# OPC UA I/O User Manual

**V10.0, 2026/01**

## U-7500 Series

### IIoT OPC UA I/O Module




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# Revision History

This chapter provides revision history information to this document.

The table below shows the revision history.

| Revision | Date | Description |
|---|---|---|
| V10.0 | 06/2025 | 10.0th Version: Provide New Functions:<br>1. 1. 4.5.1, 4.5.2 Order of chapter exchanges<br>2. 4.3.2 Server- Add the statement "File extension: .der, .cer, and .crt. only"<br>3. .4.3.3. Client Setting- Replace the interface diagram<br>4. 4.3.1 Server Settings- Add the statement that the OPC UA Server supports IPv4 only.<br>5. 3.3 Example 1 figure replacement<br>6. 4.5.1.3 Add a Line chapter<br>7. 4.5.1.4 Add a Telegram chapter<br>8. 4.5.1.5 Add an Email chapter |
| V9.1 | 03/2025 | 9.1th Version: Provide New Functions:<br>9. Increase software specification<br>-Basic256Sha256 (Sign, Sign and Encrypt)<br>- Aes128Sha256RsaOaep (Sign, Sign & Encrypt)<br>- Aes256Sha256RsaPss (Sign, Sign & Encrypt)<br>10. Modify the contents of the project file 4.2.5<br>11. 4.3.1 Add security settings, change connection setting diagram<br>12. 4.3.3 Modify the security policy content<br>13. 4.2.2 Set the analog input channels individually to enable or disable.<br>14. 4.5.4 Add the Nickname column.<br>15. 4.1.7 Replaces the maintenance interface diagram<br>16. 4.1.7 Delete 'Wait about 2 minutes' in the firmware settings.<br>17. 4.3.3 OPC UA Server supports IPv4 only.<br>18. 4.5.1.2 Modify the send message to the Line chapter |
| V9.0 | 12/2023 | 9th Version: Provide New Functions:<br>1. (4.3.1) (4.3.3) Replace the web interface picture.<br>2. 2.1.3 Refill notes<br>3. Delete the 3.5 rule setting.<br>4. 4.3.1 Add the option to automatically trust all client certificates in the connection settings.<br>5. Rewrite the content of the "Add new rule" function. |
| V8.0 | 09/2023 | 8th Version: Provide New Functions:<br>1. Modify the UA I/O manual introduction, features, and specifications.<br>2. Add Client Setting function<br>3. Add Client certificate function<br>4. Add EZ-UAQ Utility |


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| Revision | Date | Description |
|---|---|---|
| V7.1 | 05/2023 | 7.1th Version: Provide New Functions:<br>1. 1. 4.5.1 New Line function and step-by-step procedure in the event log. The setting is changed to 4.5.1.1 Main settings<br>2. Add new function 4.5.1.2 Sending messages to Line<br>3. 4.5.2 rule setting add 4.5.2.1 main settings, optimize the setting process<br>4. 4. (4.2.3) (4.2.4) (4.4.2) The Nickname in the function of [Module Setting] ➔ [I/O Setting]<br>5. 2.2.2 Original Utility changed to EZ-UAQ Utility content update |
| V7.0 | 02/2023 | 7th Version: Provide New Models & New Functions:<br>1. Add new models (*18): U-7502M, 7515M, 7517M, 7518ZM/S, 7518ZM/S2, 7524M, 7528M, 7542M, 7544M, 7545M, 7550AM, 7551M, 7552M, 7553M, 7558M, 7559M, 7561M, 7567M<br>2. Add new function: Support IoTstar Cloud management software (3.5 and 4.5.6)<br>3. Add new models to each section of CH1.<br>4. 2.2.2 Utility upgrade<br>5. Add counter function to the I/O setting (4.2.1)<br>6. Add the Test function to the MQTT Setting. (3.2.1 and 4.4.1)<br>7. InduSoft changed to AVEVA Edge<br>8. Iotstar added new features<br>9. Add 3.4 Common settings table for easy integration<br>10. Add 4.2.1 Overview<br>11. Alias changed to Nickname<br>12. chapter order changed Scaling 4.5.1→4.2.3 |
| V6.0 | 04/2022 | 6th Version: Provide New Models & New Functions:<br>1. Add new models: U-7517M-10、U-7519ZM(/S, /S2)<br>2. Add more descriptions for the 3.3, 4.1, 4.4, and 4.5 sections.<br>3. Add new models to each section of CH1. |


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# 1. UA I/O Introduction:

**UA I/O series** is a series of **IIoT I/O modules** known as **U-7500 or U-7000**. This series built-in provides the communication protocol functions of the Industrial Internet of Things (IIoT), including OPC UA Server / Client, MQTT Client and Restful API functions. It allows users to choose the network communication method according to their needs and directly transfer the value of the I/O channel to the Cloud system or the field-side control system for displaying, analysis or strategy.

## 1.1Introduction

**UA I/O modules** is a series of Ethernet I/O modules that supports the **OPC UA Server / Client, MQTT Client** and **RESTful API** services (and can be used simultaneously). Users can choose the networking mode according to their needs and environment, to transmit the values of built-in I/O channels to the Cloud system or field control system for displaying, analysis or strategy. Support Scaling. Let the analog signal be converted into a more readable value. Support logic function rule setting IF, THEN, ELSE, can set up logical condition/action for I/O and virtual point; Provide schedule function to execute the set rules at a specific time; and support RESTful API function, can read/write I/O and virtual point through HTTP or HTTPS (identity verification and communication encryption).

In the information security and data security of the platform connection method, the following functions are provided respectively to enhance the security of I/O networking:

Table 1　1-1 Connectivity for various platforms

| Connectivity for various platforms | OPC UA, MQTT, RESTful API can be used simultaneously |
|---|---|
| Connect to Cloud | MQTT |
| Connect to SCADA | OPC UA, MQTT |
| Connect to MES | OPC UA |
| Connect to IT | MQTT, RESTful API (HTTP, HTTPS) |
| | |
| Information Security | HTTPS, Port Binding, Allowlist, ICMP drop |
| Data Security | Certificate(X.509), Communication Encryption(SSL/TLS) |

UA I/O Series provides a Web-based User Interface (Web UI) to configure the module, control the output channels, monitor the connection, and I/O status via a normal web browser. It is easy, fast, and no extra APP needed.

**OPC UA Architecture:**

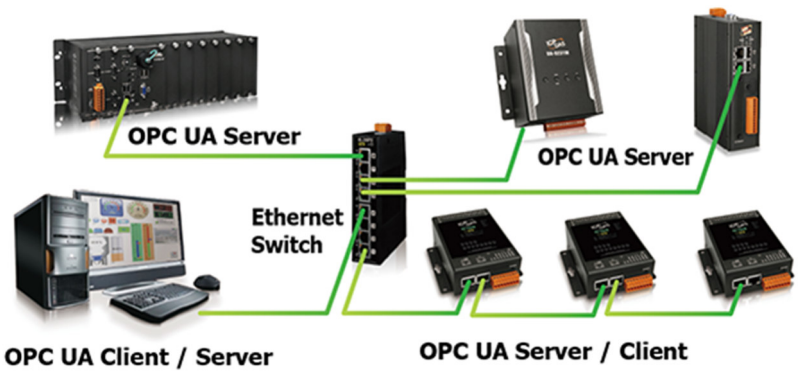



Figure 1　1-1 OPC UA Architecture



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## MQTT Architecture:

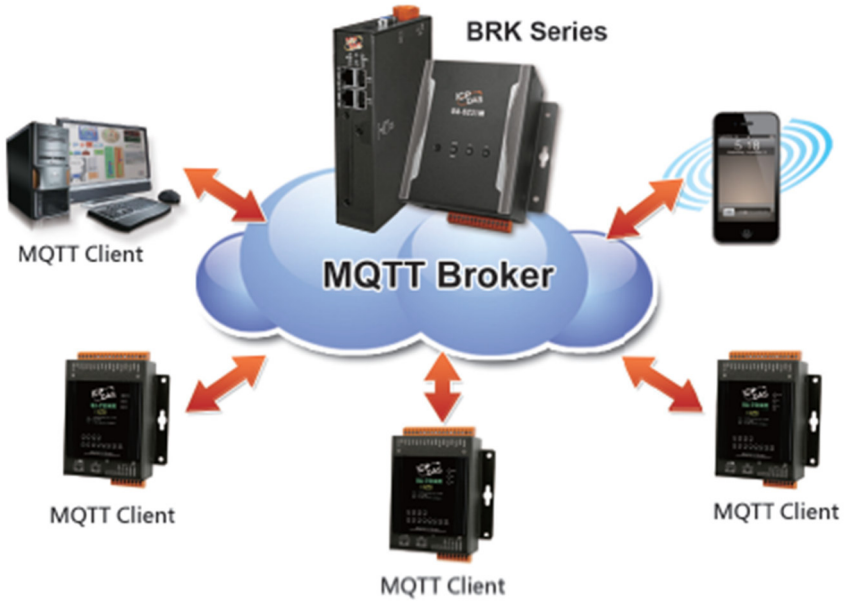



Figure 2 1-1 MQTT Architecture



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## 1.2 Features

- Built-in OPC UA Server Service
  Compliance with IEC 62541 Standard. Provides functions of Active Transmission, Transmission Security Encryption (SSL/TLS), User Authentication (X.509 Certificates / Account password), Communication Error Detection and Recovery, etc. to connect SCADA or OPC UA Clients. Recommend to keep the maximum number of sessions within 3 connections.

- Built-in OPC UA Client Service
  Compliance with IEC 62541 Standard. Provides Transmission Security Encryption ( SSL / TLS ), User Authentication (X.509 Certificates / Account password), and OPC UA Server Connectivity.

- Built-in MQTT Client Service
  Build-in MQTT Client Service (Compliance with MQTT V.3.1.1 protocol). Provides functions of IoT Active M2M Transmission, QoS (Quality of Service), Retains Mechanism, Identity Authentication, Encryption, Last Will, etc.

- Support RESTful API function
  Support to read/write I/O and Virtual points via HTTP.
  Provide high-security HTTPS (identity verification and communication encryption) to read/write I/O and Virtual points.

- Support to Execute OPC UA, MQTT, and RESTful API Communication at the Same Time.

- Support IoTstar Cloud Management Software
  UA I/O factory version 9.7 and later supports this function.

- Support Scaling
  AI/AO modules support Scaling. Let the analog signal be converted into a more readable value.

- Support logic function Rule Setting: IF, THEN, ELSE
  Users can set up logical condition/action for I/O and virtual point.

- Support Schedule
  Provide schedule function to execute the set rules at a specific time.

- Support Trigger Message
  When the I/O value changes, record the message in a file (CSV) for easy device tracking.
  When the I/O value changes, send the message to Line for easy device tracking.

- Built-in Web Server to Provide the Web User Interface
  UA I/O Series provides a Web-based User Interface (Web UI) to configure the module, control the output channels, monitor the connection, and I/O status via a normal web browser. It is easy, fast,



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and no extra APP needed.

- **Diversified Choices**
  Different models provide different AI, AO, DI, or DO channels, and users can choose the desired model according to the needs of the case.

- Dual-port Ethernet Switch for Daisy-Chain Topology
  Provide dual-port Ethernet switch for Daisy-Chain Topology. The cabling of Daisy-Chain Topology is much easier, and the total costs of cables and switches are significantly reduced.

- IEEE 802.3af-compliant Power over Ethernet (PoE)
  UA I/O follows IEEE 802.3af (classification, Class 2) compliant Power over Ethernet (PoE) specification. It allows receiving power from PoE enabled network by Ethernet pairs. This feature provides greater flexibility and efficiency to simplify system design, save space, and reduce wirings and power sockets.



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# 1.3 Selection Guide

### U-7500 Series UA I/O Selection Guide:

Table 2 1-3 U-7500 Series UA I/O Selection Guide

| U-7500 Series OPC UA I/O Module Selection Guide | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Module | AI | | AO | | DI | | DO | |
| | Ch. | Type | Ch. | Type | Ch. | Type | Ch. | Type |
| **U-7502M** | 3 | ±150 mV, ±500 mV, ±1 V, ±5 V, ±10 V +0 mA ~ +20 mA, ±20 mA, 4 ~ 20 mA | - | - | 6 | Wet (Sink/Source) | 3 | Power Relay, Form A (SPST N.O.) |
| **U-7504M** | 4 | ±500mV, ±1V, ±5V, ±10V, 0~20mA, ±20mA, 4~20mA | 4 | 0~5V, ±5V, 0~10V, ±10V, 0~20mA, 4~20mA | 4 | Dry (Source), Wet (Sink) | - | - |
| **U-7515M** | 7 | Pt100, Pt1000, Ni120, Cu100, Cu1000 | - | - | - | - | - | - |
| **U-7517M** | 8 | ±150 mV, ±500 mV, ±1 V, ±5 V, ±10 V ±20 mA, 0 ~ 20 mA, 4 ~ 20 mA | - | - | - | - | 4 | Isolated Open Collector (Sink) |
| **U-7517M-10** | 10 / 20 | ±150mV, ±500mV, ±1V, ±5V, ±10V, ±20mA, 0~20mA, 4~20mA | - | - | - | - | - | - |
| **U-7518ZM/S** | 10 | ±15 mV, ±50 mV, ±100 mV, ±500 mV, ±1 V, ±2.5 V ±20 mA, 0 ~ 20 mA, 4 ~ 20 mA Thermocouple: J, K, T, E, R, S, B, N, C, L, M, LDIN43710 | - | - | - | - | 3 | Isolated Open Collector (Sink) |
| **U-7518ZM/S2** | | | | | | | | |
| **U-7519ZM/S** | 10 | ±15mV, ±50mV, ±100mV, ±150mV, ±500mV, ±1V, ±2.5V, ±5V, ±10V, ±20mA, 0~20mA, 4~20mA Thermocouple: J, K, T, E, R, S, B, N, C, L, M, LDIN43710 | - | - | - | - | 3 | Isolated Open Collector (Sink) |
| **U-7519ZM/S2** | | | | | | | | |
| **U-7524M** | - | - | 4 | 0~5V, ±5V, 0~10V, ±10V, 0~20mA, 4~20mA | 5 | Dry (Source) Wet (Sink) | 5 | Isolated Open Collector (Sink) |
| **U-7526M** | 6 | ±500 mV, ±1V, ±5V, ±10V, 0~20mA, ±20mA, 4~20mA | 2 | 0~5V, ±5V, 0~10V, ±10V, 0~20mA, 4~20mA | 2 | Dry (Source) Wet (Sink) | 2 | Isolated Open Collector (Sink) |
| **U-7528M** | - | - | 8 | 0~5V, ±5V, 0~10V, ±10V, 0~20mA, 4~20mA | - | - | - | - |



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| U-7500 Series OPC UA I/O Module Selection Guide | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Module | AI | | AO | | DI | | DO | |
| | Ch. | Type | Ch. | Type | Ch. | Type | Ch. | Type |
| **U-7542M** | - | - | - | - | - | - | 16 | Isolated Open Collector (Sink) |
| **U-7544M** | - | - | - | - | 8 | Wet (Sink/Source) | 8 | Isolated Open Collector (Sink) |
| **U-7545M** | - | - | - | - | - | - | 16 | Isolated Open Collector (Source) |
| **U-7550AM** | - | - | - | - | 12 | Dry (Source) Wet (Sink) | 6 | Isolated Open Collector (Sink) |
| **U-7551M** | - | - | - | - | 16 | Wet (Sink/Source) | - | - |
| **U-7552M** | - | - | - | - | 8 | Wet (Sink/Source) | 8 | Isolated Open Collector (Source) |
| **U-7553M** | - | - | - | - | 16 | Dry (Source) | - | - |
| **U-7555M** | - | - | - | - | 8 | Dry (Source), Wet (Sink,Source) | 8 | Isolated Open Collector (Source) |
| **U-7558M** | - | - | - | - | 8 | Wet (Sink/Source) | - | - |
| **U-7559M** | - | - | - | - | 8 | Wet (Sink/Source) | - | - |
| **U-7560M** | - | - | - | - | 6 | Wet (Sink/Source) | 6 | Power Relay Form A (SPST N.O.) |
| **U-7561M** | - | - | - | - | - | - | 11 | Power Relay, Form A (SPST N.O.) |
| **U-7567M** | - | - | - | - | - | - | 8 | Power Relay, Form A (SPST N.O.) |



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# 1.4 Specifications

## 1.4.1 Software Specifications (Series Common)

Table 3 1-4-1 Software Specifications

| UA I/O Software Specifications (Series Common) | |
|---|---|
| **Protocol** | |
| OPC UA Server / Client | ● OPC Unified Architecture: 1.02<br>● Core Server Facet<br>● Data Access Server Facet<br>● Method Server Facet<br>● UA-TCP UA-SC UA Binary<br>● User Authentication:<br>- Anonymous<br>- Username/Password<br>- X.509 Certificate<br>● Security Policy:<br>- None<br>- Basic128Rsa15 (Sign, Sign & Encrypt)<br>- Basic256 (Sign, Sign & Encrypt)<br>- Basic256Sha256 (Sign, Sign and Encrypt)<br>- Aes128Sha256RsaOaep (Sign, Sign & Encrypt)<br>- Aes256Sha256RsaPss (Sign, Sign & Encrypt)<br>● Can Execute with MQTT and RESTful API Communication Simultaneously<br>● Max. Session Connections: 3 (Server only) |
| MQTT Client | ● Connect to the MQTT Broker to read or control the I/O channel value by the publish/subscribe messaging mechanism. (MQTT Ver. 3.1.1; TLS Ver. 1.2) |
| RESTful API | ● User can read/write the I/O & Virtual points through HTTP or HTTPS. |
| **Function** | |
| Web Interface for Configuration | ● The system operation can be performed through the browser without installing software tools.<br>● Use AES 256 encryption algorithm to encrypt web page setting data for general communication.<br>● HTTPS upgrades the security of web communication. |
| Scaling | ● Convert the analog signal to a more readable value.<br>● Function is only available for modules with AI/AO. |
| Security | ● Information Security: Provide HTTPS, Port Binding, Allowlist, ICMP drop functions.<br>● Data security: Provide Certificate (X.509), Communication Encryption (SSL/TLS) functions. |
| Rule Setting | ● Provide simple logic condition rule setting, let UA I/O do automatic condition judgment and action control, to achieve simple intelligentization. |
| Schedule | ● Provide schedule function to execute the set rules at a specific time. |
| Event Log | ● When the I/O value changes, record the current I/O value for easy device tracking in the future. |
| IoTstar Setting | ● Support IoTstar cloud management software developed by ICP DAS. |



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## 1.4.2 U-7502M Specifications

Table 4 1-4-2 U-7502M Specifications

### System Specifications

| CPU Module | |
|---|---|
| CPU | 32-bit CPU (400 MHz) |
| Watchdog Timer | Module, Communication(Programmable) |
| **Isolation** | |
| 2-way Isolation | I/O: 2500 VDC |
| **EMS Protection** | |
| ESD (IEC 61000-4-2) | ±4 kV Contact for each terminal<br>±8 kV Air for random point |
| EFT (IEC 61000-4-4) | ±2 kV for Power Line |
| Surge (IEC 61000-4-5) | ±2 kV for Power Line |
| **LED Indicators** | |
| Status | Run, Ethernet, I/O |
| **Ethernet** | |
| Ports | 2 x RJ-45, 10/100 Base-TX, Swtich Ports |
| PoE | Yes |
| LAN bypass | Yes |
| Security | ID, Password and IP Filter |

| Power | |
|---|---|
| Reverse Polarity Protection | Yes |
| Consumption | 6.6 W |
| Powered from PoE | IEEE 802.3af, Class3 |
| Powered from Terminal Block | +12 to +48 VDC |
| **Mechanical** | |
| Dimensions (mm) | 97 x 120 x 47 (W x L x H) |
| Installation | DIN-Rail mounting |
| **Environment** | |
| Operating Temperature | -25 °C ~ +75 °C |
| Storage Temperature | -30 °C ~ +80 °C |
| Humidity | 10 ~ 90% RH, Non-condensing |

### I/O Specifications

| Analog Input | |
|---|---|
| Channels | 3 (Differential) |
| Type | Voltage, Current |
| Range | ±150 mV, ±500 mV, ±1 V, ±5 V, ±10 V 0 to 20 mA, ±20 mA, 4 to 20 mA(Jumper Selectable) |
| Resolution | 16-bit |
| Accuracy | Normal Mode: ±0.1%<br>Fast Mode: ±0.5% or better |
| Sampling Rate | Normal Mode: 10 samples/second (Total)<br>Fast Mode: 50 samples/second (Total) |
| Input Impedance | Voltage: 2 MΩ<br>Current: 125 Ω |
| Common Mode Rejection | 86 dB (min.) |
| Normal Mode Rejection | 100 dB |
| Overvoltage Protection | 240 Vrms |
| Overcurrent Protection | 50 mA at 110 VDC (max.) |
| Individual Channel Configuration | Yes |
| Open Wire Detection | Yes |
| Zero Drift | ±20 μV/°C |
| Span Drift | ±25 ppm/°C |
| Isolation | ±400 VDC, Virtual Channel to Channel Isolation |

| Digital Input/Counter | |
|---|---|
| Channels | 6 |
| Type | Wet Contact |
| Sink/Source (NPN/PNP) | Sink/Source |
| ON Voltage Level | +10 ~ +50 VDC |
| OFF Voltage Level | +4 VDC (max.) |
| Max. Counts | 4,294,967,295 (32-bit) |
| Frequency | 100 Hz |
| Min. Pulse Width | 5 ms |
| Input Impedance | 10 kΩ, 0.5W |
| Overvoltage Protection | +70 VDC |

| Relay Output | |
|---|---|
| Channels | 3 |
| Type | Power Relay, Form A (SPST N.O.) |
| Contact Rating | 5 A @ 250 VAC/24 VDC (Resistive Load) |
| Operate Time | 6 ms (Typical) |
| Release Time | 3 ms (Typical) |
| Electrical Endurance | 10^5 ops. |
| Mechanical Endurance | 2 × 10^7 ops. |
| Power on Value | Programmable |
| Safe Value | Programmable |



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## 1.4.3 U-7504M Specifications

Table 5 1-4-3 U-7504M Specifications

### System Specifications

| CPU Module | |
|---|---|
| CPU | 32-bit CPU (400 MHz) |
| Watchdog Timer | Module, Communication (Programmable) |
| **Isolation** | |
| 2-way Isolation | I/O: 2500 VDC |
| **EMS Protection** | |
| EFT (IEC 61000-4-4) | ±2 kV for Power Line |
| ESD (IEC 61000-4-2) | ±4 kV Contact for each terminal<br>±8 kV Air for random point |
| Surge (IEC 61000-4-5) | ±2 kV for Power Line |
| **LED Indicators** | |
| Status | Run, Ethernet, I/O |
| **Ethernet** | |
| Ports | 2 x RJ-45, 10/100 Base-TX, Swtich Ports |
| PoE | Yes |
| LAN bypass | Yes |
| Security | ID, Password and IP Filter |

| Power | |
|---|---|
| Reverse Polarity Protection | Yes |
| Consumption | 8.2 W |
| Powered from PoE | IEEE 802.3af, Class3 |
| Powered from Terminal Block | +12 ~ +48 VDC |
| **Mechanical** | |
| Dimensions (mm) | 97 x 120 x 47 (W x L x H) |
| Installation | DIN-Rail mounting |
| **Environment** | |
| Operating Temperature | -25 °C ~ +75 °C |
| Storage Temperature | -30 °C ~ +80 °C |
| Humidity | 10 ~ 90% RH, Non-condensing |

### I/O Specifications

| Analog Input | |
|---|---|
| Channels | 4 (Differential) |
| Type | Voltage, Current |
| Range | ±500 mV, ±1 V, ±5 V, ±10 V<br>0 to 20 mA, ±20 mA, 4 to 20 mA<br>(Jumper Selectable) |
| Resolution | 16-bit |
| Accuracy | Normal Mode: ±0.1%<br>Fast Mode: ±0.5% or better |
| Sampling Rate | Normal Mode: 10 samples/second (Total)<br>Fast Mode: 50 samples/second (Total) |
| Input Impedance | Voltage: 2 MΩ<br>Current: 125 Ω |
| Common Mode Rejection | 86 dB (min.) |
| Normal Mode Rejection | 100 dB |
| Common Voltage Protection | ±200 VDC |
| Overvoltage Protection | 240 Vrms |
| Overcurrent Protection | 50 mA at 110 VDC (max.) |
| Individual Channel Configuration | Yes |
| Open Wire Detection | Yes |
| Zero Drift | ±20 μV/°C |
| Span Drift | ±25 ppm/°C |
| Isolation | ±400 VDC, Virtual Channel to Channel Isolation |

| Analog Output | |
|---|---|
| Channels | 4 |
| Type | Voltage, Current |
| Range | +0 to +5 VDC, ±5 VDC, +0 to +10 VDC, ±10 VDC, 0 to 20 mA, 4 to 20 mA (Jumper Selectable) |
| Resolution | 12-bit |
| Accuracy | ±0.1% of FSR |
| Open Wire Detection | For 4 ~ 20 mA only |
| Voltage Output Capability | 10 V @ 20 mA |
| Current Load Resistance | 400 Ω |
| Individual Channel Configuration | Yes |
| Power-on Value | Programmable |
| Safe Value | Programmable |

| Digital Input/Counter | |
|---|---|
| Channels | 4 |
| Type | Dry Contact<br>Wet Contact |
| ON Voltage Level | Dry: Open<br>Wet: +1 VDC (max.) |
| OFF Voltage Level | Dry: Close to GND<br>Wet: +3.5 to +30 VDC |
| Max. Count | 4,294,967,295 (32-bit) |
| Frequency | 100 Hz |
| Min. Pulse Width | 5 ms |
| Effective Distance | 500m (max.) |
| Overvoltage Protection | +30 VDC |



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## 1.4.4 U-7515M Specifications

Table 6 1-4-4 U-7515M Specifications

### System Specifications

| CPU Module | |
|---|---|
| CPU | 32-bit CPU (400 MHz) |
| Watchdog Timer | Module, Communication(Programmable) |
| **Isolation** | |
| 2-way Isolation | I/O: 3000 VDC |
| **EMS Protection** | |
| ESD (IEC 61000-4-2) | ±4 kV Contact for each terminal<br>±8 kV Air for random point |
| EFT (IEC 61000-4-4) | ±2 kV for Power Line |
| Surge (IEC 61000-4-5) | ±2 kV for Power Line |
| **LED Indicators** | |
| Status | Run, Ethernet, I/O |
| **Ethernet** | |
| Ports | 2 x RJ-45, 10/100 Base-TX, Swtich Ports |
| PoE | Yes |
| LAN bypass | Yes |
| Security | ID, Password and IP Filter |
| **Power** | |
| Reverse Polarity Protection | Yes |
| Consumption | 5.9 W |
| Powered from PoE | IEEE 802.3af, Class3 |
| Powered from Terminal Block | +12 ~ +48 VDC |
| **Mechanical** | |
| Dimensions (mm) | 97 x 120 x 47 (W x L x H) |
| Installation | DIN-Rail mounting |
| **Environment** | |
| Operating Temperature | -25 °C ~ +75 °C |
| Storage Temperature | -30 °C ~ +80 °C |
| Humidity | 10 ~ 90% RH, Non-condensing |

### I/O Specifications

| Analog Input | |
|---|---|
| Channels | 7 (Differential) |
| Type | RTD (2-wire, 3-wire) |
| Sensor Type | Pt100, Pt1000, Ni120, Cu100, Cu1000 |
| Resistance Measurement | 3.2 kΩ (max.) |
| Resolution | 16-bit |
| Accuracy | ±0.05% |
| Sampling Rate | 12 samples/second (Total) |
| Input Impedance | > 1 MΩ |
| Common Mode Rejection | 150 dB |
| Normal Mode Rejection | 100 dB |
| Overvoltage Protection | +120 VDC |
| Individual Channel Configuration | Yes |
| Open Wire Detection | Yes |
| 3-wire RTD Lead Resistance Elimination | Yes |
| Zero Drift | ±0.5 μV/°C |
| Span Drift | ±20 μV/°C |



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## 1.4.5 U-7517M Specifications

Table 7 1-4-5 U-7517M Specifications

### System Specifications

| CPU Module | |
|---|---|
| CPU | 32-bit CPU (400 MHz) |
| Watchdog Timer | Module, Communication(Programmable) |
| **Isolation** | |
| 2-way Isolation | I/O: 2500 VDC |
| **EMS Protection** | |
| ESD (IEC 61000-4-2) | ±4 kV Contact for each terminal<br>±8 kV Air for random point |
| EFT (IEC 61000-4-4) | ±2 kV for Power Line |
| Surge (IEC 61000-4-5) | ±2 kV for Power Line |
| **LED Indicators** | |
| Status | Run, Ethernet, I/O |
| **Ethernet** | |
| Ports | 2 x RJ-45, 10/100 Base-TX, Swtich Ports |
| PoE | Yes |
| LAN bypass | Yes |
| Security | ID, Password and IP Filter |
| **Power** | |
| Reverse Polarity Protection | Yes |
| Consumption | 6.2 W |
| Powered from PoE | IEEE 802.3af, Class3 |
| Powered from Terminal Block | +12 ~ +48 VDC |
| **Mechanical** | |
| Dimensions (mm) | 97 x 120 x 47 (W x L x H) |
| Installation | DIN-Rail mounting |
| **Environment** | |
| Operating Temperature | -25 °C ~ +75 °C |
| Storage Temperature | -30 °C ~ +80 °C |
| Humidity | 10 ~ 90% RH, Non-condensing |

### I/O Specifications

| Analog Input | |
|---|---|
| Channels | 8 (Differential) |
| Type | Voltage, Current |
| Range | ±150 mV, ±500 mV, ±1 V, ±5 V, ±10 V<br>±20 mA, 0 to 20 mA, 4 to 20 mA<br>(Jumper Selectable) |
| Resolution | 16-bit |
| Accuracy | Normal Mode: ±0.1%<br>Fast Mode: ±0.5% or better |
| Sampling Rate | Normal Mode: 10 samples/second (Total)<br>Fast Mode: 50 samples/second (Total) |
| Input Impedance | Voltage: 2 MΩ<br>Current: 125 Ω |
| Common Mode Rejection | 86 dB (min.) |
| Normal Mode Rejection | 100 dB |
| Common Voltage Protection | ±200 VDC |
| Overvoltage Protection | 240 Vrms |
| Overcurrent Protection | 50 mA at 110 VDC (max.) |
| Individual Channel Configuration | Yes |
| Open Wire Detection | For 4 ~ 20 mA only |
| Zero Drift | ±20 μV/°C |
| Span Drift | ±25 ppm/°C |
| Isolation | ±400 VDC, Virtual Channel to Channel Isolation |

| Digital Output | |
|---|---|
| Channels | 4 |
| Type | Isolated Open Collector |
| Sink/Source (NPN/PNP) | Sink |
| Load Voltage | +5 ~ +50 VDC |
| Load Current | 700 mA/channel |
| Overvoltage Protection | +60 VDC |
| Overload Protection | 1.4 A |
| Short-circuit Protection | Yes |
| Power on Value | Programmable |
| Safe Value | Programmable |



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## 1.4.6 U-7517M-10 Specifications

Table 8 1-4-6 U-7517M-10 Specifications

### System Specifications

| CPU Module | |
|---|---|
| CPU | 32-bit CPU (400 MHz) |
| Watchdog Timer | Module, Communication (Programmable) |
| **Isolation** | |
| 2-way Isolation | I/O: 2500 VDC |
| **EMS Protection** | |
| ESD (IEC 61000-4-2) | ±4 kV Contact for each terminal<br>±8 kV Air for random point |
| EFT (IEC 61000-4-4) | ±2 kV for Power Line |
| Surge (IEC 61000-4-5) | ±2 kV for Power Line |
| **LED Indicators** | |
| Status | Run, Ethernet, I/O |
| **Ethernet** | |
| Ports | 2 x RJ-45, 10/100 Base-TX, Swtich Ports |
| PoE | Yes |
| LAN bypass | Yes |
| Security | ID, Password and IP Filter |
| **Power** | |
| Reverse Polarity Protection | Yes |
| Consumption | 5.5 W |
| Powered from PoE | IEEE 802.3af, Class3 |
| Powered from Terminal Block | +12 ~ +48 VDC |
| **Mechanical** | |
| Dimensions (mm) | 97 x 120 x 47 (W x L x H) |
| Installation | DIN-Rail mounting |
| **Environment** | |
| Operating Temperature | -25 °C ~ +75 °C |
| Storage Temperature | -30 °C ~ +80 °C |
| Humidity | 10 ~ 90% RH, Non-condensing |

### I/O Specifications

| Analog Input | |
|---|---|
| Channels | 10 differential or 20 single-ended (Note1), software selectable |
| Type | Voltage, Current |
| Range | ±150 mV, ±500 mV, ±1 V, ±5 V, ±10 V, ±20 mA, 0 to 20 mA, 4 to 20 mA (Jumper Selectable) |
| Resolution | 16-bit |
| Accuracy | Normal Mode: ±0.1%<br>Fast Mode: ±0.5% or better |
| Sampling Rate | Normal Mode: 10 samples/second (Total)<br>Fast Mode: 50 samples/second (Total) |
| Input Impedance | Voltage: 2 MΩ (Differential), 1 MΩ (Single-ended)<br>Current: 125 Ω |
| Common Mode Rejection | 86 dB (min.) |
| Normal Mode Rejection | 100 dB |
| Common Voltage Protection | ±200 VDC |
| Overvoltage Protection | Differential: 240 Vrms<br>Single-ended: 150 Vrms |
| Overcurrent Protection | 50 mA at 110 VDC (max.) |
| Individual Channel Configuration | Yes |
| Open Wire Detection | For 4 ~ 20 mA only |
| Zero Drift | ±20 μV/°C |
| Span Drift | ±25 ppm/°C |
| Isolation | ±400 VDC, Virtual Channel to Channel Isolation |



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## 1.4.7 U-7518ZM/S, U-7518ZM/S2 Specifications

Table 9 1-4-7 U-7518ZM/S, U-7518ZM/S2 Specifications

### System Specifications

| CPU Module | |
|---|---|
| CPU | 32-bit CPU (400 MHz) |
| Watchdog Timer | Module, Communication (Programmable) |
| **Isolation** | |
| 2-way Isolation | I/O: 2500 VDC |
| **EMS Protection** | |
| ESD (IEC 61000-4-2) | ±4 kV Contact for each terminal<br>±8 kV Air for random point |
| EFT (IEC 61000-4-4) | ±4 kV for Power Line |
| **LED Indicators** | |
| Status | Run, Ethernet, I/O |
| **Ethernet** | |
| Ports | RJ-45 x 2, 10/100 Base-TX, Swtich Ports |
| PoE | Yes |
| LAN bypass | Yes |
| Security | ID, Password and IP Filter |
| **Power** | |
| Reverse Polarity Protection | Yes |
| Consumption | 6.1 W |
| Powered from PoE | IEEE 802.3af, Class3 |
| Powered from Terminal Block | +12 ~ +48 VDC |
| **Mechanical** | |
| Dimensions (mm) | 97 x 114 x 47 (W x L x H) |
| Installation | DIN-Rail mounting |
| **Environment** | |
| Operating Temperature | -25 °C ~ +75 °C |
| Storage Temperature | -30 °C ~ +80 °C |
| Humidity | 10 ~ 90% RH, Non-condensing |

### I/O Specifications

| Analog Input | |
|---|---|
| Channels | 10 (Differential) |
| Type | Voltage, Current, Thermocouple |
| Temperature Output Consistency | Yes |
| Stable Temperature Output in the Field | Yes |
| Range | ±15 mV, ±50 mV, ±100 mV, ±500 mV, ±1 V, ±2.5 V<br>±20 mA, 0 to 20 mA, 4 to 20 mA (Requires Optional External 125 Ω Resistor)<br>Thermocouple (J, K, T, E, R, S, B, N, C, L, M, and LDIN43710) |
| Resolution | 16-bit |
| Accuracy | ±0.1% of FSR or better |
| Sampling Rate | 10 Samples/Second (Total) |
| Input Impedance | > 300 kΩ |
| Common Mode Rejection | 150 dB (min.) |
| Normal Mode Rejection | 100 dB |
| Overvoltage Protection | 240 Vrms |
| Individual Channel Configuration | Yes |
| Open Wire Detection | Yes |
| Zero Drift | ±0.5 μV/°C |
| Span Drift | ±25 ppm/°C |
| Isolation | ±400 VDC, Virtual Channel to Channel Isolation |

| Digital Output | |
|---|---|
| Channels | 3 |
| Type | Isolated Open Collector |
| Sink/Source (NPN/PNP) | Sink |
| Load Voltage | +5 ~ +50 VDC |
| Load Current | 700 mA/channel |
| Overvoltage Protection | +60 VDC |
| Overload Protection | 1.4 A |
| Short-circuit Protection | Yes |
| Power on Value | Programmable |
| Safe Value | Programmable |



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## 1.4.8 U-7519ZM/S, U-7519ZM/S2 Specifications

Table 10 1-4-8 U-7519ZM/S, U-7519ZM/S2 Specifications

### System Specifications

| CPU Module | |
|---|---|
| CPU | 32-bit CPU (400 MHz) |
| Watchdog Timer | Module, Communication (Programmable) |
| **Isolation** | |
| 2-way Isolation | I/O: 2500 VDC |
| **EMS Protection** | |
| ESD (IEC 61000-4-2) | ±4 kV Contact for each terminal<br>±8 kV Air for random point |
| EFT (IEC 61000-4-4) | ±4 kV for Power Line |
| **LED Indicators** | |
| Status | Run, Ethernet, I/O |
| **Ethernet** | |
| Ports | 2 x RJ-45, 10/100 Base-TX, Swtich Ports |
| PoE | Yes |
| LAN bypass | Yes |
| Security | ID, Password and IP Filter |
| **Power** | |
| Reverse Polarity Protection | Yes |
| Consumption | 6.1 W |
| Powered from PoE | IEEE 802.3af, Class3 |
| Powered from Terminal Block | +12 ~ +48 VDC |
| **Mechanical** | |
| Dimensions (mm) | 97 x 114 x 47 (W x L x H) |
| Installation | DIN-Rail mounting |
| **Environment** | |
| Operating Temperature | -25 °C ~ +75 °C |
| Storage Temperature | -30 °C ~ +80 °C |
| Humidity | 10 ~ 90% RH, Non-condensing |

### I/O Specifications

| Analog Input | |
|---|---|
| Channels | 10 (Differential) |
| Type | Voltage, Current, Thermocouple |
| Temperature Output Consistency | Yes |
| Stable Temperature Output in the Field | Yes |
| Range | ±15 mV, ±50 mV, ±100 mV, ±150 mV, ±500 mV, ±1 V, ±2.5 V, ±5 V, ±10 V ±20 mA, 0 to 20 mA, 4 to 20 mA (Requires Optional External 125 Ω Resistor) Thermocouple (J, K, T, E, R, S, B, N, C, L, M, and LDIN43710) |
| Resolution | 16-bit |
| Accuracy | ±0.1% of FSR or better |
| Sampling Rate | 10 Samples/Second (Total) |
| Input Impedance | > 300 kΩ |
| Common Mode Rejection | 86 dB (min.) |
| Normal Mode Rejection | 100 dB |
| Overvoltage Protection | 240 Vrms |
| Individual Channel Configuration | Yes |
| Open Wire Detection | Yes |
| Zero Drift | ±0.5 μV/°C |
| Span Drift | ±25 ppm/°C |
| Isolation | ±400 VDC, Virtual Channel to Channel Isolation |

| Digital Output | |
|---|---|
| Channels | 3 |
| Type | Isolated Open Collector |
| Sink/Source (NPN/PNP) | Sink |
| Load Voltage | +5 ~ +50 VDC |
| Load Current | 700 mA/channel |
| Overvoltage Protection | +60 VDC |
| Overload Protection | 1.4 A |
| Short-circuit Protection | Yes |
| Power on Value | Programmable |
| Safe Value | Programmable |



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## 1.4.9 U-7524M Specifications

Table 11 1-4-9 U-7524M Specifications

### System Specifications

| CPU Module | |
|---|---|
| CPU | 32-bit CPU (400 MHz) |
| Watchdog Timer | Module, Communication(Programmable) |
| **Isolation** | |
| 2-way Isolation | I/O: 2500 VDC |
| **EMS Protection** | |
| ESD (IEC 61000-4-2) | ±4 kV Contact for each terminal<br>±8 kV Air for random point |
| EFT (IEC 61000-4-4) | ±4 kV for Power Line |
| Surge (IEC 61000-4-5) | ±2 kV for Power Line |
| **LED Indicators** | |
| Status | Run, Ethernet, I/O |
| **Ethernet** | |
| Ports | 2 x RJ-45, 10/100 Base-TX, Swtich Ports |
| PoE | Yes |
| LAN bypass | Yes |
| Security | ID, Password and IP Filter |

| Power | |
|---|---|
| Reverse Polarity Protection | Yes |
| Consumption | 8.1 W |
| Powered from PoE | IEEE 802.3af, Class3 |
| Powered from Terminal Block | +12 ~ +48 VDC |
| **Mechanical** | |
| Dimensions (mm) | 97 x 120 x 47 (W x L x H) |
| Installation | DIN-Rail mounting |
| **Environment** | |
| Operating Temperature | -25 °C ~ +75 °C |
| Storage Temperature | -30 °C ~ +80 °C |
| Humidity | 10 ~ 90% RH, Non-condensing |

### I/O Specifications

| Analog Output | |
|---|---|
| Channels | 4 |
| Type | Voltage, Current |
| Range | +0 to +5 VDC, ±5 VDC, +0 to +10 VDC, ±10 VDC, 0 to 20 mA, 4 to 20 mA (Jumper Selectable) |
| Resolution | 12-bit |
| Accuracy | ±0.1% of FSR |
| Open Wire Detection | For 4 ~ 20 mA only |
| Voltage Output Capability | 10 V @ 20 mA |
| Current Load Resistance | 500 Ω |
| Individual Channel Configuration | Yes |
| Power-on Value | Programmable |
| Safe Value | Programmable |

| Digital Input/Counter | |
|---|---|
| Channels | 5 |
| Type | Dry Contact, Wet Contact |
| ON Voltage Level | Dry: Close to GND<br>Wet: +1 VDC (max.) |
| OFF Voltage Level | Dry: Open<br>Wet: +3.5 ~ +30 VDC |
| Max. Counts | 4,294,967,295 (32-bit) |
| Frequency | 100 Hz |
| Min. Pulse Width | 5 ms |
| Effective Distance | 500m (max.) |
| Overvoltage Protection | +30 VDC |
| **Digital Output** | |
| Channels | 5 |
| Type | Isolated Open Collector |
| Sink/Source (NPN/PNP) | Sink |
| Load Voltage | +5 ~ +50 VDC |
| Load Current | 600 mA/channel |
| Overvoltage Protection | +60 VDC |
| Overload Protection | 1.4 A |
| Short-circuit Protection | Yes |
| Power on Value | Programmable |
| Safe Value | Programmable |



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## 1.4.10 U-7526M Specifications

Table 12 1-4-10 U-7526M Specifications

### System Specifications

| CPU Module | |
|---|---|
| CPU | 32-bit CPU (400 MHz) |
| Watchdog Timer | Module, Communication (Programmable) |
| **Isolation** | |
| 2-way Isolation | I/O: 2500 VDC |
| **EMS Protection** | |
| EFT (IEC 61000-4-4) | ±2 kV for Power Line |
| ESD (IEC 61000-4-2) | ±4 kV Contact for each terminal<br>±8 kV Air for random point |
| Surge (IEC 61000-4-5) | ±2 kV for Power Line |
| **LED Indicators** | |
| Status | Run, Ethernet, I/O |
| **Ethernet** | |
| Ports | 2 x RJ-45, 10/100 Base-TX, Swtich Ports |
| PoE | Yes |
| LAN bypass | Yes |
| Security | ID, Password and IP Filter |

| Power | |
|---|---|
| Reverse Polarity Protection | Yes |
| Consumption | 7.1 W |
| Powered from PoE | IEEE 802.3af, Class3 |
| Powered from Terminal Block | +12 ~ +48 VDC |
| **Mechanical** | |
| Dimensions (mm) | 97 x 120 x 47 (W x L x H) |
| Installation | DIN-Rail mounting |
| **Environment** | |
| Operating Temperature | -25 °C ~ +75 °C |
| Storage Temperature | -30 °C ~ +80 °C |
| Humidity | 10 ~ 90% RH, Non-condensing |

### I/O Specifications

| Analog Input | |
|---|---|
| Channels | 6 (Differential) |
| Type | Voltage, Current |
| Range | ±500 mV, ±1V, ±5 V, ±10 V<br>0 to 20 mA, ±20 mA, 4 to 20 mA<br>(Jumper Selectable) |
| Resolution | 16-bit |
| Accuracy | Normal Mode: ±0.1%<br>Fast Mode: ±0.5% or better |
| Sampling Rate | Normal Mode: 10 samples/second (Total)<br>Fast Mode: 50 samples/second (Total) |
| Input Impedance | Voltage: 2 MΩ<br>Current: 125 Ω |
| Common Mode Rejection | 86 dB (min.) |
| Normal Mode Rejection | 100 dB |
| Common Voltage Protection | ±200 VDC |
| Overvoltage Protection | 240 Vrms |
| Overcurrent Protection | 50 mA at 110 VDC (max.) |
| Individual Channel Configuration | Yes |
| Open Wire Detection | For 4 ~ 20 mA only |
| Zero Drift | ±20 μV/°C |
| Span Drift | ±25 ppm/°C |
| Isolation | ±400 VDC, Virtual Channel to Channel Isolation |
| **Analog Output** | |
| Channels | 2 |
| Type | Voltage, Current |
| Range | +0 to +5 VDC, ±5 VDC, +0 to +10 VDC, ±10 VDC, 0 to 20 mA, 4 to 20 mA (Jumper Selectable) |
| Resolution | 12-bit |
| Accuracy | ±0.1% of FSR |

| | |
|---|---|
| Open Wire Detection | For 4 ~ 20 mA only |
| Voltage Output Capability | 10 V @ 20 mA |
| Current Load Resistance | 500 Ω |
| Individual Channel Configuration | Yes |
| Power-on Value | Programmable |
| Safe Value | Programmable |

| Digital Input/Counter | |
|---|---|
| Channels | 2 |
| Type | Dry Contact<br>Wet Contact |
| ON Voltage Level | Dry: Close to GND<br>Wet: +1 VDC (max.) |
| OFF Voltage Level | Dry: Open<br>Wet: +3.5 to +30 VDC |
| Max. Counts | 4,294,967,295 (32-bit) |
| Frequency | 100 Hz |
| Min. Pulse Width | 5 ms |
| Effective Distance | 500m (max.) |
| Overvoltage Protection | +30 VDC |
| **Digital Output** | |
| Channels | 2 |
| Type | Isolated Open Collector |
| Sink/Source (NPN/PNP) | Sink |
| Load Voltage | +5 ~ +50 VDC |
| Load Current | 700 mA/channel |
| Overvoltage Protection | +60 VDC |
| Overload Protection | 1.4 A |
| Short-circuit Protection | Yes |
| Power-on Value | Programmable |
| Safe Value | Programmable |



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## 1.4.11 U-7528M Specifications

Table 13 1-4-11 U-7528M Specifications

### System Specifications

| CPU Module | |
|---|---|
| CPU | 32-bit CPU (400 MHz) |
| Watchdog Timer | Module, Communication(Programmable) |
| **Isolation** | |
| 2-way Isolation | I/O: 2500 VDC |
| **EMS Protection** | |
| ESD (IEC 61000-4-2) | ±4 kV Contact for each terminal<br>±8 kV Air for random point |
| EFT (IEC 61000-4-4) | ±4 kV for Power Line |
| **LED Indicators** | |
| Status | Run, Ethernet, I/O |
| **Ethernet** | |
| Ports | 2 x RJ-45, 10/100 Base-TX, Swtich Ports |
| PoE | Yes |
| LAN bypass | Yes |
| Security | ID, Password and IP Filter |
| **Power** | |
| Reverse Polarity Protection | Yes |
| Consumption | 10.4 W |
| Powered from PoE | IEEE 802.3af, Class3 |
| Powered from Terminal Block | +12 ~ +48 VDC |
| **Mechanical** | |
| Dimensions (mm) | 97 x 120 x 47 (W x L x H) |
| Installation | DIN-Rail mounting |
| **Environment** | |
| Operating Temperature | -25 °C ~ +75 °C |
| Storage Temperature | -30 °C ~ +80 °C |
| Humidity | 10 ~ 90% RH, Non-condensing |

### I/O Specifications

| Analog Output | |
|---|---|
| Channels | 8 |
| Type | Voltage, Current |
| Range | +0 to +5 VDC, ±5 VDC, +0 to +10 VDC, ±10 VDC, 0 to 20 mA, 4 to 20 mA (Jumper Selectable) |
| Resolution | 12-bit |
| Accuracy | ±0.1% of FSR |
| Open Wire Detection | For 4 ~ 20 mA only |
| Voltage Output Capability | 10 V @ 10 mA |
| Current Load Resistance | 500 Ω |
| Individual Channel Configuration | Yes |
| Power-on Value | Programmable |
| Safe Value | Programmable |



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## 1.4.12 U-7542M Specifications

Table 14 1-4-12 U-7542M Specifications

### System Specifications

| CPU Module | |
|---|---|
| CPU | 32-bit CPU (400 MHz) |
| Watchdog Timer | Module, Communication(Programmable) |
| **Isolation** | |
| 2-way Isolation | I/O: 3750 VDC |
| **EMS Protection** | |
| ESD (IEC 61000-4-2) | ±4 kV Contact for each terminal<br>±8 kV Air for random point |
| EFT (IEC 61000-4-4) | ±4 kV for Power Line |
| Surge (IEC 61000-4-5) | ±2 kV for Power Line |
| **LED Indicators** | |
| Status | Run, Ethernet, I/O |
| **Ethernet** | |
| Ports | 2 x RJ-45, 10/100 Base-TX, Swtich Ports |
| PoE | Yes |
| LAN bypass | Yes |
| Security | ID, Password and IP Filter |
| **Power** | |
| Reverse Polarity Protection | Yes |
| Consumption | 5.9 W |
| Powered from PoE | IEEE 802.3af, Class3 |
| Powered from Terminal Block | +12 ~ +48 VDC |
| **Mechanical** | |
| Dimensions (mm) | 97 x 120 x 47 (W x L x H) |
| Installation | DIN-Rail mounting |
| **Environment** | |
| Operating Temperature | -25 °C ~ +75 °C |
| Storage Temperature | -30 °C ~ +80 °C |
| Humidity | 10 ~ 90% RH, Non-condensing |

### I/O Specifications

| Digital Output | |
|---|---|
| Channels | 16 |
| Type | Isolated Open Collector |
| Sink/Source (NPN/PNP) | Sink |
| Load Voltage | + 3.5 ~ + 50 VDC |
| Load Current | 650 mA/channel at 25°C<br>Direct Drive Power Relay Module |
| Overvoltage Protection | +60 VDC |
| Overload Protection | 1.3 A |
| Short-circuit Protection | Yes |
| Power-on Value | Programmable |
| Safe Value | Programmable |



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## 1.4.13 U-7544M Specifications

Table 15 1-4-13 U-7544M Specifications

### System Specifications

| CPU Module | |
|---|---|
| CPU | 32-bit CPU (400 MHz) |
| Watchdog Timer | Module, Communication(Programmable) |
| **Isolation** | |
| 2-way Isolation | I/O: 2500 VDC |
| **EMS Protection** | |
| ESD (IEC 61000-4-2) | ±4 kV Contact for each terminal<br>±8 kV Air for random point |
| EFT (IEC 61000-4-4) | ±4 kV for Power Line |
| **LED Indicators** | |
| Status | Run, Ethernet, I/O |
| **Ethernet** | |
| Ports | 2 x RJ-45, 10/100 Base-TX, Swtich Ports |
| PoE | Yes |
| LAN bypass | Yes |
| Security | ID, Password and IP Filter |
| **Power** | |
| Reverse Polarity Protection | Yes |
| Consumption | 6 W |
| Powered from PoE | IEEE 802.3af, Class3 |
| Powered from Terminal Block | +12 ~ +48 VDC |
| **Mechanical** | |
| Dimensions (mm) | 97 x 120 x 47 (W x L x H) |
| Installation | DIN-Rail mounting |
| **Environment** | |
| Operating Temperature | -25 °C ~ +75 °C |
| Storage Temperature | -30 °C ~ +80 °C |
| Humidity | 10 ~ 90% RH, Non-condensing |

### I/O Specifications

| Digital Input/Counter | |
|---|---|
| Channels | 8 |
| Type | Wet Contact |
| Sink/Source (NPN/PNP) | Sink/Source |
| ON Voltage Level | +10 ~ +50 VDC |
| OFF Voltage Level | +4 VDC (max.) |
| Max. Counts | 4,294,967,295 (32-bit) |
| Frequency | 100 Hz |
| Min. Pulse Width | 5 ms |
| Input Impedance | 10 kΩ |
| Overvoltage Protection | +70 VDC |
| **Digital Output** | |
| Channels | 8 |
| Type | Isolated Open Collector |
| Sink/Source (NPN/PNP) | Sink |
| Load Voltage | + 3.5 ~ + 50 VDC |
| Load Current | 650 mA/channel at 25°C<br>Direct Drive Power Relay Module |
| Overvoltage Protection | +60 VDC |
| Overload Protection | 1.4 A |
| Short-circuit Protection | Yes |
| Power on Value | Programmable |
| Safe Value | Programmable |



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## 1.4.14 U-7545M Specifications

Table 16 1-4-14 U-7545M Specifications

### System Specifications

| CPU Module | |
|---|---|
| CPU | 32-bit CPU (400 MHz) |
| Watchdog Timer | Module, Communication(Programmable) |
| **Isolation** | |
| 2-way Isolation | I/O: 3750 VDC |
| **EMS Protection** | |
| ESD (IEC 61000-4-2) | ±4 kV Contact for each terminal<br>±8 kV Air for random point |
| EFT (IEC 61000-4-4) | ±4 kV for Power Line |
| Surge (IEC 61000-4-5) | ±2 kV for Power Line |
| **LED Indicators** | |
| Status | Run, Ethernet, I/O |
| **Ethernet** | |
| Ports | 2 x RJ-45, 10/100 Base-TX, Swtich Ports |
| PoE | Yes |
| LAN bypass | Yes |
| Security | ID, Password and IP Filter |
| **Power** | |
| Reverse Polarity Protection | Yes |
| Consumption | 6 W |
| Powered from PoE | IEEE 802.3af, Class3 |
| Powered from Terminal Block | +12 ~ +48 VDC |
| **Mechanical** | |
| Dimensions (mm) | 97 x 120 x 47 (W x L x H) |
| Installation | DIN-Rail mounting |
| **Environment** | |
| Operating Temperature | -25 °C ~ +75 °C |
| Storage Temperature | -30 °C ~ +80 °C |
| Humidity | 10 ~ 90% RH, Non-condensing |

### I/O Specifications

| Digital Output | |
|---|---|
| Channels | 16 |
| Type | Isolated Open Source |
| Sink/Source (NPN/PNP) | Source |
| Load Voltage | +10 ~ +40 VDC |
| Load Current | 600 mA/channel |
| Overvoltage Protection | +47 VDC |
| Overload Protection | 1.4 A (with short-circuit protection) |
| Short-circuit Protection | Yes |
| Power on Value | Programmable |
| Safe Value | Programmable |



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## 1.4.15 U-7550AM Specifications

Table 17 1-4-15 U-7550AM Specifications

### System Specifications

| CPU Module | |
|---|---|
| CPU | 32-bit CPU (400 MHz) |
| Watchdog Timer | Module, Communication(Programmable) |
| **Isolation** | |
| 2-way Isolation | I/O: 2500 VDC |
| **EMS Protection** | |
| ESD (IEC 61000-4-2) | ±4 kV Contact for each terminal<br>±8 kV Air for random point |
| EFT (IEC 61000-4-4) | ±4 kV for Power Line |
| **LED Indicators** | |
| Status | Run, Ethernet, I/O |
| **Ethernet** | |
| Ports | 2 x RJ-45, 10/100 Base-TX, Swtich Ports |
| PoE | Yes |
| LAN bypass | Yes |
| Security | ID, Password and IP Filter |
| **Power** | |
| Reverse Polarity Protection | Yes |
| Consumption | 6.3 W |
| Powered from PoE | IEEE 802.3af, Class3 |
| Powered from Terminal Block | +12 ~ +48 VDC |
| **Mechanical** | |
| Dimensions (mm) | 97 x 120 x 47 (W x L x H) |
| Installation | DIN-Rail mounting |
| **Environment** | |
| Operating Temperature | -25 °C ~ +75 °C |
| Storage Temperature | -30 °C ~ +80 °C |
| Humidity | 10 ~ 90% RH, Non-condensing |

### I/O Specifications

| Digital Input/Counter | |
|---|---|
| Channels | 12 |
| Type | Dry Contact, Wet Contact |
| Sink/Source (NPN/PNP) | Dry: Source<br>Wet: Sink |
| ON Voltage Level | Dry: Close to GND<br>Wet: 1 VDC (max.) |
| OFF Voltage Level | Dry: Open<br>Wet: +3.5 ~ +50 VDC (max.) |
| Max. Counts | 4,294,967,295 (32-bit) |
| Frequency | 100 Hz |
| Min. Pulse Width | 5 ms |
| Input Impedance | 10 kΩ |
| Overvoltage Protection | +60 VDC |
| **Digital Output** | |
| Channels | 6 |
| Type | Isolated Open Collector |
| Sink/Source (NPN/PNP) | Sink |
| Load Voltage | +5 ~ +50 VDC |
| Load Current | 500 mA/channel |
| Overvoltage Protection | +60 VDC |
| Overload Protection | 1.3 A |
| Short-circuit Protection | Yes |
| Power on Value | Programmable |
| Safe Value | Programmable |



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## 1.4.16 U-7551M Specifications

Table 18 1-4-16 U-7551M Specifications

### System Specifications

| CPU Module | |
|---|---|
| CPU | 32-bit CPU (400 MHz) |
| Watchdog Timer | Module, Communication(Programmable) |
| **Isolation** | |
| 2-way Isolation | I/O: 2500 VDC |
| **EMS Protection** | |
| ESD (IEC 61000-4-2) | ±4 kV Contact for each terminal<br>±8 kV Air for random point |
| EFT (IEC 61000-4-4) | ±4 kV for Power Line |
| **LED Indicators** | |
| Status | Run, Ethernet, I/O |
| **Ethernet** | |
| Ports | 2 x RJ-45, 10/100 Base-TX, Swtich Ports |
| PoE | Yes |
| LAN bypass | Yes |
| Security | ID, Password and IP Filter |
| **Power** | |
| Reverse Polarity Protection | Yes |
| Consumption | 6 W |
| Powered from PoE | IEEE 802.3af, Class3 |
| Powered from Terminal Block | +12 ~ +48 VDC |
| **Mechanical** | |
| Dimensions (mm) | 97 x 120 x 47 (W x L x H) |
| Installation | DIN-Rail mounting |
| **Environment** | |
| Operating Temperature | -25 °C ~ +75 °C |
| Storage Temperature | -30 °C ~ +80 °C |
| Humidity | 10 ~ 90% RH, Non-condensing |

### I/O Specifications

| Digital Input/Counter | |
|---|---|
| Channels | 16 |
| Type | Wet Contact |
| Sink/Source (NPN/PNP) | Sink/Source |
| ON Voltage Level | +10 ~ +50 VDC |
| OFF Voltage Level | +4 VDC (max.) |
| Max. Counts | 4,294,967,295 (32-bit) |
| Frequency | 100 Hz |
| Min. Pulse Width | 5 ms |
| Input Impedance | 10 kΩ |
| Overvoltage Protection | +70 VDC |



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## 1.4.17 U-7552M Specifications

Table 19 1-4-17 U-7552M Specifications

### System Specifications

| CPU Module | |
|---|---|
| CPU | 32-bit CPU (400 MHz) |
| Watchdog Timer | Module, Communication(Programmable) |
| **Isolation** | |
| 2-way Isolation | I/O: 2500 VDC |
| **EMS Protection** | |
| ESD (IEC 61000-4-2) | ±4 kV Contact for each terminal<br>±8 kV Air for random point |
| EFT (IEC 61000-4-4) | ±2 kV for Power Line |
| Surge (IEC 61000-4-5) | ±2 kV for Power Line |
| **LED Indicators** | |
| Status | Run, Ethernet, I/O |
| **Ethernet** | |
| Ports | 2 x RJ-45, 10/100 Base-TX, Swtich Ports |
| PoE | Yes |
| LAN bypass | Yes |
| Security | ID, Password and IP Filter |
| **Power** | |
| Reverse Polarity Protection | Yes |
| Consumption | 6 W |
| Powered from PoE | IEEE 802.3af, Class3 |
| Powered from Terminal Block | +12 ~ +48 VDC |
| **Mechanical** | |
| Dimensions (mm) | 97 x 120 x 47 (W x L x H) |
| Installation | DIN-Rail mounting |
| **Environment** | |
| Operating Temperature | -25 °C ~ +75 °C |
| Storage Temperature | -30 °C ~ +80 °C |
| Humidity | 10 ~ 90% RH, Non-condensing |

### I/O Specifications

| Digital Input/Counter | |
|---|---|
| Channels | 8 |
| Type | Wet Contact |
| Sink/Source (NPN/PNP) | Sink/Source |
| ON Voltage Level | +10 ~ +50 VDC |
| OFF Voltage Level | +4 VDC (max.) |
| Max. Counts | 4,294,967,295 (32-bit) |
| Frequency | 100 Hz |
| Min. Pulse Width | 5 ms |
| Input Impedance | 10 kΩ |
| Overvoltage Protection | +70 VDC |
| **Digital Output** | |
| Channels | 8 |
| Type | Isolated Open Collector |
| Sink/Source (NPN/PNP) | Source |
| Load Voltage | +10 ~ +40 VDC |
| Load Current | 650 mA/channel at 25°C |
| Overvoltage Protection | +47 VDC |
| Short-circuit Protection | Yes |
| Power on Value | Programmable |
| Safe Value | Programmable |



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## 1.4.18 U-7553M Specifications

Table 20 1-4-18 U-7553M Specifications

### System Specifications

| CPU Module | |
|---|---|
| CPU | 32-bit CPU (400 MHz) |
| Watchdog Timer | Module, Communication(Programmable) |
| **Isolation** | |
| 2-way Isolation | I/O: 2500 VDC |
| **EMS Protection** | |
| ESD (IEC 61000-4-2) | ±4 kV Contact for each terminal<br>±8 kV Air for random point |
| EFT (IEC 61000-4-4) | ±4 kV for Power Line |
| **LED Indicators** | |
| Status | Run, Ethernet, I/O |
| **Ethernet** | |
| Ports | 2 x RJ-45, 10/100 Base-TX, Swtich Ports |
| PoE | Yes |
| LAN bypass | Yes |
| Security | ID, Password and IP Filter |
| **Power** | |
| Reverse Polarity Protection | Yes |
| Consumption | 6.5 W |
| Powered from PoE | IEEE 802.3af, Class3 |
| Powered from Terminal Block | +12 ~ +48 VDC |
| **Mechanical** | |
| Dimensions (mm) | 97 x 120 x 47 (W x L x H) |
| Installation | DIN-Rail mounting |
| **Environment** | |
| Operating Temperature | -25 °C ~ +75 °C |
| Storage Temperature | -30 °C ~ +80 °C |
| Humidity | 10 ~ 90% RH, Non-condensing |

### I/O Specifications

| Digital Input/Counter | |
|---|---|
| Channels | 16 |
| Type | Dry Contact |
| Sink/Source (NPN/PNP) | Source |
| ON Voltage Level | Close to GND |
| OFF Voltage Level | Open |
| Max. Counts | 4,294,967,295 (32-bit) |
| Frequency | 100 Hz |
| Min. Pulse Width | 5 ms |
| Effective Distance | 500m (max.) |



