compere

KPM 37
Three Phase DIN Rail Power Meter Instruction Manual V2.2

⚠ Danger and Warning

- The device may only be installed by professionals. Caused any malfunction due to not follow the instructions in this manual, Manufacturers will not bear any responsibility.

⚠ Electric shock burning and explosion

- Devices can only be installed and maintained by qualified staff.
- Before any operation, the device should be isolated from the voltage input and power supply, and short circuit the secondary winding of all current transformers.
- Verify that the device is live before operation.
- All mechanical parts and covers should be restored in place before thedevice is energized.
- Device in use should provide the correct voltage.

Not paying attention to these precautions may cause serious injury.

1. Technical Parameters

1.1Environmental conditions

Operating temperature: -25℃ ~ +70℃ Storage temperature: -30℃~+75℃

Relative humidity: 5% ~ 95% No condensation Altitude :3000 meters below

1.2Rated parameters

Measuring range:Phase voltage L-N: 85~260VAC

Current: 0~800A(Depond on CTs)

Frequency：45~65Hz

Power consumptionAC voltage loop: <0.5VA / phase (rated)

AC current loop： < 0.75VA / phase (5A)

< 0.25VA / phase (1A)

Device power supply circuit: <3VA

➢ Overload capacityAC voltage loop 1.2 times rated voltage, continuous operation.
2 times rated voltage, allow 10S.

AC current loop 1.2 times the rated current, continuous operation.
20 times rated voltage, Allow 1S.

➢ **Precision index**

Parameter	Accuracy	Parameter	Accuracy
Voltage	±0.2%	Active energy	Build-in CTs: 0.5s
Current	Build-in CTs: ±0.2%		External CTs: Class 1
	External CTs: ±0.5%	Reactive	Class 2
Active power	Build-in CTs: 0.5s	Power factor	±0.5%
	External CTs: Class 1	Frequency	±0.02
Reactive power	Class 2		

1.3. Electrical insulation performance

Power frequency withstand voltage: In line with GB /T13729-2002 provisions, Power frequency voltage 2KV,Insulation resistance 1 minute.Insulation resistance: In line with GB / T13729-2002 provisions, Insulation resistance ≥50MΩ Impulse voltage: In line withGB / T13729-2002 provisions, can bear the impact of 1.2 / 50US, 5KV peak standard lightning.

1.4. Mechanical properties

Vibration response: IEC255-21-1:1998, level 1
Vibration durability: IEC255-21-1:1998, level 1
Impact response: IEC 255-21-2, level 1
Impact durability: IEC 255-21-2, level 1
Collision: IEC 255-21-2, level 1

1.5. EMC performance

Electrostatic discharge immunity: IEC61000-4-4,level 4

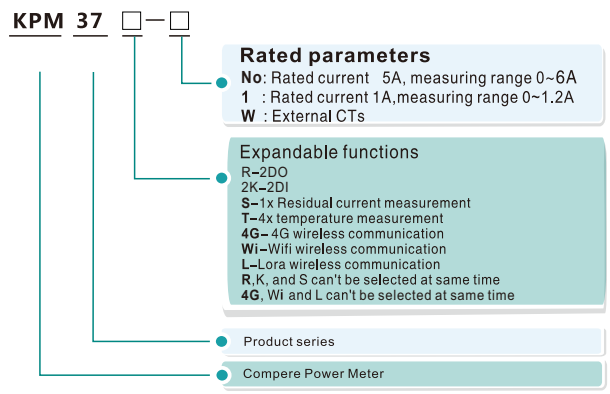
Fast pulse group immunity: IEC61000-4-5, level 4

