415

AMC series Chinese display power meter

Installation and Use Manual V1.5

Acrel Electric Co., Ltd.

Declaration

Acrel reserves the right to modify the product specifications herein without notification. Please consult the local agent about the latest specifications before placing a purchase order.

Content

1 **Overview**

AMC series intelligent power collection and monitoring devices are smart meters designed for the power monitoring needs of power systems, industrial and mining enterprises, public facilities, and smart buildings. It integrates the measurement of power parameters (such as single-phase or three-phase current, voltage, active power, reactive power, apparent power, frequency, power factor), power monitoring and assessment management. At the same time, it has a variety of peripheral interface functions for users to choose: with RS485 communication interface, using MODBUS-RTU protocol can meet the needs of communication network management; the 4-20mA analog output can correspond to the measured electrical parameters and meet the interface requirements such as DCS; with digital input and relay output, the functions of "remote signaling" and "remote control" of the circuit breaker switch can be realized. It adopts high-brightness LCD Chinese display interface, and realizes parameter setting and control through buttons, which is very suitable for real-time power monitoring system. It can directly replace conventional power transmitters and measuring meters. As an intelligent and digital front-end acquisition element, the meter has been widely used in various control systems, SCADA systems and energy management systems.

2 **Product Model Specification**

Table 1

Model	Basic Function	Optional Function	Co-selection Function
AMC72L-E4/ZKCS	Three-phase voltage、Zero sequence voltage Three-phase current、Zero sequence current Three-phase active power、Total active power Three-phase reactive power、 Total reactive power Three-phase apparent power、 Total apparent power Three-phase power factor、 Total power factor Three-phase active energy、 Total active energy Frequency、 voltage phase angle、 voltage and current unbalance Apparent energy、 four-quadrant energy metering Modbus-RTU protocol and DLT645 protocol Phase sequence detection, phase sequence adjustment	①2DI+2DO+1Ep（K） ②2DI+2DO（K） ③4DI+2DO（K） ④2DI+2DO+1M（KM） ⑤2-31 times and total harmonic measurement（H） ⑥Dual communication (2C) ⑦Multiple rate（F）	①+⑤+⑦ ②+⑤+⑥+⑦ ④+⑤+⑦ ③+⑤+⑦
AMC96L-E4/ZKCS		①4DI+2DO+1EP（K） ②2DI+2DO+1EP（K） ③2DI+2DO+2C+1Ep(K2C) ④2-31 times and total harmonic measurement（H） ⑤Multiple rate（F） ⑥2 analog outputs（2M） ⑦1 analog output（M）	①+④+⑤ ②+④+⑤+⑥ ②+④+⑤+⑦ ③+④+⑤

Note:

1. Z--Chinese display K--switch input and output M--analog output
F--event record/demand/extreme value/multi-rate energy statistics H--harmonic measurement
G-Ep--electric energy pulse C--RS485/Modbus-RTU communication 2C--Dual communication 96-96 shape
72-72 shape L-LCD display (blank is digital tube) E3-Three-phase three-wire electric energy
E4-Three-phase four-wire electric energy;
2. S is used to distinguish Chinese meters and national grid meters

3 **Technical Parameter**

Table 2

Technical Parameter			Index
Input	Wiring Method		three phase three wire、three phase four wire；
	Frequency		45～65Hz；
	Voltage		Rated value： Three phase：AC 3×57.7V/100V(100V)、3×220V/380V(400V)、3×380V/660V(690V) (Only available in 96 size)；
			Overload：1.2 times rated value (continuous)；2 times rated value/1 sec；
			Power consumption：≤ 0.5VA (each channel)；
	Current		Rated value：AC 1A、5A；
			Overload：1.2 times rated value (continuous)；10 times rated value/1 sec;
			Power consumption：≤ 0.5VA (each channel)；
Output	Electrical energy		Output mode: optocoupler pulse with open collector;
			Pulse constant: 10000imp/kWh (can be set), see wiring diagram for details;
	Communication		RS485 interface, Modbus-RTU protocol；DLT645 specification (07 and 97 versions)； Baud rate 1200~38400
Function	Switch	Input	Dry contact input, built-in power supply;
		Output	Output mode: relay normally open contact output; Contact rating：AC 250V/3A　DC 30V/3A
	Analog output		1~5V、4~20mA
Measurement accuracy			Frequency 0.05Hz, voltage and current class 0.2, reactive power class 1, reactive energy class 1, active power class 0.5, active energy class 0.5Sf, 2～31 times harmonic accuracy: ±1%, other class 0.5
Auxiliary power			AC/DC 85～265V； Power consumption ≤10VA；
Safety	Power frequency withstand voltage		Power frequency withstand voltage: AC2kV 1min between power supply//switch output//current input//voltage input and transmission//communication//pulse output//switch input; AC2kV 1min between power supply, switch output, current input and voltage input; AC1kV 1min between analog output, communication, pulse output and switch input;
	Insulation resistance		Input and output terminals to the chassis >100MΩ；
Environment			Work temperature：-25℃～+65℃； Storage temperature：-40℃～+80℃； Relative humidity：≤95% , No condensation； Altitude：≤2500m；

4 **Installation Wiring Instruction**

4.1 Outline and Installation Hole Size (Unit: mm)

Table 3

Shape	Frame Size		Shell Size			Hole Size	
	Width	Height	Width	Height	Depth	Width	Height
72 Square	75	75	66.5	66.5	94.3	67	67
96 Square	96	96	86.5	86.5	77.8	88	88

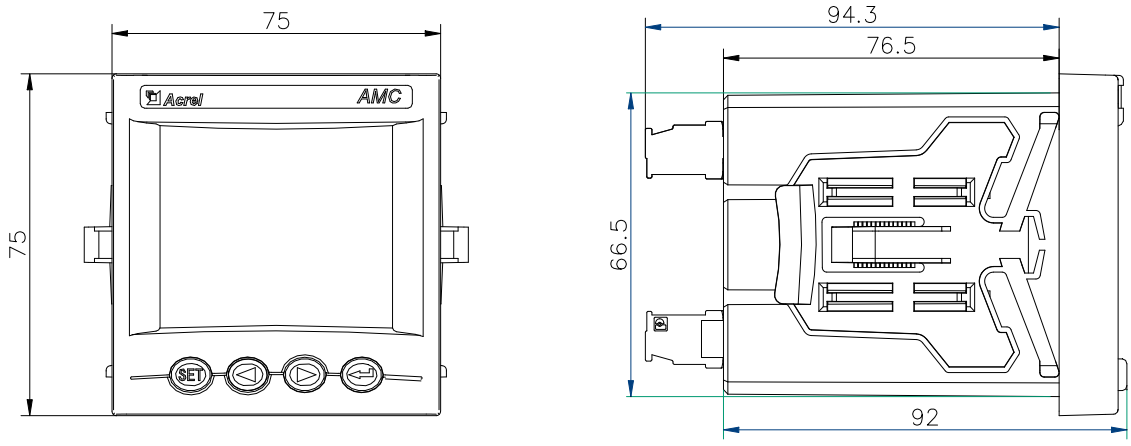


Figure 2 AMC72 shape dimension

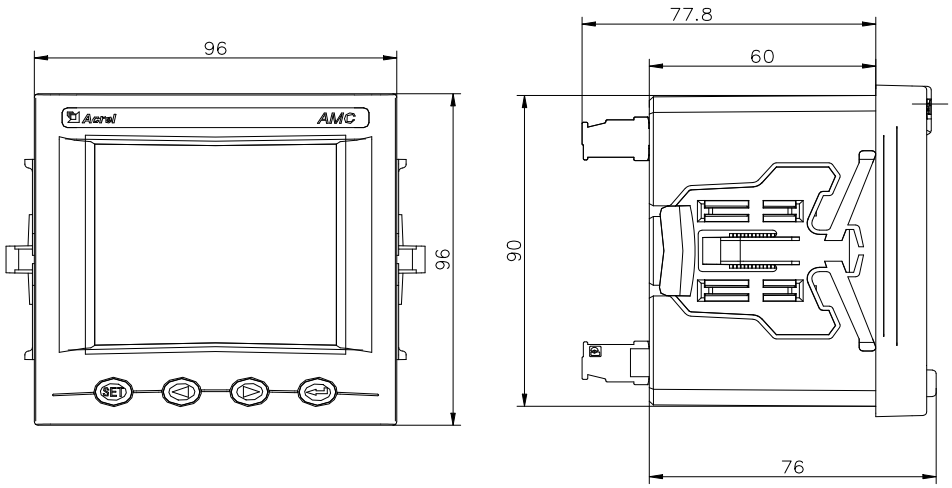


Figure 3 AMC96 shape dimension

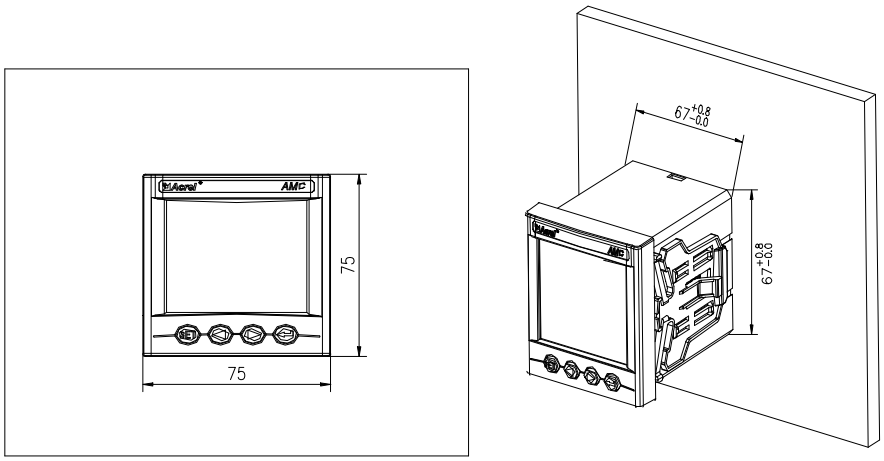


Figure 4 AMC72 installation dimension

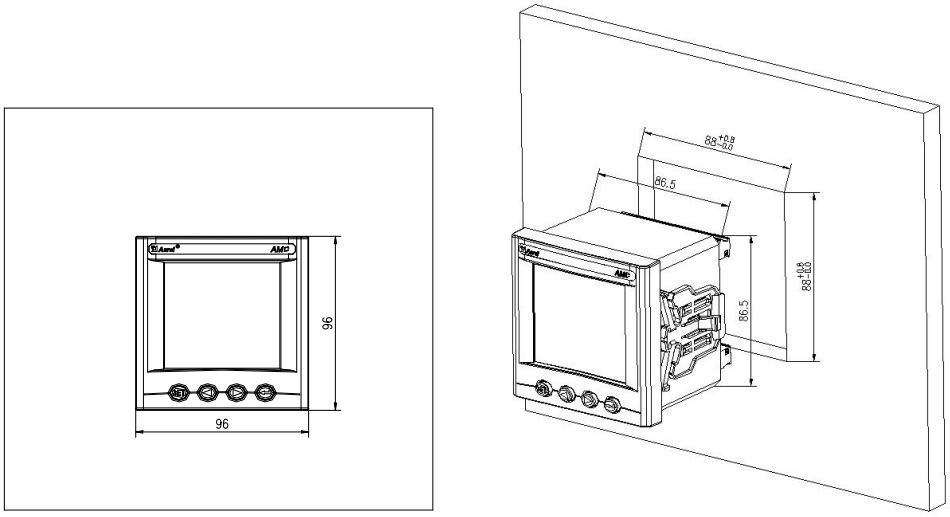


Figure 5 AMC96 installation dimension

4.2 **Installation Method**

1）Making holes in the fixed power distribution cabinet;

2）Taking out the meter and the buckle;

3）The meter is loaded into the installation hole from the front, as shown in Figure 6;

4） Inserting the meter clip to fix the meter, as shown in Figure 7.

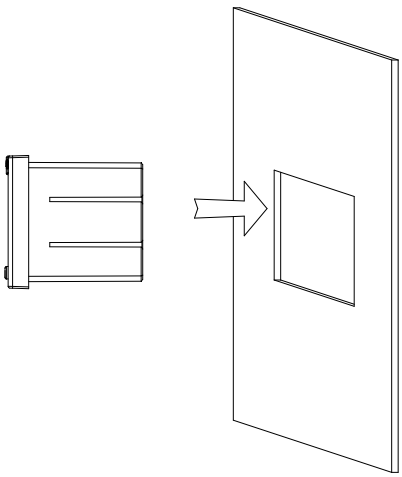


Figure 6

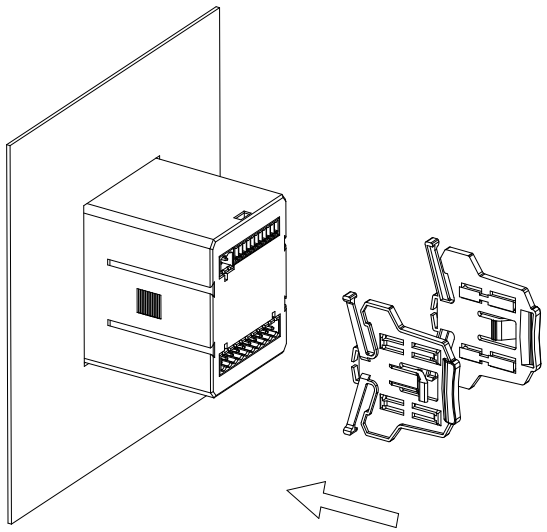


Figure 7

4.3 **Wiring Method**

According to different design requirements, it is recommended to add fuses (BS88 1A gG) to the power supply and voltage input terminals to meet the safety requirements of relevant electrical specifications.

4.3.1 Meter terminal and wiring method

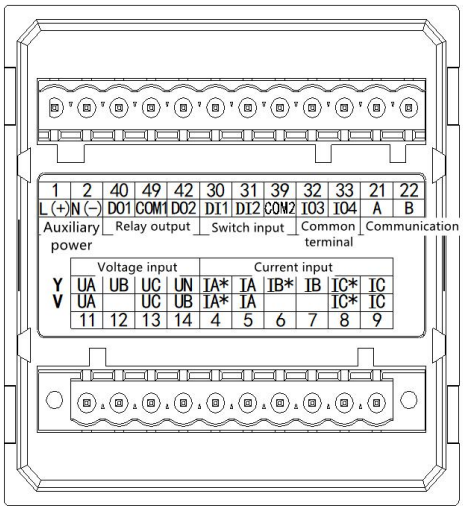


Figure 8 AMC72 series wiring terminal diagram

Note:

Common terminal functions: Switch input: 32—DI3, 33—DI4;

Pulse output: 32——E+, 33——E-;

Analog output: 32 - AO, 33 - COM3;

The second communication: 32 - A2, 33 - B2.

