HIKVISION

# B83 IO Controller

User Manual

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# Preface

The purpose of this section is to ensure that users can correctly use the product through this manual, to avoid dangers or property loss during operation. Please read the product manual carefully before using this product and keep it properly for future reference.

## Overview

This manual is applicable to the B83 IO controller.

## Symbol Conventions

For symbols appearing in the document, the explanations are as follows.

| Symbol | Description |
|---|---|
| Note | Provides additional information to emphasize or supplement important points of the main text. |
| Caution | Indicates a potentially hazardous situation, which if not avoided, could result in equipment damage, data loss, performance degradation, or unexpected results. |
| Danger | Indicates a hazard with a high level of risk, which if not avoided, will result in death or serious injury. |

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# Chapter 1 Configuration Process (Chapter Guidance)

| Use Case | Explanation |
|---|---|
| Set the web page for better experience | It is recommended to configure the web page through the inspector of browser for better experience (Appendix A). |
| Use this device as an IO expansion for the NVR | Platform access is set to SDK (4.4) → DI is configured to DI input mode (2.1) & DO is configured to normal mode (3.2) (After this device is configured according to this setting, it can be added as an IP channel to the NVR in the NVR interface, which will be automatically recognized, and the IO paths for the NVR will be increased.) |
| Directly use DI to count pulses | DI configuration is set to pulse counting mode (2.2) |
| Manual direct control of DO switch | Manual switch of DO (3.1) / Using DO's flash open mode (3.4) / flash close mode (3.5) / timing mode (3.6) |
| Control DO switch through DI signal linkage DO switch | DI configured as DI input mode (2.1) & DO configured as linkage control mode (3.3) |
| Control DI/DO or view data through platform software | Platform access settings are set to Modbus TCP/MQTT (4.4) |

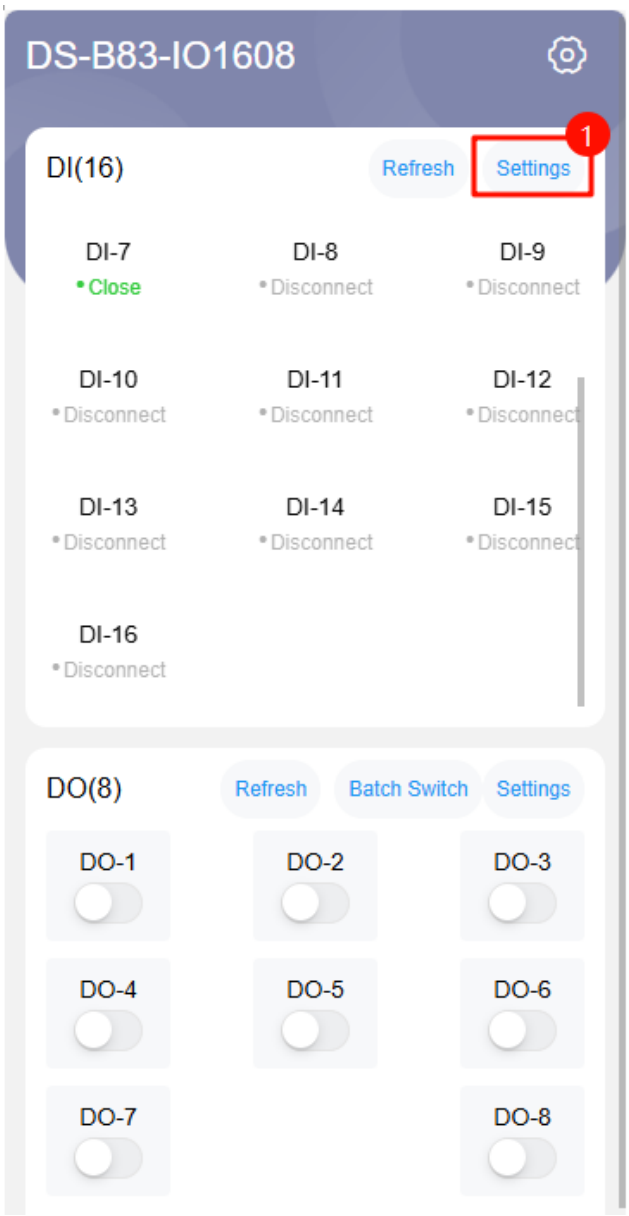
**Note**

Installation, wiring, activation, and login instructions can be found in the Quick Start Guide.

# Chapter 2 Switched Quantity Input (DI) Configuration

## 2.1 DI Input Mode

When the DI configuration is set to this mode and the DO is configured to the linkage control mode, after associating the DI channel, the switch signal input from the DI port can be used for linkage control of the DO.





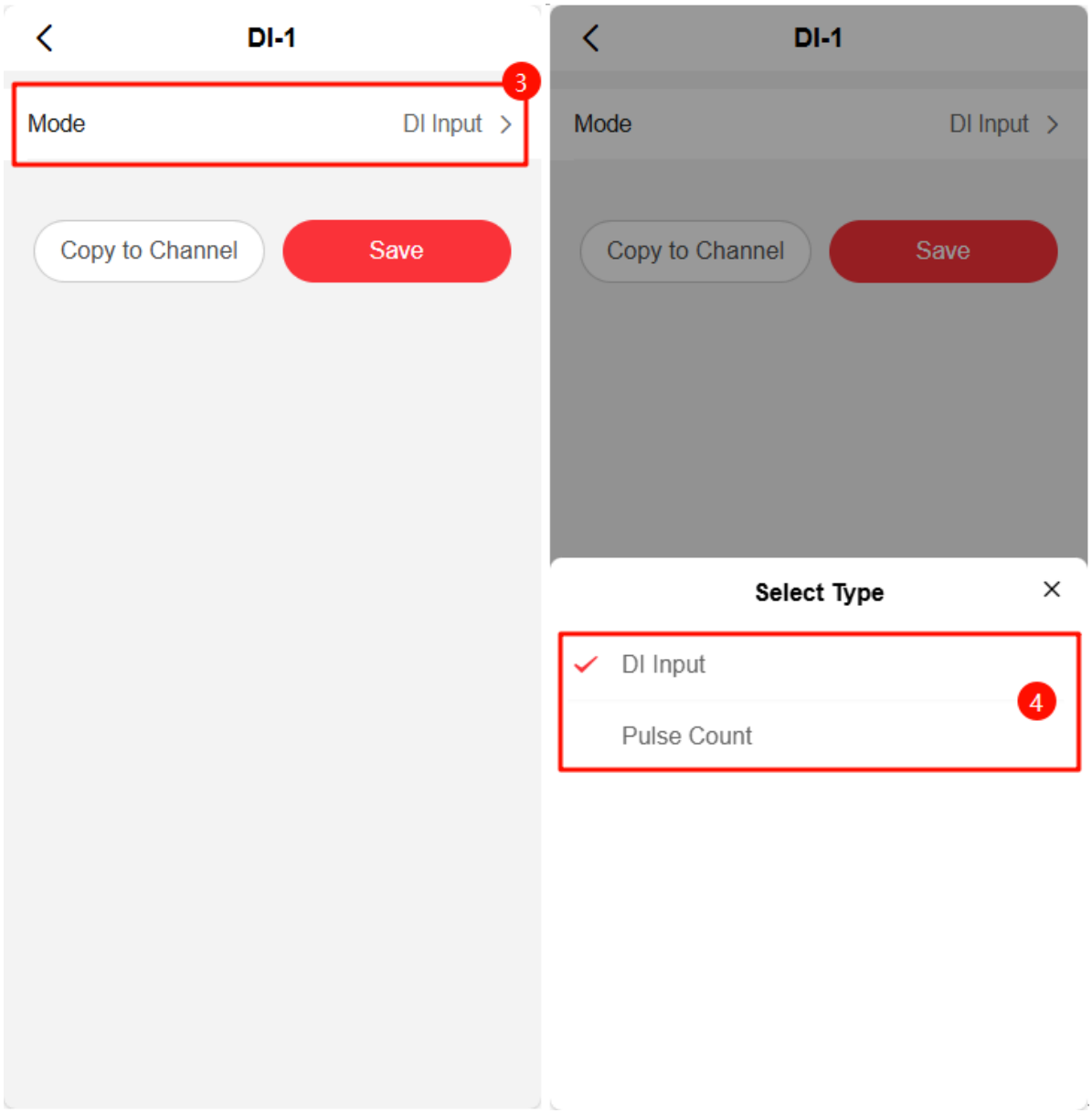




Figure 2-1 DI Mode Configuration Entry

## 2.2 Pulse Counting Mode

After configuring this mode, the device can count the pulse signals input from the DI port.

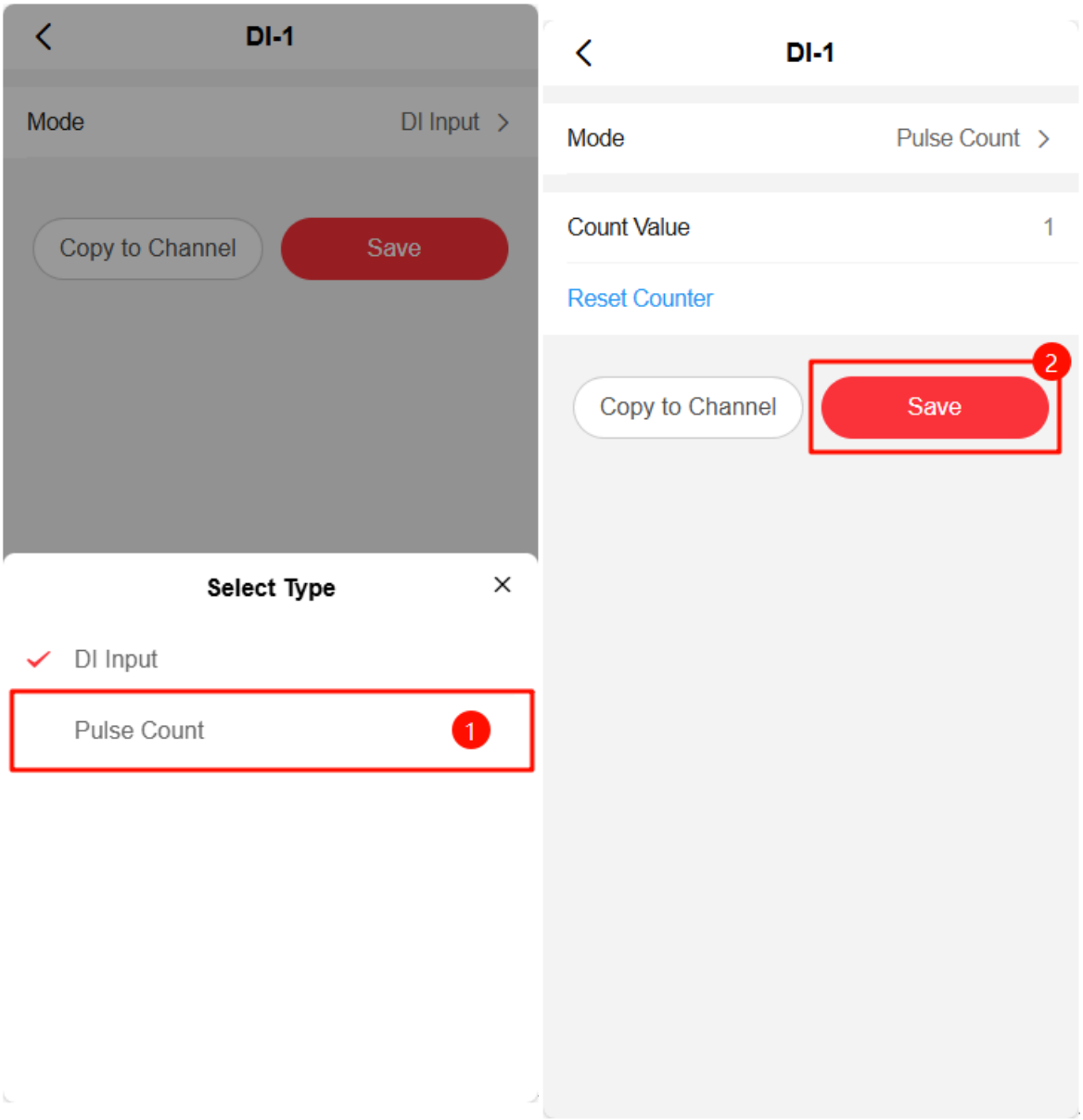



Figure 2-2 Pulse Counting Mode Configuration

# Chapter 3 Switched Output (DO) Configuration

## 3.1 Manual switch

Supports single manual switch and batch manual switch.

