



MULTIFUNCTION POWER METER

ASM3 PV USER MANUAL

1. SAFETY PRECAUTIONS

The manufacturer is not responsible of the failure comply with the instructions in this manual.

CAUTION:

Ensure that only qualified technicians work on the installation and maintenance.

Never work alone.



The electrical parameters supplied should be within the nominal range

Before any work with or on the equipment, isolate the voltage inputs and auxiliary power supplies, cut the secondary of all CTs (current transformers), but never cut the secondary of the PT. (Power Transformers)

Always use an appropriate voltage sensing device to ensure that everything is switched off and that no voltage is present in any part of the equipment

Risk in the device

- ◆ The voltage of the auxiliary power supply is outside the nominal range
- ◆ The frequency of the power distribution system is outside the nominal range.
- ◆ The input polarity of the voltage or current is connected incorrectly.
- ◆ Remove or connect communication connections without switching off the device.
- ◆ Connect the cables to the terminal contrary to the instructions.

	"Danger" is used to warn workers that a danger exists; if the "Danger" is ignored, it will cause severe personal injury, death, equipment damage or property damage.
	"Warning" is used to indicate that death or serious personal injury may occur if proper precautions are not taken.

2. ABOUT THIS MANUAL

This manual deals with the characteristics of the ASM3 PV measuring device in its different versions and shows the necessary instructions for its correct installation and start-up.

In our website you will find the ModBus register map necessary to communicate with the equipment. However, this manual describes the configuration and start-up of the equipment through the Saci software.

This software can be downloaded free from the Saci website (www.saci.es). To install it, you only need to download and run the file. Once executed, follow the installation instructions and you will have access to the application which you can communicate with the equipment.

This manual assumes that user has knowledge about the network measurement parameters and knows the measurement and power supply system's where the equipment will be installed.

If you have any questions about this user manual or the equipment, please contact your local Saci distributor.

INDEX

1. SAFETY PRECAUTIONS	1
2. ABOUT THIS MANUAL.....	2
3. GENERAL DESCRIPTION.....	5
3.1 Equipment features.....	5
4. MEASURE	7
4.1 Measurement parameters through the user interface.....	7
4.1.1 Network parameters	7
4.1.2 Energy.....	8
4.1.3 Quality	8
4.1.4 Demand	9
4.1.5 Maximums and minimums.....	10
4.1.6 Harmonics	11
5. INSTALLATION	12
5.1 Dimensions	12
5.2 Connection.....	12
5.3 Installation	13
6. CONFIGURATION SOFTWARE	15
6.1 Connecting with the equipment.....	15
6.2 Equipment configuration	15
7. Display	17
7.1 Panel.....	17
7.2 Electric parameter display	17
7.2.1 Power Display.....	17
7.2.2 Energy display	19
7.2.3 Harmonics display	20

7.2.4 Demand display	21
7.3 Button operation setting	22
7.3.1 Setup menu structure	24
7.3.2 System setting	26
7.3.3 Signal input setting.....	27
7.3.4 Communication setting	28
8. TECHNICAL SPECIFICATIONS.....	29
9. Ordering information.....	31
9.1 Specifications	31
It is possible to order the equipment with a specific configuration (consult sales team).....	31
9.2 Disclaimer	31

3. GENERAL DESCRIPTION

The ASM3-PV is designed for the calculation and measurement of the electrical variables of a network such as voltage, current, frequency, power, power factor, energy, harmonics, demand, etc.

The analyser can measure up to 800 V phase-to-phase directly, which makes it ideal for the connection of inverters in photovoltaic plants, control and energy management systems and automation of substations and distribution networks.

It has communications through the RS485 port with ModBus protocol, making it possible to acquire data from the equipment on a computer using the equipment's user application.

EQUIPMENT

- ModBus-RTU communication protocol.
- The equipment is fully configurable through the software developed by Saci or through its Modbus map.
- Panel mounting 96 x 96
- Direct measurement up to 1000V phase-to-phase; 800 V phase-to-phase nominal.

USER INTERFACE

- Available in several languages.
- Allows easy and intuitive configuration of the equipment.
- Display of electrical parameters.
- Data export to Excel table.

COMMUNICATIONS

- ModBus-RTU communication protocol
- RS485 communication port for reading and writing device parameters.