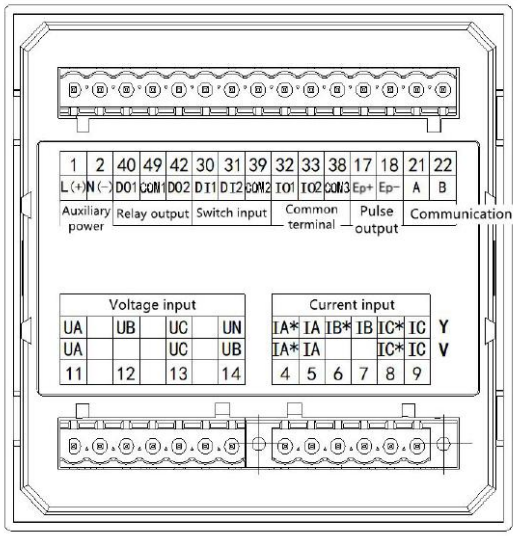


Figure 9 AMC96 series wiring terminal diagram

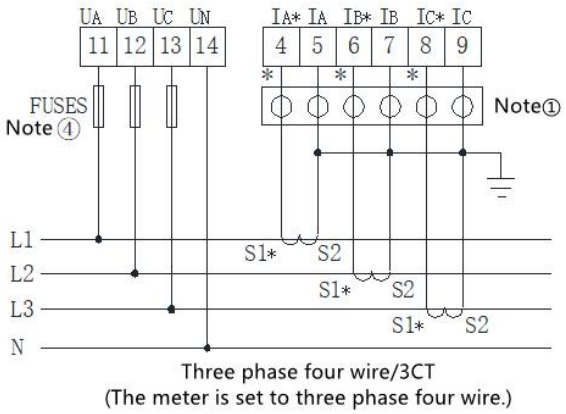
Note: Switch input: 32——DI3, 33——DI4, 38——COM3;

Analog output: 32 - AO1, 33 - AO2, 38 - COM3;

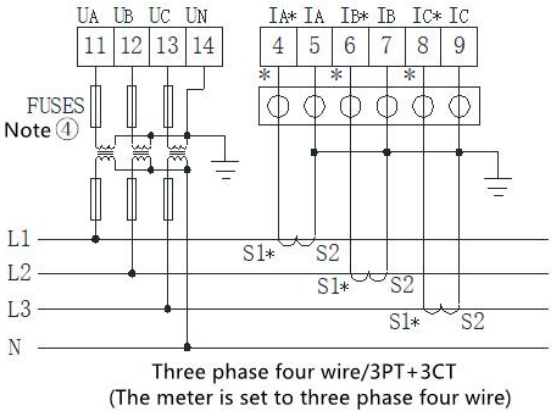
The second communication: 32——A2, 33——B2, 38——COM3

4.3.2 Meter signal terminal wiring method

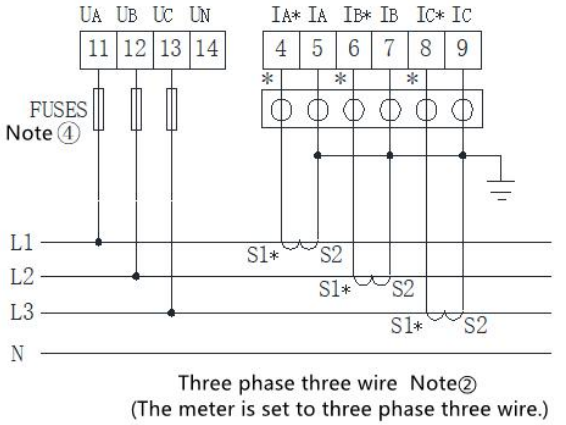
Signal terminal: "4, 5, 6, 7, 8, 9" is the terminal number of current input; "11, 12, 13, 14" is the terminal number of voltage input



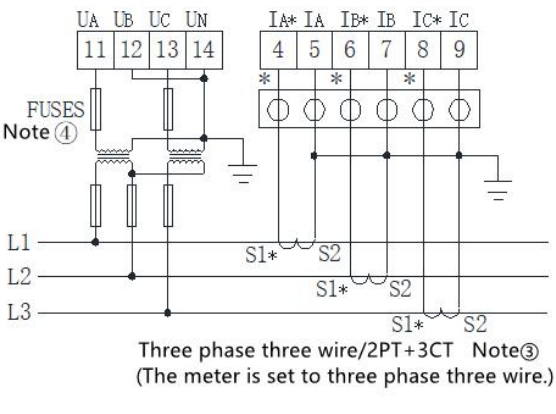
Three phase four wire/3CT
(The meter is set to three phase four wire.)



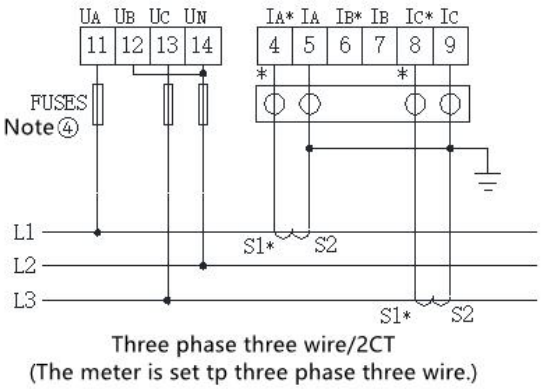
Three phase four wire/3PT+3CT
(The meter is set to three phase four wire)



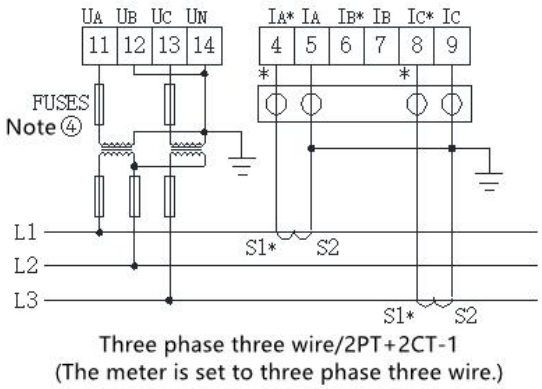
Three phase three wire Note②
(The meter is set to three phase three wire.)



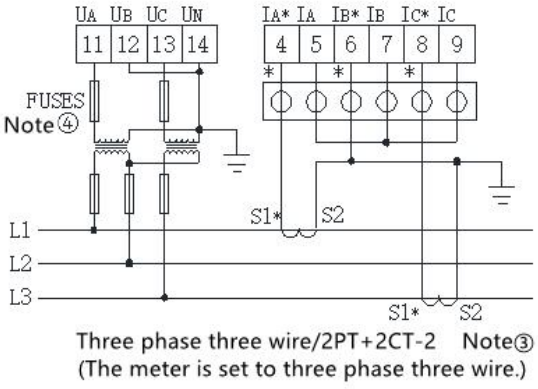
Three phase three wire/2PT+3CT Note③
(The meter is set to three phase three wire.)



Three phase three wire/2CT
(The meter is set tp three phase three wire.)



Three phase three wire/2PT+2CT-1
(The meter is set to three phase three wire.)



Three phase three wire/2PT+2CT-2 Note③
(The meter is set to three phase three wire.)

Note①: ○○○○○○ is a test terminal of CT secondary side short circuit.

Note②: It is only suitable for three- phase balanced loads.

Note③: The B-phase current is only displayed and does not participate in other power calculations.

Note④: FUSES must be fitted with a fuse with a rated current of 1A.

Figure 10 Schematic diagram of meter signal wiring

The wiring example of the communication part is shown in the following figure:

Correct wiring method: the shielding layer of the communication cable is connected to the ground

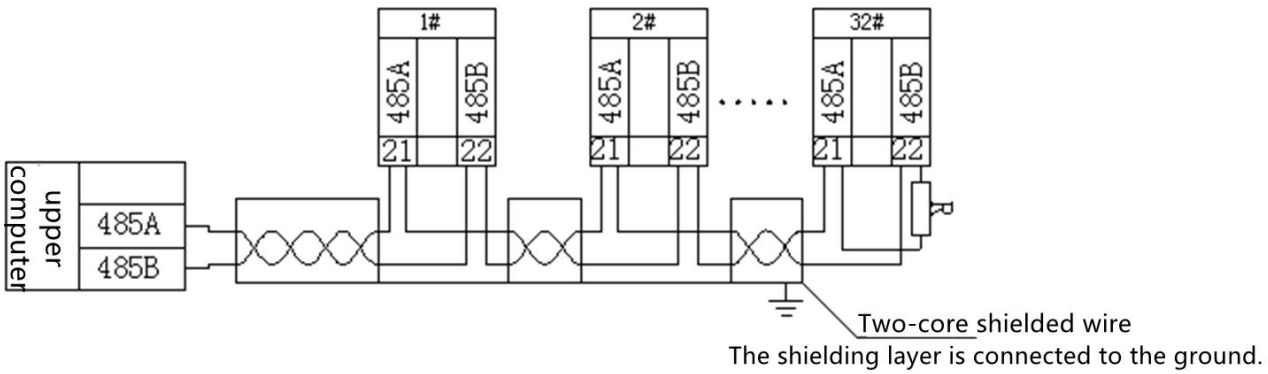


Figure 11 Schematic diagram of RS485 communication wiring

It is recommended to add a matching resistor between A and B of the last meter, and the resistance range is 120Ω~10 kΩ.

5 Instruction

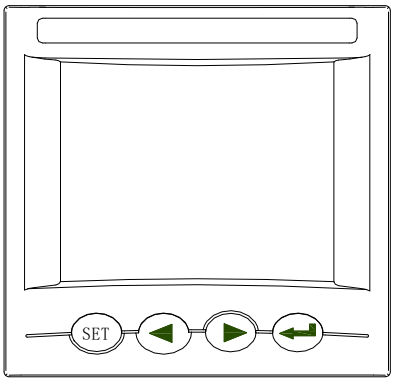


Figure 12 Front Panel

5.1 Button Function Description

The four buttons of AMC series intelligent power collection and monitoring device are SET button, left button, right button, and enter button from left to right. The specific functions are shown in Table 4.

Table 4 Button Function Description

Panel key category	Button Function
SET button (SET)	In measurement mode, press this button to enter the programming mode, the meter prompts to enter the password PASS, after entering the correct password (0001), the meter can be programmed; In programming mode, it is used to return to the previous menu.
Left button (◀)	In measurement mode, it is used to switch display items; In programming mode, it is used to switch the menu at the same level or decrease the single digit.
Right button (▶)	In measurement mode, it is used to switch display items; In programming mode, it is used to switch the menu at the same level or increase the single digit.
Enter button (↵)	In measurement mode, it is used to switch display items; In programming mode, it is used to confirm the selection of menu items and the modification of parameters.

5.2 Display Example

5.2.1 The flowchart of viewing power parameters

When the meter is powered on (or press the Enter button after selecting the power parameters), the 1/10 interface (phase voltage) is displayed as shown in the figure below. Press the left and right buttons to switch to display other interfaces: Phase voltage←→Line voltage←→Current←→Active power←→Reactive power←→Inspecting power←→Total power→Power factor←→Maximum demand←→Average value.

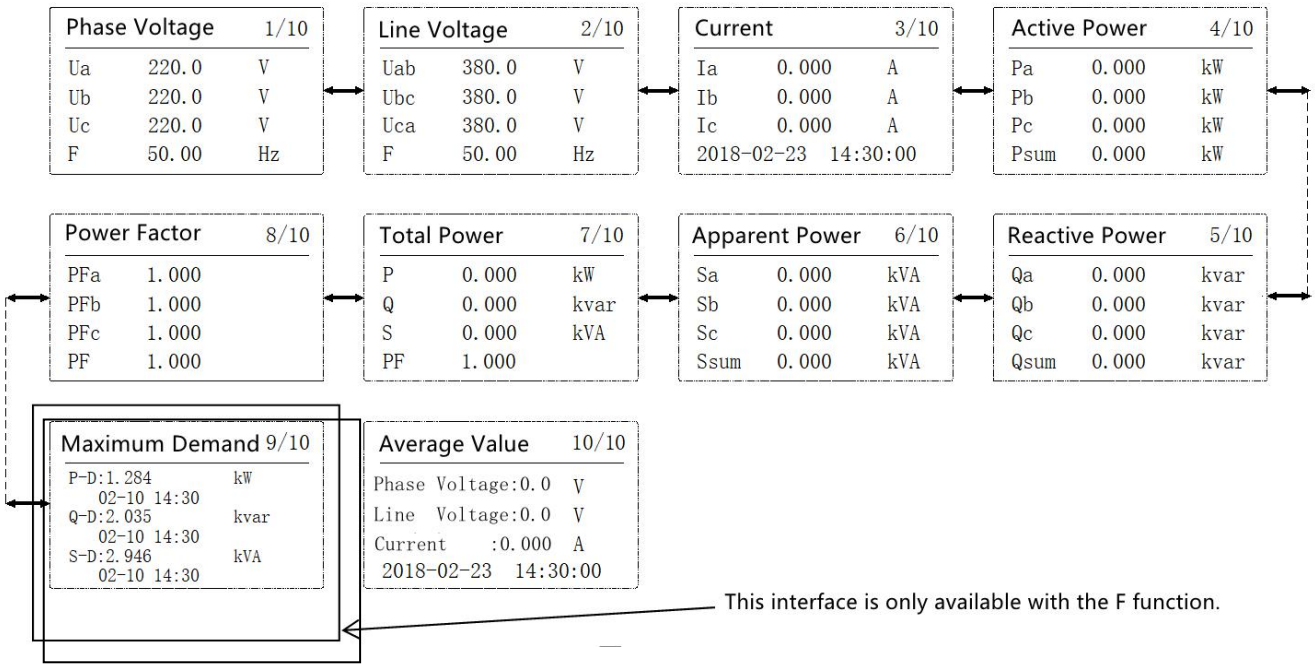


Figure 13

Note: 1. The demand interface is only available with F function. In the phase voltage interface, press the ENTER button to enter the voltage angle interface, and in the current interface, press the ENTER button to enter the current angle interface.

2. If the current interface displays "O", it means the phase sequence is wrong.

5.2.2 The process of viewing harmonic parameter

In the main menu interface, using the left and right buttons to select the harmonic parameters, and press the Enter button to enter the harmonic parameter interface to view the harmonic data.

