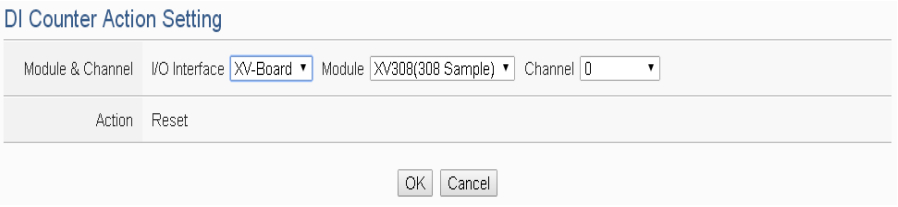


Figure 10-30：DI Counter action setting page

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:

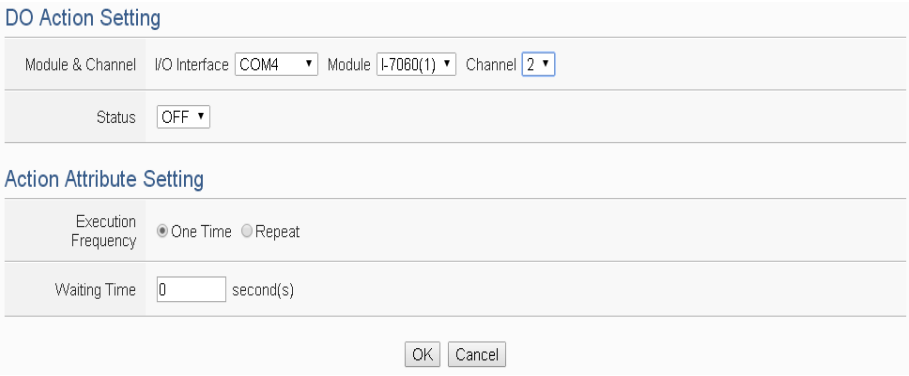


Figure 10-31：DO action setting page

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).

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:

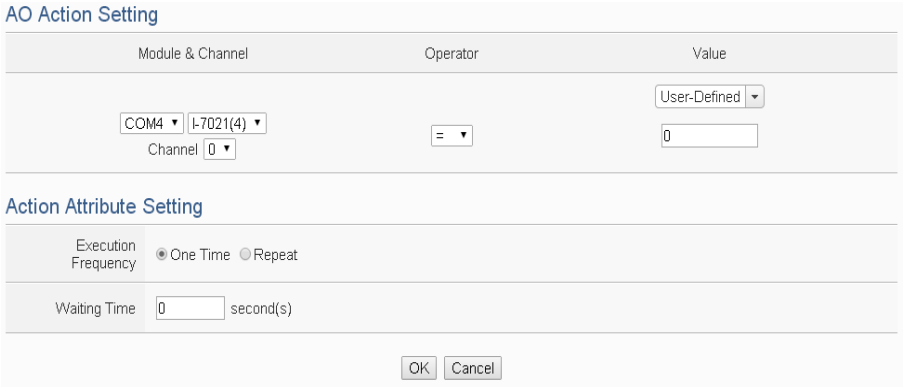


Figure 10-32：AO action setting page

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.

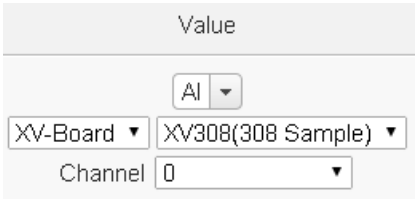
iii Set up the value in the “Value” field, WISE-52xx provides the following 6 value options to be used in the “Value” field:

- User-Defined: Input a User-Defined value under the “Value” field.

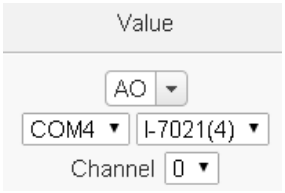
- Internal Register: Select the source and the number of the Internal Register from the dropdown list. About the “Source” field, the “Local” mean the Internal Register is from the Host controller (WISE-52xx). The “Remote”

mean the Internal Register is from the others remote WISE controller.

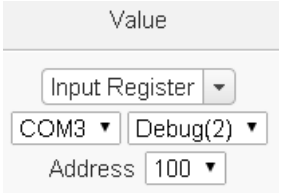
- AI: Using AI channel values from ICP DAS I/O Module, select the module and channel from the dropdown list to specify which channel value will be used.



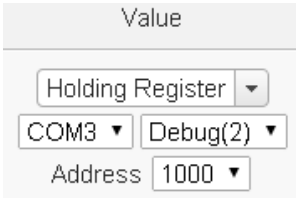
- AO: using AO channel values from ICP DAS I/O Module, select the module and channel from the dropdown list to specify which channel value will be used.



- 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.



- 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.



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).

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:

Figure 10-33：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).

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:

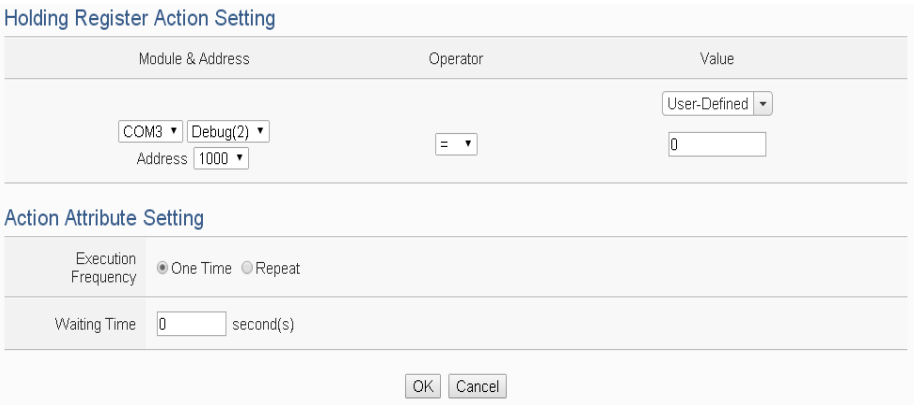


Figure 10-34：Holding Register action setting page

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-52xx 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).

vi Click "OK" button to confirm the settings and return to the Rule settings page.

10.2.3 Microsoft Azure

Click on "Microsoft Azure", 2 options will appear as the following: "Function Status" and "Publish Message".

10.2.3.1 Function Status

User can execute an action to change the connection operation between Microsoft Azure and WISE-52xx in the THEN/ELSE Action statement; the editing page is shown as follow:

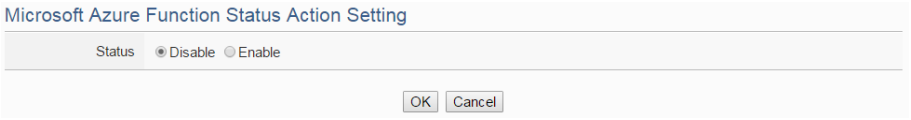


Figure 10-35：Microsoft Azure Function Status action setting page

Follow the steps below:

i Specify the connection operation between Microsoft Azure and WISE-52xx 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.

10.2.3.2 Publish Message

You can publish messages to Microsoft Azure when executing a THEN/ELSE Action statement; the editing page is shown as below:

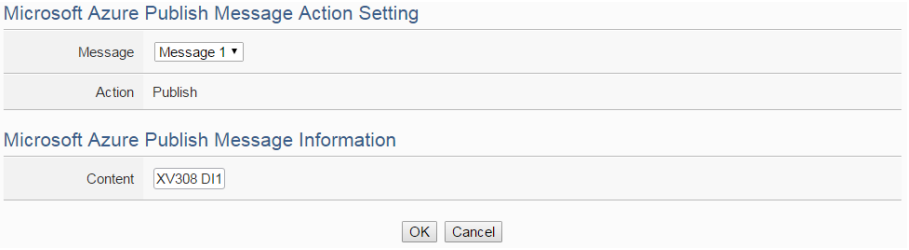


Figure 10-36：Microsoft Azure Publish Message action setting page

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 IBM Bluemix

Click on "IBM Bluemix", 2 options will appear as the following: "Function Status" and "Publish Message".