Surge immunity: IEC61000-4-2, level 4

Power frequency magnetic field immunity: IEC61000-4-8, level 4

2. Installation and wiring

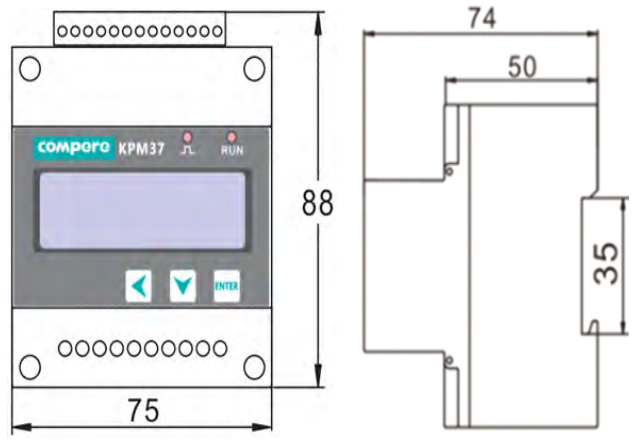
2.1. Selection criteria



KPM37 basic function:

Three phase voltage, current, active power, reactive power, apparent power, active energy, reactive energy, power factor, frequency, voltage and current total harmonic distortion, odd and even harmonic distortion rate, max & min value, 2-31st harmonic analysis, voltage and current harmonic content, voltage andcurrent imbalance rate, total power demand statistics,load and operation time statistics.

2.2 Shape and opening size



2.3 Terminal

2.3.1 Voltage and current acquisition terminal

1	2	3	4	5	6	7	8	9	10
Ia+	Ia-	Ib+	Ib-	Ic+	Ic-	Un	Uc	Ub	Ua

2.3.2 Extended function terminal

Extended functions are 2DI+2DO+1x residual current measurement. the terminal diagram is as follows:

DO11	DO12	DO21	DO22		Ig+	Ig-	DI2	DI1	COM	G	B	A
23	22	21	20	19	18	17	16	15	14	13	12	11

Extended functions are 4x temperature measurement, the terminaldiagram is as follows:

TA+	TA-	TB+	TB-	TC+	TC-	TN+	TN-			G	B	A
23	22	21	20	19	18	17	16	15	14	13	12	11

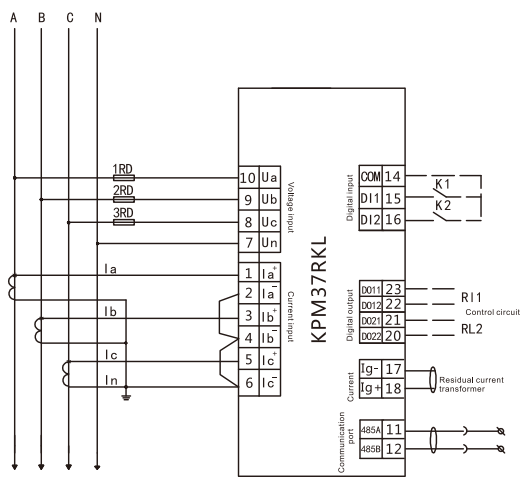
The terminal blocks are as follows:

Index	Mark	Define	Index	Mark	Define
	Ia+	Phase A current input	13	G	Rs485Grounded
	Ia-	Phase A current output	14	COM	Common terminalof digital input
3	Ib+	Phase B current input	15	DI1	Digitalinput 1
4	Ib–	Phase B current output	16	Di2/TN–	Digitalinput 2/ Temperature input TN
5	Ic+	Phase C current input	17	Ig–/TN+	Residualcurrent input negative/Temperature input TC
6	Ic–	Phase C current output	18	Ig+/TC–	Residualcurrent input positive/ Temperature input TC
7	Un	Voltage neutral line	19	TC+	Switch input 2
8	Uc	Phase C voltage input	20	DO22/TB–	Relay output 2 /Temperature input TB
9	Ub	Phase B voltage input	21	DO21/TB+	Relay output 2 /Temperature inputTB
10	Ua	Phase A voltage input	22	DO12/TA–	Relay output 1 /Temperature inputTA
11	A	RS485 positive	23	DO11/TA+	Relay output 1 / Temperature input TA
12	B	RS485 negative			