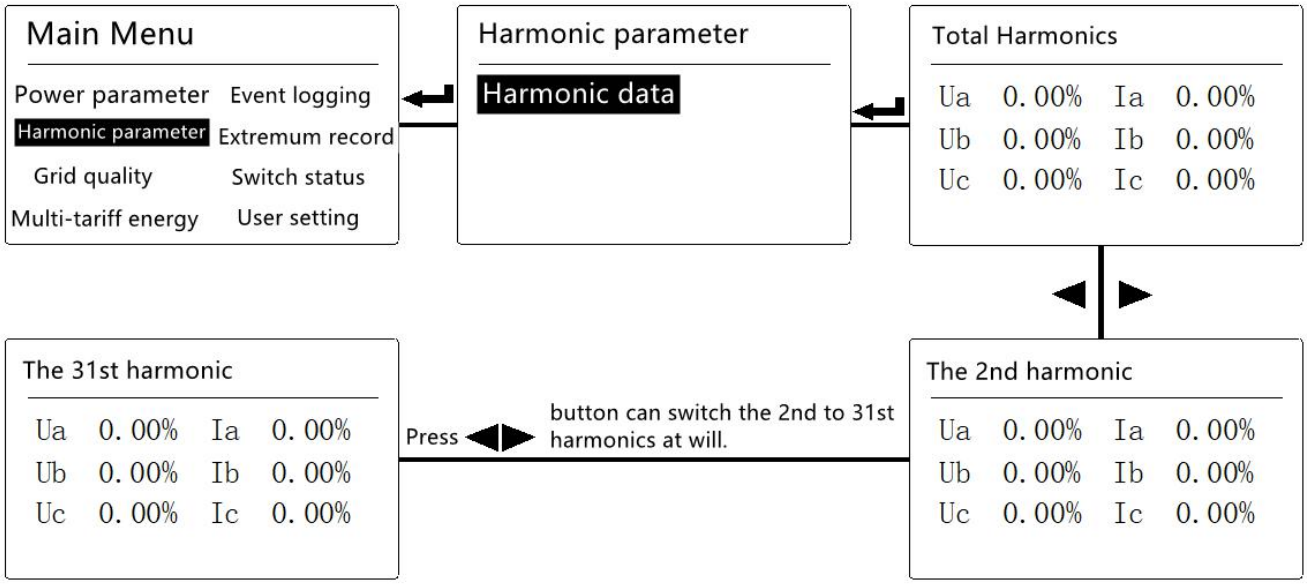


Figure 14

Note: Only with H function, there are harmonic parameters, and you cannot enter the harmonic parameter interface without matching.

5.2.3 The flowchart of viewing Grid Quality

After selecting the power grid quality in the main menu, press the Enter button to enter the power grid quality interface. At this time, the crest factor is in the selected state. You can press the left and right buttons to select the content to be viewed, and then press the Enter button to view the corresponding power grid quality parameters.

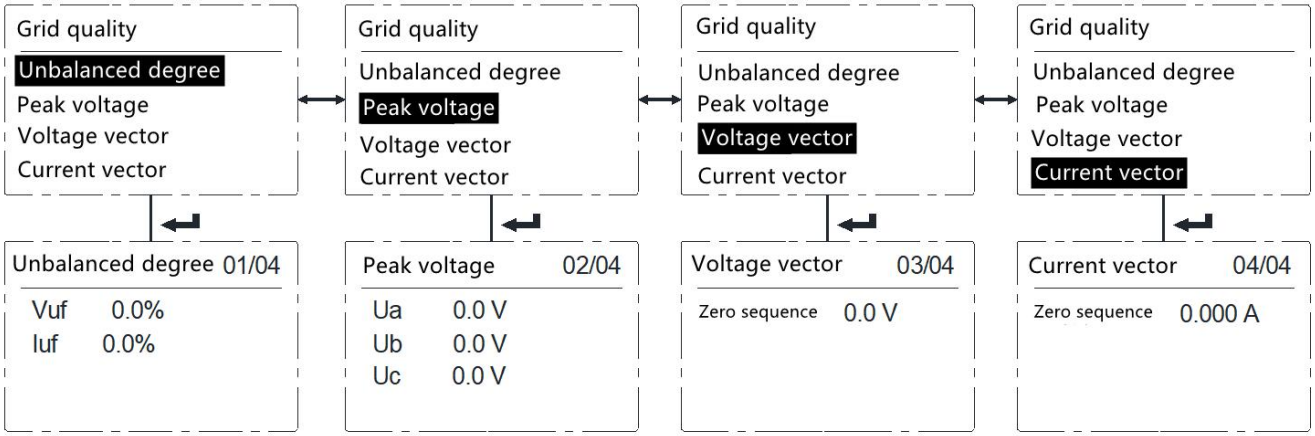


图 15

5.2.4 The flowchart of viewing multi tariff energy

Below is the instrument interface for the four-rate version.

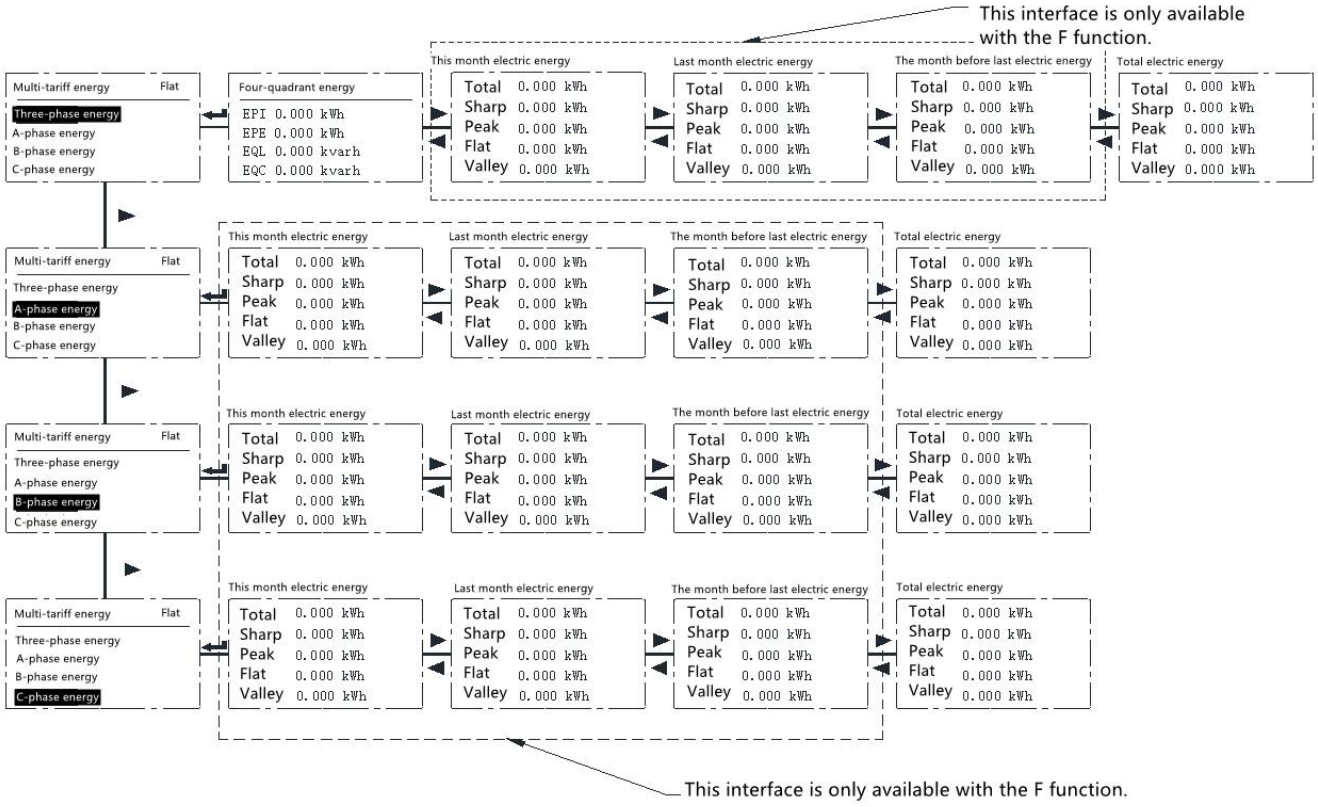
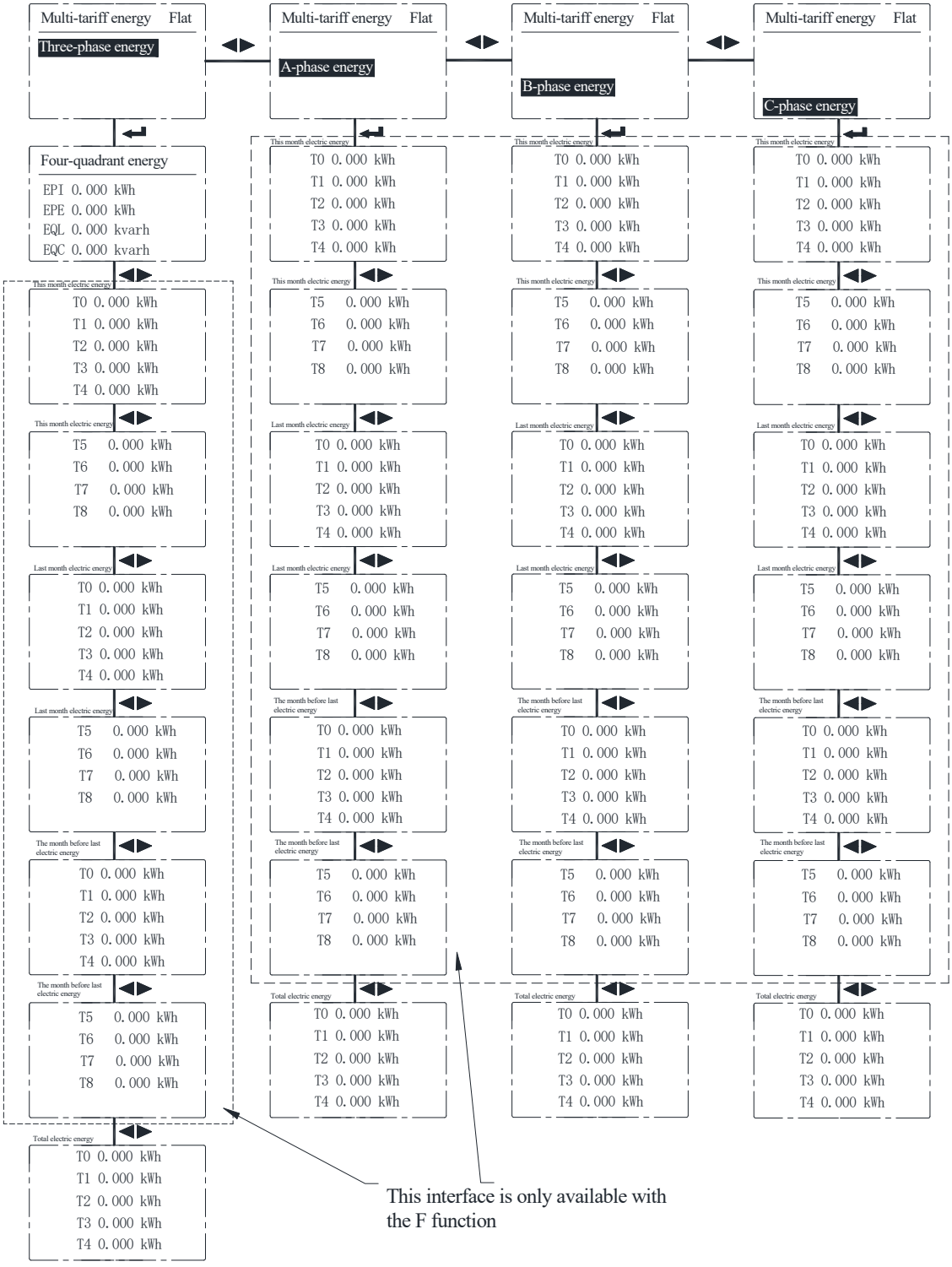


Figure 16

Below is the instrument interface for the four-rate version.



Note: Only with F function, there are multi tariff energy and last month energy, etc. This interface cannot be displayed if it is not selected.

5.2.5 The flowchart of viewing event logging

Figure 17

Note: Only with F function have event logging, etc. The interface cannot be displayed if it is not selected.

5.2.6 The flowchart of viewing extreme value record

After the meter selects the extreme value record, press the Enter button to display the extreme value interface. The following figure shows the maximum value of A/B/C phase voltage at 16:45:57 on March 15, 2021; press the left and right buttons to view the extreme values of other parameters (voltage U, current I, power P/Q/S, power factor PF, harmonic THD, frequency F, etc.).

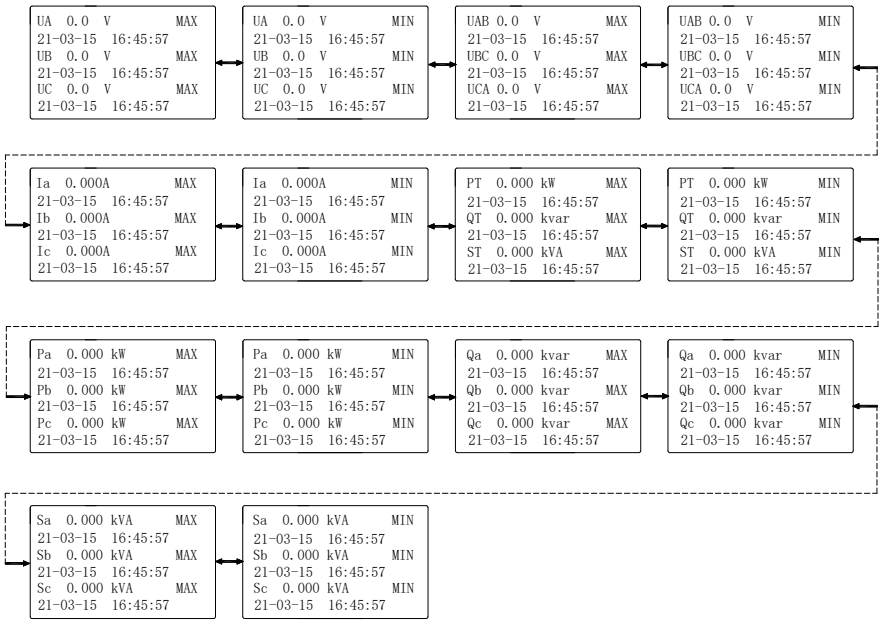


Figure 18

Note: Only with F function, there are extreme values, etc. The interface cannot be displayed if it is not selected.

5.2.7 The flowchart of viewing switch status

After the meter selects the switch status, press the Enter button to display the switch value status display interface. The switch status displays the real-time status of the current related digital input and relay output. When there is a switch input or output, the corresponding indication bit changes from split to closed.

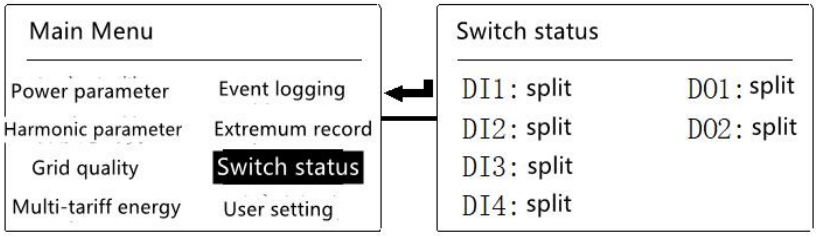


Figure 19

5.2.8 The flowchart of user setting

After entering the main menu, press the left button or the right button to select the user setting item, and press the Enter button to display the password input item. At this time, pressing the right button can move the cursor on the units, tens, hundreds, and thousands. When the digit is in the reverse white state, you can press the left button to increase or decrease the number of the digit, and the password (default is 0001) is entered correctly and then press the Enter button to enter the user setting interface.