10.2.4.1 Function Status

User can execute an action to change the connection operation between IBM Bluemix and WISE-52xx in the THEN/ELSE Action statement; the editing page is shown as follow:

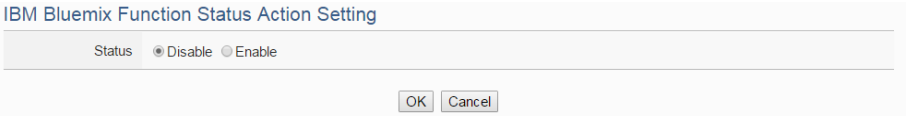


Figure 10-37：IBM Bluemix Function Status action setting page

Follow the steps below:

i Specify the connection operation between IBM Bluemix and WISE-52xx 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 IBM Bluemix when executing a THEN/ELSE Action statement; the editing page is shown as below:

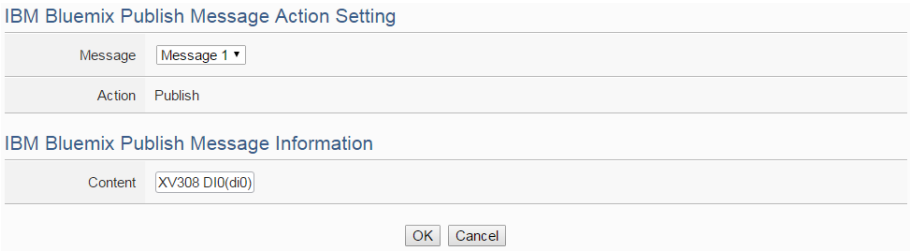


Figure 10-38：IBM Bluemix Publish Message action setting page

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 MQTT

Click on "MQTT", 2 options will appear as the following: "Broker Function" and "Publish Message".

10.2.5.1 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:

Figure 10-39：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.

10.2.5.2 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:

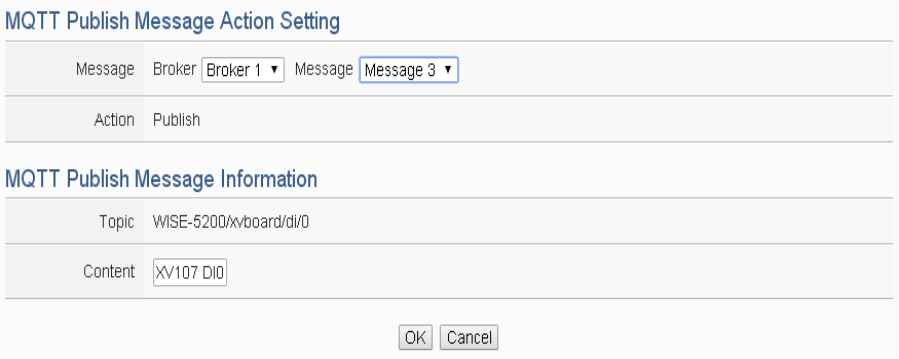


Figure 10-40：Publish Message action setting page

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 Timer

You can change the Timer status in the THEN/ELSE Action statement; the editing page for Timer Action Setting is shown as below:

Figure 10-41：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.

10.2.7 Email

You can send an Email message to an Email group when executing a THEN/ELSE Action statement; the editing page is as below:

Figure 10-42：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.

10.2.8 SMS Alarm

You can send a specific SMS Alarm message when executing a THEN/ELSE Action statement.The setting page is show as below:

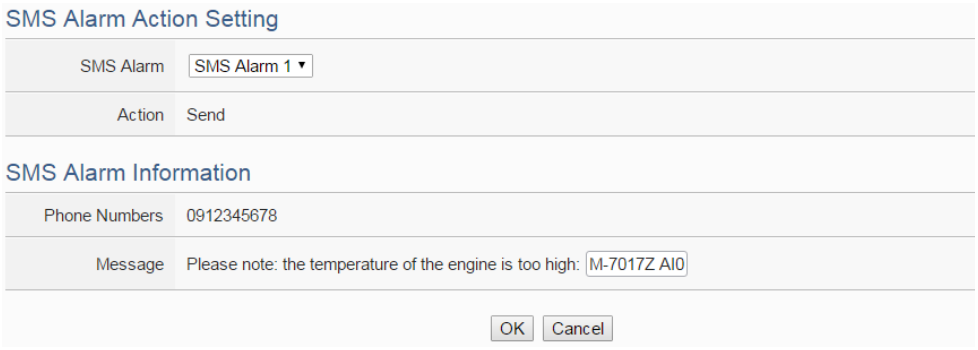


Figure 10-43：SMS Alarm action setting page

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.

10.2.9 CGI Command

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:

Figure 10-44：CGI Command action setting page

Follow the steps below:

iii 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.

iv Click "OK" button to confirm the settings and return to the Rule settings page.

10.2.10 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:

Figure 10-45：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.

10.2.11 SNMP Trap

You can send a specific SNMP Trap when executing a THEN/ELSE Action statement. The setting page is show as below:

Figure 10-46：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.

10.2.12 Re-boot System

You can reboot the WISE system when executing a THEN/ELSE Action statement. The setting page is show as below:

Figure 10-47：Reboot system action setting page

Follow the steps below:

i Click “OK” button to confirm the settings and return to the Rule settings page.

10.2.13 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:

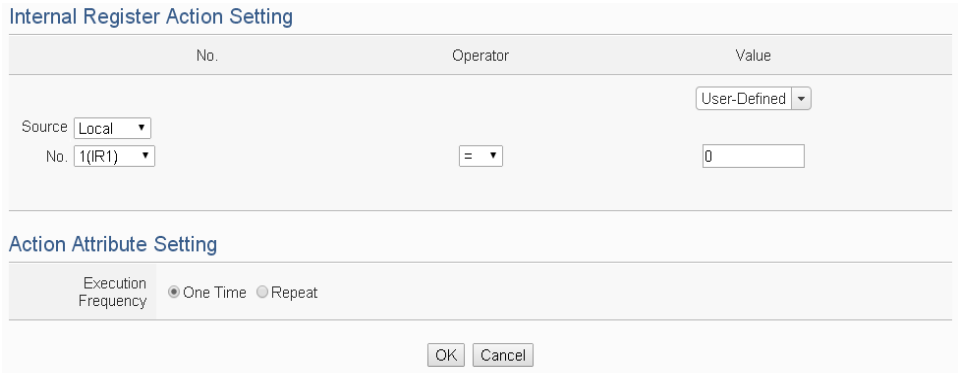


Figure 10-48：Internal Register action setting page

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-52xx). 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-52xx 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.

10.2.14 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:

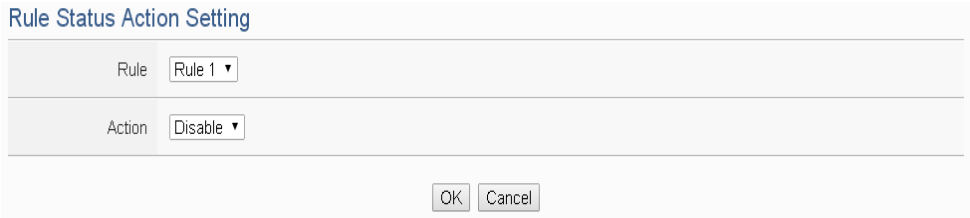


Figure 10-49：Rule Status action setting page

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.

11 Download to Module

The "Save" button on the right upper of WISE-52xx Web page allows to save all parameter settings and Rule settings to WISE-52xx. When there is a change being made on the WISE-52xx, such as add new logic or modify the settings, Click on the "Save" button to start the process.

