

# **iSmartGate SE**

## **Intelligent Gateway**

### **User Manual**

### **Version: V1.1**

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- Only CET's duly authorized representative may open your device. The unit should only be opened in a fully anti-static environment. Failure to do so may damage the electronic components and will void the warranty.

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## Chapter 1 Introduction

This chapter provides an overview of the iSmartGate SE and summarizes many of its key features.

### 1.1 Overview

The iSmartGate SE is an Intelligent Gateway that provides one 10BASE-T/100BASE-TX Ethernet port, two RS-485 ports, one optional built-in 4G modem as well as one optional wireless LoRa port with configurable ISM Bands. Featuring DIN-Rail mounting and compact construction, it is an ideal equipment that serves as a gateway to connect RS-485 and/or LoRa enabled devices to an IP-based Ethernet LAN over an Ethernet network or 4G network for any SCADA or Automation applications. With extensive protocols such as Modbus RTU, Modbus TCP, IEC 60870-5-104 (IEC 104), AnyPolling and optional BACnet/IP, etc., the iSmartGate SE facilitates access to various end devices, and data storage and upload for efficient and reliable data management. Further, the iSmartGate SE has been specifically designed with industrial automation in mind and therefore provides un-surpassed performance and reliability under the harshest industrial or commercial environments.

### 1.2 Features

#### Basic Features

- 1x10BASE-T/100BASE-TX(RJ45) with MDI/MDIX auto-detect and 2xRS-485 port are designed to withstand the harshest industrial environments
- One optional built-in 4G LTE CAT1 modem
- One optional LoRa port with configurable ISM Bands for EU863-870, RU864-870, IN865-867, US902-928, AU915-928, AS920-923 and AS923-925
- Built-in Web Server for access to Data, Configuration and Maintenance
- Automatic IP assignment using DHCP and DNS domain name resolution
- Transparent Gateway & Modbus TCP to RTU Gateway between Ethernet port and RS-485/LoRa
  - TCP Server and TCP Client modes
  - Maximum 32 downstream LoRa devices per iSmartGate SE
  - 32 Slave IEDs per RS-485 port
  - Maximum 4 Masters per RS-485/LoRa port
- One-key Reset to Factory Default
- Extended operating temperature

#### Data Concentration and Management

- Up to 2 Data Caches
- Data collection via Ethernet, RS-485 or LoRa
  - Maximum 128 downstream devices per iSmartGate SE
  - Modbus RTU, Modbus TCP, IEC 104 and Anypolling
- Support Data Recording of AI parameters and Energy parameters per Data Cache
  - Configurable interval from 1min to 60min
  - 15 days @ 1min, 900 days @ 60min
- Data push to external via Ethernet or 4G
  - 4096xAI, 4096xDI, 2048xEnergy, 1024xAO, 1024xDO, 2048xSOE
  - Extensive protocols support: Modbus TCP, IEC 104, MQTT + JSON, HTTP + JSON, AliCloud, Amazon AWS and optional BACnet/IP, etc.
  - Resumable Transfer for historical data
- Support creating virtual devices, as well as performing calculations on virtual data
  - Maximum 32 virtual devices
  - 1024xAI, 1024xDI, 512xVirtual Energy, 64xCustom SOE
- Simple configuration and commissioning via PMC-EasyCom

#### Time Synchronization

- Battery-backed Real-time Clock @ 6ppm ( $\leq 0.5s/day$ )
- Time Sync. via Communications such as SNTP, Modbus

### 1.3 Getting more information

Additional information is available from CET via the following sources:

- Visit [www.cet-global.com](http://www.cet-global.com)
- Contact your local representative
- Contact CET directly via email at [support@cet-global.com](mailto:support@cet-global.com)

## Chapter 2 Installation

### 2.1 Appearance

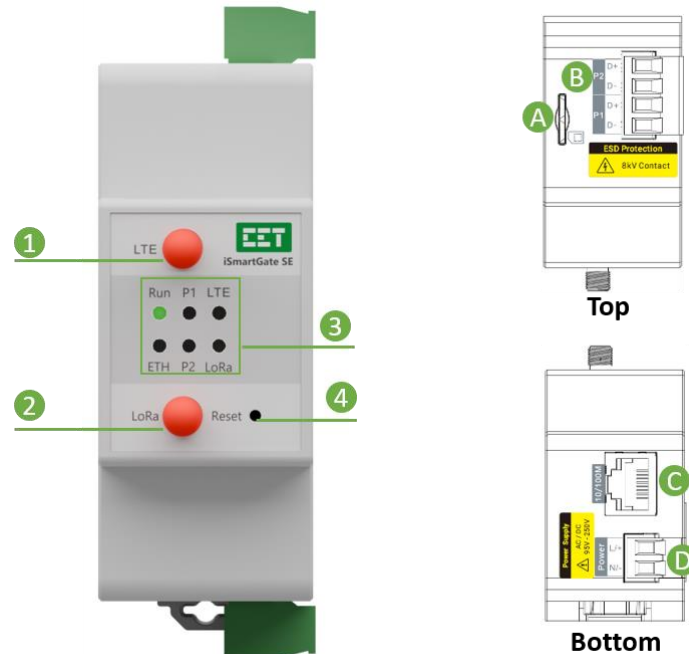


Figure 2-1 Appearance

|   | Description                  |   | Description           |
|---|------------------------------|---|-----------------------|
| 1 | LTE: 4G Antenna Interface    | A | SIM Card Slot         |
| 2 | LoRa: LoRa Antenna Interface | B | RS-485 Ports (P1, P2) |
| 3 | LED Indicators               | C | Ethernet Port         |
| 4 | Reset Key                    | D | Power Supply Terminal |

Table 2-1 Terminal Dimensions

### 2.2 Unit Mounting

The iSmartGate SE should be installed in a dry environment with no dust and kept away from heat, radiation and electrical noise sources. Installation steps:

- Before installation, make sure that the DIN Rail is already in place.
- Move the installation clip at the back of the iSmartGate SE downward to the “unlock” position.
- Align the top of the mounting channel at the back of the iSmartGate SE at an angle against the top of the DIN Rail as shown in Figure 2-2 right.
- Rotate the bottom of the iSmartGate SE towards the back while applying a slight pressure to make sure that the device is completely and securely fixed on to the DIN Rail.
- Push the installation clip upward to the “lock” position to secure the iSmartGate SE on to the DIN Rail.

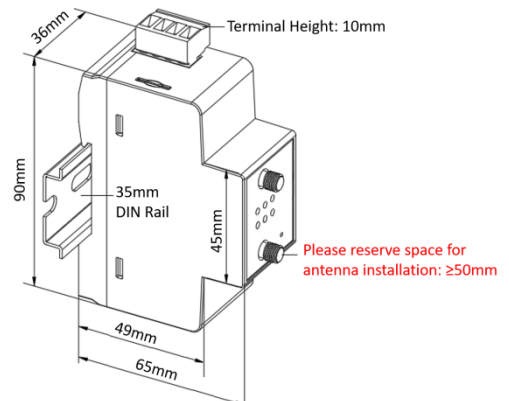


Figure 2-2 DIN-Rail Mounting

## 2.3 RS-485 Wiring

The iSmartGate SE provides two RS-485 ports (P1 and P2). Up to 32 devices can be connected on each RS-485 bus. The overall length of the RS-485 cable connecting all devices should not exceed 1200m.

The following figure illustrates the RS-485 communications connections on the iSmartGate SE:

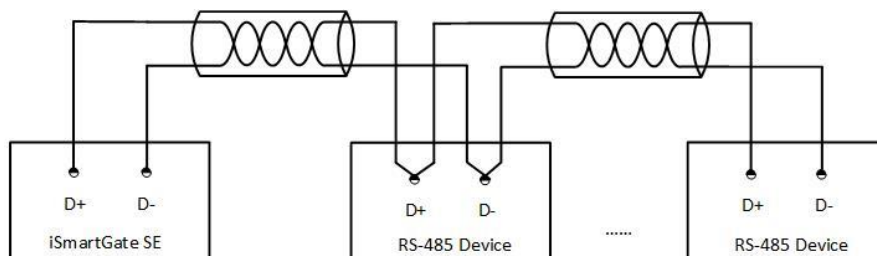


Figure 2-3 RS-485 Communications Connections

## 2.4 Ethernet Port (10BASE-T/100BASE-TX)

The iSmartGate SE comes standard with an Ethernet Port using the MDI/MIDX Auto-detect RJ45 connector, which means users can connect with a straight-through cable or a cross-over cable. The table below lists the meaning for each pin.

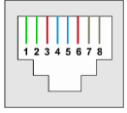
| RJ45 Connector                                                                     | Pin     | Meaning        |
|------------------------------------------------------------------------------------|---------|----------------|
|  | 1       | Transmit Data+ |
|                                                                                    | 2       | Transmit Data- |
|                                                                                    | 3       | Receive Data+  |
|                                                                                    | 4,5,7,8 | NC             |
|                                                                                    | 6       | Receive Data-  |

Table 2-2 RJ45 Connector Pin Description for 10BASE-T/100BASE-TX Applications

The figure below shows connections for the straight-through cable and the cross-over cable:

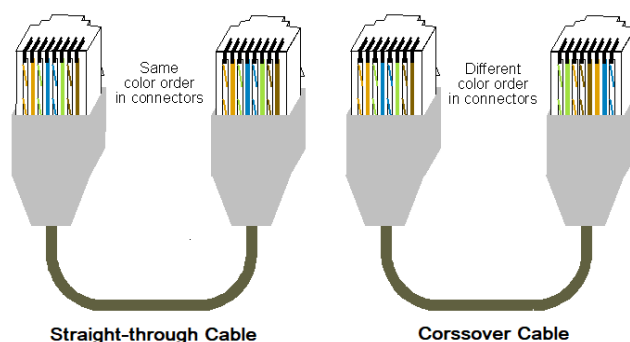


Figure 2-4 Straight-through Cable and Cross-over Cable

## 2.5 Antennas Mounting (Optional)

Before mounting the LoRa and/or 4G antennas, please check and confirm the two types of them:

- The suction cup on the bottom of the LoRa antenna is marked with 860-935MHz.
- The suction cup on the bottom of the 4G antenna will be marked with the letters '4G'.

For the best communication performance, the antenna should be mounted outside of a metal enclosure and preferably positioned vertically. The base of the antenna is equipped with a magnetic coupler for easy mounting on metal surface.

1. Removed the red SMA dust cap.
2. Carefully rotate the movable part of the metal SMA connector by hand until it can no longer be turned. Do not grasp the black rubber sleeve and forcefully twist the antenna.
3. Screw the LoRa/4G antenna into the LoRa/4G Antenna Interface.



Figure 2-6 Antennas Mounting

## 2.6 Insert SIM Card (Optional)

Insert the SIM Card to the device's SIM Card Slot at a 45 - degree angle along the flat edge, and then press it firmly into place. To remove the SIM Card, press it again.

Please note that a Micro SIM card should be used.

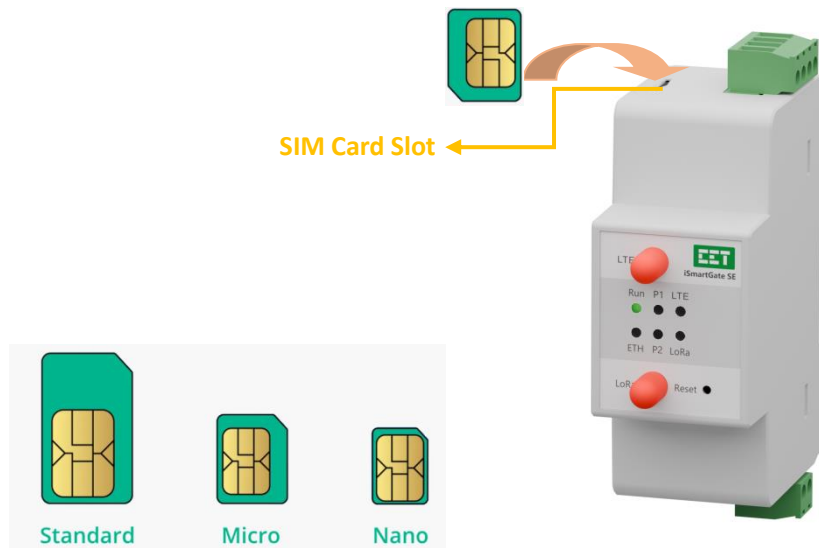


Figure 2-8 Install SIM Card

## 2.7 Power Supply Wiring

For AC supply, connect the live wire to the L/+ terminal and the neutral wire to the N/- terminal.

For DC supply, connect the positive wire to the L/+ terminal and the negative wire to the N/- terminal.

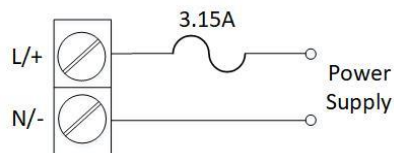
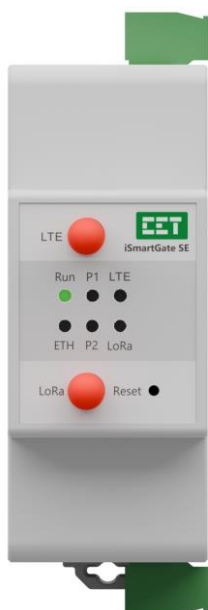


Figure 2-8 Power Supply Connections

## Chapter 3 Front Panel

### 3.1 Front Panel LED Indicators

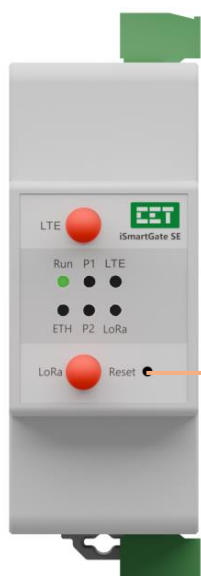
The table below describes the LED indicators on the iSmartGate SE's Front Panel:



| LED Indicator | Color  | Status           | Function                                              |
|---------------|--------|------------------|-------------------------------------------------------|
| Run           | Green  | On               | Device is running abnormally.                         |
|               |        | Off              | Power is off or device is running abnormally.         |
|               |        | Blinking         | Power is on and device is running normally.           |
| P1/P2         | Green  | Blinking         | P1/P2 is transmitting data.                           |
| LTE           | Yellow | On               | 4G is searching for a network.                        |
|               |        | Off              | SIM Card is not inserted.                             |
|               |        | Blinking Quickly | 4G signal is weak.                                    |
|               |        | Blinking Slowly  | 4G is transmitting data.                              |
| ETH           | Yellow | On               | The Ethernet Port is connected.                       |
|               |        | Off              | The Ethernet Port is disconnected.                    |
|               |        | Blinking         | Receiving or transmitting data via the Ethernet port. |
| LoRa          | Yellow | Blinking         | Receiving or transmitting data via LoRa.              |
|               |        | Off              | LoRa Communications is disabled or abnormal.          |

Table 3-1 LED Indicators

### 3.2 Reset Button



Reset button

The iSmartGate SE provides a **Reset** button at the lower right-hand corner of the front panel to reboot or load factory default settings.

- **Reboot the iSmartGate SE**

Press and hold the **Reset** button for less than 5 seconds, the iSmartGate SE will then reboot. The reboot process would be completed in approximately 30 seconds and the **Run** indicator blinks again.

- **Reset the iSmartGate SE to Factory Default**

Press and hold the **Reset** button for more than 5s and the **Run** indicator blinks at 0.5s for 3 times. This will reset the iSmartGate SE to its default factory configuration.

## Chapter 4 Web Interface

The default IP Address of the iSmartGate SE's Ethernet Port is 192.168.0.127. Please make sure to configure the IP Address and Subnet Mask for the iSmartGate SE and the PC, so that they are in the same subnet.

### 4.1 Setting PC's IP Address

- 1) To determine the PC's IP Address, click the **Start** icon , then the **Settings** button  on Windows 10 (for other MS Windows systems, please refer to this [link](#) for more instructions).

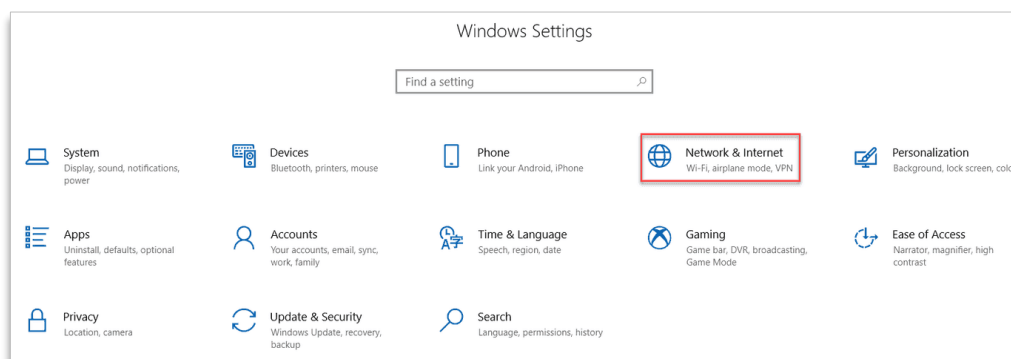


Figure 4-1 Settings-> Network & Internet

- 2) Click  **Network & Internet** and select the **Change adapter options**, and then find the appropriate Ethernet connection.

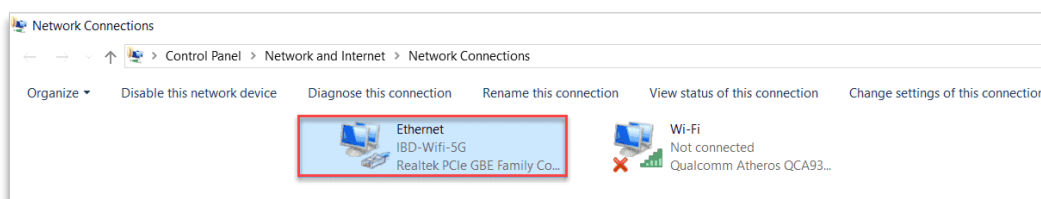


Figure 4-2 Network Connections

- 3) Right-click on the Ethernet connection and select **Properties**. Then double-click on **Internet Protocol Version 4 (TCP/IPv4)** to show its IP configuration.

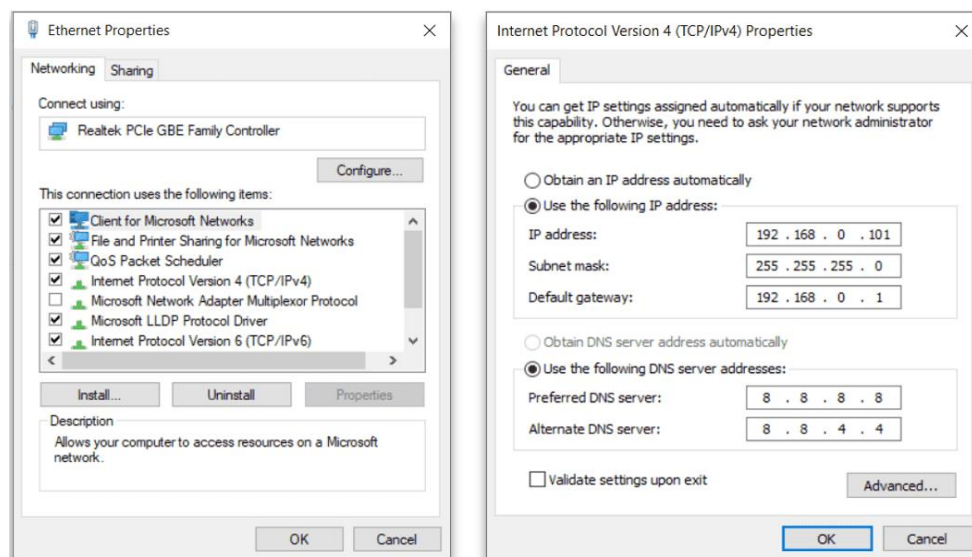


Figure 4-3 Ethernet Properties

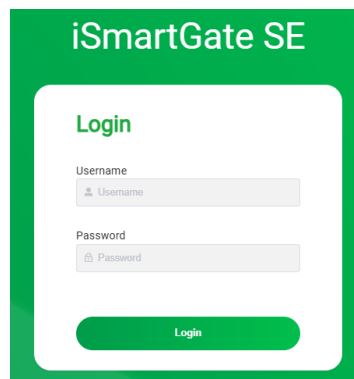
## 4.2 Web Console Login

The iSmartGate SE's Web Interface is compatible with various web browsers.

| Browser           | Browser Version |
|-------------------|-----------------|
| Internet Explorer | IE10 and above  |
| Firefox           | 24.0 and above  |
| Google Chrome     | 35.0 and above  |

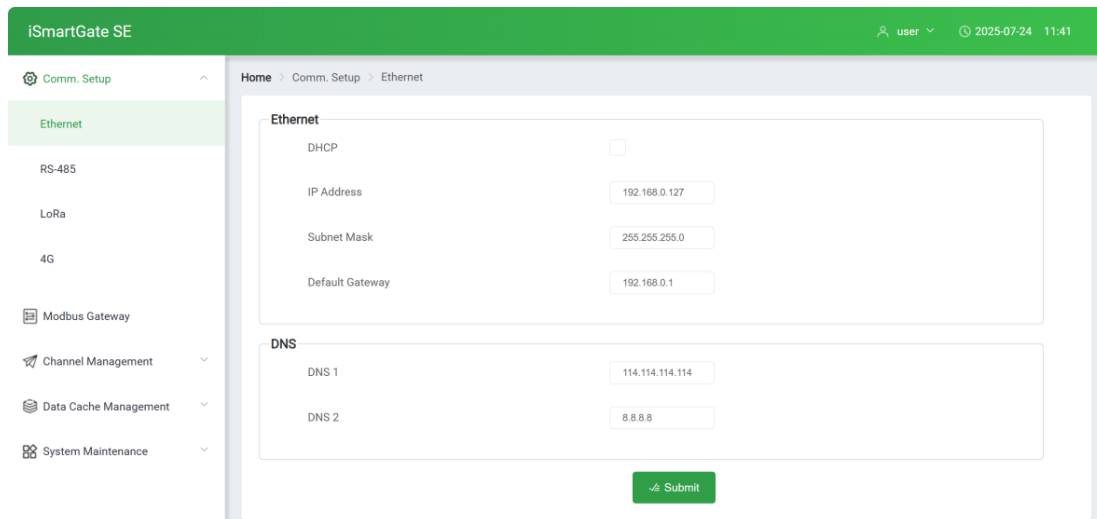
**Table 4-1 Supported Web Browser**

- 1) Enter the IP Address (e.g. 192.168.0.127) of the iSmartGate SE in the Address input box of the Internet Explorer and then press **Enter**.
- 2) The iSmartGate SE's Web Console login page appears. Enter the User name and Password and then click **Login**. The default web user name and password are "user" and "abcd1234-", respectively.



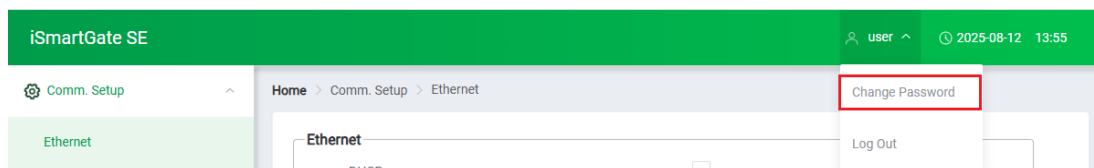
**Figure 4-4 The Login Page of Web Console**

- 3) The **Comm. Setup** page (first page displayed upon user login) appears. There are five items at the left pane - **Comm. Setup**, **Modbus Gateway**, **Channel Management**, **Data Cache Management** and **System Maintenance**.