### 3.1.1 Single Switch

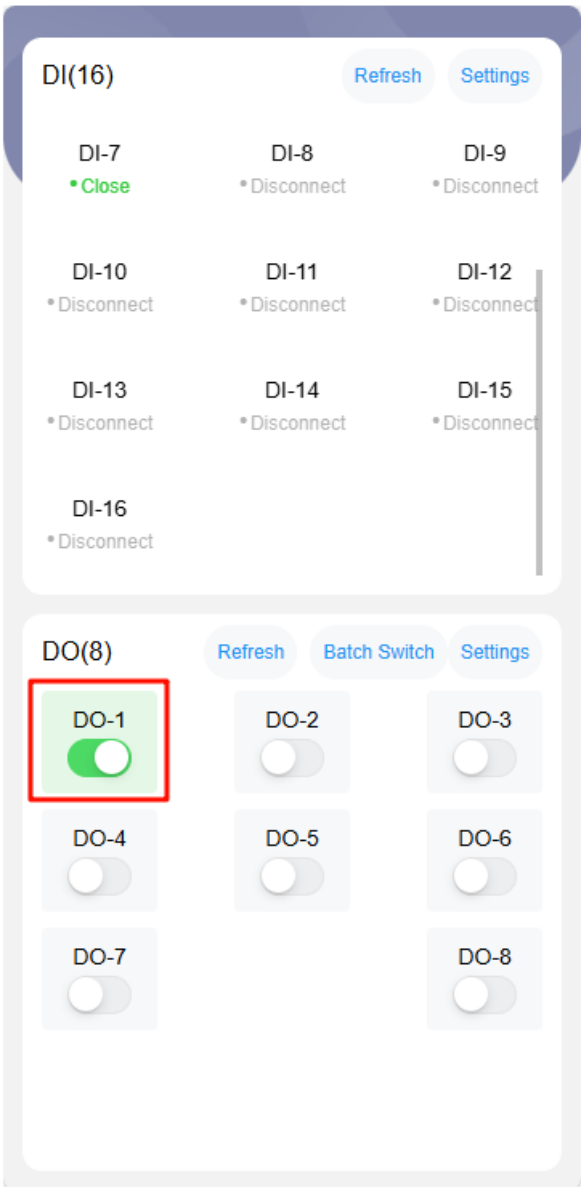



Figure 3-1 Single Switch Operation Example

### 3.1.2 Batch Switch

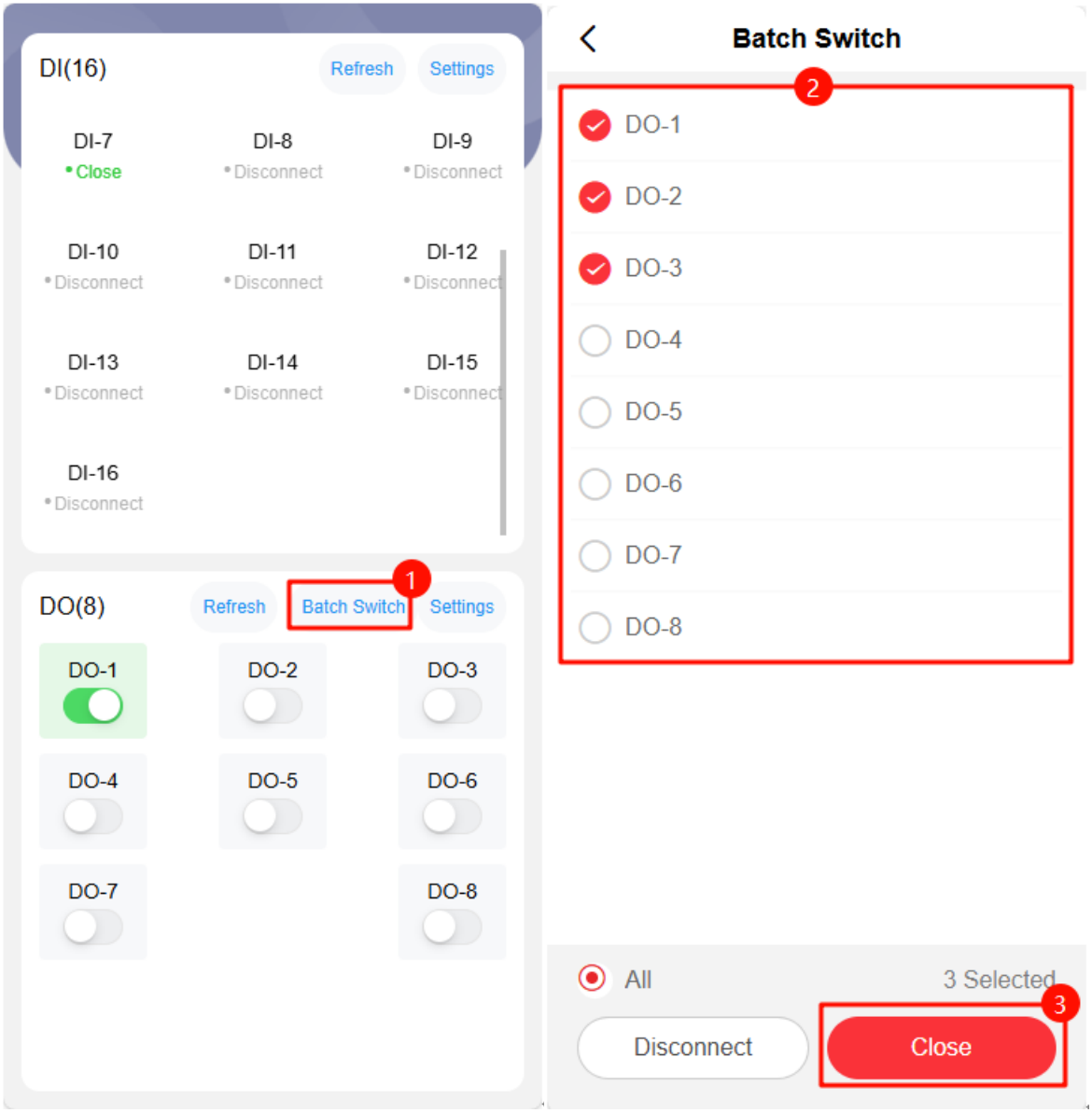
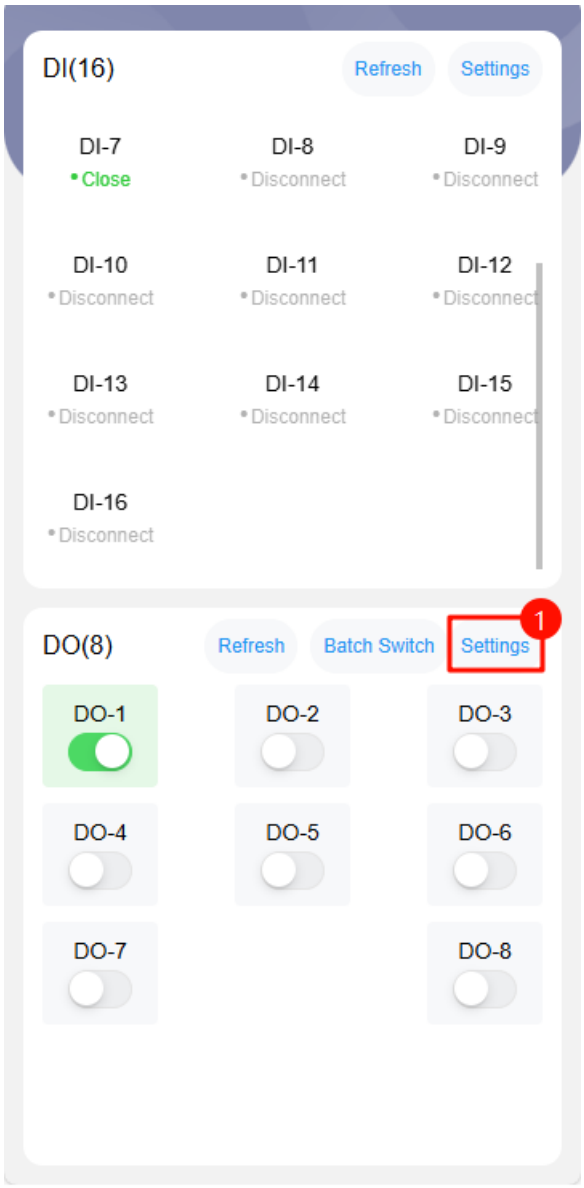
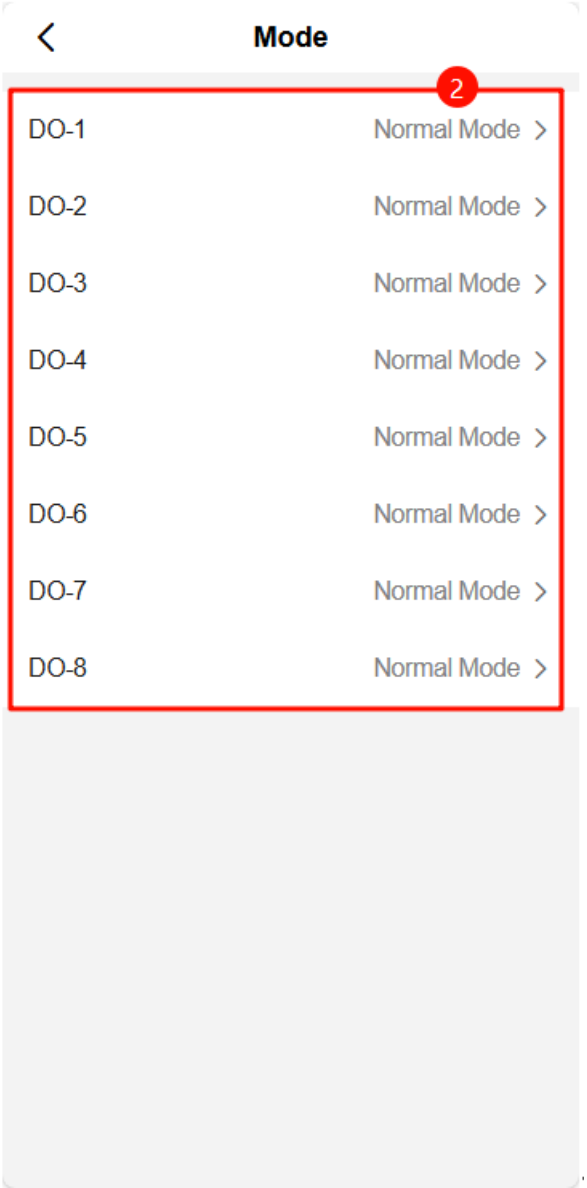



