

1.3 Electrical Insulation performance

Power frequency withstand voltage:

Comply with GB /T13729, Power frequency voltage 2KV, Insulation resistance 1 minute.

Insulation resistance: Comply with GB / T13729, Insulation resistance $\geq 50M\Omega$

Impulse voltage: Comply with GB / T13729, withstand the impact of 1.2 / 50US, 5KV peak standard lightning.

1.4. Mechanical properties

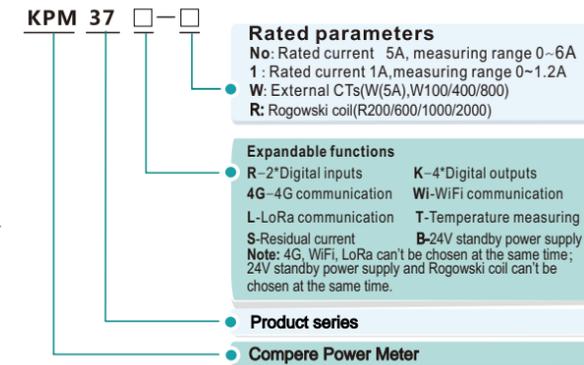
Vibration response: IEC255-21-1, level 1
 Vibration durability: IEC255-21-1, level 1
 Impact response: IEC 255-21-2, level 1
 Impact durability: IEC 255-21-2, level 1
 Collision: IEC 255-21-2, level 1

1.5. EMC performance

Electrostatic discharge disturbance IEC61000-4-2,level 4
 Radiated electromagnetic field disturbance IEC61000-4-3,level 4
 Electric fast transient disturbance IEC61000-4-4,level 4
 Surge disturbance IEC61000-4-5,level 4
 Conducted immunity IEC61000-4-6,level 3
 Power frequency magnetic field disturbance IEC61000-4-8,level 4
 Pulse magnetic field immunity IEC61000-4-9,level 4

2 Installation and wiring

2.1 Selection criteria



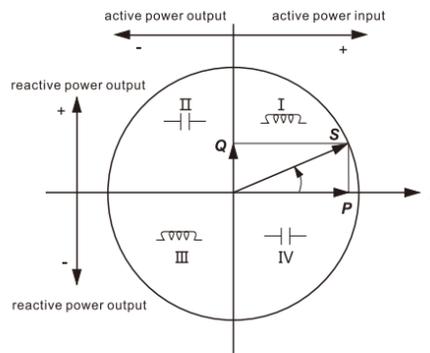
KPM37 basic function:

Three phase voltage, three phase currents, active power, reactive power, apparent power, active and reactive energy, power factor, frequency, 2-31st harmonic content, max&min value statistics, voltage and current imbalance rate, total power demand statistics, multi tariff power and historical power consumption statistics, load and operation time statistics, optional 4 wires temperature measurements and 2 wire digital inputs and outputs.1 wire Residual current.Multi rate electric energy statistics:5 kinds of rates, 2 sets of time zone tables, 2 sets of time interval tables. The MQTT protocol can transmit the 3rd, 5th and 7th harmonic content of voltage and current.The standby power supply and Rogowski coil cannot be used at the same time.

3 Function Description

3.1 Power symbol

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

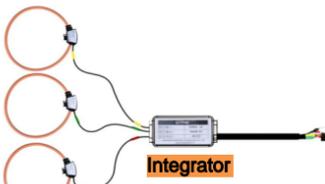


3.2. Power measurement

KPM37 records positive and negative bidirectional active and reactive energy also records the sum of positive and negative bidirectional energy, records import and export energy net vaule.And multi rate electric energy, historical electric energy statistics in the last 12 months. ABC split phase positive and negative active and reactive energy metering.

3.3. Wireless communication

PUMG307 supports the current measurement function of Rogowski coil. This function can not be used at the same time with 24V standby power supply, and the rated current can not be set to 1A, 5A, 100A, 400A and 800A (these ranges are transformer by default). Other ranges such as 200A,600A,1000A and 2000A can be used. The secondary side is current output, and the maximum output is 40mA. The accuracy of current measurement is $\pm 1\%$. As follows:

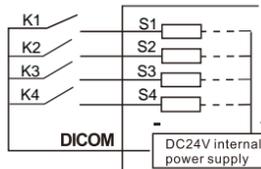


Note: the measuring range, coil size and wire length of Roche coil can be customized. The longest line is 5 meters. The current output shall be connected to the corresponding terminal of the equipment according to the wire number.

