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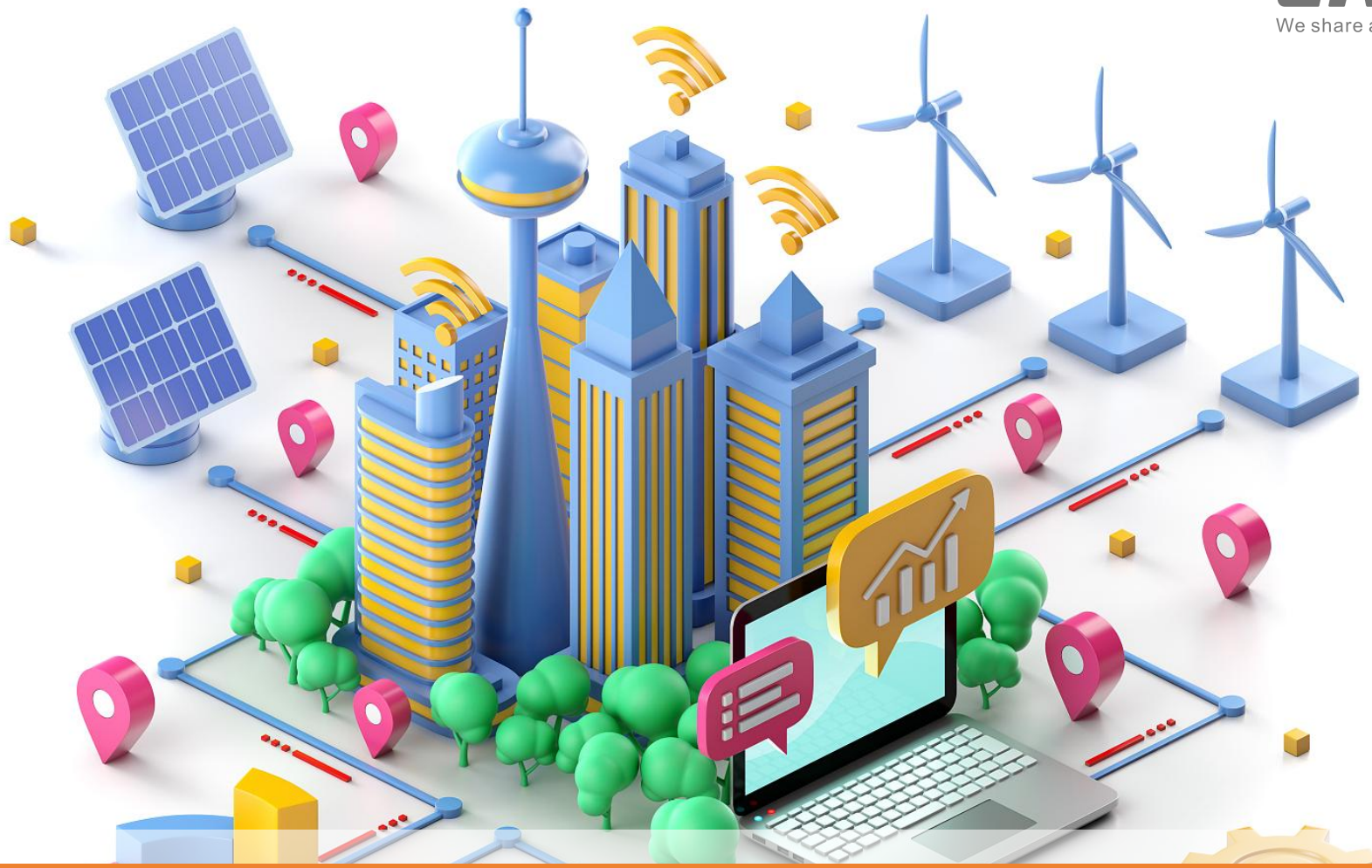

Smart Metering Implemention Guide

Shenzhen CalinMeter Co., Ltd

About Calin

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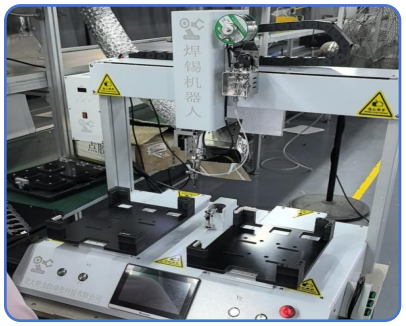
Shenzhen Calinmeter Co., Ltd. was established on November 6, 2015. The company's business projects include the production of electronic energy meters, intelligent water meters, gas meters, heat meters, gas meters, instruments, collectors, concentrators, four-meter integrated systems and equipment, communication modules, communication interfaces, meter boxes, and complete sets of instruments; plastic products and secondary processing for various instruments; and the production of molds.

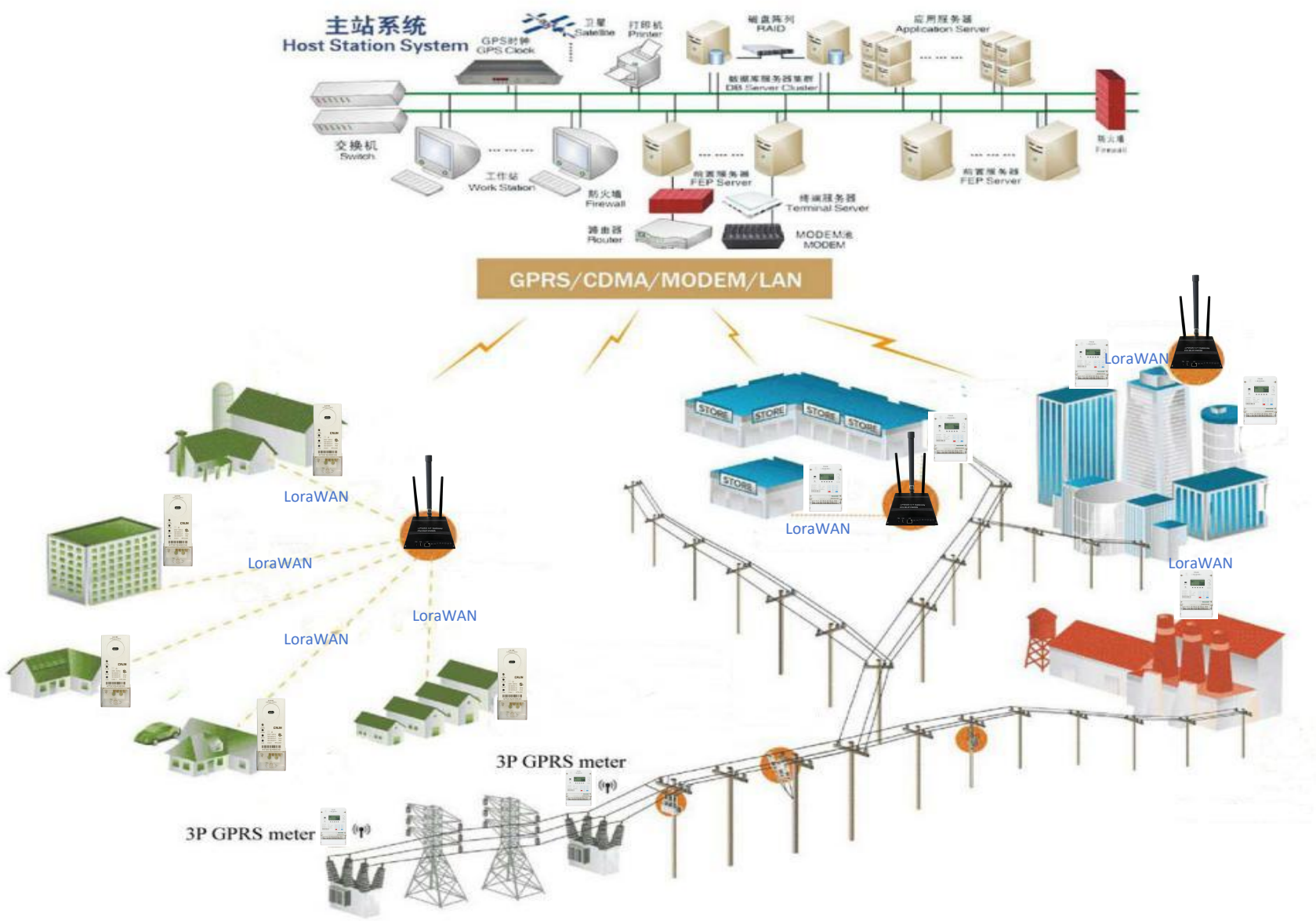
Over the past five years, we have sold and commissioned over 200,000 smart meters. We are an ISO and STS certified meter company. Our expertise extends beyond manufacturing to designing for other meter companies both in and out of China. We sincerely appreciate the opportunity to introduce our latest technology and products to cater to your needs and believe that our expertise in smart metering will bring significant value to your fields.