3.1 Equipment features

Appearance and precision	Display	LCD
	Installation	Panel mounting
	Active energy accuracy	0.5S
	Reactive energy accuracy	2S
RMS measurements	U/I/P/Q/S/PF/F	■
	Demand	■
Energy measurement	Bi-directional energy	■
	Reactive energy in the four quadrants	■

Communications port	RS485 interface	■
Power quality	Harmonic distortion THD U/I	■

4. MEASURE

The ASM3-PV can measure the following parameters. Sampling is done period by period, without ignoring any of them, so that the measurement responds exactly to the real time value. Special care has been taken to ensure the accuracy of the sampling time:

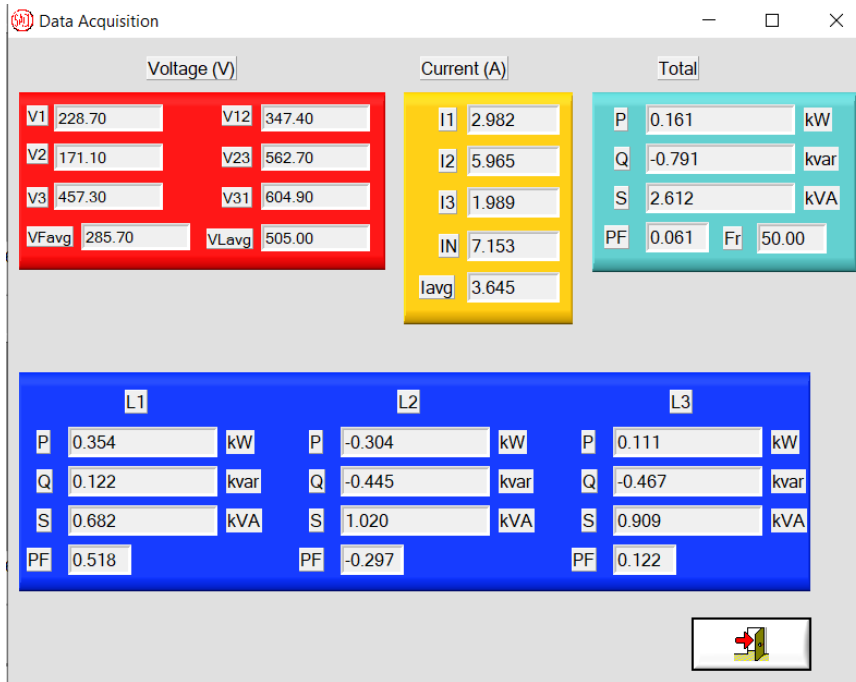
- Voltage
- Current
- Power
- Power factor
- Frequency
- Energy

Function	Signal	Accuracy	Range	Display range
VOLTAGE	U	0.5	10—690 V F-N 10—1000 V F-F	0--999.9 kV
CURRENT	I	0.5	0--5 A	0--99.99 kA
ACTIVE POWER	P	0.5	0—10.35 kW	0--9999 MW
REACTIVE POWER	Q	0.5	0—10.35 kvar	0--9999 Mvar
APPARENT POWER	S	0.5	0—10.35 kVA	0--9999 MVA
POWER FACTOR	PF	0.5	0--1.00	0--1.000
FRECUENCIA	F	±0.01Hz	45--65 Hz	45.00Hz-65.00 Hz
ACTIVE ENERGY	EP	0.5s	--	0--99999999 MWh
REACTIVE ENERGY	EQ	2	--	0--99999999 Mvarh
THD_V	THDu	Class A	51	0--99.99 %
THD_I	THDi	Class A	51	0--99.9 9%
DEMAND	--	0.5	--	--

4.1 Measurement parameters through the user interface

4.1.1 Network parameters

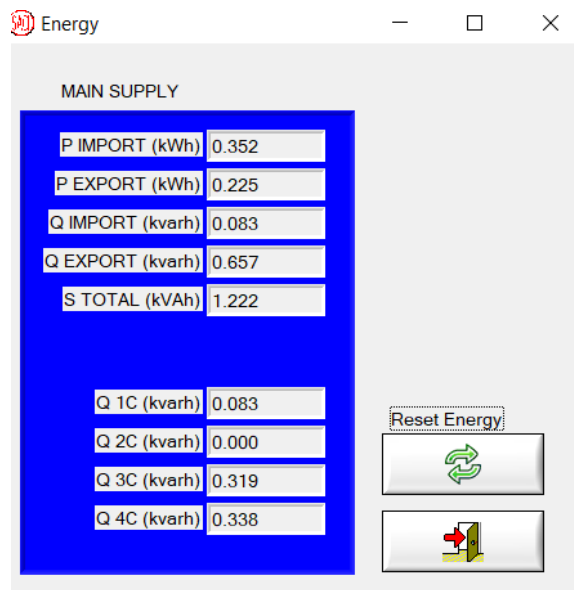
The equipment measures the voltage, current, frequency, power and power factor of each phase and of the system.




4.1.2 Energy

The equipment supports excellent energy measurement functions such as the following:

- Bi-directional measurement energy.
- Four reactive power measurement quadrants




By clicking on the icon  the energy meters are reset. To do this, it is necessary to enter the configuration password of the device.

4.1.3 Quality

The equipment displays parameters related to network quality such as voltage and current unbalances, and the phase angle between voltages and between voltages and currents.