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## 1.4.19 U-7555M Specifications

Table 21 1-4-19 U-7555M Specifications

### System Specifications

| CPU Module | |
|---|---|
| CPU | 32-bit CPU (400 MHz) |
| Watchdog Timer | Module, Communication (Programmable) |
| **Isolation** | |
| 2-way Isolation | I/O: 2500 VDC |
| **EMS Protection** | |
| EFT (IEC 61000-4-4) | ±2 kV for Power Line |
| ESD (IEC 61000-4-2) | ±4 kV Contact for each terminal<br>±8 kV Air for random point |
| Surge (IEC 61000-4-5) | ±2 kV for Power Line |
| **LED Indicators** | |
| Status | Run, Ethernet, I/O |
| **Ethernet** | |
| Ports | 2 x RJ-45, 10/100 Base-TX, Swtich Ports |
| PoE | Yes |
| LAN bypass | Yes |
| Security | ID, Password and IP Filter |
| **Power** | |
| Reverse Polarity Protection | Yes |
| Consumption | 6.3 W |
| Powered from PoE | IEEE 802.3af, Class3 |
| Powered from Terminal Block | +12 ~ +48 VDC |
| **Mechanical** | |
| Dimensions (mm) | 97 x 120 x 47 (W x L x H) |
| Installation | DIN-Rail mounting |
| **Environment** | |
| Operating Temperature | -25 °C ~ +75 °C |
| Storage Temperature | -30 °C ~ +80 °C |
| Humidity | 10 ~ 90% RH, Non-condensing |

### I/O Specifications

| Digital Input/Counter | |
|---|---|
| Channels | 8 |
| Type | Dry Contact<br>Wet Contact |
| Sink/Source (NPN/PNP) | Dry: Source<br>Wet: Sink/Source |
| On Voltage Level | Dry: Close to GND<br>Wet: +10 ~ +50 VDC |
| OFF Voltage Level | Dry: Open<br>Wet: +4 VDC (max.) |
| Max. Counts | 4,294,967,295 (32-bit) |
| Frequency | 100 Hz |
| Min. Pulse Width | 5 ms |
| Effective Distance | 500m (max.) |
| Input Impedance | 10 kΩ |
| Overvoltage Protection | +70 VDC |
| **Digital Output** | |
| Channels | 8 |
| Type | Isolated Open Collector |
| Sink/Source (NPN/PNP) | Source |
| Load Voltage | +10 ~ +40 VDC |
| Load Current | 650 mA/Channel at 25°C |
| Overvoltage Protection | +47 VDC |
| Short-circuit Protection | Yes |
| Power on Value | Programmable |
| Safe Value | Programmable |



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## 1.4.20 U-7558M Specifications

Table 22 1-4-20 U-7558M Specifications

### System Specifications

| CPU Module | |
|---|---|
| CPU | 32-bit CPU (400 MHz) |
| Watchdog Timer | Module, Communication(Programmable) |
| **Isolation** | |
| 2-way Isolation | I/O: 2500 VDC |
| **EMS Protection** | |
| ESD (IEC 61000-4-2) | ±4 kV Contact for each terminal<br>±8 kV Air for random point |
| EFT (IEC 61000-4-4) | ±4 kV for Power Line |
| **LED Indicators** | |
| Status | Run, Ethernet, I/O |
| **Ethernet** | |
| Ports | 2 x RJ-45, 10/100 Base-TX, Swtich Ports |
| PoE | Yes |
| LAN bypass | Yes |
| Security | ID, Password and IP Filter |
| **Power** | |
| Reverse Polarity Protection | Yes |
| Consumption | 5.7 W |
| Powered from PoE | IEEE 802.3af, Class3 |
| Powered from Terminal Block | +12 ~ +48 VDC |
| **Mechanical** | |
| Dimensions (mm) | 97 x 120 x 47 (W x L x H) |
| Installation | DIN-Rail mounting |
| **Environment** | |
| Operating Temperature | -25 °C ~ +75 °C |
| Storage Temperature | -30 °C ~ +80 °C |
| Humidity | 10 ~ 90% RH, Non-condensing |

### I/O Specifications

| Digital Input/Counter | |
|---|---|
| Channels | 8 |
| Type | Wet Contact |
| Sink/Source (NPN/PNP) | Sink/Source |
| ON Voltage Level | 80 ~ 250 VAC<br>±90 ~ ±250 VDC |
| OFF Voltage Level | 30 VAC (max.)<br>±30 VDC (max.) |
| Max. Counts | 4,294,967,295 (32-bit) |
| Frequency | 100 Hz |
| Min. Pulse Width | 5 ms |
| Input Impedance | 150 kΩ |
| Overvoltage Protection | 300 VAC |



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## 1.4.21 U-7559M Specifications

Table 23 1-4-21 U-7559M Specifications

### System Specifications

| | |
|---|---|
| **CPU Module** | |
| CPU | 32-bit CPU (400 MHz) |
| Watchdog Timer | Module, Communication(Programmable) |
| **Isolation** | |
| 2-way Isolation | I/O: 2500 VDC |
| **EMS Protection** | |
| ESD (IEC 61000-4-2) | ±4 kV Contact for each terminal<br>±8 kV Air for random point |
| EFT (IEC 61000-4-4) | ±4 kV for Power Line |
| **LED Indicators** | |
| Status | Run, Ethernet, I/O |
| **Ethernet** | |
| Ports | 2 x RJ-45, 10/100 Base-TX, Swtich Ports |
| PoE | Yes |
| LAN bypass | Yes |
| Security | ID, Password and IP Filter |
| **Power** | |
| Reverse Polarity Protection | Yes |
| Consumption | 5.7 W |
| Powered from PoE | IEEE 802.3af, Class3 |
| Powered from Terminal Block | +12 ~ +48 VDC |
| **Mechanical** | |
| Dimensions (mm) | 97 x 120 x 47 (W x L x H) |
| Installation | DIN-Rail mounting |
| **Environment** | |
| Operating Temperature | -25 °C ~ +75 °C |
| Storage Temperature | -30 °C ~ +80 °C |
| Humidity | 10 ~ 90% RH, Non-condensing |

### I/O Specifications

| | |
|---|---|
| **Digital Input/Counter** | |
| Channels | 8 |
| Type | Wet Contact |
| Sink/Source (NPN/PNP) | Sink/Source |
| ON Voltage Level | 10 ~ 80 VAC<br>±15 ~ ±80 VDC |
| OFF Voltage Level | 3 VAC (max.)<br>±3 VDC (max.) |
| Max. Counts | 4,294,967,295 (32-bit) |
| Frequency | 100 Hz |
| Min. Pulse Width | 5 ms |
| Input Impedance | 30 kΩ |
| Overvoltage Protection | 120 VAC |



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## 1.4.22 U-7560M Specifications

Table 24 1-4-22 U-7560M Specifications

### System Specifications

| CPU Module | |
|---|---|
| CPU | 32-bit CPU (400 MHz) |
| Watchdog Timer | Module, Communication (Programmable) |
| **Isolation** | |
| 2-way Isolation | I/O: 3000 VDC |
| **EMS Protection** | |
| EFT (IEC 61000-4-4) | ±4 kV for Power Line |
| ESD (IEC 61000-4-2) | ±4 kV Contact for each terminal<br>±8 kV Air for random point |
| Surge (IEC 61000-4-5) | ±2 kV for Power Line |
| **LED Indicators** | |
| Status | Run, Ethernet, I/O |
| **Ethernet** | |
| Ports | 2 x RJ-45, 10/100 Base-TX, Swtich Ports |
| PoE | Yes |
| LAN bypass | Yes |
| Security | ID, Password and IP Filter |
| **Power** | |
| Reverse Polarity Protection | Yes |
| Consumption | 6.8 W |
| Powered from PoE | IEEE 802.3af, Class3 |
| Powered from Terminal Block | +12 ~ +48 VDC |
| **Mechanical** | |
| Dimensions (mm) | 97 x 120 x 47 (W x L x H) |
| Installation | DIN-Rail mounting |
| **Environment** | |
| Operating Temperature | -25 °C ~ +75 °C |
| Storage Temperature | -30 °C ~ +80 °C |
| Humidity | 10 ~ 90% RH, non-condensing |

### I/O Specifications

| Digital Input/Counter | |
|---|---|
| Channels | 6 |
| Type | Wet Contact |
| Sink/Source (NPN/PNP) | Sink/Source |
| ON Voltage Level | +10 ~ +50 VDC |
| OFF Voltage Level | +4 VDC (max.) |
| Max. Counts | 4,294,967,295 (32-bit) |
| Frequency | 100 Hz |
| Min. Pulse Width | 5 ms |
| Input Impedance | 10 kΩ |
| Overvoltage Protection | +70 VDC |

| Relay Output | |
|---|---|
| Channels | 6 |
| Type | Power Relay, Form A (SPST N.O.) |
| Contact Rating | 5 A @ 250 VAC/24 VDC<br>(Resistive Load) |
| Operate Time | 10 ms (max.) |
| Release Time | 5 ms (max.) |
| Electrical Endurance | 10^5 ops. |
| Mechanical Endurance | 2 × 10^7 ops. |
| Power on Value | Programmable |
| Safe Value | Programmable |



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## 1.4.23 U-7561M Specifications

Table 25 1-4-23 U-7561M Specifications

### System Specifications

| CPU Module | |
|---|---|
| CPU | 32-bit CPU (400 MHz) |
| Watchdog Timer | Module, Communication(Programmable) |
| **Isolation** | |
| 2-way Isolation | I/O: 3000 VDC |
| **EMS Protection** | |
| ESD (IEC 61000-4-2) | ±4 kV Contact for each terminal<br>±8 kV Air for random point |
| EFT (IEC 61000-4-4) | ±4 kV for Power Line |
| Surge (IEC 61000-4-5) | ±2 kV for Power Line |
| **LED Indicators** | |
| Status | Run, Ethernet, I/O |
| **Ethernet** | |
| Ports | 2 x RJ-45, 10/100 Base-TX, Swtich Ports |
| PoE | Yes |
| LAN bypass | Yes |
| Security | ID, Password and IP Filter |
| **Power** | |
| Reverse Polarity Protection | Yes |
| Consumption | 7.3 W |
| Powered from PoE | IEEE 802.3af, Class3 |
| Powered from Terminal Block | +12 ~ +48 VDC |
| **Mechanical** | |
| Dimensions (mm) | 97 x 120 x 47 (W x L x H) |
| Installation | DIN-Rail mounting |
| **Environment** | |
| Operating Temperature | -25 °C ~ +75 °C |
| Storage Temperature | -30 °C ~ +80 °C |
| Humidity | 10 ~ 90% RH, Non-condensing |

### I/O Specifications

| Relay Output | |
|---|---|
| Channels | 11 |
| Type | Power Relay, Form A (SPST N.O.) |
| Contact Rating | 5 A @ 250 VAC/24 VDC (Resistive Load) |
| Operate Time | 10 ms (max.) |
| Release Time | 5 ms (max.) |
| Electrical Endurance | 10^5 ops. |
| Mechanical Endurance | 2 × 10^7 ops. |
| Power on Value | Programmable |
| Safe Value | Programmable |



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## 1.4.24 U-7567M Specifications

Table 26 1-4-24 U-7567M Specifications

### System Specifications

| CPU Module | |
|---|---|
| CPU | 32-bit CPU (400 MHz) |
| Watchdog Timer | Module, Communication(Programmable) |
| **Isolation** | |
| 2-way Isolation | I/O: 3000 VDC |
| **EMS Protection** | |
| ESD (IEC 61000-4-2) | ±4 kV Contact for each terminal<br>±8 kV Air for random point |
| EFT (IEC 61000-4-4) | ±4 kV for Power Line |
| Surge (IEC 61000-4-5) | ±2 kV for Power Line |
| **LED Indicators** | |
| Status | Run, Ethernet, I/O |
| **Ethernet** | |
| Ports | 2 x RJ-45, 10/100 Base-TX, Swtich Ports |
| PoE | Yes |
| LAN bypass | Yes |
| Security | ID, Password and IP Filter |
| **Power** | |
| Reverse Polarity Protection | Yes |
| Consumption | 6.8 W |
| Powered from PoE | IEEE 802.3af, Class3 |
| Powered from Terminal Block | +12 ~ +48 VDC |
| **Mechanical** | |
| Dimensions (mm) | 97 x 120 x 47 (W x L x H) |
| Installation | DIN-Rail mounting |
| **Environment** | |
| Operating Temperature | -25 °C ~ +75 °C |
| Storage Temperature | -30 °C ~ +80 °C |
| Humidity | 10 ~ 90% RH, Non-condensing |

### I/O Specifications

| Relay Output | |
|---|---|
| Channels | 8 |
| Type | Power Relay, Form A (SPST N.O.) |
| Contact Rating | 5 A @ 250 VAC/24 VDC (Resistive Load) |
| Operate Time | 10 ms (max.) |
| Release Time | 5 ms (max.) |
| Electrical Endurance | 10^5 ops. |
| Mechanical Endurance | 2 × 10^7 ops. |
| Power on Value | Programmable |
| Safe Value | Programmable |



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# 1.5 Wire Connections / Pin Assignments

## 1.5.1 U-7502M Wire Connections / Pin Assignments/Jumper Pic

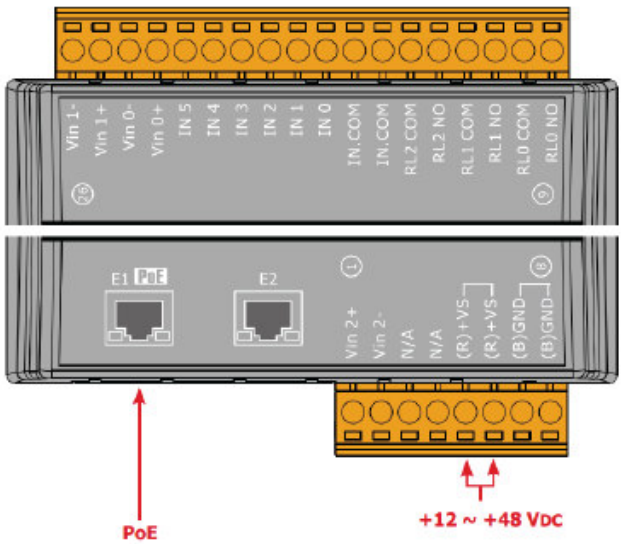
### Wire Connections

| Voltage Input | Current Input |
|---|---|
| JUMPER<br>Vinx+<br>Vinx -<br>Default | JUMPER<br>+<br>mA<br>-<br>Vinx+<br>Vinx - |

| Digital Input/ Counter | Readback as 1 | Readback as 0 |
|---|---|---|
| | +10 ~ +50 VDC | OPEN or <4 VDC |
| Sink | DIx, 10K, DI.COM, To other channels | DIx, 10K, DI.COM, To other channels |
| | +10 ~ +50 VDC | OPEN or <4 VDC |
| Source | DIx, 10K, DI.COM, To other channels | DIx, 10K, DI.COM, To other channels |

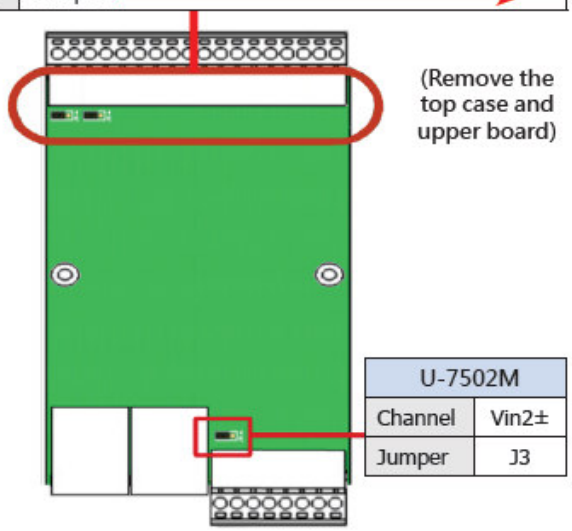
| Power Relay | ON State Readback as 1 | OFF State Readback as 0 |
|---|---|---|
| Relay Output | RLx.COM, Relay Close, AC/DC, LOAD, RLx.NO, To other channels | RLx.COM, Relay Open, AC/DC, LOAD, RLx.NO, To other channels |

### Pin Assignments




### Jumper Location

| U-7502M | | |
|---|---|---|
| Channel | Vin1± | Vin0± |
| Jumper | J2 | J1 |
| Location | Jumper | |




| U-7502M | |
|---|---|
| Channel | Vin2± |
| Jumper | J3 |

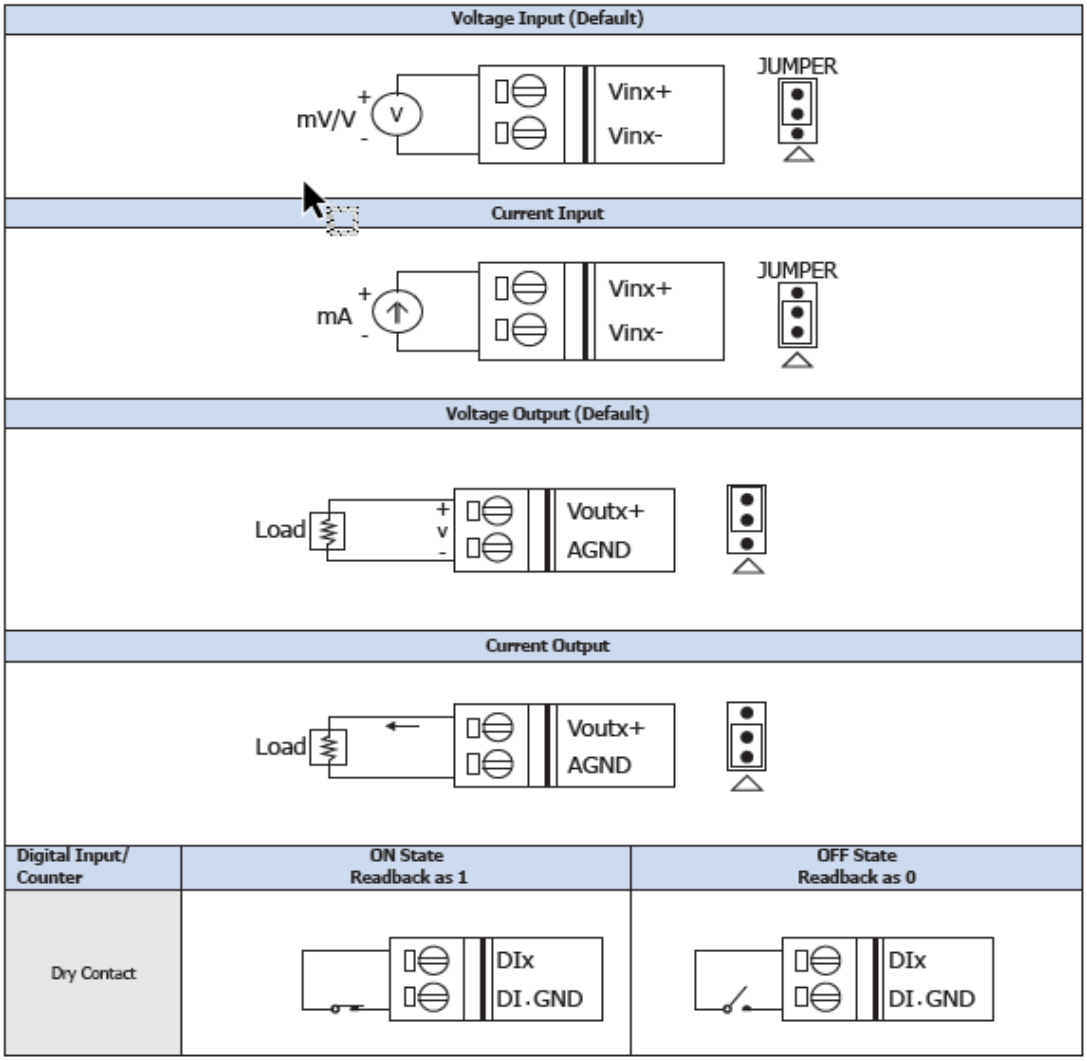
Figure 3 1-5-1 U-7502M Wire Connections / Pin Assignments/Jumper Pic



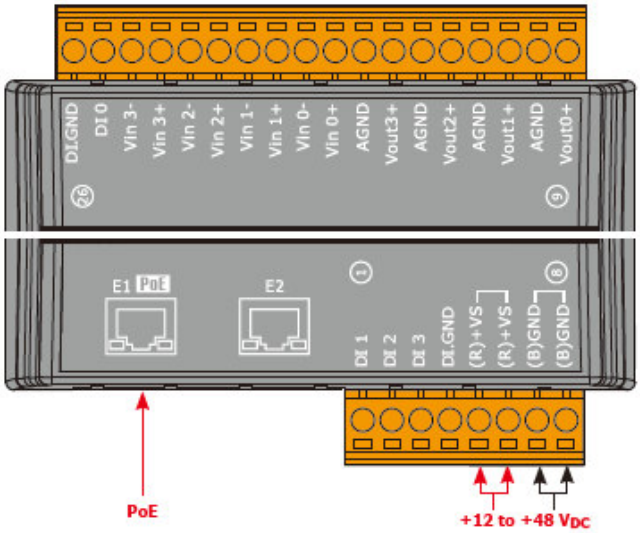
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## 1.5.2 U-7504M Wire Connections / Pin Assignments/Jumper Pic

### Wire Connections




### Pin Assignments




### Jumper Location

| U-7504M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Channel | Vin3 | Vin2 | Vin1 | Vin0 | Vout3 | Vout2 | Vout1 | Vout0 |
| Jumper | J4 | J3 | J2 | J1 | J8 | J7 | J6 | J5 |
| Location | Jumper → | | | | | | | |

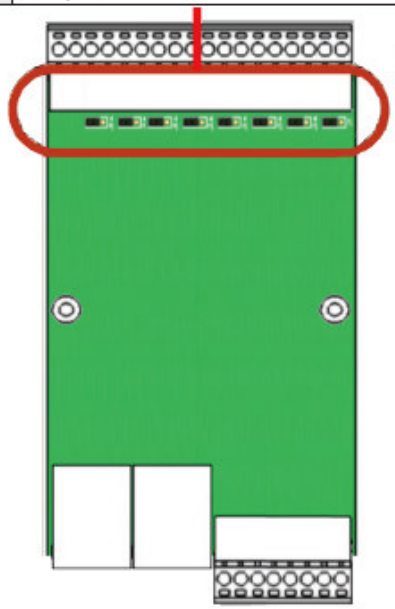


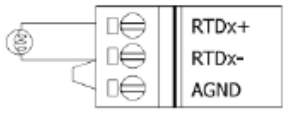
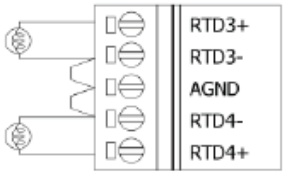
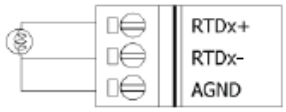
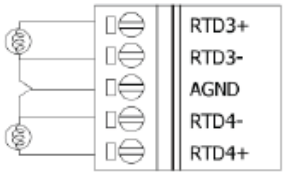

Figure 4 1-5-2 U-7504M Wire Connections / Pin Assignments/Jumper Pic



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## 1.5.3 U-7515M Wire Connections / Pin Assignments

### Wire Connections

| Open Collector (Sink) | CH0, 1, 2, 5 and 6 | CH3 and CH4 |
|---|---|---|
| 2-wire of RTD |  |  |
| 3-wire of RTD |  |  |

### Pin Assignments

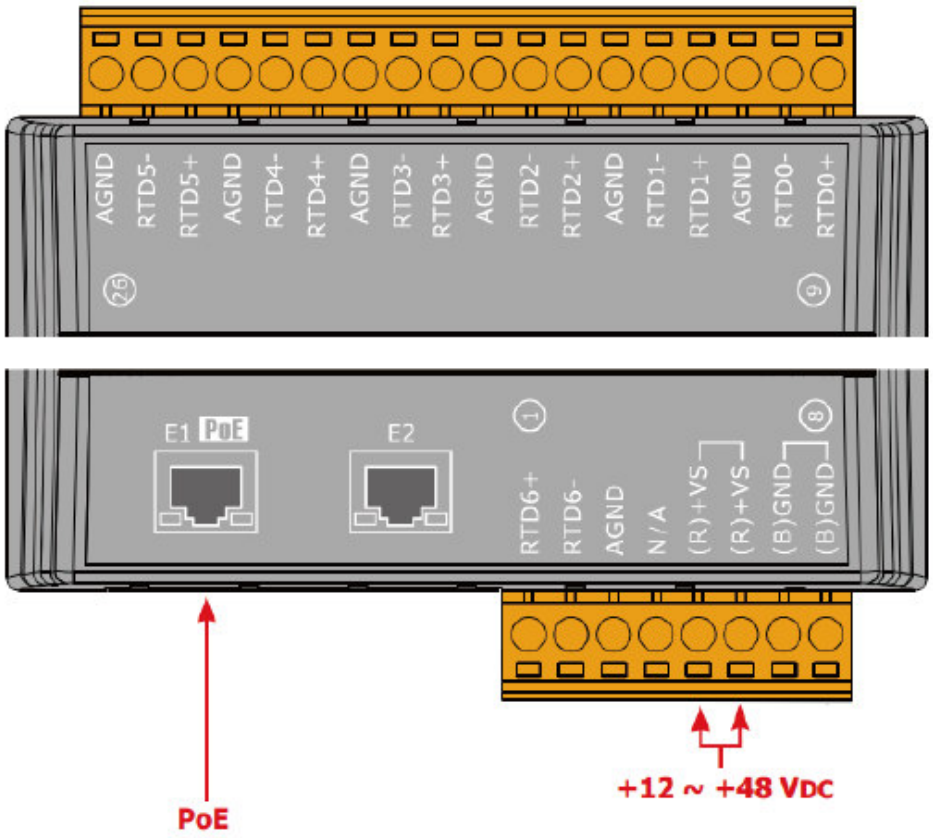


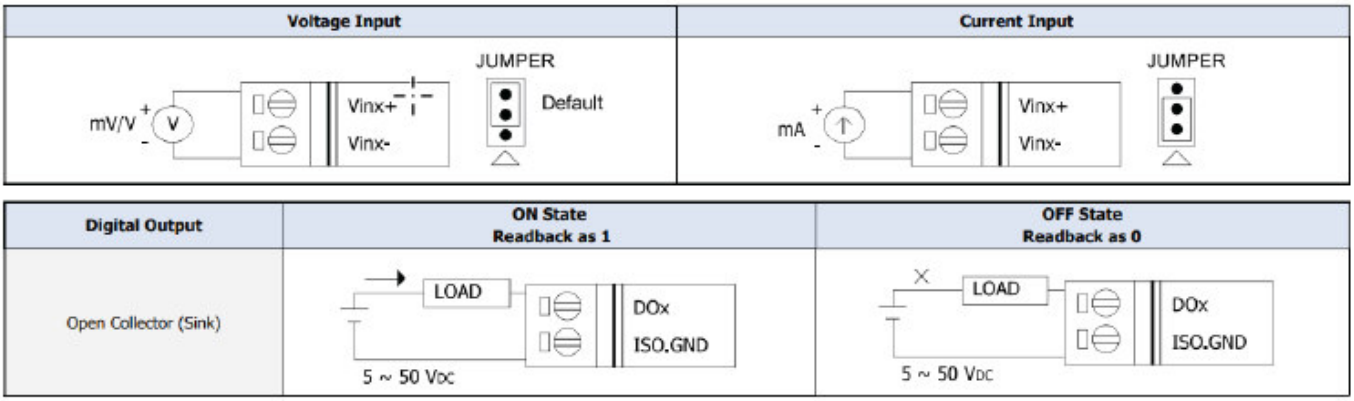

Figure 5 1-5-3 U-7515M Wire Connections / Pin Assignments



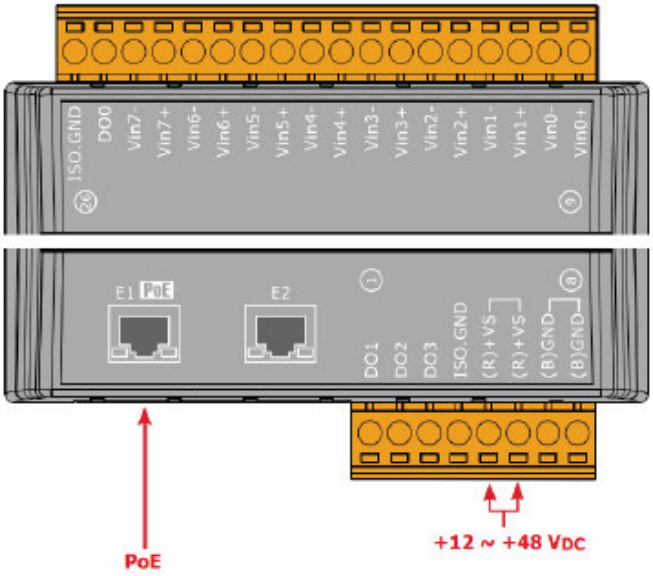
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## 1.5.4 U-7517M Wire Connections/Pin Assignments/Jumper Pic

### Wire Connections




### Pin Assignments




### Jumper Location

| U-7517M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Channel | Vin7± | Vin6± | Vin5± | Vin4± | Vin3± | Vin2± | Vin1± | Vin0± |
| Jumper | J8 | J7 | J6 | J5 | J4 | J3 | J2 | J1 |
| Location | Jumper → | | | | | | | |

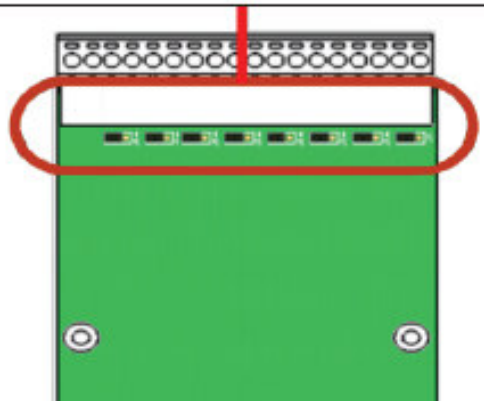


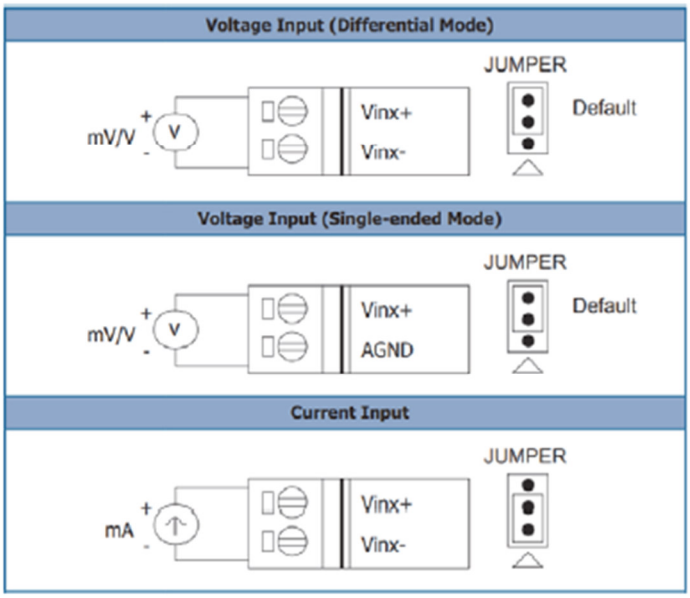

Figure 6 1-5-4 U-7517M Wire Connections/Pin Assignments/Jumper Pic



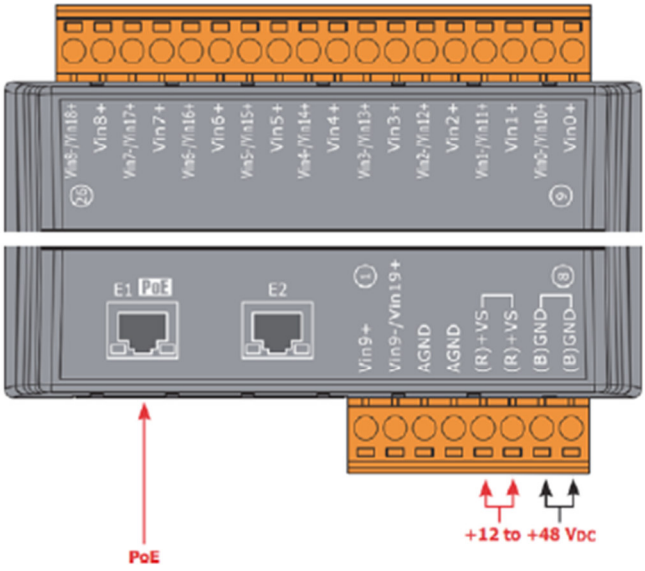
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## 1.5.5 U-7517M-10 Wire Connections/Pin Assignments/Jumper Pic

### Wire Connections

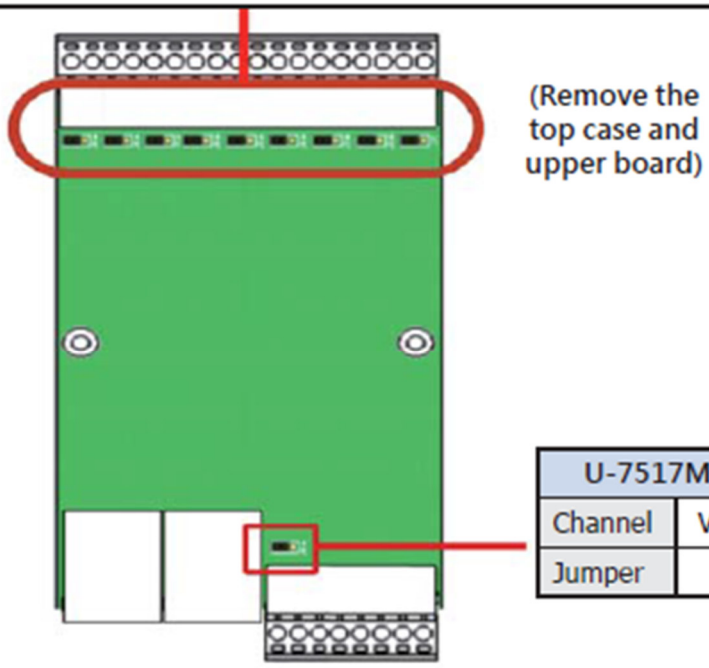



### Pin Assignments




### Jumper Location

| U-7517M-10 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Channel | Vin8± | Vin7± | Vin6± | Vin5± | Vin4± | Vin3± | Vin2± | Vin1± | Vin0± |
| Jumper | J9 | J8 | J7 | J6 | J5 | J4 | J3 | J2 | J1 |
| Location | Jumper → | | | | | | | | |




| U-7517M-10 | |
|---|---|
| Channel | Vin9± |
| Jumper | J10 |

Figure 7 1-5-5 U-7517M-10 Wire Connections/Pin Assignments/Jumper Pic



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## 1.5.6 U-7518ZM Wire Connections/Pin Assignments

### Wire Connections

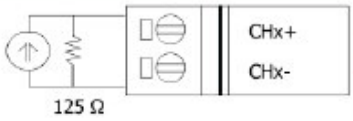
**Voltage Input (Default)**



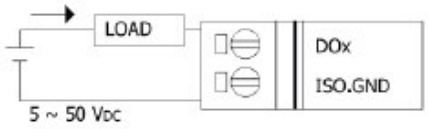
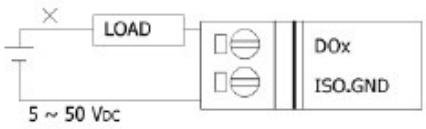

**Thermocouple Input (Default)**




**Current Input**




Note: When connecting to a current source, an optional external 125 Ω resistor is required.

| Digital Output | ON State<br>Readback as 1 | OFF State<br>Readback as 0 |
|---|---|---|
| Open Collector (Sink) |  |  |

### Pin Assignments

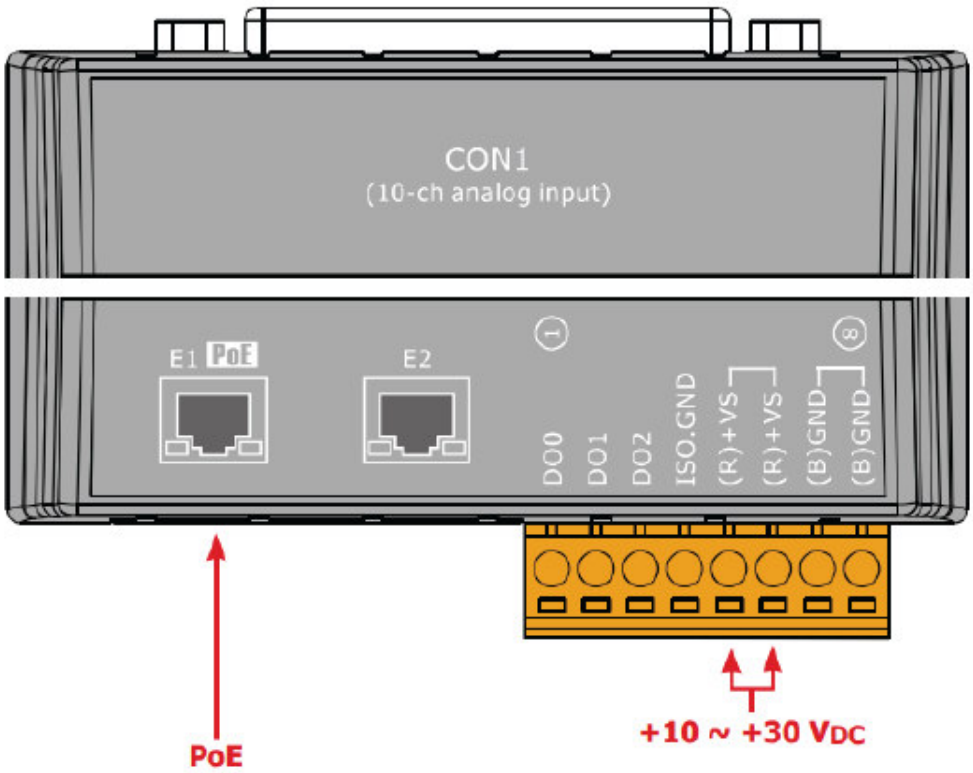


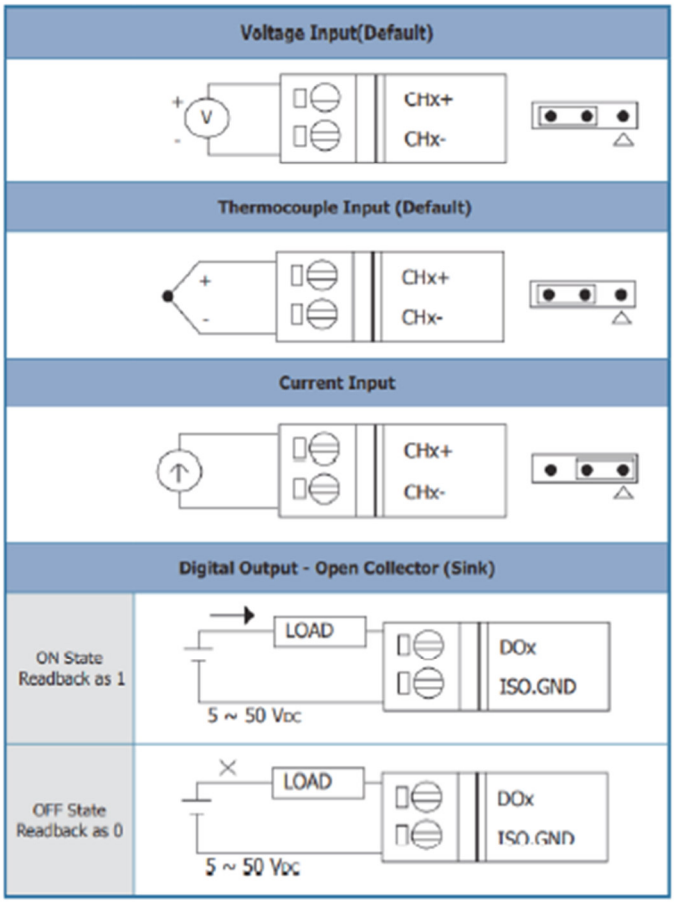

Figure 8 1-5-6 U-7518ZM Wire Connections/Pin Assignments



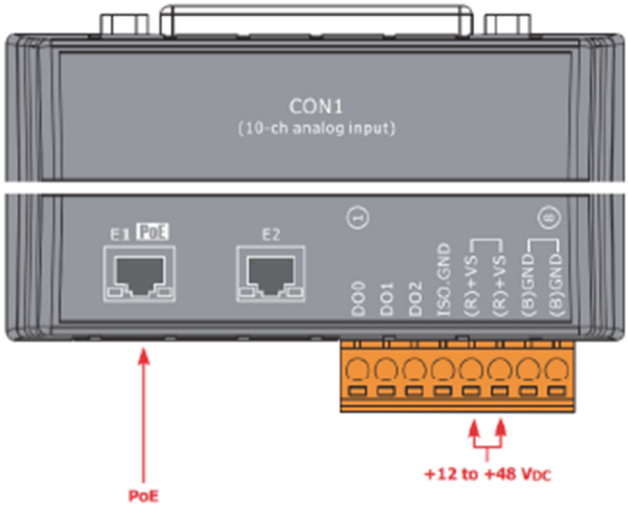
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## 1.5.7 U-7519ZM Wire Connections/Pin Assignments/Jumper Pic

### Wire Connections




### Pin Assignments




### Jumper Location

| U-7519ZM | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Channel | CH0± | CH1± | CH2± | CH3± | CH4± | CH5± | CH6± | CH7± | CH8± | CH9± |
| Jumper | J1 | J2 | J3 | J4 | J5 | J6 | J7 | J8 | J9 | J10 |
| Location | Jumper → | | | | | | | | | |

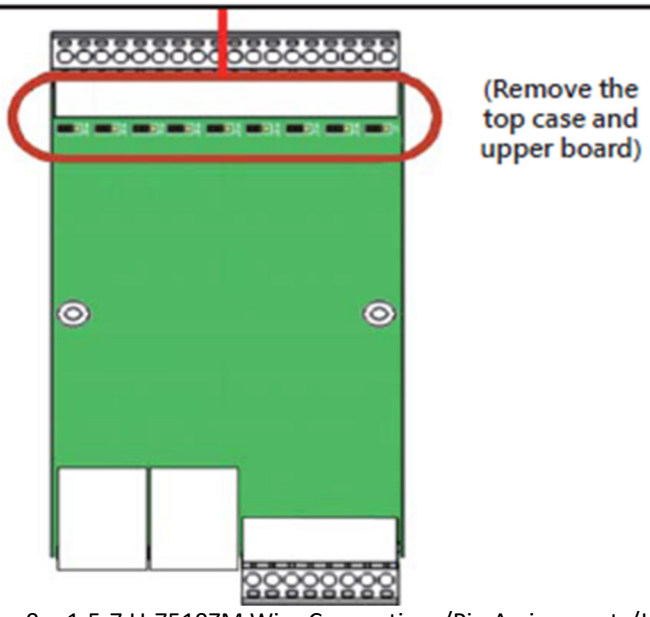


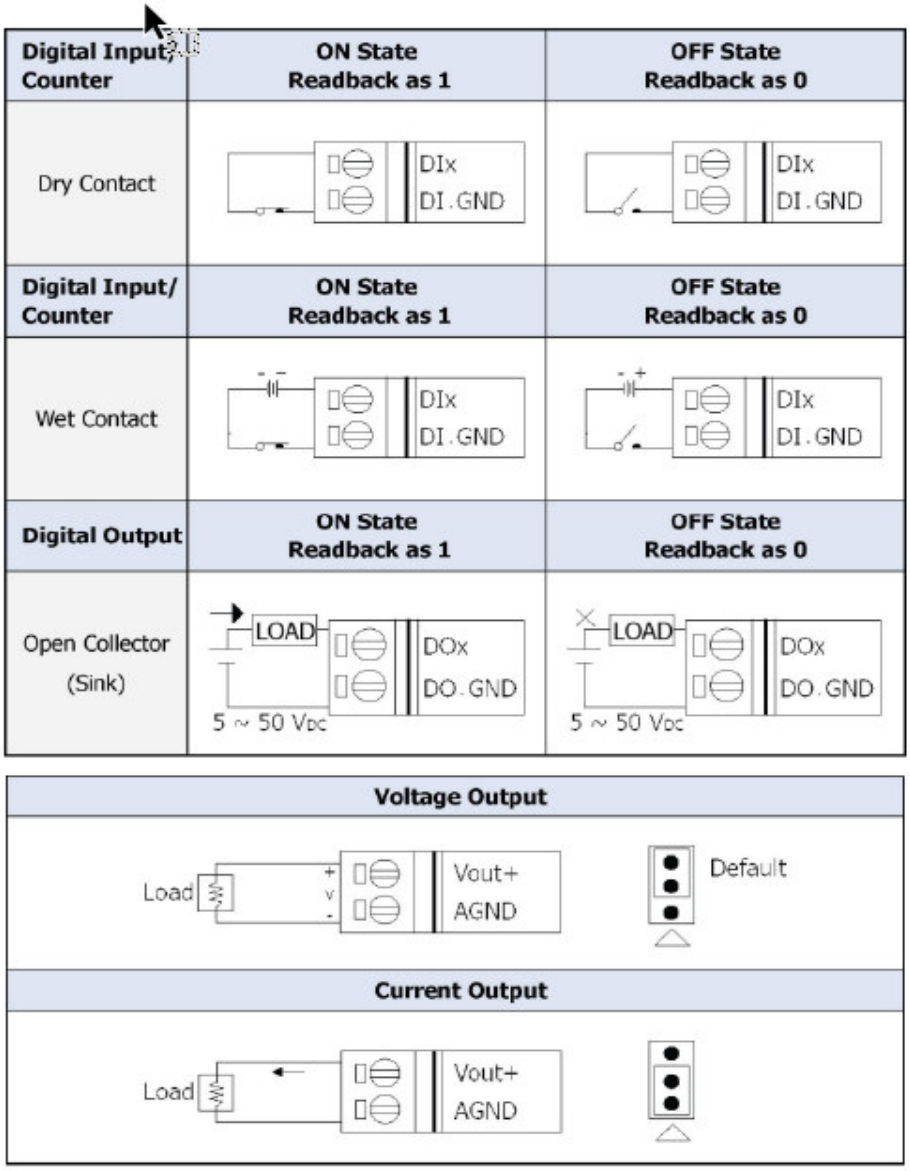

Figure 9 1-5-7 U-7519ZM Wire Connections/Pin Assignments/Jumper Pic



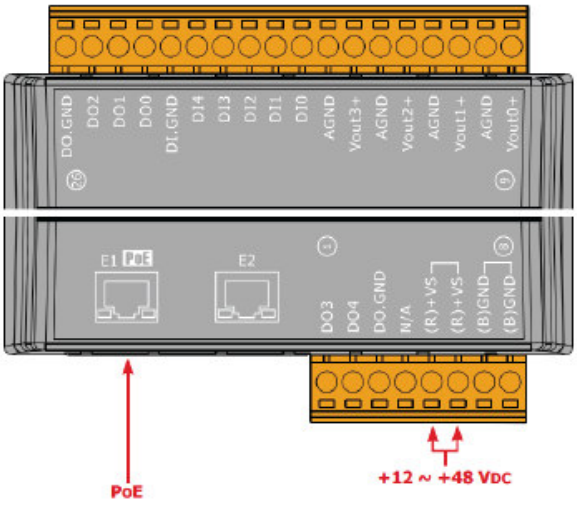
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## 1.5.8 U-7524M Wire Connections/Pin Assignments/Jumper Pic

### Wire Connections




### Pin Assignments




### Jumper Location

| U-7524M | | | | |
|---|---|---|---|---|
| Channel | Vout3+ | Vout2+ | Vout1+ | Vout0+ |
| Jumper | J4 | J3 | J2 | J1 |
| Location | Jumper → | | | |

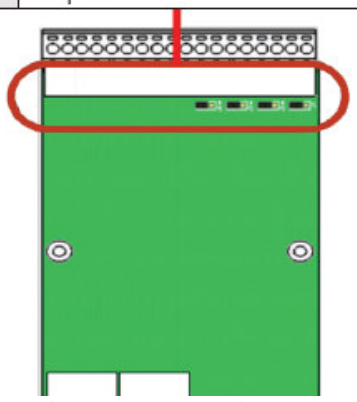


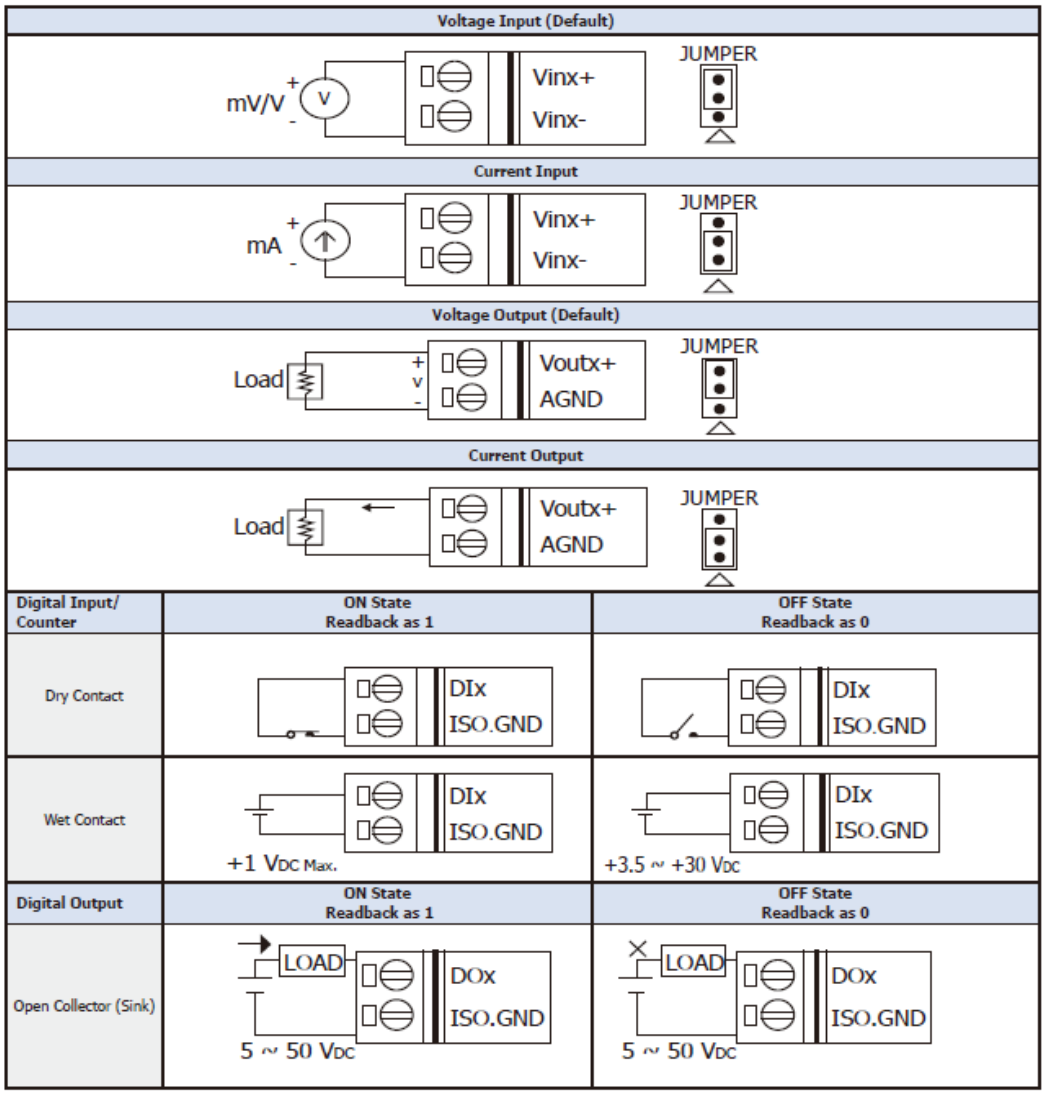

Figure 10 1-5-8 U-7524M Wire Connections/Pin Assignments/Jumper Pic



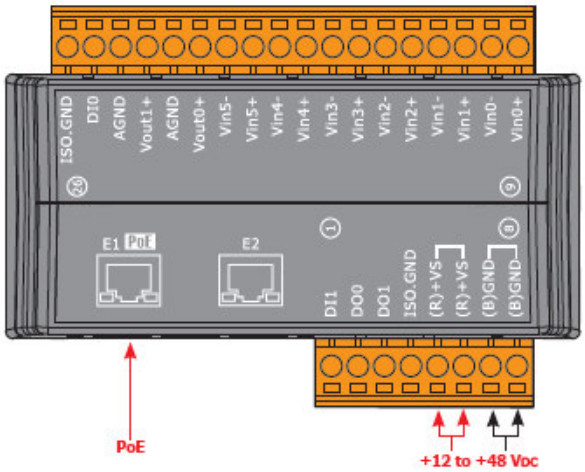
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## 1.5.9 U-7526M Wire Connections/Pin Assignments/Jumper Pic

### Wire Connections




### Pin Assignments




### Jumper Location

| U-7526M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Channel | Vout1 | Vout0 | Vin5 | Vin4 | Vin3 | Vin2 | Vin1 | Vin0 |
| Jumper | J8 | J7 | J6 | J5 | J4 | J3 | J2 | J1 |
| Location | Jumper → | | | | | | | |

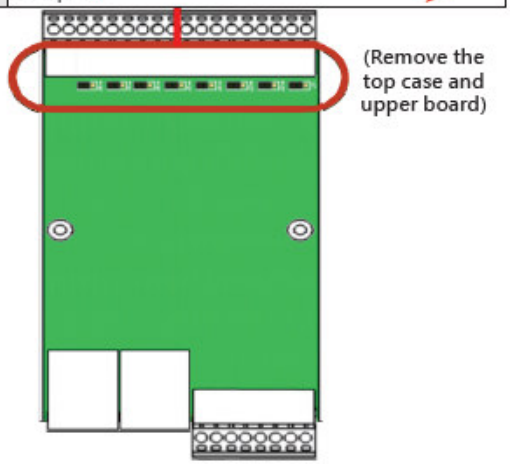


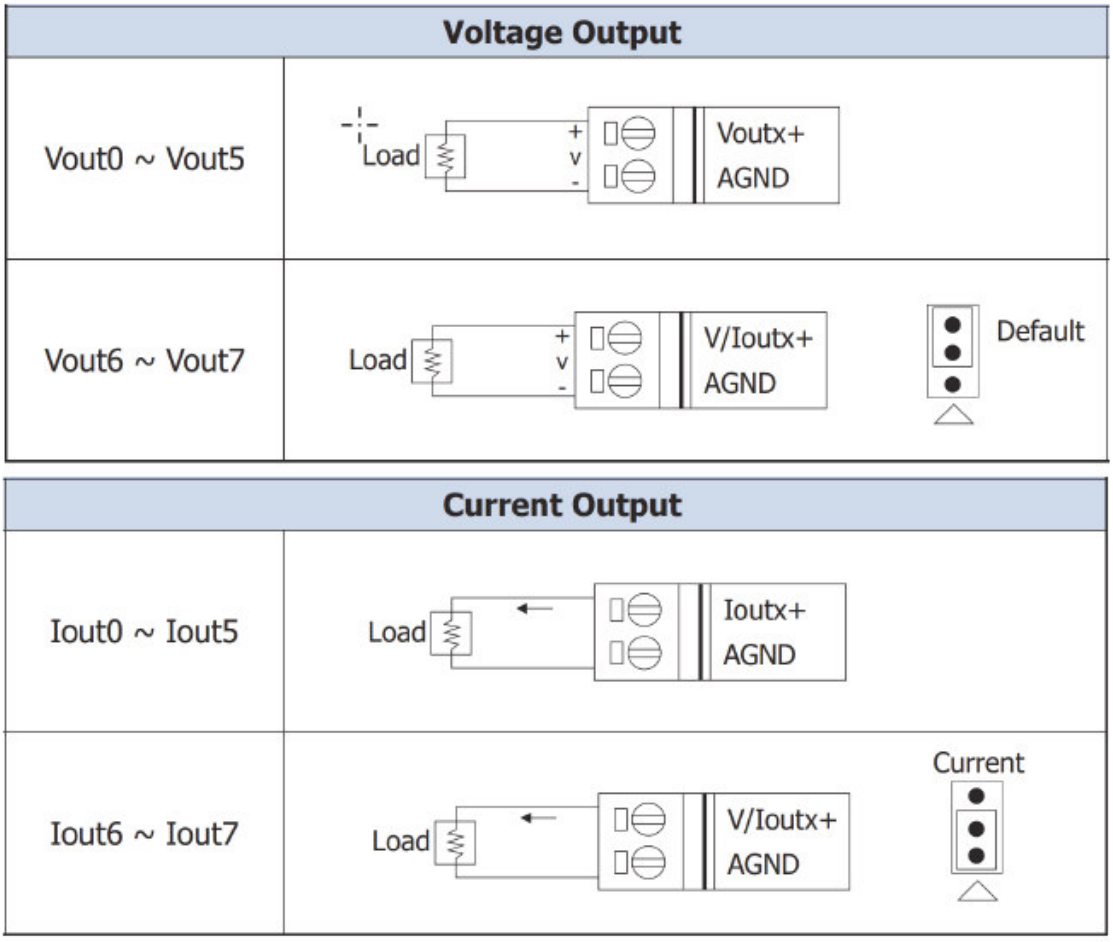

Figure 11 1-5-9 U-7526M Wire Connections/Pin Assignments/Jumper Pic



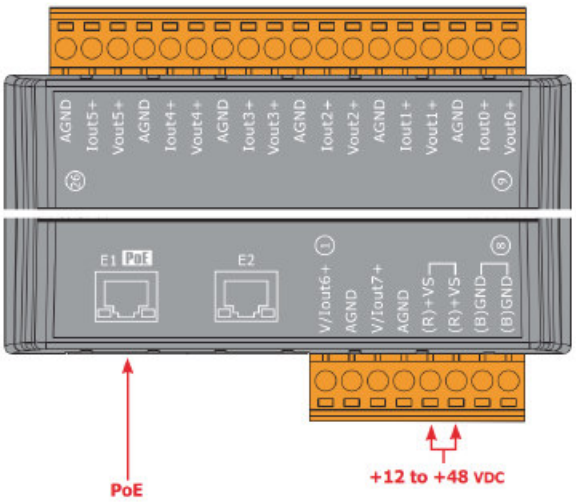
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## 1.5.10 U-7528M Wire Connections/Pin Assignments/Jumper Pic

### Wire Connections




### Pin Assignments




### Jumper Location

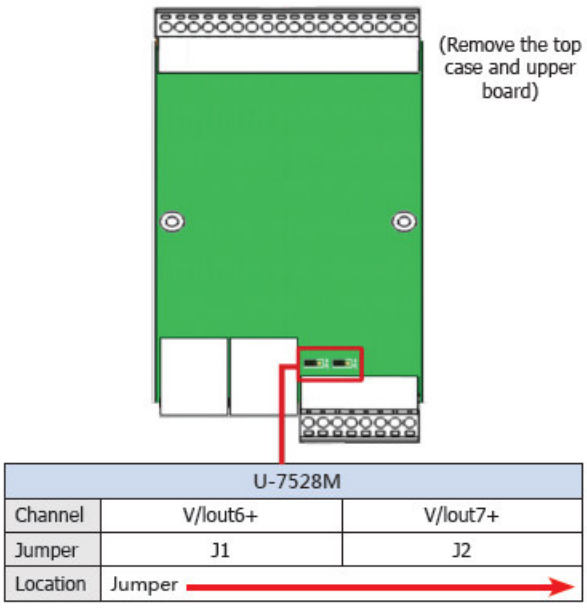


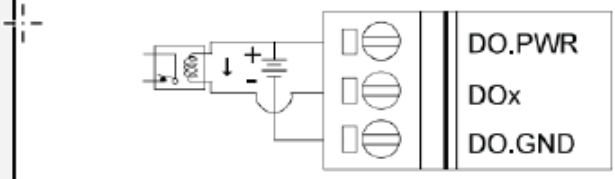
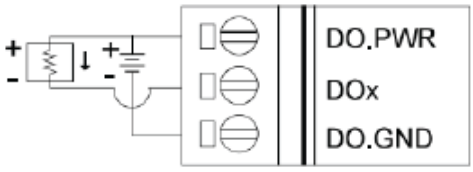

Figure 12 1-5-10 U-7528M Wire Connections/Pin Assignments/Jumper Pic

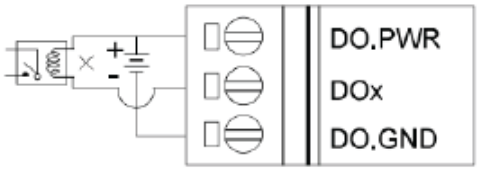
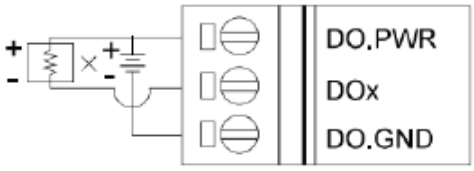


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## 1.5.11 U-7542M Wire Connections/Pin Assignments

### Wire Connections

| Output Type | ON State<br>Readback as 1 |
|---|---|
| Drive Relay |  |
| Resistance Load |  |

| Output Type | OFF State<br>Readback as 0 |
|---|---|
| Drive Relay |  |
| Resistance Load |  |

### Pin Assignments

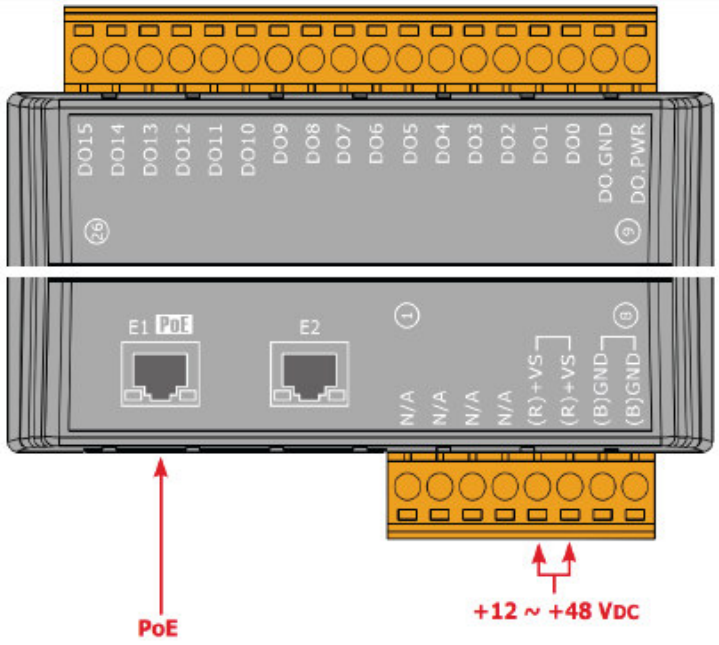


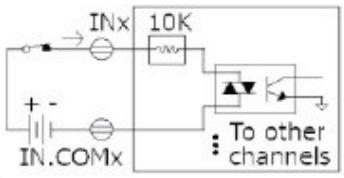
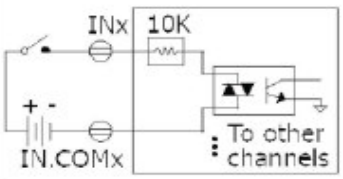
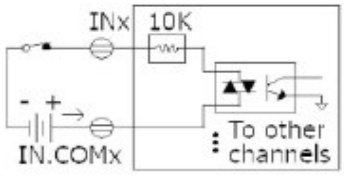
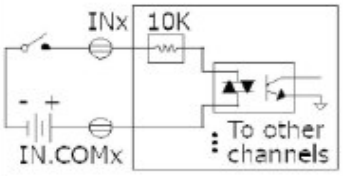