Calin Solution Overview



Serials Number

Meter Serials Number

Gateway Serials Number

47001249938

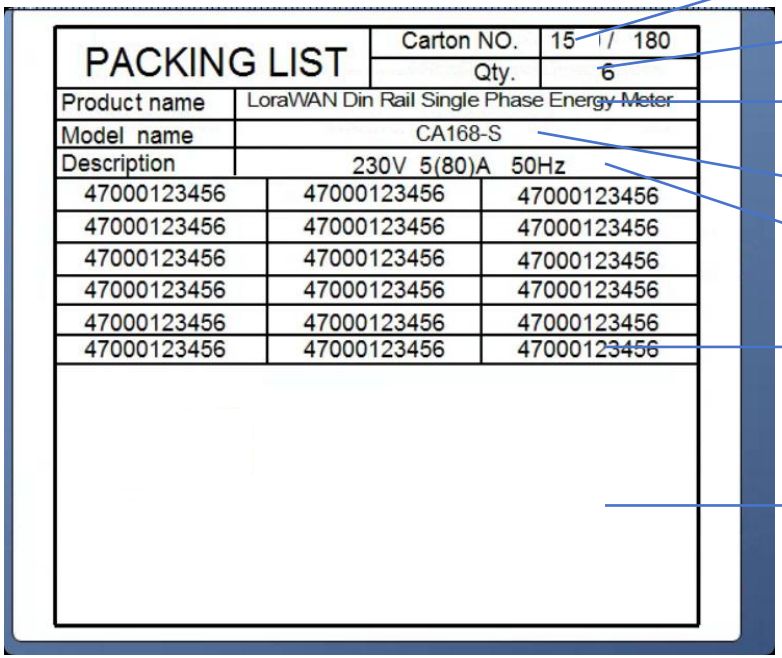
47 --- CALIN manufacturer code
00124993 --- Serials
8 --- Check Bit

short code: 65 to check the serial number

You can scan the QR code to get the gateway serials number

Gateway will send a wifi for the serial number and configuration

Carton Label



PACKING LIST	Carton NO.	15 / 180
	Qty.	6
Product name	LoraWAN Din Rail Single Phase Energy Meter	
Model name	CA168-S	
Description	230V 5(80)A 50Hz	
47000123456	47000123456	47000123456
47000123456	47000123456	47000123456
47000123456	47000123456	47000123456
47000123456	47000123456	47000123456
47000123456	47000123456	47000123456
47000123456	47000123456	47000123456

- Carton Number
- Meter Quantity in this carton
- Model Type
- Model Number
- Meter Basic parameters
- Meter Serials Number in this carton
- Shipping Mark & Remark Information

Each carton have two identical labels

Key Steps to Successful Implementation

Step one: Deployment Planning

Site Information Collection

- Number of meters required for installation
- Overall scope and size of the project

This information is critical for network planning, as each gateway (DCU) can manage up to 500 meters within a 1-kilometer radius to ensure stable and reliable communication

Meter & Gateway Distribution

Based on the project information, assign the appropriate number of gateways and meters to the site.
Ensure all gateway and meter serial numbers are properly recorded for future tracking and management.

	A	B	C	D
1	**Site Name**	**Ward / Area / Street Name**	**Community / Village Name**	
2	Odunade	xxxx	xxxx	
3				
4	**Gateway Serials**	E4-38-19-FF-FE-1A-BF-0D	E4-38-19-FF-FE-1A-BF-xx	E4-38-19-FF-FE-1A-BF
5				
6	**Meter Number**			
7	47002756790			
8	47002784412			
9	47002773613			
10	47002731744			
11	47002730969			
12	47002816065			
13	47002763044			
14	47002755628			
15	47002749803			
16	47002764539			
17	47002764208			
18	47002799246			
19	47002821131			
20	47002756782			
21	47002740984			

Key Steps to Successful Implementation

Step two: Pre-test

Pre-Installation Testing & Training

Before deployment, it is recommended to conduct a pre-test in the office to:

- Verify the compatibility between meters and gateways
- Identify any potential configuration issues in advance
- Provide a valuable opportunity to train installation personnel

Key Steps to Successful Implementation

Step three: Map your site to check the connectivity

Network Joining (Commissioning)

AC powered mode :

On power up the tester auto-joins the meter network. If all display segments light up for around 3 seconds, the join succeeded;

if they stay on continuously for exceed 10 seconds, the join failed. (A quick re-try by unplugging/re-plugging the power line or removing/re-inserting the battery will restart commissioning.)

Battery-powered mode:

After inserting the battery, wait about 30 seconds before starting any signal test. This gives the device time to power on and attempt a network join.

Site Survey-Comm Tester

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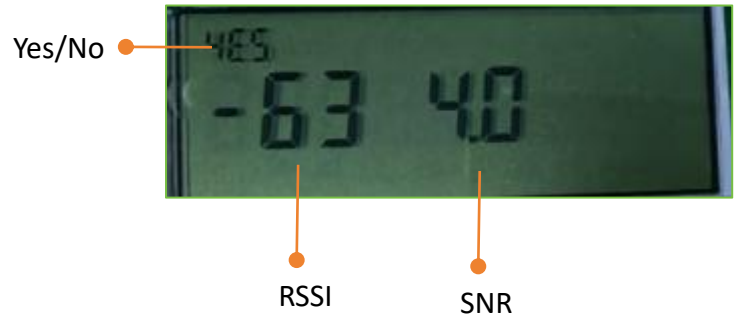
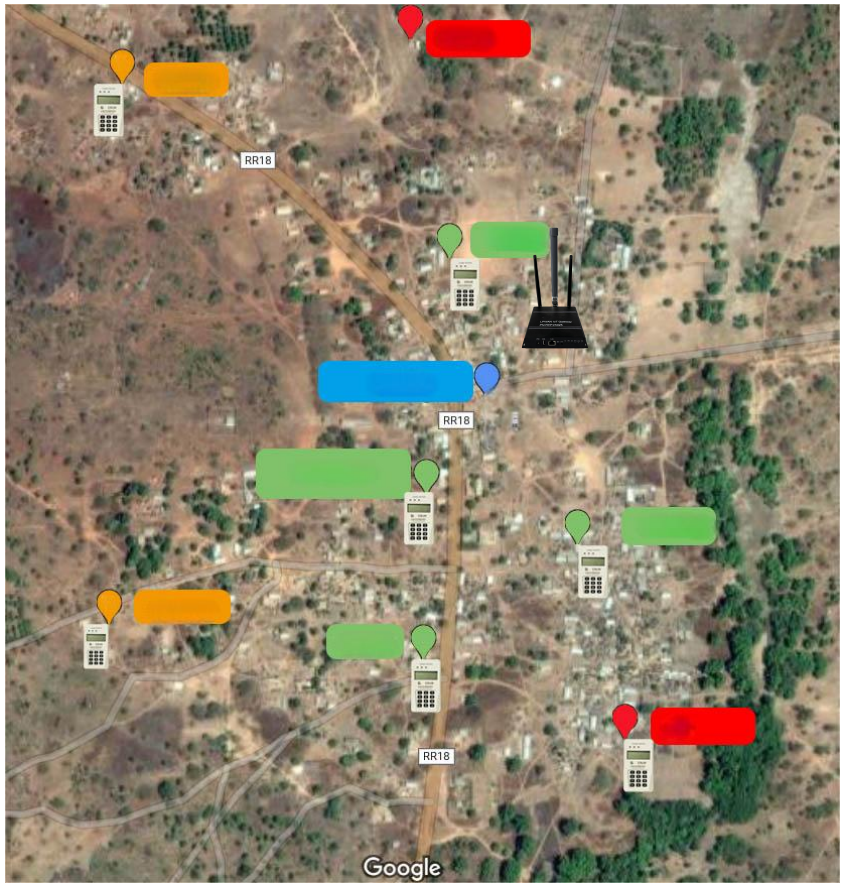
Signal-Strength Reading

After join: Wait ~20 seconds after a successful join (letting the network stabilize). Then press “00” followed by Enter to trigger a signal-quality test.

