ICP DAS WISE
User Manual for
WISE-2841M Series

[Version 1.1.0 - 2025/12/12]

ICP DAS 泓格科技
ICP DAS CO., LTD.

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Through the communication mechanisms provided by third-party companies (such as LINE, WeChat, Amazon Web Services, Microsoft Azure, IBM Bluemix), this controller can send the notification messages and information regarding this controller to the related personal account or the third-party platform (function). However, this function may not be available due to the third-party companies close or terminate the communication mechanisms of their systems.

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1 Introduction

WISE-2841M Advanced version IIoT Edge Controller is an Intelligent Web-based Multi-functions PAC controller designed by ICP DAS that functions as control units for use in remote logic control and monitoring in various industrial applications. WISE offers a user-friendly and intuitive HMI interface that allows you to implement control logic on controllers just a few clicks away; no programming is required. With this powerful and easy-to-use software, it will minimize the learning curve, shorten time to market and dramatically reduce the labor and cost spent on system development.

WISE-2841M is equipped with iMX8 cpu module, which can meet the requirements of low power consumption and high performance computing power for the embedded system, and are competent for the complex operations of edge computing and data logging. WISE-2841M also can store a large amount of log data and image data with the eMMC memory and MicroSD expansion slot that can be expanded to 2TB.

Through Web browser, you can access Web Server on WISE to perform tasks such as logic rule edition and download. WISE equips an IF-THEN-ELSE rule engine that will check whether the rules are valid or not and determine the execution of actions under specific conditions, for examples: setting up I/O channel values, perform scheduled and Timer tasks, sending Email under a specific condition. In addition, through the Modbus TCP/RTU protocol and SNMP protocol, it enables SCADA software or SNMP Management software to control and monitor I/O channel or system status on controllers in real time.

In order to meet the requirement of high level information security protection of the IoT(Internet of Things) system, WISE-2841M provides a variety of encrypted communication protocols as below. With the HTTPS protocol supported by WISE-2841M, users can securely access the WISE web page without worrying about the setting being stolen. Through the SNMP v3 protocol, WISE-2841M can be perfectly integrated with the IT and Network management system. Users can securely download data log files stored from WISE through SFTP and FTPS protocols. In each communication protocol WISE supports, users can set up the relevant protection password or encryption certificate respectively. In addition, WISE-2841M supports the firewall setting, which allows users to filter and block the specific domains. WISE-2841M also support the dynamic blacklist function to automatically add the IPs which try to login WISE and get failure many times to the blacklist to prevent the

controller from the attack of password cracking. With the equipped VPN function, WISE-2841M can connect to devices in a specific secure network domain to completely isolated from the threats of information security outside.

WISE-2841M provides supports in I/O functions. 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-2841M 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 inherit the features from the original WISE series controllers, WISE-2841M Advanced version IIoT Edge Controller also provides many advanced functions. About the Internal Register, WISE-2841M still support the 32-bit data format and the editing of mathematical formula, but add the new data formats such as 64-bit long, Double and String, and all Internal Register support the “Retain Variable” mechanism. For the floating-point sensor data which WISE get from sensor, user can set up its decimal point to 1~7 digits for the SCADA software interfaces to provide the flexibility for the appearance and accuracy of the sensor data.

In the integration with network devices, WISE-2841M provides CGI command sending and receiving functions for the two-way interaction with IP Camera or other programs; WISE-2841M also supports MQTT protocol to connect with MQTT Broker for message publish and subscribe operations. In addition, WISE-2841M supports the communication operation with the Instant Messaging Sending Software such as LINE, Telegram and WeChat, which can send the messages to the chat room and WeChat accounts user assign.

In the integration with Cloud Platform, WISE-2841M can connect to the IoT services of Amazon Web Services, Microsoft Azure and IBM Bluemix cloud platforms. It also can integrate with the IoTstar Cloud Management software provided by ICP DAS. Based on the powerful integration capabilities with IT/IoT network environment, it make WISE-284x series modules as the best IIoT Edge controller in the IoT Age.

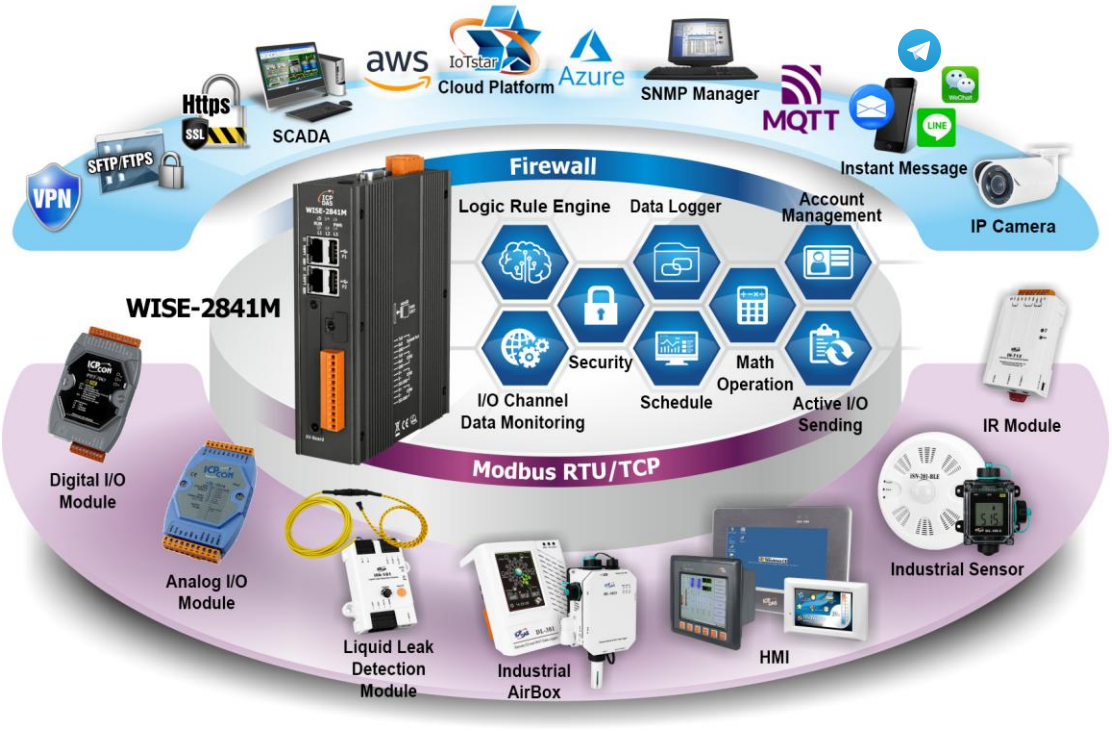


Figure 1-1：WISE-2841M System Architecture

WISE-2841M system features:

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

  WISE-2841M 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-2841M 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-2841M. No extra software tool installation is needed on the target PC.

- **Support various I/O Modules**

  WISE-2841M allows to connect 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/CL/DL/LC/IR/iSN/DLW series modules. In addition to these ICP DAS modules, WISE-2841M 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-2841M:

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/CL/DL/LC/IR/iSN/DLW 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/IR/CL/DL/DLW/iSN series module ● **Others**：The modules which support the Modbus TCP Slave Protocol.	Up to 16 modules
IP Camera	**HTTP by Ethernet**	iCAM-ZMR8422X, iCAM-MR6422X, iCAM-MR6322	Up to 12 cameras

Figure 1-2：IO module support list

◆ **Connection with IP Camera**

WISE-2841M allows connections to ICP DAS iCAM IP Camera series. Users can trigger the connected IP camera to perform snapshot or video recording with IF-THEN-ELSE logic rules. WISE-2841M provides the IP Camera Status webpage to display the event list ordered by time, and you can just click and play the images or videos on the browser. In additional, WISE-2841M provides remote backup mechanism to upload images and videos to the remote FTP server automatically.

- **Data Logger function**

  With the microSD card, WISE-22841M 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.

- **Internal Register (Perform Math formula, Retain Variable, String processing)**

  WISE-2841M provides Internal Registers function; it can be used to hold temporary variables and perform math operation. About the math formula performing, it supports to insert I/O channels to be the variables, and use the operators such as plus“+”, minus“-”, times“*”, divide“/”, superscript“^”, left parenthesis “(” and right parenthesis“)” to complete the editing of formula. Users can edit different formula in each Internal Register, then WISE will calculate the results of all formulas repeatedly, and save the results into the corresponding Internal Registers for IF-THEN-ELSE rule checking or data logging. Internal Register also provides "Retain Variable" mechanism. It means the data inside the Internal Registers can be retained even the WISE is in Power Off status. In addition, the Internal Register also supports the String editing operation. The result of the string editing of the Internal Register can be used as the content for the WISE's E-mail and Instant Message sending functions.

- **Provide Timer and Schedule operation**

  WISE-2841M 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-2841M 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-2841M.

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

  CGI command function is an important function for real-time message communication in network environment. WISE-2841M 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-2841M 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.

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

  WISE-2841M 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-2841M supports SNMP V2c and V3 protocols, 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-2841M 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-2841M 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.

- **HTTPS, SFTP, FTPS encrypted communication protocols support**

  WISE-2841M supports the encrypted communication protocols such as HTTPS, SFTP, FTPS, etc…. It allow users to set up the secure communicatoin channel for the data transmission of web pages content, sensor data and system information with WISE-2841M.

- **VPN function support**

  WISE-2841M supports 4 VPN protocols such as PPTP, L2TP, OpenVPN and SoftEther. By using the functuion, users can set up WISE-2841M to operate in a

secure closure network domain to protect WISE-2841M and the sensors it connect from the intrusion of the external threats.

- **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-2841M provide the function "Active I/O Sending" for users. Based on the "Active I/O Sending" function, WISE-2841M 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-2841M 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-2841M.

- **MQTT Message Publish/Subscribe operation**

  WISE-2841M supports the MQTT protocol. It can publish the I/O data of the I/O module which connect to WISE-2841M 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-2841M support the connection ability with the IoT Cloud Platform as Amazon Web Services, Microsoft Azure, IBM Bluemix, etc. It work as the concentrator in the IoT application to connect with Sensors and I/O modules, collect and transfer the I/O channel data to the Cloud platform for future data analysis. WISE-2841M also can receive the message which is published from the Cloud platform for the corresponding actions at the field side.

- **Connect with IoTstar Cloud Management Software**

  WISE-2841M supports the connection with IoTstar Cloud Management software developed by ICP DAS. Through the function of IoTstar, the sensor data and image files uploaded from WISE-2841M can be automatically imported and integrated, and the remote monitoring dashboard can be easily created to perform the remote monitoring and maintenance operation.

- **Mobile network connection**
  WISE-2841M-4GE/4GC/5GE/5GC support Mobile Network communication. With the 4G/5G SIM card, it can send the data logger files and Email alarm messages back to the control center via Mobile Network.

- **Provides SMS command receiving function and alarm notification function**
  WISE-2841M-4GE/4GC/5GE/5GC equip SMS command receiving and alarm message notification functions. It allows to include SMS alarm sending action into logic rules to send a pre-set SMS message to related personnel when an event occurs. In addition, the controllers allow to receive the SMS commands send by specific phones numbers to perform tasks such as real-time channel monitoring, channel data modification and logic rules execution (triggered by SMS), etc.

- **Provide Telegram message sending function**
  WISE-2841M supports to send Telegram messages to the Telegram personal account or group chat room. The Telegram message sending function can be triggered by IF-THEN-ELSE rules. The Telegram message content could be a preset string with realtime I/O channel data, or a snapshot via the connected IP camera.

- **Supports iSN-81x-MTCP Series IR Temperature Sensing Modules**
  WISE-2841M supports connecting up to 16 iSN-81x-MTCP series IR temperature sensing modules via the Modbus TCP interface. Users can monitor the thermal images collected by each IR temperature sensing module in real time through the WISE web interface and freely select specific areas of the thermal images for focused monitoring. WISE automatically compiles the temperatures of the monitored areas and records all temperature data in a CSV log file. The saved thermal images can be sent to administrators via instant messaging applications such as Telegram or WeChat or transmitted to IoTstar for event logging and storage.

- **Support remote database storage**
  WISE-2841M supports writing data to remote databases for users to perform data collection and analysis. Currently, it supports MSSQL, MySQL, and Oracle databases, and provides an automatic reconnection and data recovery feature in case of disconnection.

This document is intended to give you a full-range instruction to WISE-2841M controllers. You will be able to learn how to edit logic of the rules and how to download the rules to the controllers for conditional execution. **In the following document, we use "WISE" to represent WISE-2841M series modules.**

2 Before Installation

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

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

LAN1：DHCP

LAN2：

- 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)

Users can connect to the WISE controller through LAN1 or LAN2. The procedures are as following:

Steps for LAN1

(1) Connect WISE's LAN1 to the network environment with DHCP server.
(2) Search the WISE controller and obtain its assigned IP through the WISE-284x Utility.
(3) Open the browser and enter the IP of the searched WISE in the address bar.
(4) Successfully connect to the WISE website to start the operation.

Steps for LAN2

(1) Modify the network settings of the PC or Notebook to be the same network segment as WISE. For example:
   - IP：192.168.255.10
   - Subnet mask：255.255.0.0
   - Gateway address：192.168.0.1

(2) Connect WISE LAN to PC by network cable. (WISE is capable of auto-crossover)
(3) Start the browser and input http://192.168.255.1 in the address bar.
(4) Successfully connect to the WISE website to start the operation.
(5) After login in WISE web page, go to "System Setting → Network Setting",

modify the network setting to fit current network environment. More detailed setting information please refers to 5.2 Network Setting.

(6) Save the settings and connect WISE to the network.

3 System Login

When connect to WISE webpage server via Web browser (IE 11 / Firefox 53 / Chrome 58 version or above are recommended), in order to get a better operation experience, 1280x1024 resolution is recommended. When connect to the WISE website for the first time, it will be required to set up the password for the system administrator. The setting interface is as below.

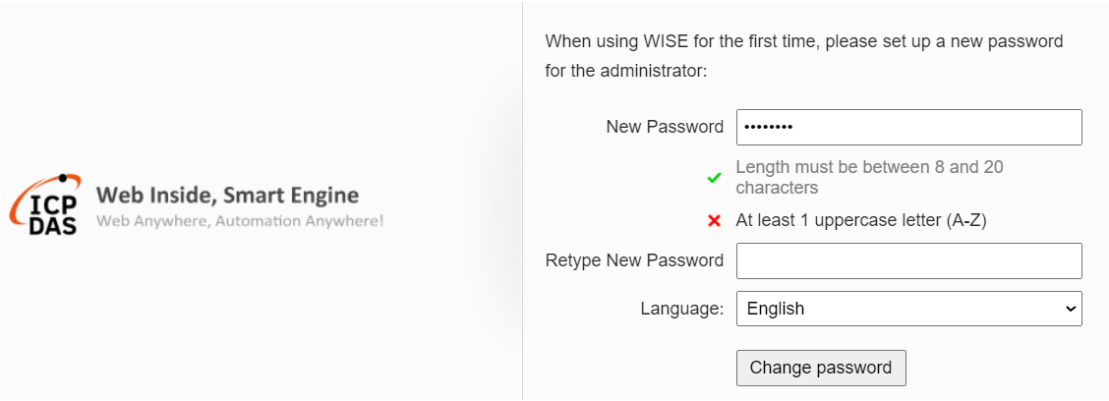


Figure 3-1：The password setting page for first time login WISE

After complete the password setting, system will show the WISE login page as below:

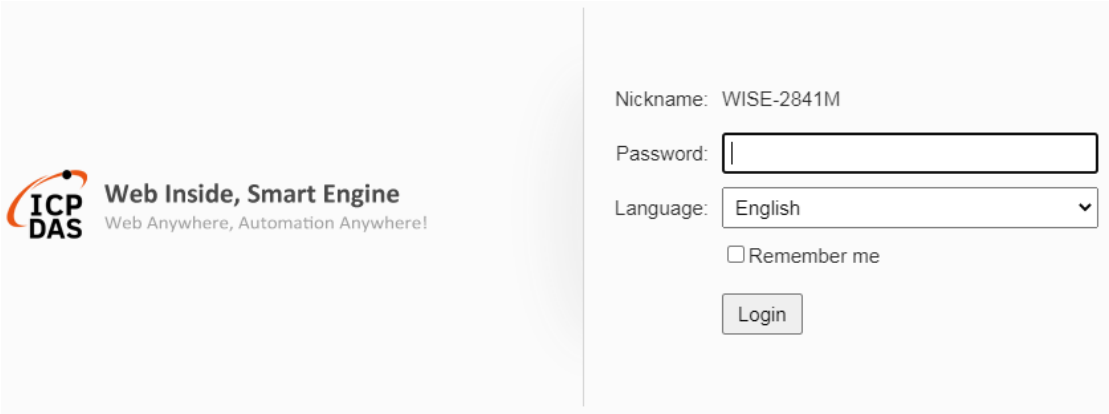


Figure 3-2：WISE Login page

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

- **Administrator**

  Login as an administrator allows performing settings and reviewing of system information and I/O modules information, it also allows performing Logic rule edition. In addition, the administrator can review the real-time I/O channel data through the Channel Status page, and can change the value for the DO/AO channel. Please Note : Only one administrator is allowed to login into the system at the same time.

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

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

- **Guest (Password is defined by Administrator)**

  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>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><td>● Can review Channel Status
● Can modify Channel Status 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.

- After 3 consecutive failed login attempts, the login page will prompt the user to enter a captcha code for verification. In addition to entering the password, the user must enter the correct 4-digit captcha code displayed on the screen to successfully login.

- After 10 consecutive failed login attempts, the user's computer IP will be automatically added to the blacklist, preventing further login attempts. To remove the IP from the blacklist, the user must log in from a different computer and delete the IP from the “Firewall setting” page.

4 WISE Web Page Overview

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

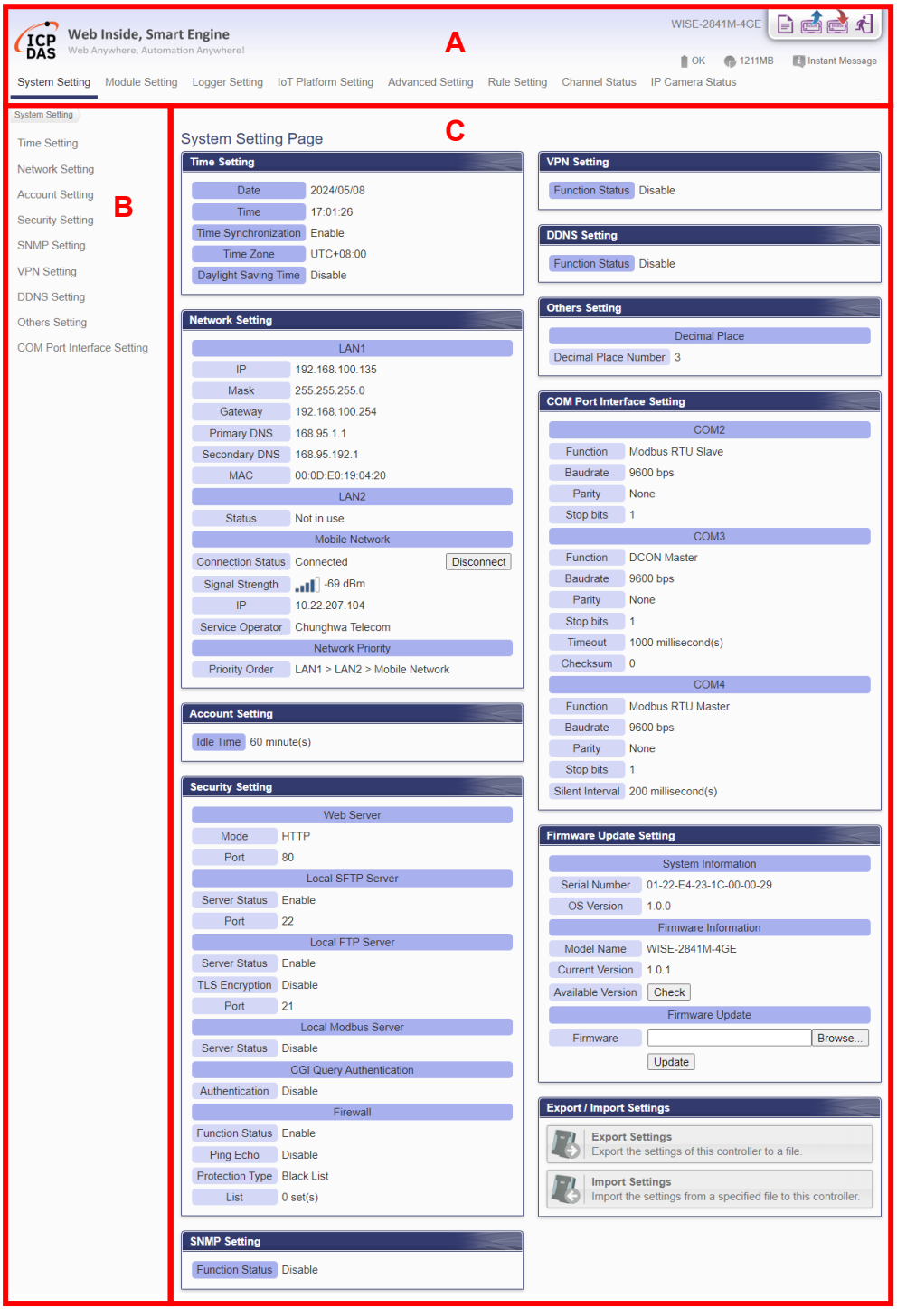


Figure 4-1：WISE home page (login as an Administrator)

WISE main page could be divided into 3 areas:

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

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

4.1 System function area

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

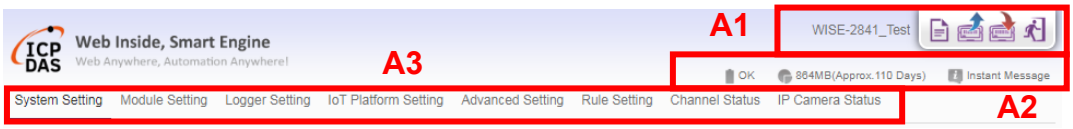


Figure 4-2：System Function Area (login as an Administrator)

System function area includes the following areas:

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

Each function in system function area is as the 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：Rules management toolbar (login as an Administrator)

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

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

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

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

The functions of the Rules management toolbar are as follow:

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

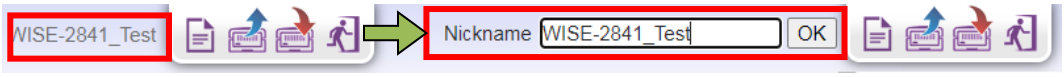


Figure 4-6：WISE Nickname setting

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

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

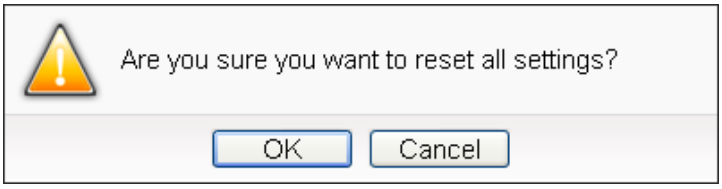


Figure 4-7：Confirm to clear settings

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

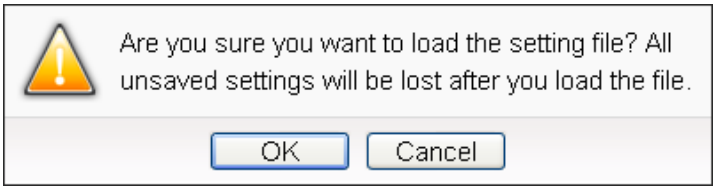


Figure 4-8：Confirm to load settings

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

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

Figure 4-9：Confirm to save settings

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

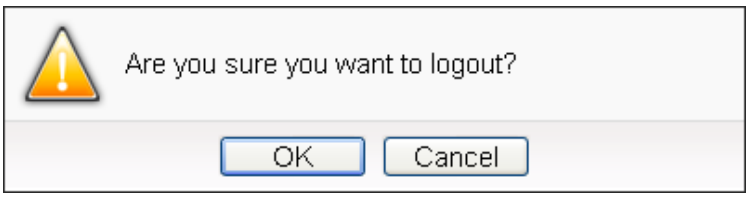


Figure 4-10：Confirm to logout (The settings are saved)

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

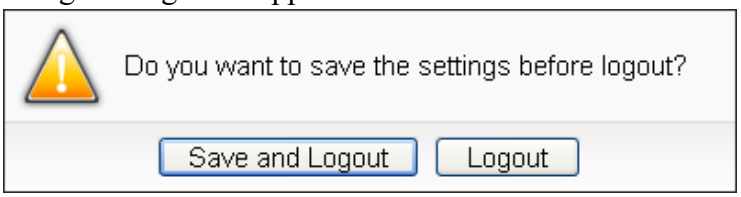


Figure 4-11：Confirm to logout (The settings are not saved)

Please note:

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

4.1.2 Real-time information area

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

Figure 4-12：Real-time information area

- OK Allows display of the current status of the battery in WISE. Please change the battery when it runs out. Otherwise, WISE would not keep the system time when it is powered off.
  2729.1MB(Approx.7047 Days) Allows display of the current free space of the microSD card in WISE. Based on the current settings of the data logger, an estimate of the remaining days to log with this microSD is provided. Please Note : The information of "estimate of the remaining days to log with this microSD" is for sensor data only, not include the image/video files. So if there are the IP cameras connect to WISE, the information will be inaccurate.

- Instant Message Allows display of real-time system information, click on “Instant Message” to open up the list of real-time information, maximum 10 information will be kept on the list.

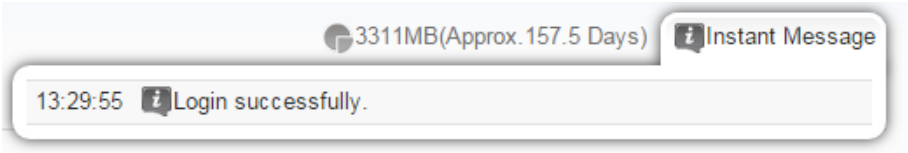


Figure 4-13：Real-time information list

4.1.3 System function toolbar

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

The System function toolbar includes the following function options:

- Chapter 5: System Setting
- Chapter 6: Module Setting
- Chapter 7: Logger Setting
- Chapter 8: IoT Platform Setting
- Chapter 9: Advanced Setting
- Chapter 10: Rule Setting
- Chapter 13: Channel Status
- Chapter 14: IP Camera Status

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

allowed to view Channel Status page

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

4.2 Sub-function area

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

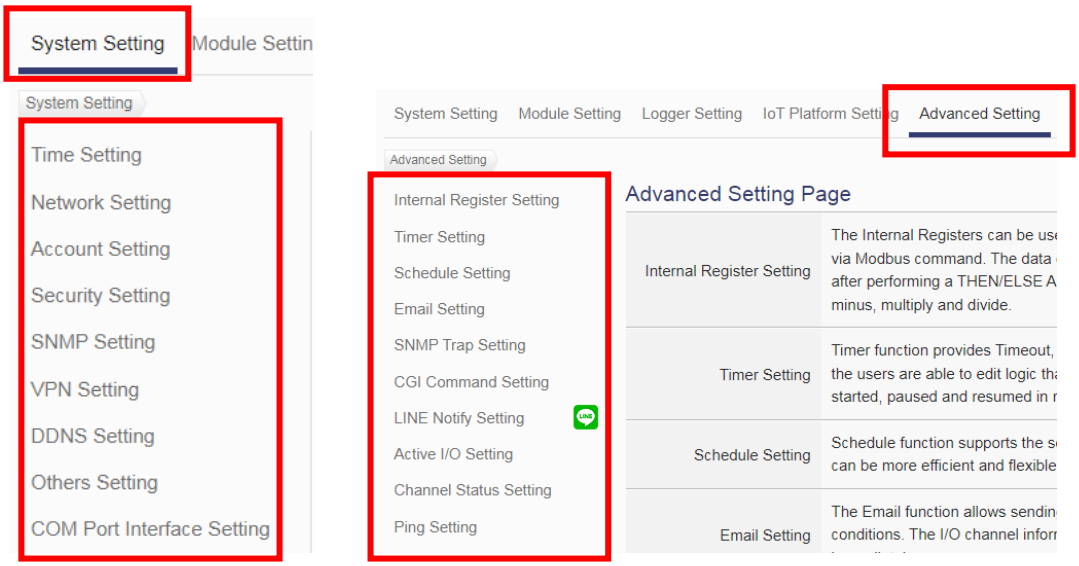


Figure 4-14：Current function path

4.3 Data review/System setting area

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

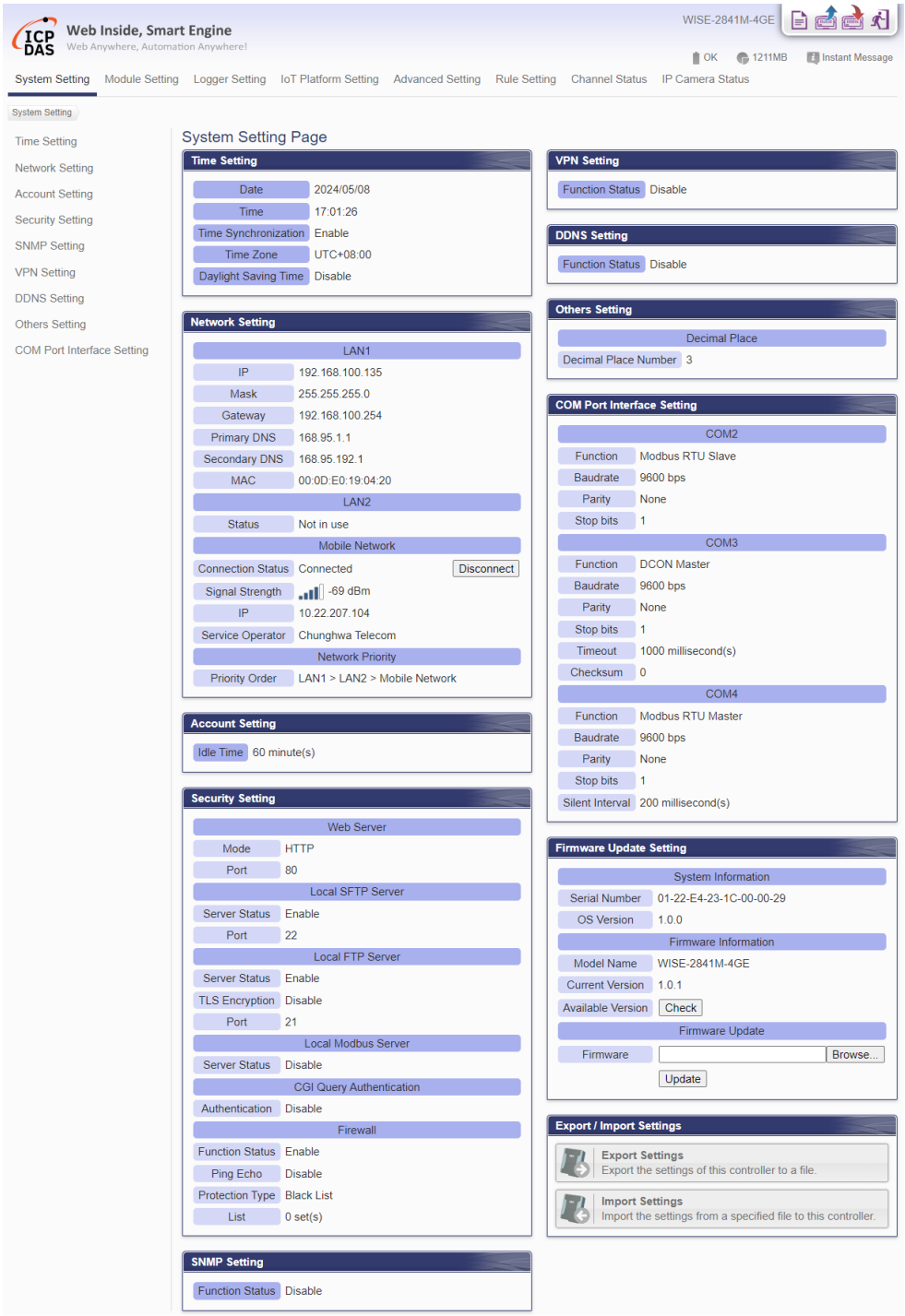


Figure 4-15：Data review/System setting area (login as an Administrator)

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

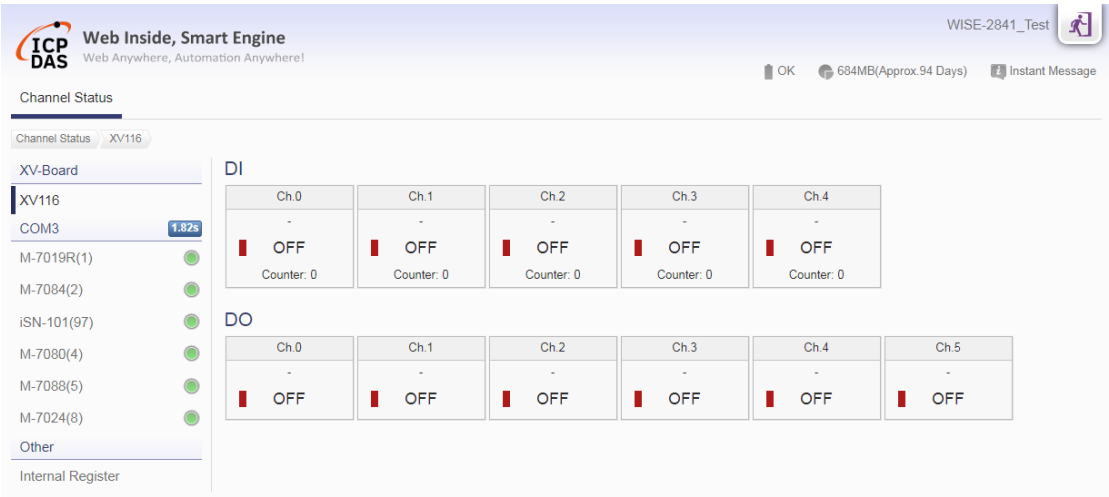


Figure 4-16：Data review/System setting area (login as User or Guest)

4.4 System and logic rule setting procedure

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

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

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

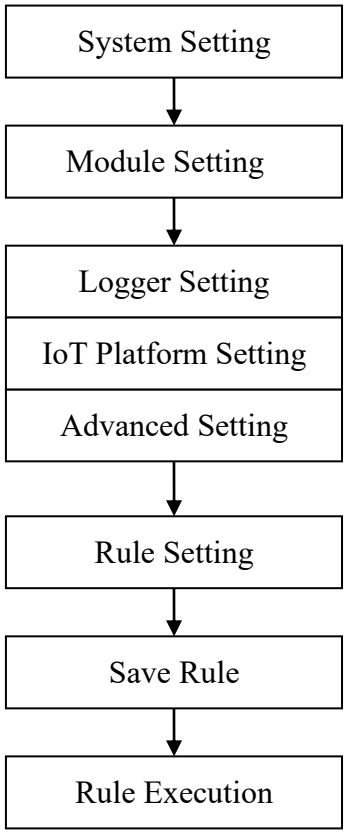


Figure 4-17：System and logic rule setting procedure

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

5 System Setting

System Setting includes 9 options: Time Setting, Network Setting, Account Setting, Security Setting, SNMP Setting, VPN Setting, DDNS Setting, Others Setting and COM Port Interface Setting. When you get into the System Setting page, the system settings information of this WISE will be displayed, as shown below.

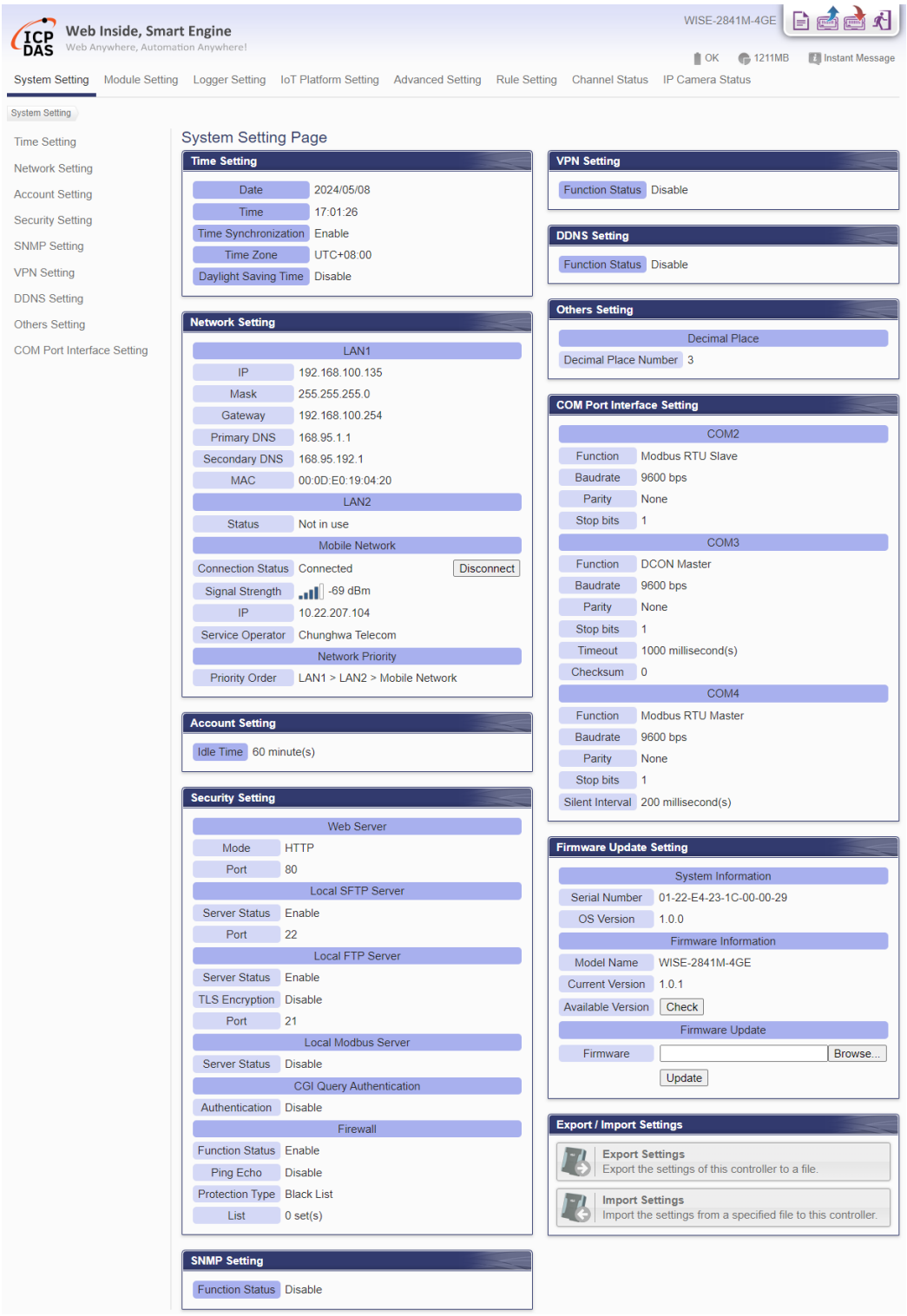


Figure 5-1：System Setting Overview Page

5.1 Time Setting

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

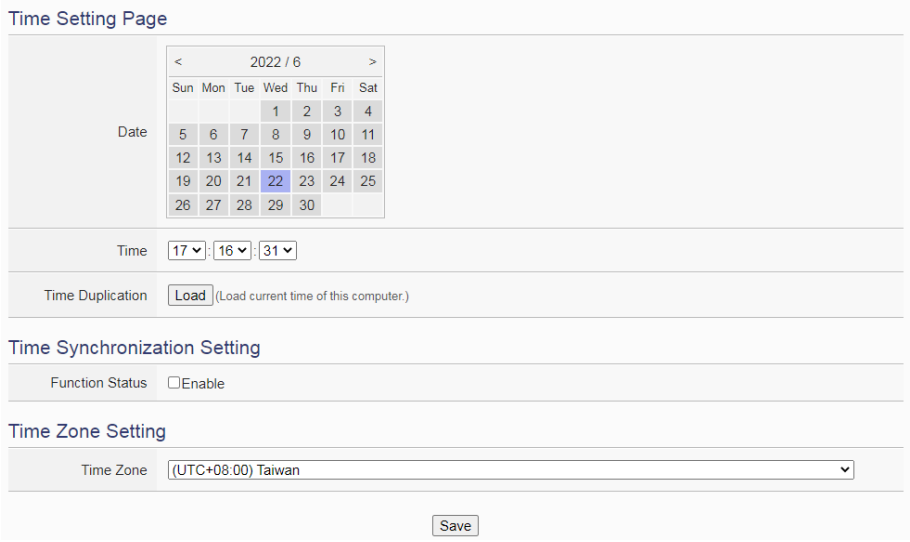


Figure 5-2：Time Setting Page

When get into this page, the system will read and display current time of the WISE. To modify the system time of WISE, set up the date and time on the Time Setting Page and then click “Save” to complete the settings. The user could click on “Load” in the “Time Duplication” field to synchronize the system time of the computer where the browser located and the system time of the WISE.

The WISE also provides SNTP Time Server function that allows to set up Time Synchronization to sync the clock through network. The following figure illustrates the set up interface:

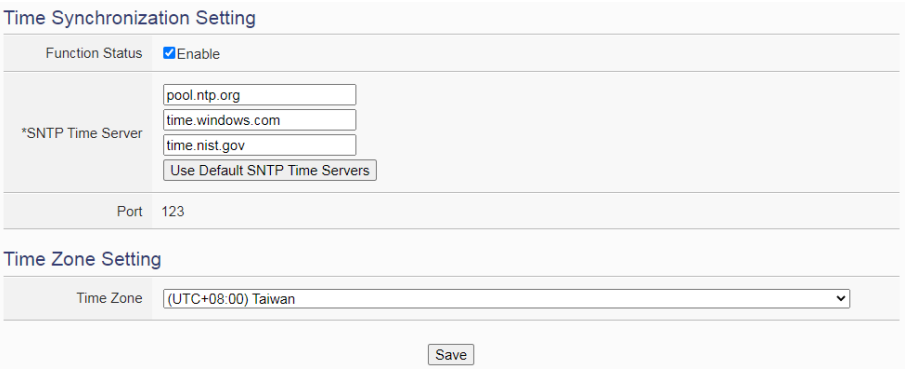


Figure 5-3：Time Synchronization Setting

Follow the steps below to set up Time Synchronization Setting:

i In the “Function Status” field, click “Enable” to enable the Time Synchronization function.

ii In the “SNTP Time Server” field, input the IP address or domain name of the SNTP Time Server. There are default SNTP Time servers, the user could modify the address to use other servers. Click “Use Default SNTP Time Servers” to restore the default Time Server settings.

iii The default Port number setting is “123”, currently it is not allowed to be modified.

iv User can select the time zone of the WISE’s location from the dropdown list in the “Time Zone” field.

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

Please Note: After enable the Time Synchronization function, user cannot manually set up the current time of WISE.

5.2 Network Setting

Network Setting allows making a change to LAN network configuration, SIM card settings, mobile network configuration and the priority order of the network interface on the WISE. The following figure illustrates the configuration interface:

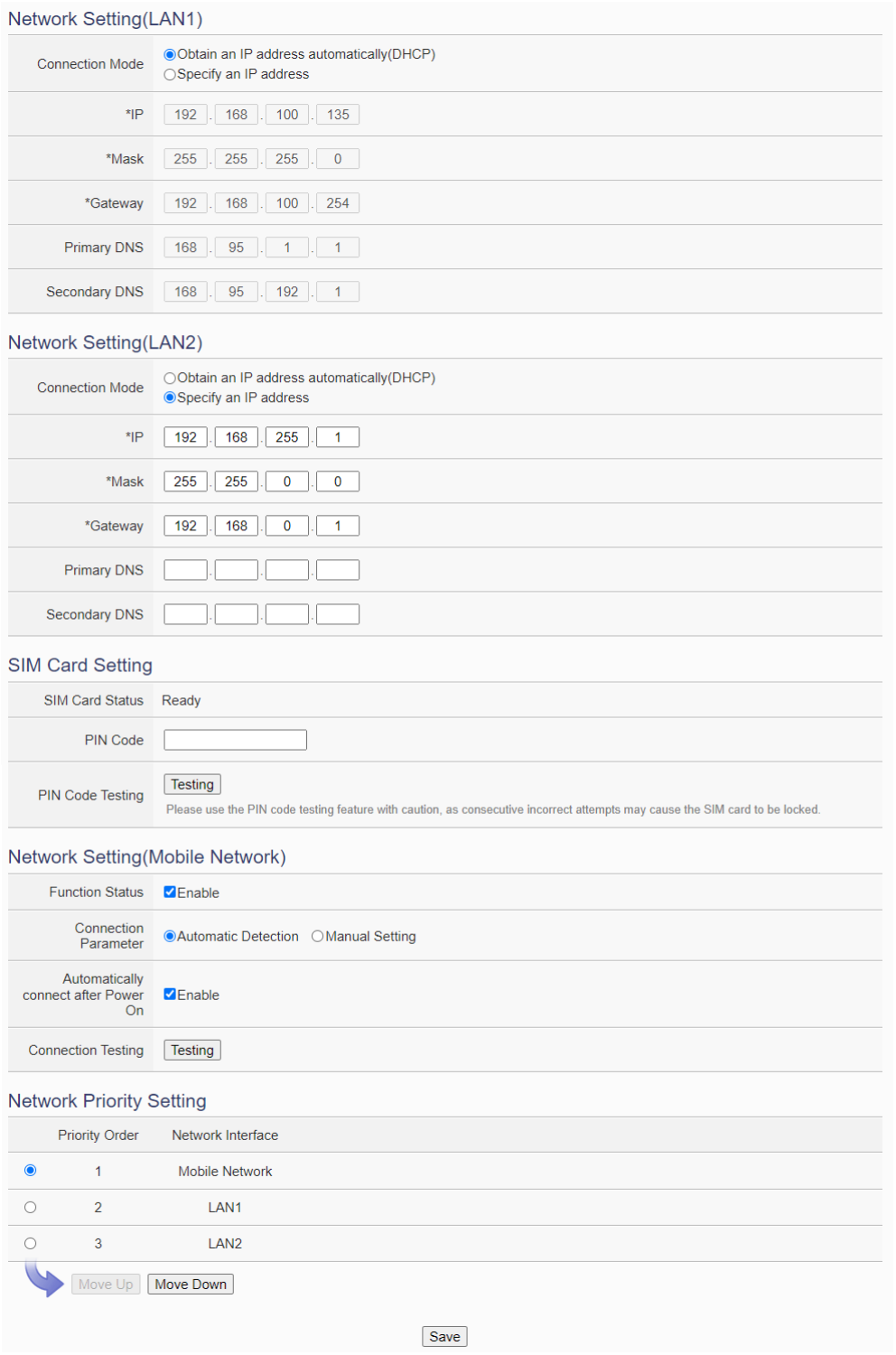


Figure 5-4：Network Setting Page

- Network Setting (LAN)

  Each time when the user enters this page, it will read and display current network configuration (LAN) and port settings from the WISE. In the "Network Setting (LAN)" section, user can select the connection mode as

"Obtain an IP address automatically (DHCP)" or "Specify an IP address" in "Connection mode" field, then modify IP/Mask/Gateway/DNS Server IP configuration.

Please note: 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-284x Utility to search the WISE, get the new IP address of WISE, and then launch browser to connect to the WISE with the new IP address.

- SIM Card Setting

  This section is for users to set the PIN code for the SIM card of WISE-2841M-4GE/4GC/5GE/5GC. User can check the real-time status of the SIM card in the "SIM Card Status" field. If the SIM card is protected by a PIN code, users have to input the PIN code to allow WISE to unlock the SIM card and use of Mobile Network and SMS functions automatically. Users can click the "Testing" button in the "PIN Code Testing" field to verify if the PIN code is correct or not.

  Please note: Please use the "PIN Code Testing" function carefully because consecutive failed attempts may cause the SIM card to be locked. In this case, you would need to unlock the SIM card with the PUK code on your mobile device.

- Network Setting (Mobile Network)

  This section is for user to complete the setting of Mobile Network of WISE-2841M-4GE/4GC/5GE/5GC. The user only needs to enable the function and select "Automatic Detection" in the "Connection Parameter" field to connect and use normally. If the user selects the "Automatic Connection When Power On" option, it will enable the WISE-2841M-4GE/4GC/5GE/5GC to complete the Mobile Network connection automatically when power on WISE controller. User can click the "Testing" button in the "Connection Testing" field to test the Mobile Network connection status between the WISE controller and the Mobile Network.

If manual setting of connection parameters is required, select “"Manual Setting” in the “Connection Parameter” field and input the values into the “APN” and “Authentication” fields. For connection parameters settings, please refer to the document provided on the WISE Web page or inquire with the Telecommunications Service Provider.

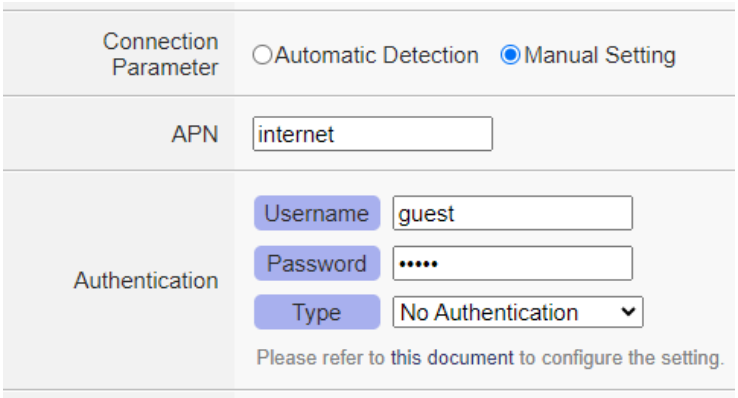


Figure 5-5：Manual Setting of Connection Parameters for Mobile Network

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

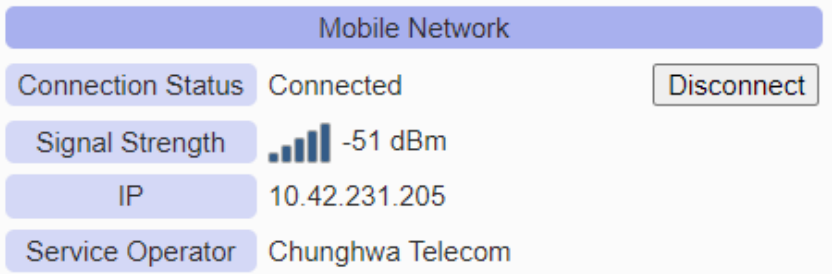


Figure 5-6：Signal Strength Level and IP Address for Mobile Network

- Network Priority Setting

  This section is provide Netowrk Priority Setting to set the priority order of network interfaces (LAN Port and Mobile Network). Allowing users to select specific network interfaces for prioritized connections.

After all settings are completed, click “Save” button to save the changes, and press the “Save” button in the upper right corner of the page to

download the setting to WISE to perform the setting.

5.3 Account Setting

WISE provides three levels of authority account as 1 Administrator account, 5 User accounts and 1 Guest account. The administrator account need to set up its password when the administrator login WISE for the first time. About the User and Guest accounts, they must be enabled by the administrator and need the administrator to assign their login passwords. All login accounts of WISE can modify its password in the "Account Setting" page, and the password length is limited to 8 to 20 characters and must contain at least 1 uppercase letter. About the "Idle Time" setting, all login accounts of WISE can set up the "Idle Time" independently. It mean the administrator/User/Guest account login the WISE page, and the idle time exceeds the pre-set time interval, the login account will be automatically logged out. After all settings are completed, click "Save" button to save the changes. Following is the interface for the setting of the Administrator account.

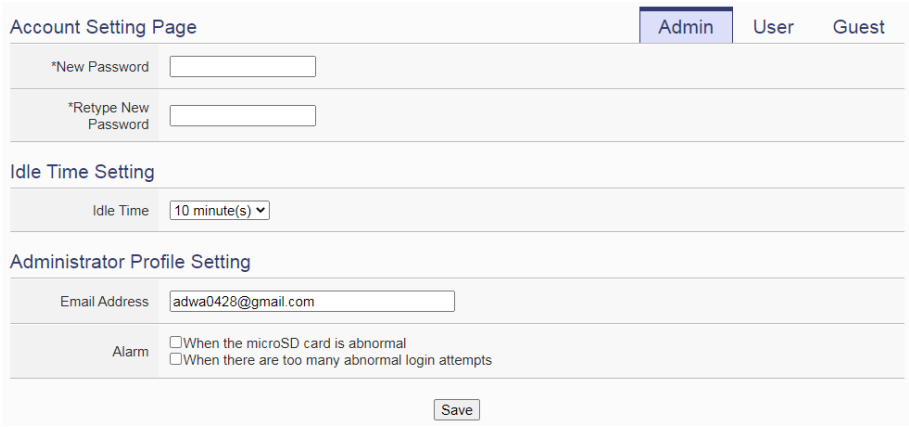


Figure 5-7：Account Setting Page for Administrator

Administrator can set up the Email address in the "Administrator Profile Setting" section. After complete the setting, WISE will send the alarm email to administrator when it is in abnormal status. Once the password is forgotten or lost, WISE could also send an email with the passwords (Administrator account, User account, Guest account, Local FTP login and CGI Query Authentication) to administrator, for more detailed information, please refer to Appendix II.

WISE provides 5 User accounts. Only Administrator can enable/disable the

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

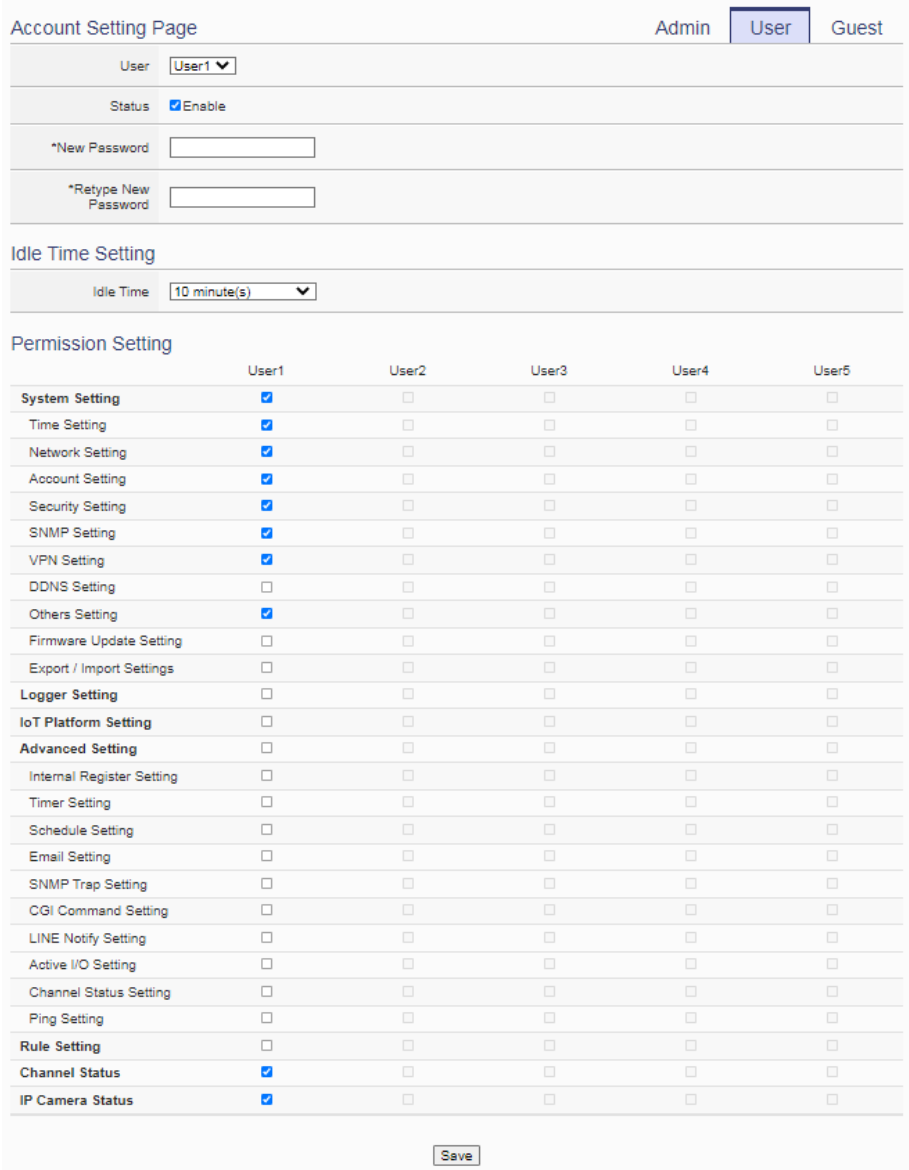


Figure 5-8：Account Setting Page for User

The settings steps are as below:

i. In the “User” filed, select the user which will be enabled. WISE provides 5 User accounts.

ii. In the “Status” field, click the “Enable” items to enable the User account, then the Password setting field and the Permission setting field will be enabled.

iii. Complete the password setting for the User.
iv. Identify the permission authority which the User can own to modify/review the WISE setting (System Setting, Logger Setting, Advanced Setting and Logic Rule Review).
v. Repeat steps i~iv to complete settings of all User accounts.
vi. After all settings are completed, click “Save” button to save the changes.

The login password setting interface of Guest account is as follows:

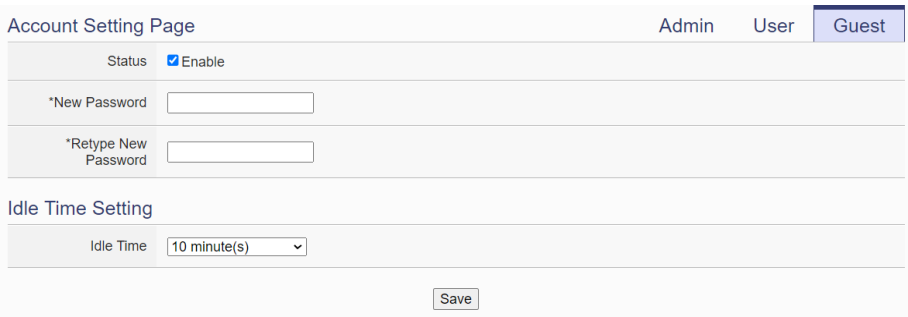


Figure 5-9：Account setting Page for Guest

Administrator can also enable or disable Guest account, set up the login password and “Idle Time” for the Guest account. After complete the setting, click the “Save” button to save the setting.

5.4 Security Setting

Security Setting allows users to change the mode of the Web Server, the Local SFTP Server setting, the Local FTP Server setting, the Local Modbus Server setting, the CGI Query Authentication setting and the Firewall setting. The Security Setting page is as follow:

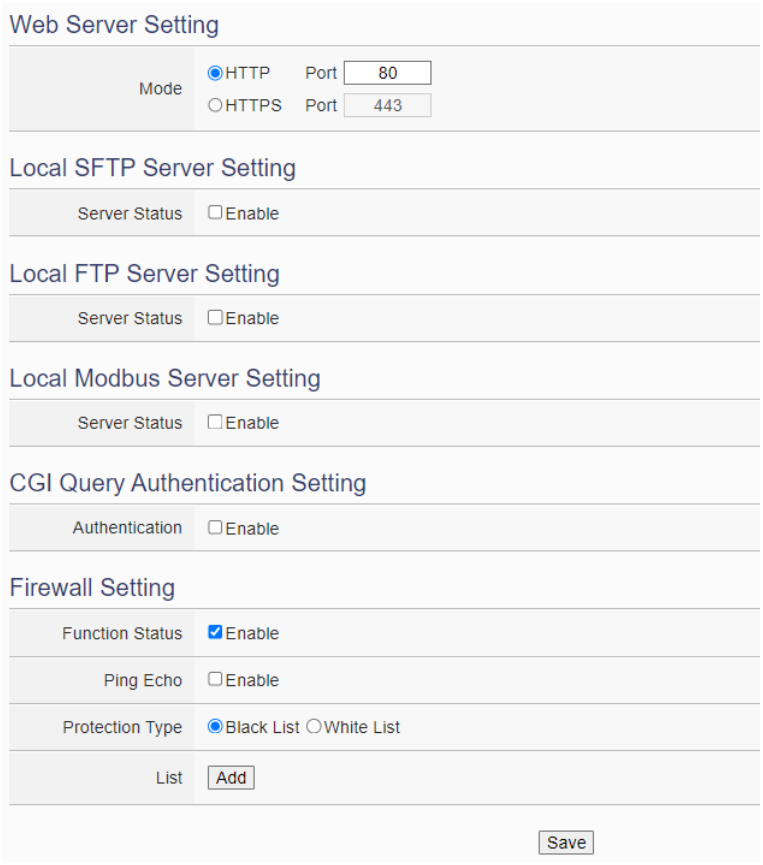


Figure 5-10：Security Setting Page

◆ Web Server Setting

The WISE's web server uses the unencrypted HTTP protocol by default. User can replace it to the encrypted HTTPS protocol to protect the content of the data transmission. The port of the web server is also changeable. The setting interface is shown as below:

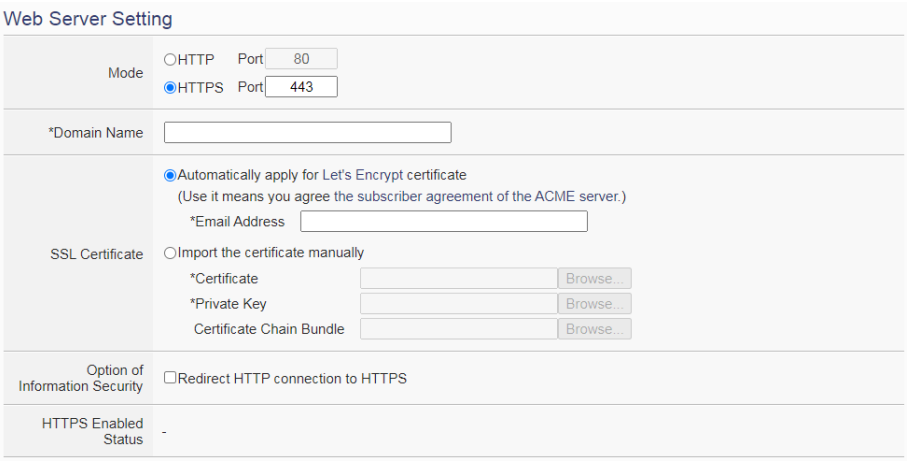


Figure 5-11：Web Server Setting page

When user selects the “HTTPS” mode, the following parameters need to

be set:

- Domain Name: To enable HTTPS mode, user must apply a domain name for the WISE controller in advance.
- SSL Certificate: To enable HTTPS mode, an SSL certificate is required for data encryption. User can manually import the files related to the SSL certificate he purchase, or directly apply for a certificate from “Let's Encrypt” directly through the WISE controller. “Let's Encrypt” credentials will automatically apply for new credentials before the credential is expiring, so there will be no issues with expired credentials. To apply a “Let's Encrypt” certificate, user must provide his email address for authentication.
- Option of Information Security: By checking “Redirect HTTP to HTTPS connection”, the HTTP port will be closed, and force to use the HTTPS protocol for the connection with WISE controller to ensure the security of connection. Before enable this setting, it is recommended to enable HTTPS mode and confirm the HTTPS connection is successfully, otherwise user may not be able to connect to WISE website.
- HTTPS Enabled Status: This field will show whether the WISE 's web server successfully enable the HTTPS mode, or not.

◆ Local SFTP Server Setting

User can enable or disable the function of WISE's SFTP server. After enable this functoin, user can connect to WISE's SFTP Server via SFTP software to remotely retrieve event log or data log files from WISE. To enable this function, please check “Enable” in the “Server Status” field and complete the setting of “Port”. The setting interface is shown as below. Please note: The SFTP server provided by WISE cannot support the file uploading operation.

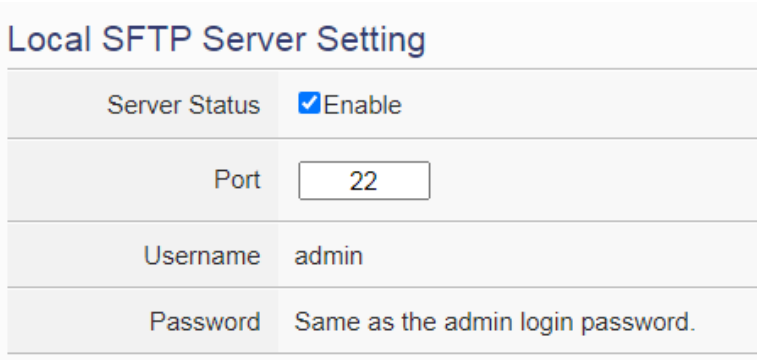


Figure 5-12：Local SFTP Server Setting Page

◆ Local FTP Server Setting

User can enable or disable the function of WISE's FTP server. After enable this functoin, he can connect to WISE FTP Server via FTP software to remotely retrieve event log or data log files from WISE. To enable this function, please check “Enable” in the “Server Status” field and complete the setting of “TLS Encryption”, “Username” and “Password”. In the “TLS encryption” field, users can disable TLS encryption of the server, or enable TLS encrption with “Explicit” or “Implicit” methods. If TLS encryption function is enabled, users must use the software with FTPS protocol for the connetcion with WISE's FTP server. The setting interafce is as shown below.

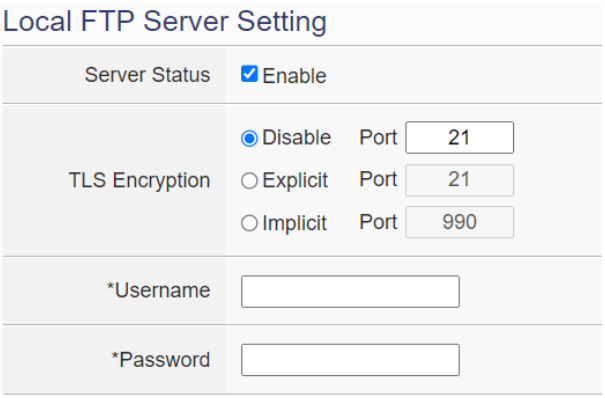


Figure 5-13：Local FTP Server Setting Page

◆ Local Modbus Server Setting

User can enable or disable the function of WISE's Modbus server. To enable this function, please check “Enable” in the “Server Status” field and complete the setting of “Port” and “NetID”. The setting interafce is as shown below.

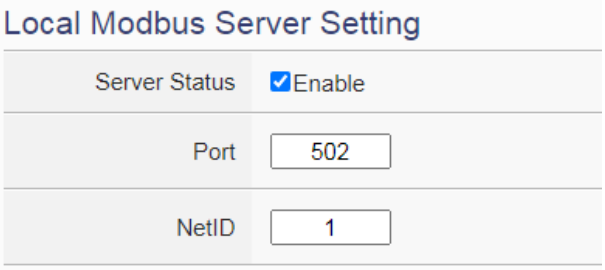


Figure 5-14：Local Modbus Server Setting Page

◆ CGI Query Authentication Setting

WISE supports fully CGI command operations as CGI command

sending and CGI command receiving. In the CGI command receiving function, administrator can set a set of account and password in the "CGI Query Authentication Setting" section to protect the operation of the WISE, then WISE will only receive the CGI commands with this account and password information, perform the corresponding operations, and ignore other CGI commands that do not with this account and password information. The CGI Query Authentication Setting page is as follow:

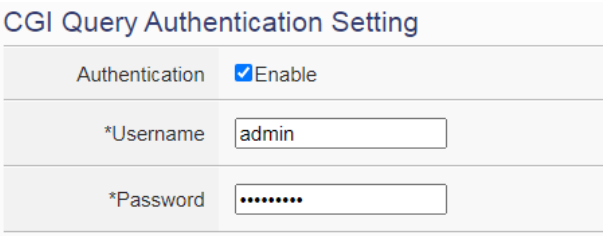


Figure 5-15：CGI Query Authentication Setting Page

◆ Firewall Setting

WISE provides the firewall mechanism to prevent the intrusion from the unknown devices on the network. Administrator can set WISE to response the ping command or not, and use the Blacklist function to prohibit the connection between WISE and the devices from the specific IP or domain; or use the Whitelist function to allow the devices from the specific domain to connect with WISE. The setting page is as shown below:

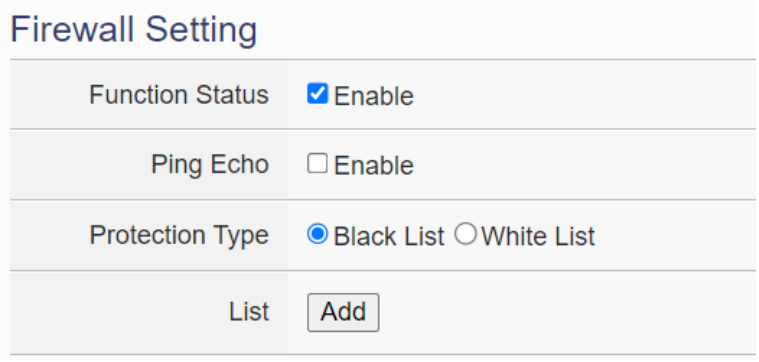


Figure 5-16：Blacklist and Whitelist Setting Page

The default setting of the firewall function is "Enable" and it would not reply to the Ping request. If you want to use the Ping command to check the status of WISE, please check "Enable" in the "Ping Echo" field. To enable this function, please check "Enable" in the "Function Status" field and select "Black List"or "White List" in the "Type" field. After press

the “Add” button in the List field, WISE provides three ways to set up the content of the Blacklist and Whitelist according to the network environment as “Single IP Address”, “Subnet” and “IP Address Range”. Please refer following.

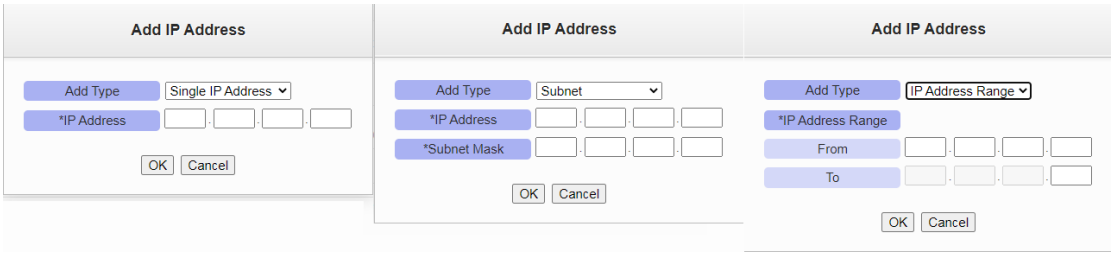


Figure 5-17：IP address Setting Page in Blacklist/Whitelist

In addition, when the WISE controller encounters many login failures from the unknown device, It will automatically add the IP of the unknown device to the Blacklist, and prohibit the IP to try to log in WISE continually.

After complete all the security settings, press the “Save” button at the bottom, and then press the “Save” button at the top right of the page to download the security settings to WISE, then WISE will start to perform the setting.

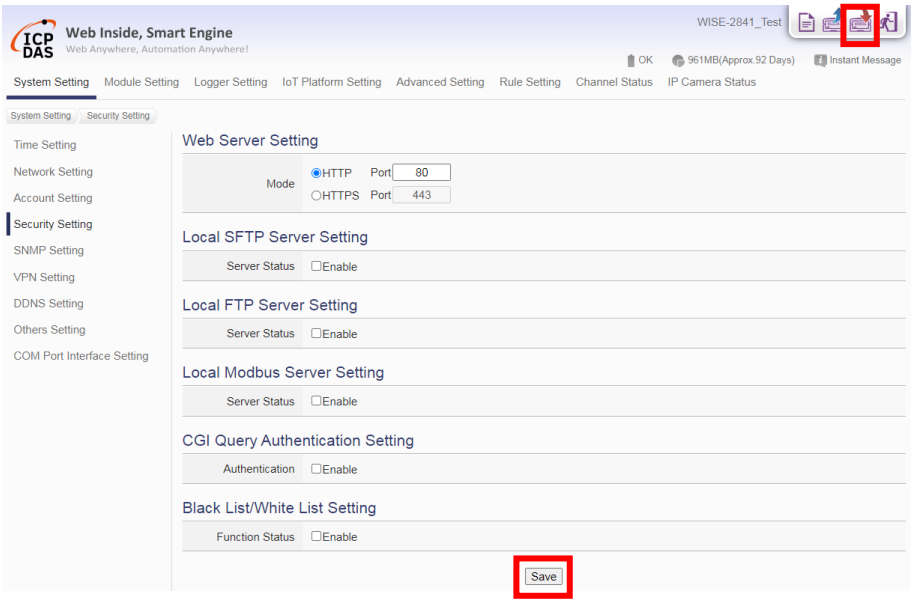


Figure 5-18：Save and Download the Security Setting

5.5 SNMP Setting

The WISE provides SNMP (Simple Network Management Protocol) V2c

and V3 to work with the SNMP Network Management software for monitoring the system data and I/O module data. The SNMP Setting page allows you to enable or modify the settings of the SNMP function on the WISE. The following figure illustrates the set up interface:

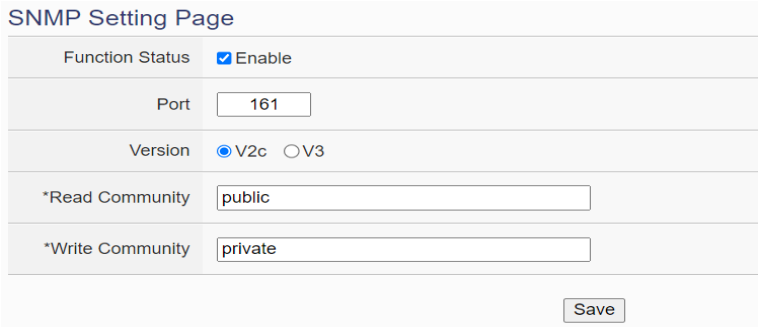


Figure 5-19：SNMP Setting Page

Please follow the steps below for the SNMP settings:

i. In the “Function Status” field, check “Enable” to enable SNMP server.

ii. In the “Version” field, select the SNMP version that you want to use. Currently WISE supports SNMP V2c and V3 protocols,

iii. If the user selects “V2c” in the “Version“ field, he must set up the string in the “Read Community” and “Write Community” fields. The default setting of “Read Community” and “Write Community” field is “public” and “private”.

iv. If the user selects “V3” in the “Version” field, he must set up the SNMP user list. The setting interface is as follows.

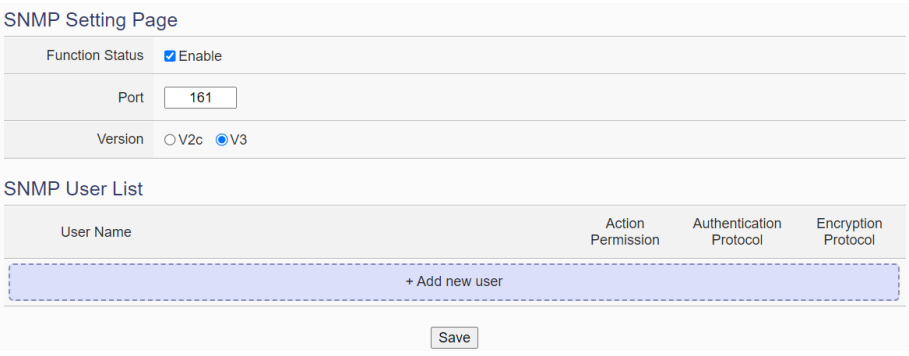


Figure 5-20：SNMP V3 Setting Page

v. Press the “+Add new user” button to enter the SNMP User Setting page. The setting interface is as follows:

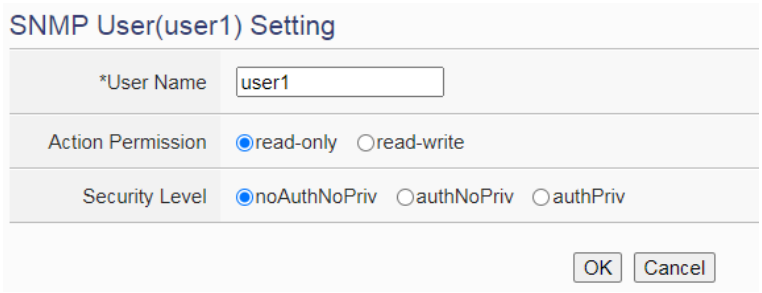


Figure 5-21：SNMP V3 User Setting Page

vi. Key in the username in the “User Name” field.

vii. Select “read-only” or “read-write” in the “Action Permission” field.

viii. There are three levels of security options in the “Security Level” field, please refer to following.

- noAuthNoPriv: Communication without authentication and encryption.
- authNoPriv: Communication shall be authenticated but not encrypted. The authentication protocol must be “SHA” or “MD5”, and set the authentication password.
- authPriv: Communication shall be authenticated and encrypted. The settings of authentication protocol must be “SHA” or “MD5”. The settings of encryption must be “AES” or “DES”, and set the password for each field. Please refer to following.

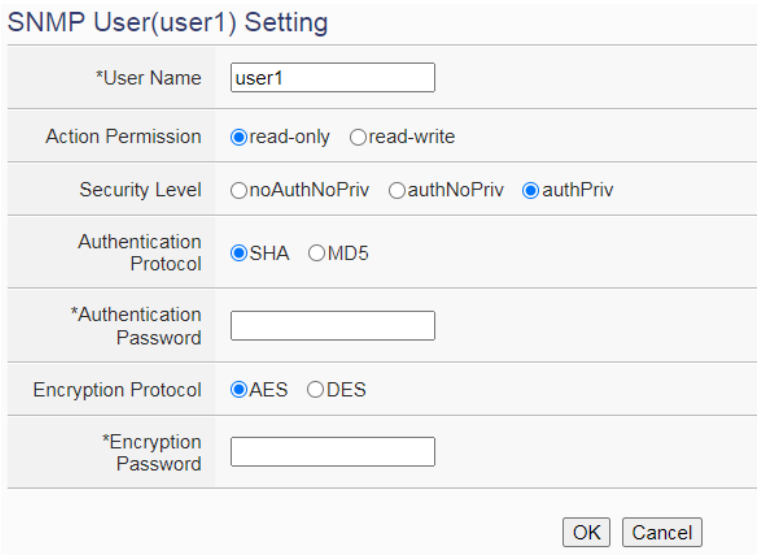


Figure 5-22：SNMP V3 User Authentication & Encryption Setting Page

ix. After complete SNMP V3 user settings, click the “OK” button to return to the SNMP settings page.

x. After complete the setting for all SNMP V3 user, click “Save” button to complete the SNMP settings.

Please Note: The official website of WISE provides the WISE-2841M MIB file. User can download it from the WISE official website.

5.6 VPN Setting

WISE provides the VPN (Virtual Private Nnetwork) service to protect WISE to avoid the malicious accessed by external devices and ensure the security of the devices installed in the VPN environment. WISE provides following 4 VPN services:

- PPTP
- L2TP/IPSec
- OpenVPN
- SoftEther

The setting interface is as below.

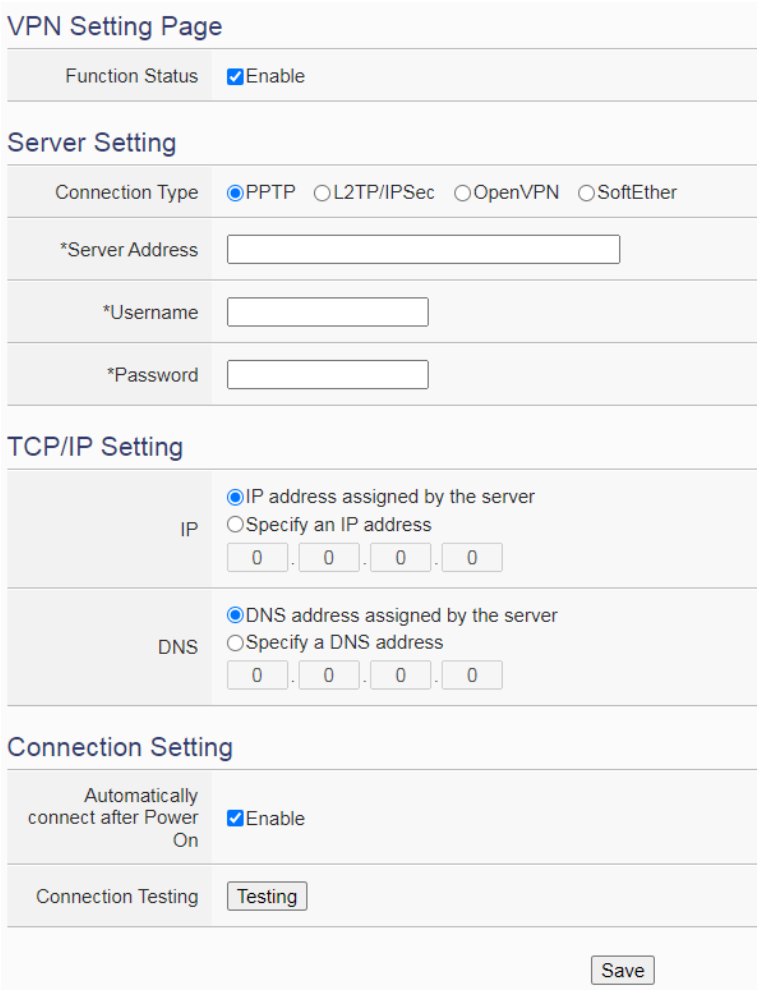


Figure 5-23：VPN Setting Page

Please follow the steps below for the VPN settings:

i. In the “Function Status” field, check “Enable” to enable the VPN function.

ii. In the “Server Settings” section, select the VPN service user want to use from the 4 connection types, then complete the setting for the connection and TCP/IP required by the service.

iii. In the “Connection Setting” section, check “Enable” in the “Automatically connect after power on” field to automatically connect to the VPN after the WISE controller is powered on.

iv. User can click the “Testing” button in the “Connection Testing” field to confirm whether the VPN connection setting is correct, or not.

v. After completing the settings, click the “Save” button to save the settings.

5.7 DDNS Setting

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

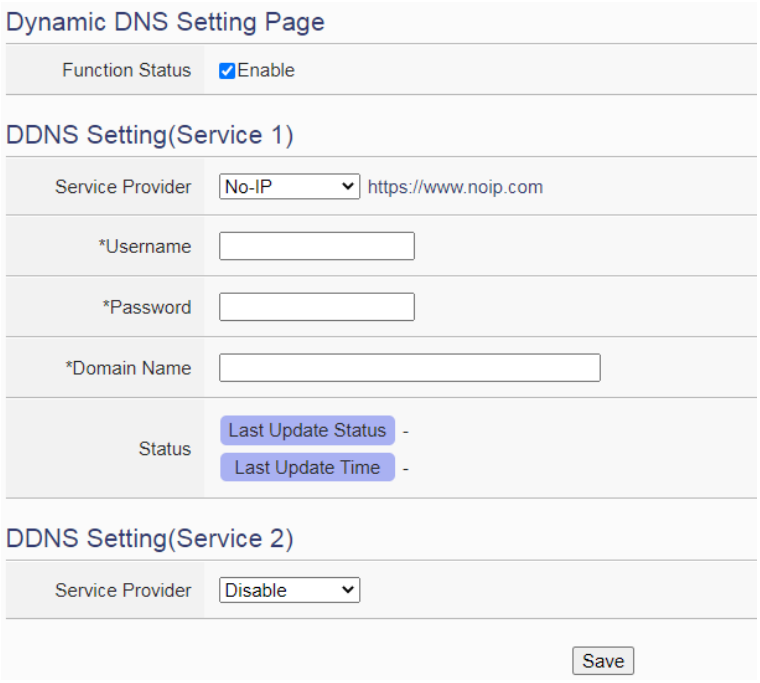


Figure 5-24：DDNS Setting Page

Follow the steps below to set up Dynamic DNS service:

i In the “Function Status” field, check “Enable” to enable the DDNS function.

ii WISE provides two DDNS services for user. Under the normal status, user can activate one DDNS service, but if user has the requirement for Redundant DDNS service, he can activate two DDNS services simultaneously.

iii In the “Service Provider” field, select the provider of Dynamic DNS service from the dropdown list. Currently system provides 6 options for selection as “No-IP”, “ChangeIP”, “Free DNS”, “Dyn”, “DNS-O-Matic” and “Disablev.

iv If user selects “No-IP”, “ChangeIP”, “Dyn” or “DNS-O-Matic”, please enter the information for the Username, Password and Domain Name fields to login the service. If user selects “Free DNS”, please insert the Token to login the service.

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

5.8 Others Setting

In Others Setting page, users can set up the decimal place number for the floating-point value displayed by WISE. The setting interface is as follows:

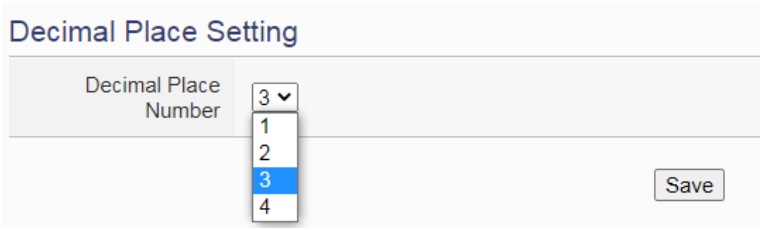


Figure 5-25：Decimal Place Number Setting Page

User can set up the decimal place number to 1~7. After the setting is completed, click the “Save” button to save the setting.