Figure 13 1-5-11 U-7542M Wire Connections/Pin Assignments

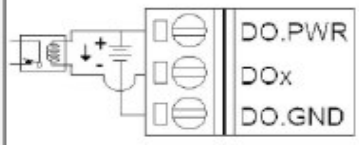
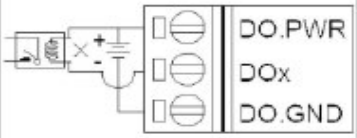
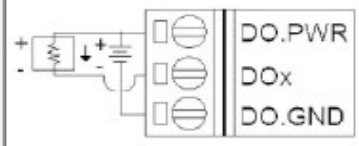
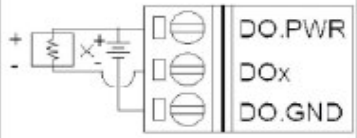


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## 1.5.12 U-7544M Wire Connections/Pin Assignments

### Wire Connections

| Digital Input/ Counter | Readback as 1 | Readback as 0 |
|---|---|---|
| Sink | +10 ~ +50 VDC | OPEN or <4 VDC |
| |  |  |
| Source | +10 ~ +50 VDC | OPEN or <4 VDC |
| |  |  |

| Output Type | ON State Readback as 1 | OFF State Readback as 0 |
|---|---|---|
| Drive Relay |  |  |
| Resistance Load |  |  |

### Pin Assignments

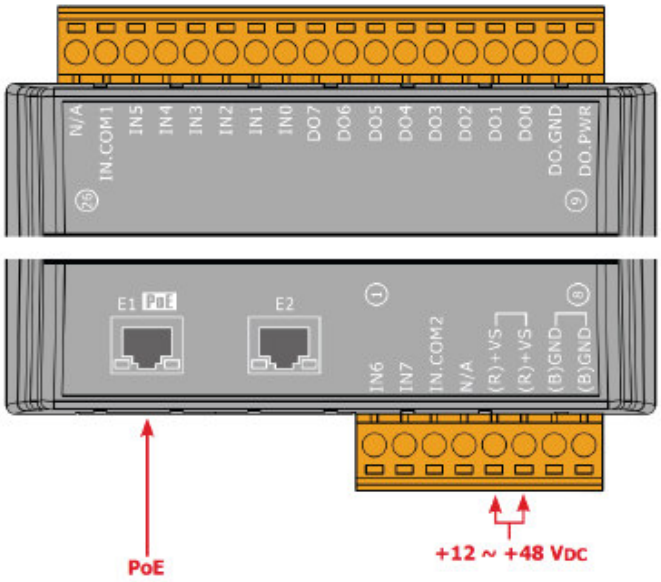


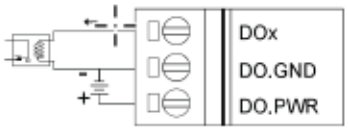
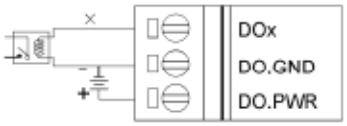
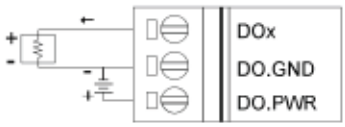
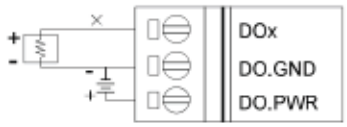

Figure 14 1-5-12 U-7544M Wire Connections/Pin Assignments



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## 1.5.13 U-7545M Wire Connections/Pin Assignments

### Wire Connections

| Output Type | ON State<br>Readback as 1 | Output Type | OFF State<br>Readback as 0 |
|---|---|---|---|
| Drive Relay |  | Drive Relay |  |
| Resistance Load |  | Resistance Load |  |

### Pin Assignments

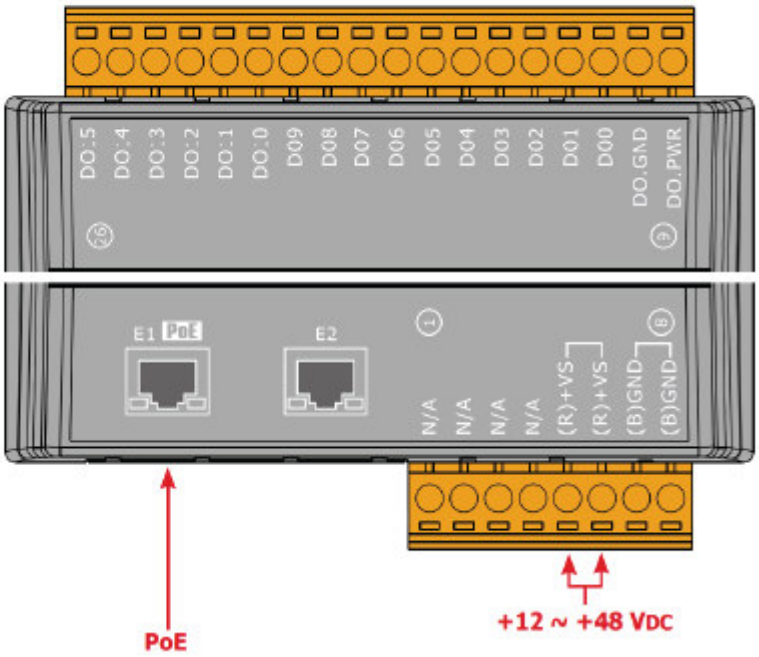


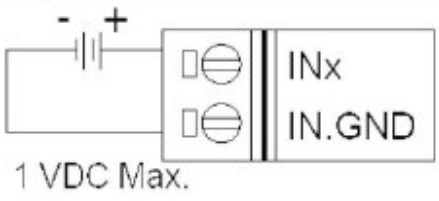
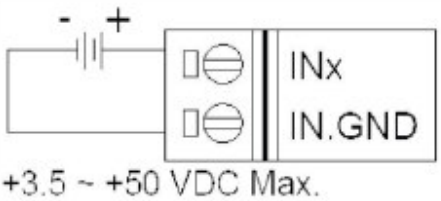
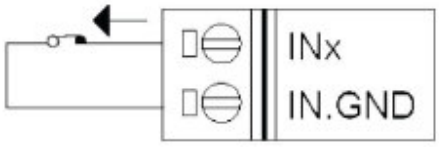
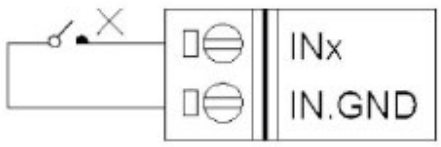
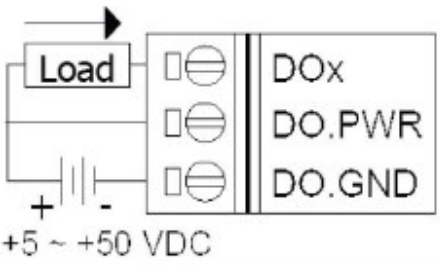
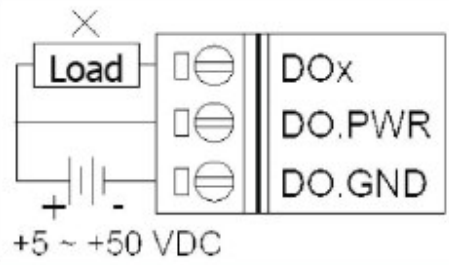

Figure 15 1-5-13 U-7545M Wire Connections/Pin Assignments



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## 1.5.14 U-7550AM Wire Connections/Pin Assignments

### Wire Connections

| Digital Input/ Counter | ON State Readback as 1 | OFF State Readback as 0 |
|---|---|---|
| Wet Contact (Sink) | 1 VDC Max.<br> | +3.5 VDC ~ +50 VDC Max.<br> |
| Dry Contact (Source) | Close to GND<br> | Open<br> |
| **Digital Output** | **ON State Readback as 1** | **OFF State Readback as 0** |
| Open Collector (Sink) |  |  |

### Pin Assignments

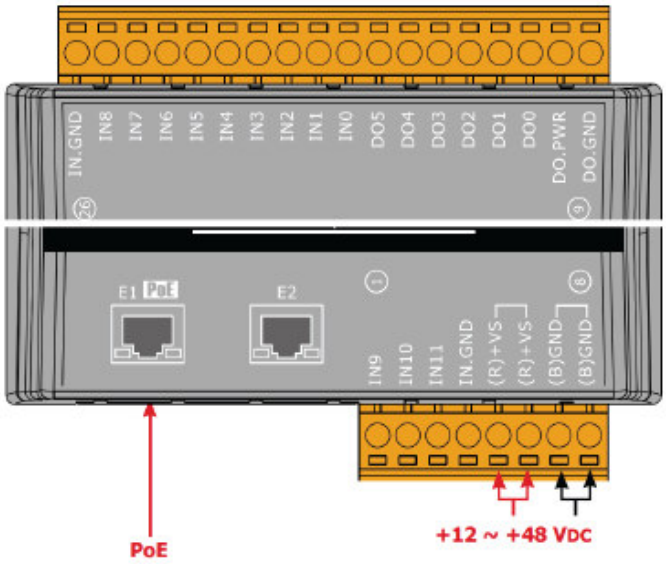


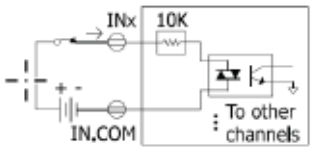
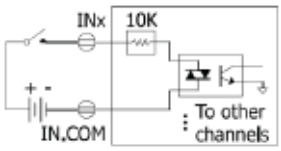
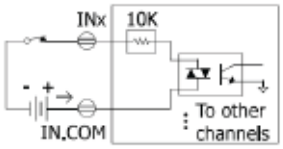
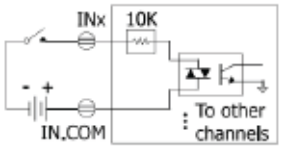

Figure 16 1-5-14 U-7550AM Wire Connections/Pin Assignments



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## 1.5.15 U-7551M Wire Connections/Pin Assignments

### Wire Connections

| Digital Input/Counter | Readback as 1 | Readback as 0 |
|---|---|---|
| Sink | +10 ~ +50 VDC | OPEN or <4 VDC |
| |  |  |
| Source | +10 ~ +50 VDC | OPEN or <4 VDC |
| |  |  |

### Pin Assignments

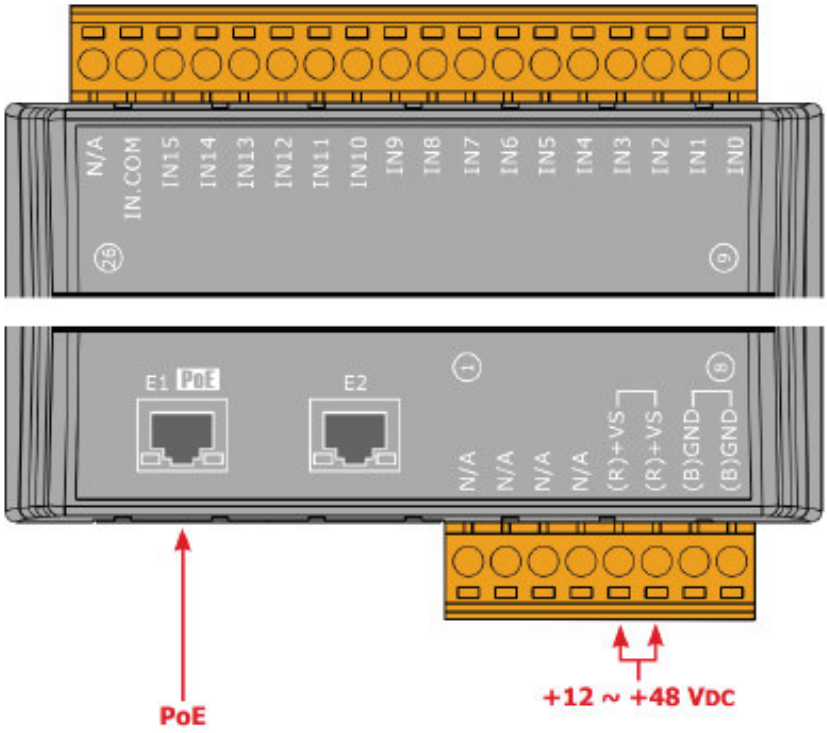


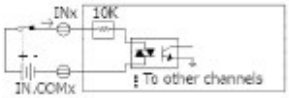
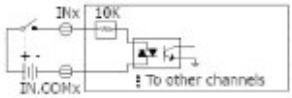
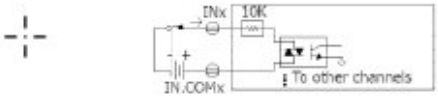
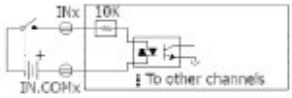

Figure 17 1-5-15 U-7551M Wire Connections/Pin Assignments

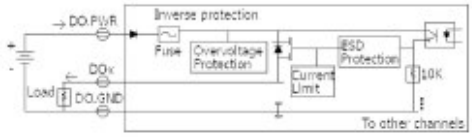
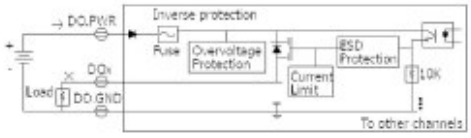


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## 1.5.16 U-7552M Wire Connections/Pin Assignments

### Wire Connections

| Digital Input/Counter | Readback as 1 | Readback as 0 |
|---|---|---|
| Sink | +10 ~ +50 VDC | OPEN or <4 VDC |
| |  |  |
| Source | +10 ~ +50 VDC | OPEN or <4 VDC |
| |  |  |

| Digital Output | ON State<br>Readback as 1 | OFF State<br>Readback as 0 |
|---|---|---|
| Source |  |  |

### Pin Assignments

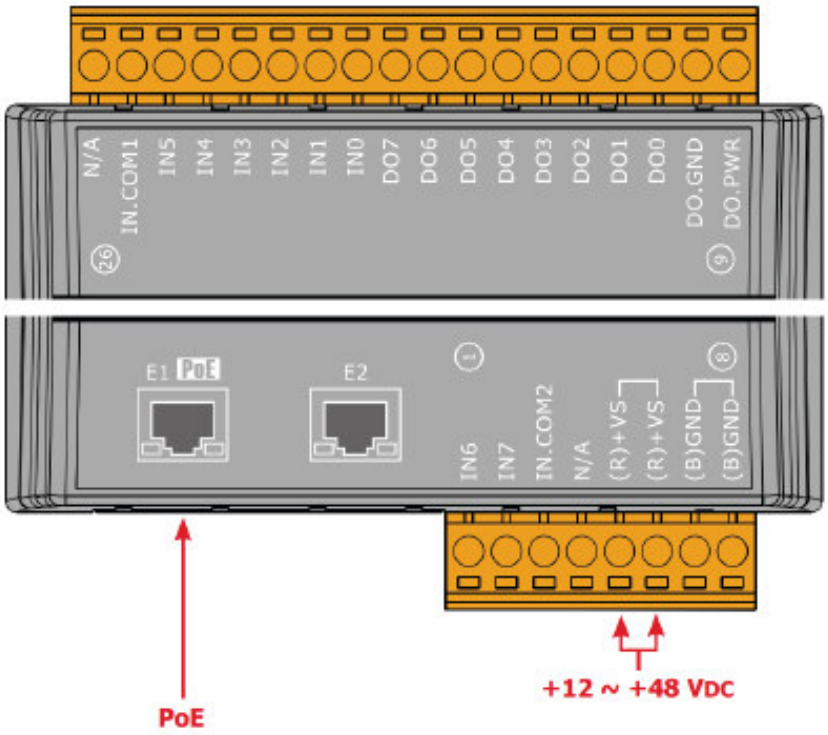


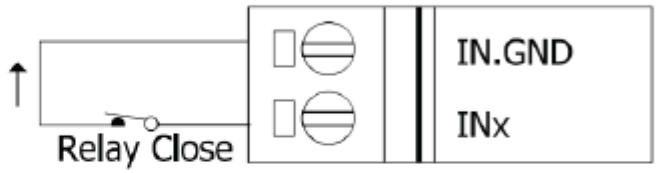
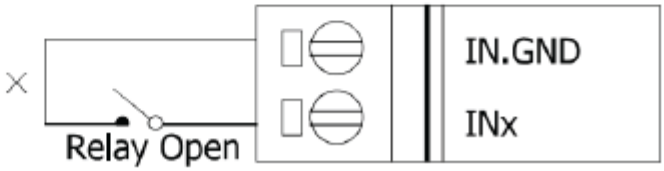

Figure 18 1-5-16 U-7552M Wire Connections/Pin Assignments



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## 1.5.17 U-7553M Wire Connections/Pin Assignments

### Wire Connections

| Digital Input/Counter | ON State<br>Readback as 1 |
|---|---|
| Dry Contact |  |
| | OFF State<br>Readback as 0 |
| |  |

### Pin Assignments

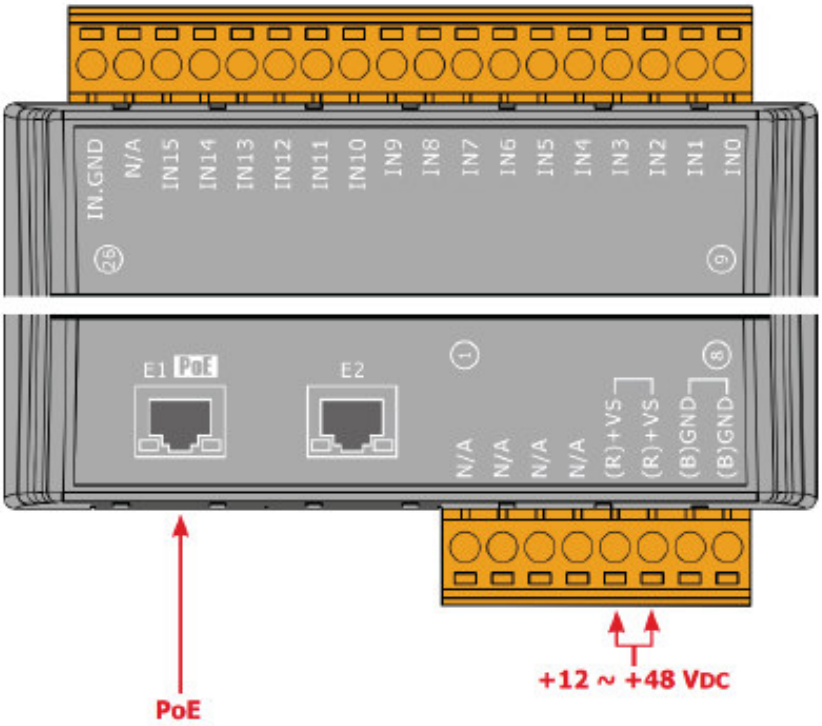


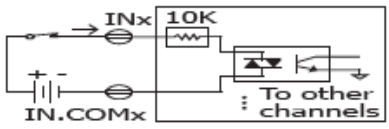
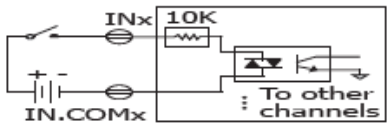
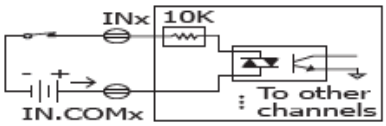
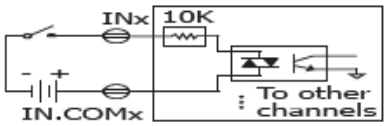

Figure 19 1-5-17 U-7553M Wire Connections/Pin Assignments

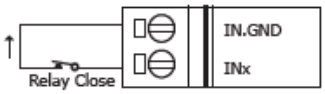
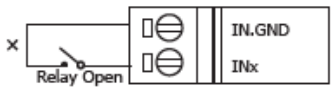


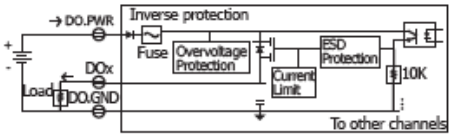
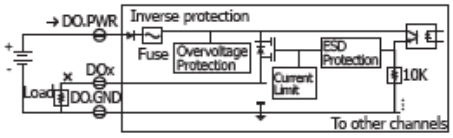
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## 1.5.18 U-7555M Wire Connections / Pin Assignments

### Wire Connections

| Digital Input/Counter | Readback as 1 | Readback as 0 |
|---|---|---|
| Wet Contact (Sink) | +10 ~ +50 VDC | OPEN or <4 VDC |
| |  |  |
| Wet Contact (Source) | +10 ~ +50 VDC | OPEN or <4 VDC |
| |  |  |

| Digital Input/Counter | ON State<br>Readback as 1 | OFF State<br>Readback as 0 |
|---|---|---|
| Dry Contact |  |  |

| Digital Output | ON State<br>Readback as 1 | OFF State<br>Readback as 0 |
|---|---|---|
| Source |  |  |

### Pin Assignments

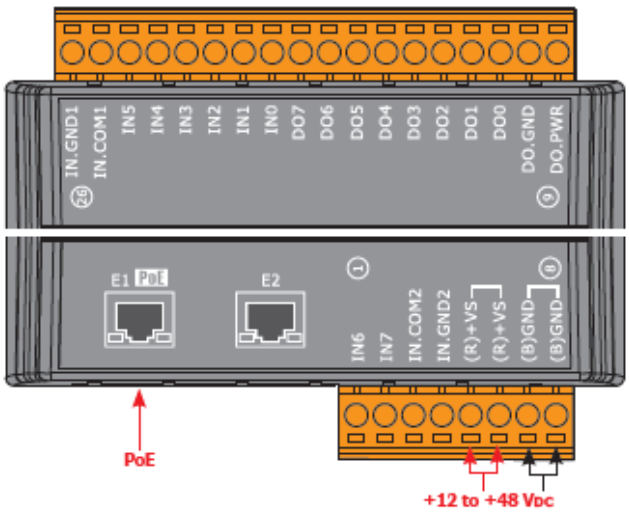


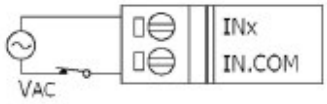
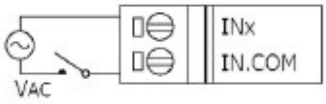
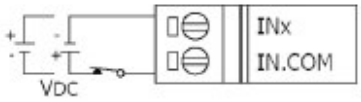
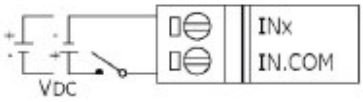

Figure 20 1-5-18 U-7555M Wire Connections / Pin Assignments



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## 1.5.19 U-7558M Wire Connections/Pin Assignments

### Wire Connections

| Digital Input/Counter | ON State<br>Readback as 1 | OFF State<br>Readback as 0 |
|---|---|---|
| AC Digital Input | 80 ~ 250 VAC | OPEN or < 30 VAC Max. |
| |  |  |
| DC Digital Input | 90 ~ 250 VDC | OPEN or < 30 VDC Max. |
| |  |  |

### Pin Assignments

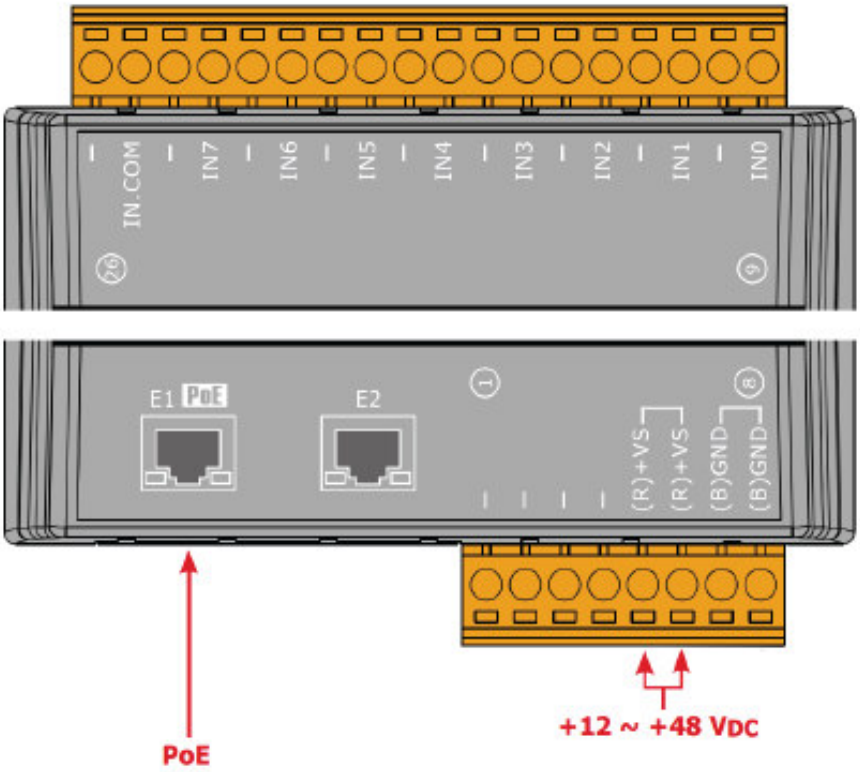


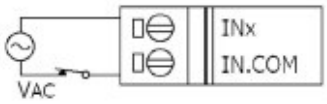
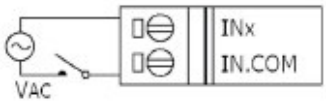
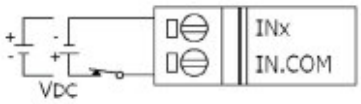
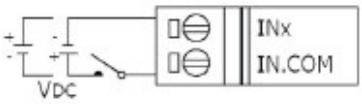

Figure 21 1-5-19 U-7558M Wire Connections/Pin Assignments



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## 1.5.20 U-7559M Wire Connections/Pin Assignments

### Wire Connections

| Digital Input/Counter | ON State<br>Readback as 1 | OFF State<br>Readback as 0 |
|---|---|---|
| AC Digital Input | 10 ~ 80 VAC | OPEN or < 3 VAC Max. |
| |  |  |
| DC Digital Input | 15 ~ 80 VDC | OPEN or < 3 VDC Max. |
| |  |  |

### Pin Assignments

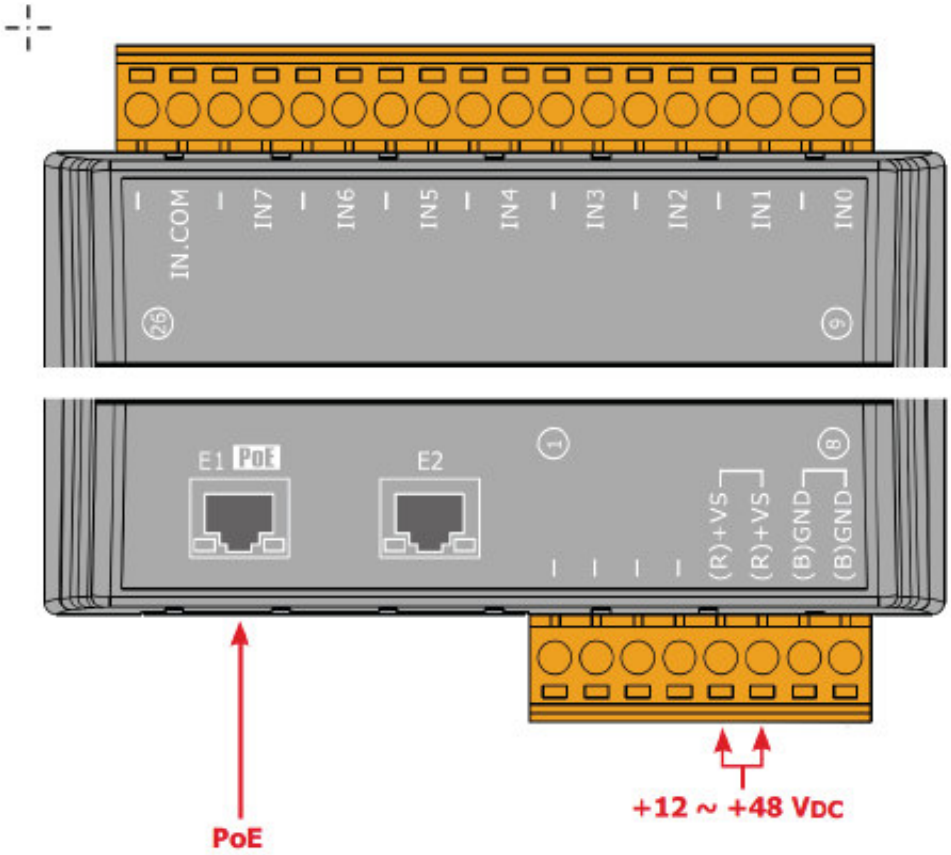


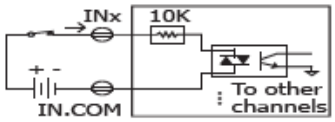
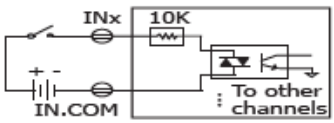
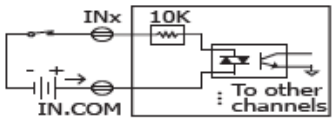
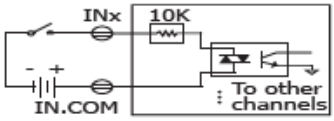

Figure 22 1-5-20 U-7559M Wire Connections/Pin Assignments

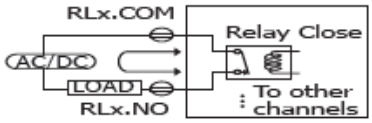
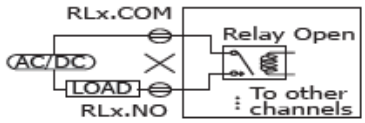


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## 1.5.21 U-7560M Wire Connections / Pin Assignments

### Wire Connections

| Digital Input/Counter | Readback as 1 | Readback as 0 |
|---|---|---|
| Sink | +10 ~ +50 VDC | OPEN or <4 VDC |
| |  |  |
| Source | +10 ~ +50 VDC | OPEN or <4 VDC |
| |  |  |

| Power Relay | ON State: Readback as 1 |
|---|---|
| Relay Output |  |
| | **OFF State: Readback as 0** |
| |  |

### Pin Assignments

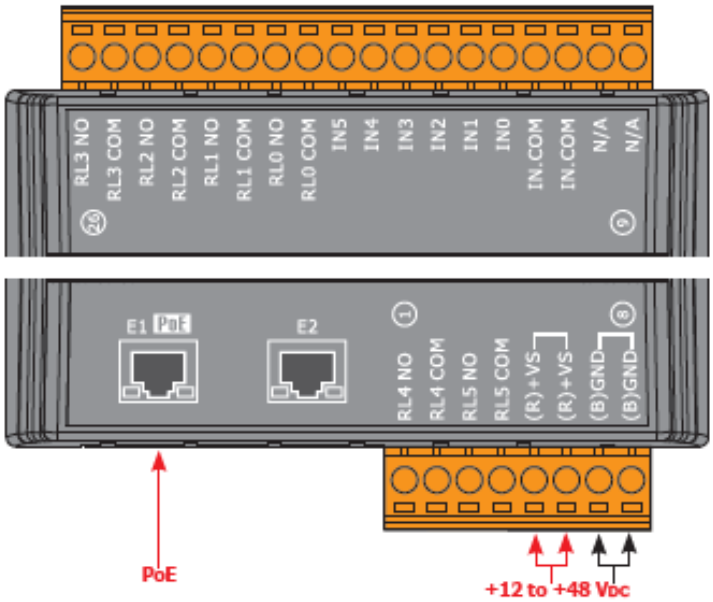



Figure 23 1-5-21 U-7560M Wire Connections / Pin Assignments



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## 1.5.22 U-7561M Wire Connections/Pin Assignments

### Wire Connections

| Power Relay | ON State<br>Readback as 1 |
|---|---|
| Relay Output |  |
| | OFF State<br>Readback as 0 |
| |  |

### Pin Assignments

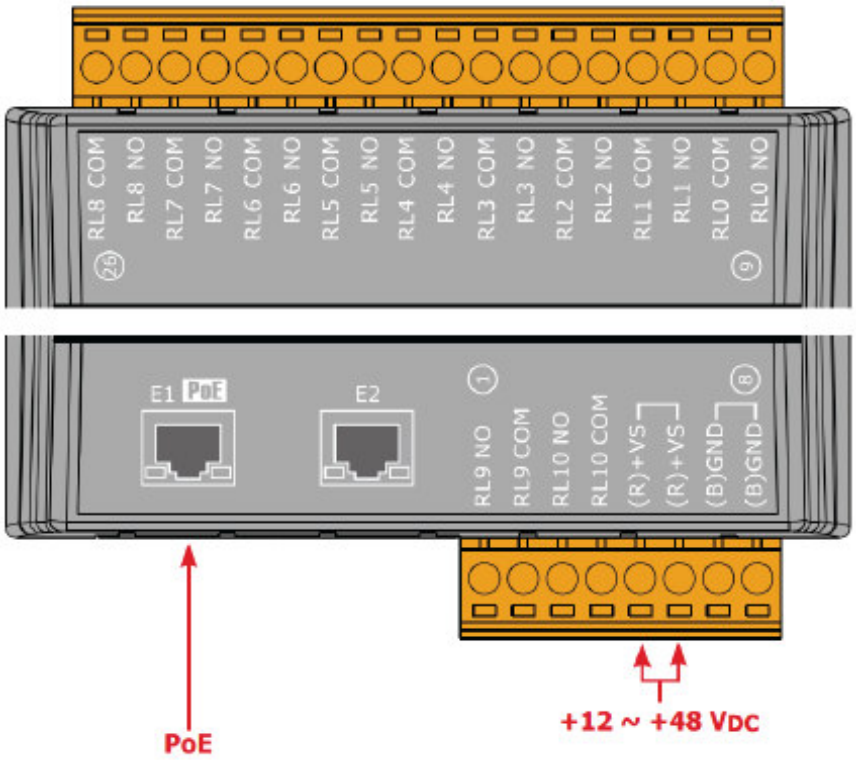


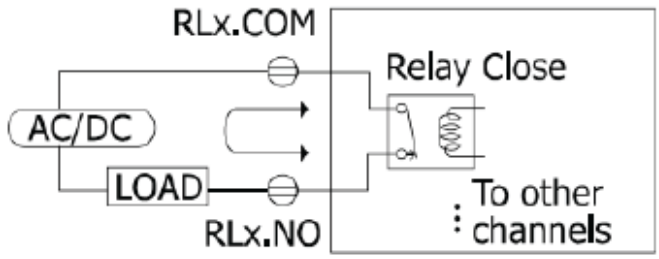
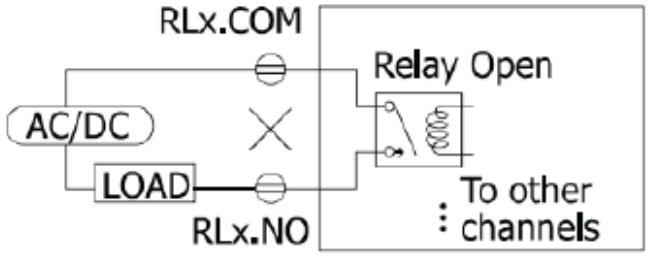

Figure 24 1-5-22 U-7561M Wire Connections/Pin Assignments



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## 1.5.23 U-7567M Wire Connections/Pin Assignments

### Wire Connections

| Power Relay | ON State<br>Readback as 1 |
|---|---|
| Relay Output |  |
| | OFF State<br>Readback as 0 |
| |  |

### Pin Assignments

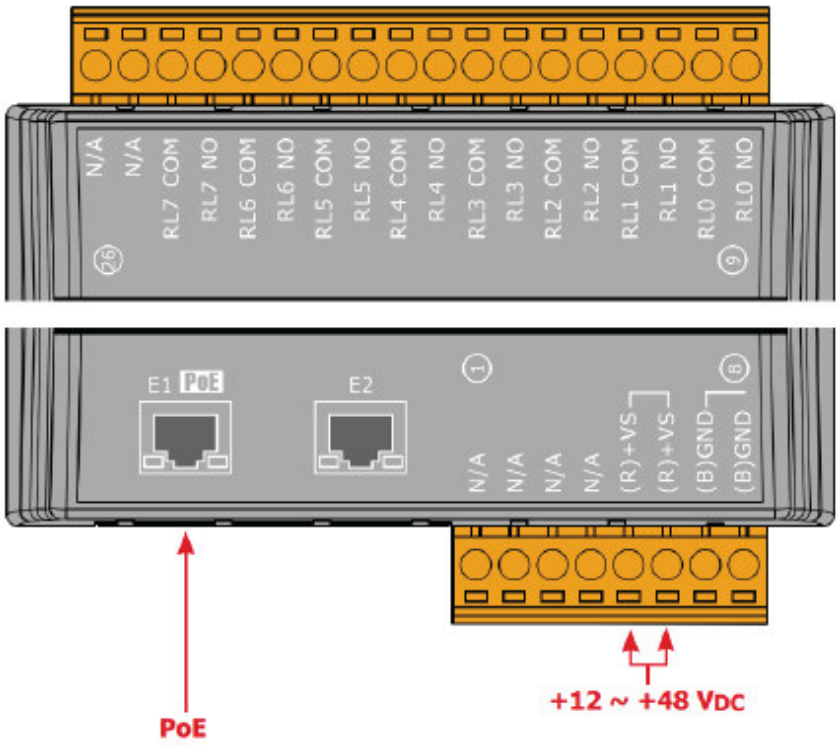



Figure 25 1-5-23 U-7567M Wire Connections/Pin Assignments



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# 1.6 Dimensions

## U-7502M/U-7504M/U-7515M/U-7517M/U-7517M-10/U-7524M /U-7526M/U-7528M/U-7542M/U-7544M/U-7545M/U-7550AM /U-7551M/U-7552M/U-7553M/U-7555M/U-7558M/U-7559M /U-7560M/U-7561M/U-7567M Dimensions

(Unit: mm)

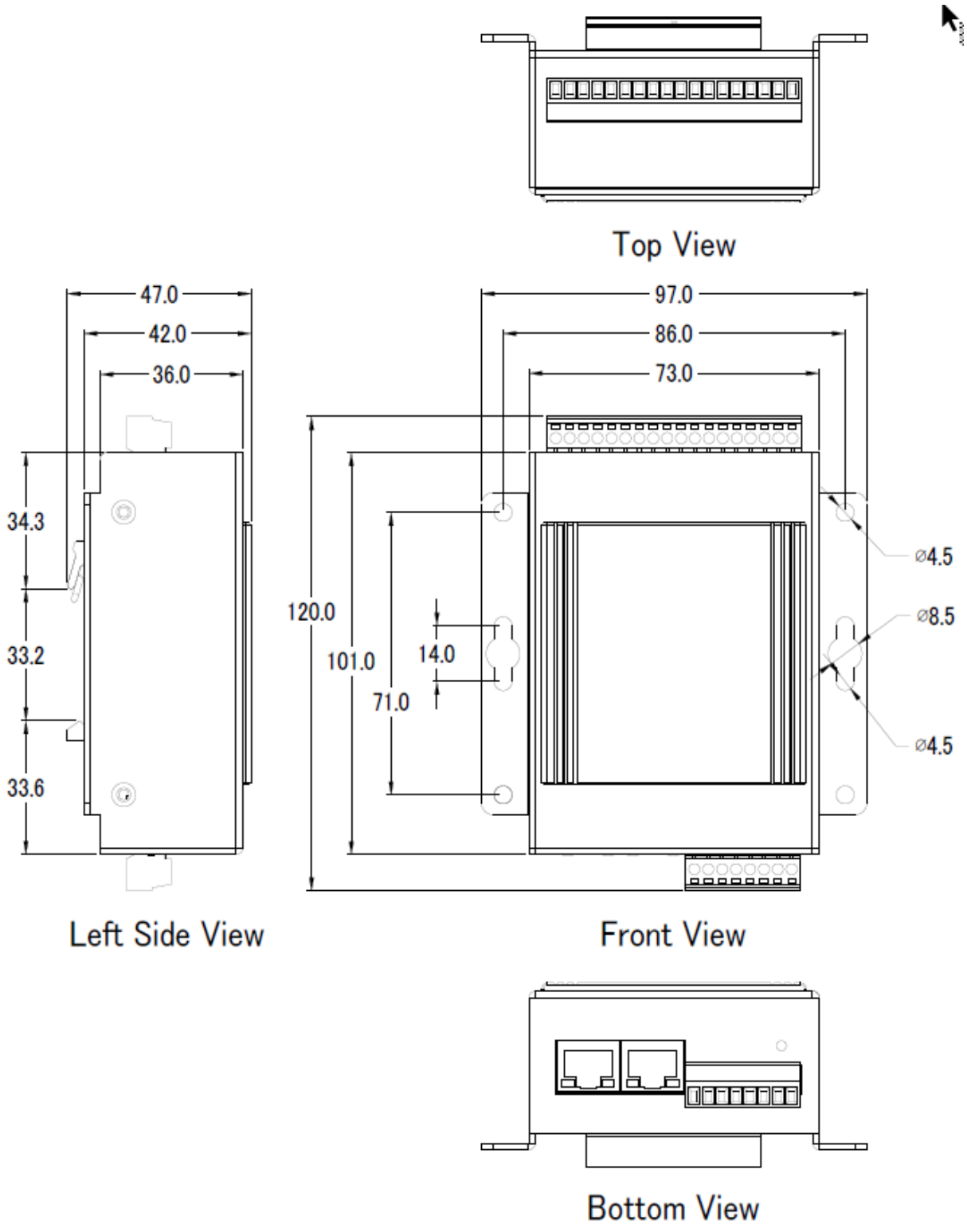



Figure 26 1-6 Dimensions



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## U-7518ZM/U-7519ZM Dimensions

(Unit: mm)

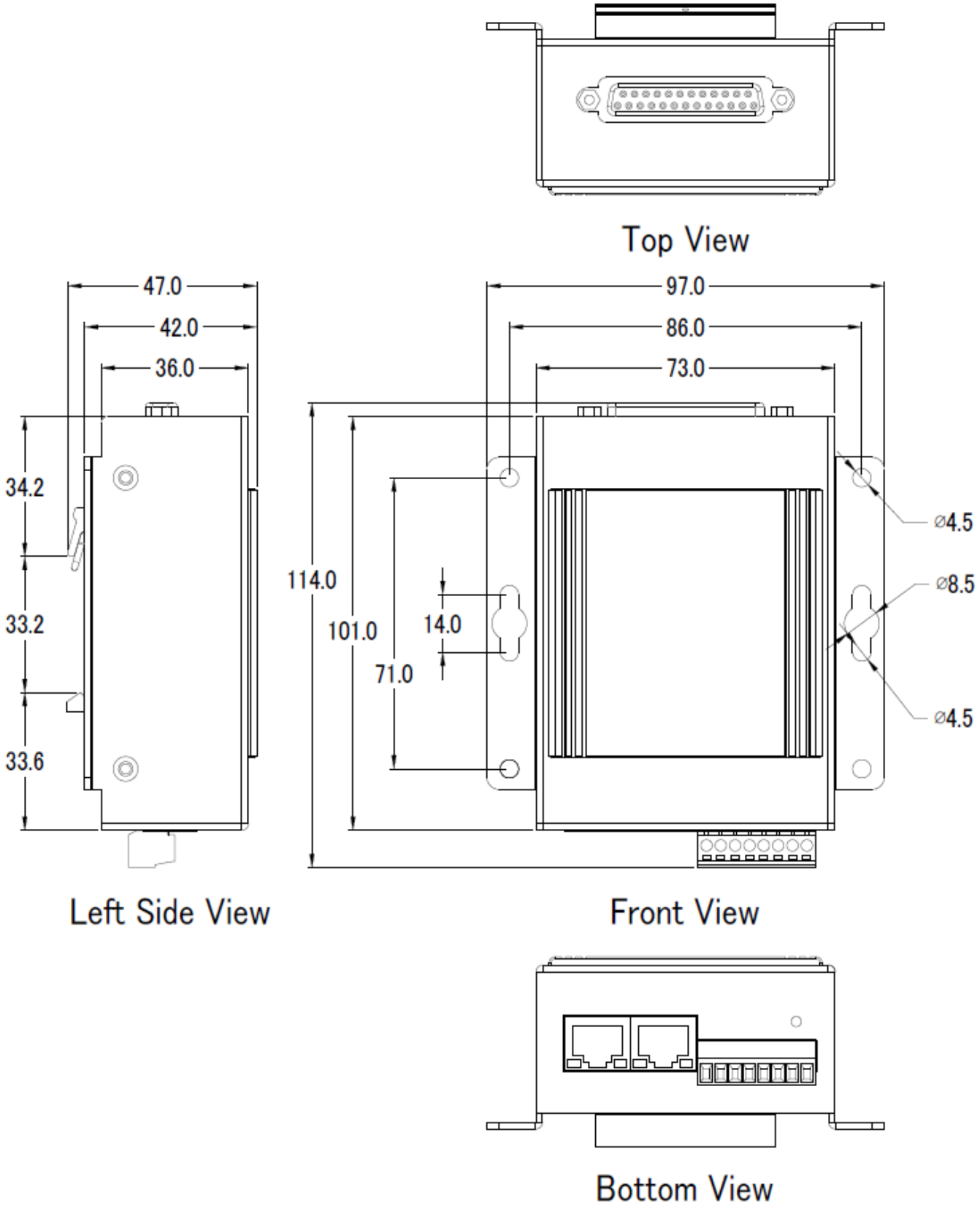



Figure 27 1-6 U-7518ZM/U-7519ZM Dimensions



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# 2. Quick Start: Hardware/Network Connection

This chapter describes the UA I/O module's hardware connection, network connection and quick setting. For how to set up a project via the Web UI on the browser, please refer to Chapter 3.

## 2.1. Hardware Connection

This section describes the hardware wiring and connection for the UA I/O module.

### 2.1.1. Preparations for Devices

In addition to the UA I/O modules (Ex: U-7555M), please prepare the following:

1. **PC/NB**: Can connect to the network and set the network
2. **Ethernet Switch/Hub**: e.g. NS-205 or **PoE Switch** NSM-208SE
3. **Power Supply: +12 ~ +48 VDC**, e.g. MDR-60-24 (If using PoE Switch, user can save a power supply.)

### 2.1.2. AI/AO Jumper Setting

This section is for setting the AI/AO jumpers, take U-7504M, U-7526M for example, if use DI/O module, please go to the next section.

**Setting the Selection Jumpers for Analog channels**:

1. **Disconnect the power, remove the top case and upper board** of the module if need to change the selection jumper, the selection jumpers are next to the connector.

2. Set up the **Jumper** corresponding to the type of **voltage/current and input/output** for each analog channel.

**Voltage/Current Input/output Selection Jumper: (Default as AI/AO: Voltage/Voltage)**

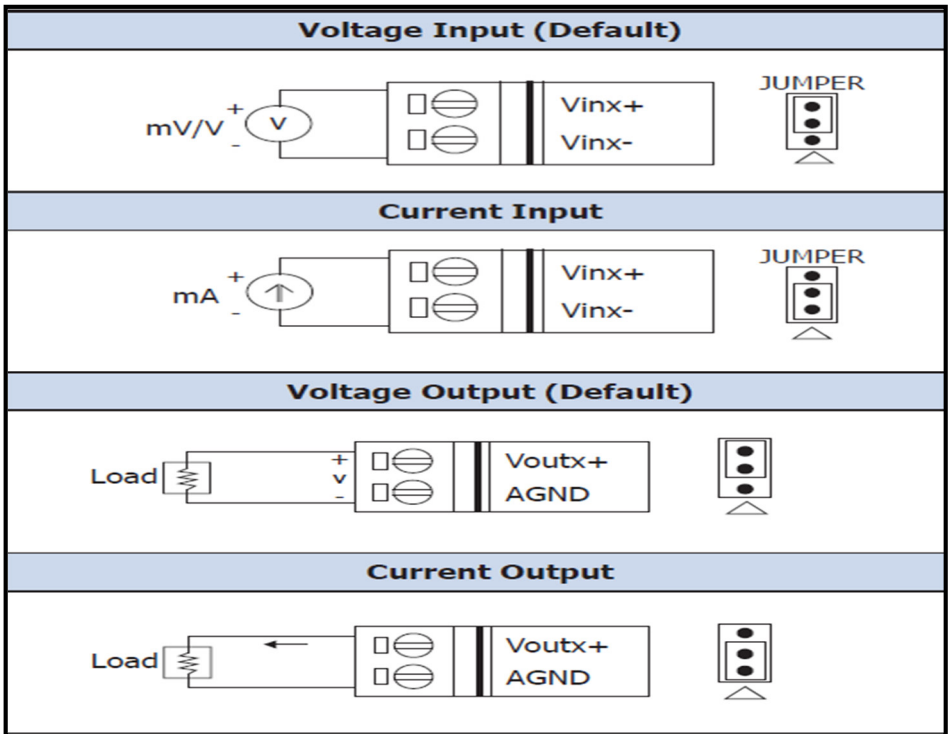



Figure 28 2-1-2 Voltage/Current Input/output Selection Jumper



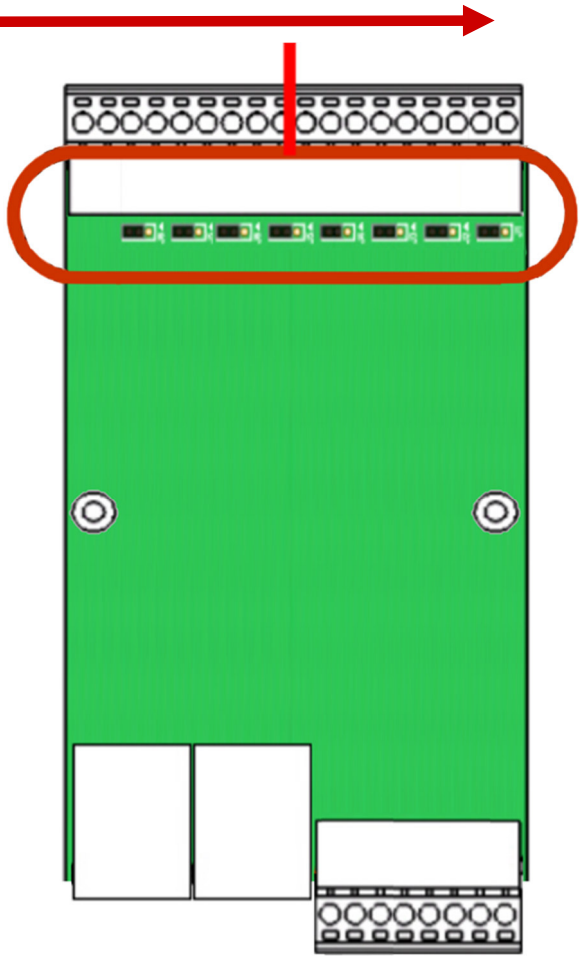
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**Jumper Location:**

| U-7504M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Channel | Vin3 | Vin2 | Vin1 | Vin0 | Vout3 | Vout2 | Vout1 | Vout0 |
| Jumper | J4 | J3 | J2 | J1 | J8 | J7 | J6 | J5 |

| U-7526M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Channel | Vout1 | Vout0 | Vin5 | Vin4 | Vin3 | Vin2 | Vin1 | Vin0 |
| Jumper | J8 | J7 | J6 | J5 | J4 | J3 | J2 | J1 |

Jumper Direction



(**Jumpers default** as:
Input: Voltage
Output: Voltage.

If you need to change the jumpers, remove the top case and upper board first.)



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### 2.1.3. Hardware Wiring

Connect the U-7500 I/O Module with the RJ-45 Ethernet port to an Ethernet switch/hub and PC (**Fig.1**). Beside, U-7500 support PoE (Power over Ethernet). If using the PoE switch, do not need one more power supply (**Fig.2** for PoE Switch). You can also directly link the U-7500 to the PC with an Ethernet cable.

After power is connected, please【**wait 1 minute**】for U-7500 start-up procedure. When the "**RUN**" light starts operating, it represents the boot is complete. **(**After a minute, the "**RUN**" light flashes at one-second intervals, showing that the contact of the SD card in the module is abnormal.**)**

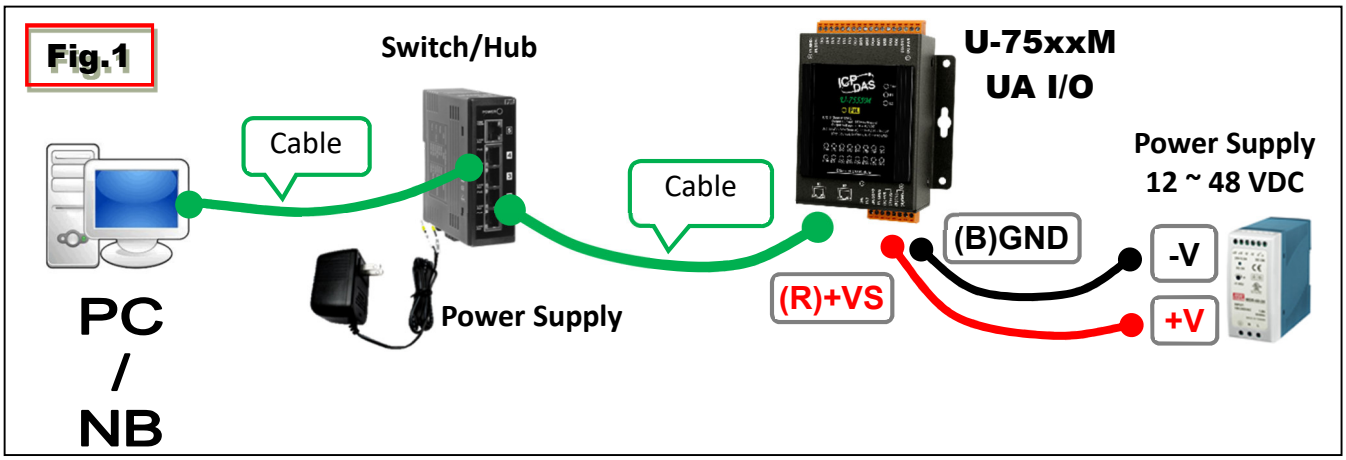



Figure 29 2-1-3 Hardware Wiring(Fig.1)

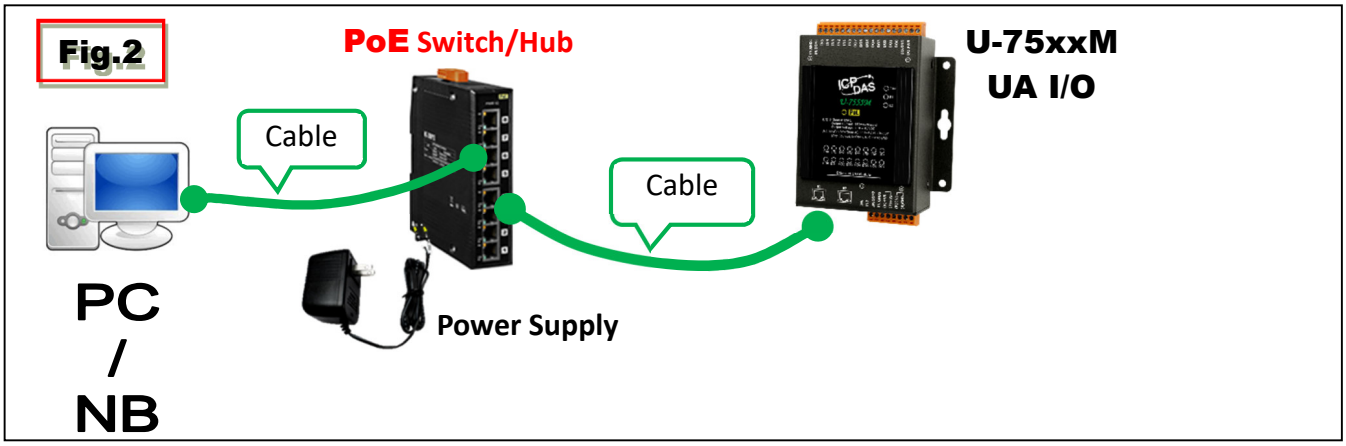



Figure 30 2-1-3 Hardware Wiring(Fig.2)



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## 2.2. Network Connection

This section introduces 3 methods to connect to the **UA I/O Web UI** (User Interface).

**Setting new UA I/O module or the new user please uses method A in Chapter 2.2.1 (The same method as the "UA I/O Quick Start" document.)**. Other users, please see the following introductions to choose method B or C.

**The methods to login the UA I/O Web UI:**

**A. Using Factory Default Setting**:
**Suitable for setting a new UA I/O module and the PC network IP is not in the same domain with UA I/O.** This method changes the PC network IP to be the same domain with the network IP of the UA I/O factory default values to login the Web UI. (Refer **Chapter 2.2.1**)

**B. Using Software Utility**:
**Suitable for quick setting when many UA I/O are in the network but the IP are unknown.** UA products provide a free software utility for auto searching UA products in the network and can quick jump to the login web page of UA. (Refer **Chapter 2.2.2)**

**C. Using IP Address**:
**Suitable for the UA has a fixed IP and in the same domain with the PC.** If the UA has a fixed IP and in the same domain with the PC, users can directly enter the IP in the address bar of a web browser and log in to the Web UI of the UA. After login the UA I/O Web UI, then can set up the UA project.




Figure 31 2-2 Use IP to login to UA I/O Web UI Web UI



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### 2.2.1. Connection by Factory Default Settings (For New UA)

The factory default settings of the UA I/O series are as the following table:

Table 27 2-2-1 Factory Default Settings of UA I/O Modules (1)

| Factory Default Settings of UA I/O Modules | | | |
|---|---|---|---|
| **Network** | **IP** | **192.168.255.1** | Assign U-7500 a new IP setting according to your case. |
| | **Mask** | **255.255.0.0** | |
| | **Gateway** | **192.168.1.1** | |
| **Web UI Account** | **Username** | **root** | **After the first login, change the default username/password to use other functions.** |
| | **Password** | **root** | |

1. Change the PC's IP setting as following. (Write down the PC original network settings before modify.)

Table 28 2-2-1 Factory Default Settings of UA I/O Modules (2)

| | |
|---|---|
| **IP** | **192.168.255.10** |
| **Subnet mask** | **255.255.0.0** |
| **Default gateway** | **192.168.1.1** |

2. Make sure the PC and UA I/O is connecting through Ethernet. Then open a PC side browser (Ex: Chrome, IE…).

   Type http://192.168.255.1 in the URL address. Use Web UI default username / password "root" / "root" to login the system.




Figure 32 2-2-1 Use root/ root to login to UA I/O Web UI



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3. Click 【System Setting】➔【Account Setting】, change the Username/password first, or user cannot use any other function (New design for data security).

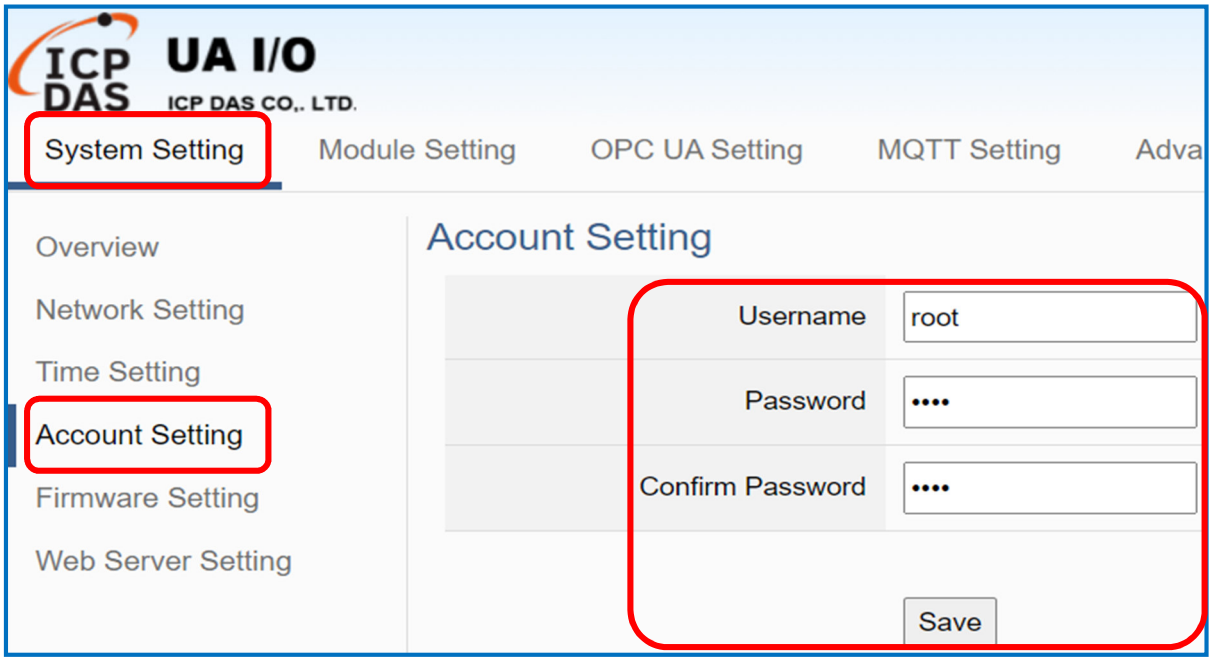



Figure 33 2-2-1 Change the Username/password

Password Setting rules:

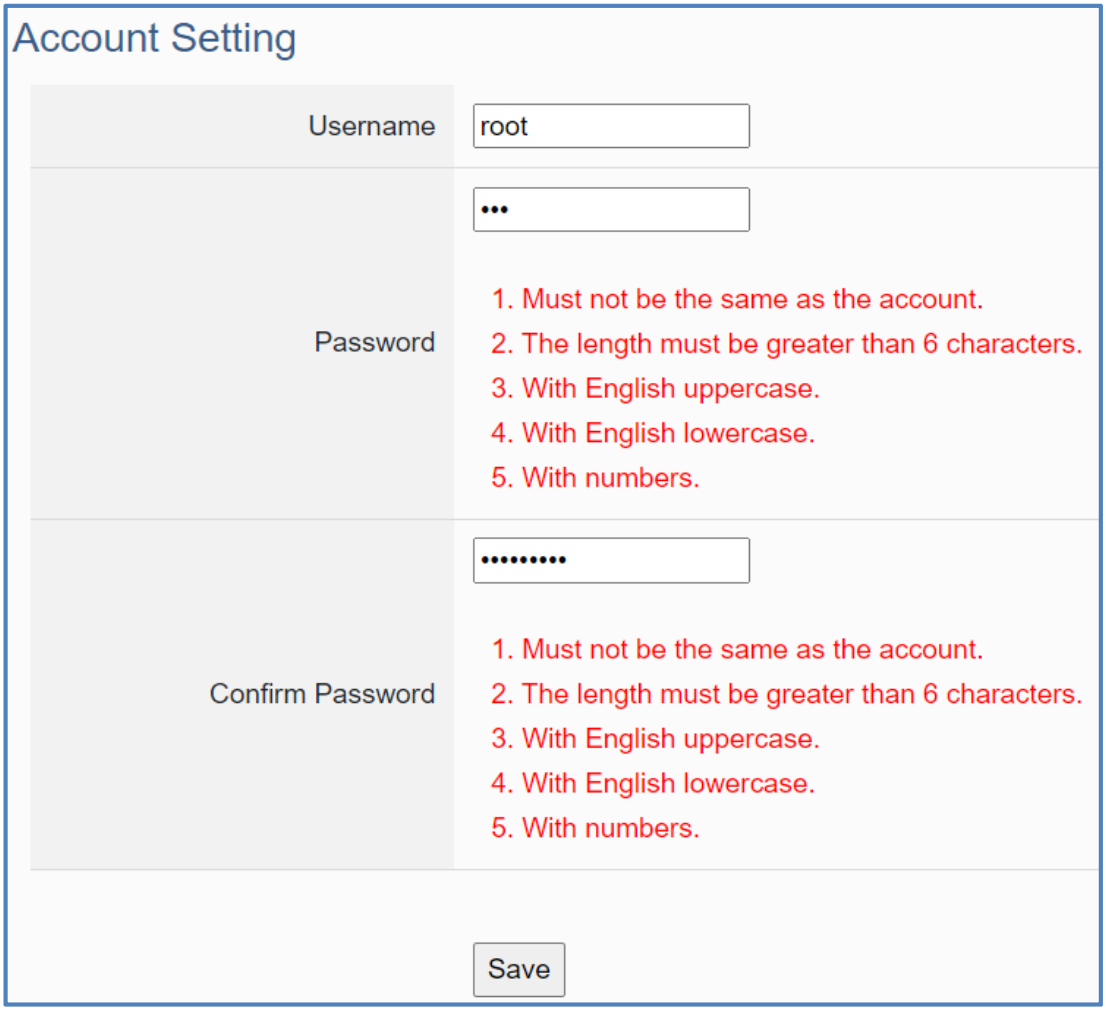



Figure 34 2-2-1 Password Setting Rules



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4. Click【System Setting】➔【Network Setting】➔【Network Setting(LAN1)】to change the IP setting by user network.