CIU indicator: On the tester’s display (“CIU”), the top-left corner will show “YES” if the signal is acceptable (good link)

Check RSSI & SNR values: Read the numeric values: RSSI (signal strength) and SNR (signal- to- noise ratio). Good link examples: RSSI = –63 dBm, SNR = 4.0 dB. In general, a higher RSSI (closer to 0) is better – for example, RSSI between –67 and –30 dBm is “good to excellent”





Failure Codes

“Busy”: The line/channel is busy (another device is transmitting). Wait a moment and retry the test.

“Not_join”: The tester has not yet joined the network. Ensure commissioning completed (power-cycle or reinsert battery to retry join).

“T_out” (Timeout): No response from meter/gateway. Common causes:

1. Too far from gateway: Weak radio link – move closer or use an extension antenna if available.
2. Temporary poor signal: Try again or power-cycle/rejoin the network (re-run commissioning).

Gateway Overview

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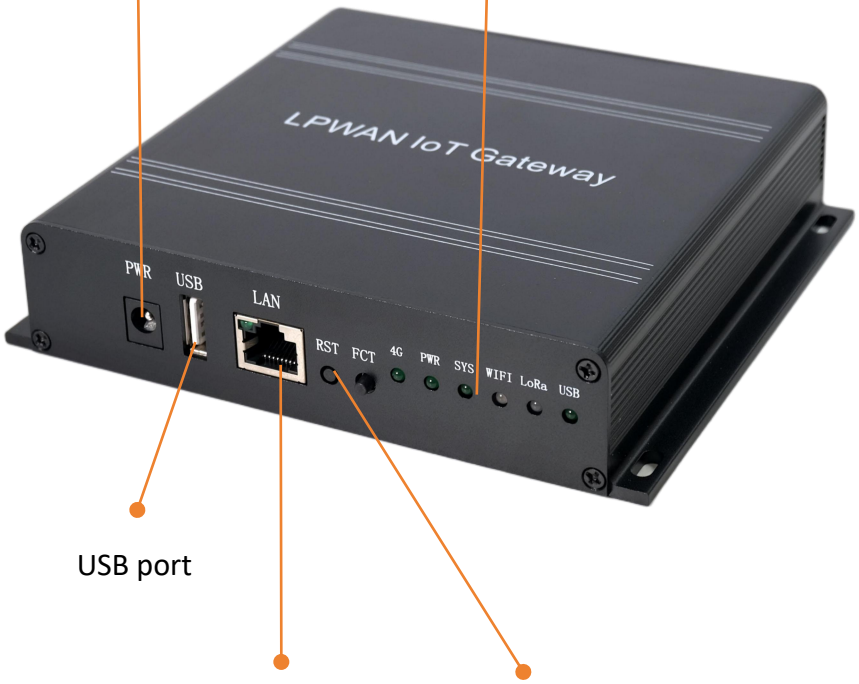
Lora Antenna port

4G Antenna port

Wifi Antenna port



Power Supply port

LED indicators

USB port

Ethernet port

Reset Button

Gateway Box Kit Overview

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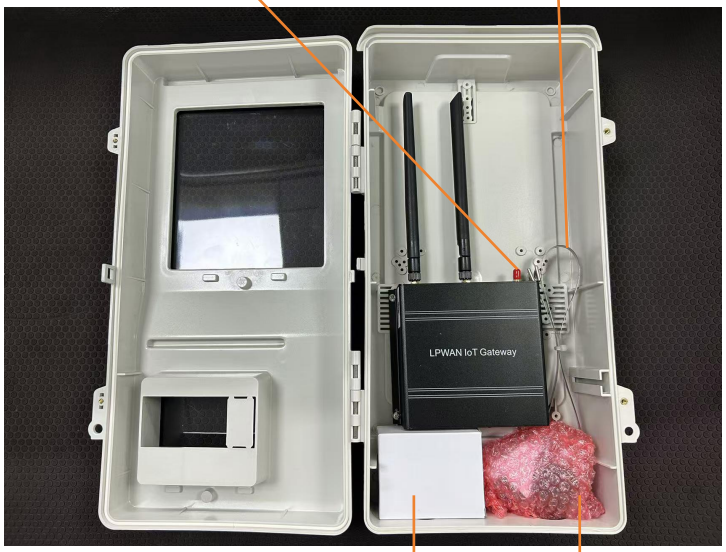
Lora Antenna

Signal Wire of Antenna

Antenna Mounting Parts

Lora Antenna Signal Wire Port

Stainless Steel Strap for Box



Power Supply Adaptor

Mounting Parts of Box

Gateway Installation Precautions

- Mount Gateways at Elevated Locations
  Place the gateway as high as possible—e.g. on rooftops, poles, or upper walls—to minimize obstacles and ensure **LOS (line-of-sight) communication** with the meters

- Ensure Antennas Are Properly Oriented
- Verify Signal Integrity Before Final Installation
- Secure Cabling and Mounting Hardware
- Confirm Stable Power & Network Conditions

DIN RAIL Meter Overview

Pulse oonstant/
kwh comsumption rate

Credit LED

Alarm LED

Comm LED

Optical port

Meter number

Terminal
Cover

Phase
export

Neutral
export

Phase
Import

Neutral
Import

Seal
Screws

Fixing Clip
(Secures the meter onto
the DIN rail)