2.4 Typical wiring

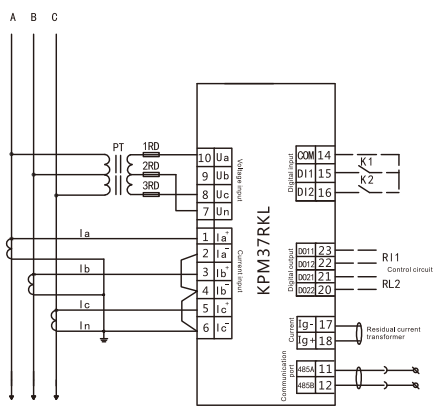
KPM37 provides star system and triangular system wiring mode, the common wiring mode is as follows:

2.4.1. Star system wiring

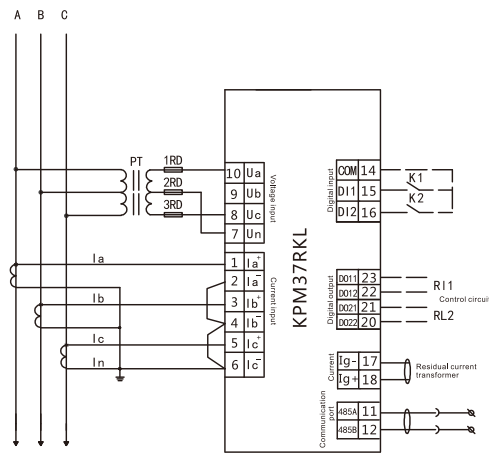


Four lines star system:Direct wiring without voltage transformer(PT)
(The device is set to P4L)

2.4.2 Triangular system wiring



Triangle system: 2 voltage transformer(PT), 3 current transformers(CT)

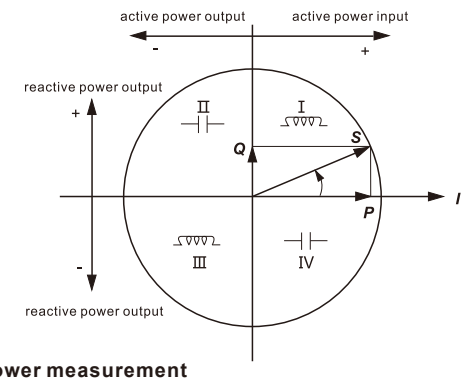


Triangle system: 2 voltage transformer(PT), 2 current transformers(CT)
(device is set to P3L2)

3.Function Description

3.1 Power symbol

KPM37 provides bidirectional power calculation, power and power factor polarity as shown in the figure.



3. 2. Power measurement

KPM37 records positive and negative bidirectional active and reactive energy also records the sum of positive and negative bidirectional energy, records positive and negative energy net vaule.

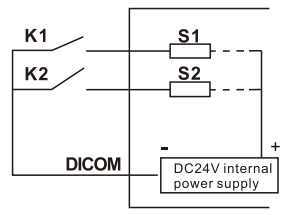
3. 3. Wireless communication

Lora :KPM37 can extend Lora wireless point–to–point data transmission function, the working frequency band is: 398~525Mhz (default frequency 470Mhz). The theoretical transmission distance is 3.5km. This function needs to be paired with our company'sLora receiver module. Before use, youneed to set two modules on the same channel and in transparent transmission mode. Withthe Modbus–RTU protocol, the default communication baud rate is 9600 bps with no parity.

4G : It needs configuration software to set the 4G mode, IP and port of the master station through the serial port of the device, and use the MQTT protocol to communicate with the master station.
Wifi: It needs configuration software to set the wifi mode, IP and port of the master station through the serial port of the device, and use the MQTT protocol to communicate with the master station.