Rogowski coil

3.4. Switching Value input

KPM37 provides 4-channel digital input, used to detect the circuit breaker 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.

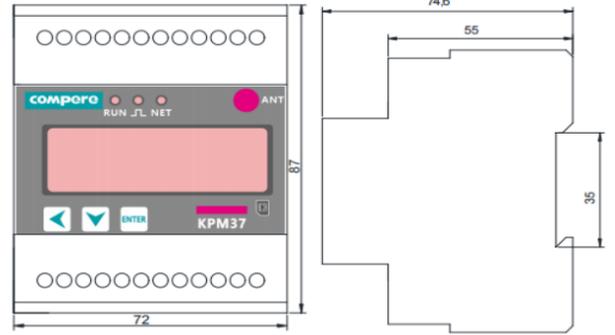


3.5. Relay output

KPM37 provides 2 relay action modes. The user should identify whether the relay is in remote mode or alarm mode. In different modes, the relays operate in different ways.

WiFi and 4G support MQTT and transparent transmission (Modbus RTU) modes. Among them, MQTT module Support for minute level data disconnection and continuation function, with a 15 minute data interval for the last 7 days of data supplementation.Data transfer items can be set. Lora supports Modbus RTU transparent transmission.

2.2 Shape and opening size(unit:mm)



2.3 Terminals

2.3.1 Current terminals

01	02	03	04	05	06	07	08	09	10	11	12
Ia+	Ia-		Ib+	Ib-		Ic+	Ic-	+5V	GND	B	A

2.3.2 Temperatures and pulse output terminals

25	26	27	28	29	30	31	32	33	34	35	36
TN-	TN+	TC-	TC+	TB-	TB+	TA-	TA+	Q+	Q-	P+	P-

2.3.3 Voltage, power supply, DO and residual current terminals

13	14	15	16	17	18	19	20	21	22	23	24
Un		Uc		Ub		Ua			N		L

37	38	39	40	41	42	43	44	45	46	47	48
DO11	DO12	DO21	DO22		DI1	DI2	DI3	DI4	COM	Ig+	Ig-

Index	Mark	Define	Index	Mark	Define	Index	Mark	Define
1	Ia+	Phase A current +	17	Ub	Phase B voltage	33	Q+	Reactive pulse output+
2	Ia-	Phase A current -	18		Spare	34	Q-	Reactive pulse output-
3		Spare	19	Ua	Phase A voltage	35	P+	Active pulse output+
4	Ib+	Phase B current +	20		Spare	36	P-	Active pulse output-
5	Ib-	Phase B current -	21		Spare	37	DO11	Digital output1
6		Spare	22	N	Power supply -	38	DO12	Digital output 1
7	Ic+	Phase C current +	23		Spare	39	DO21	Digital output 2
8	Ic-	Phase C current -	24	L	Power supply +	40	DO22	Digital output 2
9	+5V	+5V output	25	Tn-	Temperature 4 input -	41		Spare
10	GND	+5V's GND	26	Tn+	Temperature 4 input +	42	DI1	Digital Input 1
11	B	RS485B	27	Tc-	Temperature 3 input -	43	DI2	Digital Input 2
12	A	RS485A	28	Tc+	Temperature 3 input +	44	DI3	Digital Input 3
13	Un	Voltage neutral line	29	Tb-	Temperature 2 input -	45	DI4	Digital Input 4
14		Spare	30	Tb+	Temperature 2 input +	46	COM	DI public terminal
15	Uc	Phase C voltage	31	Ta-	Temperature 1 input -	47	Ig+	Residual current +
16		Spare	32	Ta+	Temperature 1 input +	48	Ig-	Residual current -

Note: when using 24V standby power supply, terminals 9 and 10 are GND of+24V and 24V respectively, and can not be used at the same time with+5V output (used when Rogowski coil function is used).