DIN RAIL Meter Box Kit Overview

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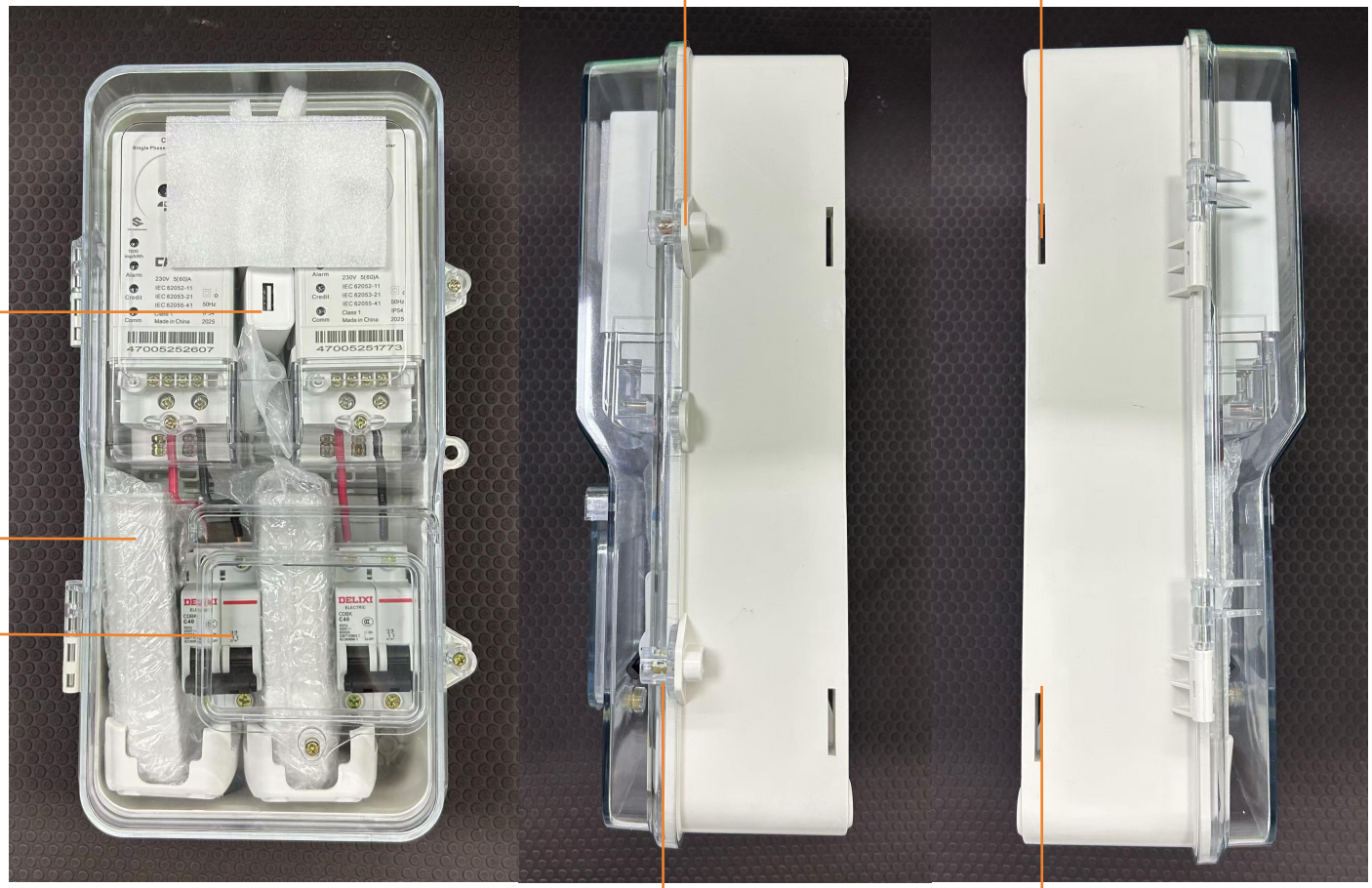

DIN RAIL Meter Box Kit Overview

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Wall Mount

Wall Mount
Screw point

Wall Mount
Screw point

Pole Mount

Three Phase Meter Overview

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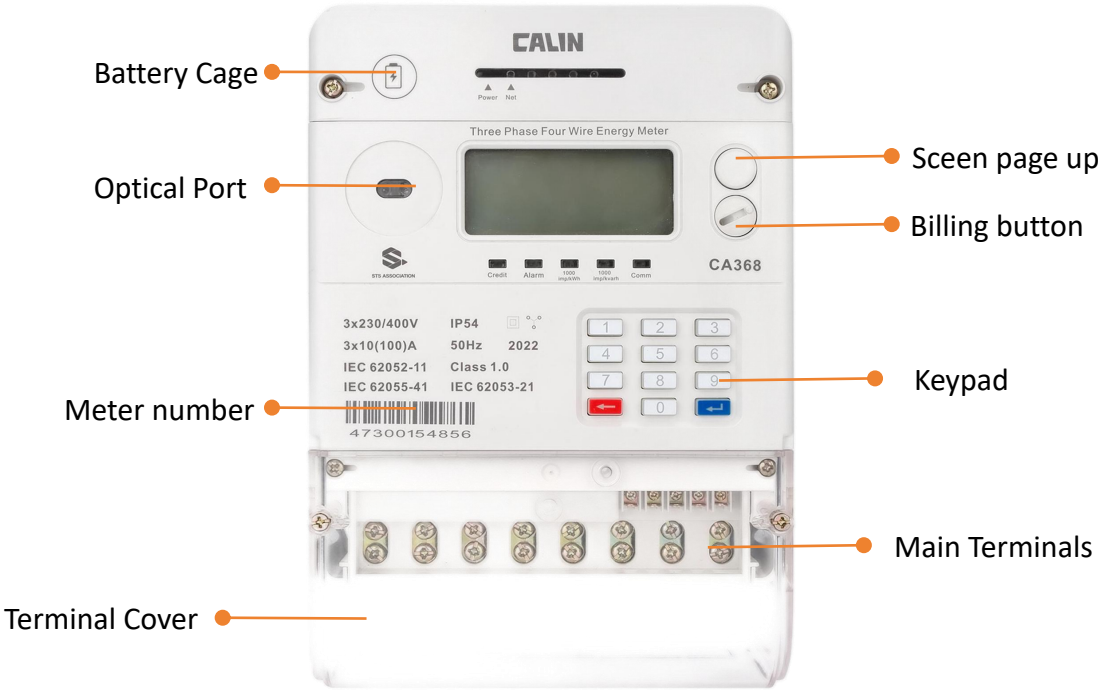

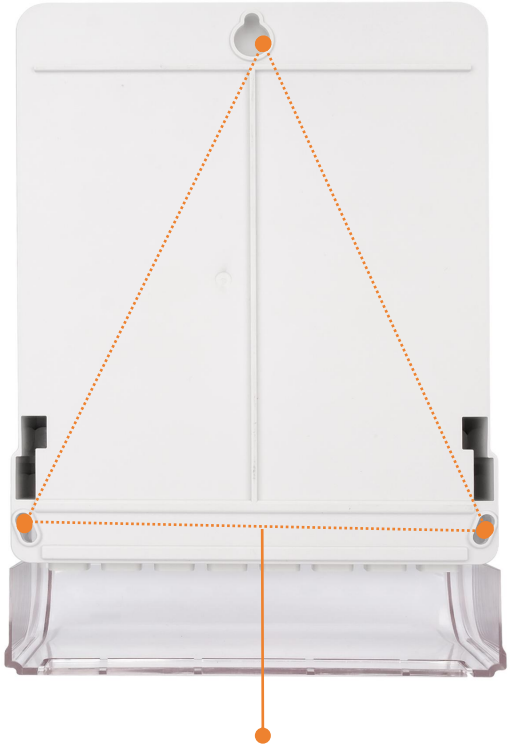

Three Phase Meter Box Kit Overview

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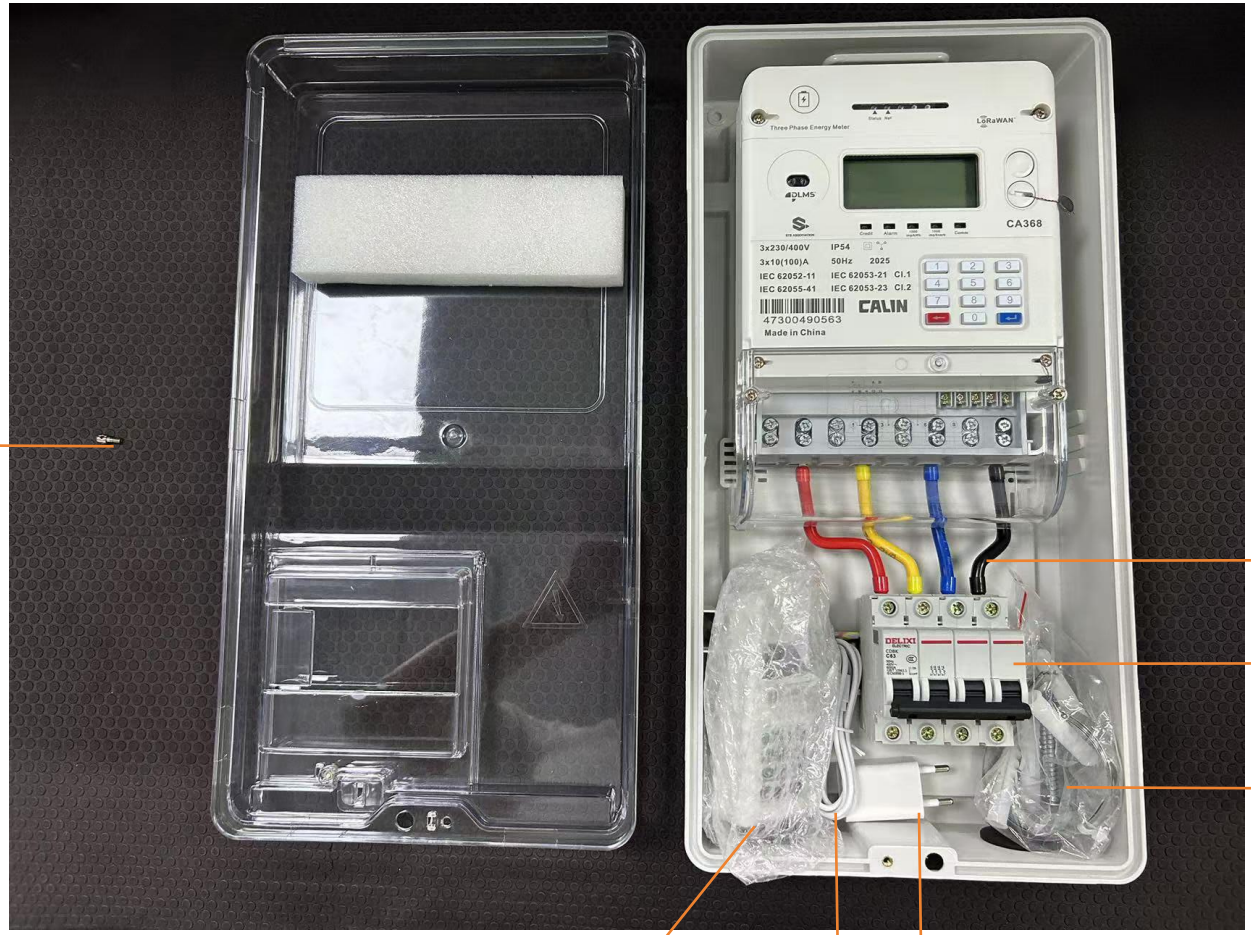