Figure 3-2 Batch Switch Configuration

## 3.2 Normal Mode



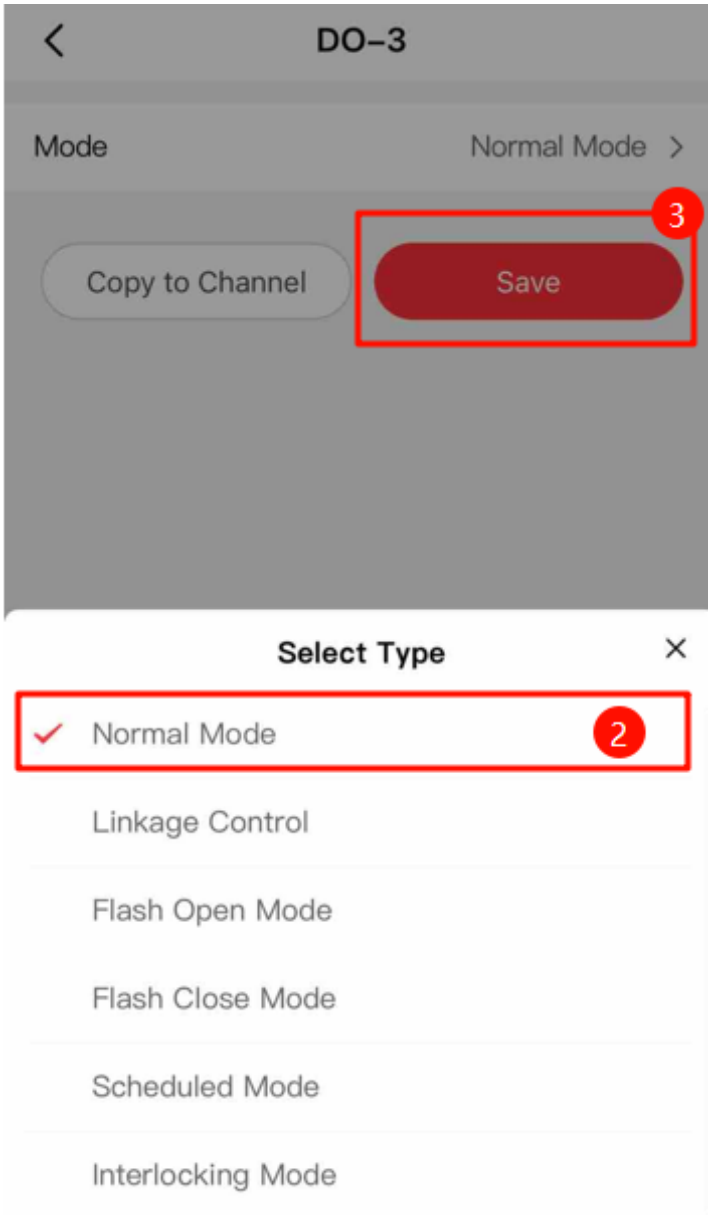



Figure 3-3 DO Mode Configuration Entry

## 3.3 Linkage Control Mode

After configuring this mode, it supports linkage control of the switch signal input through the DI port to control the switch of DO. It supports configuring the associated DI port and delay time for each DO port.

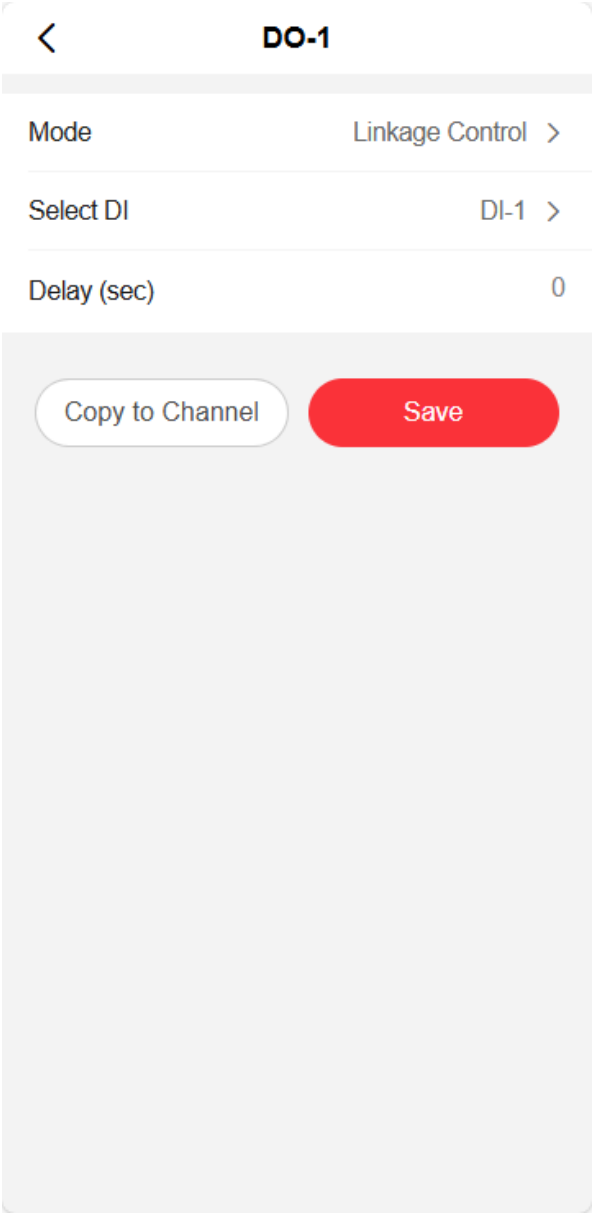



Figure 3-4 Linkage Control Mode

## 3.4 Flash Open Mode

The DO port is in a closed state. After configuring this mode, the DO port will open at the set time when it is disconnected, and it will continue to close after the set time for disconnection is reached.

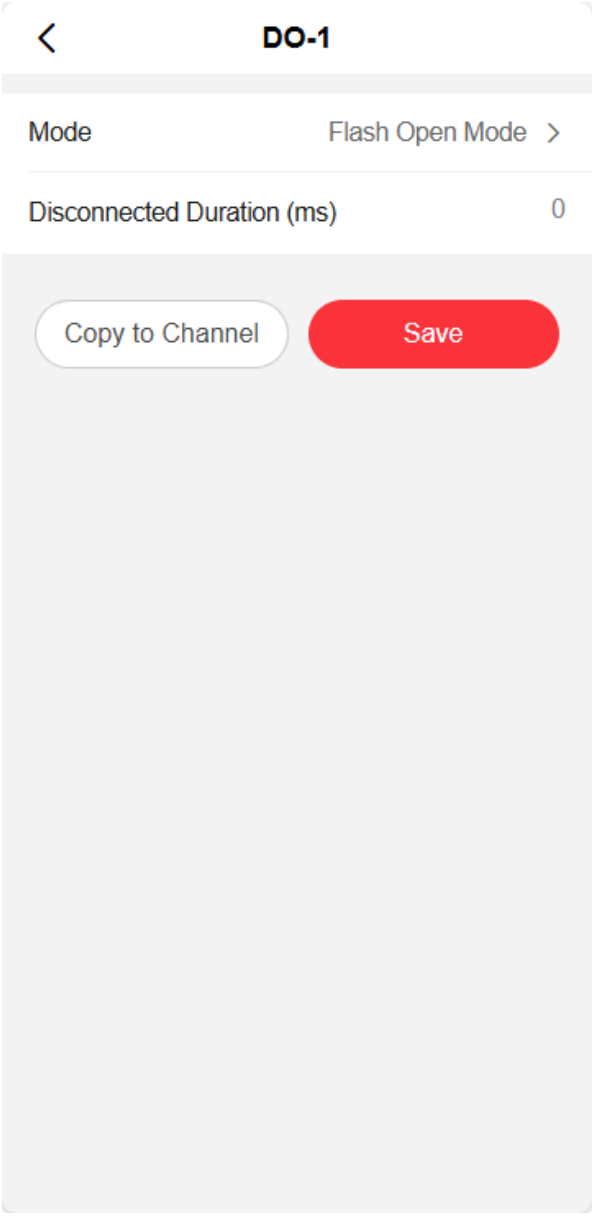



Figure 3-5 Flash Open Mode

## 3.5 Flash Close Mode

The DO port is in an open state. After configuring this mode, the DO port will close for the set time when it closes, and it will remain open after the set time is reached.

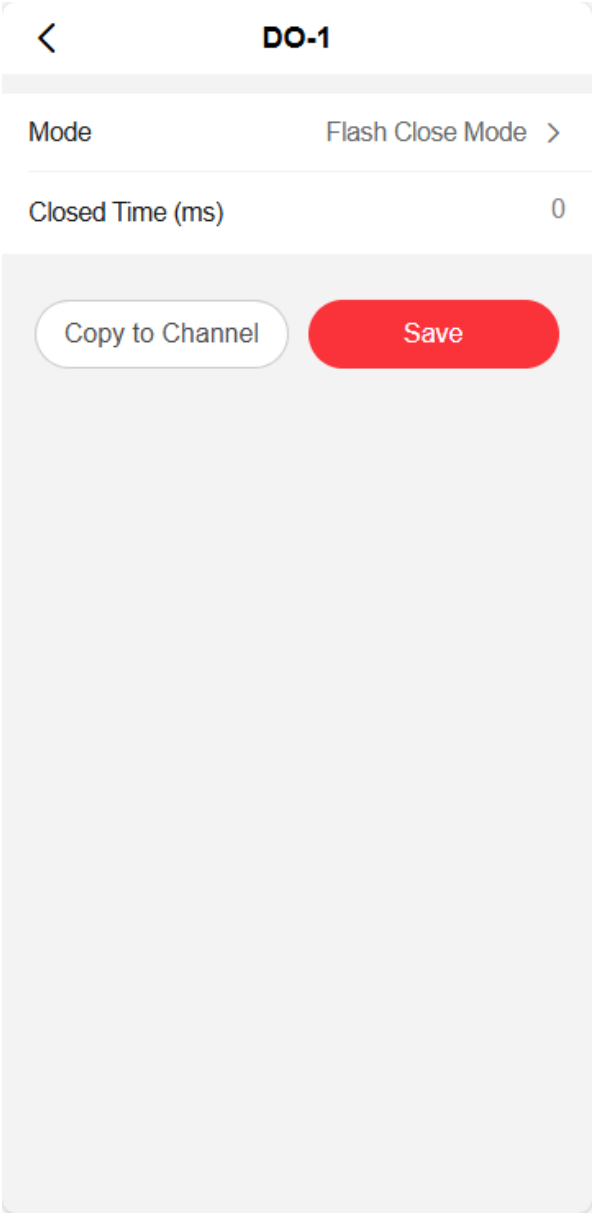



Figure 3-6 Flash Close Mode

## 3.6 Schedule Mode

This mode supports controlling the DO port to output pulse signals at specific times. It supports configuring high/low signal bandwith, and supports pulse output by count and unlimited loop pulse.