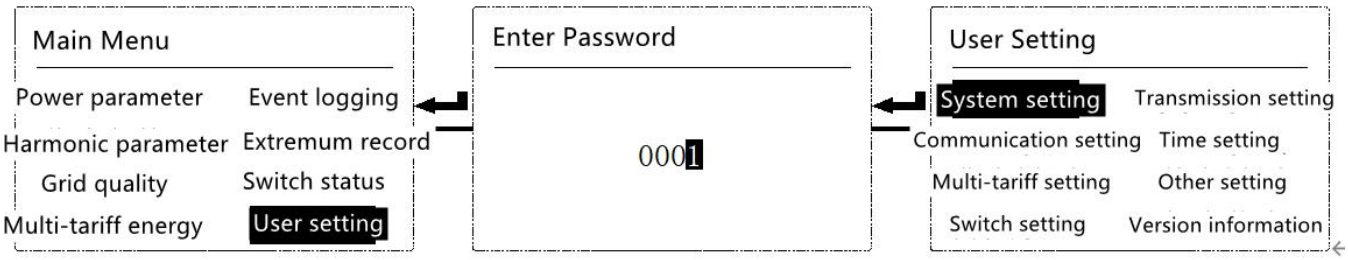


Figure 20

a)System setting

After entering the user setting interface, press the left and right buttons to select the system setting, and then press the Enter button to enter the system setting interface. In the system setting interface, press right button to select the menu that needs to be set, and make it in the reversed state. After selecting the setting menu you want to enter, press Enter button to enter the corresponding setting interface, press the right button to select the parameter to be set, and make it in a reversed state, press the left button to modify the parameters, and press the Enter button to save.

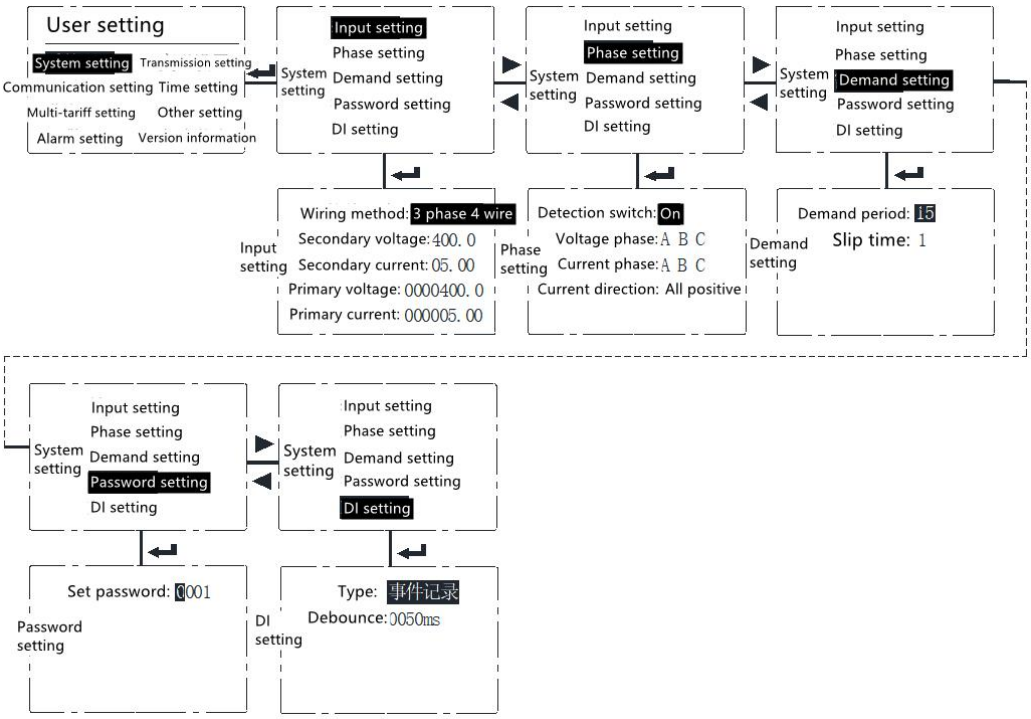


Figure 21

b)Communication setting

After entering the user setting interface, press the left and right buttons to select the communication setting, and press the Enter button to enter the communication setting interface. In the communication setting interface, press the left and right buttons to select the communication, make it in the highlighted state, and press the Enter button to enter the corresponding communication setting interface. The setting parameters include communication address (1～247), communication baud rate (1200bps, 2400bps, 4800bps, 9600bps, 19200bps, 38400bps), check mode (no check, odd check, even check, 2bits), 645 statute address.

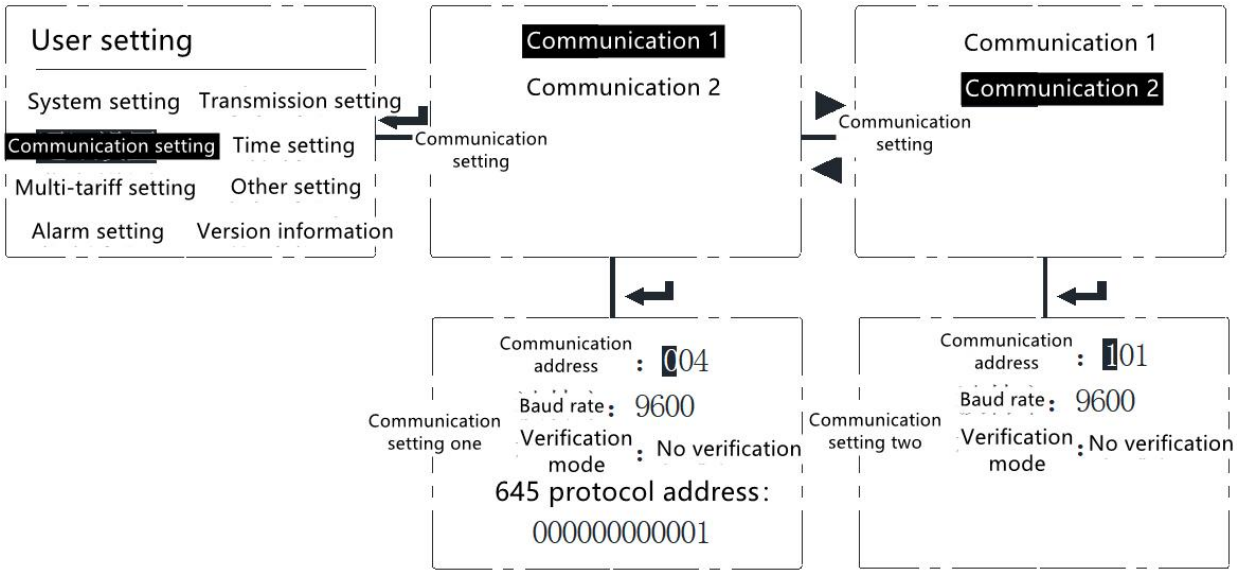
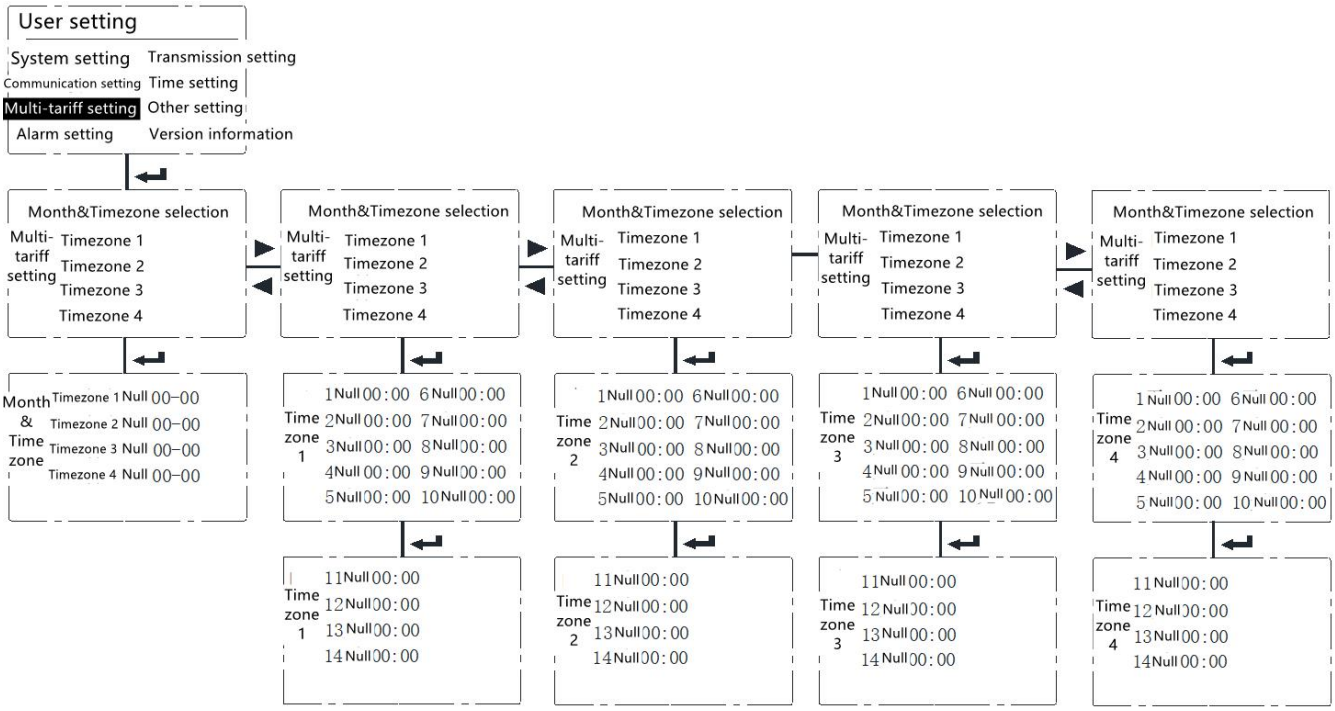


Figure 22

c)Rate setting

After entering the user setting interface, press the left and right buttons to select the rate setting, and press the Enter button to enter the rate setting interface.



Note: When setting the rate time, the later time must be larger than the previous one, otherwise an error will occur. The setting example is as follows.

Time period setting

Serial Number	Parameter	Description
1	1 07-01	During the period from 1st July to 30th November, time zone 1 is valid.
2	2 12-01	During the period from 1st December to 30th June, time zone 2 is valid.
3	Null 00：00	Null
4	Null 00：00	Null

Time zone setting

Serial Number	Parameter	Description
1	4 00：00	During the time period from 00:00 to 06:00, the rate is valley.
2	3 06：00	During the time period from 06:00 to 08:00, the rate is flat.
3	3 08：00	During the time period from 08:00 to 10:00, the rate is flat.
4	2 10：00	During the time period from 10:00 to 12:00, the rate is peak.
5	3 12：00	During the time period from 12:00 to 14:00, the rate is flat.
6	2 14：00	During the time period from 14:00 to 16:00, the rate is peak.
7	3 16：00	During the time period from 16:00 to 22:00, the rate is flat.
8	4 22：00	During the time period from 22:00 to 0:00, the rate is valley.

d)Alarm setting

Figure 24

e)Transmission setting

After entering the user setting interface, press the left and right buttons to select the transmission setting, and press the Enter button to enter the transmission setting interface.

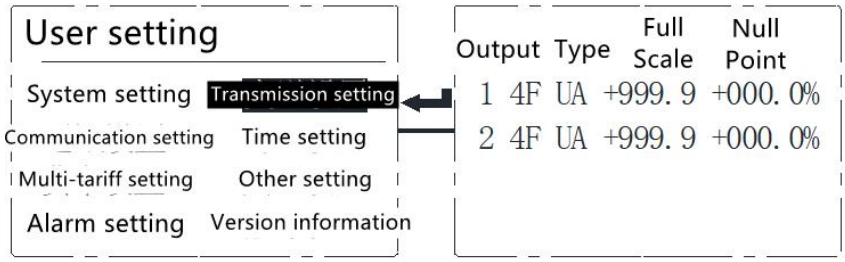


Figure 25

f)Time setting

After entering the user setting interface, press the left and right buttons to select the time setting, and then press the Enter button to enter the time setting interface. After entering the time setting interface, press the right button to select the item to be set, and press the left button to modify the setting item value.

Note: The illegal time cannot be saved. (For example: the illegal time cannot be entered at 25:05 on January 5, 2008.)

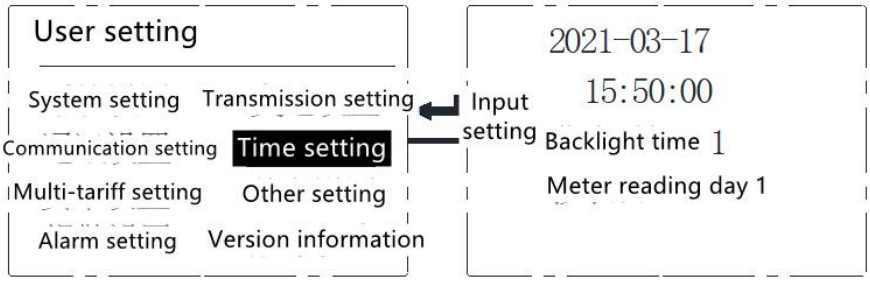


Figure 26

g)Other setting

After entering the user setting interface, press the left and right buttons to select other setting, and then press the Enter button to enter the parameter clearing interface. Press the right button to select the item to be set, and press the left button to clear the value of the setting item. The energy clearing interface includes meter reading day setting, energy clearing and event clearing.

Note: If you want to clear the electric energy, select "Yes", and then press the Enter button, the electric energy will be cleared and cannot be restored, and the data of the maximum demand will also be cleared to zero. The actual value of the pulse constant is 100 times the displayed value. For example, if the pulse liquid crystal display is 100, the actual value is 10000.

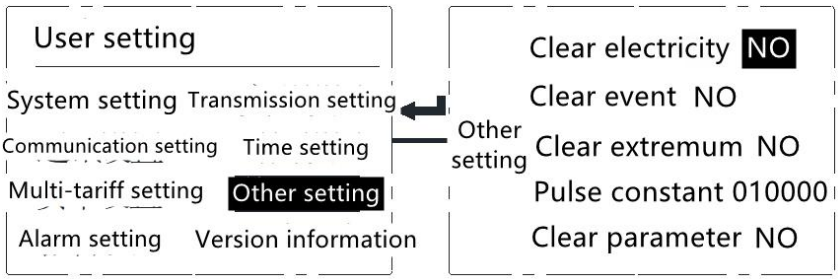


Figure 27

h)Version information

The version information is displayed when the machine is turned on, and the user can also view the relevant version information of the instrument in this interface.

i)Save setting

After the user has set the relevant parameters, press the Enter button to display the data saving interface. If you need to save, press the left button to select "Yes" and then press Enter button. If you do not need to save, select "No" and then press Enter button to exit the setting interface.