3.4. Switching Value input

KPM37 provides 2-channel switch input, used to detect the circuitbreaker position signal, switch position signal and other status information. DC24V power supply is provided inside the equipment, when the scene requires a switch input function, external access passive contact signal, when the external contact closed, the corresponding switch input state is also turned on



3.5. Relay output

KPM37 provides two kinds of relay action modes. The user shouldidentify whether the relay is in remote control or over limit alarm control. In different c
ontrol modes, the relays operate in different ways.

Remote control:
The relay is controlled by commands from the PC or PLC via communication.

Over limit alarm control:
The relay is controlled by an electrical parameter Inside the device as a response to a set point control alarm condition.

The two relays operate as follows:

Remote control:
The relay closes by accepting a PC or PLC command. The relay status will remain until the PC or PLCissues a release command or the meter loses power.

Over limit alarm control:
When the trigger relay's alarm signal is generated, the relay operates. The relay is not released until all the alarm conditions for thetrigger relay have disappeared or the meter has lost power. If the meter resumes power and the alarm condition still exists, the relay will act again.
Note: The mode setting of the relay needs to use KPM37 setting software to set through RS485

4. Operating instructions

4.1.Interface display

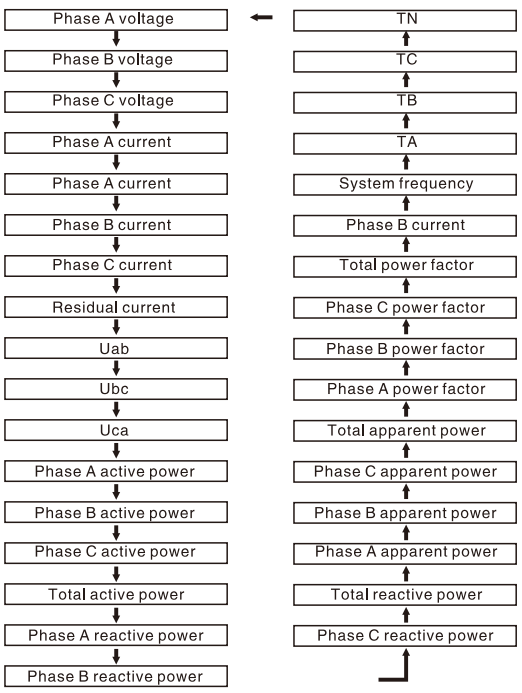
Index	Display content	Detailed Description
1	Menu indication	Includes set, RT(running time), LT (Loading time)
2	Measurement data display area	Display main measurement data: voltage, current, power, power factor, energy, frequency, parameter settings, etc.
3	Communication indication	The two small computers all disappeared, indicating no communication;Two small computers all show that the communication is normally received and sent.
4	Time indication	Display time or time statistics
5	Electrical energy type	Display: Imp (import power) Exp (Export power) Tot (Total power)
6	Unit symbol	Voltage V, kV; Current: A, kA; Active power: W, kW; Reactive power var, kvar; apparent power:VA, kVA.

4.2. Operation display

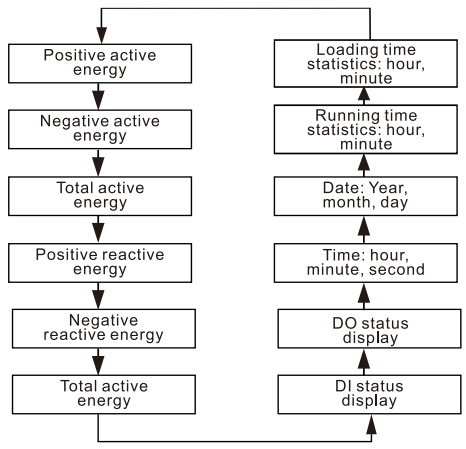
There are four touch operation buttons on the front panel. These three buttons are labeled as ◄ keys, ▼ keys,and ENTER eys from left to right. The display of different measurement data and the setting of parameters can be realized by the operation of the three buttons.