**Figure 4-5 The First Page of Web Console**

- 4) The Web Console's login password can be changed by clicking on the down arrow at the upper right-hand corner of the page and then selecting **Change Password** as shown below. Users also can change password via **System Maintenance > Password Reset**, please see **Section 4.7.1**.



**Figure 4-6 Change Login Password**

## 4.3 Comm. Setup

Click **Comm. Setup** on the left-hand pane and its sub-menus appears which includes **Ethernet**, **RS-485**, **LoRa** (LoRa option only) and **4G** (4G option only). The following sections provide a quick overview for these sub-menus.

### 4.3.1 Ethernet

Click **Ethernet** on the left-hand pane and the following screen appears on the right-hand pane. The **Ethernet** port's settings can be configured here based on the actual situation.

Figure 4-7 Ethernet Settings

| Parameter                                                                                                                                                                                                                                                                                  | Range/Option, Default*                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Ethernet</b> (The IP Address and Default Gateway should be in the same subnet)                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                     |
| DHCP                                                                                                                                                                                                                                                                                       | Assign IP automatically using DHCP by checking the <b>DHCP</b> box.<br>It is recommended to set this parameter after all configurations have been completed and saved, and make sure the on-site DHCP server is powered on.<br>If this parameter is accidentally changed and the device cannot be connected, restoring the device to its factory defaults will reset the IP address to the default (192.168.0.127). |
| IP Address                                                                                                                                                                                                                                                                                 | 192.168.0.127*                                                                                                                                                                                                                                                                                                                                                                                                      |
| Subnet Mask                                                                                                                                                                                                                                                                                | 255.255.255.0*                                                                                                                                                                                                                                                                                                                                                                                                      |
| Default Gateway                                                                                                                                                                                                                                                                            | The IP address of the iSmartGate SE that provides network access outside the server's LAN (Local Area Network). 192.168.0.1*                                                                                                                                                                                                                                                                                        |
| <b>DNS</b><br>(DNS allows users to access websites using easy-to-remember names instead of numerical IP addresses. The IP address of the DNS server should be configured to enable access the host via their domain names. DNS2 is included as a backup for use when DNS1 is unavailable.) |                                                                                                                                                                                                                                                                                                                                                                                                                     |
| DNS 1                                                                                                                                                                                                                                                                                      | Primary DNS server 1 address. 114.114.114.114*                                                                                                                                                                                                                                                                                                                                                                      |
| DNS 2                                                                                                                                                                                                                                                                                      | Secondary DNS server 2 address. 8.8.8.8*                                                                                                                                                                                                                                                                                                                                                                            |

Table 4-2 Ethernet Setup Parameters

Click **Submit** once you have finished setting up for each category and then reboot the device via clicking **Reboot** under **System Maintenance** to apply the changes.

### 4.3.2 RS-485

The iSmartGate SE is equipped with two independent RS-485 ports.

Click **RS-485** on the left-hand pane and the following screen appears on the right-hand pane, the **P1 (RS-485)** and **P2 (RS-485)** can be configured independently here based on the actual situation. After configuration, click **Submit** to save your changes.

The screenshot shows the 'iSmartGate SE' interface. The top bar is green with 'iSmartGate SE', a user profile icon, and the date/time '2025-08-28 14:47'. The left sidebar has 'Comm. Setup' expanded, showing 'Ethernet', 'RS-485' (highlighted), 'LoRa', '4G', 'Modbus Gateway', and 'Channel Management'. The main content area has a breadcrumb 'Home > Comm. Setup > RS-485'. It features two tabs: 'P1 (RS-485)' and 'P2 (RS-485)'. Under the 'Basic' tab, there are four dropdown menus: 'Baudrate' (9600), 'Data Bits' (8), 'Parity' (Even), and 'Stop Bits' (1). A green 'Submit' button is located at the bottom right of the settings area.

Figure 4-8 RS-485 Settings

The following table lists the setup parameters for P1 and P2. Some setup parameters are basic and self-explanatory. Please note that the following parameters' settings should be consistent with the downstream IEDs' configuration.

| Parameters | Range/Option, Default*                           |
|------------|--------------------------------------------------|
| Baudrate   | 300, 600, 1200, 2400, 4800, 9600*, 19200, 38400. |
| Data Bits  | 5, 6, 7, 8*                                      |
| Parity     | None, Odd, Even*                                 |
| Stop Bits  | 1*, 2                                            |

Table 4-3 RS-485 Setup Parameters

### 4.3.3 LoRa

The iSmartGate SE comes optionally with one LoRa port. Click **LoRa** on the left-hand pane and the following screen appears on the right-hand pane, and the LoRa port can be configured here based on the actual situation.

The screenshot shows the 'iSmartGate SE' interface. The top bar is green with 'iSmartGate SE', a user profile icon, and the date/time '2025-08-12'. The left sidebar has 'Comm. Setup' expanded, showing 'Ethernet', 'RS-485', 'LoRa' (highlighted), '4G', 'Modbus Gateway', 'Channel Management', 'Data Cache Management', and 'System Maintenance'. The main content area has a breadcrumb 'Home > Comm. Setup > LoRa'. It features two tabs: 'Basic' and 'Comm. Channel'. Under the 'Basic' tab, there are four dropdown menus: 'Frequency Range' (US902-928), 'Comm. Channel' (CH1), 'Baudrate' (1200), and 'Frequency' (902.00 MHz). Under the 'Comm. Channel' tab, there is a table listing 16 channels (CH1 to CH16) with their respective frequencies in MHz. A green 'Submit' button is located at the bottom right of the settings area.

Figure 4-9 LoRa Settings

| Parameter                                                                                                                                                               | Range/Option, Default*                                                                            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| <b>Basic</b>                                                                                                                                                            |                                                                                                   |
| Frequency Range                                                                                                                                                         | EU863-870, RU864-870, IN865-867, US902-928, AU915-928, AS920-923, AS923-925*, Custom and Advanced |
| Comm. Channel                                                                                                                                                           | See <b>Table 4-5</b> , CH1*                                                                       |
| Baudrate                                                                                                                                                                | 1200*, 2400, 3800, 7500, 15000                                                                    |
| Frequency                                                                                                                                                               | 923.00 MHz*                                                                                       |
| The parameters below are only displayed when the <b>Frequency Range</b> is set to <b>Advanced</b> . These parameters are for connecting a 3 <sup>rd</sup> party device. |                                                                                                   |
| Spreading Factor                                                                                                                                                        | 6, 7, 8, 9*, 10, 11                                                                               |
| Bandwidth                                                                                                                                                               | 125kHz*, 250kHz, 500kHz                                                                           |
| Code Rate                                                                                                                                                               | 4/5, 4/6*, 4/7, 4/8                                                                               |
| Low Speed Optimization                                                                                                                                                  | Enable this parameter by checking the box.                                                        |

**Table 4-4 LoRa Settings**

| Region<br>Channel | EU<br>863-870 | RU<br>864-870 | IN<br>865-867 | US<br>902-928 | AU<br>915-928 | AS<br>920-923 | AS<br>923-925 | Custom<br>(Default) |
|-------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------------|
| CH1               | 863.00        | 864.00        | 865.00        | 902.00        | 915.00        | 920.00        | 923.00        | 915.00              |
| CH2               | 863.47        | 864.41        | 865.33        | 903.73        | 915.87        | 920.33        | 923.29        | 915.33              |
| CH3               | 863.93        | 864.81        | 865.66        | 905.47        | 916.73        | 920.66        | 923.57        | 915.66              |
| CH4               | 864.40        | 865.21        | 865.99        | 907.20        | 917.60        | 920.99        | 923.86        | 915.99              |
| CH5               | 864.87        | 865.61        | 866.32        | 908.93        | 918.47        | 921.32        | 924.14        | 916.32              |
| CH6               | 865.34        | 866.01        | 866.65        | 910.67        | 919.34        | 921.65        | 924.43        | 916.65              |
| CH7               | 865.80        | 866.40        | 866.98        | 912.40        | 920.20        | 921.98        | 924.71        | 916.98              |
| CH8               | 866.27        | 866.80        | 867.31        | 914.13        | 921.07        | 922.31        | 924.99        | 917.31              |
| CH9               | 866.74        | 867.20        | 867.64        | 915.86        | 921.94        | 922.64        | 920.10        | 917.64              |
| CH10              | 867.20        | 867.60        | 867.97        | 917.60        | 922.80        | 922.97        | 920.46        | 917.97              |
| CH11              | 867.67        | 867.99        | 868.30        | 919.33        | 923.67        | 923.30        | 920.82        | 918.30              |
| CH12              | 868.14        | 868.39        | 868.63        | 921.06        | 924.54        | 923.63        | 921.18        | 918.63              |
| CH13              | 868.60        | 868.79        | 868.96        | 922.80        | 925.40        | 923.96        | 921.54        | 918.96              |
| CH14              | 869.07        | 869.19        | 869.29        | 924.53        | 926.27        | 924.29        | 921.91        | 919.29              |
| CH15              | 869.54        | 869.59        | 869.62        | 926.26        | 927.14        | 924.62        | 922.27        | 919.62              |
| CH16              | 869.99        | 869.99        | 869.95        | 927.99        | 927.99        | 924.95        | 922.63        | 919.95              |

**Table 4-5 16 Channel Assignments**

If **Frequency Range** is set as **Custom**, the **Comm. Channels** can be edited. The valid range of Frequency is 860.00-935.00MHz. If users enter a value less than 860.00 or larger than 935.00, the input value will be reset to 860.00 or 935.00 automatically after clicking anywhere outside the text box. The channel frequency assignment must be unique.

**Basic**

Frequency Range: Custom  
Comm. Channel: CH1  
Baudrate: 1200  
Frequency: 860 MHz

**Comm. Channel**

|      |            |      |            |
|------|------------|------|------------|
| CH1  | 860.00 MHz | CH2  | 860.00 MHz |
| CH3  | 935.00 MHz | CH4  | 915.99 MHz |
| CH5  | 935.00 MHz | CH6  | 916.65 MHz |
| CH7  | 916.98 MHz | CH8  | 917.31 MHz |
| CH9  | 917.64 MHz | CH10 | 917.97 MHz |
| CH11 | 918.30 MHz | CH12 | 918.63 MHz |
| CH13 | 918.96 MHz | CH14 | 919.29 MHz |
| CH15 | 919.62 MHz | CH16 | 919.95 MHz |

Submit

**Figure 4-10 LoRa Custom Channel Settings**

#### 4.3.4 4G

The iSmartGate SE is optionally equipped with one 4G port for Internet access. A micro-SIM card with the frequency bands supported by the iSmartGate SE is required to be inserted to get connected to the mobile network. By default, it should be plug-and-play.

The screenshot shows the iSmartGate SE web interface. The top bar is green with 'iSmartGate SE' and user/logout options. The left sidebar lists various configuration categories. The main panel is titled '4G Info.' and contains three sections: '4G' with fields for Auto Dial (checked), Dial Number (\*99#), Monthly Traffic Data Reset Time (1 day), and Token Authorization; 'Network Connection Test' with fields for ICMP Address (www.baidu.com), ICMP Service Port (80), and ICMP Interval (300s); and 'APN' with fields for APN Name (cmnet), APN Username, APN Password, and Authentication (No Certification). A green 'Submit' button is at the bottom right.

Figure 4-11 4G Settings

The following table illustrates the setup range and default values of the 4G parameters.

| Parameter                                                                                                                                | Range/Option, Default*                                                                                                                                                                                                                                                               |
|------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>4G</b> (The iSmartGate SE supports both <b>Auto Dial</b> and <b>Manual Dial</b> functions, with <b>Auto Dial</b> set as the default.) |                                                                                                                                                                                                                                                                                      |
| Auto Dial                                                                                                                                | When using a public network SIM card, <b>Auto Dial</b> can be enabled for automatic dialing. Simply insert the SIM card, and the device will automatically connect to the internet upon powering on. Note that when <b>Auto Dial</b> is enabled, the dial number cannot be modified. |
| Dial Number                                                                                                                              | Access Number, provided by carrier.<br>*99# (default), less than 20 ASCII characters                                                                                                                                                                                                 |
| Monthly Traffic Data Reset Time (Day)                                                                                                    | Specifies the day of the month when your carrier resets your data usage.<br>1* to 28                                                                                                                                                                                                 |
| Token Authorization                                                                                                                      | Token Authentication is a protocol that enables users to verify their identity, in exchange for which they receive a unique access token. This token is provided by the SIM card carrier.                                                                                            |
| <b>Network Connection Test</b>                                                                                                           |                                                                                                                                                                                                                                                                                      |
| ICMP Address                                                                                                                             | ICMP (Internet Control Message Protocol)<br>The ICMP address is used to detect whether the Internet connection is normal, or alternatively to verify the IP address or domain name.<br><a href="http://www.baidu.com">www.baidu.com</a> *, less than 70 ASCII characters             |
| ICMP Service Port                                                                                                                        | Specifies the port used for detecting the address.<br>1 to 65535, 80*                                                                                                                                                                                                                |
| ICMP Interval (s)                                                                                                                        | Specifies the interval for periodic ping detection.<br>0 to 60000 (s), 300*                                                                                                                                                                                                          |
| <b>APN</b> (Access Point Name)                                                                                                           |                                                                                                                                                                                                                                                                                      |
| APN Name                                                                                                                                 | Access Point Name. Provided by carrier.<br>Less than 20 ASCII characters, cmnet*                                                                                                                                                                                                     |

|                |                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Username       | Username for APN login. Provided by carrier.<br>Null*, less than 20 ASCII characters                                                                                                                                                                                                                                                                                                                                   |
| Password       | Password for APN login. Provided by carrier.<br>Null*, less than 20 ASCII characters                                                                                                                                                                                                                                                                                                                                   |
| Authentication | Some carriers require a specific verification method. Please confirm the required method with your carrier or keep the default setting. <ul style="list-style-type: none"> <li>• No Certification* (= No verification is required)</li> <li>• PAP (= Password Authentication Protocol)</li> <li>• CHAP (= Challenge Handshake Authentication Protocol)</li> <li>• PAPCHAP (= A combination of PAP and CHAP)</li> </ul> |

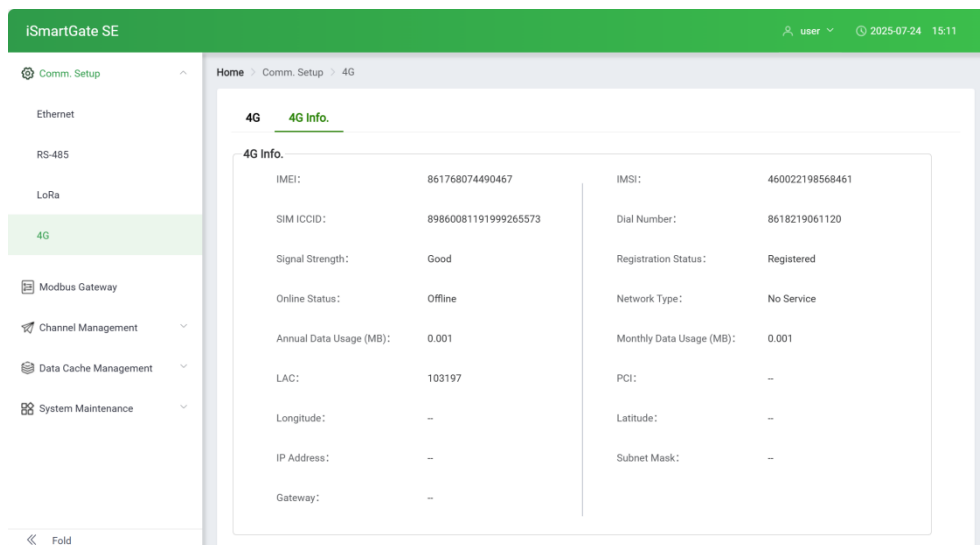
**Table 4-6 4G Setup Parameters**

The following table illustrates the Frequency Bands supported by iSmartGate SE.

| Network Type | Frequency Band     |                              |                                                                                      |
|--------------|--------------------|------------------------------|--------------------------------------------------------------------------------------|
|              | EU                 | SA                           | NA                                                                                   |
| 4G LTE       | B1/B3/B5/B7/B8/B20 | B1/B2/B3/B4/B5/B7/B8/B28/B66 | B1/B2/B3/B4/B5/B7/B8/B12/B13/B14/B18/B19/B20/B25/B26/B28/B34/B38/B39/B40/B41/B66/B71 |
| 2G GSM       | 900/1800 MHz       |                              |                                                                                      |

**Table 4-7 Frequency Bands supported by iSmartGate SE**

Click **4G Info.** tab to display dialing result.



**Figure 4-12 4G Info. Screen**

## 4.4 Modbus Gateway

Click **Modbus Gateway** in the left-hand pane to access the screen below where you can configure P1 (RS-485), P2 (RS-485), and optional LoRa, when the iSmartGate SE functions as a Transparent Gateway, Modbus Gateway, or MQTT Gateway.

### 4.4.1 Transparent Gateway

- Transparent Gateway -> TCP Server

Figure 4-13 Transparent Gateway - TCP Server Settings

- Transparent Gateway -> TCP Client

Figure 4-14 Transparent Gateway - TCP Client Settings

| Parameters      | Range/Option, Default*                                                                                                                                                                                                                                                                                                                                                              |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Basic</b>    |                                                                                                                                                                                                                                                                                                                                                                                     |
| Enable          | Check this box to enable the P1/P2/LoRa servers as a Modbus Gateway, in which case they cannot be set as acquisition channels. Therefore if enable this parameter, the following message will be promoted: "The acquisition channel is mutually exclusive with the Modbus Gateway. Enabling the Modbus Gateway will automatically exit the current channel's acquisition function." |
| Packet Interval | The maximum time gap between two consecutive bytes to be identified as the same data packet (frame). 0~60000ms, 20ms*                                                                                                                                                                                                                                                               |
| Idle Timeout    | Defines the maximum duration of inactivity after which the connection will be automatically terminated.                                                                                                                                                                                                                                                                             |

|                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                | 0 (always online) ~ 60000s, 300*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Packet Length                                                                  | Defines the maximum allowed bytes of a packet transmitted. Payload exceeding this length will be split into multiple packets.<br>1 ~ 1024* bytes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Multi Master                                                                   | <p>Select <b>Enable</b> and click <b>Configure</b> to setup <b>Polling Delay</b> and <b>Packet Timeout</b>.</p> <p><b>Polling Delay:</b> Specifies the mandatory delay interval the gateway inserts after processing a request/response cycle for one device before processing the next request for another device on the same RS-485 bus. This delay ensures stable bus turnover and prevents data collisions on the shared RS-485 bus when the gateway is rapidly switching between handling requests from different network clients aimed at different serial devices.<br/>0 ~ 60000ms, 30ms*</p> <p><b>Packet Timeout:</b> Defines the maximum time the gateway will wait to receive the first byte of a response from a Modbus RTU device after it has forwarded a request from a network client. This timeout determines if a connected Modbus RTU device is non-responsive. If no data is received from the serial device within this period, the gateway concludes the transaction and becomes available after the Polling Delay for the next transaction. 0 ~ 60000ms, 1000ms*</p> |
| <b>Advanced</b>                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Protocol                                                                       | Transparent Gateway                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Mode                                                                           | TCP Server, TCP Client                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>TCP Server</b>                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Local IP Port                                                                  | 1024 ~ 65535, 30001* (P1), 30002* (P2), 30003*(LoRa)<br>The <b>Local IP Port</b> for the P1 and P2 should be different.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>TCP Client</b>                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Registration Packet                                                            | <p>Before any normal data exchange, the gateway sends a custom hexadecimal packet to the master immediately after the connection is established. This serves two purposes:</p> <ol style="list-style-type: none"> <li>1. Allows the master to verify active communication by receiving this packet from the iSmartGate SE.</li> <li>2. Enables the master to identify the iSmartGate SE based on its device-specific information.</li> </ol> <p>Up to 63 bytes (represented as two-character hexadecimal values, 00~FF) can be configured.<br/>Null* (The iSmartGate SE won't send Registration Packet)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Heartbeat Packet                                                               | <p>A custom hexadecimal packet is sent by the gateway to the master periodically to maintain an active connection and thus prevent timeout disconnection due to inactivity.</p> <p>Up to 63 bytes of 16 decimal characters (00~FF) can be configured.<br/>Null (Do not send a heartbeat packet)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Heartbeat Interval                                                             | Specifies the interval for sending heartbeat packets.<br>0* ~ 60000. 0 means do not send a heartbeat packet.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Reconnect Interval                                                             | Defines the delay before the gateway attempts to reconnect to the master following a connection failure.<br>0 ~ 60000s, 300s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Number of Network Connections</b> (Only display for <b>TCP Client</b> mode) |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Dest. Address 1 to Dest. Address 4                                             | Up to 4 Masters can be configured.<br>Specifies the IP addresses of TCP Masters or IEDs that the iSmartGate SE will connect to.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Dest. Port 1 to Port 4                                                         | 1 ~ 65535, 502*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

Table 4-8 Transparent Gateway Setup Parameters

## 4.4.2 Modbus Gateway

- Modbus Gateway -> TCP Server

**P1 (RS-485) P2 (RS-485) LoRa**

**Basic**

Enable ☐ Packet Interval  (0~60000) ms

Idle Timeout  (0~60000) s Packet Timeout  (0~60000) ms

**Advanced**

Protocol  Mode

Local IP Port  (502~65535) Polling Delay  (1~60000) ms

**Cache**

Cache  TTL  (0~60000) s

Cache Code 1  (0~255) Cache Code 2  (0~255)

Cache Code 3  (0~255) Cache Code 4  (0~255)

Cache Code 5  (0~255) Cache Code 6  (0~255)

**Modbus Slave ID Map**

Map ID (Remote)  ~  (1~247)

Offset  (-246~246)

Unit ID (Local)  ~  (1~247)

Figure 4-15 Modbus Gateway - TCP Server Settings

- Modbus Gateway -> TCP Client

**P1 (RS-485) P2 (RS-485) LoRa**

**Basic**

Enable ☒ Packet Interval  (0~60000) ms

Idle Timeout  (0~60000) s Packet Timeout  (0~60000) ms

**Advanced**

Protocol  Mode

Registration Packet  Heartbeat Packet

Heartbeat Interval  (0~60000) s Reconnect Interval  (0~60000) s

**Number of Network Connections**

☐ Dest. Address 1  Dest. Port 1  (1~65535) Modbus ID Range  ~  (1~247)

☐ Dest. Address 2  Dest. Port 2  (1~65535) Modbus ID Range  ~  (1~247)

☐ Dest. Address 3  Dest. Port 3  (1~65535) Modbus ID Range  ~  (1~247)

☐ Dest. Address 4  Dest. Port 4  (1~65535) Modbus ID Range  ~  (1~247)