5.9 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:

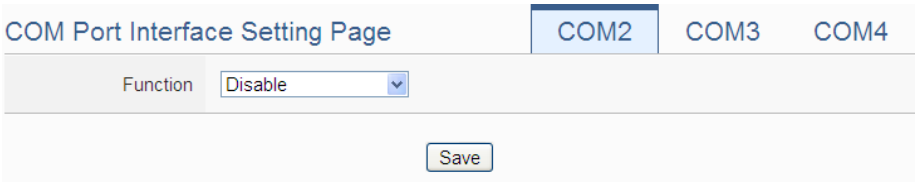


Figure 5-26：COM Port Interface Setting Page

The COM Port interface on WISE includes:

◆ COM2(RS-232)

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

◆ COM3 / COM4 (RS-485)

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

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

- Modbus RTU Slave (Connect to HMI or SCADA)

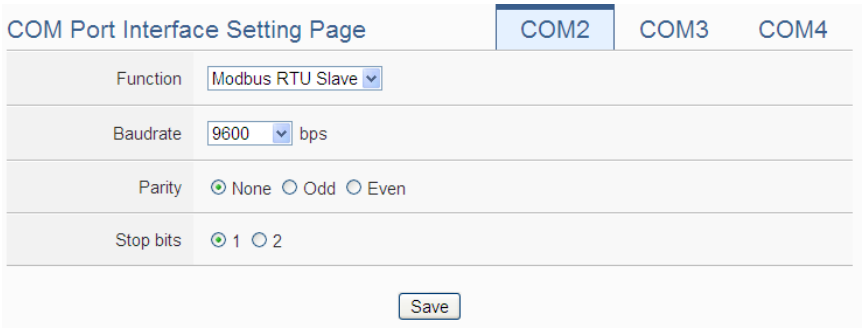


Figure 5-27：COM Port Interface Setting for Modbus RTU Slave

The settings steps are as below:

i In the “Baudrate” field, select the Baudrate from the dropdown list, the Baudrate of WISE and HMI or SCADA have to be set the same.

ii In the “Parity” and “Stop bits” fields, set up the Parity and Stop bits. The Parity and Stop bits of WISE and HMI or SCADA have to be set the same.

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

- DCON Master (Connect to DCON modules)

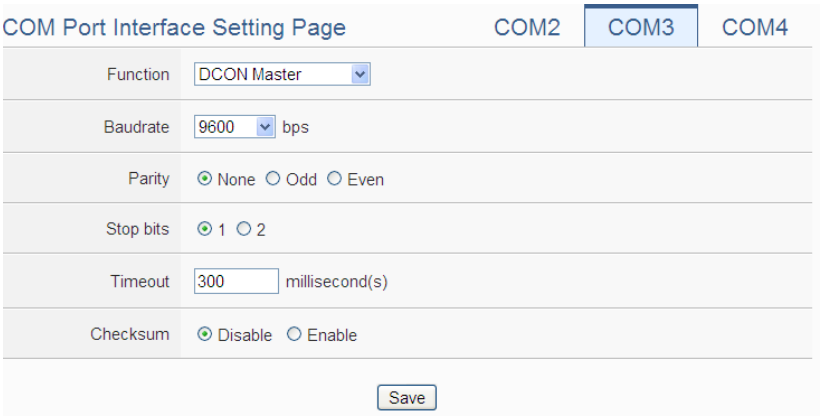


Figure 5-28：COM Port Interface Setting for DCON Master

The settings steps are as below:

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

ii In the “Parity” and “Stop bits” fields, set up the Parity and Stop bits. The Parity and Stop bits of WISE and DCON module have to

be set the same.

iii In the “Timeout” field, input the time interval for WISE to send command to the DCON module and wait for the response, the unit will be millisecond (ms).

iv In the “Checksum” field, specify the Checksum setting for the communication between WISE and DCON module to be enabled or disabled.

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

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

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

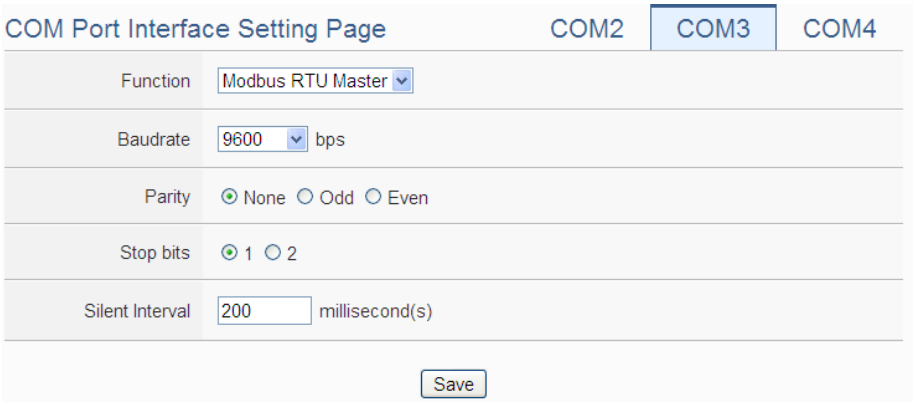


Figure 5-29：COM Port Interface Setting for Modbus RTU Master

The settings steps are as below:

i In the “Baudrate” field, select the Baudrate from the dropdown list, the Baudrate of WISE and Modbus RTU slave module have to be set the same.

ii In the “Parity” and “Stop bits” fields, set up the Parity and Stop bits. The Parity and Stop bits of WISE and Modbus RTU slave module have to be set the same.

iii In the “Silent Interval” field, input the time interval between successive sending of commands from the WISE to the Modbus RTU slave module, the unit will be millisecond (ms).

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

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

6 Module Setting

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

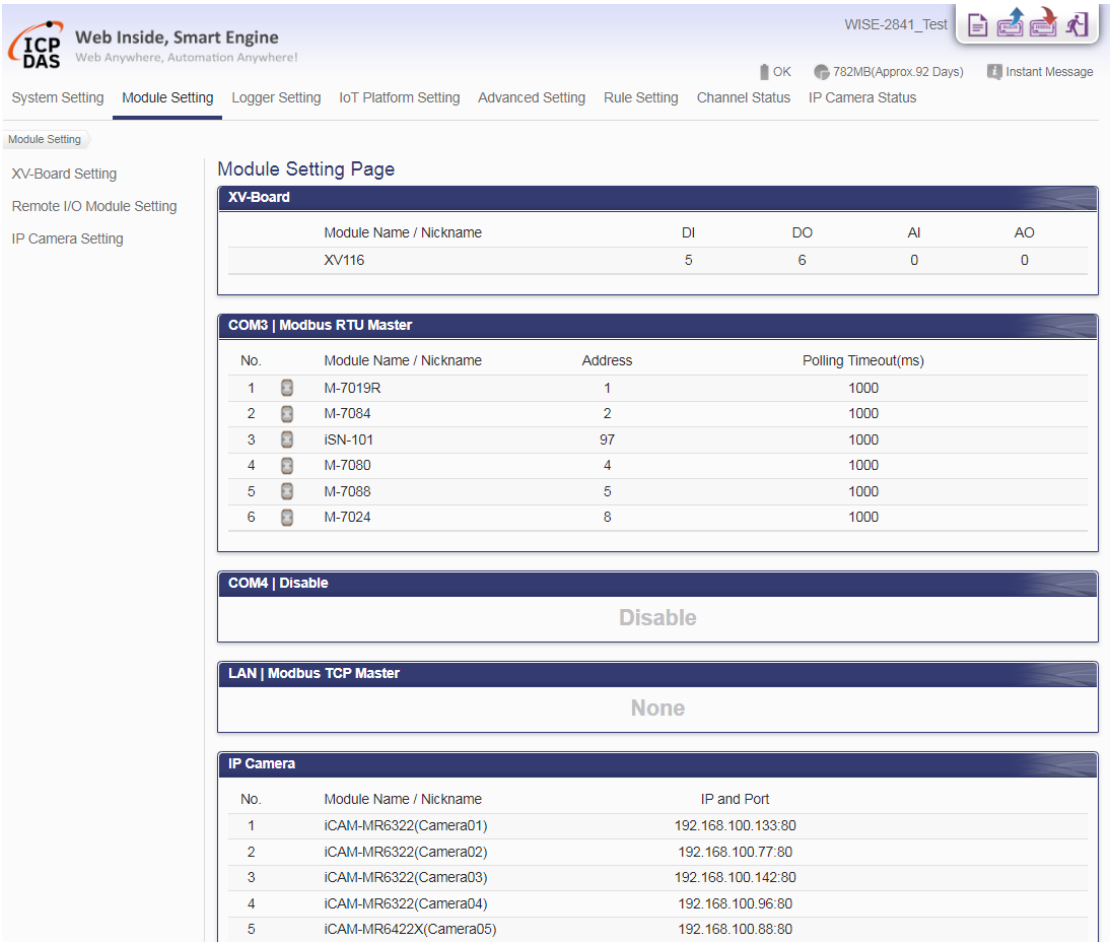


Figure 6-1：Module Setting Page

Module Setting includes the following 3 setting options:

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

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

6.1 XV-Board Setting

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

shown as follow:

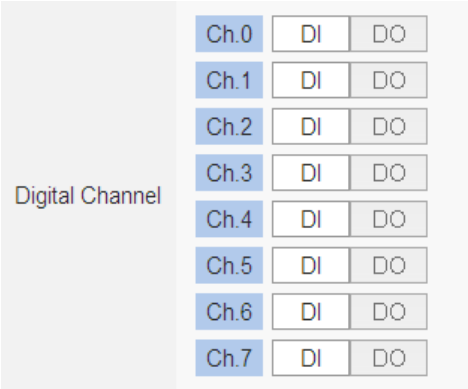
Please note: Each time WISE is allowed to connect to one XV-Board module only.

Figure 6-2：XV-Board Setting Page

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

- 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):

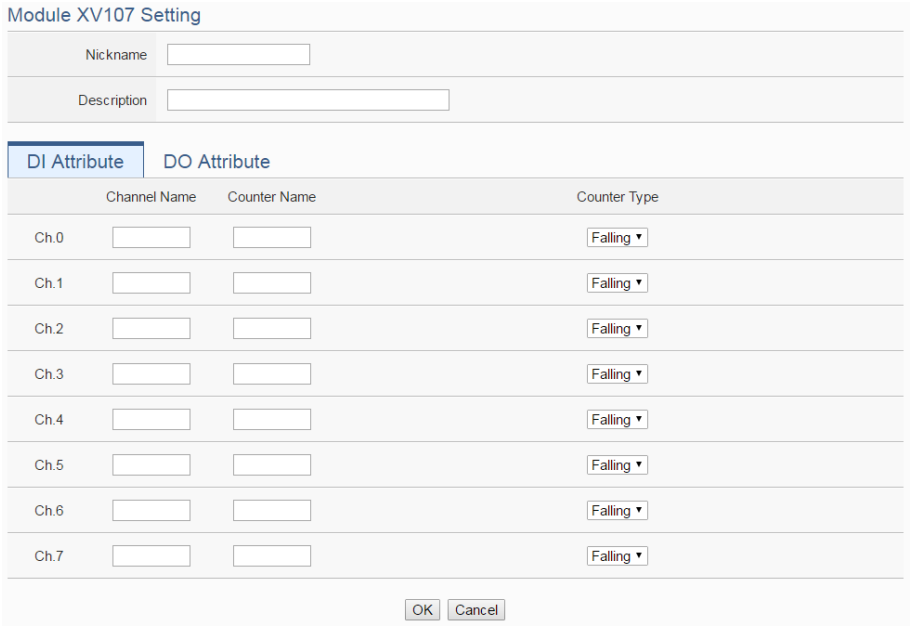


Figure 6-3：XV-Board DI Channel Setting Page

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):

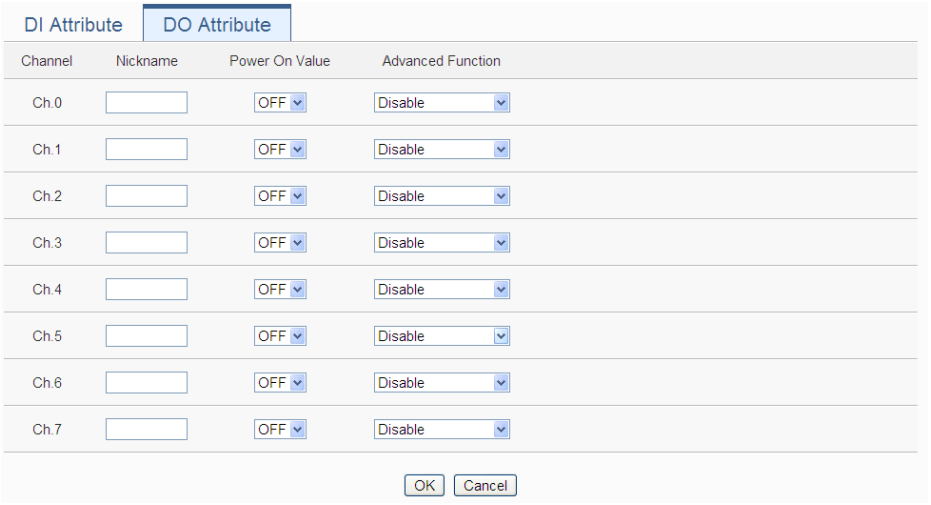


Figure 6-4：XV-Board DO Channel Setting Page

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 power on. Select the value from the dropdown list of “Power On Value” field. The default value is “OFF”.
- WISE provides 3 advanced functions, select the function from the dropdown list:
  - Pulse Output: If the Pulse Output is selected, it will allow this DO channel to perform pulse output and form a periodic pulse cycle. In Pulse Output mode, the selected DO channel will generate a square wave according to specified parameters (Pulse High and Pulse Low). Pulse High indicates the “ON” time duration and Pulse Low indicates the “OFF” time duration in a periodic Pulse cycle. The unit is 100ms.
  - Auto OFF: When “Auto OFF” is selected, it allows this DO channel to enable Auto OFF function. It is required to set up a time interval, when this DO channel is set to be “ON” and the duration of the ON status reaches the pre-set time interval, the DO will automatically be set to OFF. The unit is second.
  - DI Status Mapping: When “DI Status Mapping” is selected, the status of the DI channel with the same channel number

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

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

6.1.3 XV-Board AI Channel Settings

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

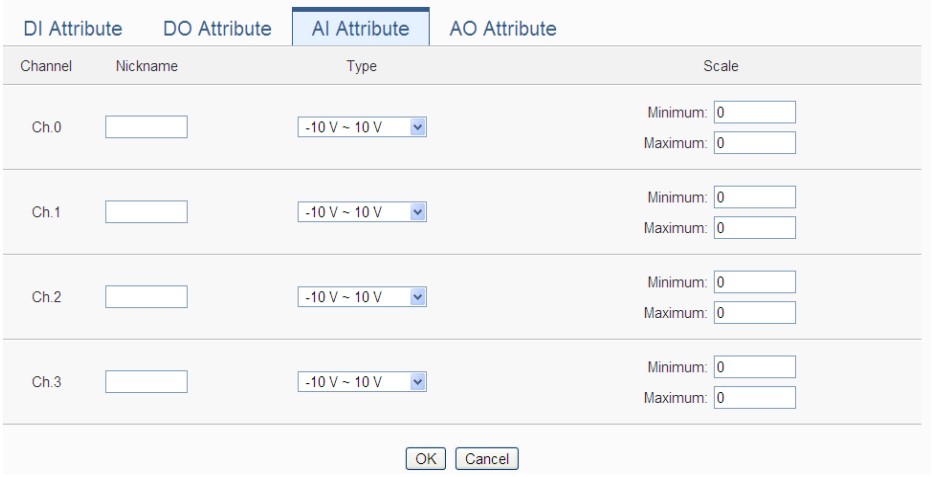


Figure 6-5：XV-Board AI Channel Setting Page

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 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):

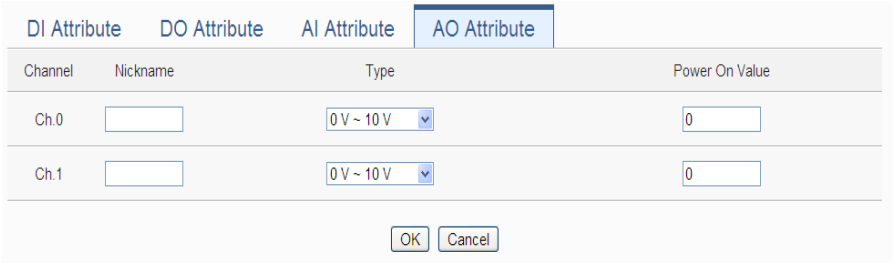


Figure 6-6：XV-Board AO Channel Setting Page

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

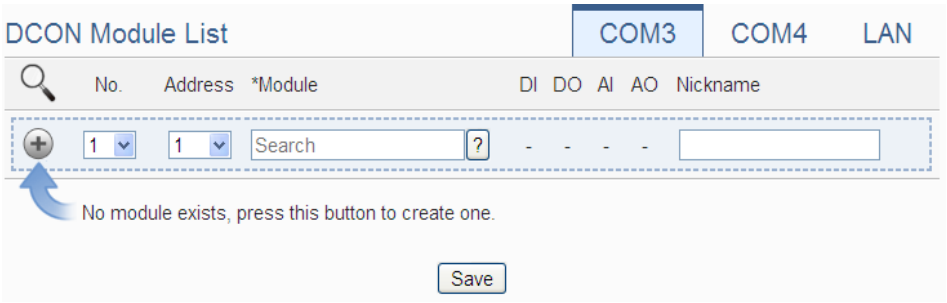


Figure 6-7：Remote I-7000/DL Module Setting Page

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

Please note:

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

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

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

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

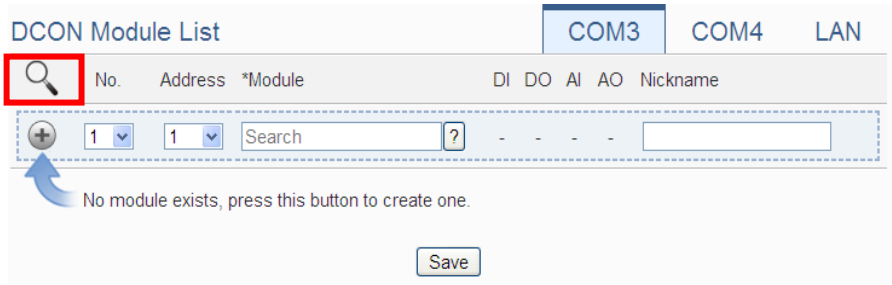


Figure 6-8：The "Scan" button to search I-7000/DL Modules

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

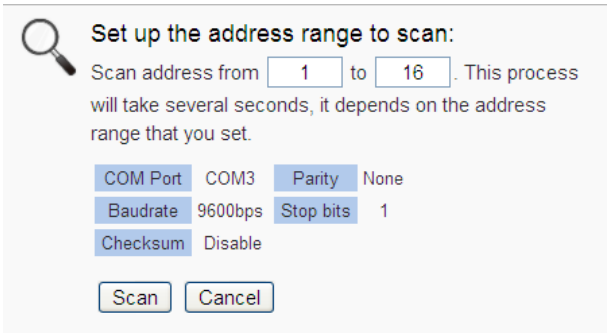


Figure 6-9：Set up the Scanning Range for the I-7000/DL modules

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

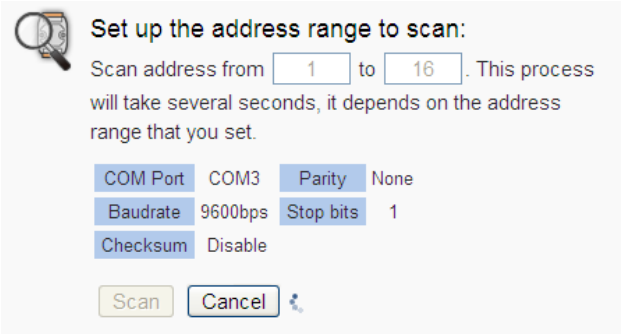


Figure 6-10：Scanning the I-7000/DL modules

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

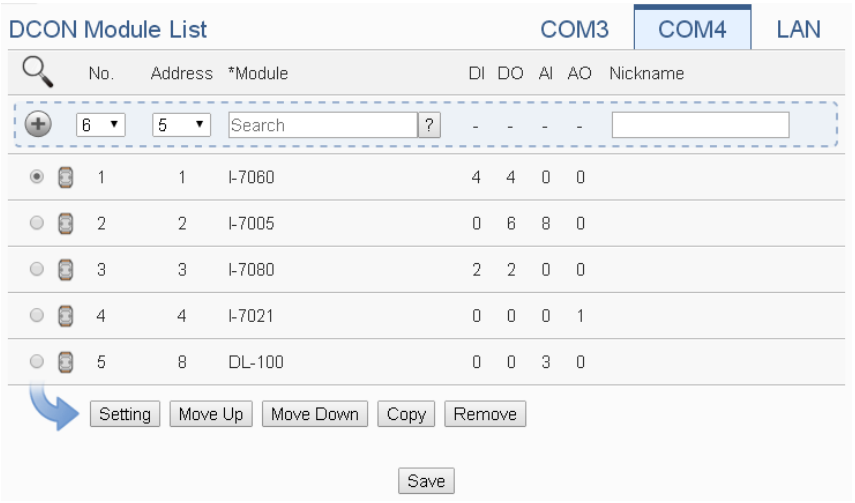


Figure 6-11：I-7000/DL module List after Scan operation

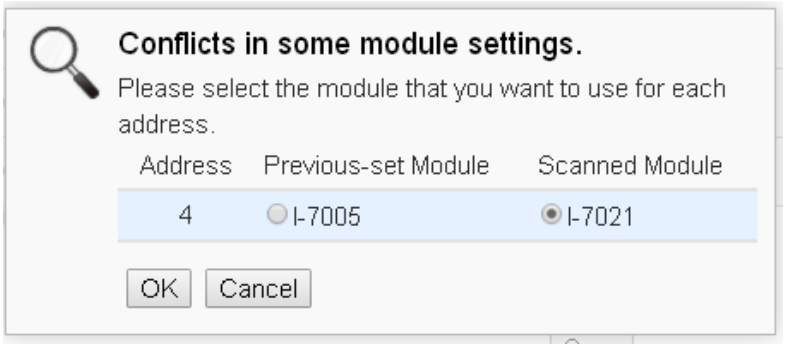


Figure 6-12：Select the actual I-7000/DL modules connected

6.2.2 Add I-7000/DL DCON Module manually

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

i. No: The number will be the order that the I/O channel data of the I-7000/DL DCON module being stored in the WISE Modbus Table. The range is 1~16.

ii. Address: The address will be the DCON address of this I-7000/DL DCON module, please make sure the address is the same as the settings of the module, if the setting is not accurate, the connection for WISE to the I-7000/DL DCON module will be failed.

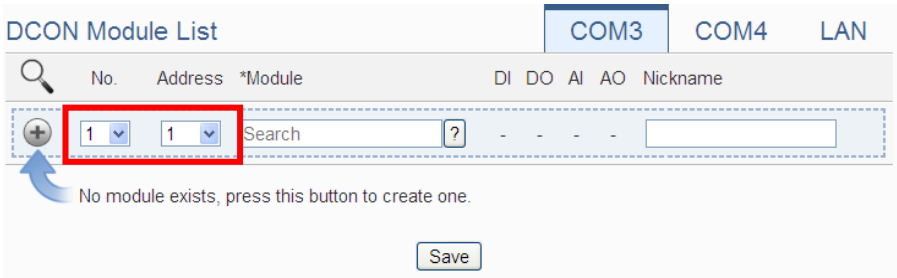


Figure 6-13：Set up the No. and Address of the I-7000/DL modules

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

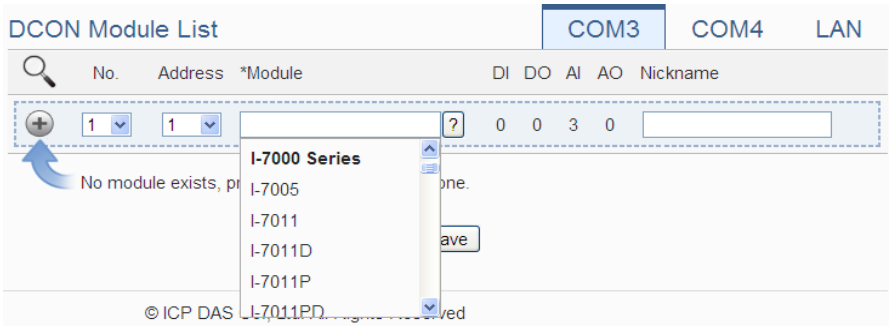


Figure 6-14：Select the model of the I-7000/DL modules

iv. Input the Nickname for the I-7000/DL DCON modules.

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

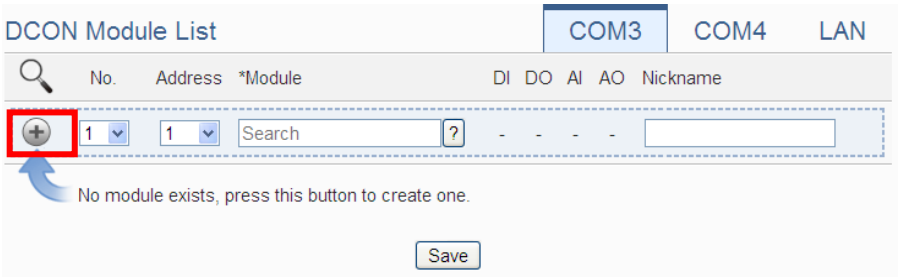


Figure 6-15：Add the I-7000/DL Module manually

6.3 I-7000/DL DCON Module List Operation Interface

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

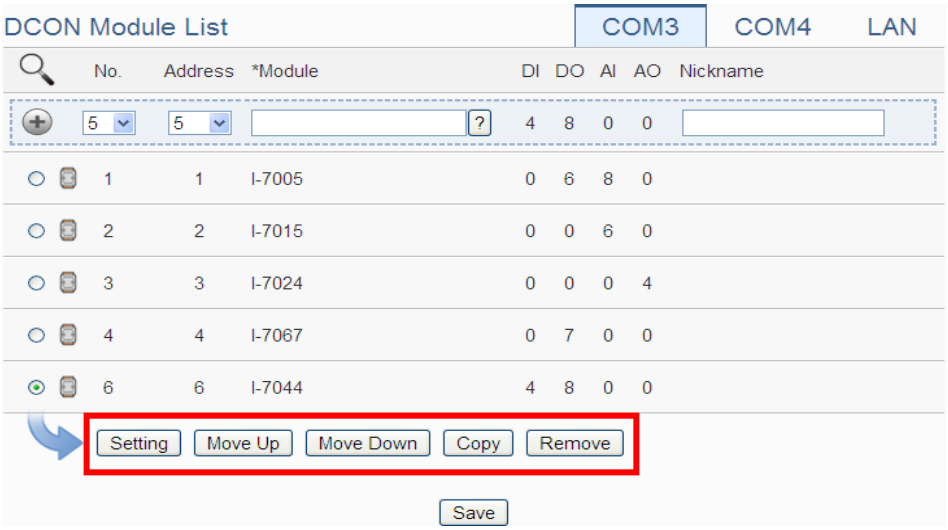


Figure 6-16：I-7000/DL Module List Operation Interface

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

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

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

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

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

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

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

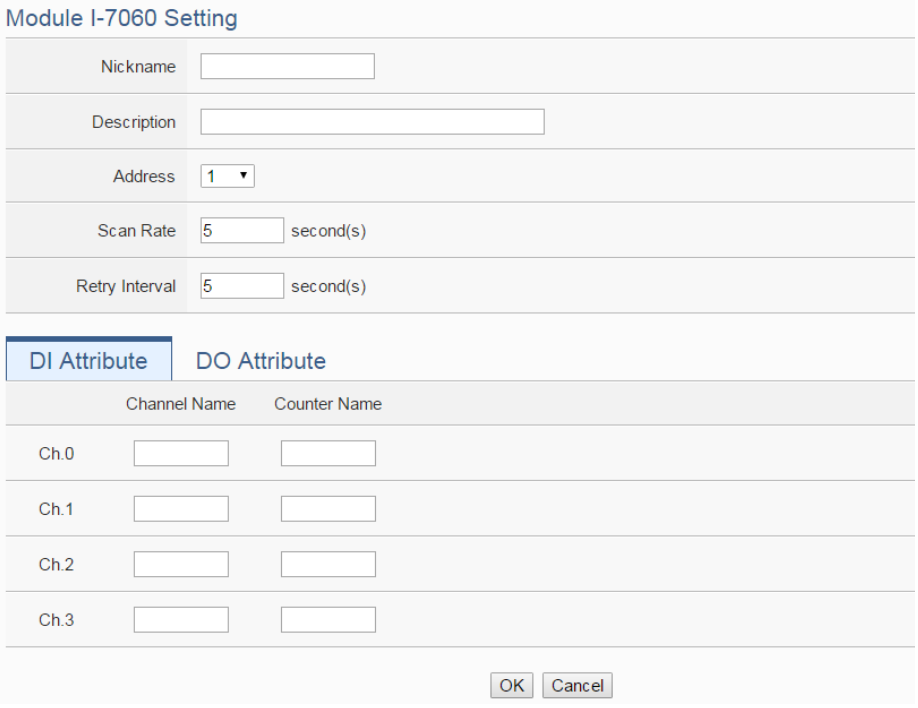


Figure 6-17：I-7000/DL Module DI Channel Setting page

The settings are as below:

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

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

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

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

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

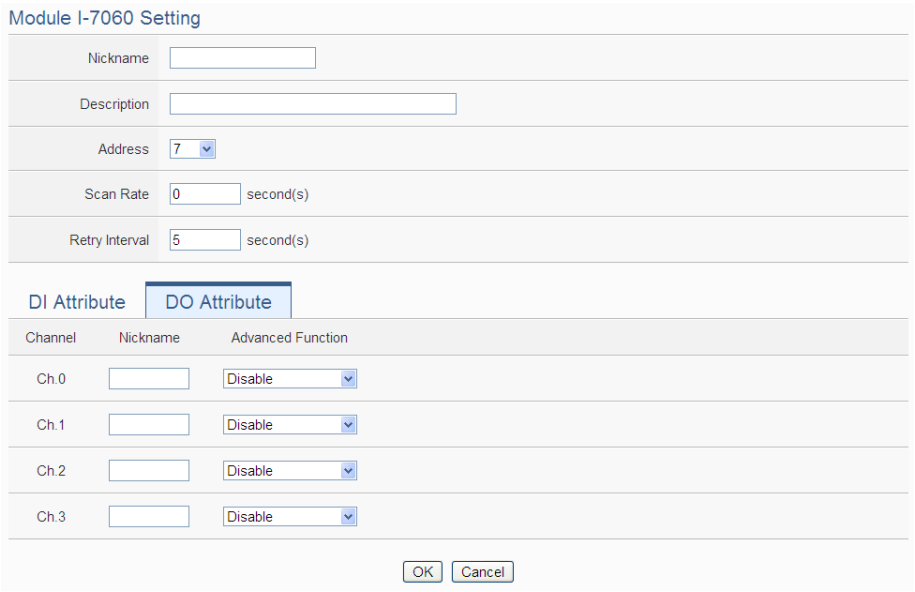


Figure 6-18：I-7000/DL Module DO Channel Setting page

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.
- For I-7000/DL DCON DO channels, WISE provides the “Auto OFF” and “DI Status Mapping” advanced functions, select the function from the dropdown list:
  - Auto OFF: When “Auto OFF” is selected, it allows this DO channel to enable Auto OFF function. It is required to set up a time interval, when this DO channel is set to be “ON” and the duration of the ON status reaches the pre-set time interval, the DO channel will automatically be set to OFF. The unit is second.
  - DI Status Mapping: When “DI Status Mapping” is selected, the status of the DI channel with the same channel number on the I-7000/DL DCON module will be copied to the DO channel. For example, when the “DI Status Mapping” is enabled on DO0, when the DI0 status is ON, DO0 will set to be ON, and when the DI0 status is OFF, DO0 will set to be OFF as well.

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

I-7000/DL DCON Module List.

Please Note:

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

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

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

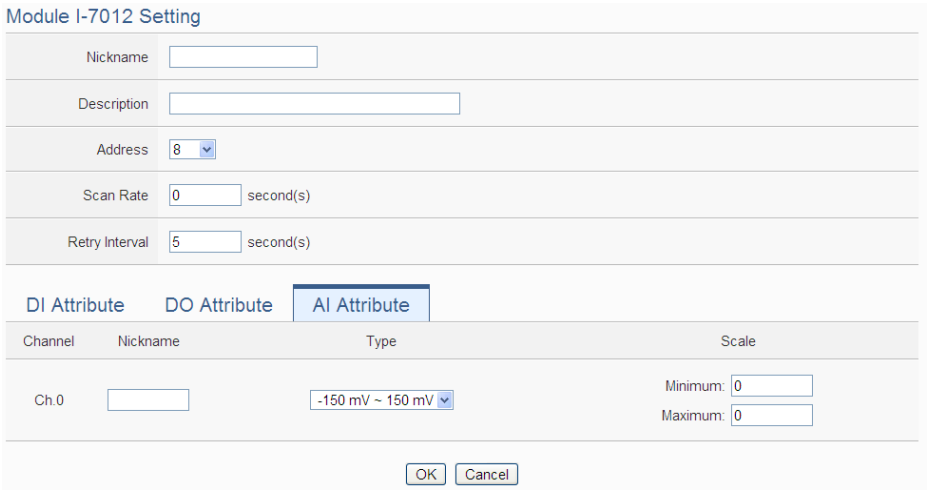
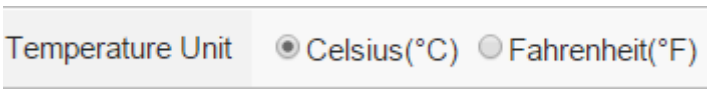


Figure 6-19：I-7000/DL Module AI Channel Setting page

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.
- 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 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):

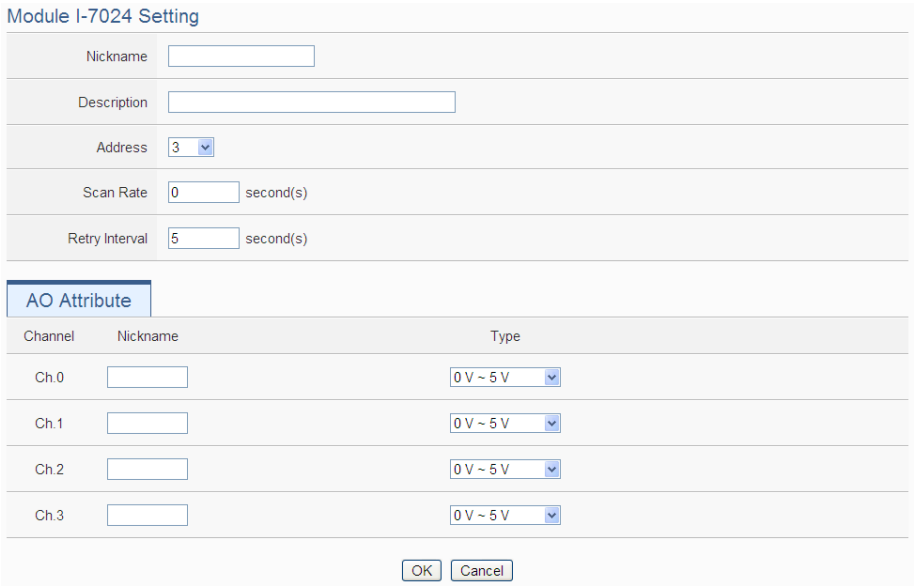


Figure 6-20：I-7000/DL Module AO Channel Setting page

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

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

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

6.4 Remote Modbus RTU Module Setting

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

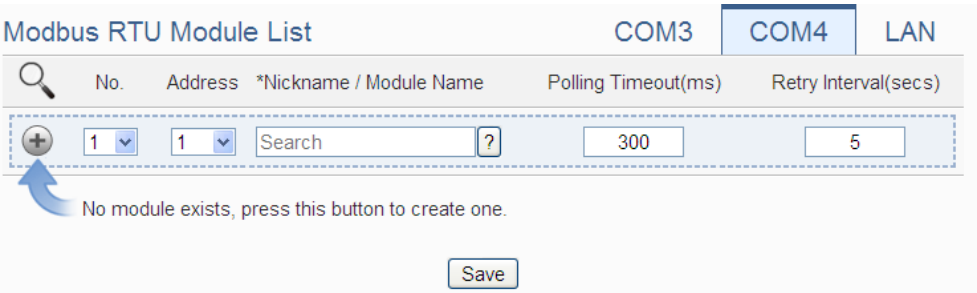


Figure 6-21：Remote Modbus RTU Module Setting page

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

Please note:

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

6.4.1 Scan to Add ICP DAS Modules

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

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

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

connected to the WISE.

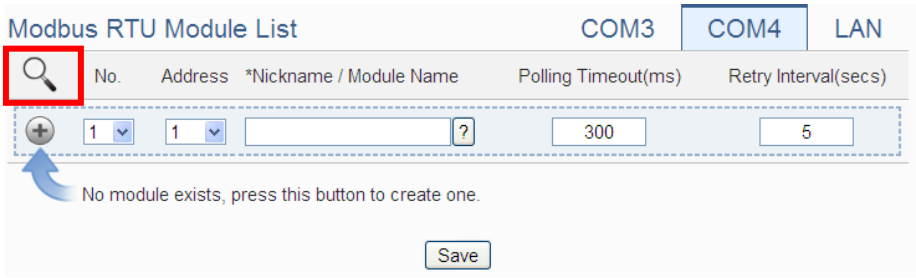


Figure 6-22：The "Scan" button to search ICP DAS module

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

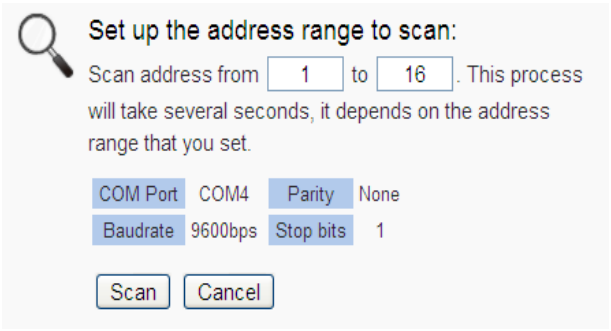


Figure 6-23：Set up the Scanning Range for the ICP DAS module

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

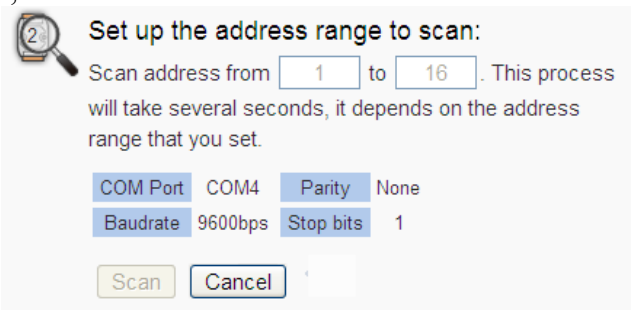


Figure 6-24：Scanning the ICP DAS module

iv. After the Scan operation is completed, an M-7000/tM/CL/DL/LC /iSN/DLW module list will appear. If the newly scanned module doesn't match the module previously set on the same address, a window will appear (Figure 6-26), please select the actual device that are connected to WISE. After all settings are completed, click "Save" button to save the changes.

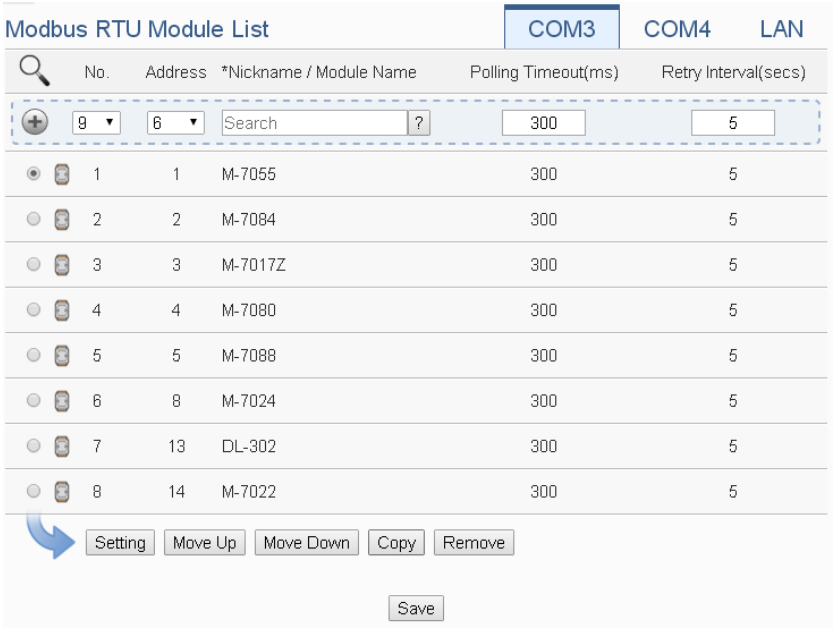


Figure 6-25：The ICP DAS module List after Scan operation

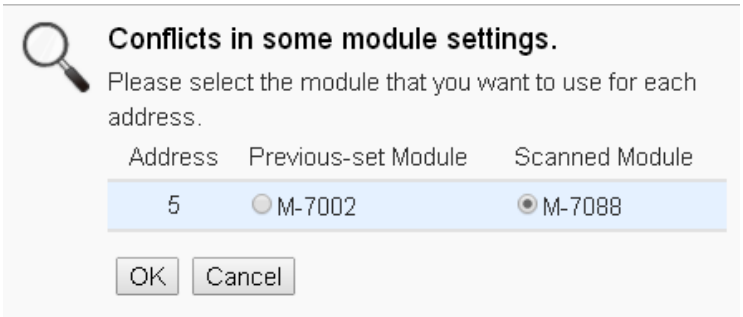


Figure 6-26：Select the actual ICP DAS modules

6.4.2 Add ICP DAS module or Modbus RTU Module manually

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

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

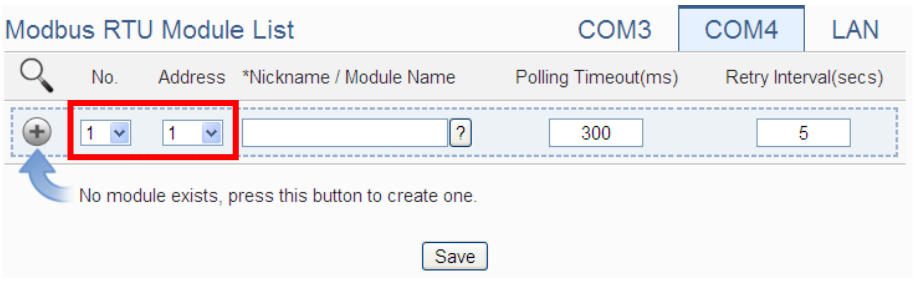


Figure 6-27：Set up the No. and Address of the Modbus RTU modules

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

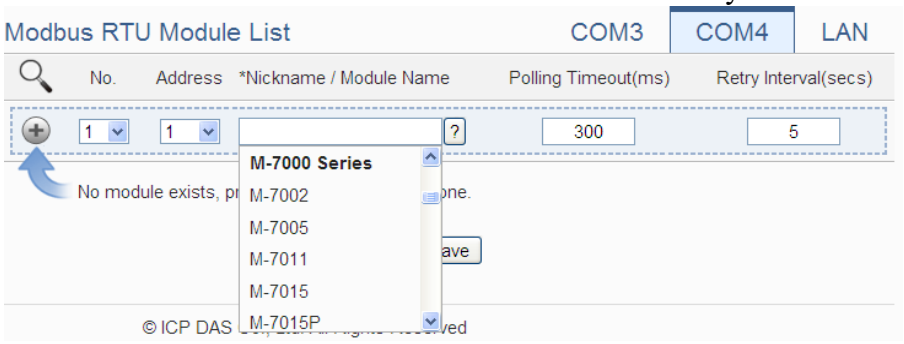


Figure 6-28：Select the model of the Modbus RTU Module

iv. Polling Timeout: The time interval for WISE to send command to the Modbus RTU module and wait for the response, the unit will be ms. The setting range will be 1~10000 ms.

v. Retry Interval: The time interval to wait for WISE to repeatedly send command again when WISE sends command to the Modbus RTU module and get no response. The unit will be second. The setting range will be 3 ~ 65535 seconds.

vi. Click ⊕ to add the Modbus RTU module to the list. After adding the Modbus RTU module, click “Save” button to save the changes.

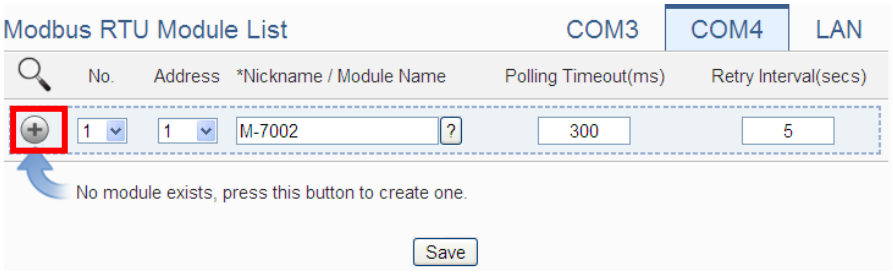


Figure 6-29：Add the Modbus RTU Module manually

6.5 Modbus RTU Module List Operation Interface

After the Modbus RTU modules are added to the Module RTU module list via auto scan or manual work, the Modbus RTU modules will be listed as below:

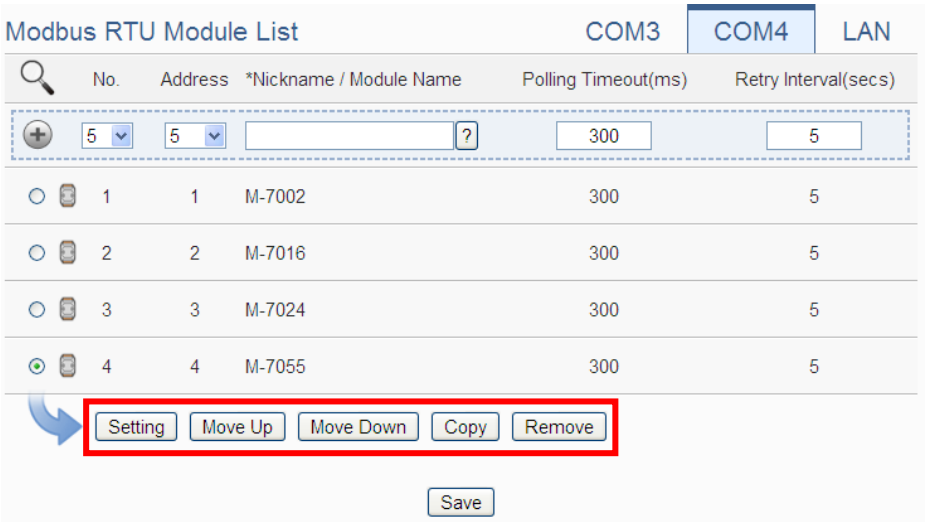


Figure 6-30：Modbus RTU module List Operation Interface

Through the operations of “Setting”, “Move Up”, “Move Down”, “Copy” and “Remove” functions, user can set up the parameters or adjust the arrangement order for each Modbus RTU module in the list. Please refer to the description of “6.3 I-7000/DL DCON Module List Operation Interface” for detail. 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/CL/DL/LC/IR/iSN/DLW 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 Modbus RTU module DI channel setting interface is shown as below (using M-7060 as an example):

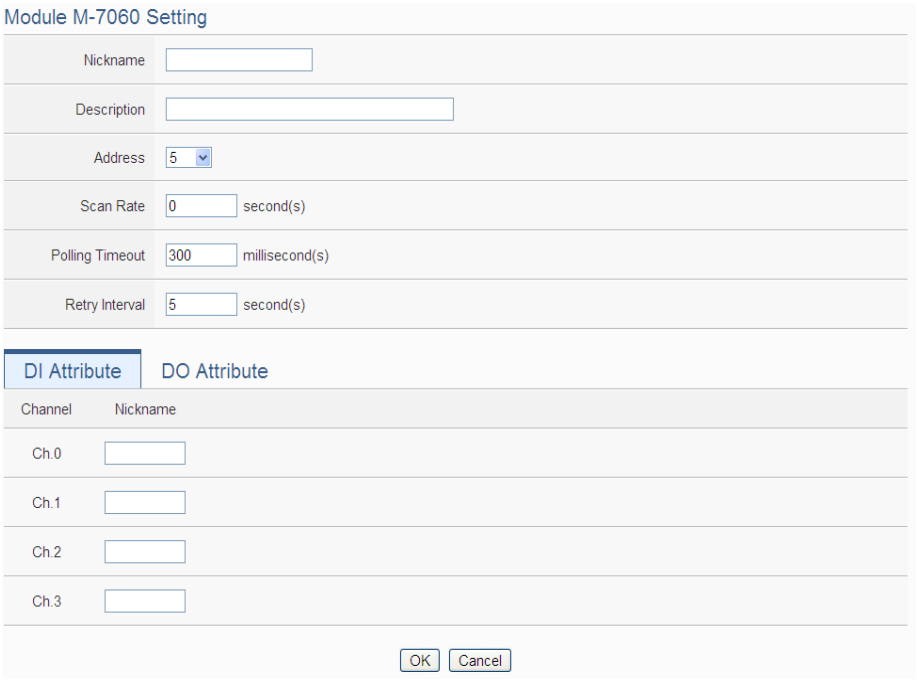


Figure 6-31：ICP DAS Modbus RTU module DI Channel Setting page

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 module, please make sure the address is the same as the settings of the module, if the setting is not accurate, the connection for WISE to the Modbus RTU module will be failed.
- Scan Rate: Input the time interval for WISE to periodically retrieve the I/O channel data of this module, the setting range will be 0 ~ 65535 seconds.
- Polling Timeout: The time interval for WISE to send command to the module and wait for the response, the unit will be ms. The setting range will be 1-10000 ms.
- Retry Interval: The time interval to wait for WISE to repeatedly send command again when WISE sends command to the 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 Modbus RTU module DO channel setting interface is shown as below (using M-7060 as an example):

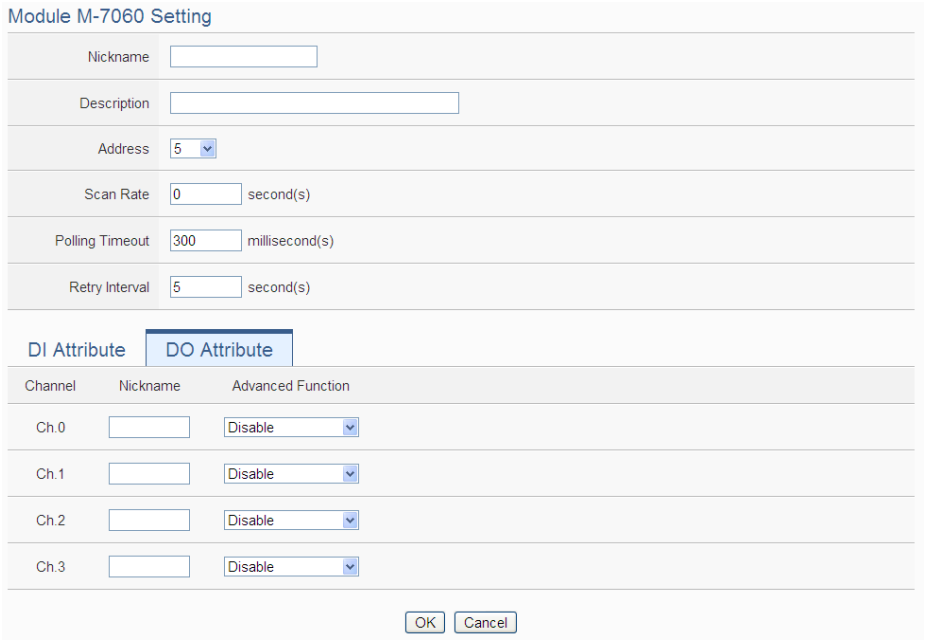


Figure 6-32：ICP DAS Modbus RTU module DO Channel Setting page

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.
- For DO channels, WISE provides the “Auto OFF” and “DI Status Mapping” advanced functions, please refer to ”6.3.2 The DO channel setting for I-7000/DL DCON module” section for detail.

After all settings of the DO channels are completed, continue the

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

Please Note:

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

6.5.3 The AI channel setting for ICP DAS module

The ICP DAS Modbus RTU module AI channel setting interface is shown as below (using M-7002 as an example):

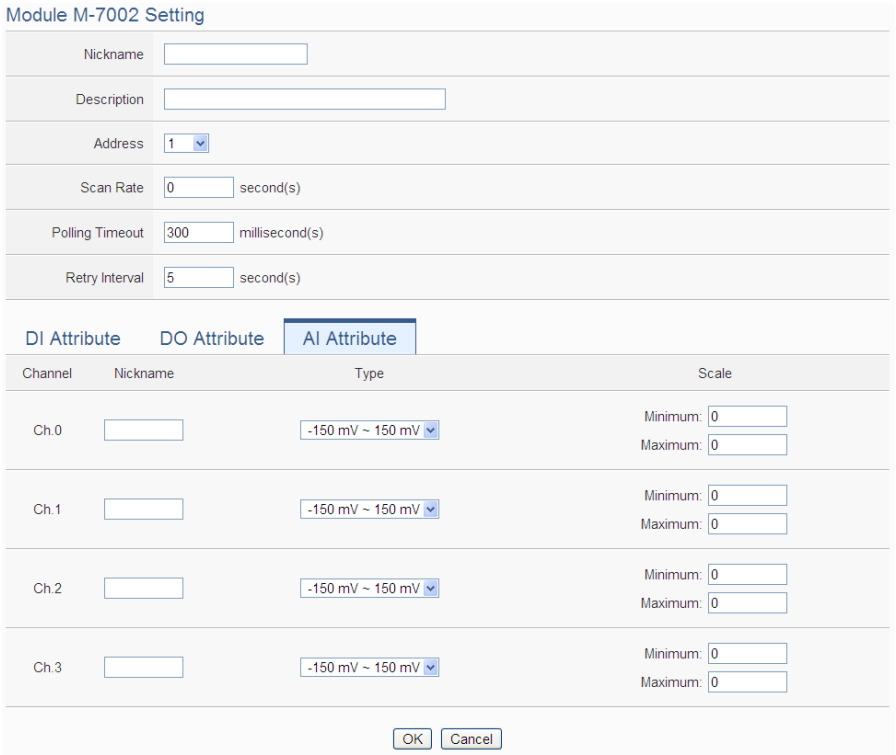
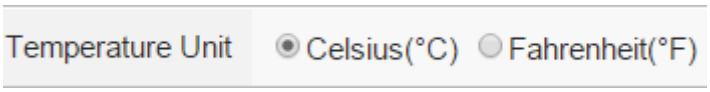


Figure 6-33：ICP DAS Modbus RTU module AI Channel Setting page

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.
- 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 Modbus RTU module AO channel setting interface is shown as below (using M-7024 as an example):

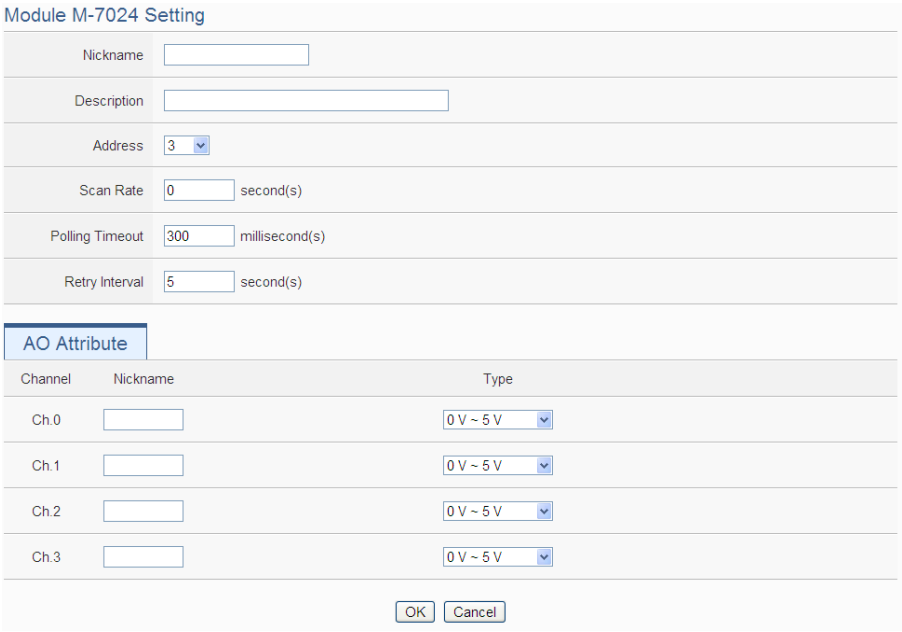


Figure 6-34：ICP DAS Modbus RTU module AO Channel Setting page

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.
- 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 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:

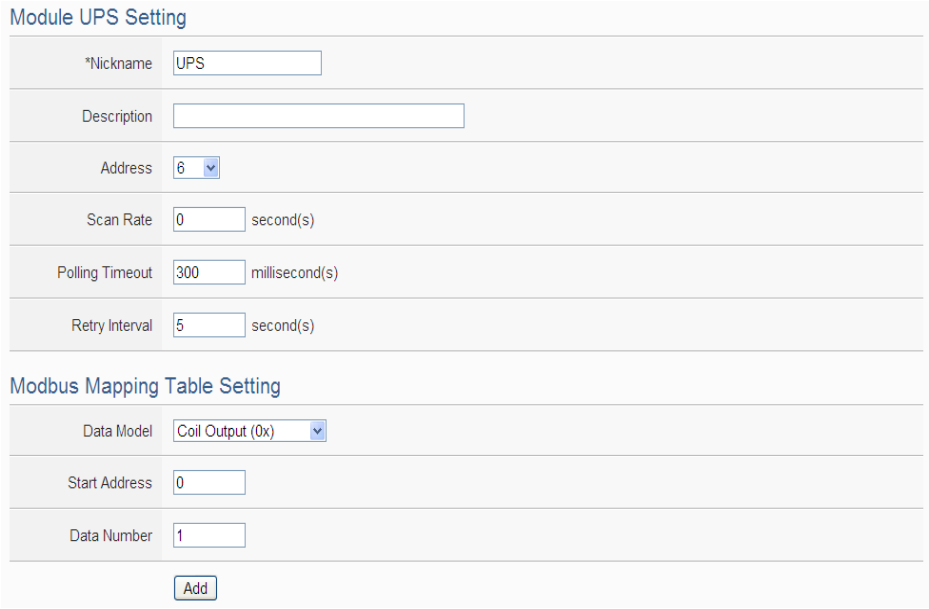


Figure 6-35：Modbus RTU module Coil Output Setting page

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 to the Modbus RTU module will be failed.
- Scan Rate: Input the time interval for WISE to periodically retrieve

the I/O channel data of this Modbus RTU module, the setting range will be 0 ~ 65535 seconds.

- Polling Timeout: The time interval for WISE to send command to the Modbus RTU module and wait for the response, the unit will be ms. The setting range will be 1-10000 ms.
- Retry Interval: The time interval to wait for WISE to repeatedly send command again when WISE sends command to the Modbus RTU module and get no response. The unit will be second. The setting range will be 3 ~ 65535 seconds.
- Data Model: WISE offers 4 Data Model selections to match the Modbus RTU module configuration. The Data Model list is as follow. In this case, please select "Coil Output (0x)".

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

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

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

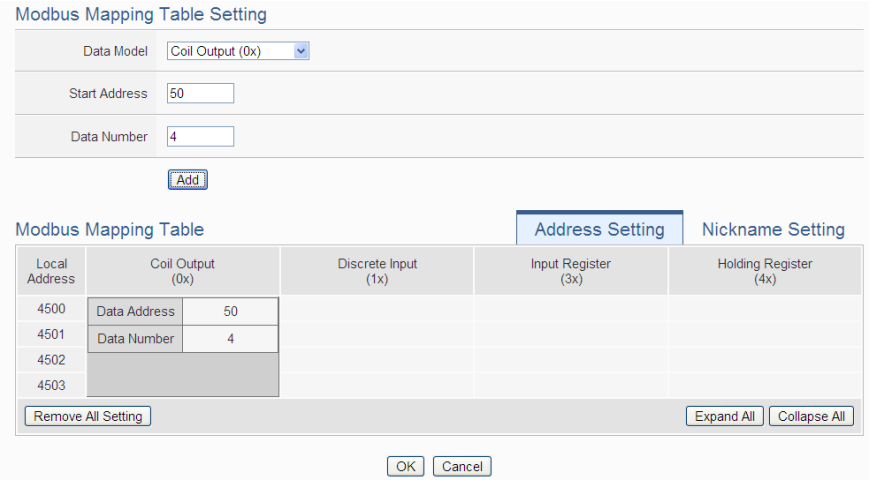
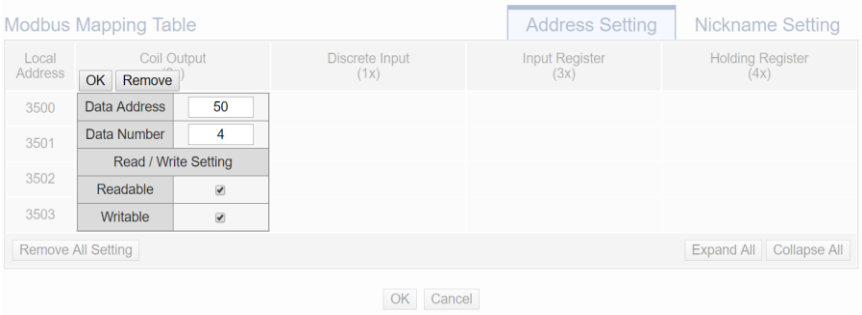


Figure 6-36：Coil Output Setting Example for Modbus RTU module

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



- 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:

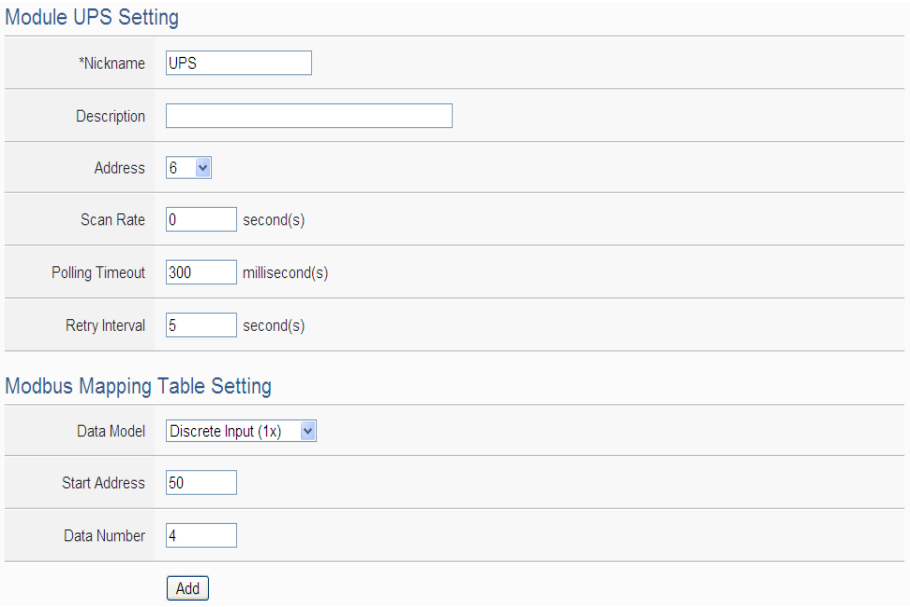


Figure 6-37：Modbus RTU module Discrete Input Setting page

The settings are as follow:

- Data Model: WISE offers 4 Data Model selections to match the Modbus RTU module configuration. Please refer to the section “6.5.5 The Coil Output Setting of Modbus RTU Module” for detailed information. In this case please selects “Discrete Input (1x)”.
- Start Address: Allows setting up the starting address of Discrete Input (1x) on the Modbus RTU module you would like to retrieve.
- Data Number: After finishing the Start Address setting, specify the Data Number, it is the number of Discrete Input data you would like to retrieve from the Start Address. The maximum address number of each data type is 500.
- After finishing the “Start Address” and “Data Number” setting, click on “Add” button. A new Discrete Input address block will be added to the Modbus address mapping table. All added address blocks will be located in sequences staring from the Starting Address (The address number on the first column of the “Local Address” indicates the local Modbus address of WISE to keep the Discrete Input data.).

Figure 6-38 shows an example about Discrete Input setting for a Modbus RTU module. The starting Modbus address of the Discrete Input block is 10020(10000 + 20), it requires to set 6 continuous Discrete Input data in the setting. So that the WISE can access the 10020, 10021, 10022, 10023, 10024, and 10025 Discrete Input address of the module, and these retrieved Discrete Input data will be kept in WISE Modbus Address 14500、14501、14502、14503、14504 and 14505.

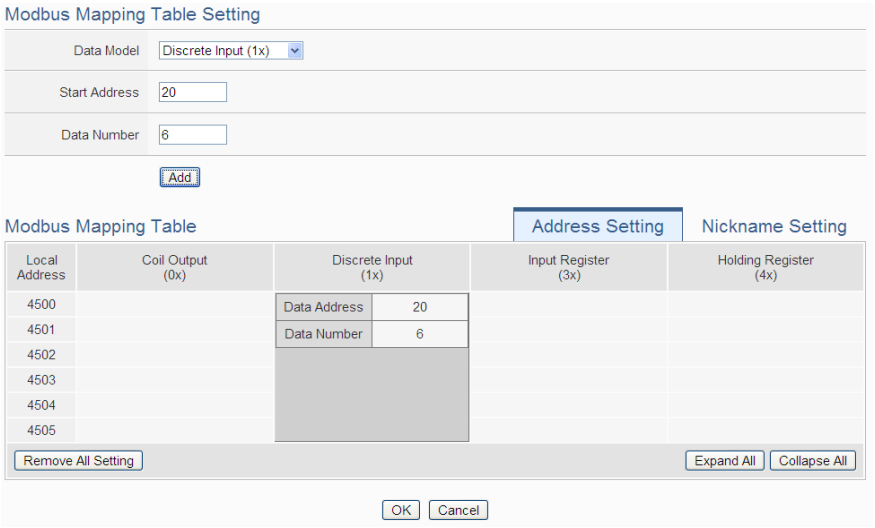
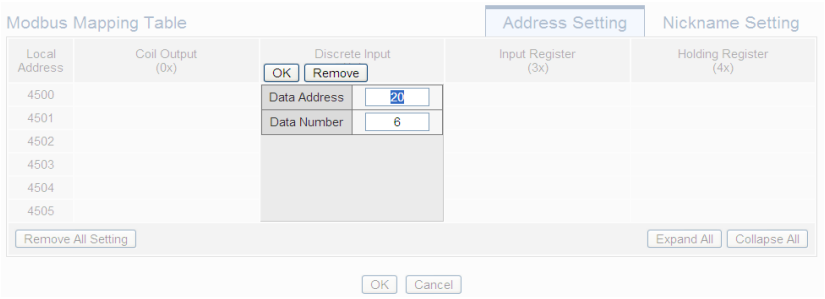
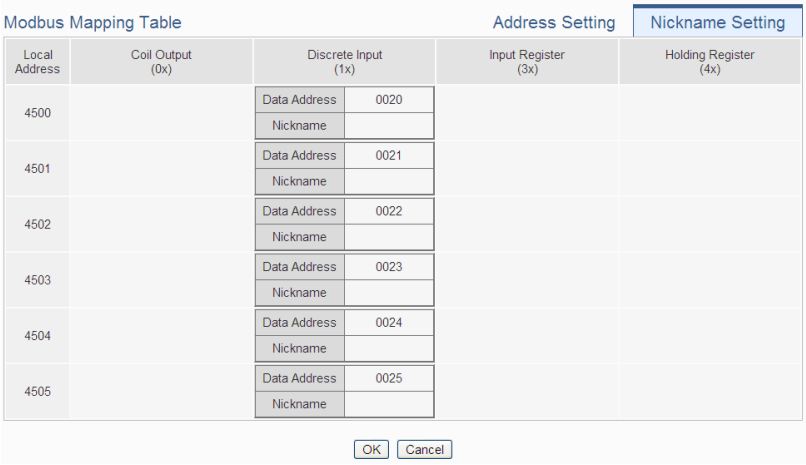


Figure 6-38：Discrete Input Setting Example for Modbus RTU module

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



- 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:

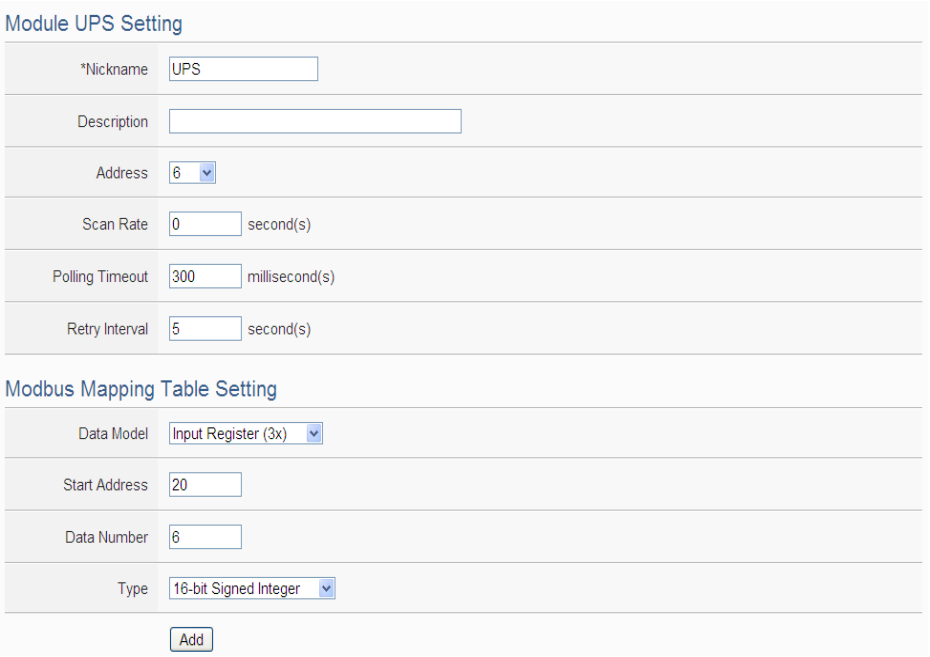


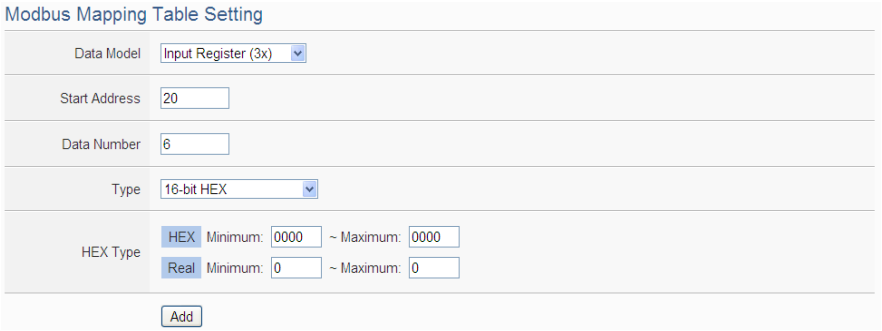
Figure 6-39：Modbus RTU module Input Register Setting page

The settings are as follow:

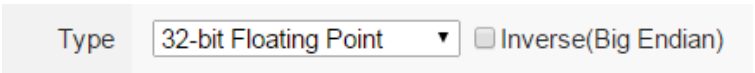
- Data Model: WISE offers 4 Data Model selections to match the Modbus RTU module configuration. Please refer to the section "6.5.5 The Coil Output Setting of Modbus RTU Module" for

detailed information. In this case please select “Input Register (3x)”.

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



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 to keep the Input Register data.).

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

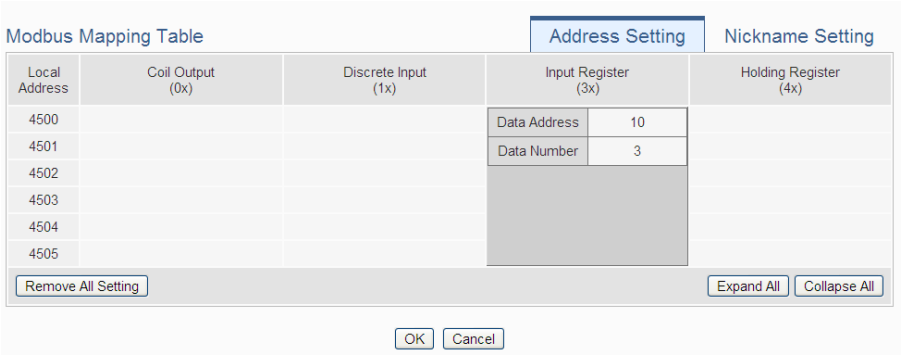
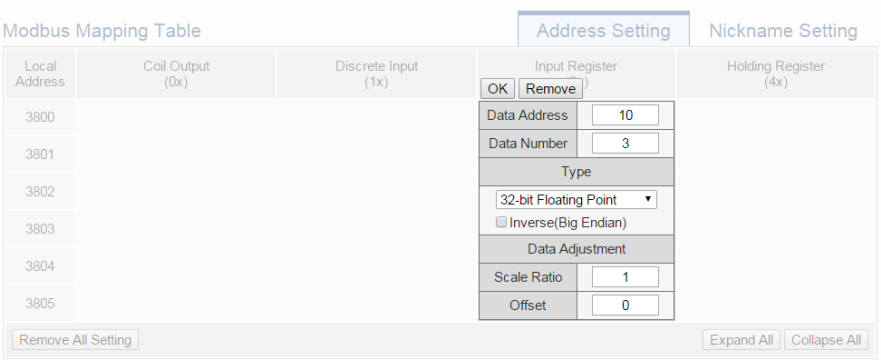


Figure 6-40：Input Register Setting Example for Modbus RTU module

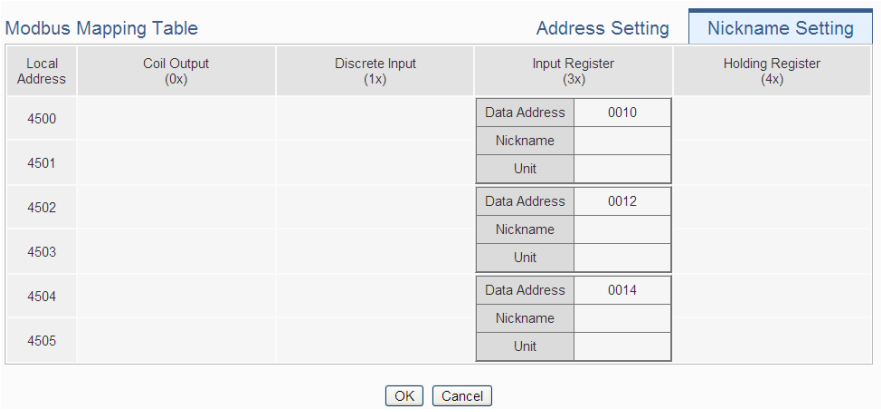
- To modify the starting address or quantity setting, please click on the setting block to perform the modification. The user could also modify Type, Scale Ratio and Offset on this interface. The Scale Ratio setting and Offset setting allows to transform the Input Register value in this block by linear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

  Transformed Value = Scale Ratio x Input Register value + Offset

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



- 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:

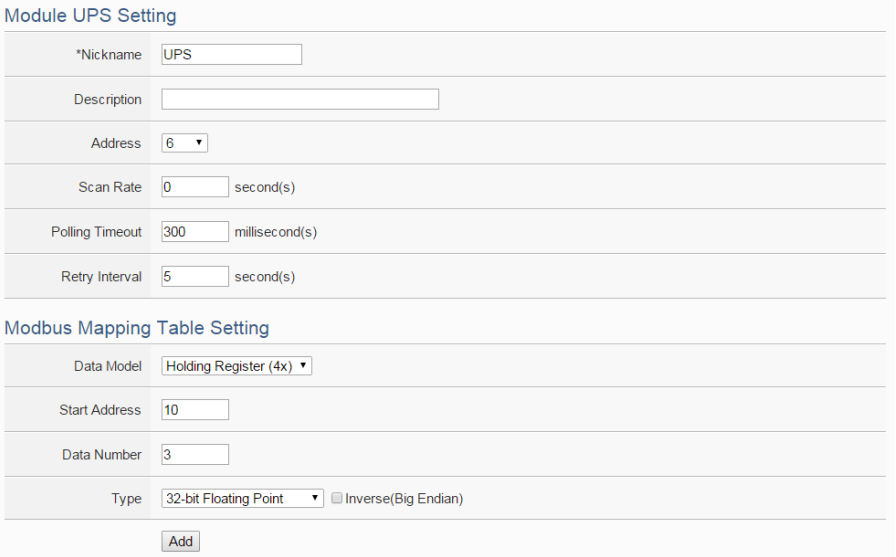
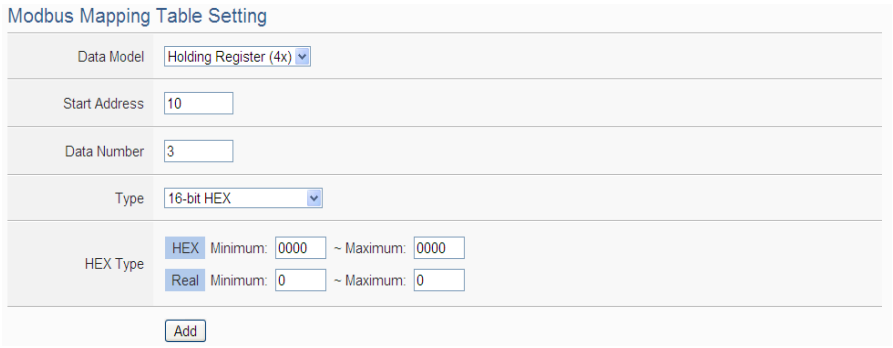


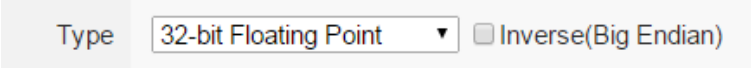
Figure 6-41：Modbus RTU module Holding Register Setting page

The settings are as follow:

- Data Model: WISE offers 4 Data Model selections to match the Modbus RTU module configuration. Please refer to the section "6.5.5 The Coil Output Setting of Modbus RTU Module" for detailed information. In this case please select "Holding Register (4x)".
- Start Address: Allows setting up the starting address of Holding Register (4x) on the Modbus RTU module you would like to retrieve.
- Data Number: After finishing the Start Address setting, specify the Data Number, it is the number of Holding Register data you would like to retrieve from the Start Address. The maximum address number of each data type is 500.
- Type: The system support 6 kinds of data type setting for Holding Register of Modbus RTU module. The 6 Data Type options are "16-bit Signed Integer", "16-bit Unsigned Integer", "16-bit Hex", "32-bit Signed Long", "32-bit Unsigned Long", and "32-bit Floating Point". If the "16-bit HEX" option is selected, it is required to setup the corresponding scale parameters for linear transformation from HEX value to real value. The WISE will retrieve the HEX value and transfer it to real value in floating point format, this real value could be included in the IF-THEN-ELSE rule for edition.



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 to keep the Holding Register data.).

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

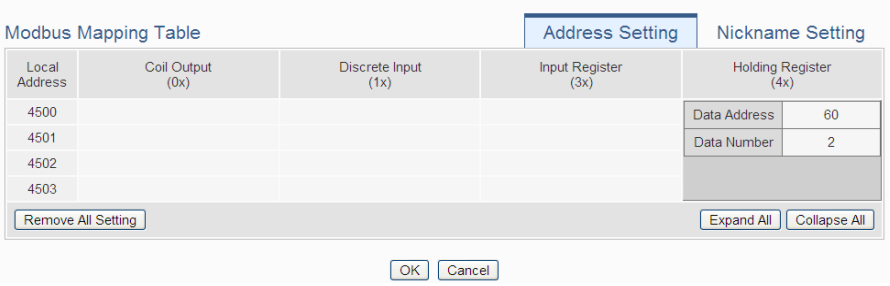
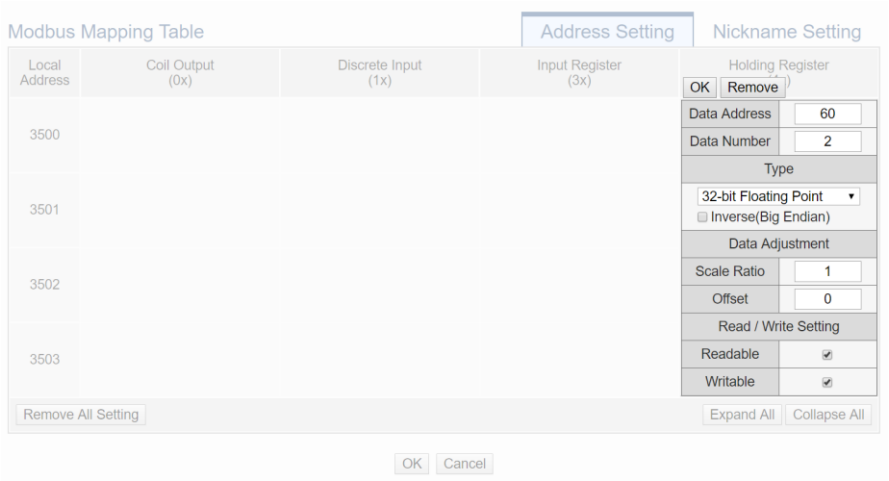


Figure 6-42：Holding Register Setting Example for Modbus RTU module

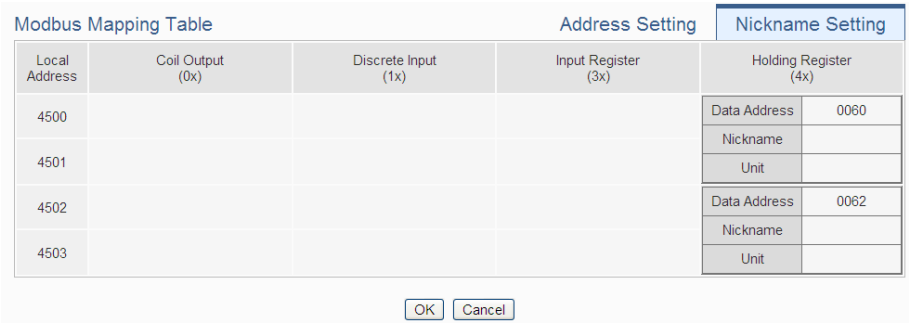
- To modify the settings of the starting address, quantity or Read/Write authority, please click on the setting block to perform the modification. The user could also modify Type, Scale Ratio, Offset, and Read/Write authority on this interface. The Scale Ratio setting and Offset setting allows to transform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

  Transformed Value = Scale Ratio x Input Register value + Offset

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



- 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 and Modbus RTU/TCP module.

6.6 Remote Modbus TCP Module Setting

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

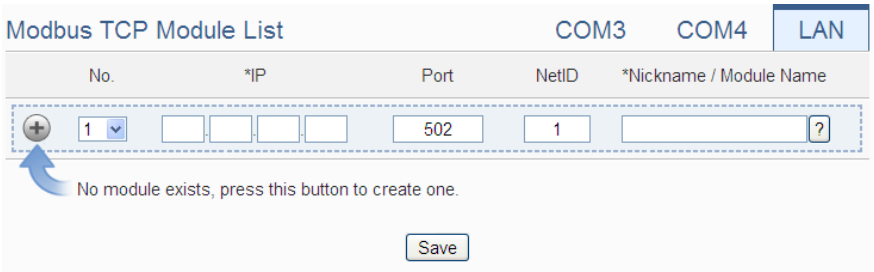


Figure 6-43：Remote Modbus TCP I/O Module Setting page

Please Note: The LAN interface on WISE allows connections to at most 16 devices ((P)ET-7000/WISE-7100/WF-2000/IR/CL/DL/DLW/iSN 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/CL/DL/ DLW/iSN module or Modbus TCP modules manually one by one, the steps are as below:

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

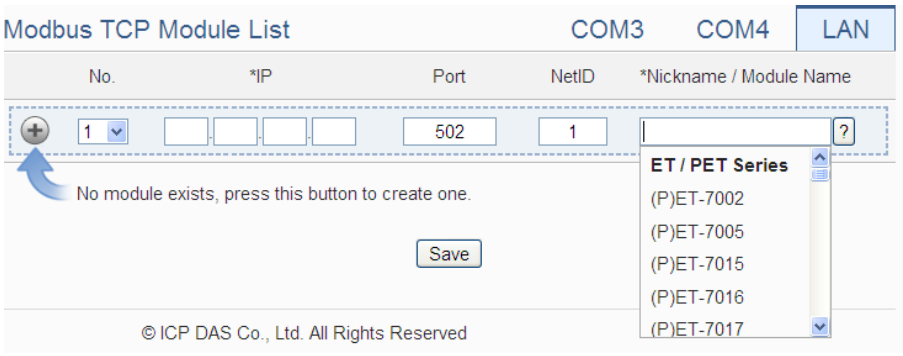


Figure 6-44：Set up the Model/Name of the Modbus TCP Module

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

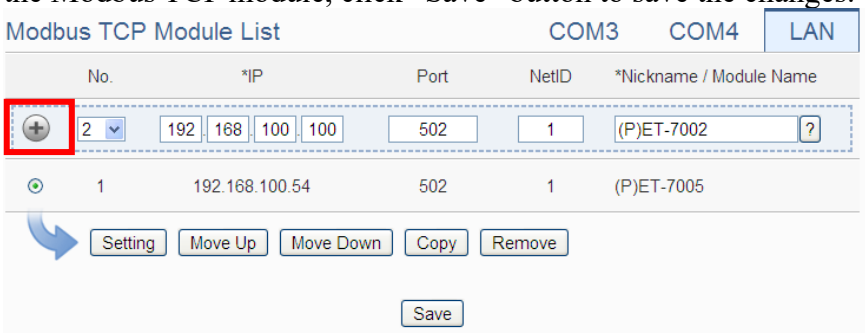


Figure 6-45：Add the Modbus TCP Module manually

6.7 Modbus TCP Module List Operation Interface

After the (P)ET-7000/WISE-7100/WF-2000/IR/CL/DL/DLW/iSN 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:

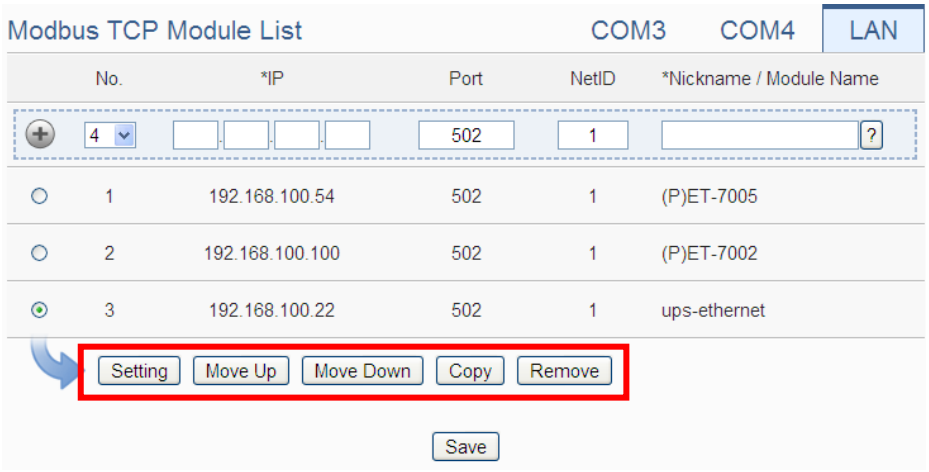


Figure 6-46：Modbus TCP I/O module List Operation Interface

Through the operations of "Setting", "Move Up", "Move Down", "Copy" and "Remove" functions, user can set up the parameters or adjust the

arrangement order for each Modbus TCP module in the list. Please refer to the description of “6.3 I-7000/DL DCON Module List Operation Interface” for detail.