Quality

Shift Angles (°)		Voltages Unbalance		Currents Unbalance					
VL1	0.0	IL1	11.6	V_SEQ_POS	211.8	I_SEQ_POS	1.428		
VL2	119.9	IL2	348.2	V_SEQ_NEG	64.8	I_SEQ_NEG	1.935		
VL3	239.9	IL3	157.9	V_SEQ_ZERO	64.8	I_SEQ_ZERO	1.683		
				DESEQ. V	30.5	%	DESEQ. I	135.5	%



4.1.4 Demand

The unit displays the current, previous and maximum demand. The variables displayed are the current per phase and total P, Q and S.


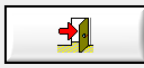
Max. Demand

Actual	Previous	Max. Demand
IL1 (A) 2.982	IL1 (A) 2.982	IL1 (A) 3.000
IL2 (A) 5.965	IL2 (A) 5.965	IL2 (A) 6.000
IL3 (A) 1.989	IL3 (A) 1.988	IL3 (A) 2.001
P (kW) 0.160	P (kW) 0.160	P (kW) 0.286
Q (kvar) -0.790	Q (kvar) -0.790	Q (kvar) -1.516
S (kVA) 2.611	S (kVA) 2.611	S (kVA) 2.642

PERIOD. 5 1..30 min
T. REFR. 60 0..9999 s

Mode: Fijo (Fix) - Vent. (Slip) - Sincro. -

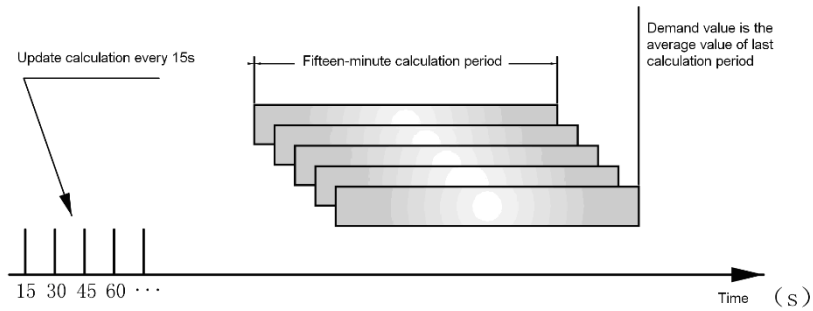
RESET

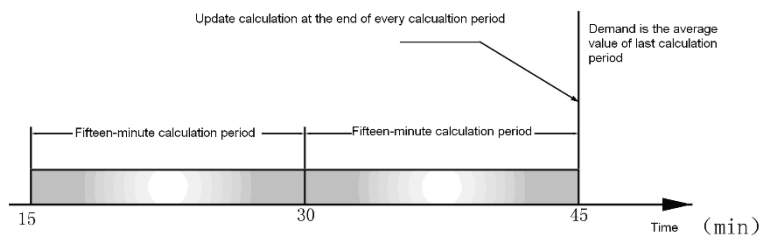
There are two demand measurement modes which are: sliding and fixed. The corresponding time parameters are set as t (update time) and T (time zone). T is integral multiple of t.

Sliding: the meter calculates the average demand during the last T minutes every t second, tests and records the value, automatically reads the demand every month.

Fixed: the meter calculates the average demand during the last T minutes after T minutes, tests and records the value, automatically reads the demand each month.



Sliding mode

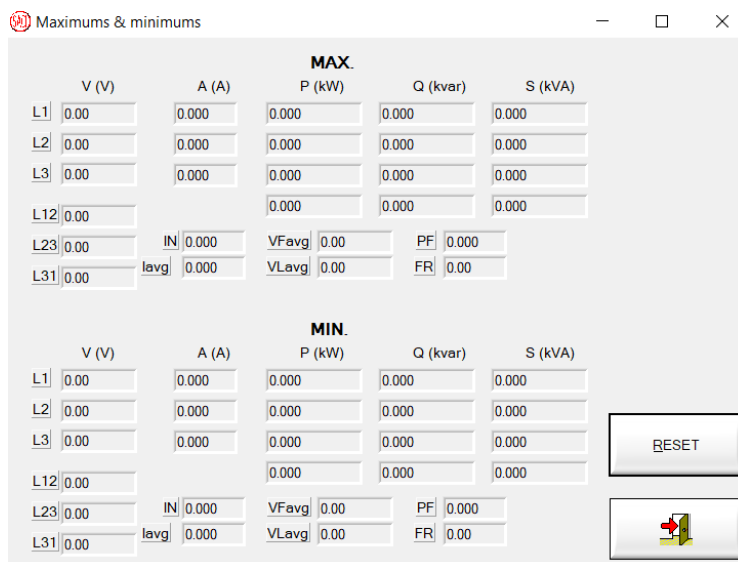


Fixed mode

Note: The calculation method for the above images takes 15 min as an example.