Name of key	Functional description
◄ key (Left key)	Switching the electric parameter items data display, and if it is
	in the parameter setting state, it is used to move the bit to be modified
▼ key (Down key)	Switching power data item display interface, and if it is in the parameter setting state, it is used to increase the parameter values
ENTER key (Enter key)	n the electric parameter measuring state, it is used to enter the parameter setting interface;And in the parameter setting state, it is used to enter the parameter setting state and confirm the parameter setting.
◄ key+ ENTER key	Exit parameter setting state

In the electric parameter measuring state, press the ◄ key to switchto display the content as shown below; in the 2LL2CT and 2LL3CT modes, the phase A voltage, separated phase active power, reactive power, apparent power and power factor are not displayed in the interface.



In the ordinary electrical parameter measurement interface, press the down key to enter the energy and timequery interface, press it continuously, the following interfaces will be displayed in turn.

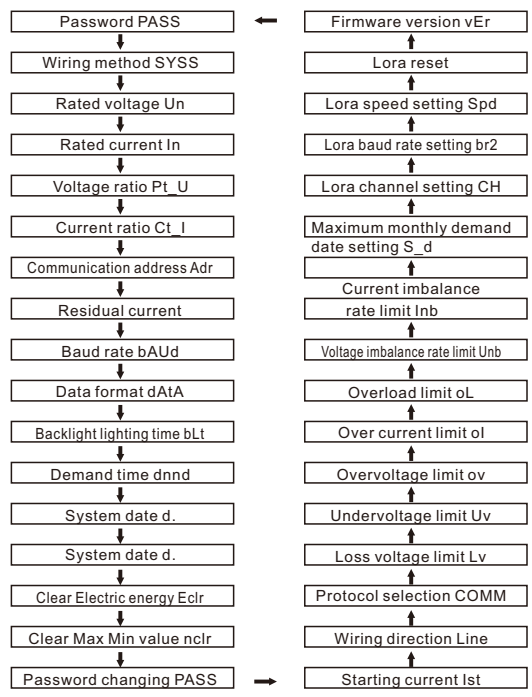


Query interface for energy data, switch vaule and time

Press the ENTER key in the parameter measurement interface to enter the password input interface. The default password is 6666. After the password is entered, press the ENTER key to confirm. If the input is correct, it will enter the parameter setting interface. If the input error, it will return to the measurement parameter display interface. In the parameter setting interface, Press ▼ button to switch the parameter item to be modified.Press ENTER button can enter the modification state of the parameter vaule, and it is accompanied by the flashing of themodified character. At this time, you can change the parameter size by pressingthe ▼ button. After the modification, press the ENTER button to confirm, you can modify the next parameters. You can also press the ◄ and the ▼ key to exit the modification state of the parameter and return to the measurement interface.

When the user does not have any operation within 60 seconds in the parameter modification state, itwill automatically return to the electrical parameter measurement display interface.Factory default value