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/CL/DL/DLW/iSN modules and Modbus TCP modules, please input the value for the IP, Port and NetID parameters for the Modbus TCP protocol first. Because others parameter are the same as the Modbus RTU device setting, so please refer to “6.5.1 The DI channel setting for ICP DAS module” ~ “6.5.8 The Holding Register Setting of Modbus RTU Module” sections for detail.

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

6.8 Infrared Temperature Sensing Module (iSN-81x-MTCP) Operation Interface

WISE supports the ICP DAS iSN-81x-MTCP infrared temperature sensing modules. In the Remote I/O Module Setting page, users can add it to the Modbus TCP module list and configure thermal imaging settings. When used together, WISE and the infrared temperature sensing module provide the following functionalities:

- Users can freely select monitoring areas; WISE will automatically calculate the maximum, minimum, and average temperatures for the selected areas.
- Measured temperatures can be utilized in IF-THEN-ELSE logic judgments and stored in log files.
- Thermal images can be saved and sent immediately to administrators via Telegram or WeChat.

The setting interface is shown below (using iSN-812-MTCP as an example):

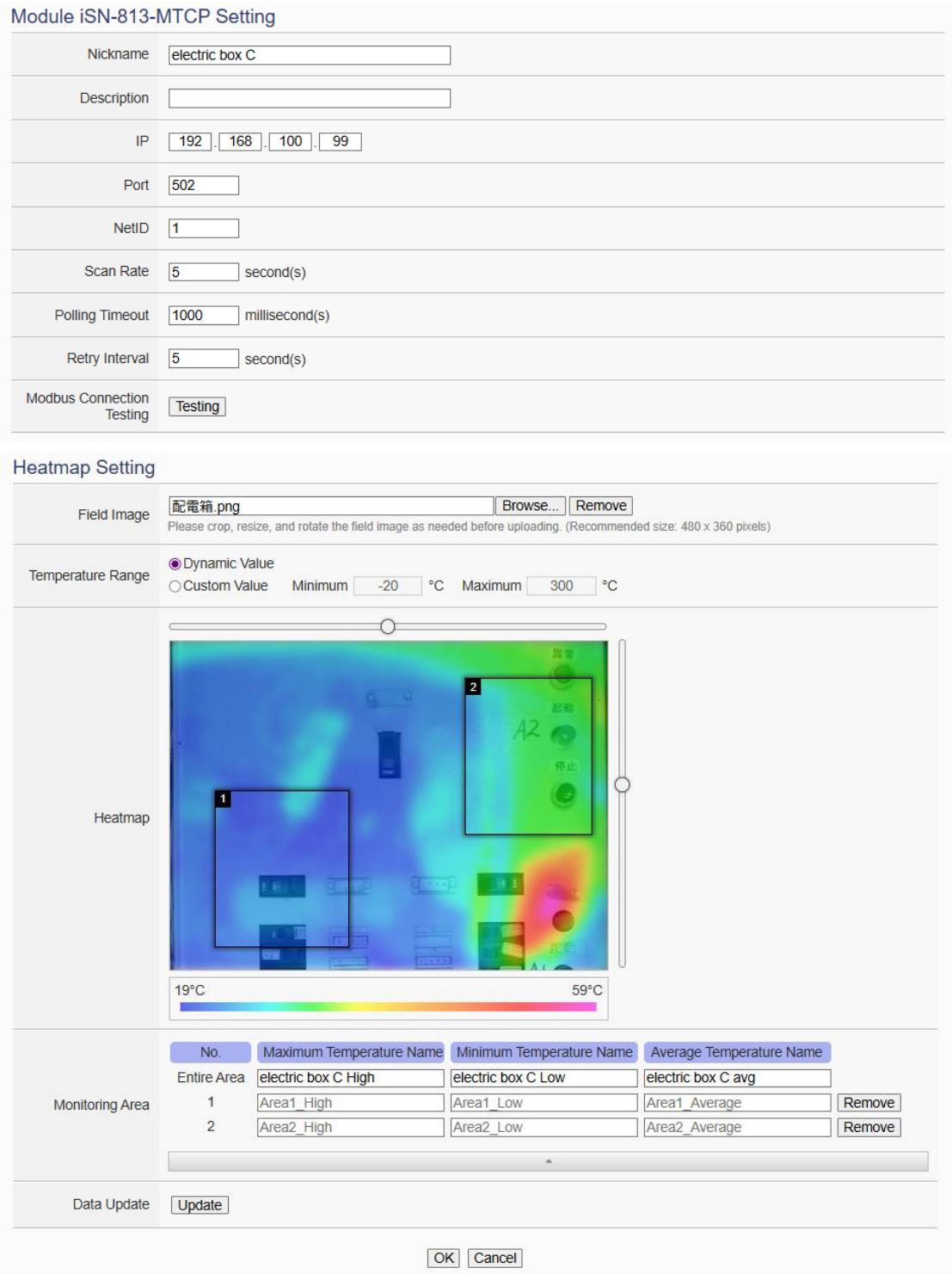


Figure 6-47: Infrared Temperature Sensing Module (iSN-81x-MTCP) Setting Page

Parameter descriptions:

- Nickname: Allows users to define the module name, which will appear on the real-time information display and logic setting pages.

- Description: Allows users to record notes or remarks.
- IP: Input the IP address of this module for connection.
- Port: Input the Modbus TCP port of this module for connection.
- NetID: Input the NetID of this module for connection.
- Scan Rate: Defines the frequency at which WISE periodically reads module data; configurable range is 0 to 65535 seconds.
- Polling Timeout: The duration WISE waits for a module response after sending a command, measured in milliseconds (ms); configurable range is 1 to 10000 ms.
- Retry Interval: The interval at which WISE resends commands when no response is received, measured in seconds (s); configurable range is 3 to 65535 seconds.
- Field Image: Allows users to upload their own captured field image. After uploading, only minor adjustments (up, down, left, right) can be made, so it is recommended to crop, resize, and rotate the image before uploading. Recommended image dimensions are 480x360 pixels. For better visualization of thermal imaging colors, images will be displayed in grayscale.
- Temperature Range: Provides "Dynamic Value" and "Custom Value" options for setting the legend temperature range. When set to "Dynamic Value," the range dynamically uses the measured maximum and minimum temperatures (Figure 6-48). When set to "Custom Value," users can manually set fixed maximum and minimum temperatures (Figure 6-49). Both methods affect the color distribution of maximum and minimum temperatures, and users can adjust according to their needs.

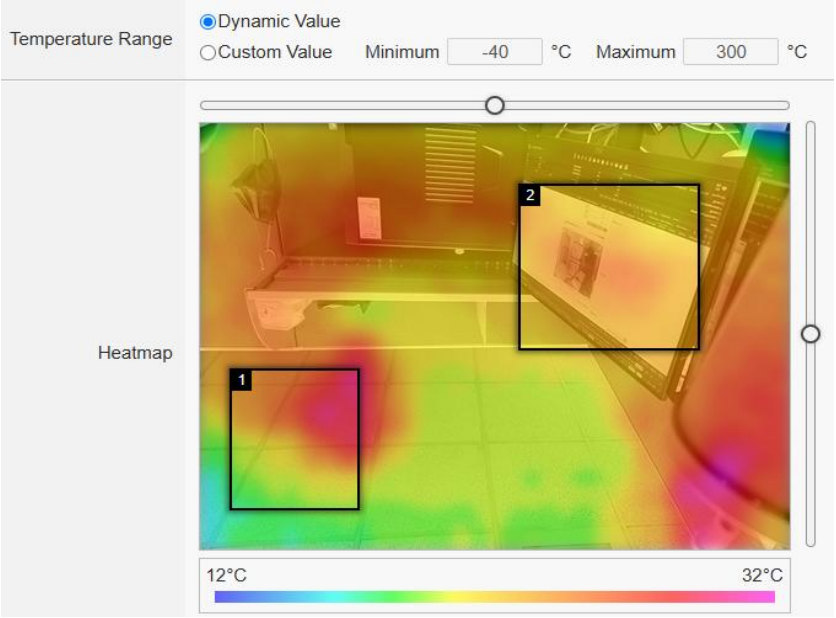


Figure 6-48: Thermal Imaging Legend Temperature Range Set to Dynamic Value.

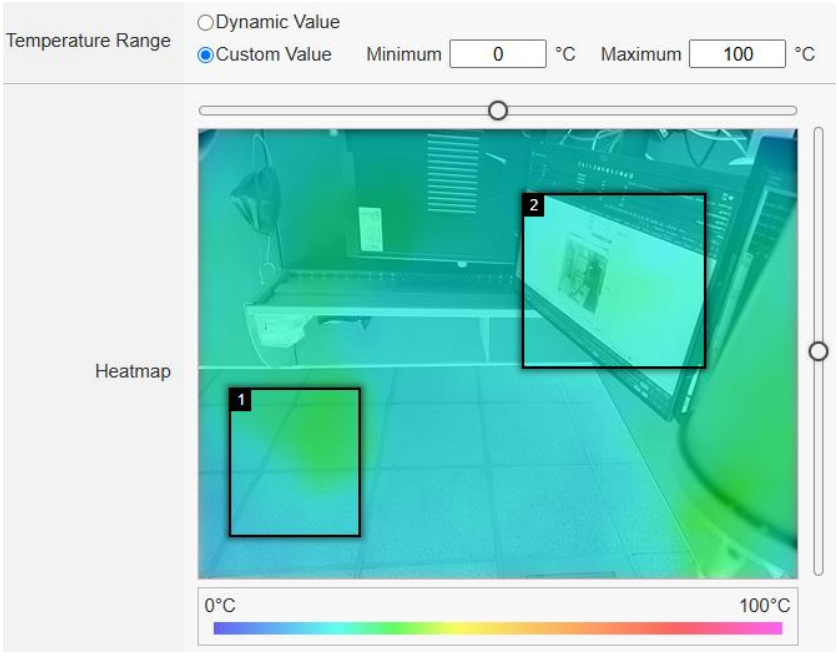


Figure 6-49: Thermal Imaging Legend Temperature Range Set to Custom Value

- Heatmap: Provides a static thermal image and legend. Users can drag with the mouse to define monitoring areas on the thermal image. WISE will calculate the maximum, minimum, and average temperatures within each monitoring area. If a field image is uploaded, sliders will appear on the top and left sides to fine-tune

the image position vertically and horizontally. When entering the setting page, the heatmap and temperature data will be automatically updated and displayed.

- Monitoring Area: Allows users to define a name for each monitoring area's highest temperature, lowest temperature and average temperature. The defined names will be displayed on the real-time information display, logic setting pages, and the chart of IoTstar. Once a monitoring area is created on the thermal image, its corresponding number will appear in the list. Clicking the "Remove" button will delete the monitoring area from both the thermal image and the list.
- Data Update: Clicking "Update" refreshes thermal imaging data and the field image.

Additionally, the iSN-81x-MTCP modules are classified into those with built-in cameras (e.g., iSN-811C-MTCP) and those without (e.g., iSN-812-MTCP). Modules without cameras allow user-uploaded field images, while modules with cameras automatically capture and store current field images upon entering the settings page. Clicking "Update" refreshes only thermal imaging data for modules without cameras, whereas modules with cameras refresh both thermal imaging data and field images.

Upon completion, click the "OK" button to return to the Modbus TCP module list. On the list, click "Save" to complete the module configuration.

6.9 IP Camera Setting

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

Camera Model	iCAM-ZMR8422X iCAM-MR6422X iCAM-MR6322
Default login account/password	admin / pass
Record video length	10~60 seconds (configurable)
I/O channel	No
OSD message setting function	English, Chinese
Supported Event Type	Motion Detection Tampering Detection

The setting page is shown as below:

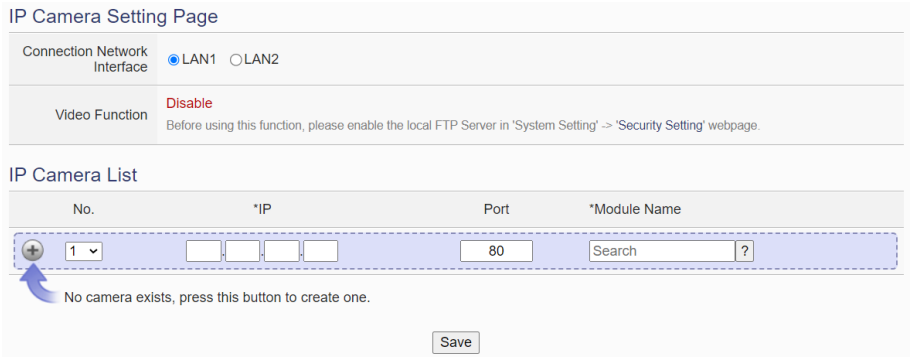


Figure 6-50：IP Camera Setting Page

Please Note：One WISE-2841M controller allows connections to at most 12 IP Cameras.

6.9.1 Set Connection Network Interface and Video Function

i. Select LAN 1 or LAN2 to be the connection network interface to connect with IP Cameras. The settings of the selected LAN port have to be in the same netowrk area with IP cameras.

ii. To enable the video recording function of IP Camera, users have to enable the local FTP server setting and disable TLS Encryption, and then IP cameras can upload the videos to WISE. Please refer to Section "5.4 Security Setting".

6.9.2 Add iCAM IP Camera

The user could add the ICP DAS iCAM IP Cameras manually one by

one, the steps are as below:

i. No.: The number will be the order of the IP Cameras. The range is 1 to 12.

ii. "IP" & "Port": Input the IP address and Port of this IP Camera.

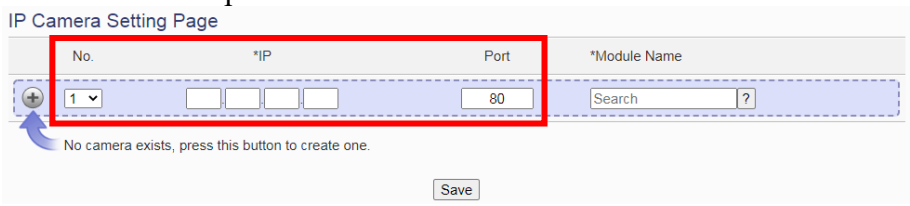


Figure 6-51：Set up the No, IP address and Port of the IP Cameras

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

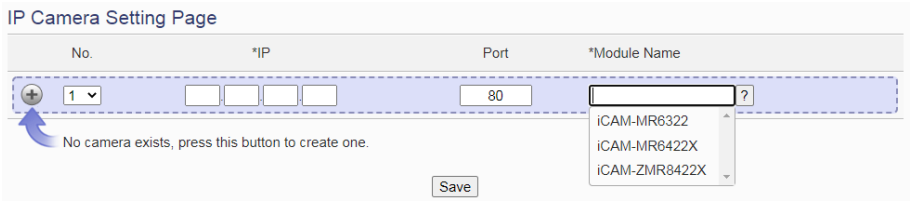


Figure 6-52：Set up the Model Name of the IP Cameras

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

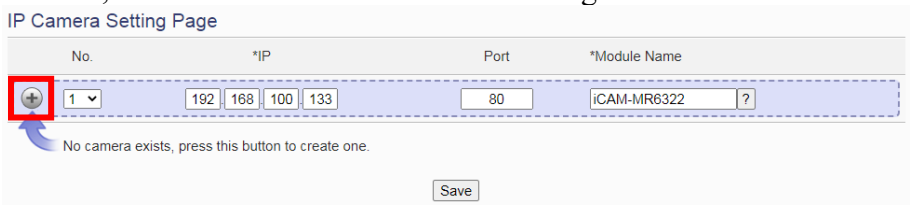


Figure 6-53：Add the IP Cameras

6.10 IP Camera List Operation Interface

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

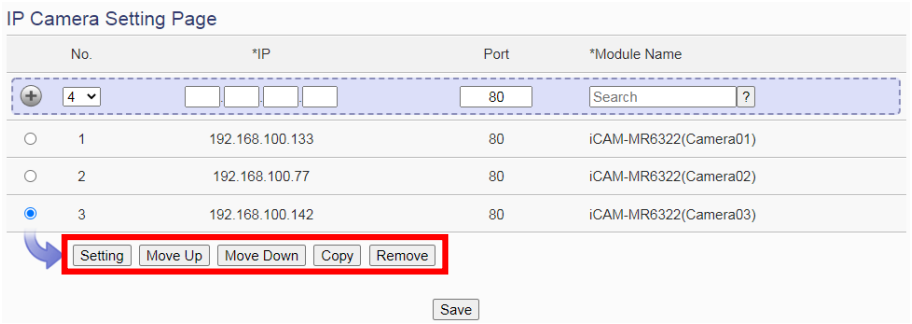


Figure 6-54：IP Camera List Operation Interface

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

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

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

6.10.1 The Setting of iCAM IP Camera(WISE)

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

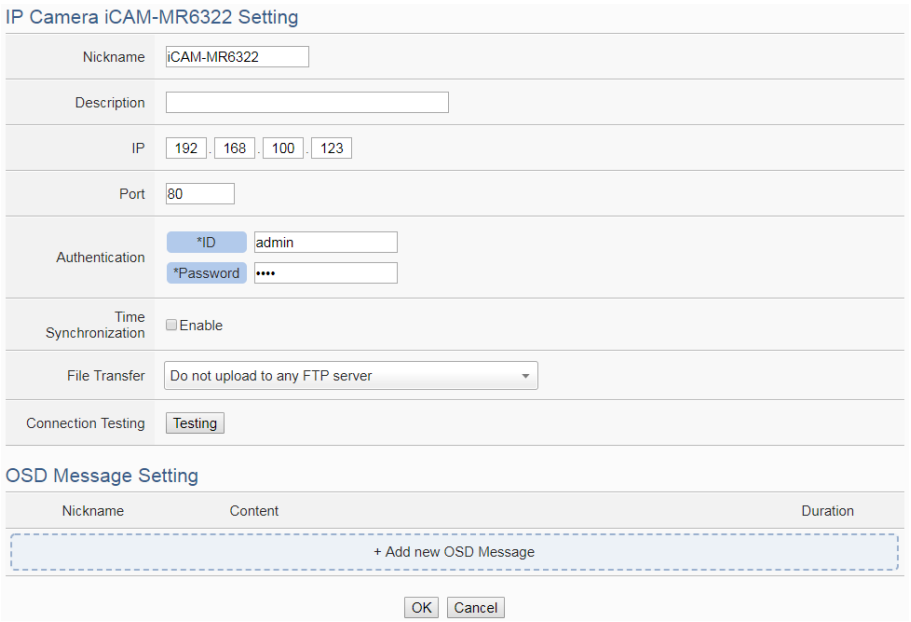


Figure 6-55：iCAM IP Camera Setting page

The settings are as below:

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

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

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

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

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

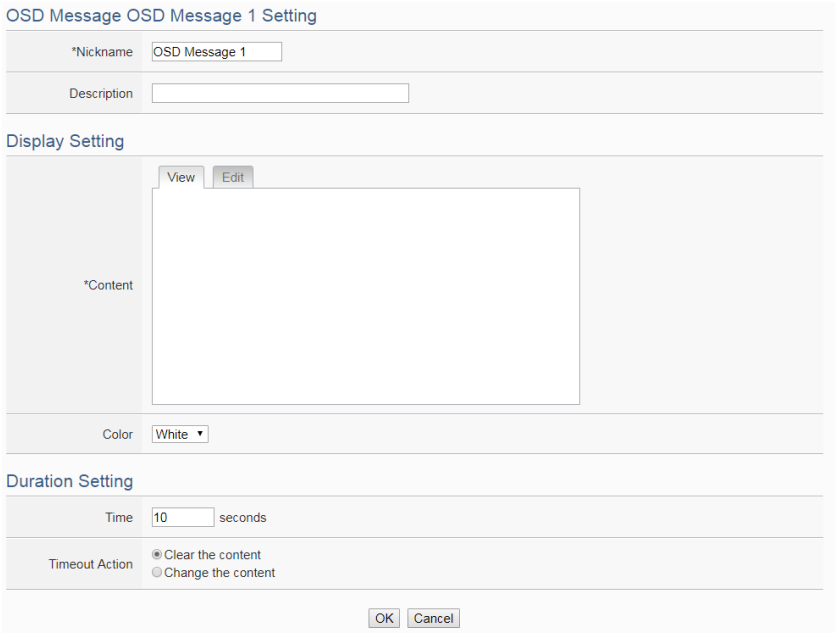
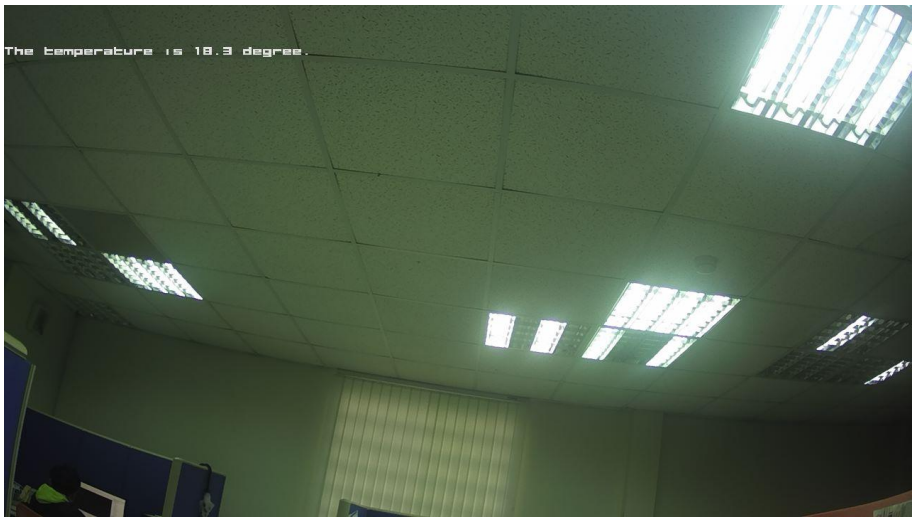


Figure 6-56：iCAM IP Camera OSD Message Setting page

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

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

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



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

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

6.10.2 The Setting of iCAM IP Camera(iCAM)

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

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

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

Please Note：

- If the user wants to enable the IP Camera's image/video capture operation, please remember to complete the settings as below.
  1. Snapshot for periodic Recording: Please complete the iCAM IP Camera's Snapshot event setting first, enable the WISE's Timer setting later, then complete the WISE's IF-THEN-ELSE rule setting with Timer and Snapshot event for periodic recording.
  2. Snapshot for Motion Detection: Please complete the iCAM IP Camera's Snapshot setting first, the trigger source is Motion Detection. Complete the WISE's IF-THEN-ELSE rule setting by the THEN/ELSE action setting with Motion Detection.
- When the micro SD card’s free space is less than 10% and 1GB, WISE will only keep the image/video files sent by iCAM IP Cameras today, and automatically delete all others old image/video files. WISE is equipped with one built-in 4 GB microSD card; for the image/video capturing application, we suggest users use the micro card with larger size (WISE supports up to 32 GB micro SDHC card or 2TB micro SDXC card).
- Please connect to iCAM IP cameras with LAN1.

6.10.3 The Path of the files sent back by IP Camera

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

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

  The path format are as below:

  - "IPCamera" is a fixed string.
  - "IP Camera A" is the module name of the IP Camera. If the module name of the IP Camera is iCAM-721F, and its IP address is "192.168.100.218", then the "IP Camera A" string will be "iCAM-721F_100.218".
  - The "201708 \ 20170810" string indicates the path of the files sorted by year, month and day. WISE will automatically create the path string for the files received from IP Cameras.

- The path of the files in remote FTP server: WISE Nickname \ IPCamera \ IP Camera A \ 201708 \ 20170810

  The path format are as below:

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

7 Logger Setting

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

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

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

Please note:

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

7.1 I/O Module Data Logger Setting

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

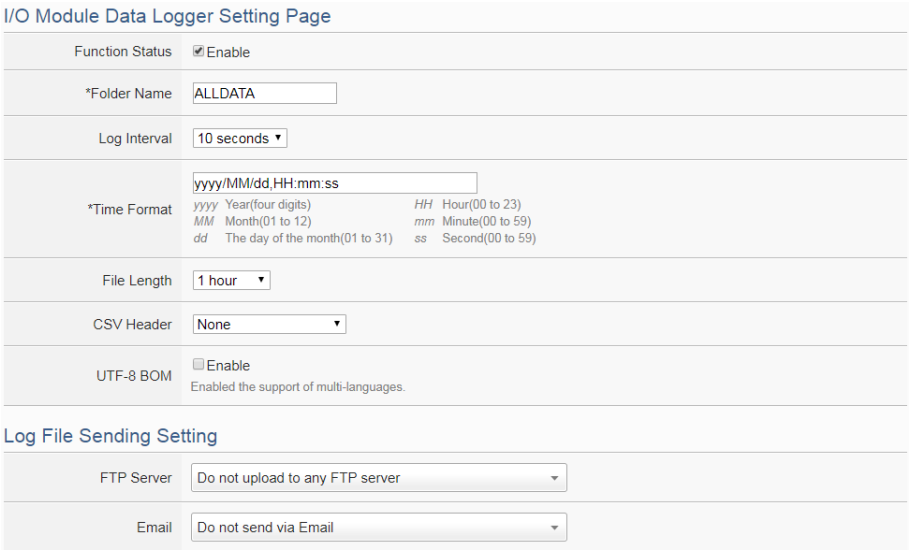


Figure 7-1：I/O Module Data Logger Setting Page

Follow the steps below:

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

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

iii. Select “Log Interval” to enable period recording function in WISE. When the time reaches the period time interval, all I/O data will be recorded once. The data recording will keep going periodically. There are ten options: 5 secs, 10 secs, 30 secs, 1 min, 2 mins, 3 mins, 5 mins, 10 min, 20 min, 30 min and 1 hour.

iv. In the “Time Format” field, define the time format of the content of the log file from the dropdown list, “yyyy” indicates western year, “MM” indicates month, “dd” indicates date, “hh” indicates hour, “mm” indicates minute and “ss” indicates second. User can insert comma (‘,’) flexibly in the “Time Format” field to define the time format of the data log file, and let it be suitable for your database system.

v. The Data Log file is in CSV format. In the data log file, current date, time and data log type (Period recording or Event trigger recording) will also be automatically pasted to each data log item. The final data

log content format will be like this:

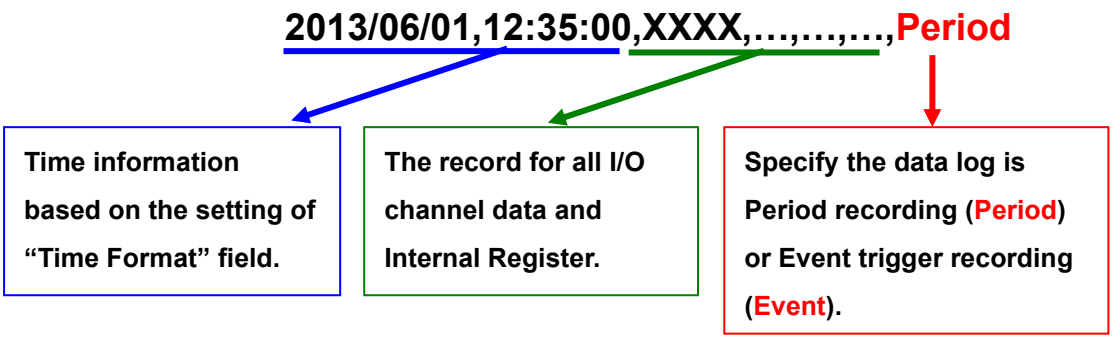


Figure 7-2：The format of record data

vi. In the "File Length" field, select the time interval to close a data log file. There are 12 options: 5 mins, 10 mins, 15 mins, 30 mins, 1 hour, 2 hours, 3 hours, 4 hours, 6 hours, 8 hours, 12 hours and 24 hours.
For example, if the "File Length" time interval is set as 3 hours, and "Log Interval" is set as 5 mins, it means WISE will record data every 5 mins. And the log file is created at 0 o'clock, 3 o'clock, 6 o'clock, 9 o'clock, 12 o'clock, 15 o'clock, 18 o'clock, and 21 o'clock. When the system time reached these specified time, the Data Log file will be closed automatically (the time interval of this first file will be shorter than 3 hours) and create a new data log file to record another 3 hours and so on.

vii. In the "CSV Header" field, there are four options: "None", "Channel", "Nickname" and "Channel + Nickname". The module name, channel address and nickname (if any) of each field will be added to the CSV Header of the data logger file if the user select "Channel + Nickname". Select "Nickname" to add the CSV Header with channel nickname only. Select "Channel" to add the CSV Header with the module name and channel address only. Select "None" to disable the "CSV Header" function.

viii. Check "Enable" in the "UTF-8 BOM" field. If you enable this item, the UTF-8 BOM (Byte Order Mark) will be added at the beginning of the log file for the support of multi-languages.

ix. In the "FTP Server" field, please specify the FTP Servers which will receive the data logger files WISE send. WISE can send the data logger files to multi-FTP Servers simultaneously. Users can directly click on the rectangle area at the right side of "FTP Server" field to configure the FTP Server.

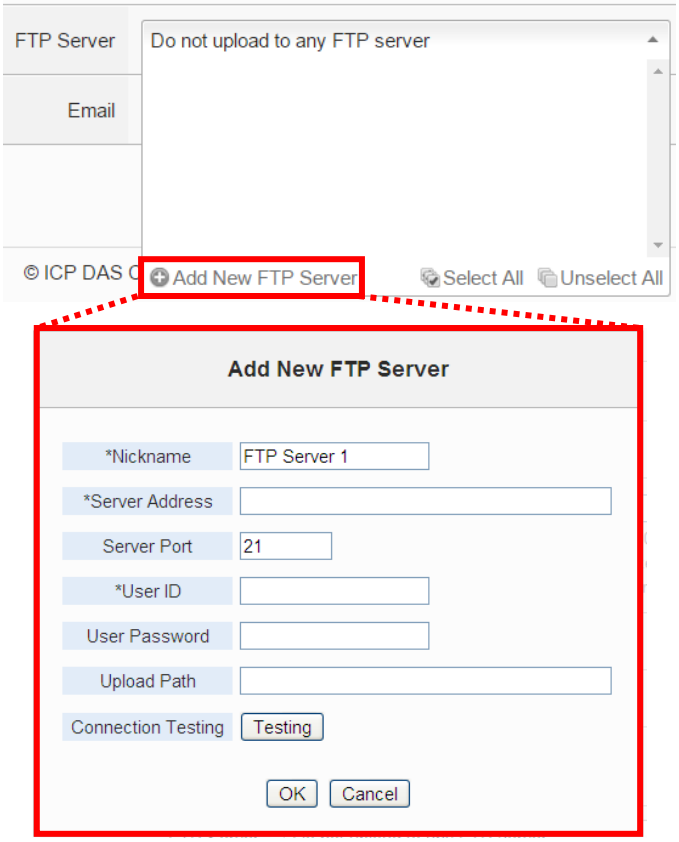


Figure 7-3：FTP server selecting and setting page

Please refer to "7.5 FTP Server Setting" section for detail. If you select "Do not upload to any FTP Server", WISE will not send the data logger file to any FTP Server.

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

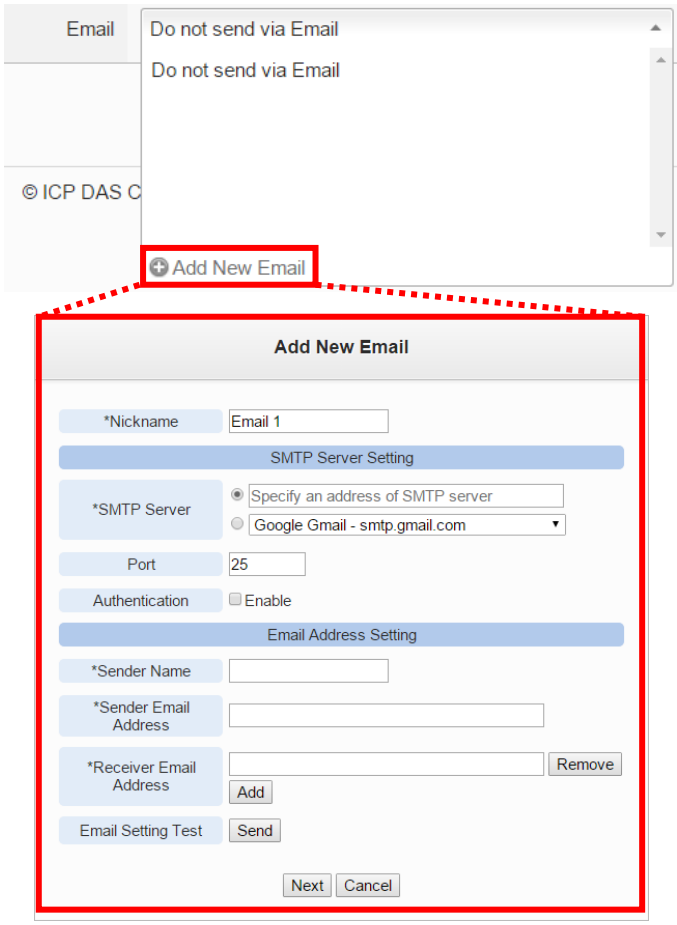


Figure 7-4：Email selecting and setting page

Please refer to "9.4 Email Setting" section for detail. If you select "Do not send via Email", WISE will not send the data logger file to any Email address.

xi. After all settings are completed, click "Save" button to save the setting.

7.2 User-Defined Data Logger

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

Follow the steps below:

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

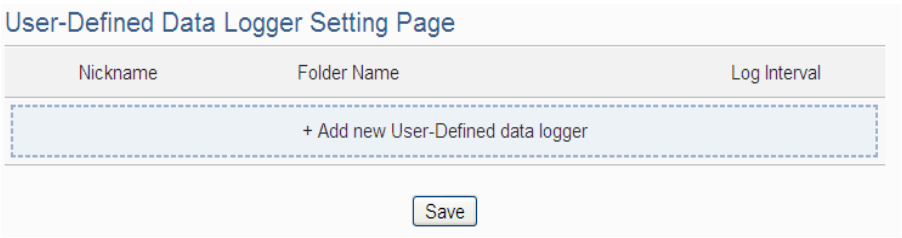


Figure 7-5：User-Define Data Logger List Interface

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

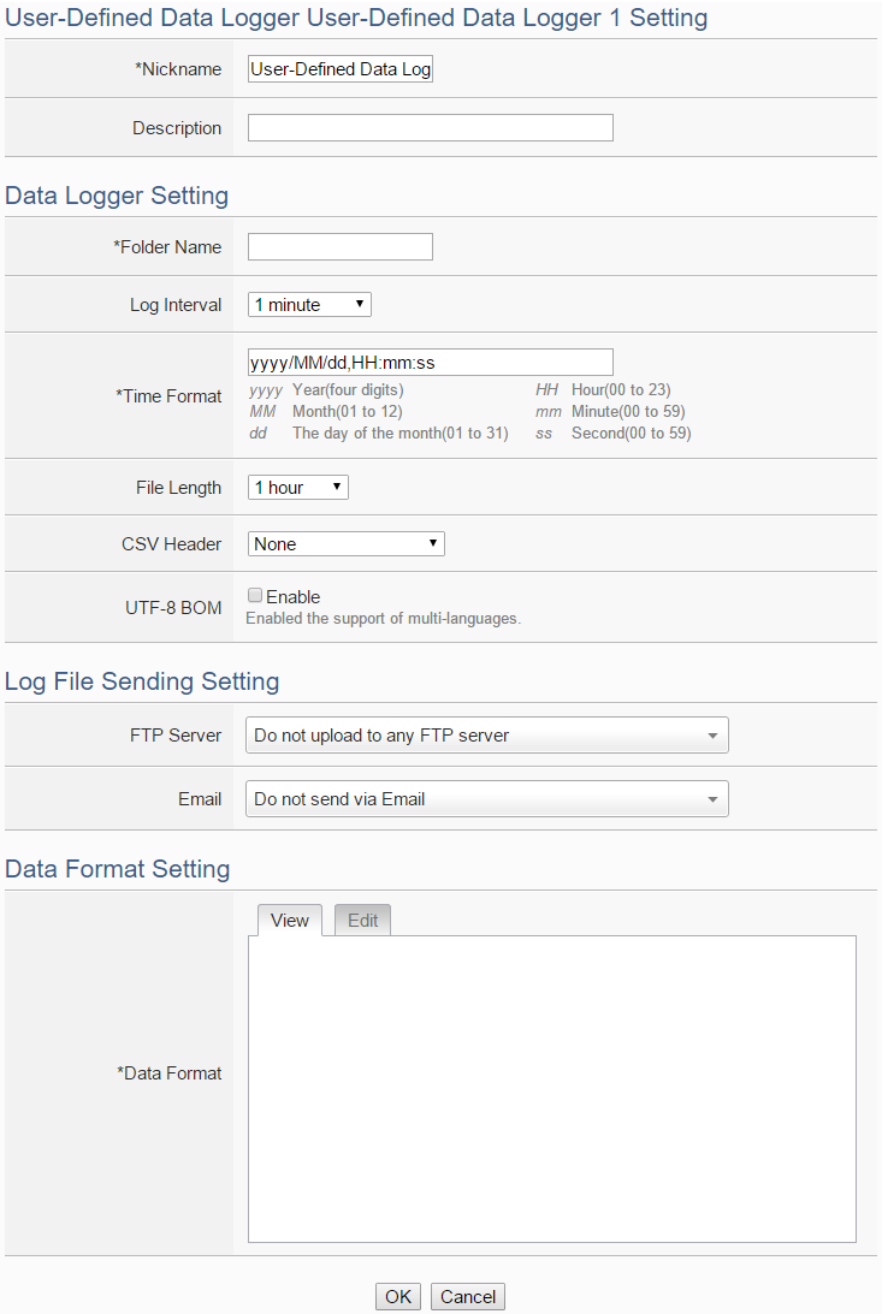


Figure 7-6：User-Define Data Logger Setting Page

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.

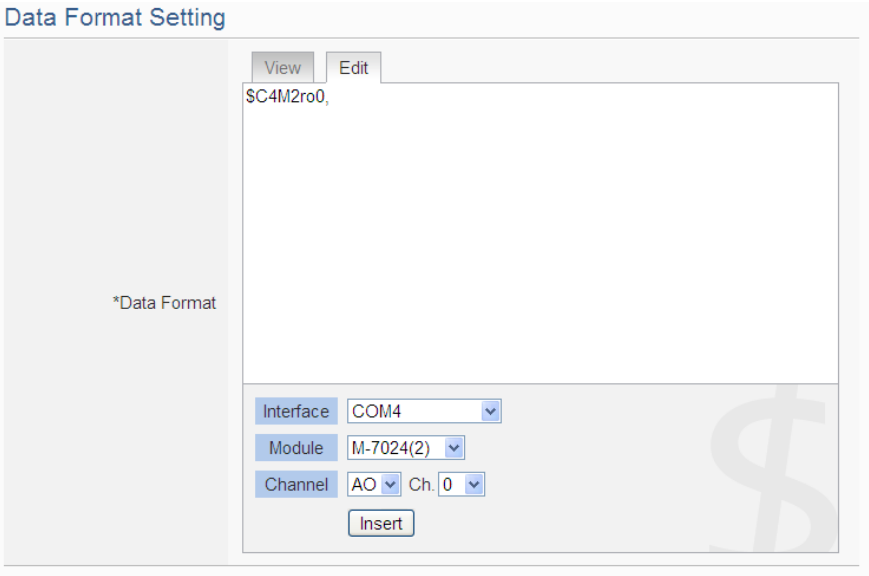


Figure 7-7：The setting interface of Real-time Variable Editor

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).

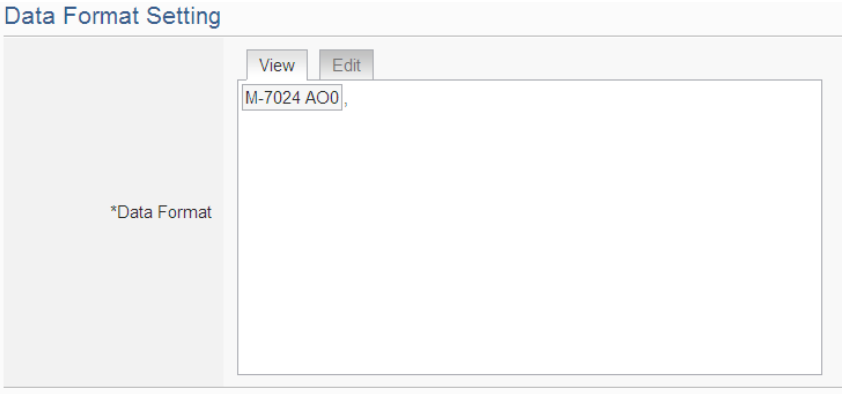


Figure 7-8：The view interface of Real-time Variable Editor

vi After all settings are completed, click “OK” button to return to the User-Defined Data Logger list page.

vii Repeat steps i~vi to complete settings of all User-Defined Data Logger.

viii To modify the settings of a pre-set User-Defined Data Logger, please click on the radio button in front of the User-Defined Data Logger, and then click on “Setting” to modify the settings.

ix To copy the settings of a pre-set User-Defined Data Logger to the new User-Defined Data Logger, please click the radio button in front of the pre-set User-Defined Data Logger and then click “Copy”, a new User-Defined Data Logger (in sequence) will be added to the list and the settings of the old User-Defined Data Logger will be copied to this newly added User-Defined Data Logger.

x To remove a pre-set User-Defined Data Logger, please click the radio button in front of the pre-set User-Defined Data Logger and then click “Remove”.

xi After all User-Defined Data Logger settings are completed, click “Save” button to save the changes.

7.3 MQTT Data Logger Setting

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

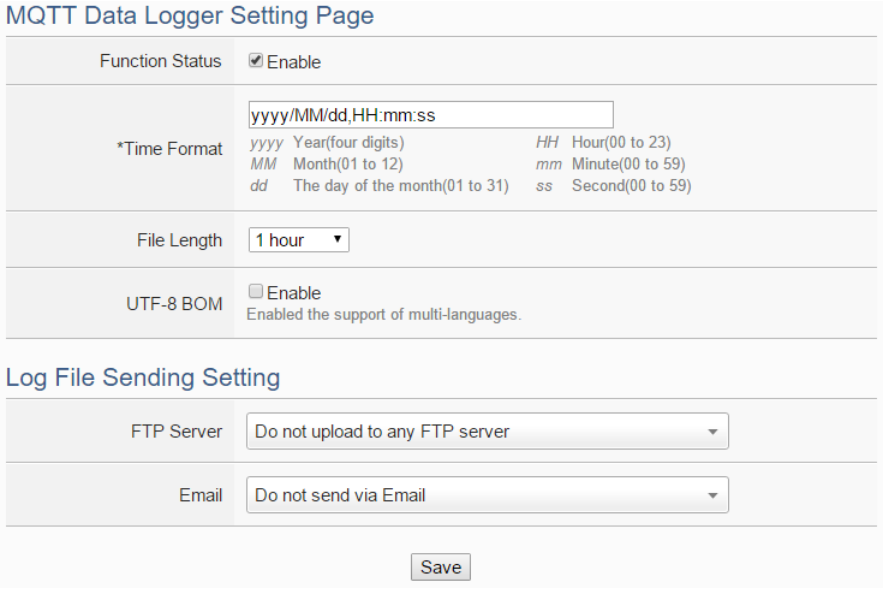


Figure 7-9：MQTT Data Logger Setting page

Follow the steps below:

i In the “Function Status” field, click “Enable” to enable the MQTT Data Logger.。

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

iii After the MQTT Data Logger settings are completed, click “Save” button to save the setting.

7.4 Event Logger Setting

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

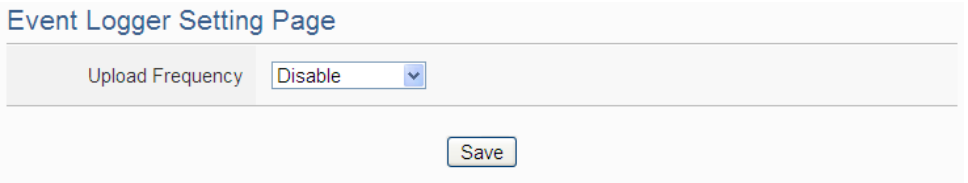


Figure 7-10：Event Data Logger Setting page

Follow the steps below:

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

keep going periodically. There are five options: “Disable”, “Once an hour”, “Once a day”, “Once a week” and “Once a month”.

ii If user selects “Once a day”, “Once a week” or “Once a month”, please select the “Upload Timing” for the Event Logger.

iii In the “FTP Server” field, please specify the FTP Servers which will receive the Event Logger files WISE send. WISE can send the Event Logger files to multi-FTP Servers simultaneously. User can directly click on the rectangle area at the right side of “FTP Server” field to configure the FTP Server. Please refer to “7.5 FTP Server Setting” section for detail. If you select “Do not upload to any FTP Server”, WISE will not send the Event Logger file to any FTP Server.

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

7.5 FTP Server Setting

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

Follow the steps below:

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

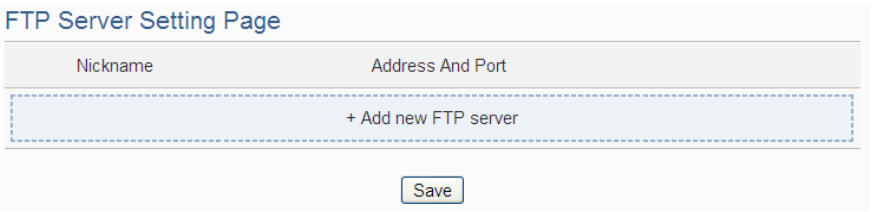


Figure 7-11：FTP/SFTP Server List page

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

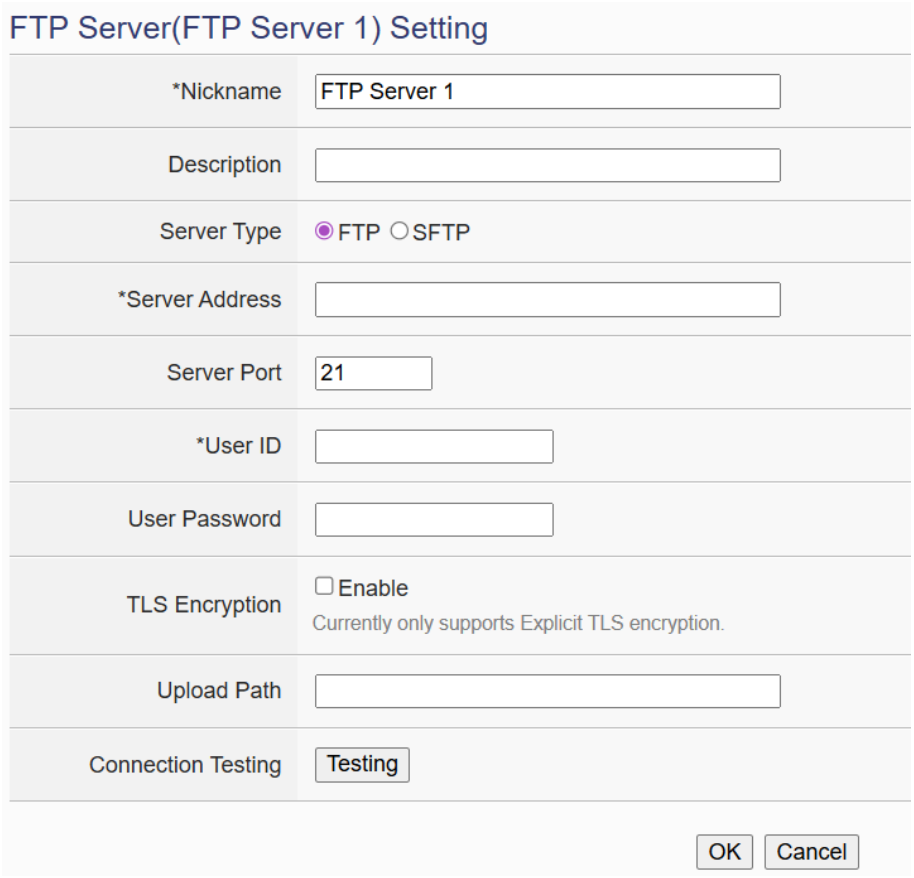


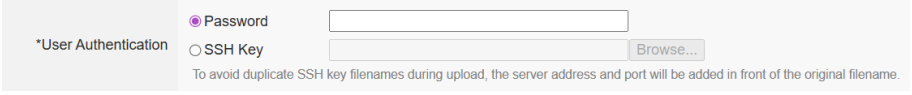
Figure 7-12：FTP/SFTP Server Setting page

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 Type” field, select whether the remote server is an FTP or SFTP server.

v In the “Server Address” and “Server Port” field, input the IP Address (or domain name) and Port number of the remote FTP Server.

vi In the “User ID” and “User Password” field, input the login ID and the login password of the remote FTP Server. If an SFTP server is selected, you can log in using a password or upload an SSH key file to authenticate using key-based login.



vii In the “TLS Encryption” field, check “Enable” to enable the TLS Encryption function.

viii In the “Upload path” field, input the path which will be used by the remote FTP Server to store the logger files.

ix 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.

x After all settings are completed, click “OK” button to return to the remote FTP Server list page.

xi Repeat steps i~viii to complete settings of all remote FTP Servers.

xii 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.

xiii 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.

xiv 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”.

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

7.6 Database Setting

The Database Setting function allows users to set up data writing from the WISE to remote databases. Users can customize the target table name, column names, and data content to be inserted. Users can set the data to be inserted periodically or when specific conditions are met. This enables effective data collection and analysis.

Follow the steps below:

i Click on “Add new database” to add a new remote database.

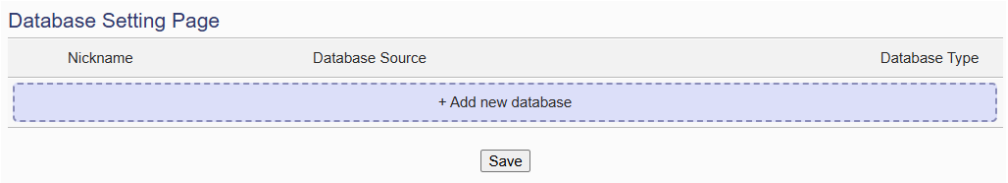


Figure 7-13：Database List page

ii After clicking the “Add new database”, the setting page of database will appear.

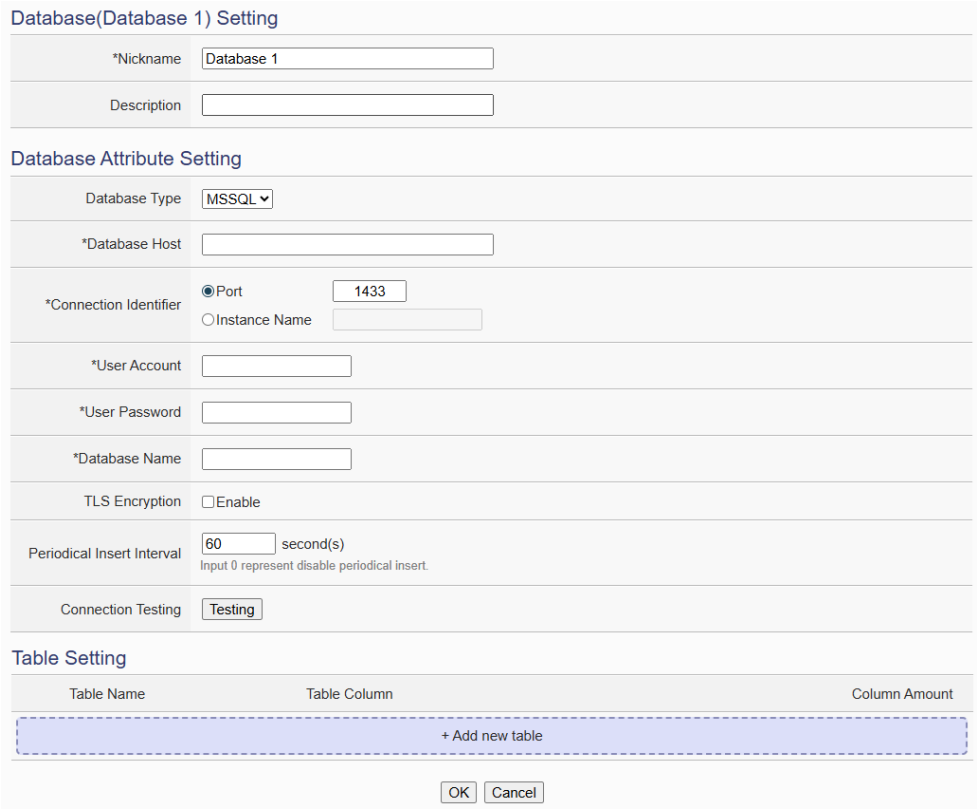


Figure 7-14：Database Setting page

iii Input a name in the “Nickname” field and you could also input the description of this database in the “Description” field.

iv In the “Database Attribute Setting” section, the setting provide three types of databases (MSSQL, MySQL, and Oracle). Users can select the database type according to their needs and input the connection information like “Host”, “Port”, “Account”, “Password”, and so on.

v In the “Periodical Insert Interval” field, set a time interval. All configured tables will perform periodical data insert according to this interval. If the value is set to 0, periodical insert will be disabled. The unit of the value is second.

vi After complete database settings, click the “Testing” button in the “Connection Testing” field to immediately connect to the remote database to check whether the connection setting is correct or not.

vii In the “Table Setting” section. Click on “Add new table” to add a new table. After clicking the “Add new table” button, the setting page of database table will appear.

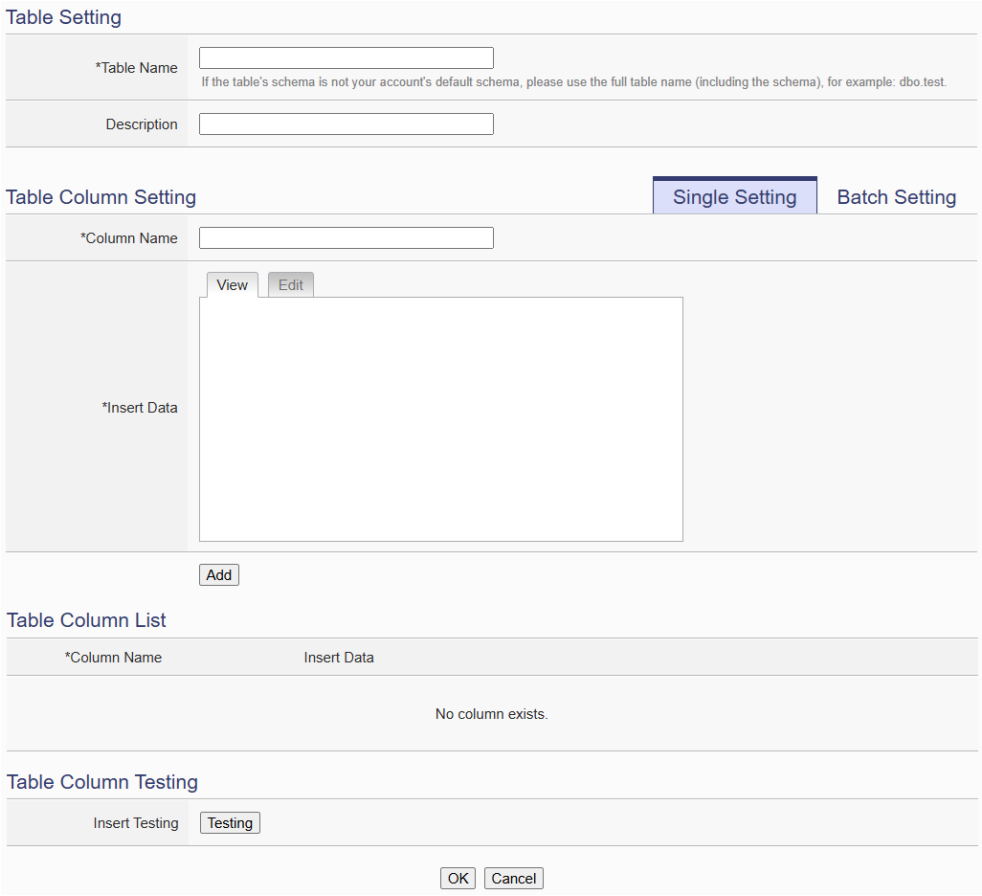


Figure 7-15：Table Setting page

viii Input the name of the table to insert data into in the “Table Name” field and you could also input the description of this table in the “Description” field.

ix In the “Table Column Setting” section, the user can use the tab in the upper right corner to switch between “Single Setting” and “Batch Setting” to add table columns. After complete the column settings, click the “Add” button to add the column and data to the “Table Column List” below.

- In the “Single Setting” tab, input the name of the column to insert data into in the “Column Name” field and input the data in the “Insert Data” field. WISE provides an “Real-time variable editor” to add current I/O channel data or Internal Register data into the field.

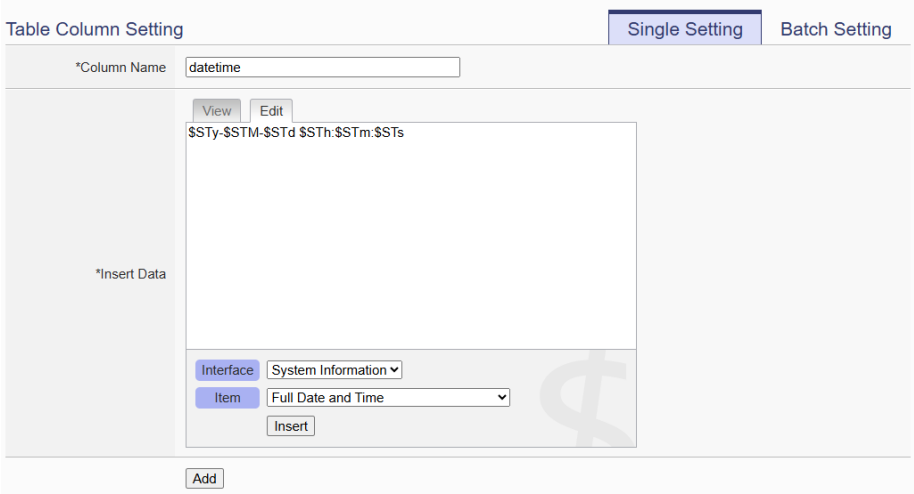


Figure 7-16：Table Column - Single Setting page

- In the “Batch Setting” tab, select the module to be added, and the user can choose the “All” option in the channel list to batch add all channels of the module. WISE will batch add them to the “Table Column List” using default column names, and the user can edit the column names in the “Table Column List”.

Figure 7-17：Table Column - Batch Setting page

x In the “Table Column List” section, the user can view the information of the added columns and edit the column name.

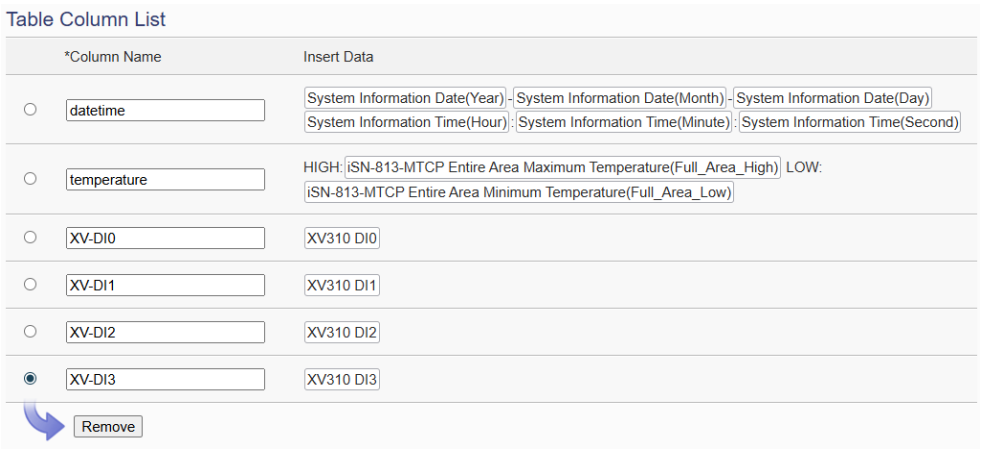


Figure 7-18：Table Column List page

xi After complete the above table settings, click the “Testing” button in the “Insert Testing” field to immediately insert data into the table to check whether the table setting is correct.

xii After complete table settings, click the “OK” button to confirm the setting, and return to the Database Setting page.

xiii If the user want to configure multiple tables, repeat step vii ~ xii to complete settings of all tables.

xiv After complete database and table settings, click the “OK” button to confirm the all setting, and return to the Database List page.

xv After finish all the database settings, click “Save” button to save the settings.

7.7 The Path of Data Log File

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

```
microSD
  ∟Log
    ∟Folder Name (Define in I/O Module Data Logger or User-Defined Data
    |    |              logger)
    |    ∟201502 ← Data files be sorted by year and month.
    |        ∟Uploaded ←Data file that are completed with upload
    |        |    |          operation will be moved into the section.
    |        |    ∟0208 ←Data files be sorted by day
    |        |    |    ∟0208_00.csv
    |        |    |    ∟0208_01.csv
    |        |    |         …
    |        |    |    ∟0208_23.csv
    |        |    ∟0209
    |        |         ∟0209_00.csv
    |        |         ∟0209_01.csv
    |        |              …
    |        |         ∟0209_09.csv
    |        ∟0209_10.csv ← The data file which is in using currently
    |                            or is waiting for the upload operation.
    |
    ∟MQTTLog (The folder for MQTT Data Logger file)
    |    ∟Broker Name (Define in Broker Setting page of MQTT Setting)
    |        ∟201502 ← Data files be sorted by year and month.
    |            ∟Uploaded ←Data file that are completed with upload
    |            |    |          operation will be moved into the section.
    |            |    ∟0208 ←Data files be sorted by day.
    |            |         ∟0208_00.csv
    |            |         ∟0208_01.csv
    |            ∟0209_10.csv ← The data file which is in using
    |                                 currently or is waiting for the
    |                                   upload operation.
    |
    ∟EventLog (The folder for Event Logger file)
        ∟201502 ← Data files be sorted by year and month
            ∟Uploaded ← Data file that are completed with upload
            |    |          operation will be moved into the section.
            |    ∟0207.csv
            |    ∟0208.csv
```

└ 0209.csv ← The data file which is in using currently or is waiting for the upload operation.

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

Upload Path
- └ WISE module nickname
  - └ Folder Name (Define in I/O Module Data Logger or User-Defined Data logger)
    - └ 201502 ← Data files be sorted by year and month
      - └ 0208_00.csv
      - └ 0208_01.csv
      - …
      - └ 0208_23.csv
      - └ 0209_00.csv
      - └ 0209_01.csv
      - …
      - └ 0209_09.csv
  - └ MQTTLog (The folder for MQTT Data Logger file)
    - └ Broker Name (Define in Broker Setting page of MQTT Setting)
      - └ 201502 ← Data files be sorted by year and month.
        - └ 0208_00.csv
        - └ 0208_01.csv
        - …
        - └ 0208_23.csv
        - └ 0209_00.csv
        - └ 0209_01.csv
        - …
        - └ 0209_09.csv
  - └ EventLog (The folder for Event Logger file)
    - └ 201502 ← Data files be sorted by year and month
      - └ 0207.csv
      - └ 0208.csv
      - └ 0209.csv

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

8 IoT Platform Setting

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

In additional, WISE supports to connect to the IoT cloud management software: IoTstar designed by ICP DAS. The supported functions for IoTstar includes Connection Setting, Real-Time Data Sending Setting, Historical Data Sending Setting, Video Data Sending Setting, and Bot Service Setting can also be set in this page..

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

- ◆ Amazon Web Services Platform Setting
- ◆ Microsoft Azure Platform Setting
- ◆ IBM Bluemix Platform Setting
- ◆ MQTT Setting

IoTstar relative functions:

- ◆ Connection Setting
- ◆ Real-Time Data Sending Setting
- ◆ Historical Data Sending Setting
- ◆ Video Data Sending Setting
- ◆ Bot Service Message Setting
- ◆ Alarm Setting

8.1 AWS Platform Setting

WISE provides the ability to connect to Amazon Web Services IoT Cloud platform. Because the setting of AWS platform is more complicated, this chapter only describe the setting that need to be set on WISE controller. For the complete connection setting between WISE and AWS platform, please to refer to the user manual of "Operation manual for WISE to connect with AWS(Amazon Web Service) cloud platform_en.pdf".

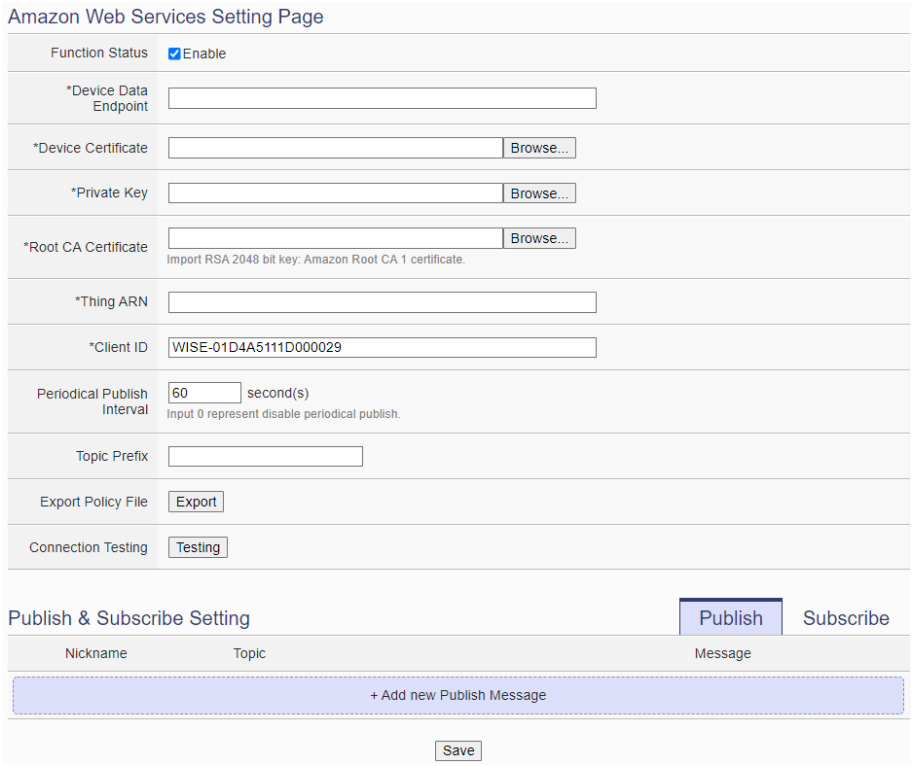


Figure 8-1：Amazon Web Services Setting page

Follow the steps below:

i Check "Enable" in the "Function Status" field to enable the connection to Amazon Web Services Cloud IoT platform.

ii In the "Device Data Endpoint" field, enter the information of AWS IoT Core endpoint set by AWS platform. The Device Data Endpoint can be obtained from the setting page of AWS IoT Core, please refer to the following:

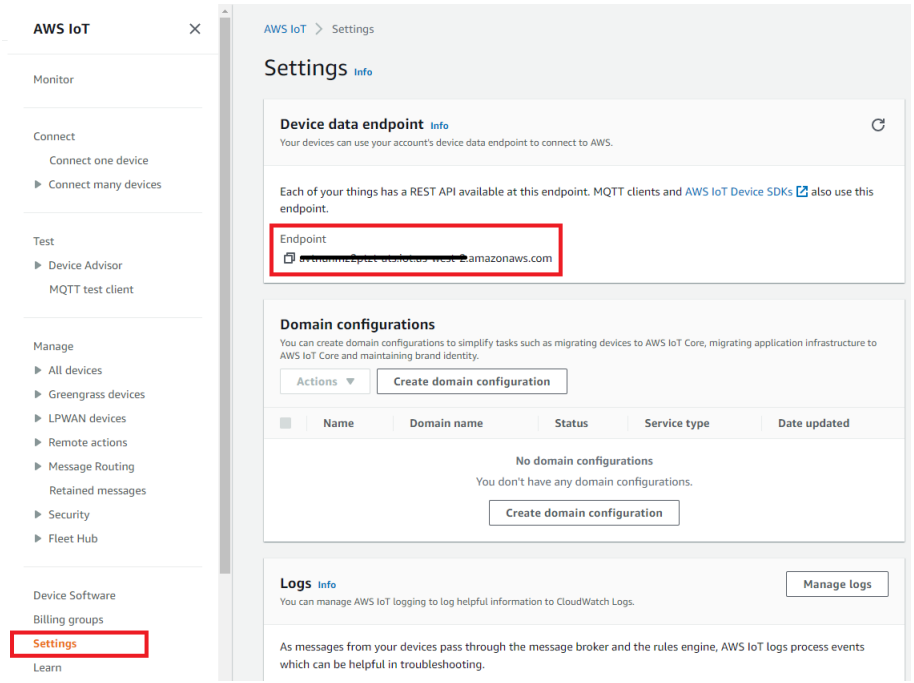


Figure 8-2："Device Data Endpoint" Setting page of Amazon Web Services

iii In the “Device Certificate”, “Private Key” and “Root CA Certificate” fields, import the certificate and key generated from the AWS platform. Following is the page for the download of the certificate and key WISE need from AWS platform:

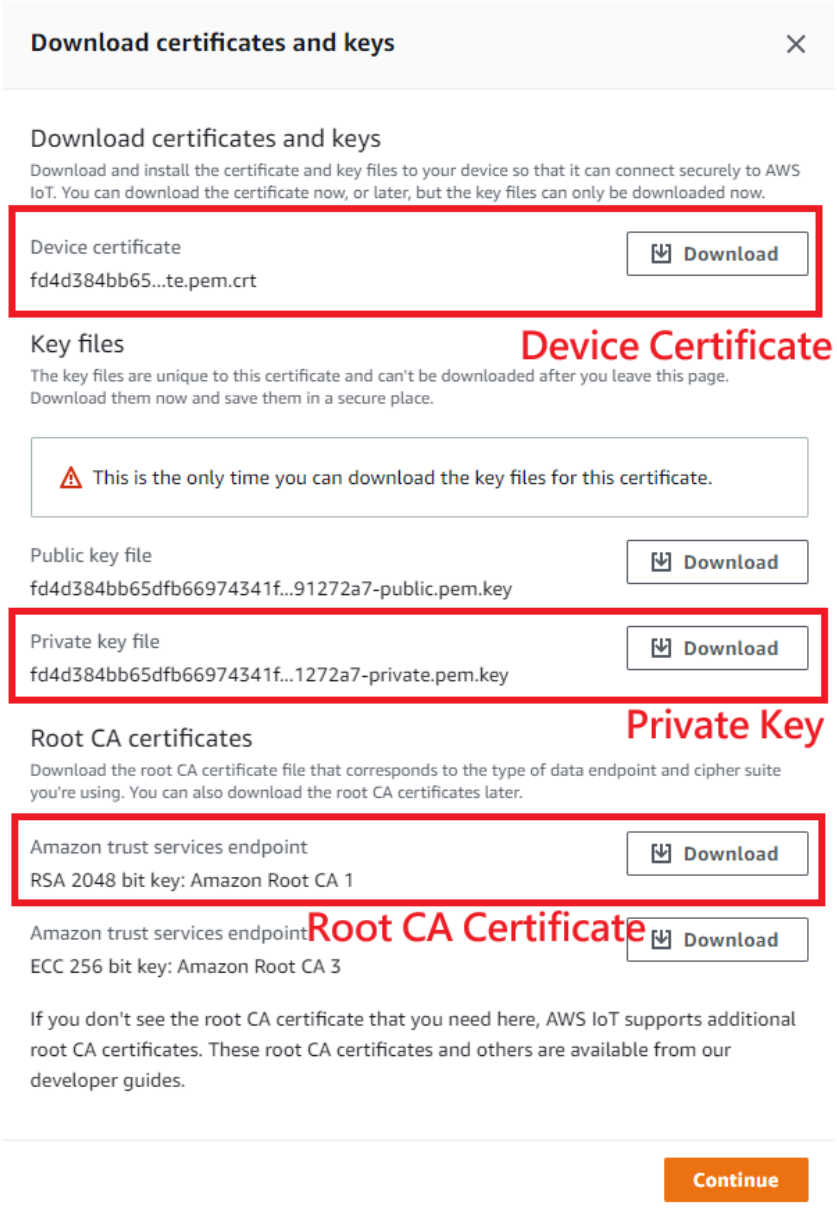


Figure 8-3：Certificate and Key Download page of Amazon Web Services

iv In the “Thing ARN” field, enter the information of “Thing ARN” set by AWS platform. Following is the page for the “Thing ARN” WISE need from AWS platform:

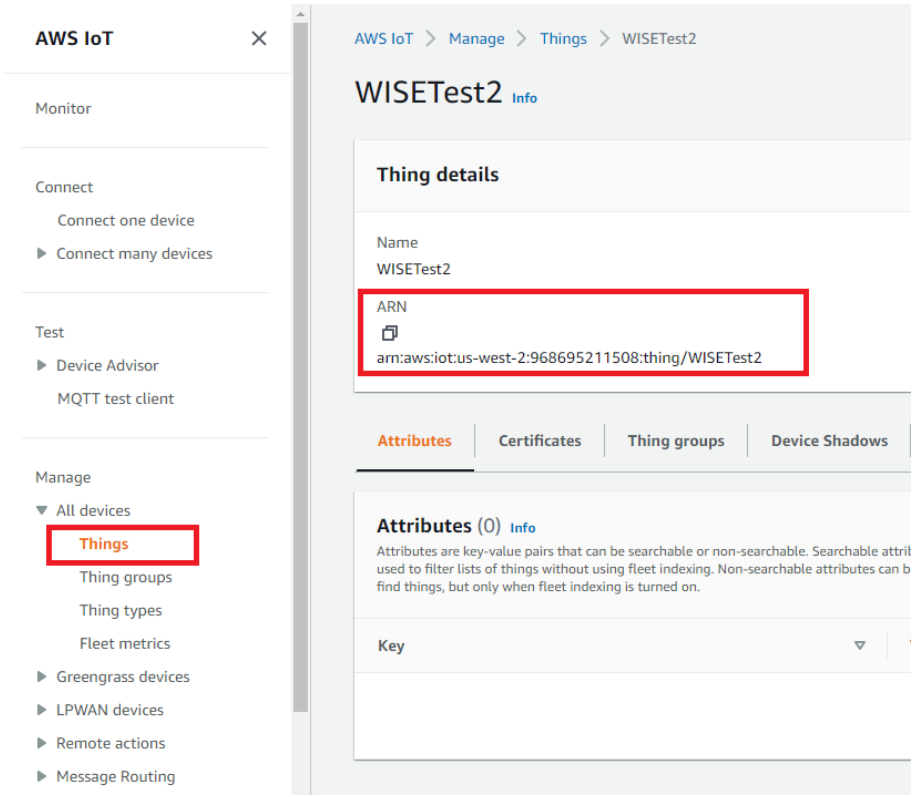


Figure 8-4："Thing ARN" page of Amazon Web Services

v In the “Client ID” field, WISE will provide a default string (with the format of “WISE-serial number”) as the unique client ID for the WISE, and user can change this string according to his requirement. The client ID must be unique. If two WISEs use the same client ID to connect to AWS platform, one of them will fail to connect.

Please Note: If users use the WISE's rule file export/import function to copy the rule file to others WISE, the information of client ID will be the same, so user need to manually modify the client ID after the import operation is completed.

vi 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.

vii The “Topic Prefix” field is for setting up a string as Topic Prefix. The prefix can be used in the Publish Topic or Subscribe Topic to simply the Topic editing. The default string of the “Topic Prefix” will be the model name of the WISE. If there are more than one WISE controllers in a system for AWS connection, please remember to change the

"Topic Prefix" setting to distinguish the Publish Topic/Subscribe Topic setting of each WISE controllers.

viii After press the "Export" button in the "Export Policy File" field, WISE will generate the policy JSON file required by AWS platform according to the current settings. User need to copy its content and paste it in the policy editor of AWS platform to complete the connection between WISE and AWS platform.

Please Note: If the user modifies the above settings (except the certificate file), or modifies the content of the publish or subscribe messages, the policy file must be re-exported, and the new version of the policy file must be copied to AWS platform again.

ix After complete the operation of policy editing, click the "Testing" button in the "Connection Testing" field to immediately connect to AWS platform to check whether the connection setting is correct, or not.

x The lower half section on the AWS Web Services Setting Page is for the Publish Message and Subscribe Topic setting. The user can click the tab of "Publish" or "Subscribe" to edit the Publish Message and Subscribe Topic. The Interface will be shown as below:

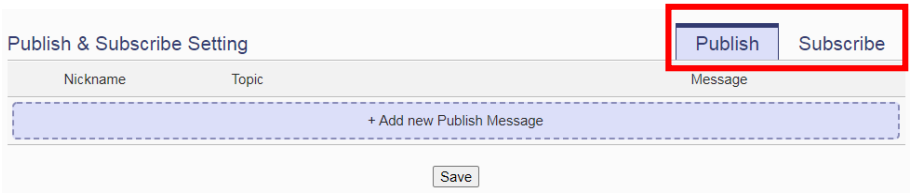


Figure 8-5：Publish and Subscribe Setting page of Amazon Web Services

xi Click the "Publish" tab to edit the Publish Message. User can click on "Add new Publish Message" to add a new Publish Message. The Publish Message setting page is shown as below.

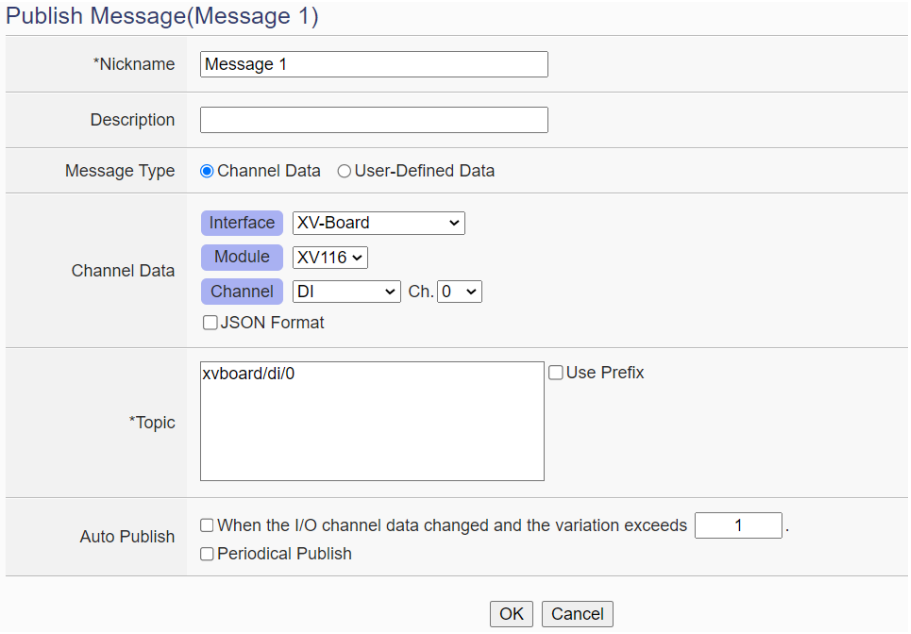
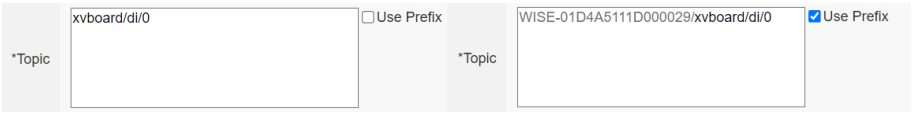


Figure 8-6：Publish Message Setting Page of Amazon Web Services

xii Input a name in the “Nickname” field and you could also input the description of this Publish Message in the “Description” field.

xiii 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 the user selects “All” I/O channels, it means all I/O channel values will be added in the Publish Message. If the user clicks 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 VII for more details.) After completing the “Channel Data” setting, the system will automatically generate the default Topic content in the “Topic” field. User can modify the content of the “Topic” field if require. If the “Use Prefix” checkbox is enabled, the string in the “Topic Prefix” field will be used as the prefix of the Publish Topic.



xiv If the user selects “User-Defined Data” in “Message Type” field, the interface will be changed to free-style editing mode. So the user can edit the content of the message by himself via the editor. The interface is shown as below.

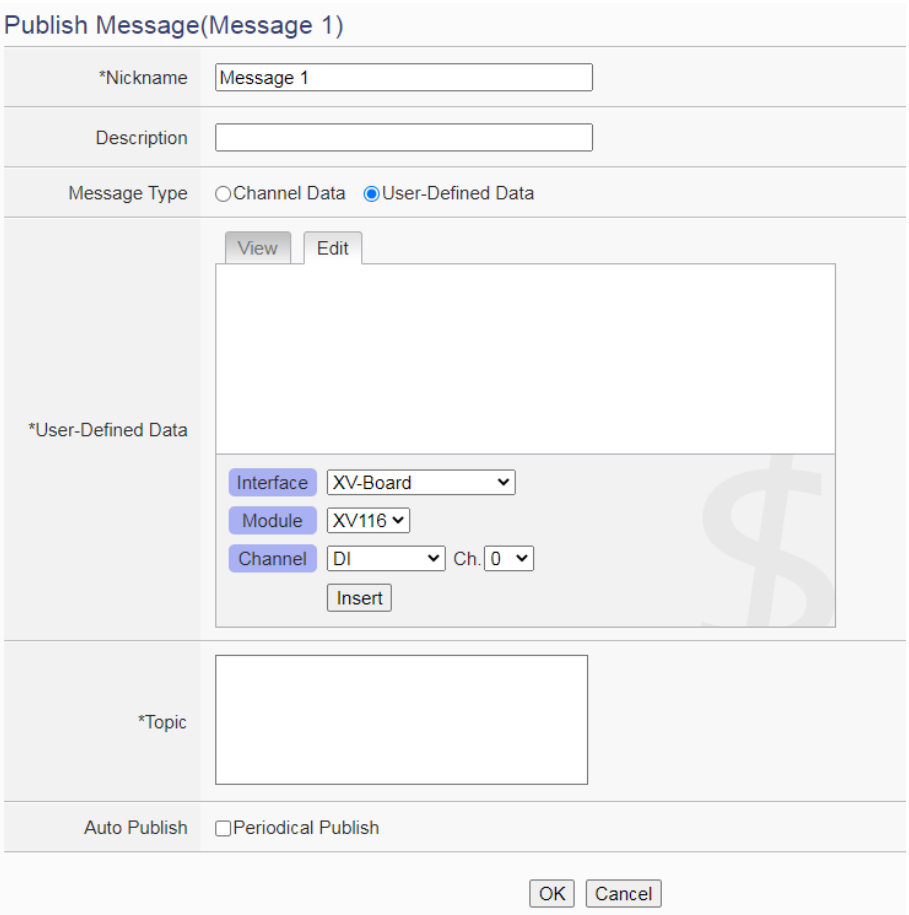


Figure 8-7：“User-Defined Data” Setting Page of Amazon Web Services

xv 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 user must assign a evaluation value, then 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 vi.

xvi After complete all settings of Publish Message, please click “OK” button to add the Publish Message to the Publish Message List.

xvii Click the “Subscribe” tab to edit the Subscribe Topic. The interface is shown as below:

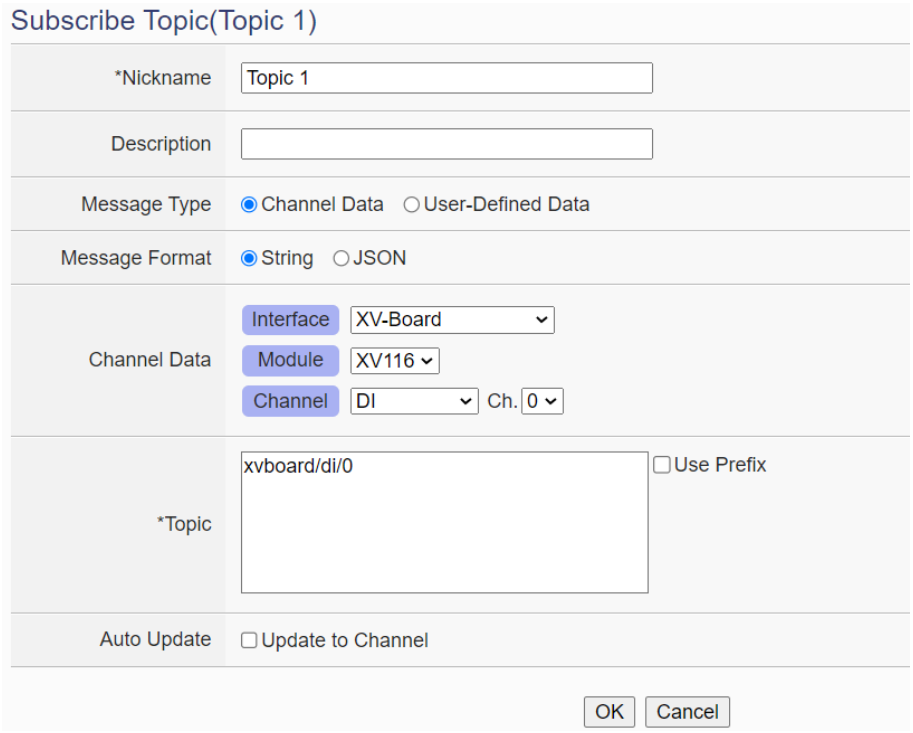


Figure 8-8：Subscribe Topic Setting Page of Amazon Web Services

xviii Input a name in the “Nickname” field and you could also input the description of this Subscribe Topic in the “Description” field.

xix In the “Message Type” field, select the “Channel Data” means that the Topic of the received message uses the Topic of the channel preset by WISE. Under this setting, if the user selects “String” in the “Message Format” field, he can check the “Update to Channel” in the “Auto Update” field, and then when WISE receives the message, it will automatically convert the message string into the numerical value and update it to the channel output value. If the “Message Format” is selected as “JSON”, then user can fill in the JSON format content expected to be received into the “JSON variable Setting” field, and WISE will parse the content of each variable and provided for use by logic rules. The interface is shown as below:

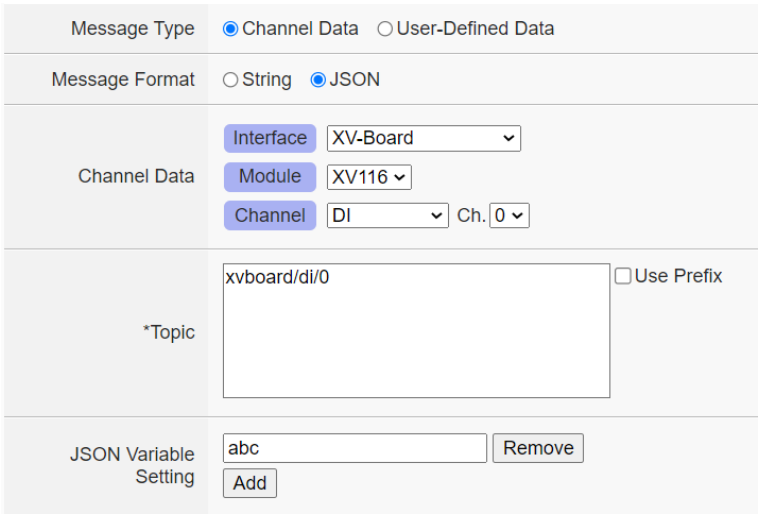


Figure 8-9：Receive messages in JSON format of Amazon Web Services

xx If the user selects “User-Defined Data” in “Message Type” field, the interface will be converted to free-style editing mode, and user can edit the Topic for the subscribe message by himself. He can also set the “Message Format” to “String” or “JSON” to parse the received message content and provided for use by logic rules.

xxi After complete all settings on Amazon Web Services Setting Page, please click “Save” button to save the setting. After downloading the setting to WISE, WISE will initiate the connection to Amazon Web Services, and start the Publish Message/Subscribe Message mechanism with Amazon Web Services.