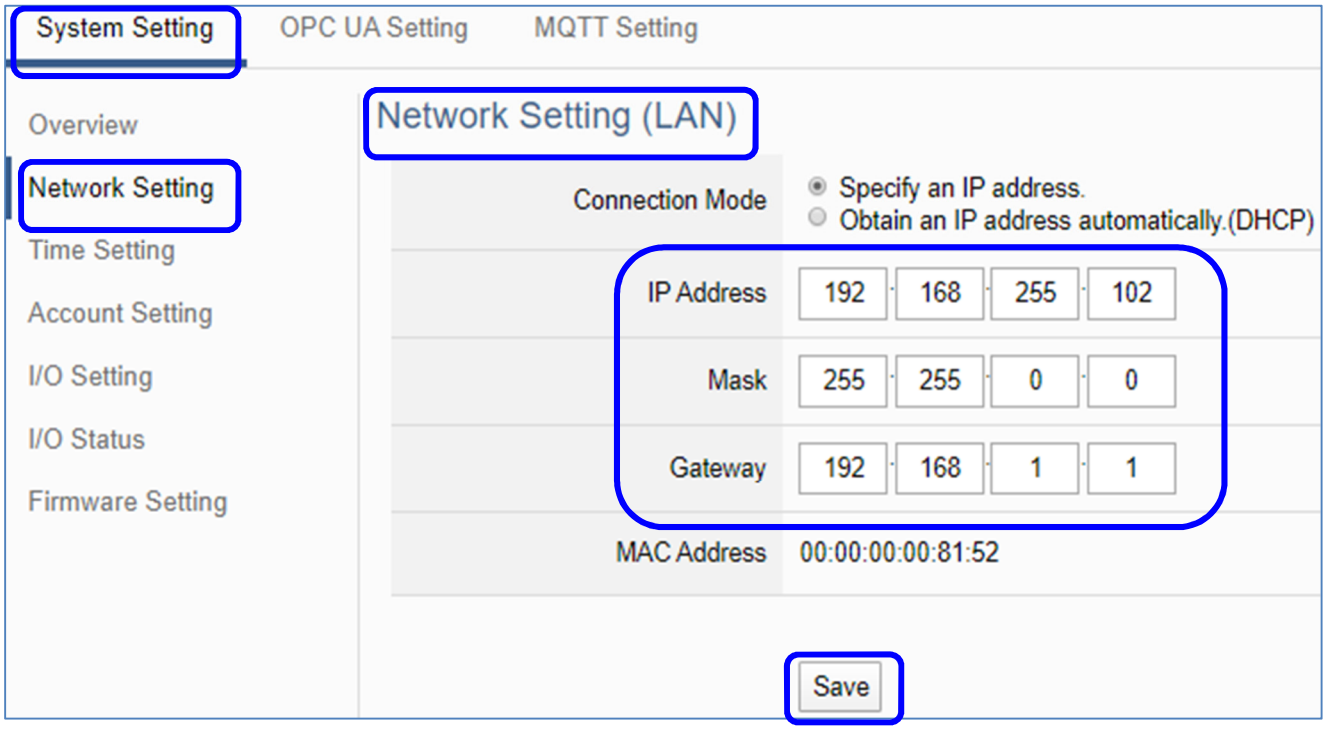



Figure 35 2-2-1 Network Setting(LAN1)

5. Save the IP setting, restore the PC original IP settings, and type the new IP in the browser as step-2 to login the Web UI of UA I/O. Then configure user's UA project.




Figure 36 2-2-1 Use the new IP to login the Web UI of UA I/O

After setting, you can enter the IP address of the UA in the browser's URL bar and connect to the network interface to set up the UA.



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## 2.2.2. Connection by Utility Searching

**Setting new UA I/O or the new user please uses the method in the Chapter 2.2.1. (A)**

If the UA I/O has a fixed IP and in the same domain as the PC, users can directly enter the IP in the address bar of a web browser and log in to the Web UI of the UA.I/O (C)

**This section introduces the 2nd method(B) that users use the UA I/O Utility to search the Network IP. This method is suitable for connecting multiple UA I/O series modules to the Internet, but the IP addresses of UA I/O are unknown or need to modify the UA I/O quickly.**

**The Utility** is a free tool software to quickly search each UA/BRK/UA_IO series on the network and connect to its Web UI for setting UA/BRK/UA_IO series products and projects.

In the PC, download and install the **Utility** (**EZ-UAQ Utility**) suitable for your PC, and then run it to connect the device. Please download the utility program from the website:
https://www.icpdas.com/en/download/show.php?num=8560&nation=US&kind1=&model=&kw=u-7

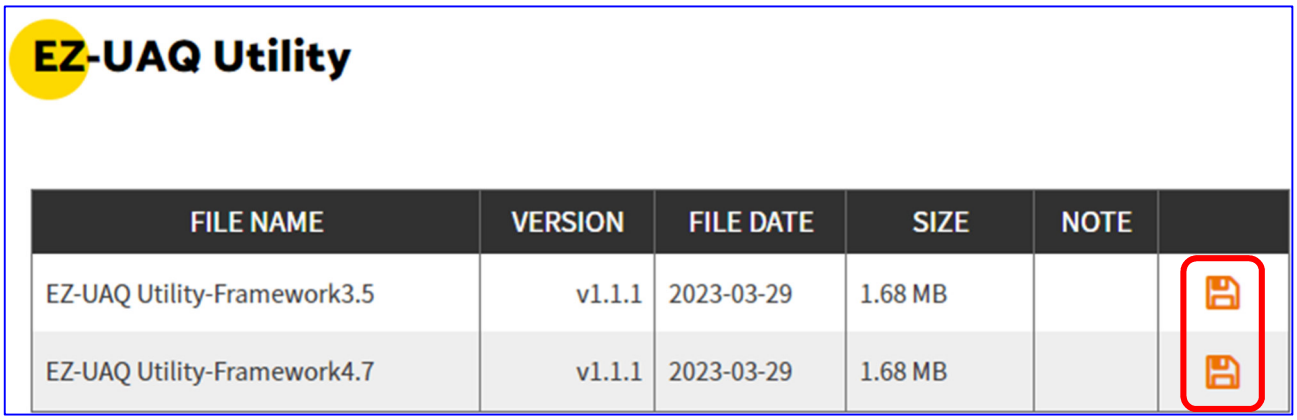



Figure 37 2-2-2 Download and install the Utility (EZ-UAQ Utility)

1. Install and execute the Utility
   Download and unzip the Utility, double-click the executable file (EZ-UAQ Utility.msi) to install and execute the Utility software.
   (If there is an old version of Utility on the PC, please uninstall it first.)

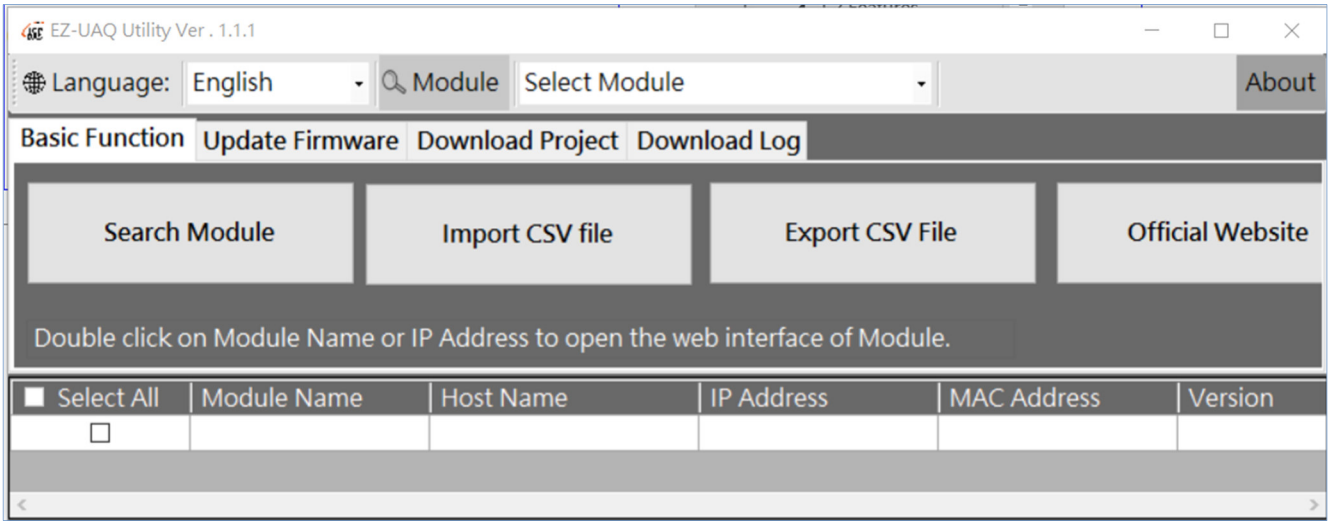



Figure 38 2-2-2 EZ-UAQ Utility Web Interface



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**2.** Search the UA/BRK/UA_IO series modules

Click the "**Search Module**" button the utility will search and list all UA/BRK/UA_IO modules in the network.

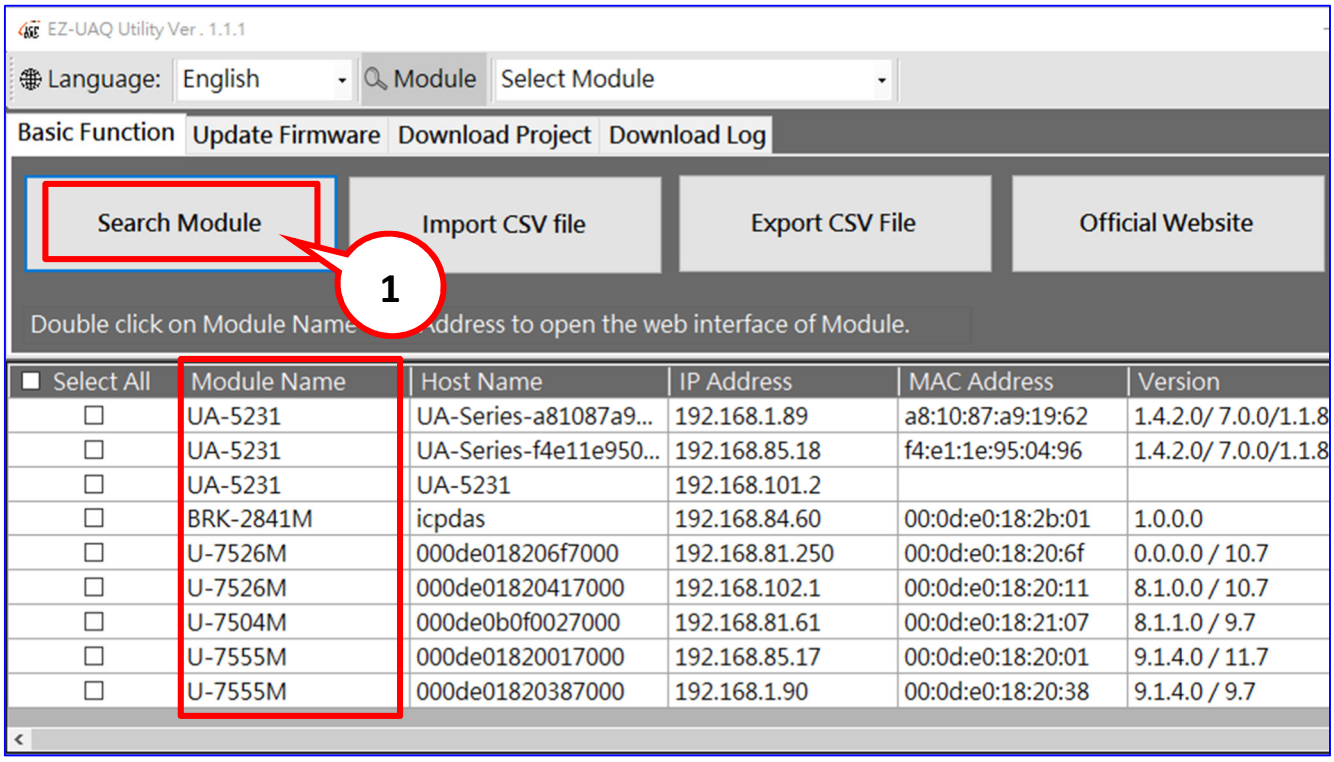



Figure 39 2-2-2 2 Search the UA/BRK/UA_IO series modules

**3.** Connect to the UA I/O Series

Double click the module list (from the Module Name to the IP address) you want to connect to, and it will directly link to the UA/BRK/UA_IO webpage via the default Web browser (Chrome, Edge, IE…).

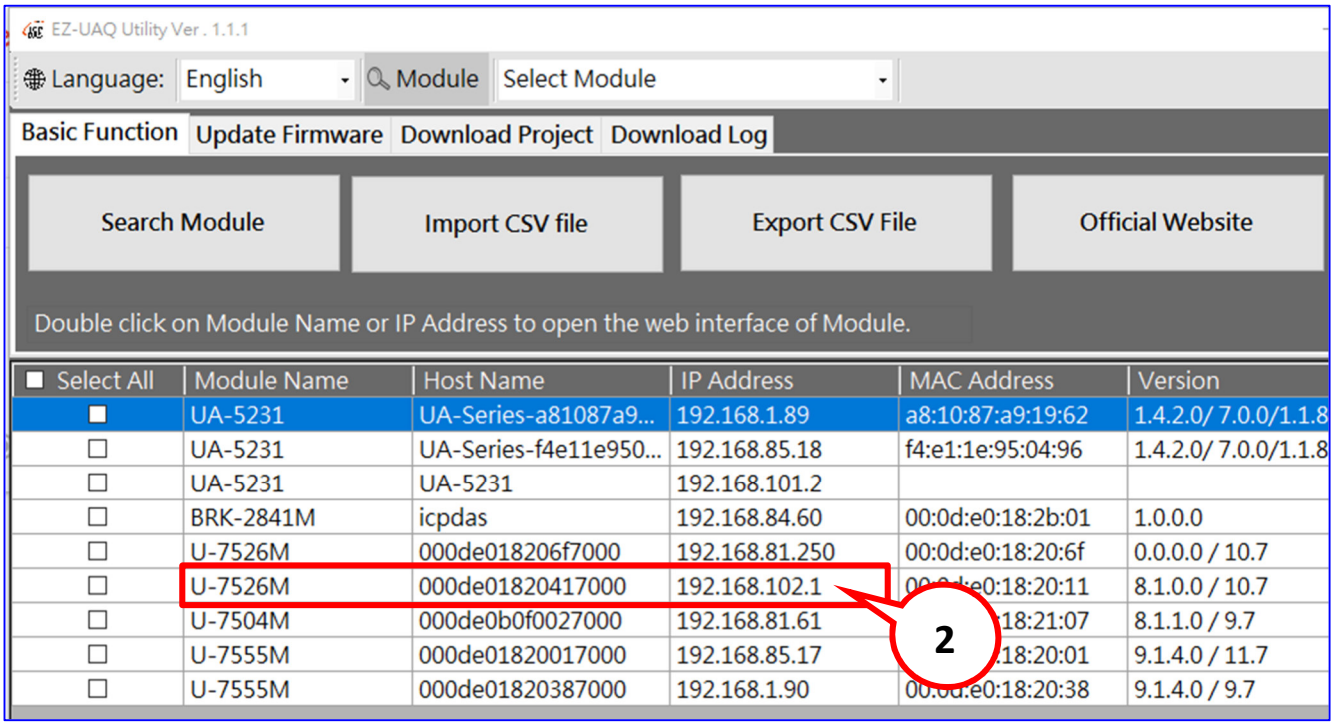



Figure 40 2-2-2 3 Connect to the UA I/O Series



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**4.** Connection to the UA I/O Web UI
The default web browser will be run and direct go to the UA login web site.
Please enter the username and password to login the UA I/O series Web UI.

The factory default username: root. The factory default password: root. After login in, change the default Username/password first, or user cannot use any other function (New design for data security).

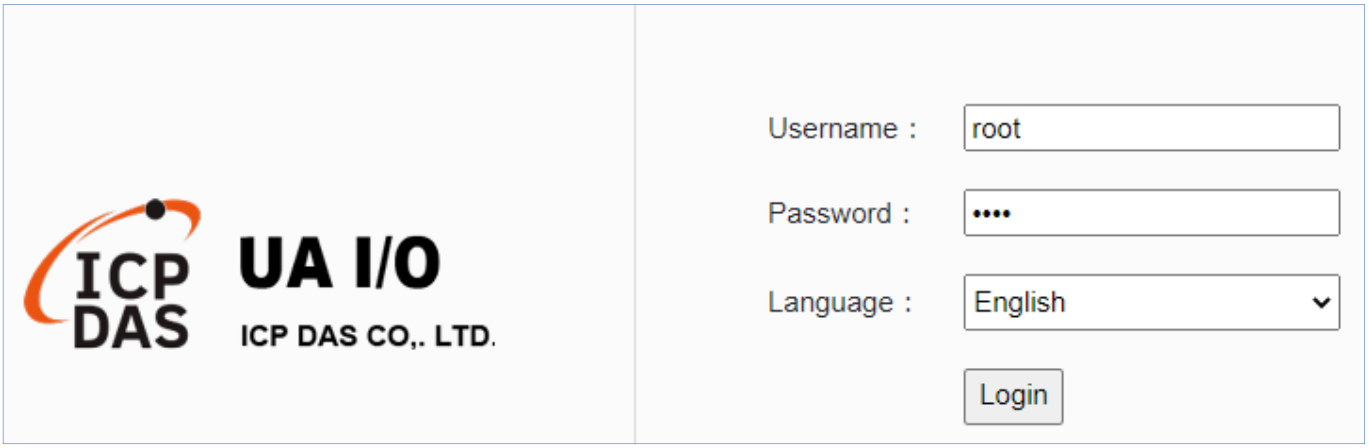



Figure 41 2-2-2 Connection to the UA I/O Web UI

**5.** Login the Web UI of the UA I/O Series
When login into the web interface, the UA I/O default home page (the main configuration screen) will as below, and will automatically read setting of that UA I/O to the webpage.

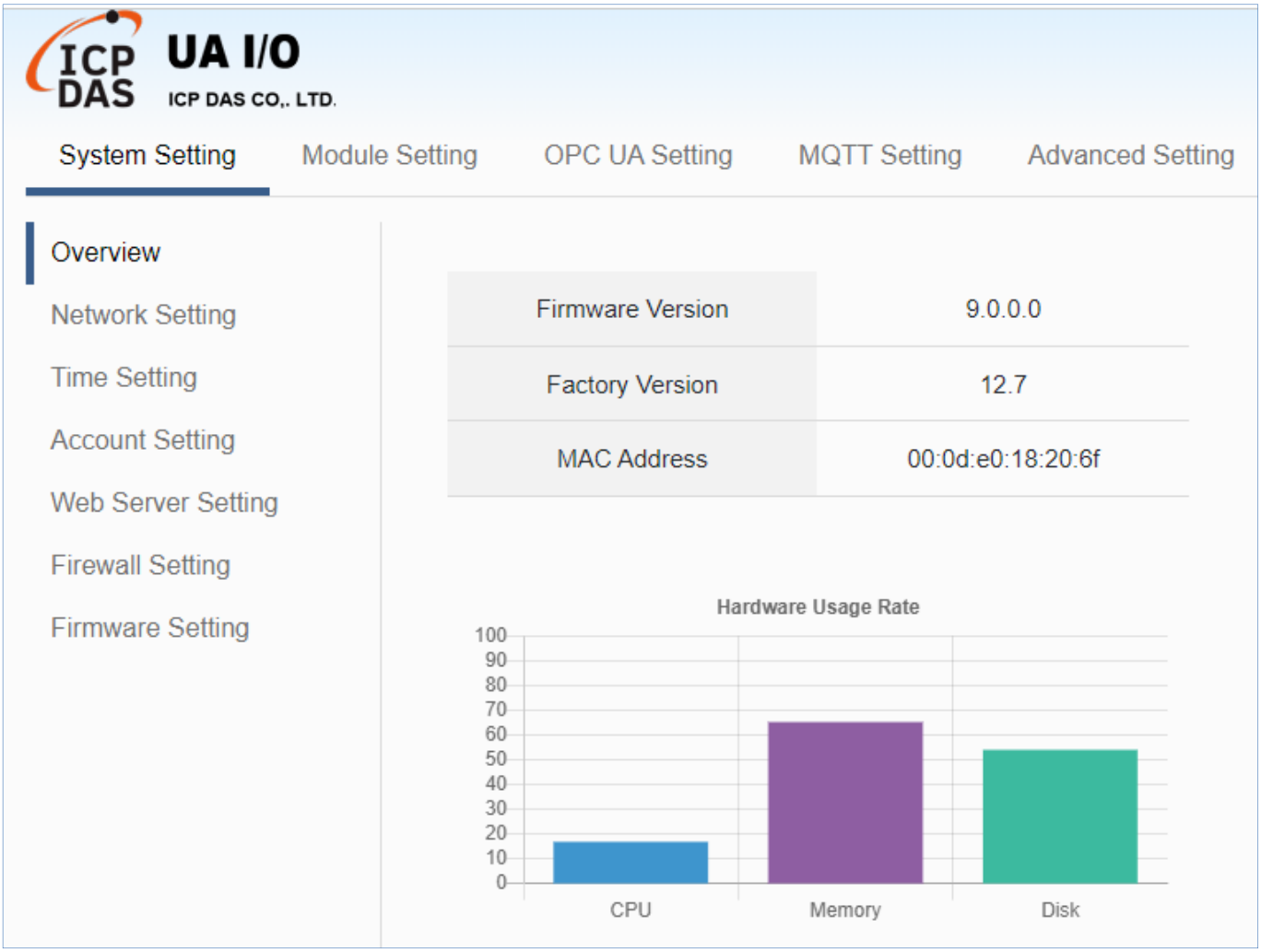



Figure 42 2-2-2 Login the Web UI of the UA I/O Series



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# 3. Main Function Settings

This chapter introduces some of the most important and commonly used functions of UA I/O and their setting steps.

**OPC UA I/O modules** is a series of Ethernet I/O modules that built-in with the **OPC UA Server / Client, MQTT Client and RESTful API services**. The OPC UA I/O module, also called UA I/O or U-7500, supports the OPC UA Server, MQTT Client and RESTful API function in industrial networking communication. Users can choose the networking mode according to their needs and environment, to transmit the values of built-in I/O channels to the cloud IT system or field control system for reading and writing. So, the main functions are the OPC UA connection and the MQTT connection. This chapter will introduce them first. Each function can be divided into the settings for the Server/Broker and Client, and how to enable secure encrypted communication, and how to download/upload the secure certificates. In addition, the AI/AO, DI/DO function applications are also very important for the UA I/O, which will be added to this chapter soon.

**OPC UA / MQTT Communication Advantages: (V.S. traditional Modbus Communication)**

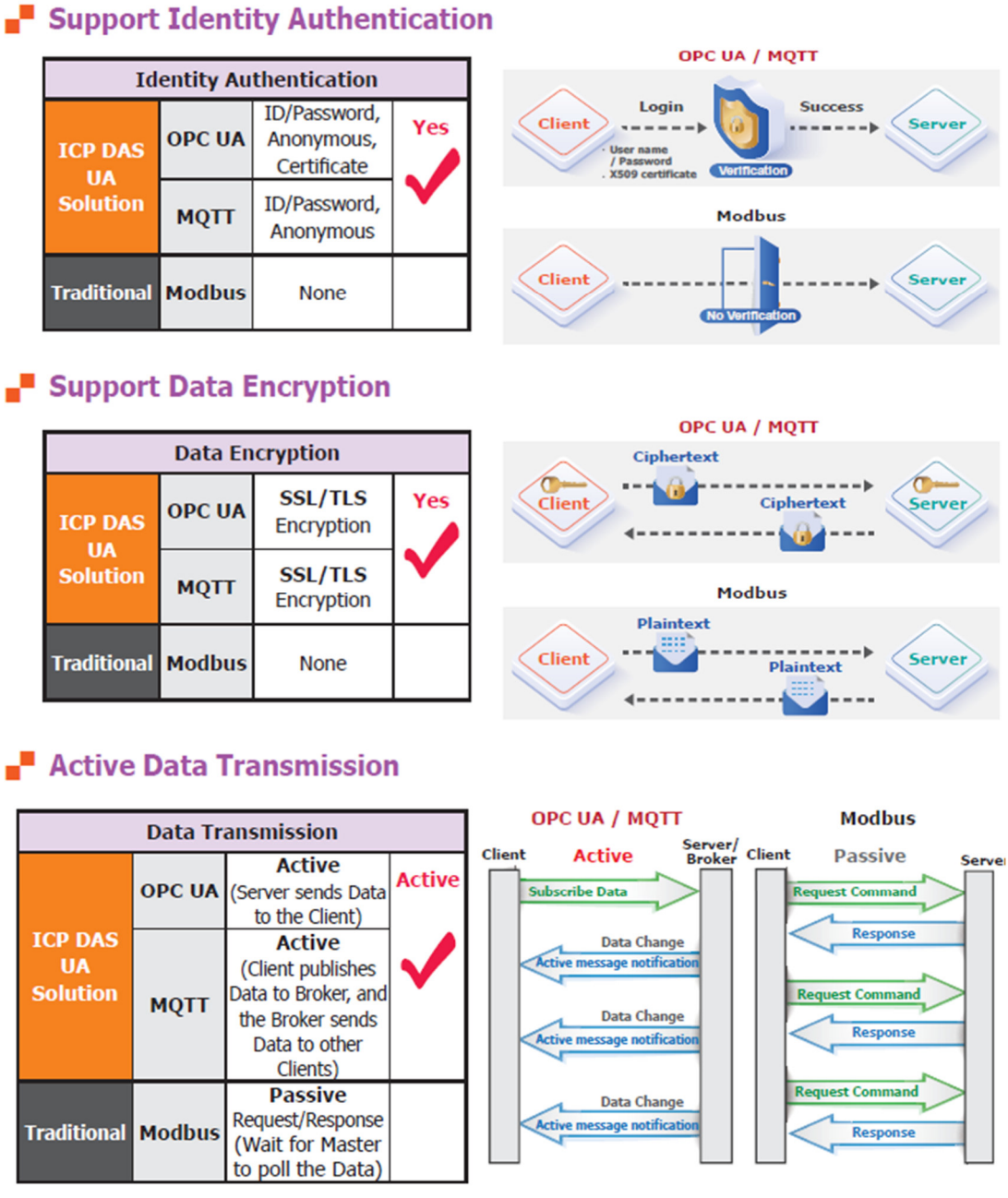



Figure 43 3 OPC UA / MQTT Communication Advantages



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# 3.1 Settings for Using OPC UA Connection

This section introduces how to set up the OPC UA communication service of UA I/O, and recommends compatible ICP DAS products.

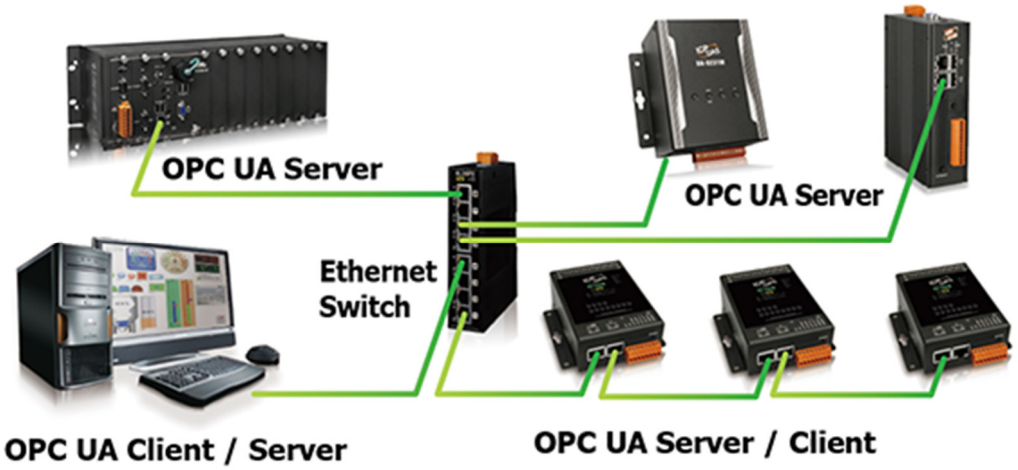
**UA I/O module built-in OPC UA Server Service** that compliance with IEC 62541 Standard. Provides functions of Active Transmission, Transmission Security Encryption (SSL/TLS), User Authentication (X.509 Certificates / Account password), Communication Error Detection and Recovery, etc. to connect SCADA or OPC UA Clients. Recommend to keep the maximum number of sessions within 3 connections.

**OPC UA connection includes the following settings that will be introduced in 3 sub-sections.**

1. OPC UA Server Connection Settings (UA I/O)
2. OPC UA Client I/O Settings (Recommend to use the AVEVA Edge/ InduSoft product of ICP DAS.)
3. How to enable secure encrypted function, and download/upload the encrypted certificates

**OPC UA Architecture and Advantages of the UA I/O:**

**OPC UA Architecture**




**Comparison: ICP DAS UA I/O Module v.s. Traditional I/O Module**

| Item | ICP DAS UA I/O Module | | Traditional I/O Module |
|---|---|---|---|
| Protocol | OPC UA Server / Client | MQTT Client | Modbus TCP Slave |
| Identity Authentication | Account ID/Password, Anonymous, Certificate Verification | Account ID/Password, Anonymous, Certificate Verification | None |
| Encryption | SSL/TLS, Anonymous | SSL/TLS, Anonymous | None |
| Data Transmission | Active (Actively sends Data to the Client) | Active (Actively publishes Data to Broker, and the Broker sends Data to other Clients) | Passive (Wait for Master to poll the Data: Query/Response) |
| Project Building | Via browse the Server Content | Via subscribe Topic from Broker | Manually assign an ID and define the Data address and type. |

Figure 44 3-1 OPC UA Architecture and Advantages of the UA I/O



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### 3.1.1 OPC UA Server Connection Settings (UA I/O)

UA I/O module built-in OPC UA Server function and itself is the Server side of the connection. So, when setting up the Server, you only need to set the connection port number and choose the login method (via anonymous, username, or certificate). Usually, the user will enable the username login method, so the user can set the username/password of the account besides.

1. Connection Setting

Click Main Menu【OPC UA Setting】➔【Server Setting】➔【Connection Setting】.

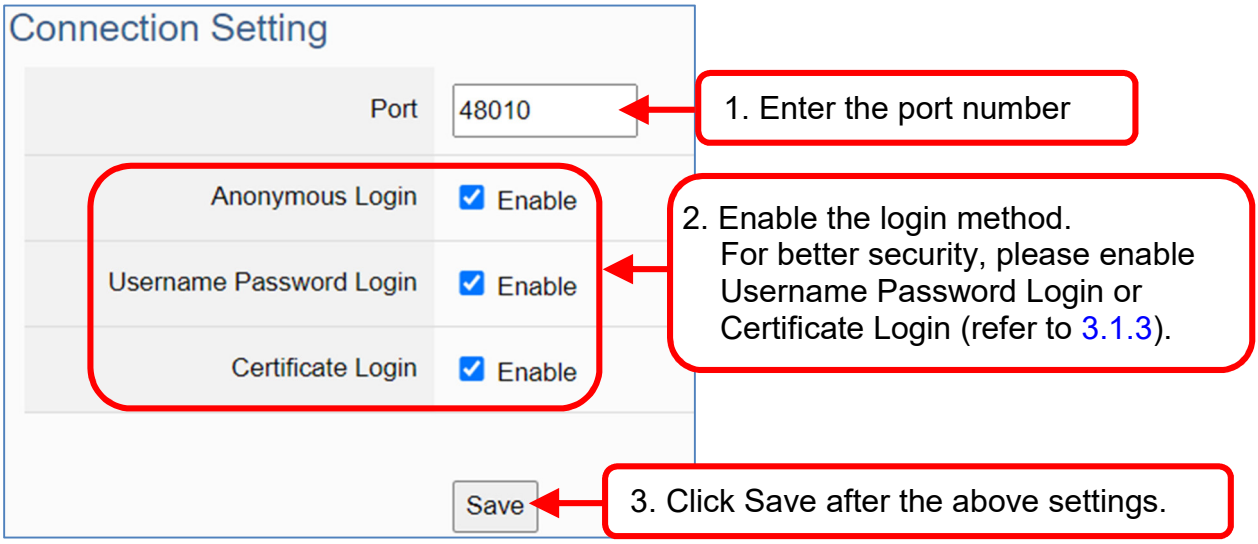



Figure 45 3-1-1 OPC UA Server Connection Setting (UA I/O)

2. When enabling username password login, please set the account in the following menu path.

Menu Path:【System Setting】➔【Account Setting】 System Setting ➔ Account Setting (Appendix A).

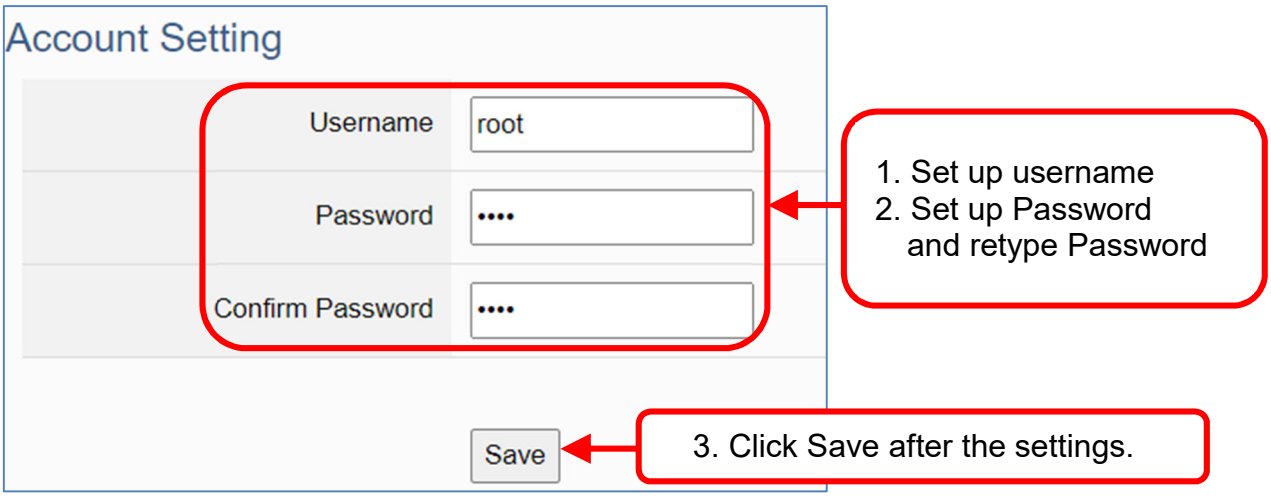



Figure 46 3-1-1 OPC UA Server Account Setting (UA I/O)

If users enable the secure and encrypted OPC UA **Certificate Login** and need to upload/download certificates, please refer to Sec.3.1.3 .

After completing the Server connection settings, then set the **Client connection** (refer to Sec.3.1.2), and then can communicate with each other.



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### 3.1.2 OPC UA Client Side: AVEVA Edge Simple Application

After setting the OPC UA Server-side (UA I/O), you only need to configure the OPC UA Client for connection. Now, go to the Client device that connects with UA I/O, and set the corresponding data point. We recommend using ICP DAS InduSoft products as the Client device. It is easier to set up relatively and can connect to UA I/O faster. For detailed settings, please refer to UA I/O FAQ-Dev-001.

The setting screen is as follows:

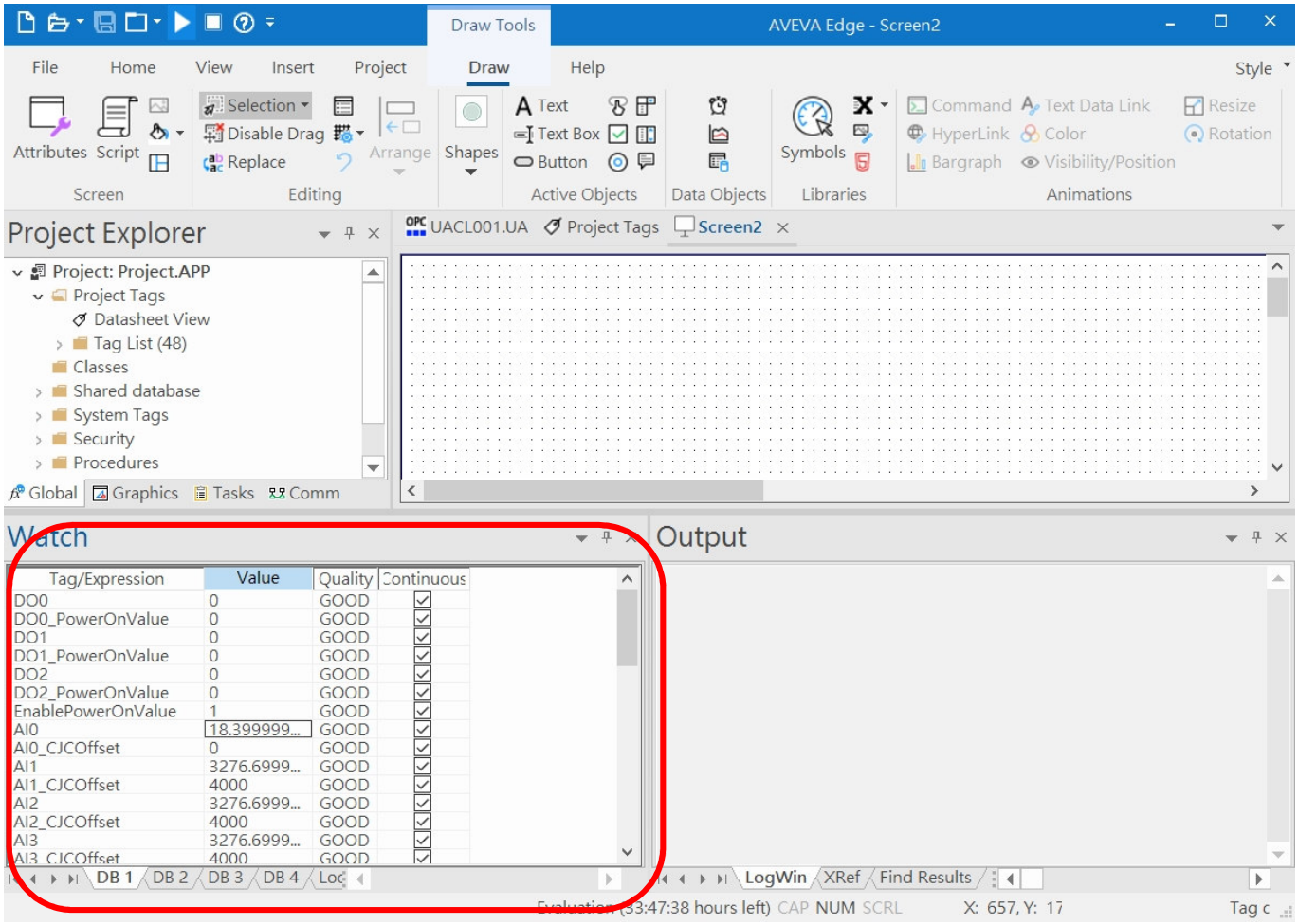



Figure 47 3-1-2 OPC UA Client Side: AVEVA Edge Simple Application



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### 3.1.3 Secure Encrypted Connection: OPC UA Certificate

When using the OPC UA connection, in addition to the account login for security, users can also enable the certificate login to double the protection by the secure encryption. This section describes how to download/upload the certificates. If you do not want to enable the certificate login, please skip.

When enabling the OPC UA certificate login, the Server/Client both sides of the connection need to add certificates to each other's trust zones. This section will show how to do the steps.

**Menu Path:**【OPC UA Setting】➔【Certificate】。OPC UA Setting ➔ Certificate (Appendix A).

A. **Provide the OPC UA Server Certificate of the UA I/O** to the Client device. That is, download the Server certificate file of the UA I/O, and then upload and import it into the software (or APP) of the OPC UA Client device.

Click the "Download" button to get the Certificate file generated by the Server.
File Name: icpdasuaserver.der

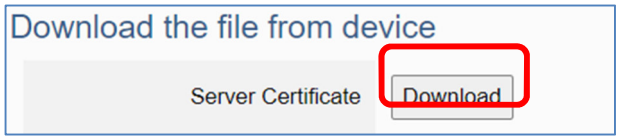



Figure 48 3-1-3 Download the file from device(1)




Figure 49 3-1-3 Download the file from device(2)

B. **Get the Trusted Certificate file of the connected OPC UA Client**, save it in the PC, and upload it into the UA I/O module.

1) Click the “Upload” button to open the “open” window.

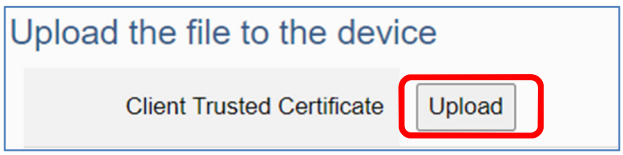



Figure 50 3-1-3 Upload the file to the device(1)

2) Select the Trusted Certificate file.

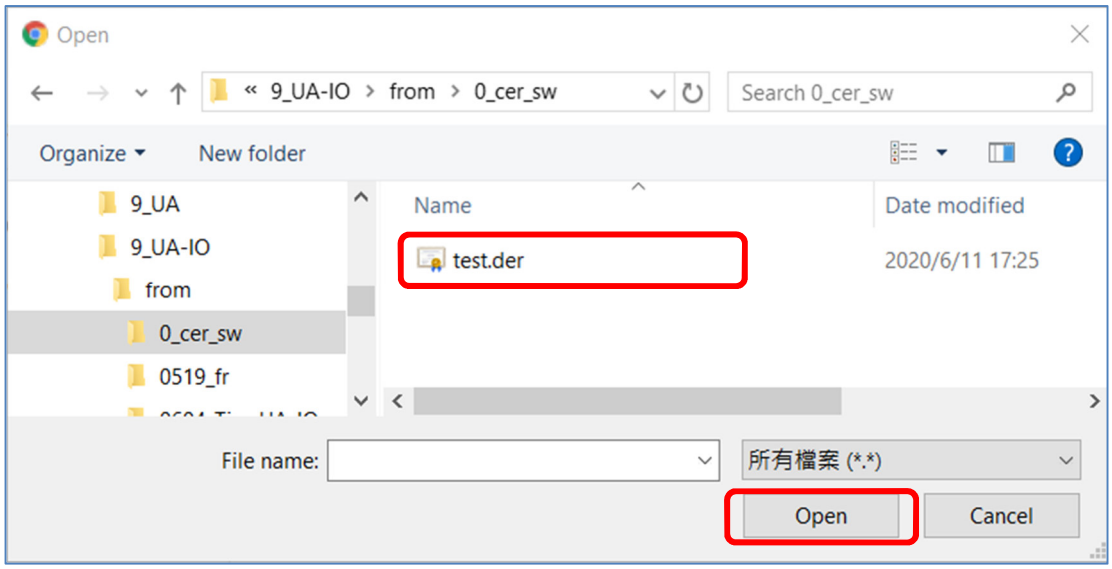



Figure 51 3-1-3 Upload the file to the device(2)



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## 3.2 Settings for Using MQTT Connection

This section introduces how to set up the MQTT Client communication of UA I/O, and recommends the compatible ICP DAS products.

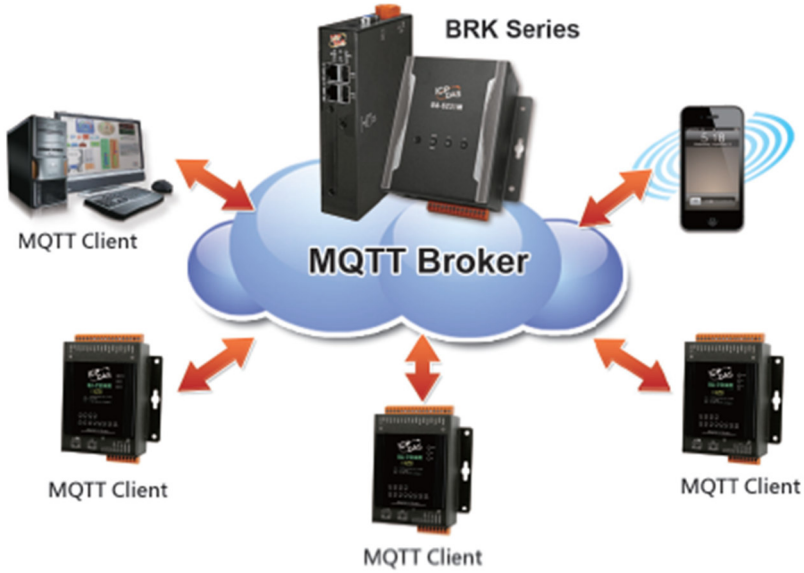
**UA I/O module built-in MQTT Client Service** (Compliance with MQTT V.3.1.1 protocol). Provides functions of IoT Active M2M Transmission, QoS (Quality of Service), Retains Mechanism, Identity Authentication, Encryption, Last Will, etc.

**MQTT connection includes the following settings that will be introduced in 3 sub-sections.**

1. MQTT Broker Connection Settings (Recommend the UA-2xxx/52xx & BRK series of ICP DAS)
2. MQTT Client side I/O Settings (UA I/O)
3. How to enable secure encrypted function, and download/upload the encrypted certificates

**MQTT Architecture and Advantages of the UA I/O:**

**MQTT Architecture**




**Comparison: ICP DAS UA I/O Module v.s. Traditional I/O Module**

| Item | ICP DAS UA I/O Module | | Traditional I/O Module |
|---|---|---|---|
| Protocol | OPC UA Server / Client | MQTT Client | Modbus TCP Slave |
| Identity Authentication | Account ID/Password, Anonymous, Certificate Verification | Account ID/Password, Anonymous, Certificate Verification | None |
| Encryption | SSL/TLS, Anonymous | SSL/TLS, Anonymous | None |
| Data Transmission | Active (Actively sends Data to the Client) | Active (Actively publishes Data to Broker, and the Broker sends Data to other Clients) | Passive (Wait for Master to poll the Data: Query/Response) |
| Project Building | Via browse the Server Content | Via subscribe Topic from Broker | Manually assign an ID and define the Data address and type. |

Figure 52 3-2 Comparison between UA I/O modules and traditional I/O modules



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### 3.2.1 Connecting to MQTT Broker

UA I/O module built-in MQTT Client function and itself is the Client side of the connection. So, when setting up the MQTT Broker, it is to set the data of the remote device (Broker) that the UA I/O module wants to connect. The data includes Broker's IP address, port number, anonymous login, account password login, etc.

MQTT Broker Device: recommend to use ICP DAS IIoT communication server **UA-2200/5200/2600 series** or MQTT Broker **BRK-2600M/5200M series**.

**Main Menu:**【MQTT Setting】➔【Connection Setting】 MQTT Setting ➔ Connection Setting (Appendix A).

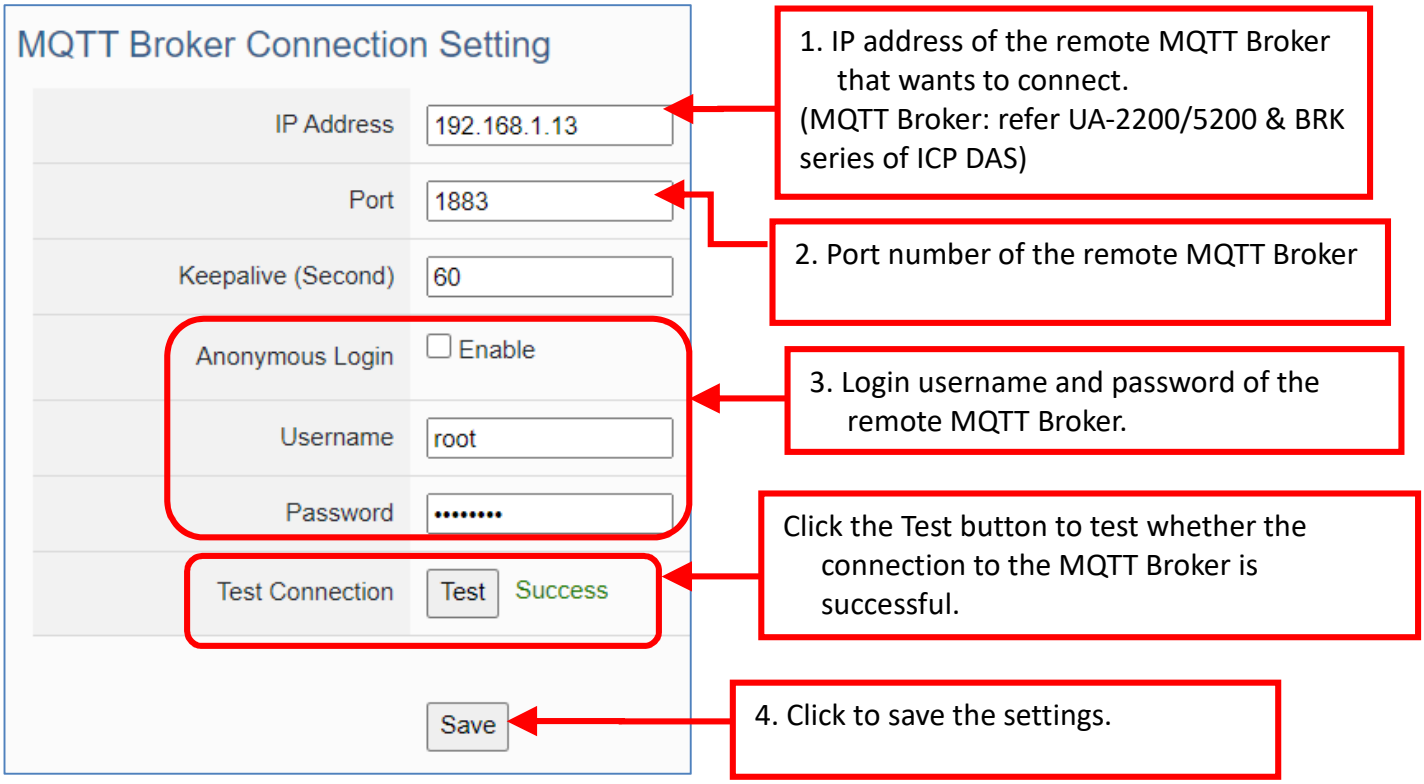



Figure 53 3-2-1 Connecting to MQTT Broker

If users enable the secure and encrypted MQTT **Certificate Login**, need to upload/download certificates, please refer to Sec.3.2.3.

After completing the MQTT Broker connection settings, then set the **Client connection** (refer to Sec.3.2.2), and then can communicate with each other.



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### 3.2.2 MQTT Client Setting of the UA I/O

UA I/O built-in MQTT Client function and itself is the MQTT Client side of the connect. When setting, please set the connecting remote MQTT Broker device first, and then set the UA I/O module of the MQTT client.

**Reference for MQTT related basic knowledge:**

**MQTT** (MQ Telemetry Transport) is a lightweight **publish/subscribe** messaging protocol. An MQTT-based application will include two or **more *clients***, which are applications exchanging messages, and **a *broker***, which is a server that accepts incoming messages and routes them to the appropriate destination client. As with most *publish-subscribe* systems, message sends involve ***publishing*** on a specified ***topic***. The **broker** then forwards the message to all ***subscribers*** of that topic. These primitives can be used to build different interaction patterns. (as the picture below)

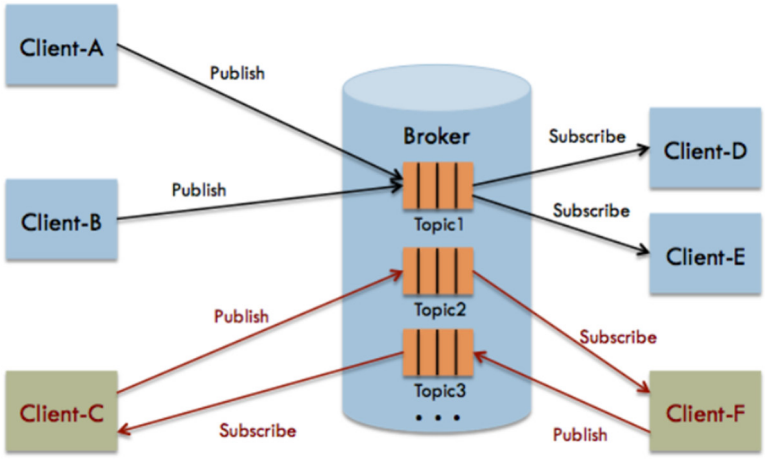



Figure 54 3-2-2 Subscribe/Distribute Architecture

MQTT gives you flexibility by specifying a *Quality of Service* (QoS) with each message. QoS is a parameter available on each publish call. It is one of three levels:

- QoS 0: At most once
- QoS 1: At least once
- Q0S 2: Exactly once

Provides a Quality-of-Service data delivery: QoS can be selected based on the needs of the application.

MQTT Retained messages: The last published message (with retained flag set to true) is stored at the broker so that new subscribers can immediately obtain last known good value rather than wait for the next update from publisher.

REFERENCES: (The above information is from the following websites.)
https://micropython-iot-hackathon.readthedocs.io/en/latest/mqtt.html
https://devopedia.org/mqtt



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**MQTT Client Setting of the UA I/O:**

**Manu Path**:【MQTT Setting】➔【Client Setting】 MQTT Setting ➔ Client Setting (Appendix A).

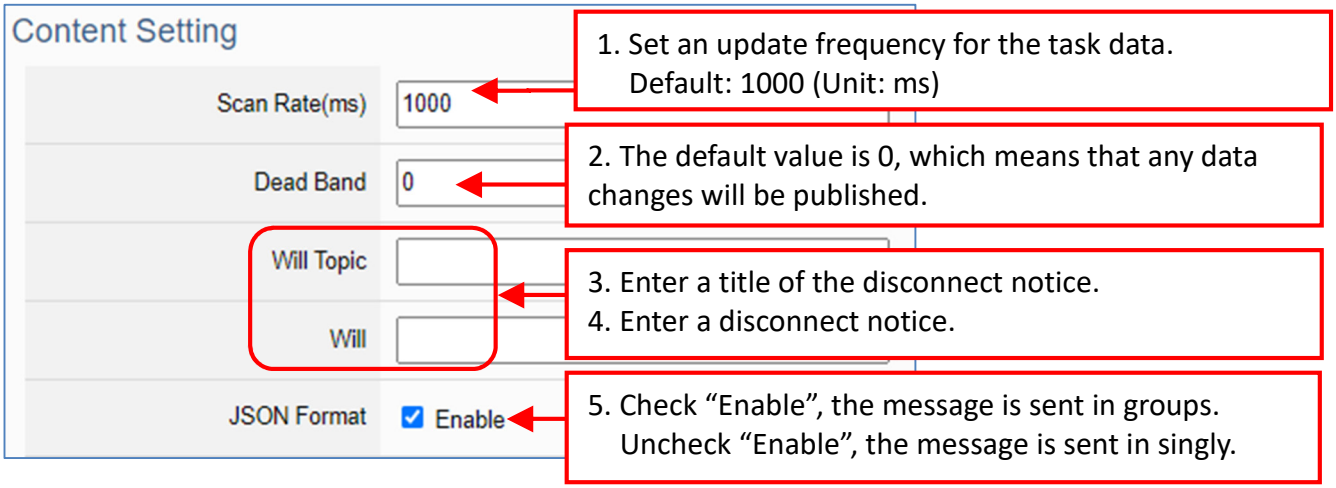



Figure 55 3-2-2 MQTT Client Setting of the UA I/O

**Enable of JSON Format:** Descriptions for the **Enable (check “Enable”)** / **Disable (uncheck “Enable”)**

- Enable: Enter the Group setting screen, the Publish & Subscribe message is sent in a group.
  **Group setting** (**JSON Format**) the Publish & Subscribe: Suitable for obtaining all I/O values at one time, it can reduce network resources. It will pack all I/O point values into a JSON string, and then send the JSON string as a message or subscribe JSON string to get all I/O values back at one time. (Refer to Appendix B for the detailed JSON format)

- Disable: Enter the Singly setting screen, the Publish & Subscribe message is sent in singly (P to P).
  **Singly setting (Point-to-point)** the Publish & Subscribe: Suitable for I/O points that require high real-time performance, or devices that do not support generating or parsing JSON format.

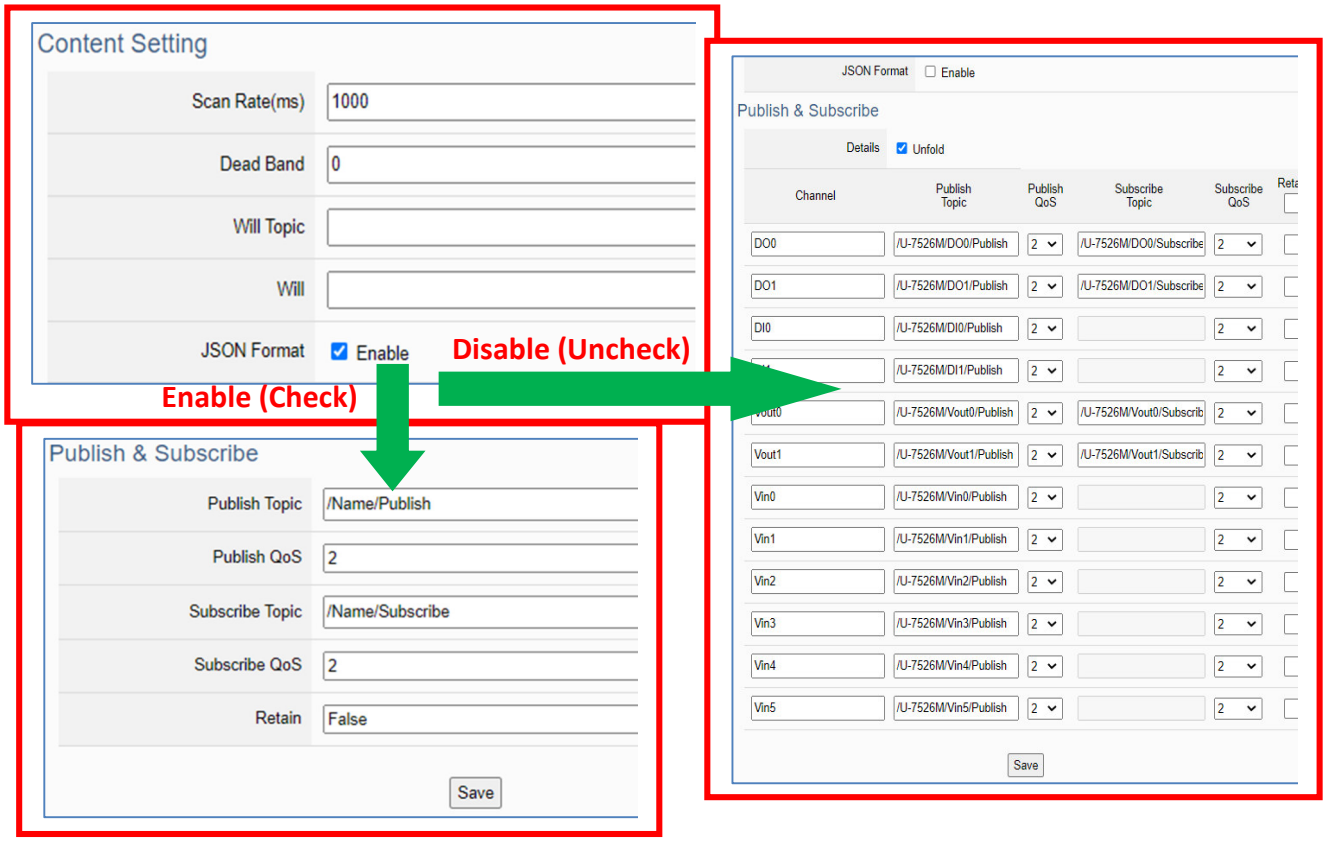



Figure 56 3-2-2 JSON Format Enable/Disable Setting



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The setting parameters for Both enable or disable the JSON Format:

Table 29 3-2-2 MQTT Setting > Client Setting - Publish & Subscribe

| **MQTT Setting > Client Setting - Publish & Subscribe** | |
|---|---|
| Publish Topic | The topic of sending data / publishing message. |
| Publish QoS | The publish Qos (Quality of Service) levels. Default: 2<br>0: Delivering a message at most once.<br>1: Delivering a message at least once.<br>2: Delivering a message at exactly once. |
| Subscribe Topic | The topic of receiving data / subscribing message. It can copy the Publish Topic of linked device. |
| Subscribe QoS | The subscribe Qos (Quality of Service) levels. Default: 2<br>0: Delivering a message at most once.<br>1: Delivering a message at least once.<br>2: Delivering a message at exactly once. |
| Retain | Set up if the Broker retains the message. |
| Save | Click to save the setting of this page. |

When **Enable JSON format**, it will pack all I/O point values into a JSON string, and then send the JSON string as a message or subscribe JSON string to get all I/O values back at one time. (Refer to Appendix B)

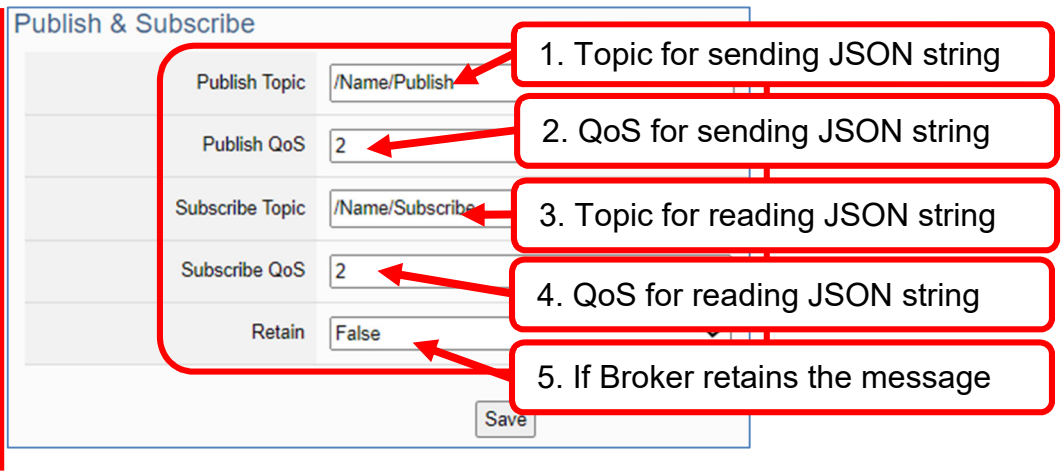



Figure 57 3-2-2 MQTT Setting > Client Setting - Publish & Subscribe(1)

When **Disable JSON format**, it will publish or subscribe the message in singly (Point-to-point). User needs to set each I/O point.