Danger and Warning

- The device can only be installed by professionals.
- The manufacturer will not take responsibility for failures caused by non-compliant operation not following this manual.

Electric shock burning and explosion

- Device should only be installed and maintained by qualified personnel.
- Before carrying out any operation on the device, isolate the voltage input and power supply, and short-circuit the secondary windings of all current transformers.
- Confirm that the voltage has been cut off before operation.
- All mechanical parts and covers, etc. should be restored to their original positions before the device is powered up.
- The device should be supplied with the correct rated voltage during use.

1 Technical Parameters

1.1 Environmental conditions

Operating temperature: -25°C~+70°C Storage temperature: -30°C~+75°C
 Relative humidity: 5% ~ 95% No condensation Altitude :3000 meters below

1.2 Rated parameters

- Measuring range: Phase voltage L-N: 10~400VAC L-L: 90~660VAC
- Current: 0~2000A(Depond on CTs or Rogowski coils)

Note: The pulse constant of the rated 5A is 3200imp/kwh.

The pulse constant of the external 100A CT is 1600imp/kwh.

The pulse constant of the external 400A and 800A CT is 3200imp/kwh.

The pulse constant of the Rogowski coil is 3200imp/kwh.

- Power consumption: AC voltage loop: <0.5VA / phase (rated)
 AC current loop: <0.75VA / phase (5A)
 <0.25VA / phase (1A)

- Device power supply circuit: <3VA

- Overload capacity:

AC 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.

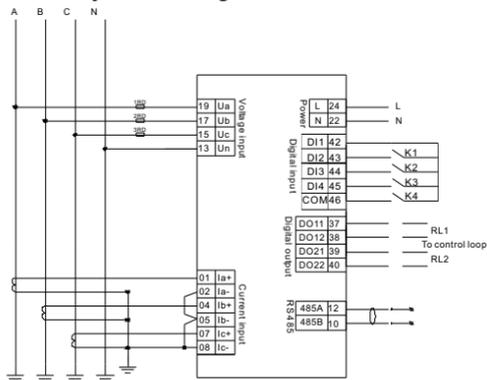
- Precision index:

Parameter	Accuracy	Parameter	Accuracy
Voltage	$\pm 0.2\%$	Active energy	Build-in CTs: 0.5s
Current	Build-in CTs: $\pm 0.2\%$		External CTs: Class1
	External CTs: $\pm 0.5\%$	Rogowski coil: Class 2	
Active power	Rogowski coil: $\pm 1.0\%$	Reactive energy	Class 2
	Build-in CTs: 0.5s	Power factor	$\pm 0.5\%$
	External CTs: Class 1	Frequency	± 0.02
Reactive power	Class 2		

2.4 Typical wiring

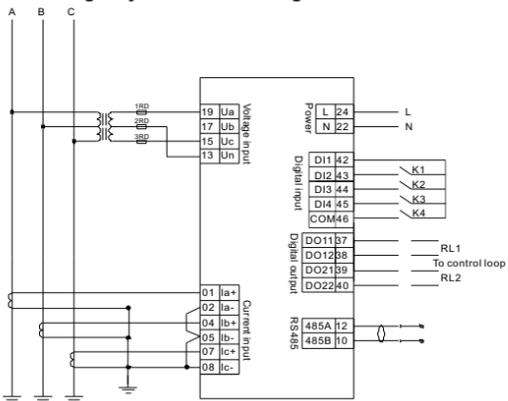
KPM37 provides star system and triangular system wiring mode,the common wiring mode is as follows:

2.4.1 Star system Y wiring

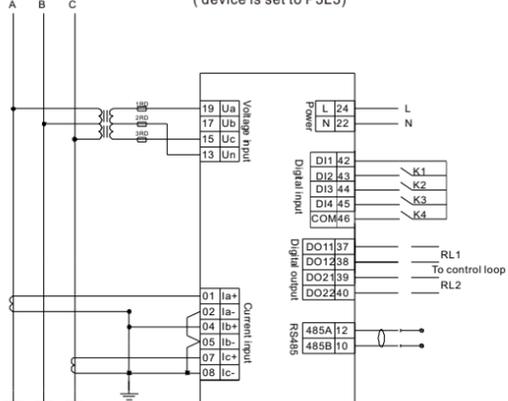


Four lines star system:Direct wiring without voltage transformer(PT) (The device is set to P4L)