Figure 28

6 Communication

6.1 Communication Address List

Table 5

Address	Name	Explanation		Word length	Type	Remark
0x1000	Addr1	Address 1	R/W	1	Uint16	1-247
0x1001	Baud1	Baud rate 1	R/W	1	Uint16	1200，2400，4800，9600，19200，38400 57600
0x1002	Check1	Check Digit 1	R/W	1	Uint16	Low byte 0: no parity 1: odd parity 2: Even parity High byte 0: 1 stop bit 1: 1.5 stop bit 2: 2 stop bits
0x1003	Addr2	Address 2	R/W	1	Uint16	1-247
0x1004	Baud2	Baud rate 2	R/W	1	Uint16	1200，2400，4800，9600，19200，38400 57600
0x1005	Check2	Check Digit 2	R/W	1	Uint16	Low byte 0: no parity 1: odd parity 2: Even parity High byte 0: 1 stop bit 1: 1.5 stop bit 2: 2 stop bits
0x1006	645Addr	645 Address	R/W	3	Uint16	BCD code high order first
0x1009	SnNum	Serial number	R/W	7	Ascii	

0x1010	Line	Wiring method	R/W	1	Uint16	0:3P4L 1:3P3L
0x1011	UbTwoSide	Voltage secondary rating	R/W	1	Uint16	one decimal place V
0x1012	IbTwoSide	Voltage secondary rating	R/W	1	Uint16	two decimal places A
0x1015	UbOneSide	Voltage primary rating	R/W	2	Uint32	one decimal place V
0x1017	IbOneSide	Voltage primary rating	R/W	2	Uint32	two decimal places A
0x101D	Password	Password	R/W	1	Uint16	1-9999
0x101E	Pluse	Pulse constant	R/W	1	Uint16	6400
0x1025	DemandWidth	Demand Width	R/W	1	Uint16	Unit min（1-5）
0x1026	DemandPeriod	Demand Period	R/W	1	Uint16	Unit min（1-30）
0x102E	BlackTime	Backlight Time	R/W	1	Uint16	0:Always bright 1:1min 2:2min
0x102F	SysTime	Time	R/W	5	Uint16	year,month， day， week，hour， minute， second，millisecond
0x1034	CopyTime	Automatic meter reading day	R/W	1	Uint16	High byte: day Low byte: hour
0x1036	DOState	DO State	R/W	1	Uint16	Bit0:DO1 Bit1: DO2...
0x1037	DIState	DI State	R	1	Uint16	Bit0:DI1 Bit1: DI2...
0x1038	ZoneNum1,ZoneMonth1,ZoneDay1 ZoneNum2,ZoneMonth2,ZoneDay2 ZoneNum3,ZoneMonth3,ZoneDay3 ZoneNum4,ZoneMonth4,ZoneDay4	First time zone timetable number First time zone start month, first time zone day Second time zone timetable number Second time zone start month, second time zone day Third time zone timetable number Third time zone start month, third time zone day Fourth time zone timetable number Fourth time zone start month, fourth time zone day	R/W	6	Uint16	Timetable number: Period 1 Period 2 Period 3 Period 4 Start month: 1-12 Start day: 1-31
0x1044	Table1 Rt1~Rt14	The first set of timetables, each period occupies three bytes, including rate, start time, start minute	R/W	21	Uint16	Multi-tariff Rate: 0 1 sharp, 2 peak 3 flat, 4 valley Start hour: 0-23

						Start minute: 1-59
0x1059	Table2 Rt1~Rt14	The second set of timetables, each period occupies three bytes, including rate, start time, start minute	R/W	21	Uint16	
0x106E	Table3 Rt1~Rt14	The third set of timetables, each period occupies three bytes, including rate, start time, start minute	R/W	21	Uint16	
0x1083	Table4 Rt1~Rt14	The fourth set of timetables, each period occupies three bytes, including rate, start time, start minute	R/W	21	Uint16	
AO parameter setting						
0x10C0	AoSet1 AoHValue1 AoLValue1	H: Transmission type L: Signal selection High point corresponding value Low point corresponding value	R/W	3	Uint16	Signal selection: 0：A-phase voltage 1：B-phase voltage 2：C-phase voltage 3：A line voltage 4：B line voltage 5：C line voltage 6：A-phase current 7：B-phase current 8：C-phase current 9：A-phase active 10：B-phase active 11：C-phase active 12：Total active 13：A-phase reactive 14：B-phase reactive 15：C-phase reactive 16：Total reactive 17：A-phase apparent 18：B-phase apparent 19：C-phase apparent 20：Total apparent 21：A-phase power factor 22：B-phase power factor 23：C-phase power factor

						24：Total power factor 25：Frequency Type: 0：4-20mA 1：0-20mA High value: -120.0%~+120.0% Low value: --120.0%~+120.0%
0x10C3	AoSet2	A02 parameter setting	R/W	3	Uint16	
DO parameter setting						
0x1100	DO1Set DO1Width	0: Remote control mode 1: Associated Alarm 1 0: Holding 1: Pulse (remote control only)	R/W	16	Uint16	DOSet: 0: Remote control 1: Alarm 1 2: Alarm 2
0x1110	DO2Set	DO2 parameter setting	R/W	16	Uint16	
Alarm 1 stage parameter						
0x1200	Alarm_Ia Alarm_Ia_HValue Alarm_Ia_LValue Alarm_Ia_Band Alarm_Ia_Delay Alarm_Ia_RecorvyDelay	A-phase current alarm High byte 0: When the value is 0, the alarm is disabled. 1: When the value is 0, the alarm is enabled. Low byte 0: Alarm off 1: Alarm on A-phase current high alarm value A-phase current low alarm value A-phase current alarm non-action band (hysteresis) A-phase current alarm delay A-phase current alarm recovery delay	R/W	6	Uint16	Alarm high byte: 0: When the value is 0, the alarm is disabled. 1: When the value is 0, the alarm is enabled. Alarm low byte: 0: Alarm off 1: Alarm on Alarm value: -120.0%~+120.0% Non-action band: 0.0%~20.0% Delay: 1~9999 Recovery delay: 1~9999
0x1206	Alarm_Ib	B-phase current alarm	R/W	6	Uint16	
0x120C	Alarm_Ic	C-phase current alarm	R/W	6	Uint16	
0x1212	Alarm_Ix	Arbitrary phase current alarm (excluding N line)	R/W	6	Uint16	

0x1218	Alarm_In	N-phase current alarm	R/W	6	Uint16	
0x121E	Alarm_Ua	A-phase voltage alarm	R/W	6	Uint16	
0x1224	Alarm_Ub	B-phase voltage alarm	R/W	6	Uint16	
0x122A	Alarm_Uc	C-phase voltage alarm	R/W	6	Uint16	
0x1230	Alarm_Ux	Arbitrary phase voltage alarm	R/W	6	Uint16	
0x1236	Alarm_Uab	AB line voltage alarm	R/W	6	Uint16	
0x123C	Alarm_Ubc	BC line voltage alarm	R/W	6	Uint16	
0x1242	Alarm_Uca	CA line voltage alarm	R/W	6	Uint16	
0x1248	Alarm_Uxx	Arbitrary line voltage alarm	R/W	6	Uint16	
0x124E	Alarm_Pa	A-phase active power alarm	R/W	6	Uint16	
0x1254	Alarm_Pb	B-phase active power alarm	R/W	6	Uint16	
0x125A	Alarm_Pc	C-phase active power alarm	R/W	6	Uint16	
0x1260	Alarm_Ps	Total active power alarm	R/W	6	Uint16	
0x1266	Alarm_Qa	A-phase reactive power alarm	R/W	6	Uint16	
0x126C	Alarm_Qb	B-phase reactive power alarm	R/W	6	Uint16	
0x1272	Alarm_Qc	C-phase reactive power alarm	R/W	6	Uint16	
0x1278	Alarm_Qs	Total reactive power alarm	R/W	6	Uint16	
0x127E	Alarm_Sa	A-phase apparent power alarm	R/W	6	Uint16	
0x1284	Alarm_Sb	B-phase apparent power alarm	R/W	6	Uint16	
0x128A	Alarm_Sc	C-phase apparent power alarm	R/W	6	Uint16	
0x1290	Alarm_Ss	Total apparent power alarm	R/W	6	Uint16	
0x1296	Alarm_PFa	A-phase power factor alarm	R/W	6	Uint16	
0x129C	Alarm_PFb	B-phase power factor alarm	R/W	6	Uint16	
0x12A2	Alarm_PFc	C-phase power factor alarm	R/W	6	Uint16	
0x12A8	Alarm_PF	Total power factor alarm	R/W	6	Uint16	
0x12AE	Alarm_F	Frequency alarm	R/W	6	Uint16	
0x12B4	Alarm_Uunbalance	Voltage unbalance alarm	R/W	6	Uint16	
0x12BA	Alarm_Iunbalance	Current unbalance alarm	R/W	6	Uint16	
0x135C	Alarm_DI1	DI1 Alarm	R/W	6	Uint16	
0x1362	Alarm_DI2	DI2 Alarm	R/W	6	Uint16	
Alarm 2 stage parameter						
0x1700	Alarm_Ia Alarm_Ia_HValue Alarm_Ia_LValue Alarm_Ia_Band	A-phase current alarm High byte 0: When the value is 0, the alarm is disabled. When the value is 1, the alarm is enabled.	R/W	6	Uint16	

	Alarm_Ia_Delay Alarm_Ia_RecorvyDelay	Low byte 0:Alarm off 1:Alarm on A-phase current high alarm value A-phase current low alarm value A-phase current alarm non-action band A-phase current alarm delay A-phase current alarm recovery delay				
0x1706	Alarm_Ib	B-phase current alarm	R/W	6	Uint16	
0x170C	Alarm_Ic	C-phase current alarm	R/W	6	Uint16	
0x1712	Alarm_Ix	Arbitrary phase current alarm (excluding N line)	R/W	6	Uint16	
0x1718	Alarm_In	N-phase current alarm	R/W	6	Uint16	
0x171E	Alarm_Ua	A-phase voltage alarm	R/W	6	Uint16	
0x1724	Alarm_Ub	B-phase voltage alarm	R/W	6	Uint16	
0x172A	Alarm_Uc	C-phase voltage alarm	R/W	6	Uint16	
0x1730	Alarm_Ux	Arbitrary phase voltage alarm	R/W	6	Uint16	
0x1736	Alarm_Uab	AB line voltage alarm	R/W	6	Uint16	
0x173C	Alarm_Ubc	BC line voltage alarm	R/W	6	Uint16	
0x1742	Alarm_Uca	CA line voltage alarm	R/W	6	Uint16	
0x1748	Alarm_Uxx	Arbitrary line voltage alarm	R/W	6	Uint16	
0x174E	Alarm_Pa	A-phase active power alarm	R/W	6	Uint16	
0x1754	Alarm_Pb	B-phase active power alarm	R/W	6	Uint16	
0x175A	Alarm_Pc	C-phase active power alarm	R/W	6	Uint16	
0x1760	Alarm_Ps	Total active power alarm	R/W	6	Uint16	
0x1766	Alarm_Qa	A-phase reactive power alarm	R/W	6	Uint16	
0x176C	Alarm_Qb	B-phase reactive power alarm	R/W	6	Uint16	
0x1772	Alarm_Qc	C-phase reactive power alarm	R/W	6	Uint16	
0x1778	Alarm_Qs	Total reactive power alarm	R/W	6	Uint16	
0x177E	Alarm_Sa	A-phase apparent power alarm	R/W	6	Uint16	
0x1784	Alarm_Sb	B-phase apparent power alarm	R/W	6	Uint16	
0x178A	Alarm_Sc	C-phase apparent power alarm	R/W	6	Uint16	
0x1790	Alarm_Ss	Total apparent power alarm	R/W	6	Uint16	
0x1796	Alarm_PFa	A-phase power factor alarm	R/W	6	Uint16	

0x179C	Alarm_PFb	B-phase power factor alarm	R/W	6	Uint16	
0x17A2	Alarm_PFc	C-phase power factor alarm	R/W	6	Uint16	
0x17A8	Alarm_PF	Total power factor alarm	R/W	6	Uint16	
0x17AE	Alarm_F	Frequency alarm	R/W	6	Uint16	
0x17B4	Alarm_Uunbalance	Voltage unbalance alarm	R/W	6	Uint16	
0x17BA	Alarm_Iunbalance	Current unbalance alarm	R/W	6	Uint16	
0x185C	Alarm_DI1	DI1 Alarm	R/W	6	Uint16	
0x1862	Alarm_DI2	DI2 Alarm	R/W	6	Uint16	
DI parameter setting						
0x1C00	DI1delay	DI1 Debounce time	R/W	1	Uint16	1ms
0x1C10	DI1mode	DI1 Mode	R/W	1	Uint16	0: conventional 1: counting

Basic electrical parameter (Function Code 03H, 04H)

Address	Name	Explanation	R/W	Word length	Type	Remark
0x2000	UA	A-phase voltage	R	2	float	V
0x2002	UB	B-phase voltage	R	2	float	V
0x2004	UC	C-phase voltage	R	2	float	V
0x2006	UAB	AB line voltage	R	2	float	V
0x2008	UBC	BC line voltage	R	2	float	V
0x200a	UCA	CA line voltage	R	2	float	V
0x200c	IA	A-phase current	R	2	float	A
0x200e	IB	B-phase current	R	2	float	A
0x2010	IC	C-phase current	R	2	float	A
0x2012	IN	N-phase current	R	2	float	A
0x2014	PA	A-phase active power	R	2	float	Kw
0x2016	PB	B-phase active power	R	2	float	Kw
0x2018	PC	C-phase active power	R	2	float	Kw
0x201a	PT	Total active power	R	2	float	Kw
0x201c	QA	A-phase reactive power	R	2	float	Kvar
0x201e	QB	B-phase reactive power	R	2	float	Kvar
0x2020	QC	C-phase reactive power	R	2	float	Kvar
0x2022	QT	Total reactive power	R	2	float	Kvar
0x2024	SA	A-phase apparent power	R	2	float	KVA
0x2026	SB	B-phase apparent power	R	2	float	KVA
0x2028	SC	C-phase apparent power	R	2	float	KVA