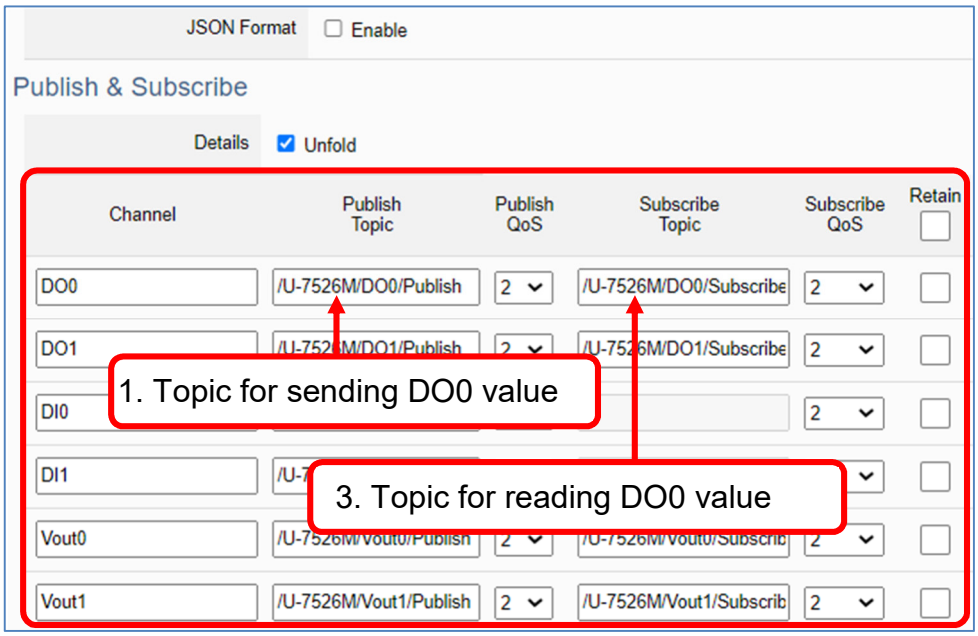



Figure 58 3-2-2 MQTT Setting > Client Setting - Publish & Subscribe(2)



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- Group Setting example: Check “Enable” of “JSON Format”

Here is an example of the lighting control in a factory. Use the I/O points of the U-7555M module to connect the light switches of Room 1 to 7 in the factory Building-A to monitor/control the on/off of the room lights. We want to use the **Group Setting**, so **check** **"Enable"** of the "**JSON Format**". The following is a parameter example for the settings of **[MQTT Setting] > [Client Setting]**.

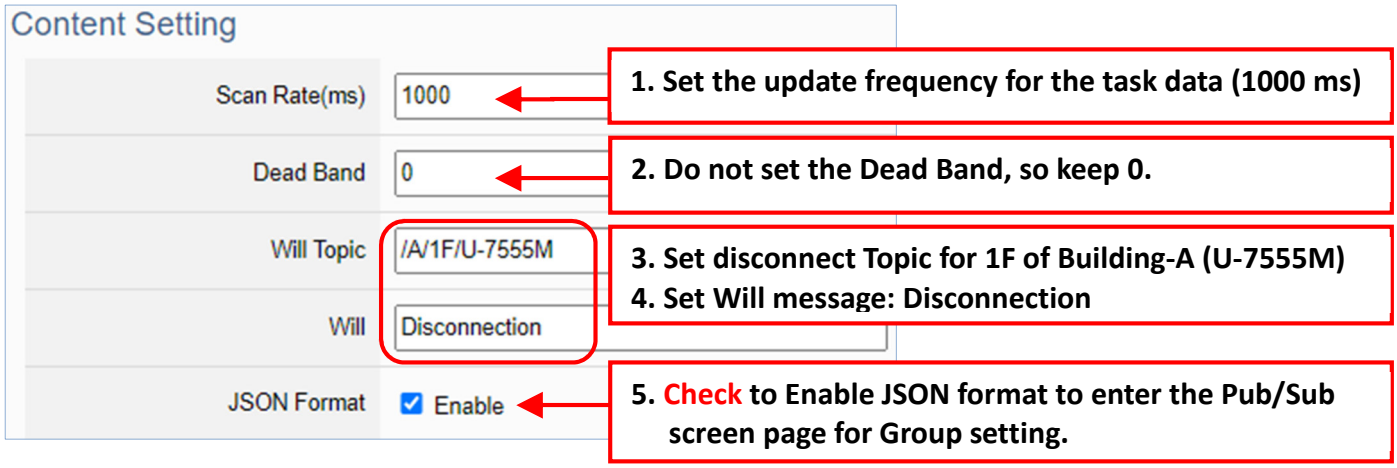
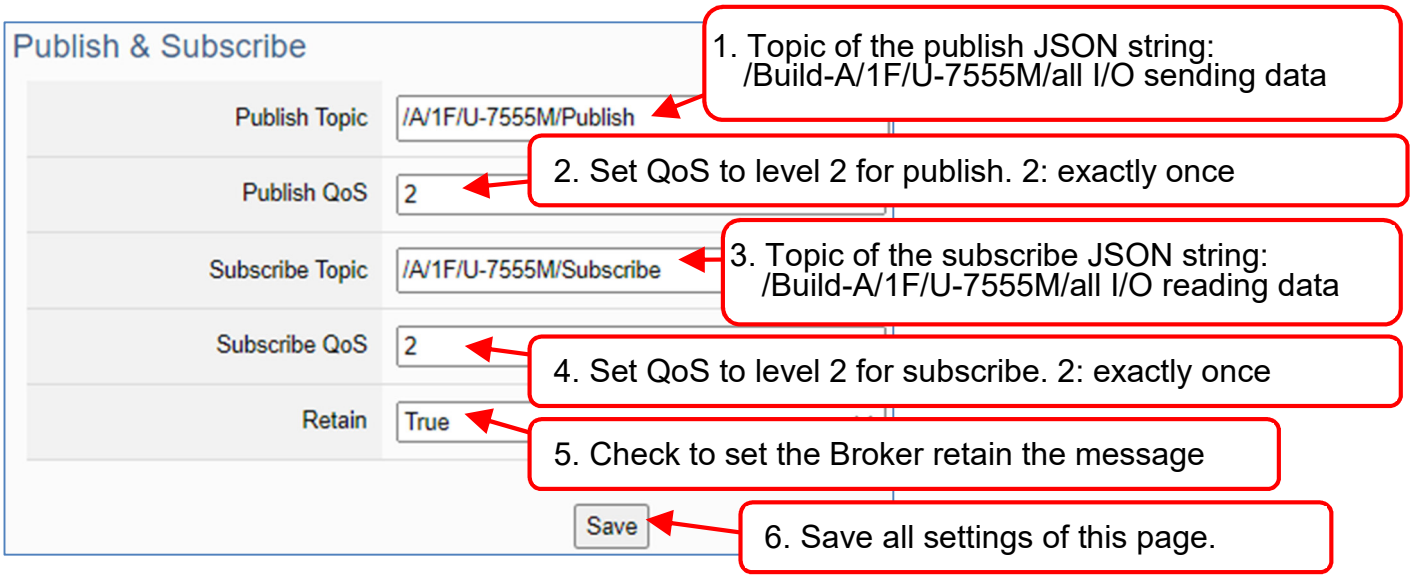



Figure 59 3-2-2 Group Setting example: Check “Enable” of “JSON Format”(1)

The Pub & Sub setting page when enable the JSON Format: Sending/Reading the JSON string




**Note:**

When setting the Pub/Sub of MQTT Client, please also set the Nickname of I/O channel, which includes MQTT Nickname and OPC UA Description.

MQTT Client setting should cooperate with MQTT Nickname of the I/O channels for the accuracy/readability of MQTT communication settings.

Menu: 【Module Setting】>【I/O Setting】 As shown on the right.

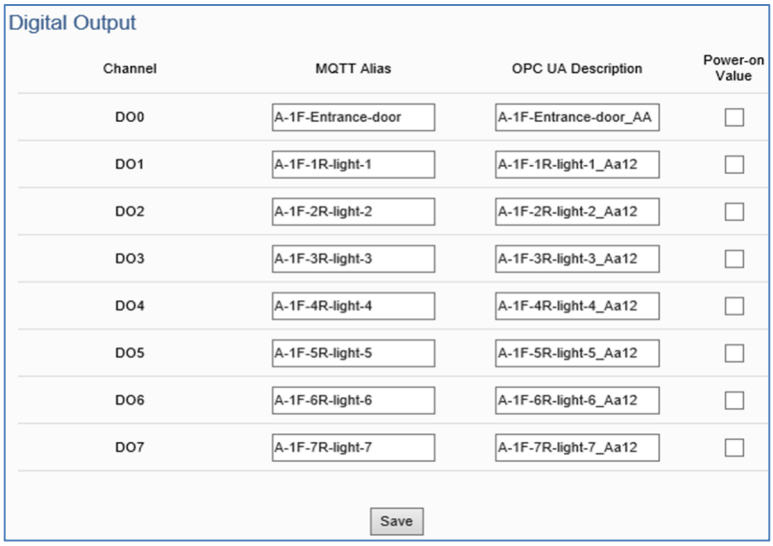



Figure 60 3-2-2 Group Setting example: Check “Enable” of “JSON Format”(2)



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- Singly Setting example: Uncheck “Enable” of “JSON Format”

Here is an example of the lighting control in a factory. Use the I/O points of the U-7555M module to connect the light switches of Room 1 to 7 in the factory Building-A to monitor/control the on/off of the room lights. We want to use the **Point-to-Point Setting**, so **uncheck** **"Enable"** of the "**JSON Format**". The following is a parameter example for the settings of **[MQTT Setting] > [Client Setting]**.

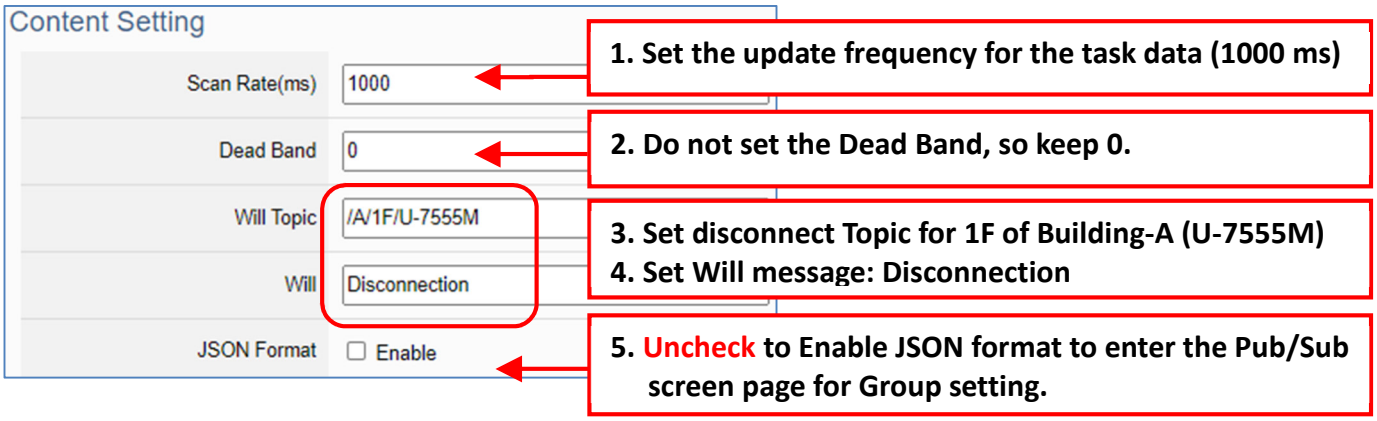



Figure 61 3-2-2 Singly Setting example: Uncheck “Enable” of “JSON Format”(1)

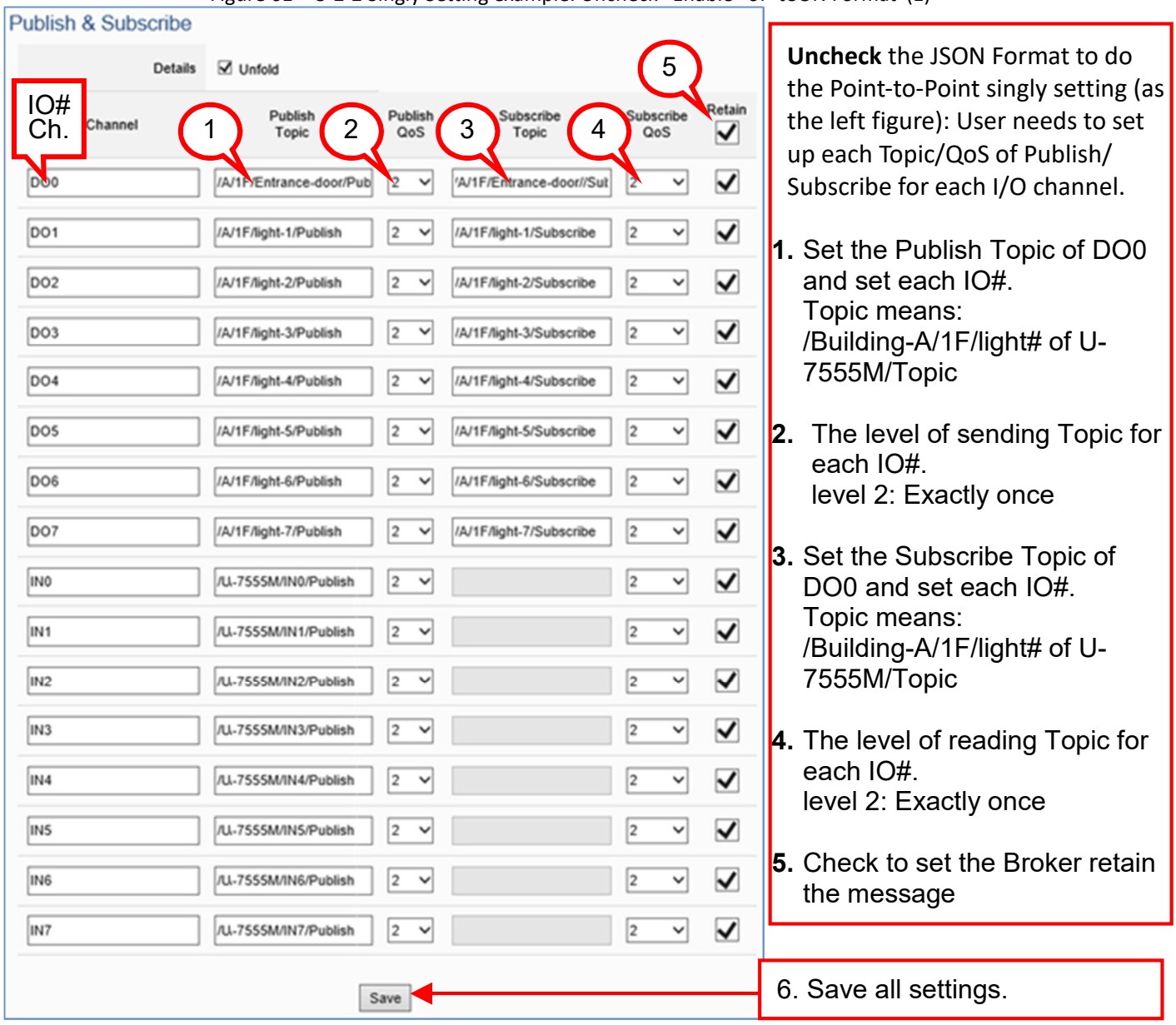



Figure 62 3-2-2 Singly Setting example: Uncheck “Enable” of “JSON Format”(2)



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### 3.2.3 Secure Encrypted Connection: MQTT Certificate

When using the MQTT connection, in addition to the account login for security, users can also enable the SSL/TLS login to use the MQTT Certificate protection of the secure encryption. This section describes how to download/upload the certificates. If you do not want to enable the certificate login, please skip.

The settings of MQTT certificate connection need to enable the SSL/TLS secure encryption. And the UA I/O needs to get the certificate of the connecting device first. And then upload the certificates to UA I/O. There are three types of certificates: Trusted Certificate, Certificate, and Private Key.

Please upload the files to the UA I/O module according to the type of certificates:
**To perform the One-way authentication, you need to upload the Trusted Certificate.**
**To perform the Two-way authentication, you need to upload the Trusted Certificate first, and then upload the Certificate and Private Key.**

Note:

1. One-way authentication: The Client verifies the validity of Broker credentials; need to upload the Trusted Certificate.
2. Two-way authentication: The Client and Broker verify the validity of the certificate with each other; need to upload the Trusted Certificate first, and then upload the Certificate and Private Key.
3. Trusted Certificate: File format must be PEM. Extension name must be “pem”, “cer”, or “crt”.
4. Certificate: File format must be PEM. Extension name must be “pem”, “cer”, or “crt”.
5. Private Key: File format must be PEM. Extension name must be “key”.

**Manu Path**:【MQTT Setting】➔【Client Setting】 MQTT Setting ➔ Client Setting (Appendix A).

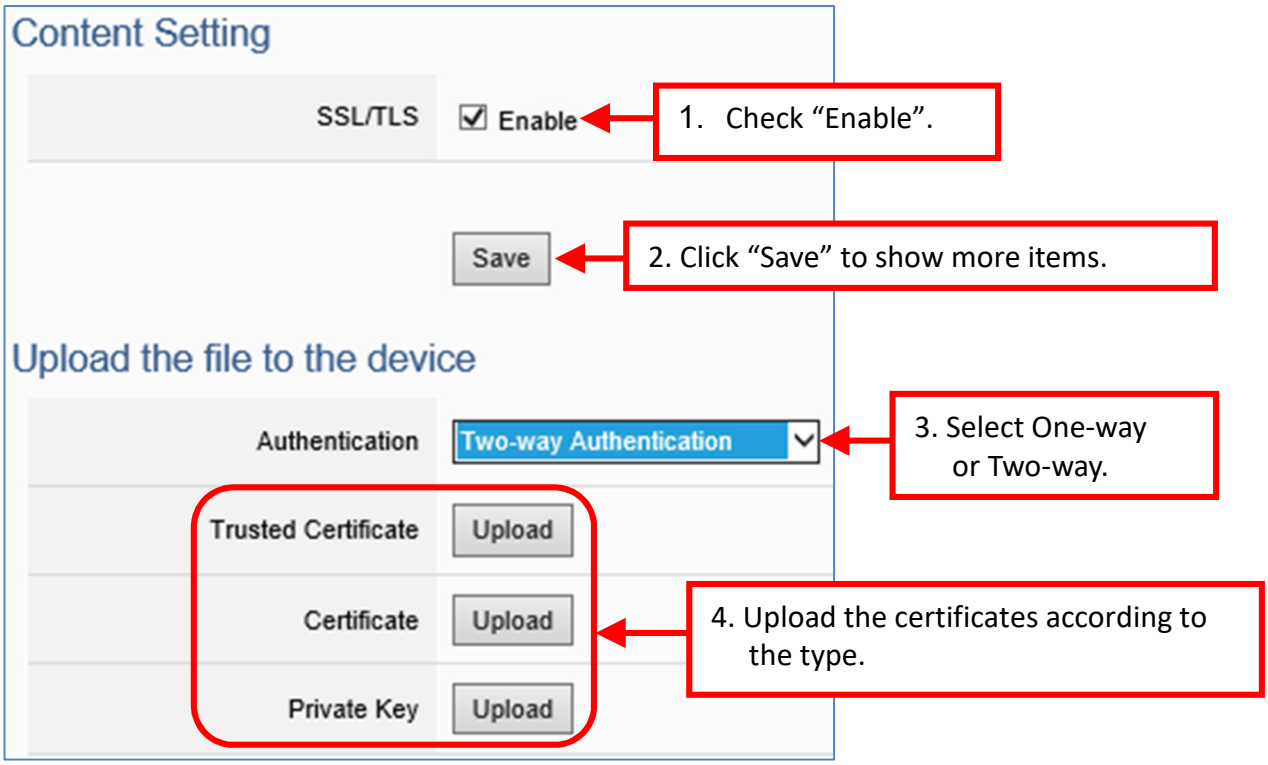



Figure 63 3-2-3 Secure Encrypted Connection: MQTT Certificate



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## 3.3 RESTful API: Read and Write I/O and Virtual Point

This section describes RESTful API functions and usage. UA I/O supports RESTful API functions. Users can remotely read and write the I/O points (include the virtual point) of UA I/O modules through HTTP.

**What is Restful API?**

**REST** (Representational state transfer) is a software architectural style that was created to guide the design and development of the architecture for the World Wide Web. REST is a widely accepted set of guidelines for creating stateless, reliable web APIs. A web API that obeys the REST constraints is informally described as **RESTful**. **RESTful** web APIs are typically loosely based on HTTP methods to access resources via URL-encoded parameters and transmit data.

**Use RESTful with UA I/O**

Reading and writing the virtual points are the same as that of physical I/O points. Examples:

**[Example 1]**

**IP/AllVariableName :** The statuses and values of all DI, DO, AI, AO of the U-7526M, as well as the 10 built-in software points (all types are AO), and the names all start with VirtualTag (red box in the figure below).

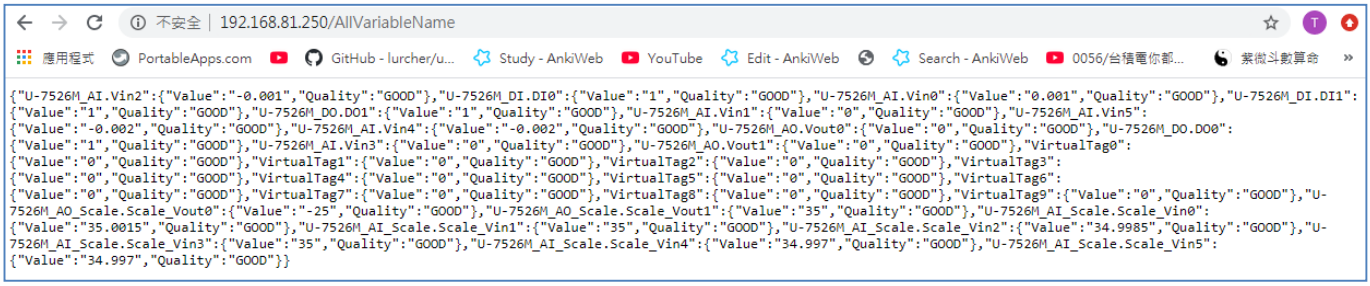



Figure 64 3-3 Restful API [Example 1]

**[Example 2]**

**IP/VariableInformation?VirtualTag0 :** RESTful **Read** the value of VirtualTag0

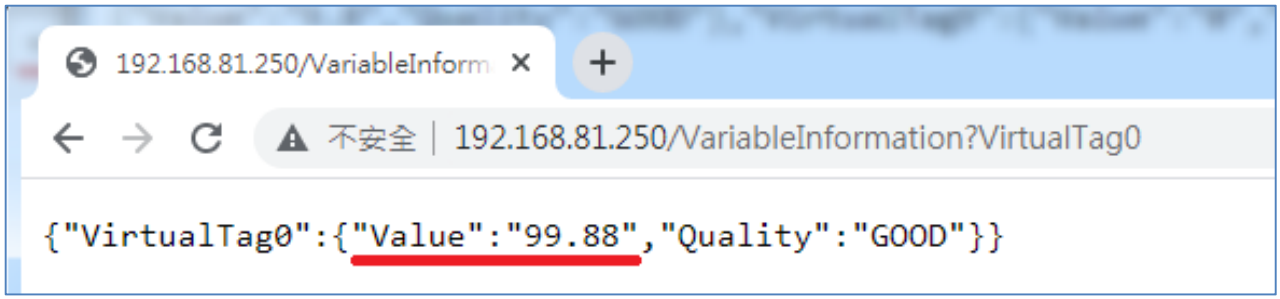



Figure 65 3-3 Restful API [ Example 2-1]



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Or as following:

**IP/VariableInformation?U-7504M_DI.DI0 :** RESTful **Read** the DI.DI0 value of U-7504M.

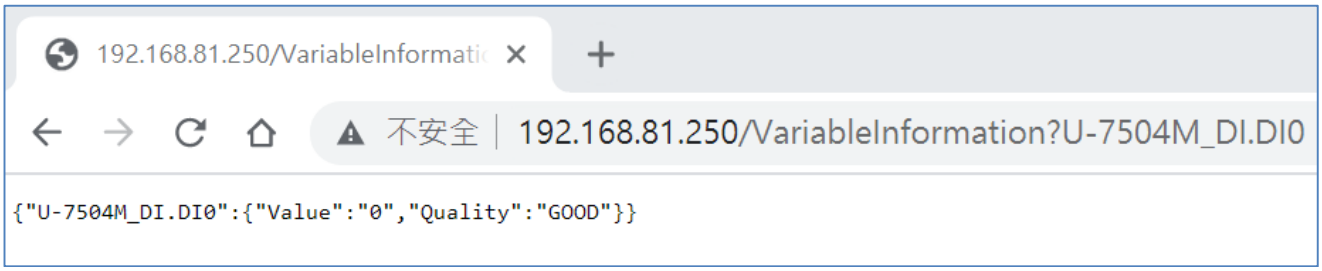



Figure 66 3-3 Restful API [Example 2-2]

**[Example 3]**

**IP/VariableInformation** : RESTful **write** the value of VirtualTag0

This example uses the Firefox as the RESTful client.

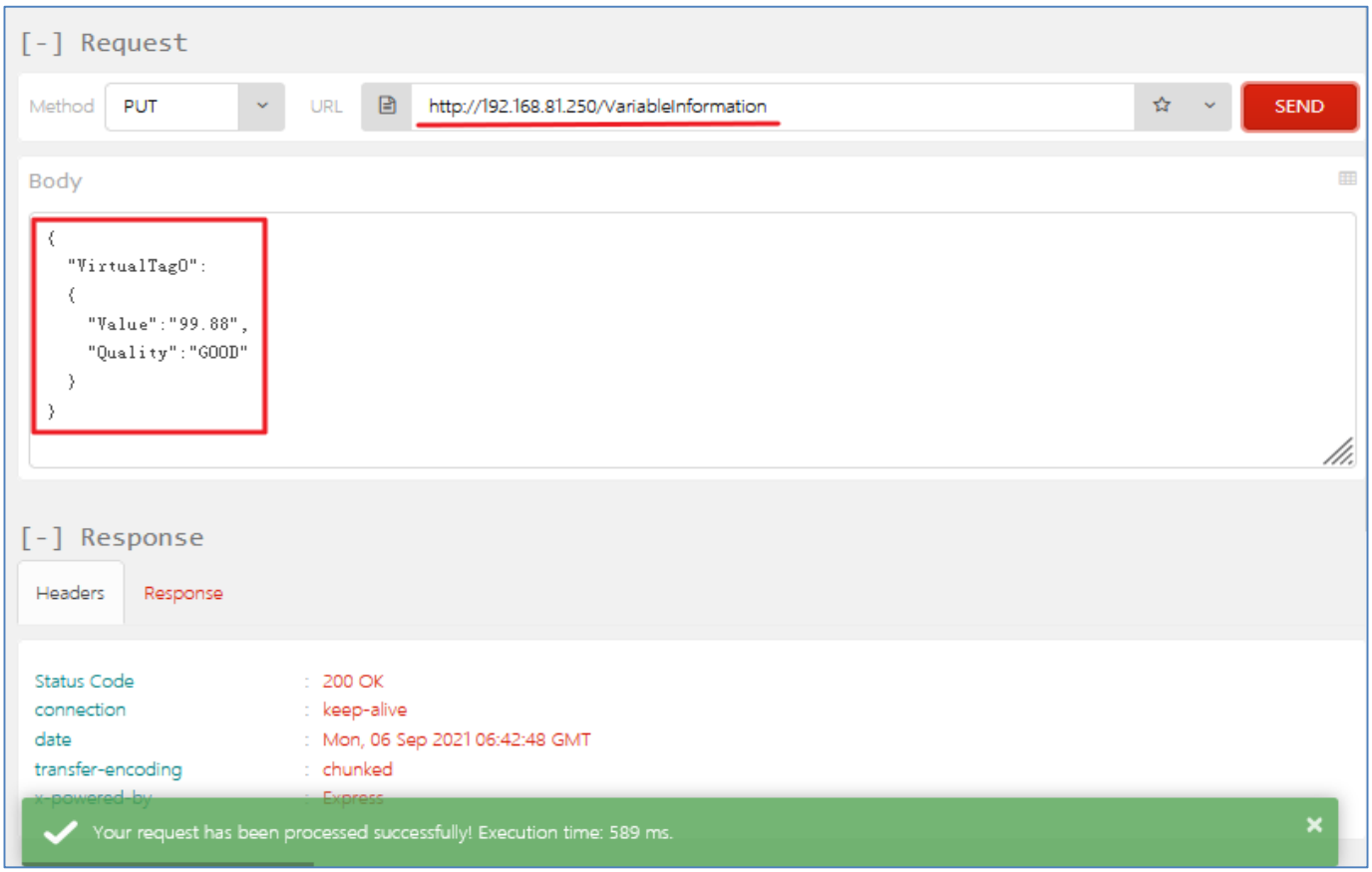



Figure 67 3-3 Restful API [Example 3]



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**RESTful Description**

## [Resource Definition]

Table 30 3-3 RESTful [Resource Definition]

| HTTP Method | Path | Description | Remarks |
|---|---|---|---|
| GET | /AllVariableName | Read all variable data. | Link to Example G1.1 |
| | /VariableInformation?var0,var1, var2… | Read the data of var0, var1, var2… in all variables, data are separated by commas. | Link to Example G1.2 |
| PUT | /VariableInformation | writes the variable data being used. | Link to Example P1.1 |

## [JSON Description]

Table 31 3-3 RESTful [JSON Description]

| JSON Content | Item | Description |
|---|---|---|
| {<br>"Var1": {<br>"Quality": "Good",<br>"Value": "24.5"<br>},<br>"Var2": {<br>"Quality": "Good",<br>"Value": "24.5"<br>}<br>} | Quality | The communication quality of the variable.<br><br>Return Item:<br>Good, Uncertain, Bad. |
| | Value | Return the value of the variable. |



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## [GET Examples]

Table 32 3-3 RESTful [GET Examples]

| Resource Definition | Actual Application Corresponding to the Resource Definition |
|---|---|
| GET /AllVariableName | GET /AllVariableName |
| Description | Back to G1.1 |
| GET：Read<br>/AllVariableName：All variables<br><br>For Example：<br>GET /AllVariableName：Read all variable data, and the return value is in JSON format. | |

| Resource Definition | Actual Application Corresponding to the Resource Definition |
|---|---|
| GET /VariableInformation?var0, var1, var2… | GET /VariableInformation?U-7560M_DO.RL0,U-7560M_DO.RL1 |
| Description | Back to G1.2 |
| GET：Read<br>/VariableInformation：Variable Information.<br>?：Used to separate the API and the parameters.<br>U-7560M_DO.RL0：The variable name of the module.<br>U-7560M_DO.RL1：The variable name of the module.<br>Use "commas" to separate variables.<br><br>For Example：<br>GET /VariableInformation?U-7560M_DO.RL0, U-7560M_DO.RL1<br>The data of variables such as U-7560M_DO.RL0, U-7560M_DO.RL1. The return value is in JSON format. | |



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## [PUT Example]

Table 33 3-3 RESTful [PUT Examples]

| Resource Definition | Actual Application Corresponding to the Resource Definition |
|---|---|
| PUT /VariableInformation | PUT /var/use<br><br>[RAW Body]<br>{<br>"Var1": {<br>"Quality": "Good",<br>"Value": "24.5"<br>},<br>"Var2": {<br>"Quality": "Good",<br>"Value": "24.5"<br>}<br>} |
| Description Back to P1.1 | |
| PUT：Write<br>/VariableInformation：Variable Information.<br>[RAW Body]：The JSON format to be written.<br>PUT /VariableInformation：Compare from [RAW Body], check whether the variable name exists on the server side, modify it if it exists, and skip it if it doesn’t. The return value is a string. | |



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**Use RESTful API HTTPS with UA I/O**

Before using RESTful API HTTPS, users need to check whether "Https Web Server" has imported the certificate.

If the certificate has not been imported, please open the web interface and switch to the following menu location to upload the certificate.

**Manu Path**:

【System Setting】➔【Web Server Setting】 System Setting ➔ Web Server Setting (Appendix A).

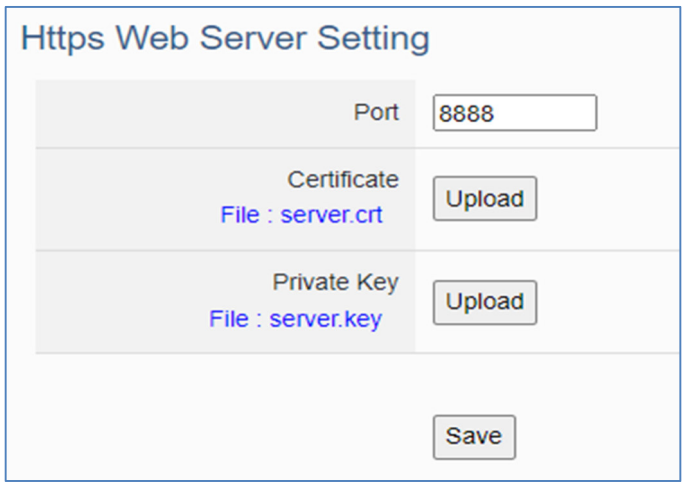



Figure 68 3-3 RESTful API HTTPS Web Server Setting

After uploading the certificate, users can read and write I/O according to the RESTful API example in the previous section.

Apply on the Website Address Bar:

**https://IP:Port/Resource Definition**

IP：Device IP.

Port：Https Web Server Port; Default is 8888 for UA I/O.

**[ Example ]：https://192.168.81.250:8888/AllVariableName**




Figure 69 3-3 https://IP:Port/Resource Definition



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## 3.4 Common settings table for easy integration

This section explains how UA I/O can obtain the necessary settings for software integration, allowing users to integrate the site more quickly. UA-I/O provides a common settings table that includes the settings of OPC UA, MQTT, and HTTP (HTTPS) protocols. These settings are compiled into a file so that users can find the required settings quickly and easily.
The following is the UA-I/O with ICP DAS product AVEVA Edge as an example of how to use the common setup table.

**Setting Steps:**

[Step 1]

**Menu Path:**

【Module Setting】➔【Overview】 Module Setting ➔ I/O Setting (Appendix A).

Set the Nickname: Enter a name that is easily identifiable.

Analog Input

| Channel | Nickname | OPC UA Description | Input Type |
|---|---|---|---|
| Vin0 | 二棲_A房_電熱水器 | | -10 ~ 10 V |
| Vin1 | 2階_B室_電気温水器 | | -10 ~ 10 V |
| Vin2 | 2층_C룸_전기온수기 | | -10 ~ 10 V |
| Vin3 | Электрический водонагрева | | -10 ~ 10 V |
| Vin4 | ชั้น 2_ห้อง E_เครื่องทำน้ำอุ่น | | -10 ~ 10 V |
| Vin5 | Salle F_Chauffe-eau électriqı | | -10 ~ 10 V |

Figure 70 3-4 Common settings(1)



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[Step 2]

**Menu Path:**

【Module Setting】➔【Overview】 Module Setting ➔ Overview (Appendix A).

Click the Download button and get CommonSettings.csv

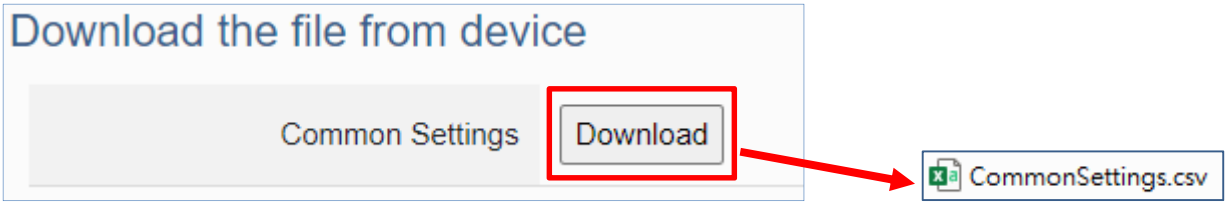



Figure 71 3-4 Common settings(2)

[Step 3]

Find the settings for the software by "Nickname" and copy and paste them into the software settings to complete the communication integration.

Below is an example of AVEVA Edge.

| | | | |
|---|---|---|---|
| 20 | EnablePowerOnValue | | ns=2;s=U-7526M.EnablePowerOnValue |
| 21 | Vin0 | 二樓_A房_電熱水器 | ns=2;s=U-7526M.Vin0 |
| 22 | Vin1 | 2階_B室_電気温水器 | ns=2;s=U-7526M.Vin1 |
| 23 | Vin2 | 2층_C룸_전기온수기 | ns=2;s=U-7526M.Vin2 |
| 24 | Vin3 | Электрический водонагреватель | ns=2;s=U-7526M.Vin3 |
| 25 | Vin4 | ชั้น 2_ห้อง E_เครื่องทำน้ำอุ่น | ns=2;s=U-7526M.Vin4 |
| 26 | Vin5 | Salle F_Chauffe-eau électrique | ns=2;s=U-7526M.Vin5 |
| 27 | Vin0_Type | | ns=2;s=U-7526M.Vin0_Type |
| 28 | Vin1_Type | | ns=2;s=U-7526M.Vin1_Type |
| 29 | Vin2_Type | | ns=2;s=U-7526M.Vin2_Type |
| 30 | Vin3_Type | | ns=2;s=U-7526M.Vin3_Type |

Figure 72 3-4 Common settings(3)

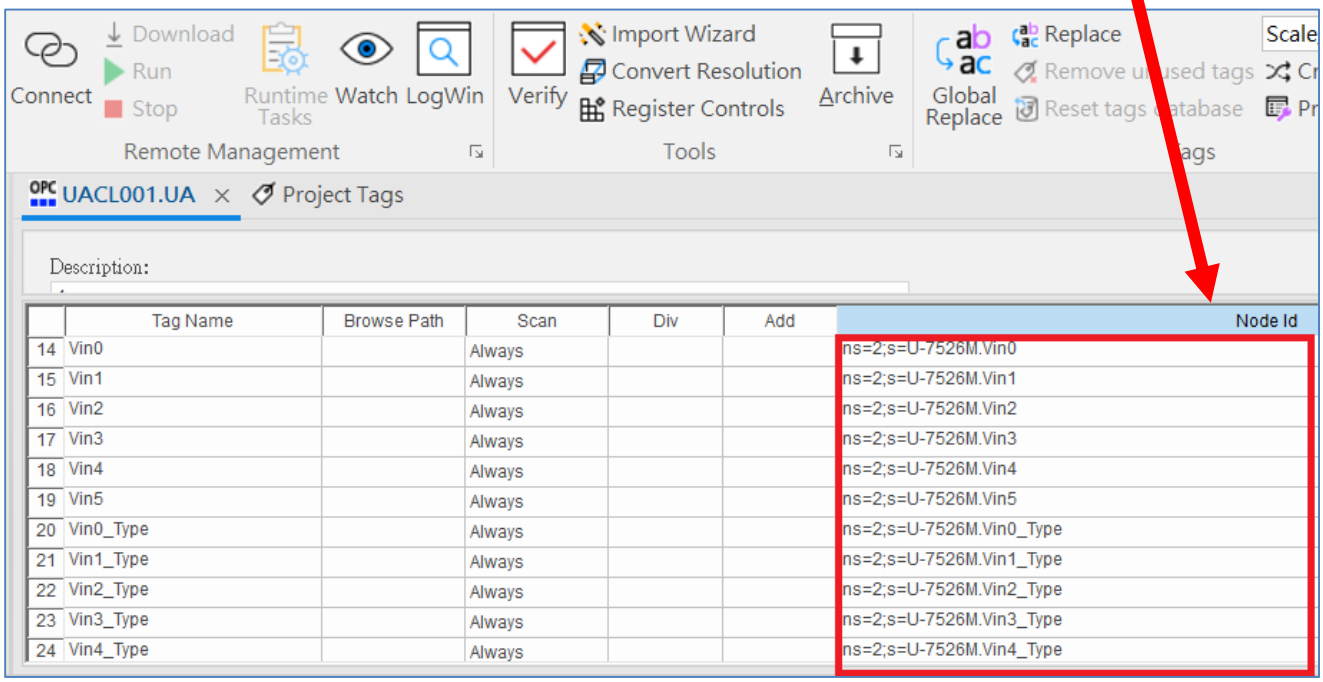


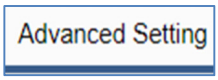

Figure 73 3-4 Common settings(4)

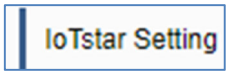


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## 3.5 IoTstar Connection Example

This section introduces the IoTstar connection settings. Please go to the IoTstar setting menu.

**Manu Path**:【Advanced Setting】➔【IoTstar Setting】 

➔ 


(Appendix A)

Please go to the following link to apply for a free trial account

https://www.icpdas.com/en/product/guide+IIoT+Software+IoTstar#1080

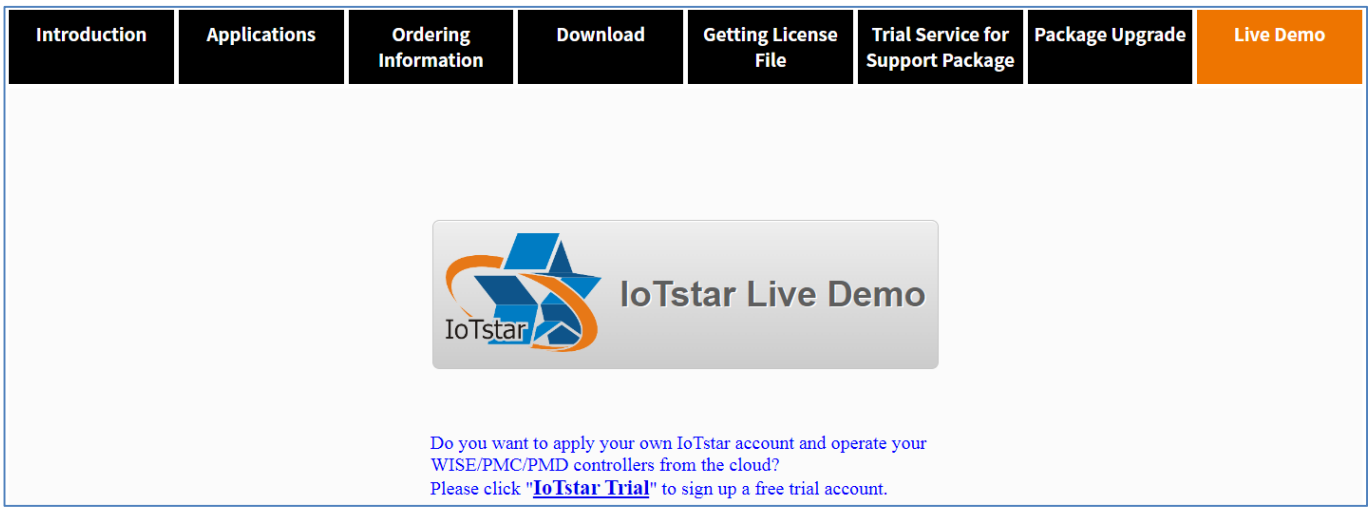



Figure 74 3-5 IoTstarLive Demo webpage

Enter the following information:

Server IP: iotstardemo.icpdas.com

Username: The account name of the free trial account

Password: Password for a free trial account

The other items are default values and click Save. The screen is as follows.



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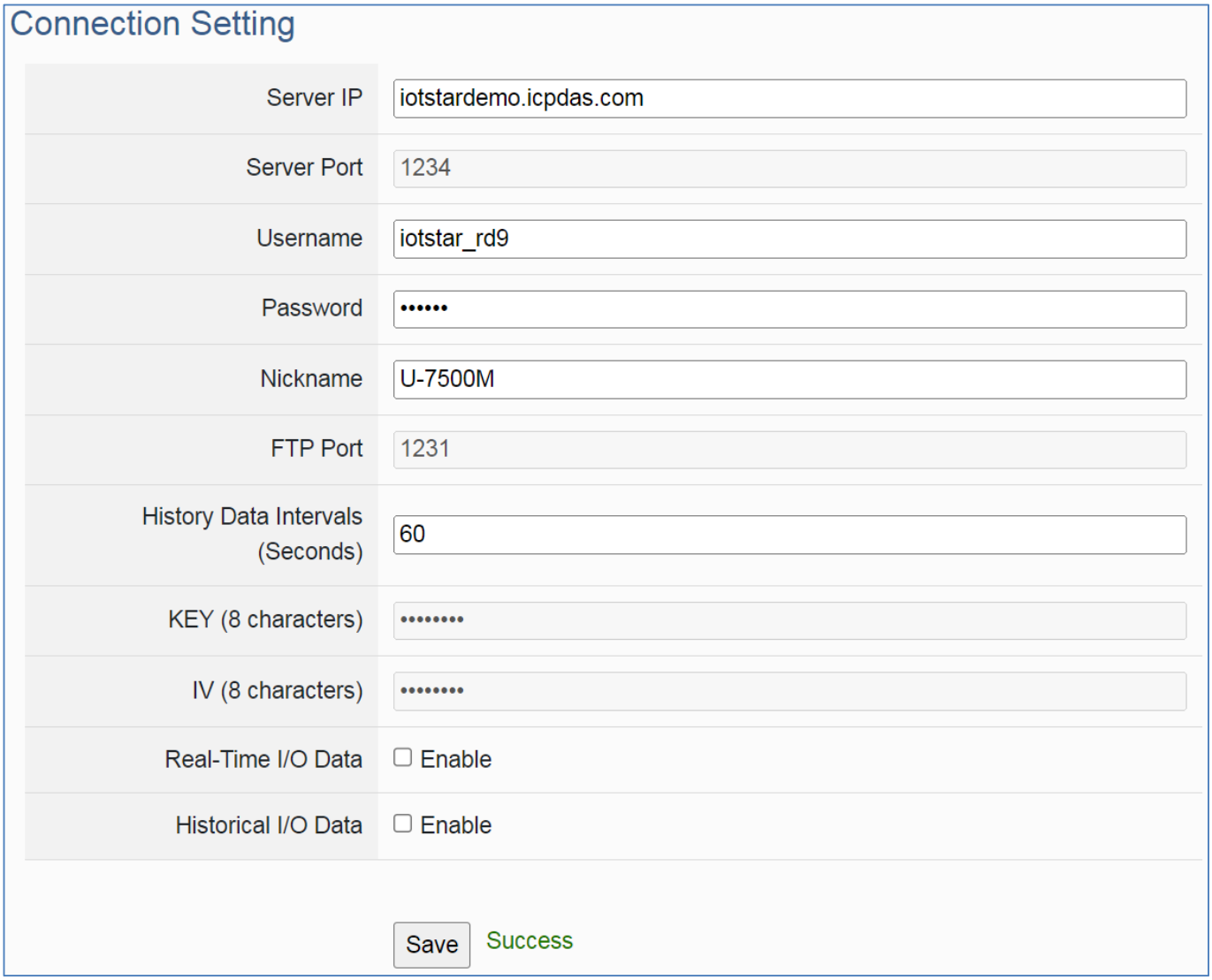



Figure 75 3-5 Connection Setting

After saving successfully, the connection will be completed.



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# 4. Main Menu: Parameter Descriptions

This chapter introduces the menu functions of the UA I/O web UI and is more focused on the function parameters of the menu. Each section introduces one main menu and its sub-menu functions. The function location is shown in a brief text and diagram of【Menu Path】, for Menu Path introductions please refer to Appendix A.

## 4.1 Main Menu - System Setting

**System Setting** is the first item of the Main Menu. This item is about the settings related to the hardware and operating system.

### 4.1.1 Overview

**Function:** Display the current information on the hardware and operating system.
**Support Module:** All UA I/O modules support this function.

**Manu Path**:【System Setting】➔【Overview】 System Setting ➔ Overview (Refer to Appendix A).

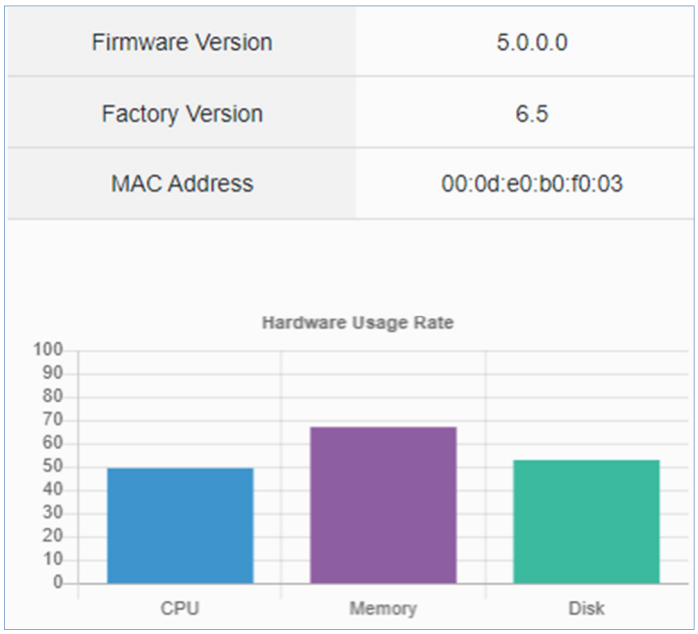



Figure 76 4-1-1 System Setting

Table 34 4-1-1 System Setting-Overview

| System Setting > Overview | |
|---|---|
| Firmware Version | Display the firmware version of the UA I/O module. |
| Factory Version | Display the factory version (OS & UI) of the UA I/O module. |
| MAC Address | The LAN MAC address of this UA I/O. |
| CPU | Display the current CPU usage of the module. Do not use to achieve 95% or more. |
| Memory | Display the current memory usage of the module. Do not use to achieve 95% or more. |
| Disk | Display the current disk usage of the module. Do not use to achieve 95% or more. |



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### 4.1.2 Network Setting

**Function:** Display and set up the network settings of the UA I/O.
**Support Module:** All UA I/O modules support this function.
**Manu Path**:【System Setting】➔【Network Setting】 System Setting ➔ Network Setting (Appendix A).

**Network Setting (LAN)**

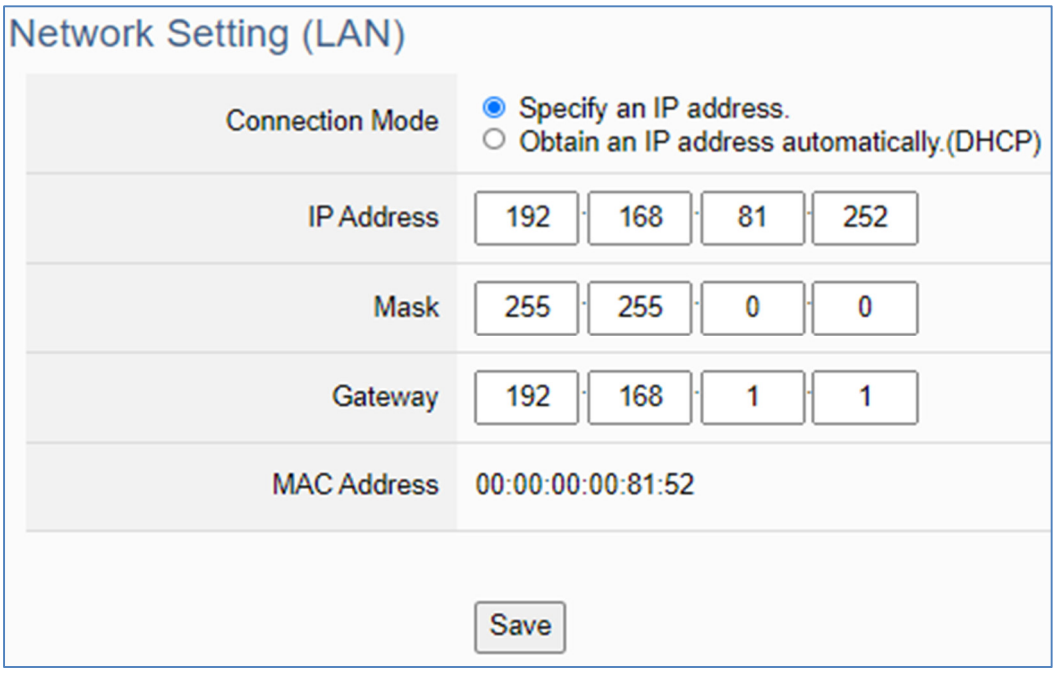



Figure 77 4-1-2 Network Setting (LAN)

Table 35 4-1-2 Network Setting (LAN)

| **System Setting > Network Setting - Network Setting (LAN)** | |
|---|---|
| Connection Mode | **Specify an IP address**: Users input the values in the fields of IP, Mask, and Gateway according to the customer's network. Detail information for the factory default value of the UA controller network refers to the. Sec. 4.1.7<br>**Obtain an IP address automatically (DHCP)**: It's the Dynamic Host Configuration Protocol mode. The system assigns the IP, Mask, and Gateway automatically. |
| IP Address | The LAN IP address of this UA I/O.<br>Factory Default: 192.168.255.1 |
| Mask | The LAN mask address of this UA I/O.<br>Factory Default: 255.255.0.0 |
| Gateway | The LAN gateway address of this UA I/O.<br>Factory Default: 192.168.1.1 |
| MAC Address | The LAN MAC address of this UA I/O. |
| Save | Click to save the settings of the LAN item. |



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**Hostname Setting**

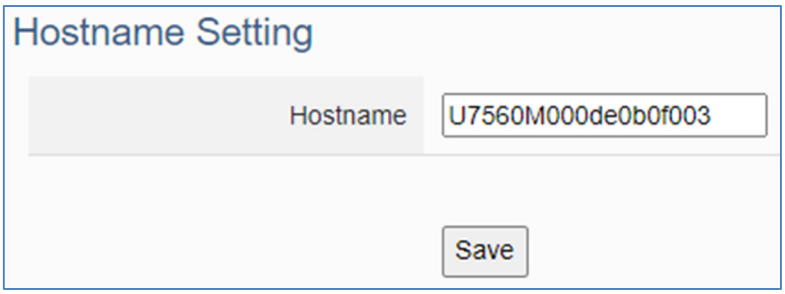



Figure 78 4-1-2 Hostname Setting

Table 36 4-1-2 Hostname Setting

| **System Setting > Network Setting - Hostname Setting** | |
|---|---|
| Hostname | The host name of this UA I/O. Default: system value. Users can give a new name, but cannot be null, Chinese characters, or special symbols. |
| Save | Click to save the settings of this item. |



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### 4.1.3 Time Setting

**Function:** Display and set up the date and time of the UA I/O.
**Support Module:** All UA I/O modules support this function.
**Manu Path**:【System Setting】➔【Time Setting】 System Setting ➔ Time Setting (Appendix A).

**Date and Time Display**

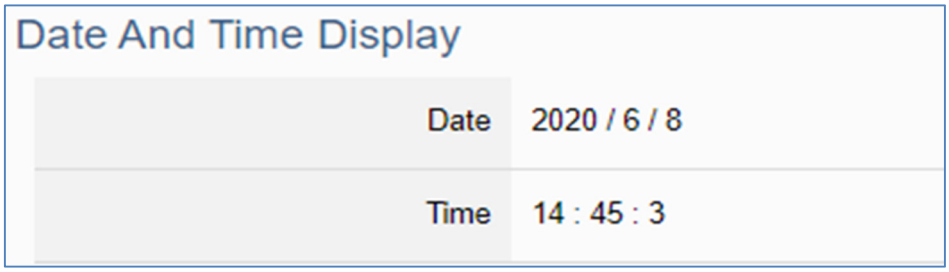



Figure 79 4-1-3 Date and Time Display

Table 37 4-1-3 Date and Time Display

| System Setting > Time Setting - Date And Time Display | |
|---|---|
| Date | Display the date of the UA I/O module, including year, month, and day. |
| Time | Display the current time of the UA I/O module, including hour, minute, and second. |

When the device time is one day different from the local computer time, a warning message "Please check the time" will be displayed, as shown below.

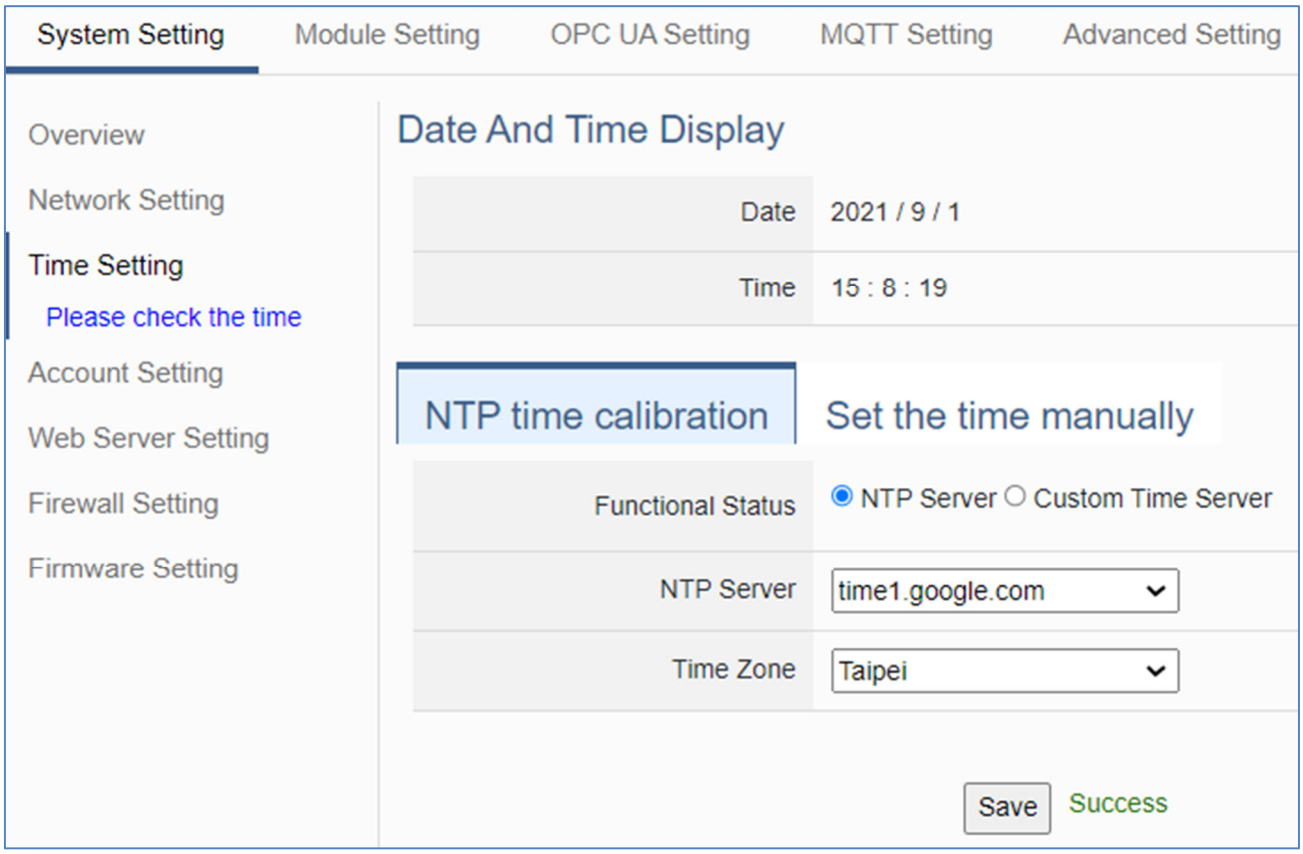



Figure 80 4-1-3 Time Setting-Please check the time



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### NTP time calibration

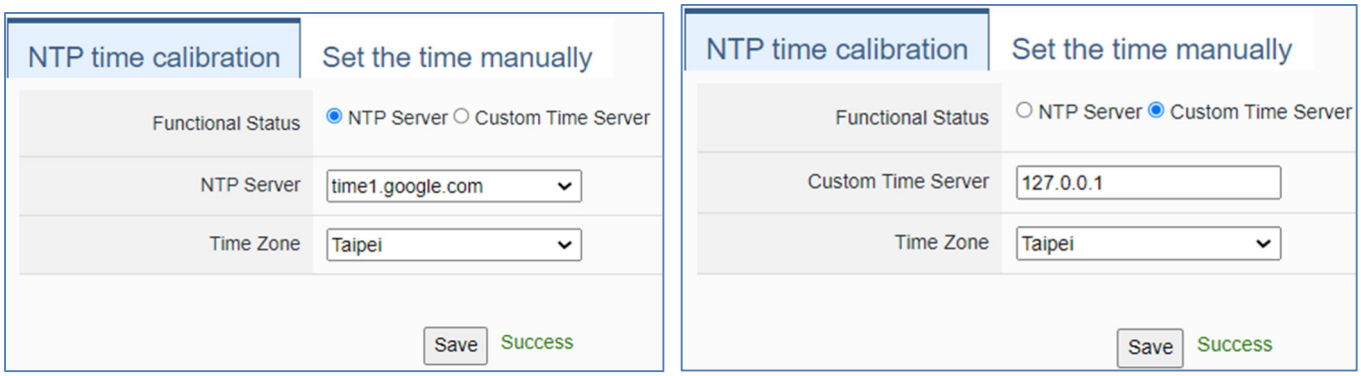



Figure 81 4-1-3 NTP time calibration

Table 38 4-1-3 NTP time calibration

| System Setting > Time Setting - NTP time calibration | |
|---|---|
| Functional Status | NTP Server: Click to display the setting columns for NTP Server.<br>Custom Time Server: Click to display the setting columns for Custom Time Server. |
| NTP Server | Select the common time server provided by the system. |
| Custom Time Server | Enter the IP address of the time server by custom. |
| Time Zone | Select the time zone of your location. |
| Save | Click to save the settings of this item and update the data of “Time Setting” to the “Date And Time Display” on the top of this page. |

### Set the time manually

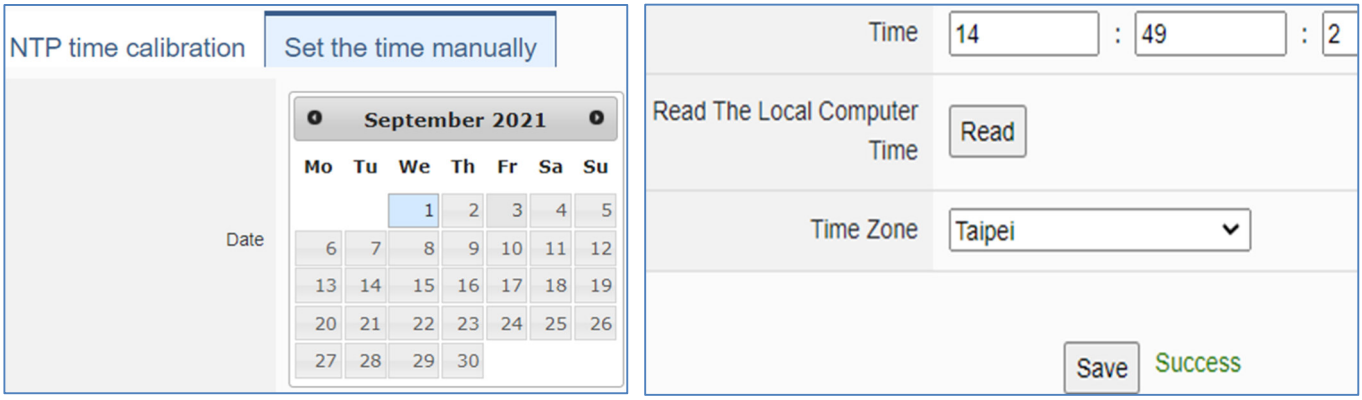



Figure 82 4-1-3 Set the time manually

Table 39 4-1-3 Set the time manually

| System Setting > Time Setting - Set The Time Manually | |
|---|---|
| Date | Set the system date of the UA I/O manually. Directly enter the new year/month/day, and then click “Save”. |
| Time | Set the system time of the UA I/O manually. Directly enter the new hour: minute: and second, and then click “Save”. |
| Read The Local Computer Time | Click [Read] can copy the current time of the using computer to the “Time Setting” of this item. |
| Time Zone | Select the time zone of your location. |
| Save | Click to save the settings of this item and update the data of “Time Setting” to the “Date And Time Display” on the top of this page. |



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### 4.1.4 Account Setting

**Function:** Display and set up the login username and password of the UA I/O Web UI.
**Support Module:** All UA I/O modules support this function.