Figure 4-16 Modbus Gateway - TCP Client Settings

| Parameters                                      | Range/Option, Default*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Basic</b>                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Enable                                          | Check this box to enable the P1/P2/LoRa servers as a Modbus Gateway, in which case they cannot be set as acquisition channels. Therefore if enable this parameter, the following message will be promoted: "The acquisition channel is mutually exclusive with the Modbus Gateway. Enabling the Modbus Gateway will automatically exit the current channel's acquisition function."                                                                                                                                                        |
| Packet Interval                                 | The maximum time gap between two consecutive bytes to be identified as the same data packet (frame). 0 ~ 60000ms, 20ms*                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Idle Timeout                                    | Defines the maximum duration of inactivity after which the connection will be automatically terminated.<br>0 (always online) ~ 60000s, 300*                                                                                                                                                                                                                                                                                                                                                                                                |
| Packet Timeout                                  | Packet Timeout is the timeout setting for IP connections, not for serial or LoRa connections. This means IP connections will be closed if no activity occurs between the application software and the iSmartGate SE after the specified timeout period. This is to prevent potential IP connection failures on the iSmartGate SE if the application software fails to close the IP connections due to unforeseen issues.<br>0 ~ 60000ms, 1000ms*                                                                                           |
| <b>Advanced</b>                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Protocol                                        | Modbus Gateway                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Mode                                            | TCP Server                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>TCP Server</b>                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Local IP Port                                   | 502 ~ 65535, 502* (P1), 503* (P2), 504*(LoRa)<br>The <b>Local IP Port</b> for the P1 and P2 should be different.                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Polling Delay                                   | Set polling interval for multiple downstream Modbus RTU devices located in RS-485 port. 0 ~ 60 000ms, 30ms*                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>TCP Client</b>                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Registration Packet                             | Before any normal data exchange, the gateway sends a custom hexadecimal packet to the master immediately after the connection is established. This serves two purposes:<br>1. Allows the master to verify active communication by receiving this packet from the iSmartGate SE.<br>2. Enables the master to identify the iSmartGate SE based on its device-specific information.<br>Up to 63 bytes (represented as two-character hexadecimal values, 00~FF) can be configured.<br>Null* (The iSmartGate SE won't send Registration Packet) |
| Heartbeat Packet                                | A custom hexadecimal packet sent by the gateway to the master periodically to maintain an active connection and prevent timeout disconnection due to inactivity.<br>Up to 63 bytes of 16 decimal characters (00~FF) can be configured.<br>Null (Do not send a heartbeat packet)                                                                                                                                                                                                                                                            |
| Heartbeat Interval                              | The interval of sending a heartbeat packet.<br>0* ~ 60000. 0 means do not send a heartbeat packet.                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Reconnect Interval                              | Defines the delay before the gateway attempts to reconnect to the master after a connection failure.<br>0 ~ 60000s, 300s                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Cache (Only display for TCP Server mode)</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Cache                                           | With cache function enabled, gateway stores frequently accessed Modbus register values (Read-only) in local memory, allowing it to respond instantly to TCP client requests with the cached data. Meanwhile, the gateway automatically refreshes the cache by periodically polling the connected devices in the background.<br>Enable, Disable                                                                                                                                                                                             |
| TTL                                             | TTL (Time-To-Live)<br>Specifies survival time for cache function code, once TTL expires, the cached data is automatically cleared. For example, setting TTL to 5 mins means the iSmartGate SE will remove this function code when it doesn't receive message from the masters after 5 mins.<br>0 ~ 60000s, 300s*                                                                                                                                                                                                                           |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cache Code 1 to 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Each Cache Code maintains independent cache storage.<br>0x01, 0x02, 0x03, 0x04 and two customized cache codes.<br>0 means disabled. Only Read function code can be configured. |
| <b>Modbus Slave ID Map</b> (Only display for <b>TCP Server</b> mode)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                |
| When connecting multiple ModbusTCP masters to a serial port server, the sent message uses the serial device' virtual address which has a certain mapping relationship with the real address to distinguish which master sent the message. The iSmartGate SE will convert the received command into the real address of the serial port device and sends it to the corresponding device. The data return also follows this path to ensure that only the master that sent the command receives the command.<br>Mapping relationship: Unit ID (Local)=Map ID (Remote)+Offset |                                                                                                                                                                                |
| Map ID (Remote)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Note: Only Modbus TCP messages with a unit identifier within the virtual address range will be forwarded, otherwise, they will be filtered and discarded.                      |
| Offset                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | -246 ~ 246, 0*                                                                                                                                                                 |
| Unit ID (Local)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1 ~ 247                                                                                                                                                                        |
| <b>Number of Network Connections</b> (Only display for <b>TCP Client</b> mode)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                |
| Dest. Address 1 to 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | IP/domain name for TCP Servers that the iSmartGate SE wishes to connect with.<br>Up to 4 TCP Servers can be configured                                                         |
| Dest. Port 1 to 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Service Port of TCP Server. 1 ~ 65535, 502*                                                                                                                                    |
| Modbus ID Range                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Modbus address range. The data from the serial devices that within this address range will be forwarded to the corresponding destination network address.<br>1 ~ 247           |

Table 4-9 Modbus Gateway Setup Parameters

## 4.4.3 MQTT

**Basic**

☐ Enable
  Idle Timeout (0~60000) s

**Advanced**

Protocol 
 Mode

Server Address 
 Server Port  (1~65535)

Username 
 Password

Client ID 
 Head Packet

Publish Topic 
 Subscribe Topic

Heartbeat Interval  (0~60000) s
 

Enable TLS ☐
 Upload TLS Certificate

Figure 4-17 MQTT Gateway

| Parameters      | Range/Option, Default*                                                                                                                                                                                                                                                                                                                                                              |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Basic</b>    |                                                                                                                                                                                                                                                                                                                                                                                     |
| Enable          | Check this box to enable the P1/P2/LoRa servers as a Modbus Gateway, in which case they cannot be set as acquisition channels. Therefore if enable this parameter, the following message will be promoted: "The acquisition channel is mutually exclusive with the Modbus Gateway. Enabling the Modbus Gateway will automatically exit the current channel's acquisition function." |
| Idle Timeout    | Define the maximum duration of inactivity after which the connection will be automatically terminated.<br>0 (always online) ~ 60000s, 300*                                                                                                                                                                                                                                          |
| <b>Advanced</b> |                                                                                                                                                                                                                                                                                                                                                                                     |
| Protocol        | MQTT                                                                                                                                                                                                                                                                                                                                                                                |
| Mode            | Fixed as MQTT Client.                                                                                                                                                                                                                                                                                                                                                               |
| Server Address  | The LAN IP address, fixed public IP address, or dynamic/static domain name address of the                                                                                                                                                                                                                                                                                           |

|                        |                                                                                                                                                                                                                                               |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                        | main station that iSmartGate SE needs to connect to.                                                                                                                                                                                          |
| Server Port            | The port no. of the main station.                                                                                                                                                                                                             |
| Username               | Provided by the main station.                                                                                                                                                                                                                 |
| Password               | Provided by the main station.                                                                                                                                                                                                                 |
| Client ID              | Each device connecting to the MQTT Broker must have a unique ClientID.                                                                                                                                                                        |
| Head Packet            | The data packets sent by iSmartGate SE at regular intervals to the server to maintain the connection.                                                                                                                                         |
| Publish Topic          | Where messages are sent.                                                                                                                                                                                                                      |
| Subscribe Topic        | Where messages are received.                                                                                                                                                                                                                  |
| Heartbeat Interval     | The interval of sending a heartbeat packet. Heartbeat is a function to notify the reachability to the other router by sending a packet containing its own name and IP address.<br>0* ~ 60000. 0 means do not send a heartbeat packet.         |
| Enable TLS             | Enable Transport Layer Security (TLS) Encryption by checking the box.<br>Disabled TLS Encryption means unencrypted.                                                                                                                           |
| Upload TLS Certificate | Select TLS Encryption but do not upload TLS Certificate means one-way authentication.<br>Select TLS Encryption and upload 3 TLS Certificate means two-way authentication.<br>Please note that the certificates should be uploaded one by one. |

Table 4-10 MQTT Setup Parameters

## 4.5 Channel Management

Click **Channel Management** on the left-hand pane and its sub-menus appears which includes **Channel Settings**, **Slave IED Management** and **Driver Management**. The following sections provide a quick overview for these sub-menus.

### 4.5.1 Channel Settings

The iSmartGate SE provides 4 collection channels:

- Channel 1-2: RS-485 serial ports (P1/P2)
- Channel 3: LoRa
- Channel 4: Ethernet

Note: If the P1/P2/LoRa port is set to Modbus Gateway, it cannot be set as an acquisition channel here anymore.

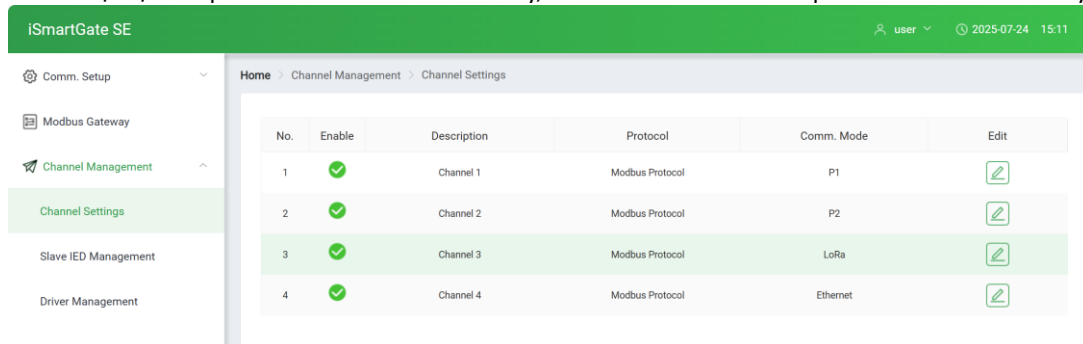


Figure 4-18 Channel Settings Interface

Click the  on the right of the channel to edit each channel's parameters.

- For the **Channel 1 to Channel 3 (P1, P2 and LoRa)**:

Figure 4-19 Edit Channel Parameters

| Parameter                                                                                                                                                                                                                        | Range/Option, Default*                                                                                                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Basic</b>                                                                                                                                                                                                                     |                                                                                                                                                                                              |
| Enable                                                                                                                                                                                                                           | Enable*, Disable                                                                                                                                                                             |
| Description                                                                                                                                                                                                                      | Channel 1*<br>Channel 1 -> P1 (RS-485), Channel 2 -> P2 (RS-485), Channel 3 -> LoRa                                                                                                          |
| Comm. Mode                                                                                                                                                                                                                       | P1 and P2: Serial<br>LoRa: LoRa                                                                                                                                                              |
| Protocol                                                                                                                                                                                                                         | Modbus Protocol *, Anypolling Protocol.<br>Additional protocols can be extended based on customers requirements.                                                                             |
| <b>Serial Para./Wireless Para.</b>                                                                                                                                                                                               |                                                                                                                                                                                              |
| Serial Port                                                                                                                                                                                                                      | Appears only for the Channel 1 and Channel 2.<br>P1*, P2*                                                                                                                                    |
| Server Port                                                                                                                                                                                                                      | Service port when the iSmartGate SE serves as transparent transmission function.<br>0 ~ 60000. 20001*(P1), 20002*(P2), 20003*(LoRa)                                                          |
| Comm. Timeout (s)                                                                                                                                                                                                                | If there is no communication through the port after configured time, the connection will be terminated automatically.<br>1 ~ 60000s, 3s*                                                     |
| Remark                                                                                                                                                                                                                           | Reserved extended parameters                                                                                                                                                                 |
| <b>Advanced</b><br>(Generally, there is no need to adjust the advanced parameters. However, if the quality of communication fails to meet the required standard, please contact our technical support engineers for assistance.) |                                                                                                                                                                                              |
| Polling Delay (ms)                                                                                                                                                                                                               | When multiple slave IEDs are connected to this channel, this parameter defines the time interval between the acquisition and polling of two IEDs.<br>0 ~ 60000ms, 30ms*                      |
| Packet Timeout (ms)                                                                                                                                                                                                              | If the response time exceeds the configured timeout, it is considered that the IEDs have no data reply.<br>0 ~ 60000ms, 1000ms*                                                              |
| Byte Timeout (ms)                                                                                                                                                                                                                | Defines the the gap between two consecutive bytes of data during its transmission. After the configured interval, the message (frame) will be considered as completed.<br>0 ~ 60000ms, 20ms* |
| Transmit Delay (ms)                                                                                                                                                                                                              | Defines the waiting time before sending an acquisition command.<br>0 ~ 60000ms, 0ms*                                                                                                         |
| Time Sync. Interval (s)                                                                                                                                                                                                          | Defines time synchronization interval when the iSmartGate SE servers as a time server.<br>0 ~ 60000s, 300s*                                                                                  |
| Loop Delay (s)                                                                                                                                                                                                                   | Defines the time interval for acquiring all devices on the same channel.<br>0 ~ 60000ms, 0s*                                                                                                 |
| Reconnection Interval (min)                                                                                                                                                                                                      | Defines the next retry communication time in the event of the iSmartGate SE fails to connect slave IEDs.<br>0 ~ 60min, 5min*                                                                 |
| No. of Connection Retries                                                                                                                                                                                                        | Defines the number of communication retries in the event of the iSmartGate SE fails to connect slave IEDs.<br>0 ~ 60000, 5*                                                                  |
| Remark                                                                                                                                                                                                                           | Reserved extended parameters                                                                                                                                                                 |

Table 4-11 Channel 1-3 Settings

- For the **Channel 4 (Ethernet)**:

| Parameter                                                                                                                                                                                                                        | Range/Option, Default*                                                                                                                                                                                                                                                                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Basic</b>                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                           |
| Enable                                                                                                                                                                                                                           | Enable*, Disable                                                                                                                                                                                                                                                                          |
| Description                                                                                                                                                                                                                      | Channel 4*                                                                                                                                                                                                                                                                                |
| Comm. Mode                                                                                                                                                                                                                       | Ethernet                                                                                                                                                                                                                                                                                  |
| Protocol                                                                                                                                                                                                                         | Modbus Protocol*, IEC104 Protocol<br>Additional protocols can be extended based on customer requirements.<br>When changing the protocol, the system will prompt: "Modifying the protocol will clear all devices under the acquisition channel." To confirm the protocol change, click OK. |
| <b>Advanced</b><br>(Generally, there is no need to adjust the advanced parameters. However, if the quality of communication fails to meet the required standard, please contact our technical support engineers for assistance.) |                                                                                                                                                                                                                                                                                           |
| Polling Delay (ms)                                                                                                                                                                                                               | When multiple slave IEDs are connected to this channel, this parameter defines the time interval between the acquisition and polling of two IEDs.<br>0 ~ 60000ms, 30ms*                                                                                                                   |
| Packet Timeout (ms)                                                                                                                                                                                                              | If the response time exceeds the configured timeout, it is considered that the IEDs have no data reply.<br>0 ~ 60000ms, 1000ms*                                                                                                                                                           |
| Byte Timeout (ms)                                                                                                                                                                                                                | Defines the the gap between two consecutive bytes of data during its transmission. After the configured interval, the message (frame) will be considered as completed.<br>0* ~ 60000ms                                                                                                    |
| Transmit Delay (ms)                                                                                                                                                                                                              | Defines the waiting time before sending an acquisition command.<br>0 ~ 60000ms, 0ms*                                                                                                                                                                                                      |
| Time Sync. Interval (s)                                                                                                                                                                                                          | Defines time synchronization interval when the iSmartGate SE servers as a time server.<br>0 ~ 60000s, 300s*                                                                                                                                                                               |
| Loop Delay (s)                                                                                                                                                                                                                   | Defines the time interval for acquiring all devices on the same channel.<br>0 ~ 60000ms, 0s*                                                                                                                                                                                              |
| Reconnection Interval (min)                                                                                                                                                                                                      | Defines the next retry communication time in the event of the iSmartGate SE fails to connect slave IEDs.<br>0 ~ 60min, 5min*                                                                                                                                                              |
| No. of Connection Retries                                                                                                                                                                                                        | Defines the number of communication retries in the event of the iSmartGate SE fails to connect slave IEDs.<br>0 ~ 60000, 5*                                                                                                                                                               |
| Remark                                                                                                                                                                                                                           | Reserved extended parameters                                                                                                                                                                                                                                                              |

Table 4-12 Channel 4 Settings

#### 4.5.2 Slave IED Management

Click **Slave IED Management** on the left-hand pane and the following screen appears which displays slave IEDs management.

- Select a specific channel (Channel 1 to Channel 4) by clicking the drop-down menu at the top of the page. Click **Add IED** to add an IED to the selected channel and configure its parameters.

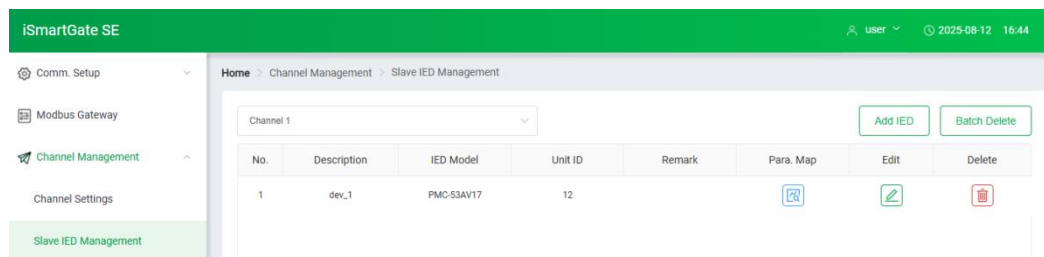


Figure 4-20 Slave IED Management Settings Interface

- Setup the new IED, then click **Confirm**.
  - IED Model: select from the drop-down box.
  - Description: description of the IED.
  - Unit ID: indicates the communication ID/IP address of the IED when the Serial/Ethernet acquisition channel is selected.

Add IED

IED Model \*

PMC-352-DVv09

Description \*

dev\_2

Unit ID \*

2

Remark

Cancel

Confirm

Figure 4-21 Add a Slave IED

- Click **Submit**.

iSmartGate SE

user

2025-09-11 10:39

Comm. Setup

Modbus Gateway

Channel Management

Channel Settings

Slave IED Management

Driver Management

Data Cache Management

System Maintenance

Home > Channel Management > Slave IED Management

Channel 1

Add IED

Batch Delete

| No. | Description | IED Model     | Unit ID | Remark | Para. Map | Edit | Delete |
|-----|-------------|---------------|---------|--------|-----------|------|--------|
| 1   | dev_1       | PMC-340-A6V10 | 1       |        |           |      |        |
| 2   | dev_2       | PMC-352-DVv09 | 2       |        |           |      |        |

Submit

Figure 4-22 Submit for Added Slave IEDs

- Click  to view the data list of the selected IED.

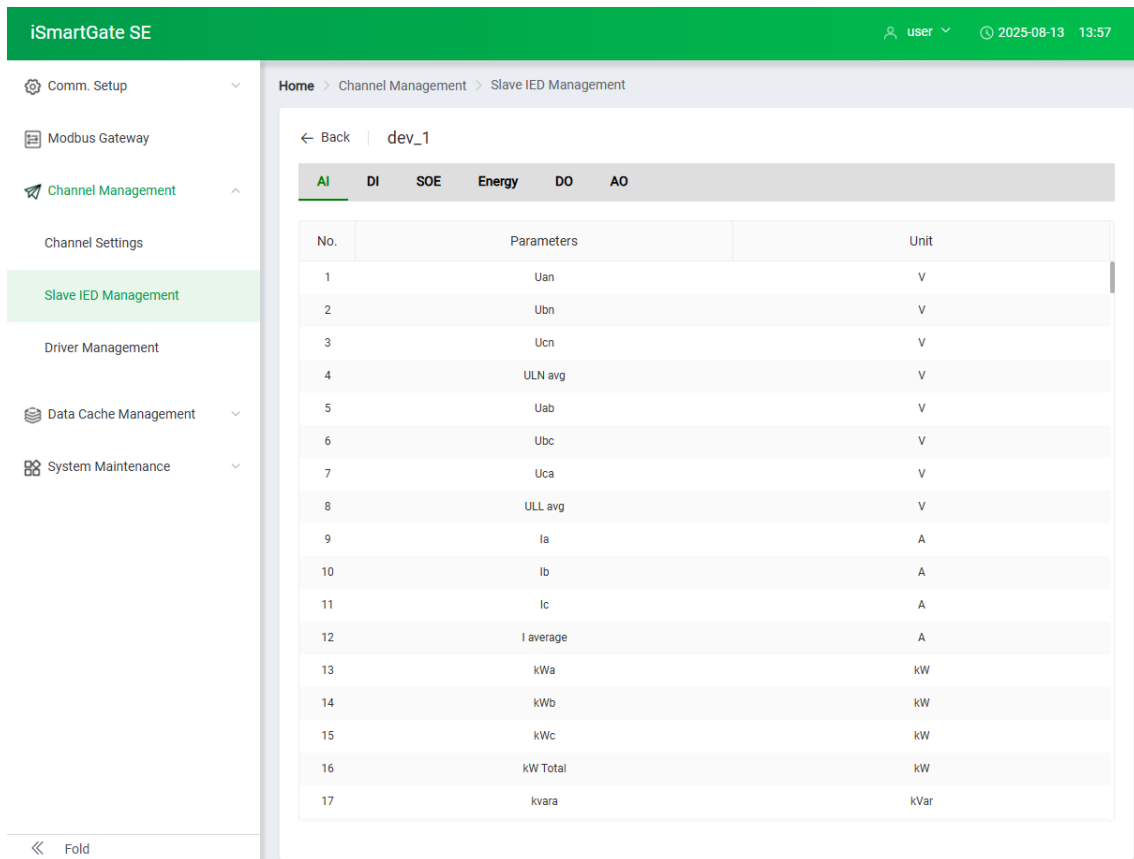


Figure 4-23 Slave IED Management Interface

5. Delete IEDs in batches: click **Batch Delete** and select the IEDs that will be removed, and then click .

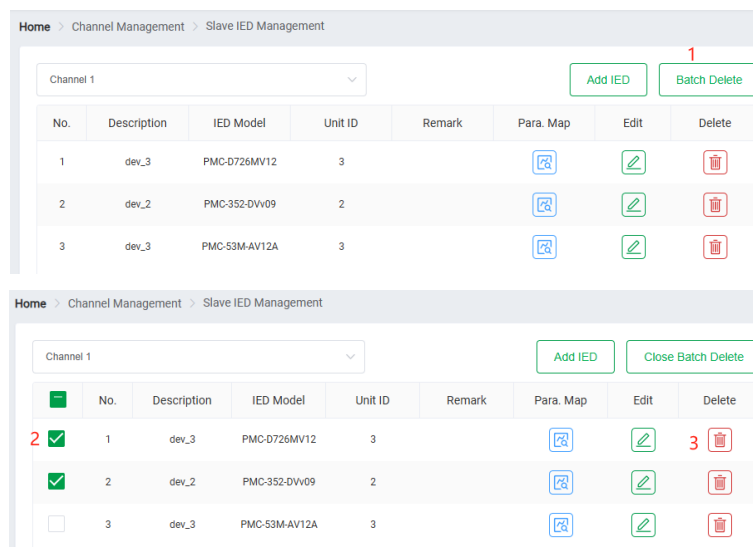


Figure 4-24 Delete IED In Batches

### 4.5.3 Driver Management

Click **Driver Management** on the left-hand pane and the following screen appears which allows users to view uploaded device drivers and add a new driver file.

Click  to delete a driver. Please note that the  means the corresponding driver is the device's built-in one and cannot be deleted.