8.2 Microsoft Azure Platform 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:

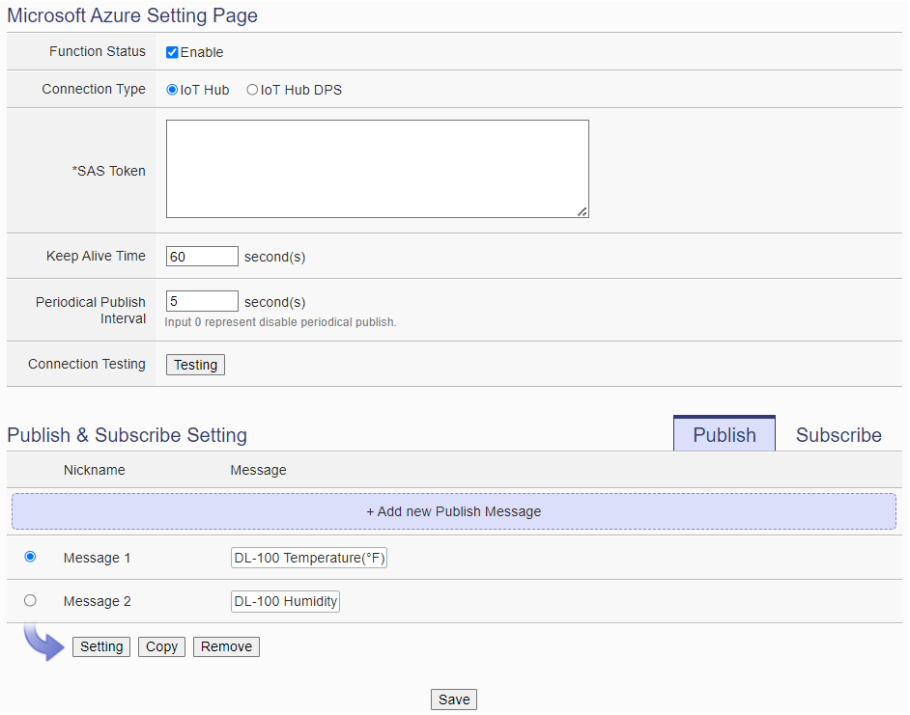


Figure 8-10：Microsoft Azure Setting page

Follow the steps below:

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

ii Select “Connection Type” as “IoT Hub” or “IoT Hub DPS”.

iii If “IoT Hub” is selected, in the “SAS Token” field, input the SAS Token which you previously registered for this WISE from Microsoft Azure. For the procedure to generate a SAS Token, please use Azure IoT Explorer (Download Link) to generate the SAS token of the device in the IoT Hub as below:

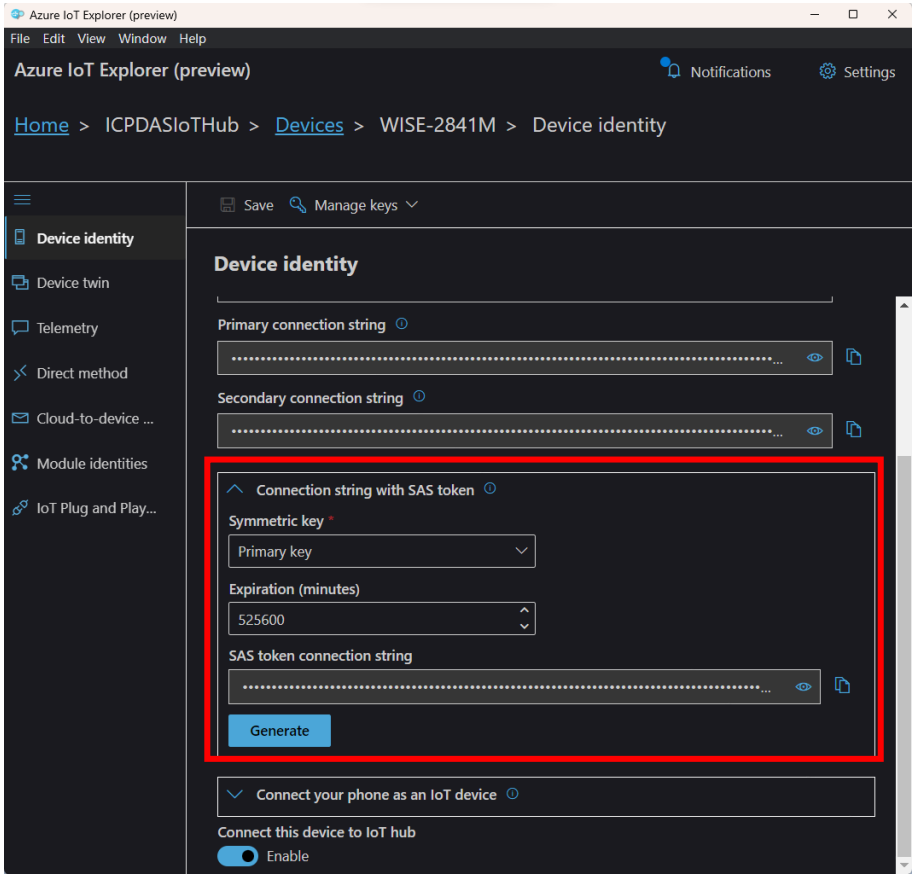


Figure 8-11：SAS Token generating interface on Azure IoT Explorer

iv If “IoT Hub DPS” is selected, get “DPS Endpoint”, “DPS ID Scope”, “Registration ID” and “Symmetric Key” parameters from the IoT Hub Device Provisioning Service(DPS) function page on the Azure platform.

v The value in “keep alive Time” field defines the maximum amount of time in second that pass away without communication between the WISE and Microsoft Azure. The “keep alive interval” enables Microsoft Azure to detect if the connection to the WISE is no longer available without having to wait for the long TCP/IP timeout.

vi 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.

vii To verify whether the SAS Token setting is correct, click “Testing” in the “Connection Testing” section, then WISE will try to connect Microsoft Azure with the SAS Token setting, and reply the connection

status.

viii 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:

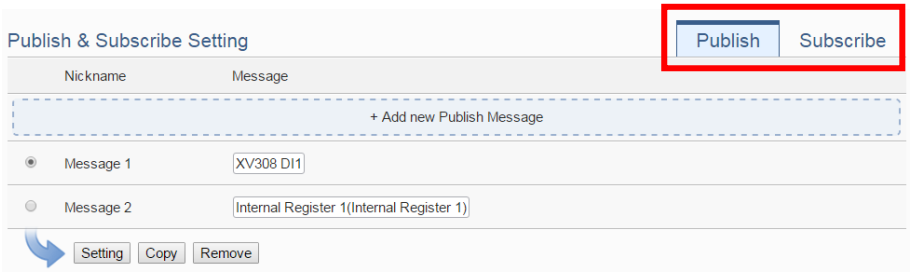


Figure 8-12：Microsoft Azure Publish/Subscribe Setting page

ix Click the "Publish" tab to edit the Publish Message. User can click on "Add new Publish Message" to add a new Publish Message.

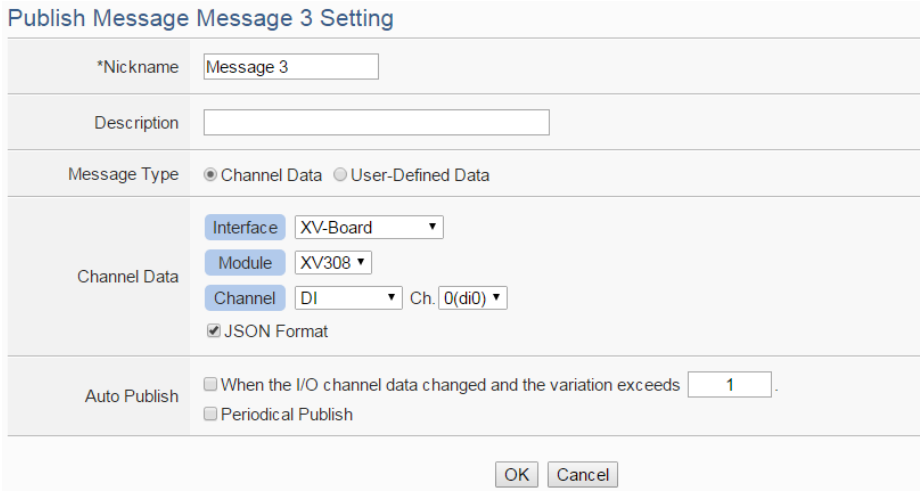


Figure 8-13：Microsoft Azure Publish Message setting page

x Input a name in the "Nickname" field and you could also input the description of this Publish Message in the "Description" field.

xi 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 VII 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.

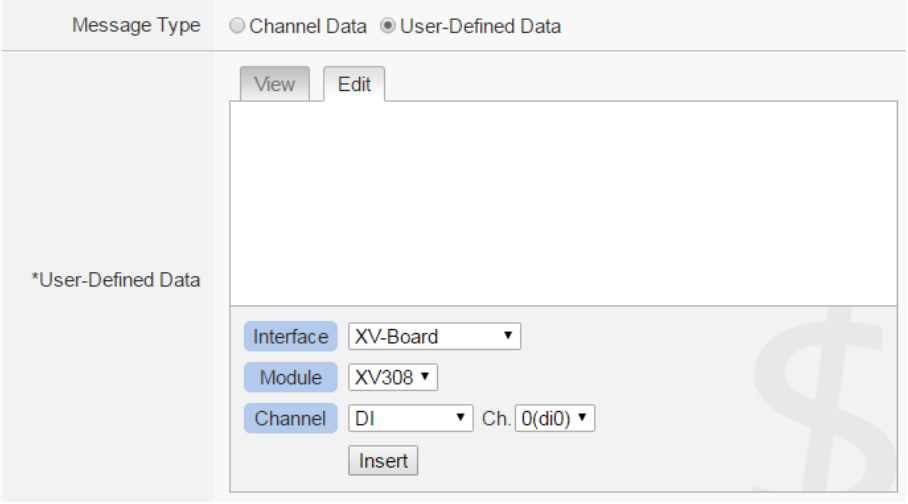


Figure 8-14：“User-Defined Data” Setting Interface of Microsoft Azure

xii 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.

xiii After completing all settings of Publish Message, please click “OK” button to add the Publish Message to the Publish Message List.

xiv Click the “Subscribe” tab to edit the Subscribe Topic. The user interface is shown as below:

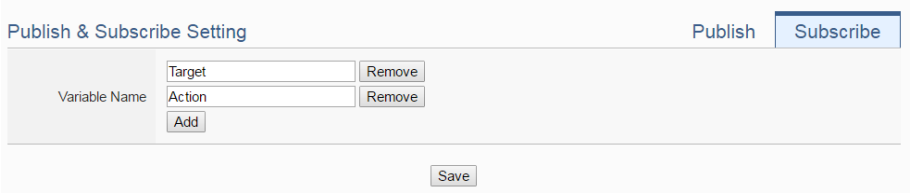


Figure 8-15：Microsoft Azure Subscribe Topic setting page

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

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

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

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

8.3 IBM Bluemix Platform 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:

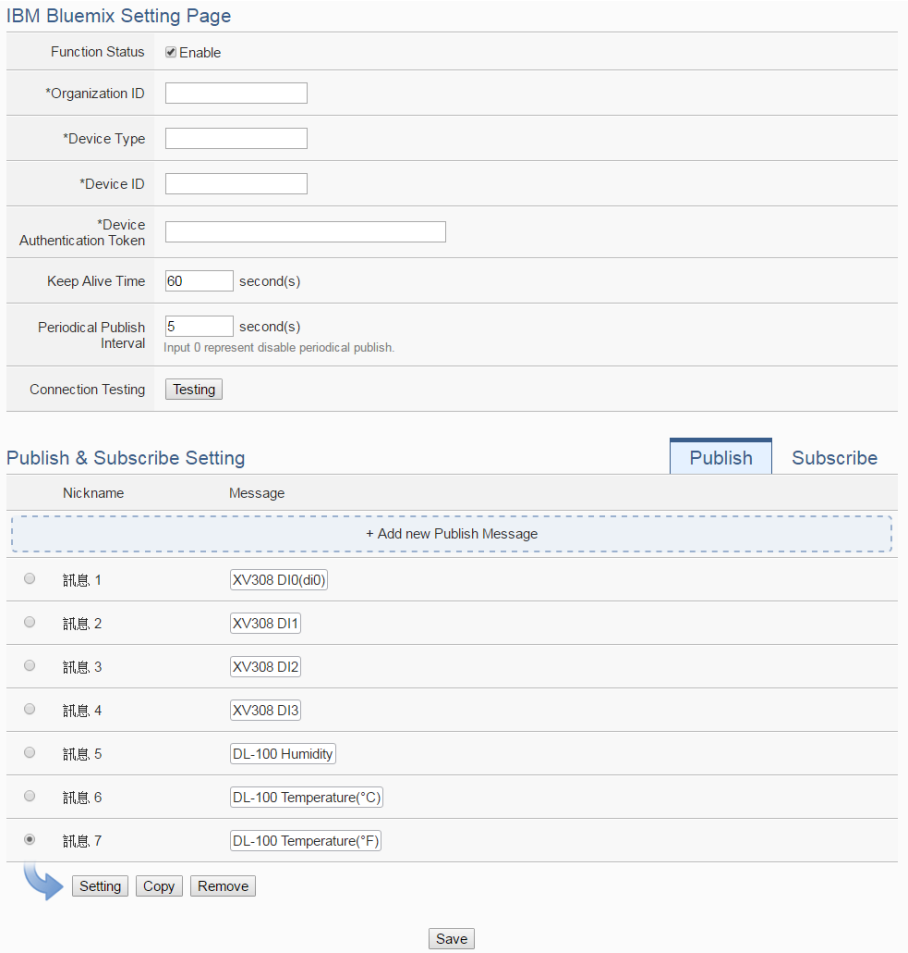


Figure 8-16：IBM Bluemix Setting page

Follow the steps below:

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

ii In the “Organization ID”, “Device Type”, “Device ID” and “Device Authentication Token” fields, input the data you previously registered for this WISE from IBM Bluemix. After you completing the device settings on IBM Bluemix for the WISE, IBM Bluemix will reply you the device information similar as below.

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

iii The value in “keep alive Time” field defines the maximum amount of time in second that pass away without communication between the

WISE and IBM Bluemix. The “keep alive interval” enables IBM Bluemix to detect if the connection to the WISE is no longer available without having to wait for the long TCP/IP timeout.

iv The value in “Periodical Publish Interval” field defines the time interval to automatically and periodically send the Publish Messages which are with the “Periodical Publish” attribute. If the value of the “Periodical Publish Interval” field is 0, it means the “Periodical Publish” operation is disabled. The unit of the value is second.

v Click “Testing” in the “Connection Testing” section, then WISE will try to connect IBM Bluemix, and reply the connection status to verify the setting is correct, or not.

vi The lower half section on the IBM Bluemix Setting Page is for the Publish Message and Subscribe Message setting. User can click the tab of “Publish” or “Subscribe” to edit the Publish Message and Subscribe Message. For the settings of the Publish Message, please refer to “8.2 Microsoft Azure Setting” section.

vii Click the “Subscribe” tab to edit the Subscribe Message. The user interface is shown as below:

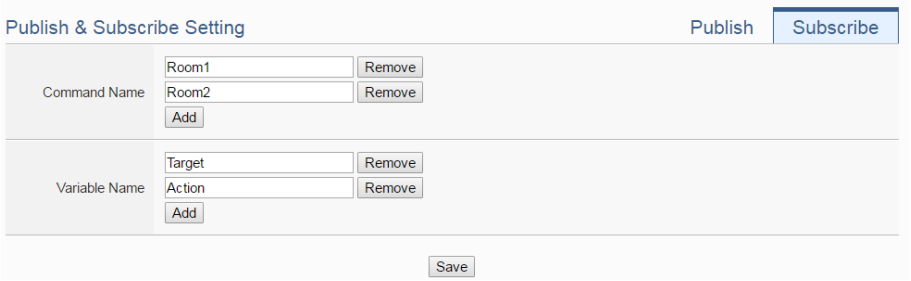


Figure 8-17：IBM Bluemix Subscribe Message setting page

viii In the “Command Name” field, the user can specify the command strings to be sent from the IBM Bluemix to the WISE-521xx. The content of “Command Name” setting can be used as the IF Condition of IF-THEN-ELSE logic rule to filter the commands sent from IBM Bluemix. WISE can be set to only receive the commands that are pre-defined in the field, the other commands will be ignored by WISE.

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

which WISE receives:

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

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

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

8.4 MQTT Setting

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

8.4.1 Broker Setting

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

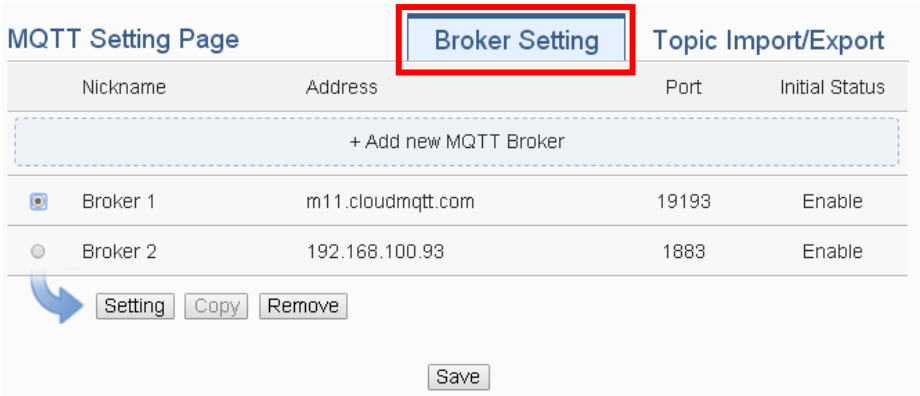


Figure 8-18：MQTT setting page (Broker)

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:

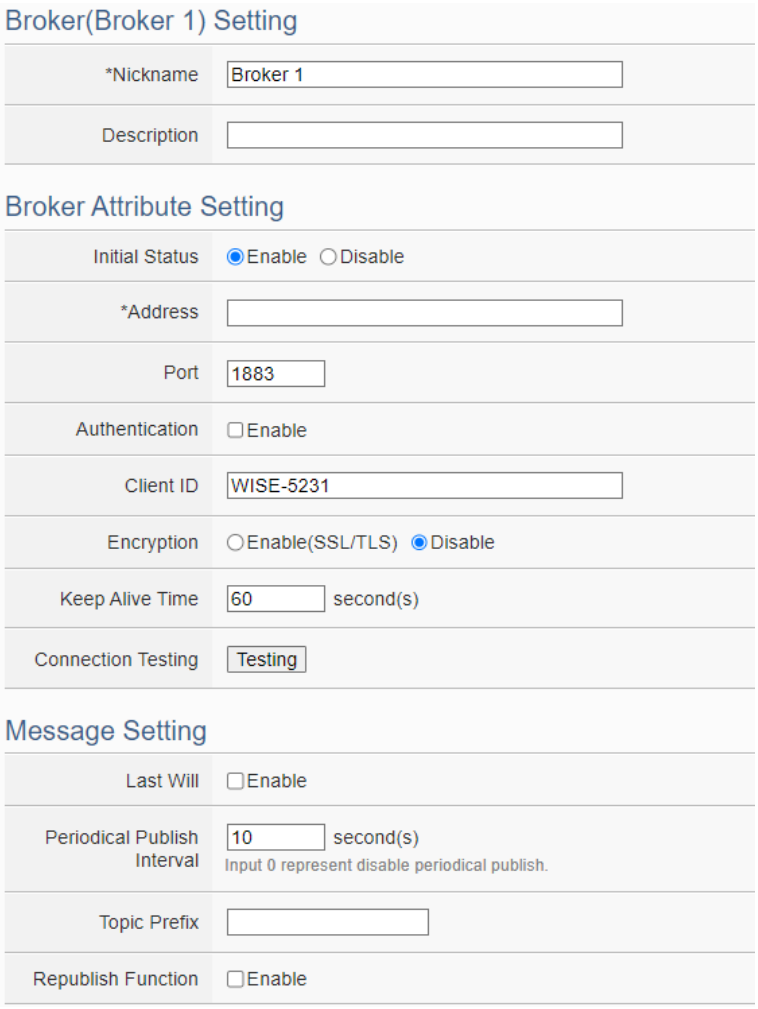


Figure 8-19：MQTT Broker Parameter setting page

iii In the Broker parameters setting page, you can input the name of the Broker in the “Nickname” field and you could also input the description of this Broker in the “Description” field.

iv Check “Enable” or “Disable” in the “Initial Status” field to enable the initial connection status with the Broker. If the user clicks “Enable”, it means the WISE will start the communication with the Broker after it is powered on.

v Enter the Broker IP address (or domain name) in the “Address” field.

vi Enter the Broker Port number in the “Port” field.

vii If the Broker requires account and password validation, please select the “Enable” checkbox in the “Authentication” field, and enter the login ID and password in the “ID” and “Password” fields to login into the Broker. If the Broker doesn’t need account and password validation, uncheck the “Enable” checkbox and go

directly to next step.

viii Enter the Client ID information in the “Client ID” field. The Client ID is used for Broker to verify if the MQTT Client is allowed to connect to the Broker or not. If the Broker does not require Client ID for the connection, this field can be ignored.

ix If the SSL/TLS encryption mechanism is required for the connection between the Broker and the WISE via MQTT, click the “Enable” checkbox of the “Encryption” field to enable this function.

x The value in “keep alive Time” field defines the maximum time that should pass without communication between the WISE and the Broker. The WISE will ensure that at least one message travels across the network within each keep alive period. In the absence of a data-related message during the time period, the WISE sends a very small MQTT “ping” message, which the Broker will acknowledge. The keep “alive interval” enables the WISE to detect when the Broker is no longer available without having to wait for the long TCP/IP timeout. The unit of the value is second.

xi To verify whether your Broker setting is correct, click “Testing” in the “Connection Test” section, then WISE will try to connect to the Broker and reply the connection status.

xii Click the “Enable” checkbox in the “Last Will” field to allow the Broker to send the alarm Topic to other MQTT client devices when WISE lost connection to the Broker. After clicking the “Enable” checkbox, the setting of Last Will Topic, Message content and QoS will be brought up.

xiii The value in “Periodical Publish Interval” field defines the time interval (in second) to send all Publish Topics with the “Periodical Publish” attribute automatically and periodically. If the value of the “Periodical Publish Interval” field is 0, it means the “Periodical Publish” operation is disabled.

xiv The “Topic Prefix” field is for setting up a string as Topic Prefix. The prefix can be used in the Publish Topic or Subscribe Topic to simply the Topic editing. The default string of the “Topic Prefix”

will be the model name of the WISE. If there are more than one WISE controllers in a system for MQTT connection, please remember to change the “Topic Prefix” setting to distinguish the Publish Topic/Subscribe Topic setting of each WISE controllers.

xv Click the “Enable” checkbox in the “Republish Function” field to allow WISE to keep sending messages when WISE lost connection to the Broker. When the connection works normally, WISE would publish all saving messages to the Broker.

xvi 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:

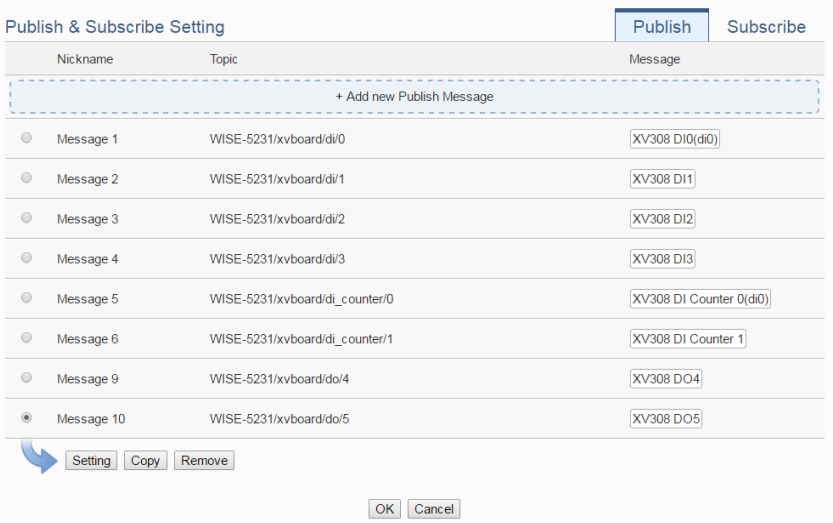


Figure 8-20：Publish Message and Subscribe Topic setting page

xvii 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:

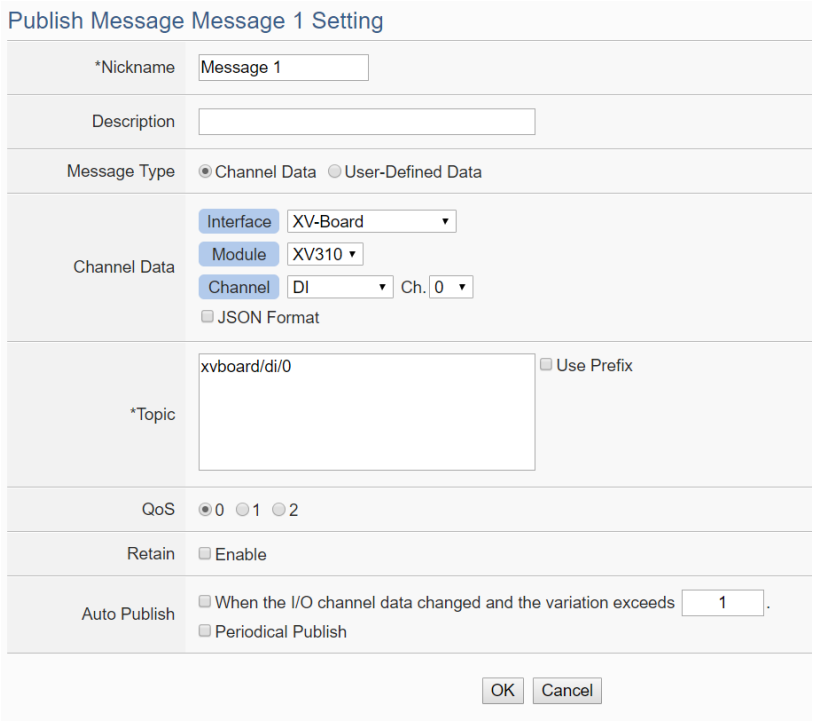


Figure 8-21：Publish Message Setting Page

xviii Input a name in the “Nickname” field and you could also input the description of this Publish Message in the “Description” field.

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

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

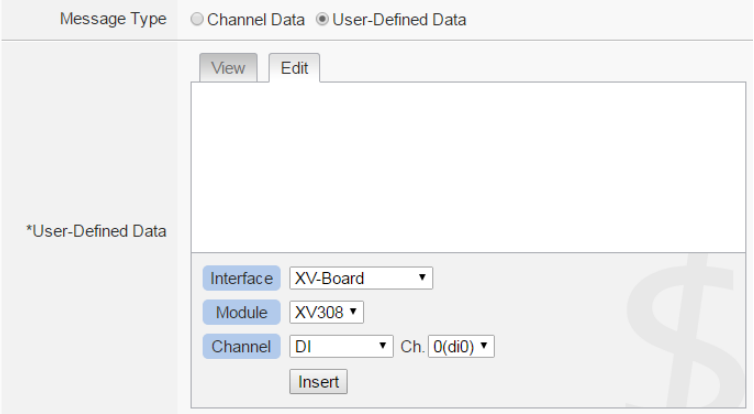


Figure 8-22：Publish User-Defined Message Setting Page

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

xxi In the “Retain” field, user can click the “Enable” checkbox to keep the Publish Message in the Broker.

xxii 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.

xxiii After completing all settings of Publish Topic, please click “OK” button to add the Publish Topic to the Publish Message List.

xxiv Click the “Subscribe” tab to edit the Subscribe Topic. The user interface is shown as below.

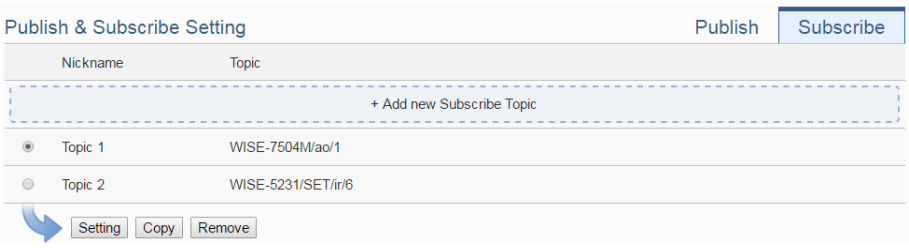


Figure 8-23：MQTT Subscribe Setting Page

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

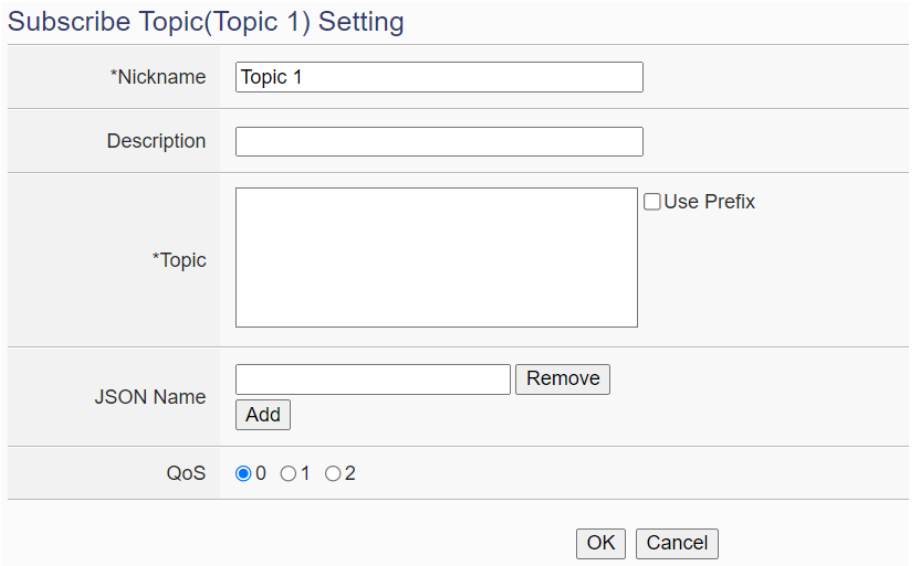


Figure 8-24：MQTT Subscribe Topic Setting Page

xxvi 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. If the payload format of the subscribe topic is JSON, and users want to get values of some specific keys for IF-THEN-ELSE rules or calculation, they could add the keys into “JSON Name” fields. In addition, all Internal Registers and the I/O modules connected to WISE have their own default definition of Subscribe Topic. It allows user to change the value of the Internal

Register and the value of the output channel of I/O module by MQTT protocol. Please refer to Appendix VII for detailed information.

xxvii 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.

8.4.2 Topic Import/Export Setting

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

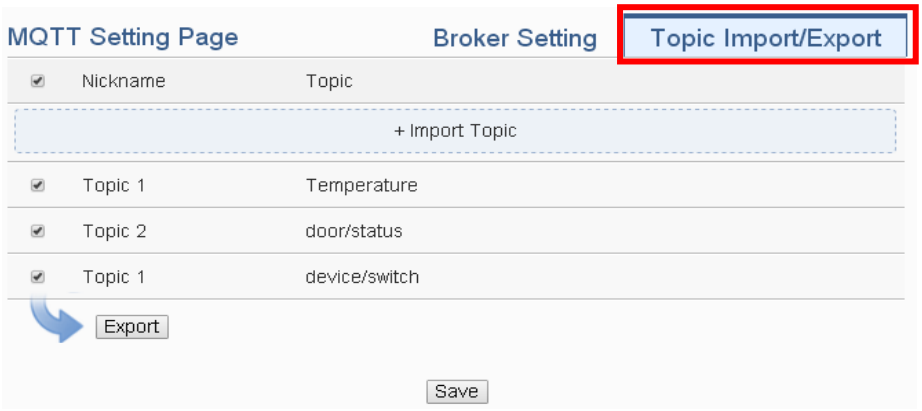


Figure 8-25：MQTT Topic Import/Export setting page

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

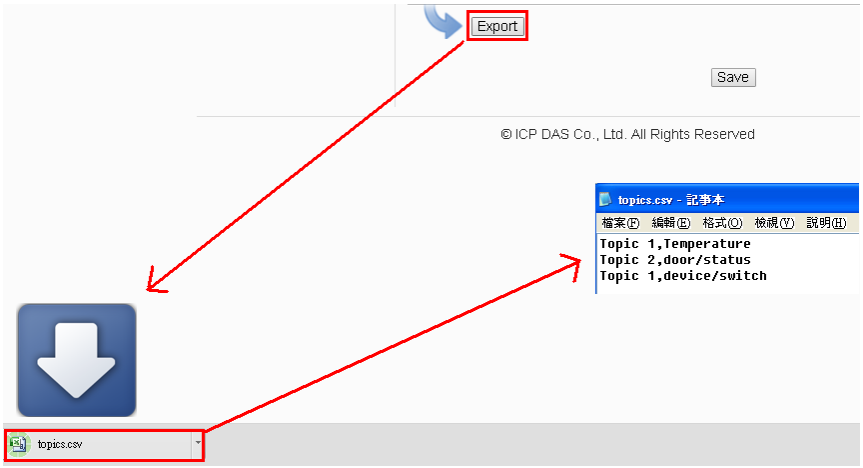


Figure 8-26：The Export of MQTT Topic

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.

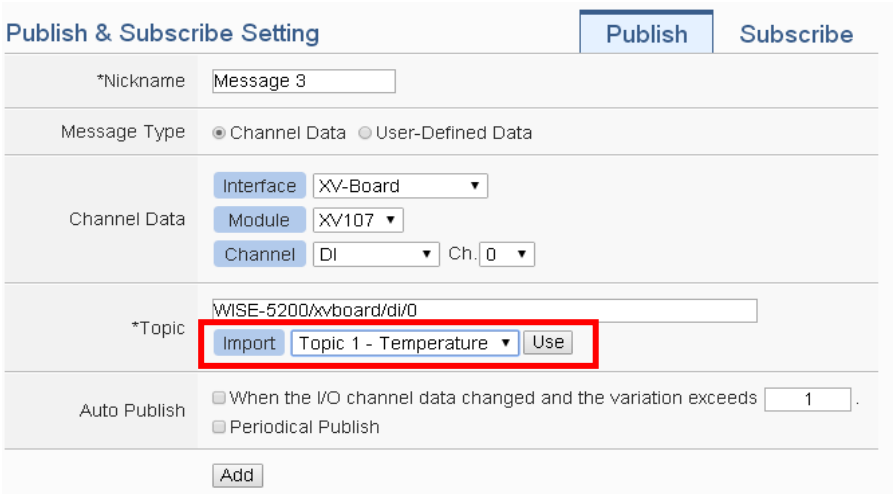


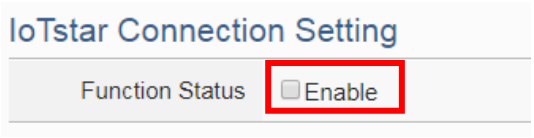
Figure 8-27：The Import of MQTT Topic

8.5 IoTstar Connection Setting

The section is for user to complete the connection setting between WISE

and IoTstar or “ICP DAS IoTstar Trial Service”. Please follow the steps below for the setting:

i Click “Enable” of the “Function Status” field to enable the connection to IoTstar.



ii Two options : “User-built IoTstar” and “IoTstar Trial” are available for selection.

If users select “User-built IoTstar”, please click

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

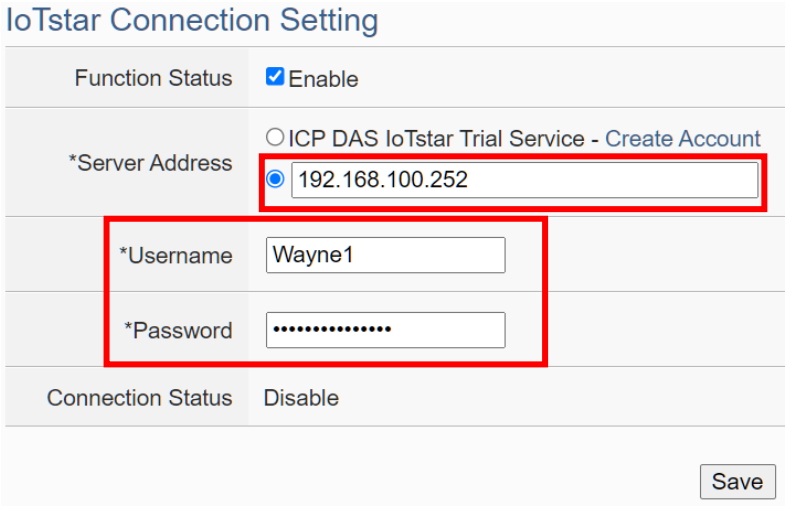
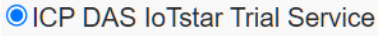


Figure 8-28：IoTstar Connection Setting Page(1)

If users want the WISE to connect the “IoTstar Trial”, please click 

in the “Server Address” field, then enter the login username and password (require to apply in advance) in the “Username” and “Password” fields. WISE will login and connect to the “IoTstar Trial” by the information provided.

Please Note: For the account application of the “IoTstar Trial”, please refer to the instructions in Appendix IX: ICP DAS “IoTstar Trial” account application.

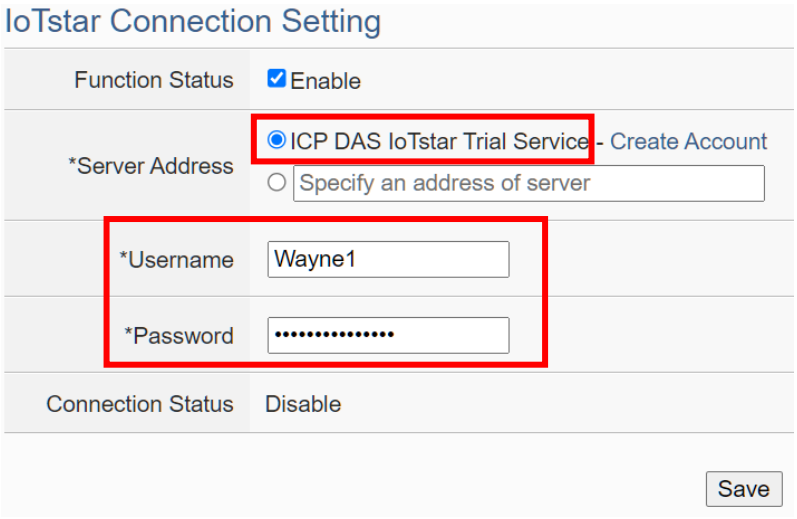


Figure 8-29：IoTstar Connection Setting Page(2)

iii After all settings are completed, click "Save" button to save the changes. After download the setting to WISE, WISE will connect to IoTstar, and the user can review the current connection status between WISE and IoTstar through the information displayed in the "Connection Status" field.

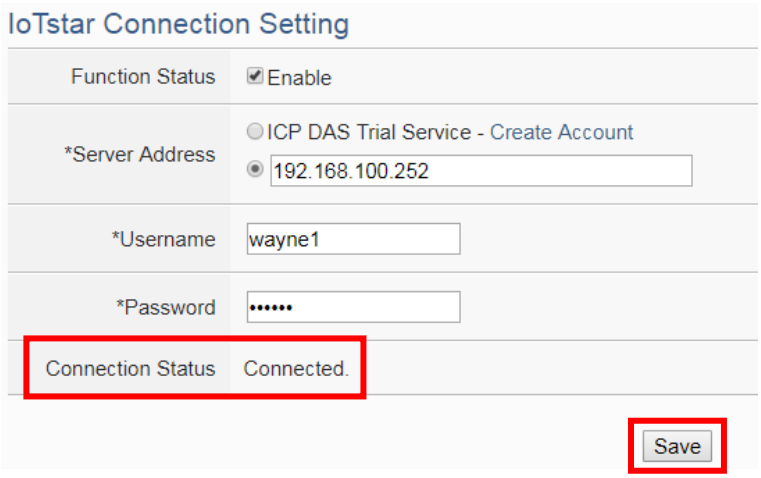


Figure 8-30：IoTstar Connection Status

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

8.6 IoTstar Real-Time Data Sending Setting

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

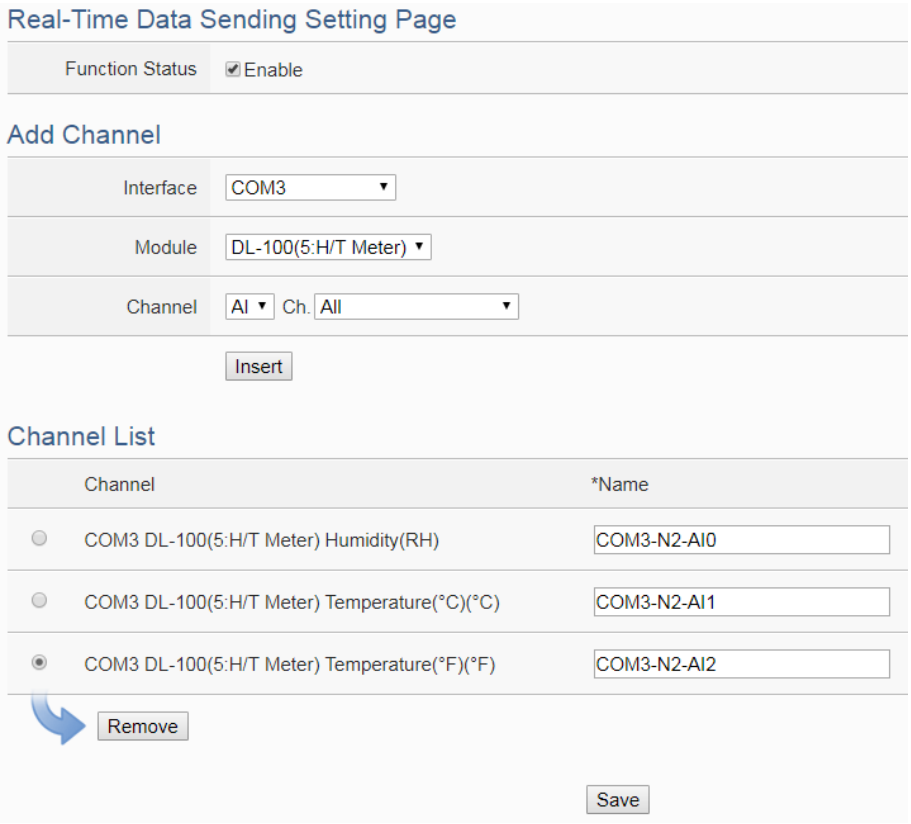


Figure 8-31：IoTstar Real-Time Data Sending Setting page

Follow the steps below:

i In the “Function Status” field, check “Enable” to enable the Real-Time I/O data upload operation.

ii In the “Add Channel” section, select the “Interface”, “Module” and “Channel” from the dropdown list and click “Insert” to add the I/O channel into the “Channel List” section. User can select “All” in “Channel” field to insert all I/O channels of the module at once.

iii WISE will actively send the Real-Time I/O channel data which is located in the “Channel List” section to IoTstar. User can modify the database field name of the I/O channel data in the “*Name” field. To remove a pre-set I/O channel, please click the radio button in front of the pre-set I/O channel and then click “Remove” button.

Please Note:

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

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

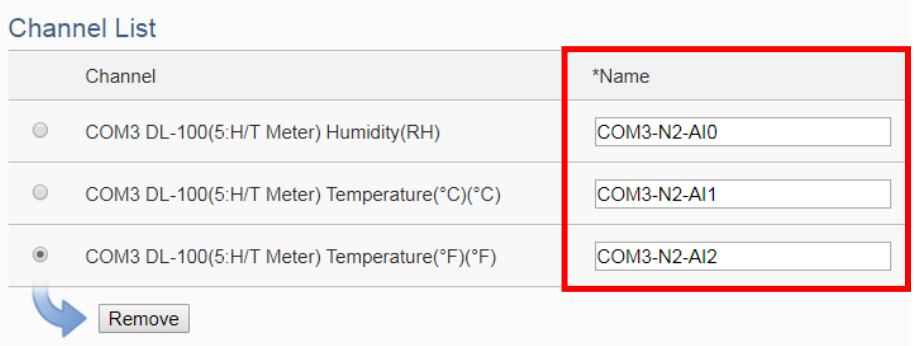


Figure 8-32：Channel Names of Realtime data table of IoTstar database

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

8.7 IoTstar Historical Data Sending Setting

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

Figure 8-33：IoTstar Historical Data Sending Setting page

Follow the steps below:

i To enable WISE's historical I/O data upload operation, users need to enable “I/O Module Data Logger” function first. More detailed setting information please refers to the section “7.1 I/O Module Data Logger Setting”.

ii Check “Enable” to enable the Historical Data Sending function, and click “Save” button to save the setting.

8.8 IoTstar Video Data Sending Setting

WISE supports to send the snapshots or video files captured by iCAM cameras or other devices to IoTstar. IoTstar would save the uploaded files

and perform the following actions:

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

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

- IP Camera: If the WISE controller connected with ICP DAS iCAM series IP cameras, it is able to collect the snapshot or video files captured by iCAM cameras.
- Sendbox: Upload files to the specific path (/Sendbox/IoTstar) of the FTP server on the WISE.
- CGI server: Connect to CGI servers and get the image files with CGI commands. (For example, users can use WISE controllers to connect with general IP cameras, and get snapshot files with CGI commands.)
- Heatmap file: If the WISE controller connected with ICP DAS iSN-81x-MTCP series infrared temperature measurement modules, it is able to collect the heatmap files generated by iSN-81x-MTCP modules.

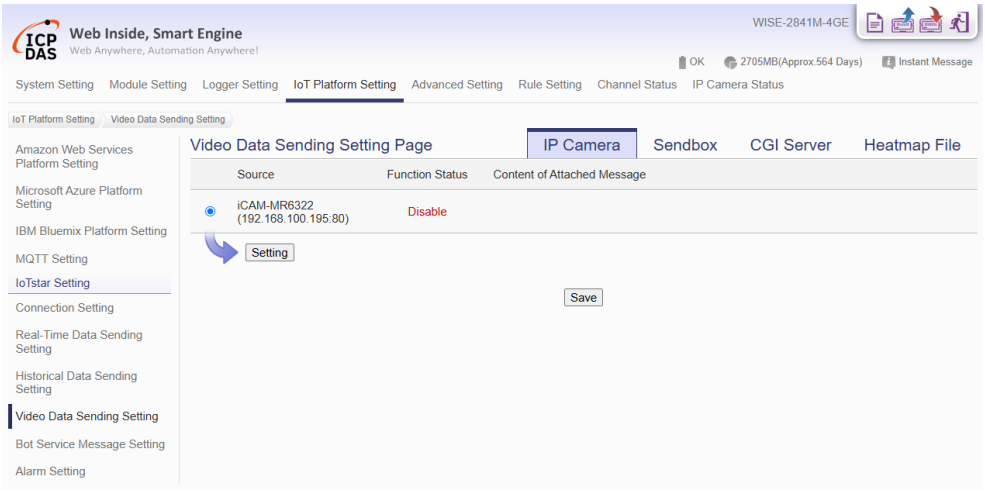


Figure 8-34：IoTstar Video Data Sending Setting page (1)

Follow the steps below:

i To select the data resource for image/video data sending, click on one of the tabs: “IP Camera”, “Sendbox”, “CGI Server” and “Heatmap File” at the right-upper corner of the Video Data Sending Setting page.

ii To send the desired files, please specify and click on the radio button of the file source, and click the “Setting” button to enter the setting page.

iii Check the “Enable” function, and then the message setting interface will be shown as below. Enter the message content in the “Content of Attached Message” field to discribe the video data resource. WISE provides an “Real-time variable editor” to add current I/O channel data or Internal Register data into the messages.

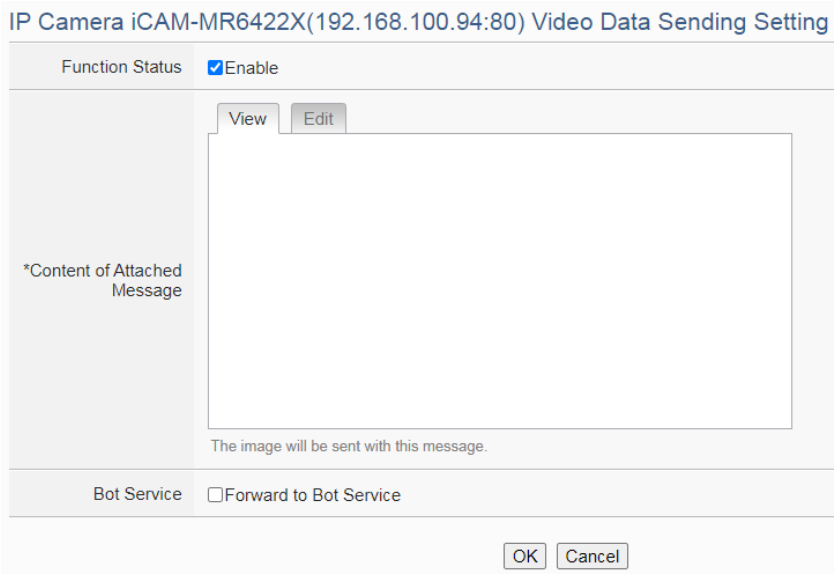


Figure 8-35：IoTstar Video Data Sending Setting page (2)

iv If the IoTstar enabled Bot Service package, check “Forward to Bot Service” to send the image/video data of the data resource to the specific LINE account.

v Click the “OK” button to save the setting of the data resource.

vi After you finish all the “Video Data Sending” settings, click “Save” button to save the settings.

8.9 IoTstar Bot Service Message Setting

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

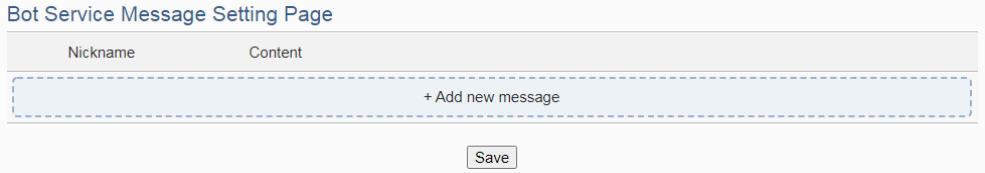


Figure 8-36：IoTstar Bot Service Message Setting page (1)

Follow the steps below:

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

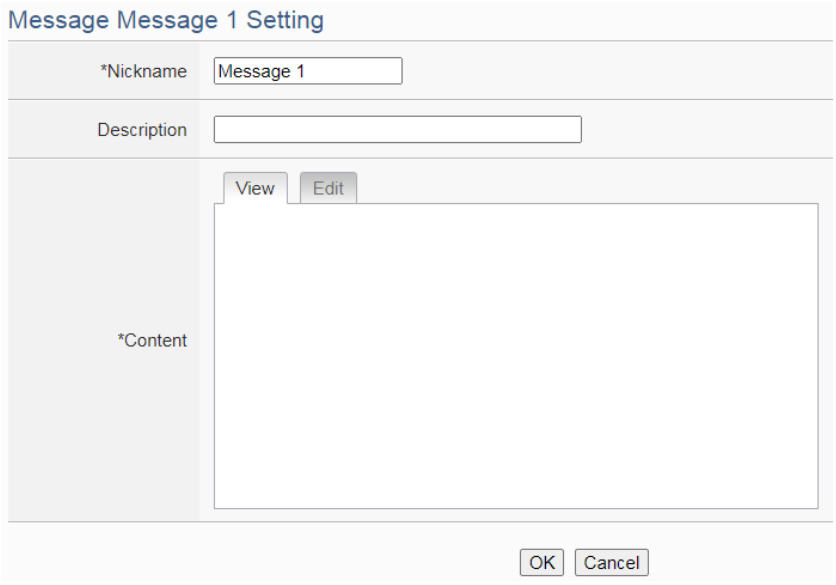


Figure 8-37：IoTstar Bot Service Message Setting page (2)

ii Input name in the “Name” field and you could also input the description of this LINE message in the “Description” field.

iii Enter the message content in the “Content” field. WISE provides an “Real-time variable editor” to add current I/O channel data or Internal Register data into the messages.

iv After complete all settings, click the “OK” button to confirm the message setting, and return to the Message Setting page.

v Repeat steps i ~ iv to complete settings of all messages for IoTstar Bot Service.

vi After you finish all the Message settings, click “Save” button to save the settings.

8.10 IoTstar Alarm Setting

When users configure WISE to connect to the IoTstar server, alarm messages can be sent to IoTstar to alert the control center in specific situations. The alarms can include a severity level, helping administrators prioritize which alerts require immediate attention. Each alarm can independently display five different statuses: **Critical**, **Severe**, **Moderate**, **Minor**, and **No Impact**. Users can adjust the urgency of the alarm by sending corresponding statuses and messages. The configuration page is shown as below:

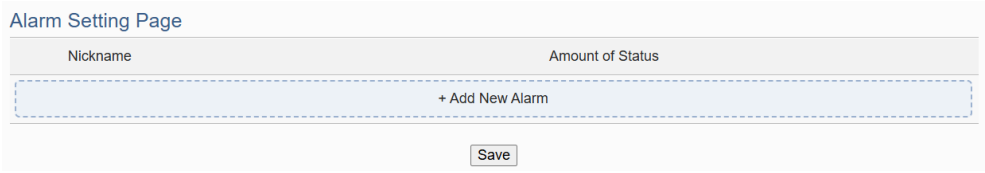


Figure 8-38：IoTstar Alarm Setting page (1)

Follow the steps below:

i Click “Add New Alarm” to open the alarm settings page, as shown below:

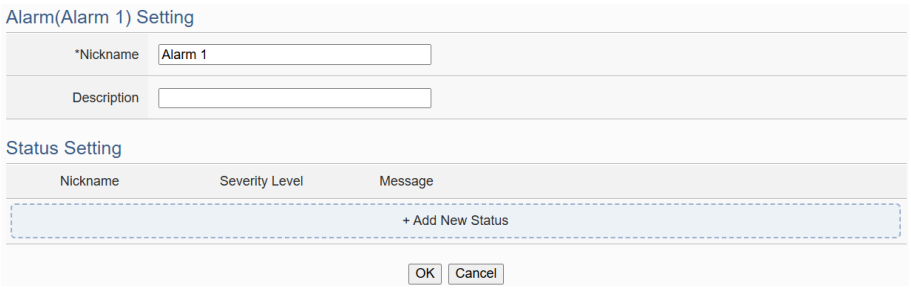


Figure 8-39：IoTstar Alarm Setting page (2)

ii Input the name in the “Nickname” field and you could also input the description of this alarm in the “Description” field.

iii Click “Add New Status” to open the Status setting page for the alarm. You can add a status and the desired alarm message, as shown below:

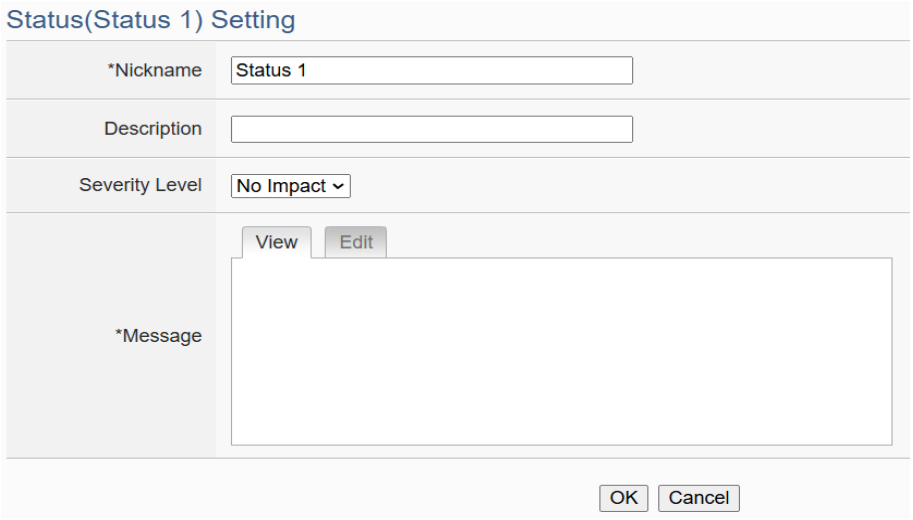


Figure 8-40：IoTstar Alarm Setting page (3)

iv Input the name in the “Nickname” field and you could also input the description of this status in the “Description” field.

v In the “Severity Level” field, set the severity level represented by this status.

vi Enter the message content in the “Message” field. WISE provides an “Real-time variable editor” to add current I/O channel data or Internal Register data into the messages.

vii After complete all settings, click the “OK” button to confirm the status setting, and return to the Alarm Setting page.

viii Repeat steps iii ~ vii to complete settings of all statuses for the alarm.

ix Repeat steps i ~ viii to complete settings of all alarms.

x After you finish all the Alarm settings, click “Save” button to save the settings.

9 Advanced Setting

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

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

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

9.1 Internal Register Setting

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

- String
- 16-bits Signed Integer
- 16-bits Unsigned Integer
- 32-bits Signed Long
- 32-bits Unsigned Long
- 32-bits Floating Point
- 64-bit Signed Long

- 64-bit Unsigned Long
- 64-bit Double

The data on the registers or each bit of the data can be read and evaluated in IF Condition, and be written or calculated after performing a THEN/ELSE Action. The data can also be read/written on the Registers via Modbus command. Each Internal Register features the "Retain Variable" mechanism, and the value stored in it will not be reset to zero due to program interruption or controller power failure. Please Note: If the Internal Register is set to String format type, the "Retain Variable" mechanism will be disable.

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

- Plus "+"
- Minus "-"
- Times "*"
- Divide "/"
- Superscript "^"
- Left parenthesis "(" and Right parenthesis ")"

Users can edit different formula in each Internal Register. WISE will calculate the results of all formulas repeatedly, and save the results into the corresponding Internal Registers for IF-THEN-ELSE rule checking or data logging.

The settings are as following steps:

i Select the No of the Internal Register from the dropdown list and input "Name". If the nickname of the register is not inputted, the name will be automatically set as "Internal Register#" (#is the number of the register).

ii In the "Type" field, select the data type of the Internal Register. There are nine options: "String", "16-bits Signed Integer", "16-bits Unsigned Integer", "32-bits Signed Long", "32-bits Unsigned Long" and "32-bits Floating Point", "64-bits Signed Long", "64-bits Unsigned Long". The default data type is "32-bits Floating Point".

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. (If the data type is Numeric, the default setting is 0, and if the data type is String, the default setting is Null.)

iv Repeat steps i~iii to complete settings of all Internal Register.

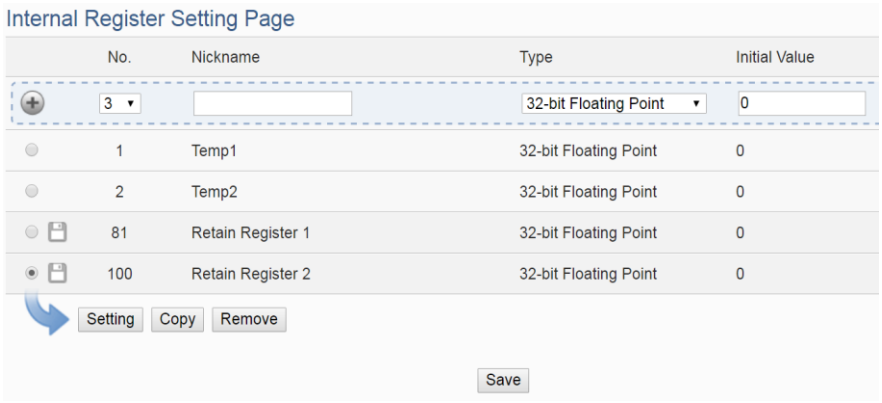


Figure 9-1：Internal Register List Page

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” and “Retain Variable” of Internal Register in the Internal Register Setting page, and input the description of this Internal Register in the “Description” field. If users want to use the bit value of the Internal Register in the IF condition setting, then please click on the rectangle at the right-side of “Bit Nickname” field to set up the nickname for each bit of the Internal Register.

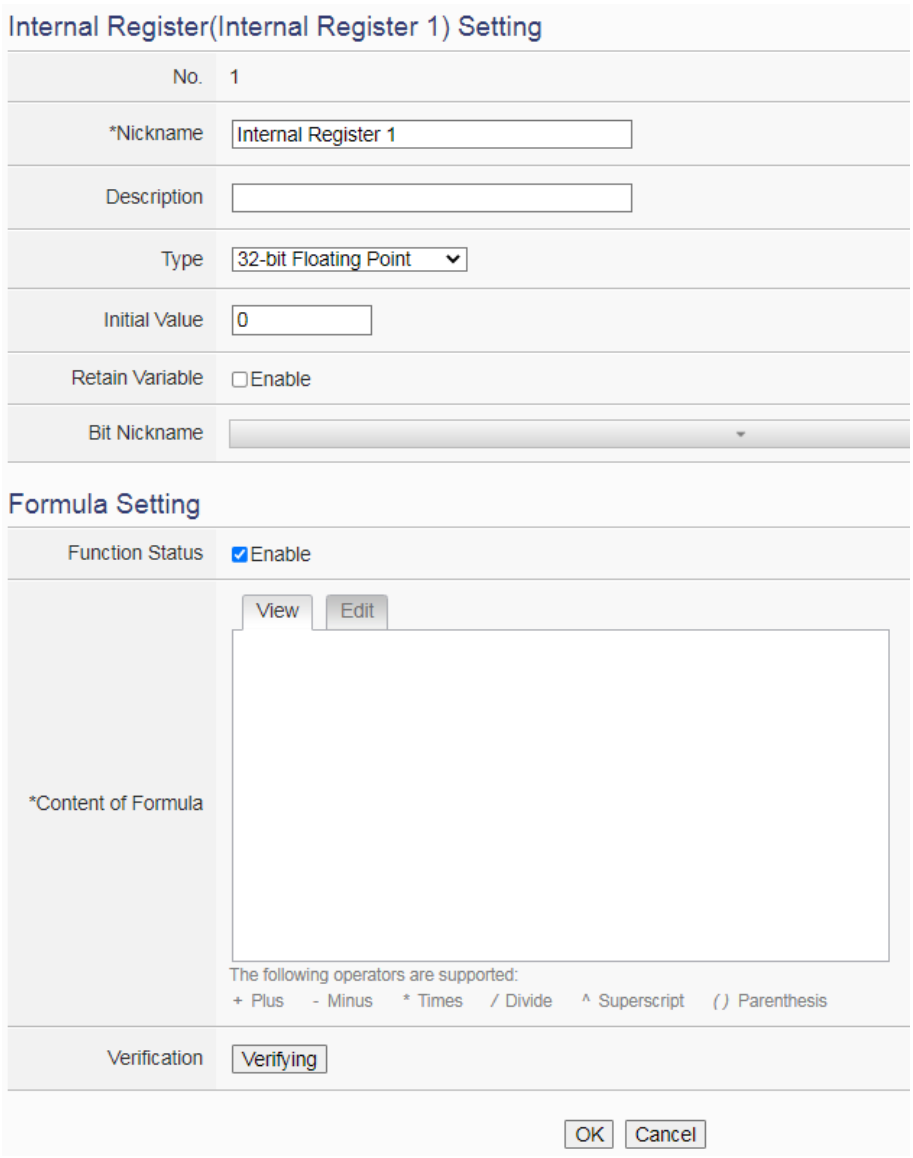
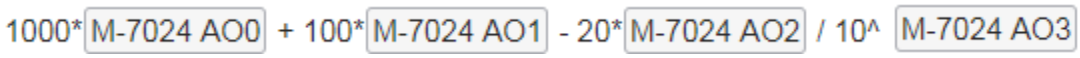


Figure 9-2：Internal Register Setting page

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

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

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



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

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

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

viii Click on "OK" to confirm the setting and return to the Internal Register list page.

ix After return to Internal Register list page, if user want to copy the settings of a pre-set Internal Register to the new Internal Register, please click the radio button in front of the pre-set Internal Register and then click "Copy", a new Internal Register (in sequence) will be added to the list and the settings of the old Internal Register will be copied to this newly added Internal Register.

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

xi After all Internal Register settings are completed, click "Save" button to save the changes.

9.2 Timer Setting

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

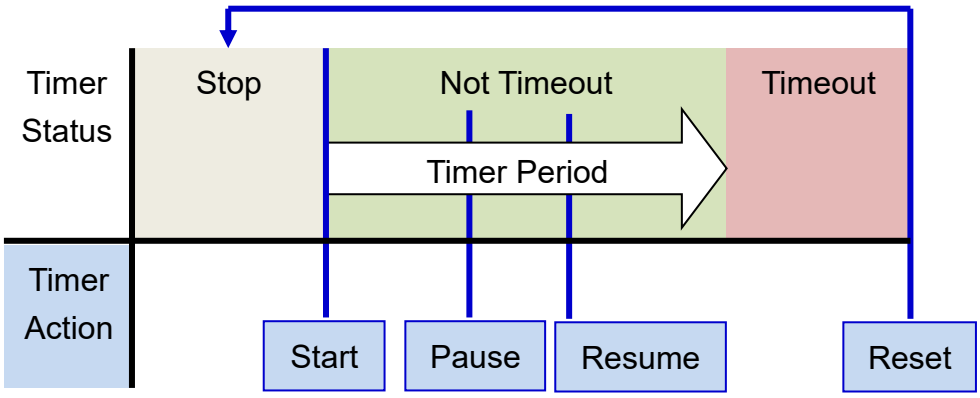


Figure 9-3：Timer Status and Actions

Follow the following steps：

i Input the nickname of the timer in the “Nickname” field.

ii Specify the initial status of the timer from the dropdown list of the “Initial Status” field. The “Initial Status” could be “Stop” or “Start” status.

iii Specify the period interval in units of seconds. There are two options to setup the period interval:

- Assign Period: Input the period interval in units of seconds manually.

- 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.

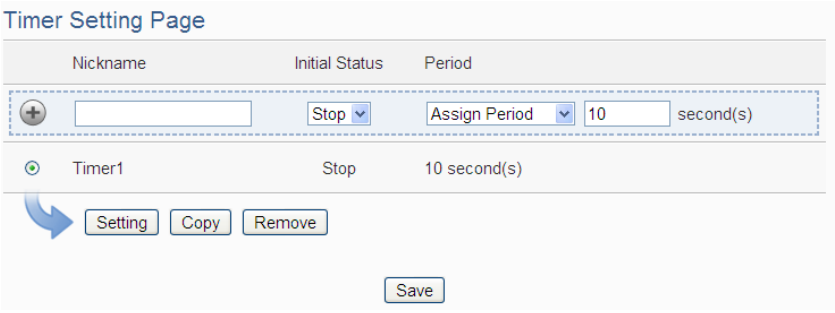


Figure 9-4：Timer List Page

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:

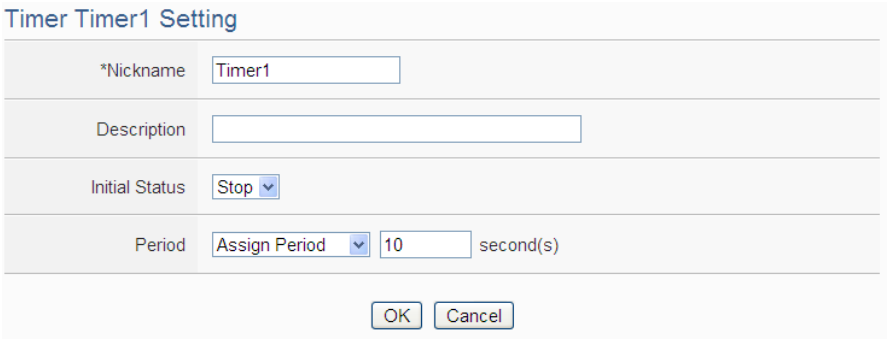


Figure 9-5：Timer Setting page (by assign value)

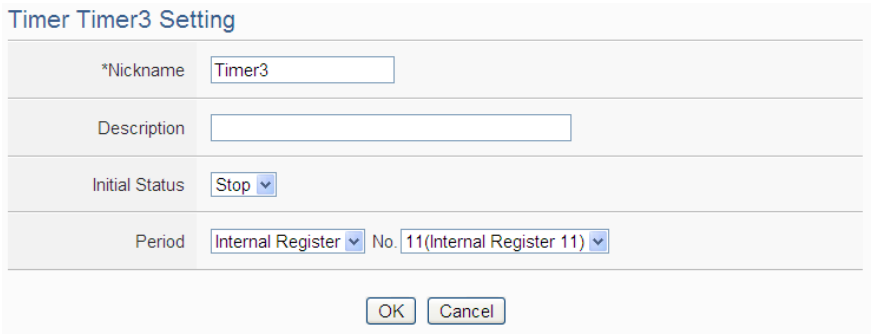


Figure 9-6：Timer Setting page (by Internal Register)

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

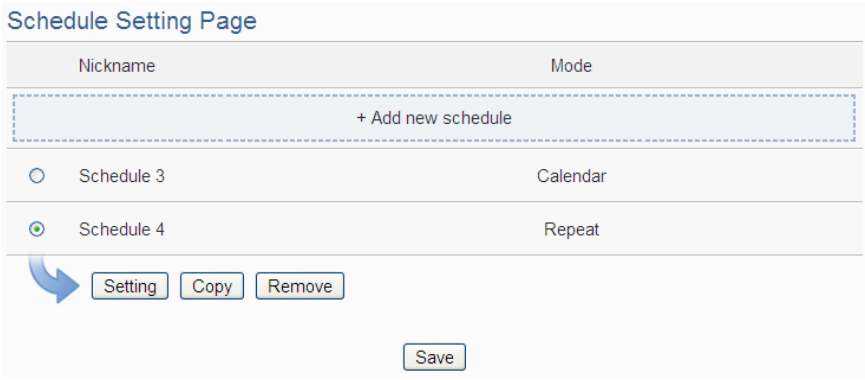


Figure 9-7：Schedule List Page

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:

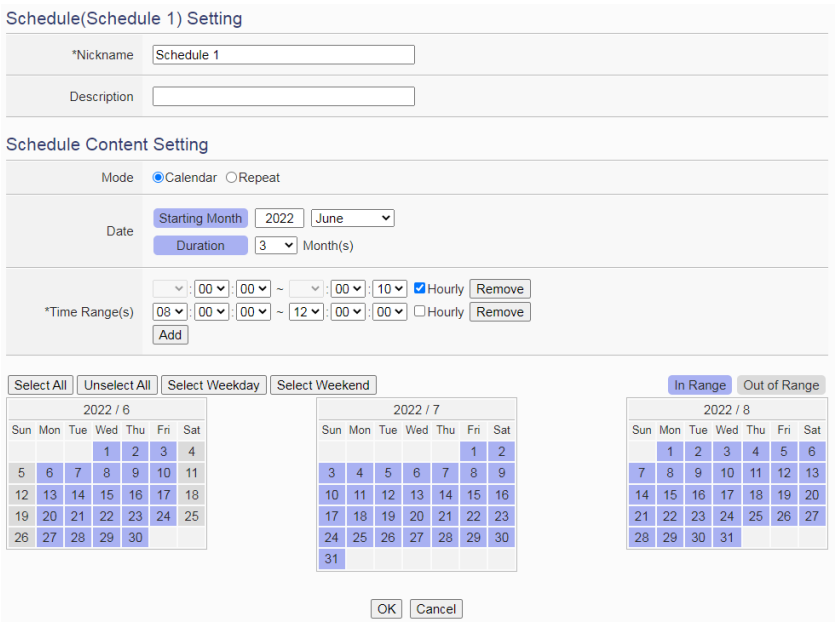


Figure 9-8：Calendar mode of Schedule setting

(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. User can also enable the “Hourly” option for the “Time Range” seting to launch the schedule with the set date. 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 purple 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 “Select 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 “Select 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:

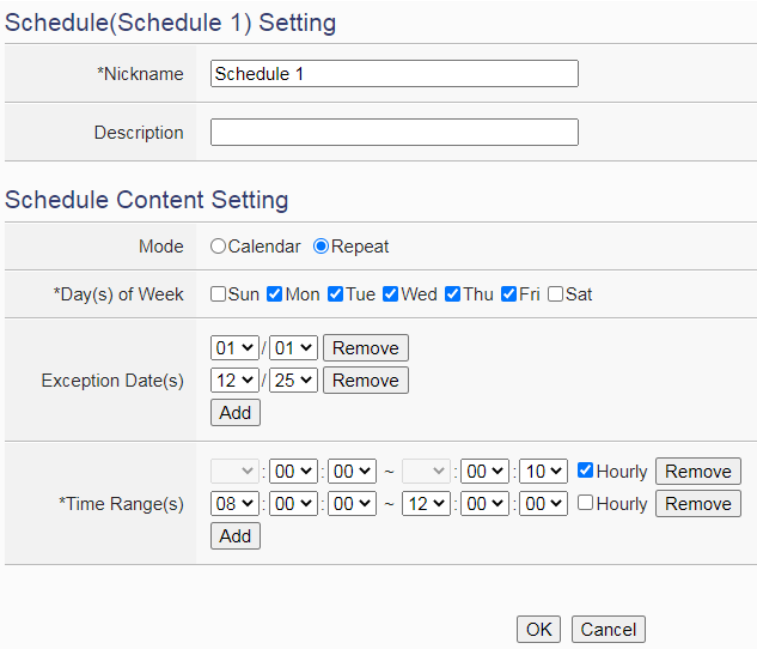


Figure 9-9：Repeat mode of Schedule setting

(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. User can also enable the “Hourly” option for the “Time Range” seting to launch the schedule with the set date. Each Schedule is required to set at least one Time Range; click on “Add” to add more Time Range. Please note: the time zones you specified can’t be overlapped. If you specify an end time that is earlier than the start time, such as 20:00:00 ~ 06:00:00, it indicates the end time will be set one day after the start date. Click “Remove” to remove a pre-set Time Range.

iv Click on “OK” to confirm the setting and leave the setting page.

v Repeat steps i~iv to complete settings of all Schedules.

vi To modify the settings of a pre-set Schedule, please click on the radio button in front of the Schedule, and then click on “Setting” to modify the settings.

vii To copy the settings of a pre-set Schedule to the new Schedule, please click the radio button in front of the pre-set Schedule and then click “Copy”, a new Schedule (in sequence) will be added to the list and the settings of the old Schedule will be copied to this newly added Schedule.

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

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

9.4 Email Setting

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

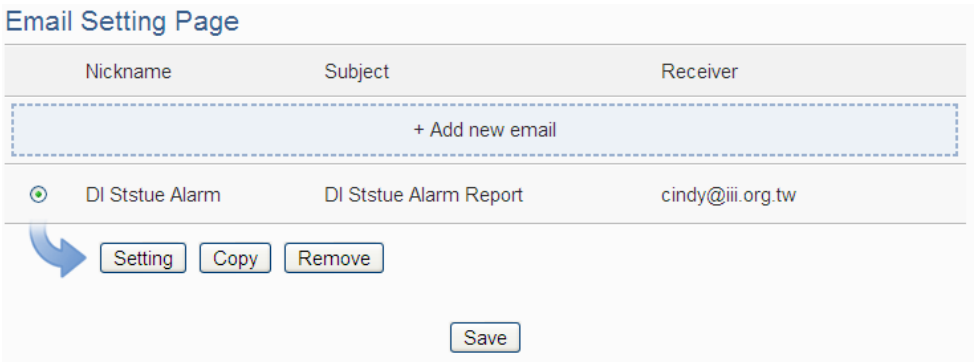


Figure 9-10：Email List Page

The settings steps are as below:

i Click on “Add new email” to add a new email setting.

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

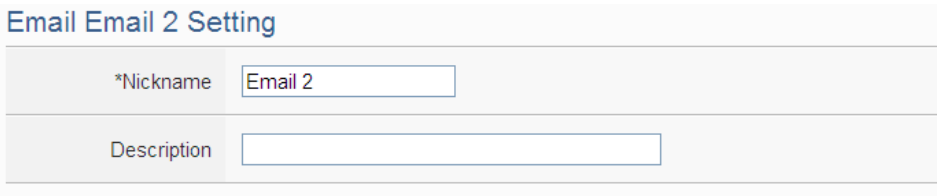


Figure 9-11：Email setting page (Name & Description)

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

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

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

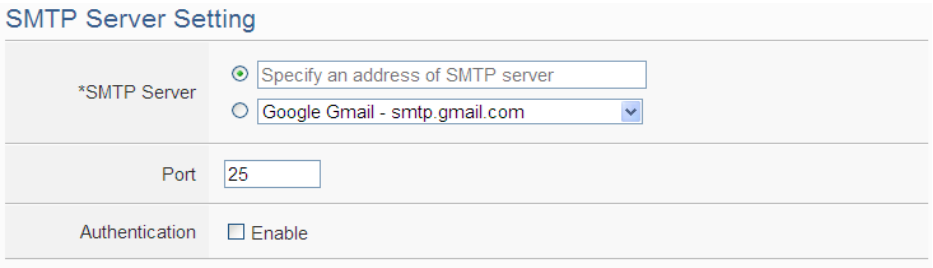


Figure 9-12：Email setting page (SMTP Server)

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” or “TLS/SSL” from the dropdown list.

ix After complete SMTP server setting, continue to input Email address setting. In the “Sender Name” field, input the name of the sender.

x Enter the sender's email address in the "Sender Email Address" field.

xi In the "Receiver Email Address" section, click on "Add" to add the receiver's email address. At least one email address has to be entered. The number of the receiver's email addresses is unlimited.

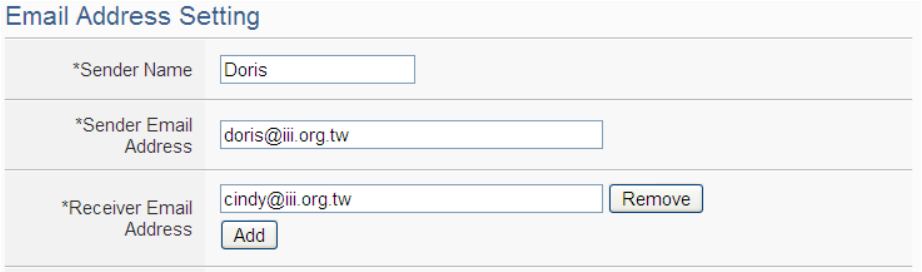


Figure 9-13：Email setting page (Email Address)

xii 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:

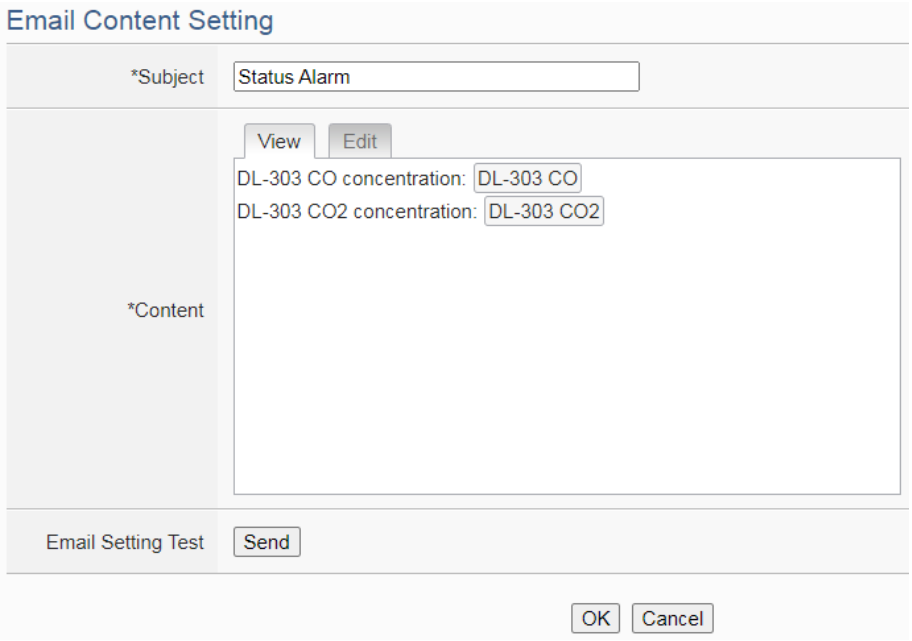


Figure 9-14：Email setting page (Email Content)

xiii 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".

xiv To verify whether your email setting is correct to send the Email, click

"Send" in the "Email Setting Test" section, then WISE will send a test Email to the receivers' email addresses.

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-2841M-4GE/4GC/5GE/5GC offer SMS Alarm message sending and SMS Command receiving functions. For SMS Alarm function; it allows to send pre-set SMS alarm message to specific phone numbers. For SMS command function; it allows to set up authorized phone numbers to receive SMS commands. WISE will execute the commands received from authorized phone numbers only. There are 2 types of SMS commands:

- **Retrieve channel data (GET):** The user can retrieve specific channel real-time data. The user could add the encoded string to the message to retrieve the related channel data.
- **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 Phone Number Group Setting

If users want to send a SMS alarm to many cell phone numbers, they can group the cell phone numbers before setting SMS Alarm. It would be easier to set SMS Alarm and modify SMS receivers with the Phone Number Group function. The Phone Number Group Setting page is shown as below:

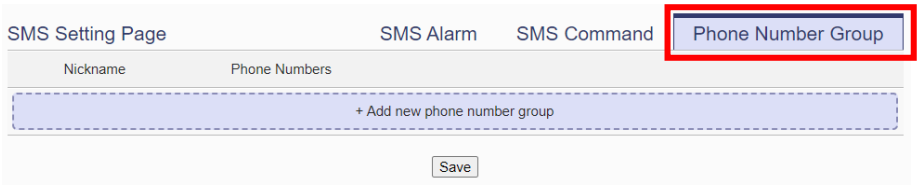


Figure 9-15：Phone Number Group setting page (1)

Please follow the steps below:

i Make sure the “Phone Number Group” Tab is selected.

ii Click “Add new phone number group”, the Phone Number Group Setting page will appear as follow:

Figure 9-16：Phone Number Group setting page (2)

iii Input name in the “Name” field and you could also input the description of this phone number group in the “Description” field.

iv In the “Phone Number” section, click on “Add” to input the phone numbers to receive the SMS Alarm messages. Keep on clicking “Add” to add all phone numbers to receive the Alarm message, click “Remove” to remove the phone numbers you want to delete. The number of the phone numbers in a group is unlimited.

v Click on “OK” to confirm the setting and leave the setting page.

vi Repeat steps ii~v to complete settings of all phone number group setting.

vii After you finish all the Phone Number Group selections and settings, click “Save” button to save the settings.