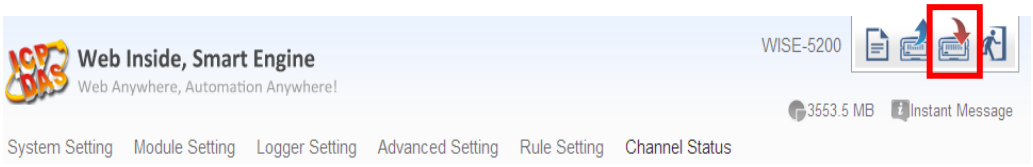


Figure 11-1：“Save” button of Rules management toolbar

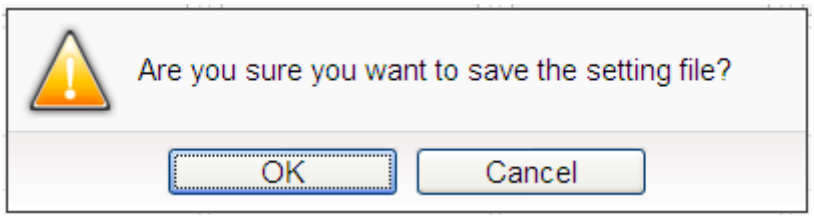


Figure 11-2：Confirm to save settings

Click "OK" button to complete the process and save all parameter settings and Rule settings from the web page of WISE-52xx to the WISE-52xx 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.

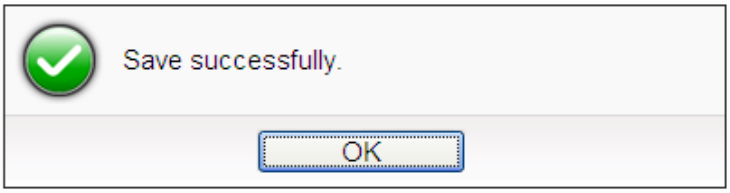


Figure 11-3：Save settings successfully

12 Upload from Module

The “Load” button on the right upper of WISE-52xx Web page allows you to retrieve the setting and rules information from the WISE-52xx hardware to the Web page of WISE-52xx. Click on the “Load” to start the process.

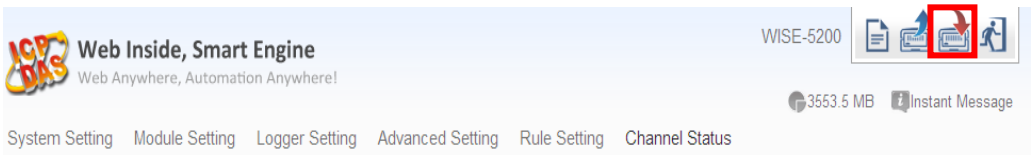


Figure 12-1：“Load” button of Rules management toolbar

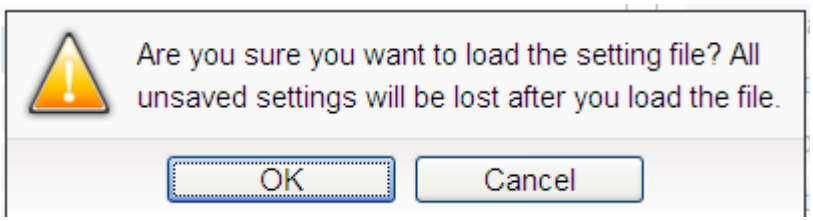


Figure 12-2：Confirm to load settings

Click “OK” button to complete the process and load all parameter settings and Rule settings from the WISE-52xx hardware to the web page of WISE-52xx. Now you can modify and download the edited rules to the hardware devices later again.

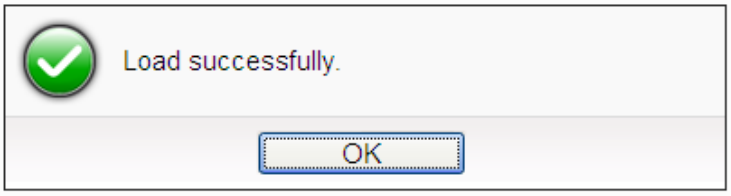


Figure 12-3：Load settings successfully

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. 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-52xx's Internal Register status.
- Event Log List: It displays the system event of WISE-52xx.
- Log File List: It displays the WISE-52xx'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.
- CGI file list: It displays the file list which WISE-52xx creates and save the reply content from the remote CGI Servers.

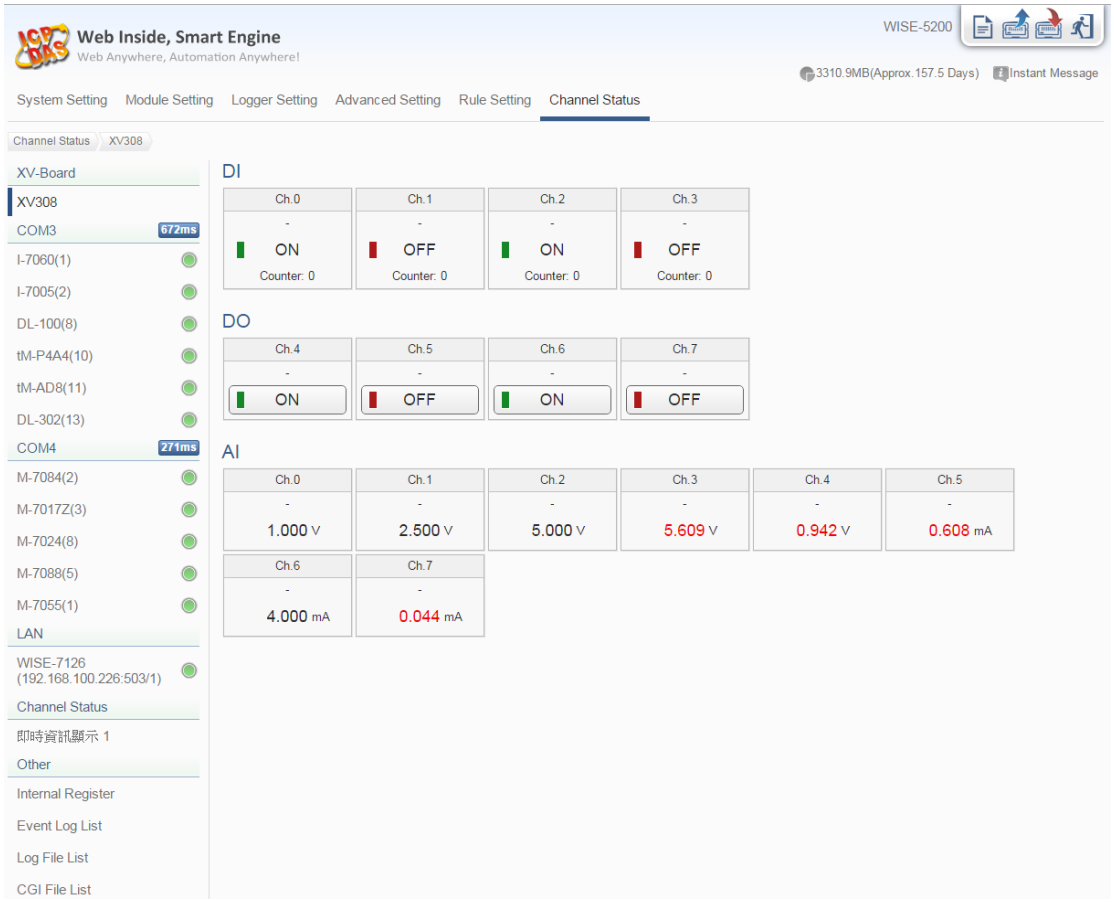


Figure 13-1：Channel Status page

14 Firmware Update

WISE-52xx allows to update firmware via browser, after the update is completed; the WISE-52xx 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-52xx firmware program. Copy the file to the computer that you will use to connect with WISE-52xx via browser.
   - Connect the WISE-52xx (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-52xx firmware. Connect the browser with the IP address of the WISE-52xx Web page.

iii. Login in the WISE-52xx as the Administrator.

iv. Go to "System Setting" page, under the "Firmware Update Setting" section, click on "Browse".