2.4.2 Triangle system Delta wiring



Triangle system: 2 voltage transformer(PT), 3 current transformers(CT) (device is set to P3L3)



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

Remote mode:

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

Alarm mode:

The relay is controlled by an electrical parameter inside the device as a response to a set value control alarm condition.

The 2 relays output modes:

Level mode:

Relays maintain their open and closed states through levels, with high-level relays closed and low-level relays open. The relay remains disconnected after power off.

Pulse mode:

The action of the relay is achieved by outputting a pulse signal, with a default pulse duration of 200ms (which can be set).

Note: The control mode and output mode of the relay need to be set by the user according to the situation. The default control mode of the instrument is "remote mode", and the output mode is "pulse mode".

3.6 Temperature measurement

Optional 4-wire temperature measurement, accuracy is $\pm 1\%$, using a 10k Ω 3950 NTC temperature sensor with an accuracy of 1%.Range:-20~100

3.7 Residual current measurement

Expandable 1 channel residual current measurement, measurement range: 0~1A, accuracy $\pm 1\%$. We need to use a 1000mA:0.5mA leakage current transformer with an accuracy requirement of 1%. It can be purchased by yourselves or equipped by our company (cost separately).

4. Operating instructions

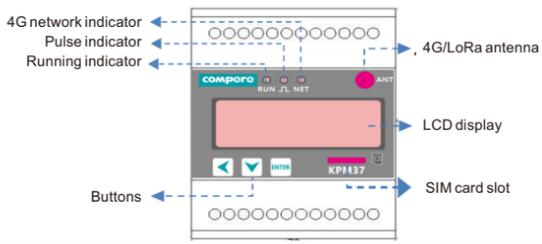
4.1.Interface display



Index	Display content	Detailed Description
1	Menu indication	Includes Set, RT(running time), LT (Loading time)
2	Measurement data display	Display 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; Activepower: W, kW; Reactive power var, kvar; apparent power:VA, kVA.
7	Multiple rate display symbol	Ⓢ: Sharp Ⓟ: Peak Ⓣ: Flat Ⓡ: Valley, Ⓢ & Ⓡ: Deep valley

4.2 Operations

There are 3 touch operation buttons on the panel. These 3 buttons are labeled as keys, keys, and keys 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.



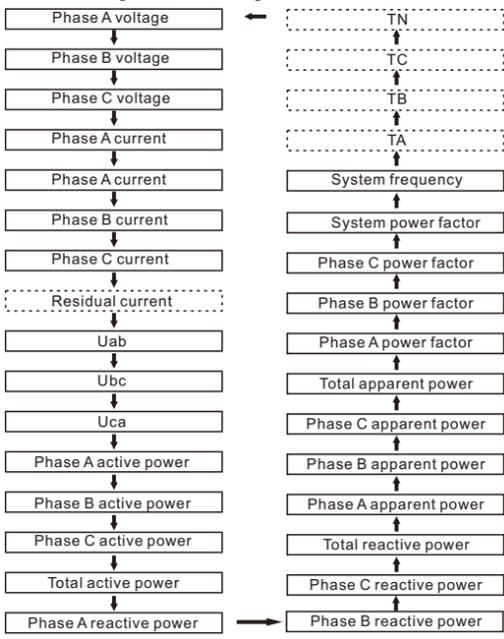
Name of key	Functional description
Left key	Switching power parameters display. If it is in the parameter setting state, it is used to move the bit to be modified
Down key	Switching power parameters display. If it is in the parameter setting state, it is used to increase the parameter values
Enter key	In the power parameter measuring state, it is used to enter the parameter setting interface. In the parameter setting state, it is used to enter the parameter setting state and confirm the parameter setting.
Left key+Enter key	Exit parameter setting state

In the electric parameter measuring state, press the **Left key** to switch to display the content as shown below. In the 3 phase 3 wire modes, the split phase voltage, split phase active power, reactive power, apparent power and power factor are not displayed in the interface.