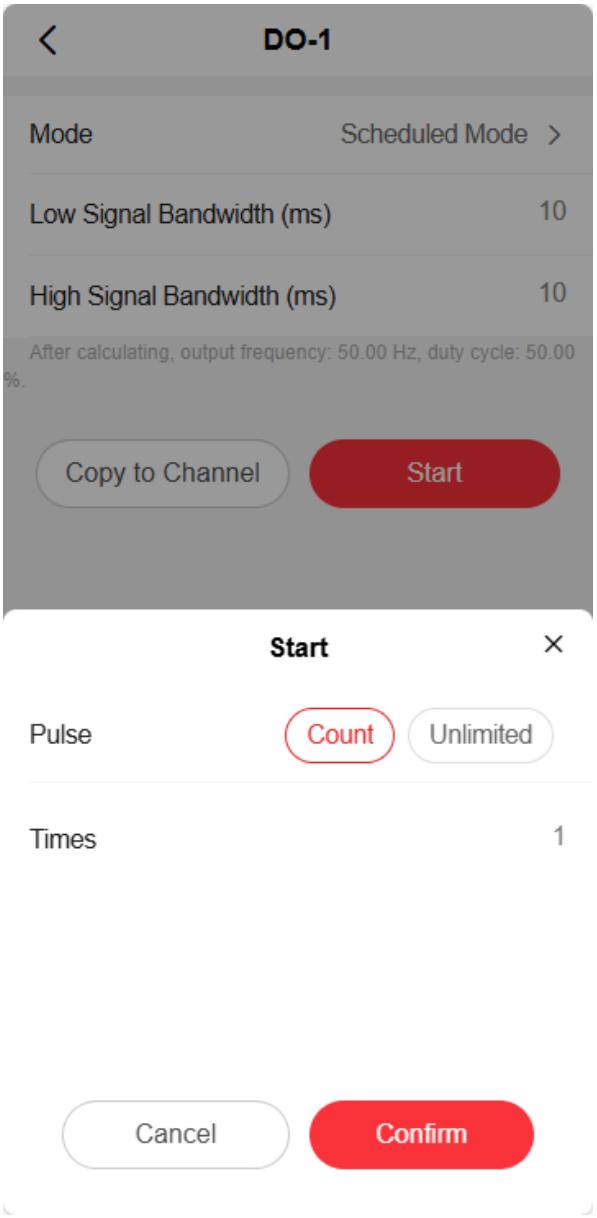



Figure 3-7 Timing Mode

## 3.7 Interlocking Mode

The DO output interlock mode refers to a mechanism in control systems that ensures, through software or hardware logic, that multiple outputs cannot be activated simultaneously, thereby preventing potential conflicts or hazardous situations from occurring.

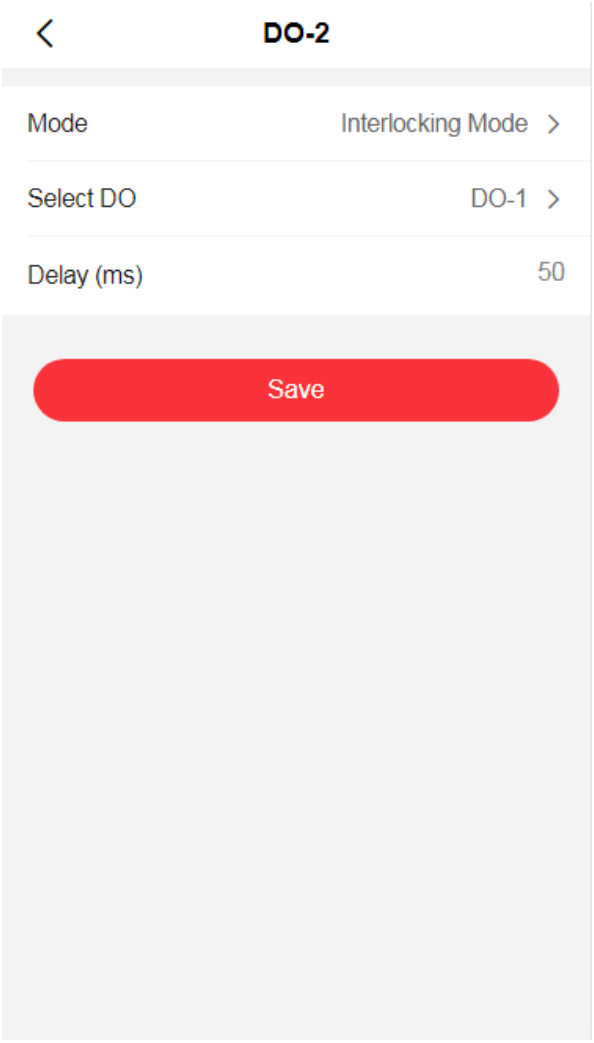


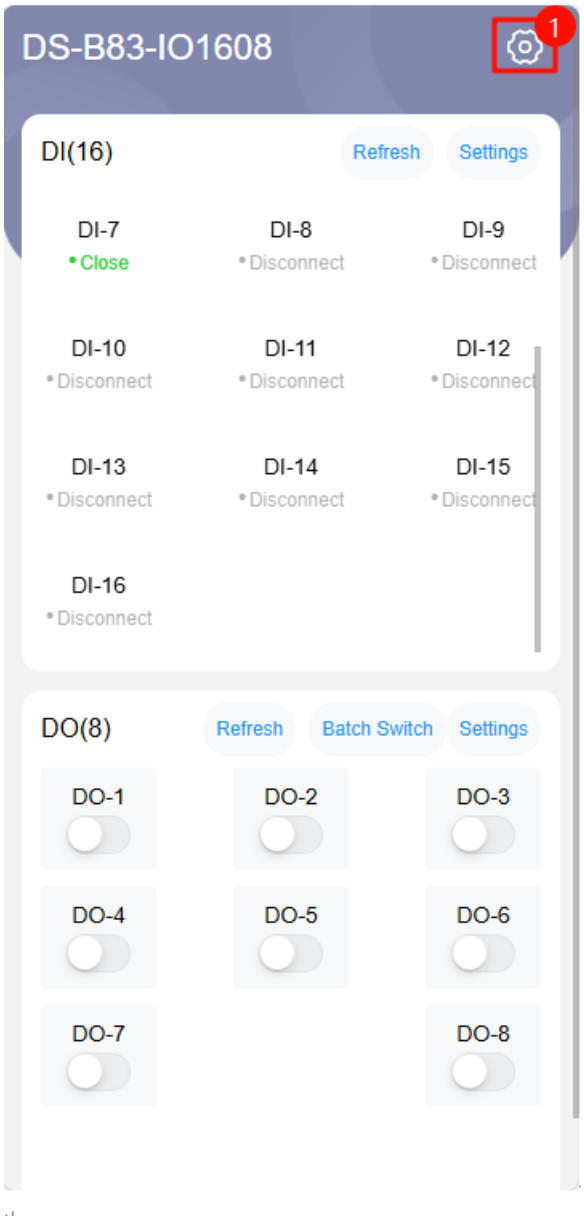

Figure 3-8 Interlocking Mode

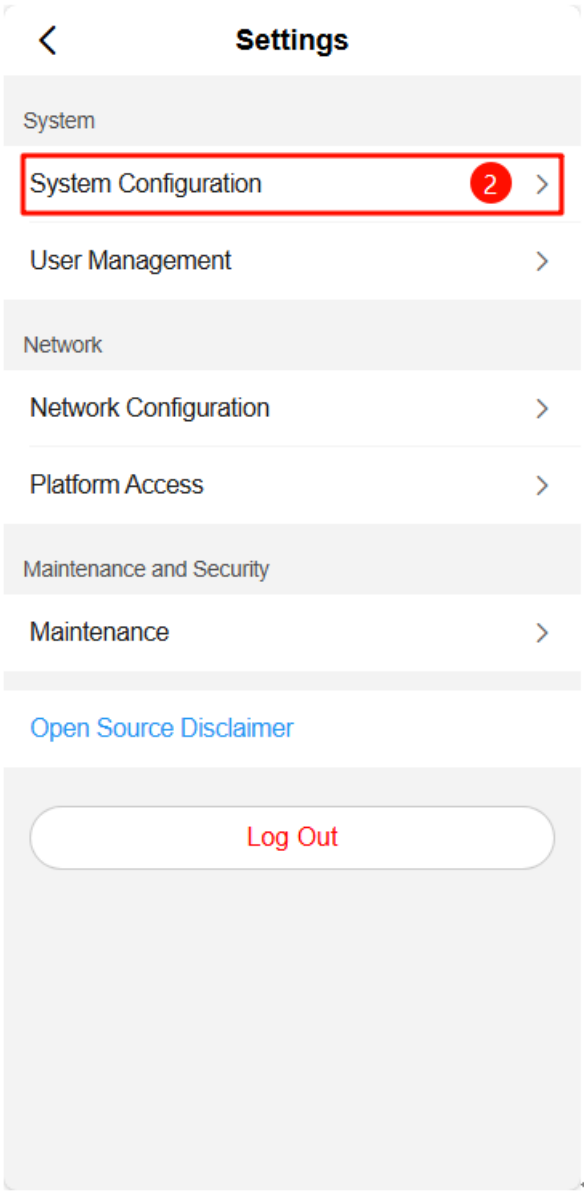
# Chapter 4 Other Configurations

## 4.1 System Configuration

### 4.1.1 Basic Information

Support for viewing basic device information. The device name and device number are editable.