4.1.5 Maximums and minimums

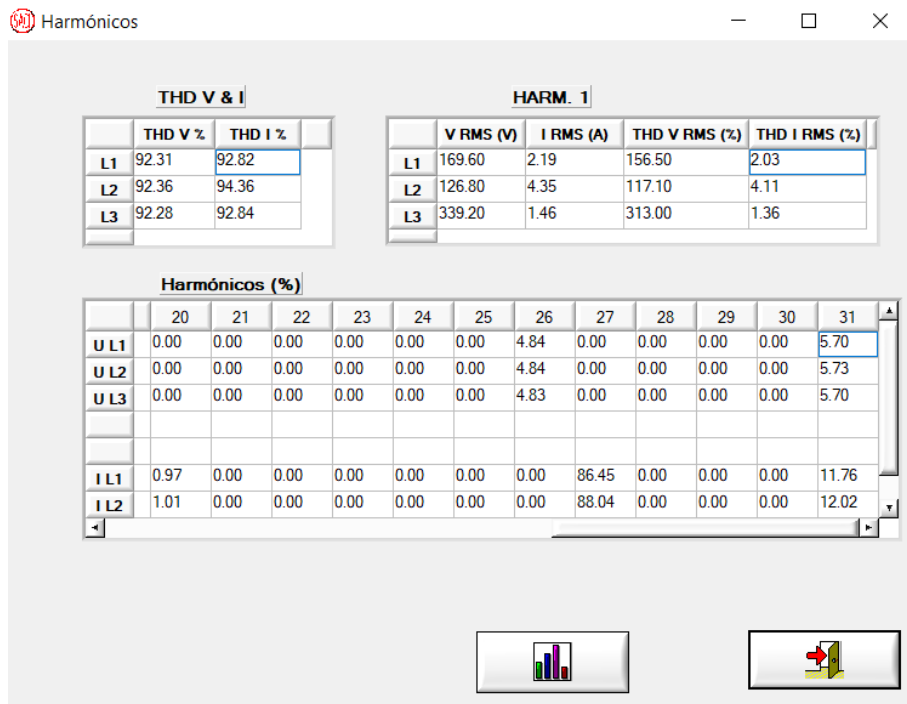
The equipment displays both the maximum and minimum of the instantaneous variables it measures.



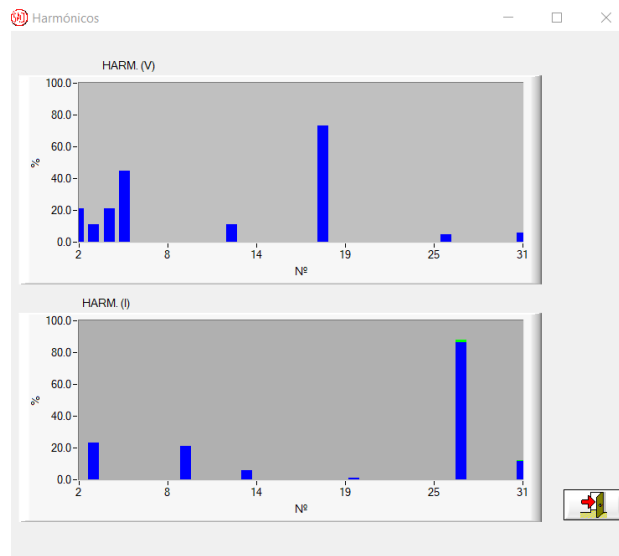
The equipment also allows to know the maximum and minimum that occur in each time interval (configurable) obtaining the maximum and minimum of the previous interval.

4.1.6 Harmonics

The device displays both the fundamental harmonic and the harmonics up to 31 of the voltage and current. In addition, it also displays the THD value of the voltage and current per phase.

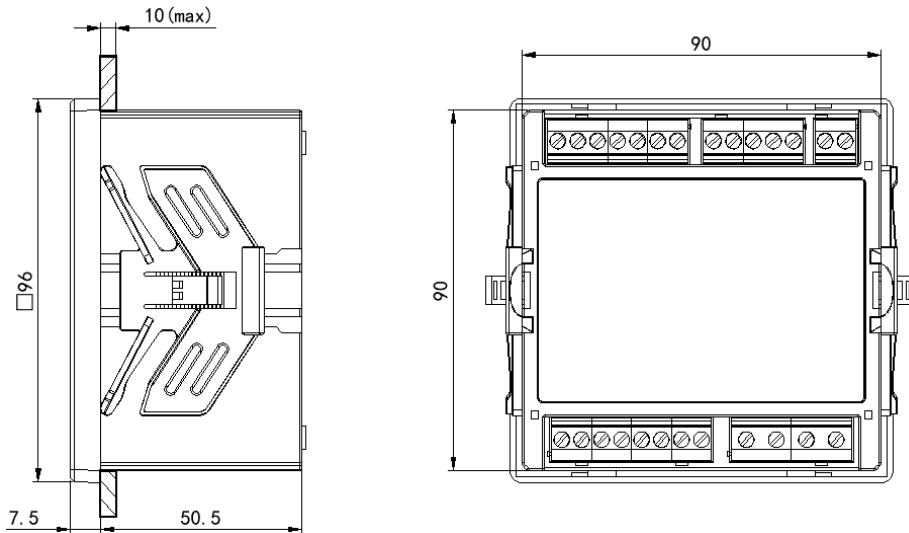


Harmonic information can also be displayed as a bar graph:

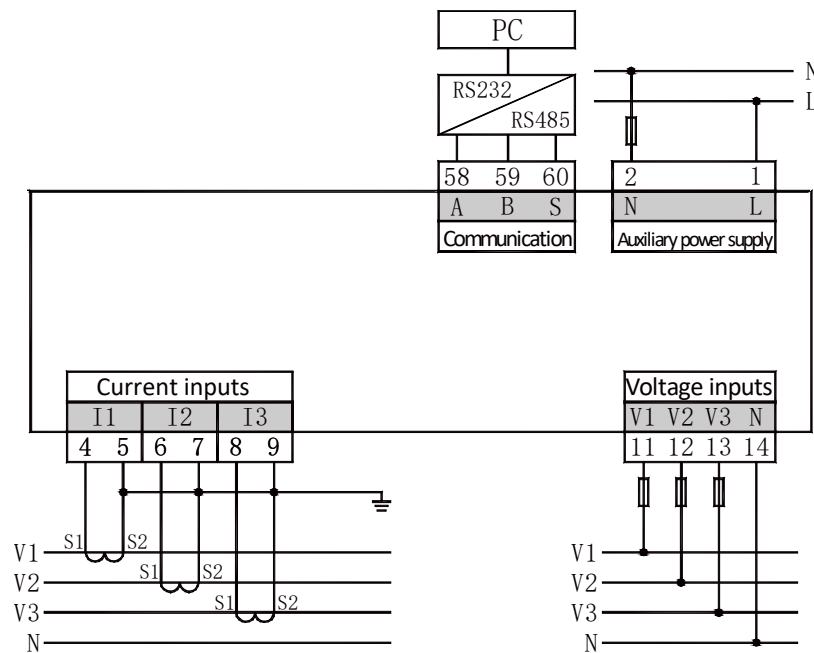


5. INSTALLATION

5.1 Dimensions



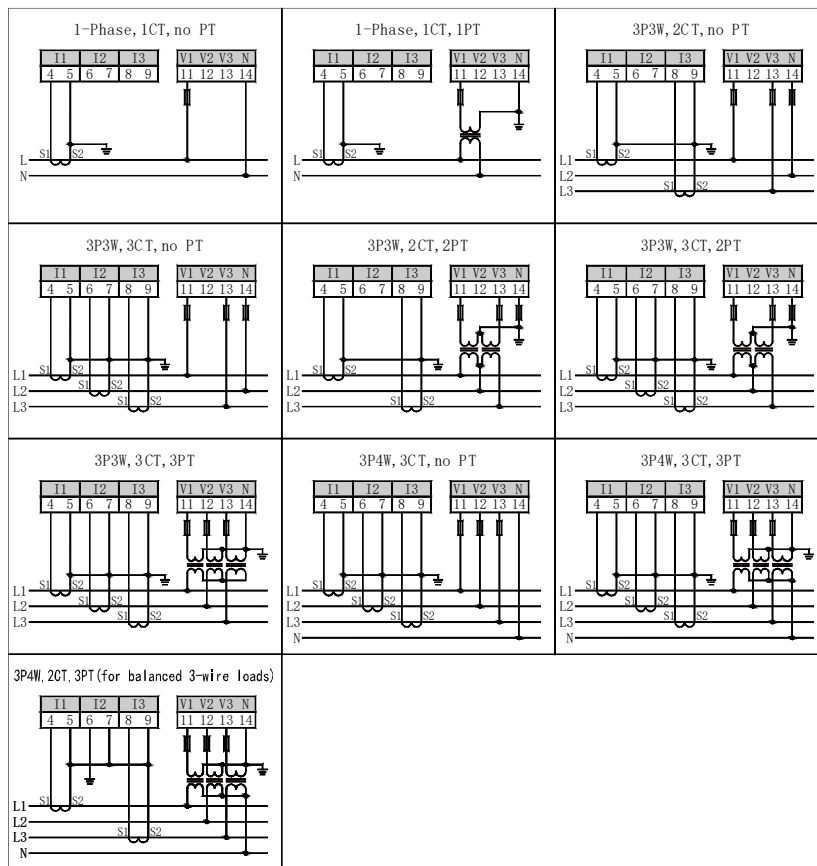
5.2 Connection



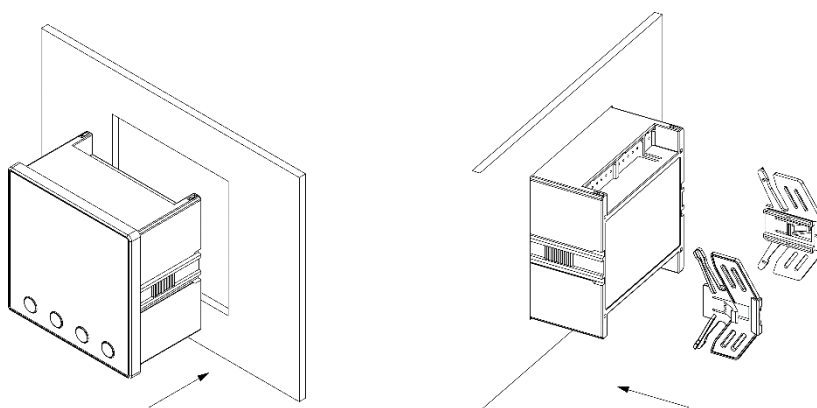
Power supply	1, 2	For AC and DC
Current signals	4, 5, 6, 7, 8, 9	Current input
Voltage signals	11, 12, 13, 14	Voltage input
Communication	58, 59, 60	A, B y S.

The equipment can operate in three-phase three-wire (3P3W), three-phase four-wire (3P4W) or single-phase two-wire (1P2W) mode. The user must select the appropriate wiring mode

according to the intended use. It should be noted that the wiring method must be consistent with the measurement method configured in the equipment, otherwise the measurement data of the equipment will be incorrect.



5.3 Installation



- 1) Open a 91×91 (mm) hole in the power distribution cabinet.
- 2) Pull out the instrument and remove the fixing bracket.
- 3) The instrument is installed into the hole created from the front.