Indicator description:

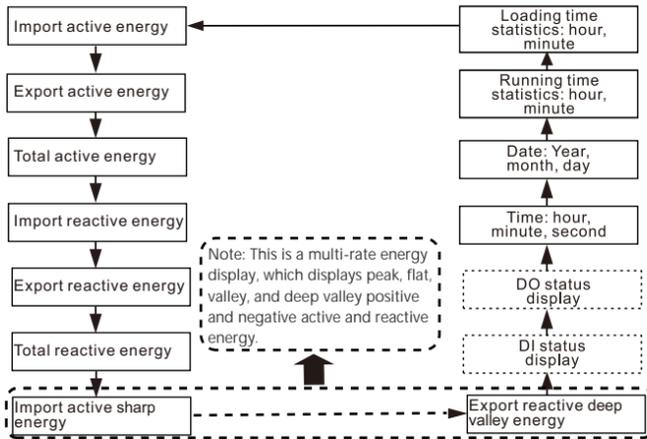
In Lora mode: the operation indicator flashes once for 1s regardless of whether the platform is connected or not; When the operation and maintenance platform or energy management platform is connected, the net indicator flashes according to the data transmission frequency.

In 4G/WiFi mode: when only connected to the operation and maintenance platform, the NET indicator will flash; When connected to the energy management platform, the NET indicator and the running indicator flash together.



Note: The parameters in dotted box can only be displayed when the functions are selected.

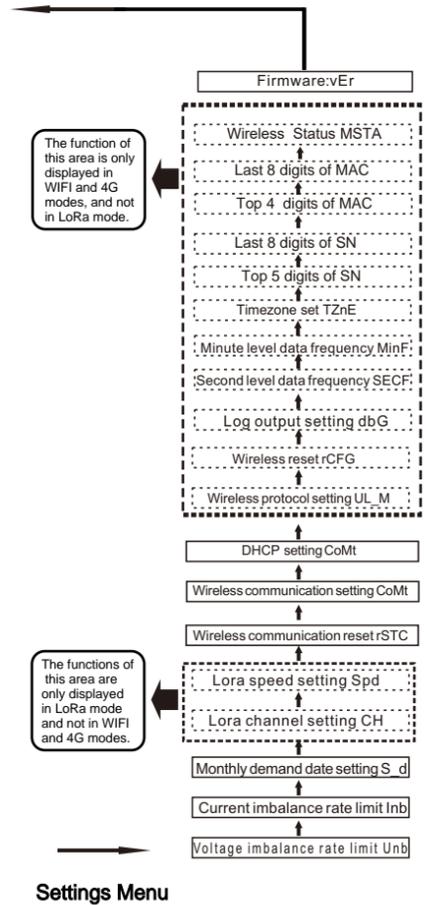
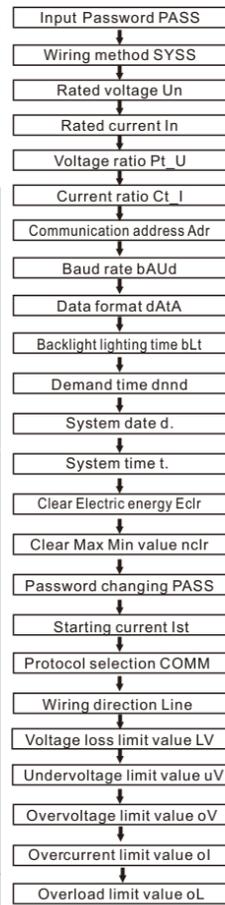
In the power parameter measurement interface, press the **Down key** to enter the consumption and time query interface, press it continuously, the following interfaces will be displayed in turn.



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 **Down** 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 the modified character. At this time, you can change the parameter size by pressing the **Down** button. After the modification, press the **Enter** button to confirm, you can modify the next parameters. You can also press the **Left** and the **Enter** key to exit the modification state and return to the measurement interface. When the user does not have any operation within 60 seconds in the parameter modification state, it will automatically return to the power parameter measurement display interface.