Three Phase Meter Box Kit Overview

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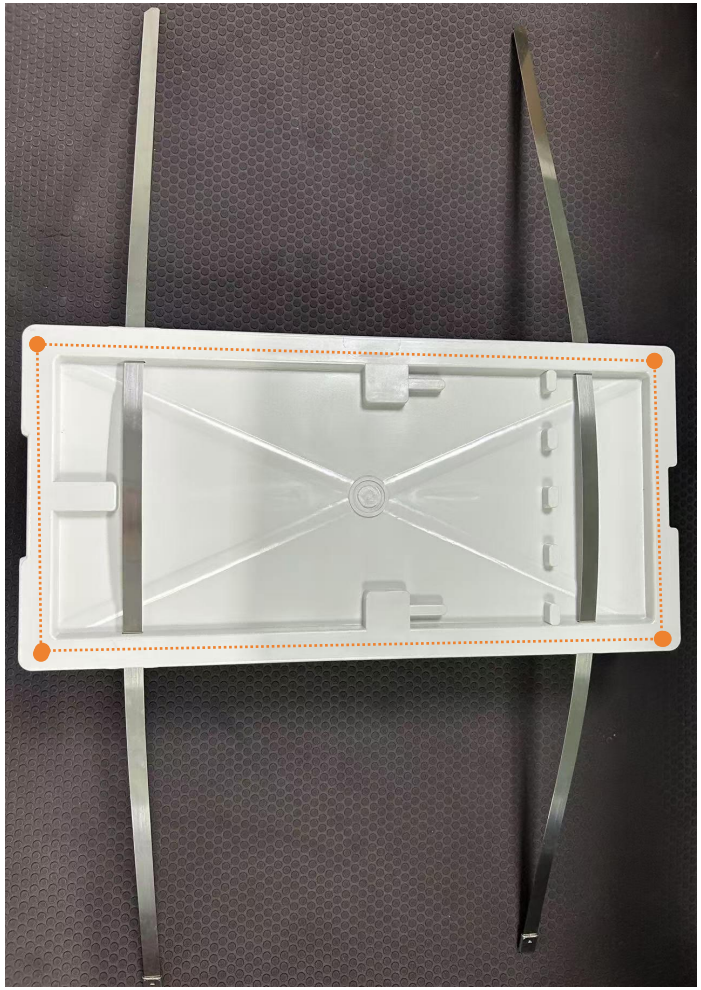
Wall Mount

Pole Mount



CT 3-Phase Meter (GPRS communication) Overview

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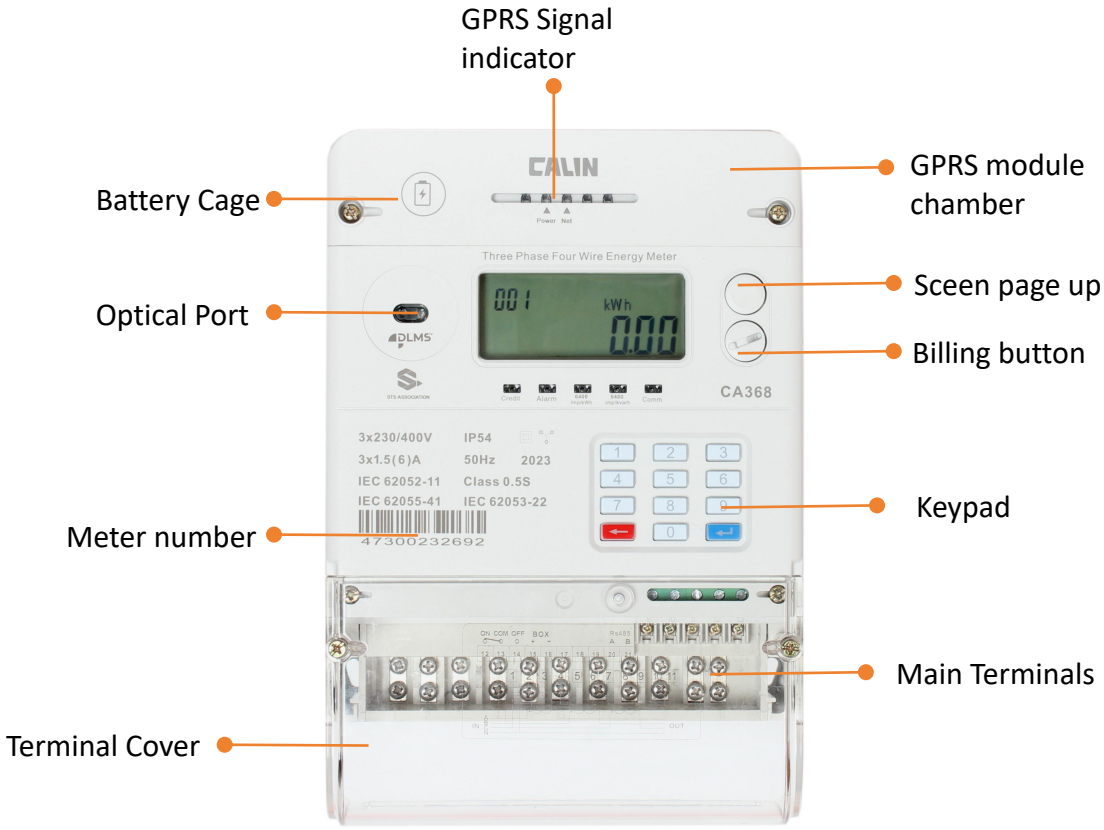