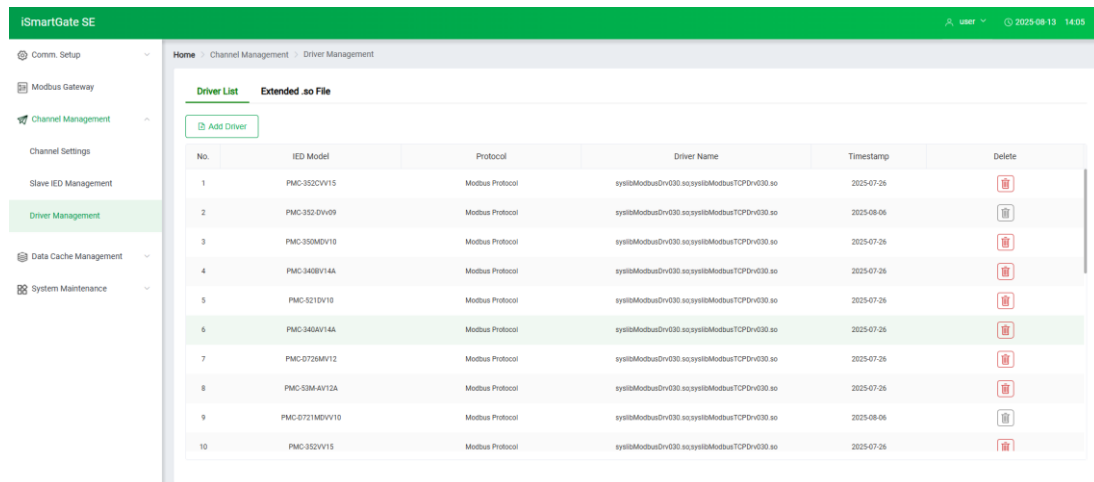


Figure 4-25 Driver Management Screen

To add a new driver file:

1. Click **Add Driver**
2. Click **Click to Upload** to select a driver file in the pop-up dialog.
3. Click **Upload** to upload the selected driver file.

For the 3<sup>rd</sup> party devices which use non-standard protocols, click **Extended .so File** tab to manage .so files.

## 4.6 Data Cache Management

Click **Data Cache Management** on the left-hand pane and its sub-menus appear which includes **Cache Management** and **Data Cache**. The following sections provide a quick overview for these sub-menus.

### 4.6.1 Cache Management

The iSmartGate SE supports up to two independent cache channels. Click **Cache Management** on the left-hand pane and the following screen appears which allows users to setup protocols for the two cache channels.

Click **Protocol** drop-down box to select protocol for the Data Cache x.

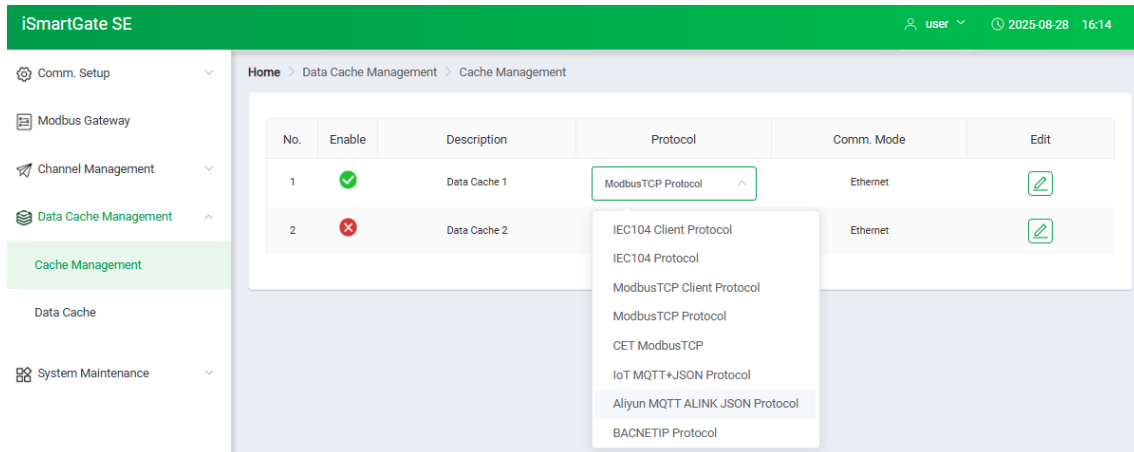


Figure 4- 26 Data Cache Management Interface

Click  to edit other parameters after setting the protocol for the Data Cache.

**Note:** When the Protocol is configured as **Modbus TCP Protocol**, the number of TCP connections established between the remote master stations and iSmartGate SE cannot exceeds 16.

The **Sections 4.6.1.1 to 4.6.1.7** describe basic and advanced parameters for each of the protocols.

#### 4.6.1.1 Modbus TCP Protocol / Modbus TCP Client Protocol

When set **Protocol** to **Modbus TCP Protocol** or **Modbus TCP Client Protocol**:

The screenshot displays the configuration interface for the Modbus TCP Protocol, divided into two main sections: Basic and Advanced.

**Basic Section:**

- Enable:** A green checkmark icon, indicating the protocol is enabled.
- Description:** A text field containing "Data Cache 1".
- Port:** A numeric input field with a value of 2001.
- Client IP 1 through Client IP 16:** A series of 16 empty text input fields for specifying remote station IP addresses.

**Advanced Section:**

- AI Register Address:** A numeric input field with a value of 0.
- AI Function Code:** A dropdown menu set to 0x03.
- AI Data Type:** A dropdown menu set to FLOAT.
- DI Register Address:** A numeric input field with a value of 20000.
- DI Function Code:** A dropdown menu set to 0x03.
- Energy Register Address:** A numeric input field with a value of 30000.
- Energy Function Code:** A dropdown menu set to 0x03.
- Energy Data Type:** A dropdown menu set to INT32.
- DO Register Address:** A numeric input field with a value of 40000.
- DO Function Code:** A dropdown menu set to 0x05.
- AO Register Address:** A numeric input field with a value of 45000.
- AO Function Code:** A dropdown menu set to 0x10.
- Retain Data on Comm Loss:** An unchecked checkbox.
- Idle Timeout(min):** A numeric input field with a value of 5.
- Data Upload Delay after Restart(s):** A numeric input field with a value of 0.
- Remark:** An empty text area for additional notes.

Figure 4- 27 Modbus TCP Protocol

| Parameter                | Range/Option, Default*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Basic</b>             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Port                     | In scenarios where multiple remote stations access the iSmartGate SE's cache channels, it is imperative that the Master Station IP and Port are configured to differentiate between them. In the event of the same port being required for different cache channels, it is necessary to set different Master Station IPs in order to distinguish between them.<br>A cache channel should be uniquely determined by: Port + Master Station IP.<br>1 ~ 65535, 2001* for cache channel 1 and 2002* for cache channel 2 |
| Client IP 1~16           | The <b>Client IP 1~16</b> are the IP addresses of the remote stations and only the specified stations are able to retrieve data from iSmartGate SE's cache channels.<br>Setting the <b>Client IP 1~16</b> as null allows any stations to retrieve data from iSmartGate SE's cache channels.                                                                                                                                                                                                                         |
| <b>Advanced</b>          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| AI Register Address      | 0* ~ 65535                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| AI Function Code         | 0x01, 0x02, 0x03*, 0x04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| AI Data Type             | INT8, UINT8, INT16, UINT16, INT32, UINT32, INT64, UINT64, FLOAT*, DOUBLE                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| DI Register Address      | 0 ~ 65535, 20000*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| DI Function Code         | 0x01, 0x02, 0x03*, 0x04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Energy Register Address  | 0 ~ 65535, 30000*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Energy Function Code     | 0x01, 0x02, 0x03*, 0x04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Energy Data Type         | INT8, UINT8, INT16, UINT16, INT32*, UINT32, INT64, UINT64, FLOAT, DOUBLE                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| DO Register Address      | 0 ~ 65535, 40000*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| DO Function Code         | 0x05*, 0x06, 0x0F                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| AO Register Address      | 0 ~ 65535, 45000*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| AO Function Code         | 0x06, 0x10*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Retain Data on Comm Loss | Checking this box means retaining data upload prior to the communication failure. Unchecking the box will upload invalid values.                                                                                                                                                                                                                                                                                                                                                                                    |
| Idle Timeout (min)       | The connection will be closed if there is no activities between the serial ports in the specified time.<br>1 ~ 60min, 5*                                                                                                                                                                                                                                                                                                                                                                                            |

|                                    |                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Data Upload Delay after Restart(s) | After the gateway is reset, it begins to collect and upload IEDs' data to the platform, which will take approximately 2 seconds. During this period, the data sent by the gateway to the platform may be invalid values. Setting this parameter to give the gateway sufficient time to collect valid data from the IEDs and avoid uploading invalid data.<br>0* ~ 300s |
|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Figure 4- 28 Modbus TCP Protocol

Basic

Enable ☒

Description

Main Station Address

Main Station Port

Backup Station Address

Backup Station Port

Login Packet

Heartbeat Interval(s)

Heartbeat Packet

KeepAlive Interval(s)

Advanced

AI Register Address

AI Function Code

AI Data Type

DI Register Address

DI Function Code

Energy Register Address

Energy Function Code

Energy Data Type

DO Register Address

DO Function Code

AO Register Address

AO Function Code

Retain Data on Comm Loss ☐

Idle Timeout(min)

Data Upload Delay after Restart(s)

Remark

Figure 4- 29 Modbus TCP Client Protocol

| Parameter                                                                    | Range/Option, Default*                                                                                                                                                                                                                                                           |
|------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Basic</b>                                                                 |                                                                                                                                                                                                                                                                                  |
| Main Station Address                                                         | The connected master station address. Users can set LAN IP address, fixed public IP address, or dynamic/static domain name address.                                                                                                                                              |
| Main Station Port                                                            | The port number of the master station server. 10000*                                                                                                                                                                                                                             |
| Backup Station Address                                                       | Reserved                                                                                                                                                                                                                                                                         |
| Backup Station Port                                                          | Reserved                                                                                                                                                                                                                                                                         |
| Login Packet                                                                 | The iSmartGate SE sends data packets when it is actively connecting to the server. These packets can uniquely identify the data packets of a gateway.                                                                                                                            |
| Heartbeat Interval (s)                                                       | The interval of sending a heartbeat packet.<br>0* ~ 60000. 0 means do not send a heartbeat packet.                                                                                                                                                                               |
| Heartbeat Packet                                                             | A custom hexadecimal packet sent by the gateway to the master periodically to maintain an active connection and prevent timeout disconnection due to inactivity.<br>Up to 63 bytes of 16 decimal characters (00~FF) can be configured.<br>Null (Do not send a heartbeat packet). |
| KeepAlive Interval (s)                                                       | A parameter used in network communication (especially in protocols like TCP, MQTT, and HTTP) to maintain persistent connections by periodically sending small packets to prevent timeouts.                                                                                       |
| <b>Advanced</b> (Please refer to advanced Parameters of Modbus TCP Protocol) |                                                                                                                                                                                                                                                                                  |

Table 4-9 Modbus TCP Client Protocol

#### 4.6.1.2 IEC104 Client Protocol / IEC104 Protocol

When set **Protocol** to **IEC104 Protocol** or **IEC104 Client Protocol**:

The screenshot displays the configuration interface for the IEC104 Protocol, divided into two main sections: Basic and Advanced.

**Basic Section:**

- Enable:** A green checkmark icon indicates the protocol is enabled.
- Description:** A text box containing "Data Cache 1".
- Port:** A numeric input field with a value of 2404, flanked by minus and plus buttons.
- Client IP 1 through Client IP 16:** A series of 16 empty text input fields for specifying client IP addresses.

**Advanced Section:**

- Number of Common Address Bytes:** A dropdown menu set to 2.
- Number of Transmission Reason Bytes:** A dropdown menu set to 2.
- Number of Information Object Bytes:** A dropdown menu set to 3.
- AI Start Address:** A numeric input field with a value of 16385, flanked by minus and plus buttons.
- AI Upload Type:** A dropdown menu set to ASDU13.
- DI Start Address:** A numeric input field with a value of 1, flanked by minus and plus buttons.
- DI Upload Type:** A dropdown menu set to ASDU1.
- Energy Start Address:** A numeric input field with a value of 25601, flanked by minus and plus buttons.
- Energy Upload Type:** A dropdown menu set to ASDU15.
- SOE Start Address:** A numeric input field with a value of 1, flanked by minus and plus buttons.
- SOE Upload Type:** A dropdown menu set to ASDU30.
- DO Start Address:** A numeric input field with a value of 24577, flanked by minus and plus buttons.
- AO Start Address:** A numeric input field with a value of 28673, flanked by minus and plus buttons.
- Common Address:** A numeric input field with a value of 1, flanked by minus and plus buttons.
- Upload Virtual SOE:** An unchecked checkbox.
- Upload AI Change:** A checked checkbox.
- Energy Upload Interval(s):** A numeric input field with a value of 0, flanked by minus and plus buttons.
- AI Upload Interval(s):** A numeric input field with a value of 0, flanked by minus and plus buttons.
- Idle Timeout(min):** A numeric input field with a value of 5, flanked by minus and plus buttons.
- Data Upload Delay after Restart(s):** A numeric input field with a value of 0, flanked by minus and plus buttons.
- Remote Time Sync:** A dropdown menu set to On.
- Remark:** An empty text box.

Figure 4-30 IEC104 Protocol

| Parameter                           | Range/Option, Default*                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Basic</b>                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Port                                | In scenarios where multiple remote stations access the iSmartGate SE's cache channels, it is imperative that the Master Station IP and Port are configured to differentiate between them. In the event of the same port being required for different cache channels, it is necessary to set different Master Station IPs in order to distinguish between them.<br>A cache channel should be uniquely determined by: Port + Master Station IP.<br>1 ~ 65535, 2404* |
| Client IP 1~16                      | The <b>Client IP 1~16</b> are the IP addresses of the remote stations and only the specified stations are able to retrieve data from iSmartGate SE's cache channels.<br>Setting the <b>Client IP 1~16</b> as null allows any stations to retrieve data from iSmartGate SE's cache channels.                                                                                                                                                                       |
| <b>Advanced</b>                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Number of Common Address Bytes      | 1, 2*                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Number of Transmission Reason Bytes | 1, 2*                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Number of Information Object Bytes  | 2, 3*                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| AI Start Address                    | 1 ~ 65535, 16385*                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| AI Upload Type                      | ASDU9, ASDU11, ASDU13*<br>ASDU9: Transmits data in normalized values<br>ASDU11: Transmits data in scaled values<br>ASDU13: Transmits data in floating-point numbers                                                                                                                                                                                                                                                                                               |
| DI Start Address                    | 1* ~ 65535                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| DI Upload Type                      | ASDU1*, ASDU3<br>ASDU1: Transmits Single Point Information (SPI)<br>ASDU3: Transmits Double Point Information (DPI)                                                                                                                                                                                                                                                                                                                                               |

|                                     |                                                                                                                                                                                                                                                                                                                                                                        |
|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Energy Start Address                | 1 ~ 65535, 25601*                                                                                                                                                                                                                                                                                                                                                      |
| Energy Upload Type                  | ASDU13, ASDU15*<br>ASDU13: Transmits data in floating-point numbers<br>ASDU15: Transmits data in integer format (32-bit signed)                                                                                                                                                                                                                                        |
| SOE Start Address                   | 1* ~ 65535                                                                                                                                                                                                                                                                                                                                                             |
| SOE Upload Type                     | ASDU30*, ASDU31<br>ASDU30: Transmits Single Point SOE (SP-SOE)<br>ASDU31: Transmits Double Point SOE (DP-SOE)                                                                                                                                                                                                                                                          |
| DO Start Address                    | 1 ~ 65535, 24577*                                                                                                                                                                                                                                                                                                                                                      |
| AO Start Address                    | 1 ~ 65535, 28673*                                                                                                                                                                                                                                                                                                                                                      |
| Common Address                      | 1* ~ 65535                                                                                                                                                                                                                                                                                                                                                             |
| Upload Virtual SOE                  | Disable*, Enable                                                                                                                                                                                                                                                                                                                                                       |
| Upload AI Change                    | Disable, Enable*                                                                                                                                                                                                                                                                                                                                                       |
| Energy Upload Interval (s)          | 0* ~ 60000, 0 indicates no data upload.                                                                                                                                                                                                                                                                                                                                |
| AI Upload Interval (s)              | 0* ~ 60000, 0 indicates no data upload.                                                                                                                                                                                                                                                                                                                                |
| Idle Timeout(min)                   | Define the maximum duration of inactivity after which the connection will be automatically terminated.<br>1 ~ 60min, 5*                                                                                                                                                                                                                                                |
| Data Upload Delay after Restart (s) | After the gateway is reset, it begins to collect and upload IEDs' data to the platform, which will take approximately 2 seconds. During this period, the data sent by the gateway to the platform may be invalid values. Setting this parameter to give the gateway sufficient time to collect valid data from the IEDs and avoid uploading invalid data.<br>0* ~ 300s |
| Remote Time Sync                    | On*, Off<br>Enable/Disable IEC 104 Time Synchronization Command Execution.                                                                                                                                                                                                                                                                                             |

Table 4-13 IEC104 Client Protocol

Basic

Enable ☒

Description

Main Station Address

Main Station Port

Backup Station Address

Backup Station Port

Login Packet

Heartbeat Interval(s)

Heartbeat Packet

KeepAlive Interval(s)

Advanced

Number of Common Address Bytes

Number of Transmission Reason Bytes

Number of Information Object Bytes

AI Start Address

AI Upload Type

DI Start Address

DI Upload Type

Energy Start Address

Energy Upload Type

SOE Start Address

SOE Upload Type

DO Start Address

AO Start Address

Common Address

Upload Virtual SOE ☐

Upload AI Change ☒

Energy Upload Interval(s)

AI Upload Interval(s)

Idle Timeout(min)

Data Upload Delay after Restart(s)

Remote Time Sync

Remark

Figure 4-31 IEC104 Client Protocol

| Parameter                                                         | Range/Option, Default*                                                                                                                                                                                                                                                           |
|-------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Basic</b>                                                      |                                                                                                                                                                                                                                                                                  |
| Main Station Address                                              | The connected master station address. Users can set LAN IP address, fixed public IP address, or dynamic/static domain name address.                                                                                                                                              |
| Main Station Port                                                 | The port number of the master station server. 10000*                                                                                                                                                                                                                             |
| Backup Station Address                                            | Reserved                                                                                                                                                                                                                                                                         |
| Backup Station Port                                               | Reserved                                                                                                                                                                                                                                                                         |
| Login Packet                                                      | iSmartGate SE sends data packets when it is actively connecting to the server. These packets can uniquely identify the data packets of a gateway.                                                                                                                                |
| Heartbeat Interval (s)                                            | The interval of sending a heartbeat packet.<br>0* ~ 60000. 0 means do not send a heartbeat packet.                                                                                                                                                                               |
| Heartbeat Packet                                                  | A custom hexadecimal packet sent by the gateway to the master periodically to maintain an active connection and prevent timeout disconnection due to inactivity.<br>Up to 63 bytes of 16 decimal characters (00~FF) can be configured.<br>Null (Do not send a heartbeat packet). |
| KeepAlive Interval (s)                                            | A parameter used in network communication (especially in protocols like TCP, MQTT, and HTTP) to maintain persistent connections by periodically sending small packets to prevent timeouts.                                                                                       |
| <b>Advanced</b> (Please refer to advanced IEC104 Client Protocol) |                                                                                                                                                                                                                                                                                  |

Table 4-14 IEC104 Client Protocol

#### 4.6.1.3 CET Modbus TCP Protocol

When set **Protocol** to **CET TCP Client Protocol**:

Basic

Enable

☐

Description

Data Cache 1

Port

–

2001

+

Client IP 1

Client IP 2

Client IP 3

Client IP 4

Client IP 5

Client IP 6

Client IP 7

Client IP 8

Client IP 9

Client IP 10

Client IP 11

Client IP 12

Client IP 13

Client IP 14

Client IP 15

Client IP 16

Storage Intervals

5min

▼

Advanced

Retain Data on Comm Loss

☐

Idle Timeout(min)

–

5

+

Unit ID

–

255

+

Dual-Active

☐

Ethernet List

ETH1

Data Upload Delay after Restart(s)

–

0

+

Storage Method during Failure

Store Invalid Value

▼

Remark

Figure 4- 32 CET Modbus TCP Protocol

| Parameter                          | Range/Option, Default*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Basic</b>                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Port                               | In scenarios where multiple remote stations access the iSmartGate SE's cache channels, it is imperative that the Master Station IP and Port are configured to differentiate between them. In the event of the same port being required for different cache channels, it is necessary to set different Master Station IPs in order to distinguish between them.<br>A cache channel should be uniquely determined by: Port + Master Station IP.<br>1 ~ 65535, 2001* for cache channel 1 and 2002* for cache channel 2 |
| Client IP 1~16                     | The <b>Client IP 1~16</b> are the IP addresses of the remote stations and only the specified stations are able to retrieve data from iSmartGate SE's cache channels.<br>Setting the <b>Client IP 1~16</b> as null allows any stations to retrieve data from iSmartGate SE's cache channels.                                                                                                                                                                                                                         |
| Storage Intervals                  | Off/1/5*/10/15/20/30/60 min                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Advanced</b>                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Retain Data on Comm Loss           | Checking this box means retaining data upload prior to the communication failure. Unchecking the box will upload invalid values.                                                                                                                                                                                                                                                                                                                                                                                    |
| Idle Timeout(min)                  | Defines the maximum duration of inactivity after which the connection will be automatically terminated.<br>1 ~ 60min, 5*                                                                                                                                                                                                                                                                                                                                                                                            |
| Unit ID                            | Specifies the Comm. ID of the gateway during systems collecting data based on Modbus TCP protocol.<br>1 ~ 255*                                                                                                                                                                                                                                                                                                                                                                                                      |
| Dual-Active (Reserved)             | Disable*, Enable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Ethernet List (Reserved)           | ETH1*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Data Upload Delay after Restart(s) | After the gateway is reset, it begins to collect and upload IEDs' data to the platform, which will take approximately 2 seconds. During this period, the data sent by the gateway to the platform may be invalid values. Setting this parameter to give the gateway sufficient time to collect valid data from the IEDs and avoid uploading invalid data.<br>0* ~ 300s                                                                                                                                              |
| Storage Method during Failure      | Specifies historical data storage mode after a communication interruption.<br>Store Invalid Value*, Retain the Last Valid Value                                                                                                                                                                                                                                                                                                                                                                                     |

Table 4-10 CET Modbus TCP Protocol

#### 4.6.1.4 IoT MQTT+JSON Protocol

When set **Protocol** to **IoT MQTT+JSON Protocol**:

The screenshot displays the configuration interface for the IoT MQTT+JSON Protocol, divided into two main sections: Basic and Advanced.