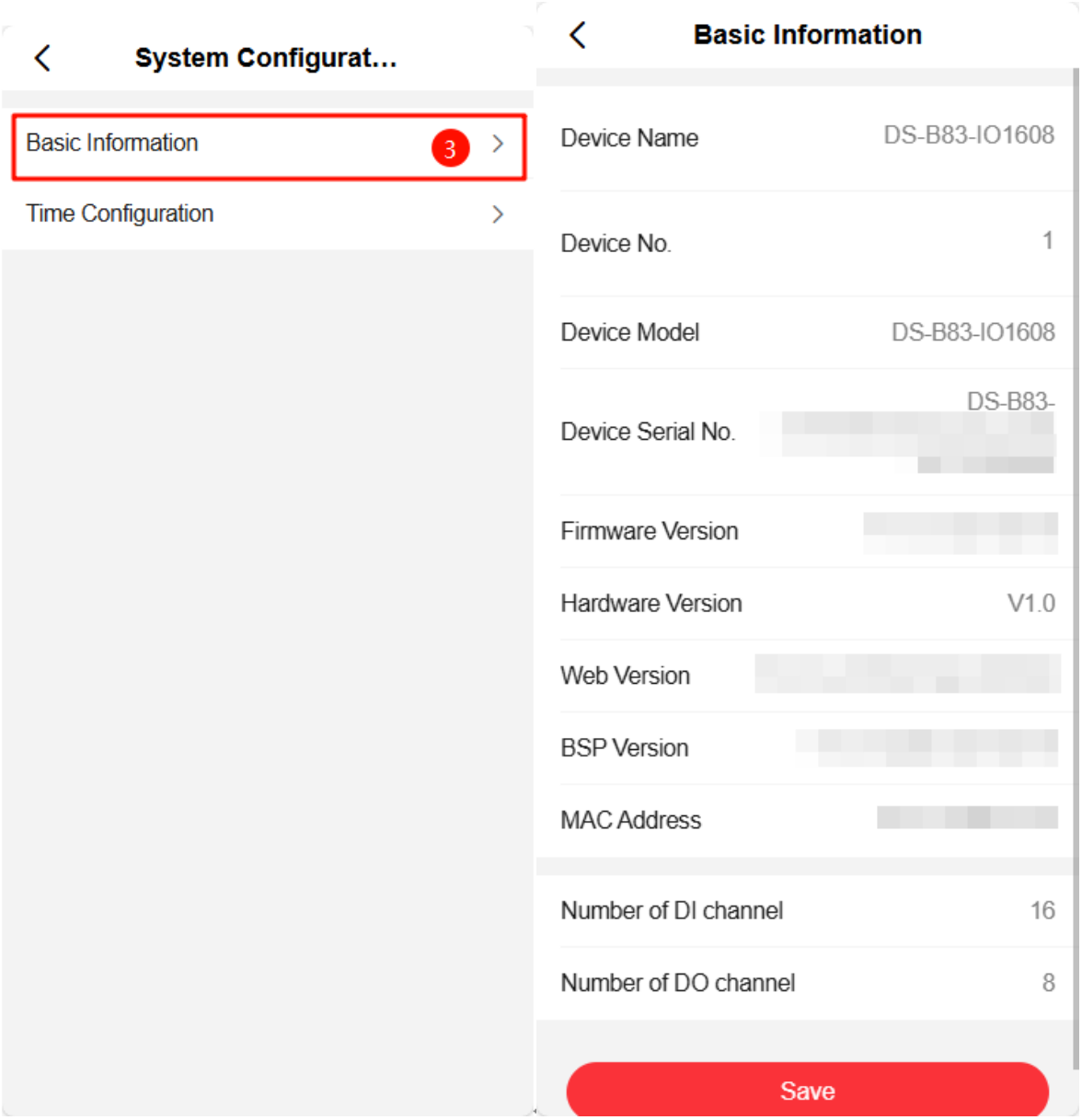



Figure 4-1 Check basic information

### 4.1.2 Time Configuration

Supports device time configuration.

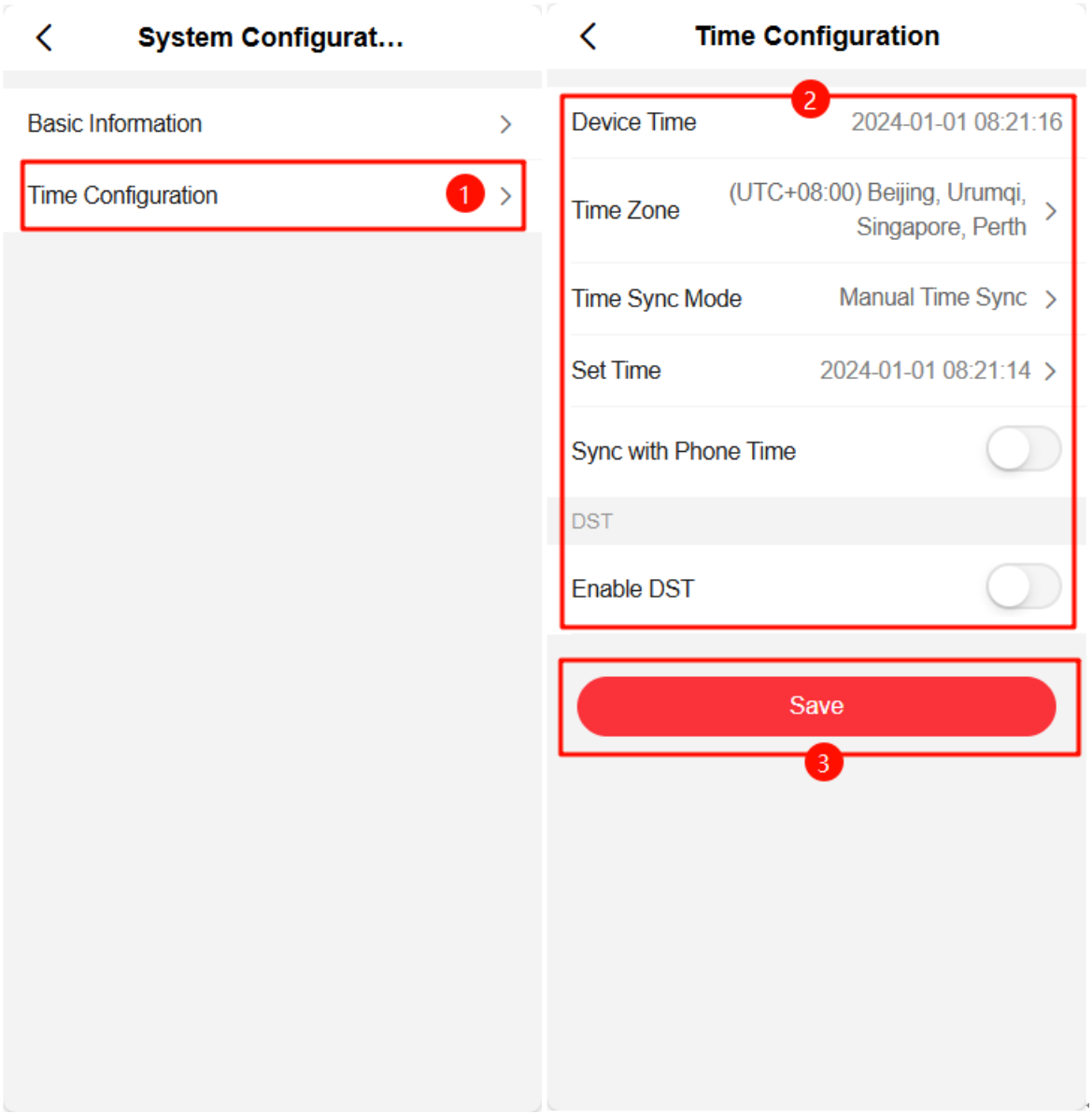
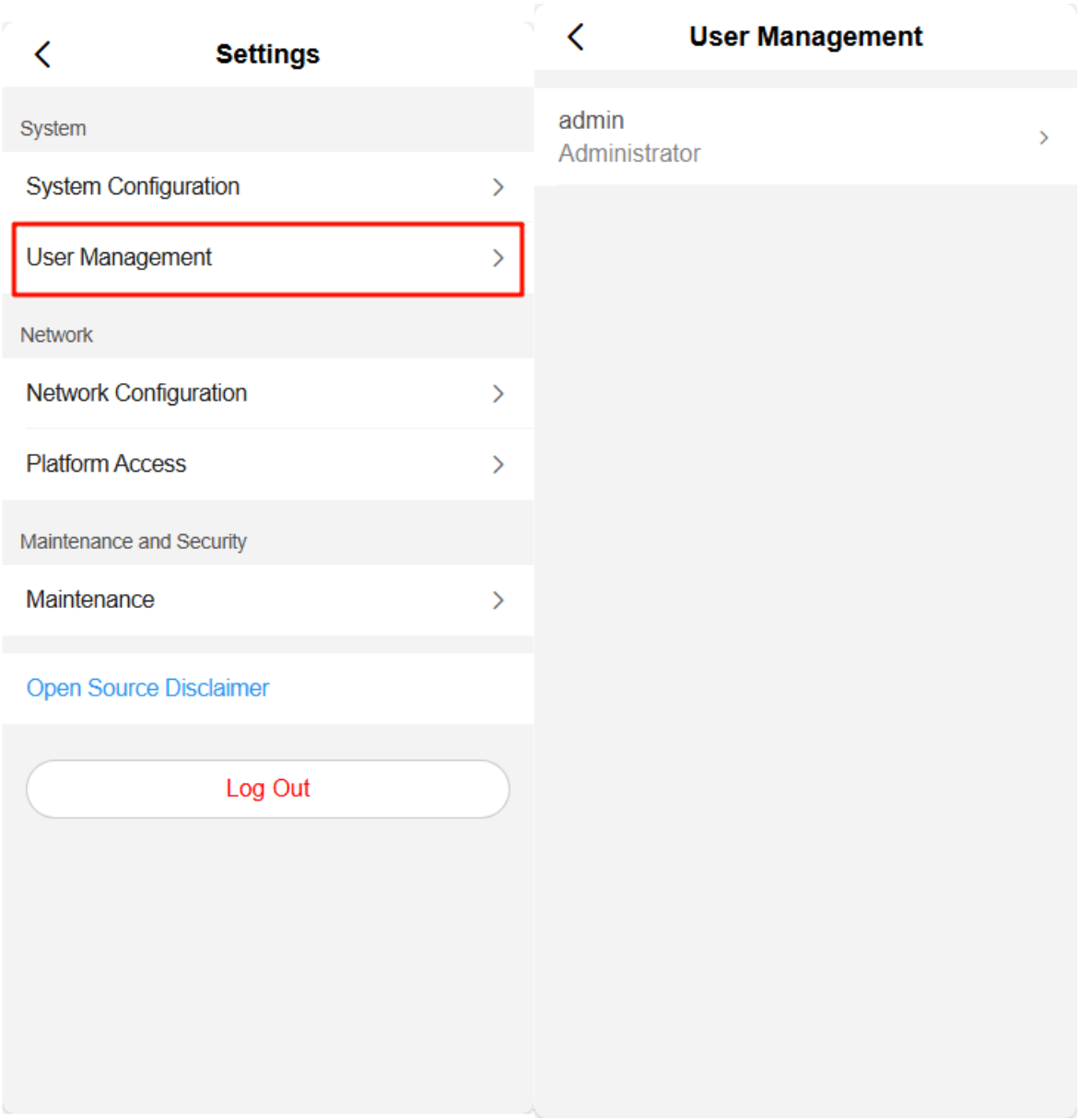



Figure 4-2 Configuration Time

## 4.2 User Management

Support setting the password for the administrator user.