**Manu Path**:【System Setting】➔【Account Setting】 System Setting ➔ Account Setting (Appendix A).

There are two modes of account setting: **Administrator Setting** and **User Setting,** only one administrator or user can log in at any one time. The administrator login provides customers with the most complete device information and setting items.
The user login only allows customers to read device I/O point information and control items.

**Administrator Setting**
**Account Setting:**

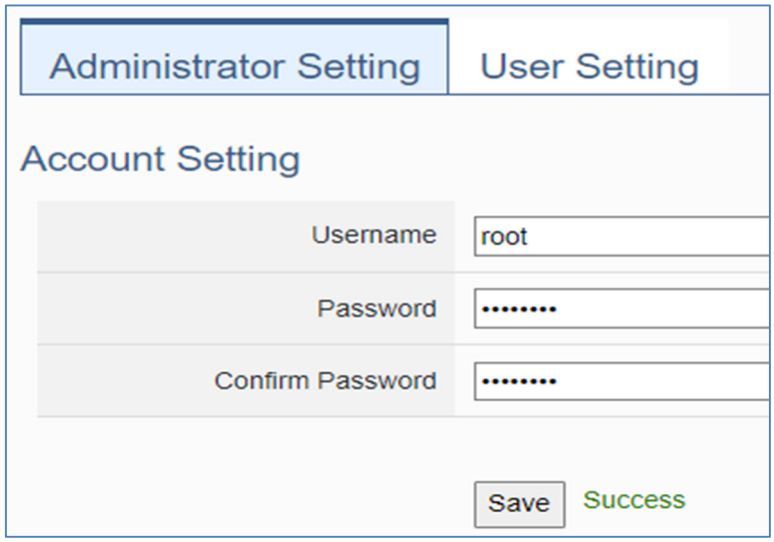



Figure 83 4-1-4 Account Setting

Table 40 4-1-4 Account Setting

| System Setting > Account Setting | |
|---|---|
| Username | The login username for the UA Web UI. Factory default: root. Cannot be null.<br>**After the first login in using the factory default settings, change the default username/password first, or the user cannot use any other function (designed for data security) except the [Overview] and [Account Setting] (Mouse showing hand shape).** |
| Password | The login password for the UA Web UI. Factory default: root. Cannot be null.<br>**After the first login in using the factory default settings, change the default username/password first, or the user cannot use any other function (designed for data security) except the [Overview] and [Account Setting] (Mouse showing hand shape).**<br>**Password setting rules:**<br>Password<br>1. Must not be the same as the account.<br>2. The length must be greater than 6 characters.<br>3. With English uppercase.<br>4. With English lowercase.<br>5. With numbers. |
| Confirm Password | Retype the password for the operation conform when setting the new account information. |
| Save | Click to save the settings of this page. |



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**Login Error Notification:**

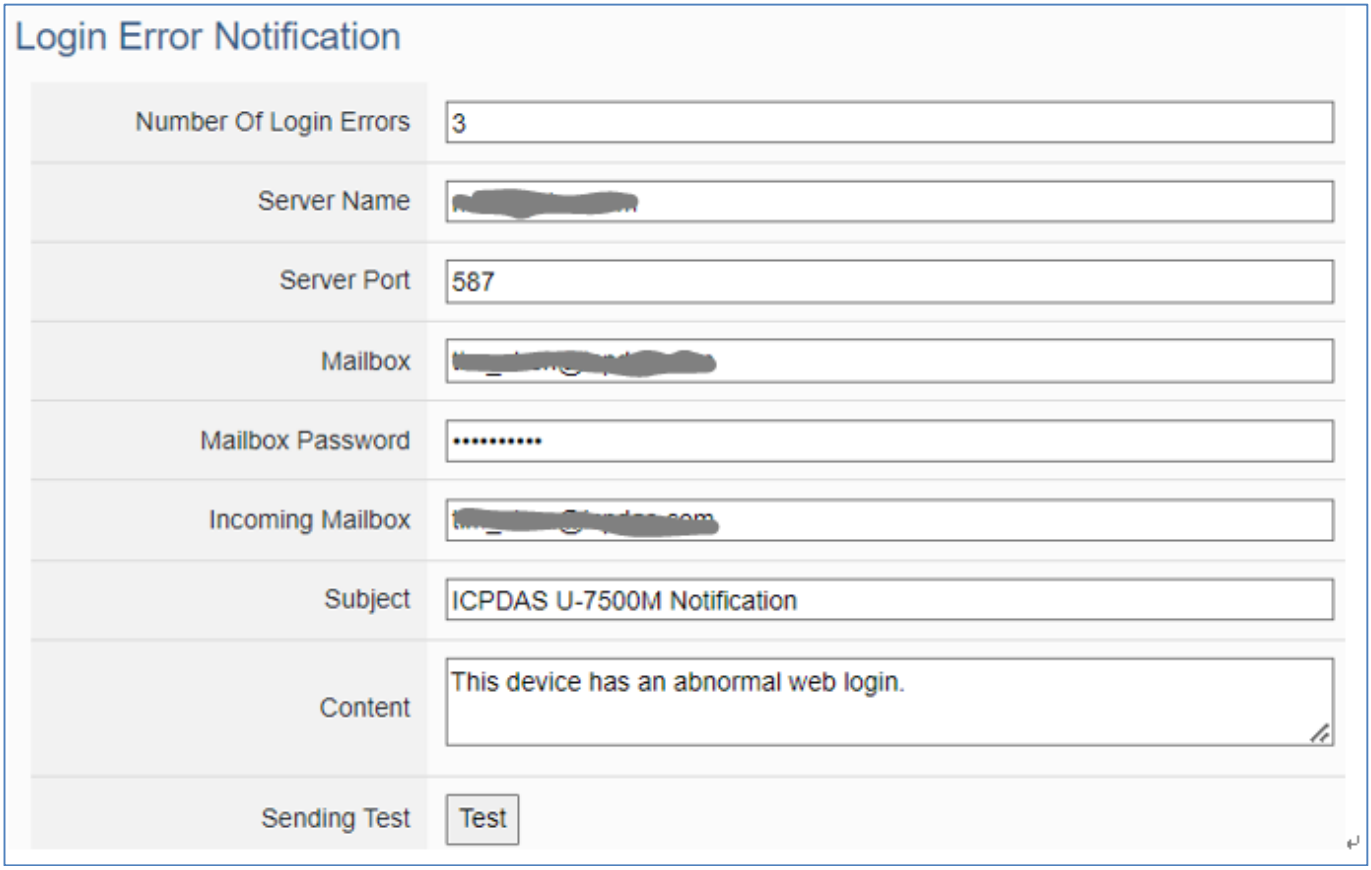



Figure 84 4-1-4 Login Error Notiifcation

Table 41 4-1-4 Login Error Notiifcation

| **System Setting > Account Setting - Login Error Notification** | |
|---|---|
| Number Of Login Errors | Default: 3<br>The number of times the wrong account or password is allowed.<br>Example: Set the value 3. If the input is wrong 3 times, the system will send a notification. |
| Server Name | Mail server URLs provided by MIS, or URLs of major well-known mail servers. |
| Server Port | Default: 587<br>The mail server Port is provided by MIS, or the ports of major famous mail servers. |
| Mailbox | Set up an available mailbox for sending emails to notify customers. |
| Mailbox Password | Enter the password for the mailbox. |
| Incoming Mailbox | The mailbox to receive messages. |
| Subject | Default: ICP DAS U-7500M Notification.<br>The subject of the sanding letter. |
| Content | Default: This device has an abnormal web login.<br>The content of the sanding letter. |
| Sending Test | Click the test button. After success, the settings are available. At the same time, the set value is also stored in the device. |



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**User Setting**

**Account Setting:**

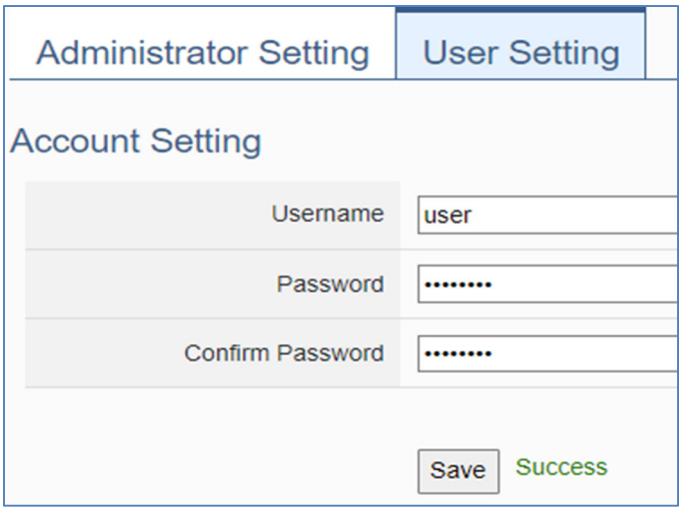



Figure 85 4-1-4 User Setting

Table 42 System Setting-Account Setting

| **System Setting > Account Setting** | |
|---|---|
| Username | The login username for the UA Web UI. Factory default: root. Cannot be null.<br>**After the first login in using the factory default settings, change the default username/password first, or the user cannot use any other function (designed for data security) except the [Overview] and [Account Setting] (Mouse showing hand shape).** |
| Password | The login password for the UA Web UI. Factory default: root. Cannot be null.<br>**After the first login in using the factory default settings, change the default username/password first, or the user cannot use any other function (designed for data security) except the [Overview] and [Account Setting] (Mouse showing hand shape).**<br>**Password setting rules:**<br>Password<br>1. Must not be the same as the account.<br>2. The length must be greater than 6 characters.<br>3. With English uppercase.<br>4. With English lowercase.<br>5. With numbers. |
| Confirm Password | Retype the password for the operation conform when setting the new account information. |
| Save | Click to save the settings of this page. |



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### 4.1.5 Web Server Setting

**Function:** Provide Web Server settings, such as display and set the Web Server port.
**Support Module:** All UA I/O modules support this function, both Http and Https can be enabled.
**Manu Path**: 【System Setting】➔【Web Server Setting】 System Setting ➔ Web Server Setting (Appendix A).

**Http Web Server Setting**

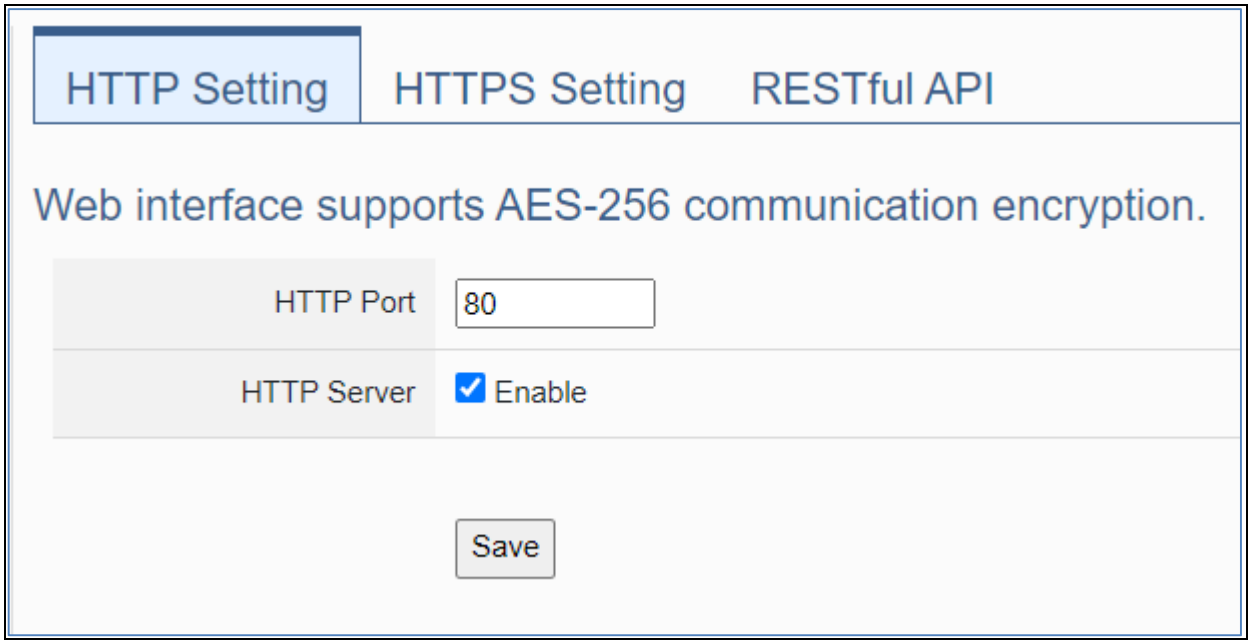



Figure 86 4-1-5 Web Server Setting(1)

Table 43 4-1-5 Web Server Setting

| System Setting > Web Server Setting | |
|---|---|
| HTTP Port | Web Server port of the UA I/O device.<br>Factory default port: 80. |
| HTTP Server | When Enable is checked, HTTP Server is enabled. |
| Save | Click to save the settings. |

**NOTE**: After clicking the “save” icon, the system will restart the Web Server. It takes time to start, please wait patiently.


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**Https Web Server Setting**

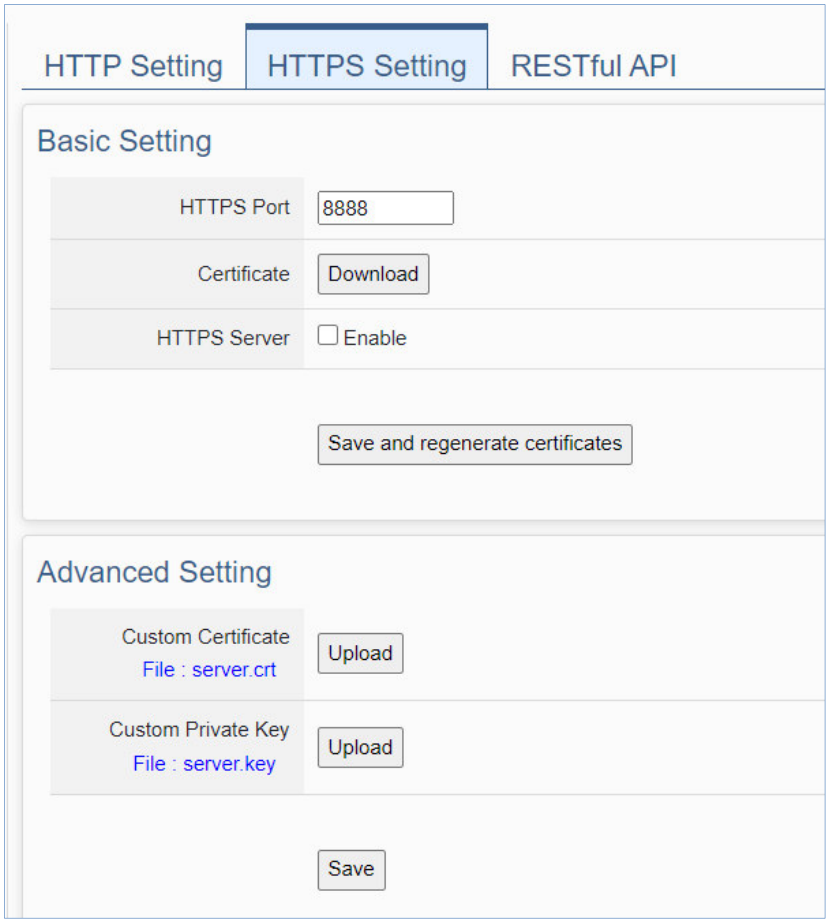



Figure 87 4-1-5 Web Server Setting(2)

Table 44 4-1-5 Web Server Setting-Basic Setting

| **System Setting > Web Server Setting - Basic Setting** | |
|---|---|
| HTTPS Port | HTTPS Web Server port of the UA I/O device.<br>Factory default port: 8888. |
| Certificate | Click the Download button to download the .crt file from the module to the local computer. |
| HTTPS Server | When Enable is checked, HTTPS Server is enabled. |

Table 45 4-1-5 Web Server Setting-Advanced Setting

| **System Setting > Web Server Setting - Advanced Setting** | |
|---|---|
| Custom Certificate | Customize the server certificate.<br>Filename rules: [A-Z, a-z, 0-9].crt, only .crt files consisting of letters and numbers are accepted. |
| Custom Private Key | Customize the Private Key.<br>Filename rules: [A-Z, a-z, 0-9].key, only .key files consisting of letters and numbers are accepted. |

**NOTE**: After clicking the “save” icon, the system will restart the Web Server. It takes time to start, please wait patiently.



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## RESTful API

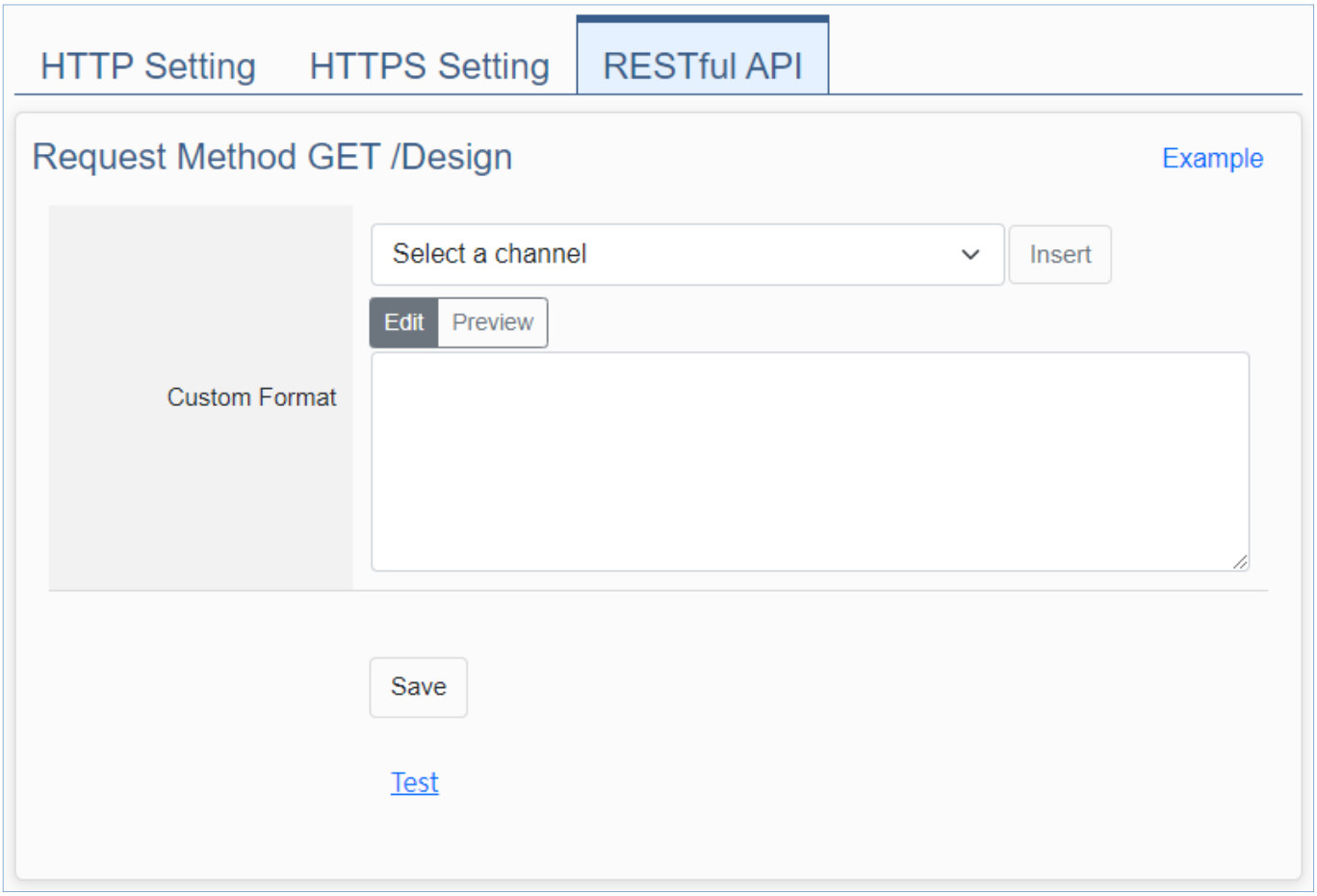



Figure 88 4-1-5 RESTful API-Request Method GET/Design

Table 46 4-1-5 RESTful API-Request Method GET/Design

| System Setting > Web Server Setting – Request Method Get / Design | |
|---|---|
| Custom Format | Please click on the "Examples" button on the top right corner of the page for detailed instructions.<br>Step 1: Select the channel and click the Insert button. Insert the identifier into the edit box.<br>Step 2: Click the Edit button to customize the content.<br>Step 3: Click the Preview button to check if the customized content is correct.<br>Step 4: Click the Save button to save the setting.<br>Step 5: Click the Test button to test if the format is correct. |



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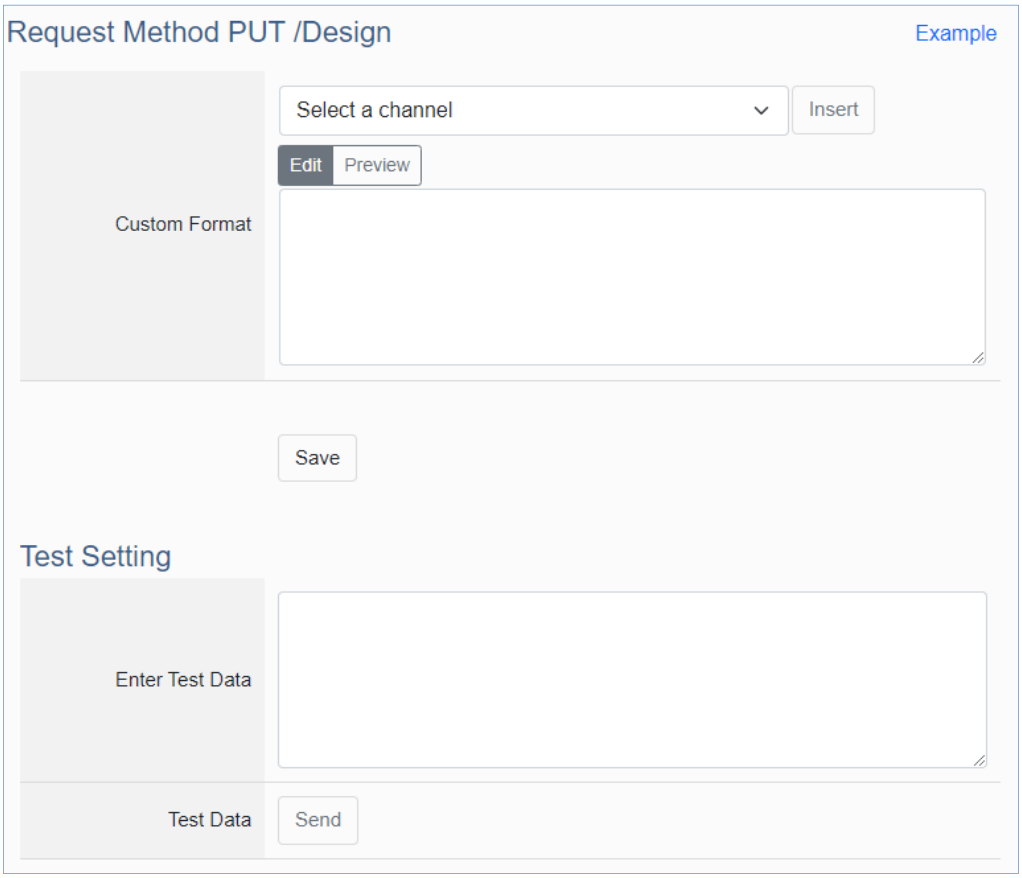



Figure 89 4-1-5 RESTful API-Request Method PUT/Design

Table 47 4-1-5 RESTful API-Request Method PUT/Design

| **System Setting > Web Server Setting – Request Method PUT / Design** | |
|---|---|
| Custom Format | Please click on the " Examples " button on the top right corner of the page for detailed instructions.<br>Step 1: Select the channel and click the Insert button. Insert the identifier into the edit box.<br>Step 2: Click the Edit button to customize the content.<br>Step 3: Click the Preview button to check if the customized content is correct.<br>Step 4: Click the Save button to save the setting. |

Table 48 4-1-5 RESTful API-Test Setting

| **System Setting > Web Server Setting - Test Setting** | |
|---|---|
| Enter Test Data | Step 1: Copy the customized content and enter it into the edit box.<br>Step 2: Change the identifier of the customized content to a value. |
| Test Data | Step 1: Click the Send button<br>Step 2: Check if the I/O channel value has changed. |



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### 4.1.6 Firewall Setting

**Function:** Provide firewall settings, allowing specific IP to have permission to connect to the module.

**Support Module:** All UA I/O modules support this function.

**Manu Path**:【System Setting】➔【Firewall Setting】 System Setting ➔ Firewall Setting (Appendix A).




Figure 90 4-1-6 Firewall Setting

Table 49 4-1-6 Firewall Setting

| **System Setting > Firewall Setting** | |
|---|---|
| Allow all IP | Check the box to allow all IPs to connect to UA-I/O.<br>Factory default value: Enabled. |
| Allow IP | Enter the IP to allow a specific IP to connect to UA-I/O.<br>Limit the number of IP connections: Up to 3 sets of client computer or device IP. |
| Allow IP zones | Allow UA-I/O connection for specific IP zones |



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### 4.1.7 Firmware Setting

**Function:** Provide firmware settings, such as restore factory setting and update firmware.
**Support Module:** All UA I/O modules support this function.

**Manu Path**:【System Setting】➔【Firmware Setting】 System Setting ➔ Firmware Setting (Appendix A).

**Restore Factory Setting**

1. Check the “Enable” box to enable the “Restore” button, and then click on the “Restore” button to start the restore operation.

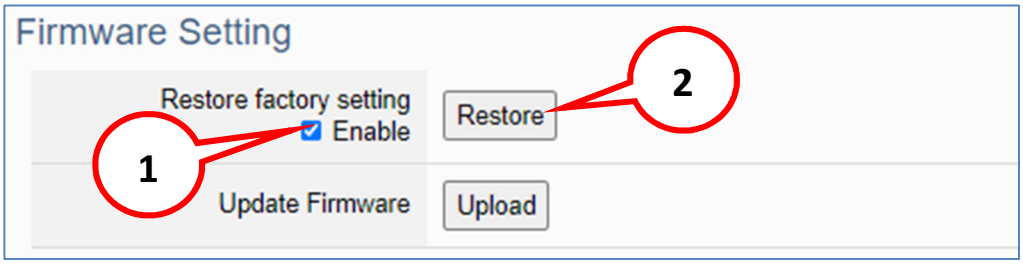



Figure 91 4-1-7 Restore factory setting(1)

2. A message will prompt appear, showing the installation process of the restore program.

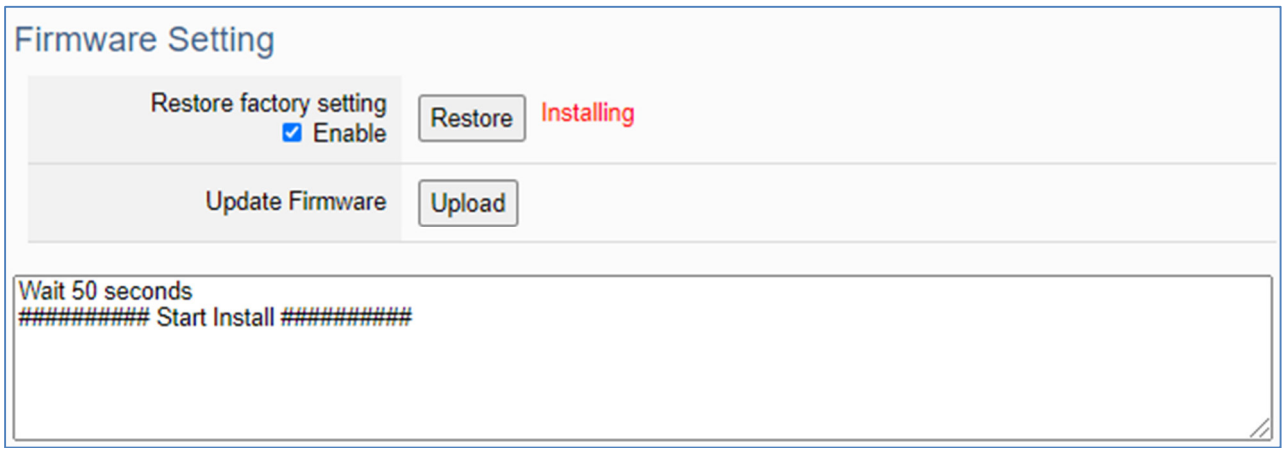



Figure 92 4-1-7 Restore factory setting(2)



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3. After the process finished, it appears a box message "During device restart, after waiting for 60 seconds, press OK", indicating that **this restoration succeeds**. If the box does not pop up, **this restoration fails**.

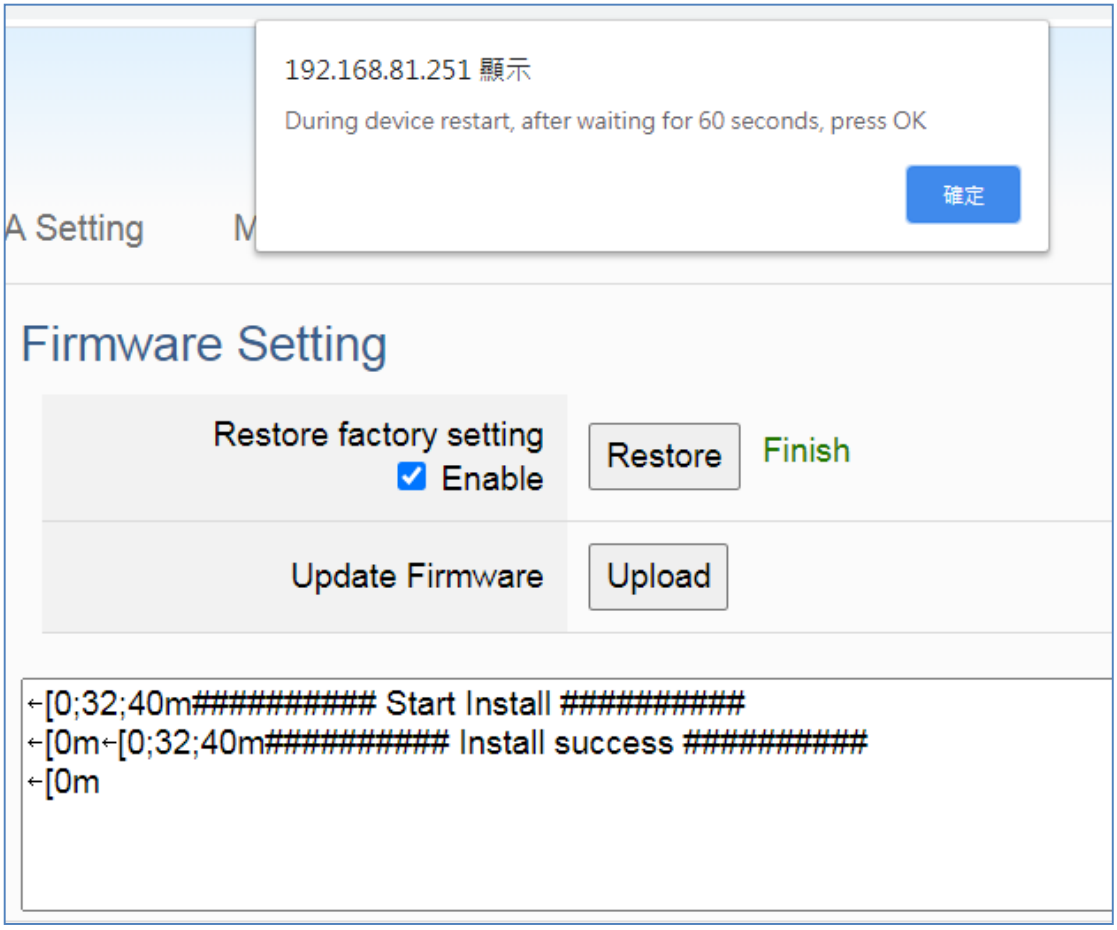



Figure 93 4-1-7 Restore factory setting(3)

4. After restarting, the module will restore the factory default settings as follows: (Web IP address automatically changes to 192.168.255.1)

Table 50 4-1-7 Factory Default Settings of UA I/O Modules

| **Factory Default Settings of UA I/O Modules** | | | |
|---|---|---|---|
| **Network** | **IP (LAN)** | **192.168.255.1** | Assign UA I/O a new IP setting according to your case. |
| | **Netmask** | **255.255.0.0** | |
| | **Gateway** | **192.168.1.1** | |
| **Web UI Account** | **Username** | **root** | **After login, change the default username/password to use other functions.** |
| | **Password** | **root** | |



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**Update Firmware**

When UA I/O has new functions, users can go to the UA series download center on the ICP DAS website to download the latest version of Firmware software, and then update the firmware of your UA I/O module according to the steps in this section.

**UA series download center on the ICP DAS website:**
https://www.icpdas.com/en/download/index.php?nation=US&kind1=&model=&kw=ua-

1. Click on the “Upload” button

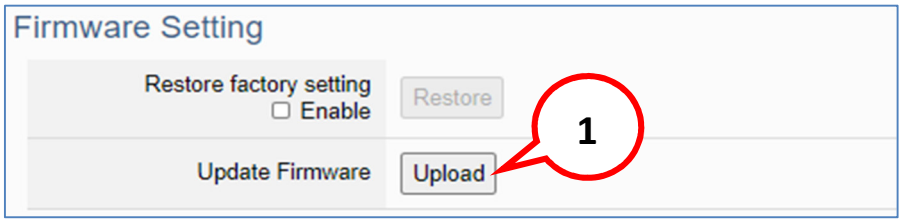



Figure 94 4-1-7 Update Firmware(1)

2. Select the firmware file

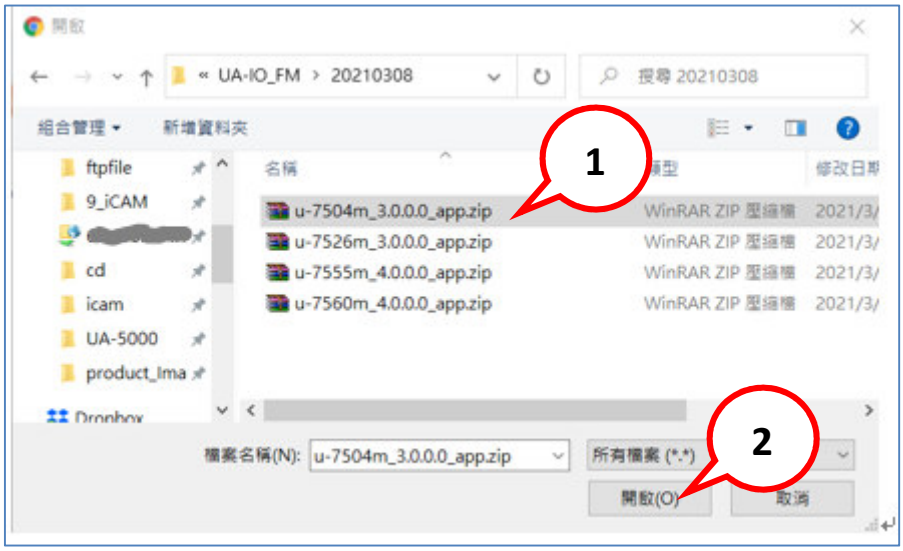



Figure 95 4-1-7 Update Firmware(2)

3. Begin to upload the Firmware file, and the lower message box will show the progress.

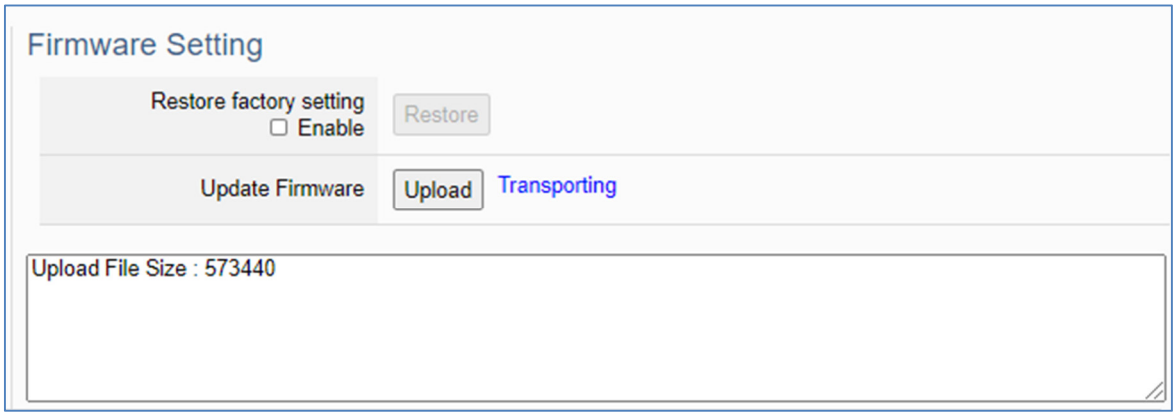



Figure 96 4-1-7 Update Firmware(3)



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4. After uploading the file, it begins to install the firmware.

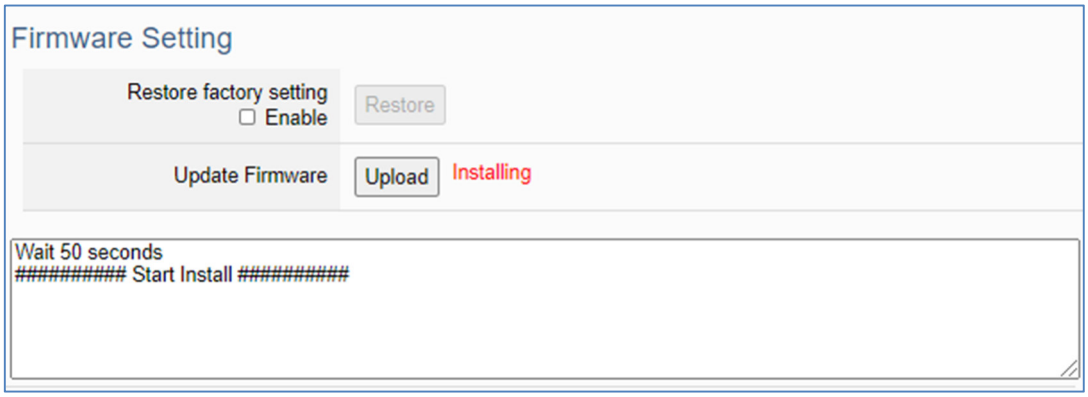



Figure 97 4-1-7 Update Firmware(4)

5. After the process is finished, it appears a box message "During device restart, after waiting for 60 seconds, press OK", indicating that **this update succeeds**. If the box does not pop up, **this update fails**.

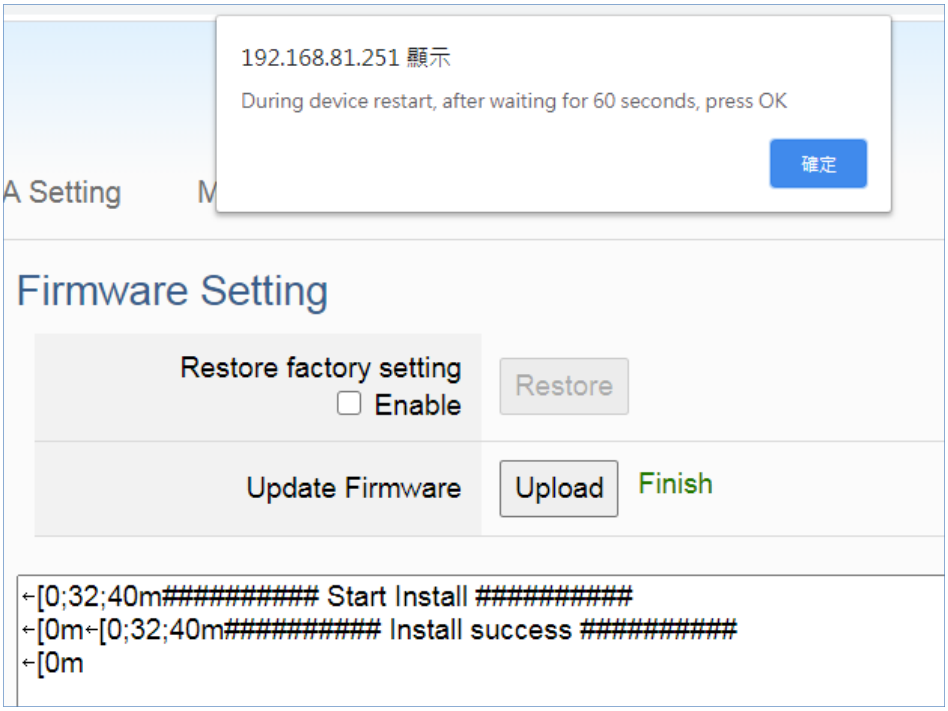



Figure 98 4-1-7 Update Firmware(5)

6. After restarting, the module will recover the UA I/O settings as follows:

Table 51 4-1-7 Update Firmware

| Update Firmware of UA I/O Modules | | | |
|---|---|---|---|
| **Network** | **IP (LAN)** | **Keep the original setting** | Assign UA I/O a new IP setting according to your case. |
| | **Netmask** | **Keep the original setting** | |
| | **Gateway** | **Keep the original setting** | |
| **Web UI Account** | **Username** | **root** | **After login, change the default username/password to use other functions.** |
| | **Password** | **root** | |



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**Maintenance**

This function is only provided to ICP DAS R&D personnel for maintenance using. It is reserved and not open for use.

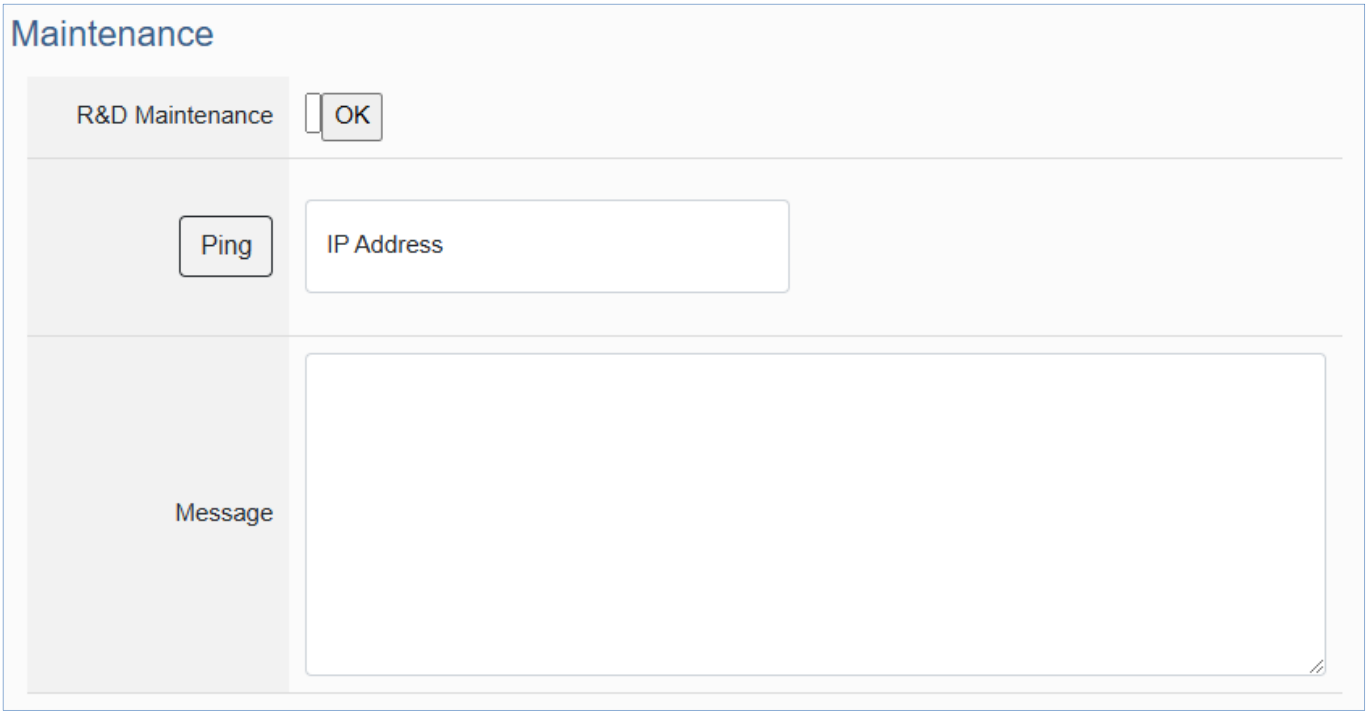



Figure 99 4-1-7 Maintenance



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# 4.2 Main Menu - Module Setting

This main menu aggregates all modules and projects in the module-related function settings. This chapter focuses on parameter descriptions. For the detailed steps and notices for using OPC UA connection/certificate, please refer to **3.1 Settings for Using OPC UA Connection** of Chapter 3 Main Function Settings.

## 4.2.1 I Overview

**Function:** Provides the status of the I/O functions, and a common settings table for download.

**Support Module:** All UA I/O modules support this function.

**Manu Path**:【Module Setting】➔【Overview】 Module Setting ➔ Overview (Refer to Appendix A)

**Function Overview**

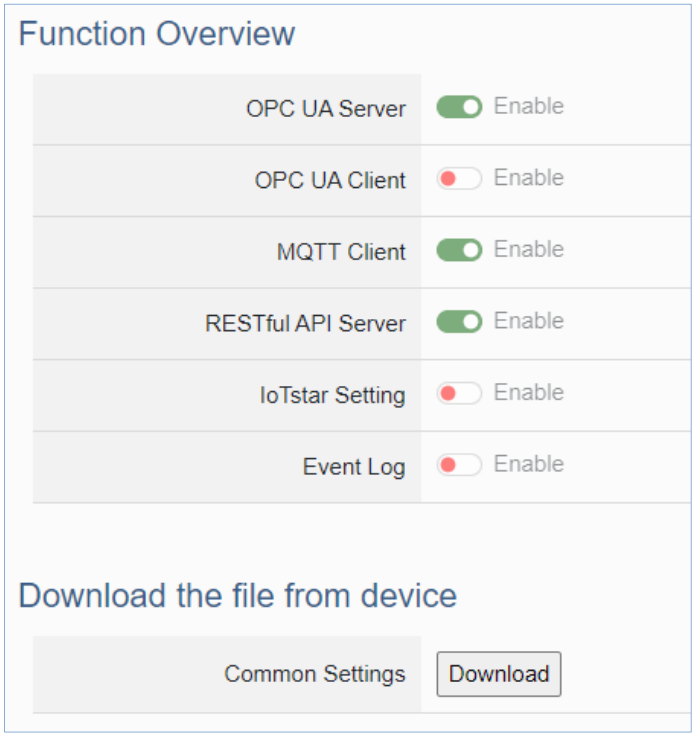



Figure 100 4-2-1 Function Overview

Table 52 4-2-1 Function Overview

| **Module Setting > Overview> Function Overview** | |
|---|---|
| OPC UA Server | Display the OPC UA Server enable status. |
| OPC UA Client | Display the OPC UA Client enable status. |
| MQTT Client | Display the MQTT Client enable status. |
| RESTful API Server | Display the RESTful API Server enable status. |
| IoTstar Setting | Display the IoTstar Client enable status. |
| Event Log | Display the Event Log enable status. |



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**Download the file from device**

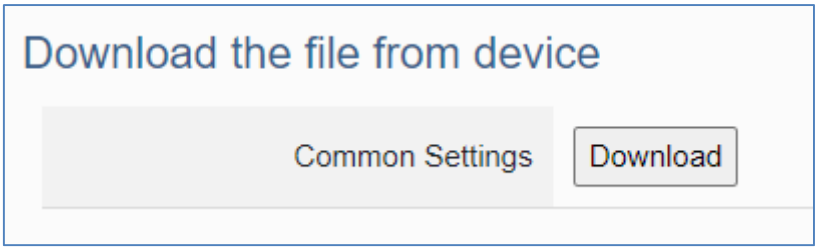



Figure 101 4-2-1 Download the file from device

Table 53 4-2-1 Download the file from device

| **Module Setting > Overview> Download the file from device** | |
|---|---|
| Common Settings | Press the Download button to get the common settings table. Example reference: For a simple setup example, please refer to Section 3.4. |



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### 4.2.2 I/O Setting

**Function:** Display and change the I/O settings of the UA I/O module.

**Support Module:** All UA I/O modules support this function, Http, and Https, both can be enabled.

**Manu Path**:【Module Setting】➔【I/O Setting】 Module Setting ➔ I/O Setting (Appendix A).

**Digital Input**

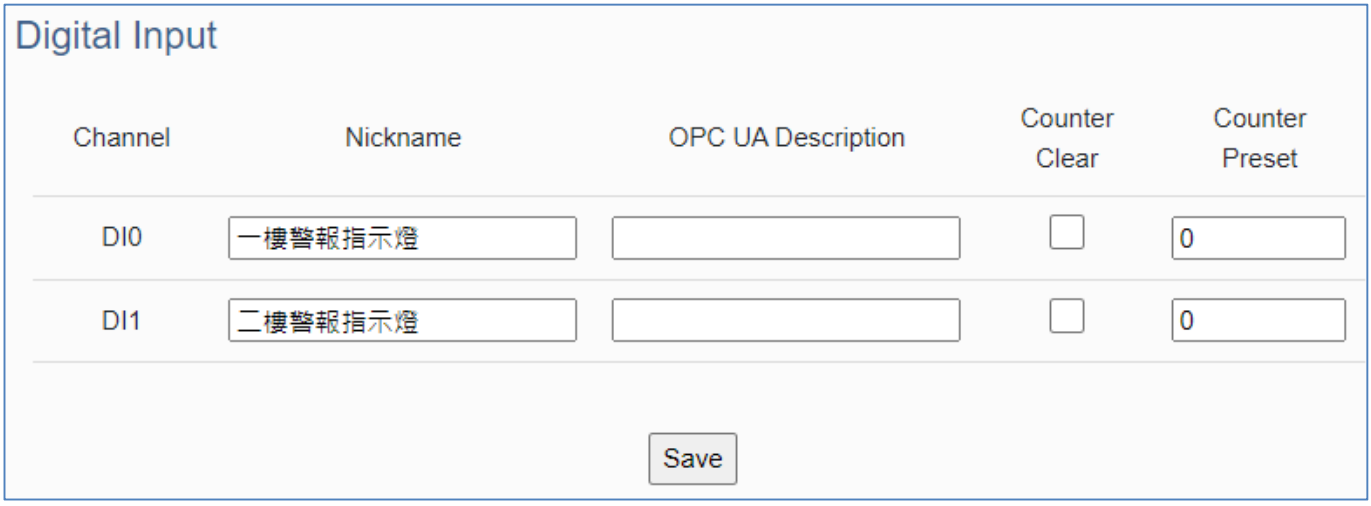



Figure 102 4-2-2 I/O Setting-Digital Input

Table 54 4-2-2 I/O Setting-Digital Input

| **Module Setting > I/O Setting - Digital Input** | |
|---|---|
| Channel | The channel name (number) of the UA I/O hardware. |
| Nickname | The identification name of the channel for easy identification |
| OPC UA Description | The messages got from the description column of the OPC Client when using an OPC UA connection. |
| Counter Clear | Counter reset to zero |
| Counter Preset | The count starts from this set value after powering on, and the count will return to zero after the module is powered off. |



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**Digital Output**




Figure 103 4-2-2 I/O Setting-Digital Output

Table 55 4-2-2 I/O Setting-Digital Output

| **Module Setting > I/O Setting - Digital Output** | |
|---|---|
| Channel | The channel name (number) of the UA I/O hardware. |
| Nickname | The identification name of the channel for easy identification |
| OPC UA Description | The messages got from the description column of the OPC Client when using an OPC UA connection. |
| Power-on Value | After the power is turned off and restarted, the startup value of I/O, if checked, the boot output will output True, otherwise, it will output False. |



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**Analog Input**

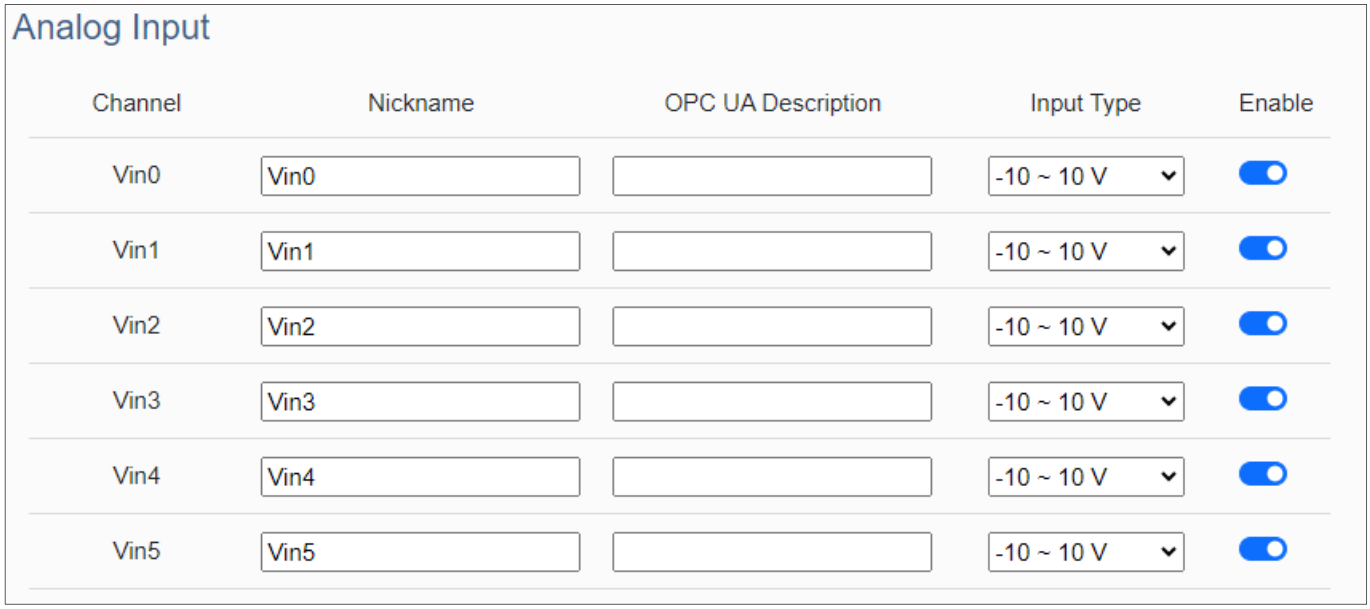



Figure 104 4-2-2 I/O Setting-Analog Input

Table 56 4-2-2 I/O Setting-Analog Input

| **Module Setting > I/O Setting – Analog Input** | |
|---|---|
| Channel | The channel name (number) of the UA I/O hardware. |
| Nickname | The identification name of the channel for easy identification |
| OPC UA Description | The messages got from the description column of the OPC Client when using an OPC UA connection. |
| Input Type | Select the Input type by user's need. |
| Enable | Set the analog input channels individually to enable or disable. |



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**Analog Output**

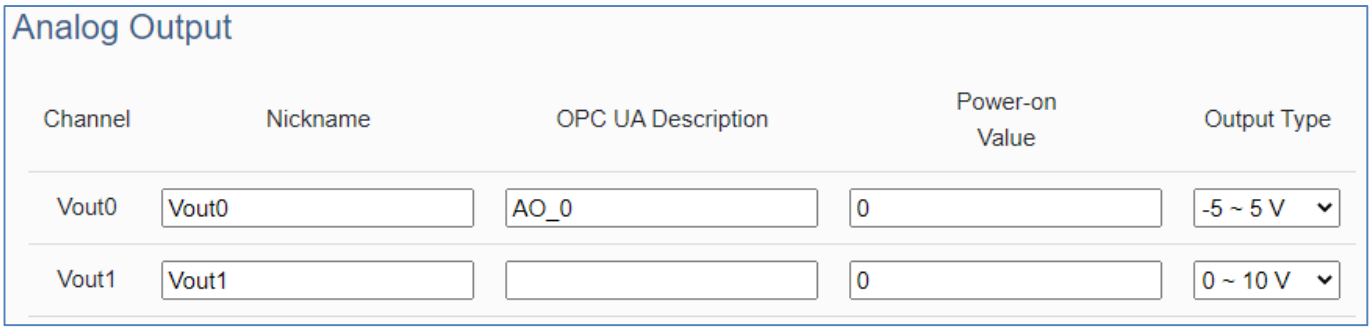



Figure 105 4-2-2 I/O Setting-Analog Output

Table 57 4-2-2 I/O Setting-Analog Output

| **Module Setting > I/O Setting – Analog Output** | |
|---|---|
| Channel | The channel name (number) of the UA I/O hardware. |
| Nickname | The identification name of the channel for easy identification |
| OPC UA Description | The messages got from the description column of the OPC Client when using an OPC UA connection. |
| Power-on Value | The initial value of the I/O channel after the power off and restart to on. |
| Output Type | Select the Output type by user's need. |



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### 4.2.3 Scaling

**Function:** The Setting of scaling converts the analog signal to a more readable value. This function is only available for modules with AI/AO.

**Support Module:** All UA AI/AO modules support this function.

**Manu Path**:【Module Setting】➔【Scaling】 Module Setting ➔ Scaling (Appendix A).

When the variable value needs to be scaled or converted before output. Fill in the Min/Max items of the Source/Output Variable, and add a description, the Scaling conversion function will be activated.

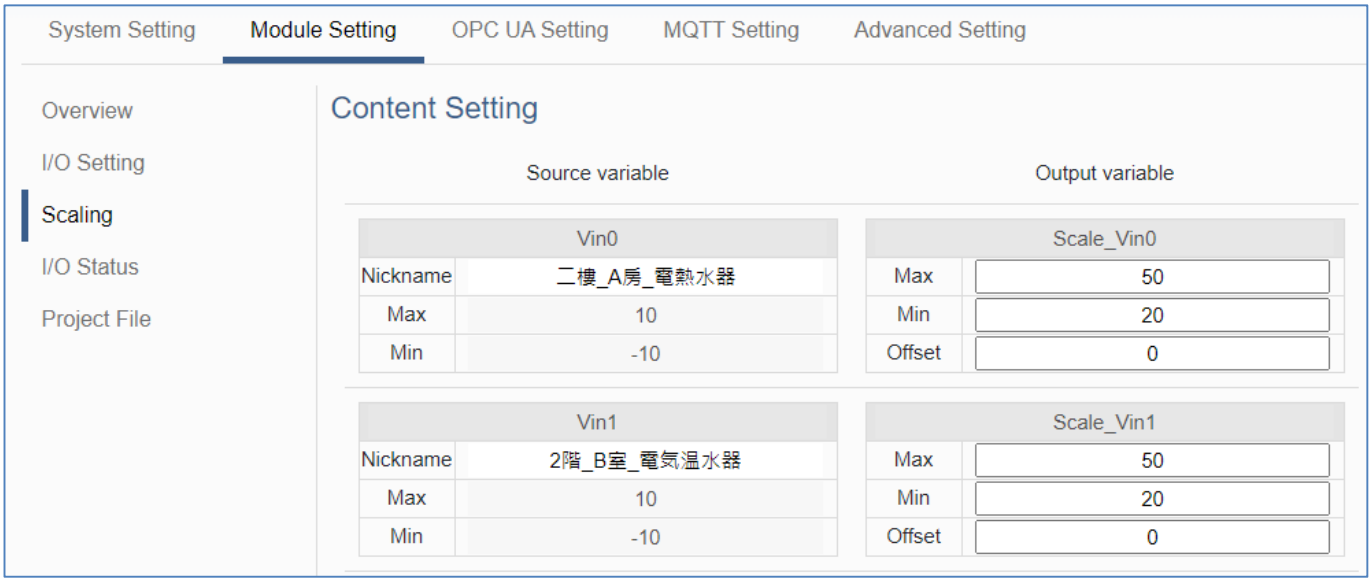



Figure 106 4-2-3 Module Setting-Scaling

Table 58 4-2-3 Module Setting-Scaling

| **Module Setting > Scaling – Content Setting** | |
|---|---|
| Nickname(Source variable) | The Nickname in the function of [Module Setting] ➔ [I/O Setting] |
| Min (Source variable) | The source variable that is to be converted; Fill in its minimum value. |
| Max (Source variable) | The source variable that is to be converted; Fill in its maximum value. |
| Min (Output variable) | The output variable that is to be converted; Fill in its minimum value. |
| Max (Output variable) | The output variable that is to be converted; Fill in its maximum value. |
| Offset (output variable) | Output variable + Offset = Actual Value |



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### 4.2.4 I/O Status

**Function:** Display and change the I/O status of the UA I/O module.

**Support Module:** All UA I/O modules support this function.

**Manu Path**:【Module Setting】➔【I/O Status】 Module Setting ➔ I/O Status (Appendix A).

**Digital Input (& Counter)**




Figure 107 4-2-4 I/O Status-Digital Input

Table 59 4-2-4 I/O Status-Digital Input

| **Module Setting > I/O Status - Digital Input** | |
|---|---|
| Channel | The channel name (number) of the UA I/O hardware. |
| Nickname | The Nickname in the function of [Module Setting] ➔ [I/O Setting] |
| Value | Current channel status value. When the value changes, the signal LED will change. |
| Status | GOOD, BAD, or UNCERTAIN. |



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**Digital Output**




Figure 108 4-2-4 I/O Status-Digital Output

Table 60 4-2-4 I/O Status-Digital Output

| **Module Setting > I/O Status - Digital Output** | |
|---|---|
| Channel | The channel name (number) of the UA I/O hardware. |
| Nickname | The Nickname in the function of [Module Setting] ➔ [I/O Setting] |
| Value | Current channel status value. When the value changes, the signal LED will change. |
| Status | GOOD, BAD, or UNCERTAIN. |



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**Analog Input**

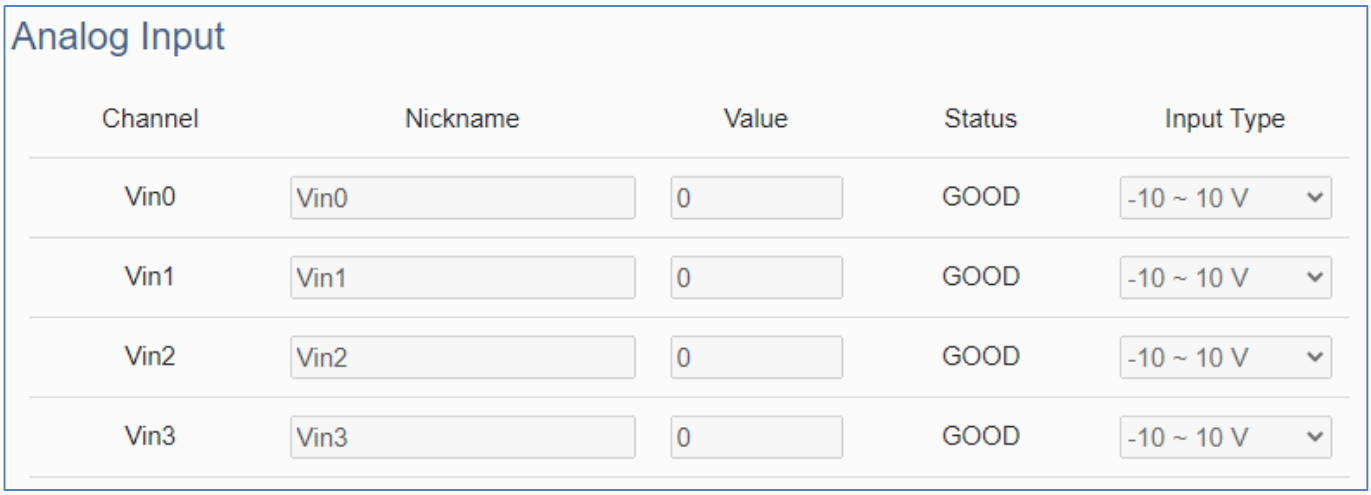



Figure 109 4-2-4 I/O Status-Analog Input

Table 61 4-2-4 I/O Status-Analog Input

| **Module Setting > I/O Status – Analog Input** | |
|---|---|
| Channel | The channel name (number) of the UA I/O hardware. |
| Nickname | The Nickname in the function of [Module Setting] ➔ [I/O Setting] |
| Value | Current channel status value.<br>When the input type is 4-20mA, if an abnormal state occurs, the value will display as -32.768. |
| Status | GOOD, BAD, or UNCERTAIN. |

| Input type | Display Value | Anomalous narrative |
|---|---|---|
| 4~20mA | -32.768 | Signal source disconnected |



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**Analog Output**




Figure 110 4-2-4 I/O Status-Analog Output

Table 62 4-2-4 I/O Status-Analog Output

| **Module Setting > I/O Status - Analog Output** | |
|---|---|
| Channel | The channel name (number) of the UA I/O hardware. |
| Nickname | The Nickname in the function of [Module Setting] ➔ [I/O Setting] |
| Value | Current channel status value. |
| Status | GOOD, BAD, or UNCERTAIN. |



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### 4.2.5 Project File

**Function:** download and upload the project file of the UA I/O module.
**Support Module:** All UA I/O modules support this function.
**Manu Path**:【Module Setting】➔【Project File】 Module Setting ➔ Project File (Appendix A).