0x202a	ST	Total apparent power	R	2	float	KVA
0x202c	PFA	A-phase power factor	R	2	float	
0x202e	PFB	B-phase power factor	R	2	float	
0x2030	PFC	C-phase power factor	R	2	float	
0x2032	PF	Total power factor	R	2	float	
0x2034	F	Frequency	R	2	float	
0x2036	UNAvg	Phase voltage average	R	2	float	V
0x2038	ULAvg	Line voltage average	R	2	float	V
0x203a	IAvg	Current average	R	2	float	A
0x203c	Uunbalance	Voltage unbalance	R	2	float	%
0x203e	Iunbalance	Current unbalance	R	2	float	%
0x2040	Uresidual	Zero sequence voltage	R	2	float	V
0x2042	Iresidual	Zero sequence current	R	2	float	A
0x2044	APangle	A power angle	R	2	float	°
0x2046	BPangle	B power angle	R	2	float	°
0x2048	CPangle	C power angle	R	2	float	°
0x204a	AUangle	A voltage angle	R	2	float	°
0x204c	BUangle	B voltage angle	R	2	float	°
0x204e	CUangle	C voltage angle	R	2	float	°
0x2050	AIangle	A current angle	R	2	float	°
0x2052	BIangle	B current angle	R	2	float	°
0x2054	CIangle	C current angle	R	2	float	°
Secondary side power						
0x3000	EP	Total active energy secondary value	R/W	2	Uint32	w
0x3002	EPI	Positive active energy secondary value	R/W	2	Uint32	w
0x3004	EPE	Negative active energy secondary value	R/W	2	Uint32	w
0x3006	EQ	Total reactive energy secondary value	R/W	2	Uint32	w
0x3008	EQL	Positive reactive energy secondary value	R/W	2	Uint32	w
0x300a	EQC	Negative reactive energy secondary value	R/W	2	Uint32	w
0x300c	ES	Apparent energy secondary value	R/W	2	Uint32	w
0x3016	EPI-F1	Positive active energy sharp secondary value	R/W	2	Uint32	w
0x3018	EPI-F2	Positive active energy peak secondary value	R/W	2	Uint32	w
0x301a	EPI-F3	Positive active energy flat secondary value	R/W	2	Uint32	w
0x301c	EPI-F4	Positive active energy valley secondary	R/W	2	Uint32	w

		value				
0x3042	EPIA-F1	A positive active energy sharp secondary value	R/W	2	Uint32	w
0x3044	EPIA-F2	A positive active energy peak secondary value	R/W	2	Uint32	w
0x3046	EPIA-F3	A positive active energy flat secondary value	R/W	2	Uint32	w
0x3048	EPIA-F4	A positive active energy valley secondary value	R/W	2	Uint32	w
0x304c	EPIB	B-phase positive active energy secondary value	R/W	2	Uint32	w
0x3056	EPIB-F1	B positive active energy sharp secondary value	R/W	2	Uint32	w
0x3058	EPIB-F2	B positive active energy peak secondary value	R/W	2	Uint32	w
0x305a	EPIB-F3	B positive active energy flat secondary value	R/W	2	Uint32	w
0x305c	EPIB-F4	B positive active energy valley secondary value	R/W	2	Uint32	w
0x3060	EPIC	C-phase positive active energy secondary value	R/W	2	Uint32	w
0x306a	EPIC-F1	C positive active energy sharp secondary value	R/W	2	Uint32	w
0x306c	EPIC-F2	C positive active energy peak secondary value	R/W	2	Uint32	w
0x306e	EPIC-F3	C positive active energy flat secondary value	R/W	2	Uint32	w
0x3070	EPIC-F4	C positive active energy valley secondary value	R/W	2	Uint32	w
Primary side energy						
0x3080	EP	Total active energy primary value	R/W	2	float	w
0x3082	EPI	Positive active energy primary value (user power consumption)	R/W	2	float	w
0x3084	EPE	Negative energy primary value	R/W	2	float	w
0x3086	EQ	Total reactive energy primary value	R/W	2	float	w
0x3088	EQL	Positive reactive energy primary value	R/W	2	float	w
0x308a	EQC	Negative reactive energy primary value	R/W	2	float	w
0x308c	ES	Apparent energy primary value	R/W	2	float	w
0x3096	EPI-F1	Positive active energy sharp primary value	R/W	2	float	w

0x3098	EPI-F2	Positive active energy peak primary value	R/W	2	float	w
0x309a	EPI-F3	Positive active energy flat primary value	R/W	2	float	w
0x309c	EPI-F4	Positive active energy valley primary value	R/W	2	float	w
0x30b8	EPIA	A-phase positive active energy primary value	R/W	2	float	w
0x30c2	EPIA-F1	A positive active energy sharp value	R/W	2	float	w
0x30c4	EPIA-F2	A positive active energy peak value	R/W	2	float	w
0x30c6	EPIA-F3	A positive active energy flat value	R/W	2	float	w
0x30c8	EPIA-F4	A positive active energy valley value	R/W	2	float	w
0x30cc	EPIB	B-phase positive active energy primary value	R/W	2	float	w
0x30d6	EPIB-F1	B positive active energy sharp value	R/W	2	float	w
0x30d8	EPIB-F2	B positive active energy peak value	R/W	2	float	w
0x30da	EPIB-F3	B positive active energy flat value	R/W	2	float	w
0x30dc	EPIB-F4	B positive active energy valley value	R/W	2	float	w
0x30e0	EPIC	C-phase positive active energy primary value	R/W	2	float	w
0x30ea	EPIC-F1	C positive active energy sharp value	R/W	2	float	w
0x30ec	EPIC-F2	C positive active energy peak value	R/W	2	float	w
0x30ee	EPIC-F3	C positive active energy flat value	R/W	2	float	w
0x30f0	EPIC-F4	C positive active energy valley value	R/W	2	float	w

Secondary-side energy (eight-rate version)						
E200	EP	Total active energy secondary side value	R/W	2	Uint32	Three decimal places kwh
E202	EPI	Positive active energy secondary side value	R/W	2	Uint32	Three decimal places kwh
E204	EPE	Reverse active energy secondary side value	R/W	2	Uint32	Three decimal places kwh
E206	EQ	Total reactive energy secondary side value	R/W	2	Uint32	Three decimal places kwh
E208	EQL	Positive reactive energy secondary side value	R/W	2	Uint32	Three decimal places kwh
E20A	EQC	Reverse reactive energy secondary side value	R/W	2	Uint32	Three decimal places kwh
E20C	ES	Apparent energy secondary side value	R/W	2	Uint32	Three decimal places kwh
E20E	EP-F1	Total active energy tip secondary side	R/W	2	Uint32	Three decimal

		value				places kwh
E210	EP-F2	Total active energy peak secondary side value	R/W	2	Uint32	Three decimal places kwh
E212	EP-F3	Total active energy flat secondary side value	R/W	2	Uint32	Three decimal places kwh
E214	EP-F4	Total active energy valley secondary side value	R/W	2	Uint32	Three decimal places kwh
E216	EP-F5	Total active energy deep valley secondary side value	R/W	2	Uint32	Three decimal places kwh
E218	EP-F6	Total active energy 6 secondary side value (Preserve Definition)	R/W	2	Uint32	Three decimal places kwh
E21A	EP-F7	Total active energy 7 secondary side value (Preserve Definition)	R/W	2	Uint32	Three decimal places kwh
E21C	EP-F8	Total active energy 8 secondary side value (Preserve Definition)	R/W	2	Uint32	Three decimal places kwh
E21E	EPIA	A-phase positive active energy secondary side value	R/W	2	Uint32	Three decimal places kwh
E220	EPIA-F1	A-phase positive active energy tip secondary side value	R/W	2	Uint32	Three decimal places kwh
E222	EPIA-F2	A-phase positive active energy peak secondary side value	R/W	2	Uint32	Three decimal places kwh
E224	EPIA-F3	A-phase positive active energy flat secondary side value	R/W	2	Uint32	Three decimal places kwh
E226	EPIA-F4	A-phase positive active energy valley secondary side value	R/W	2	Uint32	Three decimal places kwh
E228	EPIA-F5	A-phase positive active energy deep valley secondary side value	R/W	2	Uint32	Three decimal places kwh
E22A	EPIA-F6	A-phase positive active energy 6 secondary side value (Preserve Definition)	R/W	2	Uint32	Three decimal places kwh
E22C	EPIA-F7	A-phase positive active energy 7 secondary side value (Preserve Definition)	R/W	2	Uint32	Three decimal places kwh
E22E	EPIA-F8	A-phase positive active energy 8 secondary side value (Preserve Definition)	R/W	2	Uint32	Three decimal places kwh
E230	EPIB	B-phase positive active energy secondary side value	R/W	2	Uint32	Three decimal places kwh
E232	EPIB-F1	B-phase positive active energy tip secondary side value	R/W	2	Uint32	Three decimal places kwh
E234	EPIB-F2	B-phase positive active energy peak secondary side value	R/W	2	Uint32	Three decimal places kwh
E236	EPIB-F3	B-phase positive active energy flat secondary side value	R/W	2	Uint32	Three decimal places kwh

E238	EPIB-F4	B-phase positive active energy valley secondary side value	R/W	2	Uint32	Three decimal places kwh
E23A	EPIB-F5	B-phase positive active energy deep valley secondary side value	R/W	2	Uint32	Three decimal places kwh
E23C	EPIB-F6	B-phase positive active energy 6 secondary side value (Preserve Definition)	R/W	2	Uint32	Three decimal places kwh
E23E	EPIB-F7	B-phase positive active energy 7 secondary side value (Preserve Definition)	R/W	2	Uint32	Three decimal places kwh
E240	EPIB-F8	B-phase positive active energy 8 secondary side value (Preserve Definition)	R/W	2	Uint32	Three decimal places kwh
E242	EPIC	C-phase positive active energy secondary side value	R/W	2	Uint32	Three decimal places kwh
E244	EPIC-F1	C-phase positive active energy tip secondary side value	R/W	2	Uint32	Three decimal places kwh
E246	EPIC-F2	C-phase positive active energy peak secondary side value	R/W	2	Uint32	Three decimal places kwh
E248	EPIC-F3	C-phase positive active energy flat secondary side value	R/W	2	Uint32	Three decimal places kwh
E24A	EPIC-F4	C-phase positive active energy valley secondary side value	R/W	2	Uint32	Three decimal places kwh
E24C	EPIC-F5	C-phase positive active energy deep valley secondary side value	R/W	2	Uint32	Three decimal places kwh
E24E	EPIC-F6	C-phase positive active energy 6 secondary side value (Preserve Definition)	R/W	2	Uint32	Three decimal places kwh
E250	EPIC-F7	C-phase positive active energy 7 secondary side value (Preserve Definition)	R/W	2	Uint32	Three decimal places kwh
E252	EPIC-F8	C-phase positive active energy 8 secondary side value (Preserve Definition)	R/W	2	Uint32	Three decimal places kwh
Primary side energy (eight-rate version)						
E280	EP	Total active energy primary side value	R/W	2	float	Three decimal places kwh
E282	EPI	Positive active energy primary side value (consumer consumption)	R/W	2	float	Three decimal places kwh
E284	EPE	Reverse energy primary side value	R/W	2	float	Three decimal places kwh
E286	EQ	Total reactive energy primary side value	R/W	2	float	Three decimal places kwh
E288	EQL	Positive reactive energy primary side value	R/W	2	float	Three decimal places kwh
E28A	EQC	Reverse reactive energy primary side value	R/W	2	float	Three decimal places kwh

E28C	ES	Apparent energy primary side value	R/W	2	float	Three decimal places kwh
E28E	EP-F1	Total active energy tip primary side value	R/W	2	float	Three decimal places kwh
E290	EP-F2	Total active energy peak primaryside value	R/W	2	float	Three decimal places kwh
E292	EP-F3	Total active energy flat primaryside value	R/W	2	float	Three decimal places kwh
E294	EP-F4	Total active energy valley primary side value	R/W	2	float	Three decimal places kwh
E296	EP-F5	Total active energy deep valley primary side value	R/W	2	float	Three decimal places kwh
E298	EP-F6	Total active energy 6 primary side value (Preserve Definition)	R/W	2	float	Three decimal places kwh
E29A	EP-F7	Total active energy 7 primary side value (Preserve Definition)	R/W	2	float	Three decimal places kwh
E29C	EP-F8	Total active energy 8 primary side value (Preserve Definition)	R/W	2	float	Three decimal places kwh
E29E	EPIA	A-phase positive active energy primary side value	R/W	2	float	Three decimal places kwh
E2A0	EPIA-F1	A-phase positive active energy tip primary side value	R/W	2	float	Three decimal places kwh
E2A2	EPIA-F2	A-phase positive active energy peak primary side value	R/W	2	float	Three decimal places kwh
E2A4	EPIA-F3	A-phase positive active energy flat primary side value	R/W	2	float	Three decimal places kwh
E2A6	EPIA-F4	A-phase positive active energy valley primary side value	R/W	2	float	Three decimal places kwh
E2A8	EPIA-F5	A-phase positive active energy deep valley primary side value	R/W	2	float	Three decimal places kwh
E2AA	EPIA-F6	A-phase positive active energy 6 primary side value (Preserve Definition)	R/W	2	float	Three decimal places kwh
E2AC	EPIA-F7	A-phase positive active energy 7 primary side value (Preserve Definition)	R/W	2	float	Three decimal places kwh
E2AE	EPIA-F8	A-phase positive active energy 8 primary side value (Preserve Definition)	R/W	2	float	Three decimal places kwh
E2B0	EPIB	B-phase positive active energy primary side value	R/W	2	float	Three decimal places kwh
E2B2	EPIB-F1	B-phase positive active energy tip primary side value	R/W	2	float	Three decimal places kwh
E2B4	EPIB-F2	B-phase positive active energy peak	R/W	2	float	Three decimal

		primary side value				places kwh
E2B6	EPIB-F3	B-phase positive active energy flat primary side value	R/W	2	float	Three decimal places kwh
E2B8	EPIB-F4	B-phase positive active energy valley primary side value	R/W	2	float	Three decimal places kwh
E2BA	EPIB-F5	B-phase positive active energy deep valley primary side value	R/W	2	float	Three decimal places kwh
E2BC	EPIB-F6	B-phase positive active energy 6 primary side value (Preserve Definition)	R/W	2	float	Three decimal places kwh
E2BE	EPIB-F7	B-phase positive active energy 7 primary side value (Preserve Definition)	R/W	2	float	Three decimal places kwh
E2C0	EPIB-F8	B-phase positive active energy 8 primary side value (Preserve Definition)	R/W	2	float	Three decimal places kwh
E2C2	EPIC	C-phase positive active energy primary side value	R/W	2	float	Three decimal places kwh
E2C4	EPIC-F1	C-phase positive active energy tip primary side value	R/W	2	float	Three decimal places kwh
E2C6	EPIC-F2	C-phase positive active energy peak primary side value	R/W	2	float	Three decimal places kwh
E2C8	EPIC-F3	C-phase positive active energy flat primary side value	R/W	2	float	Three decimal places kwh
E2CA	EPIC-F4	C-phase positive active energy valley primary side value	R/W	2	float	Three decimal places kwh
E2CC	EPIC-F5	C-phase positive active energy deep valley primary side value	R/W	2	float	Three decimal places kwh
E2CE	EPIC-F6	C-phase positive active energy 6 primary side value (Preserve Definition)	R/W	2	float	Three decimal places kwh
E2D0	EPIC-F7	C-phase positive active energy 7 primary side value (Preserve Definition)	R/W	2	float	Three decimal places kwh
E2D2	EPIC-F8	C-phase positive active energy 8 primary side value (Preserve Definition)	R/W	2	float	Three decimal places kwh

Interval head address	Historical data
0xc0-0xcb	Last 1 month of energy - last 12 months of energy

Example: 0xc080 is the total positive active energy of the last 1 month, 0xc180 is the total positive active energy of the last 2 months.... ...0xcb80 is the total positive active energy for the last 12 months.