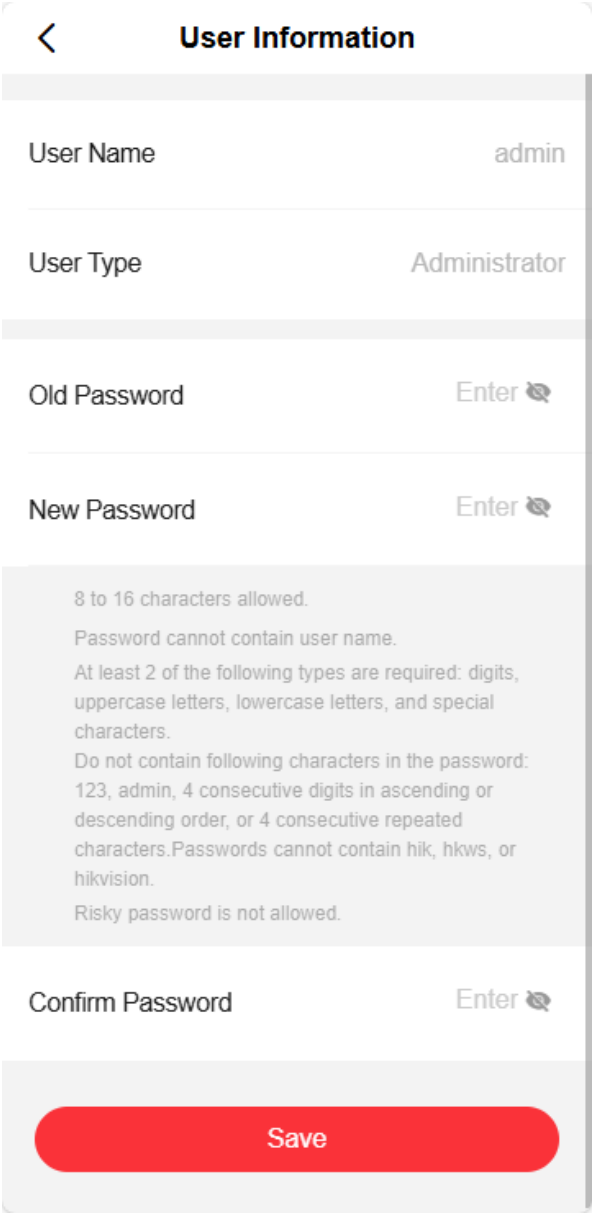


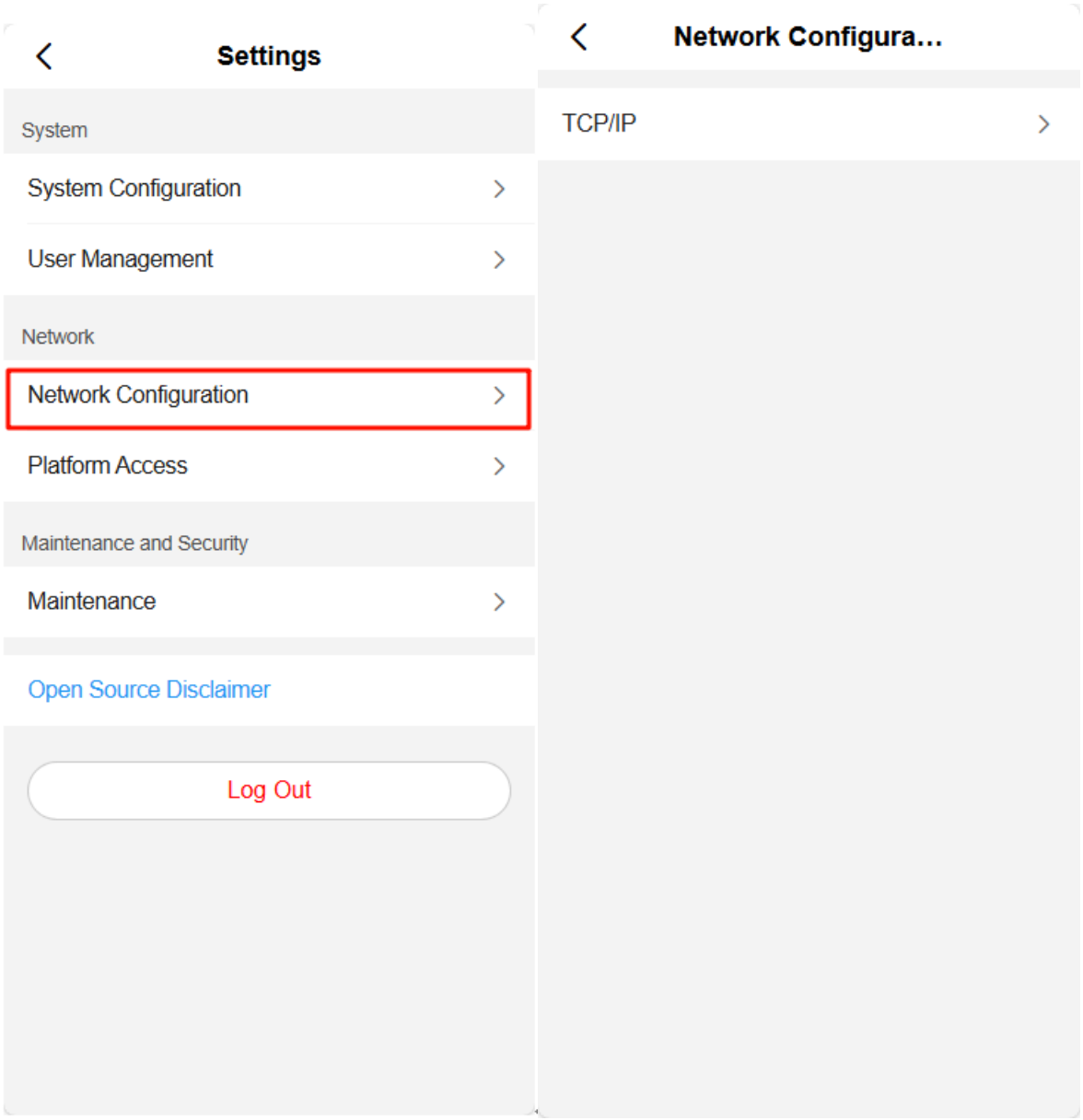

Figure 4-3 Set password

**Caution**

The password reset will also serve as the network key when connecting the device to Wi-Fi.

## 4.3 Network Configuration

Supports the configuration of TCP/IP parameters for devices.



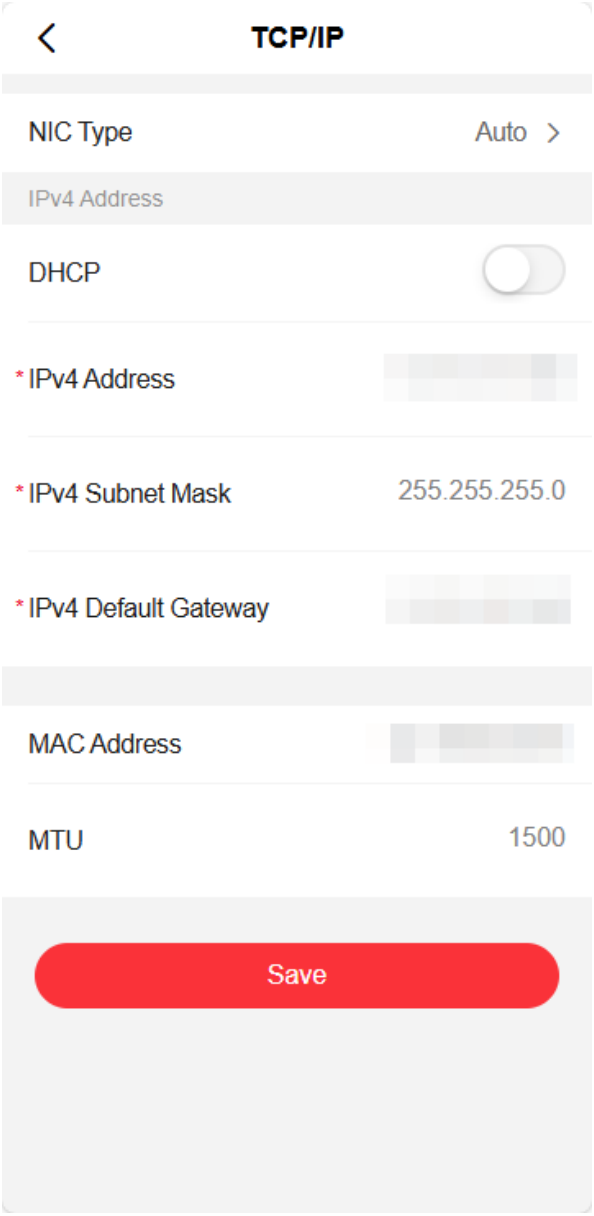



Figure 4-4 Configure the network

## 4.4 Platform Access

Supports configuration platform access protocols.