9.5.2 SMS Alarm Setting

The SMS Alarm Setting page is shown as below:

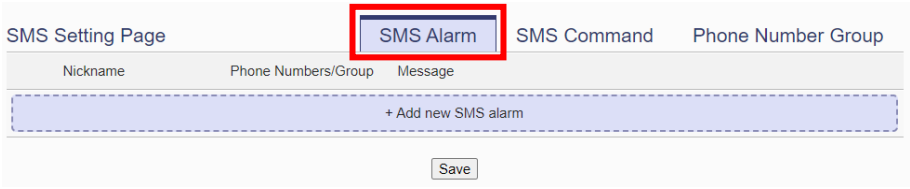


Figure 9-17：SMS Alarm setting page (1)

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:

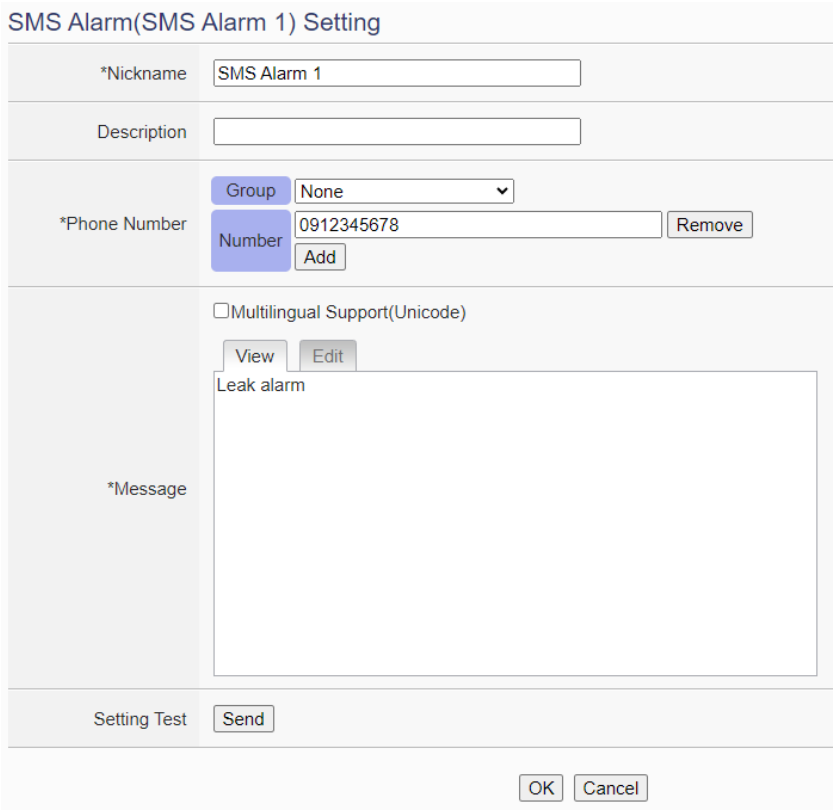


Figure 9-18：SMS Alarm setting page (2)

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, select a preset phone number group, or click on "Add" to input the phone numbers to receive the SMS Alarm messages. The SMS can be sent to multiple receivers. Keep on clicking "Add" to add all phone numbers to receive the Alarm message, click "Remove" to remove the phone numbers you want to delete. The number of the SMS alarm receivers is unlimited.

v Enter the content in the “Message” field. If content includes characters other than English, it must be checked for “Multilingual Support(Unicode)”. 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 To verify whether your SMS Alarm setting is correct to send the SMS message, click “Send” in the “Setting Test” section, then WISE will send a test SMS to the phone numbers.

vii Click on “OK” to confirm the setting and leave the setting page.

viii Repeat steps ii~vii to complete settings of all SMS Alarm setting.

ix 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.

x 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.

xi To remove a pre-set SMS Alarm, please click the radio button in front of the pre-set SMS Alarm and then click “Remove”.

xii After you finish all the SMS Alarm selections and settings, click “Save” button to save the settings.

9.5.3 SMS Command Setting

The SMS Command Setting page is shown as below:

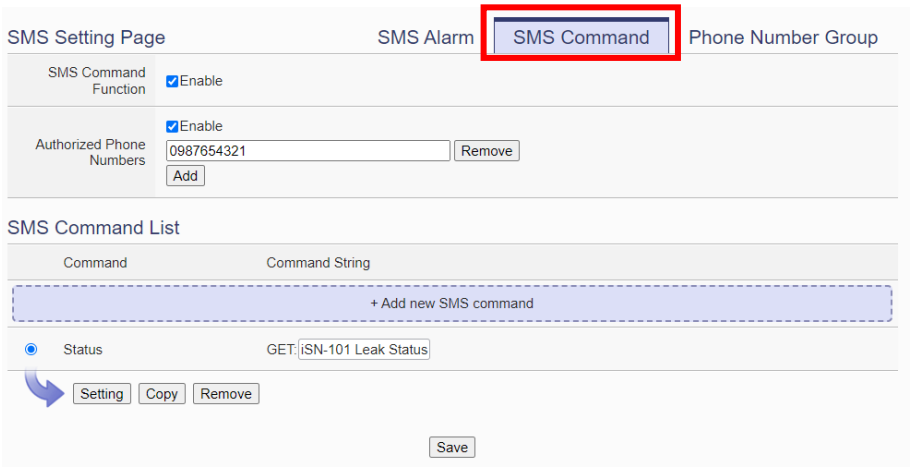


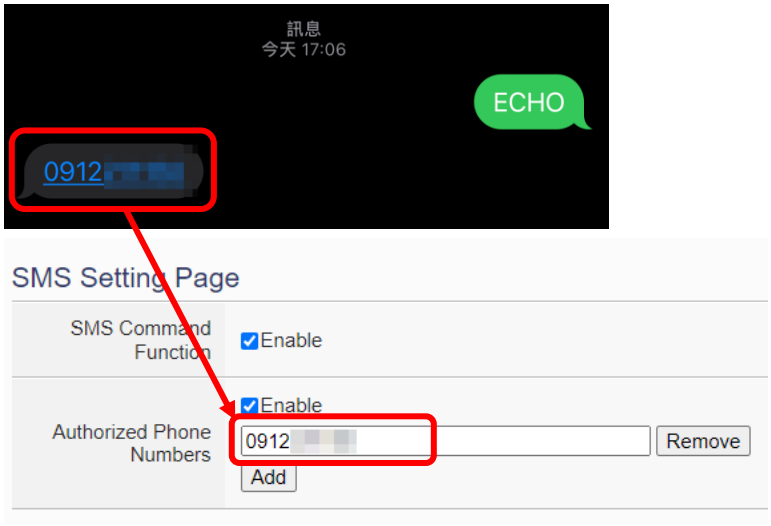
Figure 9-19：SMS command setting page

Please follow the steps below:

i Make sure the “SMS Command” Tab is selected.

ii In the “SMS Command Function” section, click on “Enable” to enable SMS Command function. The SMS Command list will be displayed. If “Disable” is selected, the SMS Command list will be disabled.

iii In the “Authorized Phone Number” field, click on “Enable” to set the phone numbers you would like to authorize to send SMS commands to WISE-2841M-4GE/4GC/5GE/5GC. If this field is not enabled, this WISE controller would receive SMS commands from any cell phone. Click on “Enable” and keep on clicking “Add” to add all phone numbers to send the SMS commands to WISE, click “Remove” to remove the phone numbers you want to delete. Please note: the Authorized Phone Number has to be input in the normal format. For example, if the Authorized Phone Number is a cell phone number 0987654321 in Taiwan area, Just input the Authorized Phone Number as “0987654321”. If you cannot send the command to WISE successfully, you can use the cellular phone to send the SMS command “ECHO” to the WISE module. When WISE receives the command, it will reply a SMS message to the cellular phone you use. The SMS message will include the phone number that WISE received. After getting the information, you can enter the exact phone number of the SMS message sender in the 'Authorized Phone Number' field of the WISE module.



iv Click “Add new SMS command”, the SMS Command Setting page will appear.

v Input a command string in the “Command” field as the nickname for the original corresponding command in the “Command String Editor” section. In the “Command String Editor” section, select the command type to be “GET” (retrieve real-time channel data) or “SET” (modify channel data) from the dropdown list. For “GET” command (shown as Figure 9-20); 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 9-21), 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 9-21 as an example, you can leave the “Value “field blank and input the SMS Command AO/2.3 to modify the AI channel value to be 2.3.

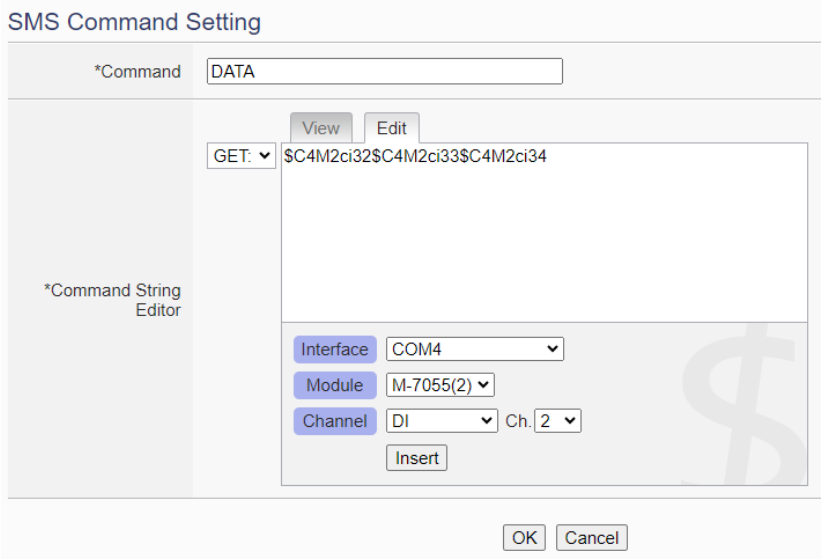


Figure 9-20：SMS command setting for GET command

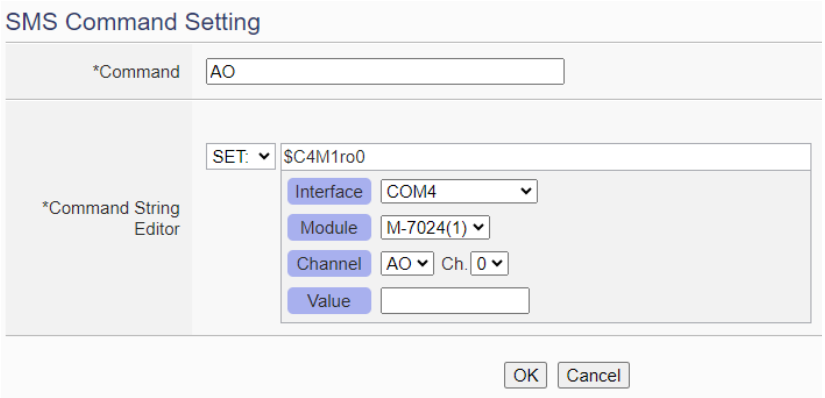


Figure 9-21：SMS command setting for SET command

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.

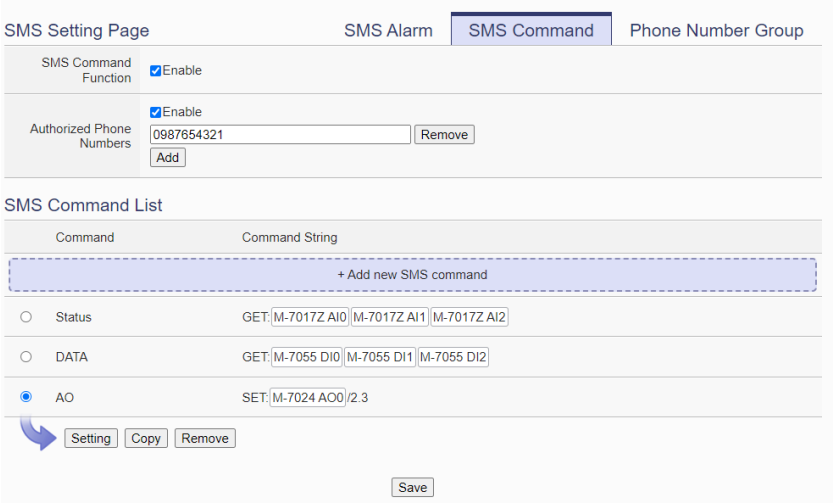


Figure 9-22：SMS command list

On Figure 9-22, taking the second SMS Command on the list as an example, when user send SMS message “DATA” to WISE, WISE will send back the data of DI0, DI1, & DI2 of the M-7055 to the command sender.

Taking the third SMS Command on the list as an example, when user send SMS message “AO” to WISE, WISE will set the value of 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 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:

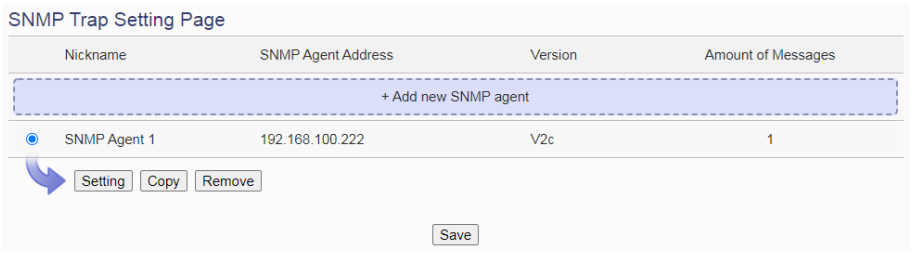


Figure 9-23：SNMP Trap List Page

The settings steps are as below:

i Click “Add new SNMP agent” to add a new SNMP Agent.

ii After click “Add new SNMP Agent”, the setting page of this SNMP Agent will be shown. Enter the informatoin for the “Nickname” and “SNMP Agent Address” fields.

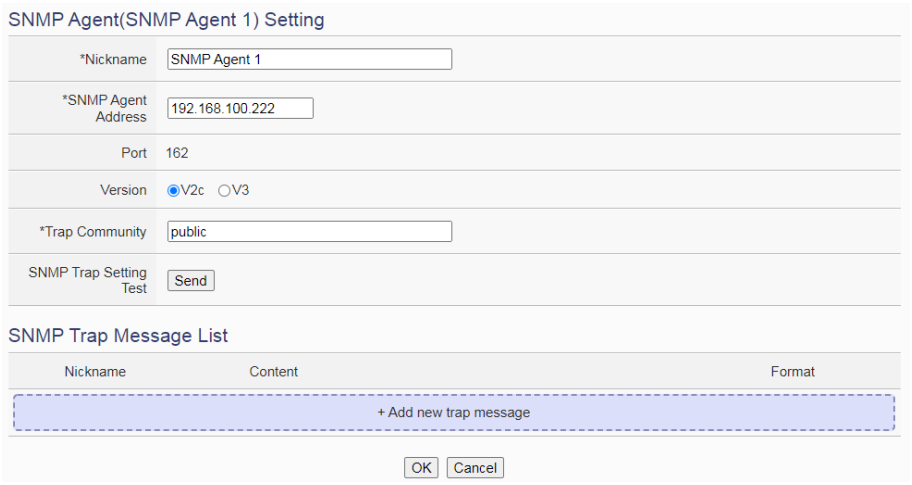


Figure 9-24：SNMP Agent Setting Page of V2c version

iii Select the version used by this SNMP Agent in the “Version” field. Different versions will require different information to be entered. V2c needs to enter the information for “Trap Community” field. For V3, user need to enter the information for “Username” field and select the “Security Level”, and then set up the information for “Authentication Protocol”, “Authentication Password”, “Encryption Protocol” and

"Encryption Password" according to the selected security level.

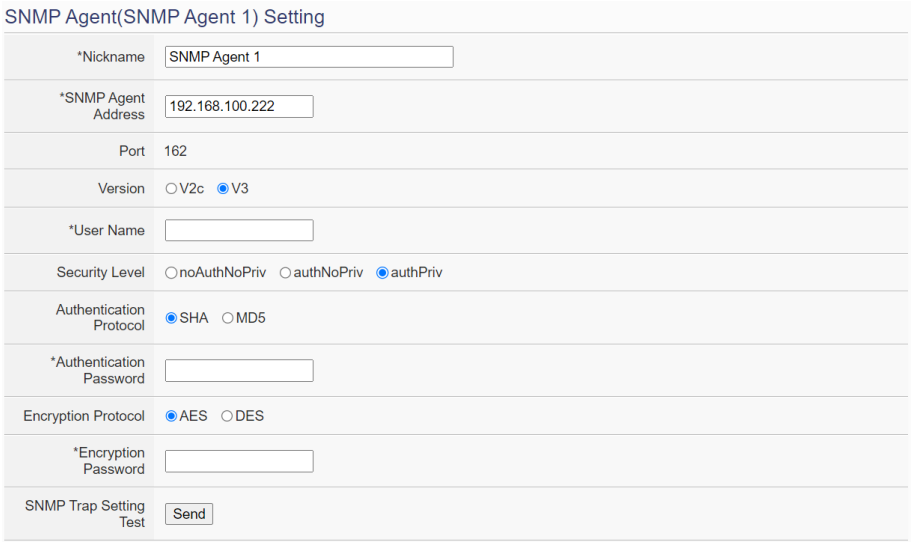


Figure 9-25：SNMP Agent Setting Page of V3 version

iv Click the "Send" button in "SNMP Trap Setting Test" field to immediately send a test SNMP Trap to the SNMP Agent address user enter to check whether the SNMP Trap setting is correct, or not.

v Click "+ Add new trap message" to add the new SNMP trap message for the SNMP Agent.

vi After click "+ Add new trap message", the "SNMP Trap Message" setting page will be shown. Please assign the Nickname for the SNMP Trap message, then select the type of the "SNMP Trap Message". WISE provides two options of "SNMP Trap Message" as "Channel data" and "User-Defined Data" for users to easily edit the content of SNMP Trap message, the setting page is as follows.

■ Channel Data type

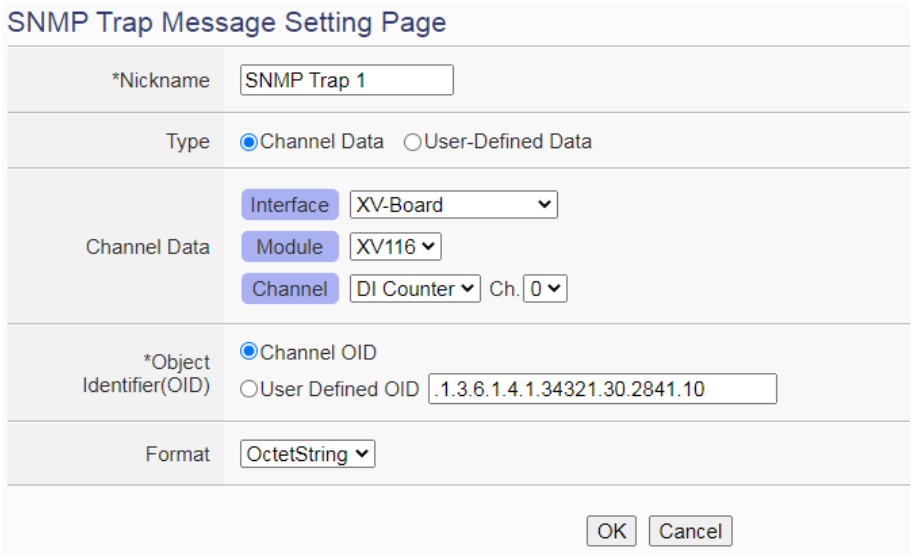


Figure 9-26：SNMP Trap "Channel Data" type Setting Page

Select the “Interface”, “Module”, “Channel”, “Object Identifier (OID)” and “Format” from the dropdown list, then click “OK” button, and the system will add the code string of the I/O channel to the content of the “SNMP Trap Message”, and store the actual value in the “SNMP Trap Message” of the SNMP Agent according to the data format set up by user. Following is an example that the SNMP Agent contains three “SNMP Trap messages”, the first “SNMP Trap message” represents the counter value of the DI counter channel 0 of the XV116 module connected to the XV-Board interface, and the second “SNMP Trap message” represents the AI0 value of the M-7019R connected to COM4, and the third “SNMP Trap message” represents the value of the iSN-101 Leak module connected to COM4.

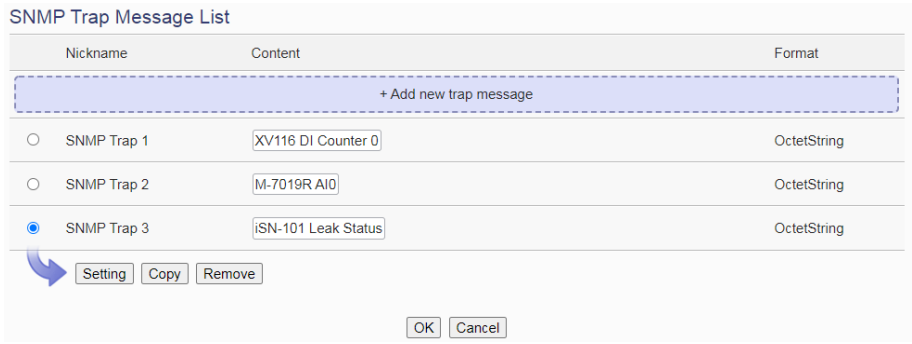


Figure 9-27：List of "SNMP Trap Messages" edited by "Channel Data" type

■ User-Defined Data type

In addition to the “Channel Data” type, user can also select the “User-Defined Data” type to edit the content of the SNMP Trap message. Following is the setting page of the “User-Defined Data” type:

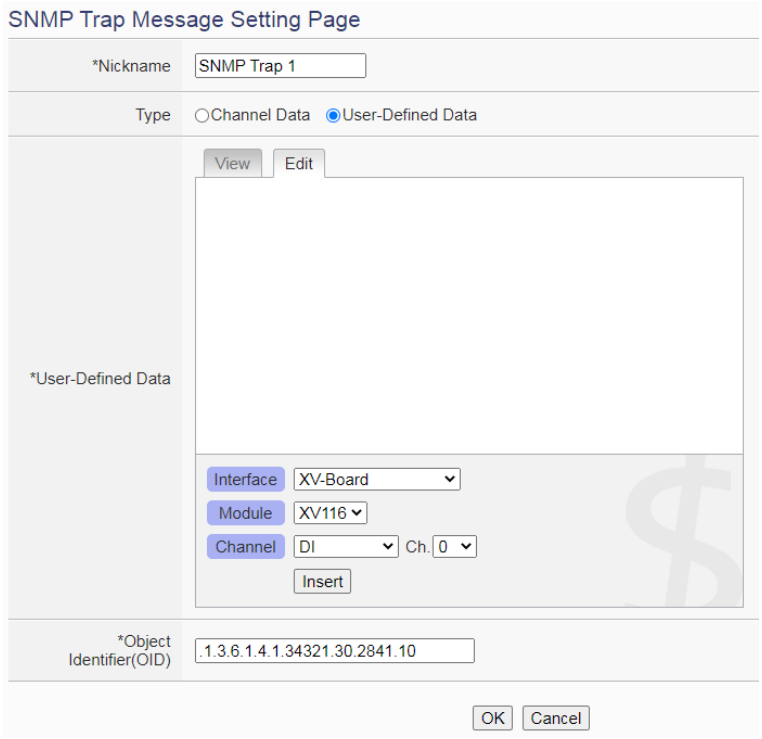


Figure 9-28：SNMP Trap "User-Defined Data" type Setting Page

In the “User-Defined Data” type settings page, the user can enter the words (or sentence) he want to present in the message and edit the data format and message content by himself. The “User-Defined Data” field provides users with a special code string to add real-time I/O module channel data into the “User-Defined Data” text. User can click the “Edit” tab or directly click the “User-Defined Data” text area, and the “Real-time Variable Editor” will appear as below.

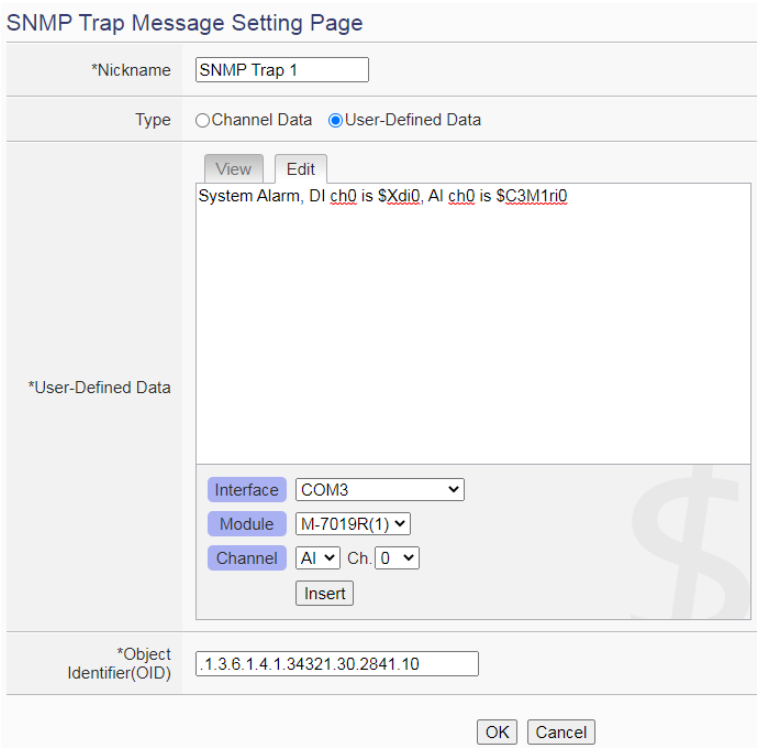


Figure 9-29："User-Defined Data" Interface in Edit Mode

User can input 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 message. 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 I/O channel for user to check the settings in an easy way. The figure above shows an example of the encoded strings, the variable $Xdi0 indicates the DI0 data of XV116, the variable $C3M1ri0 indicates the AI0 data of M-7019R on the module 1 that is connected to COM3. When users select the “View” tab, the I/O channel value encoded string will be displayed as below for user to check if the setting is appropriate, or not.

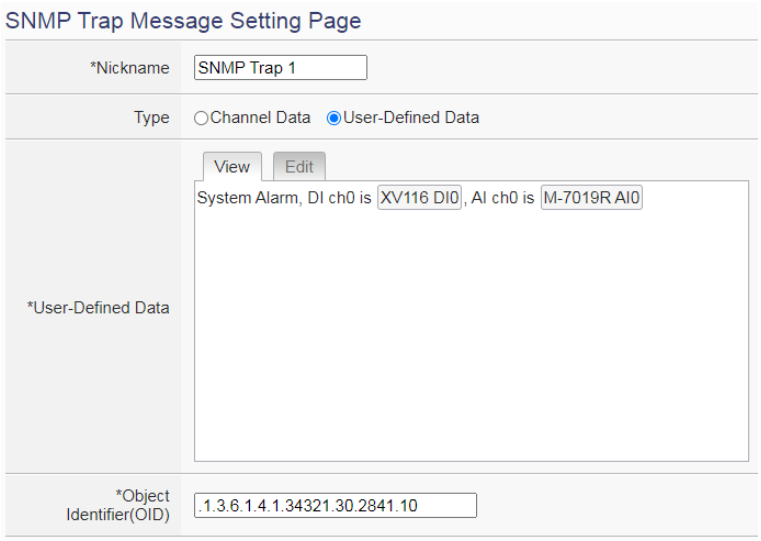


Figure 9-30："User-Defined Data" Interface in View Mode

vii After complete all settings, click the "OK" button to confirm the "SNMP Trap Message" setting and return to the SNMP Agent setting page.

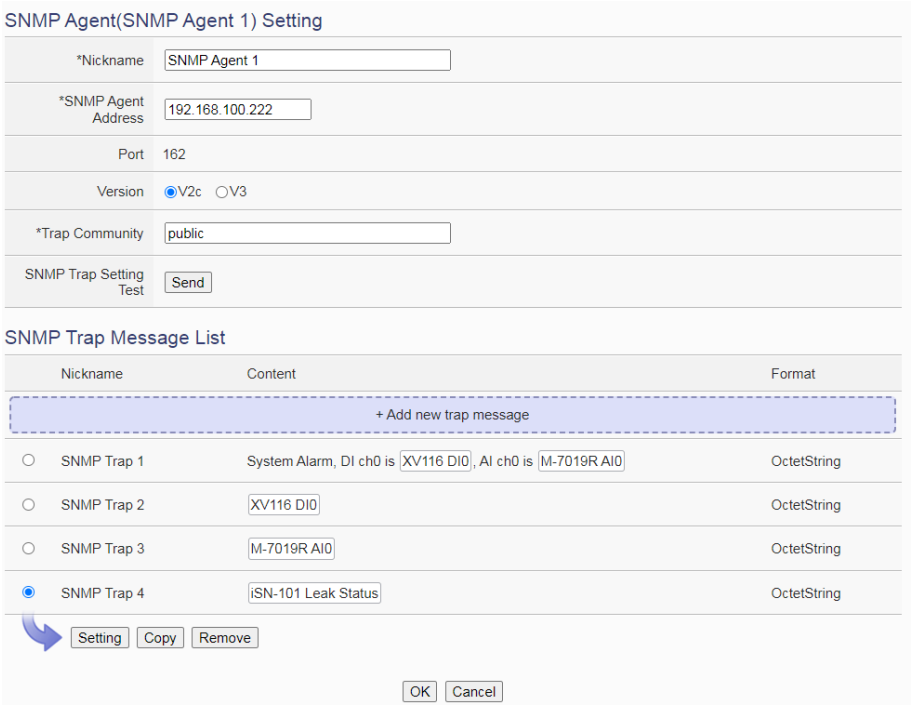


Figure 9-31：SNMP Agent Setting Page(with SNMP Trap Message)

viii Repeat steps v~vii to complete the setting of each SNMP Trap message.

ix After complete all settings, please click "OK" button to save the content of the "SNMP Trap Message" and return to the SNMP Trap list

page.

x Repeat steps i~ix to complete the setting of each SNMP Trap.

xi After complete all SNMP Trap settings, please click “OK” button to save the setting for all SNMP Trap.

9.7 CGI Command Setting

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

After the user completing the settings of a CGI Server, WISE will automatically create a mapping folder under the CGI directory in the microSD card. The new folder will use the nickname of the CGI Server as the folder name, however, if the CGI Server's nickname is not in English format or numbers; the new folder will use the IP address of the CGI Server as the folder name. After the CGI command receiving function is enabled and requires the response of CGI Server to be saved; the response from the CGI Server will be saved as files in its mapping CGI Server folder. The files inside the folder will be classified automatically by date. User can also enable the file transfer operation, then the WISE will send back all files inside the folder to the remote FTP Server. The configuration page for CGI command sending and CGI command receiving setting is shown as below.

9.7.1 The setting of CGI command sending

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

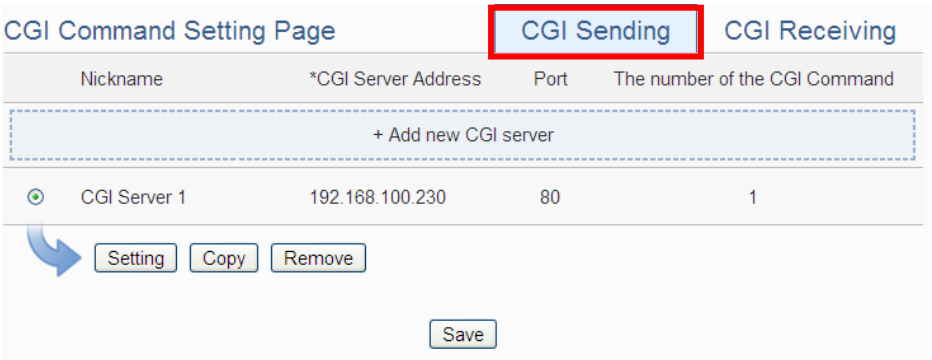


Figure 9-32：CGI Command Server List Page

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:

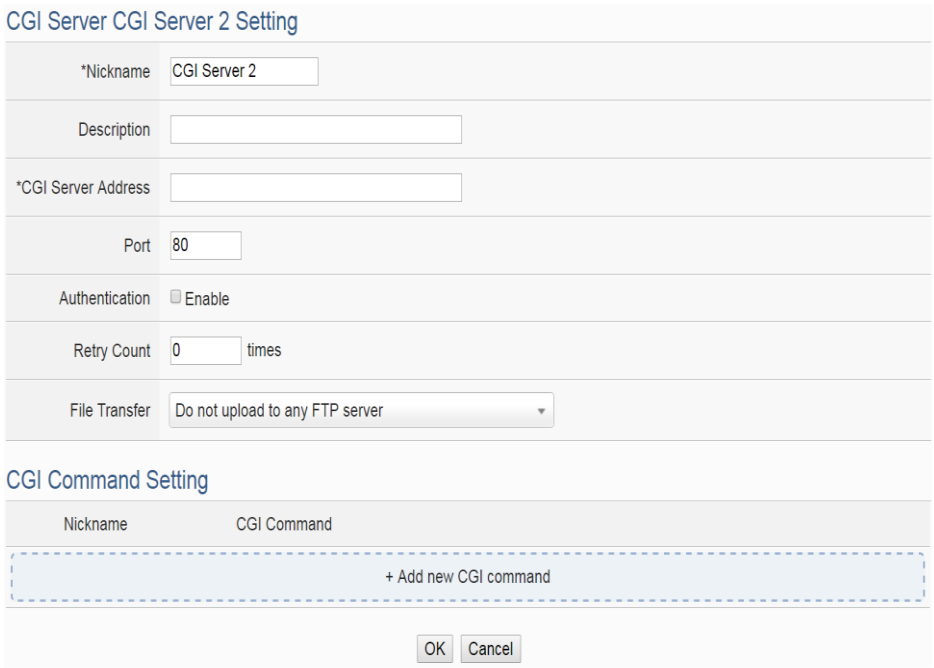


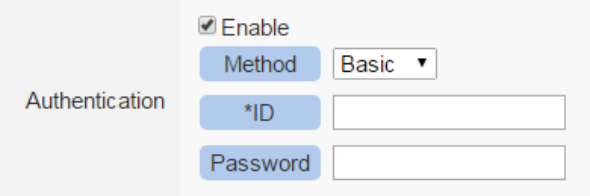
Figure 9-33：CGI Command Server Setting page

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

xi In the “FTP Transfer” field, please specify the FTP Servers to receive the CGI Server files that sent by the WISE. The content on the “FTP Transfer” dropdown list will be the same as the content on the “FTP Server” dropdown list of Data Logger. Please refer to “7.5 FTP Server Setting” section for detailed settings.

xii After the setting of remote CGI Server, please continue the steps as below for the CGI Command setting. The setting page interface will be shown as below:

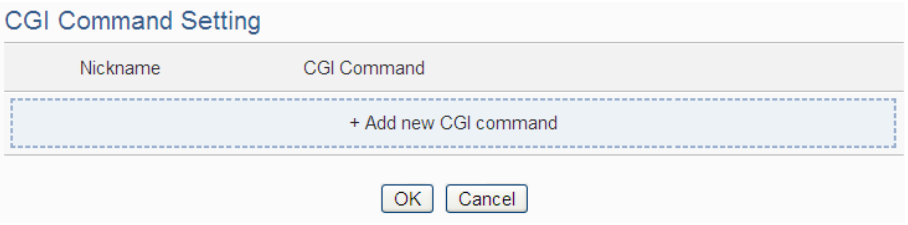


Figure 9-34：CGI Command List Page

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

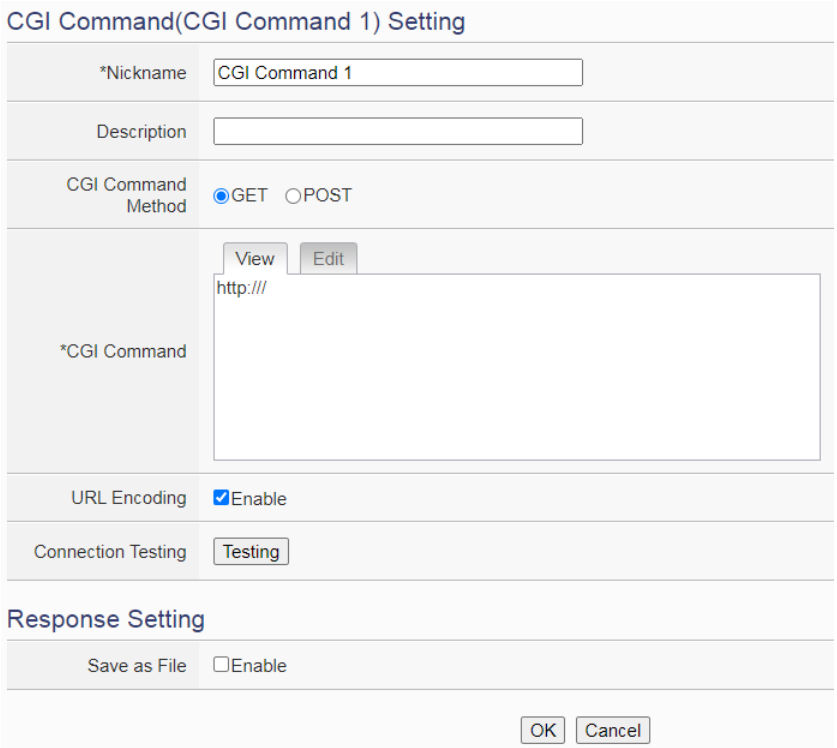


Figure 9-35：CGI Command (Sending) Setting page

xiv In the CGI Command Setting Page, you can input the name of the CGI Command in the "Nickname" field and you could also input the description of this CGI Command in the "Description" field.

xv Enter the content of the CGI Command in the "CGI Command" field. In addition, it provides encoded strings for users to add current I/O channel value or Internal Register value into the CGI Command content. To make it easy to add the encoded string, WISE provides "Real-time variable editor" for operation. Please refer to "7.2 User-Defined Data Logger" for more detailed information of the "Real-time variable editor".

xvi In the "URL encoding" field, if user want to use the URL encoding for the transmission of CGI commands, please click "Enable" to enable this function. Pleaes Note: For the CGI command sending to iKAN, please be sure to enable this function.

xvii To verify if the setting of the CGI Server and the CGI Command is correct or not, please click "Testing" in the "Connection Testing" field, then WISE will send the CGI Command the user entered to the remote CGI Server for testing.

xviii If the CGI Command send by WISE will trigger the CGI Server to send back a reply to WISE, users can select the "Enable" checkbox

in the “Save content into the file” filed to enable WISE to save the content of the reply of the CGI command into a file. The file can be sent as the attached file by the WISE Email function.

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

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

xxi 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.

xxii 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.

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

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

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

xxvi After you finish all the CGI Server settings, click “Save” button to save the settings.

9.7.2 The setting of CGI command receiving

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

Figure 9-36：CGI Command (Receiving) Setting page (1)

The settings steps are as below:

i Click the “CGI Receiving” Tab on the right-top corner of the CGI Command Setting page.

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

User creates two variables “DO” and “AO” in the variable adding process, the system will show the usage format of the CGI command as “http://192.168.100.102/dll/cgi.dll?DO=value&AO=value”. It means the remote network devices can send the CGI command to WISE (with IP address 192.168.100.102). After WISE receives the CGI command, it will immediately update the value of “DO” and “AO” variables in WISE kernel engine. If the “DO” or “AO” variables are used in the IF condition statements of WISE logic rules, WISE will also evaluate the result of the IF condition and trigger the related the THEN/ELSE actions.

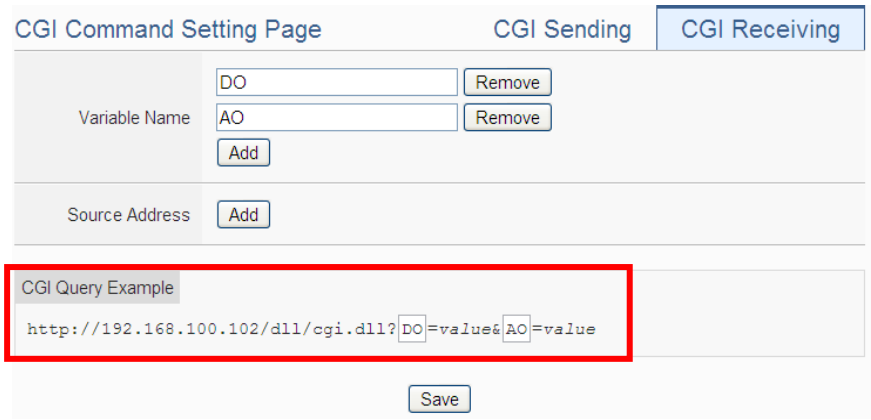


Figure 9-37：CGI Command (Receiving) Setting page (2)

Please Note: Because CGI Query Authentication Setting in the “Security Setting” page is necessary, you have to add the parameters (&id=“Username”&password=“Password”) into the CGI command.

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

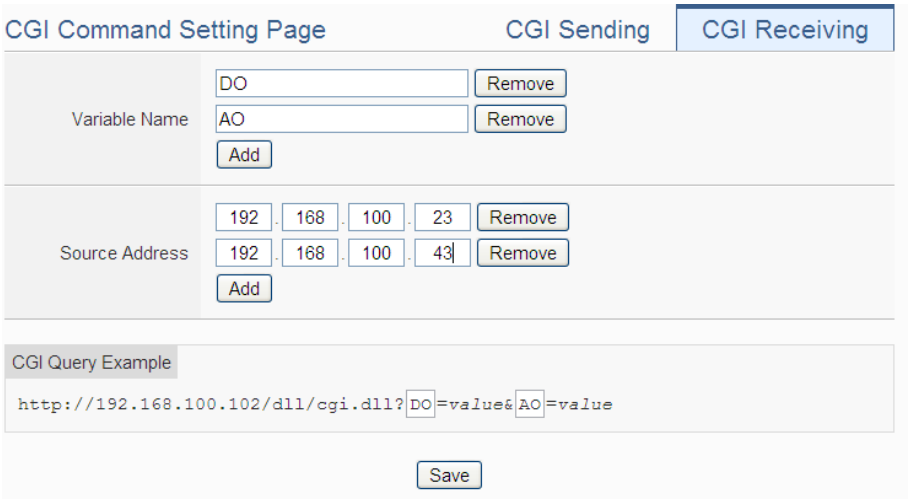
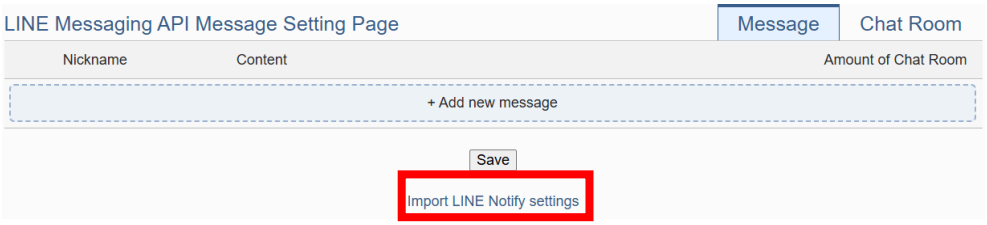


Figure 9-38：CGI Command (Receiving) Setting page (3)

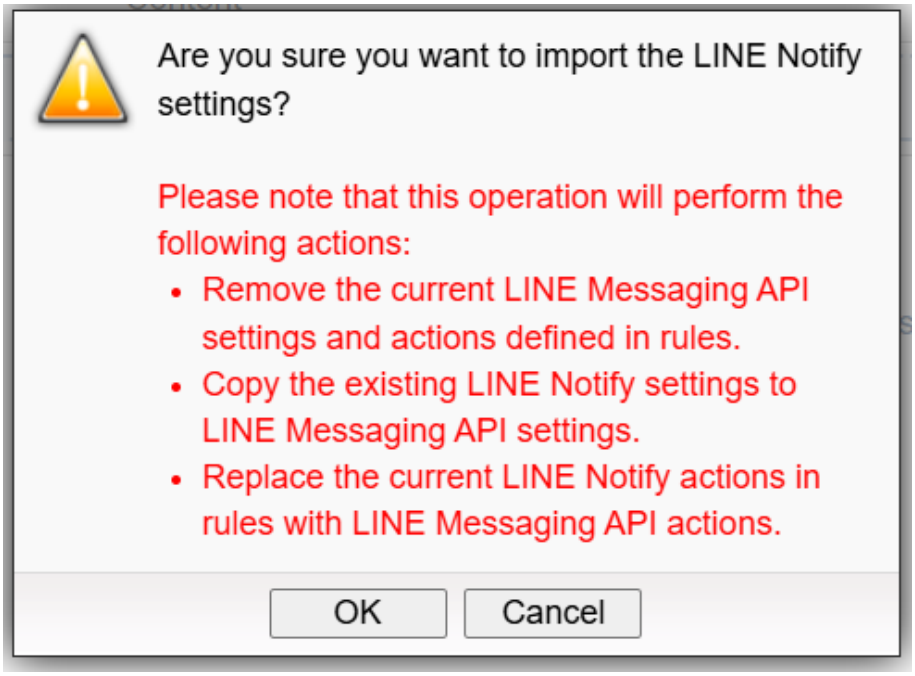
iv After you finish all the CGI command receiving settings, click “Save” button to save the settings.

9.8 LINE Messaging API Settings

WISE provides the function to push text messages via the LINE Messaging API to one-on-one or group chat rooms. Users must first register a LINE Business ID and create a LINE official account to use this function. Below are the message setting interface, chat room setting interface, and steps to create a LINE official account.



At the bottom of the LINE Messaging API message setting page, there is an option to “Import LINE Notify settings”. Clicking this will copy the LINE Notify messages and related settings to the LINE Messaging API settings, and logical rules will convert the action of sending LINE Notify messages into sending LINE Messaging API messages. However, due to the structural differences between LINE Messaging API chat rooms and LINE Notify chat rooms, users still need to manually replace the LINE Notify chat rooms with LINE Messaging API chat rooms.



Note:

- After completing the import action, you still need to click "Save" to take effect.
- Do not click import repeatedly, as this may delete logical actions that have already been converted to LINE Messaging API.
- This import action can only be executed in either LINE Messaging API settings or Telegram settings, but not both.

9.8.1 Message Setting

In the message settings page, you can edit the LINE Messaging API messages to be sent. In addition to entering the message content, you can also include real-time I/O channel data in the message. Below is the message settings page:

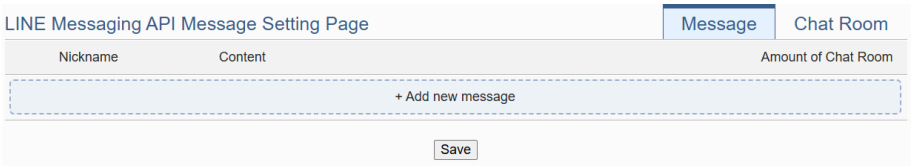


Figure 9-39：LINE Messaging API Message Setting page (1)

The settings steps are as below:

i Click the “Message” tab at the top right of the “LINE Messaging

API Message Settings Page".

ii Click "Add new message" to open the LINE Messaging API message settings page.

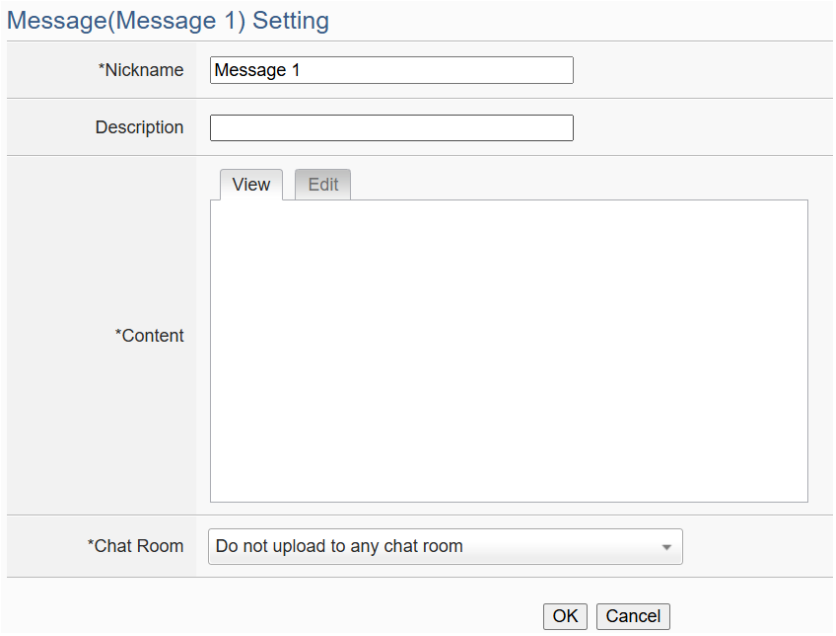


Figure 9-40：LINE Messaging API Message Setting page (2)

iii Input name in the "Name" field and you could also input the description of this LINE message in the "Description" field.

iv Enter the message content in the "Content" field. LINE Messaging API message provides an encoded string for you to add current I/O channel data or Internal Register data into the messages. To make it easy to add the encoded string, WISE provides "Real-time variable editor". Please refer to "7.2 User-Defined Data Logger" for more detailed information of the "Real-time variable editor".

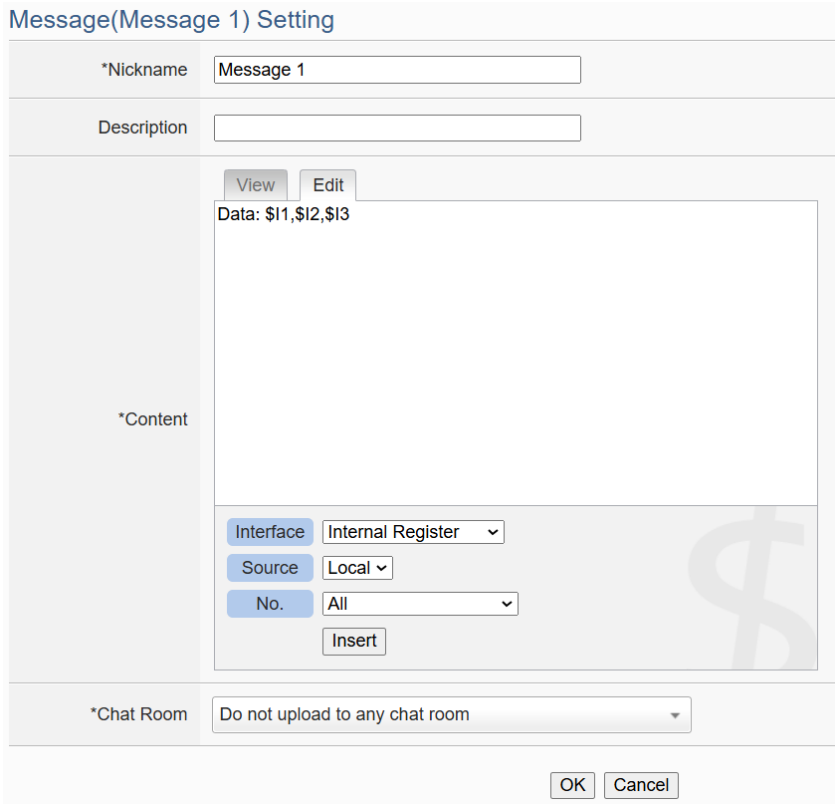


Figure 9-41：LINE Messaging API Message Setting page (3)

v In the “Chat Room” field, please specify the Chat rooms which will receive the message WISE send. WISE can send the messages to multi-chat rooms simultaneously. Users can directly click on the “Add new Chat Room” to connect with a new chat room, please refer to the section “9.9.2 Chat Room Setting”.

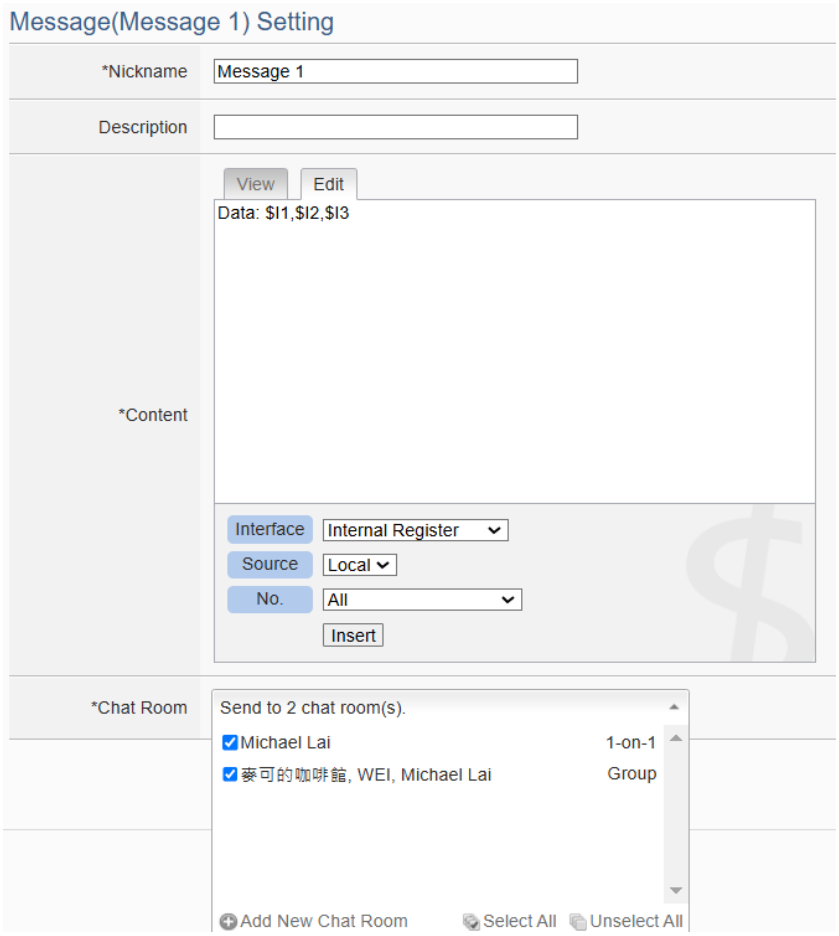


Figure 9-42：LINE Messaging API Message Setting page (4)

vi After complete all settings, click the “OK” button to confirm the LINE Messaging API message setting, and return to the Message Setting page.

vii Repeat steps ii~vi to complete settings of all LINE Messaging API messages.

viii After you finish all the LINE Messaging API Message settings, click “Save” button to save the settings.

9.8.2 Chat Room Setting

Chat rooms are the push targets for LINE Messaging API messages. You can add or manage chat rooms through the settings page. The chat room settings page is as follows:

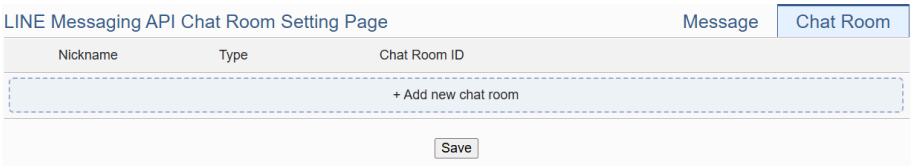


Figure 9-43：LINE Messaging API Chat Room Setting page (1)

The settings steps are as below:

i After clicking the “Add new chat room” button, WISE will open a chat room ID recording window as below. Enter the Channel Secret of the official account to be used in the “Channel Secret” field and enter the Channel Access Token of the official account to be used in the “Channel Access Token” field. Click the “Start getting LINE chatroom information” button.

Figure 9-44：LINE Messaging API Chat Room Setting page (2)

ii Use your phone to chat in the chat room with the official account, and WISE will record the chat room IDs that have been engaged. After recording all chat room IDs, click the “Finished getting LINE chatroom information” button to stop recording chat room IDs.

Figure 9-45：LINE Messaging API Chat Room Setting page (3)

iii After adding, the newly added chat room will appear in the list and can be used as a message sending target.

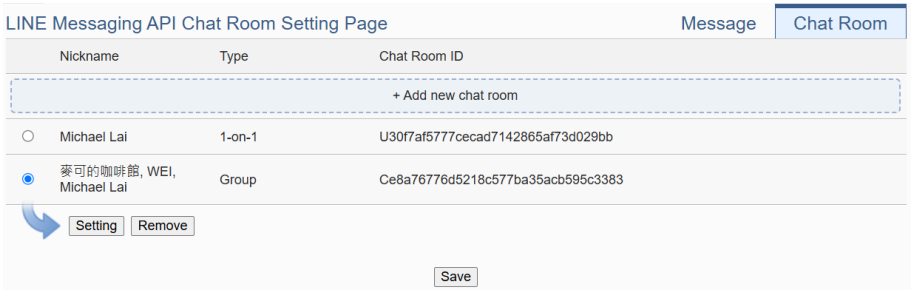


Figure 9-46：LINE Messaging API Chat Room Setting page (4)

iv You can select a chat room and click the “Setting” button to enter the chat room settings page. In addition to setting the chat room's description, you can also click the “Send” button, and WISE will send a test message to the chat room.

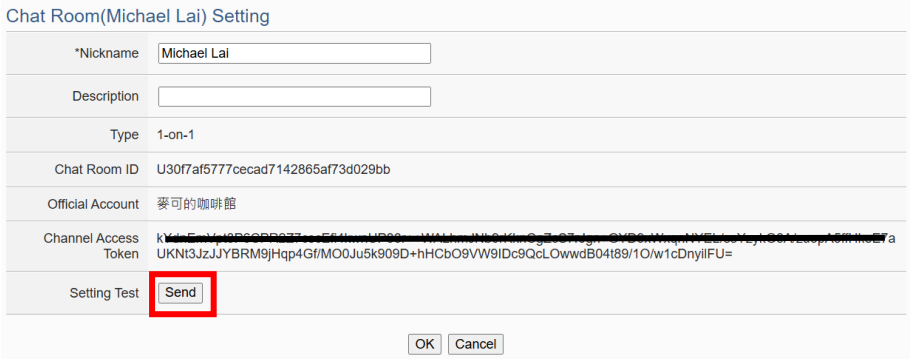


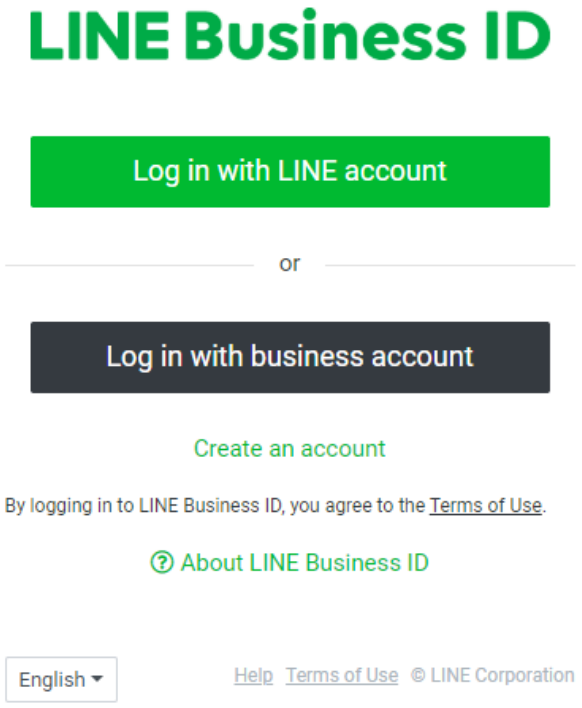
Figure 9-47：LINE Messaging API Chat Room Test Function

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

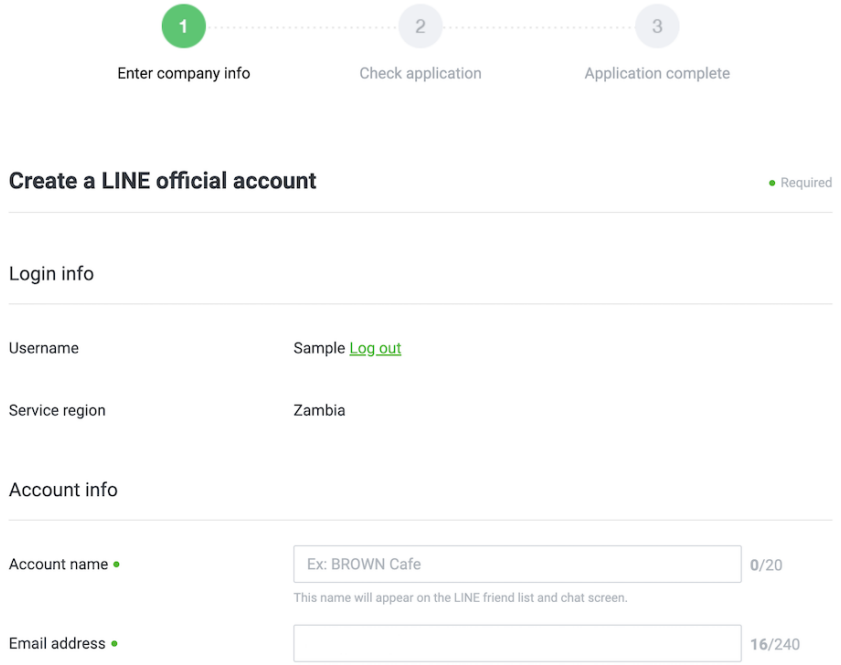
9.8.3 Line Official Account Application and Settings

Users must first register a LINE Business ID and create a LINE official account to use the LINE Messaging API message push function. The setup steps are as follows:

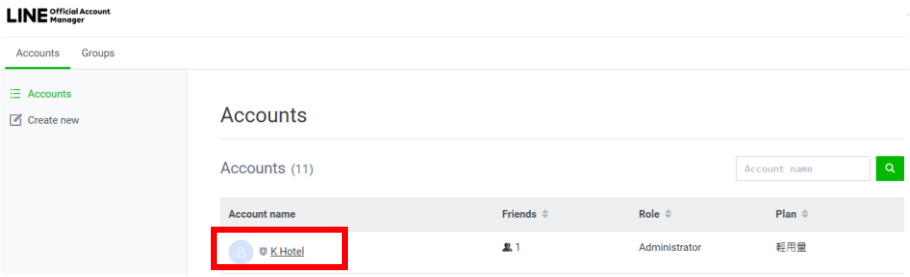
i Before creating a LINE Official Account, you need to log in to LINE Business ID using your LINE account or business account.



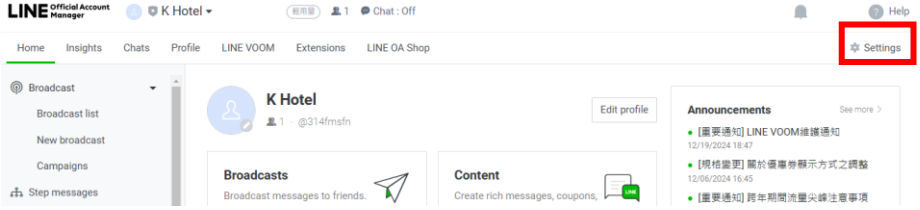
ii After logging into LINE Business ID, you will be directed to [the create a LINE official account page](). On the page's form, fill in the relevant information for the account you want to create and submit it to complete the creation of the LINE Official Account.



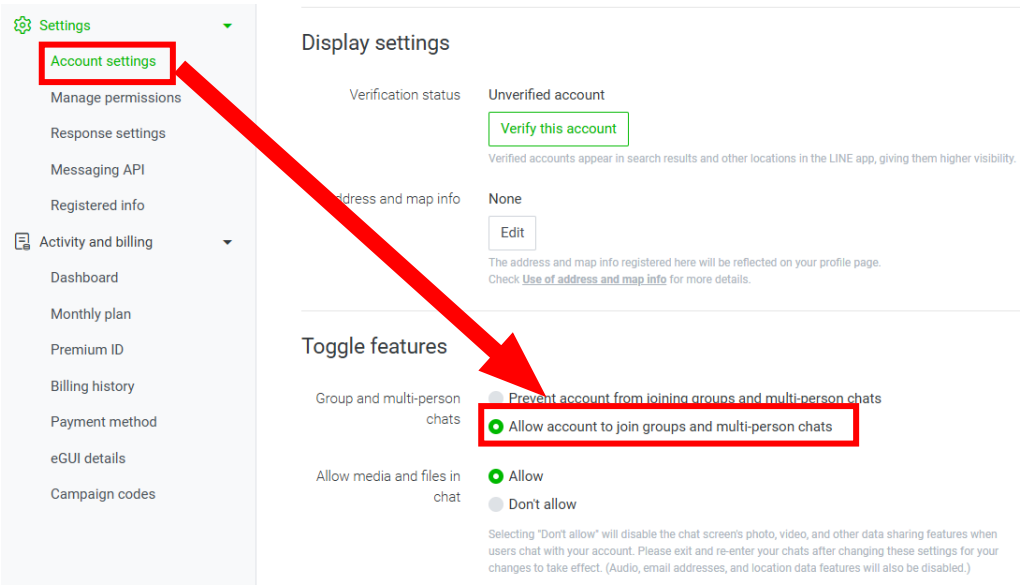
iii After the official account is created, go to [the LINE Official Account Manager website]() to configure it. In the account list, select the account you just created.



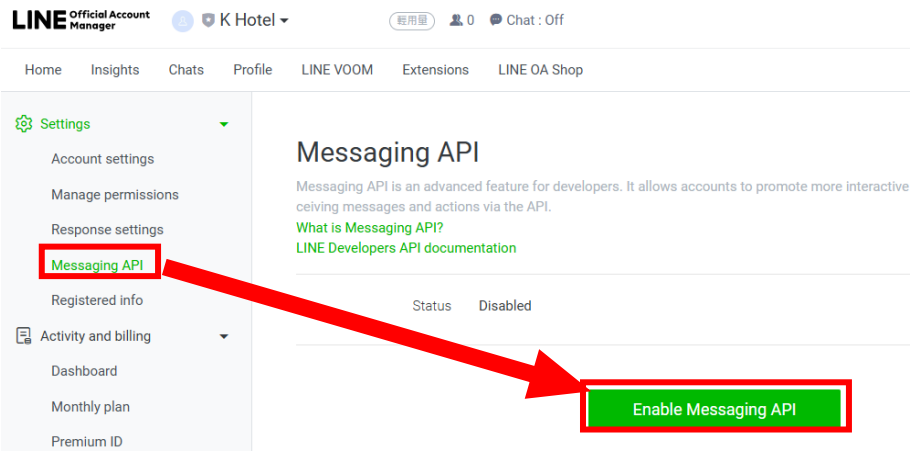
iv Once on the settings page, click the “Settings” button located at the top right corner.



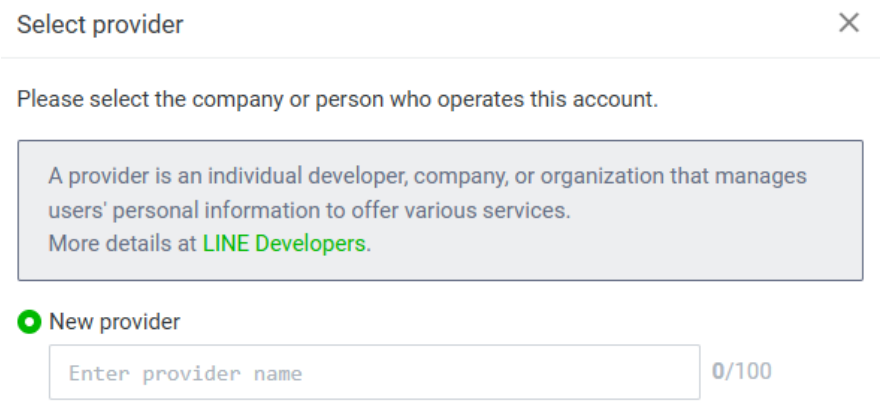
v Click on “Account Settings” on the left, then toggle the function to “Allow account to join groups and multi-perion chats”.



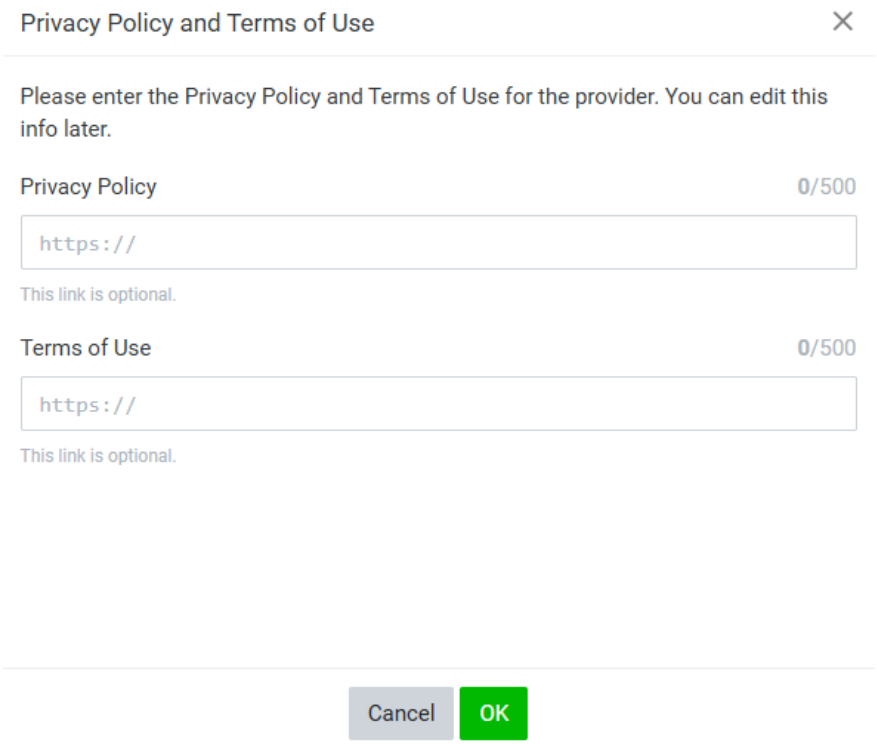
vi Click on “Messaging API” on the left, and then click “Enable Messaging API”.



vii Enter the name of the service provider (enter any name you prefer), then click “Agree”.

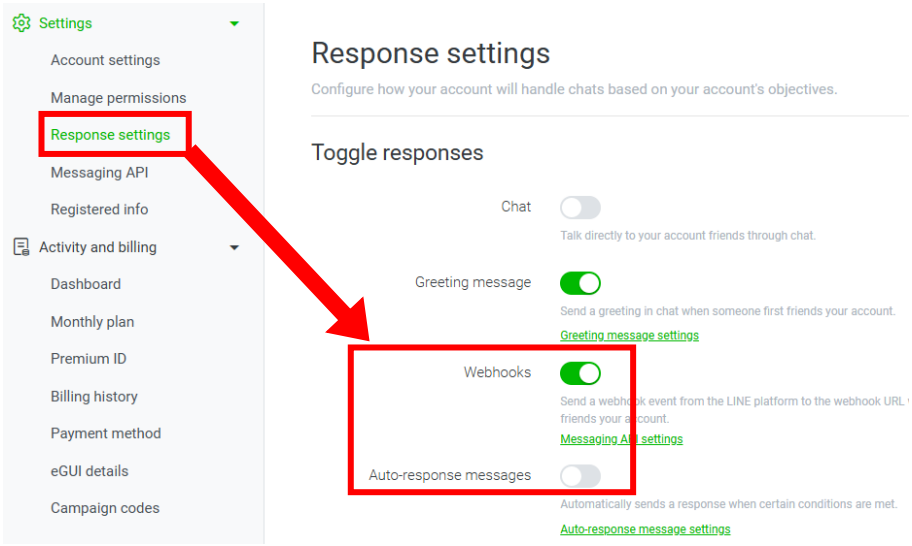


viii You can skip the Privacy Policy and Terms of Service by clicking "OK".

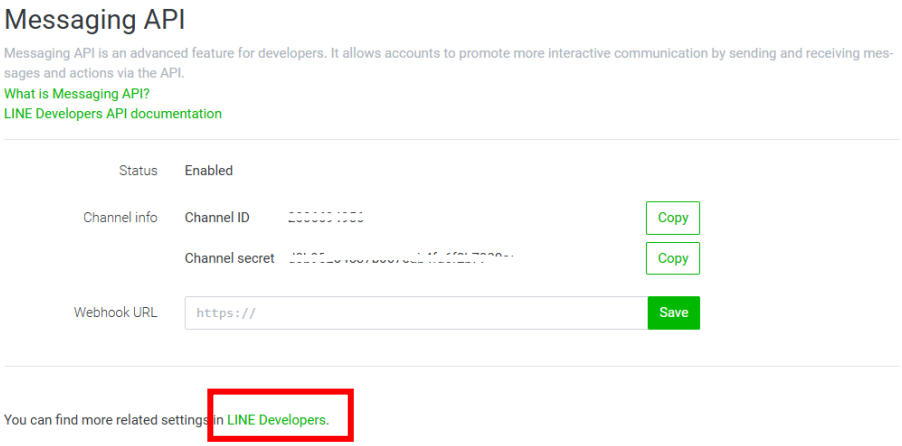


ix Once the official account is set up, return to the "Messaging API" page, input the following URL in the "Webhook URL" field, and click the "Save" button:
https://wise.icpdas.com/line/messaging_webhook.php

x Click on “Response settings” on the left, activate the “Webhook” function and disable the “Auto-response messages” function.

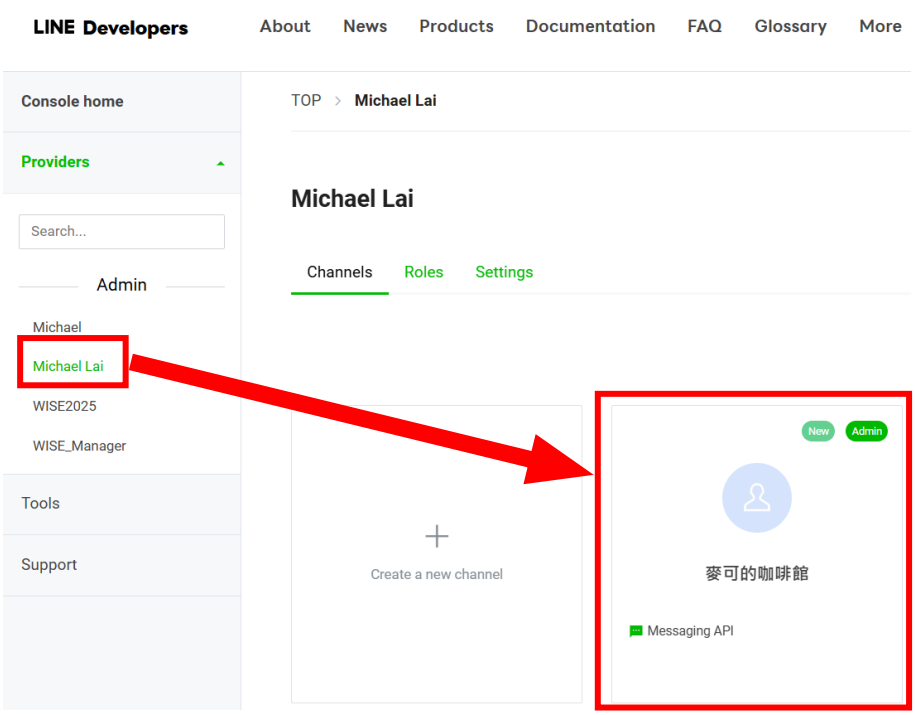


xi Return to the “Messaging API” page, then click “LINE Developers” at the bottom to navigate to the LINE Developers page.

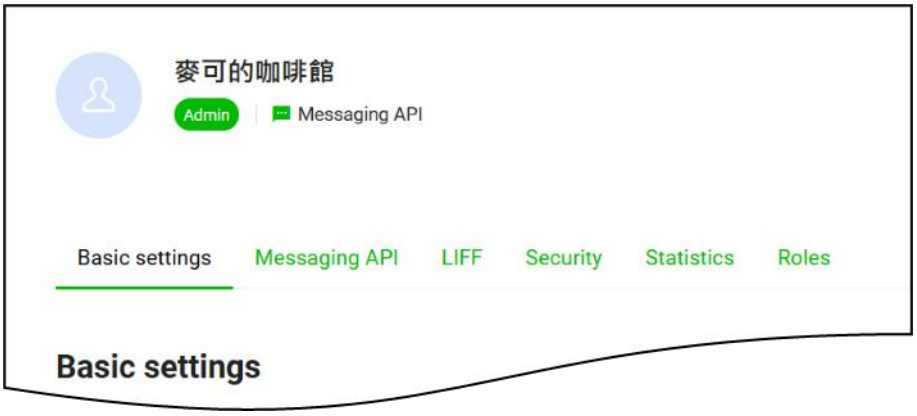


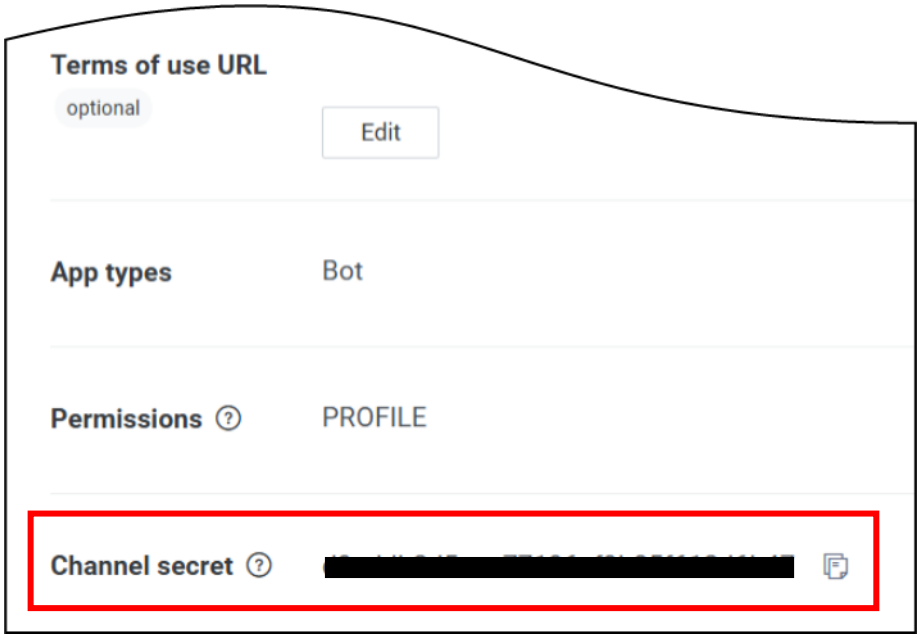
xii Click “Console” to enter the configuration page.

xiii Select the service provider name you previously entered, find the official account you created, and click to access its settings page.

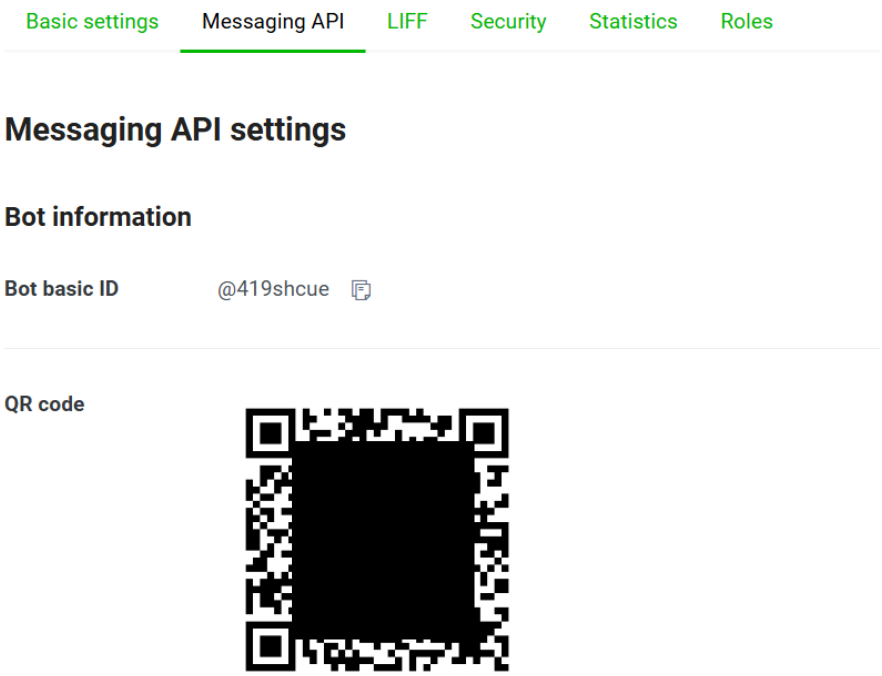


xiv Go to the “Basic settings” page, find the “Channel secret” information below, this is a necessary parameter for WISE configuration.

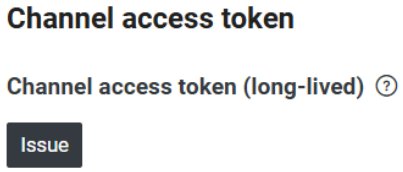




xv Navigate to the “Messaging API” page, use the QR code on this page to add this official account as a friend and create a chat room.



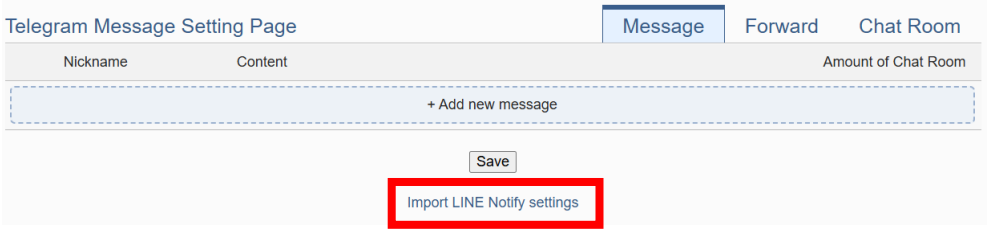
xvi At the bottom of the “Messaging API” page, find the “Channel access token” section, click the “Issue” button to generate a token and record it. This information is a required parameter for WISE configuration.



xvii After obtaining the “Channel secret” and “Channel access token”, you can complete the chat room settings on WISE. This concludes the setup for the LINE Official Account.

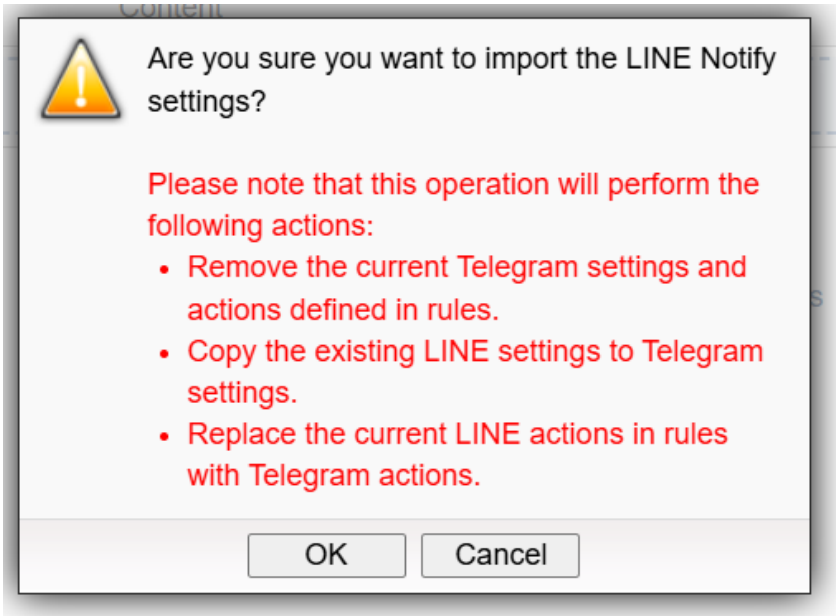
9.9 Telegram Setting

WISE provides Telegram message sending function. With this function, WISE can send the text messages, send messages with snapshots and videos from iCAM series IP cameras, and forward image files captured by other devices to Telegram 1-on-1 or group chat rooms via Telegram Bot account. To send the Telegram message, users have to apply a Telegram Bot account first and add the bot account into a group chat room to be sent. The configuration page for Telegram message setting, “Forward” setting, chat room setting, and the application procedure of Telegram Bot account is shown as below.



At the bottom of the Telegram settings page, there is an option labeled “Import LINE Notify settings”. Clicking this option will copy LINE Notify messages and related settings into the Telegram configuration. The logical rules will also convert the action of sending LINE Notify messages into the action of sending Telegram messages. However, due to structural differences between Telegram chatrooms and LINE Notify chatrooms, users

must manually replace the Telegram chatrooms.



Note:

- After completing the import action, you still need to click "Save" to take effect.
- Do not click import repeatedly, as this may delete logical actions that have already been converted to Telegram.
- This import action can only be executed in either LINE Messaging API settings or Telegram settings, but not both.

9.9.1 Message Setting

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

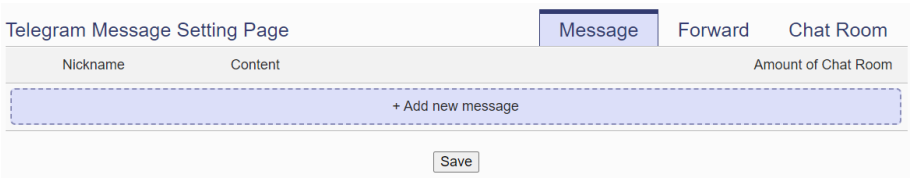


Figure 9-48：Telegram Message Setting page (1)

The settings steps are as below:

i Make sure the “Message” Tab is selected.

ii Click “Add new message”, the Telegram Message Setting page will appear as following:

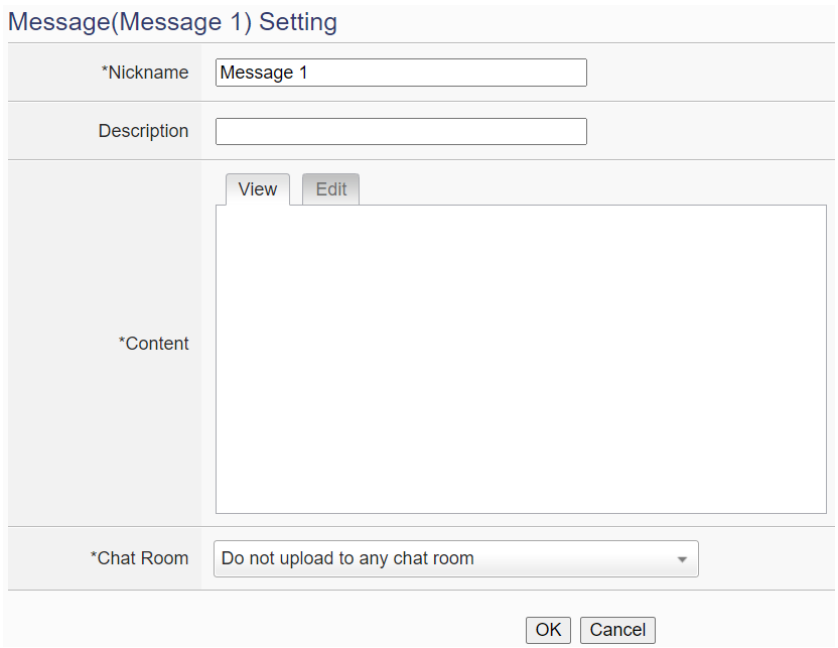


Figure 9-49：Telegram Message Setting page (2)

iii Input name in the “Name” field and you could also input the description of this Telegram message in the “Description” field.

iv Enter the message content in the “Content” field. Telegram message provides an encoded string for you to add current I/O channel data or Internal Register data into Telegram messages. To make it easy to add the encoded string, WISE provides “Real-time variable editor”. Please refer to “7.2 User-Defined Data Logger” for more detailed information of the “Real-time variable editor”.