80	EPI	Positive active energy primary side value	R/W	2	float	Three decimal places kwh

81	EPI-F1	Total active energy tip primary side value	R/W	2	float	Three decimal places kwh
82	EPI-F2	Total active energy peak primaryside value	R/W	2	float	Three decimal places kwh
83	EPI-F3	Total active energy flat primaryside value	R/W	2	float	Three decimal places kwh
84	EPI-F4	Total active energy valley primary side value	R/W	2	float	Three decimal places kwh
85	EPI-F5	Total active energy deep valley primary side value	R/W	2	float	Three decimal places kwh
86	EPI-F6	Total active energy 6 primary side value (Preserve Definition)	R/W	2	float	Three decimal places kwh
87	EPI-F7	Total active energy 7 primary side value (Preserve Definition)	R/W	2	float	Three decimal places kwh
88	EPI-F8	Total active energy 8 primary side value (Preserve Definition)	R/W	2	float	Three decimal places kwh
89	EPIA	A-phase positive active energy primary side value	R/W	2	float	Three decimal places kwh
8A	EPIA-F1	A-phase positive active energy tip primary side value	R/W	2	float	Three decimal places kwh
8B	EPIA-F2	A-phase positive active energy peak primary side value	R/W	2	float	Three decimal places kwh
8C	EPIA-F3	A-phase positive active energy flat primary side value	R/W	2	float	Three decimal places kwh
8D	EPIA-F4	A-phase positive active energy valley primary side value	R/W	2	float	Three decimal places kwh
8E	EPIA-F5	A-phase positive active energy deep valley primary side value	R/W	2	float	Three decimal places kwh
8F	EPIA-F6	A-phase positive active energy 6 primary side value (Preserve Definition)	R/W	2	float	Three decimal places kwh
90	EPIA-F7	A-phase positive active energy 7 primary side value (Preserve Definition)	R/W	2	float	Three decimal places kwh
91	EPIA-F8	A-phase positive active energy 8 primary side value (Preserve Definition)	R/W	2	float	Three decimal places kwh
92	EPIB	B-phase positive active energy primary side value	R/W	2	float	Three decimal places kwh
93	EPIB-F1	B-phase positive active energy tip primary side value	R/W	2	float	Three decimal places kwh
94	EPIB-F2	B-phase positive active energy peak primary side value	R/W	2	float	Three decimal places kwh
95	EPIB-F3	B-phase positive active energy flat primary side value	R/W	2	float	Three decimal

						places kwh
96	EPIB-F4	B-phase positive active energy valley primary side value	R/W	2	float	Three decimal places kwh
97	EPIB-F5	B-phase positive active energy deep valley primary side value	R/W	2	float	Three decimal places kwh
98	EPIB-F6	B-phase positive active energy 6 primary side value (Preserve Definition)	R/W	2	float	Three decimal places kwh
99	EPIB-F7	B-phase positive active energy 7 primary side value (Preserve Definition)	R/W	2	float	Three decimal places kwh
9A	EPIB-F8	B-phase positive active energy 8 primary side value (Preserve Definition)	R/W	2	float	Three decimal places kwh
9B	EPIC	C-phase positive active energy primary side value	R/W	2	float	Three decimal places kwh
9C	EPIC-F1	C-phase positive active energy tip primary side value	R/W	2	float	Three decimal places kwh
9D	EPIC-F2	C-phase positive active energy peak primary side value	R/W	2	float	Three decimal places kwh
9E	EPIC-F3	C-phase positive active energy flat primary side value	R/W	2	float	Three decimal places kwh
9F	EPIC-F4	C-phase positive active energy valley primary side value	R/W	2	float	Three decimal places kwh
A0	EPIC-F5	C-phase positive active energy deep valley primary side value	R/W	2	float	Three decimal places kwh
A1	EPIC-F6	C-phase positive active energy 6 primary side value (Preserve Definition)	R/W	2	float	Three decimal places kwh
A2	EPIC-F7	C-phase positive active energy 7 primary side value (Preserve Definition)	R/W	2	float	Three decimal places kwh
A3	EPIC-F8	C-phase positive active energy 8 primary side value (Preserve Definition)	R/W	2	float	Three decimal places kwh
00	EPI	Positive active energy secondary side value	R/W	2	uint32	Three decimal places kwh
02	EPI-F1	Total active energy tip secondary side value	R/W	2	uint32	Three decimal places kwh
04	EPI-F2	Total active energy peak secondary side value	R/W	2	uint32	Three decimal places kwh
06	EPI-F3	Total active energy flat secondary side value	R/W	2	uint32	Three decimal places kwh
08	EPI-F4	Total active energy valley secondary side value	R/W	2	uint32	Three decimal places kwh
0A	EPI-F5	Total active energy deep valley secondary side value	R/W	2	uint32	Three decimal places kwh

0C	EPI-F6	Total active energy 6 secondary side value (Preserve Definition)	R/W	2	uint32	Three decimal places kwh
0E	EPI-F7	Total active energy 7 secondary side value (Preserve Definition)	R/W	2	uint32	Three decimal places kwh
10	EPI-F8	Total active energy 8 secondary side value (Preserve Definition)	R/W	2	uint32	Three decimal places kwh
12	EPIA	A-phase positive active energy secondary side value	R/W	2	uint32	Three decimal places kwh
14	EPIA-F1	A-phase positive active energy tip secondary side value	R/W	2	uint32	Three decimal places kwh
16	EPIA-F2	A-phase positive active energy peak secondary side value	R/W	2	uint32	Three decimal places kwh
18	EPIA-F3	A-phase positive active energy flat secondary side value	R/W	2	uint32	Three decimal places kwh
1A	EPIA-F4	A-phase positive active energy valley secondary side value	R/W	2	uint32	Three decimal places kwh
1C	EPIA-F5	A-phase positive active energy deep valley secondary side value	R/W	2	uint32	Three decimal places kwh
1E	EPIA-F6	A-phase positive active energy 6 secondary side value (Preserve Definition)	R/W	2	uint32	Three decimal places kwh
20	EPIA-F7	A-phase positive active energy 7 secondary side value (Preserve Definition)	R/W	2	uint32	Three decimal places kwh
22	EPIA-F8	A-phase positive active energy 8 secondary side value (Preserve Definition)	R/W	2	uint32	Three decimal places kwh
24	EPIB	B-phase positive active energy secondary side value	R/W	2	uint32	Three decimal places kwh
26	EPIB-F1	B-phase positive active energy tip secondary side value	R/W	2	uint32	Three decimal places kwh
28	EPIB-F2	B-phase positive active energy peak secondary side value	R/W	2	uint32	Three decimal places kwh
2A	EPIB-F3	B-phase positive active energy flat secondary side value	R/W	2	uint32	Three decimal places kwh
2C	EPIB-F4	B-phase positive active energy valley secondary side value	R/W	2	uint32	Three decimal places kwh
2E	EPIB-F5	B-phase positive active energy deep valley secondary side value	R/W	2	uint32	Three decimal places kwh
30	EPIB-F6	B-phase positive active energy 6 secondary side value (Preserve Definition)	R/W	2	uint32	Three decimal places kwh
32	EPIB-F7	B-phase positive active energy 7 secondary side value (Preserve Definition)	R/W	2	uint32	Three decimal places kwh
34	EPIB-F8	B-phase positive active energy 8 secondary side value	R/W	2	uint32	Three decimal

		(Preserve Definition)				places kwh
36	EPIC	C-phase positive active energy secondary side value	R/W	2	uint32	Three decimal places kwh
38	EPIC-F1	C-phase positive active energy tip secondary side value	R/W	2	uint32	Three decimal places kwh
3A	EPIC-F2	C-phase positive active energy peak secondary side value	R/W	2	uint32	Three decimal places kwh
3C	EPIC-F3	C-phase positive active energy flat secondary side value	R/W	2	uint32	Three decimal places kwh
3E	EPIC-F4	C-phase positive active energy valley secondary side value	R/W	2	uint32	Three decimal places kwh
40	EPIC-F5	C-phase positive active energy deep valley secondary side value	R/W	2	uint32	Three decimal places kwh
42	EPIC-F6	C-phase positive active energy 6 secondary side value (Preserve Definition)	R/W	2	uint32	Three decimal places kwh
44	EPIC-F7	C-phase positive active energy 7 secondary side value (Preserve Definition)	R/W	2	uint32	Three decimal places kwh
46	EPIC-F8	C-phase positive active energy 8 secondary side value (Preserve Definition)	R/W	2	uint32	Three decimal places kwh

Meter electricity demand (Function Code 03H, 04H)

0x4050	SDaydemand	Total Apparent Power Daily Demand	R	2	float	kva
0x4052	SDaydemandTime	Total apparent power demand occurrence time of the day	R	2	Uint16	Month, day, hour, minute
0x4054	PPDaydemand	Total positive active power daily demand	R	2	float	kw
0x4056	PPDaydemandTime	Total positive active power demand occurrence time of the day	R	2	Uint16	Month, day, hour, minute
0x4058	PNDaydemand	Total Negative Active Power Daily Demand	R	2	float	kw
0x405a	PNDaydemandTime	Total negative active power demand occurrence time of the day	R	2	Uint16	Month, day, hour, minute
0x405c	QPDaydemand	Total positive reactive power daily demand	R	2	float	kvar
0x405e	QPDaydemandTime	Total positive reactive power demand occurrence time of the day	R	2	Uint16	Month, day, hour, minute
0x4060	QDaydemand	Total Negative Reactive Power Daily Demand	R	2	float	kvar
0x4062	QDaydemandTime	Total negative reactive power demand occurrence time of the day	R	2	Uint16	Month, day, hour, minute
0x407c	PPMonthdemand	Total positive active power monthly demand	R	2	float	kw

0x407e	PPMonthdemandTime	Total positive active power demand occurrence time of the month	R	2	Uint16	Month, day, hour, minute
0x4080	PNMonthdemand	Total negative active power monthly demand	R	2	float	kw
0x4082	PNMonthdemandTime	Total negative active power demand occurrence time of the month	R	2	Uint16	Month, day, hour, minute
0x4084	QPMonthdemand	Total positive reactive power monthly demand	R	2	float	kvar
0x4086	QPMonthdemandTime	Total positive reactive power demand occurrence time of the month	R	2	Uint16	Month, day, hour, minute
0x4088	QMonthdemand	Total negative reactive power monthly demand	R	2	float	kvar
0x408a	QMonthdemandTime	Total negative reactive power demand occurrence time of the month	R	2	Uint16	Month, day, hour, minute

Meter frozen parameter (Function Code 03H, 04H)

Range start address	Historical data
0x68-0x86	Parameter frozen value from last 1 day to last 31 days
0x87-0x92	Parameter frozen value from last January to last December

Offset Address	Electrical Energy	R/W	Word length	Type	
Power Freeze					
0x00	Primary value of total active energy	R	2	float	
0x02	Primary value of positive active energy	R	2	float	
0x04	Primary value of negative active energy	R	2	float	
0x06	Primary value of total reactive energy	R	2	float	
0x08	Primary value of positive reactive energy	R	2	float	
0x0a	Primary value of negative reactive energy	R	2	float	
0x0c	Primary value of apparent energy	R	2	float	
0x16	Positive active energy sharp primary value	R	2	float	
0x18	Positive active energy peak primary value	R	2	float	
0x1a	Positive active energy flat primary value	R	2	float	
0x1c	Positive active energy valley primary value	R	2	float	
0x38	A-phase positive active energy primary value	R	2	float	
0x42	A positive active energy sharp value	R	2	float	
0x44	A positive active energy peak value	R	2	float	
0x46	A positive active energy flat value	R	2	float	
0x48	A positive active energy valley value	R	2	float	
0x4c	B-phase positive active energy primary value	R	2	float	

0x56	B positive active energy sharp value	R	2	float	
0x58	B positive active energy peak value	R	2	float	
0x5a	B positive active energy flat value	R	2	float	
0x5c	B positive active energy valley value	R	2	float	
0x60	C-phase positive active energy primary value	R	2	float	
0x6a	C positive active energy sharp value	R	2	float	
0x6c	C positive active energy peak value	R	2	float	
0x6e	C positive active energy flat value	R	2	float	
0x70	C positive active energy valley value	R	2	float	
Demand Freeze					
Oxa4	Total apparent power demand	R	2	float	
0xa6	Total Apparent Power Demand Occurrence Time	R	2	Uint16	
0xa8	Total positive active power demand	R	2	float	
0xaa	Total Active Power Demand Occurrence Time	R	2	Uint16	
Oxac	Total negative active power demand	R	2	float	
0xae	Total Negative Active Power Demand Occurrence Time	R	2	Uint16	
0xb0	Total positive reactive power demand	R	2	float	
0xb2	Total positive reactive power demand occurrence time	R	2	Uint16	
0xb4	Total negative reactive power demand	R	2	float	
0xb6	Total Negative Reactive Power Demand Occurrence Time	R	2	Uint16	
Hourly, daily, monthly power usage freeze					
0xd8	Total primary value of active energy consumption	R	2	float	
0xda	Positive active energy consumption sharp primary value	R	2	float	
0xdc	Positive active energy consumption peak primary value	R	2	float	
0xde	Positive active energy consumption flat primary value	R	2	float	
0xe0	Positive active energy consumption valley primary value	R	2	float	
0xe2	A total positive active energy consumption primary value	R	2	float	
0xe4	A positive active energy consumption sharp primary value	R	2	float	
0xe6	A positive active energy consumption peak primary value	R	2	float	
0xe8	A positive active energy consumption flat primary value	R	2	float	
0xea	A positive active energy consumption valley primary value	R	2	float	
0xec	B total positive active energy consumption primary value	R	2	float	
0xee	B positive active energy consumption sharp primary value	R	2	float	
0xf0	B positive active energy consumption peak primary value	R	2	float	
0xf2	B positive active energy consumption flat primary value	R	2	float	
0xf4	B positive active energy consumption valley primary value	R	2	float	

0xf6	C total positive active energy consumption primary value	R	2	float	
0xf8	C positive active energy consumption sharp primary value	R	2	float	
0xfa	C positive active energy consumption peak primary value	R	2	float	
0xfc	C positive active energy consumption flat primary value	R	2	float	
0xfe	C positive active energy consumption valley primary value	R	2	float	

Meter extreme value

Range start address	Historical data	Range start address	Historical data
0x93	Maximum value record of the month	0x97	Minimum value record of the month
0x94	Last January	0x98	Last January

Offset Address	Name	Explanation	R/W	Word length	Type	
Ox00	UA	A-phase voltage	R	2	float	V
Ox02	UATime	A-phase voltage extreme value occurrence time	R	2	Uint16	year, month, day, hour, minute, second
0x05	UB	B-phase voltage	R	2	float	V
0x07	UBTime	B-phase voltage extreme value occurrence time	R	2	Uint16	year, month, day, hour, minute, second
0x0a	UC	C-phase voltage	R	2	float	V
0x0c	UCTime	C-phase voltage extreme value occurrence time	R	2	Uint16	year, month, day, hour, minute, second
0x0f	UAB	AB line voltage	R	2	float	V
0x11	UABTime	AB line voltage extreme value occurrence time	R	2	Uint16	year, month, day, hour, minute, second
0x14	UBC	BC line voltage	R	2	float	V
0x16	UBCTime	BC line voltage extreme value occurrence time	R	2	Uint16	month, day, hour, minute
0x19	UCA	CA line voltage	R	2	float	V
0x1b	UCATime	CA line voltage extreme value occurrence time	R	2	Uint16	year, month, day, hour, minute, second
0x1e	IA	A-phase current	R	2	float	A
0x20	IATime	A-phase current extreme value occurrence time	R	2	Uint16	year, month, day, hour, minute, second
0x23	IB	B-phase current	R	2	float	A
0x25	IBTime	B-phase current extreme value occurrence time	R	2	Uint16	year, month, day, hour, minute, second
0x28	IC	C-phase current	R	2	float	A
0x2a	ICTime	C-phase current extreme value occurrence time	R	2	Uint16	year, month, day, hour, minute, second