Parameter	Display character	Defaults vaule	Meaning
Password	PASS	6666	Used to protect it from non-staff personnel to modify instrument parameters
Wiring method	SYSS	P4L	3 phase 4 wire, P3L2 & P3L3 are 3 phase 3 wire
Rated voltage	Un	220	Could be set to 100V, 220V
Rated current	In	5	Could be set to 1A, 5A
Voltage ratio	Pt_U	1	Voltage transformer ratio (1-9999)
Current ratio	Ct_I	1	Current transformer ratio (1-9999)
Communication address	Adr	1	Meter address for network communication 1~247
Baud rate	bPS	9600	Communication baud rate 1200~19200
Data format	dAtA	81n	Data frames format: 8 data bits, a parity bit and one stop bit
Backlight lighting time	bIt	1	units : minute(0-120) ; If set to 0, the backlight will never go out
Demand time	dnnd.	5	Unit: minute; the time window width in the calculation of the sliding window demand
System date	d.	Current date	Such as: 2012.05.08
System time	t.	Current time	Such as: 09:35:20
Clear Electric energy	Eclr	Cleared	Used to clear the energy parameters.
Clear Max Min value	ncLr	Cleared	Used to clear the maximum and minimum value
Password changing	PASS	6666	Default password is 6666
Firmware version	VEr	V1.00	The firmware program version
Starting current	Ist	15	
Wiring direction	Line		Can be set base on actual direction of current
Protocol selection	COMM	Mod	Default Modbus-RTU, DLT645-2007
Loss voltage limit	LV	20%	0~40%Un (rated voltage)
Undervoltage limit	UV	80%	0~100%Un (rated voltage)
Overvoltage limit	OU	120%	0~200%Un(rated voltage)
Overcurrent limit	OI	120%	0~200%In(rated current)
Overload limit	OL	120%	0~200%Pn (rated power)
Voltage imbalance rate limit	Unb	2%	0~100%
Current imbalance rate limit	Inb	10%	0~100%
Maximum monthly demand date setting	S_d	1	1~28
Lora channel setting	CH	1	1~127
Lora baud rate setting	br2	9600	1200~115200bps
Lora speed setting	SPd	10	1~10
Lora reset	rELL	No	
Firmware version	VEr	V3.0	



Setting interface

5. Communication

KPM37 multifunction meter provides MODBUS-RTU communication protocol, a start, 8-bit data bits, 1 parity, 1 stop bits. Each byte length is 11 bits. Supported baud rates: 1200, 2400, 4800, 9600, 19200, 38400. Factory default communication parameters: 9600, no parity.

The format of the data frame is as follows:

Address field + Command field + Data field + CRC check area

Please contact supplier for Modbus-RTU protocol document for more details

6. Common malfunction Analysis

➢ Nothing is displayed after the unit is powered on
- Check if the supply voltage and other wiring are correct, also the supply voltag should be within the operating range
- Turn off the device and the host computer, and then reboot

➢ The device is not working properly after power on
- Turn off the device and the host computer, and then reboot

➢ Voltage or current readings incorrect
- Check if the wiring mode setting matches the actual wiring mode
- Check whether the voltage transformer (PT) and current transformer (CT) ratio are set correctly
- Check if GND is grounded properly
- Check if the shield is grounded
- Check if the voltage transformer (PT) and current transformer (CT) are intact

➢ The power or power factor reading is incorrect, but the voltage and current reading are correct
- Compare the voltage and current input of the actual wiring and wiring diagram, an check if the phase relationship is correct

➢ RS-485 communication is not working properly
- Check whether the communication baud rate, ID and communication protocol settings of the host computer are consistent with the meter
- Please check the data bits, stop bits, parity settings and the host computer is consistent
- Check if the RS-232 / RS-485 converter is working properly
- Check if there are the problems in the entire communications network lines (Such as short circuit, open circuit, grounding, if the shield is properly grounded at one end, etc.)
- Turn off the device and the host computer, and then reboot
- If the communication line is longer, it is recommended to parallel connect a 100~200Ω matching resistors at the end of the communication line

Note: If there are any unsolved problems, please contact our company's after-sales service department

7 Wifi Communication

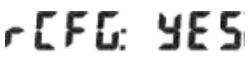
KPM37 has optional LoRa Modbus RTU transparent transmission communication, WIFI communication, and 4G communication. Only one of the three can be choosed. It can be selected through the "CoMt" (wireless communication setting) on the device setting interface.

1. LoRa communication: The setting can be performed through the interface of the device, mainly to set its channel (60~127), communication rate (1~10), and communication baud rate (1200~115200bps), MODBUS RTU protocol.