**Basic Section:**

- Enable:** Checked (indicated by a green checkmark).
- Description:** Data Cache 1
- Main Station Address:** (Empty text field)
- Main Station Port:** 10000 (with increment/decrement buttons)
- Backup Station Address:** (Empty text field)
- Backup Station Port:** 10000 (with increment/decrement buttons)
- Storage Intervals:** 5min (dropdown menu)
- Scheduled Upload Interval(s):** 300 (with increment/decrement buttons)
- UserName:** (Empty text field)
- Password:** (Empty text field)
- Product Key:** (Empty text field)
- Gateway SN:** (Empty text field)
- Gateway Name:** (Empty text field)
- Manufacturer ID:** (Empty text field)

**Advanced Section:**

- TLS Encryption:** Checked (indicated by a green checkmark).
- Upload TLS Certificate:** Select File (green button) and Click to Upload (red button)
- Idle Timeout(min):** 5 (with increment/decrement buttons)
- DI Upload Mode:** On-change + Scheduled Upload (dropdown menu)
- AI Change Upload:** (Unchecked checkbox)
- Time Sync Timeout(min):** 0 (with increment/decrement buttons)
- Data Upload Delay after Restart(s):** 0 (with increment/decrement buttons)
- KeepAlive Interval(s):** 20 (with increment/decrement buttons)
- Storage Method during Failure:** Store Invalid Value (dropdown menu)
- Remark:** (Empty text field)

Figure 4- 33 Parameters for the MQTT Protocol

| Parameter              | Range/Option, Default*                                                                                                              |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| <b>Basic</b>           |                                                                                                                                     |
| Main Station Address   | The connected master station address. Users can set LAN IP address, fixed public IP address, or dynamic/static domain name address. |
| Main Station Port      | The port number of the master station server. 10000*                                                                                |
| Backup Station Address | Reserved                                                                                                                            |
| Backup Station Port    | Reserved                                                                                                                            |

|                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Storage Intervals                  | Specifies storing log interval.<br>1min, 5min*, 10min, 15min, 20min, 30min, 60min, Off<br>The system can store data for 15 days @ 1-minute interval and for 900 days @ 60-minute interval.                                                                                                                                                                                                                                                                          |
| Scheduled Upload Interval(s)       | In general, the automatic upload interval of the gateway should be consistent with the <b>Storage Interval</b> when the former is set to 1 minute or longer.<br>It is not recommended to set the data upload interval to less than 10 seconds, as this may lead to data congestion.<br>10 - 65535, 300*                                                                                                                                                             |
| Username                           | The username for the MQTT or EMQX server, provided by the master station.                                                                                                                                                                                                                                                                                                                                                                                           |
| Password                           | The password for the MQTT or EMQX server, provided by the master station.                                                                                                                                                                                                                                                                                                                                                                                           |
| Product Key                        | Corresponds to the "pKey" field in the JSON messages.                                                                                                                                                                                                                                                                                                                                                                                                               |
| Gateway SN                         | A number that can be used to uniquely identify the gateway. It is recommended to use the gateway SN, which corresponds to the SN in the JSON message.                                                                                                                                                                                                                                                                                                               |
| Gateway Name                       | IoT Gateway Name                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Manufacturer ID                    | Enter according to master station requirements (optional).                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Advanced</b>                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| TLS Encryption                     | Enable Transport Layer Security (TLS) Encryption.                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Upload TLS Certificate             | <ul style="list-style-type: none"> <li>No encryption (plaintext communication): Uncheck the <b>TLS Encryption</b> box</li> <li>Server-side TLS only: Check the <b>TLS Encryption</b> box but do not upload TLS Certificate</li> <li>Mutual TLS (mTLS) authentication: Check the <b>TLS Encryption</b> box and upload three Certificates</li> </ul> Click <b>Select File</b> to upload certificates.<br><b>Note:</b> Only one Certificate can be uploaded at a time. |
| Idle Timeout (min)                 | The connection will be closed if there is no activities between the serial ports in the specified time.<br>1 ~ 60min, 5min*                                                                                                                                                                                                                                                                                                                                         |
| DI Upload Mode                     | <ul style="list-style-type: none"> <li>On-change+Scheduled Upload *</li> <li>Scheduled Upload</li> <li>On-change Upload</li> </ul>                                                                                                                                                                                                                                                                                                                                  |
| AI Change Upload                   | Enable uploading AI Change<br>Disable*, Enable                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Time Sync Timeout (min)            | When the time difference between the platform's synchronization command and the gateway's local clock exceeds configured value, the time calibration will be rejected.<br>0 means fully time synchronization by the platform.<br>0* ~ 600min                                                                                                                                                                                                                        |
| Data Upload Delay after Restart(s) | After the gateway is reset, it begins to collect and upload IEDs' data to the platform, which will take approximately 2 seconds. During this period, the data sent by the gateway to the platform may be invalid values. Setting this parameter to allow the gateway sufficient time to collect data from the IEDs and avoid uploading invalid data.<br>0* ~ 300s                                                                                                   |
| KeepAlive Interval(s)              | A parameter used in network communication (especially in protocols like TCP, MQTT, and HTTP) to maintain persistent connections by periodically sending small packets to prevent timeouts.<br>0~60000s, 20*                                                                                                                                                                                                                                                         |
| Storage Method during Failure      | Specifies historical data storage mode after a communication interruption.<br>Store Invalid Value*, Retain the Last Valid Value                                                                                                                                                                                                                                                                                                                                     |

Table 4-15 Parameters for the MQTT

#### 4.6.1.5 Aliyun MQTT ALINK JSON Protocol

When set **Protocol** to **Aliyun MQTT ALINK JSON Protocol**:

Basic

Enable

☒

Description

Data Cache 1

Main Station Address

Main Station Port

10000

Backup Station Address

Backup Station Port

10000

Storage Intervals

5min

Advanced

Gateway Name

Gateway Key

GateWay Secert Key

Gateway ID

Region ID

Power Loss Alarm

☐

Resume from BreakUp

☒

DI Change Upload

☐

AI Change Upload

☐

Topic Type

Thing topic

Extended Parameter 1

Extended Parameter 2

Extended Parameter 3

Extended Parameter 4

Extended Parameter 5

Extended Parameter 6

Extended Parameter 7

Extended Parameter 8

Extended Parameter 9

Storage Method during Failure

Store Invalid Value

Figure 4- 34 AliyunMQTT

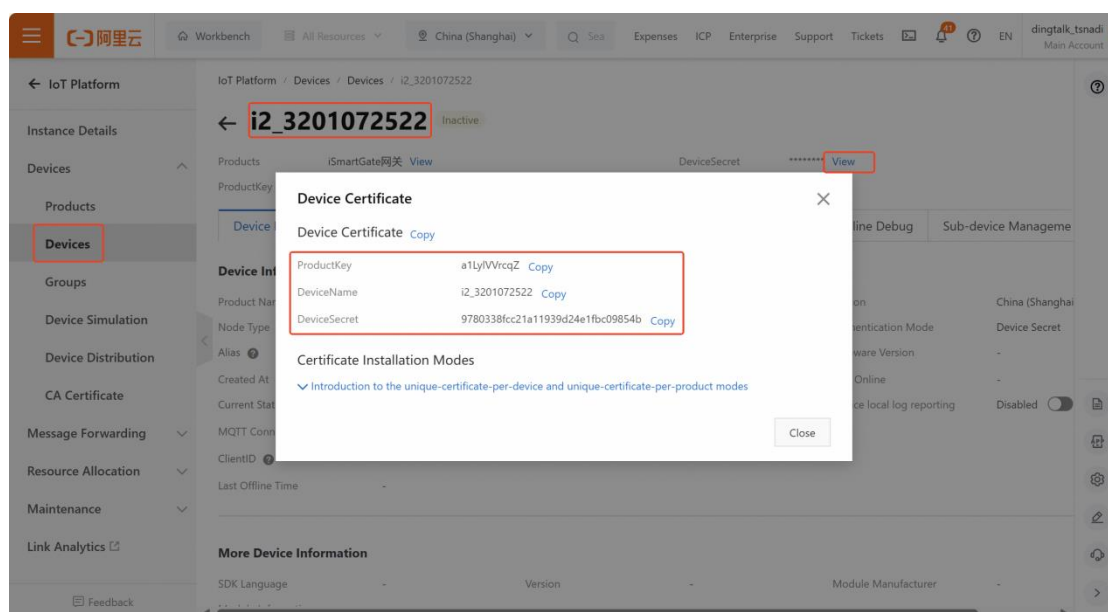


Figure 4- 35 Alibaba Cloud IoT Platform

| Parameter                     | Range/Option, Default*                                                                                                                                                                                                              |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Basic</b>                  |                                                                                                                                                                                                                                     |
| Main Station Address          | The connected master station address. Users can set LAN IP address, fixed public IP address, or dynamic/static domain name address.                                                                                                 |
| Main Station Port             | The port number of the master station server. 10000*                                                                                                                                                                                |
| Backup station Address        | Reserved                                                                                                                                                                                                                            |
| Backup Station Port           | Reserved                                                                                                                                                                                                                            |
| Storage Intervals             | Specifies storing log interval. Scheduled Upload Interval=Storage Intervals. 1min, 5min*, 10min, 15min, 20min, 30min, 60min, Off<br>The system can store data for 15 days @ 1-minute interval and for 900 days@ 60-minute interval. |
| <b>Advanced</b>               |                                                                                                                                                                                                                                     |
| Gateway Name                  | Corresponds to the <b>DeviceName</b> in the Alibaba Cloud (IoT Platform > Devices > Devices > The Gateway).                                                                                                                         |
| Gateway Key                   | Corresponds to the <b>ProductKey</b> in the Alibaba Cloud (IoT Platform > Devices > Devices > The Gateway).                                                                                                                         |
| Gateway Secret Key            | Corresponds to the <b>DeviceSecret</b> in the Alibaba Cloud (IoT Platform > Devices > Devices > The Gateway).                                                                                                                       |
| Gateway ID                    | Parameter Requirement: Must be unique. It is recommended to fill in the gateway's factory serial number (SN).                                                                                                                       |
| Region ID                     | Optional and configure this parameter only it is required by the Alibaba Cloud Platform.                                                                                                                                            |
| Power Loss Alarm              | Disable*, Enable                                                                                                                                                                                                                    |
| Resume from BreakUp           | Disable, Enable*                                                                                                                                                                                                                    |
| DI Change Upload              | Disable*, Enable                                                                                                                                                                                                                    |
| AI Change Upload              | Enable uploading changed Analog Value<br>Disable*, Enable                                                                                                                                                                           |
| Topic Type                    | Thing topic* (Preferred)<br>Customization topic<br>Please contact CET before resetting the parameter to <b>Customization topic</b> .                                                                                                |
| Extended Parameter 1-9        | Reserved                                                                                                                                                                                                                            |
| Storage Method during Failure | Specifies historical data storage mode after a communication interruption.<br>Store Invalid Value*, Retain the Last Valid Value                                                                                                     |

Table 4-16 Parameters for the AliyunMQTT Protocol

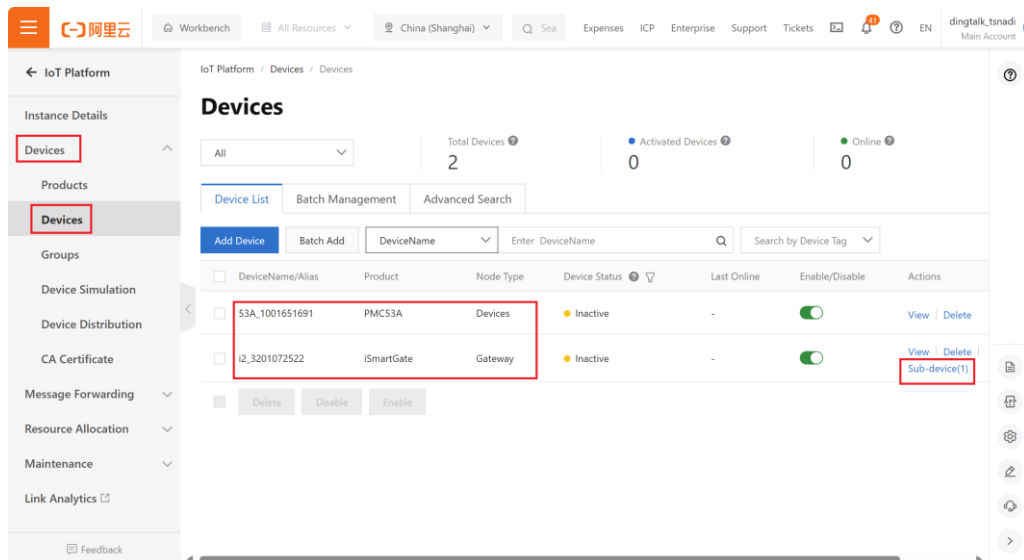


Figure 4- 36 Alibaba Cloud IoT Platform

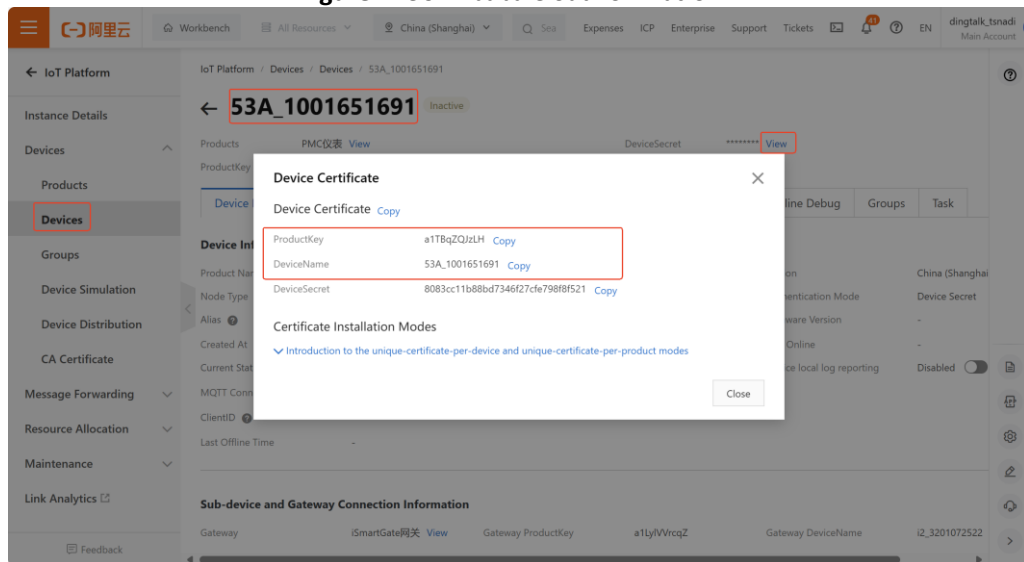


Figure 4- 37 Alibaba Cloud IoT Platform of IED/Sub-device

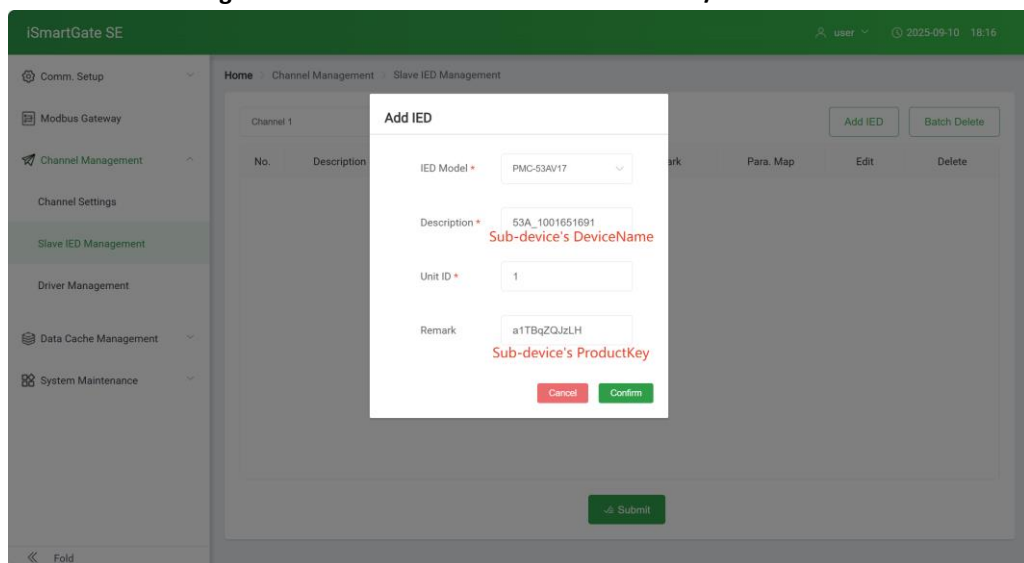


Figure 4- 38 Sub-device's DeviceName and ProductKey

On the Alibaba Cloud platform, the **DeviceName** and **ProductKey** of the sub-device must be configured in the **Slave IED Management** interface of the iSmartGate SE.

- The **Description** field in the Slave IED Management interface corresponds to the **DeviceName** of the sub-device on Alibaba Cloud.
- The **Remark** field in the Slave IED Management interface corresponds to the **ProductKey** of the sub-device on Alibaba Cloud.

#### 4.6.1.6 BACnet/IP Protocol

When set **Protocol** to **BACnet/IP Protocol**:

Figure 4-39 BACnet/IP

| Parameter                           | Range/Option, Default*                                                                                                                                                                                                                                                                                                                                                |
|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Gateway Name                        | Gateway name.                                                                                                                                                                                                                                                                                                                                                         |
| Gateway Description                 | The gateway itself also functions as a BACnet/IP device. Describe the gateway based on on-site requirements via this parameter.                                                                                                                                                                                                                                       |
| Gateway Instance Number             | The Device ID of the gateway which is a unique number that identifies a gateway. It is recommended to use the gateway's serial number.                                                                                                                                                                                                                                |
| Network Number                      | Network Number for IEDs that are connected to the Gateway.<br>1 ~ 65534, 2709*                                                                                                                                                                                                                                                                                        |
| Data Upload Delay after Restart (s) | After the gateway is reset, it begins to collect and upload IEDs' data to the platform, which will take approximately 2 seconds. During this period, the data sent by the gateway to the platform may be invalid values. Setting this parameter to allow the gateway sufficient time to collect data from the IEDs and avoid uploading invalid data.<br>0 ~ 300s, 10* |
| Energy Data Type                    | Analog Input*, Accumulator                                                                                                                                                                                                                                                                                                                                            |
| Invalid Data Upload                 | Upload Last Valid Value* or Custom Invalid Value                                                                                                                                                                                                                                                                                                                      |
| Custom Invalid Value                | Only valid when Invalid Data Upload is set to Custom Invalid Value.                                                                                                                                                                                                                                                                                                   |

Table 4-17 BACnet/IP

**Note:** The IED's Instance Number of **BACnet/IP Protocol** can be set in the **Remark** of the **Slave IED Management**, as shown in the figure below.

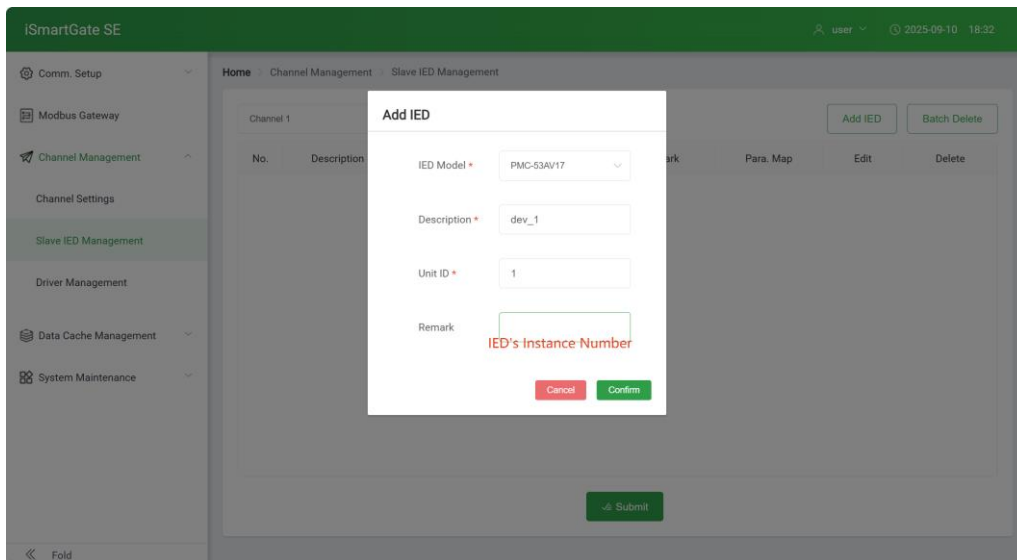


Figure 4-40 IED's Instance Number

#### 4.6.1.7 Custom Http+Json Protocol

It is recommended to set parameters for the **Custom Http+Json Protocol** via the **PMC-EasyCom** configuration software as not all parameters can be configured via the web interface

#### 4.6.2 Data Cache

Click **Data Cache** on the left-hand pane and the following screen appears. Click data cache drop-down box to select the data cache to add parameters or delete parameters.

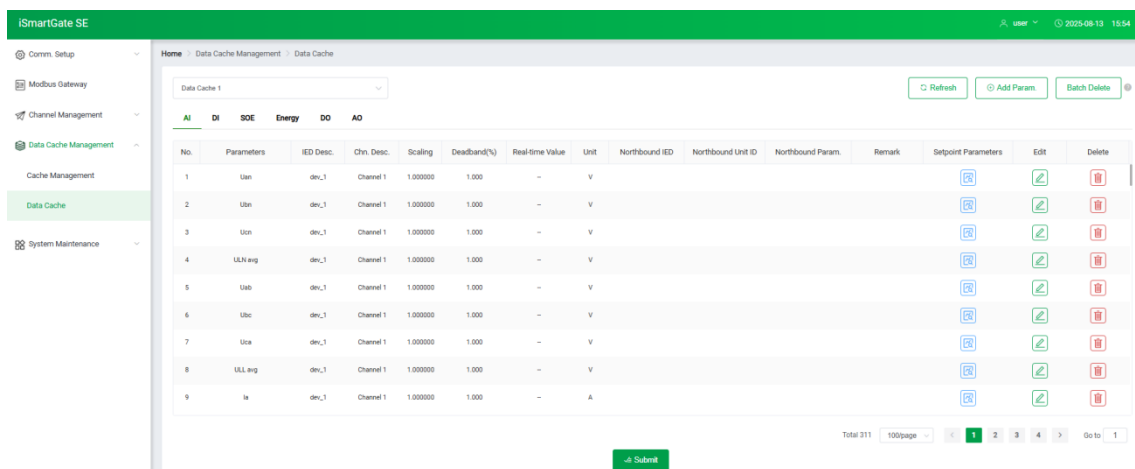


Figure 4-41 Data Cache

Click **Add Param.**, then select the required measurement points in the pop-up dialog box. Users can select parameters in batches to add to the **Added Parameters** area, and then click **Confirm**.

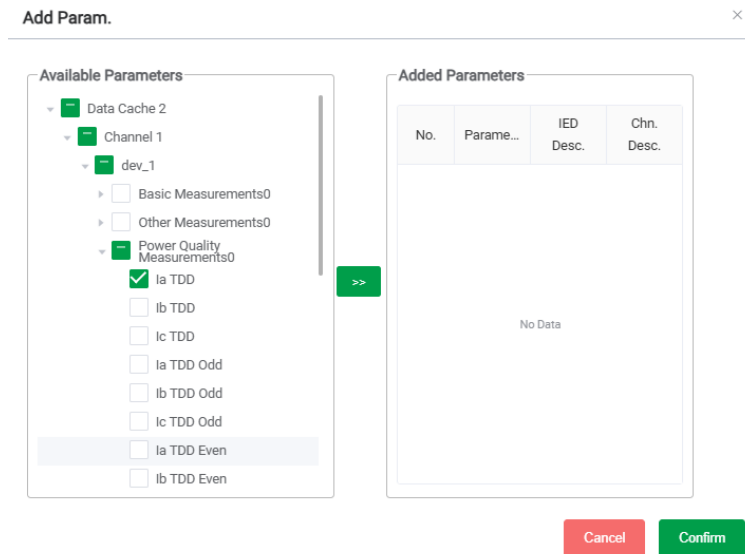


Figure 4-42 Add Param.