**Download the file from device**

APP Project File: Easy to copy the APP settings of this UA-I/O to other UA-I/Os.
APP Project File + System Settings: When this UA-I/O fails, the same UA-I/O can be copied immediately by uploading the AllSetting file.

Click the [Download] button to download the file to your computer.

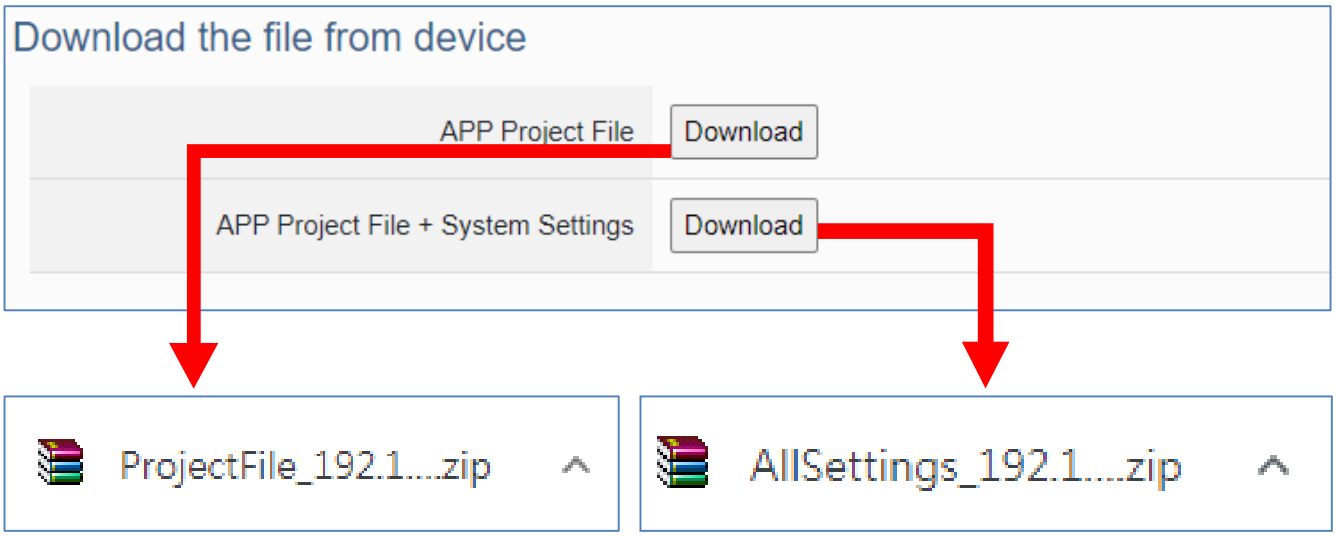



Figure 111 4-2-5 Download the file from device(1)



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**Upload the file to the device**

Upload the "ProjectFile_xxx_.zip" file to replace the backed-up project file, then you can restore the project parameters.

Click [Upload] button, select the project file in the PC.

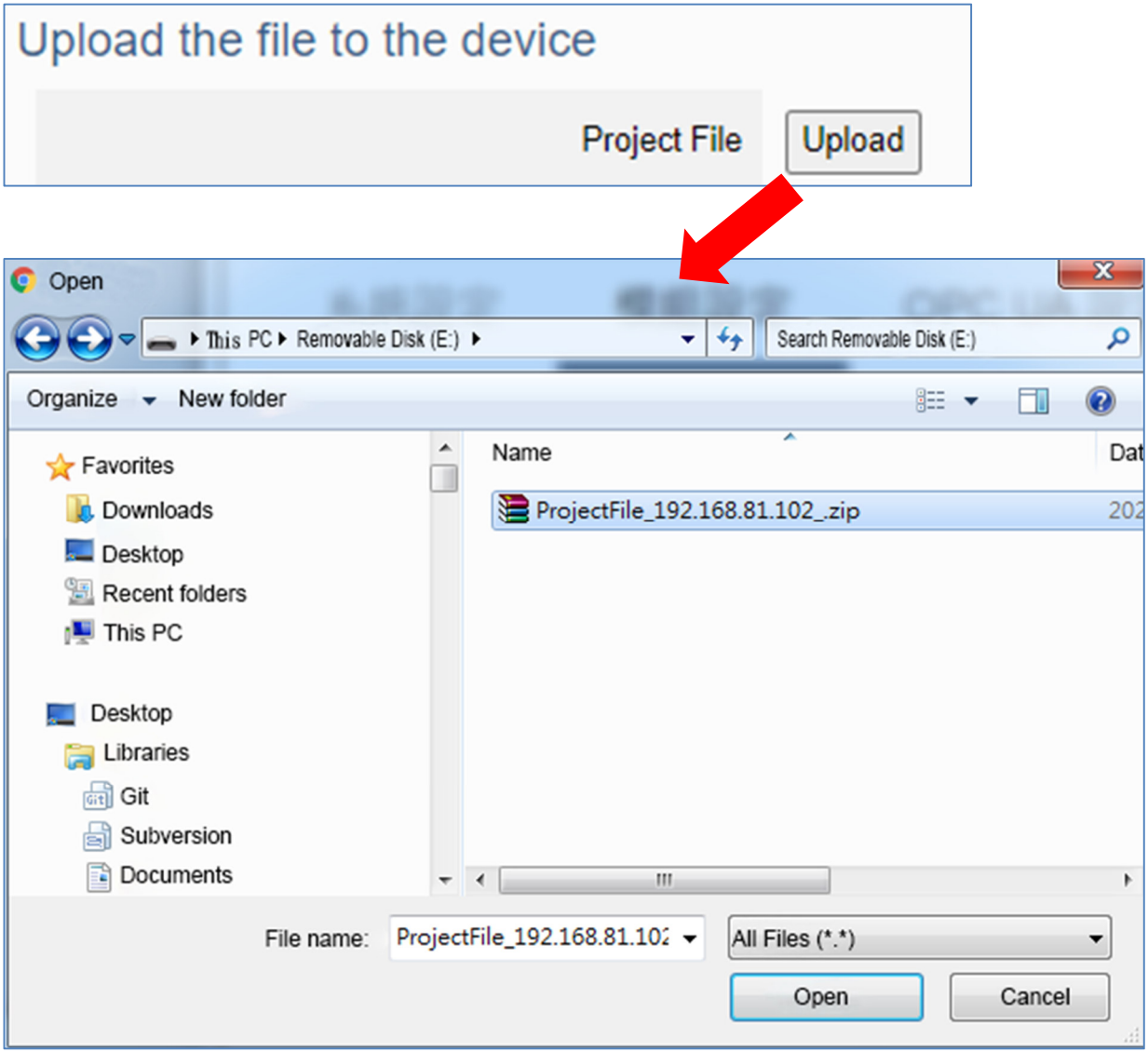



Figure 112 4-2-5 Download the file from device(2)



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Upload the "AllSettings_xxx_.zip" file to restore all previous UA-I/O settings.

Click the [Upload] button, and select the project file to be uploaded.

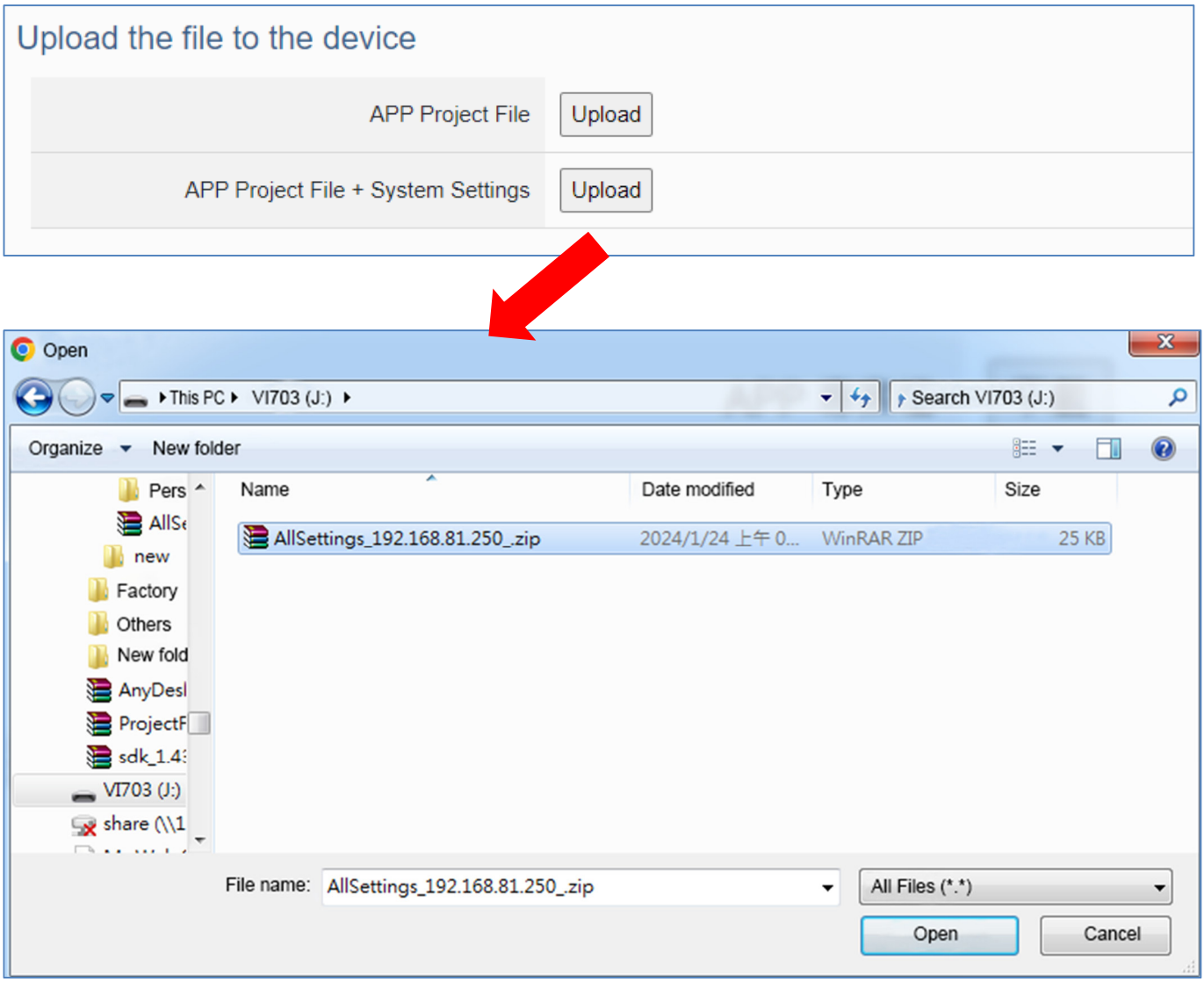



Figure 113 4-2-5 Download the file from device(3)



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# 4.3 Main Menu - OPC UA Setting

This main menu aggregates all OPC UA related settings. This chapter focuses on parameter descriptions. About the detailed steps and notices for using OPC UA connection/certificate, please refer to **3.1 Settings for Using OPC UA Connection** of Chapter 3 Main Function Settings.

**NOTE:**
When the main menu "**OPC UA Setting**" has a message of "Please remove the server certificate" (as the picture below), that means there is something error about the server certificate file.

Please click the menu【OPC UA Setting】➔【Certificate】 OPC UA Setting ➔ Certificate (Appendix A) to remove the Server Certificate, the function of OPC UA menu will be normal again.

The operation to remove the Server Certificate, please refer to the next two section "4.3.2 Certificate".

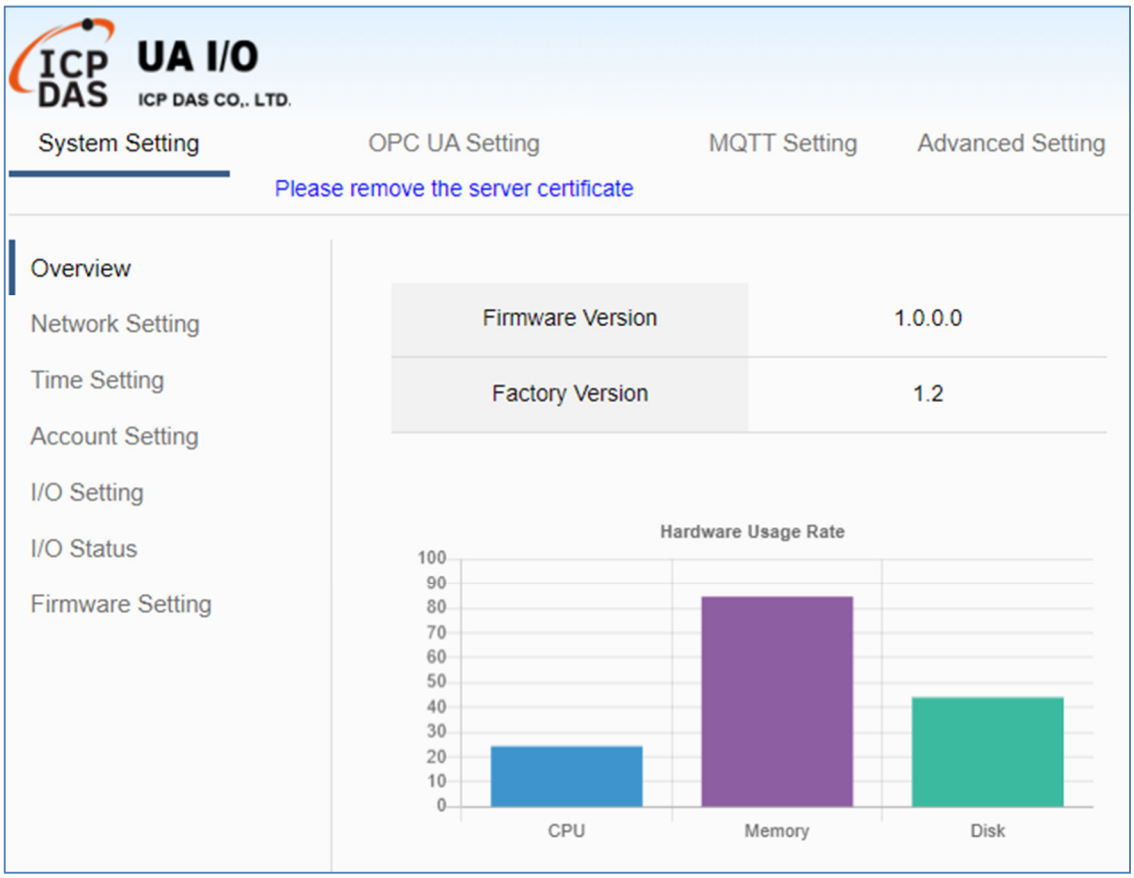



Figure 114 4-3 OPC UA Setting-Please remove the server certiifcate



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### 4.3.1 Server Setting

**Function:** Provide the Server settings for using the OPC UA connection.
**Support Module:** All UA I/O modules support this function.

**Manu Path**:【OPC UA Setting】➔【Server Setting】 OPC UA Setting ➔ Server Setting (Appendix A).

**Sample: For a simple setting example, please refer to Section 3.1 .**

**The OPC UA Server supports IPv4 only.**

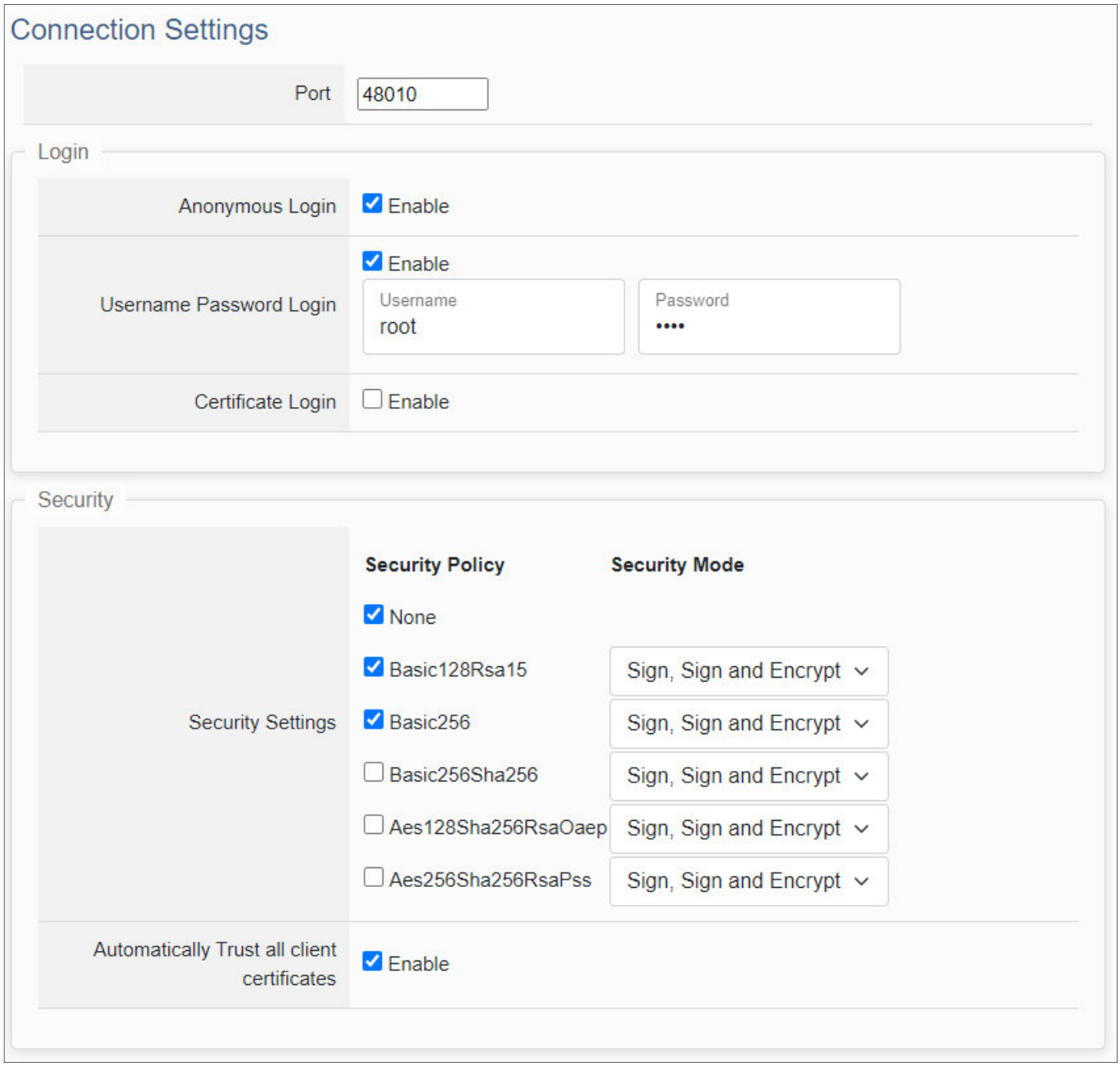



Figure 115 4-3-1 Server Setting-Connection Settings



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Table 63 4-3-1 Server Setting-Connection Settings

| **OPC UA Setting > Server Setting - Connection Setting** | | |
|---|---|---|
| Port | The communication port number of the OPC UA Server.<br>System Default: 48010. | |
| Anonymous Login | Check to enable the anonymous login from OPC UA clients. | |
| Username Password Login | Check to enable the user password login from OPC UA clients.<br>The following are the defaults for username and password:<br>Username: root<br>Password: root | |
| Certificate Login | Check to enable the certificate login from OPC UA clients.<br>(refer to next section, Server Certificate) | |
| Security Setting | Security Policy | Security Mode |
| | None | |
| | Basic128Rsa15 | Sign, Sign and Encrypt |
| | Basic256 | Sign, Sign and Encrypt |
| | Basic256Sha256 | Sign, Sign and Encrypt |
| | Aes128Sha256RsaOaep | Sign, Sign and Encrypt |
| | Aes256Sha256RsaPss | Sign, Sign and Encrypt |
| Automatically Trust all client certificates | Set this item to true if the OPC UA Client requires only the security policy but doesn't need to exchange certificates when connecting. Set this item to false if you need to exchange certificates.<br>Default: true | |
| Save | Click to save the connection settings of the OPC UA Server. | |



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### 4.3.2 Server Certificate

**Function:** When selecting the OPC UA certificate connection, the UA I/O (Server side) needs to exchange the certificate with the connecting client side. This page is about setting the OPC UA Certificate for security and encryption, e.g. upload, download, delete the certificate.
**Support Module:** All UA I/O modules support this function.
**Manu Path**:【OPC UA Setting】➔【Server Certificate】 OPC UA Setting ➔ Server Certificate (Appendix A).

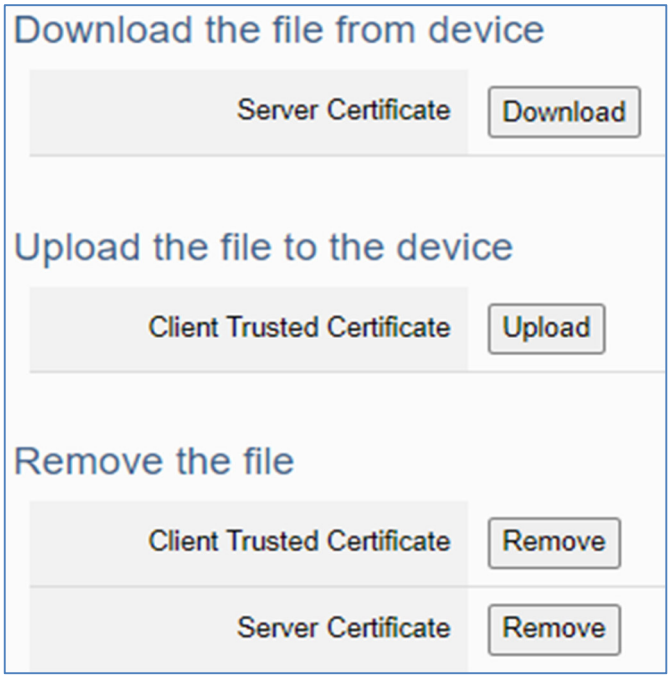



Figure 116 4-3-2 Server Certificate

Table 64 4-3-2 Server Certificate

| | |
|---|---|
| **OPC UA Setting > Server Certificate – Download the file from device** | |
| Server Certificate | Click “Download” to download the OPC UA Server Certificate file to the PC for the use of the client-side device. File Name: icpdasuaserver.der |
| **OPC UA Setting > Server Certificate –Upload the file to the device** | |
| Client Trusted Certificate | Click “Upload” to select the OPC UA Client Trusted Certificate file on your PC, and upload the Trusted Certificate file to the UA I/O module.<br>File extension: **.der**, **.cer**, and **.crt**. only |
| **OPC UA Setting > Server Certificate – Remote the file** | |
| Client Trusted Certificate | Click “Remove” to delete all Client Trusted Certificate files. |
| Server Certificate | Click “Remove” to delete all Server Certificate files. |


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### 4.3.3 Client Setting

**Function:** The OPC UA Client connection settings.
**Support Module:** All UA I/O modules support this function.

**Manu Path**:【OPC UA Setting】➔【Client Setting】 OPC UA Setting ➔ Client Setting (Appendix A).

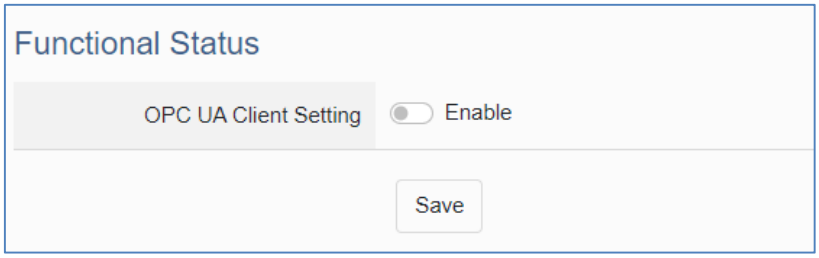



Figure 117 4-3-3 Client Setting-Functional Status

Table 65 4-3-3 Client Setting-Functional Status

| OPC UA Setting > Client Setting - Functional Status | |
|---|---|
| OPC UA Client | To use this function, select Enable and click the Save button. |

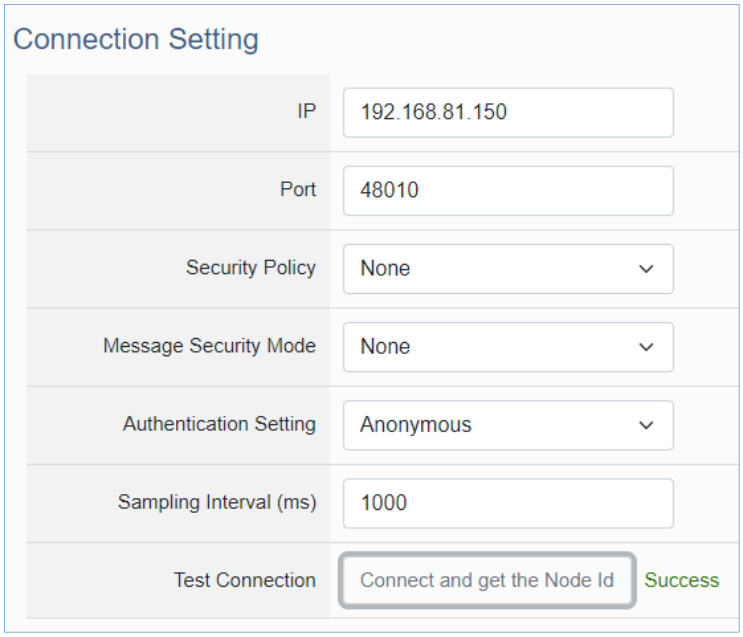



Figure 118 4-3-3 Client Setting-Connection Setting

Table 66 4-3-3 Client Setting-Connection Setting

| OPC UA Setting > Client Setting - Connection Setting | |
|---|---|
| IP | The IP address of the OPC UA Server. (IPv4 only) |
| Port | The port used by the OPC UA Server. |
| Security Policy | The security policy to use so that you can secure messages that are read from the OPC-UA source.<br>Choose one of the following: None, Basic128Rsa15, Basic256, Basic256Sha256, Aes128Sha256RsaOaep, Aes256Sha256RsaPss. |
| Message Security Mode | The message security mode to use to secure connections to the OPC-UA source.<br>Choose one of the following: None, Sign, Sign & Encrypt. |
| Server Certoficate Verify | This item appears when the "Security Policy" option is not None. |



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| | |
|---|---|
| | Used to select either to authenticate the uploaded OPC UA Server certificate or not. |
| Authentication Setting | The client makes the settings for user authentication.<br>Choose one of the following: Anonymous, Username, Password, Certificate, Private Key. |
| Sampling Interval (ms) | Synchronize the time interval of I/O data so the data of the module and OPC UA Server are synchronized. |
| Test Connection | Click "Connect and get node Id" to connect to OPC UA Server.<br>Success: You can connect and get the node ID of the Server side. (IdentifierType = String or Numeric only). |

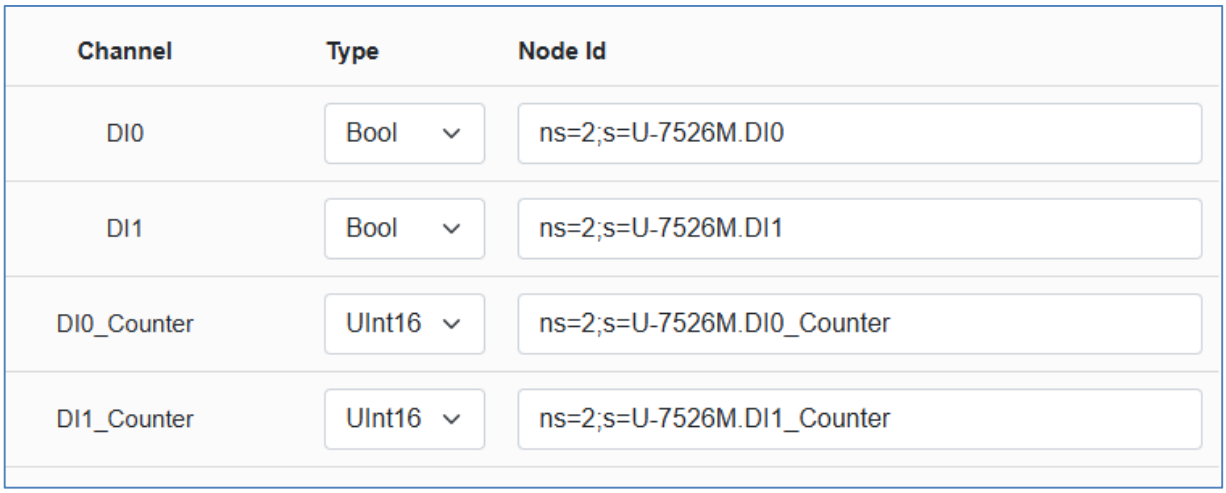



Figure 119 4-3-3 Client Setting- Connect and get the Node Id

Table 67 4-3-3 Client Setting-Connection Setting

| **OPC UA Setting > Client Setting – Connection Setting** | |
|---|---|
| Channel | The Nickname in the function of [Module Setting] ➔ [I/O Setting] |
| Type | Select Data Type.<br>Data Type: Bool, SByte, Int16, Int32, Int64, Byte, UInt16, UInt32, UInt64, Float, Double, String |
| Node Id | Select the node Id on the OPC UA Server (IdentifierType = String or Numeric only), and synchronize the channel I/O data to the Server. |



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### 4.3.4 Client Certificate

**Function:** When OPC UA Certificates are connected, they need to exchange certificates with each other. The interface provides Certificate Upload, Download, and Remove functions.
**Support Module:** All UA I/O modules support this function.

**Manu Path**:【OPC UA Setting】➔【Client Certificate】 OPC UA Setting ➔ Client Certificate (Appendix A).

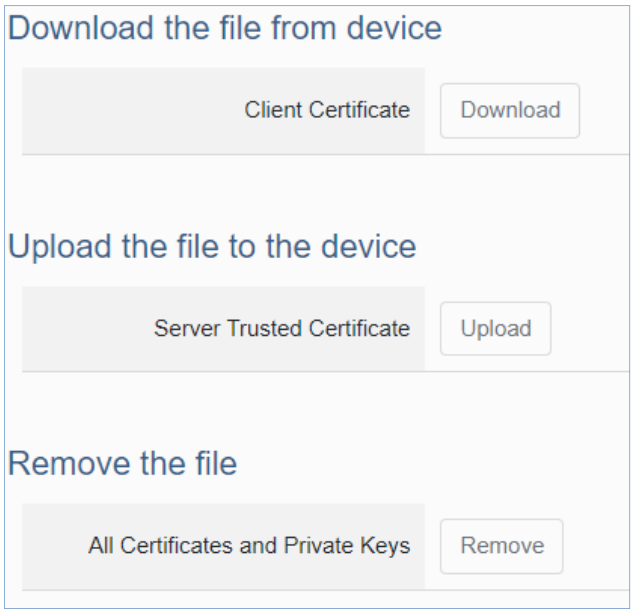



Figure 120 4-3-4 Client Certificate- Download the file from the device

Table 68 4-3-4 Client Certificate- Download the file from the device

| **OPC UA Setting >Client Certificate – Download the file from device** | |
|---|---|
| Client Certificate | Click “download” to get the Client Certificate.<br>File Name: icpdasuasclient.der. |
| **OPC UA Setting > Client Certificate –Upload the file to the device** | |
| Server Trusted Certificate | Click “Upload” to select the OPC UA Server Trusted Certificate file on your PC.<br>File extension: **.der**, **.cer**, and **.crt**. only |
| **OPC UA Setting > Client Certificate – Remote the file** | |
| All Certificates and Private Keys | Click "Remove" to delete Client Certificates, Server trusted Certificates and. the certificate and private key in the OPC UA setting. |



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# 4.4 Main Menu – MQTT Setting

This main menu aggregates all MQTT-related settings. This chapter focuses on parameter descriptions. For the detailed steps and notices for using MQTT connection/certificate, please refer to **3.2 Settings for Using MQTT Connection** of Chapter 3 Main Function Settings.

## 4.4.1 Connection Setting

**Function:** Provide the remote MQTT Broker settings for using the MQTT connection.
**Support Module:** All UA I/O modules support this function.

**Manu Path**:【MQTT Setting】➔【Connection Setting】 MQTT Setting ➔ Connection Setting (Appendix A).

**Sample: For a simple setting example, please refer to Section 3.2 .**

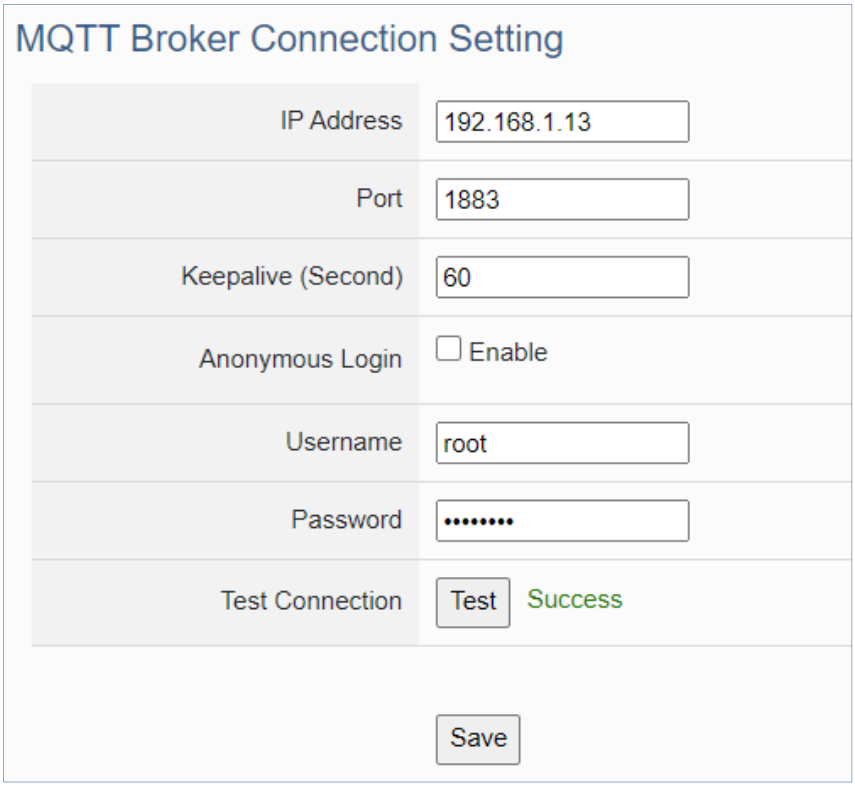



Figure 121 4-4-1 MQTT Broker Connection Setting

Table 69 4-4-1 MQTT Broker Connection Setting

| **MQTT Setting > Connection Setting** | |
|---|---|
| IP Address | The IP address of the remote MQTT Broker |
| Port | The communication port number of the remote MQTT Broker. |
| Keepalive (Second) | Keep alive detection time. Default: 60 |
| Anonymous Login | When checking the item box, it can connect without a username and password. If not checked, it needs to set a username and password. |
| Username | The username to login the remote MQTT Broker |
| Password | The password to login the remote MQTT Broker |
| Test Connection | Click the Test button to test whether the connection to the MQTT Broker is successful. |
| Save | Click to save the setting of this page. |



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### 4.4.2 Client Setting

**Function:** Provide the MQTT Client settings for using MQTT connection.

**Support Module:** All UA I/O modules support this function.

**Manu Path**:【MQTT Setting】➔【Client Setting】 MQTT Setting ➔ Client Setting (Appendix A).

**Sample: For a simple setting example, please refer to Section 3.2 .**

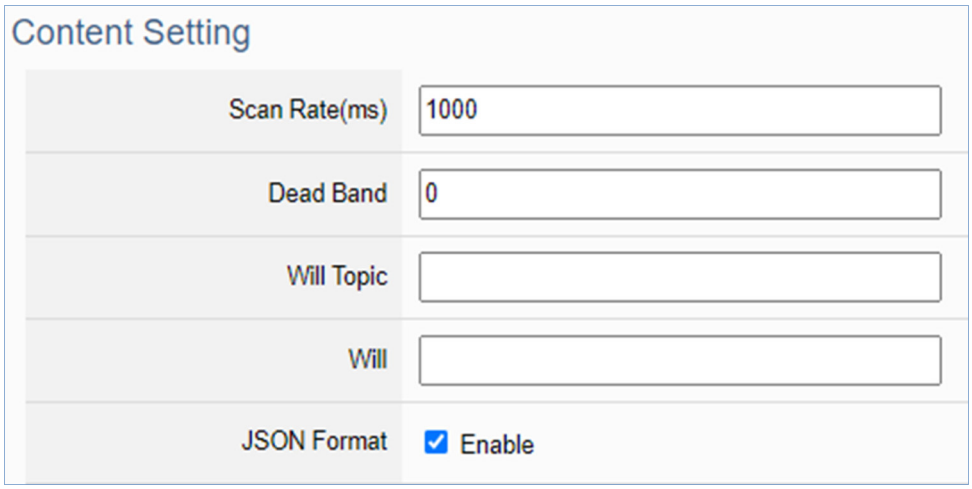



Figure 122 4-4-2 Client Setting-Content Setting

Table 70 4-4-2 Client Setting-Content Setting

| **MQTT Setting > Client Setting – Content Setting** | |
|---|---|
| Update Rate(ms) | Set an update frequency for the task data. Default: 1000 (Unit: ms) |
| Dead Band | Give a dead bend value for updating a float signal. Default: 0<br>Dead Band description please refer to Appendix C. |
| Will Topic | Topic with abnormal disconnection. Default: Null.<br>When the Broker detects that the client is disconnected abnormally, it will publish the Will message to Specified Will Topic.<br>(Topic cannot contain “#”, “+”, and “$” |
| Will | Enter a disconnect notice. Default: Null. |
| JSON Format | Switch the format for sending MQTT messages.<br>If "Enable" is checked, the message will send in groups. For the message format, please refer to Appendix B.<br>If "Enable" is not checked, the message will send in singly. |

If the JSON format is checked as "Enable", the message is sent as a group. For its setting items and parameter descriptions, please see the next page.

If the JSON format is not checked, the message is sent in singly. For its setting items and parameter descriptions, please see the page after the next page.



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- JSON Format: Enable (message is sent as a group):

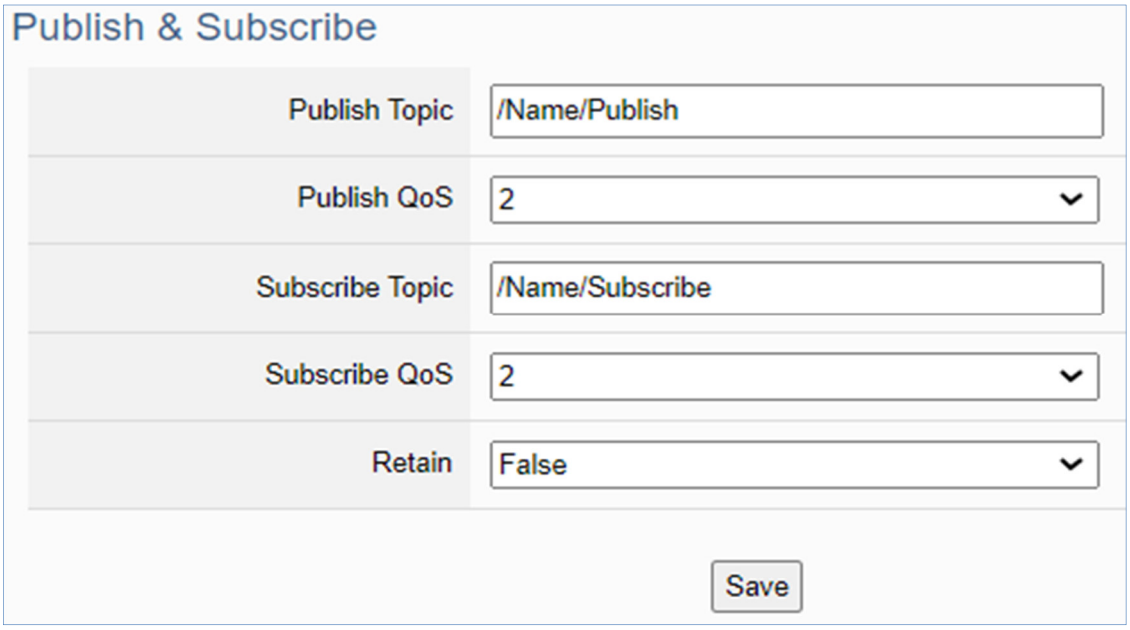



Figure 123 4-4-2 JSON Format-Enable

Table 71 4-4-2 JSON Format-Enable

| **MQTT Setting > Client Setting - Publish & Subscribe (JSON Format: ☑ Enable)** | |
|---|---|
| Publish Topic | The topic of sending data/publishing messages. |
| Publish QoS | The publish Qos (Quality of Service) levels. Default: 2<br>0: Delivering a message at most once.<br>1: Delivering a message at least once.<br>2: Delivering a message at exactly once. |
| Subscribe Topic | The topic of receiving data / subscribing messages. It can copy the Publish Topic of the linked device. |
| Subscribe QoS | The subscribe Qos (Quality of Service) levels. Default: 2<br>0: Delivering a message at most once.<br>1: Delivering a message at least once.<br>2: Delivering a message at exactly once. |
| Retain | Set up if the Broker retains the message. |
| Save | Click to save the setting of this page. |



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- JSON Format: Not Enable (message is sent in singly):

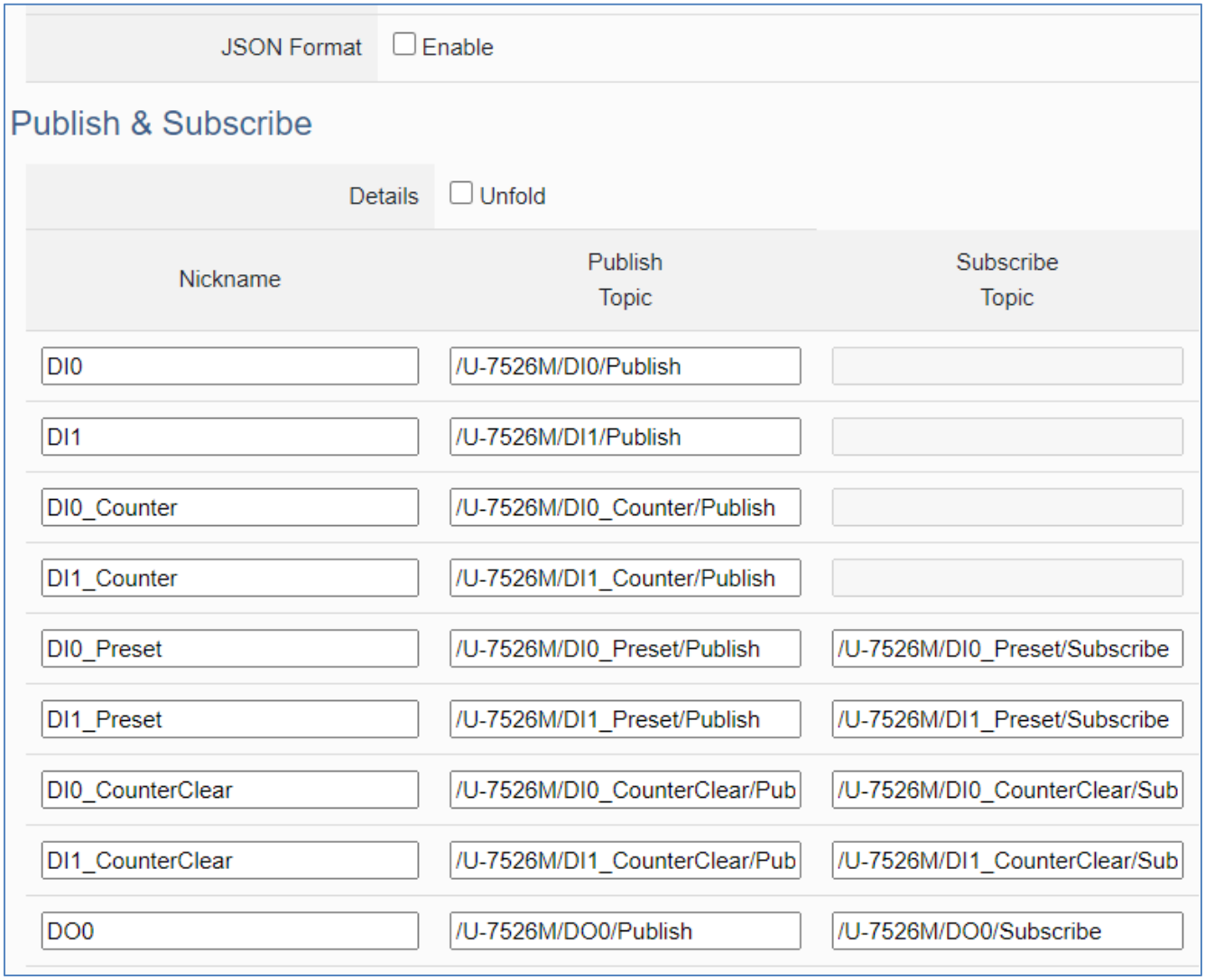



Figure 124 4-4-2 JSON Format-Not Enable

Table 72 4-4-2 JSON Format-Not Enable

| **MQTT Setting > Client Setting - Publish & Subscribe (JSON Format: ☑ Enable)** | |
|---|---|
| Details | Check “Unfold” to display all fields. |
| Nickname | The Nickname in the function of [Module Setting] ➔ [I/O Setting] |
| Publish Topic | The topic of sending data / publishing message. |
| Publish QoS | The publish Qos (Quality of Service) levels. Default: 2<br>0: Delivering a message at most once.<br>1: Delivering a message at least once.<br>2: Delivering a message at exactly once. |
| Subscribe Topic | The topic of receiving data / subscribing message. It can copy the Publish Topic of linked device. |
| Subscribe QoS | The subscribe Qos (Quality of Service) levels. Default: 2<br>0: Delivering a message at most once.<br>1: Delivering a message at least once.<br>2: Delivering a message at exactly once. |
| Save | Click to save the setting of this page. |



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### 4.4.3 Certificate

**Function:** When selecting MQTT certificate connection, the UA I/O needs to exchange the certificate with the connecting device. This page is about setting the MQTT Certificate for the security and encryption.

**Support Module:** All UA I/O modules support this function.

**Manu Path**:【MQTT Setting】➔【Client Setting】 MQTT Setting ➔ Client Setting (Appendix A).

1. "SSL/TLS" is not "enable" by default. When not enabled, other setting items will be hidden.

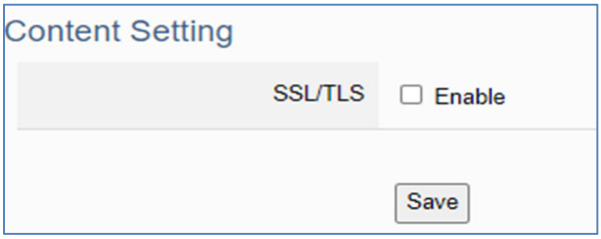
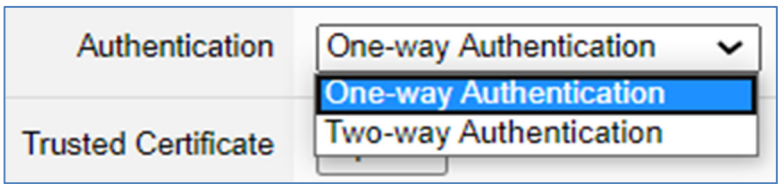



Figure 125 4-4-3 Certificate-SSL/TLs is not enable

Table 73 4-4-3 Certificate-SSL/TLs is not enable

| MQTT Setting > Certificate – Content Setting | |
|---|---|
| SSL/TLS | Check the box and click "Save" to enable the settings for SSL/TLS secure communication. Default: uncheck.<br>The setting items will not appear until clicking the "Save" button. |

2. Authentication setting item will show up after enable "SSL/TLS". Select one way or two way authentication.




**One-way authentication:** The **Client verifies** the validity of **Broker** credentials.
**Two-way authentication:** The **Client and Broker verify** the validity of the certificate with **each other**.

This setting page is setting for the MQTT secure encrypted communication (SSL/TLS: Secure Socket Layer / Transport Layer Security). Before setting this function, you need to download or upload the relevant certificates. There are three types of certificates: Trusted Certificate, Certificate, and Private Key. Please upload the files to the UA I/O module according to the type of certificates.

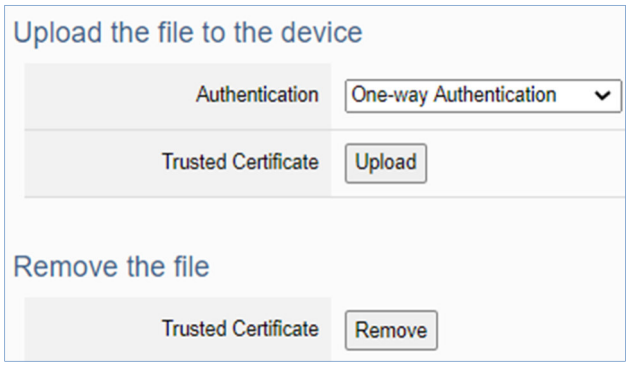
**To perform the One-way authentication, you need to upload the Trusted Certificate.**
**To perform the Two-way authentication, you need to upload the Trusted Certificate first, and then upload the Certificate and Private Key.**



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Parameter Function Descriptions:

**One-way Authentication Screen**




**Two-way Authentication Screen**

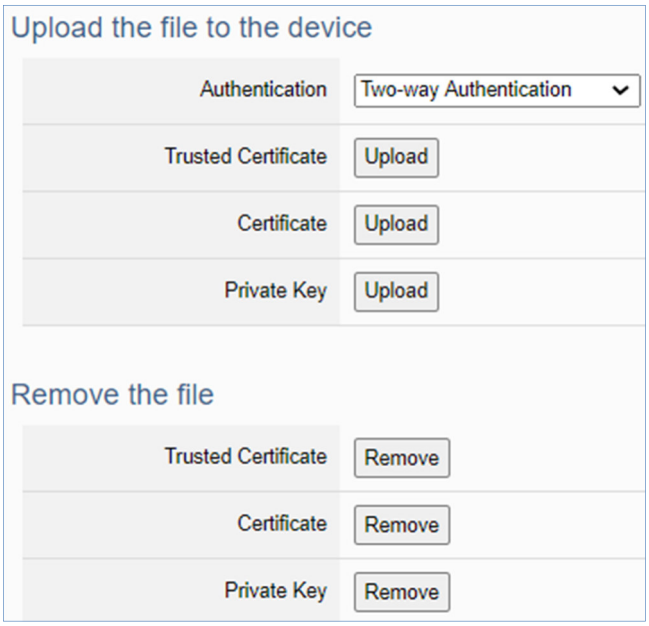



Figure 126 4-4-3 One/Two-way Authentication Screen

Table 74 4-4-3 One/Two-way Authentication Screen

| **MQTT Setting > Certificate – Upload the file to the device** | |
|---|---|
| Authentication | **One-way authentication**: The Client verifies the validity of Broker credentials; need to upload the Trusted Certificate.<br>**Two-way authentication**: The Client and Broker verify the validity of the certificate with each other; need to upload the Trusted Certificate first, and then upload the Certificate and Private Key. |
| Trusted Certificate | **Upload**: Click to select the MQTT Trusted Certificate file of the device, and upload the MQTT Trusted Certificate file to the UA I/O module.<br>• File format must be PEM. Extension name must be “pem”, “cer”, or “crt”. |
| Certificate | **Upload**: Click to select the MQTT Certificate file of the device, and upload the MQTT Certificate file to the UA I/O module.<br>• File format must be PEM. Extension name must be “pem”, “cer”, or “crt”. |
| Private Key | **Upload**: Click to select the MQTT Private Key of the device, and upload the MQTT Private Key file to the UA I/O module.<br>• File format must be PEM. Extension name must be “key”. |
| **MQTT Setting > Certificate – Remove the file** | |
| Trusted Certificate | Click “Remove” to delete all Trusted Certificate files in the UA I/O module. |
| Certificate | Click “Remove” to delete all Certificate files in the UA I/O module. |
| Private Key | Click “Remove” to delete all Private Key files in the UA I/O module. |



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# 4.5 Main Menu – Advanced Setting

This main menu aggregates the advanced settings, such as the Scaling setting that function can convert the analog signal to a more readable value. The scaling function is only available for AI/AO channels. ICP DAS will develop more advanced functions in the future.

## 4.5.1 Logic Control

### 4.5.1.1 Rule Settings

**Function:** The Rule Setting function provides simple logic condition rule setting, let UA I/O do automatic condition judgment and action control, to achieve simple AI.

**Support Module:** All UA I/O modules support this function.

**Manu Path**:【Advanced Setting】➔【Logic Control】➔【Rule Settings】

Advanced Setting ➔ Logic Control ➔ Rule Settings (Appendix A).

**Add Rules: Click on "Add new rule" to go to the settings page.**

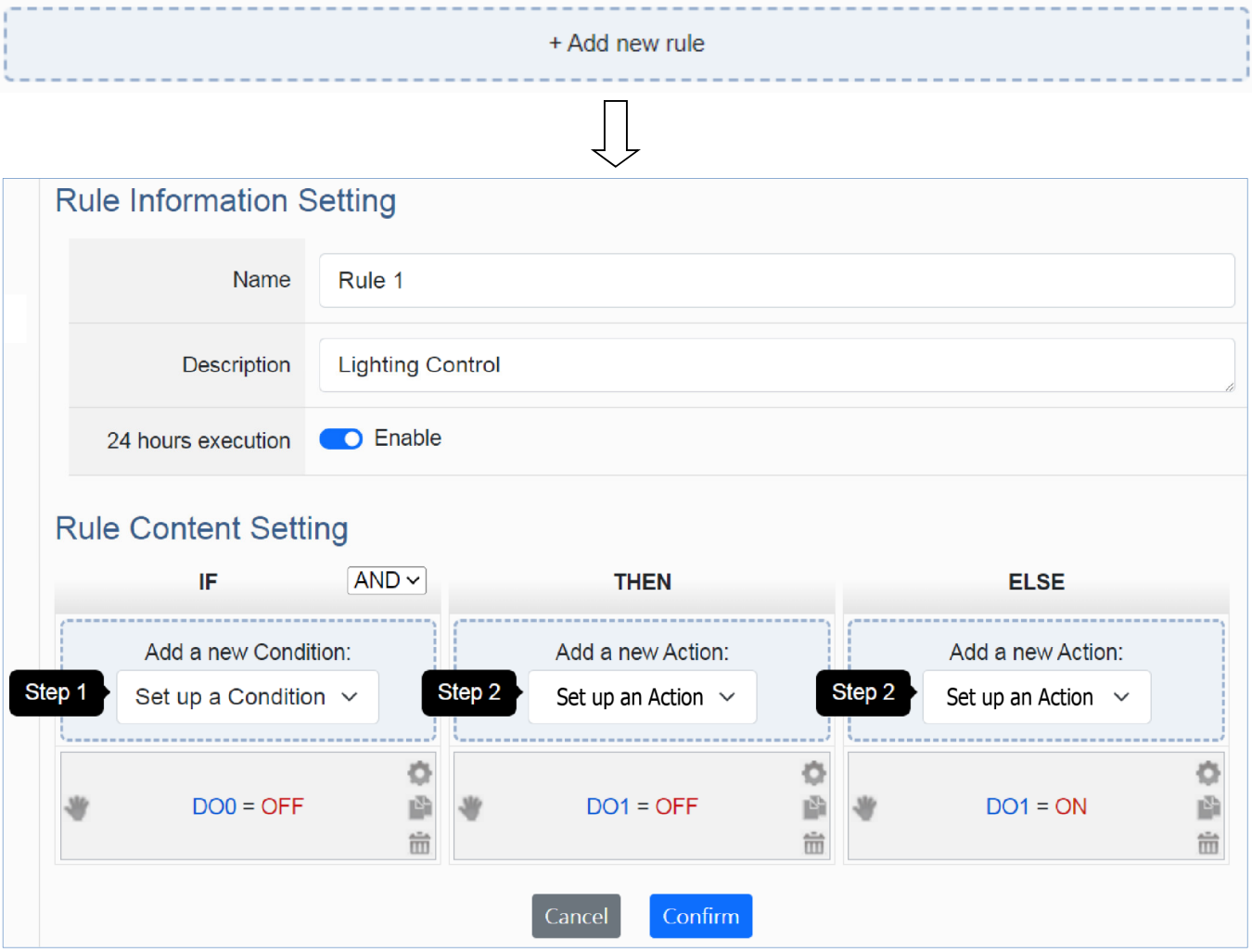



Figure 127 4-5-2 Rule Information Setting



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Table 75 4-5-2 Rule Information Setting

| **Advanced Setting > Logic Control > Rule Settings - Add new rule> Rule Information Setting** | |
|---|---|
| Name | The rule name auto-given by the system is used for schedule identification. (For the schedule function, refer to【Advanced Setting】>【Schedule】) |
| Description | A specific description of the rule can be set to improve recognition. |
| Resident Execution | Check: the rule will be executed 24 hours a day. Default: enabled.<br>Uncheck: the "Schedule" has been set. (For Schedule function, refer to【Advanced Setting】>【Schedule】) |
| **Advanced Setting > Logic Control > Rule Settings - Add new rule> Rule Content Setting** | |
| IF | Set the IF Condition statement of the logic rule.<br>The values or status for evaluation criteria: DI, DO, AI, AO, Virtual Point.<br>Conditions Type: AND, OR. |
| THEN | When the IF Condition is "Yes", execute the THEN setting.<br>Selectable Action: DO, AO, Delay, Virtual Point, I/O Control, and Link-Up. |
| ELSE | When the IF Condition is "NO", execute the ELSE setting.<br>Selectable Action: DO, AO, Delay, Virtual Point, I/O Control, and Link-Up. |

**Advanced Setting:**




Figure 128 4-5-2 Rule Setting-Advanced Setting

Table 76 4-5-2 Rule Setting-Advanced Setting

| **Advanced Setting > Logic Control > Rule Settings – Advanced Setting** | |
|---|---|
| I/O Sampling Interval Time (milliseconds) | Enter the interval time (milliseconds) to obtain the value of UA I/O. |



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#### 4.5.1.2. Scenario Control

**Function:** Provide UA-I/O series modules to package the I/O points into highly Identifying names. **Must be used with rule setting.**

**Support Module:** This function is only supported by U-7504M, U-7526M, U-7555M, U-7560M, U-7519ZM, and U-7517M-10.

**Manu Path**:【Advanced Setting】➔【Scenario Control】 Advanced Setting ➔ Scenario Control (Appendix A).

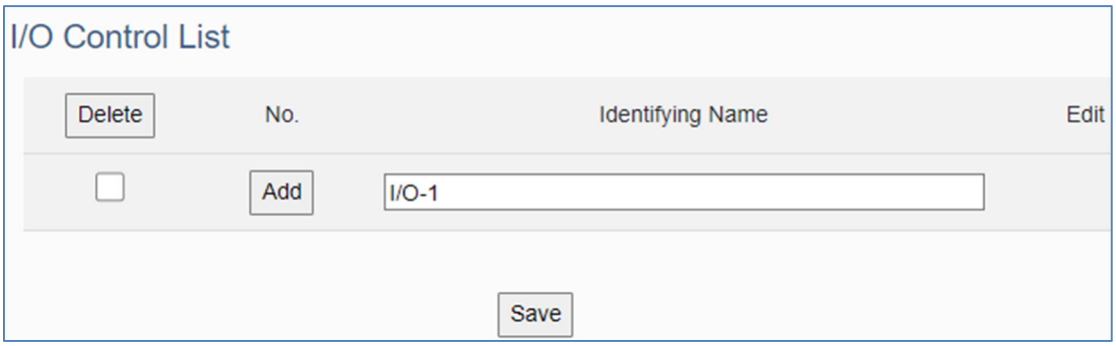



Figure 129 4-5-1-2 I/O Control(1)

Table 77 4-5-1-2 I/O Control

| Advanced Setting > Logic Control > Scenario Control | |
|---|---|
| Delete | Check the box and press the Delete button to delete the item. |
| No. | The number is automatically given by the system for easy identification. |
| Identifying Name | Can input Multi-language text. For convenient **Rule Setting** and recognition. (For the function of Rule Setting, please refer to [Advanced Settings] > [Rule Setting]) |
| Edit | Enter the Edit Setting screen to provide more detailed settings. |

**Setting method:**

1. Fill in the name in the identifying name, for example: I/O-1.
2. Click the "Add" button.
3. Click the "Edit" button of the item to enter the setting page, and set the I/O action of the device.

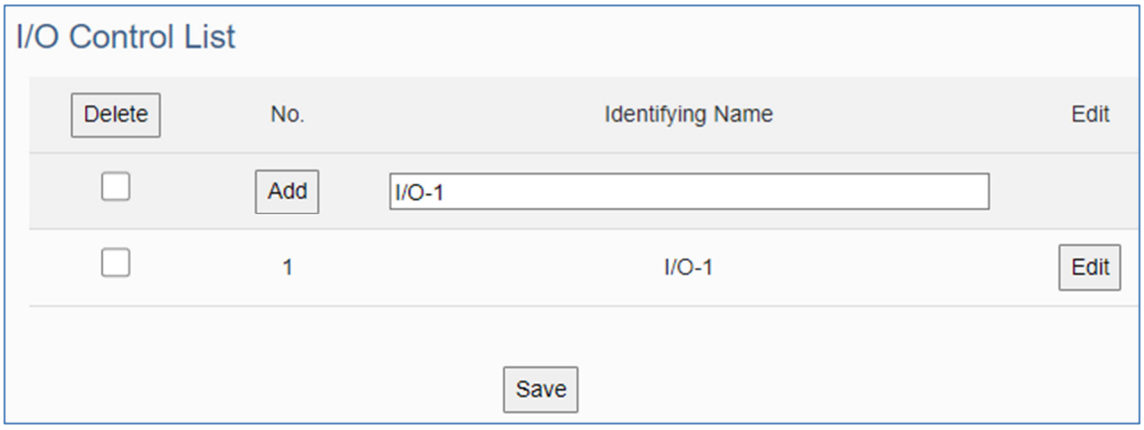



Figure 130 4-5-1-2 I/O Control(2)



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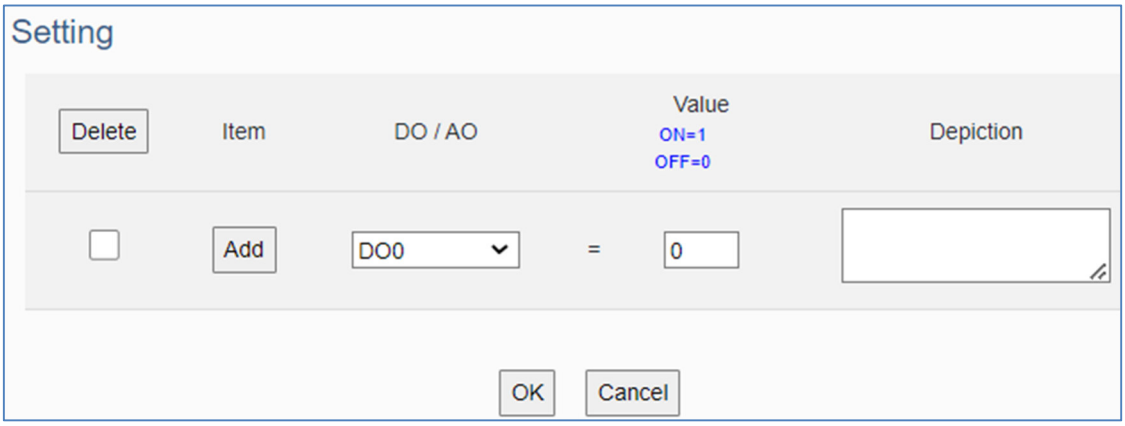



Figure 131 4-5-1-2 I/O Control-Setting

Table 78 4-5-2-2 I/O Control-Setting

| **Advanced Setting > Logic Control > Scenario Control > I/O Control(Edit) > Setting** | |
|---|---|
| Delete | Check the box and press the Delete button to delete the item. |
| Item | The number is automatically given by the system for easy identification. |
| DO / AO | According to the module model, select the corresponding I/O. |
| Value | Set the I/O value.<br>Default: 0. |
| Depiction | Used to set a more detailed description of the item to improve recognition. |

After setting, remember to click OK to return to the I/O control list, and click Save.