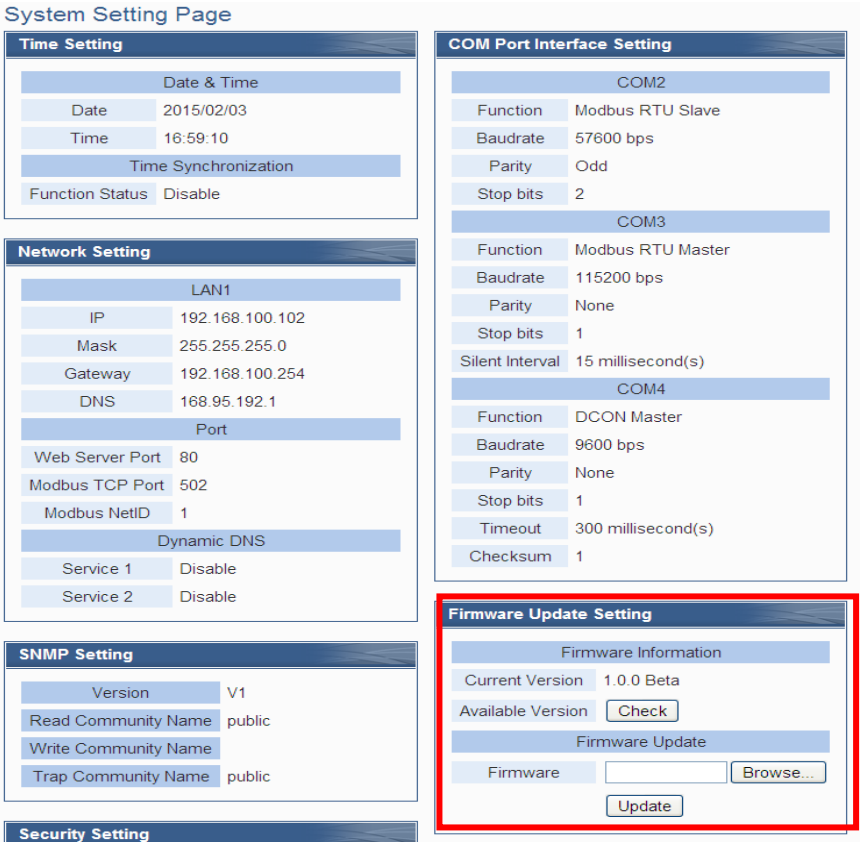


Figure 14-1：Firmware Update Setting page

v. Browse through to select the new firmware file and click “Open”.

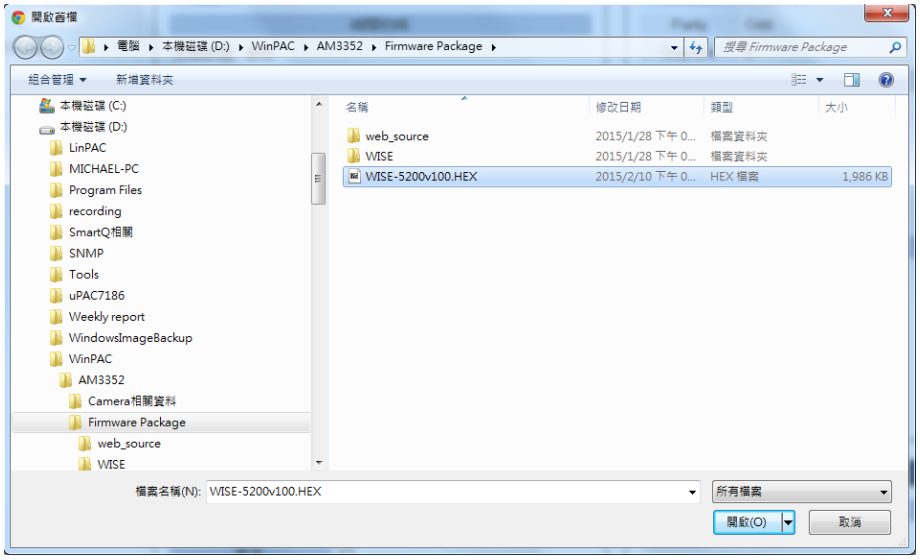


Figure 14-2：Firmware Update (1)

vi. Click “Update” to update the firmware.

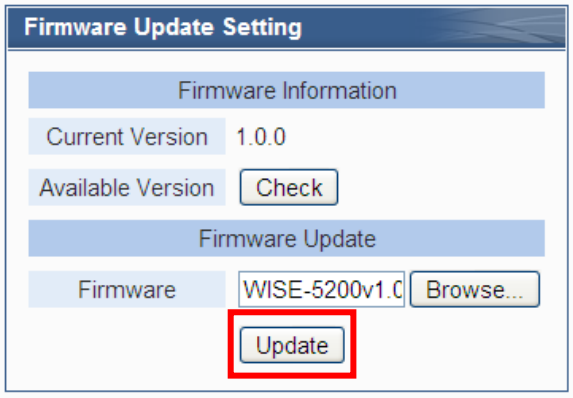


Figure 14-3：Firmware Update (2)

vii. Click “OK” to start the firmware update process, to cancel the firmware update, click “Cancel”.

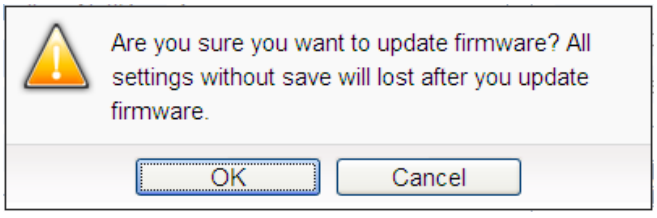


Figure 14-4：Firmware Update (3)

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.

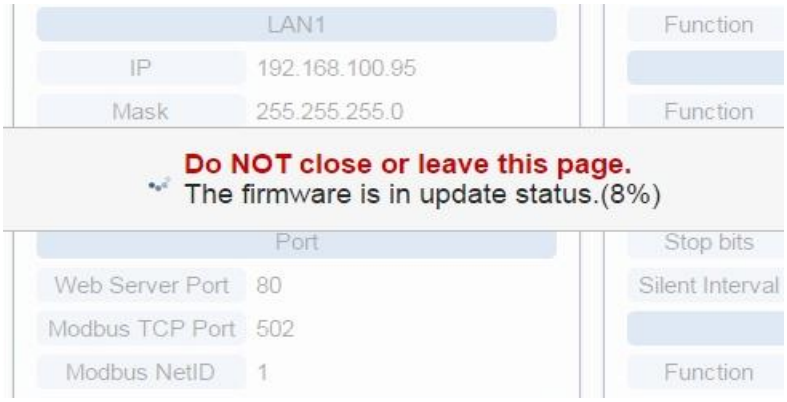


Figure 14-5：Firmware Update (4)

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 14-6：Firmware Update (5)

Appendix I：Modbus Address Table

WISE-52xx allows SCADA software or HMI device to retrieve the I/O channel data and system information via Modbus TCP/RTU protocol. WISE-52xx 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/AOChannel 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.

WISE-52xx Modbus Address Table

Modbus Address	Coil Output (0x)	Discrete Input (1x)	Input Register (3x)	Holding Register (4x)
0~59	WISE-52xx 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) WISE-52xx System Data

This block stores the system information of WISE-52xx, 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
micro SD Free Space	30034	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-52xx, 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-52xx. 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	Length	Data	Range

	Address		Type	
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-52xx.

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 Setting" section.		
Internal Register 98	40244			
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-52xx 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 Starting Modbus Address of the data block of the module) based on the type of the connection port and the index number.