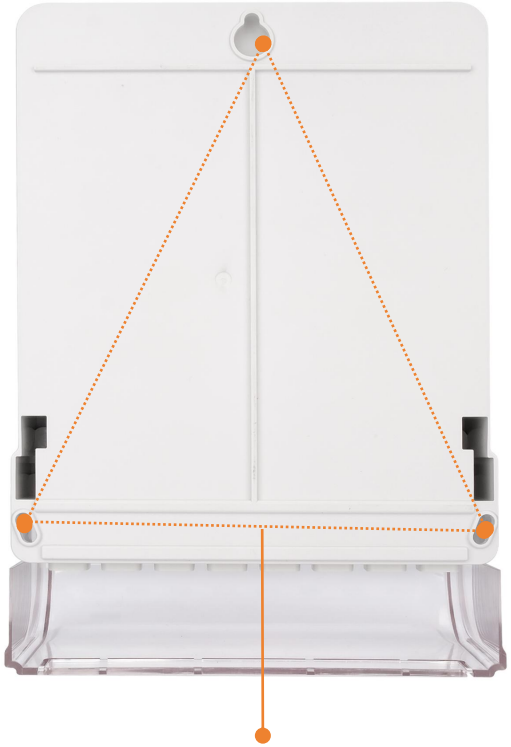

CT 3-Phase Meter Box Kit Overview

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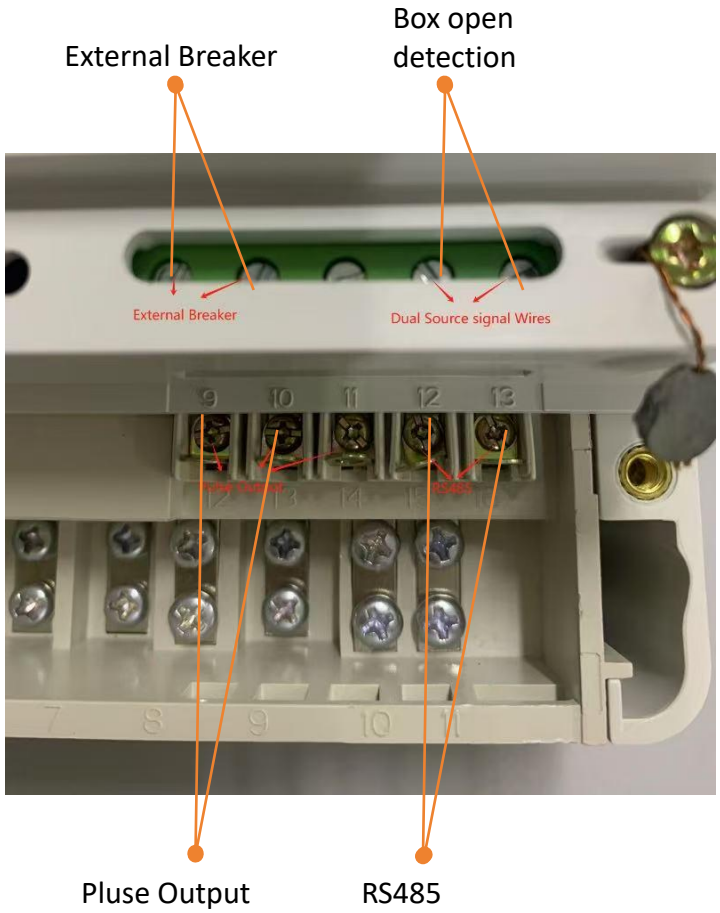
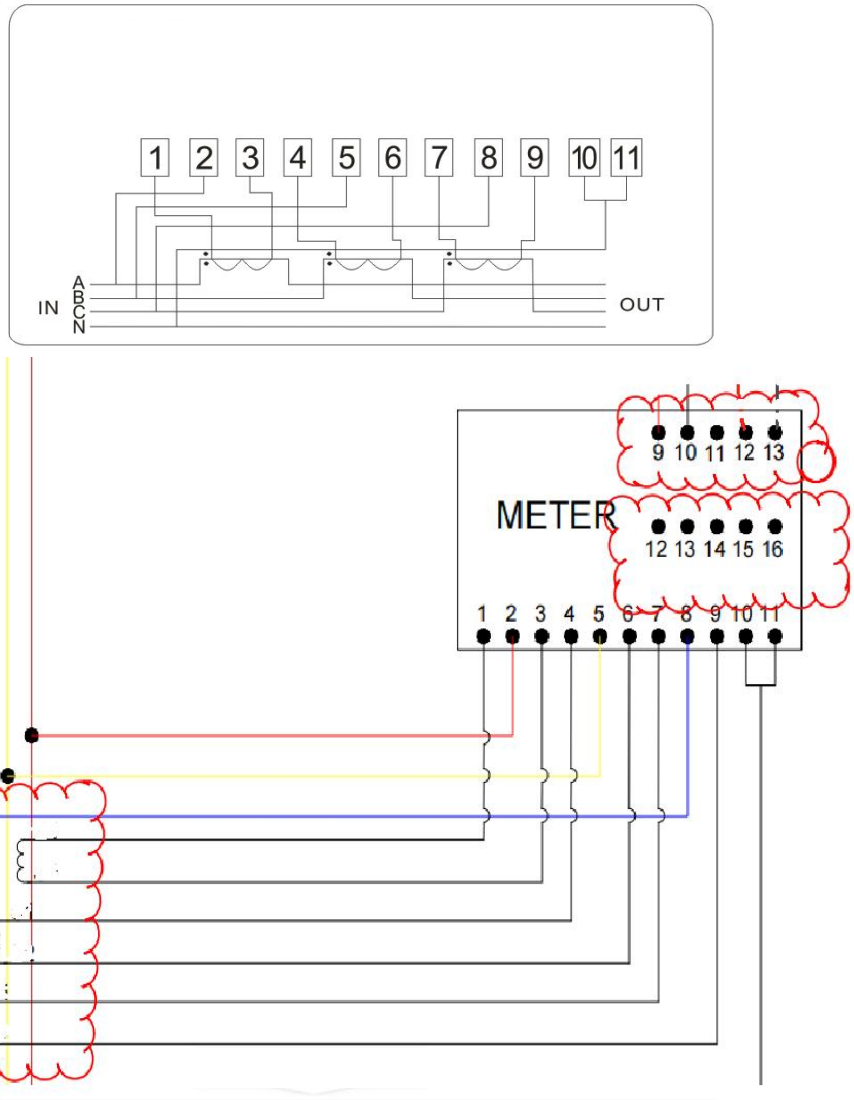
CT meter