2. 4G and WIFI communication can choose MODBUS RTU transparent transmission and MQTT, which can be selected through "UL_M" (wireless communication mode setting) on the device setting interface. Among them, "Mqtt" is the MQTT mode, and "_toU" is the MODBUS RTU transparent transmission mode.
The server configuration of both modes needs to use Touch Energy APP-meter setting function. The configuration steps are as follows:

Step 1: Reconfigure the wireless on the device side

Enter the setting interface of the instrument, press “left” or “down” to turn to the “rCFG” interface, as shown in the figure below:



Press the "Enter" key, the "no" position will flash, press "down" to change to the "yES" state, and then press the "Enter" key. At this time, the device will connect to the Compere operation and maintenance platform, then configure by Touch Energy - Meter setting.
Note: If it is WIFI wireless communication, please open the mobile data and hotspot. Set the WIFI hotspot account to compere-debug and set the password to kpm-debug for the meter to connect. Then start the settings on Touch Energy APP.

Step 2: ‘Touch Energy’ APP meter setting

1. Download ‘Touch Energy’ from Google play or Apple store. As Fig 1.

2. Click ‘Meter setting’ to enter the code search page. As shown in Fig 2.

3. Search for devices: Input the production number to search
If the number is wrong, the search button will be grayed and cannot be clicked. If the number is correct, click the “code search” button to identify the device.

4. Input the configuration parameters and submit:
After entered the device details page, click refresh button in Device status until it's online.

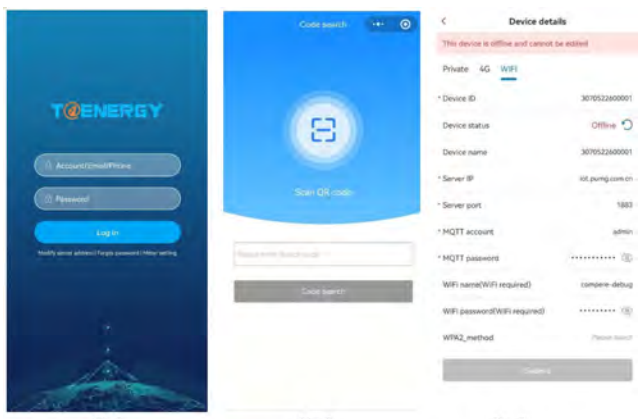


Fig1 Fig 2 Fig 3

4.1 Private server settings
This page is for the meters sending data to the customers’ private server.
Input private server address (support domain name and IP address), server port, MQTT account, MQTT password, etc.
If using WIFI meter, the local WIFI name and Password are required. WPA2 for enterprise level WIFI can be set too.

If using 4G meter, the WIFI name and Password is not required.

4.2 4G communication setting
Input server address (support domain name and IP address), port, MQTT account, MQTT password and submit.
The default information is for sending data to T@ENERGY cloud platform.

4.3 WIFI communication setting
Input server address (support domain name and IP address), port, MQTT account, MQTT password, local WiFi name and password (WPA2 for enterprise level WIFI can be set too) and submit.
The default information is for sending data to T@ENERGY cloud platform.

5. Wait for about 20 seconds for the meter to return status information.
If the configuration is successful, it will display "Successfully issued, please continue", click ‘exist’ to return to the device ID search interface.
Click "next" for bulk quantity meters settings. It will enter the last setting page and retain the data set last time. Users only need to change the meter number and submit.

Note: The device status will be offline after submitted successfully.

FAQ for network communication

1. Issuing timeout: settings are not successfully or setting is succeeded but data return is failed.
Solution: Click ‘OK’ to stay on the device information page and wait for 30 seconds to see if the device is showing offline. If yes (offline), that means the setting is succeeded.
If not（online), pls submit again.

2. Parameter lost: settings are not successfully or setting is succeeded but data return is failed.
Solution: Click ‘OK’ to stay on the device information page and wait for 30 seconds to see if the device is showing offline. If yes (offline), that means the setting is succeeded.
If not（online), pls submit again.

8 Contact Details

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