SA = The starting Modbus addressof 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

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-52xx. For example: Assume there is an M-7024 module connected to the COM4 of WISE-52xx. Its module index number is 3. So the SA value of the M-7024 is 9000 + (3 – 1) x 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** ● **M-7005**		**(6 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

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** ● **M-7011**		**(1 DI、2 DO、1 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
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)**		
Parameter Name	Modbus Address	Length	Data Type	Range
Input Register (3x), Unit : Register(16 Bits)				
AI Ch.0	SA + 300000	2	Float	Floating Point

● **I-7015、I-7015P** ● **M-7015、M-7015P**		**(6 AI Channel)**		
Parameter Name	Modbus	Length	Data	Range

	Address		Type	
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

● **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** ● **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**				**(8 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

● **I-7017Z** ● **M-7017Z** ● **(P)ET-7017-10、(P)ET-7217-10**				**(10 Differential AI Channel)** **(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

● **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** ● **M-7022**		**(2 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
AO Ch.1	SA + 400002	2	Float	Floating Point

● **I-7024** ● **M-7024**		**(4 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
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** ● **M-7024R**		**(5 DI、4 AO Channel)**		
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
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** ● **M-7000 DI/DO Module**		**(Maxinum16 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

● **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

● **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** ● **LC-221**	**(1 DI、1 DO、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
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**		**(Maxinum 8 DI Channel / 8 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
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**		**(Maxinum 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** ● **WF-2000 DI/DO Module**		**(Maxinum 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	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**		**(Maxinum 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

● **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**		**(Maxinum 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-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(℃)	SA + 300002	2	Float	Floating Point
Temperature(℉)	SA + 300004	2	Float	Floating Point

● **DL-302**	**(CO2、Temperature、Humidity、1 DO Channel)**			
Parameter Name	Modbus	Length	Data	Range

	Address		Type	
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	2	Float	Floating Point
Humidity	SA + 300002	2	Float	Floating Point
Temperature(℃)	SA + 300004	2	Float	Floating Point
Temperature(℉)	SA + 300006	2	Float	Floating Point
Dew Point(℃)	SA + 300008	2	Float	Floating Point
Dew Point(℉)	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 *The LSB represents ch.1.*

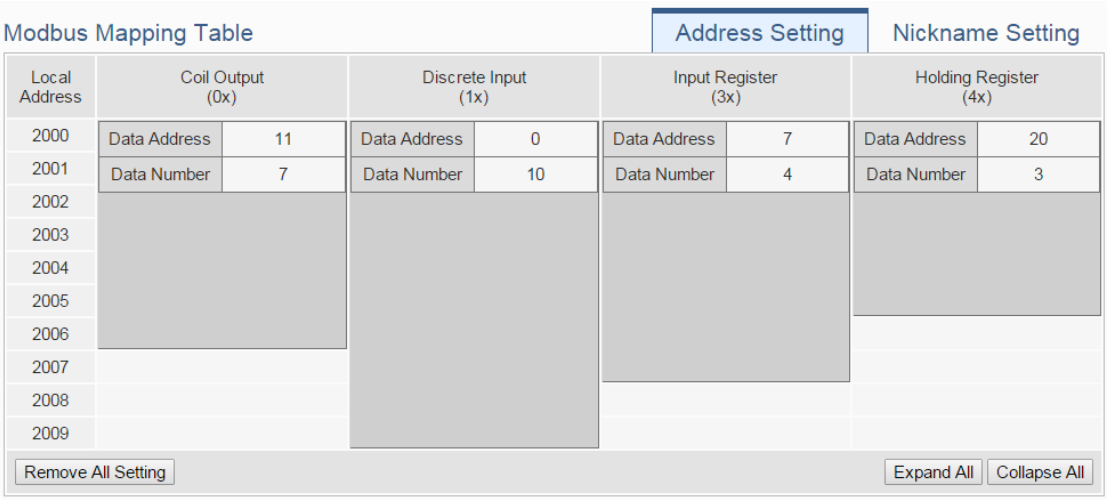
● **IR-712、IR-712A、IR-712-MTCP**		**(2 Infrared Output)**		
Parameter Name	Modbus Address	Length	Data Type	Range
Holding Register (4x), Unit : Register(16 Bits)				
IR Command	SA + 400000	1	UInt16	IR-712: 1~36 IR-712A: 1~224 IR-712-MTCP:1~512
IR Output Channels	SA + 400001	1	UInt16	1~3 *The LSB represents ch.1.*

- **Modbus Module**

  This block stores the Modbus TCP/RTU module I/O channel data in WISE-52xx. 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-52xx. Its module index number is 3. So the SA value of the Modbus RTU module in WISE-52xx is 1000 + (3 - 1) x 500 = 2000. The Modbus address of the I/O channel of the module is in sequence arrangement from the module starting address 2000.



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-52xx 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-52xx
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-52xx 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-52xx
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-52xx 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-52xx
1	30007	32000
2	30009	32002
3	30011	32004
4	30013	32006

The allocation of the Modbus Address in WISE-52xx for the Holding Register setting of this Modbus RTU module is shown as below：

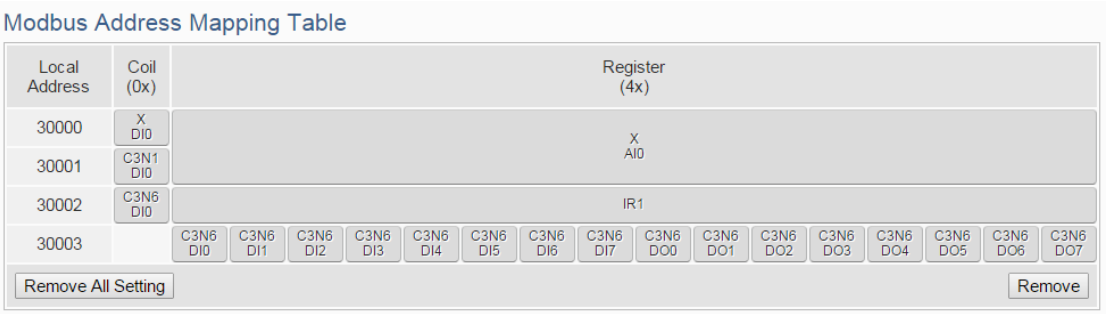
Holding Register Index	The Modbus Address in Modbus RTU Module	The mapping Modbus Address in WISE-52xx
1	40020	42000
2	40022	42002
3	40024	42004

(7) I/O Data Table for “Active I/O sending” function

WISE-52xx 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-52xx. “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.



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-52xx. Its module index number is 1.
- I/O channel value of the module which is connected to COM3 of WISE-52xx. Its module index number is 6.
- The Internal Register with index number 1. Its data type is 16-bit Signed Integer

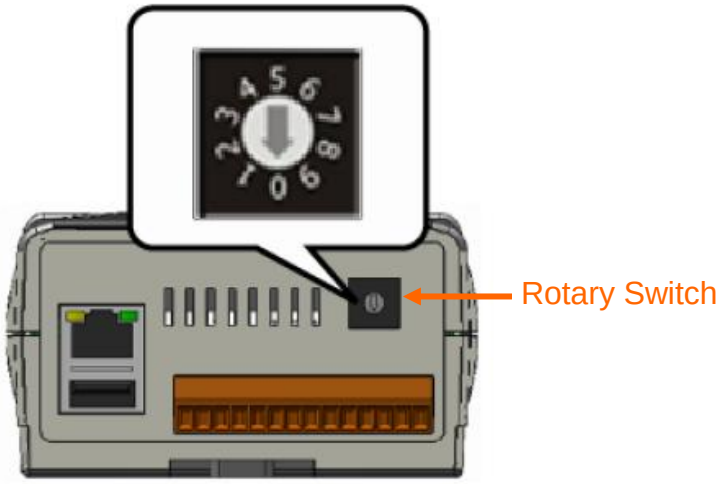
In the I/O Data Table, the “Local Address” in the left side is the address for saving I/O Data Table in the WISE-52xx Modbus Address Table.

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 *Each bit represents a ch.*

Appendix II：Reset to Factory Default Setting and send password to Administrator

During the operation of WISE-52xx, 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-52xx 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-52xx.



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: ● Restore network settings ● Reset all password settings ● Delete the parameter and rule settings, and remove all log files in the microSD card.