Wires Hub

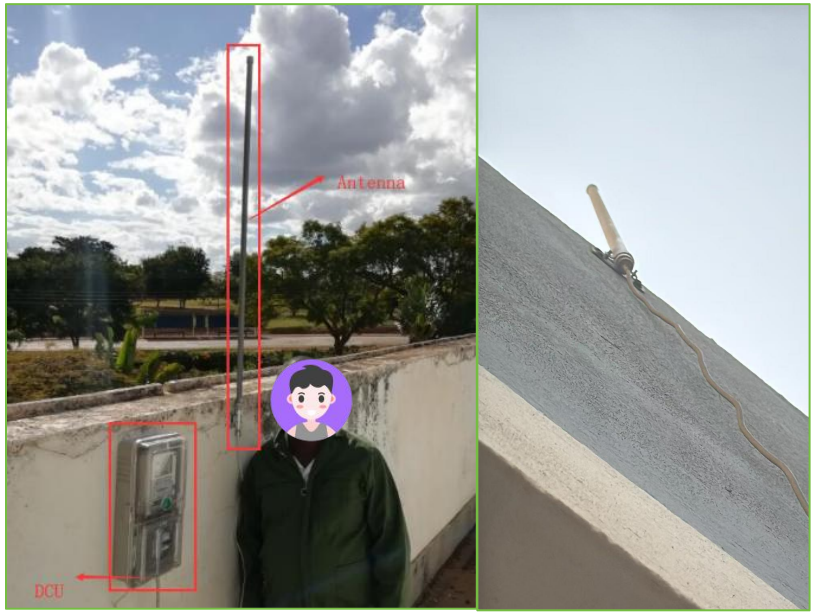
Current Transformer

Wire Connection





Site Installation-Gateway

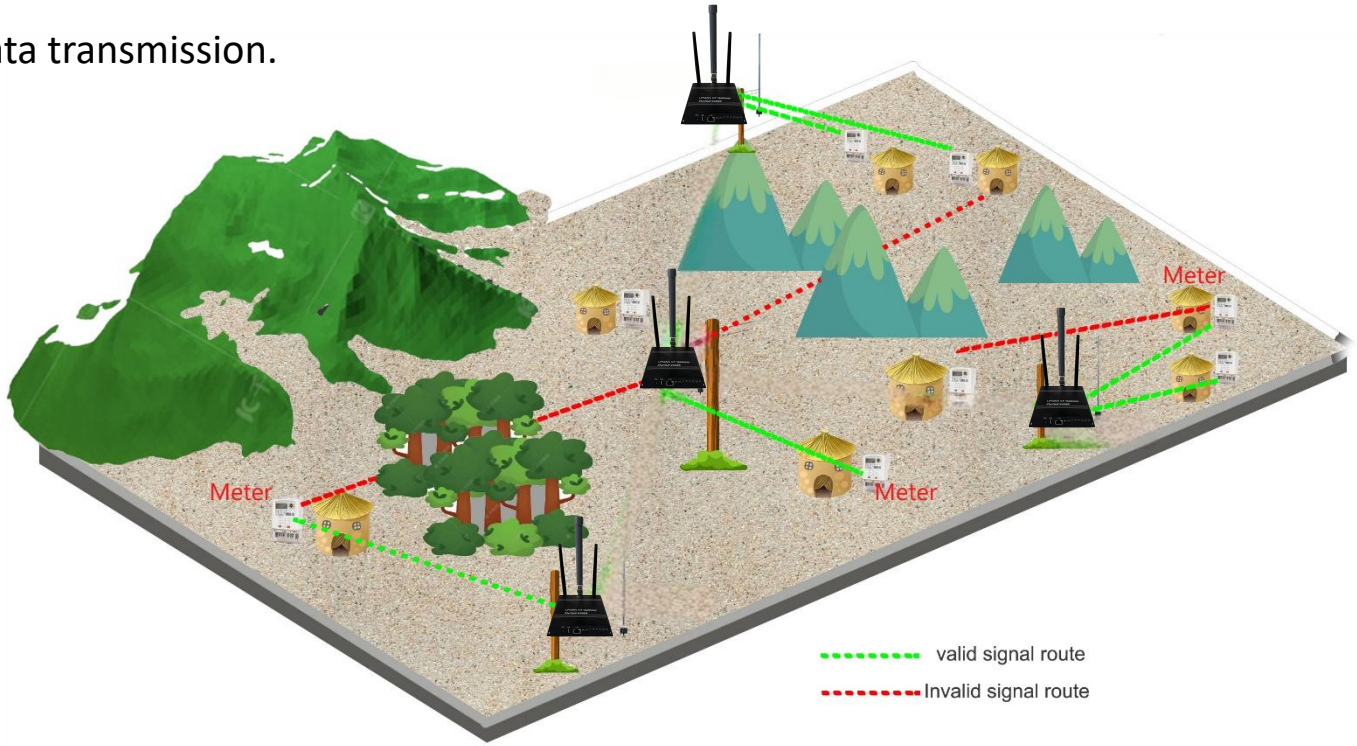


Key Tips

- In office: test power & network before mounting
- High Elevation: Mount rooftop/pole/upper wall to ensure LOS
- Signal-Friendly Setup: Keep away from metal surfaces or shielding objects
- Proximity: Ideally within 1000m of electric meters
- Antenna Orientation: Antennas vertical, firmly tightened
- Stable power & GPRS/Ethernet connectivity required

Site Installation-Meters

- Mount the gateway as high as possible to maximize coverage and improve line-of-sight communication with meters.
- Minimize physical obstructions between the gateway and meters—avoid placing near walls, metal structures, trees, or other blocking objects.
- Ensure reliable backhaul connectivity, such as stable Ethernet or cellular (GPRS/4G) connection for data transmission.

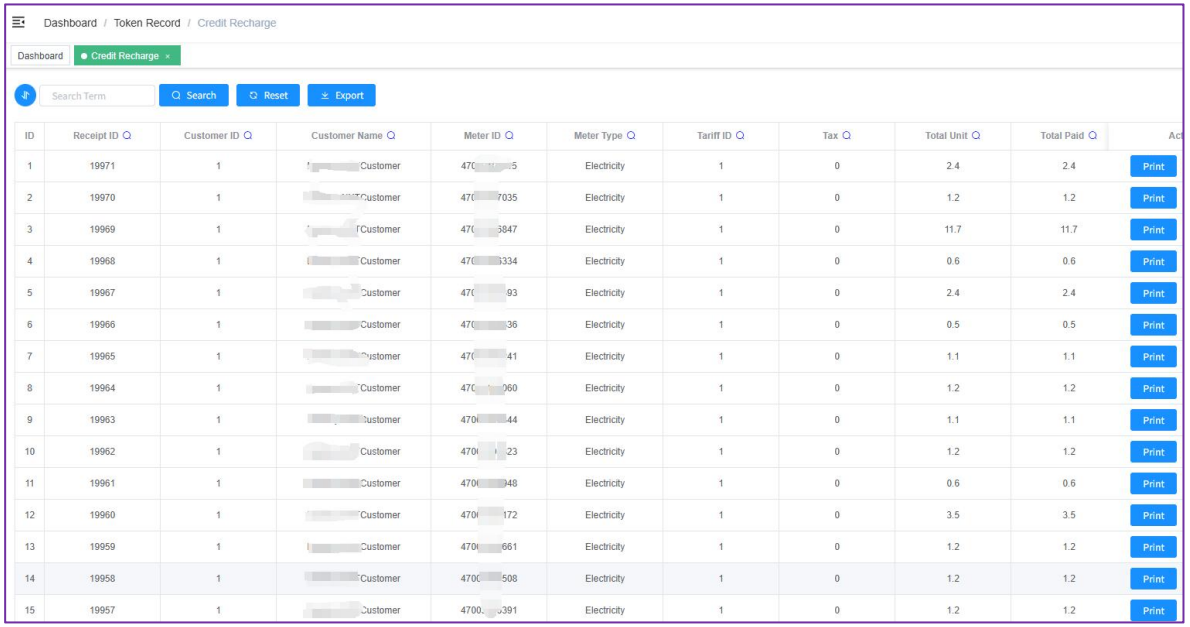


Token Generation and Records

Our system supports the generation of the following types of tokens:

- Credit Token
- Clear Tamper Token
- Clear Credit Token
- Maximum Power Limitation Token

All generated tokens are permanently recorded in the system.



ID	Receipt ID	Customer ID	Customer Name	Meter ID	Meter Type	Tariff ID	Tax	Total Unit	Total Paid	Ac
1	19971	1	Customer	470 5	Electricity	1	0	2.4	2.4	Print
2	19970	1	Customer	470 7035	Electricity	1	0	1.2	1.2	Print
3	19969	1	Customer	470 3847	Electricity	1	0	11.7	11.7	Print
4	19968	1	Customer	470 3334	Electricity	1	0	0.6	0.6	Print
5	19967	1	Customer	470 93	Electricity	1	0	2.4	2.4	Print
6	19966	1	Customer	470 36	Electricity	1	0	0.5	0.5	Print
7	19965	1	Customer	470 41	Electricity	1	0	1.1	1.1	Print
8	19964	1	Customer	470 060	Electricity	1	0	1.2	1.2	Print
9	19963	1	Customer	470 44	Electricity	1	0	1.1	1.1	Print
10	19962	1	Customer	470 23	Electricity	1	0	1.2	1.2	Print
11	19961	1	Customer	470 48	Electricity	1	0	0.6	0.6	Print
12	19960	1	Customer	470 172	Electricity	1	0	3.5	3.5	Print
13	19959	1	Customer	470 661	Electricity	1	0	1.2	1.2	Print
14	19958	1	Customer	470 508	Electricity	1	0	1.2	1.2	Print
15	19957	1	Customer	4700 391	Electricity	1	0	1.2	1.2	Print