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#### 4.5.1.3 Line

**Function:** The UA-I/O series devices can send I/O messages from the module to LINE. It must be used together with rule settings.

**Support Module:** All UA I/O modules support this function.

**Manu Path**:【Advanced Setting】➔【Line】 Advanced Setting ➔ LINE (Appendix A).

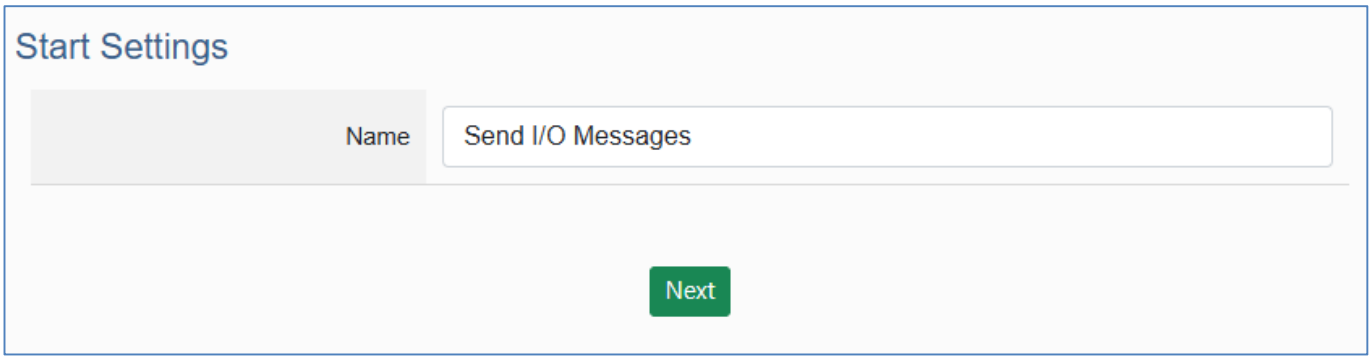



Figure 132 4-5-1-3 Advanced Setting-Line

Table 79 4-5-1-3 Advanced Setting-Line

| **Advanced Setting > Logic Control > Line – Start Settings** | |
|---|---|
| Name | To identify which function is being set, use it together with rule settings. |

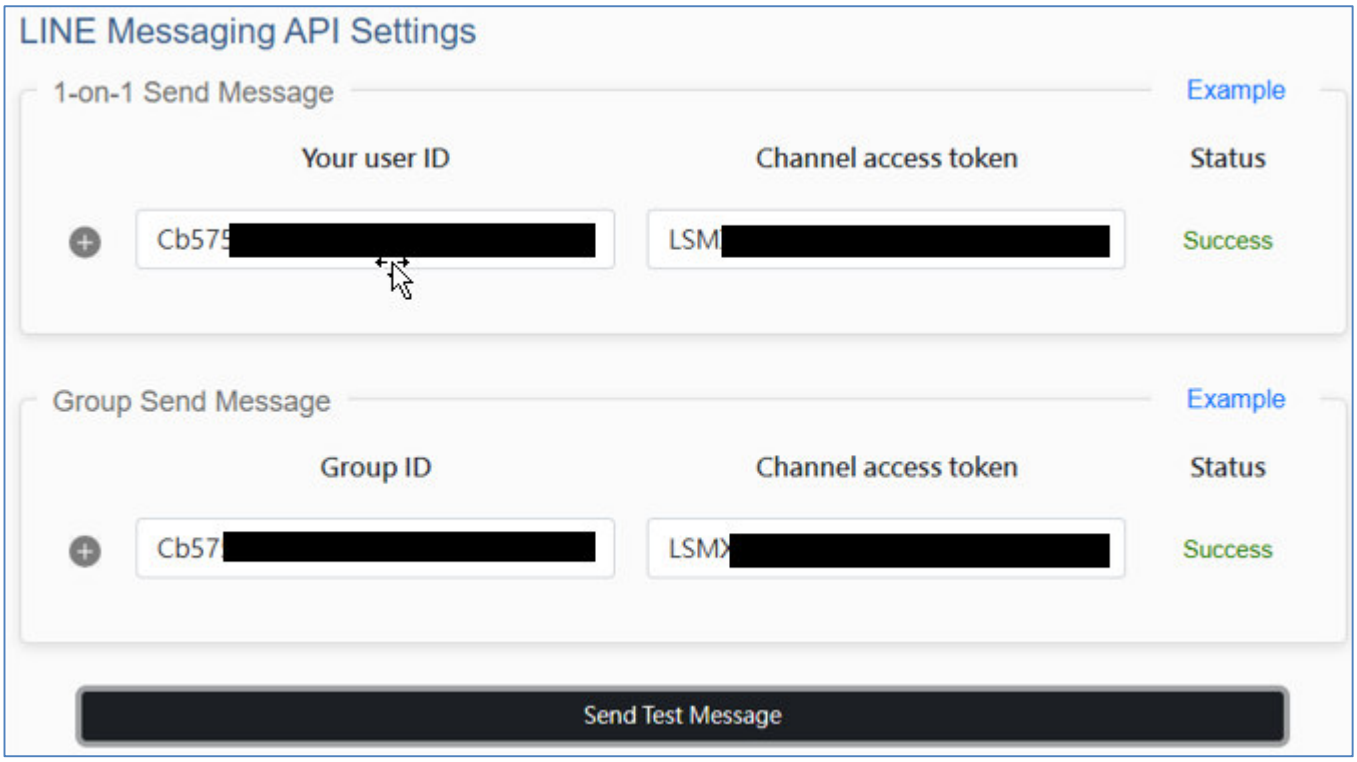



Figure 133 4-5-1-3 LINE Messaging API Settings

Table 80 4-5-1-3 LINE Messaging API Settings

| **Advanced Setting > Logic Control > Line Messaging API Settings** | |
|---|---|
| 1-on-1 Send Message | To send messages to LINE users via LINE Bot, the following settings are required:<br>Your user ID: Click the example button for documentation on how to obtain it.<br>Channel access token: Click the example button for documentation on how to obtain it. |
| Group Send Message | To send messages to LINE users via LINE Bot, the following settings are required:<br>Group ID: Click the example button for documentation on how to obtain it.<br>Channel access token: Click the example button for documentation on how to obtain it. |



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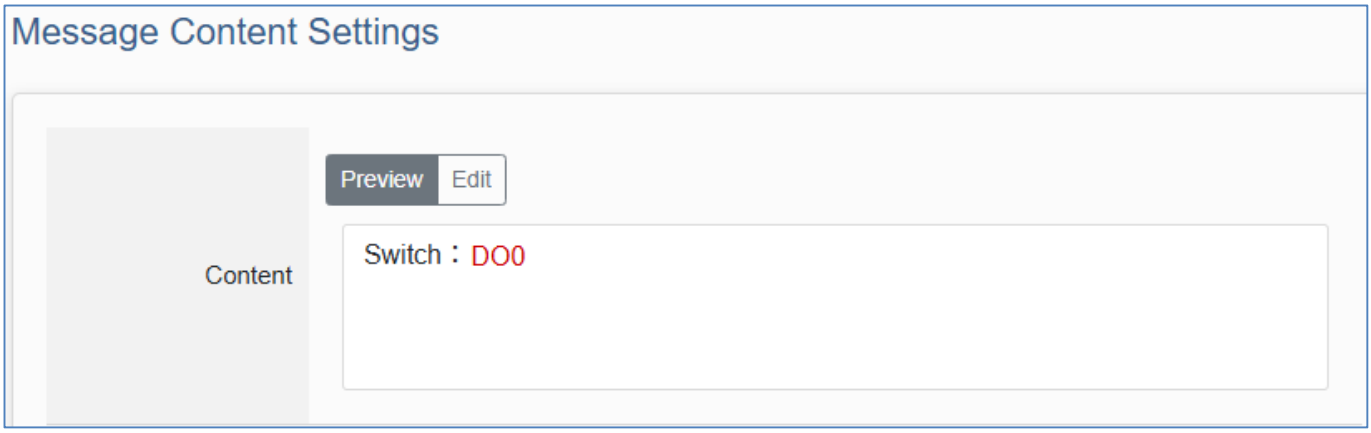



Figure 134 4-5-1-3 Messaging Cotent Settings

Table 81 4-5-1-3 Messaging Cotent Settings

| **Advanced Setting > Logic Control > Line – Message Content Settings** | |
|---|---|
| Content | Preview: During preview, aliases of [Module Settings] ➔ [I/O Settings] will be displayed in red for easy customer identification.<br>Edit: Select which I/O messages to send to LINE. |



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#### 4.5.1.4 Telegram

**Function:** The UA-I/O series devices can send I/O messages from the module to Telegram. It must be used together with rule settings.

**Support Module:** All UA I/O modules support this function.

**Manu Path**:【Advanced Setting】➔【Telegram】 Advanced Setting ➔ Telegram (Appendix A).

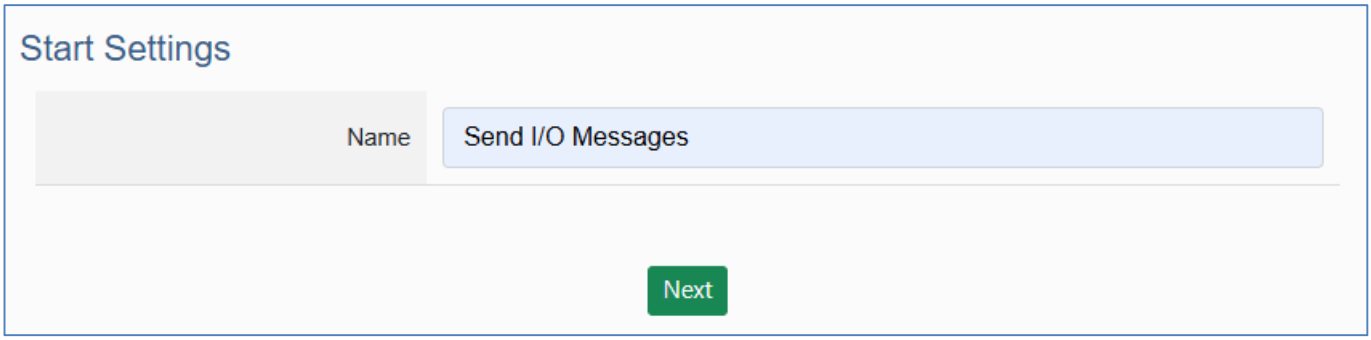



Figure 135 4-5-1-4 Advanced Setting-Telegram

Table 82 4-5-1-4 Advanced Setting-Telegram

| **Advanced Setting > Logic Control > Telegram – Start Settings** | |
|---|---|
| Name | To identify which function is being set, use it together with rule settings. |

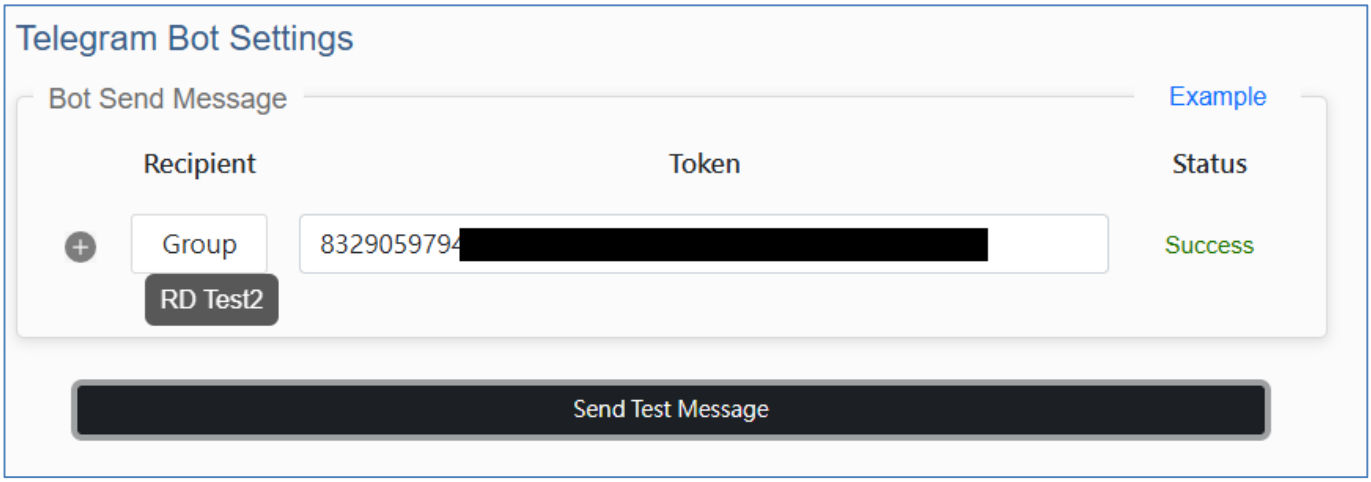



Figure 136 4-5-1-4 Telegram Bot Settings

Table 83 4-5-1-4 Telegram Bot Settings

| **Advanced Setting > Logic Control > Line – Message Content Settings** | |
|---|---|
| Recipient | Default: Unknown.<br>Click 'Send Test Message' to automatically retrieve the Telegram bot name or group name upon successful completion. |
| Token | To send messages to Telegram via a Telegram Bot, the following settings are required:<br>Token: Click the example button for documentation on how to obtain it. |
| Status | Click the 'Send Test Message' button to display the message delivery status.<br>Status: Not tested, Failed, and Success. |



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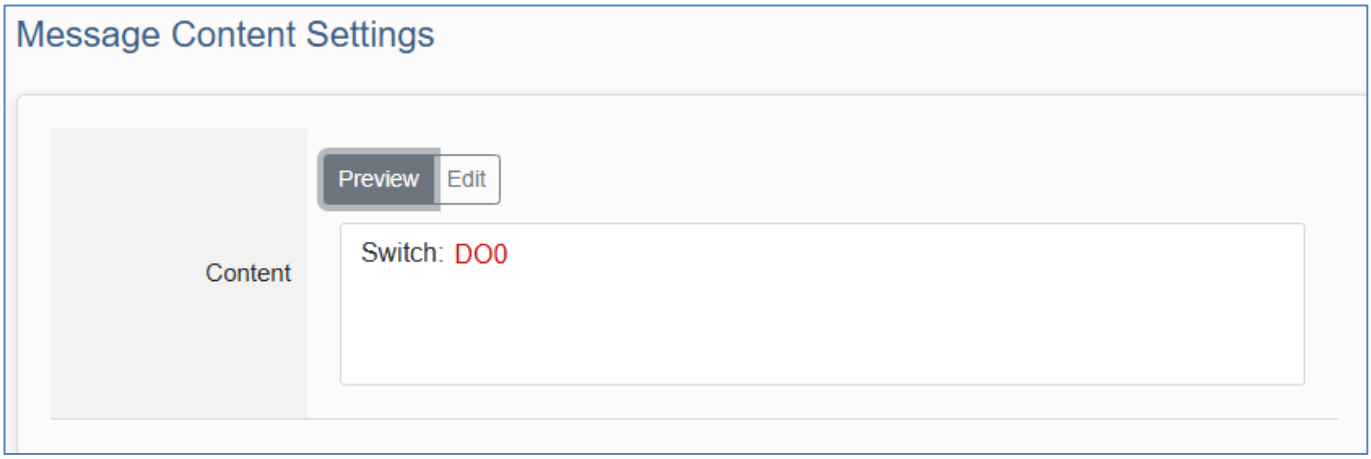



Figure 137 4-5-1-4 Message Content Settings

Table 84 4-5-1-4 Message Content Settings

| **Advanced Setting > Logic Control > Telegram – Message Content Settings** | |
|---|---|
| Content | Preview: During preview, aliases of [Module Settings] ➔ [I/O Settings] will be displayed in red for easy customer identification.<br>Edit: Select which I/O messages to send to Telegram. |



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#### 4.5.1.5 Email

**Function:** The UA-I/O series devices can send I/O messages from the module to Email. It must be used together with rule settings.

**Support Module:** All UA I/O modules support this function.

**Manu Path**:【Advanced Setting】➔【Email】 Advanced Setting ➔ Email (Appendix A).

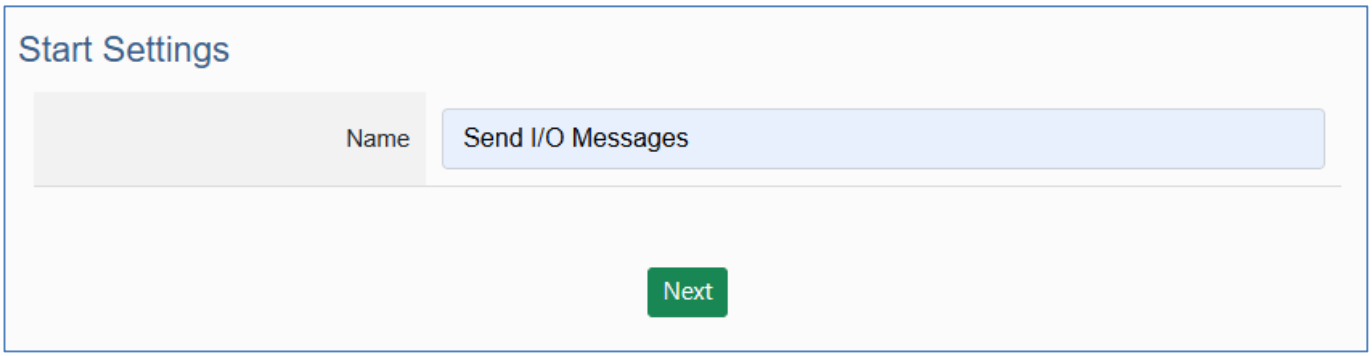



Figure 138 4-5-1-5 Advanced Setting-Email

Table 85 4-5-1-5 Advanced Setting-Email

| **Advanced Setting > Logic Control > Email– Start Settings** | |
|---|---|
| Name | To identify which function is being set, use it together with rule settings. |

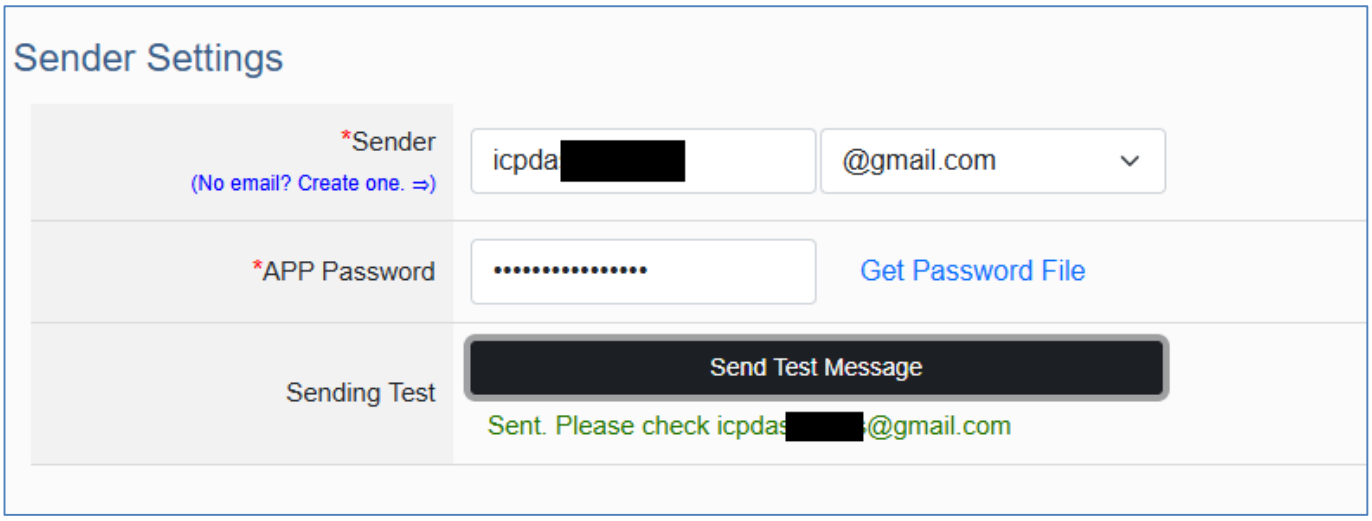



Figure 139 4-5-1-5 Sender Settings

Table 86 4-5-1-5 Sender Settings

| **Advanced Setting > Logic Control > Line – Message Content Settings** | |
|---|---|
| Sender | E-mail address used for sending I/O messages.<br>Support gmail.com and zohomail.com. |
| APP Password | Please click the 'Get Password File' button. The file contains instructions on how to obtain app passwords for each platform. |
| Send Test Message | Send a test message to verify that the settings are working. |



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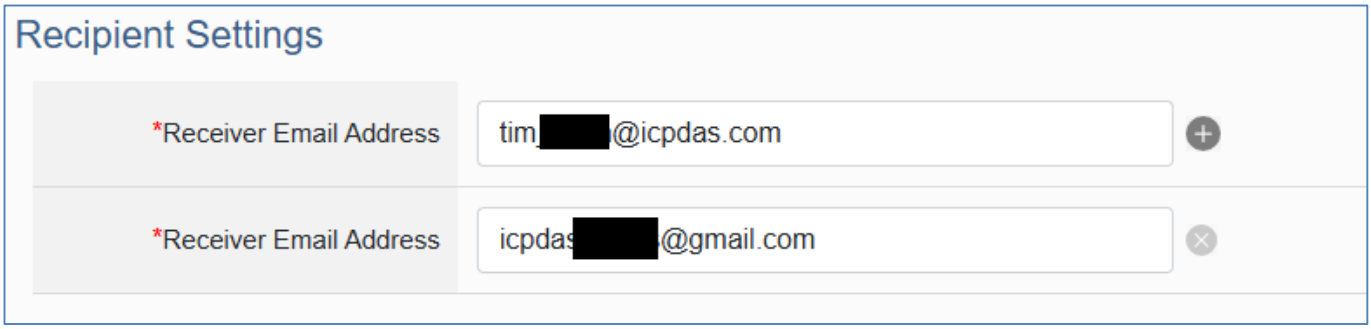



Figure 140 4-5-1-5 Recipient Settings

Table 87 4-5-1-5 Recipient Settings

| **Advanced Setting > Logic Control > Email – Recipient Settings** | |
|---|---|
| Receiver Email Address | E-mail address for receiving I/O messages |

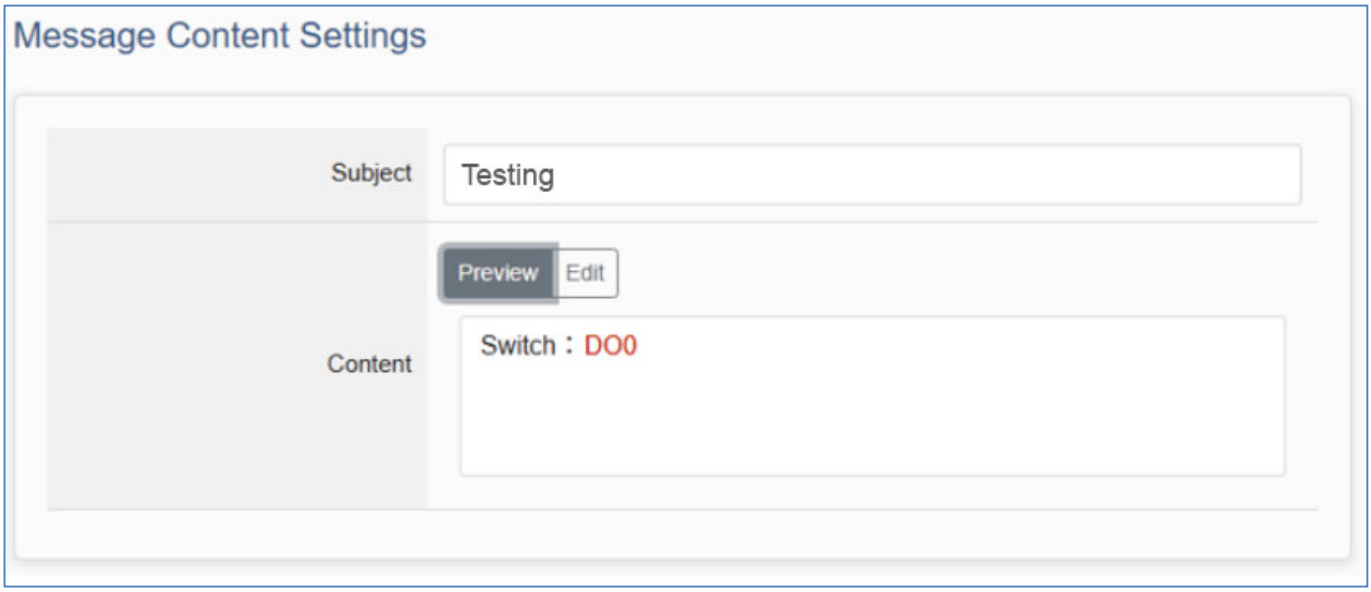



Figure 141 4-5-1-5 Message Content Settings

Table 88 4-5-1-5 Message Content Settings

| **Advanced Setting > Logic Control > Email - Message Content Settings** | |
|---|---|
| Subject | Email Subject |
| Content | Preview: During preview, aliases of [Module Settings] ➔ [I/O Settings] will be displayed in red for easy customer identification.<br>Edit: Select which I/O messages to send to the recipient's email address. |

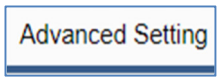


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#### 4.5.1.6 Schedule

**Function:** The Schedule function can achieve the timing control for the rule list in Rule Setting.

**Support Module:** All UA I/O modules support this function.

**Manu Path**:【Advanced Setting】➔【Schedule】 

(Appendix A).

**Sample: For a simple setting example, please refer to Section 3.5 .**

**Note: This webpage will display the rule items (number and name) that have been set in【Rule Setting】; If no rules are set in【Rule Setting】, there will not be any list on this page.**




Figure 142 4-5-2-3 Schedule-Rule Setting List

Table 89 4-5-2-3 Schedule-Rule Setting List

| **Advanced Setting > Logic Control > Schedule > Rule Setting List** | |
|---|---|
| No. | The number automatically given by the system corresponds to the number of the【Rule Setting】function, users can find it in the menu: 【Advanced Setting】➔【Rule Setting】. |
| Rule Name | The names are the corresponding to the Rule Name of the【Rule Setting】function, users can find it in the menu: 【Advanced Setting】➔【Rule Setting】➔【Rule Name】. |
| Edit | Click “Edit” to enter the editing screen to edit more detailed settings. |




Figure 143 4-5-2-3 Schedule-Content Setting

Table 90 4-5-2-3 Schedule-Content Setting

| **Advanced Setting > Logic Control > Schedule > Rule Setting List (Edit) > Content Setting** | |
|---|---|
| No | The number automatically given by the system. It is the same as the number in the menu: 【Advanced Setting】➔【Rule Setting】 |
| Rule Name | This name can be modified to a more recognizable name here.<br>It is the same as the rule name in the menu: 【Advanced Setting】➔【Rule Setting】➔【Rule Name】. |



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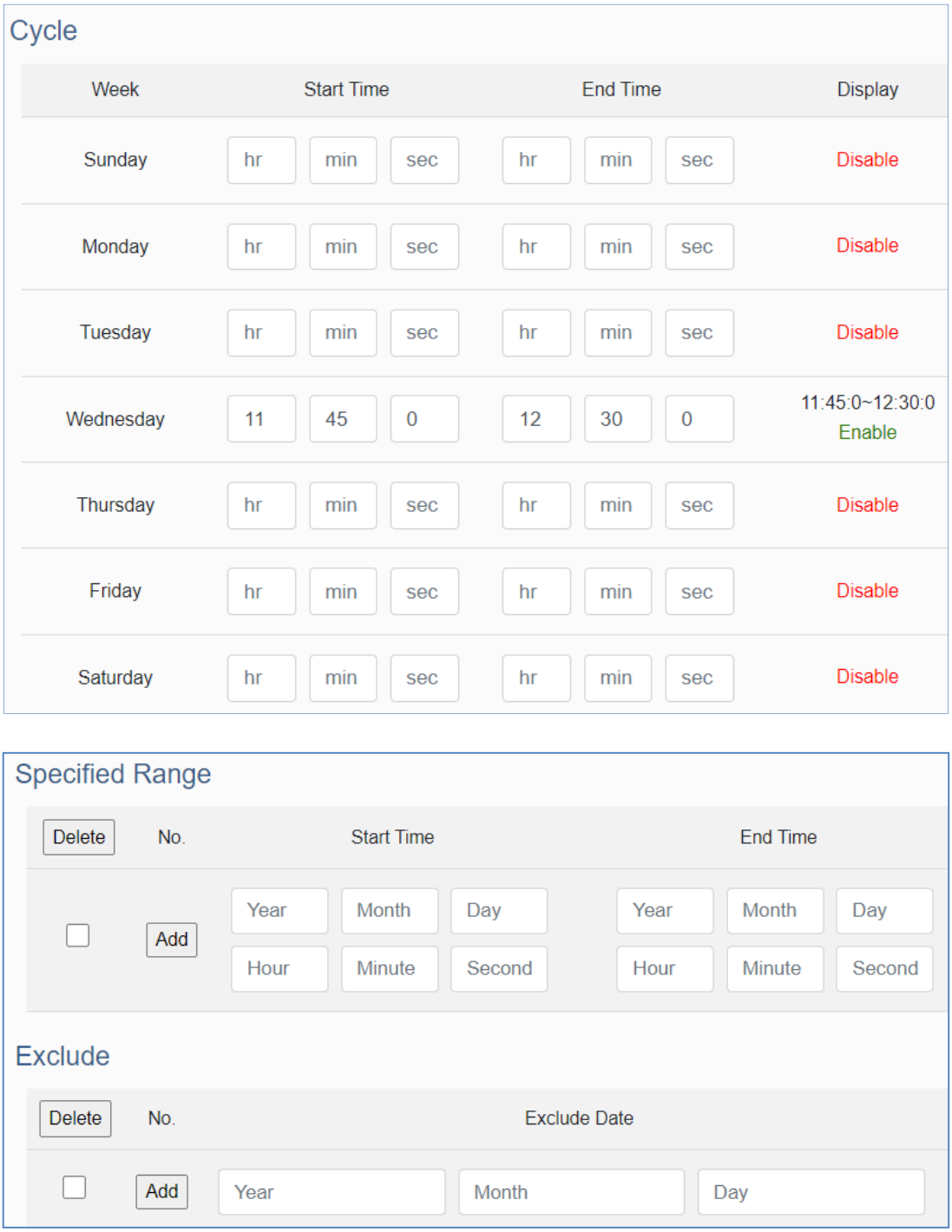



Figure 144 4-5-2-3 Schedule-Cycle/Specified Range/Exclude

Table 91 4-5-2-3 Schedule-Cycle/Specified Range/Exclude

| Advanced Setting > Logic Control > Schedule > Rule Setting List (Edit) > | |
|---|---|
| Cycle | The rule is enabled and executed every week.<br>Set the start/end time in any day, it will be automatically enabled. |
| Specified Range | The rule is enabled and executed within a specific time period.<br>Need to set the Start/End time. |
| Exclude | Specify the exclude date for not execute the rule.<br>If the above two time settings overlap, set the Exclude Date not to execute the rule.<br>Specify the date to exclude the rule. |



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## 4.5.2 I/O Trigger Message

### 4.5.2.1 Msgs→File(CSV)

**Function:** When the I/O value changes, record the current I/O value for easy device tracking in the future.

**Support Module:** All UA I/O modules support this function.

**Manu Path**:【Advanced Setting】➔【I/O Trigger Message】➔【Msgs→File(CSV)】

Advanced Setting ➔ I/O Trigger Message ➔ Msgs → File(CSV) (Appendix A).

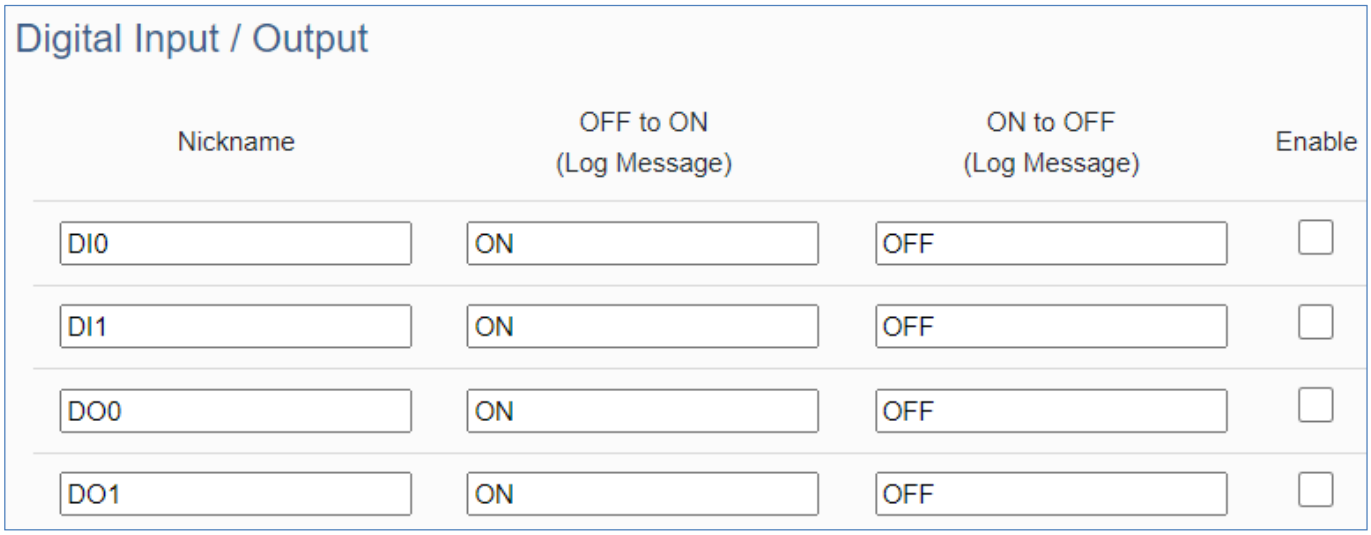



Figure 145 4-5-1 Event Log-Digital Input/Output

Table 92 4-5-1 Event Log-Digital Input/Output

| **Advanced Setting > I/O Trigger Message > Msgs→File(CSV) > Interface Setting > Digital Input / Output** | |
|---|---|
| Nickname | The nickname in the function of [Module Setting] ➔ I/O Setting] |
| Off to On (log message) | When I/O is ON, the log file will store this log message. Easy for customers to read. |
| On to Off (log message) | When I/O is OFF, the log file will store this log message. Easy for customers to read. |
| Enable | Check this item to enable the event log function for this I/O.<br>Default: not enabled |



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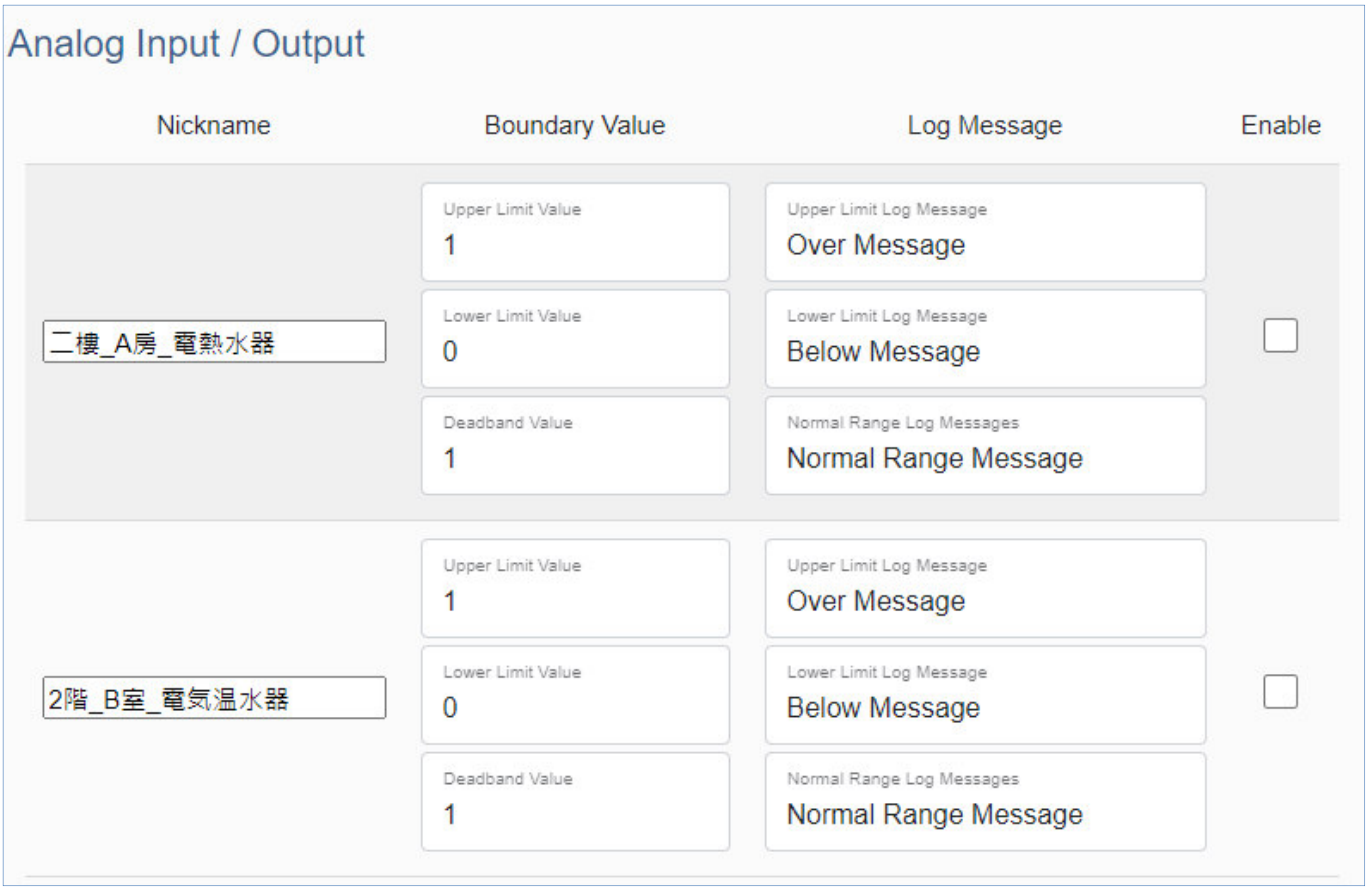



Figure 146 4-5-1 Event Log-Analog Input/Output

Table 93 4-5-1 Event Log-Analog Input/Output

| **Advanced Setting > I/O Trigger Message > Msgs→File(CSV) > Interface Setting > Analog Input / Output** | |
|---|---|
| Nickname | The Nickname in the function of [Module Setting] ➔ [I/O Setting] |
| Boundary value | Upper limit: Above the upper limit, it is considered abnormal. Preset: 1 |
| | Lower limit: Below the lower limit, it is considered abnormal. Preset: 0 |
| | Deadband: Dead zone, inactive zone.<br>Set the Deadband value for the floating point data update. Default: 1<br>(Refer to Appendix C) |
| Log message | Upper log message: Above the upper limit, this log message is recorded. |
| | Lower log message: Below the upper limit, this log message is recorded. |
| | Normal range log message: This log message is recorded between the upper limit value and the lower limit value (only recorded once). |
| Enable | Check this item to enable the event log function for this I/O.<br>Default: not enabled |



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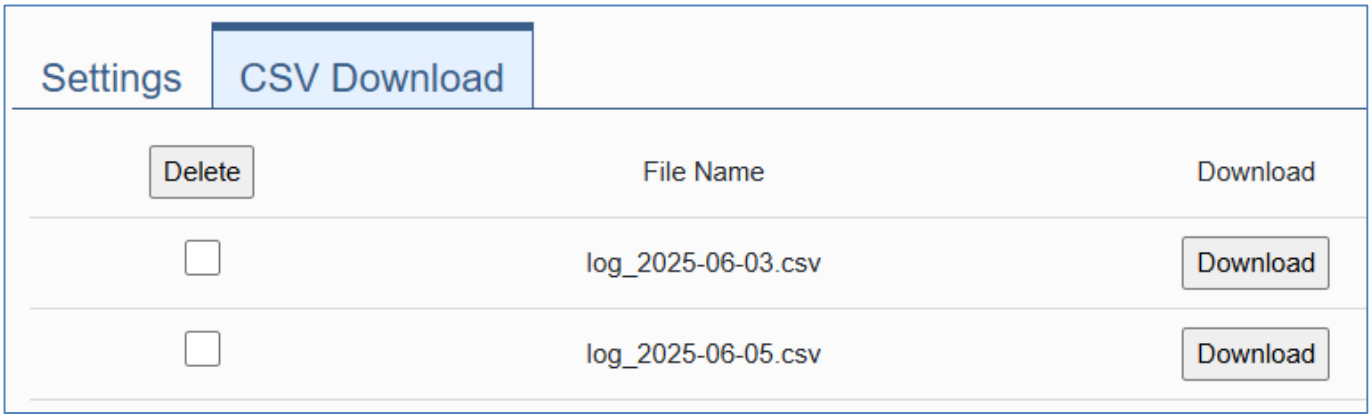



Figure 147 4-5-1 Event Log-Log File Download

Table 94 4-5-1 Event Log-Log File Download

| **Advanced Setting > I/O Trigger Message > Msgs→File(CSV) – CSV Download** | |
|---|---|
| File Name | The file name is composed of year, month, day, hour, minute, and second. This time is the time of the first content. |
| Download | Click this button to download the log file. |

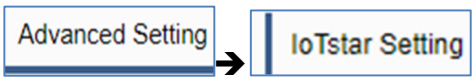


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### 4.5.3 IoTstar Setting

**Function:** The IoTstar Setting function can connect to ICP DAS IoTstar cloud IoT management software.

**Support Module:** All UA I/O modules support this function.

**Manu Path**:【Advanced Setting】➔【IoTstar Setting】 


(Appendix A).

**Sample: For a simple setting example, please refer to Section 3.6 .**

**Currently supported features:**

1. Through ICP DAS IoTstar management software, remote operating the web settings.

2. Through ICP DAS IoTstar management software, remote operating the web I/O status reading.

3. Through ICP DAS IoTstar management software, remote operating the web firmware update.

4. Through ICP DAS IoTstar management software, display Real-time I/O data.

5. Through ICP DAS IoTstar management software, display Historical I/O data.

6. Through ICP DAS IoTstar management software, the meter version can control DO, AO value remotely.

7. I/O data of U-7500M → Access to the database via ICP DAS IoTstar management software.

**Note: When operating the web interface, please keep only one user in the web interface.**



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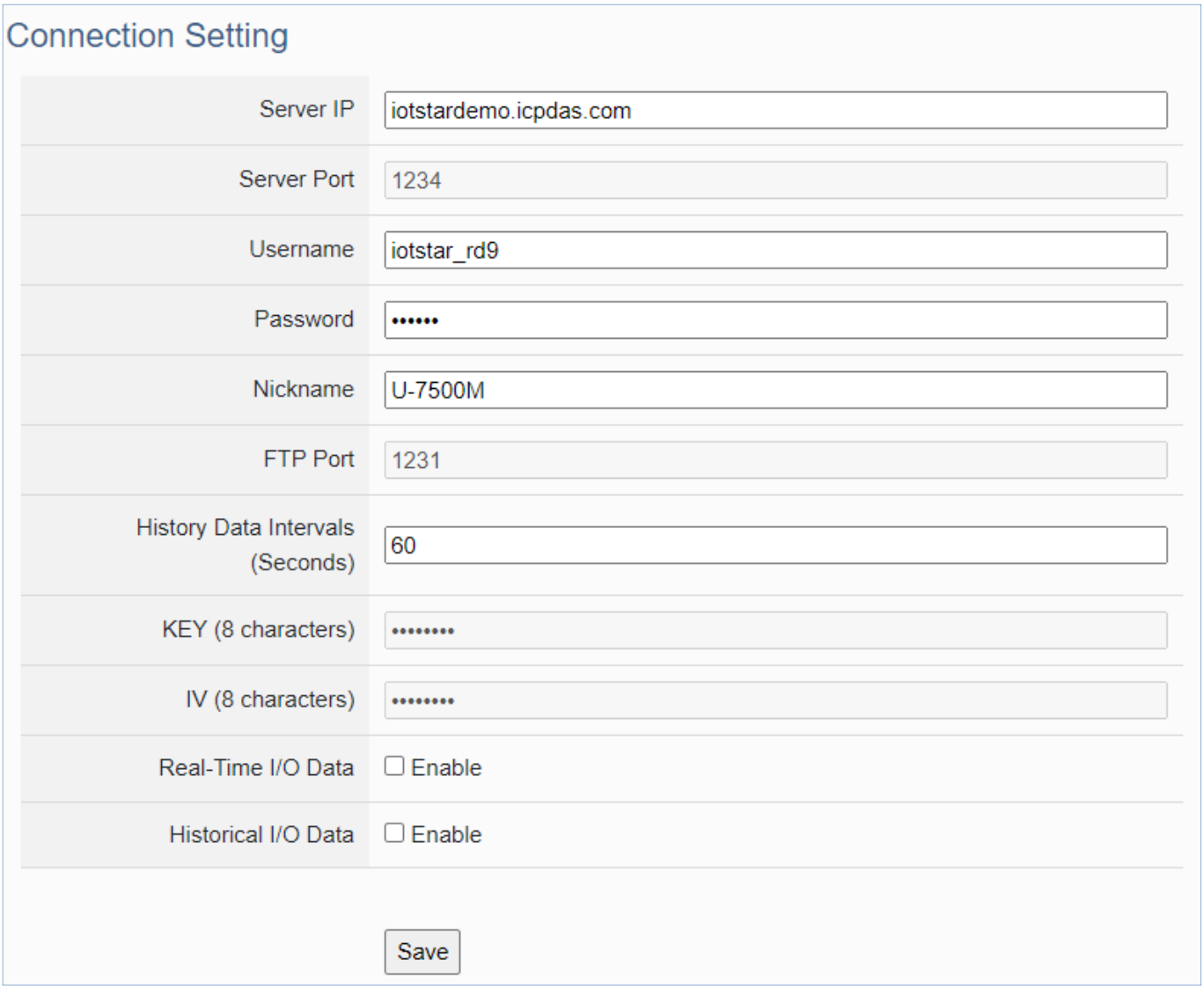



Figure 148 4-5-3 IoTstar Setting-Connection Setting

Table 95 4-5-3 IoTstar Setting-Connection Setting

| **Advanced Setting > IoTstar Setting > Connection Setting** | |
|---|---|
| Server IP | The IP address or domain name of the IoTstar. |
| Username | Enter the account username registered with the IoTstar. |
| Password | Enter the password registered with the IoTstar. |
| Nickname | Default: U-7500M.<br>This item is the title name of the IoTstar Device List. |
| Historical Data Interval | Default: 60<br>This item is the interval time for sending I/O historical data to IoTstar. |
| Real-time I/O information | Allows all UA-I/O data to be sent to IoTstar.<br>Factory default: Not enabled. |
| Historical I/O information | When enabled, the UA-I/O data is temporarily stored in the module and sent to IoTstar.<br>Factory default: Not enabled. |

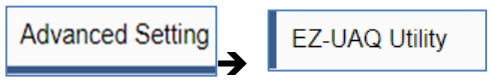


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### 4.5.4 EZ-UAQ Utility

**Function:** Settings related to the EZ-UAQ Utility network management tool.

**Support Module:** All UA I/O modules support this function.

**Manu Path**:【Advanced Setting】➔【EZ-UAQ Utility】 


(Appendix A).

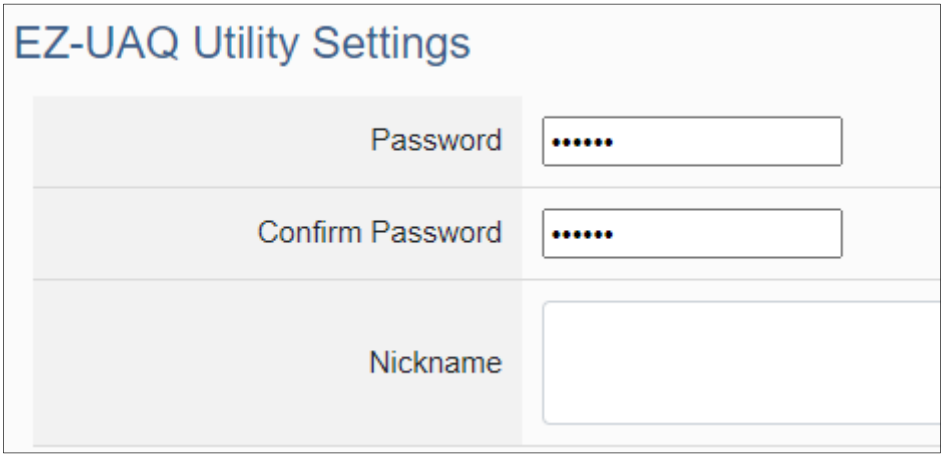



Figure 149 4-5-4 EZ-UAQ Utility Settings

Table 96 4-5-4 EZ-UAQ Utility Settings

| **Advanced Setting > EZ-UAQ Utility** | |
|---|---|
| Password | Set a password to restrict the authorization of the EZ-UAQ Utility.<br>When the EZ-UAQ Utility gets the same password, you can control the module. |
| Confirm Password | Retype the password for the operation conform when setting the new account information. |
| Nickname | The nickname can be seen in the【Advanced Setting】➔【EZ-UAQ Utility】.<br>It is convenient for users to identify the module. |



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# 5. Recovering Firmware Setting (Reset)

This chapter explains how to use the Reset button to recover the firmware settings, **please wait for ten minutes.**

The steps are as follows:

1. Please find the **Reset** button on the UA I/O bottom side, and then press the **Reset** button.




Figure 150 5 Recovering Firmware Setting(1)

2. When starting the recovering process, all the LEDs on the panel will light up red or green.




Figure 151 5 Recovering Firmware Setting(2)

3. If all LEDs light on red, it indicates an error. When this happens, please press the Reset button again.




Figure 152 5 Recovering Firmware Setting(3)

4. If all LEDs light on green, it means the recovering process is successful.




Figure 153 5 Recovering Firmware Setting(4)



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5. After restarting, the module will recover the UA I/O settings as follows:

Table 97 5 Recovering Firmware Setting

| Recovering Firmware of UA I/O Modules | | | |
|---|---|---|---|
| **Network** | **IP (LAN)** | **Keep the original setting** | Assign UA I/O a new IP setting according to your case. |
| | **Mask** | **Keep the original setting** | |
| | **Gateway** | **Keep the original setting** | |
| **Web UI Account** | **Username** | **root** | **After login, change the default username/password to use other functions.** |
| | **Password** | **root** | |



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# Appendix A. Menu Path Diagram Description

【Menu Path】diagram shows the main menu function section path in a brief way that user can follow the menu path order (text/diagram) to select the main menu and the sub-menu, then can go to the function setting web page. Please see the examples below for detail description.

**[Example 1]** Description for the menu path of【System Setting】➔【Overview】:

1. Click【System Setting】function of main menu on the upper side, such as System Setting .
2. Click【Overview】function of sub-menu appeared on the left side, such as Overview .
3. Check or set up the information or function items on the setting area of the【Overview】.

**Menu Path :** ➔

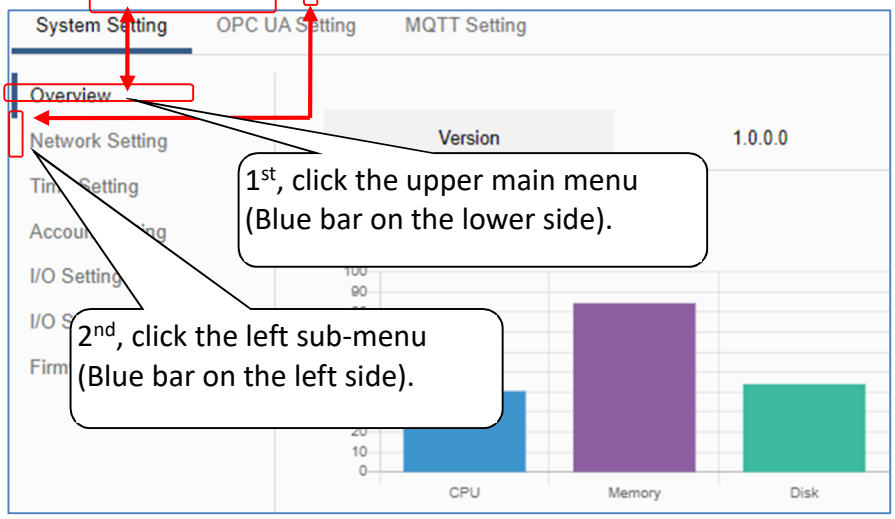



Figure 154 Appendix A. Menu Path Diagram Description (example 1)

**[Example 2]** Description for the menu path of【OPC UA Setting】➔【Certificate】:

1. Click【OPC UA Setting】function of main menu on the upper side, as below.
2. Click【Certificate】function of sub-menu appeared on the left side, as below.
3. Set up the function items on the setting area of the【Certificate】.

**Menu Path :** OPC UA Setting ➔ Certificate

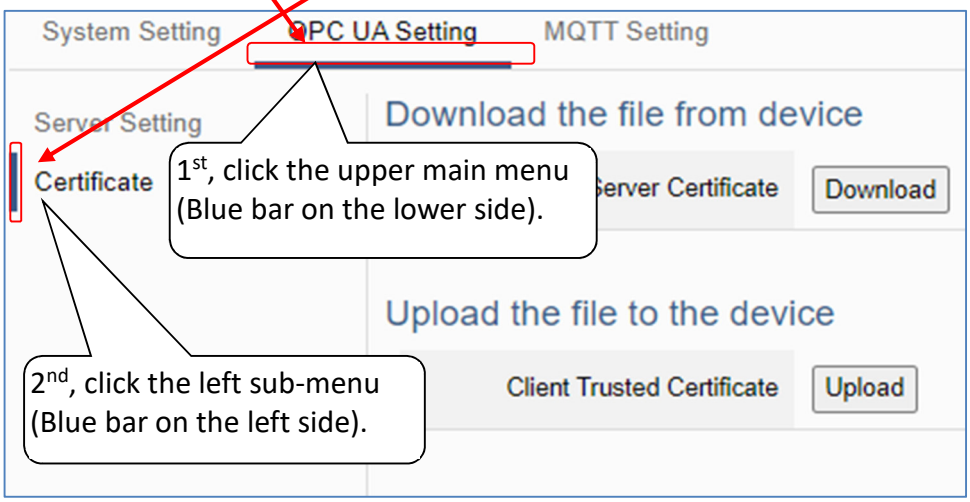



Figure 155 Appendix A. Menu Path Diagram Description (example 2)



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# Appendix B. MQTT JSON Format of the UA I/O Series

**MQTT JSON Example & Format Descriptions for the U-7526M:**


```
{
   "DO0": 0,
   "DO1": 0,
   "DI0": 0,
   "DI1": 0,
   "Vout0": 4.999,
   "Vout1": 4,
   "Vin0": 5.003,
   "Vin1": -32.768,
   "Vin2": -32.768,
   "Vin3": 0,
   "Vin4": 0,
   "Vin5": 0,
   "DI0_Counter": 0,
   "DI1_Counter": 0,
   "DI0_Preset": 0,
   "DI1_Preset": 0,
   "DI0_CounterClear": 0,
   "DI1_CounterClear": 1,
   "Scale_Vout0": 34.997,
   "Scale_Vout1": 32,
   "Scale_Vin0": 35.009,
   "Scale_Vin1": -78.304,
   "Scale_Vin2": -78.304,
   "Scale_Vin3": 20,
   "Scale_Vin4": 20,
   "Scale_Vin5": 20
}
```


Table 98 Appendix B. MQTT JSON Format of the UA I/O Series

| Name | Description |
|---|---|
| Left column<br>(such as DO0, DO1...etc.) | the name of the variable.<br>It will change according to the module. |
| Right column | The value of the variable. |

Method 1 to get the variable name: Login to the web interface

Through【Module Setting】➔【I/O status】 Module Setting ➔ I/O Status

**Channel items can be obtained.**

Digital Input

| Channel | Nickname | Value | Status |
|---|---|---|---|
| DI0 | DI0 tim | | GOOD |
| DI1 | DI1 tim | | GOOD |
| DI0_Counter | DI0 tim_Counter | 0 | GOOD |
| DI1_Counter | DI1 tim_Counter | 0 | GOOD |

Method 2 to get the variable name: Login to the web interface

Through 【 Module Setting】➔【Overview】 Module Setting ➔ Overview

For common settings, click the download button. You can get CommonSettings.csv。

**I/O Channel items can be obtained.**

| ##### MQTT | ########## | ########## | ######### | ######### | ######### | ########## | ########## |
|---|---|---|---|---|---|---|---|
| I/O Channel | Nickname | JSON Format Enable | Publish Top | Publish QoS | Subscribe T | Subscribe Q | Retain |
| DI0 | DI0 | TRUE | /Name/Publ | 2 | /Name/Subs | 2 | TRUE |
| DI0_Counter | DI0_Counter | TRUE | /Name/Publ | 2 | /Name/Subs | 2 | TRUE |
| DI0_CounterClear | DI0_CounterClear | TRUE | /Name/Publ | 2 | /Name/Subs | 2 | TRUE |
| DI0_Preset | DI0_Preset | TRUE | /Name/Publ | 2 | /Name/Subs | 2 | TRUE |
| DI1 | DI1 | TRUE | /Name/Publ | 2 | /Name/Subs | 2 | TRUE |
| DI1_Counter | DI1_Counter | TRUE | /Name/Publ | 2 | /Name/Subs | 2 | TRUE |
| DI1_CounterClear | DI1_CounterClear | TRUE | /Name/Publ | 2 | /Name/Subs | 2 | TRUE |
| DI1_Preset | DI1_Preset | TRUE | /Name/Publ | 2 | /Name/Subs | 2 | TRUE |
| DO0 | DO0 | TRUE | /Name/Publ | 2 | /Name/Subs | 2 | TRUE |
| DO1 | DO1 | TRUE | /Name/Publ | 2 | /Name/Subs | 2 | TRUE |
| Vin0 | Vin0 | TRUE | /Name/Publ | 2 | /Name/Subs | 2 | TRUE |
| Vin1 | Vin1 | TRUE | /Name/Publ | 2 | /Name/Subs | 2 | TRUE |

Figure 156 Appendix B. MQTT JSON Format of the UA I/O Series



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# Appendix C. Dead Band Description

**(B)** If select **AIO Variable**, then Condition is "Value" and can set the "Dead Band". The condition will be triggered and send the message when the detected value exceeds the upper or lower Dead Band. (Below is a CO2 example. Detect per 500 ms)

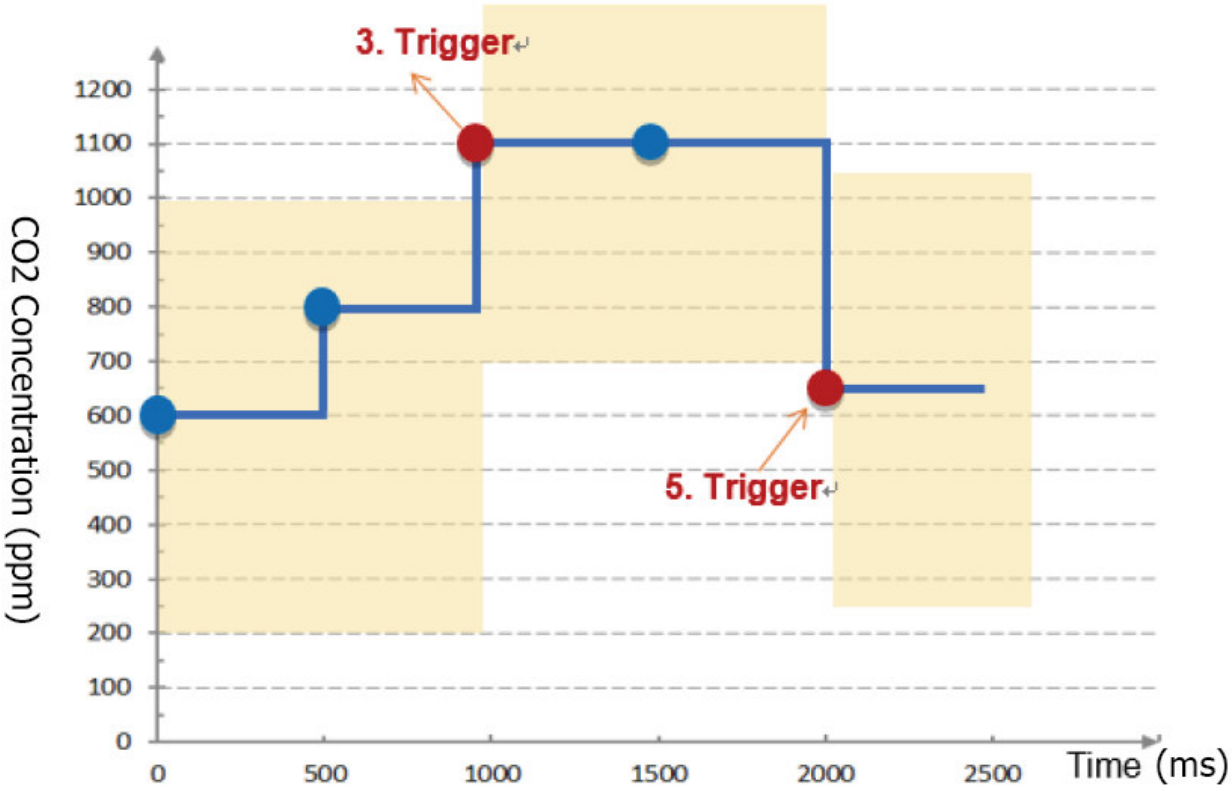



Figure 157 Appendix C. Dead Band Description

**AIO Trigger:** (Detect per 500 ms the yellow block means the Dead Band)

1. Detect initial CO2 concentration 600 (ppm)
   Set Dead Band=400 (Initial Trigger Condition: **>=** 1000 **or <=** 200)
2. Detect CO2 concentration 800. It is in the range of Dead Band.
3. Detect CO2 concentration 1100. It exceeds the upper value (>= 1000) of Dead Band, so trigger a message for danger notification.
4. Detect CO2 concentration 1100. It si in the new range of Dead Band.
   Dead Band=400 (New Trigger Condition: **>=** 1500 or **<=** 700)
5. Detect CO2 concentration 650. It is below the lower value (<= 700) of Dead Band, so trigger a message for safety notification.



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