Add DI, SOE, Energy, DO, and AO parameters similarly.

## 4.7 System Maintenance

Click **System Maintenance** on the left-hand pane and its sub-menus appears which includes **Password Setup**, **Clear History Data**, **Docker**, **WebGUI**, **Backup/Restore**, **System Information**, **Device Log**, **Ping**, **Upgrade** and **Reboot**. The following sections provide a quick overview for these sub-menus.

### 4.7.1 Password Reset

Click **Password Reset** on the left-hand pane and the following screen appears on the right-hand pane, which allows users to change password for the "user". The original password is "abcd1234-".

Enter the new password twice and click **Submit** to save your changes.

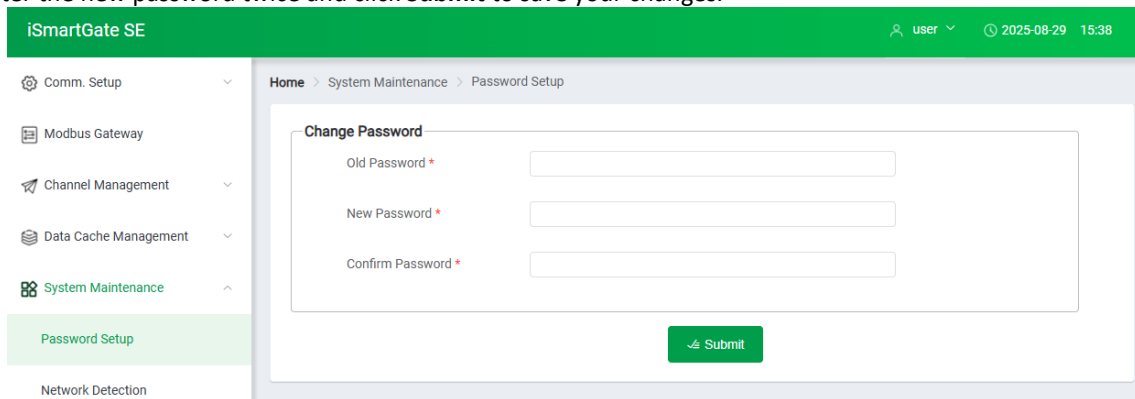


Figure 4- 43 Reset Password Screen

### 4.7.2 Network Detection

Click **Network Detection** on the left-hand pane and the following screen appears on the right-hand pane which allows users to test the network access for the iSmartGate SE and connected devices. If the network access is abnormal, users can monitor message and export packet file to locate fault.

#### Packet Capture:

1. Select **Interface** type (**4G** or **ETH**) from drop-down box.
2. Select **Packet Capture Max Value** (5MB or 10MB) from the drop-down box.
3. Click **Start** to capture packet and click **Stop & Save** to save the captured packet

For example: 🇺🇸 eth0\_20250813\_082347.pcap.gz

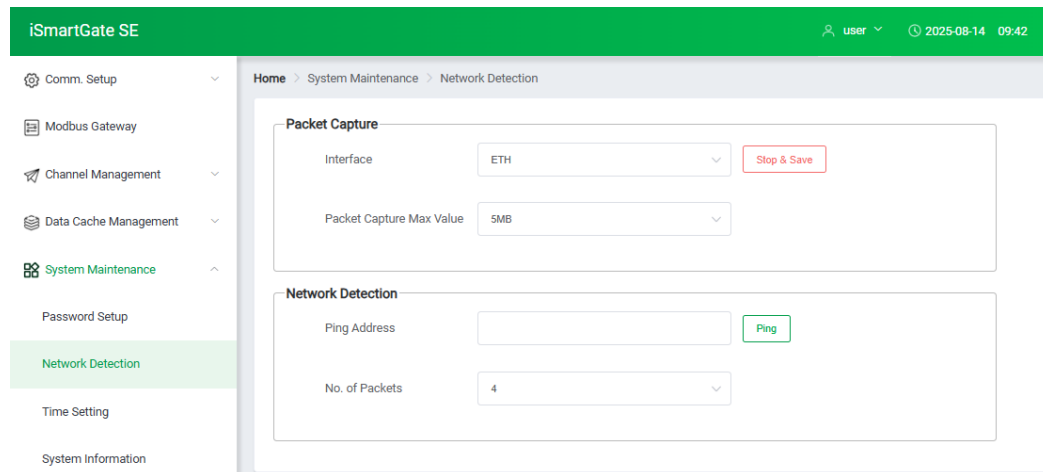


Figure 4- 44 Packet Capture Screen

4. Open the exported file via Wireshark and check the fault cause.

#### Network Detection:

Enter a destination IP address and click **Ping**, and the detection result will be displayed.

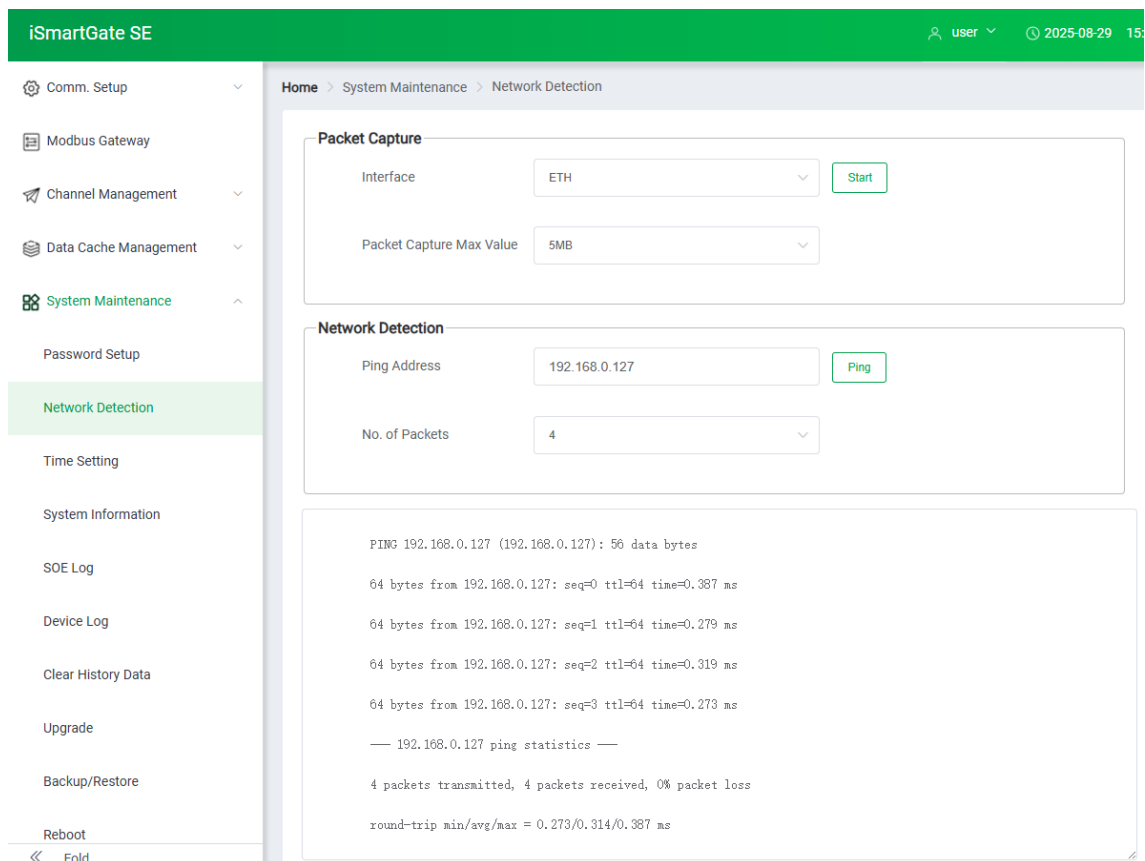


Figure 4-45 Network Detection Screen

### 4.7.3 Time Settings

Click **Time Setting** on the left-hand pane and the following screen appears on the right-hand pane. Users can setup date and time via setup **Device Clock** and **Device Time** areas. Besides, users can synchronize the device time with the PC by simple checking **Sync. PC Clock** box.

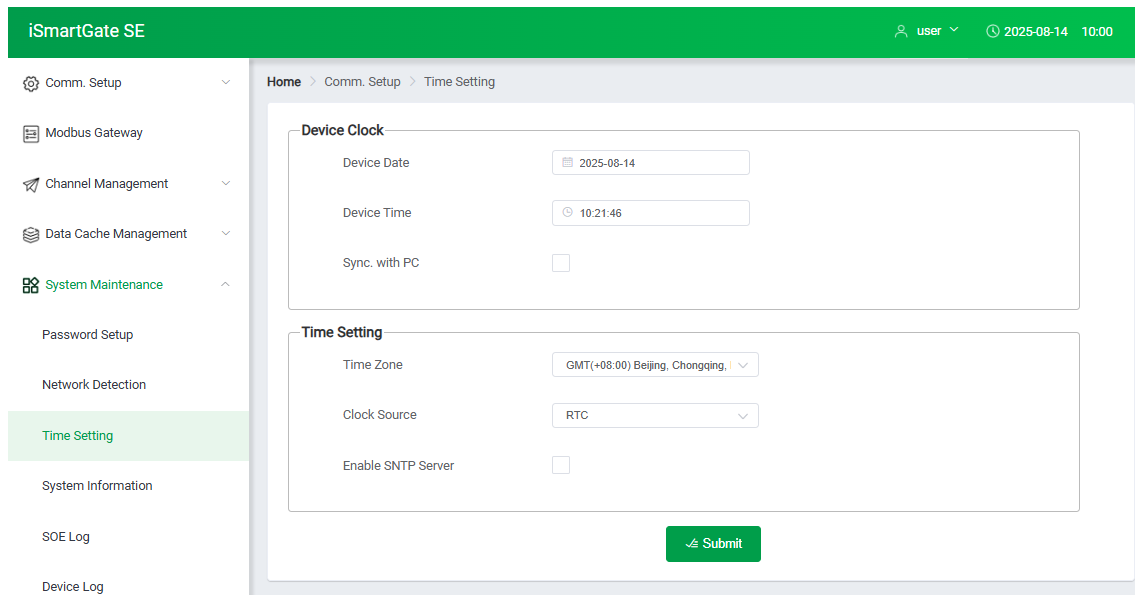


Figure 4-46 Time Setting Screen-Device Clock

The iSmartGate SE supports **RTC** and **SNTP** time synchronization modes.

#### RTC:

The iSmartGate SE is equipped with a 6ppm, battery-backed real-time clock that has a maximum error of 0.5s per day. If the supply power is lost or removed, the internal back-up battery keeps the real-time clock running until power is restored. The **Clock Source** is set to **RTC** by default and users can change it via the web.

#### SNTP:

**SNTP** (Simple Network Time Protocol) can be used to synchronize the iSmartGate SE's clock with an external **SNTP Server** through its Ethernet port providing that the network has been properly configured. Additionally, if the device is equipped with 4G option and the 4G supports public mobile network, the iSmartGate SE's clock can be synchronized with an external SNTP server via the 4G connection.

| Parameters   | Options/Range                                                                                                                                                                                                                                                                                                   | Default Setting |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| Time Zone    | GMT-12:00/GMT-11:00/GMT-10:00/GMT-9:00/GMT-8:00/GMT-7:00/GMT-6:00/GMT-5:00/GMT-4:00/GMT-3:30/GMT-3:00/GMT-2:00/GMT-1:00/GMT-0:00/GMT+1:00/GMT+2:00/GMT+3:00/GMT+3:30/GMT+4:00/GMT+4:30/GMT+5:00/GMT+5:30/GMT+5:45/GMT+6:00/GMT+6:30/GMT+7:00/GMT+8:00/GMT+9:00/GMT+9:30/GMT+10:00/GMT+11:00/GMT+12:00/GMT+13:00 | GMT+8:00        |
| Clock Source | RTC, SNTP                                                                                                                                                                                                                                                                                                       | RTC             |
| SNTP Address | Set the IP address of the <b>SNTP Server</b> .                                                                                                                                                                                                                                                                  |                 |

Table 4-18 Time Setting Parameters

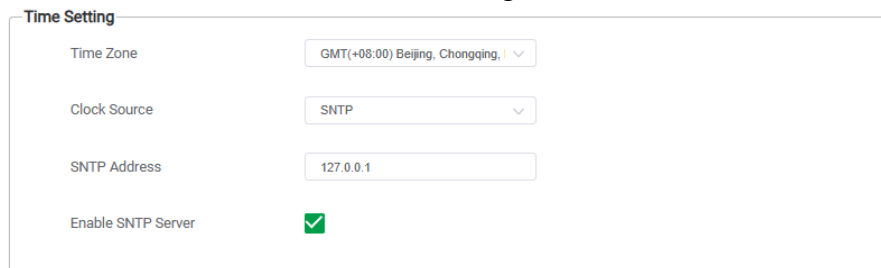


Figure 4-47 Time Setting Screen

In addition, the iSmartGate SE can serve as a SNTP server for the download Ethernet IED's to synchronize time.

#### 4.7.4 System Information

Click **System Information** on the left-hand pane and the following screen appears on the right-hand pane where displays the iSmartGate SE model and basic configuration information, including device name, description, firmware, firmware date, S/N and MAC1.

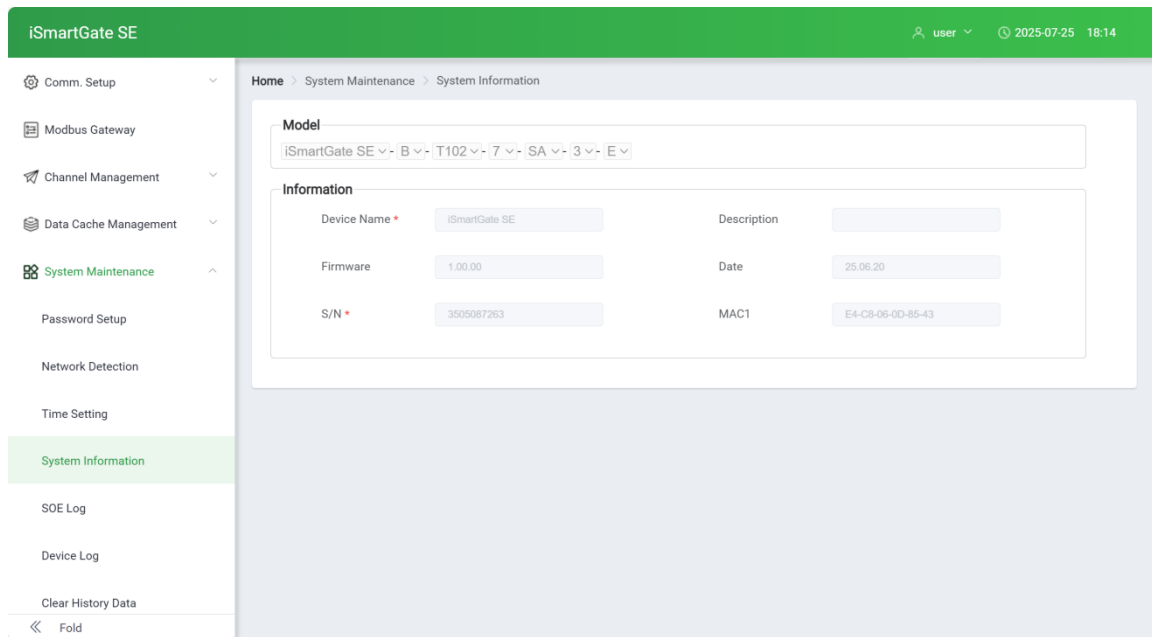


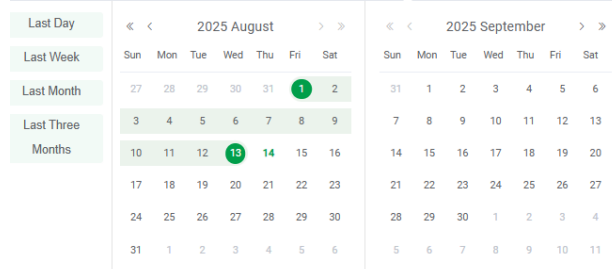
Figure 4- 48 System Information

#### 4.7.5 SOE Log

Click **SOE Log** on the left-hand pane to display the SOE Log on the right-hand pane starting with the most recent events. The interface supports the following filtering mechanism.

**Event Type:** Use the drop-down box on the left to select a particular event type, including **All SOE**, **Operations** and **Self-diagnostics**.

**Search Period:** You can click **Last Day**, **Last Week**, **Last Month**, **Last Three Months** or select a specific period.



The **Previous Period** and **Next Period** will be previous or next time range same period depending on the **Search Period**. For example, if the **Search Period** is set to **Last Week**, click **Previous Period** will display SOE logs of the week before last. And there will be no logs for the **Next Period**.

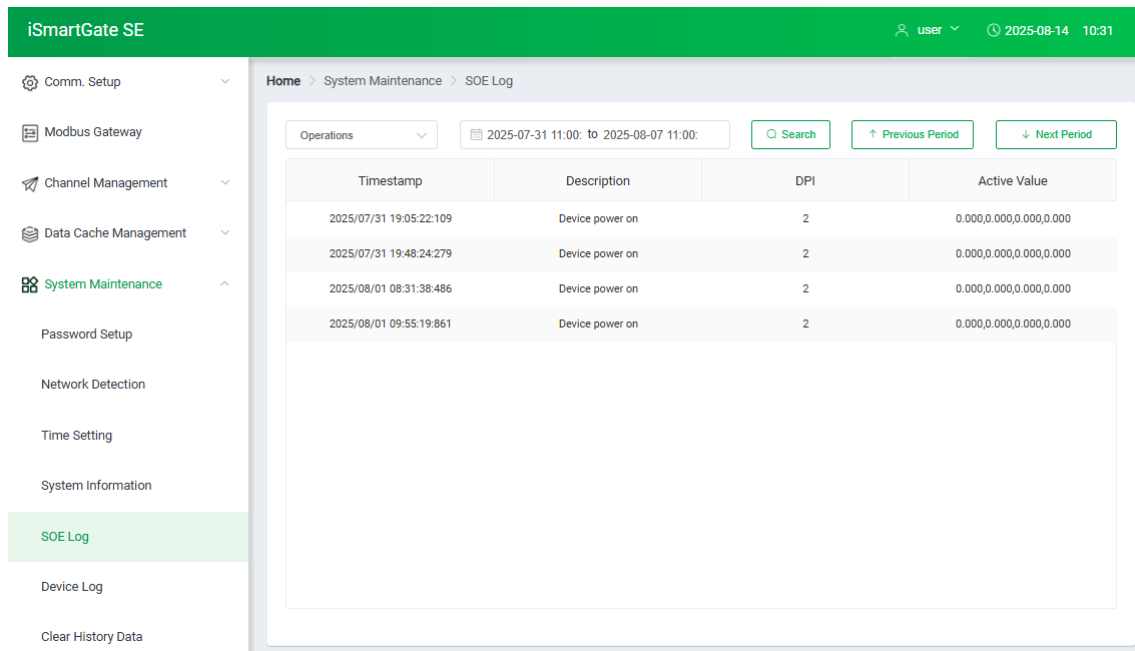


Figure 4-49 SOE Log

#### 4.7.6 Device Log

Click **Device Log** on the left-hand pane and the following screen appears on the right-hand pane starting with the most recent events. The device logs will help to identify of faults when the iSmartGate SE malfunctions. Click **Clear Log** to clear device logs and click **Export Log** to download the current page's device logs.

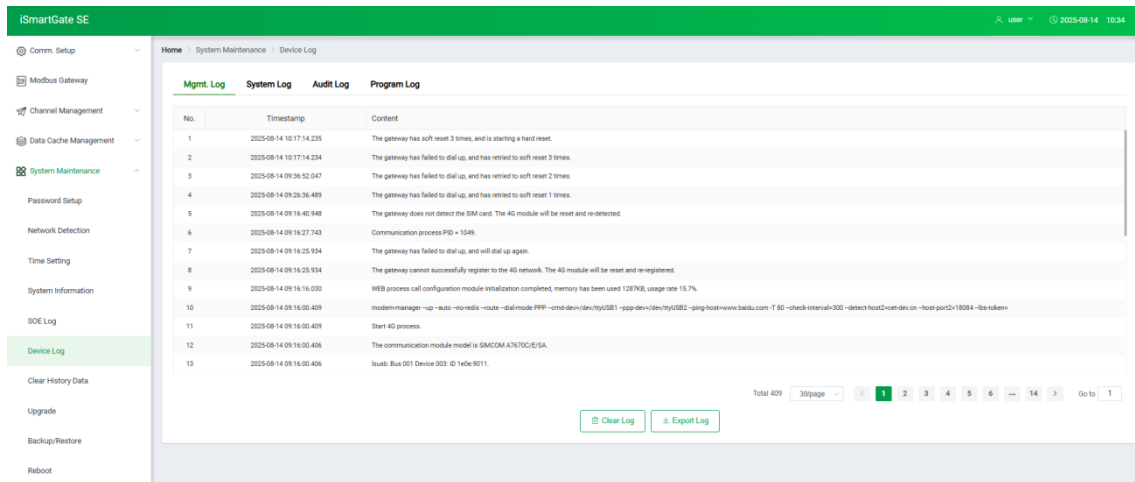


Figure 4-50 Device Log Screen

#### 4.7.7 Clear History Data

Click **Clear History Data** on the left-hand pane and the following screen appears on the right-hand pane to clear data records and historical SOE logs.

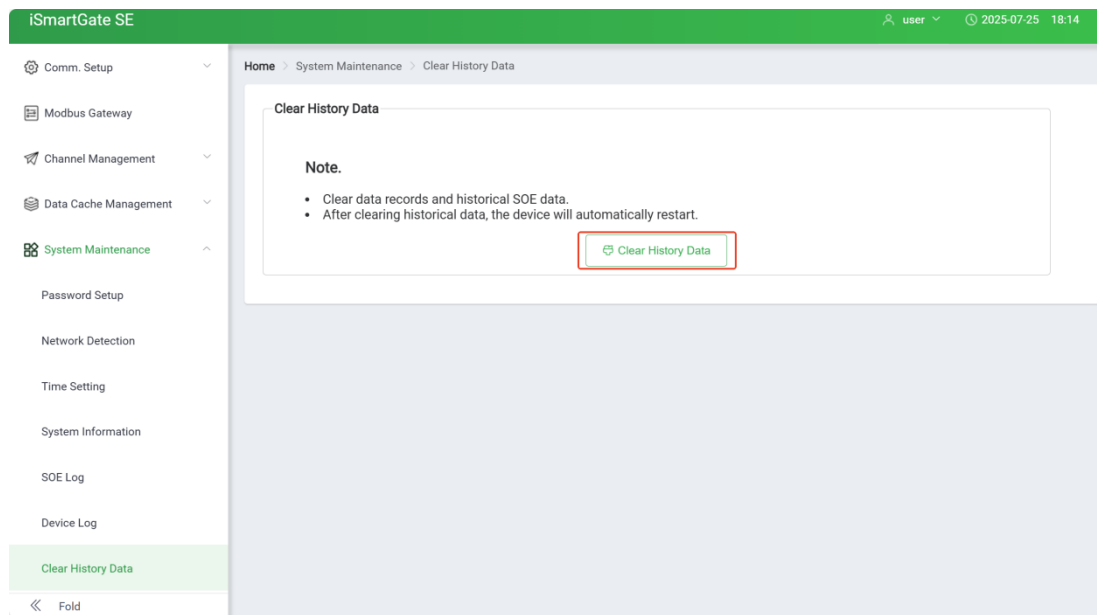


Figure 4-51 Clear History Data Screen

#### 4.7.8 Upgrade

Click **Upgrade** on the left-hand pane to upgrade web program online.