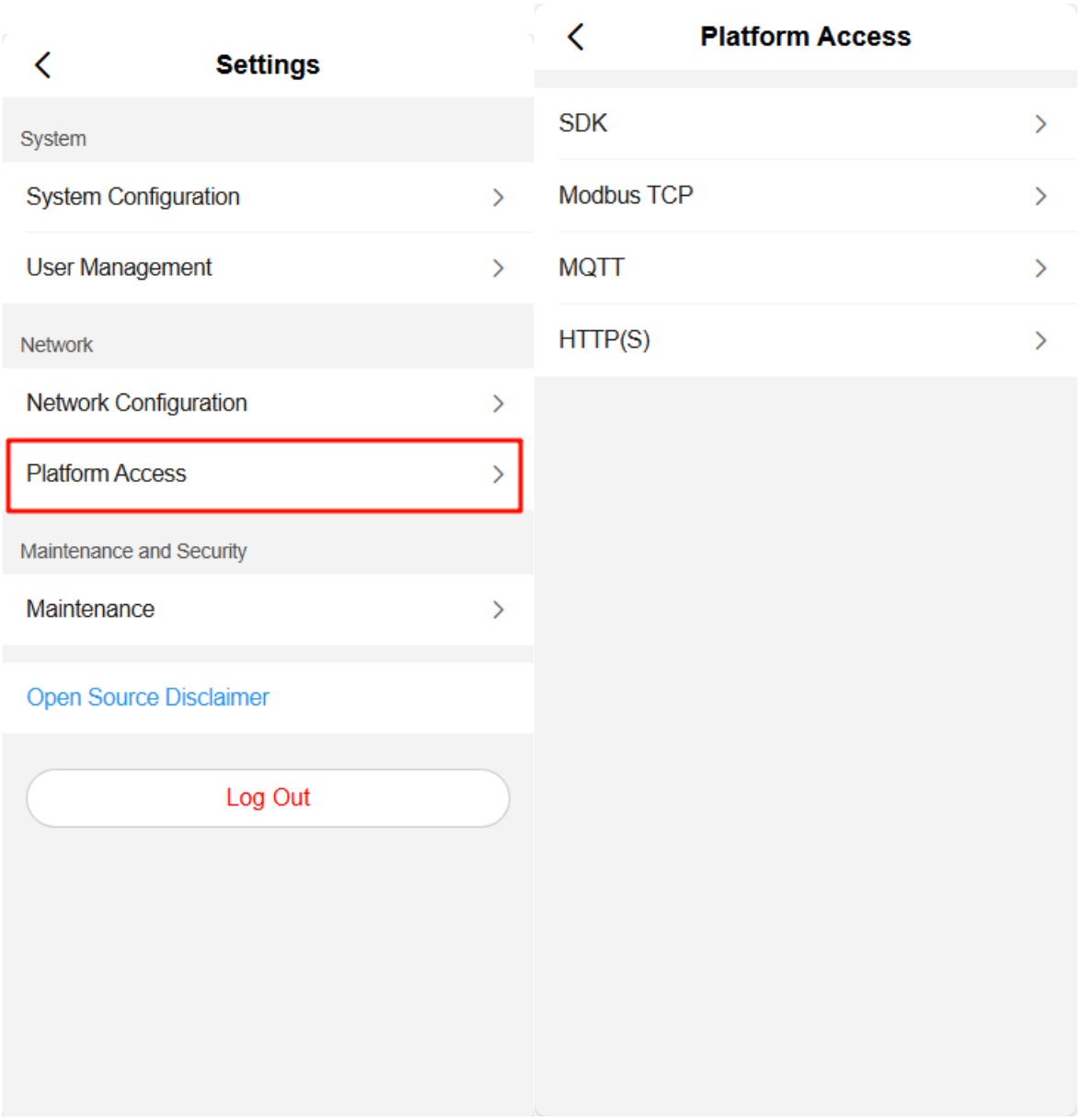
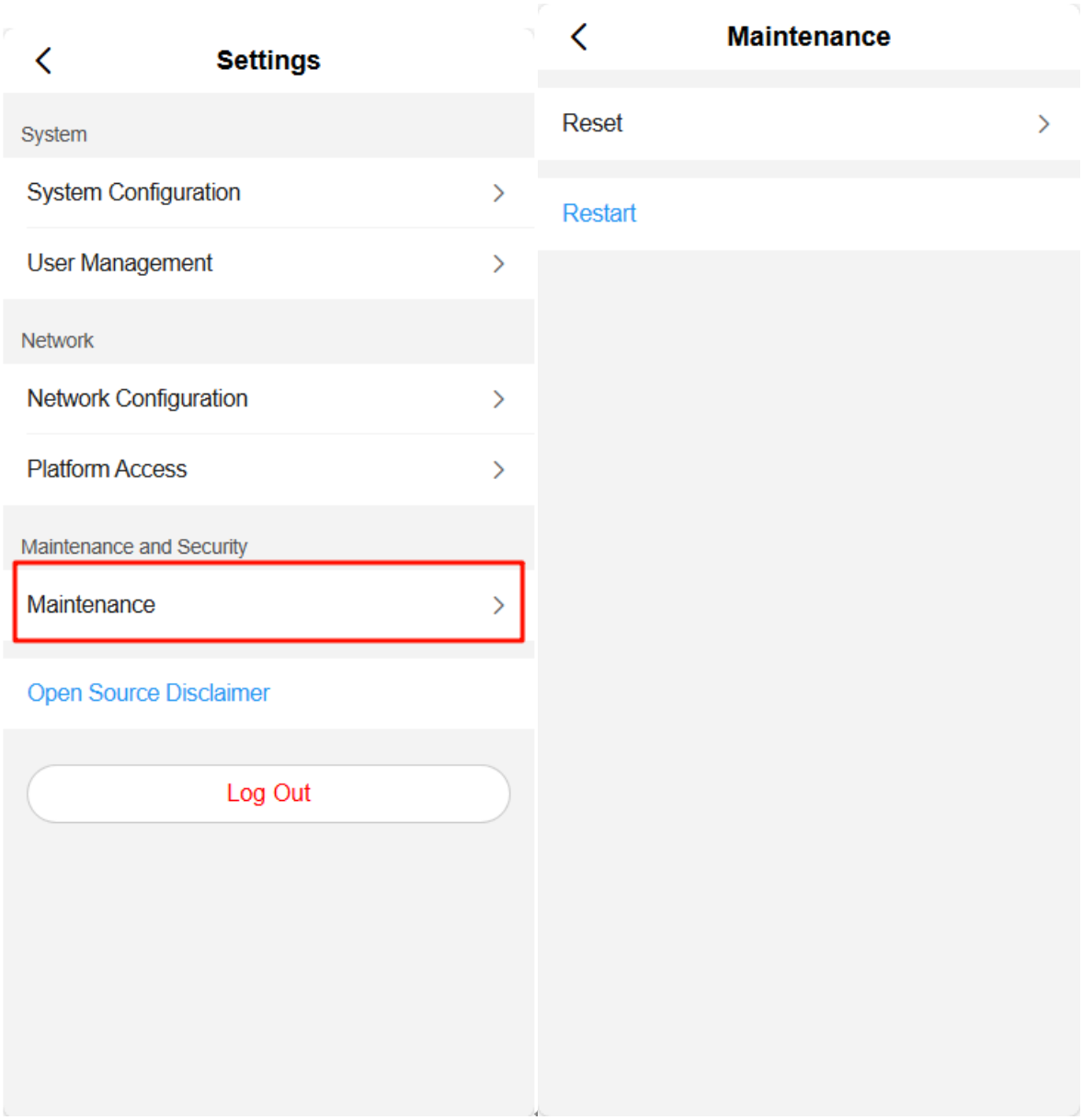



Figure 4-5 Platform Access Protocol Configuration

- SDK: Used for accessing NVR or configuring the network using SADP.
- Modbus TCP/MQTT: Used for connecting to servers, controlling devices or viewing device data using platform software, etc.

## 4.5 Maintainance

Support device reset and restart.



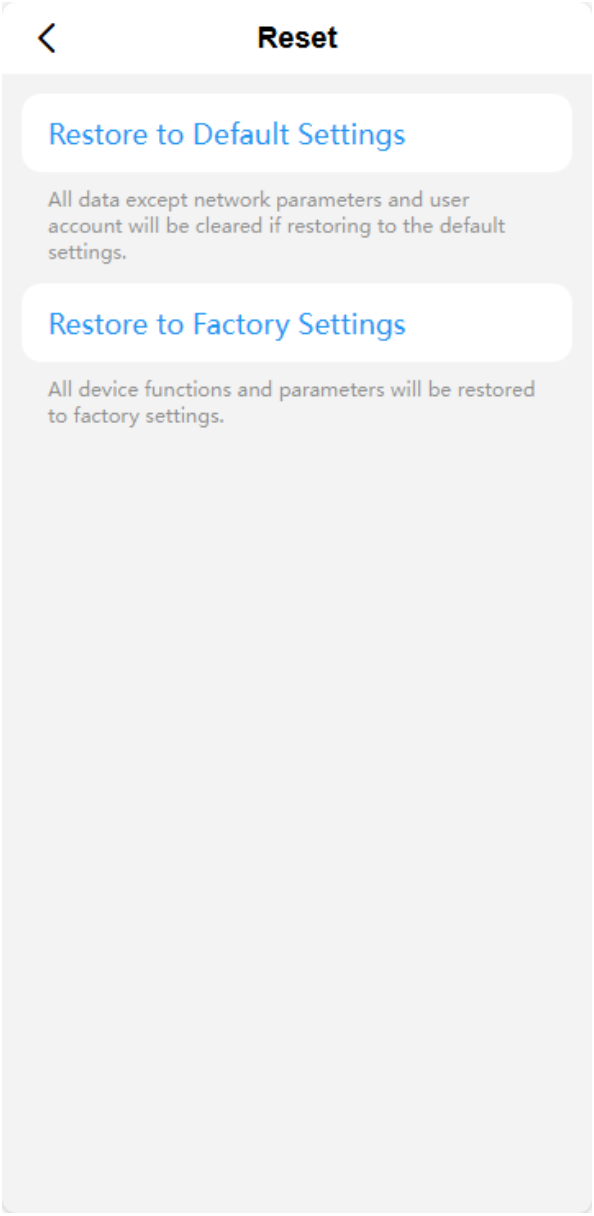



Figure 4-6 Equipment Maintenance

**Caution**

Resetting the device will clear the data, please operate with caution!

# Appendix A Set Web Page for Better Experience

It is recommended to configure the web page through the inspector of browser for better experience. Steps as follow:

Step 1 Right-click on the web page or press F12.

Step 2 Click **Inspect**.

Step 3 Select a display model at **Dimensions**.

**Note**

If there is no Dimensions menu bar on the page, click at the upper left corner of the inspector.

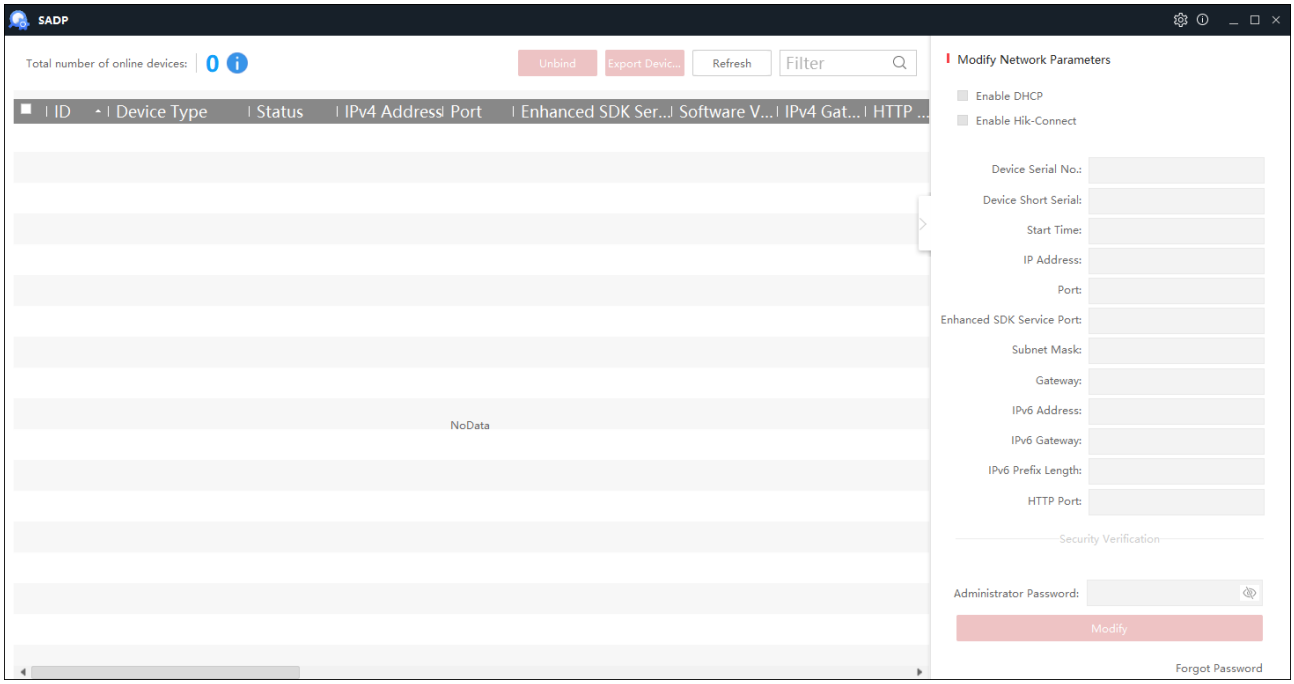
# Appendix B Configure the network using SADP

Step 1 Connect this device and computer to the same switch network.