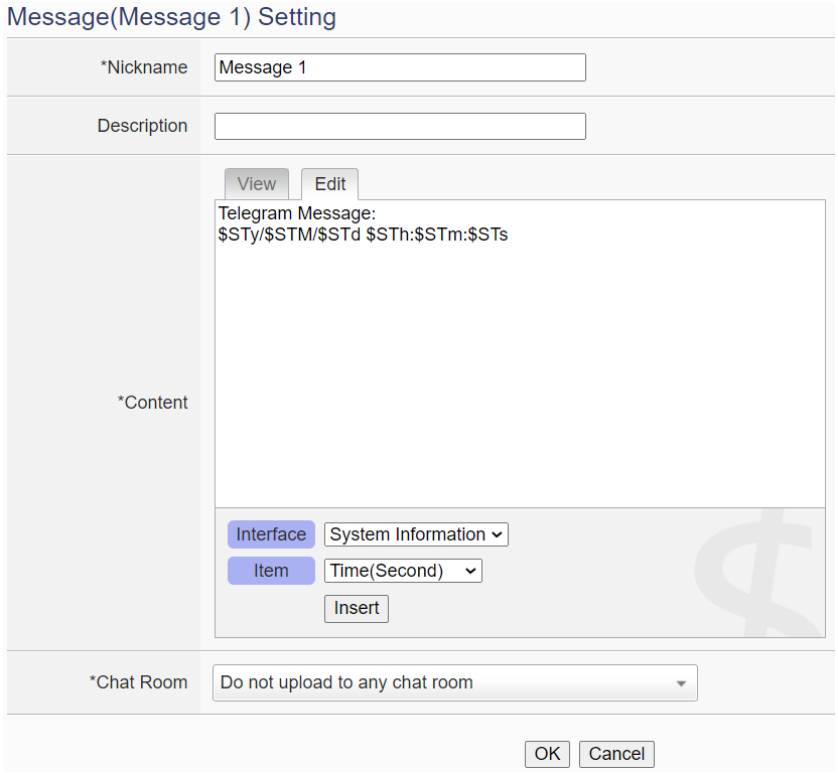


Figure 9-50：Telegram Message Setting page (3)

v In the “Chat Room” field, please specify the Chat rooms which will receive the message WISE send. WISE can send the messages to multi-chat rooms simultaneously. Users have to entry a Bot Token and add new chat rooms before selecting the chat rooms to be sent. To apply a Telegram Bot account, please refer to the section “Create Telegram Bot Account and Get the Token”. Users can directly click on the “Add new Chat Room” to connect with a new chat room, please refer to the section “9.10.3 Chat Room Setting”.

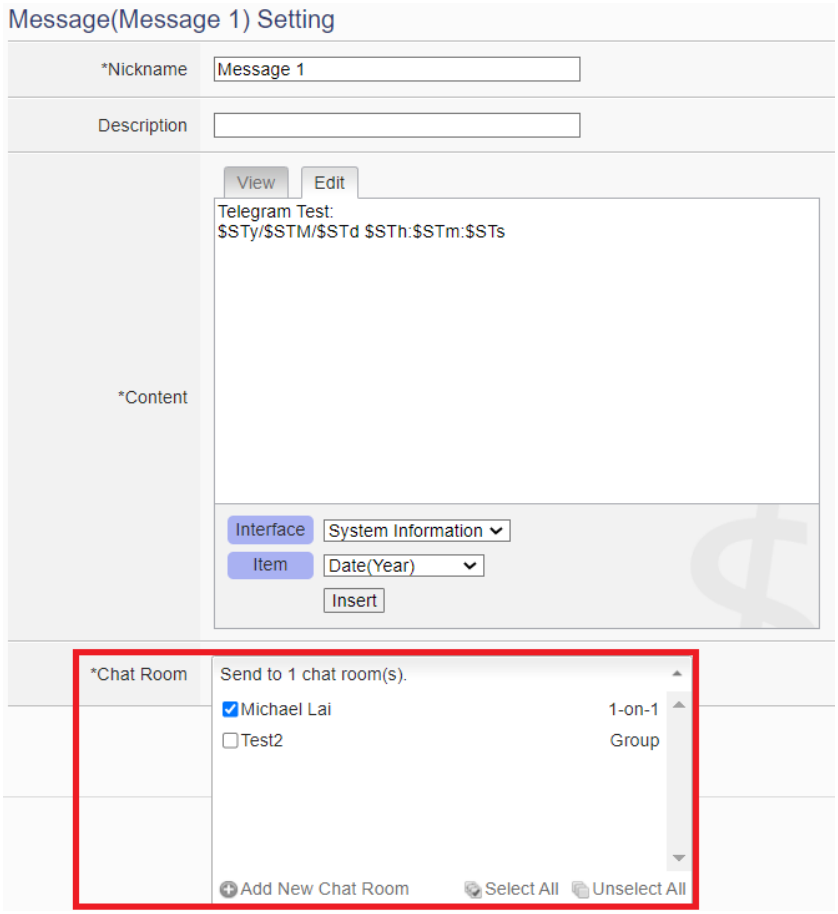


Figure 9-51：Telegram Message Setting page (4)

vi After complete all settings, click the "OK" button to confirm the Telegram message setting, and return to the Message Setting page.

vii Repeat steps ii~vi to complete settings of all Telegram messages.

viii After you finish all the Telegram Message settings, click "Save" button to save the settings.

9.9.2 Forward Setting

WISE supports the message forward function to send the image files with Telegram service. It can send images in JPG or PNG format and videos in MP4 format. The source of the image files includes following type:

- Upload files to the specific path (/Sendbox/Telegram) of the FTP server on the WISE, and then WISE would forward the files automatically.
- Connect to iCAM series IP cameras. WISE can collect the snapshots and videos captured by iCAM cameras.
- Connect to CGI servers and get the images with CGI commands.

(For example, users can use WISE controllers to connect with general IP cameras, and get snapshots with CGI commands.)

- Connect to iSN-81x-MTCP series infrared temperature measurement modules. WISE can collect the heatmap file generated by iSN-81x-MTCP modules.

The Forward Setting page is as below:

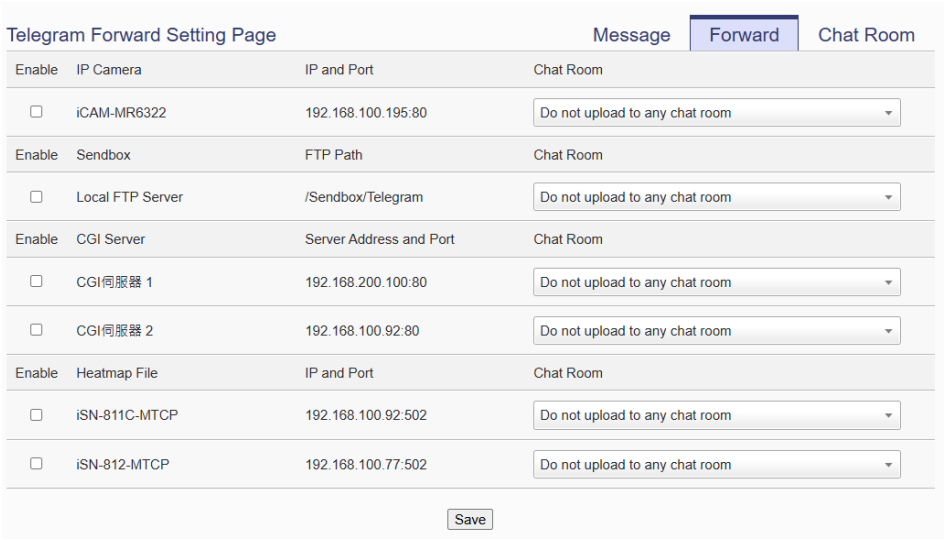


Figure 9-52：Telegram Forward Setting page(1)

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

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

When the WISE controller connect with a CGI server (ex. IP camera), and get the snapshots from the CGI server through CGI commands. These files also can be forwarded to the specified Telegram chat rooms. In addition, when users connect WISE with iSN-81x-MTCP series infrared temperature measurement modules, the “Forward” setting

page will show the list of connected iSN-81x-MTCP modules. Users can use IF-THEN-ELSE rule to trigger save heatmap file action and send to the specified Telegram chat room.

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

i Click on the "Forward" tab at the right-upper corner of the Telegram setting page.

ii To forward the desired files, please specify and click on the "Enable" checkbox of the file source, and specify the Chat rooms which will receive the message WISE send. WISE can send the messages to multi-chat rooms simultaneously. Users have to entry a Bot Token and add new chat rooms before selecting the chat rooms to be sent. To apply a Telegram Bot account, please refer to the section "Create Telegram Bot Account and Get the Token". Users can directly click on the "Add new Chat Room" to connect with a new chat room, please refer to the section "9.10.3 Chat Room Setting".

iii After you finish all the forward settings, click "Save" button to save the settings. After enable the "Forward" function and complete the message settings, the snapshots and event pictures will be sent to the Telegram chat room.

9.9.3 Chat Room Setting

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

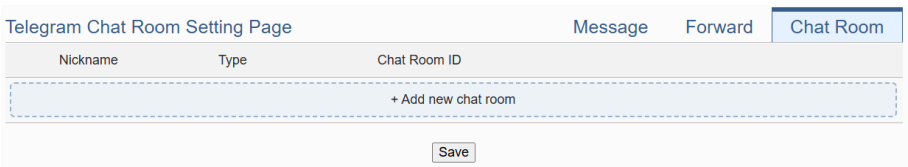


Figure 9-53：Telegram Chat Room Setting page (1)

The settings steps are as below:

i Click "Add new chat room", in the "Bot Token" field, key in the token of the Telegram Bot account. Please refer to the section "Create Telegram Bot Account and Get the Token" to get the

token.

ii Before add the Telgram chat rooms to WISE, You have to interact with the chat rooms by Telegram app. To interact with 1-on-1 chat room, you have to send messages to the Bot account. To interact with a Group chat room, you have to add the Bot account into the group chat room. Users must complete the interactions with Telegram app via cell phone or PC, and add the chat rooms on WISE within 24 hours. Otherwise, you need to interact with the chat rooms again for adding then into WISE.

iii Click the "Next" button, the chat rooms that have been interacted within 24 hours would be shown on the list.

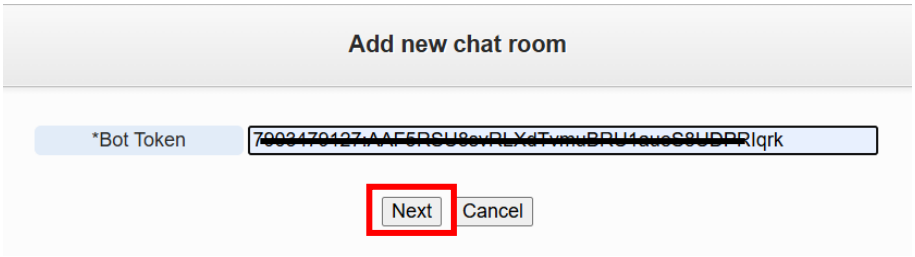


Figure 9-54：Telegram Chat Room Setting page (2)

iv To add the chat rooms, click on the checkbox in fornt of the chat rooms and press "OK" button.

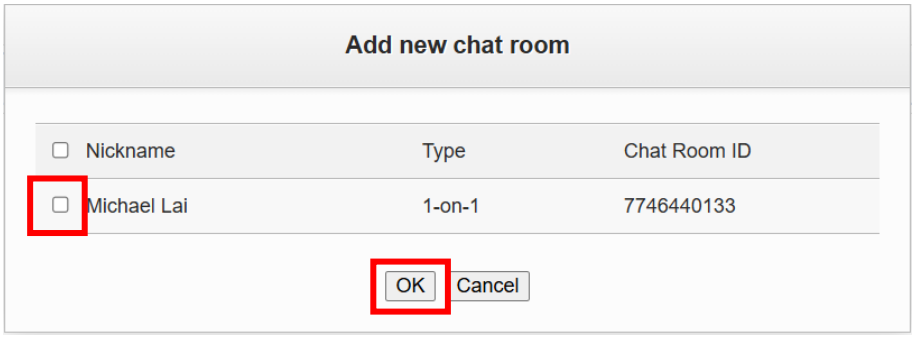


Figure 9-55：Telegram Chat Room Setting page (3)

v After the adding procedure is complete, the new chat room will appear in the list, and it can be selected in the message setting page.

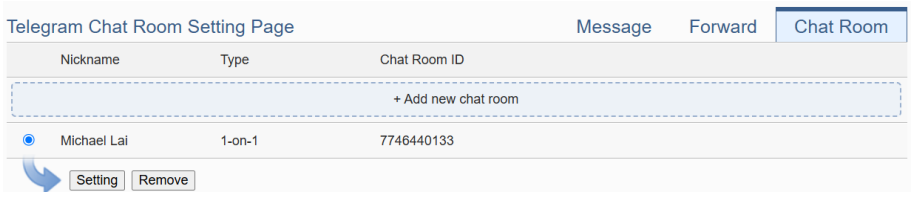


Figure 9-56：Telegram Chat Room Setting page (5)

vi Select a chat room and click the “Setting” button to enter the setting page of the chat room. Users can make a brief description of this chat room, and click “Testing” button to send a testing message to this chat room.

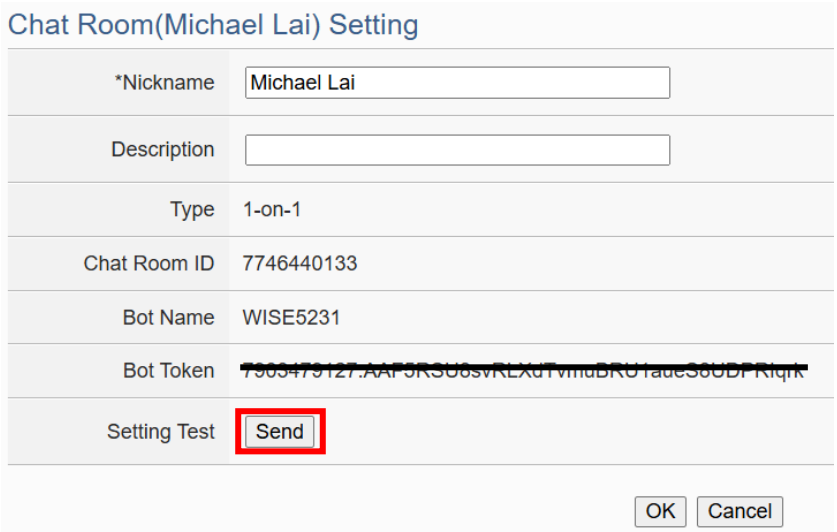


Figure 9-57：Telegram Chat Room Test Function

vii After you finish all the Telegram Chat Room settings, click “Save” button to save the settings.

- Create Telegram Bot Account and Get the Token

1. Connect to Telegram Web Version and login via Browser. And open Telegram BotFather official webpage, click on “OPEN IN WEB” button to enter the dialog window with BotFather account.

Figure 9-58：Create Telegram Bot Account(1)

2. In the message field, key in the message “/newbot” to create a Bot account, and then input the “Name” and “Username” for the Bot account. The “Username” must be end with the “bot” string. After the Bot is created, click the Bot account link in the following message to enter the dialog window of the Bot account. Click on the Token to copy it, and then paste it on the WISE Chat Room Setting Page.

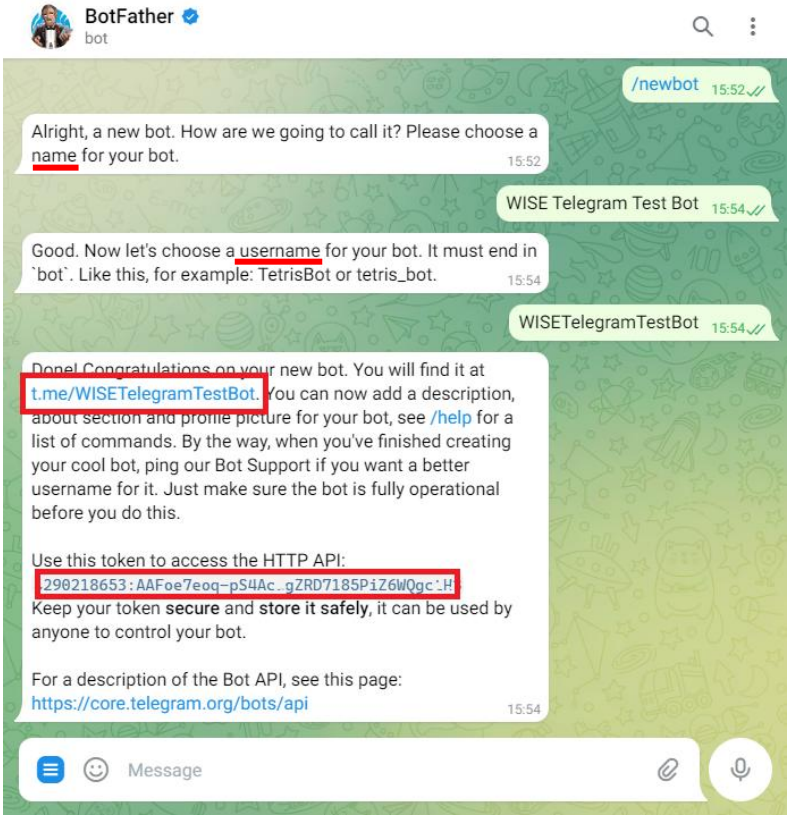


Figure 9-59：Create Telegram Bot Account(2)

3. If you had created a bot, key in "/mybots" in the message field, and select the Username of the Bot account, and then click the "API Token" button. Click the Bot account link in the following message to enter the dialog window of the Bot account. Click on the Token to copy it, and then paste it on the WISE Chat Room Setting Page.

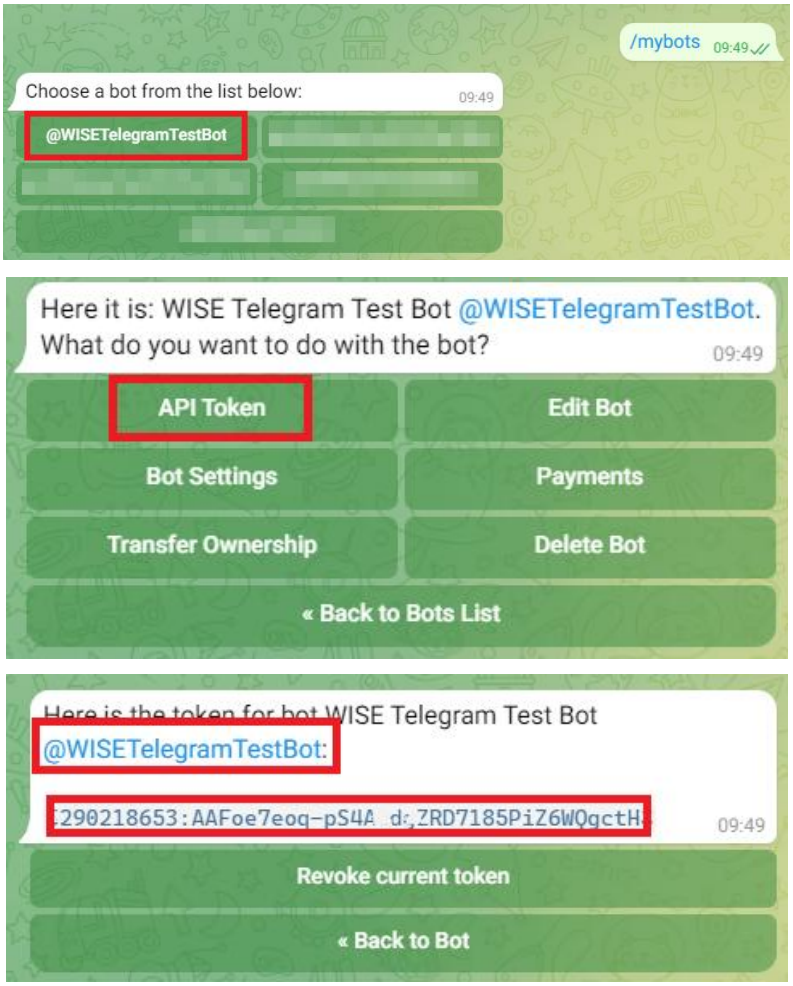


Figure 9-60：Get the Token of Telegram Bot Account

- Please Note:
  1. Telegram Bot account can send message numbers in every chat room: 20 per minute.
  2. WISE would not calculate the number of messages sent. The message sending operation would be fail if the number of message sent is over the limitation.
  3. If you copy the WISE rule file from one WISE controller to another, they would share the quota of messages. You can create new Telegram Bot accounts to avoid this problem.
  4. WISE can only send:
     - Text message
     - Image (JPG or PNG format, smaller than 10MB)
     - Video (MP4 format, smaller than 50MB)
  5. To perform the chat room setting, please confirm that the WISE controller is connected with internet. The setting could only be

done by connecting with Telegram server.

9.10 Active I/O Sending Setting

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

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

9.10.1 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.

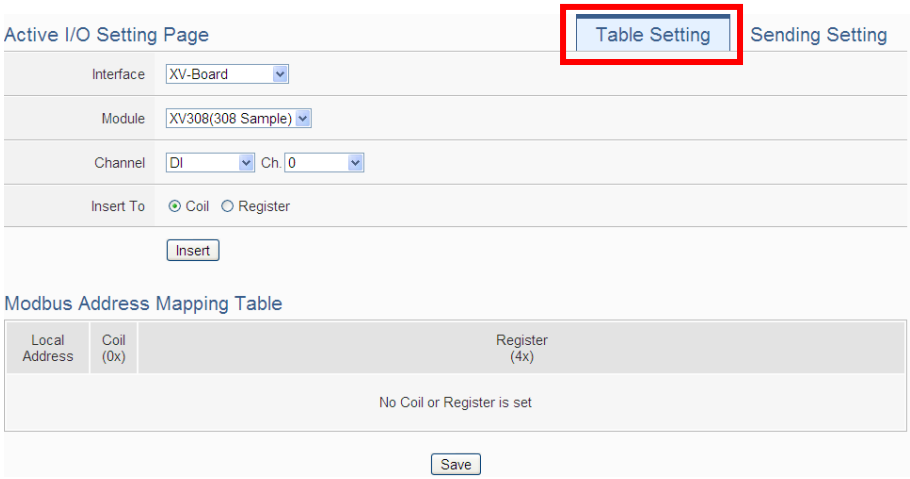


Figure 9-61：I/O Data Table Setting page (1)

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.

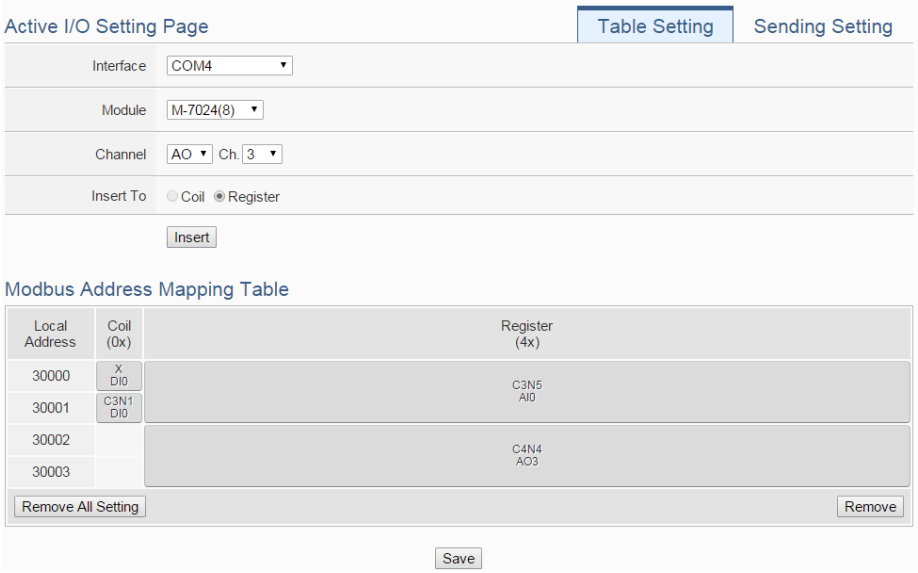


Figure 9-62：I/O Data Table Setting page (2)

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.

9.10.2 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.

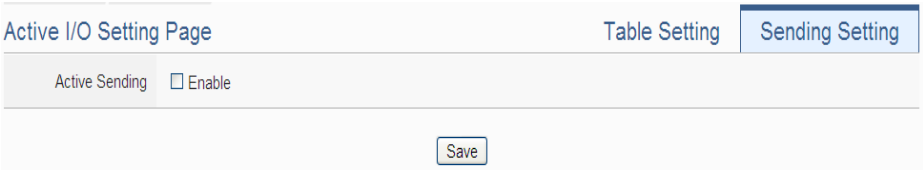


Figure 9-63：“Active Sending of I/O Data Table” Setting page (1)

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

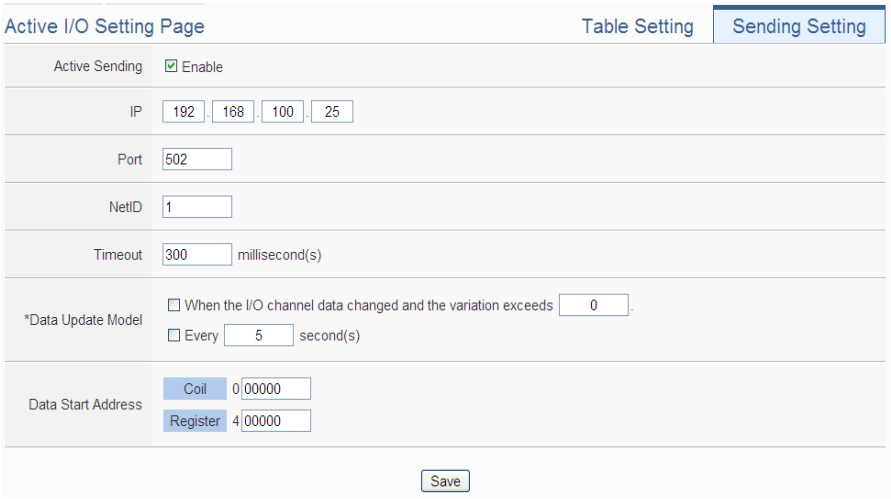


Figure 9-64：“Active Sending of I/O Data Table” Setting page (2)

iii Complete the receiver’s (SCADA software) IP address, the Modbus TCP Slave’s Port number, NetID and Timeout value setting. Make sure all the setting is the same as the settings of the receiver (SCADA software). If the setting is not accurate, the connection for WISE to the receiver (SCADA software) will be failed.

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

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

v In the “Start Address” field, set up the start address which the receiver (SCADA software) will use to save the data of I/O Data Table from WISE.

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

9.11 Channel Status Setting

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

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

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

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

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

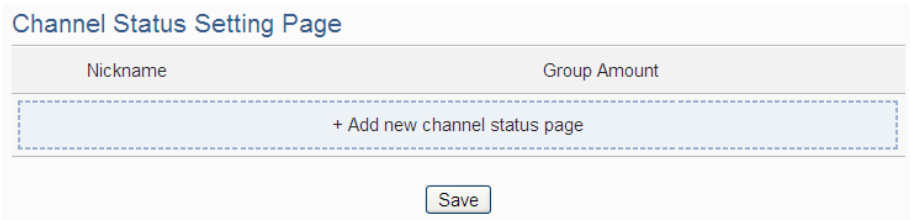


Figure 9-65：Channel Status List Page

ii After clicking the “Add new Channel Status page”, the Channel Status setting page will appear. 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. The setting page interface will be shown as below:

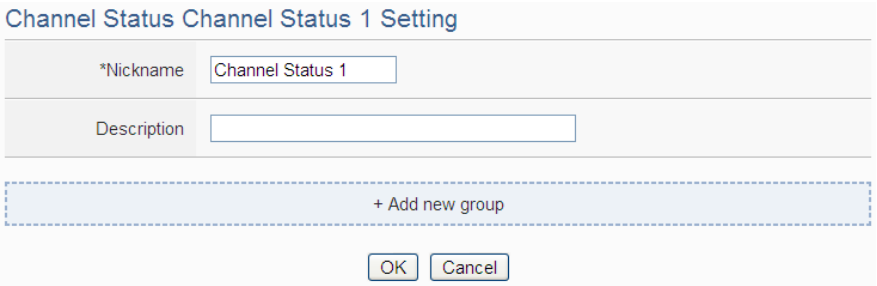


Figure 9-66：Channel Status Setting Page

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

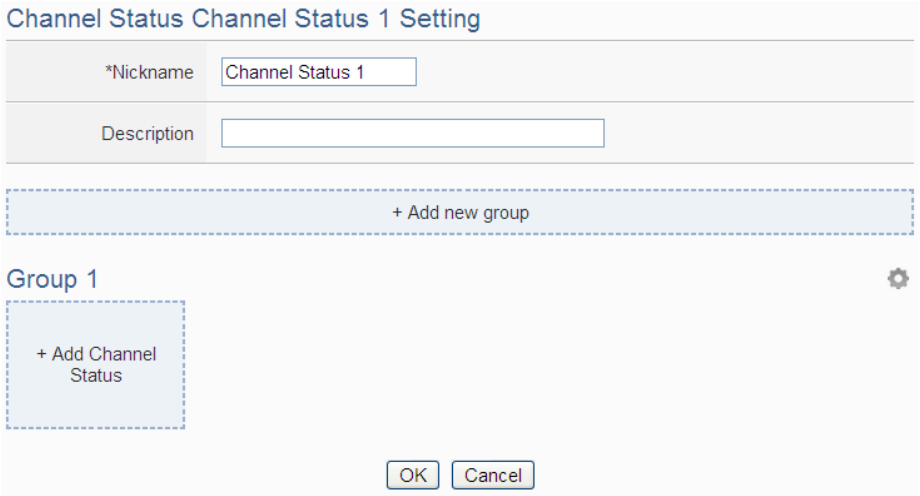


Figure 9-67：Add a new group

iv 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.

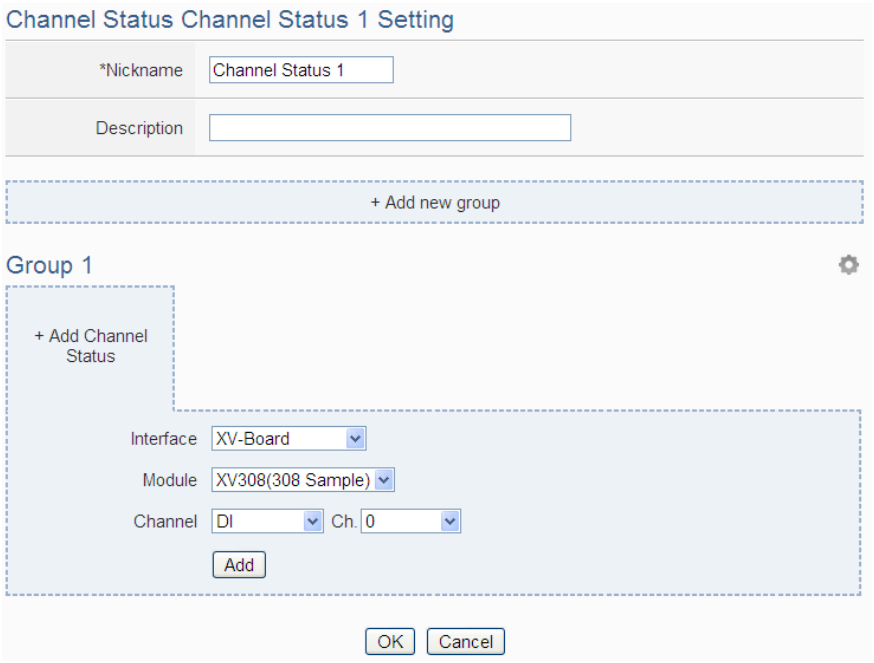


Figure 9-68：Add I/O Channels into Group

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

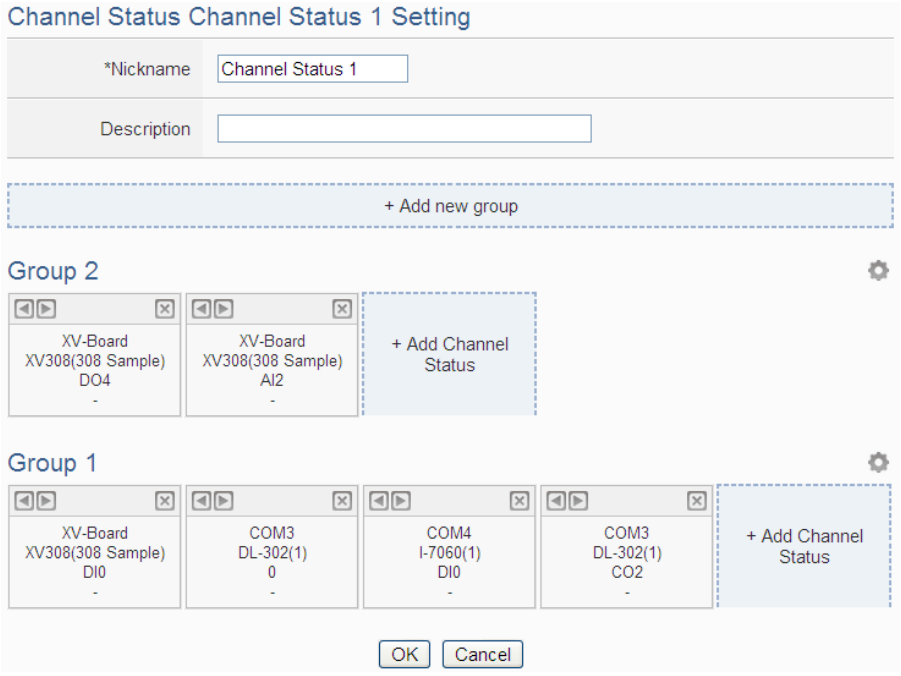


Figure 9-69：Multi-Groups Setting in User-defined Channel Status page

vi 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.

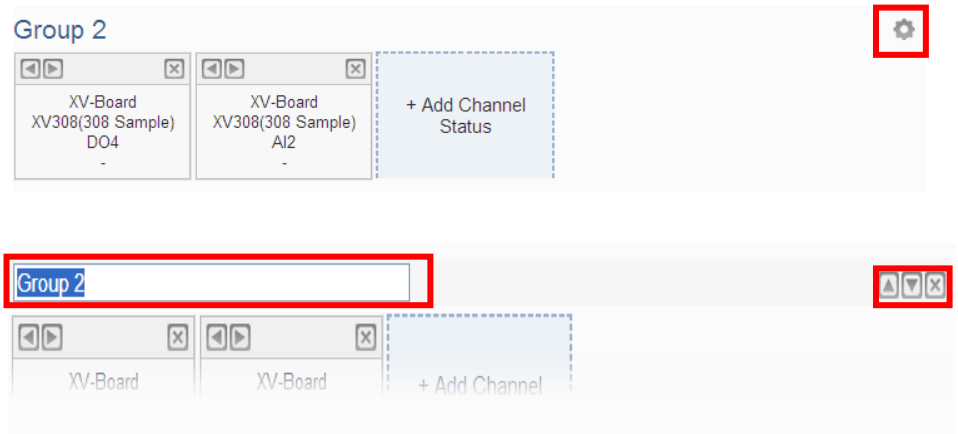


Figure 9-70：Tool bar of User-defined Channel Status page

vii 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.

viii Repeat steps i~ viii to complete the setting for all User-defined Channel Status pages.

ix 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.

x 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.

xi 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”.

xii After you finish all the User-defined Channel Status page settings, click “Save” button to save the settings.

9.12 Ping Setting

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

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

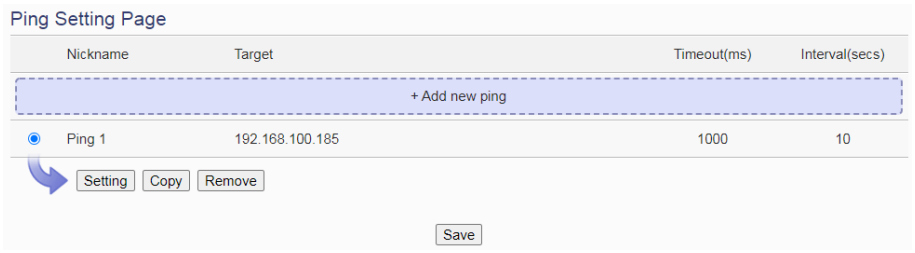


Figure 9-71：Ping List Page

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

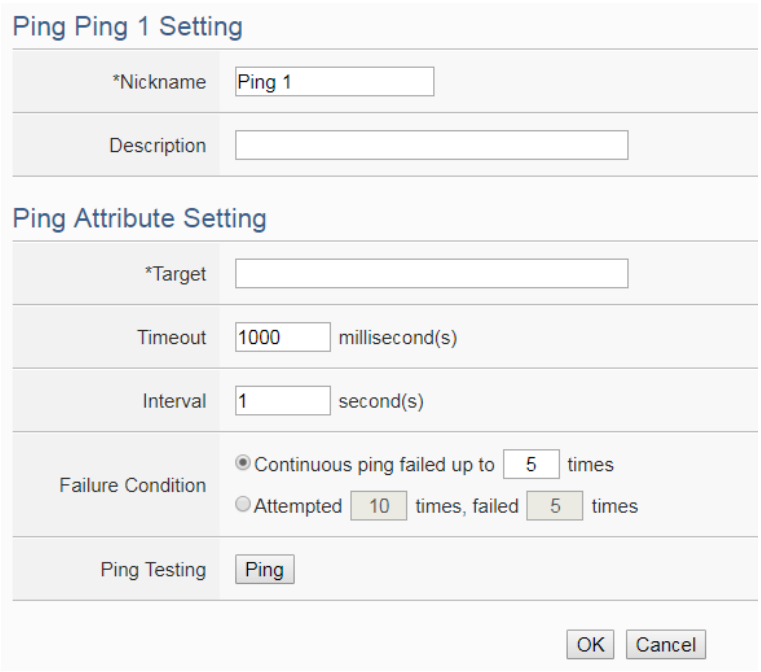


Figure 9-72：Ping Setting Page

iii In the “Target” field, enter the IP or the domain name of the target to be pinged.

iv In the “Timeout” field, enter the timeout value of the Ping function for waiting the response. The unit will be millisecond (ms).

v In the “Interval” field, set the time interval to specify how often the WISE will automatically ping the target. The unit will be second (sec).

vi In the “Failure Condition” field, select the judgment method to check the Ping IF condition. If you select “Continuous ping failed up to X times”, you can set the continuous failed times with a number between 1 to 60. The Ping status would become failure when the ping action failed continuously and the failed number exceeds the number you set. If you select “Attempted X times, failed Y times”, WISE would check the latest X ping results, if the failed number exceeds the number Y, the Ping status would become failure.

vii User can click the “Ping” button in the “Ping Testing” field to test the Ping status between the WISE controller and the target.

viii Click on “OK” to confirm the setting and return to the Ping list page.

ix Repeat steps ii~ vi to complete settings of all Pings.

x After you finish all the Ping settings, click “Save” button to save the settings.

10 Rules Setting

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

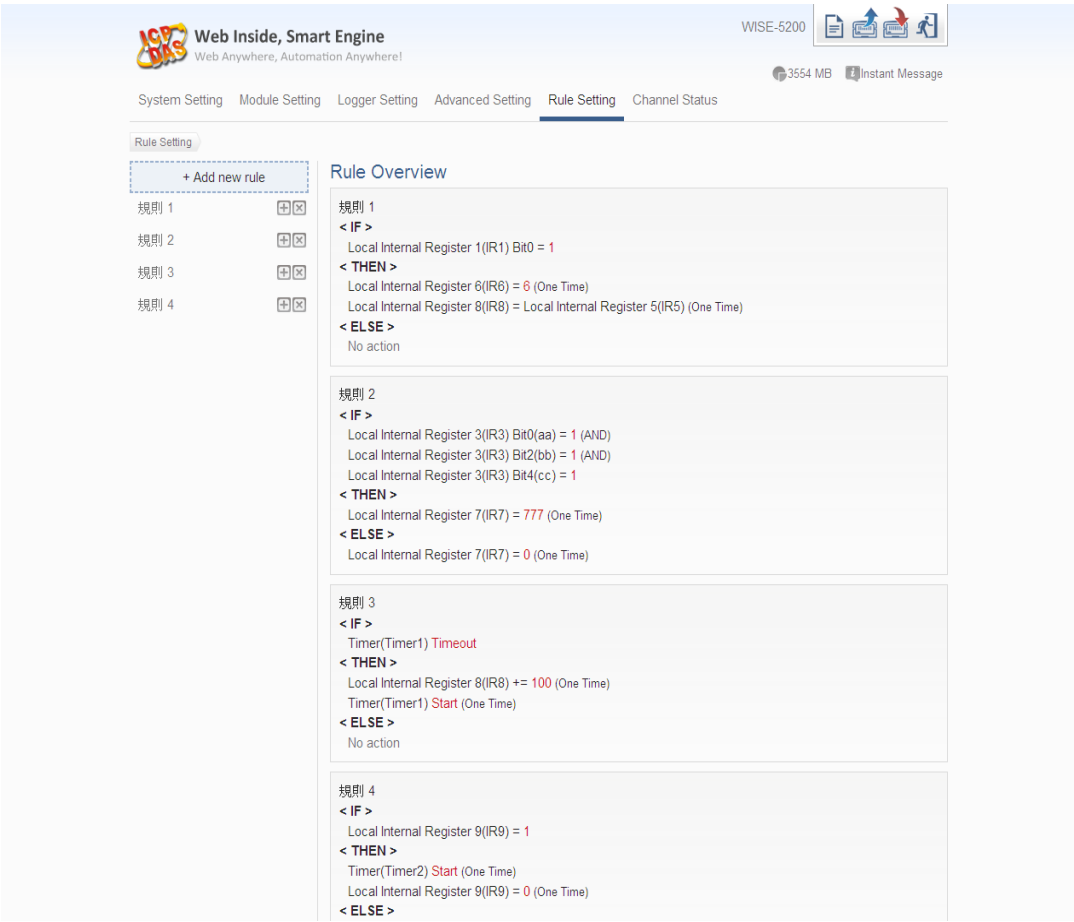


Figure 10-1：Rules overview page

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

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

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

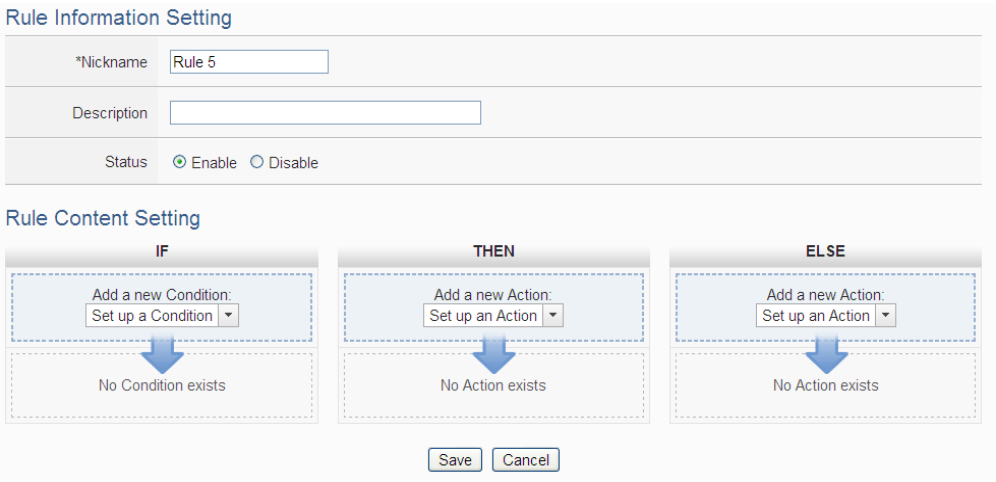
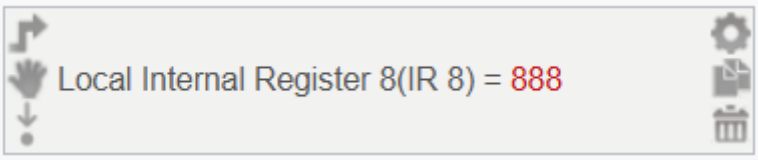


Figure 10-2：Rules Setting page

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

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

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



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

- **Setting:** to edit a pre-set function component, click on to get in to the setting page of the function component.
- **Copy:** to copy a pre-set function component, click on to generate a new component with the same pre-set component settings. The new function component will be listed under the pre-set component.
- **Remove:** to remove a pre-set function component, click on to remove the component.
- **Action Operation mode**：If the function component is Action and operation mode is "One-Time", the icon will be shown at the left-top corner of the component; otherwise, the icon for "Repeat" operation mode will be shown at the left-top corner of the function component.
- **Arrange order:** the order of the function component might result in different outcomes of IF-THEN- ELSE rule execution, therefore, user could click on and drag the component to arrange the components into appropriate order.
- **Skip At Startup:** When configuring a component as an Action, if set to execute on startup when conditions are met, the icon will be displayed in the lower-left corner. If set to skip the action on startup when conditions are met, the icon will be displayed in the lower-left corner.

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

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

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

10.1 IF Condition Setting

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

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

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

10.1.1 ICP DAS Module

Click on ICP DAS I/O Module, 6 options will appear as the following: DI, DI Counter, DO, DO Counter, AI, and AO.

10.1.1.1 DI

DI channel value from ICP DAS I/O Module can be used as evaluation criteria for IF condition statement; the setting page for DI Condition Setting is shown as below:

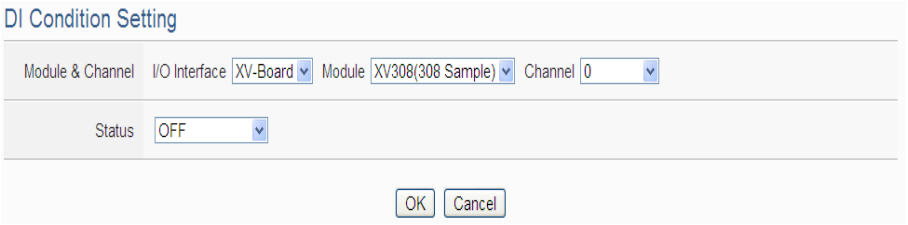


Figure 10-3：DI condition setting page

Follow the steps below:

i Specify the module and the channel from the dropdown list of the “Module & Channel” section that you are going to include its value in the IF condition statements.

ii Define the evaluation criteria of the status in IF statement to be “OFF”, “ON”, “ON to OFF”, “OFF to ON” or “Change”. Once the DI channel value matches the evaluation criteria, the result of this condition evaluation will be “true”. Please note: If the statement involves state transitions: “ON to OFF”, “OFF to ON” and “Change”, the action will be executed only once and only at the moment when the state transition occurs.

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

10.1.1.2 DI Counter

DI counter value from ICP DAS I/O Module can be used as evaluation criteria for IF condition statement; the editing page for DI Counter Condition Setting is shown as follow:

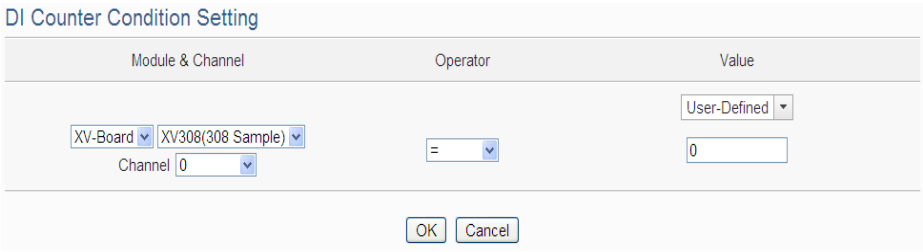


Figure 10-4：DI Counter condition setting page

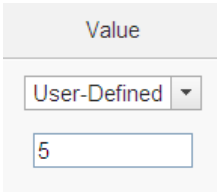
Follow the steps below:

i Specify the module and the channel from the dropdown list of the "Module & Channel" section that you are going to include its value in the IF condition statements.

ii Set up the expression statement for this counter value. Select an operator from "=", ">", "<", ">=", "<=" or "Change".

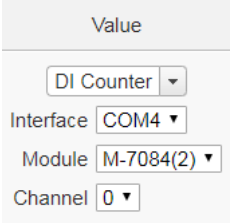
iii Specify the evaluation value. If this DI counter value match the evaluation criteria, the result of this condition evaluation will be "true". WISE provides the following 12 values options; you can compare them with the DI counter value for condition evaluation. Please note: If the statement involves 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.

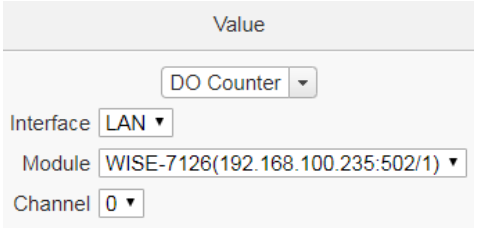


- Internal Register: The "Internal Register" value could be used as evaluation criteria; select the "Source" and the number of the Internal Register from the dropdown list. The "Local" in the "Source" field mean the Internal Register is from the Host controller (WISE). The "Remote" in the "Source" field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

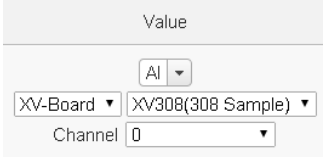
- DI Counter: The DI channel counter value from other ICP DAS I/O modules could be used as evaluation criteria; select the module and the channel from the dropdown list to specify which channel value will be used.



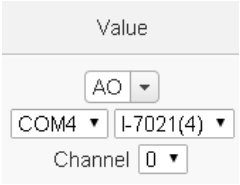
- DO Counter: The DO channel counter value from other ICP DAS WISE-71xx modules could be used as evaluation criteria; select the module and the channel from the dropdown list to specify which channel value will be used.



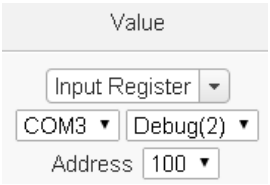
- AI: The AI channel value from other ICP DAS I/O modules could be used as evaluation criteria; select the module and the channel from the dropdown list to specify which channel value will be used.



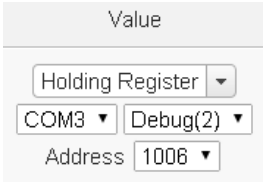
- AO: The AO channel value from other ICP DAS I/O modules could be used as evaluation criteria; select the module and the channel from the dropdown list to specify which channel value will be used.



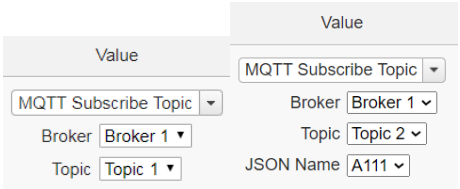
- Input Register: The Input Register value from other Modbus RTU/TCP Slave modules could be used as evaluation criteria; select the module and the address from the dropdown list to specify which channel value will be used.



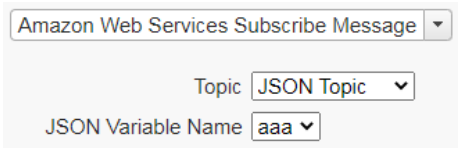
- Holding Register: The Holding Register value from other Modbus RTU/TCP Slave modules could be used as evaluation criteria; select the module and the address from the dropdown list to specify which channel value will be used.



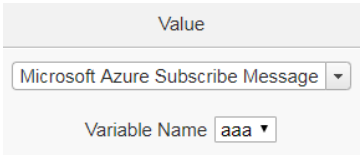
- MQTT: The value of the MQTT subscribe topic could be used as evaluation criteria; select the broker and the subscribe topic from the dropdown list to specify which topic will be used. If there was JSON Name in the subscribe setting, the JSON Name could be used as evaluation criteria.



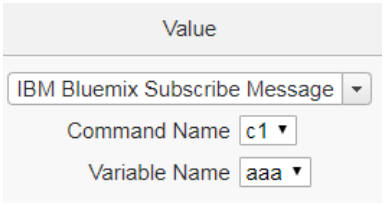
- AWS: The value of the AWS received parameter could be used as evaluation criteria; select the Topic or the JSON Variable from the dropdown list to specify which variable will be used.



- Azure: The value of the Azure received parameter could be used as evaluation criteria; select the variable name from the dropdown list to specify which variable will be used.



- Bluemix: The value of the Bluemix received parameter could be used as evaluation criteria; select the command and the variable name from the dropdown list to specify which variable will be used.



Please Note: The content of received MQTT subscribe topic or AWS / Azure / Bluemix parameter must be a number, otherwise 0 will be assigned.

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

10.1.1.3 DO

DO channel value from ICP DAS I/O Module can be used as evaluation criteria for IF condition statement; the setting page for DO Condition Setting is shown as below:

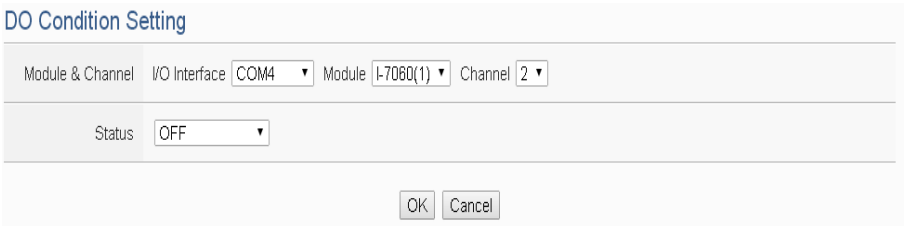


Figure 10-5：DO condition setting page

Follow the steps below:

i Specify the module and the channel from the dropdown list of the “Module & Channel” section that you are going to include its value in the IF condition statements.

ii Define the evaluation criteria of the status in IF statement to be “OFF”, “ON”, “ON to OFF”, “OFF to ON” or “Change”. Once the DO channel value matches the evaluation criteria, the result of this condition evaluation will be “true”. Please note: If the statement involves state transitions: “ON to OFF”, “OFF to ON” and “Change”, the action will be executed only once and only at the moment when the state transition occurs.

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

10.1.1.4 DO Counter

DO counter values from remote ICP DAS WISE-71xx series modules can be used as evaluation criteria for IF condition statement; the editing page for DO Counter Condition Setting is shown as follow:

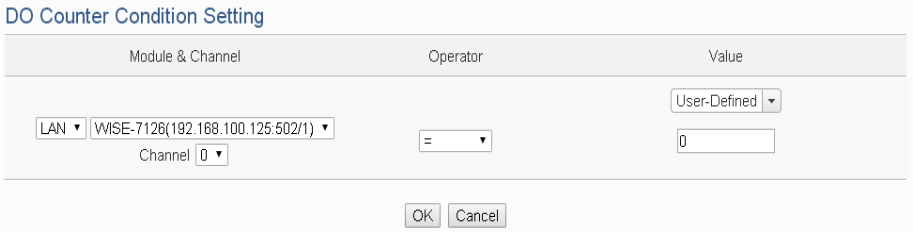


Figure 10-6：DO Counter condition setting page

Follow the steps below:

i Specify the module and the channel from the dropdown list of the “Module & Channel” section that you are going to include its value in the IF condition statements.

ii Set up the expression statement for this counter value. Select an operator from “=”, “>”, “<”, “>=”, “<=” or “Change”.

iii Specify the evaluation value. If this DO counter value match the evaluation criteria, the result of this condition evaluation will be “true”. WISE provides 12 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:

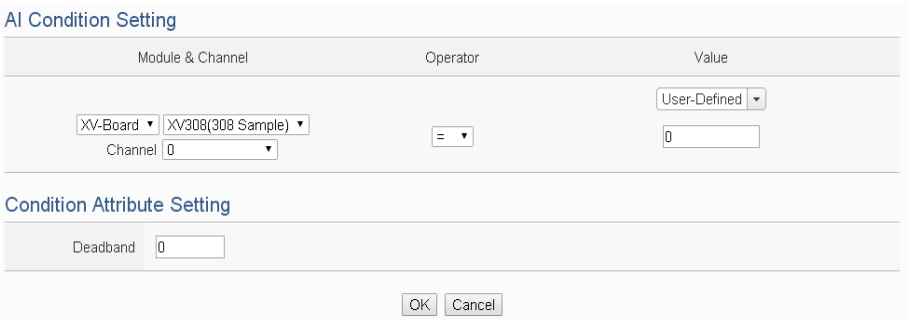


Figure 10-7：AI condition setting page

Follow the steps below:

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.

Set up the expression statement for this channel value. Select an operator from “=”, “>”, “<”, “>=” or “<=”.

Specify the evaluation value. If this AI channel value match the evaluation criteria, the result of this condition evaluation will be “true”. WISE provides 11 values options; you can compare them with the AI channel value for condition evaluation. Please refer to “10.1.1.2 DI Counter” for detail.

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.

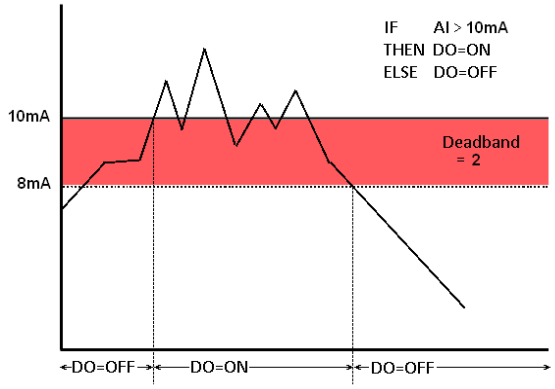


Figure 10-9：AI Deadband Operation (> or >= a numerical value)

(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.

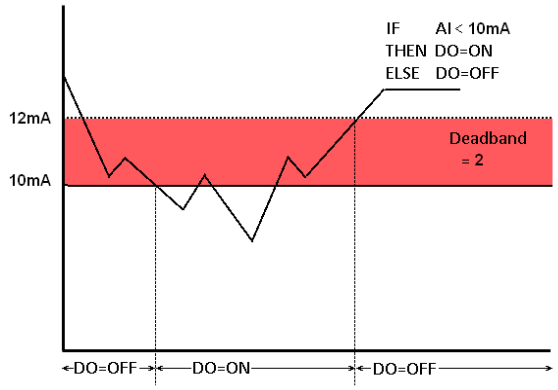


Figure 10-10：AI Deadband Operation (< or <= a numerical value)

(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.

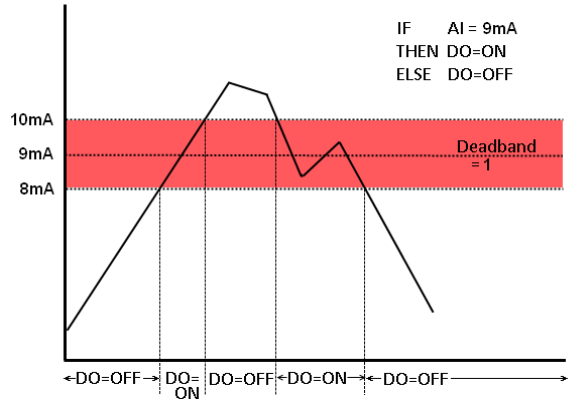


Figure 10-11：AI Deadband Operation (= a numerical value)

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:

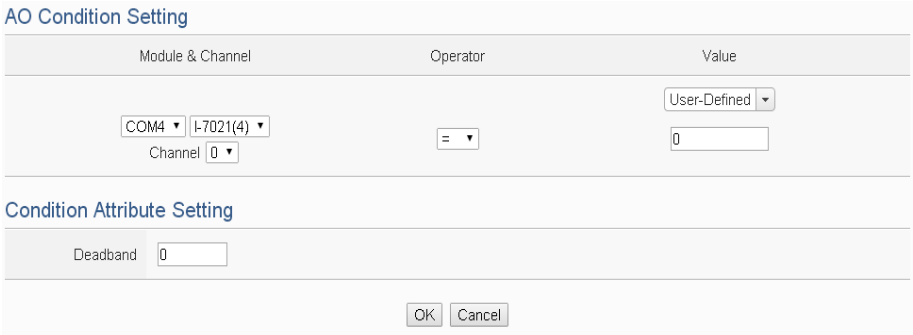


Figure 10-12：AO condition setting page

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 provides 12 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", "ON", "ON to OFF", "OFF to ON" or "Change". Once the Discrete Input value matches the evaluation criteria, the result of this condition evaluation will be "true". Please note: If the statement involves state transitions: "ON to OFF", "OFF to ON" and "Change", the action will be executed only once and only at the moment when the state transition occurs.

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

10.1.2.2 Coil Output

Coil Output value from Modbus TCP/RTU Slave module can be included in the IF condition statements; the editing page for Coil Output Condition Setting is shown as below:

Figure 10-14：Coil Output condition setting page

Follow the steps below:

i Specify the module and the address of the Modbus TCP/RTU Slave module from the dropdown list of the "Module & Address" section that you are going to include its value in the IF condition statements.

ii Define the evaluation criteria of the status in IF statement to be “OFF”, “ON”, “ON to OFF”, “OFF to ON” or “Change”. Once the Coil Output value matches the evaluation criteria, the result of this condition evaluation will be “true”. Please note: If the statement involves state transitions: “ON to OFF”, “OFF to ON” and “Change”, the action will be executed only once and only at the moment when the state transition occurs.

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

10.1.2.3 Input Register

Input Register value from Modbus TCP/RTU Slave module can be included in the IF condition statements; the editing page for Input Register Condition Setting is shown as below:

Figure 10-15：Input Register condition setting page

Follow the steps below:

i Specify the module and the address of the Modbus TCP/RTU Slave module from the dropdown list of the “Module & Address” section that you are going to include its value in the IF condition statements.

ii Set up the expression statement for this Input Register address value. Select an operator from “=”, “>”, “<”, “>=” or “<=”.

iii Specify the evaluation value. If this Input Register value match the evaluation criteria, the result of this condition evaluation will be “true”. WISE provides 12 values options; you can compare them with the Input Register value for condition evaluation. Please refer to “10.1.1.2 DI Counter” for detail.

iv In order to avoid signal oscillation that may result in instability to the measurement of the Input Register value or system operations, the user can set up a Deadband value for the Input

Register to reduce the oscillation effect to the channel value. Please refer "10.1.1.5 AI" for detail.

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

10.1.2.4 Holding Register

Holding Register value from Modbus TCP/RTU Slave module can be included in the IF condition statements; the editing page for Holding Register Condition Setting is shown as below:

Figure 10-16：Holding Register condition setting page

Follow the steps below:

i Specify the module and the address of the Modbus TCP/RTU Slave module from the dropdown list of the "Module & Address" section that you are going to include its value in the IF condition statements.

ii Set up the expression statement for this Holding Register address value. Select an operator from "=", ">", "<", ">=" or "<=".

iii Specify the evaluation value. If this Holding Register value match the evaluation criteria, the result of this condition evaluation will be "true". WISE provides 12 values options; you can compare them with the Holding Register value for condition evaluation. Please refer to "10.1.1.2 DI Counter" for detail.

iv In order to avoid signal oscillation that may result in instability to the measurement of the Holding Register value or system operations, the user can set up a Deadband value for the Holding Register to reduce the oscillation effect to the channel value. Please refer to "10.1.1.5 AI" for more detail information.

v Click "OK" button to confirm the settings and return to the Rule

settings page.

10.1.3 IP Camera

Event from IP Camera can be used as evaluation criteria for IF condition statement; the setting page for Event Condition Setting is shown as below:

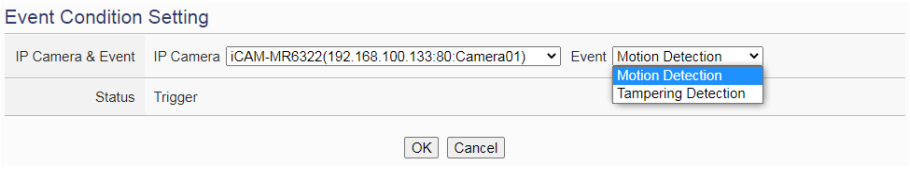


Figure 10-17：IP Camera's Event condition setting page

Follow the steps below:

i Specify the IP Camera and the Event type from the dropdown list of the “IP Camera & Event” section that you are going to include its value in the IF condition statements. iCAM IP Camera provides 2 Event options as Motion Detection and Tampering Detection for settings. If the IP Camera's Event is triggered and WISE receives the notification from IP Camera, then the result of this condition evaluation will be “true”.

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

10.1.4 CGI Command

The parameters (Variable & Source) of CGI Receiving Command can be included in the IF condition statements; the editing page for CGI Command variable and source condition setting is shown as below:

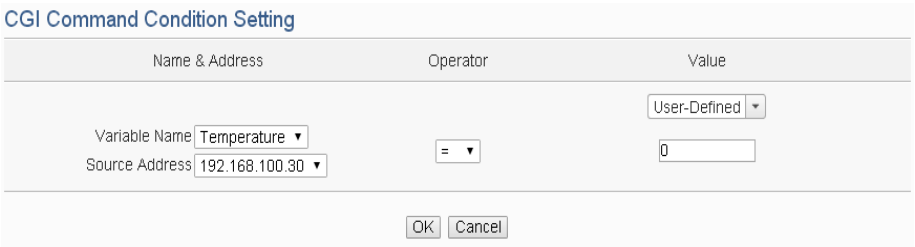


Figure 10-18：CGI Receiving Command condition setting page

Follow the steps below:

i Specify the CGI Command variable and CGI Command source from the dropdown list of “Variable Name” field and “Source Address”

field that you are going to include them in the IF condition statements. When the source of the CGI Receiving Command consists with the "Source Address" setting, the evaluation of CGI Command variable will be continued. If user selects "Anywhere" from the dropdown list of "Source Address", it means the evaluation of CGI Receiving Command will ignore the "Source Address" setting.

ii Set up the expression statement for this CGI Command variable value. Select an operator from "=", ">", "<", ">=" or "<=".

iii Specify the user-defined evaluation value or user-defined string. If this CGI Command variable value match the evaluation criteria or equal to the user-defined string, the result of this condition evaluation will be "true". WISE provides 12 values options; you can compare them with the CGI Command variable value for condition evaluation. Please refer to "10.1.1.2 DI Counter" for detail.

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

10.1.5 Amazon Web Services

Click on Amazon Web Services(AWS), 2 options will appear as the following: "Connection Status" and " Subscribe Message".

10.1.5.1 Connection Status

The Connection Status between WISE and AWS can be used as evaluation criteria for IF condition statement. The editing page for AWS Connection Status Condition Setting is shown as below:

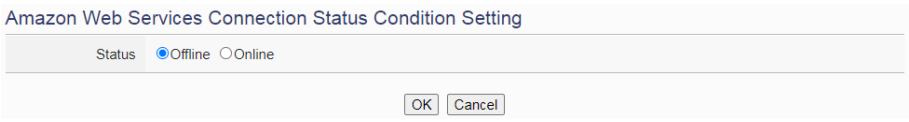


Figure 10-19：AWS Connection Status condition setting page

Follow the steps below:

i Specify the connection status to be "Offline" or "Online". If the connection status of AWS match the evaluation criteria, the result of this condition evaluation will be "true".

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

10.1.5.2 Subscribe Message

The Variable in the Subscribe Message from Amazon Web Services can be used in the IF condition statements; the editing page for AWS Subscribe Message condition setting is shown as below:

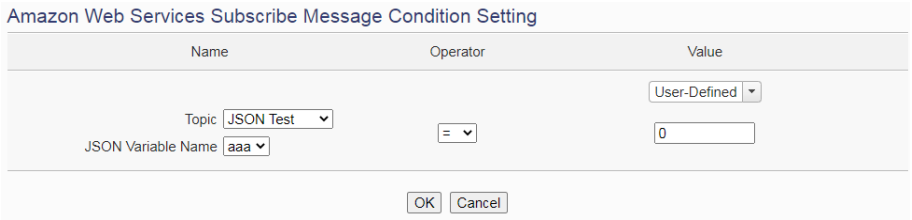


Figure 10-20：AWS Subscribe Message condition setting page

Follow the steps below:

i Specify the variable from the dropdown list of “Topic” or “JSON Variable Name” field that you are going to include it in the IF condition statements.

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

iii Specify the user-defined evaluation value. If the content of this variable match the evaluation criteria, the result of this condition evaluation will be “true”. WISE provides 12 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 Microsoft Azure

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

10.1.6.1 Connection Status

The Connection Status between WISE and Microsoft Azure can be used as evaluation criteria for IF condition statement. The editing page for Microsoft Azure Connection Status Condition Setting is shown as below:

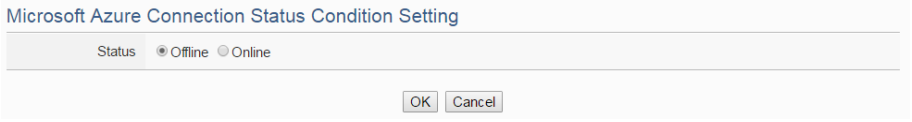


Figure 10-21：Microsoft Azure Connection Status condition setting page

Follow the steps below:

i Specify the connection status to be “Offline” or “Online”. If the connection status of Microsoft Azure match the evaluation criteria, the result of this condition evaluation will be “true”.

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

10.1.6.2 Subscribe Message

The Variable in the Subscribe Message from Microsoft Azure can be used in the IF condition statements; the editing page for Microsoft Azure Subscribe Message condition setting is shown as below:

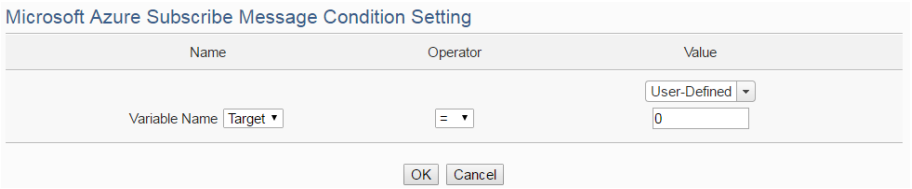


Figure 10-22：Microsoft Azure Subscribe Message condition setting page

Follow the steps below:

i Specify the variable from the dropdown list of “Variable Name” field that you are going to include it in the IF condition statements.

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

iii Specify the user-defined evaluation value. If the content of this variable match the evaluation criteria, the result of this condition evaluation will be “true”. WISE provides 12 values options; you can compare them with the content of this Subscribe Topic for condition evaluation. Please refer to “10.1.1.2 DI Counter” for detail.

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

10.1.7 IBM Bluemix

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

10.1.7.1 Connection Status

The Connection Status between WISE and IBM Bluemix can be used as evaluation criteria for IF condition statement. The editing page for IBM Bluemix Connection Status Condition Setting is shown as below:

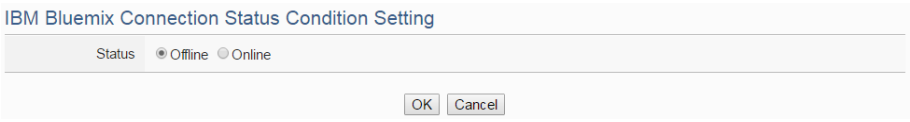


Figure 10-23：IBM Bluemix Connection Status condition setting page

Follow the steps below:

i Specify the connection status to be “Offline” or “Online”. If the connection status of IBM Bluemix match the evaluation criteria, the result of this condition evaluation will be “true”.

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

10.1.7.2 Subscribe Message

The Command and Variable in the Subscribe Message from IBM Bluemix can be used in the IF condition statements; the editing page for IBM Bluemix Subscribe Message condition setting is shown as below:

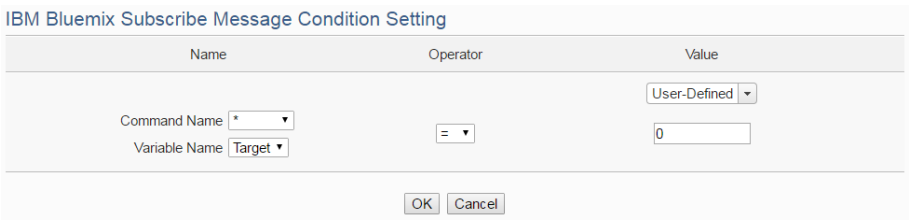


Figure 10-24：IBM Bluemix Subscribe Message condition setting page

Follow the steps below:

i Specify the Command and Variable from the dropdown list of “Command Name” and “Variable Name” fields that you are going to include them in the IF condition statements. Only when the Subscribe Message is bound with the setting of the

"Command Name", then the IF condition statements will be processed. User can select "*" to ignore the criteria.

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

iii Specify the user-defined evaluation value. If the content of this Subscribe Topic match the evaluation criteria, the result of this condition evaluation will be "true". WISE provides 12 values options; you can compare them with the content of this Subscribe Topic for condition evaluation. Please refer to "10.1.1.2 DI Counter" for detail.

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

10.1.8 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:

10.1.8.1 Broker Connection Status

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

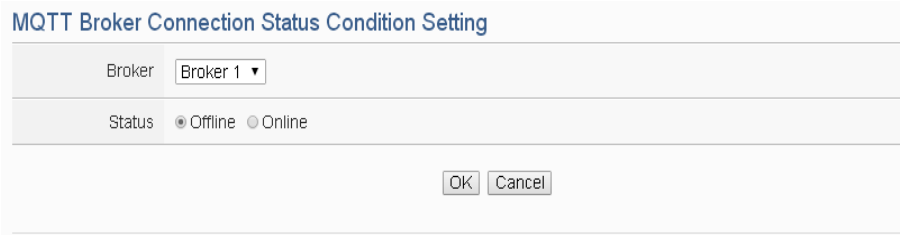


Figure 10-25：Broker Connection Status condition setting page

Follow the steps below:

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

ii And then specify the connection status to be "Offline" or "Online". If the connection status of the Broker match the evaluation criteria, the result of this condition evaluation will be "true".

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

10.1.8.2 Subscribe Topic

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

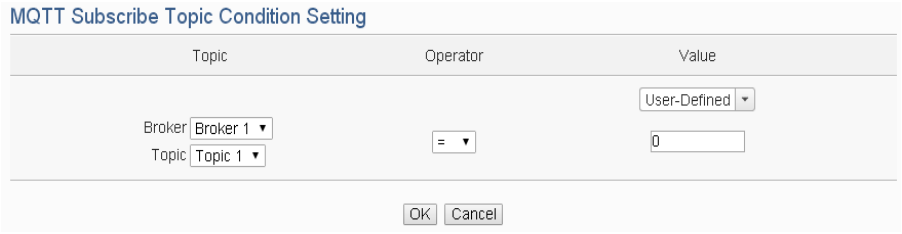


Figure 10-26：Subscribe Topic condition setting page

Follow the steps below:

i Specify the Broker and Subscribe Topic from the dropdown list of “Broker” field and “Topic” field that you are going to include them in the IF condition statements.

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

iii Specify the user-defined evaluation value. If the content of this Subscribe Topic or the value of the JSON parameter match the evaluation criteria, the result of this condition evaluation will be “true”. WISE provides 12 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.

10.1.9 Connection Status

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

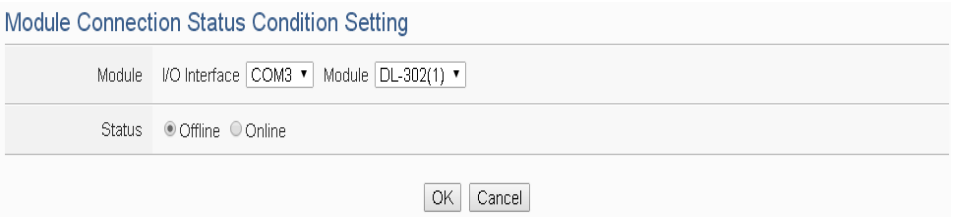


Figure 10-27：Connection Status condition setting page

Follow the steps below:

i Specify the module from the dropdown list of the “Module” section that you are going to include its Connection Status in the IF condition statements.

ii And then specify the Connection Status to be “Offline” or “Online”. If the Connection Status of the module match the evaluation criteria, the result of this condition evaluation will be “true”.

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

10.1.10 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 10-28：Timer condition setting page

Follow the following steps:

i Select the timer that you are going to use its status as evaluation criteria for IF condition statement. Specify the timer from the dropdown list of the “Timer” field.

ii Define the evaluation criteria of the timer status in IF statement to be “Not timeout”, “Timeout” or “Stop”. If the timer status match the evaluation criteria, the result of this condition evaluation will be “true”.

iii Click “OK” button to save the settings. The popup window will be closed and return to the Rule settings page.

10.1.11 Schedule

The Schedule can be used as evaluation criteria for IF condition statement; the editing page for Schedule Condition Setting is shown as follow:

Figure 10-29：Schedule condition setting page

Follow the steps below:

i Select the Schedule that you are going to use for IF condition statement from the dropdown list of "Schedule" field.

ii Define the evaluation criteria of the schedule status in IF statement to be "In Range" or "Out of Range". If the schedule status match the evaluation criteria, the result of this condition evaluation will be "true".

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

10.1.12 Mobile Network Signal Strength

The Mobile Network Signal Strength can be used as evaluation criteria for IF condition statement; the editing page for Mobile Network Signal Strength Condition Setting is shown as follow:

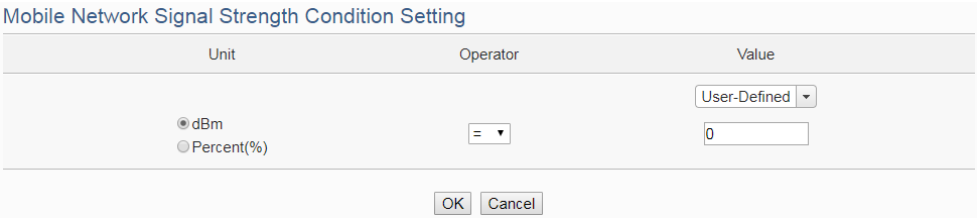


Figure 10-30：Mobile Network Signal Strength condition setting page

Follow the steps below:

i Select the unit that you are going to use for IF condition statement. The interface provides dBm and Percent(%) for selection.

ii Set up the expression statement for the Mobile Network Signal Strength value. Select an operator from "=", ">", "<", ">=" or "<=".

iii Specify the evaluation value. If the Mobile Network Signal Strength value match the evaluation criteria, the result of this condition evaluation will be "true".

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

10.1.13 SD Card Status

The status of SD Card can be used as evaluation criteria for IF condition statement; the editing page for SD Card Status Condition Setting is shown as follow:

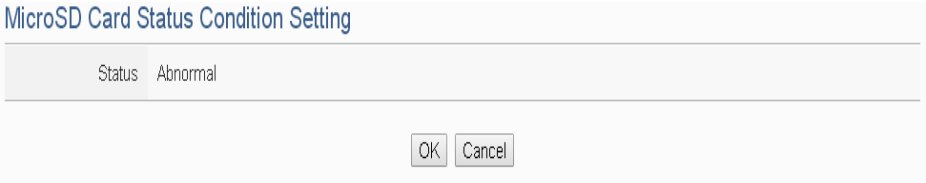


Figure 10-31：SD Card Status condition setting page

Follow the steps below:

i When the status of micro SD Card appears abnormal (micro SD Card is not detected or the space is less than 100MB), the result of this condition evaluation will be “true”.

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

10.1.14 Internal Register

Internal Register value can be used as evaluation criteria for IF condition statement; the editing page for Internal Register Condition Setting is shown as follow:

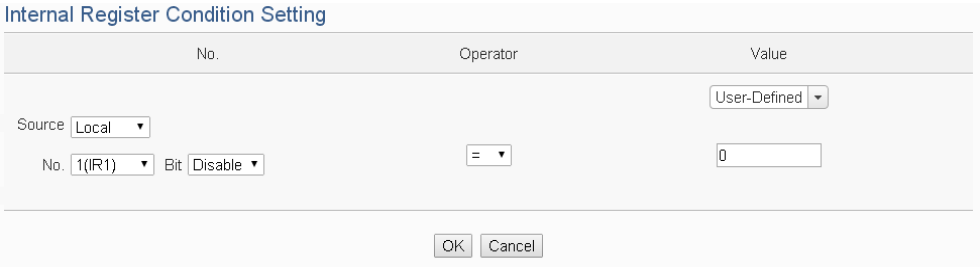


Figure 10-32：Internal Register condition setting page

Follow the steps below:

i Select the Internal Register that you are going to use the value as evaluation criteria for IF condition statement. Specify the data source of the Internal Register from the dropdown list of “Source” field. The “Local” mean the Internal Register is from the Host controller (WISE). The “Remote” mean the Internal Register is from the others remote WISE-71xx controller.

ii Specify the number of Internal Register from the dropdown list of

"No." field.

iii Specify the bit index of the Internal Register from the dropdown list of "Bit" field if required. "Disable" in "Bit" field mean user disable the bit operation, and use Internal Register value for operation.

iv Set up the expression statement for this Internal Register value. Select an operator from "=", ">", "<", ">=" or "<=".

v Specify the evaluation value. If this Internal Register value match the evaluation criteria, the result of this condition evaluation will be "true". WISE provides 12 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.

10.1.15 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 for setting up Rule Status in the IF Condition Setting page. The editing page for Rule Status Condition Setting is shown as below:

Figure 10-33：Rule Status condition setting page

Follow the steps below:

i Specify the Rule that is going to be used in the IF Condition statement from the dropdown list of the "Rule" field.

ii Specify the Rule status to be "Disable" or "Enable" from the dropdown list of the "Status" field. When the Rule status matches the specified status, the evaluation result will be "true".

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

10.1.16 Ping

The Ping Status can be used as evaluation criteria for IF condition statement. The editing page for Ping Condition Setting is shown as below:

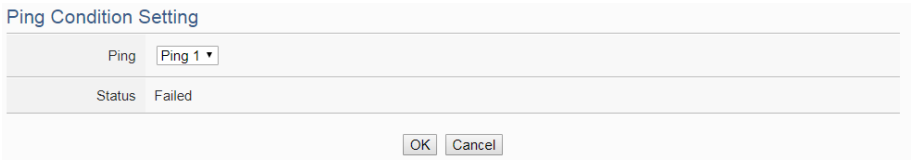


Figure 10-34：Ping condition setting page

Follow the steps below:

i Specify the Ping that is going to be used in the IF Condition statement from the dropdown list of the “Ping” field. When the Ping status was failure, the evaluation result will be “true”.

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

10.2 THEN/ELSE Action Setting

To add a THEN/ELSE Action, please select and set the Action from the dropdown list in the “Add a new Action” field under the THEN/ELSE Action setting section. THEN/ELSE Action provides the following Action setting options:

- ICP DAS Module
- Modbus Module
- IP Camera
- Amazon Web Services
- Microsoft Azure
- IBM Bluemix
- MQTT
- Timer
- Email
- SMS Alarm
- CGI Command
- Data Logger
- Database
- SNMP Trap
- LINE Messaging API
- IoTstar Bot Service
- IoTstar Alarm
- Telegram
- Re-boot System
- Reset modem
- Internal Register
- Rule Status
- Delay

If the WISE is connected to ICP DAS I/O modules or Modbus TCP/RTU modules, the setting options for I/O channel information (DI Counter, DO, AO, Coil Output and Holding Register) will be automatically displayed on the dropdown list. In addition, If therer is ICP DAS iCAM IP camera connect to WISE, the related setting options of IP camera event(Snapshot, Video and OSD message) will also be automatically displayed in the dropdown list.

To include subjects other than modules mentioned above in the THEN/ELSE Action statement; they have to be pre-defined in Advanced Setting first. The setting options of the subjects that already being defined

in Advanced Setting will appear on the dropdown list of THEN/ELSE Action. Select the Action option from the dropdown list in the "Add a new Action" field under the THEN/ELSE Action setting section, a window will pop up for you to edit detailed information. The THEN Action statement will be executed only when the result of IF condition statement is found "true"; otherwise the ELSE Action statement will be executed. In order to meet application requirement, for some Actions, WISE offers options to execute the Action one-time or repeatedly. The setting options of THEN/ELSE Action are as follow:

- One-Time: when the IF Condition is TRUE, this Action will be executed once and only once. This Action will not be executed again until the IF Condition turns to be TRUE again.
- Repeat: when the IF Condition is TRUE, this Action will be executed repeatedly until the IF Condition turns to be FALSE.

For THEN/ELSE actions, the system provides the option "Execute" or "Skip" under the setting "At Startup (Condition Met)". By configuring this setting, users can prevent specific actions from being executed during startup.

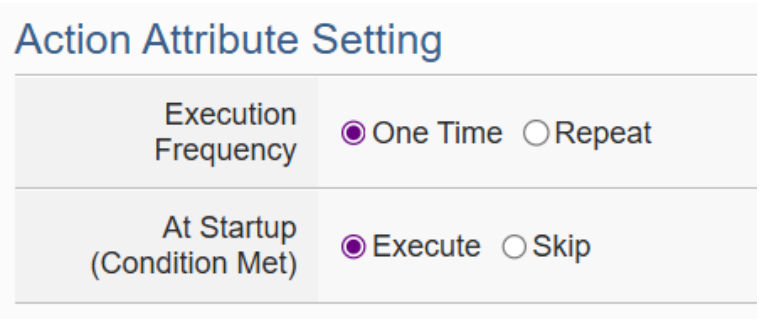


Figure 10-35：THEN/ELSE Action Attribute Setting

The setting options of THEN/ELSE Action are as follow:

10.2.1 ICP DAS Module

Click on ICP DAS Module, 5 options will appear as the following: DI Counter, DO, AO, Infrared and Heatmap File.