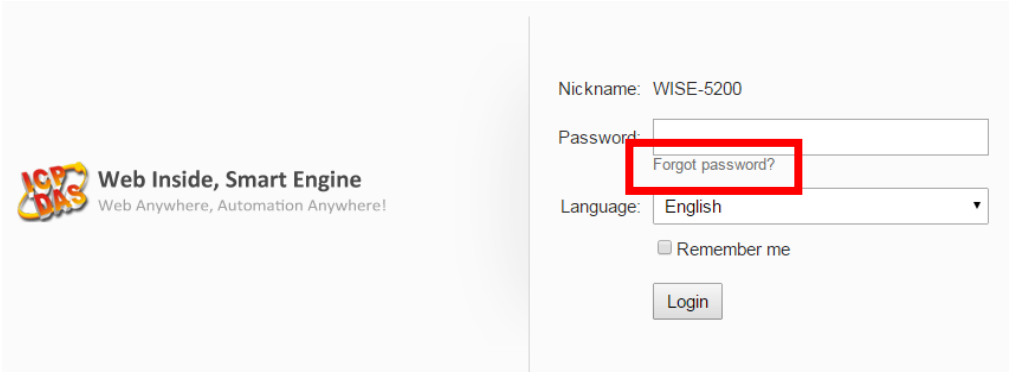
Please follow the steps below to restore network settings to factory default or send the passwords to the Email account of the Administrator:

- Restore network settings to factory default
  1. Power off the WISE-52xx.
  2. Switch the Rotary Switch to position 7.
  3. Power on the WISE-52xx 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-52xx 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-52xx sends to the Email account of the Administrator. The Email content will include the following information.

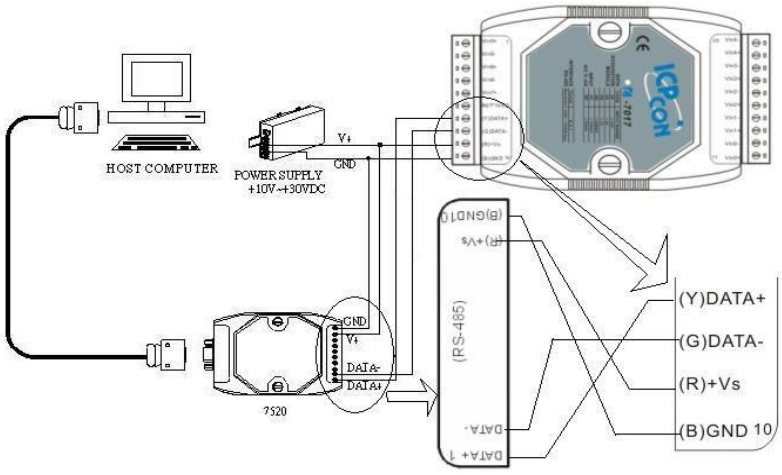
Administrator password is "Admin".
User1 password is "User1".
User2 password is "User2".
User3 password is "User3".
User4 password is "User4".
User5 password is "User5".
Guest password is "Guest".
Local FTP password is "Admin".
CGI password is "CGI_Admin".

3. Switch the Rotary Switch to position 0.

Appendix III：The configuration setting of ICP DAS modules

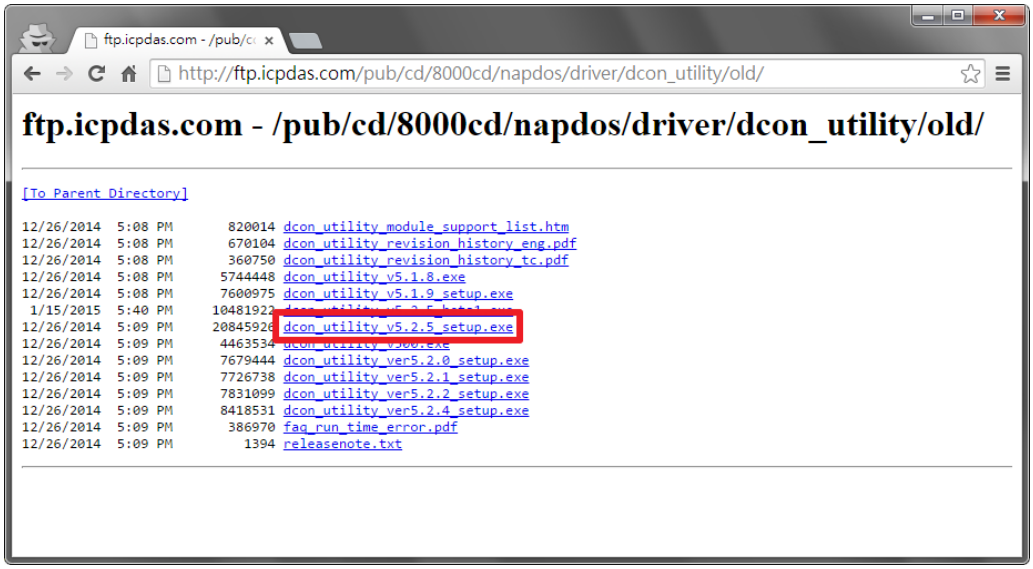
WISE-52xx allows connection to ICP DAS I/O modules for the I/O channel data retrieve. However, for other configuration of the ICP DAS I/O modules must be completed via related utility (For example: DCON Utility) in advance, so that the WISE-52xx can accurately connect to ICP DAS I/O module. The procedures 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

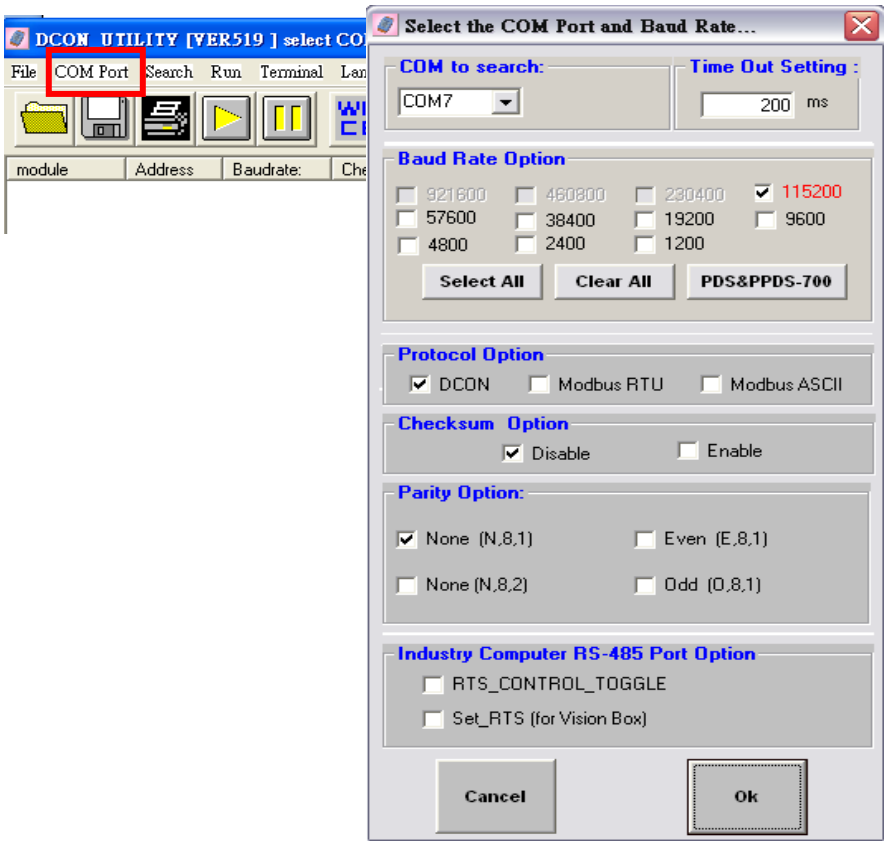


   If the communication interface between ICP DAS I/O modules and PC is Ethernet, make sure the Ethernet is properly connected through Hub between PC and ICP DAS I/O modules or directly connect PC and ICP DAS I/O modules with Ethernet cable.