Step 2 Go to the Hikvision official website using a computer browser, navigate to → Service Support → HiTools, and download the "SADP".

Step 3 Open the "SADP" software.

Step 4 Find this device in the list by model.



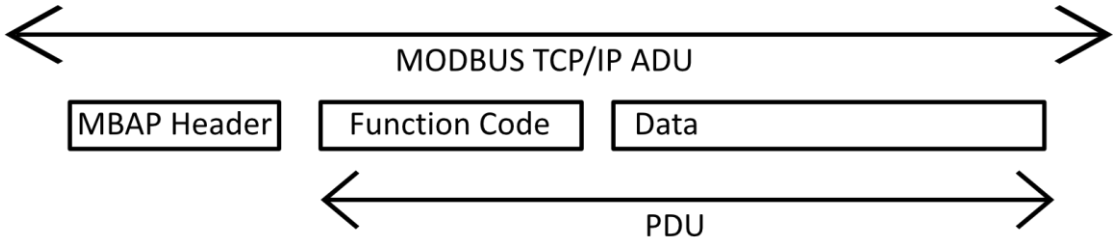

Step 5 Check this device.

Step 6 Configure network parameters on the right side of the interface.

Step 7 Click "Modify."

# Appendix A Modbus TCP Communication Example

The composition of the MODBUS TCP message is as follows:




Message header includes the following fields:

| Domain | Length | Description |
|---|---|---|
| Transaction Unit Identifier | 2 bytes | Paired for transaction processing. In the response, the MODBUS server replicates the transaction identifier from the request. |
| Protocol Identifier | 2 bytes | Used for multiplexing within the system. The MODBUS protocol is identified by the value 0. |
| Length | 2 bytes | The length field is the number of bytes of the next field, including the unit identifier and the data field. |
| Unit Identifier | 1 byte | Identification code of a remote slave station connected via a serial link or other bus |

1. Function Code 03

Used to read analog register, which reads a 16-bit integer or unsigned integer.

Corresponding data operation address: 40001~40740

Example:

Read working mode of DO0~5 channels

| | | | | |
|---|---|---|---|---|
| Host sends: | 00 00 00 00 00 06 00 | 03 | 00 00 | 00 06 |
| | Header | Function Code | Register Address 40001 | Number of Registers |

| | | | | |
|---|---|---|---|---|
| Device Return: | 00 00 00 00 00 0F 00 | 04 | 0C | 00 01 00 01 00 01 00 01 00 01 00 01 |
| | Header | Function Code | Number of Bytes | Data |
| | | | | Channel 0 is in immediate output mode: 00 01 |
| | | | | Channel 1 is in immediate output mode: 00 01 |
| | | | | Channel 2 is in immediate output mode: 00 01 |
| | | | | Channel 3 is in immediate output mode: 00 01 |
| | | | | Channel 4 is in immediate output mode: 00 01 |
| | | | | Channel 5 is in immediate output mode: 00 01 |

2.06 Function Code

Used to write a single saved register

Corresponding data operation address: 40001~40740

Example:

Write DO0 pulse output count

| | | | | |
|---|---|---|---|---|
| Host sends: | 00 00 00 00 00 06 00 | 06 | 00 80 | 00 64 |
| | Header | Function Code | Register Address 40129 | Data: Output 100 Pulses |
| Device Return: | 00 00 00 00 00 06 00 | 06 | 00 80 | 00 64 |

| | Header | Function Code | Register Address 40129 | Data |
|---|---|---|---|---|

3, 10 Function Code

Used to save multiple registers

Corresponding data operation address: 40001~40740

Example:

Write DO0 pulse output count

| | | | | | | |
|---|---|---|---|---|---|---|
| Host sends: | 00 00 00 00 00 0B 00 | 10 | 00 80 | 00 02 | 04 | 00 00 00 64 |
| | Header | Function Code | Register Address 40129 | Number of Registers | Bytes | Data:<br>Output 100 pulses |
| Device Return: | 00 00 00 00 00 06 00 | 10 | 00 80 | 00 02 | | |
| | Header | Function Code | Register Address 40129 | Number of Registers | | |

4.01 Function Code

Used to read switch quantities, reading is a single bit.

Corresponding data operation address: 00001~00750

Example:

Read the output status of channels DO0~5

| | | | | |
|---|---|---|---|---|
| Host sends: | 00 00 00 00 00 06 00 | 01 | 00 00 | 00 06 |
| | Header | Function Code | Register Address 00001 | Quantity of Switches |

| | | | | |
|---|---|---|---|---|
| Device Return: | 00 00 00 00 00 04 00 | 01 | 01 | 0F |
| | Header | Function Code | Number of Bytes | Data |
| | | | | Channel 0 is in the conductive state: 1 |
| | | | | Channel 1 is in an conductive state: 1 |
| | | | | Channel 2 is in conductive state: 1 |
| | | | | Channel 3 is in conductive state: 1 |
| | | | | Channel 4 is in a disconnected state: 0 |
| | | | | Channel 5 is in a disconnected state: 0 |

5, 02 Function Code

Used to read switch quantities, reading is a single bit.

Corresponding data operation address: 10001~10006

Example:

Read the input status of channels DI0~5

| | | | | |
|---|---|---|---|---|
| Host sends: | 00 00 00 00 00 06 00 | 02 | 00 00 | 00 06 |
| | Header | Function Code | Register Address 00001 | Quantity of Switches |
| Device Return: | 00 00 00 00 00 04 00 | 02 | 01 | 0F |
| | Header | Function Code | Number of Bytes | Data |
| | | | | Channel 0 is a high-level input: 1 |

Channel 1 is a high-level input: 1

Channel 2 is a high-level input: 1

Channel 3 is a high-level input: 1

Channel 4 is a low-level input: 0

Channel 5 is a low-level input: 0

6, 05 Function Code

Used for writing a single switch quantity

Corresponding data operation address: 00001~00750

Example:

Set DO0 safety output status to conductive

| | | | | |
|---|---|---|---|---|
| Host sends: | 00 00 00 00 00 06 00 | 05 | 00 40 | FF 00 |
| | Header | Function Code | Register Address 00065 | Data:<br>Set channel 0 security status to conductive |
| Device Return: | 00 00 00 00 00 06 00 | 05 | 00 40 | FF 00 |
| | Header | Function Code | Register Address 00065 | Data |

6, 0f function code

Used to write multiple switch quantities

Corresponding data operation address: 00001~00750

Example:

Set DO0~5 safe output status

| | | | | | | |
|---|---|---|---|---|---|---|
| Host sends: | 00 00 00 00 00 0B 00 | 0F | 00 40 | 00 06 | 00 01 | 00 0F |
| | Header | Function Code | Register Address 00065 | Number of Registers | Bytes | Data:<br>DO0 Conducted<br>DO1 Conducted<br>DO2 Conducted<br>DO3 Conducted<br>DO4 shutdown<br>DO5 Shutdown |
| Device Return: | 00 00 00 00 00 06 00 | 0F | 00 40 | 00 06 | | |
| | Header | Function Code | Register Address 00065 | Number of Registers | | |

Query the number of channels

This is a hexadecimal sequence and does not require translation. It appears to be a binary or hexadecimal data packet, possibly used in network communication or device configuration.

Query DO

00 00 00 00 00 06 00 01 00 00 00 08

Query DI

00 00 00 00 00 06 00 02 00 00 00 08

Query Count Value

00 00 00 00 00 06 00 03 02 98 00 08

Query version number and serial number

00 00 00 00 00 06 00 03 01 F4 00 06

Set Single Relay

00 00 00 00 00 06 00 05 00 00 FF 00

Set multiple relays

00 00 00 00 00 08 00 0F 00 00 00 08 01 01

This is a sequence of hexadecimal numbers. It appears to be a data packet or a command in a specific protocol. Here is the translation:

00 00 00 00 00 08 00 0F 00 00 00 08 01 00

00 00 00 00 00 08 00 0F 00 00 00 08 01 00

00 00 00 00 00 08 00 0F 00 00 00 08 01 0F

Set delay time

00 01 00 00 00 17 FF 10 00 A0 00 08 10 00 00 27 10 00 00 2A F8 00 00 2E EE 00 00 32 C8 (10000 11000 12014 13000) Low to High

00 01 00 00 00 17 FF 10 00 C0 00 08 10 00 00 27 10 00 00 2A F8 00 00 2E EE 00 00 32 C8 (10000 11000 12014 13000) High to Low

Clear count value

00 00 00 00 00 0F FF 10 (Function Code) 02 88 (Start Address: Hexadecimal equivalent address 648=40649-40001) 00 04 (Number of Set Registers) 08 (Number of Bytes = Registers * 2, one register corresponds to two bytes) 00 01 00 01 00 01 00 01

00 00 00 00 00 17 FF 10 02 88 00 08 10 00 01 00 01 00 01 00 01 00 00 00 00 00 00 00

# Appendix C MQTT protocol format

Request Topic: Web Configuration

{

"Code": 1

/* req:integer 0-read the number of DI and DO channels 1-read the relay status 2-read the status of switch input 3-read the status of switch counter 4-set relay (1-closed, 0-open) 5-set relay working mode (1-immediate output, 2-low to high delay output, 3-high to low delay output) 6-clear switch counter */

"SerialNumber":"123321"

/* req:string 9-digit serial number */

"StartAddress":1,

/* req: integer operation starting sequence number, corresponding to the nth DI output, DO input, or timer */

"Count": 4

/* opt integer: Code = 1/2/3/6 when needed, indicating the number of reads or clears required */

"modeList": [1, 2, 3]

/* opt array integer: Code = 5 when needed, indicating the setting mode 1-immediate output, 2-low to high delay output, 3-high to low delay output */

```json
"valueList":[1,1,1,1]
```

/* opt array integer: Code = 4/5 when in mode, 5 sets relay working mode - indicates setting the delay value, immediate output is set to 0; 4 sets relay - 1-closed, 0-released */

}

Return

Subject: HIK/IO/REPLY/Serial Number

For example, if the SerialNumber returned by the subscription topic is 123321, then other clients need to subscribe to the topic returned by the device as HIK/IO/REPLY/123321. The reason for doing this is to distinguish messages returned to different clients.

{

"Code": 1

"Result":"sucess"

/* req string: Execution result - success-failure */

"DOChannelNum":8,

/* opt integer: Code = 0 when needed, indicating the DO channel data to be read */

"DIChannelNum": 16

/* opt integer: Code = 0 when needed, indicating the DI channel data to be read */

StateList:[1,1,1,1]

/* opt integer: Code = 1/2/3 when needed, indicating the data to be read */

}

Active Reporting

Subject: HIK/IO/EVENT/Device Short Serial Number

{

"DIStateList": [1, 1, 1, 1]

"DOStateList": [1, 1, 1, 1]

}


See Far, Go Further