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:

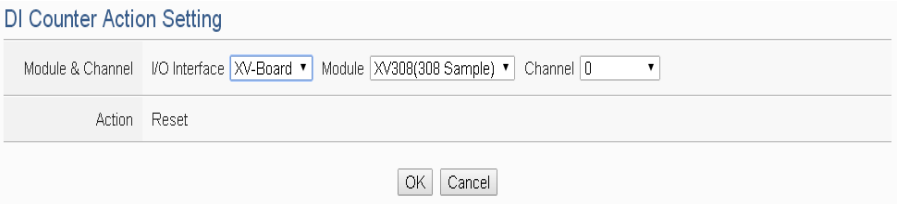


Figure 10-36：DI Counter action setting page

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:

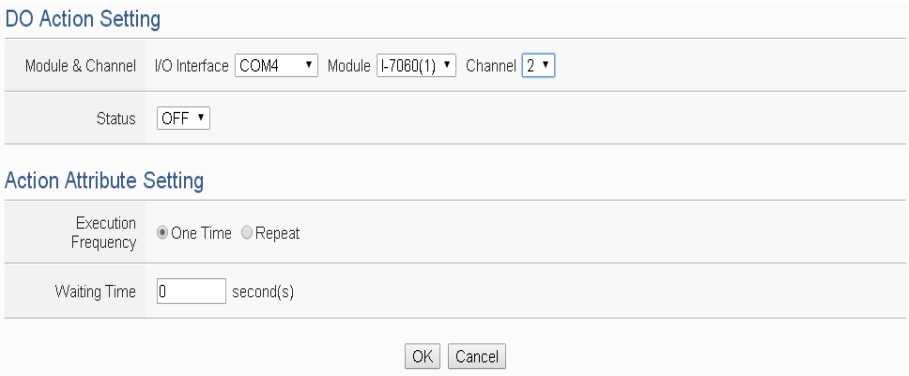


Figure 10-37：DO action setting page

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 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:

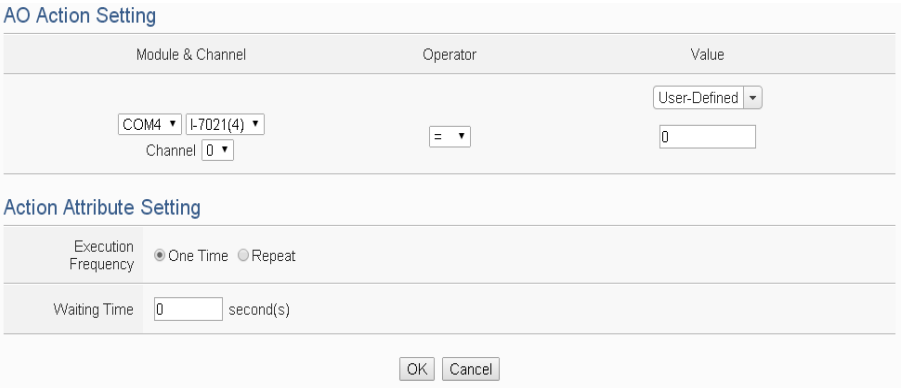


Figure 10-38：AO action setting page

Follow the steps below:

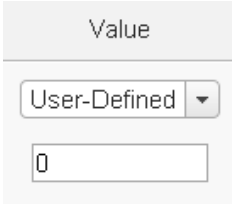
i From the dropdown list of the “Module & Channel” field, select the AO channel to execute actions.

ii Specify the Operator to be “=”, “+=”, or “-=” from the dropdown list in the “Operator” field. The 3 operators are as follow：

- “=”：Indicate assign the new AO channel value as the value in “Value” field
- “+=”：Indicate assign the new AO channel value as the original AO channel value plus the value in “Value” field.
- “-=”：Indicate assign the new AO channel value as the original AO channel value minus the value in “Value” field.

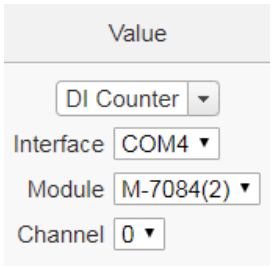
iii Set up the value in the “Value” field, WISE provides the following 12 value options to be used in the “Value” field:

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

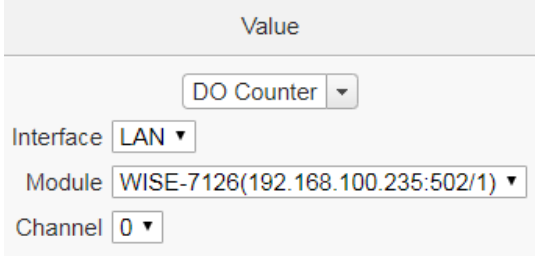


- Internal Register: Select the source and the number of the Internal Register from the dropdown list. About the "Source" field, the "Local" mean the Internal Register is from the Host controller (WISE). The "Remote" mean the Internal Register is from the others remote WISE controller.

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

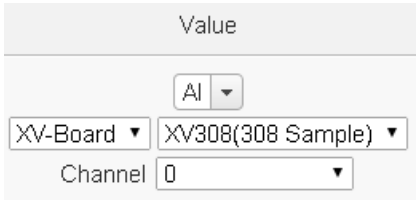


- DO Counter: Using DO channel counter values from ICP DAS WISE-71xx Module, select the module and channel from the dropdown list to specify which channel value will be used.

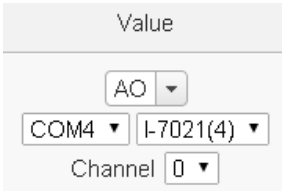


- AI: Using AI channel values from ICP DAS I/O Module, select the module and channel from the dropdown list to

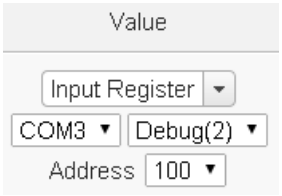
specify which channel value will be used.



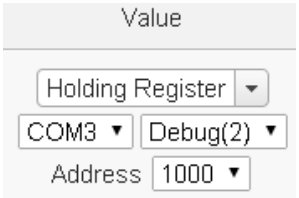
- AO: using AO channel values from ICP DAS I/O Module, select the module and channel from the dropdown list to specify which channel value will be used.



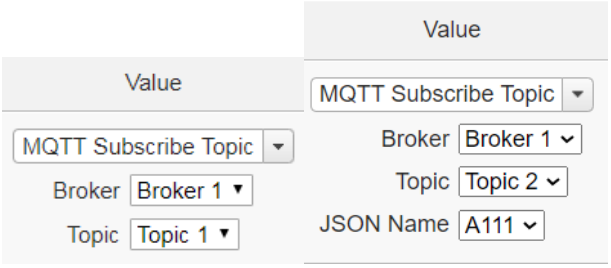
- Input Register: using the Input Register values from Modbus RTU/TCP Slave modules, select the module and the address from the dropdown list to specify which channel value will be used.



- 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.

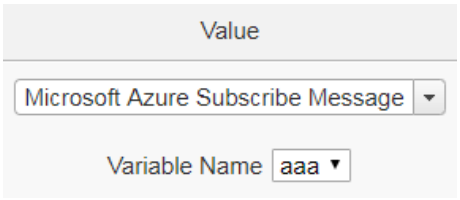


- MQTT: using the value of MQTT subscribe topic, select the broker and the subscribe topic from the dropdown list to specify which value will be used. If there was JSON Name in the subscribe setting, the value of the JSON Name could be used for operation.

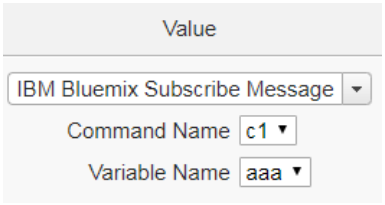


- AWS: using the value of AWS received parameter, select the topic or the JSON Variable name from the dropdown list to specify which value will be used.

- Azure: using the value of Azure received parameter, select the parameter from the dropdown list to specify which value will be used.



- Bluemix: using the value of Bluemix received parameter, select the command and the parameter from the dropdown list to specify which value will be used.



Please Note: The content of received MQTT subscribe topic or AWS / Azure / Bluemix parameter must be a number, otherwise 0 will be assigned.

iv Specify the "Execution Frequency" to be "One Time" or "Repeat". Please refer to "10.2 THEN/ELSE Action Setting" for detail.

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

10.2.1.4 Infrared

User can execute an action in ICP DAS IR module in THEN/ELSE Action statement; the editing page for Infrared Action is shown as follow:

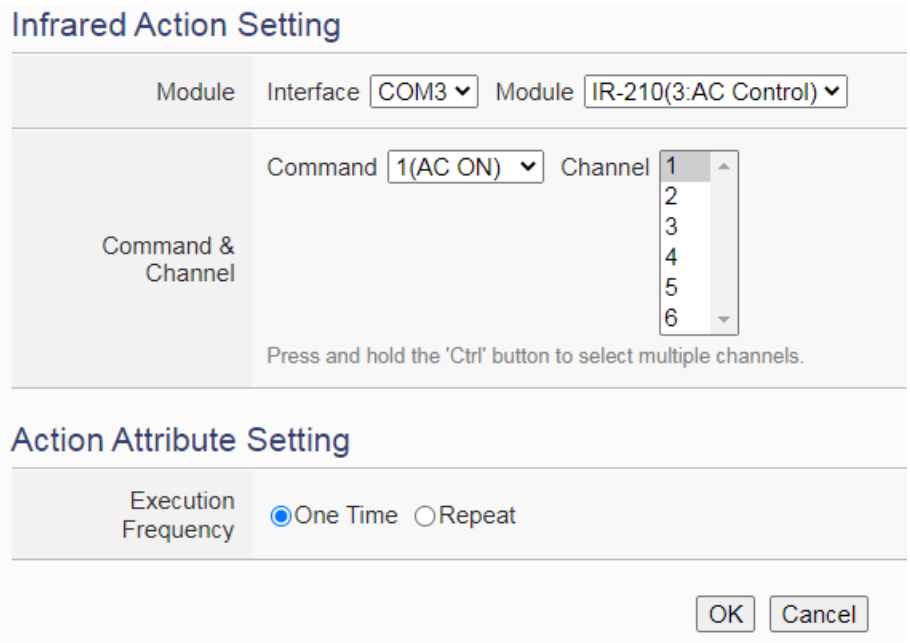


Figure 10-39：Infrared action setting page

Follow the steps below:

i Select the IR module from the dropdown list of the “Module” section.

ii In the “Command and Channel” field, set up the Infrared command to be sent.

iii Specify the “Execution Frequency” to be “One Time” or “Repeat”. Please refer to “10.2 THEN/ELSE Action Setting” for detail.

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

10.2.1.5 Heatmap File

User can execute the save action in ICP DAS iSN-81x-MTCP module in THEN/ELSE Action statement; the editing page for Heatmap File Action is shown as follow:

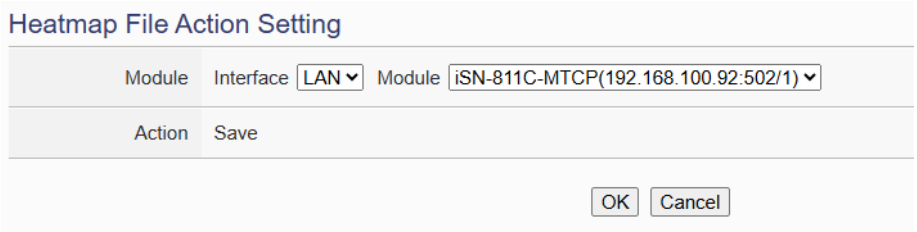


Figure 10-40：Heatmap File action setting page

Follow the steps below:

i Select the iSN-81x-MTCP module from the dropdown list of the “Module” section. When the WISE rule is triggered, it can generate and save the heatmap file.

ii 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 10-41：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 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:

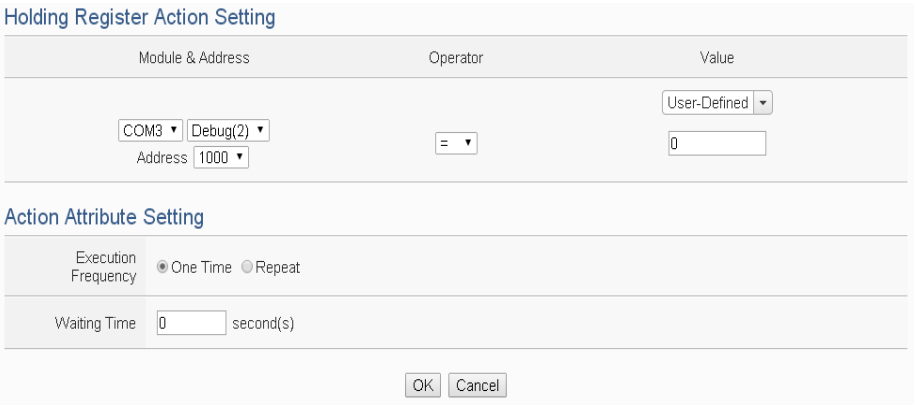


Figure 10-42：Holding Register action setting page

Follow the steps below:

i Select the module and the address of the Holding Register from the dropdown list of the “Module & Address” section.

ii Specify the Operator in the “Operator” field. The 3 operators are as follow：

- “=”：Indicate assign the new Holding Register value as the value in “Value” field.
- “+=”：Indicate assign the new Holding Register value as the original Holding Register value plus the value in “Value” field.
- “-=”：Indicate assign the new Holding Register value as the original Holding Register value minus the value in “Value” field.

iii Set up the value in the “Value” field, WISE provides 12 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 Click “OK” button to confirm the settings and return to the

Rule settings page.

10.2.3 IP Camera

Click on IP Camera, 3 options will appear as the following: Snapshot, Video and OSD Message.

10.2.3.1 Snapshot

User can trigger the IP Camera for the Snapshot operation in the THEN/ELSE Action statement; the editing page for Snapshot Action is shown as follow:

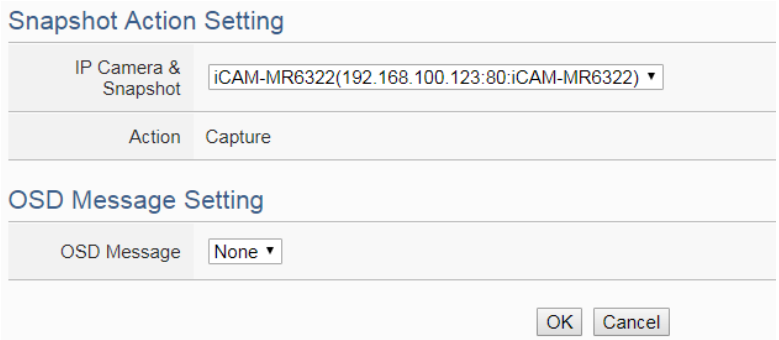


Figure 10-43：IP Camera's Snapshot action setting page

Follow the steps below:

i Specify the IP Camera from the dropdown list of the “IP Camera & Snapshot” section. If the WISE's action is executed, the WISE will trigger the IP Camera to capture a snapshot and save it.

ii If the IP Camera supports OSD message function and user has completed the setting, then a pre-set OSD message could be selected from the dropdown list of the “OSD message” field. The snapshot which the IP Camera captures will bind the OSD message and save it.

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

10.2.3.2 Video

User can trigger the IP Camera for the Video Recording operation in the THEN/ELSE Action statement; the editing page for Video Action is shown as follow:

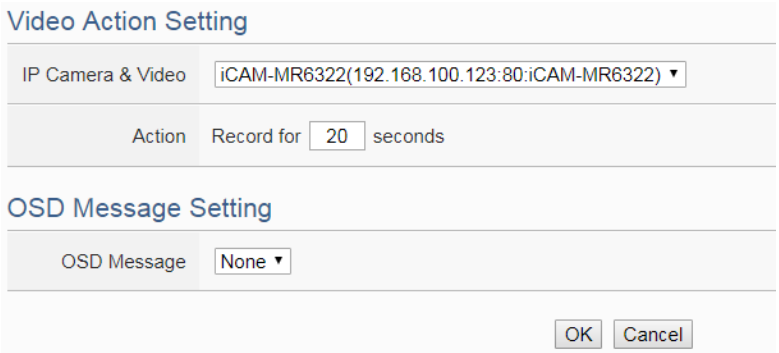


Figure 10-44：IP Camera's Event action setting page

Follow the steps below:

i Specify the IP Camera from the dropdown list of the "IP Camera & Video" section. If the WISE's action is executed, the WISE will trigger the IP Camera to record a video and save it. Some IP Cameras can set the length of time for video recording (10~60 seconds). The video file will be automatically uploaded to WISE after the video recording is finished.

ii If the IP Camera supports OSD message function and user has completed the setting, then a pre-set OSD message could be selected from the dropdown list of the "OSD message" field. The video which the IP Camera records will bind the OSD message.

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

10.2.3.3 OSD Message

User can trigger the IP Camera to enable the OSD message display operation in the THEN/ELSE Action statement; the editing page for OSD Message Action is shown as follow:

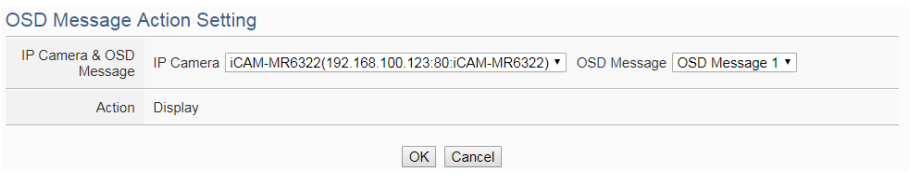


Figure 10-45：IP Camera's OSD Message action setting page

Follow the steps below:

i Specify the IP Camera and OSD message from the dropdown

lists of the “IP Camera” and “OSD message” sections. If the WISE's action is executed, the WISE will trigger the IP Camera to show the content of the selected OSD message.

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

10.2.4 Amazon Web Services

Click on “Amazon Web Services”, 3 options will appear as the following: “Function Status”, “Publish Message” and “Reset Variable”.

10.2.4.1 Function Status

User can execute an action to change the connection operation between Amazon Web Services(AWS) and WISE in the THEN/ELSE Action statement; the editing page is shown as follow:

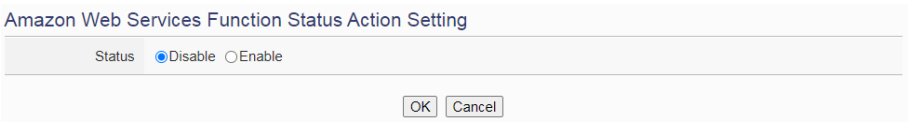


Figure 10-46：AWS Function Status action setting page

Follow the steps below:

i Specify the connection operation between AWS and WISE to be “Disable” or “Enable” from the dropdown list of the “Status” field.

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

10.2.4.2 Publish Message

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

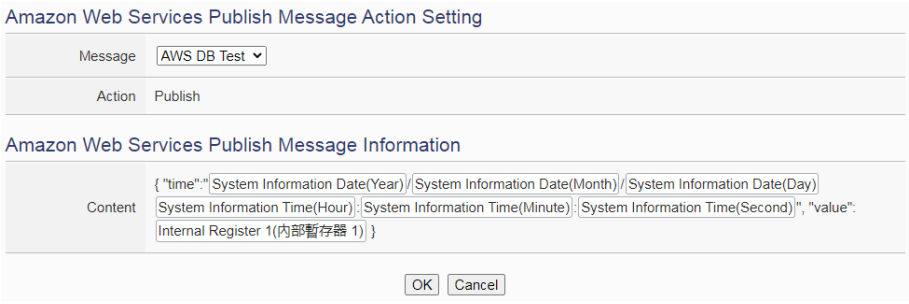


Figure 10-47：AWS Publish Message action setting page

Follow the steps below:

i Select a pre-set Publish message from the dropdown list of the "Message" field. The Publish message will be displayed for you to verify if this is the message you are going to send to.

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

10.2.4.3 Reset Variable

You can reset the saved content of the subscribe variable from AWS when executing a THEN/ELSE Action statement; the editing page is shown as below:

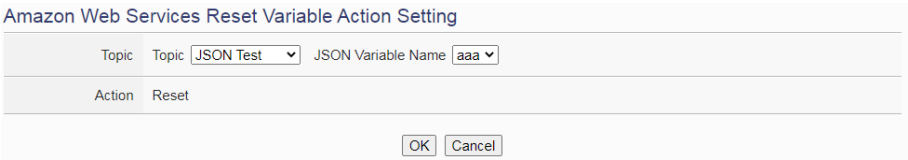


Figure 10-48：AWS Reset Variable action setting page

Follow the steps below:

i Select a pre-set Subscribe variable from the dropdown list of the "Variable Name" field. When this action is executed, WISE would reset the content of the variable, and the evaluation result of the IF statement which is associated with the variable will be verified again.

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

10.2.5 Microsoft Azure

Click on "Microsoft Azure", 3 options will appear as the following: "Function Status", "Publish Message" and "Reset Variable".

10.2.5.1 Function Status

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

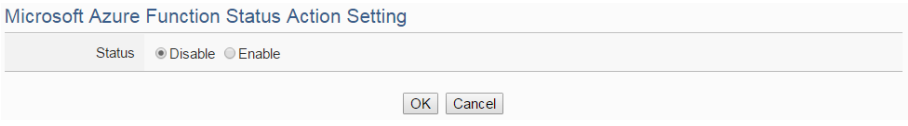


Figure 10-49：Microsoft Azure Function Status action setting page

Follow the steps below:

i Specify the connection operation between Microsoft Azure and WISE to be “Disable” or “Enable” from the dropdown list of the “Status” field.

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

10.2.5.2 Publish Message

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

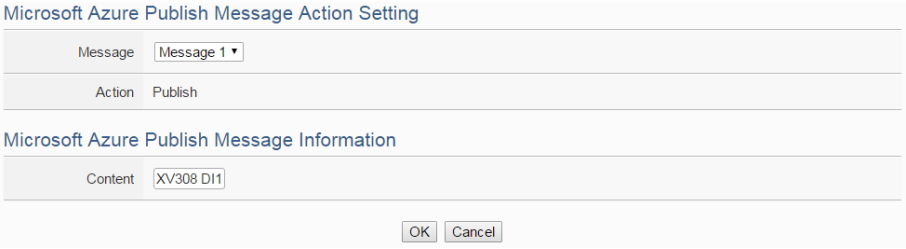


Figure 10-50：Microsoft Azure Publish Message action setting page

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.

10.2.5.3 Reset Variable

You can reset the saved content of the subscribe variable from Microsoft Azure when executing a THEN/ELSE Action statement; the editing page is shown as below:

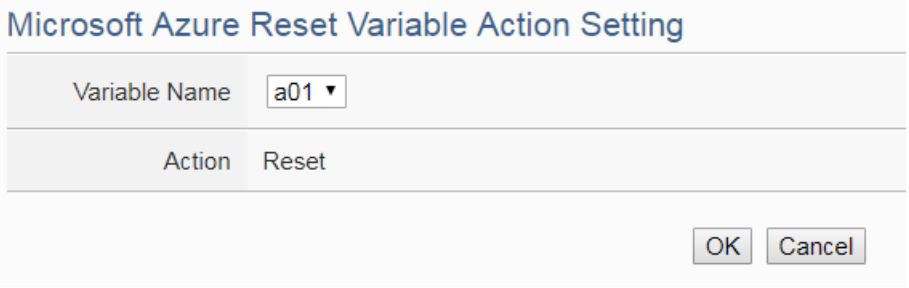


Figure 10-51：Microsoft Azure Reset Variable action setting page

Follow the steps below:

i Select a pre-set Subscribe variable from the dropdown list of the “Variable Name” field. When this action is executed, WISE would reset the content of the variable, and the evaluation result of the IF statement which is associated with the variable will be verified again.

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

10.2.6 IBM Bluemix

Click on “IBM Bluemix”, 3 options will appear as the following: “Function Status”, “Publish Message” and “Reset Variable”.

10.2.6.1 Function Status

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

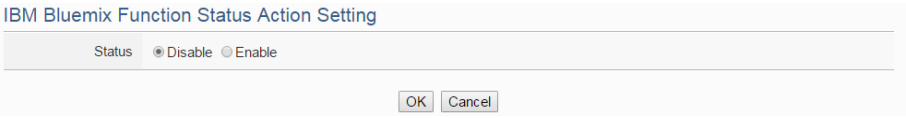


Figure 10-52：IBM Bluemix Function Status action setting page

Follow the steps below:

i Specify the connection operation between IBM Bluemix and WISE to be “Disable” or “Enable” from the dropdown list of the “Status” field.

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

10.2.6.2 Publish Message

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

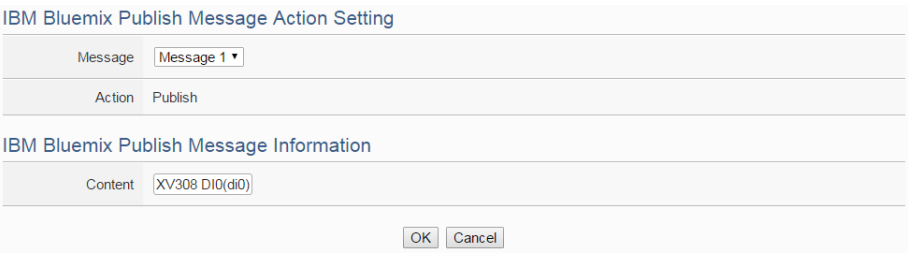


Figure 10-53：IBM Bluemix Publish Message action setting page

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.

10.2.6.3 Reset Variable

You can reset the saved content of the subscribe variable from IBM Bluemix when executing a THEN/ELSE Action statement; the editing page is shown as below:

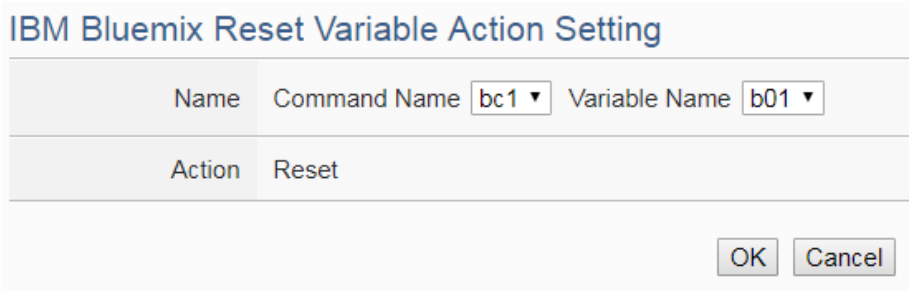


Figure 10-54：IBM Bluemix Reset Variable action setting page

Follow the steps below:

i Select a Command and a Variable from the dropdown list of the "Name" field. When this action is executed, WISE would reset the content of the variable, and the evaluation result of the IF statement which is associated with the variable will be verified again.

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

10.2.7 MQTT

Click on "MQTT", 3 options will appear as the following: "Broker Function", "Publish Message" and "Reset Topic".

10.2.7.1 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 10-55：MQTT Broker Function action setting page

Follow the steps below:

i Select the specific Broker from the dropdown list of the "Broker" field.

ii Specify the Broker Function status to be "Disable" or "Enable" from the dropdown list of the "Status" field. When the Action being executed, the Broker Function status will be changed to specified status.

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

10.2.7.2 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:

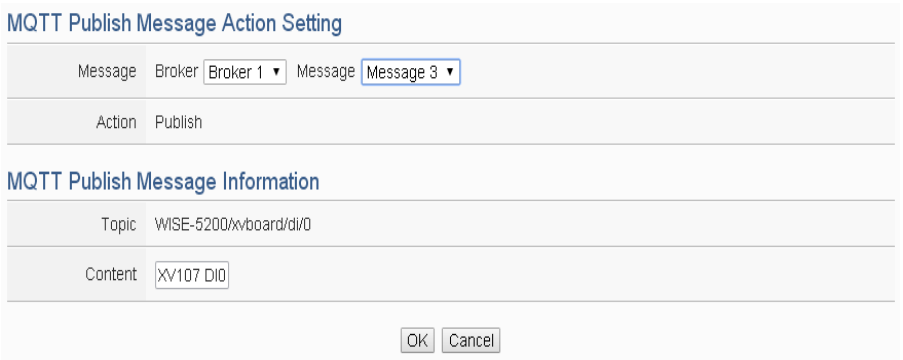


Figure 10-56：MQTT Publish Message action setting page

Follow the steps below:

i Select a pre-set MQTT Publish Topic message from the dropdown list of the "Broker" and "Message" fields. The MQTT Publish Topic message will be displayed for you to verify if this is the MQTT Publish Topic message you are going to send to.

ii Click "OK" button to confirm the settings and return to the Rule

settings page.

10.2.7.3 Reset Topic

You can reset the saved content of the subscribe topic when executing a THEN/ELSE Action statement; the editing page is shown as below:

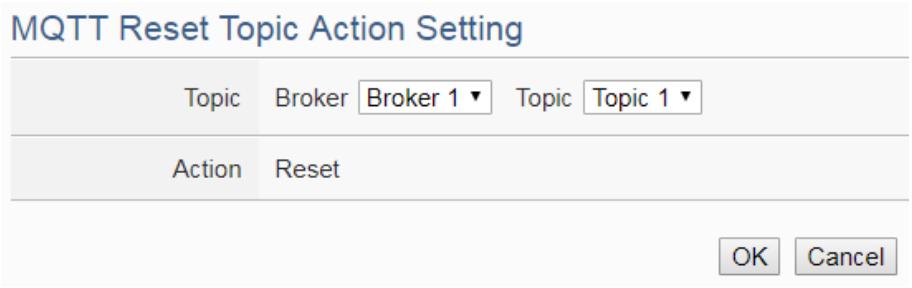


Figure 10-57：MQTT Reset Topic action setting page

Follow the steps below:

i Select a pre-set MQTT Subscribe Topic from the dropdown list of the “Broker” and “Topic” fields. When this action is executed, WISE would reset the message of the topic, and the evaluation result of the IF statement which is associated with the topic will be verified again.

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

10.2.8 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 10-58：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.

10.2.9 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 10-59：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.

10.2.10 SMS Alarm

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

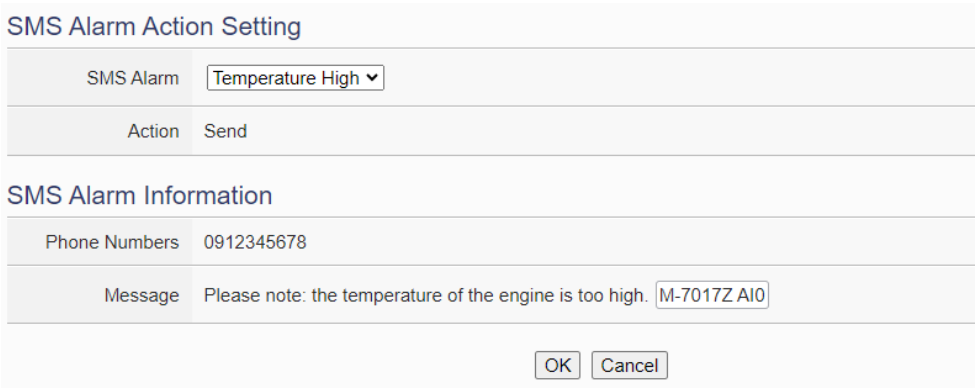


Figure 10-60：SMS Alarm action setting page

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.

10.2.11 CGI Command

Click on "CGI Command", 2 options will appear as the following: "Send" and "Reset Variable".

10.2.10.1 Send

You can send a CGI Command to a Remote CGI Server device when executing a THEN/ELSE Action statement; the editing page is shown as below:

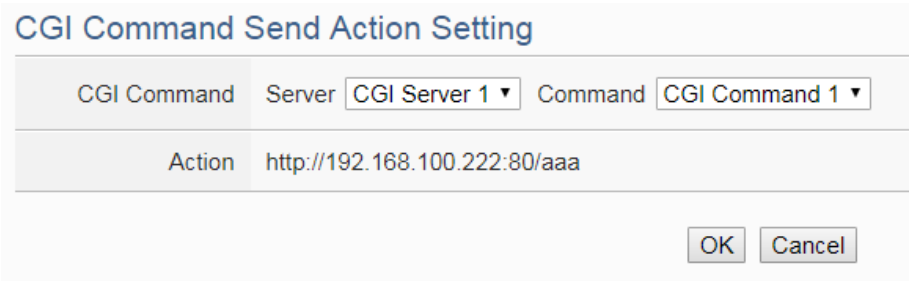


Figure 10-61：CGI Command Send action setting page

Follow the steps below:

i Select a pre-set CGI Command from the dropdown list of the

"Server" and "Command" field of the CGI Command section. The CGI Command information will be displayed for you to verify if this is the CGI Command you are going to send to.

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

10.2.10.2 Reset Variable

You can reset the saved content of the CGI Command variable when executing a THEN/ELSE Action statement; the editing page is shown as below:

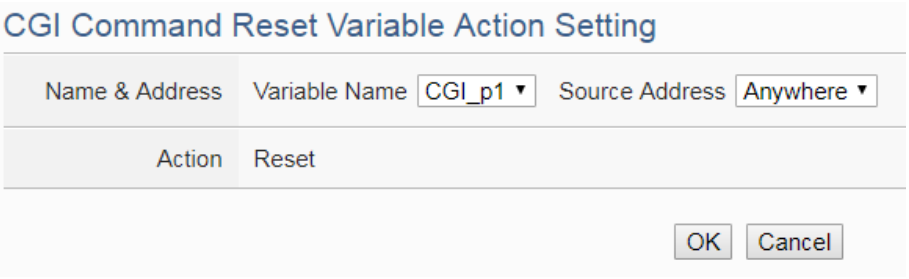


Figure 10-62：CGI Command Reset Variable action setting page

Follow the steps below:

i Specify the CGI Command variable and CGI Command source from the dropdown list of "Variable Name" field and "Source Address" field. When this action is executed, WISE would reset the content of the variable, and the evaluation result of the IF statement which is associated with the variable will be verified again.

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

10.2.12 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 10-63：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.

10.2.13 Database

You can insert the data into the table when executing a THEN/ELSE Action statement. The setting page is show as below:

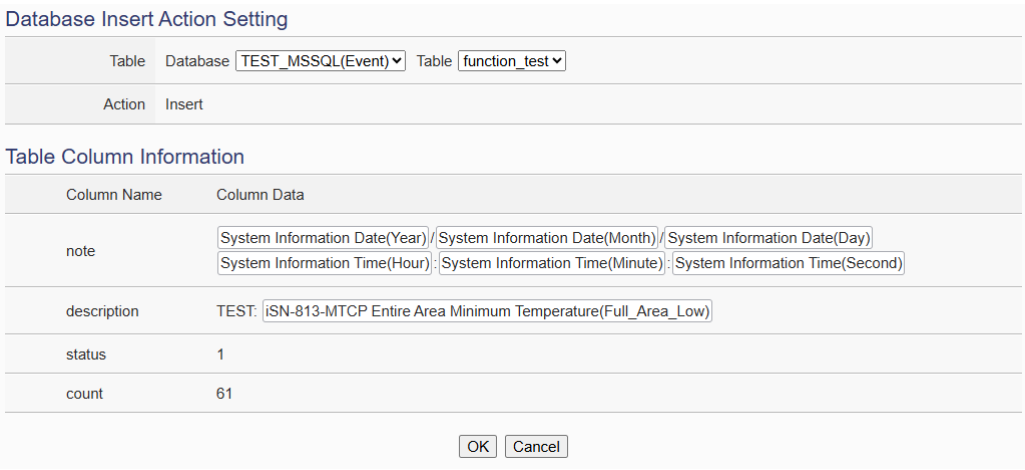


Figure 10-64：Database action setting page

Follow the steps below:

i In the “Table” field, select the configured database and table. The selected table description and column information will be displayed for you to verify if this is the table you want to insert.

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

10.2.14 SNMP Trap

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

Figure 10-65：SNMP Trap action setting page

Follow the steps below:

iii In the “Agent” and “Trap” field, specify the SNMP Trap you want to execute in Action from the dropdown list. The selected SNMP Trap message content will be displayed for you to verify if this is the SNMP Trap you want to send.

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

10.2.15 LINE Messaging API

Users can configure the THEN/ELSE actions to send LINE Messaging API messages to a LINE personal account or group chat room when certain conditions are met. The configuration interface is as follows:

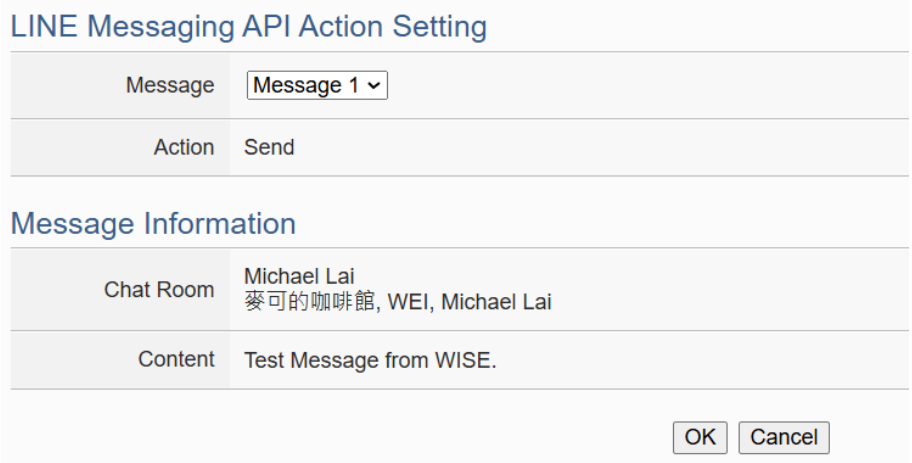


Figure 10-66：LINE Messaging API action setting page

Follow the steps below:

i In the “Message” field, select a pre-configured LINE Messaging API message. After selecting the LINE Messaging API message, the system will display the chat room to which the message will be sent and the content of the message. This allows the user to verify that the

selected LINE Messaging API message will be sent to the correct recipient and with the correct content.

ii Click the “OK” button to save this setting and exit this page to return to the rule configuration page.

10.2.16 IoTstar Bot Service

You can send a specific IoTstar Bot Service message to the LINE personal account which is bound with IoTstar when executing a THEN/ELSE Action statement. The setting page is show as below:

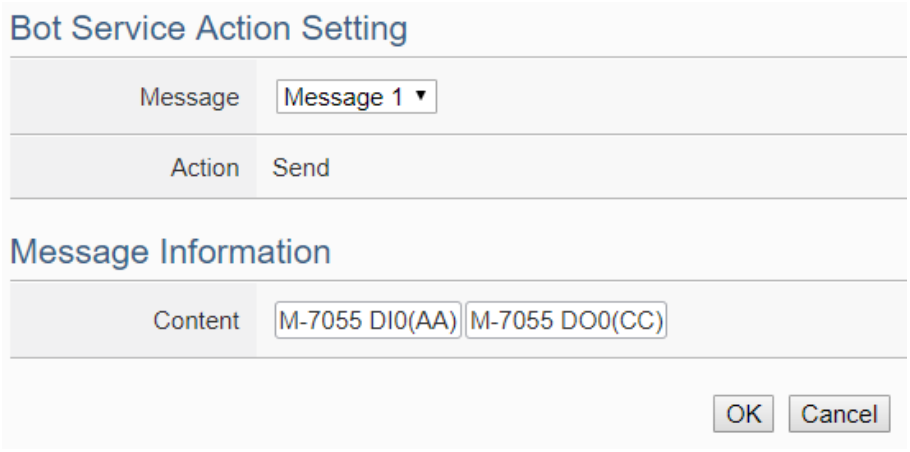


Figure 10-67：IoTstar Bot Service action setting page

Follow the steps below:

i In the “Message” field, specify the message you want to send in Action from the dropdown list. The content of the selected Bot Service message will be displayed for you to verify if this is the message you want to send.

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

10.2.17 IoTstar Alarm

Users can configure actions to send alarms to the IoTstar server when specific conditions are met, along with the severity level of the alarm. The configuration interface is shown below:

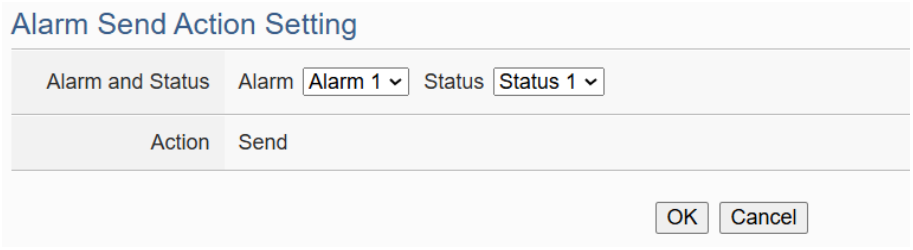


Figure 10-68：IoTstar Alarm action setting page

Follow the steps below:

i In the “Alarm and Status” field, select the alarm and its corresponding status to be sent.

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

10.2.18 Telegram

You can send a specific Telegram message to Telegram bot account or group chat rooms when executing a THEN/ELSE Action statement. The setting page is show as below:

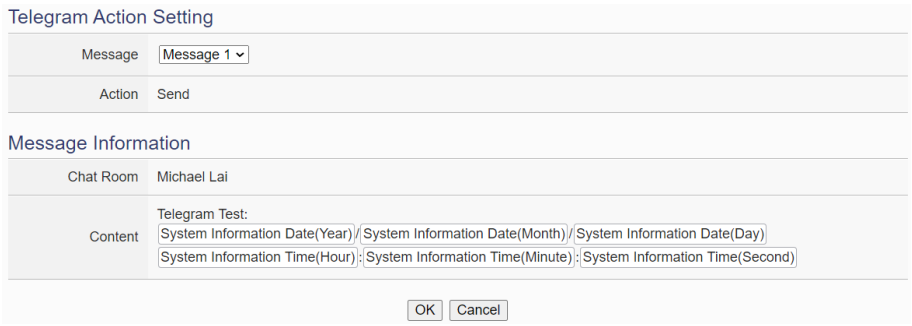


Figure 10-69：Telegram action setting page

Follow the steps below:

i In the “Message” field, specify the Telegram message you want to send in Action from the dropdown list. The selected Telegram message such as “Chat Room” and message content will be displayed for you to verify if this is the Telegram message you want to send.

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

10.2.19 Re-boot System

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

Figure 10-70：Reboot system action setting page

Follow the steps below:

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

10.2.20 Reset Modem

The Reset modem action would power off and then power on the modem again to force the modem back to the initial status, and then the mobile connection would be re-started if the mobile network connection is enabled. The setting page is show as below:

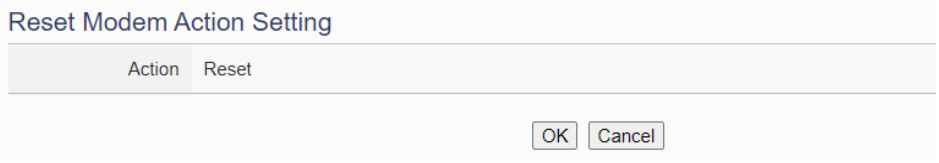


Figure 10-71：Reset modem action setting page

Follow the steps below:

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

10.2.21 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:

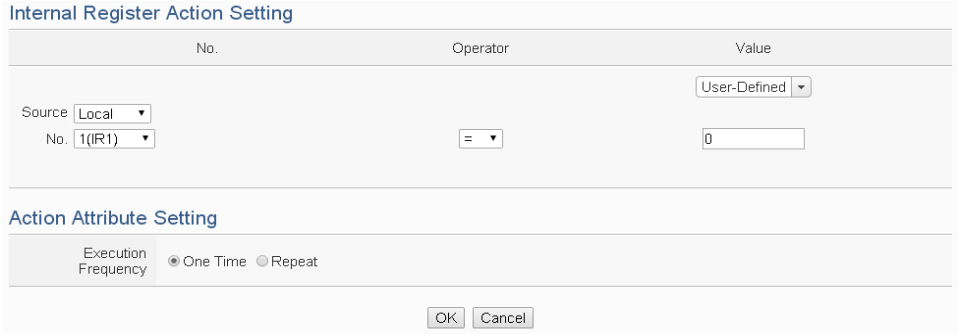


Figure 10-72：Internal Register action setting page

Follow the steps below:

i Select the pre-defined Internal Register from the dropdown lists of the "Source" and "No" field. The "Local" in the "Source" field mean the Internal Register is from the Host controller (WISE). The "Remote" in the "Source" field mean the Internal Register is from the remote WISE-71xx controller. Please note: the Internal Register you select has to be enabled in Advanced Setting.

ii Specify the Operator in the "Operator" field. The 6 operators are as follow:

- "=" : Indicate assign the new Internal Register value as the value in "Value" field.
- "+=" : Indicate assign the new Internal Register value as the original Internal Register value plus the value in "Value" field.
- "-=" : Indicate assign the new Internal Register value as the original Internal Register value minus the value in "Value" field.
- "*=" : Indicate assign the new Internal Register value as the original Internal Register value times the value in "Value" field.
- "/=" : Indicate assign the new Internal Register value as the original Internal Register value is divided by the value in "Value" field.
- "%=" : Indicate assign the new Internal Register value as the original Internal Register value divide the value in "Value" field and return the remainder.

iii Set up the value in the "Value" field, WISE provides 12 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.

10.2.22 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:

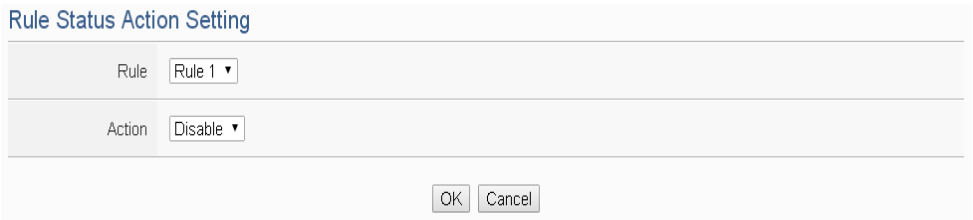


Figure 10-73：Rule Status action setting page

Follow the steps below:

i Specify the Rule (It has to be a previously saved Rule) that is going to be changed in the Action Condition statement from the dropdown list of the "Rule" field.

ii Specify the Rule status to be "Disable" or "Enable" from the dropdown list of the "Action" field. When the Action being executed, the Rule status will be changed to specified status.

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

10.2.23 Delay

Users can add the Delay action to define the delay time before the execution of next actions. The editing page for Delay Action Setting is shown as below:

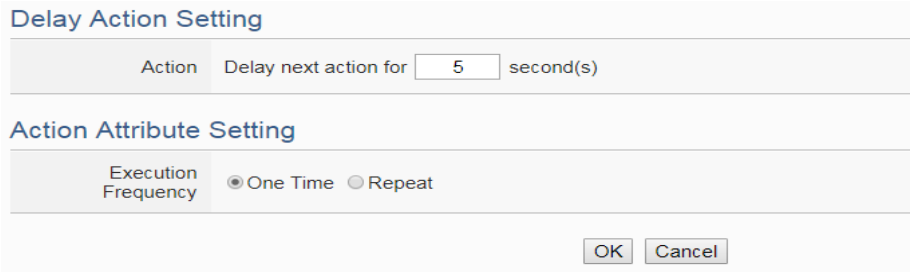


Figure 10-74：Delay action setting page

Follow the steps below:

i In the "Action" field, set the delay time (unit: second) before the execution of next actions. The counting of the delay time would start when the previous action starts, rather than when the previous action is done.

ii Specify the "Execution Frequency" to be "One Time" or "Repeat". Please refer to "10.2 THEN/ELSE Action Setting" for detail.

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

11 Download to Module

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

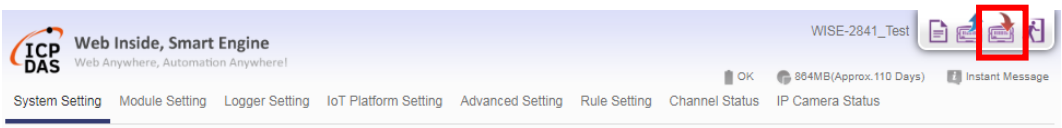


Figure 11-1：“Save” button of Rules management toolbar

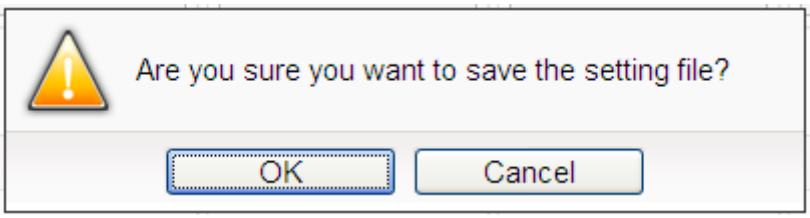


Figure 11-2：Confirm to save settings

Click “OK” button to complete the process and save all parameter settings and Rule settings from the web page of WISE to the WISE hardware. Now WISE will start to run the rules that have been downloaded. At this time, you can still edit or modify the content of the rules.

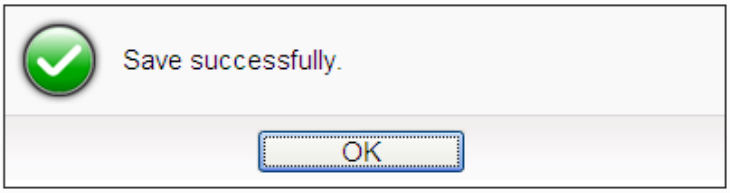


Figure 11-3：Save settings successfully

12 Upload from Module

The "Load" button on the right upper of WISE Web page allows you to retrieve the setting and rules information from the WISE hardware to the Web page of WISE.

Click on the "Load" to start the process.

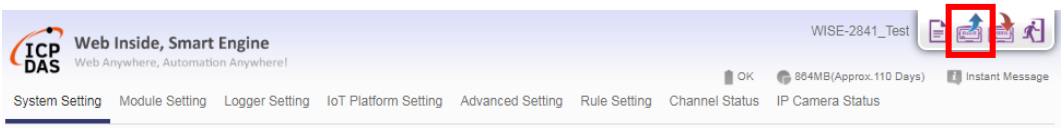


Figure 12-1：“Load” button of Rules management toolbar

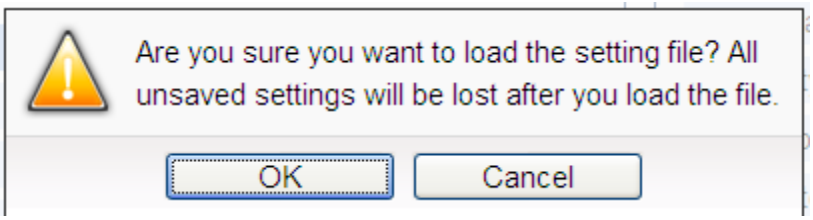


Figure 12-2：Confirm to load settings

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

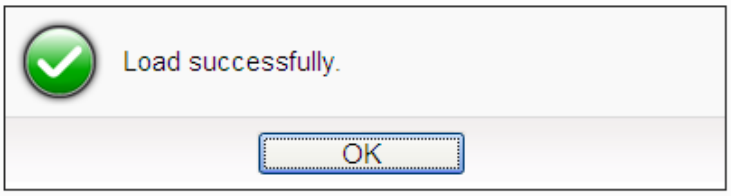


Figure 12-3：Load settings successfully

13 Channel Status

Channel Status page offers an easy way to view monitoring page that allows you to view important controller information in real time without SCADA software. This page will be updated once every 5 seconds, showing the latest data of the controllers. The Channel Status page includes the following information.

- Default Channel Status page: It displays the all I/O channel information based on the sorting of all I/O Modules.

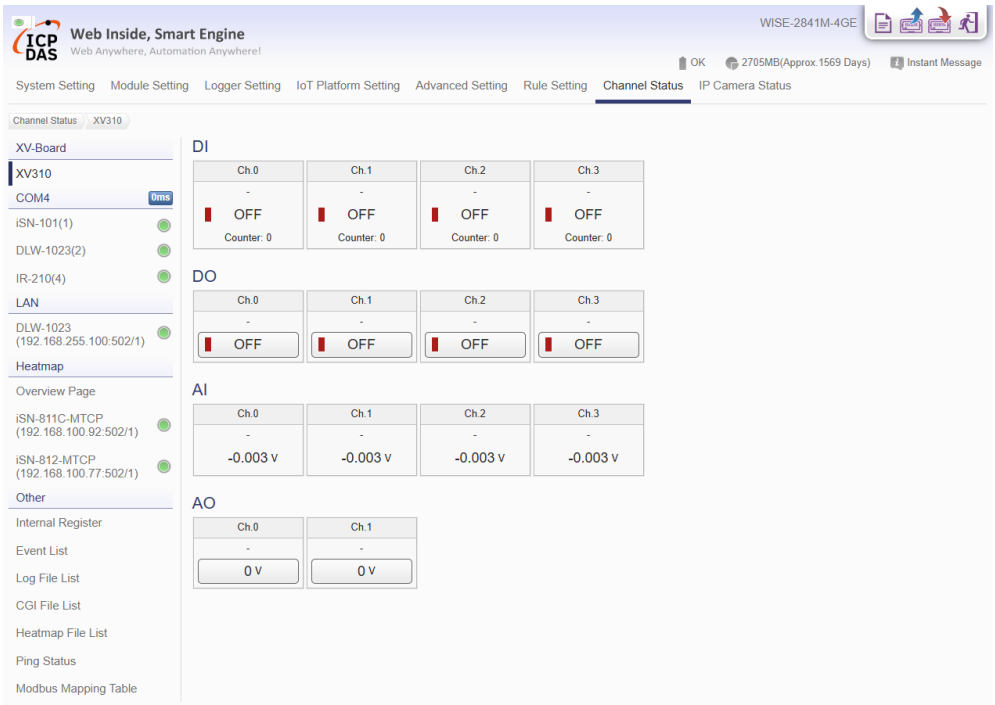


Figure 13-1：Channel Status page

- User-defined Channel Status page: It displays the I/O channel status based on the user-defined arrangement. Please refer "9.12 Channel Status Setting" section for detail.
- Heatmap Status Page: The ICP DAS iSN-81x-MTCP series infrared temperature measurement modules are displayed independently under the "Heatmap" category, providing real-time heatmap along with the highest, lowest, and average temperatures of the areas. If multiple iSN-81x-MTCP modules are configured, an "Overview Page" will be shown in the category, allowing users to view the real-time heatmap of all modules at once page.

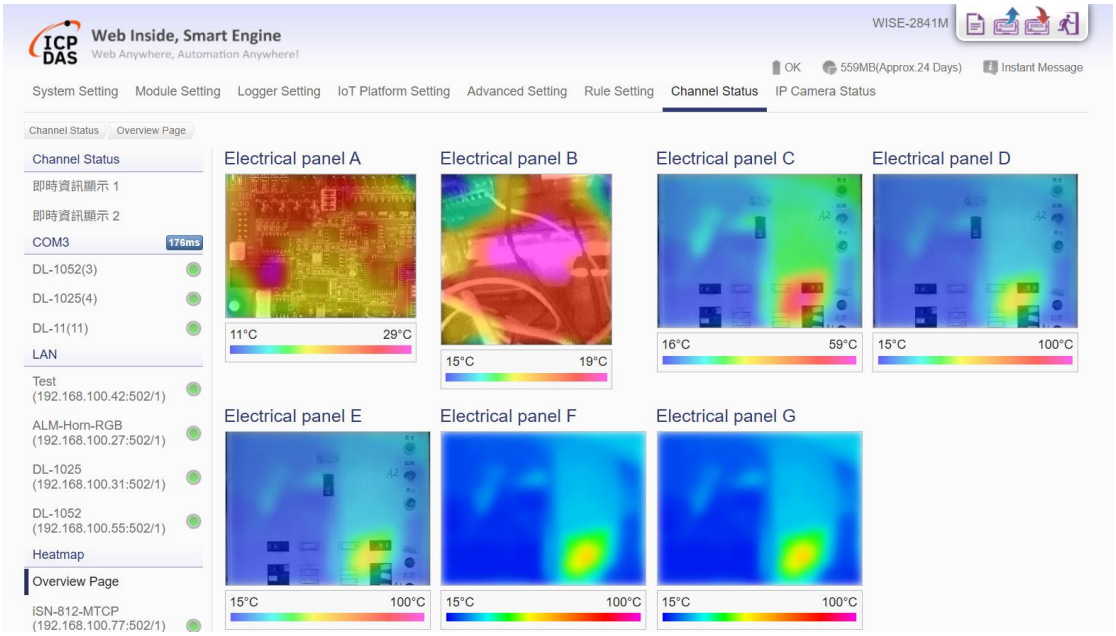


Figure 13-2：Heatmap Overview page

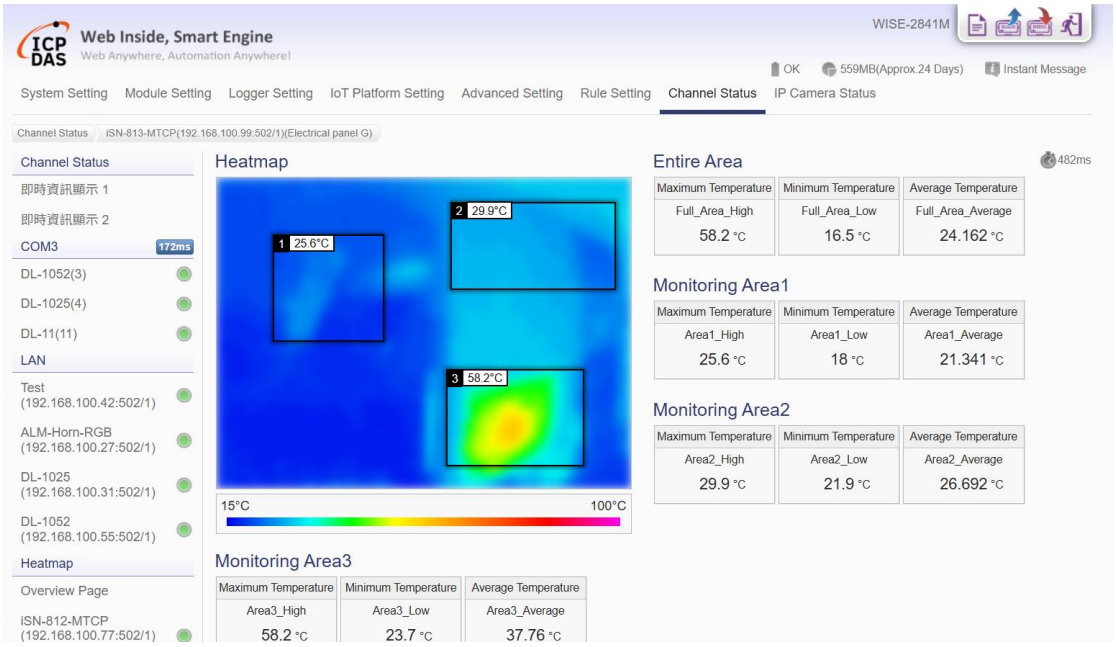


Figure 13-3：Heatmap Single Module page

- Internal Register Status Page: It displays the WISE's Internal Register status.

- Event List: It displays the system event list of WISE.

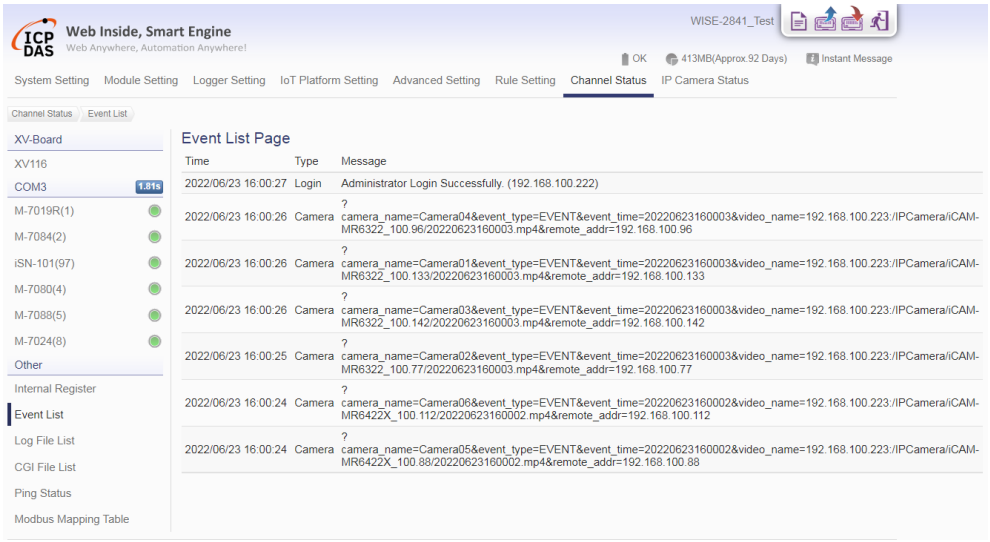


Figure 13-4：Event List page

- Log File List: It displays the WISE's Data Logger file list. It includes the logger file from I/O Module Data Logger, User-Defined Data Logger, Event Logger and MQTT Logger. Click on the desired single item to download the file.

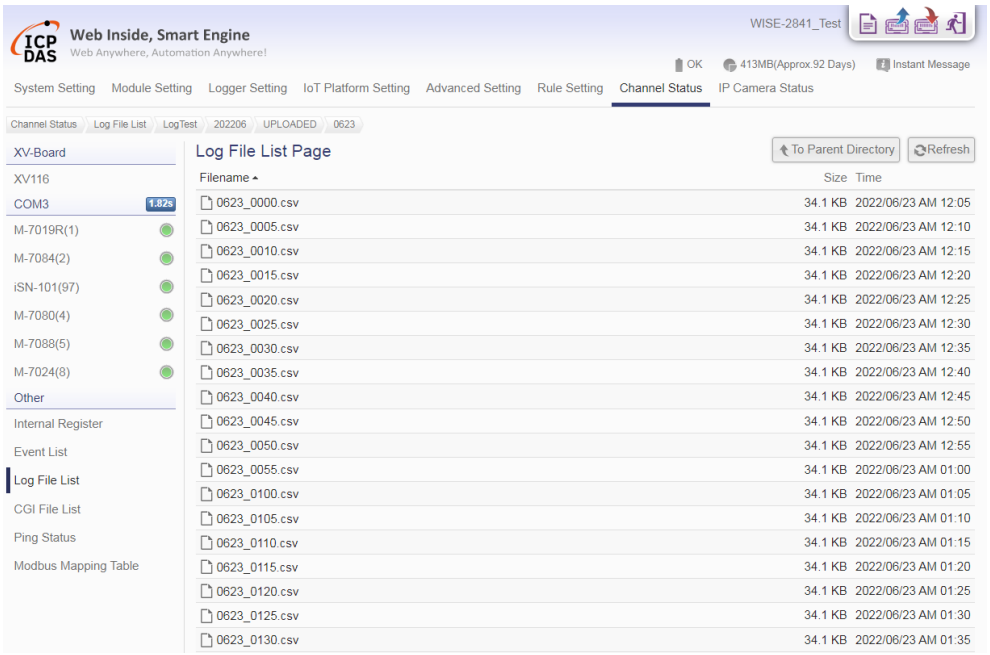


Figure 13-5：Log File List page

- CGI file list: It displays the file list which WISE creates and save the reply content from the remote CGI Servers. If the CGI file is an Image or Video file, the users can click on it directly to display the content of the file by

Browser. The users can choose to view the file list in “List” or “Thumbnail” format by clicking the button on the Right-Top corner of the page. The user can also click on the “Refresh” button to refresh the file list of the folder.

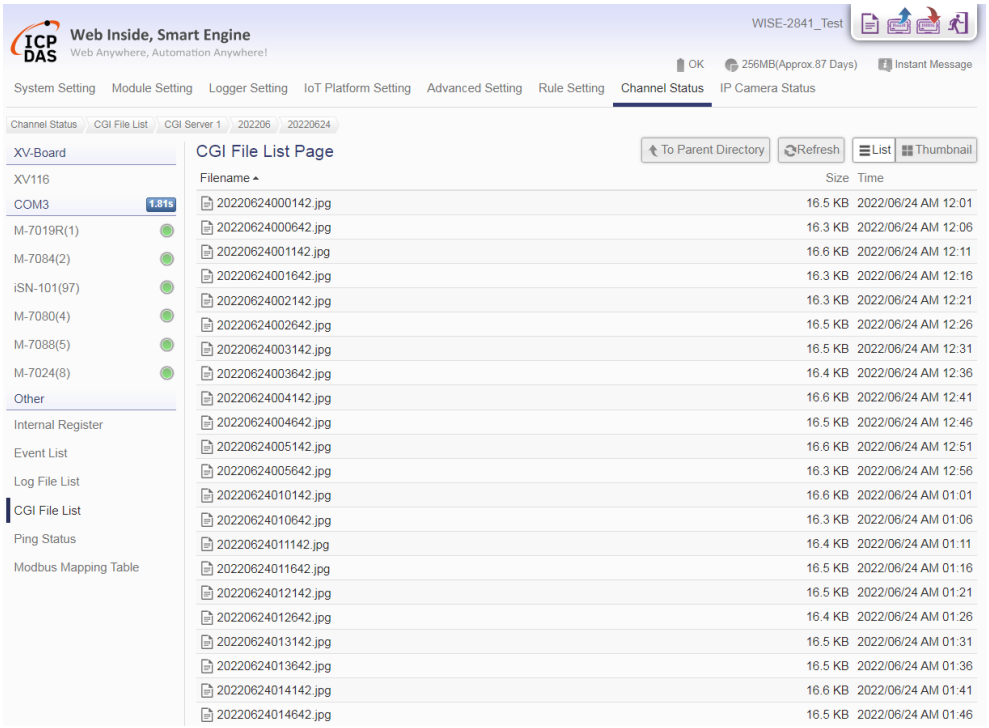


Figure 13-6：CGI file list page by “List” format

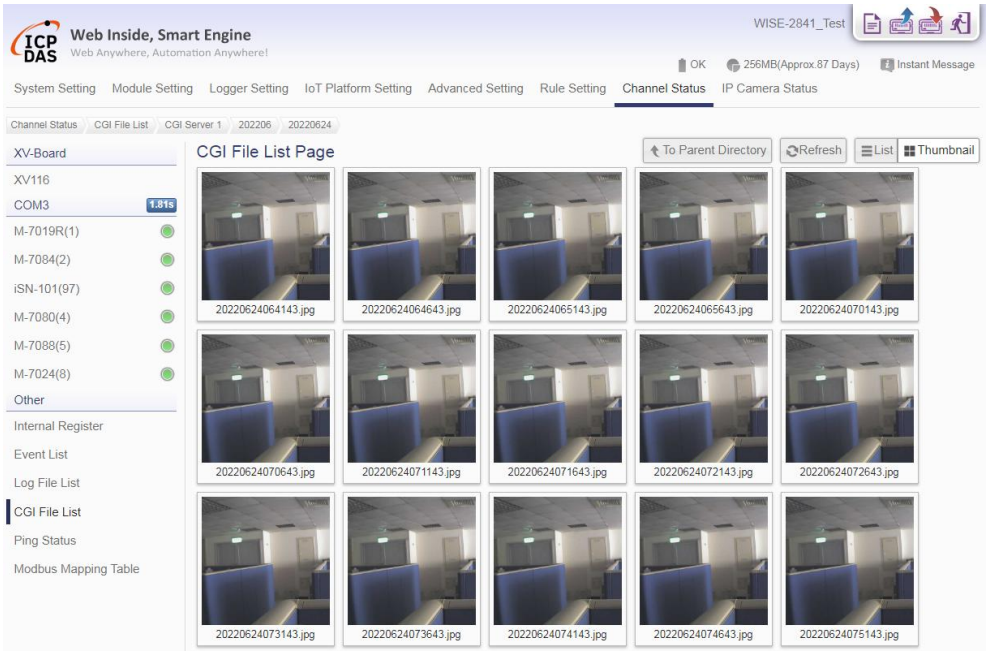


Figure 13-7：CGI file list page by “Thumbnail” format

- Heatmap File List: It displays the heatmap file saved by the iSN-81x-MTCP modules connected to WISE. The users can click on the heatmap file directly to display the content of the file by Browser. The users can choose to view the file list in “List” or “Thumbnail” format by clicking the button on the Right-Top corner of the page. The user can also click on the “Refresh” button to refresh the file list of the folder.

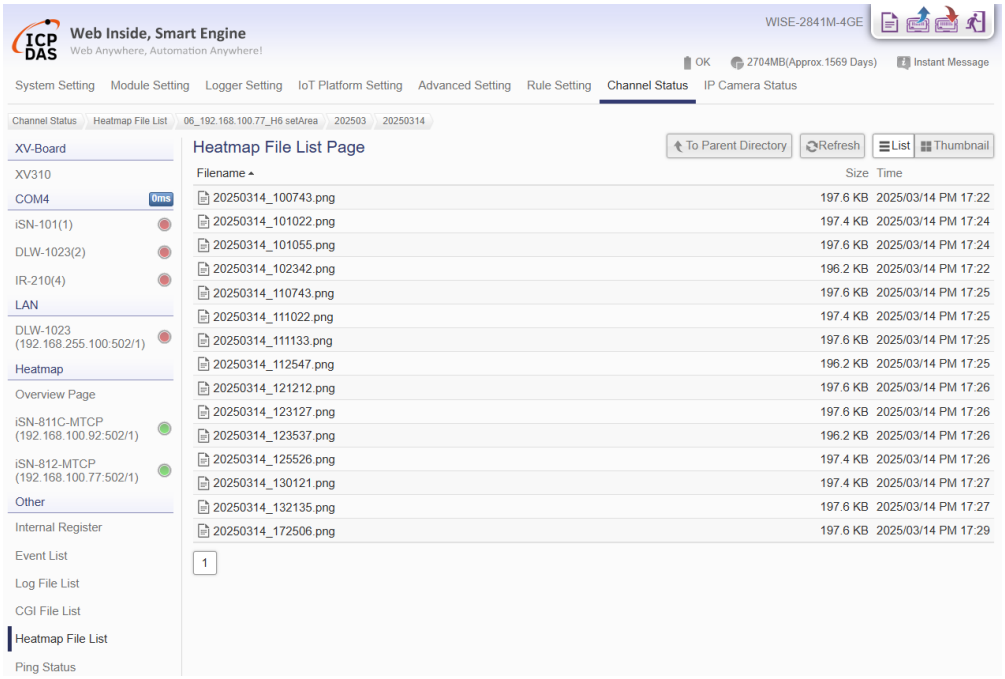


Figure 13-8：Heatmap file list page by “List” format

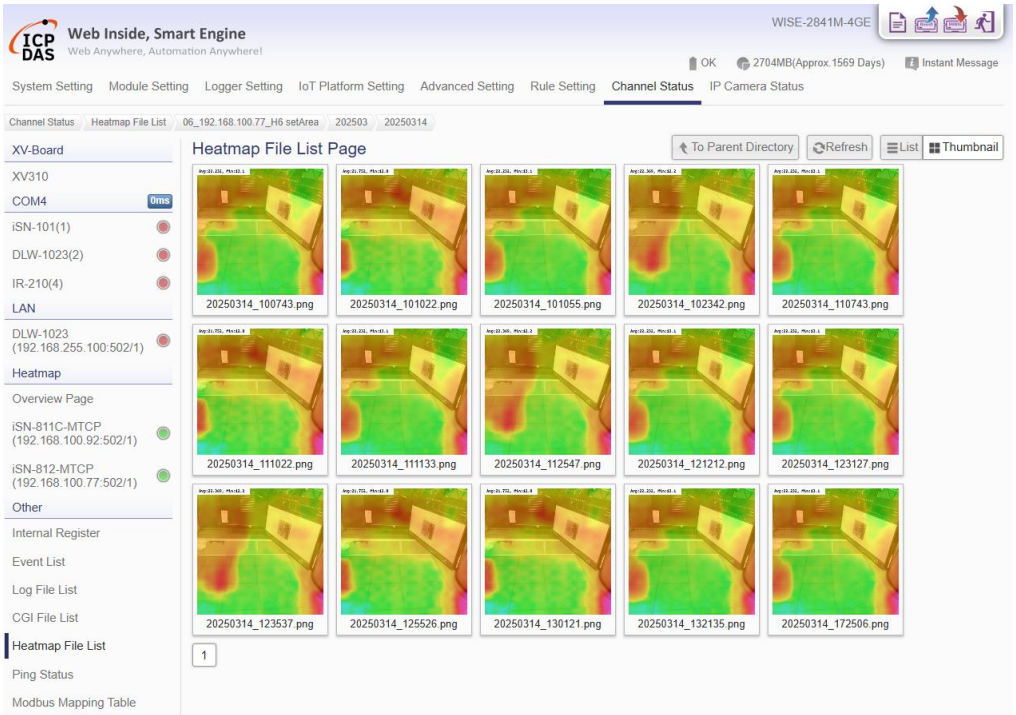


Figure 13-9：Heatmap file list page by “Thumbnail” format

- Ping Status Page: It displays the latest Ping results of all Ping targets. The latest ping result is displayed in the “Result” column, and the response time is displayed in the “Response Time” column. In the “Failed Times/Ratio” column, it displays the continuous failed times or the failed ratio that depends on the Failed Condition. The “Last Success Time” column displays the timestamp of the latest successful ping.

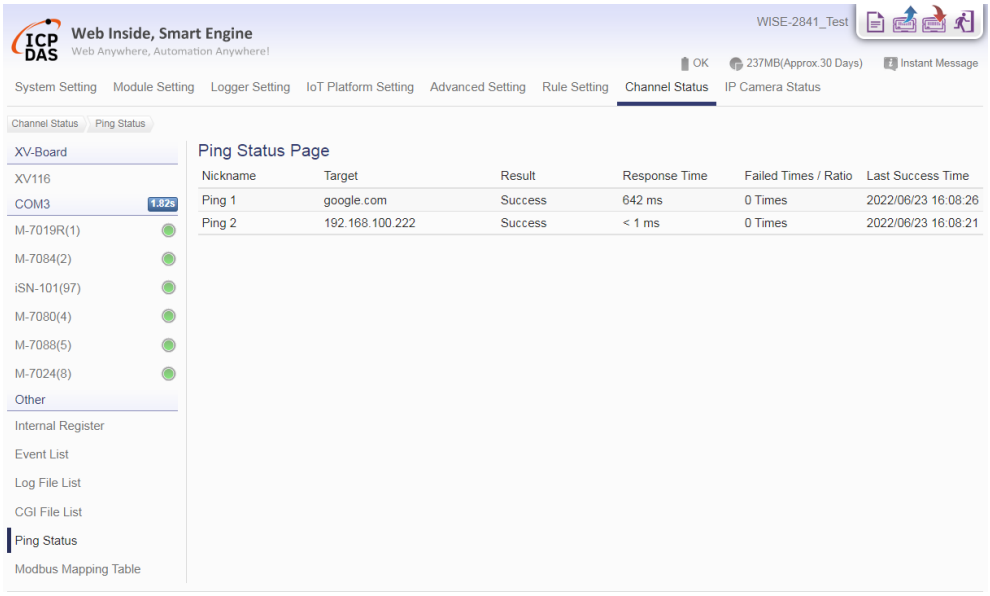


Figure 13-10：Ping Status page

- Modbus Mapping Table: It displays the Modbus address of all I/O channels on the I/O modules which are connected to WISE. With the help of this page, users do not have to calculate the Modbus address of the I/O channels

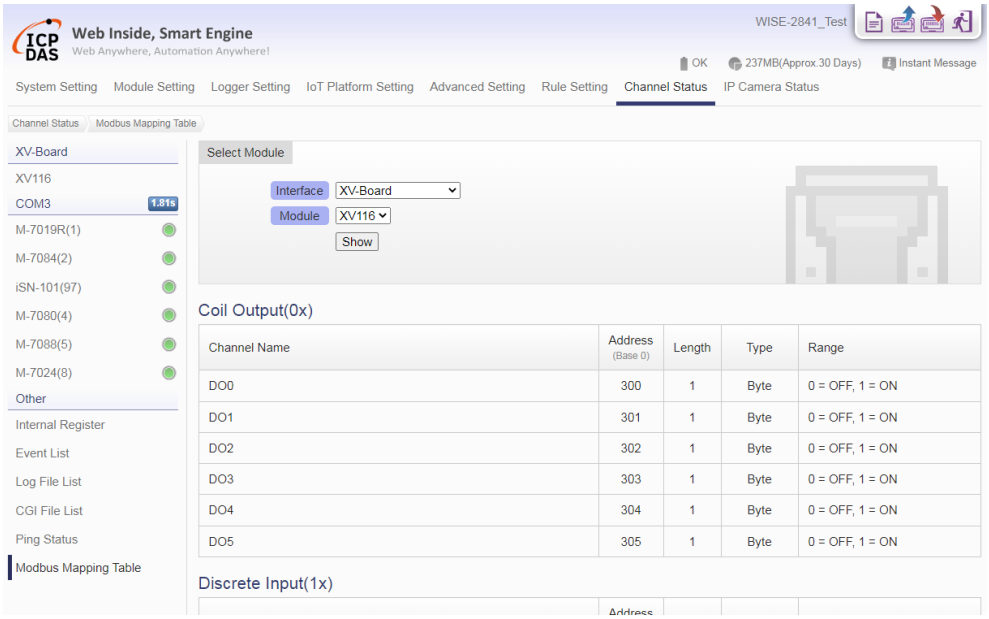


Figure 13-11：Modbus Mapping Table page

14 IP Camera Status

Click on the “IP Camera Status page”, it shows the Image/Video files captured by the IP Camera and sent back to the WISE and displays the Event List. The user can directly click and review the Image/Video file on this page. The IP Camera Status page could be divided into 2 sections:

i. The IP Camera List: On the left side of the page, it will show the list of the IP Cameras which are connected to the WISE. It will also show the connection status between the IP Camera and the WISE.

ii. Event List:

- The Calendar interface will show the Time range by month for the dates if there is an Event happened. The date will be marked with a Blue triangle on the left upper corner

.
- Click on the Date marked with the Blue triangle, the lower area of the page will show a list of all events happened in that date with all Image/Video files corresponding to these events. The Name of Event will be the same as the name of the IF-THEN-ELSE rule that triggered the IP Camera operation or the pre-defined Event's name of the IP Camera. All Image/Video files of the same Event will be sorted in the same folder of the Image List.
- Click on the icon of the Image/Video file to directly review the original Image file or the content of the Video file.

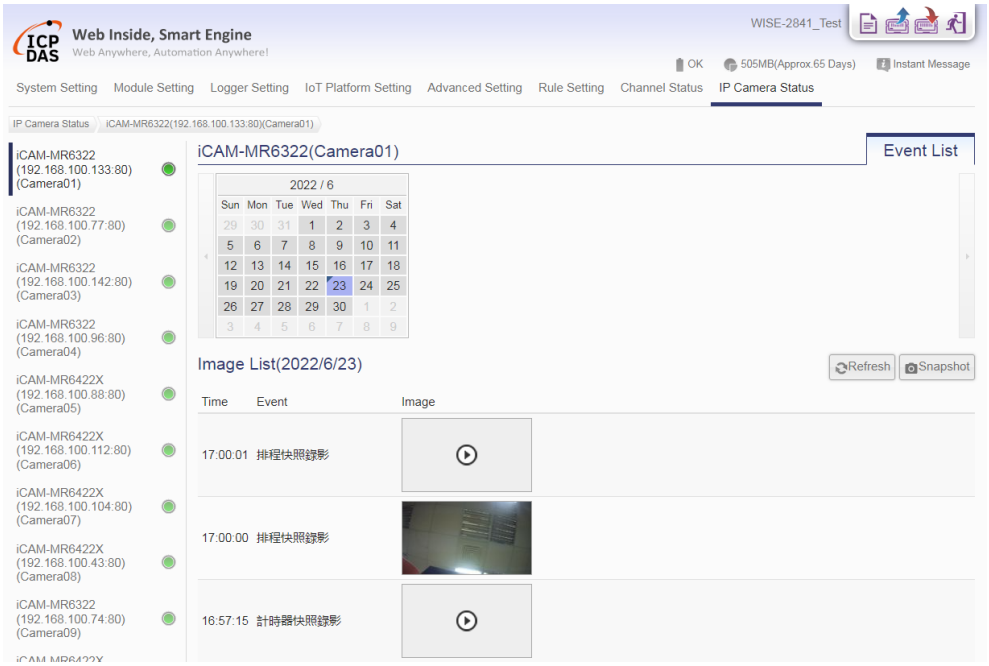


Figure 14-1：IP Camera Status and Event List page

15 Firmware Update

WISE allows to update firmware via browser, after the update is completed; the WISE doesn't require to reboot. Please follow the steps below:

i. Before update
   - Please visit WISE product web site (http://wise.icpdas.com/) or contact ICP DAS service to obtain the latest version of the WISE firmware program. Copy the file to the computer that you will use to connect with WISE via browser.
   - Connect the WISE (the one you are going to update WISE firmware) to the network. Please verify and make a note of the WISE IP address, you will need it later in the process.

ii. Launch the browser from the computer which owns the latest version of the WISE firmware. Connect the browser with the IP address of the WISE Web page.

iii. Login in the WISE as the Administrator.

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

Figure 15-1：Firmware Update Setting page

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

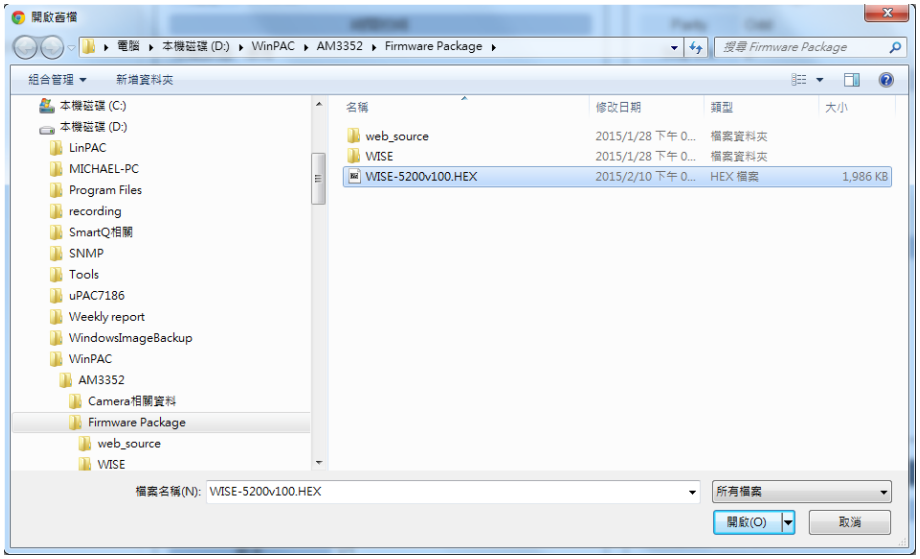


Figure 15-2：Firmware Update (1)

vi. Click “Update” to update the firmware.

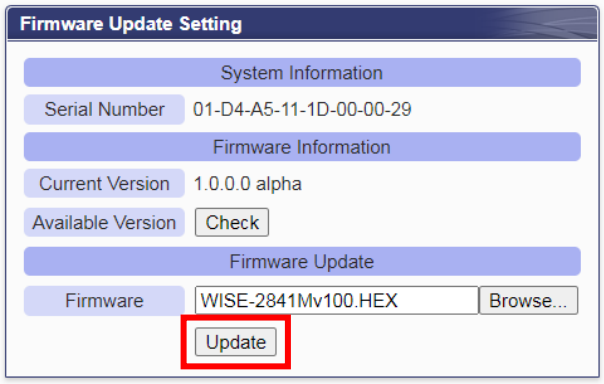


Figure 15-3：Firmware Update (2)

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

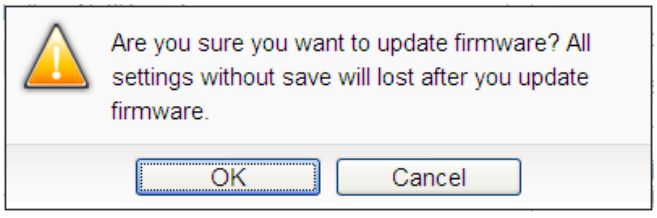


Figure 15-4：Firmware Update (3)

viii. Updating the firmware.

Please note: when the firmware update process is started, please DO NOT close the update window or perform any system modification, or may result in

unexpected failures.

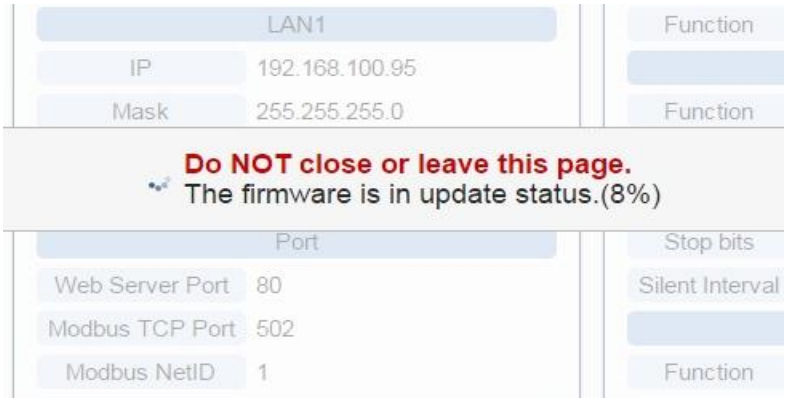


Figure 15-5：Firmware Update (4)

ix. Click “OK” to complete the update process. After the update is completed, please clear the cache and cookies on your browser. If the update process is failed, please perform the update again.

Figure 15-6：Firmware Update (5)

16 Rule File Import & Export

WISE can directly perform the WISE's Rule file import and export operations through the Browser to complete the update and backup of the WISE's setting. The “Export / Import Settings” operation can back up all WISE settings. The items of the backup setting is the same as the file backup using WISE-284x Utility, and the files backed up by the two interfaces are compatible.

Figure 16-1：Export/Import Setting page and the settings to be backed up

- Export WISE's Rule file:
  1. After click the “Export Settings” button, the rule file would be stored in the default download path according to the browser's setting. If there was setting of WISE has not been saved before the export operation, it will ask if you want to save the setting before the export operation.
  2. If the rule file include the setting as “Enabled web server settings (use HTTPS mode and use manual import SSL certificate), VPN settings (connection type is OpenVPN) or AWS platform”, the “Export Settings” and “Export Certificates” message windows will pop up separately for user to download the rule files and its related credentials files.

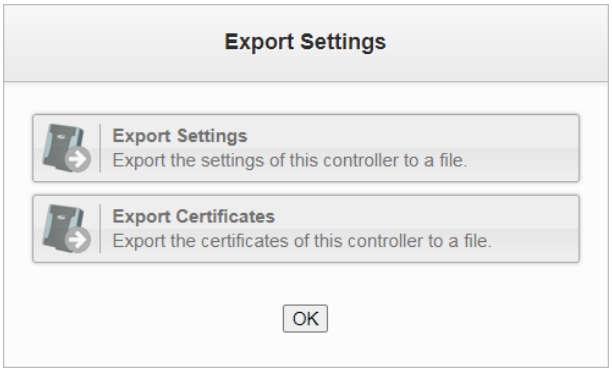


Figure 16-2："Export Settings" and "Export Certificates" message windows

- Import WISE's Rule file:
  1. After press the “Import Settings” button, select the rule file to be imported, enter the password of the rule file, then click “Next”.