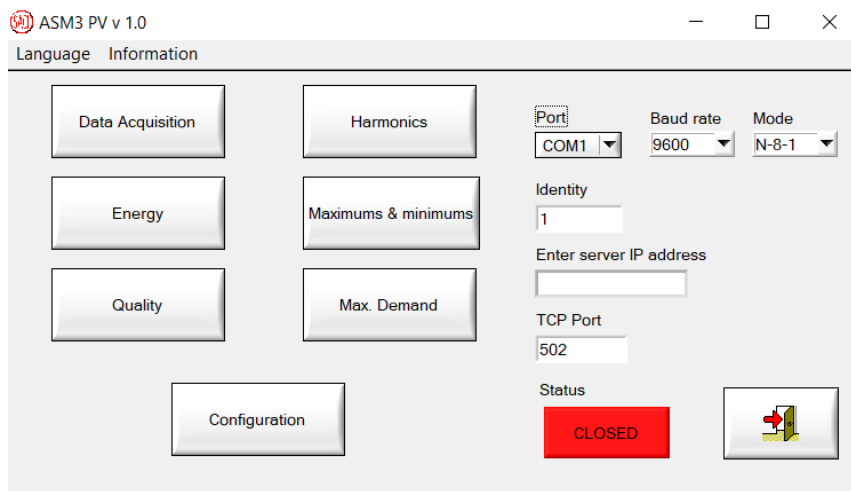
4) Insert the instrument fixing bracket and tighten the screw or push the clamp to fix the instrument.

6. CONFIGURATION SOFTWARE

Once the equipment has been installed, the application has been downloaded and the communication has been carried out, you have to configure the equipment according to your installation:

6.1 Connecting with the equipment.

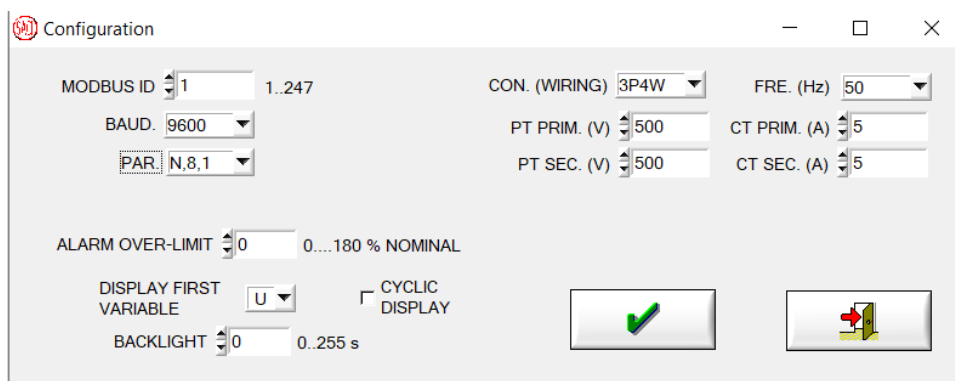
To communicate with the equipment through the ModBus protocol it is necessary that the equipment has an identity (by default all the equipment's have identity 1). By connecting the equipment through the RS485 port, it can be connected through a COM port or through TCP/IP. In this case, the IP address and port must be entered.



Once you have entered the connection parameters, simply press the "close" button and enter the configuration menu.