0x2d	IN	N line current	R	2	float	A
0x2f	INTime	N-phase current extreme value occurrence time	R	2	Uint16	year, month, day, hour, minute, second
0x32	PA	A-phase active power	R	2	float	KW
Ox34	PATime	A-phase active power extreme value occurrence time	R	2	Uint16	year, month, day, hour, minute, second
Ox37	PB	B-phase active power	R	2	float	KW
0x39	PBTime	B-phase active power extreme value occurrence time	R	2	Uint16	year, month, day, hour, minute, second
0x3c	PC	C-phase active power	R	2	float	KW
0x3e	PCTime	C-phase active power extreme value occurrence time	R	2	Uint16	year, month, day, hour, minute, second
Ox41	PT	Total active power	R	2	float	KW
Ox43	PTTime	Total active power extreme value occurrence time	R	2	Uint16	year, month, day, hour, minute, second
0x46	QA	A-phase reactive power	R	2	float	Kvar
0x48	QATime	A-phase reactive power extreme value occurrence time	R	2	Uint16	year, month, day, hour, minute, second
0x4b	QB	B-phase reactive power	R	2	float	Kvar
0x4d	QBTime	B-phase reactive power extreme value occurrence time	R	2	Uint16	year, month, day, hour, minute, second
Ox50	QC	C-phase reactive power	R	2	float	Kvar
Ox52	QCTime	C-phase reactive power extreme value occurrence time	R	2	Uint16	year, month, day, hour, minute, second
0x55	QT	Total reactive power	R	2	float	Kvar
0x57	QTTime	Total reactive power extreme value occurrence time	R	2	Uint16	year, month, day, hour, minute, second
0x5a	SA	A-phase apparent power	R	2	float	KVA
0x5c	SATime	A-phase apparent power extreme value occurrence time	R	2	Uint16	day, hour, minute, second
0x5f	SB	B-phase apparent power	R	2	float	KVA
0x61	SBTime	B-phase apparent power extreme value occurrence time	R	2	Uint16	year, month, day, hour, minute, second
0x64	SC	C-phase apparent power	R	2	float	KVA
0x66	SCTime	C-phase apparent power extreme value occurrence time	R	2	Uint16	year, month, day, hour, minute, second
0x69	ST	Total apparent power	R	2	float	KVA
0x6b	STTime	Total Apparent Power Extremum Occurrence Time	R	2	Uint16	year, month, day, hour, minute, second

Meter harmonic fundamental wave (Function Code 03H, 04H)

Address	Name	Explanation	R/W	Word length	Type	remark
0x9B00	THDUaP	A-phase voltage total harmonic content rate	R	1	Uint16	0.1%
0x9B01	THDUbP	B-phase voltage total harmonic content rate	R	1	Uint16	0.1%
0x9B02	THDUcP	C-phase voltage total harmonic content rate	R	1	Uint16	0.1%
0x9B03	THDIaP	A-phase current total harmonic content rate	R	1	Uint16	0.1%
0x9B04	THDIbP	B-phase current total harmonic content rate	R	1	Uint16	0.1%
0x9B05	THDIcP	C-phase current total harmonic content rate	R	1	Uint16	0.1%
0x9B06	THDUaPO	A-phase Voltage Total Odd Harmonic Content Rate	R	1	Uint16	
0x9B07	THDUbPO	B-phase Voltage Total Odd Harmonic Content Rate	R	1	Uint16	
0x9B08	THDUcPO	C-phase Voltage Total Odd Harmonic Content Rate	R	1	Uint16	
0x9B09	THDIaPO	A-phase Current Total Odd Harmonic Content Rate	R	1	Uint16	
0x9B0A	THDIbPO	B-phase Current Total Odd Harmonic Content Rate	R	1	Uint16	
0x9B0B	THDIcPO	C-phase Current Total Odd Harmonic Content Rate	R	1	Uint16	
0x9B0C	THDUaPE	A-phase Voltage Total Even Harmonic Content Rate	R	1	Uint16	
0x9B0D	THDUbPE	B-phase Voltage Total Even Harmonic Content Rate	R	1	Uint16	
0x9B0E	THDUcPE	C-phase Voltage Total Even Harmonic Content Rate	R	1	Uint16	
0x9B0F	THDIaPE	A-phase Current Total Even Harmonic Content Rate	R	1	Uint16	
0x9B10	THDIbPE	B-phase Current Total Even Harmonic Content Rate	R	1	Uint16	
0x9B11	THDIcPE	C-phase Current Total Even Harmonic Content Rate	R	1	Uint16	
0x9B12	THUaP（2-31）	A-phase voltage 2-31 harmonic content rate	R	1	Uint16	
0x9B50	THUbP（2-31）	B-phase voltage 2-31 harmonic content rate	R	1	Uint16	
0x9B8E	THUcP（2-31）	C-phase voltage 2-31 harmonic content	R	1	Uint16	

		rate				
0x9BCC	THIaP（2-31）	A-phase current 2-31 harmonic content rate	R	1	Uint16	
0x9C0A	THIbP（2-31）	B-phase current 2-31 harmonic content rate	R	1	Uint16	
0x9C48	THIcP（2-31）	C-phase current 2-31 harmonic content rate	R	1	Uint16	
0x9C86	THDUaV	A-phase voltage total harmonic amplitude	R	2	float	
0x9C88	THDUbV	B-phase voltage total harmonic amplitude	R	2	float	
0x9C8A	THDUcV	C-phase voltage total harmonic amplitude	R	2	float	
0x9C8C	THDIaV	A-phase current total harmonic amplitude	R	2	float	
0x9C8E	THDIbV	B-phase current total harmonic amplitude	R	2	float	
0x9C90	THDIcV	C-phase current total harmonic amplitude	R	2	float	
0x9C92	THUaV（2-31）	A-phase voltage 2-31 harmonic amplitude	R	2	float	
0x9D0E	THUbV（2-31）	B-phase voltage 2-31 harmonic amplitude	R	2	float	
0x9D8A	THUcV（2-31）	C-phase voltage 2-31 harmonic amplitude	R	2	float	
0x9E06	THIaV（2-31）	A-phase current 2-31 harmonic amplitude	R	2	float	
0x9E82	THIbV（2-31）	B-phase current 2-31 harmonic amplitude	R	2	float	
0x9EFE	THIcV（2-31）	C-phase current 2-31 harmonic amplitude	R	2	float	

Meter alarm record (Function Code 03H, 04H) Note: A total of 128 alarm records can be read.

Address	Name	Explanation	R/W	Word length	Type	Remark
0xA000	Alarm 1 type	High byte: alarm number 1-90 Low byte: 0: alarm release, 1: high alarm, 2: low alarm	R	1	Uint16	
0xA001	Alarm 1 year month	High byte: year Low byte: month	R	1	Uint16	
0xA002	Alarm 1 day hour	High byte: day Low byte: hour	R	1	Uint16	
0xA003	Alarm 1 minute second	High byte: minute Low byte: second	R	1	Uint16	
0xA004	Alarm 1 millisecond	Millisecond 0-999ms	R	1	Uint16	
0xA005	Alarm 1 value	The value when the alarm occurs	R	2	float	
0xA007	Alarm 1 channel	Low byte: 1: Alarm 1 2: Alarm 2	R	1	Uint16	
0xA008	Alarm 2 record	Alarm 2 record	R	8	Uint16	
0xA010	Alarm 3 record	Alarm 3 record	R	8	Uint16	

Alarm number				
1: A-phase current	2：B-phase current	3：C-phase current	4: Arbitrary phase current	5：N-phase current
6：A-phase voltage	7：B-phase voltage	8：C-phase voltage	9：Arbitrary phase voltage	10：AB line voltage
11：BC line voltage	12：CA line voltage	13：Arbitrary line voltage	14：A-phase active	15：B-phase active
16：C-phase active	17：Total active	18：A-phase reactive	19：B-phase reactive	20：C-phase reactive
21：Total reactive	22：A-phase apparent	23：B-phase apparent	24：C-phase apparent	25：Total apparent
26：A-phase power factor	27：B-phase power factor	28：C-phase power factor	29：Total power factor	30：Frequency
31：Voltage unbalance	32：Current unbalance	33：A-phase current total harmonic content rate	34： B-phase current total harmonic content rate	35：C-phase current total harmonic content rate
36： A-phase voltage total harmonic content rate	37：B-phase voltage total harmonic content rate	38：C-phase voltage total harmonic content rate	39: A-phase current total even harmonic content rate	40：B-phase current total even harmonic content rate
41：C-phase current total even harmonic content rate	42：A-phase voltage total even harmonic content rate	43：B-phase voltage total even harmonic content rate	44：C-phase voltage total even harmonic content rate	45：A-phase current total odd harmonic content rate
46：A-phase current total odd harmonic content rate	47：A-phase current total odd harmonic content rate	48：A-phase voltage total odd harmonic content rate	49：B-phase voltage total odd harmonic content rate	50：C-phase voltage total odd harmonic content rate
51：A-phase current demand alarm	52：B-phase current demand alarm	53：C-phase current demand alarm	54：Total positive active demand alarm	55：Total Negative Active Demand Alarm
56：Total positive reactive power demand alarm	57：Total negative reactive power demand alarm	58：Total apparent power demand alarm	59：DI1 alarm	60：DI2 alarm
61：DI3 alarm	62：DI4 alarm	63：DI5 alarm	64：DI6 alarm	65：DI7 alarm
66：DI8 alarm	67：DI9 alarm	68：DI10 alarm	69：DI11 alarm	70：DI12 alarm
71：DI13 alarm	72：DI14 alarm	73：DI15 alarm	74：DI16 alarm	75：Leakage (temperature) 1
76：Leakage (temperature) 2	77：Leakage (temperature) 3	78：Leakage (temperature) 4	79：Leakage (temperature) 5	80：Leakage (temperature) 6
81：Leakage (temperature) 7	82：Leakage (temperature) 8	83：Leakage (temperature) 9	84：Leakage (temperature) 10	85：Leakage (temperature) 11
86：Leakage (temperature) 12	87：Leakage (temperature) 13	88：Leakage (temperature) 14	89：Leakage (temperature) 15	90：Leakage (temperature) 16

Meter event logging (Function Code 03H, 04H) Note: A total of 64 event records can be read.

Address	Name	Explanation	R/W	Word length	Type	Remark
0xA400	Action type	High byte 0: null 1：DO 2：DI Low byte 0: open 1: close	R	1	Uint16	
0xA401	Action channel	Channel 1~8	R	1	Uint16	
0xA402	Action year month	High byte: year Low byte: month	R	1	Uint16	
0xA403	Action day hour	High byte: day Low byte: hour	R	1	Uint16	
0xA404	Action minute second	High byte: minute Low byte: second	R	1	Uint16	
0xA405	Action millisecond	Millisecond 0-999ms	R	1	Uint32	

0xA406	Event 2 record	Alarm 3 record	R	6	Uint16	
0xA41C	Event 3 record	Alarm 3 record	R	6	Uint16	

Other parameter (Function Code 03H, 04H)

Address	Name	Explanation	R/W	Word length	Type	Remark
0xB000	DI1cnt	Pulse count 1	R	2	Uint32	
0xB002	DI2cnt	Pulse count 2	R	2	Uint32	
0xB004	DI3cnt	Pulse count 3	R	2	Uint32	
0xB006	DI4cnt	Pulse count 4	R	2	Uint32	
0xB008	Operation hour	Unit:minute	R	2	Uint32	
0xB00A	I-pecnt	Load rate 0.1%	R	1	Uint16	

6.2 Communication App Detail

AMC series intelligent power collection and monitoring devices have unified planning on the communication address table during the design. Users can easily realize telemetry, remote signaling, remote control and other functions according to the following introduction.

The digital input of AMC series intelligent power collection and monitoring device adopts dry contact switch signal input method. The instrument is equipped with +5V working power supply inside, without external power supply. When the external contact is closed or disconnected, the instrument displays the switch status locally. At the same time, the remote transmission function, that is, the "remote communication" function, can be realized through the communication port of the instrument.

The switch output of AMC series intelligent power acquisition and monitoring device is relay output, which can be controlled remotely by the host computer (there are two ways of remote control: 1. Level trigger; 2. Pulse trigger) to realize the "remote control" function. Corresponding alarm functions (such as overcurrent and undervoltage) can also be implemented according to customer requirements.

The communication addresses related to the digital input and output of the AMC series intelligent power collection monitoring device are 1036H and 1037H, and the corresponding relationship with the digital input and output is as follows:

1036H	7	6	5	4	3	2	1	0
							DO2	DO1
1037H	7	6	5	4	3	2	1	0
					DI4	DI3	DI2	DI1

6.3 Correspondence

Communication is compatible with MODBUS-RTU protocol, DLT645 protocol supports 07 and 97 versions.

DLT-645 protocol supports reading four-quadrant energy, three-phase voltage, current, active power, reactive power and power factor(multi-rate table supports reading positive active energy in various periods of time, historical energy, time). It can be read in blocks.

E.g. The command to read the 07 version of the positive active energy specification is:

Send→	11H	68 11 00 00 00 00 00 68 11 04 33 33 34 33 C3 16	2013-06-05 11:27:53	
Receive←	91H	68 11 00 00 00 00 00 68 91 08 33 33 34 33 A8 35 33 33 8A 16	2013-06-05 11:27:53	Success

The command to read the 97 version of the positive active energy specification is:

Send→	01H	68 11 00 00 00 00 00 68 01 02 43 C3 EA 16	2013-06-05 11:27:06	
Receive←	81H	68 11 00 00 00 00 00 68 81 06 43 C3 A8 35 33 33 B1 16	2013-06-05 11:27:06	Success

7 Common Fault Analysis

7.1 Wiring Diagnostics

Voltage/current phase sequence diagnosis: when the voltage and current phase sequences are the same, the phase sequence is defined as correct. When the voltage and current phase sequences are inconsistent, there is a circle at the corresponding phase position of the current interface.

Table 9 Analysis and elimination of common faults

Fault content	Analysis	Remark
No display when powering on	Check whether the power supply voltage is within the operating voltage range.	
Incorrect readings of voltage, current, energy, etc.	Check whether the voltage-to-current ratio setting is correct. Check whether the wiring mode setting is consistent with the actual. Check whether the voltage transformer and current transformer are in good condition.	
Incorrect power or power factor	Check whether the wiring mode setting is consistent with the actual. Check whether the voltage and current phase sequence is correct. Check whether the wiring is correct.	
Abnormal Communication	Check whether the address, baud rate, check digit, etc. in the communication settings are consistent with the host computer. Check whether the RS485 converter is normal. The communication terminal should be connected in parallel with a resistance of more than 120 ohms. Check whether the wiring is correct.	

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