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	P4L:3 phase 4 wire, P3L2 & P3L3 :3 phase 3 wire
Rated voltage	Un	220	Could be set to 100V, 220V
Rated current	In	5	Can be set to 1/5/100/200/400/800/1000/2000
Voltage ratio	Pt	1.0	PT(0.1-6000.0)
Current ratio	Ct	1.0	CT(0.1-6000.0)
Communication address	Adr	1	Meter address for network communication 1-247
Baud rate	bPS	9600	Communication baud rate 1200~38400
Data format	dAtA	81n	Data frames format: 8 data bits, a parity bit and one stop bit
Backlight lighting time	bLt	1	units : minute(0-120) ; If set to 0, the backlight will never go out
Demand time	dnnd.	15	Unit: minute; the time window width in the calculation of the sliding window demand
System date	d.	Current date	Such as: 12.05.08
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 modification	PASS	6666	Default password 6666
Starting current	Ist	15	Meter starting current
Wiring direction	LinE	000	Can be set according to real current direction
Protocol selection	COMM	Mod	Default Modbus RTU, optional MQTT
Password setting	PASS	6666	Default password is 6666
Voltage loss limit	LV	20%	0-40% Un (Rated voltage)
Undervoltage limit	uV	80%	0-100% Un (Rated voltage)
Overvoltage limit	oV	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 limit	Unb	2%	0-100%
Current imbalance limit	Inb	10%	0-100%
Monthly demand date	S_d	1	1-28
Lora channel setting	CH	4755	4300-5250
Lora speed setting	Spd	07	07-12
Reboot Wireless	rSTC	no	Device reboot
communication setting	CoMt	LoRA	0-Lora, 1-WiFi, 2-4G
DHCP Setting	dHCP	yES	Default enabled, only WIFI can be used
Wireless protocol setting	UL_M	Mqtt	0-Mqtt, 1_toU (transparent)
Wireless reset	rCFG	no	Reset information in WIFI/4G mode
Log output	dbG	no	"YES" for log output by RS485
Second level data upload frequency	SECF	30	5,30,60,300,900,1200,1800,3600s
Minute level data upload frequency	MinF	05	01,05,10,15,20,30,60,1440mins
Timezone set	TZnE	no	no:no ntp,else:E1-E12,W1-W12
Display SN	Sn_	Display 13 digit SN number, divided into two screens. When the SN is illegal, display "Err"	
Display the wifi's Mac	mAC	WIFI module MAC address display	
Wireless Connection Status	MSTA: 0001: MQTT mode, disconnection; 0101: MQTT mode, connection is normal; 0002: Debug mode, disconnection; 0102: Debug mode, connection is normal Note: The first digit represents the signal strength, with 0-5 and 5 being the strongest		
Firmware version	AV4.9.2509		



5. Communication

5.1 RS485 communication

KPM37 provides MODBUS-RTU communication protocol through RS485 port, with 1 start bit, 8-bit data bits, 1/0 odd even parity bit, 1 stop bits.

Each byte length is 11 bits.

Supported baud rates: 1200, 2400, 4800, 9600, 19200, 38400.

Factory default communication parameters: Modbus RTU protocol, 9600bps, 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 for more details.

Note: The minimum frame interval is 100ms.

5.2 Wireless communication

KPM37 has optional LoRa wireless point-to-point transparent transmission communication, WIFI wireless communication, and 4G wireless communication. Only one of the three can be used.

Through the device settings interface "CoMt" (wireless communication setting) to select.

5.2.1 LoRa

Can be set on the meter, mainly to set the channel (4300~5250), communication speed (07~12). LoRa communication adopts Modbus-RTU protocol.

5.2.2 WiFi/4G

KPM37 supports optional WIFI/4G wireless communication. The protocol can be selected between MODBUS RTU transparent or MQTT. The protocol can be set in wireless protocol setting (UL_M). Both of them needs to be set in Touch Energy APP. Specific configuration steps are as follows:

Step 1: Set the meter to debug mode

Enter the setting interface, press **Left key** or **Down key** to enter the rCFG page and set it to "YES".

rCFG: YES

Press the **Enter key**, the position of "no" will flash, press **Left key**, it will be changed to "YES" status, and then press **Enter key**.