6.2 Equipment configuration

Once connected to the equipment, you can access its configuration. To do so, press the CONFIGURATION button:

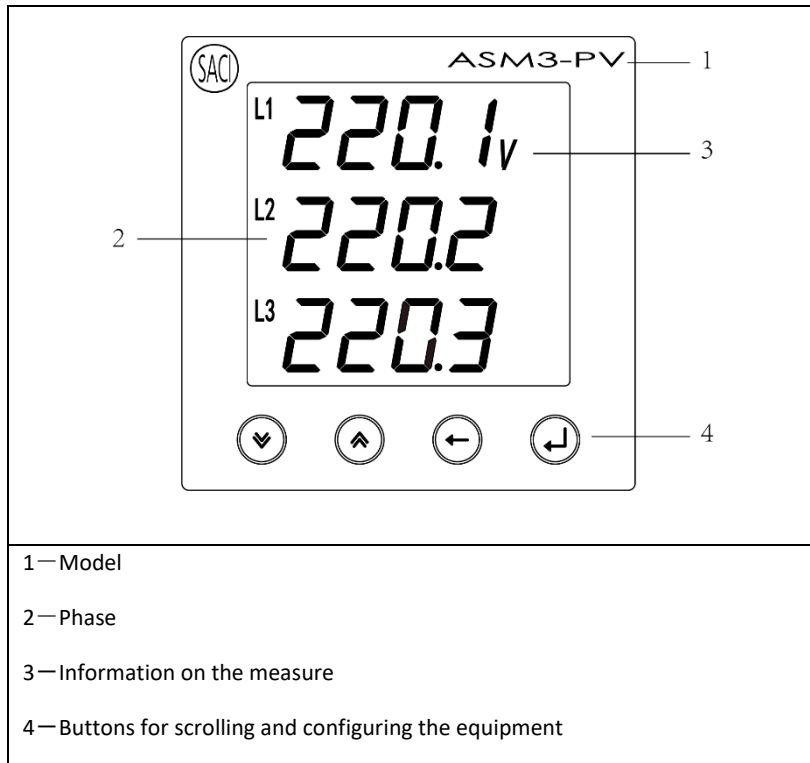


In this screen you can change the communication parameters. By default, the equipment comes with Modbus ID 1, speed 9600 baud and parity N-8-1. The nominal values of the installation to be measured; and the display configuration can also be selected.

In addition, the alarm trigger value can also be configured.

7. Display

7.1 Panel



7.2 Electric parameter display

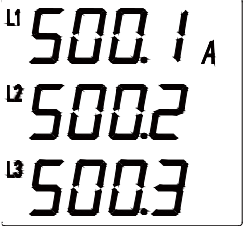
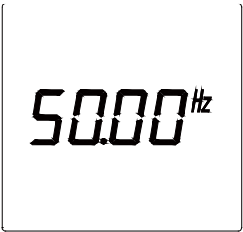
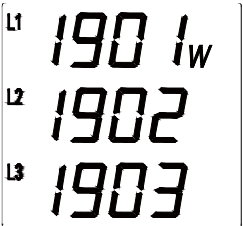
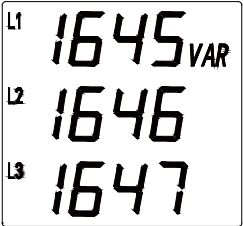
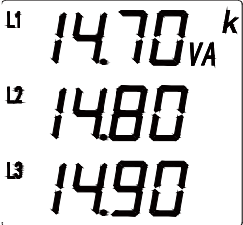
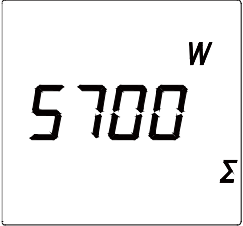
The basic categories included in the meter measurement display: basic power, bidirectional power, harmonics, and demand. Press the "↓" or "↑" key to display the measurement data cyclically and press the "←" key to quickly switch the display between each measurement category.


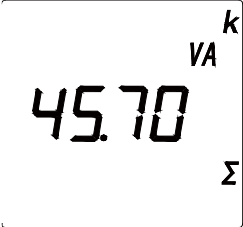
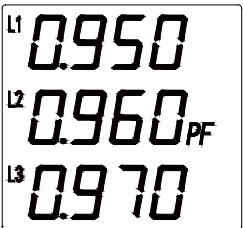
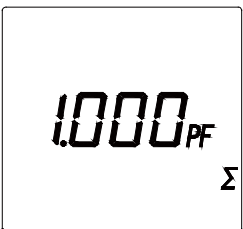
7.2.1 Power Display

The power display interface displays voltage, current, active/reactive/apparent power, power factor, and frequency respectively. The description of the display interface is as follows:

Table 4-1 Power display interface

Power display interface	Description
	Three phase phase voltage U L1=220.1V, U L2=220.2V, U L3=220.3V。
	Three phase line voltage U L12=380.5V, U L23=380.6V, U L31=380.7V。