1. Click **Upgrade** on the right-hand pane.
2. Drag upgrade files or click to select upgrade files to the **Add Upgrade Package** dialog box.

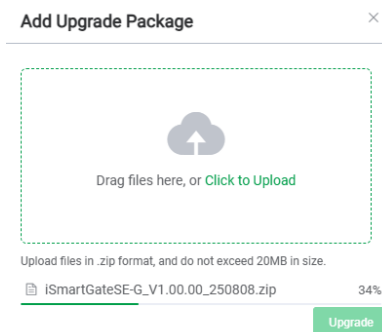


Figure 4-52 Add Upgrade Package Dialog

3. After uploading the upgrade file, click **Upgrade**.
4. Wait for upgrading and then reboot the device.

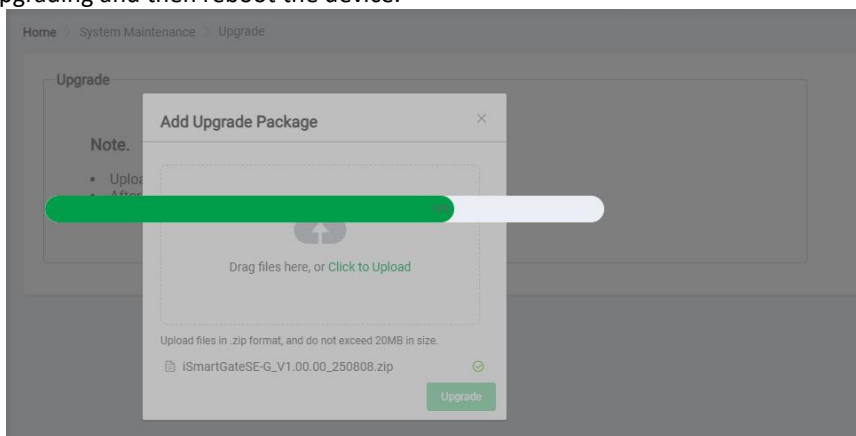


Figure 4-53 Upgrade Screen

#### 4.7.9 Backup/Restore

Click **Backup/Restore** on the left-hand pane and the following page are shown in the right pane.

**Backup:** click **Export Config** to export device configuration file to local PC.

**Restore:** click **Select Config** to select the configuration file and click **Restore Config** to reset the iSmartGate SE to the specific configuration.

**Restore Factory Defaults:** allows users to reset the iSmartGate SE to the factory default configuration.

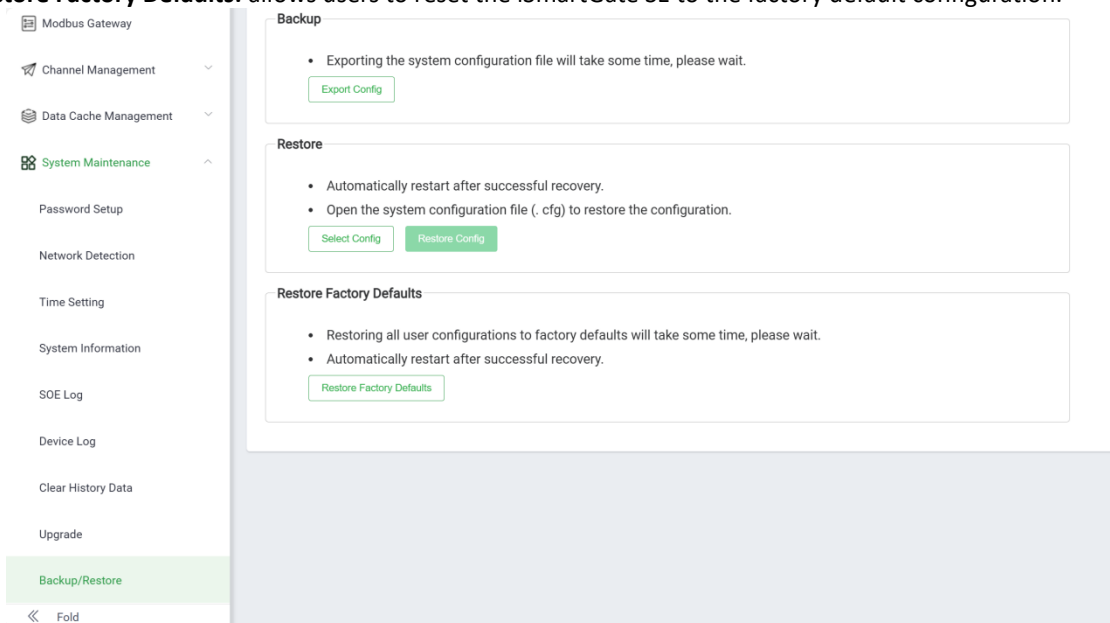


Figure 4-54 Backup/Restore Screen

#### 4.7.10 Reboot

Configuration changes will not take effect until the **Reboot** operation has been executed. Click **Reboot** on the left-hand pane and the following screen appears on the right-hand pane. Click the **Reboot** button to initiate the restart sequence. After restart, the user needs to log in again to access to the iSmartGate SE Web.

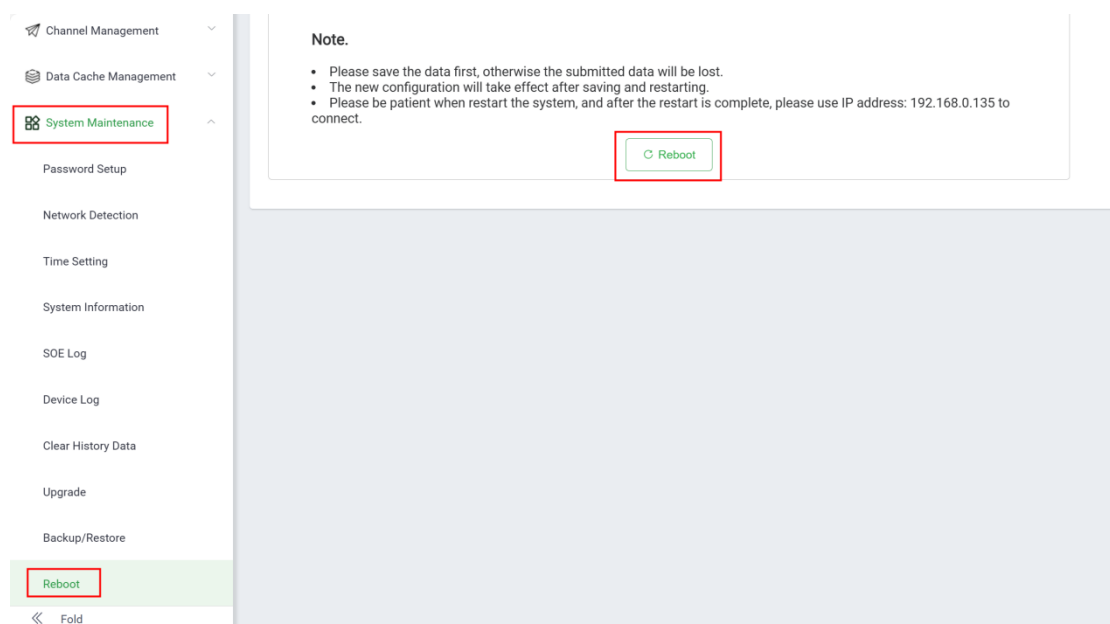


Figure 4-55 Reboot Screen

## Chapter 5 Applications

The iSmartGate SE enables efficient transfer of serial packets between upstream network - based applications and downstream RS-485 or optional LoRa wireless devices through a TCP/IP connection.

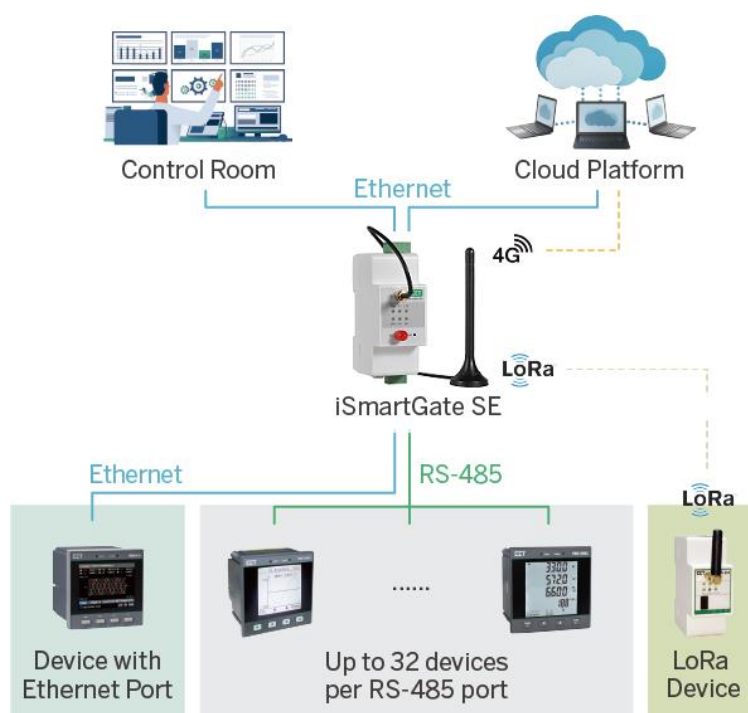
Traditional methods often involve using a Windows - based “Virtual COM” driver along with a port - mapping utility. However, this approach frequently encounters driver incompatibility issues across various Windows versions. In contrast, the iSmartGate SE allows applications to directly connect to it via TCP/IP. This enables transparent transfer of serial packets within TCP/IP frames to and from downstream devices.

The iSmartGate SE is ideally suited for communicating with industrial devices featuring timing - sensitive protocols. It offers a reliable interface for SCADA or similar applications. These applications, which already support direct connection with an Ethernet Gateway, can communicate with serial devices regardless of the protocols used.

Moreover, the iSmartGate SE supports the Modbus TCP to Modbus RTU Gateway function. This function simplifies the process for any Modbus TCP Master applications to interface with Modbus RTU - enabled IEDs over a local area network. A user - friendly web - based interface allows easy configuration of the TCP to RTU address mapping for downstream Slave IEDs connected via RS-485, Ethernet or optional LoRa.

The iSmartGate SE can be configured to support multiple Masters. This not only facilitates information sharing but also minimizes implementation costs. Additionally, the optional LoRa port supports configurable ISM Bands, making it suitable for wireless IoT applications in most countries.

The following figure illustrates a typical application scenario for the iSmartGate SE.



**Figure 5-1 Typical Application**

### 5.1 Transparent Gateway

The iSmartGate SE supports the efficient transfer of serial packets between the upstream network-based applications and the downstream RS-485/LoRa devices via a TCP/IP connection.

The Transparent Gateway function on the iSmartGate SE supports two modes: TCP Server and TCP Client.

### 5.1.1 TCP Server Mode

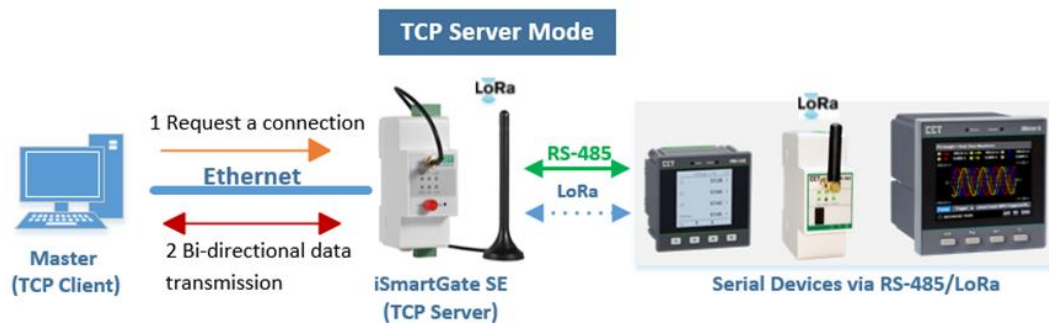


Figure 5-1 TCP Server Mode

The iSmartGate SE, which works in the TCP Server mode, will wait passively network connection requests from the Master via Ethernet, allowing the Master to establish a connection with and retrieve data from the downstream serial devices. The iSmartGate SE will listen on the local port set by the user and build a connection after receiving Master's connection request. Data from the serial devices will be sent to the Master via the iSmartGate SE. As illustrated in the figure above, the process is as follows:

1. The Master requests a connection to the iSmartGate SE.
2. Once the connection is established, data can be transmitted between the Master and serial devices via the iSmartGate SE.

### 5.1.2 TCP Client Mode



Figure 5-2 TCP Client Mode

The iSmartGate SE that works in the TCP Client mode will connect to the Master to enable data transmission between the serial devices and the Master. The iSmartGate SE can actively establish a TCP connection to the Master when serial data is received. As illustrated in the figure above, the process is as follows:

1. The iSmartGate SE requests a connection to the Master.
2. Once the connection is established, data can be transmitted between the Master and serial devices via the iSmartGate SE.

### 5.1.3 Multiple Masters

The iSmartGate SE supports Multiple-Master connections under Transparent Gateway to allow multiple network clients to send requests asynchronously. The gateway queues these requests and executes them sequentially on the RS-485 bus. For each request, it waits for the response for up to the Packet Timeout duration. After each transaction (whether a successful response or a timeout), the gateway enforces the Polling Delay. This mechanism ensures fair and stable access to the shared RS-485 bus for all network masters, preventing data corruption. The Multiple Masters function is disabled by default and can be enabled via the Web Console. A maximum of 4 Masters per RS-485/LoRa port can be connected.

1. Click **Modbus Gateway**.
2. Select **P1 (RS-485)**, **P2 (RS-485)** or **LoRa**. Here taking P1 as an example.
3. Set **Protocol** to **Transparent Gateway**.
4. Set **Multi Master** as **Enable** and click **Configure** to setup parameters including Polling Delay and Packet Timeout. Please refer to the **Section 4.4** for details.

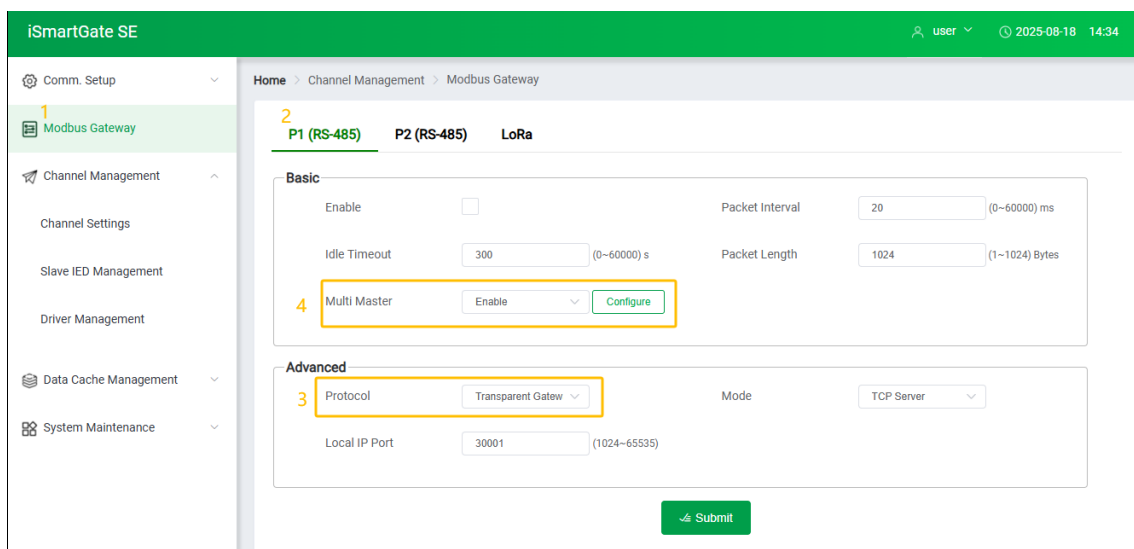


Figure 5-3 Multiple Masters Settings

## 5.2 Modbus Gateway

The iSmartGate SE provides the Modbus Gateway function that makes it extremely simple for any Modbus TCP Master applications to interface with slaves (Modbus RTU enabled IEDs) over a local area network.

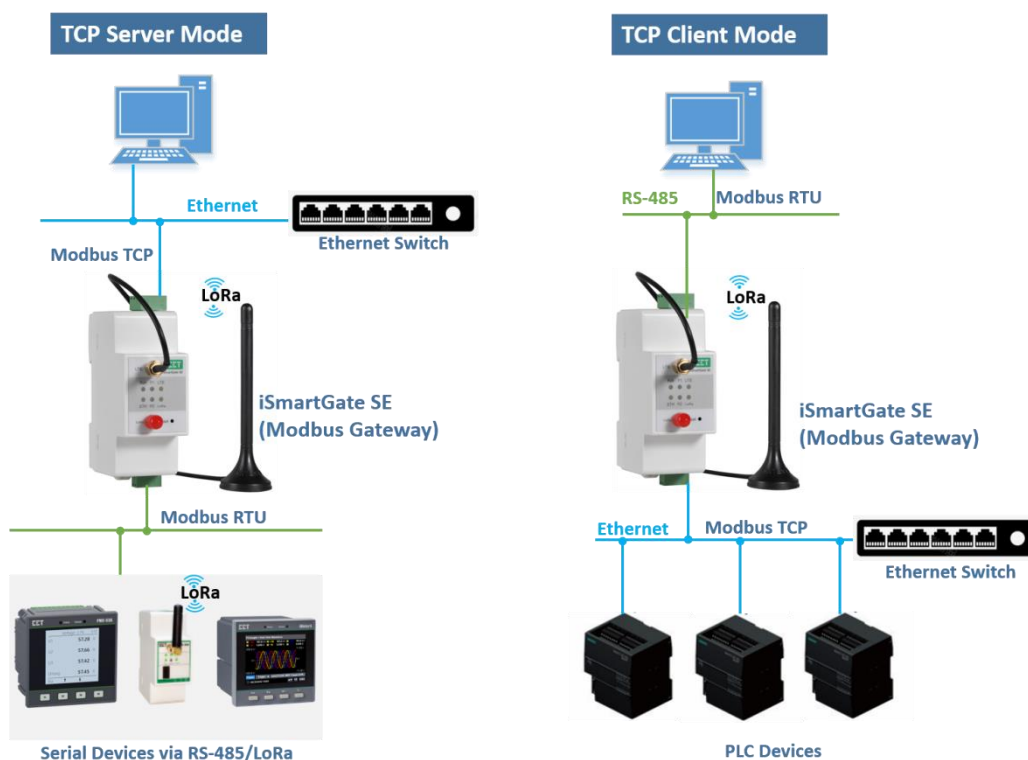


Figure 5-4 Modbus Gateway Function

The iSmartGate SE supports:

- TCP Server and TCP Client modes
  - TCP Server mode: The iSmartGate SE provides the master with **server** functionality via Modbus TCP through the Ethernet port.
  - TCP Client mode: The iSmartGate SE provides the master with **client** functionality via Modbus TCP through the Ethernet port.
- A maximum of 32 downstream LoRa devices per iSmartGate SE
- 32 Slave IEDs per RS-485 port
- A maximum of 4 Masters per RS-485/LoRa port

The following is the process flow:

1. Establish connection between the Master and the iSmartGate SE.
  - TCP Server mode: The Master requests a connection to the iSmartGate SE.
  - TCP Client mode: The iSmartGate SE requests a connection to the Master.
2. After the connection is established, the Master sends TCP message to the iSmartGate SE.
3. iSmartGate SE converts the received RTU message to TCP format and sends it to the slaves.
4. The slaves returns a response (RTU message) to the iSmartGate SE.
5. The iSmartGate SE converts the RTU message to TCP format and returns it to the Master.

A simple web console allows users to easily configure the TCP to RTU address mapping for downstream Slave IEDs connected via RS-485/LoRa port. Please refer to **Section 4.5.2** for details.

### 5.3 Data Cache

With one Ethernet port and one built-in 4G modem, as well as extensive protocols support such as Modbus RTU, Modbus TCP, IEC 60870-5-104 (IEC 104), AnyPolling and optional BACnet/IP, etc., the iSmartGate SE supports pushing the following data to external: 4096xAI, 4096xDI, 2048xEnergy, 1024xAO, 1024xDO, 2048xSOE. In addition, it also supports resumable transfer for historical data. Please refer to **Section 4.6.2** for guidelines to manage pushed data.

Up to 2 Data Cache channels (Ethernet or 4G) can be configured. The detailed parameters are different based on selected protocols, please refer to **Section 4.6.1** for more information.

### 5.4 Data Collection and Management

The iSmartGate SE is capable of collecting data via 4 channels (Ethernet, RS-485 or LoRa) from maximum 128 downstream devices.

1. Click **Channel Management > Channel Settings** on the left-hand pane to setup 4 channels. Please refer to **4.5 4.5.1** for details.

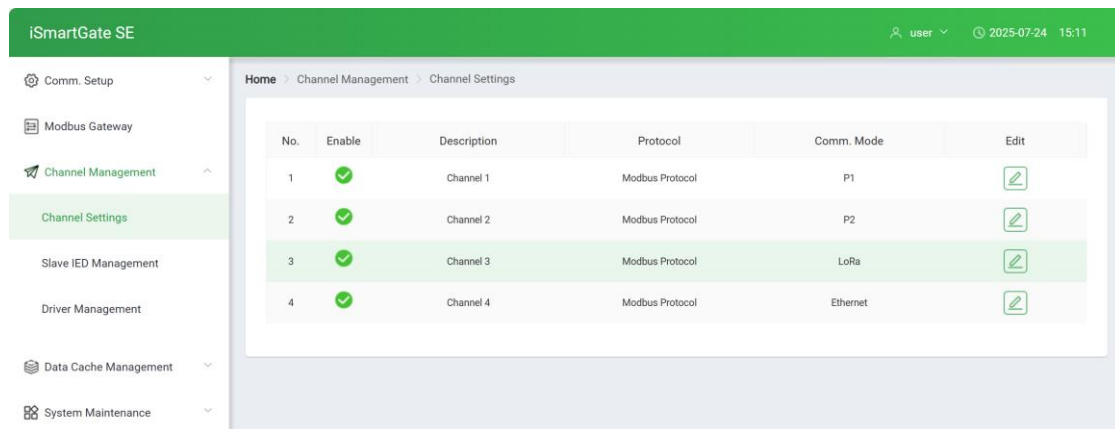


Figure 5-5 Channel Setting

2. Click **Channel Management > Slave IED Management** on the left-hand pane to manage connected IEDs. Please refer to **4.5 4.5.2** for details.

iSmartGate SE user 2025-08-18 14:41

Comm. Setup ▼

Modbus Gateway

Channel Management ^

Channel Settings

Slave IED Management

Driver Management

Data Cache Management ▼

System Maintenance ▼

Home > Channel Management > Slave IED Management

Channel 1 ▼ Add IED Batch Delete

| No. | Description | IED Model     | Unit ID | Remark | Para. Map | Edit | Delete |
|-----|-------------|---------------|---------|--------|-----------|------|--------|
| 1   | dev_1       | PMC-340-A6V10 | 1       |        |           |      |        |
| 2   | dev_2       | PMC-220V103A  | 2       |        |           |      |        |
| 3   | dev_3       | PMC-352-DVv09 | 3       |        |           |      |        |

Submit

Figure 5-6 IED Management Setting

## Chapter 6 Modbus Register Map

This chapter provides a complete description of the Modbus register map (**Protocol Version 1.0**) for the iSmartGate SE to facilitate the development of 3<sup>rd</sup> party communications driver for accessing information on the iSmartGate SE. For a complete Modbus Protocol Specification, please visit <http://www.modbus.org>. The iSmartGate SE supports the following Modbus functions:

- 1) Read Holding Registers (Function Code 0x03)
- 2) Force Single Coil (Function Code 0x05)
- 3) Preset Multiple Registers (Function Code 0x10)

The following table provides a description of the different data formats used for the Modbus registers. The iSmartGate SE uses the Big Endian byte ordering system.

| Format       | Description                                            |
|--------------|--------------------------------------------------------|
| UINT16/INT16 | Unsigned/Signed 16-bit Integer                         |
| UINT32/INT32 | Unsigned/Signed 32-bit Integer                         |
| Float        | IEEE 754 32-bit Single Precision Floating Point Number |

### 6.1 Analog Input Register

| Register | Property | Description | Format |
|----------|----------|-------------|--------|
| 0000     | RO       | AI1         | Float  |
| 0002     | RO       | AI2         | Float  |
| 0004     | RO       | AI3         | Float  |
| ...      | RO       | ...         | Float  |
| 1022     | RO       | AI512       | Float  |

Table 6-1 AI Measurements

Notes:

- 1) The register value is invalid if the AIx's reading is 0x7FFFFFFF, which may indicate the AI's associated IDE is disconnected.