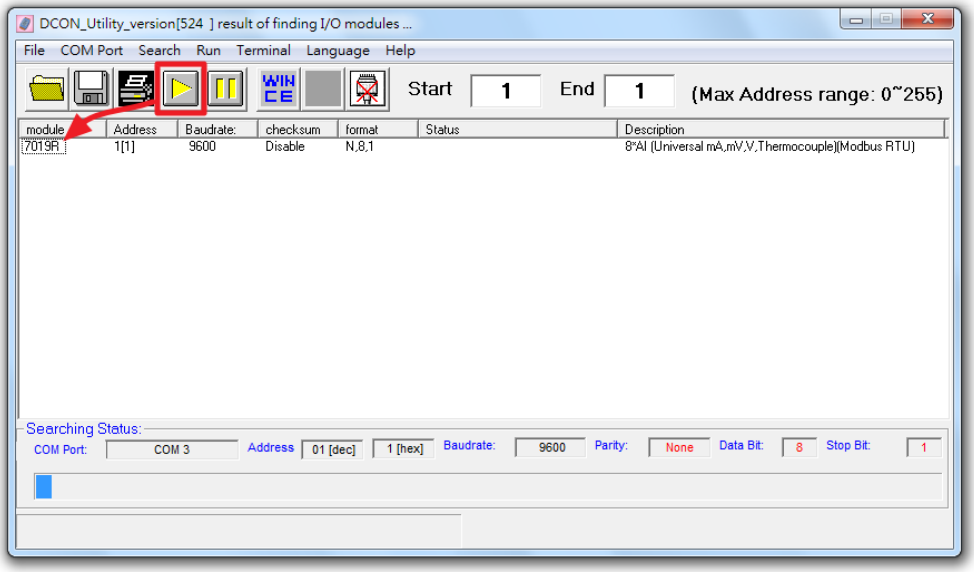
2. If the ICP DAS I/O module is I-7000、M-7000、tM series, please follow the steps as below for the configuration setting.
   A. Download DCON Utility from the link below, and Install the DCON Utility on PC.
      http://ftp.icpdas.com/pub/cd/8000cd/napdos/driver/dcon_utility/old



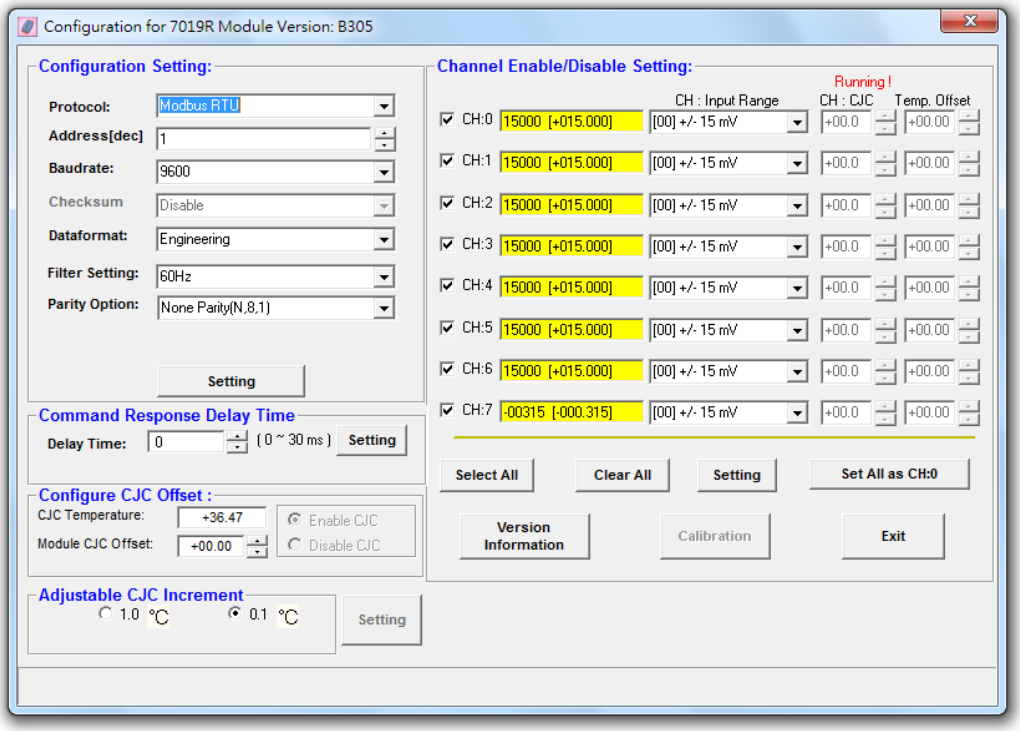
B. Start the DCON Utility and verify if the COM Port parameters are accurate.



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-52xx 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-52xx has to be set exactly the same.

- Baudrate: the Baudrate has to be set the same as the Baudrate of WISE-52xx 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-52xx 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-52xx, 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_v*XXX*.pdf

b. WISE-7000 series module

link	http://wise.icpdas.com/downloads/manual/
File name	ICP DAS WISE User Manual_v*X*.*XX*en_71xx.pdf

c. WF-2000 series module

link	http://ftp.icpdas.com/pub/cd/usbcd/napdos/wifi/
File name	wf-20*XX*/manual/wf_2000_aio_usermanual_en_v*X*.*X*.pdf or wf-20*XX*/manual/wf_2000_usermanual_en_v*X*.*X*.pdf

d. LC series module

link	http://ftp.icpdas.com.tw/pub/cd/8000cd/napdos/lc/
File name	lc-*XXX*/lc_*XXX*_usermanual_v*XXX*.pdf

e. DL-100 module

link	http://ftp.icpdas.com.tw/pub/cd/usbcd/napdos/dl_100/dl100tm485/documents/
File name	dl_100tm485_v*XXX*.pdf

f. DL-302 module

link	http://ftp.icpdas.com.tw/pub/cd/usbcd/napdos/dl-302/document/
File name	dl302_user_manial_chinese_v*XXX*.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_v*X*_*X*.pdf

Appendix IV：The SNMP Variables for WISE-52xx

The WISE-52xx 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-52xx.

●RFC1213 MIB II Supported SNMP Variables

The following SNMP variables are built into the WISE-52xx 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	icmpInDestUnreachs

	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-52xx SNMP Agent. About the detailed information, please refer to the description file in the WISE-52xx CD or from the ICP DAS WISE product Web page.

System	serialNumber	firmwareVersion	nickname
	systemCurrentTime	webserverPort	modbusTcpPort
	modbusTcpNetID	serviceIndex	serverName
	domainName	updateStatus	updateTime
	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	xvBoardAONname	xvBoardAOValue
	xvBoardAOType	xvBoardAOPowerOnValue	

Remote I/O Module	***I*io*N*Index**	***I*io*N*Interface**
	***I*io*N*ModbusID**	***I*io*N*ModuleName**
	***I*io*N*ConnectionStatus**	***I*io*N*DiscInputAmount**
	***I*io*N*CoilOutputAmount**	***I*io*N*InputRegAmount**
	***I*io*N*HoldingRegAmount**	***I*io*N*DiscInputIndex**
	***I*io*N*DiscInputName**	***I*io*N*DiscInputValue**
	***I*io*N*DiscInputModbusAdd**	***I*io*N*DiscInputCounterValue**
	***I*io*N*CoilOutputIndex**	***I*io*N*CoilOutputName**
	***I*io*N*CoilOutputValue**	***I*io*N*CoilOutputModbusAdd**
	***I*io*N*CoilOutputAdvFunction**	***I*io*N*InputRegIndex**
	***I*io*N*InputRegName**	***I*io*N*InputRegValue**
	***I*io*N*InputRegModbusAdd**	***I*io*N*InputRegType**
	***I*io*N*InputRegScaleRatio**	***I*io*N*InputRegOffset**
	***I*io*N*InputRegScaleMin**	***I*io*N*InputRegScaleMax**
	***I*io*N*HoldingRegIndex**	***I*io*N*HoldingRegName**
	***I*io*N*HoldingRegValue**	***I*io*N*HoldingRegModbusAdd**
	***I*io*N*HoldingRegType**	***I*io*N*HoldingRegScaleRatio**
	***I*io*N*HoldingRegOffset**	

The SNMP Variables naming rule of the remote I/O modules that are connected to WISE-52xx.