Note: The system only stays in YES status for a few seconds then it will go back to NO. Once u changed to YES status and pressed **Enter key**, the reconfigure step is finished.

At this time, the device will connect to the Compere maintenance platform. Then use the KPM Config APP to configure.

Note: If it is a WIFI wireless communication, you need to turn on the mobile hotspot and set the account to **compere-debug** and the password to **kpm-debug**. Then the device will connect to the default hotspot and connect to the Compere maintenance platform for configuration.

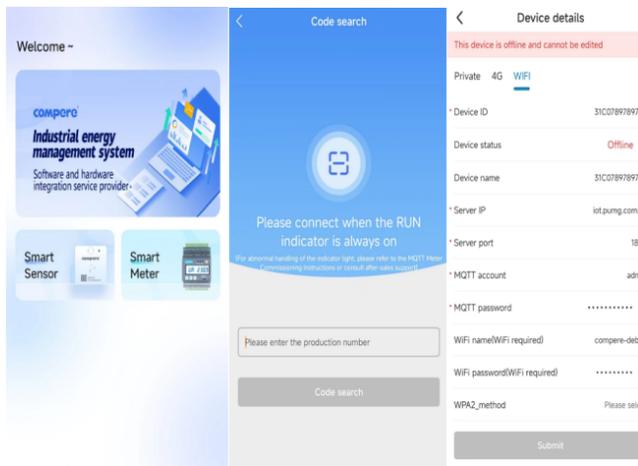


Fig1

Fig2

Fig3

Step 2: 'KPM Config' APP meter setting

1) Download 'KPM Config' from Google play or Apple APP store.

(The account to 'kpmconfig' and the password to 'kpmconfig')

2) Click 'Smart Meter' to enter the code search page. As Fig 1.

3) Search for devices: Input the production number to search. As Fig 2.

If the number is wrong, the search button will be grayed and can't 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.

• Private server settings

This page is for the meters sending data to the customers to 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.

• 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.

• 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 20s for the meter to return status information.

If the configuration is successful, it will display "Successfully issued, please continue", click 'Exit' 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 of fine after submitted successfully.

6 Common Failure Analysis

➢ No display after device is powered on

- Check whether the power supply voltage and other wiring are correct, and the power supply voltage should be within the working range.
- Turn off the device and host computer, and then restart.
- The device does not work properly after power-on.
- Turn off the device and host computer, and then restart.

➢ Incorrect voltage or current reading

- Check the wiring mode setting.
- Check the PT and CT ratio.
- Check if GND is grounded properly.
- Check if the shield is grounded.
- Check if the PT and CT are in good condition.
- Power or PF is incorrect while the voltage and current is correct.
- Compare the voltage and current input of the actual wiring and the wiring diagram, and check whether the phase wiring is correct.

➢ RS485 communication is abnormal

- Check whether the communication baud rate, ID and communication protocol settings of the host computer are consistent with the device.
- Check whether the settings of data bits, stop bits and parity bits are consistent with those of the host computer.
- Check if the RS-232/RS-485 converter is normal.
- Check whether there is any problem with the entire communication network line (short circuit, open circuit, grounding, whether the shielded wire is properly grounded, etc.)
- Turn off the device and the host computer, and then turn it on again.
- It is recommended to connect a 100-200Ω in parallel at the end of the communication line.

➢ Wireless communication is abnormal

- Lora wireless communication
 - Check whether the antenna placement, channel, speed and relative equipment are consistent.
- WIFI wireless communication
 - Check whether the WiFi hotspot account and password are correct.
 - Check if the WIFI can be connected to the Internet normally
- 4G wireless communication
 - Check 4G antenna placement, server is normal, if SIM card is in arrears

7. Contact information

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Sales hotline: +86-86181681 Web: www.comperepower.com Address Unit 1, Building 38, Liandong U Valley, No. 352 Lianhua Street, High-tech Zone, Zhengzhou, China

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