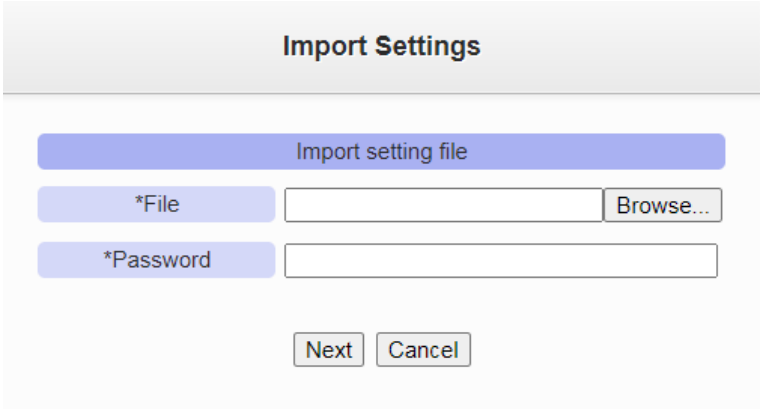


Figure 16-3：Import Settings Window(1)

  2. Some settings in WISE rule file are unique and are not suitable for copying to other WISE(such as network settings). Therefore, before import the rule file to WISE, user can select the settings to be imported from the “Select the settings be imported” section to avoid to copy the same settings to two

WISEs and cause the two WISEs in confusion status. If the settings to be imported include “Enabled web server settings (use HTTPS mode and use manual import SSL certificate), VPN settings (connection type is OpenVPN) or AWS platform”, user need to additionally upload the certificate files from the “Import Certificate File” section, and then click “OK”.

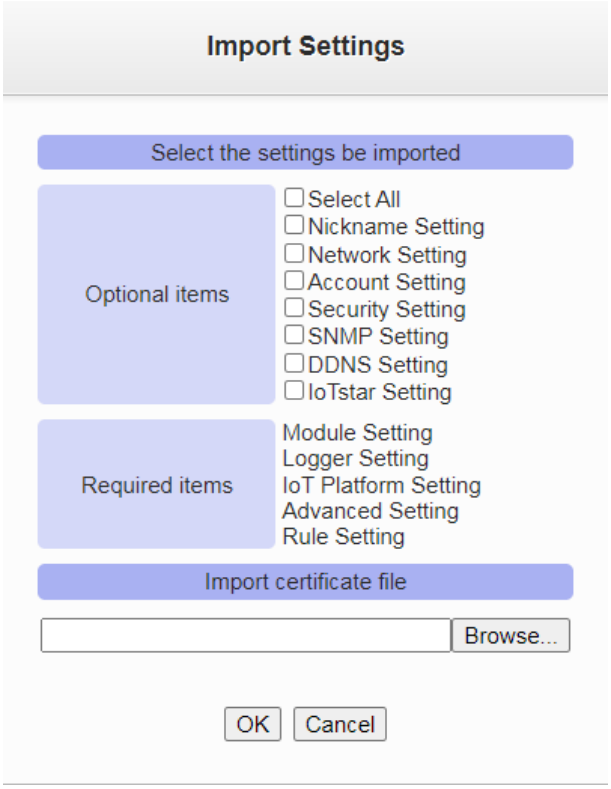


Figure 16-4：Import Settings Window(2)

3. After complete the setting, user will be asked if he want to abandon the current settings, and use the new setting for replacement. If “Yes”, press the “Import” button to start the rule file import operation.

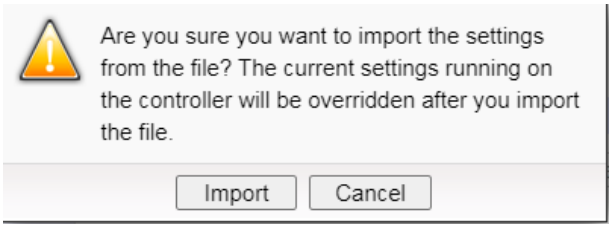


Figure 16-5：Import Settings Window(3)

4. After complete the import operation, the imported rule file will be automatically executed. If the imported rule file is incomplete or not exported via the WISE web interface, it will display the “Import failure” message.

17 Export Diagnostic File

When the WISE controller encounters an operational issue and ICP DAS technical support is required, click the “Export Diagnostic File” button. The browser will automatically download the diagnostic file “debug.zip.” Please provide this file to your ICP DAS support contact. The location of the “Export Diagnostic Data” button is shown in the figure below:

Figure 17-1：Export Diagnostic File

Appendix I：Modbus Address Table

WISE allows SCADA software or HMI device to retrieve the I/O channel data and system information via Modbus TCP/RTU protocol. WISE register addresses are specified according to Modbus register mapping tables (more detailed information will follow).

Please Note:

- The addresses are in **Base 0** format
- The addresses are in **Decimal** format
- The **default value of NetID is 1,** and you can modify the NetID value in the Ethernet Setting page. (Please refer to "5.4 Security Setting" section).
- If the data is displayed in Floating format or 32 bits format (AI/AO Channel value、Internal Register value、Input Register value and Holding Register value), each record of data will take two registers to hold the data.
- If the data of Internal Register is displayed in Double or 64bit, each record of data will take four registers to hold the data.
- WISE support **Little Endian** for the wayof storing multibyte data-types.

Modbus Address Table

<table>
<tr><th>Modbus Address</th><th>Coil Output (0x)</th><th>Discrete Input (1x)</th><th>Input Register (3x)</th><th>Holding Register (4x)</th></tr>
<tr><td>0~59</td><td colspan="4">System Data(1)</td></tr>
<tr><td>60~75</td><td rowspan="6"></td><td>COM3 module connection status(2)</td><td>COM3 module Information(3)</td><td rowspan="3"></td></tr>
<tr><td>76~91</td><td>COM4 module connection status(2)</td><td>COM4 module Information(3)</td></tr>
<tr><td>92~99</td><td rowspan="2">LAN(Modbus TCP) module connection status(2)</td><td rowspan="2">LAN(Modbus TCP) module Information(3)</td></tr>
<tr><td>100~107</td><td rowspan="3">Internal Register Data(4)</td></tr>
<tr><td>108~499</td><td></td><td></td></tr>
<tr><td>…</td><td></td><td></td><td></td></tr>
</table>

900~999	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)			
…	…			
40000~40399	Data Table for Schedule Setting No.1 (7)			
40400~40799	Data Table for Schedule Setting No.2 (7)			
…	…			
49600~49999	Data Table for Schedule Setting No.25 (7)			
50000~55999	Active I/O Table Data for Coil data type(8)			Active I/O Table Data for Register data type(8)

More detailed information for each block please refers to the number in quotes and finds the related information in the following section.

(1) System Data

This block stores the system information of WISE, shown as below:

Parameter Name	Modbus Address	Length	Data Type	Range
Discrete Input (1x), Unit : Coil(8 Bits)				
Modbus slave	10000	1	Byte	0=Disable 1=Enable
HTTPS	10001	1	Byte	
SNMP Server	10002	1	Byte	
FTP Server	10003	1	Byte	
SFTP Server	10004	1	Byte	
CGI Query	10005	1	Byte	
Time Sync	10006	1	Byte	
IoTstar Connection Status	10007	1	Byte	0=Disconnected

MQTT Broker 1 Status	10008	1	Byte	1=Connected
MQTT Broker 2 Status	10009	1	Byte	
AWS Connection Status	10010	1	Byte	
Azure Connection Status	10011	1	Byte	
Bluemix Connection Status	10012	1	Byte	
Active I/O Connection	10013	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
XV Board Update Rate	30021	1	UInt16	0~65535(ms)
COM3 Update Rate	30022	1	UInt16	0~65535(ms)
COM4 Update Rate	30023	1	UInt16	0~65535(ms)
Modbus Slave NetID	30024	1	UInt16	1~247
Modbus TCP Port	30025	1	UInt16	1~65535
Web HTTP Port	30026	1	UInt16	1~65535
Web HTTPS Port	30027	1	UInt16	1~65535
SNMP port	30028	1	UInt16	1~65535
FTP port	30029	1	UInt16	1~65535
SFTP port	30030	1	UInt16	1~65535

Decimal Place Number	30031	1	UInt16	1~4
micro SD Free Space	30032	1	UInt16	0~65535(MB)
Holding Register (4x), Unit : Register(16 Bits)				
LAN 1 IP	40000	4	UInt16	0~255
LAN 2 IP	40004	4	UInt16	0~255

(2) COM3 / COM4 / LAN Modules Connection Status

This block stores the connection status of ICP DAS I/O modules and Modbus TCP/RTU modules that are connected to the WISE, detailed information is shown as below:

Parameter Name	Modbus Address	Length	Data Type	Range
Discrete Input (1x), Unit : Coil(8 Bits)				
The connection status of ICP DAS I/O modules and Modbus RTU modules that are connected to COM3.	10060-10075	1	Byte	0=Offline 1=Online
The connection status of ICP DAS I/O modules and Modbus RTU modules that are connected to COM4.	10076-10091	1	Byte	0=Offline 1=Online
The connection status of CP DAS I/O modules and Modbus TCP modules that are connected to LAN.	10092-10107	1	Byte	0=Offline 1=Online

(3) COM3 / COM4 / LAN Modules Information

This block stores the module type or address information of ICP DAS I/O modules and Modbus TCP/RTU modules that are connected to the WISE. If the module is ICP DAS I/O module, it will show the module type. If it is the Modbus TCP/RTU module, it will show the Address or NetID of the module. Detailed information is shown as below:

Parameter Name	Modbus Address	Length	Data Type	Range
Input Register (3x), Unit : Register(16 Bits)				
The module type or address of ICP DAS I/O module or Modbus RTU	30060-30075	1	UInt16	Module type or Module Address(1~128)

modules that are connected to COM3.				
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. The starting address, data length, type and range of the Internal Register are based on user's settings. It is recommended to query the detailed Modbus information of Internal Register from the “Modbus Mapping Table” on the “Channel Status” page.

Parameter Name	Modbus Address	Length	Data Type	Range
Holding Register (4x), Unit : Register(16 Bits)				
Internal Register 1	40100	1/2/4	Based on user's settings	
	⋮			
Internal Register 100	40499	1/2/4		

(5) XV-Board Data

This block is used to store the information of XV Board. For different XV Board modules, the data will be store in different address It is recommended to query the detailed Modbus information of XV Board from the “Modbus Mapping Table” on the “Channel Status” page.

(6) Remote Module Data

This block is used to store 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. Based on the I/O module's connection port and the index number, It is recommended to query the detailed Modbus information of the I/O module from the “Modbus Mapping Table” on the “Channel Status” page.

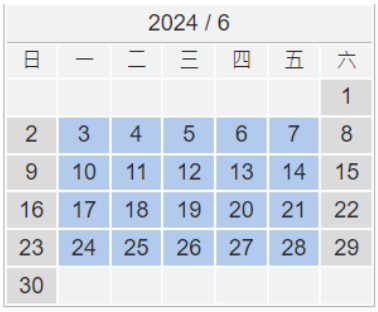
(7) Data Table for Schedule Setting

This block is used to store the information of each Schedule setting in the WISE's "Advanced Setting → Schedule Setting" page. It allows users to read or change WISE's Schedule settings through Modbus protocol. This block starts from address 40000. Each schedule uses 400 addresses to store the information of its setting, and totally of 25 sets of schedule information can be stored in the block. The detailed Modbus table for each schedule's information is shown as below:

Modbus Address (40000 ~)	Coil (0x)	Holding Register (4x)	
		Calendar Mode	Repeat Mode
0	Change Schedule settings (Enter 1 to write new settings to the Schedule you assigned)	The index of Schedule you want to read/modify its setting (1 ~ 25).	
1		Schedule's initial status (0→Stop; 1→Running)	
2		Schedule's mode (0→Calendar;1→Repeat)	
3		Number of "Time Range" (1 ~ n)	
4		Starting Year (2024 ~)	Day(s) of week for operation 1 ~ 1234567 (Data format is long)
5		Starting Month (1 ~ 12)	
6		Duration (1 ~ 120; unit: Month)	Number of Exception Date (0 ~ 365)
7~9		Reserved	
10		Time Range(1st): Starting time (Hour) (0 ~ 23; If user want to execute hourly, set it to -1.)	
11		Time Range(1st): Starting time (Minute) (0 ~ 59)	
12		Time Range(1st): Starting time (Second) (0 ~ 59)	
13		Time Range(1st): End time (Hour) (0 ~ 23; If user want to execute hourly, set it to -1.)	
14		Time Range(1st): End time (Minute) (0 ~ 59)	
15		Time Range(1st): End time (Second) (0 ~ 59)	
16		Time Range(2nd): Starting time (Hour)	
17		Time Range(2nd): Starting time (Minute)	
18		Time Range(2nd): Starting time (Second)	
19		Time Range(2nd): End time (Hour)	

20		Time Range(2nd): End time (Minute)	
21		Time Range(2nd): End time (Second)	
…		…	
10+6(n-1)		Time Range(nth): Starting time (Hour)	
10+6(n-1)+1		Time Range(nth): Starting time (Minute)	
10+6(n-1)+2		Time Range(nth): Starting time (Second)	
10+6(n-1)+3		Time Range(nth): End time (Hour)	
10+6(n-1)+4		Time Range(nth): End time (Minute)	
10+6(n-1)+5		Time Range(nth): End time (Second)	
10+6n		Exception Date for 1st Month (Long Integer for 31 bit)	1st Exception Date (January 1→101; December 31→1231)
10+6n+1			2nd Exception Date
10+6n+2		Exception Date for 2nd Month	3rd Exception Date
10+6n+3			4th Exception Date
…		…	…
10+6n+2(m-1)		Exception Date for mth Month	
10+6n+2(m-1)+1			

About the definition of Exception Date for Schedule (Calendar Mode), following is an example for reference:



If the working days of the month are selected as “In Range” of the Schedule, then the bit arrangement for the exception dates is as following (Bit 1 is the 1st day of the month, Bit 30 is the 30th day of the month):

00110000 01100000 11000001 10000011

Bit 32 Bit 1

Convert the bits to long to get number 811647363, and fill it into the correct address of Holding register.

However, when the user changes the Schedule setting through Modbus protocol, he does not actually need to input the complete information for Schedule. The reason is when WISE execute the Schedule function, all schedule setting information will be read out and placed in the Modbus Table. Therefore, if the user just wants to change the first Time Range settings of the first Schedule, he only needs to complete the two operations as below:

- Assign the time information he wants to change

The address of Starting time (Hour)：40010	08	→	09
The address of Starting time (Minute)：40011	30	→	00
The address of Starting time (Second)：40012	00	→	00
The address of End time (Hour)：40013	12	→	12
The address of End time (Minute)：40014	00	→	30
The address of End time (Second)：40015	00	→	00

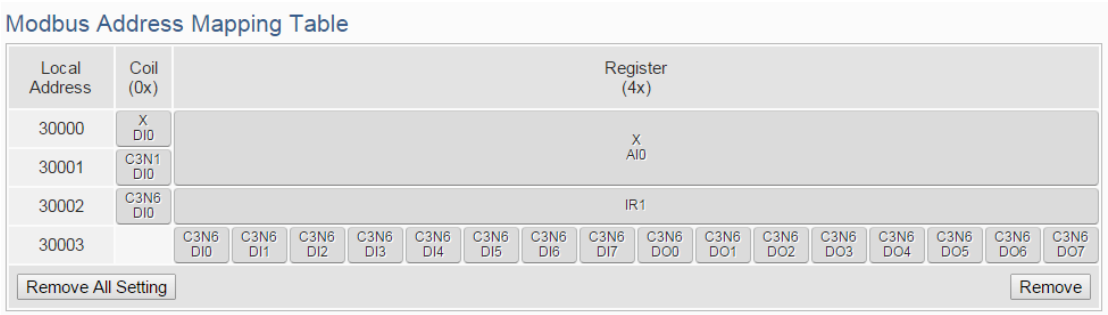
- Trigger the Write operation: Set Coil address 40000 to 1, then WISE will write the new settings and start the Schedule operation.

PS：Since there is no limitation for the creation of schedule provided by WISE, so there are only the 1st ~ 25th Schedule's information can be read/modified by Modbus protocol. The 26th and subsequent schedule settings will not be read/modified by Modbus protocol.

(8) I/O Data Table for "Active I/O sending" function

WISE equips the "Active I/O sending" function. This "I/O Data Table" area is used to store the I/O channel data and Internal Register data which user defines in the "Active I/O Sending" of "Advanced Setting" of WISE. "Active I/O sending" function allows to rearrange the I/O channels data from different I/O modules and puts them into a continuous Modbus address memory block, and then SCADA software can retrieve all I/O channels data from different modules by using one single Modbus command. Comparing to traditional polling mechanism, it will greatly save time and polling attempts.

Based on different setting, the data which is stored in this area is also different. Please refer to the following example.



In this example, we store following I/O channel data in the I/O Data Table.

- I/O channel value of XV Board
- I/O channel value of the module which is connected to COM3 of WISE. Its

module index number is 1.

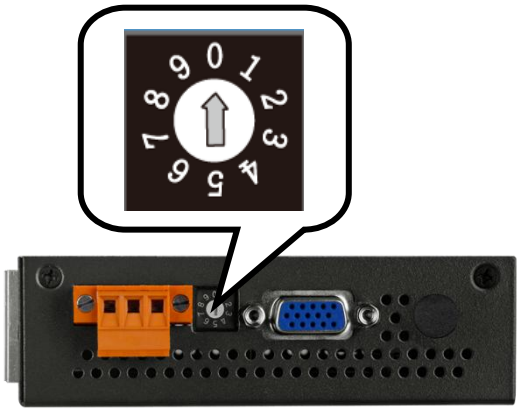
- I/O channel value of the module which is connected to COM3 of WISE. Its module index number is 6.
- The Internal Register with index number 1. Its data type is 16-bit Signed Integer

In the I/O Data Table, the "Local Address" in the left side is the address for saving I/O Data Table in the WISE Modbus Address Table.

Parameter Name	Modbus Address	Length	Data Type	Range
Coils Output, Unit : Coil(8 Bits)				
X(XV-Board) DI0	030000	1	Byte	0=OFF, 1=ON
C3N1(COM3 Module1) DI0	030001	1	Byte	0=OFF, 1=ON
C3N6(COM3 Module6) DI0	030002	1	Byte	0=OFF, 1=ON
Holding Register (4x), Unit : Register(16 Bits)				
X(XV-Board) AI0	430000	2	Float	Floating Point
IR1(Internal Register 1)	430002	1	Int16	-32768 ~ 32767
C3N6(COM3 Module6) DI0~DI7 + DO0~DO7	430003	1	UInt16	0 ~ 65535 *Each bit represents a channel.*

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

During the operation of WISE, if you forget the setting of network or password, or encounter the status of firmware damaged, you can use the Rotary Switch to perform the operations as “Recovery the firmware”, “Reset the login password”, or “Reset the settings to factory default” The following figure shows the location of the Rotary Switch of the WISE.

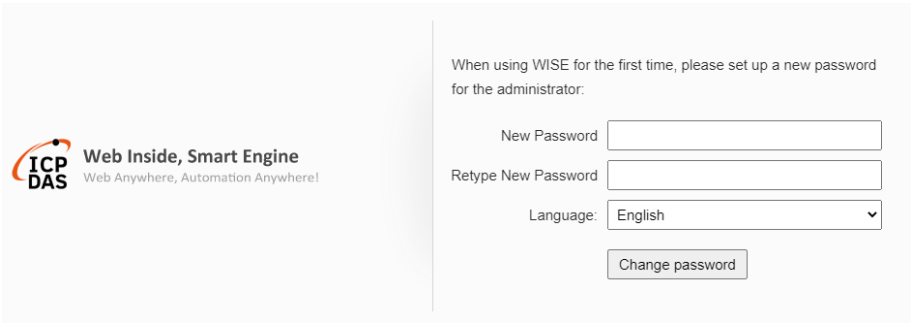


The function of the position of the Rotary Switch：

Rotary Switch	Function
2	Do not execute the rule file currently.
5	Reinstall WISE firmware via MicroSD.
6	Reinstall WISE firmware via USB Disk.
7	Reinstall OS via MicroSD.
8	Reset the login password.
9	Reset to factory default, includes: ● Restore network settings. ● Reset all password settings. ● Delete the rule file.

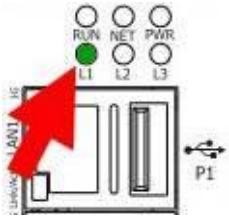
Please follow the steps below to restore network settings to factory default or send the passwords to the Email account of the Administrator:

- **Rotary Switch=2**：Do not execute the rule file currently.
  1. Power off WISE.
  2. Set up the Rotary Switch of WISE to position **2**.
  3. Connect the WISE to power and wait for the system to start up (the “Run” LED starts flashing)
  4. Enter the WISE login page, the WISE login page will be restored to the same as user login WISE first time, and the administrator's password needs to be set again as below:



  5. Set up the Rotary Switch of WISE to position 0.
  6. After complete the setting of a new password, the previous setting of WISE will be cleared, and the user can reset it.

- **Rotary Switch=5**：Reinstall WISE firmware via MicroSD
  1. Make sure the L1 indicator is ON. It means the firmware can be installed.



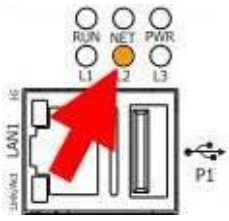
  2. Take out the MicroSD card from the WISE's MicroSD slot, and connect to computer via card reader

  3. Copy the firmware file and WiseFirmwareRestore.setting file to the \FirmwareRestore\ directory of the MicroSD card. The content of the WiseFirmwareRestore.setting file is as follow:

```
DeviceName=WISE-2841M
```

(DeviceName is as the same as the header of the firmware filename(WISE-2841MvXXX.HEX))

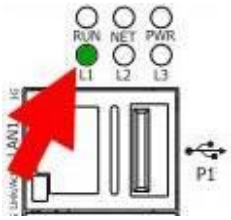
4. Insert the MicroSD card back into the WISE's MicroSD slot.
5. Turn the Rotary Switch of WISE to position 5 to trigger the installation of firmware.
6. If the L2 indicator is ON, it means the firmware installation is in progress.



7. After waiting for a few minutes, if the installation is successful, L1, L2, and L3 indicators will flash at the same time; if the installation fails, only L1 indicator will flash.
8. Turn the Rotary Switch of WISE to position 0 (Normal).
9. Power off and power on WISE again to complete the firmware update procedure.

- **Rotary Switch=6**：Reinstall WISE firmware via USB Disk

1. Make sure the L1 indicator is ON. It means the firmware can be installed.



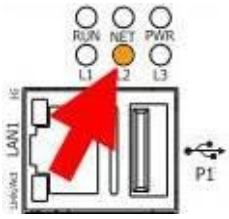
2. Copy the firmware file and WiseFirmwareRestore.setting file to the \FirmwareRestore\ directory of the USB Disk. The content of the WiseFirmwareRestore.setting file is as follow:

```
DeviceName=WISE-2841M
```

(DeviceName is as the same as the header of the firmware filename(WISE-2841MvXXX.HEX))

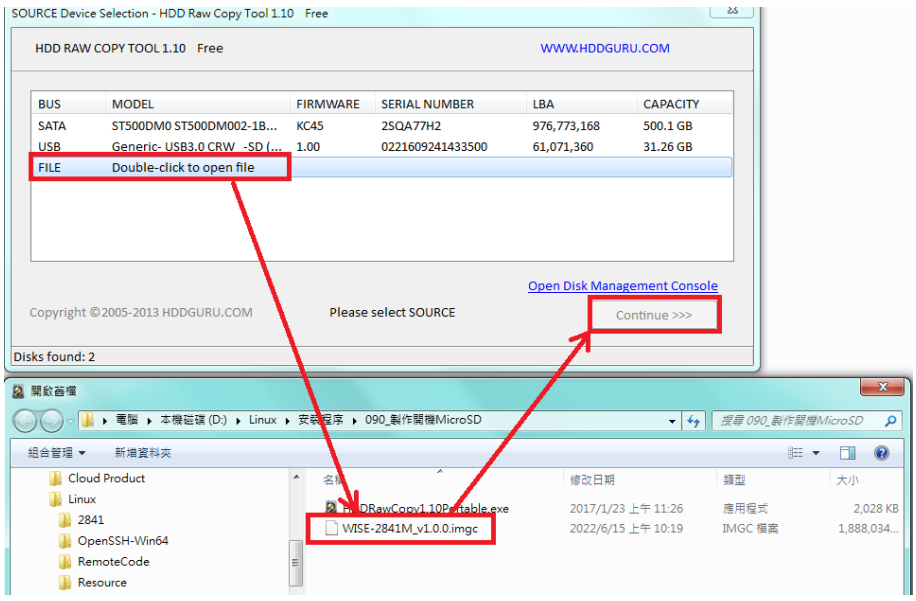
3. Insert the USB Disk into the WISE 's USB slot.
4. Turn the Rotary Switch of WISE to position 6 to trigger the installation of firmware.

5. If the L2 indicator is ON, it means the firmware installation is in progress.

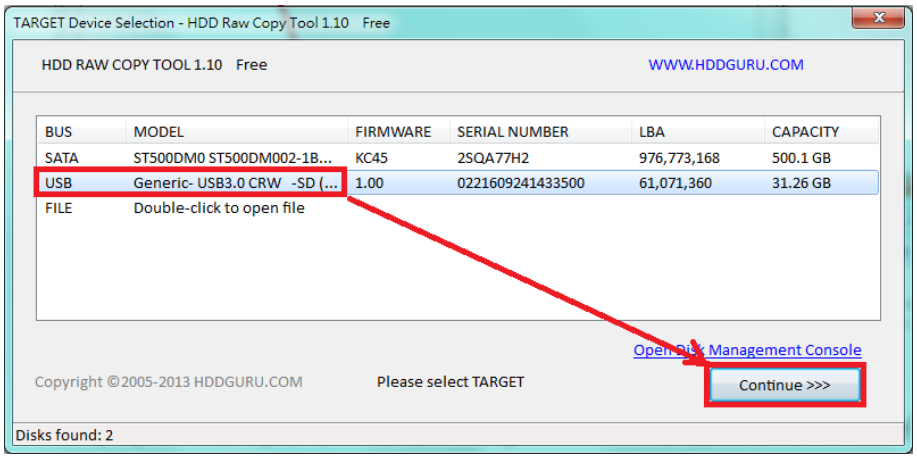


6. After waiting for a few minutes, if the installation is successful, L1, L2, and L3 indicators will flash at the same time; if the installation fails, only L1 indicator will flash.
7. Turn the Rotary Switch of WISE to position 0 (Normal).
8. Power off and power on WISE again to complete the firmware update procedure.

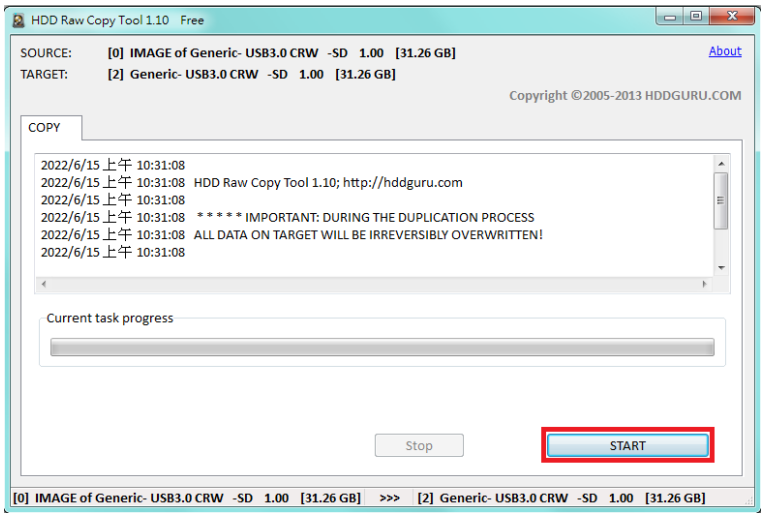
- **Rotary Switch=7**：Reinstall OS and firmware via MicroSD
  1. Power off WISE.
  2. Go to WISE official website (http://wise.icpdas.com) to download the WISE-2841M OS Recovery Kit: WISE-2841M_OS_recovery.zip.
  3. Prepare a MicroSD card with a capacity greater than 8GB, insert the card directly into the computer or connect to the computer via card reader.
  4. Uncompress the file of OS Recovery Kit and execute HDDRawCopy1.10Portable.exe.
  5. Select the source which will be burned to WISE from the interface, click the OS image file in the OS Recovery Kit: WISE-2841M_vX.X.X.imgc, and press the “Continue” button after selection.



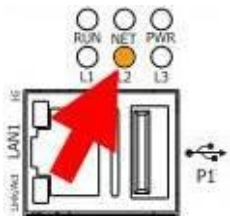
6. Select the target which will be burned, click on the MicroSD card and press the “Continue” button.



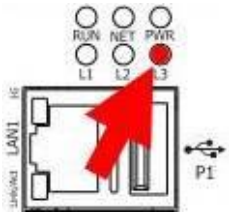
7. Press “Start” button and wait for the boot card be created.



8. After complete the creation of the boot card, insert the MicroSD card into the WISE's MicroSD card slot, turn the Rotary Switch to the position 7, and then power on again.
9. If the operation is normal status, The L2 indicator will be ON. It means the OS recovery operation is in progress.

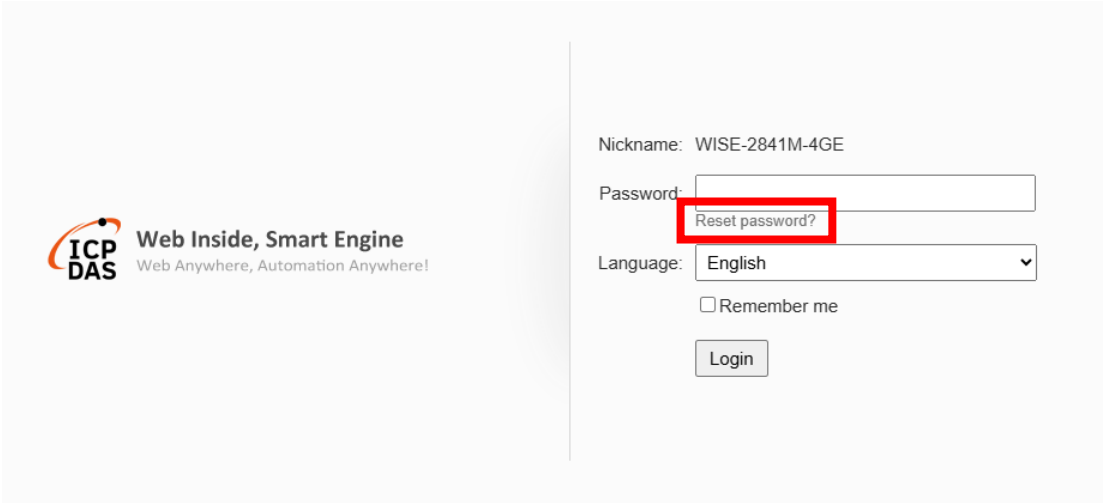


10. When the L2 indicator is OFF and the L3 indicator is ON, the OS recovery operation is complete.



11. Power off the WISE, remove the MicroSD card for the OS recovery operation, insert the original MicroSD card back, set the Rotary Switch to position 0 and power on again to complete the procedure of “Reinstall OS and firmware”.

- **Rotary Switch=8**：Reset the login password.
  1. Switch the Rotary Switch to position 8.
  2. Connect to WISE Login webpage via Web browser. Now a “Reset password?” message will be displayed under the password field. Click the “Reset password?” message, then the system will reset the login password of the Administrator as the default password “Admin123”.



  3. Switch the Rotary Switch to position 0.

- **Rotary Switch=9**：Restore all settings to factory default
  1. Power off the WISE.
  2. Switch the Rotary Switch to position 9.
  3. Power on the WISE and complete the booting process. When the booting process is complete, the network settings will be set as the factory default

as below.

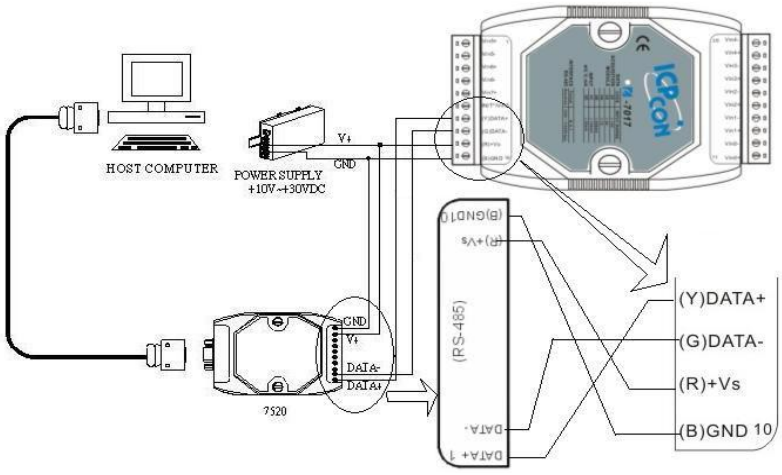
LAN 1	
Network Setting	DHCP
LAN 2	
IP	192.168.255.1
Mask	255.255.0.0
Gateway	192.168.0.1
DNS	8.8.8.8

4. Switch the Rotary Switch to position 0

Appendix III：The configuration setting of ICP DAS modules

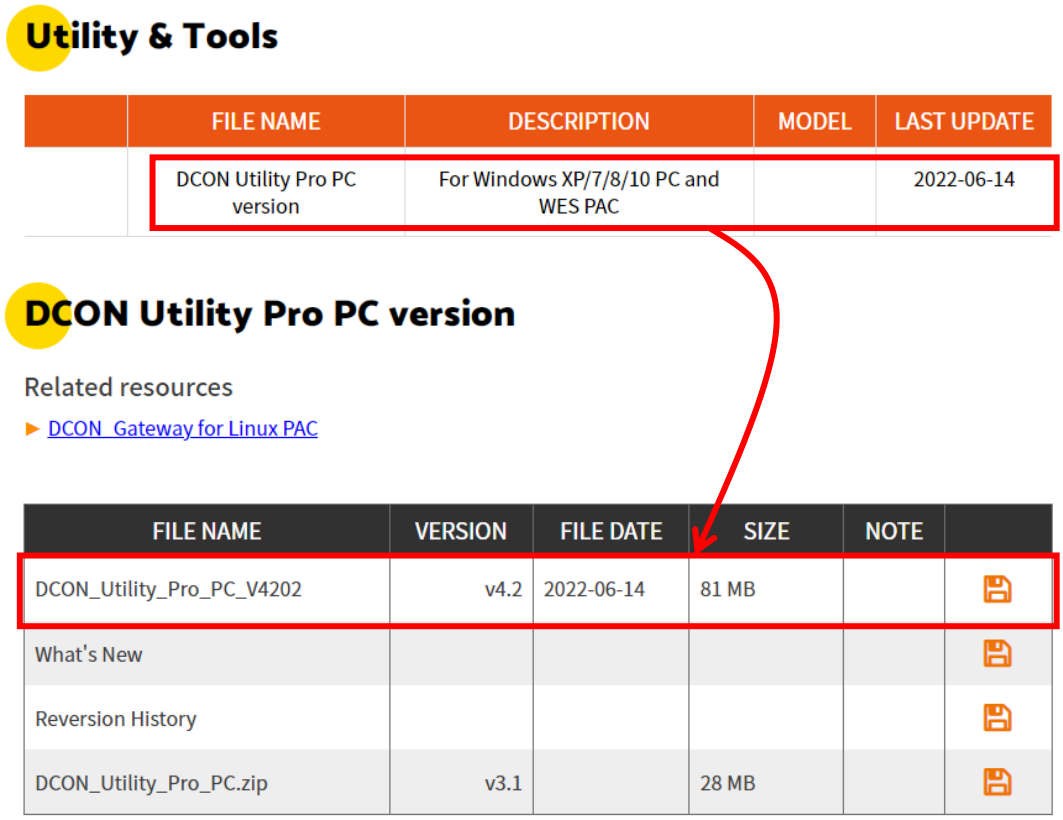
WISE allows connection to ICP DAS I/O modules for the I/O channel data retrieve. However, for other configuration of the ICP DAS I/O modules must be completed via related utility (For example: DCON Utility Pro) in advance, so that the WISE can accurately connect to ICP DAS I/O module. The procedures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

1. Make sure the ICP DAS I/O module can accurately connect to PC. If the ICP DAS I/O modules connect to PC via RS-485 cable makes sure the RS-485 cable is properly connected. For PC to receive RS-485 signals, a RS-232 to RS-485 or a USB to RS-485 converter is required. For more converter information, please refer to ICP DAS converter product page:
   https://www.icpdas.com/tw/product/guide+Industrial__Communication+Serial__Communication+Converter



   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 Pro from the link below:
      https://www.icpdas.com/tw/download/index.php?kind1=62&kind2=87&kw=DCON+Utility+Pro+PC



Utility & Tools

	FILE NAME	DESCRIPTION	MODEL	LAST UPDATE
	DCON Utility Pro PC version	For Windows XP/7/8/10 PC and WES PAC		2022-06-14

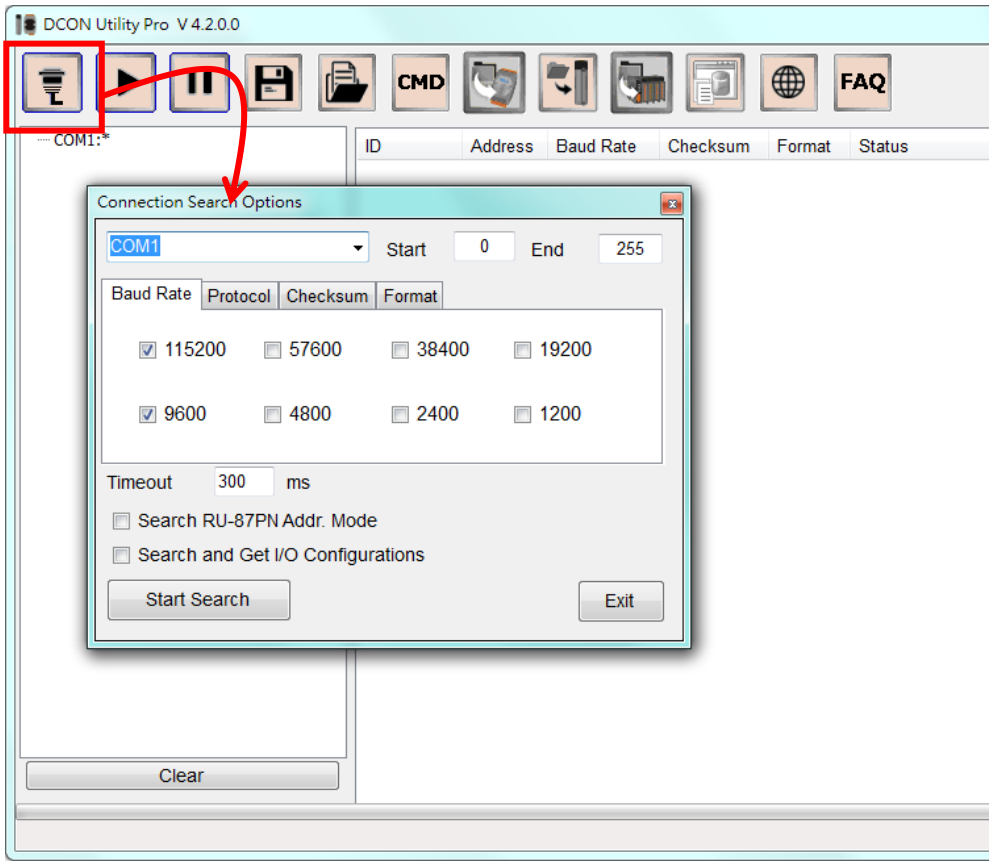
DCON Utility Pro PC version

Related resources

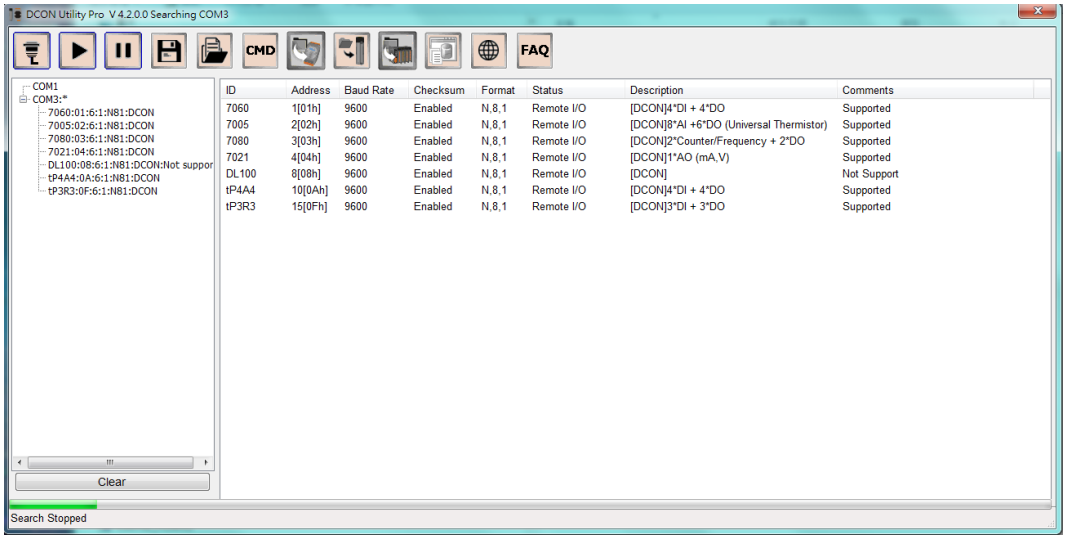
► DCON_Gateway for Linux PAC

FILE NAME	VERSION	FILE DATE	SIZE	NOTE	
DCON_Utility_Pro_PC_V4202	v4.2	2022-06-14	81 MB		
What's New					
Reversion History					
DCON_Utility_Pro_PC.zip	v3.1		28 MB		

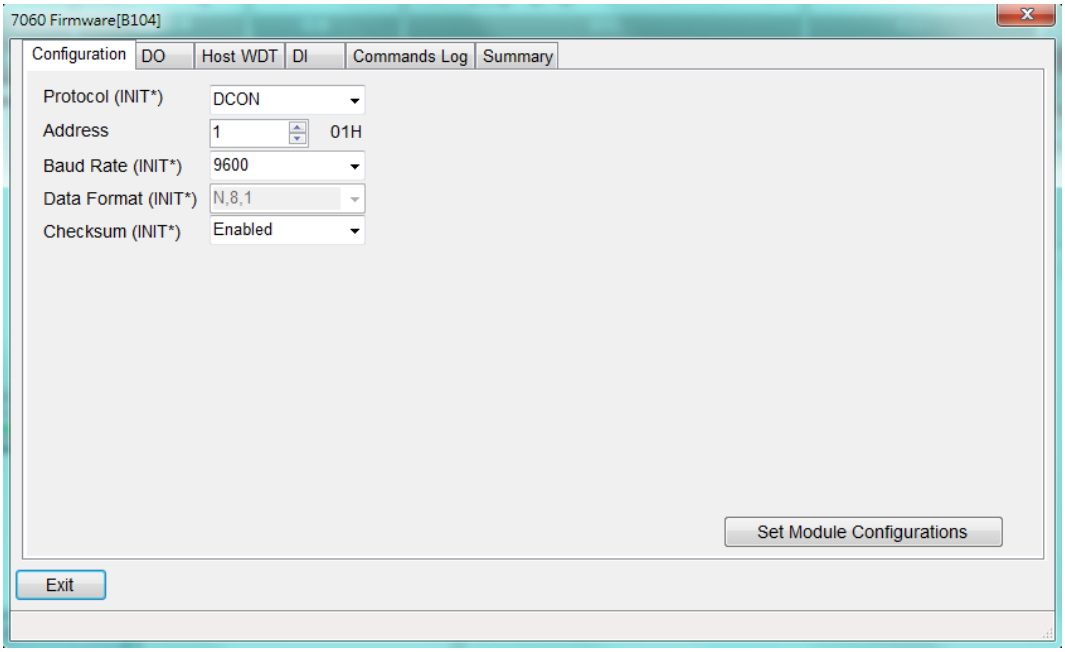
B. Execute the DCON Utility Pro and verify if the COM Port parameters are accurate.



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 I-7060 as an example):



Please note: The following parameters has to be accurate to connect with WISE properly:

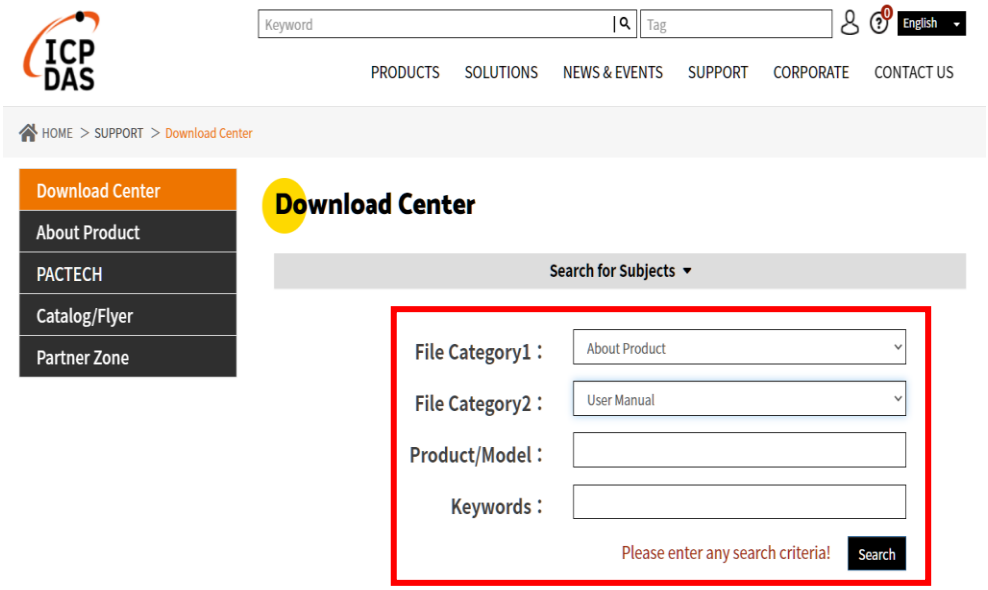
- Baudrate: the Baudrate has to be set the same as the Baudrate of WISE COM Port which the module will connect. All I/O modules' Baudrate have to be set the same as well.
- Data format: set to be "Engineering" format.
- Parity: the Parity has to be set the same as the Parity of WISE COM Port which the module will connect. All I/O modules' Parity has to be set the same as well.

For more detailed information, please refer to DCON Utility manual as below.
https://www.icpdas.com/tw/download/index.php?kind1=62&kind2=63&kw=DCON+Utility+Pro

3. For others ICP DAS I/O module, please refer to related user manual for the configuration setting. In order to accurately connect with WISE, please make sure of the COM port setting (Module address (1~255), 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.
   - Go to the "Download Center" page of ICP DAS offical website, select "About Product" in the "File Category1" field, select "User Manual" in the "File Category2" field, and enter the desired information in the "Product/Model" or "Keyword" field, then click the "Search" button to

search the corresponding product manual you need.

The “Download Center” page of ICP DAS offical website: https://www.icpdas.com/tw/download/index.php



Appendix IV：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
	Signal Relay Output	XV119
Others	Multi-Function	XV303、XV306、XV307、XV308、XV310

- **I-7000 series module support list**

Function		Model
AI / AO	Voltage & Current	I-7012、I-7012D、I-7012F、I-7012FD、I-7017、I-7017F、I-7017R、I-7017C、I-7017FC、I-7017RC、I-7017R-A5、I-7017Z
	Thermocouple	I-7011、I-7011D、I-7011P、I-7011PD、I-7018、I-7018P、I-7018R、I-7018Z、I-7019R
	RTD	I-7013、I-7013D、I-7015、I-7015P、I-7033、I-7033D
	Thermistor	I-7005
	Transmitter	I-7014D
	Strain Gauge	I-7016、I-7016D、I-7016P、I-7016PD
	Analog Output	I-7021、I-7021P、I-7022、I-7024、I-7024R
DI / DO	DC Digital Input	I-7041、I-7041D、I-7041P、I-7041PD、I-7051、I-7051D、I-7052、I-7052D、I-7053-FG、I-7053D-FG
	AC Digital Input	I-7058、I-7058D、I-7059、I-7059D
	DC Digital Output	I-7042、I-7042D、I-7043、I-7043D、I-7045、I-7045D、I-7045-NPN、I-7045D-NPN
	DC Digital Input & Output	I-7044、I-7044D、I-7050、I-7050D、I-7050A、I-7050AD、I-7055、I-7055D、

		I-7055-NPN、I-7055D-NPN
Relay Output	Power Relay Output	I-7060、I-7060D、I-7061、I-7061D、I-7063、I-7063D、I-7065、I-7065D、I-7067、I-7067D
	Solid State Relay Output	I-7063A、I-7063AD、I-7063B、I-7063BD、I-7065A、I-7065AD、I-7065B、I-7065BD
	Photomos Relay Output	I-7066、I-7066D
Others	Counter / Frequency	I-7080、I-7080D、I-7080B、I-7080BD、I-7088、I-7088D

- **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-7011D、M-7018、M-7018R M-7018Z、M-7019R、M-7019Z
	RTD	M-7015、M-7015P
	Thermistor	M-7005
	Strain Gauge	M-7016、M-7016D
	Analog Output	M-7022、M-7024、M-7024R、M-7024L、M-7028、M-7028D
	RMS Input	M-7017RMS
DI / DO	DC Digital Input	M-7041、M-7041D、M-7041P、M-7041PD、M-7041-A5、M-7041D-A5、M-7046、M-7046D、M-7051、M-7051D、M-7052、M-7052D、M-7053、M-7053D
	AC Digital Input	M-7058、M-7058D、M-7059、M-7059D
	DC Digital Output	M-7043、M-7043D、M-7045、M-7045D、M-7045-NPN、M-7045D-NPN
	DC Digital Input & Output	M-7050、M-7050D、M-7055、M-7055D、M-7055-NPN、M-7055D-NPN
Relay Output	Power Relay Output	M-7060、M-7060D、M-7060P、M-7060PD、M-7061、M-7061D、

		M-7064、M-7064D、M-7065、M-7065D、M-7067、M-7067D、M-7068、M-7068D、M-7069、M-7069D
	Solid State Relay Output	M-7065B、M-7065BD
	Photomos Relay Output	M-7066P、M-7066PD
Others	Counter / Frequency	M-7080、M-7080D、M-7080B、M-7080BD、M-7084、M-7088、M-7088D
	Multi-Function	M-7002、M-7003、M-7024U、M-7024UD、M-7026

- **tM series module support list**

Function		Model
AI	Voltage & Current	tM-AD2、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、(P)ET-7217-A5
	Thermocouple	(P)ET-7018Z、(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、(P)ET-7245
	DC Digital Input & Output	(P)ET-7044、(P)ET-7050、

		(P)ET-7052、(P)ET-7055、 (P)ET-7244、(P)ET-7250A、 (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
	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、WISE-7255
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-101H、LC-102H、LC-103H

- **iSN series module support list**

Function	Model
Liquid Leakage Detection Module	iSN-101、iSN-104

- **CL / DL series module support list**

Function	Model
Illumination	DL-120-E、DL-120-E-W
Temperature / Humidity	DL-10、DL-100
Temperature / Humidity / Illumination	DL-110-E、DL-110-E-W
Temperature / Humidity / O2	CL-250、DL-1050
Temperature / Humidity / CO	CL-201、DL-301
Temperature / Humidity / CO2	CL-202、DL-302
Temperature / Humidity / CO / CO2	CL-203、DL-303
Temperature / Humidity / CO / CO2 / PM1 / PM2.5 / PM10	CL-210、CL-211、CL-212、CL-213、DL-1020、DL-1021、DL-1022、DL-1023、DL-1025、DL-1052
Temperature / Humidity / CO / CO2 / PM1 / PM2.5 / PM10 / TVOC	CL-208、DL-1038
Temperature / Humidity / HCHO / TVOC	CL-204
Temperature / Humidity / NH3	CL-205
Temperature / Humidity / H2S	CL-206

- **IR series module support list**

Function	Model
IR Learning Remote Module	IR-210、IR-712A、IR-712-MTCP

- **iCAM IP Camera support list**

Function	Model
IP Camera Module	iCAM-MR6322、iCAM-MR6422X、iCAM-ZMR8422X

- **DLW series module support list**

Function	Model
Mini Weather Station	DLW-1023, DLW-1100, DLW-1120, DLW-1200, DLW-1243

Appendix V：The format of CGI Query command

WISE supports the HTTP protocol to set up and retrieve the I/O channel value, Internal Register value or system information. In addition, WISE also supports the JSON format for message exchange. JSON is a popular format; it can reduce the loading of data transfer, and is easy to be integrated with other Network system.

- **CGI Query command**

  The following is the format of CGI Query command:

  ```
  http://IP address:port/dll/query.dll?command
  ```

  The “IP address” is the actual IP address that the WISE is using now. The default IP address of WISE is “192.168.255.1”. The “Port” is the port number of Web server port of WISE. The default IP address of WISE is “80”. If the port number is 80, you can skip it in the setting.

  The Command consist a set of parameters. Each parameter consist one name and one value. The name and the value of a parameter are linked by symbol “=”. The parameters are linked by symbol “&”. Depended on the query items, follow the format to include the corresponding parameters in each CGI command.

  The following an example of CGI Query command shows querying the value of the Internal Register 1 of WISE.

  ```
  http://192.168.255.1/dll/query.dll?job=get_ir_val&ir_no=1
  ```

  In the above CGI Query command, it consist two parameters: “job=get_ir_val” and “ir_no=1”. For “job=get_ir_val”, “job” is the name of the first parameter, “get_ir_val” is the value of the first parameter. The first parameter is used to query the value of Internal Register of WISE. And then for“ir_no=1”, “ir_no” is the name of the second parameter, “1” is the value of the second parameter. The combination of first parameter and second parameter indicates to query the value of Internal Register 1 of WISE. When WISE receives the CGI Query command, it will reply the following message to the command sender.

  ```
  {
     "status": "OK",
     "result": {
        "value": 2.3
     }
  }
  ```

The returned value will be shown in the JSON format. In the above example, the value of Internal Register 1 is 2.3. It is located in “value” section of the “result” area.

- **CGI Query Authentication**

  After enabling the CGI Query Authentication in the Security Setting section, two extra parameters - “id” and “password” have to be added to the CGI command. The value of “id” is for the user account, and the value of “password” is for the password. The following is an example to enable the CGI Query Authentication.

```
http://192.168.255.1/dll/query.dll?job=get_ir_val&ir_no=1
&id=icpdas&password=wise
```

  In this example, “icpdas” is the user account, “wise” is the password. If the user account or password is in error status, then the system will return the following status message.

```
{
   "status": "PASSWORD_ERROR"
}
```

- **JSONP Supported**

  If user wants to enable the JSONP, he/she can add an extra parameter “callback” to the original CGI command, and then assign the value of the “callback” parameter to the function which is used to receive the returned values. The following is an example to enable the JSONP.

```
http://192.168.255.1/dll/query.dll?job=get_ir_val&ir_no=1
&callback=foo
```

  In this example, the function named “foo” is used to receive the returned values. The returned values are as below.

```
foo({
   "status": "OK",
   "result": {
      "value": 2.3
   }
});
```

The following table gives detailed information of the query command, command parameters and returned values. For parameters “id”, “password” and “callback”, please refer to the examples in section above.

- **Set up the I/O channel value.**

<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. If the I/O interface is XV-Board, skip this parameter.</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
ICP DAS I/O Module：do, ao
Infrared Module：ir</td></tr>
</table>
<table>
<tr><td>Name</td><td>ch_addr</td></tr>
</table>
</td></tr>
</table>

	<table><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 ICP DAS I/O module, the ch_addr is the channel sequence number starting from 0. For infrared module, the ch_addr is the output channels in binary format. The first bit (LSB) of the value represents the 1st channel. The 2th bit represents the 2th channel. For example: The 1st and 2nd output channels: 0x03 == 0011 (binary)</td></tr></table> <table><tr><td>Name</td><td>ch_value</td></tr><tr><td>Description</td><td>The value you want to assign to the output channel.</td></tr><tr><td>Value</td><td>Digital type channel: 0 or 1. Analog type channel: Number Infrared module: command index</td></tr></table>

Response	The channel is existed.
	
	{
	"status": "OK"
	}
	
	The module or channel does not exist.
	
	{
	"status": "CHANNEL_NOT_EXIST"
	}
	
	Password error
	
	{
	"status": "PASSWORD_INCORRECT"
	}

- **Get the specific channel value of the remote I/O module.**

<table>
<tr><td>Command</td><td>job=get_channel_val&
if_type=val&com_port=val&module_no=val&
ch_type=val&ch_addr=val</td></tr>
<tr><td>Parameters</td><td>
<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 for 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>
<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：ci, co, ri, ro
Other Modules：di, dic, do, ai, ao</td></tr>
</table>
<table>
<tr><td>Name</td><td>ch_addr</td></tr>
<tr><td>Description</td><td>The channel address</td></tr>
<tr><td>Value</td><td>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.</td></tr>
</table>
</td></tr>
<tr><td>Response</td><td>The channel is existed.</td></tr>
<tr><td></td><td>{
"status": "OK",</td></tr>
</table>

	<pre>{
	  "result": {
	  "value": 2.5,
	  "connection": "ONLINE" //or "OFFLINE"
	  }
	}</pre>

	The module or channel does not exist.

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

	Password error

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

```
{
  "status": "OK",
  "result": {
    "ci": [
      {
        "address": "32"
        "value": 0
      },
      …
    ],
    "co": [], //if there is no channel of this type.
    "ri": [
      {
        "address": "10"
        "value": 1.3
      },
      …
    ],
    "ro": [
      {
        "address": "22"
        "value": 2.5
      },
      …
    ],
    "connection": "ONLINE" //or "OFFLINE"
  }
}
```

For other modules:

```
{
  "status": "OK",
  "result": {
    "di": [0, 1, …],
    "dic": [0 , 2, …],
    "do": [], //if there is no channel of this type.
    "ai": [0.2, 1.5, …],
    "ao": [4.5, 1.1, 2.2, …],
    "connection": "ONLINE" //or "OFFLINE"
  }
}
```

The module does not exist.

	{
	"status": "MODULE_NOT_EXIST"
	}

	Password error

	{
	"status": "PASSWORD_INCORRECT"
	}

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

Command	job=get_module_status
Parameters	None
Response	Normal

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

	Password error

	{
	"status": "PASSWORD_INCORRECT"
	}

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

<table>
<tr><td>Command</td><td>job=set_ir_val&
ir_no=val&ir_value=val</td></tr>
<tr><td>Parameters</td><td>
<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>
</td></tr>
<tr><td rowspan="6">Response</td><td>The Internal Register is enabled.</td></tr>
<tr><td><pre>{
  "status": "OK"
}</pre></td></tr>
<tr><td>The Internal Register is disabled.</td></tr>
<tr><td><pre>{
  "status": "INTERNAL_REGISTER_NOT_EXIST"
}</pre></td></tr>
<tr><td>Password error</td></tr>
<tr><td><pre>{
  "status": "PASSWORD_INCORRECT"
}</pre></td></tr>
</table>

- **Get the value of a specific Internal Register.**

<table>
<tr><td>Command</td><td>job=get_ir_val&
ir_no=val</td></tr>
<tr><td>Parameters</td><td>
<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>
</td></tr>
<tr><td>Response</td><td>The Internal Register is enabled.</td></tr>
</table>

	<pre>{
	  "status": "OK",
	  "result": {
	  "value": 12.5
	  }
	}</pre>

	The Internal Register is disabled.

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

	Password error

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

- **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_INCORRECT"
	}</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_INCORRECT"
	}</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_INCORRECT"
	}</pre>

- **Get the current firmware version.**

Command	job=get_firmware_version
Parameters	None
Response	Normal Status

	{
	"status": "OK",
	"result": {
	"version": "1.0.0"
	}
	}

	Password error

	{
	"status": "PASSWORD_INCORRECT"
	}

- **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_INCORRECT"
	}

- **Set up Schedule and query the setting of Schedule.**
  WISE supports querying of schedule setting and modifying the setting of schedule through CGI commands. The corresponding commands are as follows:

  - **Get the quantity of schedule:**

Command	job=get_schedule_num
Parameters	None
Response	Normal Status

	{
	"schedule_num": "2"
	}

	Password error

	{
	"status": "PASSWORD_INCORRECT"
	}

  - **Get schedule setting**

Command	job=get_schedule& index=val
Parameters	Name: index Description: The index number of the Schedule. Value: Integer; start from 1.
Response	If the schedule exists, the corresponding XML configuration code of the schedule will be replied.
	<S idx="1" status="1" type="0" nickname="Schedule 1"> <TIME h1="-1" m1="1" s1="1" h2="-1" m2="1" s2="5" idx="1"/> <TIME h1="-1" m1="30" s1="1" h2="-1" m2="30" s2="5" idx="2"/> <DATE year="2022" month="6" duration="9"/> <SKIP>0,0,0,0,0,0,0</SKIP> </S>
	No such schedule

	{
	"status": " INDEX_ERROR"
	}

	Password error

	{
	"status": "PASSWORD_INCORRECT"
	}

➢ **Modify schedule setting (POST Command)**

Command	job=set_schedule& index=*val*
Parameters	Name: index Description: The index number of the Schedule. Value: Integer; start from 1.
Body	Modify the setting of the corresponding schedule by the XML configuration coding system get.
	<SCHEDULE> <S idx="1" status="1" type="0" nickname="schedule 1"> <TIME h1="-1" m1="1" s1="1" h2="-1" m2="1" s2="5" idx="1"/> <TIME h1="-1" m1="30" s1="1" h2="-1" m2="30" s2="5" idx="2"/> <DATE year="2021" month="9" duration="6"/> <SKIP> 7,202911840,25363980,811647363,0,0</SKIP> </S> <S idx="2" status="1" type="1" nickname="Test" week="1234567"> <TIME h1="-1" m1="0" s1="0" h2="-1" m2="0" s2="5" idx="1" /> <SKIP>1/1,3/3</SKIP> </S> </SCHEDULE>
Parameters	■ The next level of <Schedule> can contain multiple <S>s. The quantity of <S> is limited to the number of schedules. ■ <S> is the content of the schedule setting, following are the description of the parameters. ◆ idx:Index ◆ status:0 is Disable; 1 is Enable.

	◆ type:0 is “Calendar” mode; 1 is “Repeat” mode. ◆ week:“Repeat” mode only, it use 1234567 to represent the days in a week(form Monday to Sunday) that is going to execute the schedule. ■ <TIME> is the content of the time range setting. ◆ idx is the number of the time range. ◆ h1, m1, s1 are the start time(hour, minute and second). If h1 equals to -1, it means to enable the “Hourly” option. ◆ h2, m2, s2 are the end time(hour, minute and second). If h2 equals to -1, it means to enable the “Hourly” option. ■ <DATE> is the duration setting for the schedule (Calendar mode) ◆ month is the starting month. ◆ duration is the number of months for the schedule. ■ <SKIP> is the exception date setting for the schedule ◆ Calender Mode: The content of the setting is composed by comma-separated numbers. The quantity of numbers is the same as the value of duration in the <DATE>. Each number is a 32-bit integer which indicates whether the 1st to the 31st of the month is an exception date, or not. For example, if the 1st, 2nd, and 3rd of the month are exception days, the number must be 7. ◆ Repeat Mode: The content of the setting is composed by comma-separated month/day group. For example, if January 1 and March 3 are the exception dates, the content will be 1/1, 3/3.
Response	No such schedule

	{
	"status": "SCHEDULE_NOT_FOUND"
	}

	Password error
	{

	"status": "PASSWORD_INCORRECT" }
	Content with incorrect format

	{
	"status": "SCHEDULE_FORMAT_INCORRECT"
	}

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

WISE supports the MQTT protocol. User can use it to change the value of the Internal Register of WISE or the value of the output channel of I/O module which connect to WISE. Based on MQTT, user just needs to publish the specific topics to Broker, and WISE will automatically subscribe and receive the specific topics to complete the action. Following will list the format of Public topic to the related output channel of I/O module and Internal Register.

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

Topic	*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 VII：The JSON format for the communication with IoT Platform

WISE supports the functions to publish the JSON format messages to Amazon Web Services, Microsoft Azure and IBM Bluemix IoT Cloud platforms, and also subscribe/receive the JSON format messages from IoT Cloud platform to change the value of the output channel of I/O modules that are connected to WISE. The following lists the detailed information of JSON format message with WISE.

- **Message format**

{

"msg_type" :

"SYSTEM_INFORMATION_UPDATE"	It means the update message of the System information WISE sent.
"CHANNEL_UPDATE"	The "CHANNEL_UPDATE" type of message indicates the message published by WISE to inform IoT Cloud platform the update of the I/O channel status.
"CHANNEL_OUTPUT"	If WISE receives the message in the type of "CHANNEL_OUTPUT", then WISE will perform the task to change the value of the output channel.

"info_item" : Items for the system information. If the msg_type field is SYSTEM_INFORMATION_UPDATE, then this field will exist. Following is for the describptions of the codes.

"DATE_YEAR"	Date(Year)
"DATE_MONTH"	Date(Month)
"DATE_DAY"	Date(Day)
"TIME_HOUR"	Date(Hour)
"TIME_MINUTE"	Date(Minute)
"TIME_SECOND"	Date(Second)
"UNIX_TIMESTAMP"	Timestamp

<table>
<tr><td>"if_type" :</td><td>It indicates the connection interface between WISE and the I/O module where the I/O channel resides. The following table shows the code and the interface it represents.
<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 and the I/O module is COM port 3. "4" indicates the connection interface between WISE and the I/O module is COM port 4. If the connection interface is XV-Board or Ethernet, please ignore this field.</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 Modbus Table. The range is 1~16. If the connection interface is XV-Board, please ignore this field.</td></tr>
<tr><td>"ch_type" :</td><td>It indicates the type of the I/O channel. The following table shows the code and the I/O channel type it represents.
<table>
<tr><td>"DI"</td><td>DI Channel</td></tr>
<tr><td>"DI_COUNTER"</td><td>The counter of the DI Channel</td></tr>
<tr><td>"DO"</td><td>DO Channel</td></tr>
<tr><td>"DO_COUNTER"</td><td>The counter of the DO Channel</td></tr>
<tr><td>"AI"</td><td>AI Channel</td></tr>
<tr><td>"AO"</td><td>AO Channel</td></tr>
<tr><td>"DISCRETE_INPUT"</td><td rowspan="4">The data type of the Modbus module</td></tr>
<tr><td>"COIL_OUTPUT"</td></tr>
<tr><td>"INPUT_REGISTER"</td></tr>
<tr><td>"HOLDING_REGISTER"</td></tr>
<tr><td>"IR"</td><td>Internal Register</td></tr>
</table></td></tr>
<tr><td>"ch_addr" :</td><td>It indicates the I/O channel index, Modbus address or Internal Register number.</td></tr>
<tr><td>"nickname" :</td><td>It indicates the nickname of the I/O channel.</td></tr>
<tr><td>"value" :</td><td>It indicates the real-time value of the I/O channel.</td></tr>
</table>

}

- **Example**

The following is the format to publish a message with the value of DI channel 2

which resides at the I/O module with module number 5 to IoT Cloud platform. The I/O module is connected to the COM3 of WISE.

```
{
    "msg_type":"CHANNEL_UPDATE",
    "if_type":1,
    "com_port":3,
    "module_no":5,
    "ch_type":"DI",
    "ch_addr":2,
    "nickname":"door sensor",
    "value":"1"
}
```

The following is a format to publish the message with the value of Internal Register 13 to IoT Cloud platform.

```
{
    "msg_type":"CHANNEL_UPDATE",
    "ch_type":"IR",
    "ch_addr":13,
    "nickname":"function result 1",
    "value":"63.87"
}
```

The following is a format of the received message from IoT Cloud platform, it is used to change the value of AO channel 1 of XV-Board of WISE to 3.6.

```
{
    "msg_type":"CHANNEL_OUTPUT",
    "if_type":0,
    "ch_type":"AO",
    "ch_addr":1,
    "value":"3.6"
}
```

The following is a format of the received message from IoT Cloud platform, it is used to change the value of AO channel 2 which resides at the I/O module with

module number 3 to 5.0. The I/O module is connected to the COM4 of WISE.

```
{
      "msg_type":" CHANNEL_OUTPUT ",
      "if_type":1,
      "com_port":4,
      "module_no":3,
      "ch_type":"AO",
      "ch_addr":2,
      "nickname":"fan speed",
      "value":"5.0"
}
```

Appendix VIII：WISE-2841M LED Indicators

LED indicators of WISE provide a very convenient way of status indications for faster, easier diagnostics.

LED	LED Status	Module Status
PWR (Red)	ON	The module is powered on.
4G (Orange)	Blinking	The modem is functioning normally.
	OFF	The modem is missing or damaged.
RUN (Green)	Blinking Red (one flash per second)	The module is functioning normally. PS：When WISE is powered on, please wait about one minute to complete the start-up procedure, until the “RUN” led starts flashing.
L1	ON	Watchdog is under operation.
L2	OFF	Only for firmware recovery operation.
L3	OFF	Only for firmware recovery operation.

Appendix IX：ICP DAS “IoTstar Trial” account application

IoTstar is a software developed by ICP DAS for WISE/PMC/PMD controllers in a variety of Industrial IoT applications. Using IoTstar to build the IoT Cloud system, it can provide the following major services:

- Controller Remote Access Service: Status Monitoring, System Setting, and Firmware Update for WISE/PMC/PMD controllers.
- Sensor Data Collection Service: Sensor data collected and imported into Database at cloud.
- Sensor Data Visualization Service: Review sensor data through Dashboard interface.
- Sensor Data Report Service: Review sensor data through statistical report.
- Bot Service with Mobile Phone: Query and monitor sensor data by mobile phone Bot service.

During the IoT Cloud system development, there is no-programming-required, and the system setting can be completed only through the web interface operation. In addition, through the SQL command, IoTstar can be quickly integrated with the Cloud platforms, data analysis tools (Power BI, Google Data Studio or SCADA system etc.) to help users quickly build the “IoT + Big Data” Cloud application.

WISE/PMC/PMD users are welcome to experience the benefits of building a cloud IoT system through the "IoTstar+WISE/PMC/PMD" solution-the “IoTstar Trial” provided by ICP DAS. Users only need to complete the account application for “IoTstar Trial”, and then can use the WISE/PMC/PMD controller at hand and the “IoTstar Trial” provided by ICP DAS to actually perform the IoT cloud-based operations for WISE/PMC/PMD controllers.

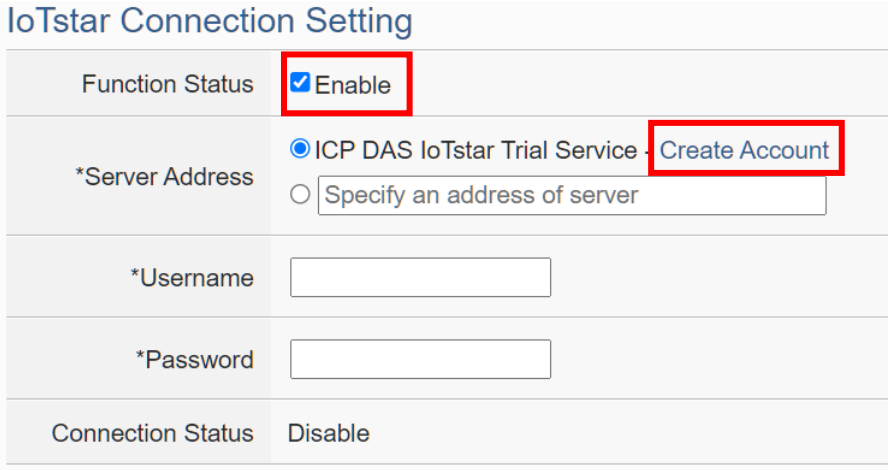
Please note:

1. Each “IoTstar Trial” account provides "30 days trial period, allowing up to 4 WISE/PMC/PMD controllers connected and 1G database storage space".
2. IoTstar supports WISE-523x/WISE-2x4x series (with v1.6.0 or later version firmware), WISE-284x series (with v1.0.0 or later version firmware), PMC-523x/PMC-2x4x/PMD series (with v3.6.0 or later version firmware), and PMC-284x series (with v1.0.0 or later version firmware). If the WISE/PMC/PMD does not install with the right firmware version. Please update the firmware.

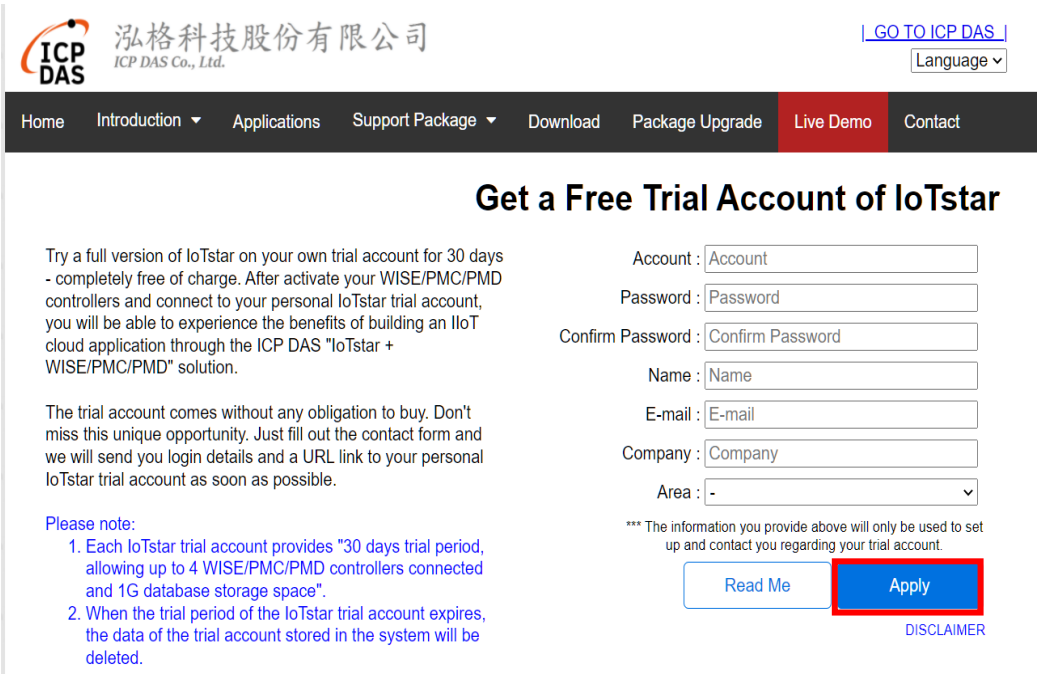
3. When the trial period of the “IoTstar Trial” account expires, the data of the trial account stored in the system will be deleted.

For the account application of “IoTstar Trial”, please refer to the following steps:

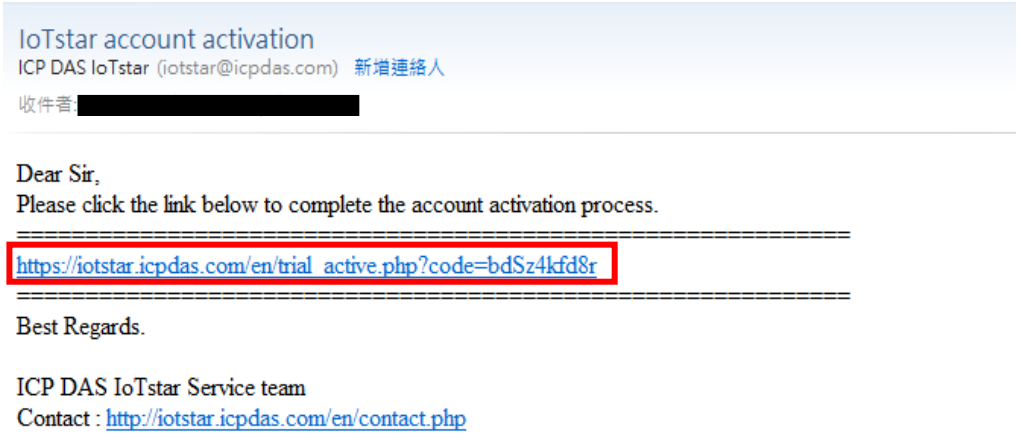
i. Click “Enable” in the “Function Status” field of the “System Setting→Network Setting→IoTstar Connection Setting” on the WISE page to open the parameter setting page of “IoTstar Connection Setting”, then click the Create Account button next to “ICP DAS IoTstar Trial Service”.



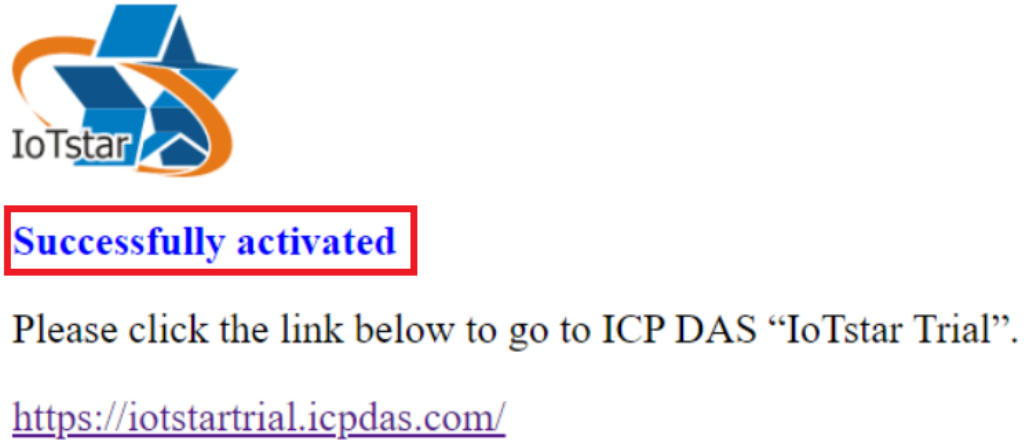
ii. On the account application page of “IoTstar Trial”, enter the following information: “Account”, “Password”, “Name”, “Email”, “Company”, “Area”, and then click “Apply” button, the system will send an “Account Activation” email to the email address you entered.



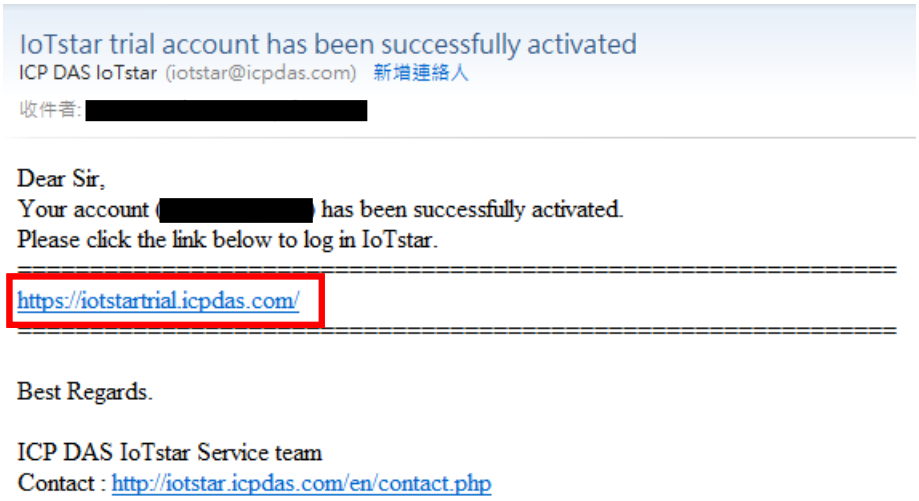
iii. Check your mailbox and find the “Account Activation” email sent by “IoTstar Trial”, and then click the link of the account application “IoTstar Trial” provided in the email to complete the activation process of the trial account.



iv. When the trial account is successfully activated, the page will display the “Successfully activated” message as below.



v. When the trial account is successfully activated, the “IoTstar Trial” will send a “Trial Account Activated” email to the email address you entered, click https://iotstartrial.icpdas.com to visit the login page of the “IoTstar Trial”.

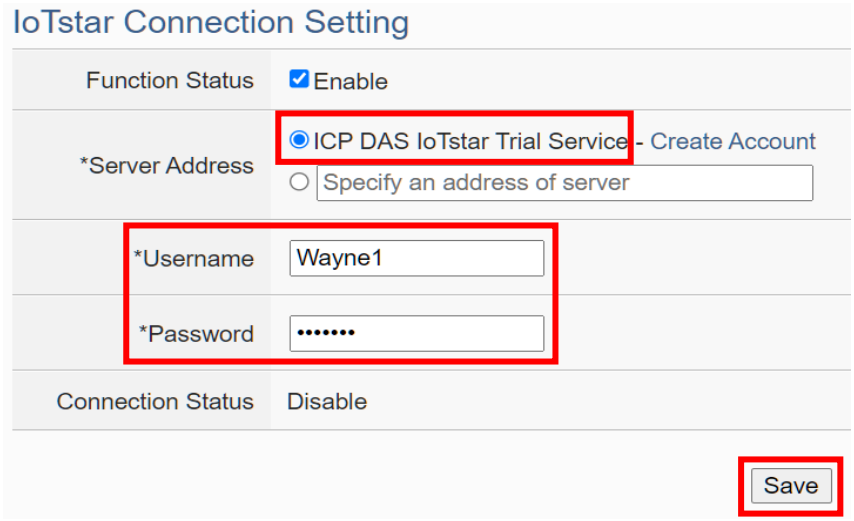

IoTstar trial account has been successfully activated
ICP DAS IoTstar (iotstar@icpdas.com) 新增連絡人
收件者: [redacted]

Dear Sir,
Your account ([redacted]) has been successfully activated.
Please click the link below to log in IoTstar.
==========
https://iotstartrial.icpdas.com/
==========

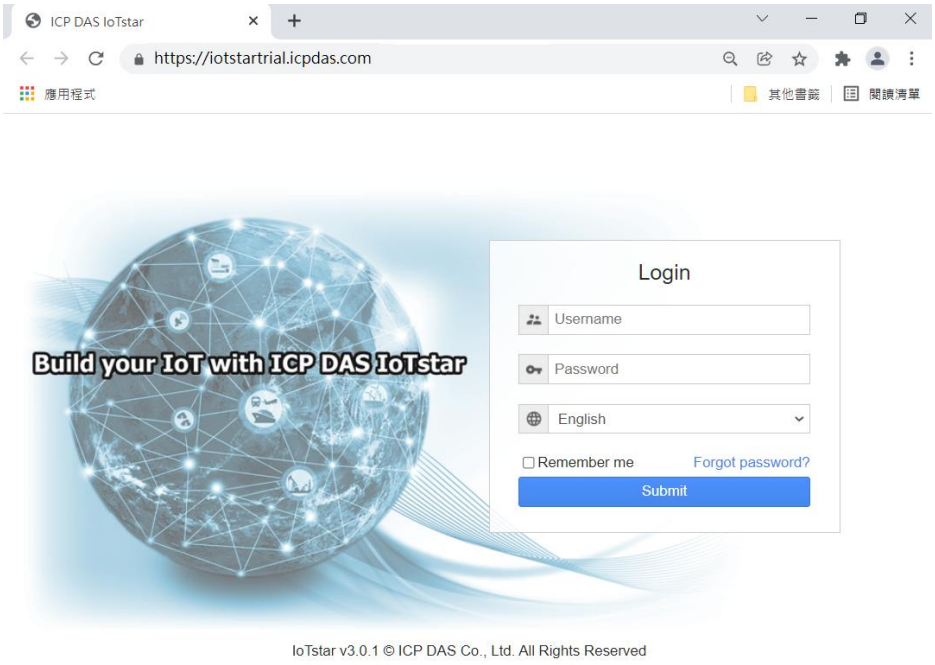
Best Regards.

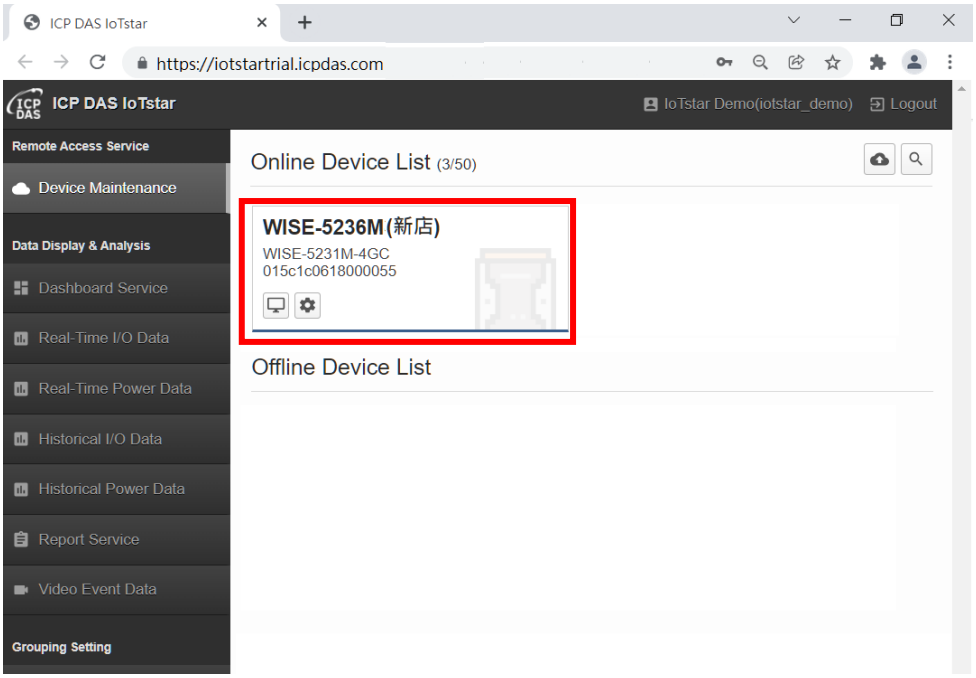
ICP DAS IoTstar Service team
Contact : http://iotstar.icpdas.com/en/contact.php

vi. Go back to the "IoTstar Connection Settings" page of WISE, and enter the "Username" and "Password" information you set in the step ii, click "Save" button to save the setting, then download the settings to WISE. After that, the WISE controller will connect to the "IoTstar Trial" account you applied.



vii. Go to https://iotstartrial.icpdas.com to visit the login page of the "IoTstar Trial", enter the "Account" and "Password" information you set in the step ii, then you can log in to the "IoTstar Trial" through the account you applied.
Now you can manage and change the setting of the WISE controller set in step vi and use the functions provided by IoTstar.





For more information about IoTstar IoT cloud management software, please refer to [IoTstar official website].