Every I/O module that is connected to WISE-52xx 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 **com3**io**1**), the I/O Module2 SNMP Variables are similar to listed information above but with prefix **com3**io**2** instead**,** and the I/O Module16 SNMP Variables are also similar to the listed information above but with prefix **com3**io**16** 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 **com4**io**1,** the I/O Module2 SNMP Variables are similar to listed information above but with prefix **com4**io**2** instead**,** and the I/O Module16 SNMP Variables are also similar to the listed information above but with prefix **com4**io**16** 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 **lan**io**1, t**he I/O Module2 SNMP Variables are similar to listed information above but with prefix **lan**io**2** instead**,** and the I/O Module16 SNMP Variables are also similar to the listed information above but with prefix **lan**io**16** 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-100
CO2 / Temperature / Humidity	DL-302

- **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-52xx supports the HTTP protocol to set up and retrieve the I/O channel value, Internal Register value or system information. In addition, WISE-52xx 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-52xx is using now. The default IP address of WISE-52xx is “192.168.255.1”. The “Port” is the port number of Web server port of WISE-52xx. The default IP address of WISE-52xx 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-52xx.

  ```
  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-52xx. 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-52xx. When WISE-52xx 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.**

<table>
<tr><td>Command</td><td>job=set_channel_val&
if_type=val&com_port=val&module_no=val&
ch_type=val&ch_addr=val&ch_value=val</td></tr>
<tr><td>Parameters</td><td>
<table>
<tr><td>Name</td><td>if_type</td></tr>
<tr><td>Description</td><td>The I/O module Interface</td></tr>
<tr><td>Value</td><td>0: XV-Board
1: COM Port
2: Network</td></tr>
</table>
<table>
<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
…and so on.</td></tr>
</table>
<table>
<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>
<table>
<tr><td>Name</td><td>ch_type</td></tr>
<tr><td>Description</td><td>The channel type</td></tr>
<tr><td>Value</td><td>Modbus Module：co, ro
Other Modules：do, ao</td></tr>
</table>
<table>
<tr><td>Name</td><td>ch_addr</td></tr>
<tr><td>Description</td><td>Channel Address</td></tr>
<tr><td>Value</td><td>The ch_addr is Modbus Data Address for the Modbus module. For other</td></tr>
</table>
</td></tr>
</table>

	module, the ch_addr is the channel sequence number starting from 0.

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

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& if_type=*val*&com_port=*val*&module_no=*val*& ch_type=*val*&ch_addr=*val*
Parameters	

Name	if_type
Description	The type of I/O Interface
Value	0: XV-Board 1: COM Port 2: Ethernet

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 for the COM Port number.
Value	0: COM0 1: COM1 …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：ci, co, ri, ro Other Modules：di, dic, do, ai, ao

Name	ch_addr
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.

```
{
  "status": "OK",
  "result": {
    "value": 2.5,
    "connection": "ONLINE" //or "OFFLINE"
  }
}
```

The module or channel does not exist.

```
{
  "status": "CHANNEL_NOT_EXIST"
}
```

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><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> <table><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> <table><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>
Response	The module is existed.

	If it is a Modbus module：
	<pre>{
	  "status": "OK",
	  "result": {
	   "ci": [
	    {
	     "address": "32"
	     "value": 0
	    },
	    …
	   ],
	   "co": [], //if there is no channel of this type.
	   "ri": [</pre>

	<pre>{
	"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"
	}
	}</pre>

	The module does not exist.

	<pre>{
	"status": "MODULE_NOT_EXIST"
	}</pre>

	Password error

	<pre>{
	"status": "PASSWORD_ERROR"
	}</pre>

- **Get the connection status of all remote I/O modules.**

Command	job=get_module_status
Parameters	None

Response	Normal

	<pre>{
	  "status": "OK",
	  "result": {
	  "com2": [
	  {
	  "no": 1,
	  "connection": "ONLINE" //or "OFFLINE"
	  },
	  …
	  ],
	  "com3": [], //No modules or is in disabled status.
	  "network": [
	  {
	  "no": 3,
	  "connection": "OFFLINE"
	  },
	  …
	  ]
	  }
	}</pre>

	Password error

	<pre>{
	  "status": "PASSWORD_ERROR"
	}</pre>

- **Set up the value of a specific Internal Register.**

Command	job=set_ir_val& ir_no=*val*&ir_value=*val*
Parameters	<table><tr><td>Name</td><td>ir_no</td></tr><tr><td>Description</td><td>The index number of the Internal Register.</td></tr><tr><td>Value</td><td>Integer; start from 1.</td></tr></table> <table><tr><td>Name</td><td>ir_value</td></tr><tr><td>Description</td><td>The value you want to assign to the Internal Register.</td></tr><tr><td>Value</td><td>Number</td></tr></table>
Response	The Internal Register is enabled.

	{
	"status": "OK"
	}

	The Internal Register is disabled.

	{
	"status": "INTERNAL_REGISTER_NOT_EXIST"
	}

	Password error

	{
	"status": "PASSWORD_ERROR"
	}

- **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.

	{
	"status": "OK",
	"result": {
	"value": 12.5
	}
	}

	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

	<pre>{
	  "status": "OK",
	  "result": [
	  {
	  "no": 1,
	  "value": 100
	  },
	  …
	  ]
	}</pre>

	Password error

	<pre>{
	  "status": "PASSWORD_ERROR"
	}</pre>

- **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
	{ "status": "OK", "result": { "free_space": 1560 //Free space. Unit is MB. } }
	No microSD card detected.
	{ "status": "SDCARD_NOT_EXIST" }
	Password error
	{ "status": "PASSWORD_ERROR" }

Appendix VII：Change the value of output channel of I/O module or Internal Register by MQTT protocol

WISE-52xx supports the MQTT protocol. User can use it to change the value of the Internal Register of WISE-52xx or the value of the output channel of I/O module which connect to WISE-52xx. Based on MQTT, user just needs to publish the specific topics to Broker, and WISE-52xx 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	*Prefix*/SET/xvboard/do/*channel_no* Prefix: Please refer to 8.3 MQTT Setting channel_no: 0~15
Message	0 or 1

- **AO channel of ICP DAS XV-Board**

Topic	*Prefix*/SET/xvboard/ao/*channel_no* 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	*Prefix*/SET/*interface*/*module_no*/do/*channel_no* 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	*Prefix*/SET/*interface*/*module_no*/ao/*channel_no* 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	*Prefix*/SET/lan/*module_no*/ir/*ir_no* 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	*Prefix*/SET/*interface*/*module_no*/coil_output/*channel_address* 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	*Prefix*/SET/*interface*/*module_no*/holding_register/*channel_address* 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**

<table>
<tr><td>Topic</td><td>Prefix/SET/ir/ir_no
<table><tr><td>Prefix</td><td>Please refer to 8.3 MQTT Setting</td></tr><tr><td>ir_no</td><td>1~80</td></tr></table></td></tr>
<tr><td>Message</td><td>Floating value</td></tr>
</table>

Appendix VIII：The JSON format for the communication with IoT Platform

WISE-52xx 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-52xx. The following lists the detailed information of JSON format message with WISE-52xx.

- **Message format**

{

<table>
<tr><td>"msg_type" :</td><td><table>
<tr><td>"CHANNEL_UPDATE"</td><td>The "CHANNEL_UPDATE" type of message indicates the message published by WISE-52xx to inform IoT Cloud platform the update of the I/O channel status.</td></tr>
<tr><td>"CHANNEL_OUTPUT"</td><td>If WISE-52xx receives the message in the type of "CHANNEL_OUTPUT", then WISE-52xx will perform the task to change the value of the output channel.</td></tr>
</table></td></tr>
<tr><td>"if_type" :</td><td>It indicates the connection interface between WISE-52xx and the I/O module where the I/O channel resides. The following table shows the code and the interface it represents.<table>
<tr><td>0</td><td>XV-Board</td></tr>
<tr><td>1</td><td>COM Port</td></tr>
<tr><td>2</td><td>Ethernet</td></tr>
</table></td></tr>
<tr><td>"com_port" :</td><td>"3" indicates the connection interface between WISE-52xx and the I/O module is COM port 3. "4" indicates the connection interface between WISE-52xx and the I/O module is COM port 4. If the connection interface is XV-Board or Ethernet, please ingore this field.</td></tr>
<tr><td>"module_no" :</td><td>The number indicates the order that the I/O channel data of the module being stored in the WISE-52xx Modbus Table. The</td></tr>
</table>

		range is 1~16. If the connection interface is XV-Board, please ingore 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.

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-52xx.

```
{
    "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-52xx 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-52xx.

```
{
    "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"
}
```