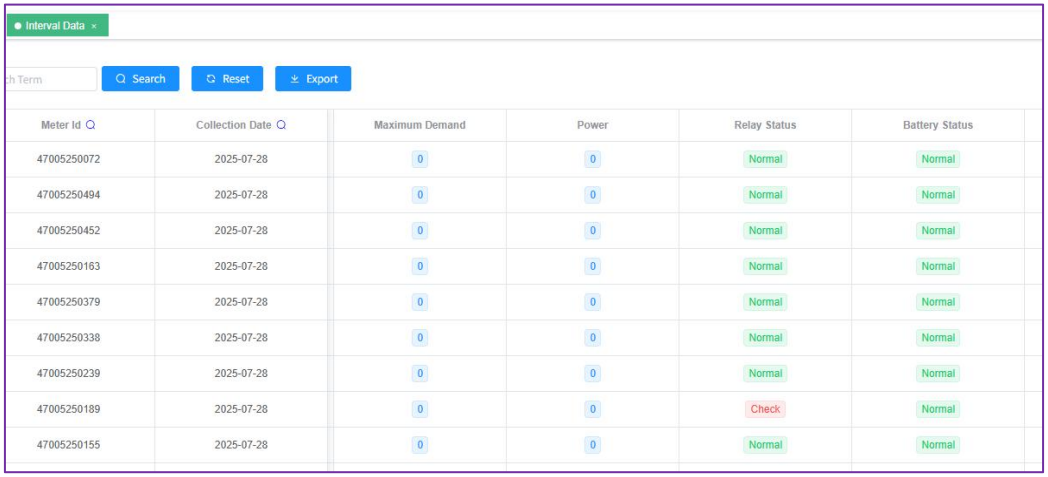
Interval Data - Hourly Report

Our LoRaWAN smart meter reports data once every hour. The reported data items include:

- Total Energy
- Credit Balance
- Maximum Demand
- Power

Meter Status, including:

- Relay Status
- Battery Status
- Magnetic Tamper Status
- Terminal Cover Open/Close Status
- Upper Cover Open/Close Status
- Current Reverse Detection
- Current Unbalance Detection



Remote Meter Diagnosis - Meter Reading

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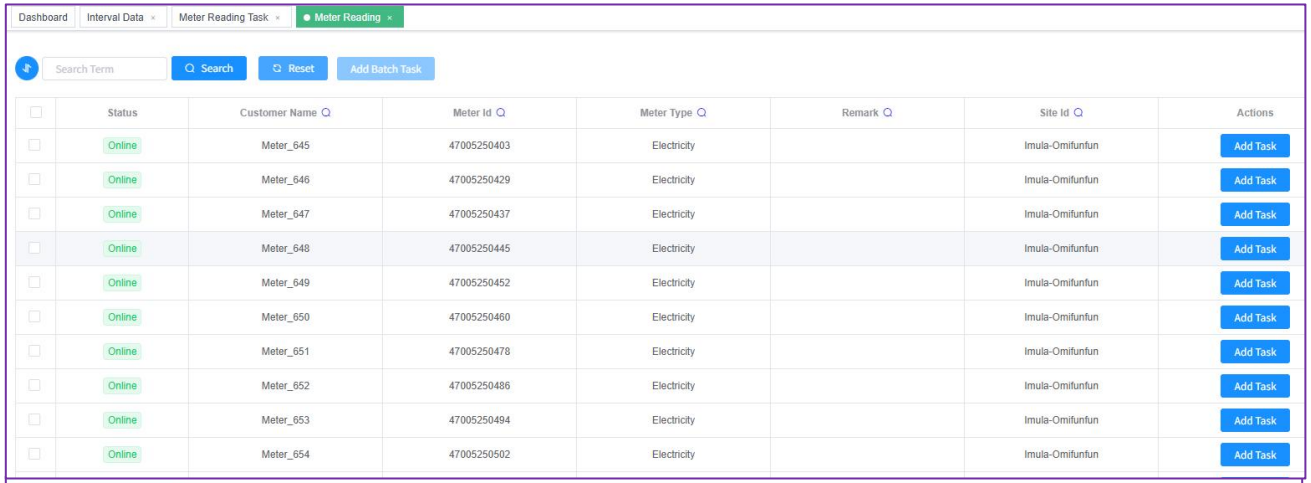
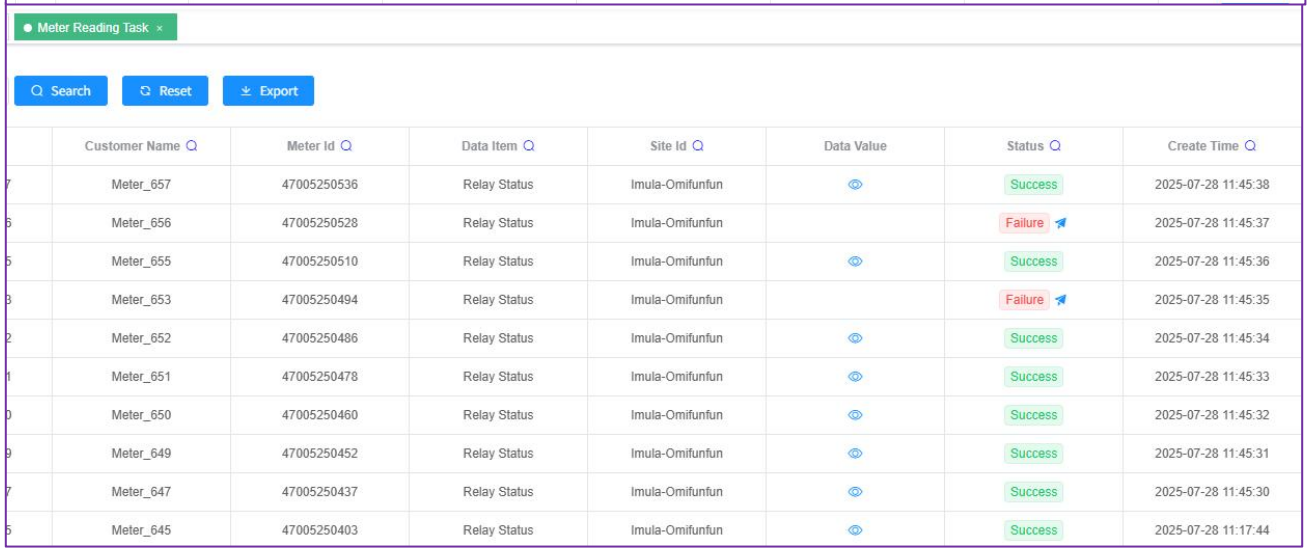
The meter is capable of real-time remote data acquisition for diagnosing suspected meter faults.





Troubleshooting-Relay keep open

- Activate meter:
  Input **12345 +enter**
- Tamper alarm (yellow LED + LCD icon ✋):
  Reinstall terminal cover tightly → Input clear tamper token
- Tamper persists
  Terminal cover may be loose → Reinstall firmly
- Short code 87:
  Record result → Report to CALIN
- Check power limit:
  Short code 14 Auto reconnection after overload
- No credit = Meter trips
  Check balance

- Check voltage:
  Short codes 71/72/73 → Record values, Over/under voltage may cause trip

Troubleshooting-CIU read fail

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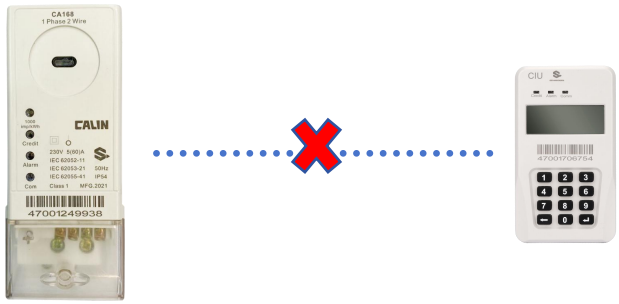

The pair code for calin meters

On the CIU,

step1 > Enter **0014 4115 1882 1007 6194** ,

step 2> Watch out for a T or an A on the upper left of the LCD SCREEN

step3 >Pess meter number like this 047xxxxxxxx(add 0 ahead of the meter serial number)

Step 4> Hit the enter button

- **Verify Water Meter Status**

Check if the meter is powered on and functioning normally (e.g., display activity, valve operation).

- **Test Communication with a Known-Good CIU**

Use a verified functional CIU to attempt communication with the problematic meter.

- **Test the Suspected CIU with a Functional Meter**

Connect the problematic CIU to a confirmed working water meter.