### 6.2 Digital Input Register

| Register | Property | Description | Format |
|----------|----------|-------------|--------|
| 9000     | RO       | DI1~DI16    | UINT16 |
| 9001     | RO       | DI17~DI32   | UINT16 |
| 9002     | RO       | DI33~DI48   | UINT16 |
| ...      | RO       | ...         | UINT16 |
| 9015     | RO       | DI241~DI256 | UINT16 |

Table 6-2 DI Measurements

Notes:

- 1) Each of connected devices is defined as a virtual DI to show communication status, where 1 means **Connected**, while 0 means **Disconnected**.

### 6.3 Energy Register

| Register | Property | Description | Format | Unit    |
|----------|----------|-------------|--------|---------|
| 10000    | RO       | PI1         | INT64  | 0.01kWh |
| 10004    | RO       | PI2         | INT64  |         |
| 10008    | RO       | PI3         | INT64  |         |
| ...      | RO       | ...         | INT64  |         |
| 10508    | RO       | PI128       | INT64  |         |

Table 6-3 Energy Measurements

Notes:

- 1) The register value is invalid if the PIx's reading is 0x7FFFFFFF, which may indicate the PIx's associated IDE is disconnected.

### 6.4 Remote Control

| Register | Property | Description                           | Format | Note                                                           |
|----------|----------|---------------------------------------|--------|----------------------------------------------------------------|
| 61000    | WO       | Arm Remote Control #1 Close/Open      | UINT16 | Writing "0xFF00" to the register execute the described action. |
| 61001    | WO       | Execute Remote Control # 1 Close/Open | UINT16 |                                                                |
| 61002    | WO       | Arm Remote Control #2 Close/Open      | UINT16 |                                                                |
| 61003    | WO       | Execute Remote Control #2 Close/Open  | UINT16 |                                                                |
| ...      | WO       | ...                                   | UINT16 |                                                                |
| 61254    | WO       | Arm Remote Control #128 Close/Open    | UINT16 |                                                                |

|       |    |                                        |        |  |
|-------|----|----------------------------------------|--------|--|
| 61255 | WO | Execute Remote Control #128 Close/Open | UINT16 |  |
|-------|----|----------------------------------------|--------|--|

Table 6-4 Remote Control

## 6.5 AO Register

| Register    | Property | Description | Format | Scale |
|-------------|----------|-------------|--------|-------|
| 63100~63101 | WO       | AO1         | INT32  | X100  |
| 63102~63103 | WO       | AO2         | INT32  |       |
| 63104~63105 | WO       | AO3         | INT32  |       |
| ...         |          | ...         | INT32  |       |
| 63354~63355 | WO       | AO128       | INT32  |       |

Table 6-5 AO Register

## 6.6 Time

| Register | Property | Description                | Format  | Note     |
|----------|----------|----------------------------|---------|----------|
| 60000    | WO       | High-order Byte: Year-2000 | UINT16  | 1-37     |
|          |          | Low-order Byte: Month      |         | 1 to 12  |
| 60001    | WO       | High-order Byte: Day       | UINT16  | 1 to 31  |
|          |          | Low-order Byte: Hour       |         | 0 to 23  |
| 60002    | WO       | High-order Byte: Minute    | UINT16  | 0 to 59  |
|          |          | Low-order Byte: Second     |         | 0 to 59  |
| 60003    | WO       | Millisecond                | UINT16  | 0 to 999 |
| 60004    | WO       | UNIX Time                  | UINT132 |          |

Table 6-6 Time Registers

## 6.7 Data Recorder Log

The real-time data, including AI and PI, is recorded as Data Recorder logs and stored in the iSmartGate SE storage. A DR log records all the AI and PI data in data cache at a certain moment.

| Register | Property | Description             | Format |
|----------|----------|-------------------------|--------|
| 30000    | RO       | DR Log Index            | UINT32 |
| 30002    | RW       | Current DR Log Pointer  | UINT32 |
| 30004    | RO       | DR Depth                | UINT16 |
| 30005    | RO       | High-order Byte: Year   | UINT16 |
|          |          | Low-order Byte: Month   |        |
| 30006    | RO       | High-order Byte: Day    | UINT16 |
|          |          | Low-order Byte: Hour    |        |
| 30007    | RO       | High-order Byte: Minute | UINT16 |
|          |          | Low-order Byte: Second  |        |

Table 6-7 Data Recorder Log

### Notes:

- 1) **DR Log Index** indicates the latest DR Log index in data cache with a range of 0 and 0xFFFFFFFF. The register is incremented by 1 and will roll over to 1 when its current value is 0xFFFFFFFF.
- 2) The **Current DR Log Pointer** indicates its current reading position.

### 6.7.1 AI Log Buffer

| Register | Property | Description | Format |
|----------|----------|-------------|--------|
| 30100    | RO       | AI1         | Float  |
| 30102    | RO       | AI2         | Float  |
| 30104    | RO       | AI3         | Float  |
| ...      |          | ...         |        |
| 38290    | RO       | AI4096      | Float  |

Table 6-8 AI Log Buffer

### 6.7.2 PI Log Buffer

| Register | Property | Description | Format | Unit     |
|----------|----------|-------------|--------|----------|
| 40000    | RO       | PI1         | INT64  | X0.01kWh |
| 40004    | RO       | PI2         | INT64  |          |
| 40008    | RO       | PI3         | INT64  |          |
| ...      |          | ...         |        |          |
| 48188    | RO       | PI2048      | INT64  |          |

Table 6-9 PI Log Buffer

## 6.8 Device Configuration

| Register    | Property | Description     | Format | Note |
|-------------|----------|-----------------|--------|------|
| 60200       | RO       | CPU Load        | Float  |      |
| 60202       | RO       | RAM (MB)        | Float  |      |
| 60204       | RO       | Memory Usage    | Float  |      |
| 60206       | RO       | ROM (MB)        | Float  |      |
| 60208       | RO       | Available ROM   | Float  |      |
| 60210~60212 | RO       | Reserved        | UINT16 |      |
| 60213       | RO       | Alarm/DO Status | UINT16 |      |

Table 6-10 Device Information

## 6.9 Device Information

| Register | Property | Description               | Format | Note                                     |
|----------|----------|---------------------------|--------|------------------------------------------|
| 65000    | RO       | Device Model <sup>1</sup> | ASCII  |                                          |
| 65020    | RO       | Firmware Version          | UINT16 | e.g. 10000 shows the version is V1.00.00 |
| 65021    | RO       | Modbus Version            | UINT16 | e.g. 10 shows the version is V1.0        |
| 65022    | RO       | Modbus Update Date: Year  | UINT16 | 1-37 (Year-2000)                         |
| 65023    | RO       | Modbus Update Date: Month | UINT16 | 1 to 12                                  |
| 65024    | RO       | Modbus Update Date: Day   | UINT16 | 1 to 31                                  |
| 65025    | RO       | Energy Data Type          | UINT16 | 0=INT32<br>1=INT64                       |
| 65026    | RO       | Reserved                  | UINT16 |                                          |

Table 6-11 Device Information

### Note:

- 1) The Device Model appears in registers 65000 to 65019 and contains the ASCII encoding of the string "iSmartGate SE" as shown in the following table.

| Register    | Value(Hex) | ASCII  |
|-------------|------------|--------|
| 65000       | 0x69       | i      |
| 65001       | 0x53       | S      |
| 65002       | 0x6D       | m      |
| 65003       | 0x61       | a      |
| 65004       | 0x72       | r      |
| 65006       | 0x74       | t      |
| 65007       | 0x47       | G      |
| 65008       | 0x61       | a      |
| 65009       | 0x74       | t      |
| 65010       | 0x65       | e      |
| 65011       | 0x20       | <Null> |
| 65012       | 0x53       | S      |
| 65013       | 0x45       | E      |
| 65014~65019 | 0x20       | <Null> |

Table 6-12 ASCII Encoding of "iSmartGate SE"

## 6.10 Custom Data Registers

### 6.10.1 Analog Input Registers

| Register | Property | Description | Format |
|----------|----------|-------------|--------|
| 0000     | RW       | AI1         | Float  |
| 0002     | RW       | AI2         | Float  |
| 0004     | RW       | AI3         | Float  |
| ...      | RW       | ...         | Float  |
| 2046     | RW       | AI1024      | Float  |

Table 6-13 Custom AI Registers

### 6.10.2 Digital Input Register

| Register | Property | Description | Format |
|----------|----------|-------------|--------|
| 3000     | RW       | DI1         | UINT16 |
| 3001     | RW       | DI2         | UINT16 |
| 3002     | RW       | DI3         | UINT16 |
| ...      | RW       | ...         | UINT16 |
| 4023     | RW       | DI1024      | UINT16 |

Table 6-14 DI Measurements

### 6.10.3 Energy Register

| Register | Property | Description | Format | Unit    |
|----------|----------|-------------|--------|---------|
| 5000     | RW       | PI1         | INT64  | 0.01kWh |
| 5004     | RW       | PI2         | INT64  |         |
| 5008     | RW       | PI3         | INT64  |         |
| ...      | RW       | ...         | INT64  |         |
| 7044     | RW       | PI512       | INT64  |         |

Table 6-15 Energy Measurements

## Appendix A - Technical Specifications

| Communication                      |                                                                                                                                                                                                                                                                                                                                                       |
|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ethernet Port                      |                                                                                                                                                                                                                                                                                                                                                       |
| Speed                              | 10/100 Mbps                                                                                                                                                                                                                                                                                                                                           |
| Protocol                           | TCP, HTTP, MQTT, BACnet/IP, IEC 104                                                                                                                                                                                                                                                                                                                   |
| RS-485                             |                                                                                                                                                                                                                                                                                                                                                       |
| Baudrate                           | 300/600/1200/2400/4800/9600/19200/38400 bps                                                                                                                                                                                                                                                                                                           |
| Data Bits                          | 5, 6, 7, 8                                                                                                                                                                                                                                                                                                                                            |
| Stop Bits                          | 1, 2                                                                                                                                                                                                                                                                                                                                                  |
| 4G LTE CAT1 modem                  |                                                                                                                                                                                                                                                                                                                                                       |
| Type                               | 4G LTE<br>2G GSM: 900/1800 MHz                                                                                                                                                                                                                                                                                                                        |
| Applicable to                      |                                                                                                                                                                                                                                                                                                                                                       |
| EU                                 | Belgium, Britain, Cambodia, Denmark, Finland, France, Germany, Holland, Hong Kong (China), Indonesia, Italy, Japan, Korea, Lithuania, Macao (China), Malaysia, New Zealand, Norway, Pakistan, Philippines, Poland, Russia, Serbia, Singapore, South Africa, Spain, Sweden, Switzerland, Thailand, Tanzania, Vietnam, Zimbabwe, Nigeria, Algeria, etc. |
| SA                                 | Argentina, Australia, Brazil, Chile, Saudi Arabia, Taiwan (China), Turkey, United Arab Emirates                                                                                                                                                                                                                                                       |
| NA                                 | America, Canada, Mexico and Paraguay                                                                                                                                                                                                                                                                                                                  |
| LoRa (Optional)                    |                                                                                                                                                                                                                                                                                                                                                       |
| RF Range                           | 860-930 MHz                                                                                                                                                                                                                                                                                                                                           |
| ISM Bands                          | EU863-870, RU864-870, IN865-867, US902-928, AU915-928, AS920-923, AS923-925 and Custom                                                                                                                                                                                                                                                                |
| RF Output Power                    | 18 dBm (Maximum)                                                                                                                                                                                                                                                                                                                                      |
| Receiver Sensitivity               | -136 dBm (Maximum)                                                                                                                                                                                                                                                                                                                                    |
| Output Watts                       | 0.03 (Typical)                                                                                                                                                                                                                                                                                                                                        |
| FCC 47 CFR Part 15C                | Certified                                                                                                                                                                                                                                                                                                                                             |
| Power Supply (L/+, N/-)            |                                                                                                                                                                                                                                                                                                                                                       |
| Standard                           | 95-250VAC/DC $\pm 10\%$ , 47-440Hz                                                                                                                                                                                                                                                                                                                    |
| Optional                           | 12-36VDC                                                                                                                                                                                                                                                                                                                                              |
| Burden                             | $\leq 3W$                                                                                                                                                                                                                                                                                                                                             |
| Protection                         |                                                                                                                                                                                                                                                                                                                                                       |
| ESD Protection                     | 15kV (Air) & 8kV (Contact)                                                                                                                                                                                                                                                                                                                            |
| Isolation Protection               | 3kV for RS-485<br>1.5kV for Ethernet Port                                                                                                                                                                                                                                                                                                             |
| Environmental Conditions           |                                                                                                                                                                                                                                                                                                                                                       |
| Operating Temp.                    | -25°C to +70°C                                                                                                                                                                                                                                                                                                                                        |
| Storage Temp.                      | -40°C to +85°C                                                                                                                                                                                                                                                                                                                                        |
| Humidity                           | 5% to 95% non-condensing                                                                                                                                                                                                                                                                                                                              |
| Atmospheric pressure               | 70kPa to 106kPa                                                                                                                                                                                                                                                                                                                                       |
| Mechanical Characteristics         |                                                                                                                                                                                                                                                                                                                                                       |
| Unit Dimensions                    | 36x65x90mm                                                                                                                                                                                                                                                                                                                                            |
| Mounting                           | DIN Rail                                                                                                                                                                                                                                                                                                                                              |
| LoRa Antenna                       |                                                                                                                                                                                                                                                                                                                                                       |
| Frequency Range                    | 860-935MHz                                                                                                                                                                                                                                                                                                                                            |
| Band Width                         | 75MHz                                                                                                                                                                                                                                                                                                                                                 |
| Impedance                          | 50 $\Omega$                                                                                                                                                                                                                                                                                                                                           |
| Power Capability                   | 50W                                                                                                                                                                                                                                                                                                                                                   |
| Height                             | 239.5 $\pm$ 5mm                                                                                                                                                                                                                                                                                                                                       |
| VSWR (Voltage Standing Wave Ratio) | $\leq 2$                                                                                                                                                                                                                                                                                                                                              |
| Gain                               | 2.0dBi                                                                                                                                                                                                                                                                                                                                                |
| 4G Antenna                         |                                                                                                                                                                                                                                                                                                                                                       |
| Frequency Range                    | 699-960/1710-2690 MHz                                                                                                                                                                                                                                                                                                                                 |
| Impedance                          | 50 $\Omega$                                                                                                                                                                                                                                                                                                                                           |
| Height                             | 105 $\pm$ 3mm                                                                                                                                                                                                                                                                                                                                         |
| VSWR (Voltage Standing Wave Ratio) | $\leq 2.5$                                                                                                                                                                                                                                                                                                                                            |
| Gain                               | >3.0dBi                                                                                                                                                                                                                                                                                                                                               |

**Appendix B - Standards Compliance**

| <b>Safety Requirements</b>                                                                                                                                 |                                                                  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| Audio/Video, Information and Communication Technology Equipment - Part 1: Safety Requirements                                                              | IEC 62368-1: 2014 + A1: 2017                                     |
| <b>Electromagnetic Compatibility</b>                                                                                                                       |                                                                  |
| <b>CE EMC Directive 2014 / 30 / EU (EN 55035: 2017 + A11: 2020)</b>                                                                                        |                                                                  |
| Electrostatic Discharge                                                                                                                                    | EN 61000-4-2: 2009                                               |
| Radiated Fields                                                                                                                                            | EN IEC 61000-4-3: 2020                                           |
| Fast Transients                                                                                                                                            | EN 61000-4-4: 2012                                               |
| Surges                                                                                                                                                     | EN 61000-4-5: 2014 + A1: 2017                                    |
| Conducted Disturbances                                                                                                                                     | EN 61000-4-6: 2014                                               |
| Magnetic Fields                                                                                                                                            | EN 61000-4-8: 2010                                               |
| Voltage Dips and Interruptions                                                                                                                             | EN IEC 61000-4-11: 2020                                          |
| <b>Emission Tests</b>                                                                                                                                      |                                                                  |
| Electromagnetic Compatibility of Multimedia Equipment- Emission Requirements                                                                               | EN 55032: 2015 + A11: 2020                                       |
| Electromagnetic Compatibility of Multimedia Equipment- Immunity Requirements                                                                               | EN 55035: 2017 + A11: 2020                                       |
| Limits for Harmonic Current Emissions for Equipment with Rated Current $\leq 16$ A                                                                         | EN IEC 61000-3-2: 2019 + A1: 2021                                |
| Limitation of Voltage Fluctuations and Flicker in Low-Voltage Supply Systems For Equipment with Rated Current $\leq 16$ A                                  | EN 61000-3-3: 2013 + A1: 2019 + A2: 2021                         |
| Radiated Emission and Conducted Emission                                                                                                                   | ETSI EN 301 489-1 V2.2.3<br>ETSI EN 301 489-3 V2.3.2             |
| <b>Radio Equipment Directive (RED) 2014 / 53 /EU</b>                                                                                                       |                                                                  |
| Assessment of Electronic and Electrical Equipment Related to Human Exposure Restrictions for Electromagnetic Fields (0 Hz - 300 GHz)                       | EN IEC 62311: 2020                                               |
| Determination of RF Field Strength, Power Density and SAR in the Vicinity of Radio Communication Base Station for the Purpose of Evaluating Human Exposure | EN 62232: 2017                                                   |
| Short Range Devices (SDR) Operating in the Frequency Range 25 MHz to 1000 MHz                                                                              | ETSI EN 300 220-1 V3.1.1: 2017<br>ETSI EN 300 220-2 V3.1.1: 2017 |
| <b>Mechanical Tests</b>                                                                                                                                    |                                                                  |
| Freefall                                                                                                                                                   | IEC 60068-2-31: 2008                                             |
| Vibration                                                                                                                                                  | IEC 60068-2-6: 2007                                              |
| Shock                                                                                                                                                      | IEC 60068-2-27: 2008                                             |

## Appendix C - Ordering Guide



Version 20250508

| Product Code                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                       | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| iSmartGate SE Intelligent Gateway                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                                                                                                             | Basic Function                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                                                                                                             | R                                                                                                                                                                                                                                                                                                                                                     | <ul style="list-style-type: none"> <li>• Modbus TCP/RTU Gateway and Transparent Gateway</li> <li>• Modbus Mastering with large 8GB On-Board memory and Max. number of data in Data Cache: 4096xAI, 4096xDI, 2024xEnergy, 1024xAO, 1024xDO, 2048xSOE Logs</li> <li>• Supports protocol conversion with,                             <ul style="list-style-type: none"> <li>o Client protocols: Modbus RTU, Modbus TCP, IEC 104, Anypolling</li> <li>o Server protocols: IEC 104, Modbus TCP, MQTT+JSON, HTTP+JSON, AliCloud, Amazon AWS</li> </ul> </li> </ul> |
|                                                                                                                                                             | B*                                                                                                                                                                                                                                                                                                                                                    | R option + BACnet/IP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                                                                                                                                                             | Communication Ports                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                                                                                                             | T102                                                                                                                                                                                                                                                                                                                                                  | 1x10Base-T/100Base-TX + 2xRS-485                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                             | LoRa                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                                                                                                             | N                                                                                                                                                                                                                                                                                                                                                     | None                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                                                                                                                                                             | 7*                                                                                                                                                                                                                                                                                                                                                    | LoRa (860-930 MHz) configurable for EU863-870, RU864-870, IN865-867, US902-928, AU915-928, AS920-923, AS923-925                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                                                                                                             | 4G~ <sup>1</sup>                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                                                                                                             | NN                                                                                                                                                                                                                                                                                                                                                    | None                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                                                                                                                                                             | CN*                                                                                                                                                                                                                                                                                                                                                   | Applicable to India                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                                                                                                                                                             | EU*                                                                                                                                                                                                                                                                                                                                                   | Applicable to Europe and Southeast Asia Region                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                                                                                                                                             | SA*                                                                                                                                                                                                                                                                                                                                                   | Applicable to South America                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                                                                                                                                                             | NA*                                                                                                                                                                                                                                                                                                                                                   | Applicable to North America                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                                                                                                                                                             | Power Supply                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                                                                                                             | 2                                                                                                                                                                                                                                                                                                                                                     | 95-250V AC/DC ± 10%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                                                                                                                                                             | 3*                                                                                                                                                                                                                                                                                                                                                    | 12-36V DC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                                                                                                                             | Language                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                                                                                                             | E                                                                                                                                                                                                                                                                                                                                                     | English                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| iSmartGate SE - R - T102 - N - NN - 2 - E                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                       | iSmartGate SE-R-T102-N-NN-2E (Standard Model)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| * Additional charges apply.<br>~ Applicable to 4G/3G/2G networks.<br>1. The 4G options EU, SA and NA are applicable to the following countries and regions: |                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| EU                                                                                                                                                          | Belgium, Britain, Cambodia, Denmark, Finland, France, Germany, Holland, Hong Kong (China), Indonesia, Italy, Japan, Korea, Lithuania, Macao (China), Malaysia, New Zealand, Norway, Pakistan, Philippines, Poland, Russia, Serbia, Singapore, South Africa, Spain, Sweden, Switzerland, Thailand, Tanzania, Vietnam, Zimbabwe, Nigeria, Algeria, etc. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| SA                                                                                                                                                          | Argentina, Australia, Brazil, Chile, Saudi Arabia, Taiwan (China), Turkey, United Arab Emirates                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| NA                                                                                                                                                          | America, Canada, Mexico and Paraguay                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 2.SIM Card Requirement Micro-SIM.                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

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**Revision History Logs**

| Version | Date     | Description of Changes                                                                                                                                          |
|---------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| V1.0    | 20250916 | Initial Version                                                                                                                                                 |
| V1.1    | 20260618 | <ul style="list-style-type: none"><li>• Updated Maximum downstream LoRa device number per device.</li><li>• Updated the default password of the user.</li></ul> |