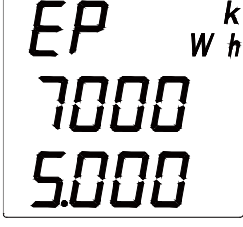
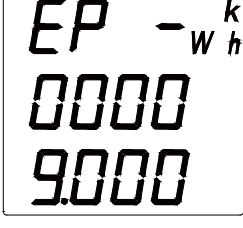
	<p>Three phase current</p> <p>I L1=500.1A, I L2=500.2A, I L3=500.3A。</p>
	<p>Frequency F=50.00Hz。</p>
	<p>Three phase active power</p> <p>P L1=1901W, P L2=1902W, P L3=1903W。</p>
	<p>Three phase reactive power</p> <p>Q L1=1645var, Q L2=1646var, Q L3=1647var。</p>
	<p>Three phase apparent power</p> <p>S L1=14.7kVA, S L2=14.8kVA, S L3=14.9kVA。</p>
	<p>Total active power</p> <p>P=5700W。</p>

	<p>Total reactive power</p> <p>Q=4936var。</p>
	<p>Total apparent power</p> <p>S=45.7kVA。</p>
	<p>Three phase power factors</p> <p>PF L1=0.950,</p> <p>PF L2=0.960,</p> <p>PF L3=0.970。</p>
	<p>Total power factor</p> <p>PF=1.000。</p>

7.2.2 Energy display

The energy display interface displays the two-way active and reactive power respectively. The descriptions are as follows:

Table 4-2 Energy display interface

Energy display interface	Description
	<p>Total import active energy</p> <p>EP=70005kWh</p>
	<p>Total export active energy</p> <p>EP-=9kWh</p>

<p>The display shows 'EQ' followed by a small 'k' and 'VARh' to the right. Below this, the number '0065' is displayed on the top line, and '0000' is displayed on the bottom line.</p>	<p>Total import reactive energy EQ=650kvarh</p>
<p>The display shows 'EQ' followed by a minus sign and a small 'k' and 'VARh' to the right. Below this, the number '0000' is displayed on the top line, and '0000' is displayed on the bottom line.</p>	<p>Total export reactive energy EQ- =0kvarh</p>

7.2.3 Harmonics display

The harmonic display interface displays the total harmonic distortion rate of each phase voltage and current respectively. The harmonic components can be read through communication, and the display interface is described as follows:

Table 4-4 Harmonic display interface

Harmonic display interface	Description
<p>The display shows 'THD' followed by 'U1' and a small 'THD' to the right. Below this, the number '04.16%' is displayed.</p>	<p>Displays the total harmonic distortion ratio of the voltage The total distortion ratio of U1=4.16%.</p>
<p>The display shows 'THD' followed by 'U2' and a small 'THD' to the right. Below this, the number '04.20%' is displayed.</p>	<p>Displays the total harmonic distortion ratio of the voltage The total distortion ratio of U2=4.20%.</p>
<p>The display shows 'THD' followed by 'U3' and a small 'THD' to the right. Below this, the number '04.03%' is displayed.</p>	<p>Displays the total harmonic distortion ratio of the voltage The total distortion ratio of U3=4.03%.</p>
<p>The display shows 'THD' followed by 'I1' and a small 'THD' to the right. Below this, the number '03.01%' is displayed.</p>	<p>Displays the total harmonic distortion ratio of the current The total distortion ratio of I1=3.01%.</p>

<p>The LCD display shows the text 'tHd' on the top line, '12' on the second line, 'THD' on the right side of the second line, and '03.12%' on the third line.</p>	<p>Displays the total harmonic distortion ratio of the current The total distortion ratio of I2=3.12%.</p>
<p>The LCD display shows the text 'tHd' on the top line, '13' on the second line, 'THD' on the right side of the second line, and '03.04%' on the third line.</p>	<p>Displays the total harmonic distortion ratio of the current The total distortion ratio of I3=3.04%.</p>
<p>The LCD display shows the text 'tHd' on the top line, 'U12' on the second line, 'THD' on the right side of the second line, and '04.15%' on the third line.</p>	<p>Display the total harmonic distortion rate of the voltage in the case of three-phase three-wire The total harmonic distortion rate of U12=4.15%</p>
<p>The LCD display shows the text 'tHd' on the top line, 'U32' on the second line, 'THD' on the right side of the second line, and '04.01%' on the third line.</p>	<p>Display the total harmonic distortion rate of the voltage in the case of three-phase three-wire The total harmonic distortion rate of U32=4.01%</p>

7.2.4 Demand display








Demand display interface displays demand value of three phase current and power. The display interface is described as follows:





Table 4-5 Demand display interface



Demand display interface	Description
<p>The LCD display shows the text 'dPd' on the top line, 'A' on the right side of the top line, '11' on the second line, and '3000' on the third line.</p>	<p>The maximum demand of I1=3A.</p>
<p>The LCD display shows the text 'dPd' on the top line, 'A' on the right side of the top line, '12' on the second line, and '4000' on the third line.</p>	<p>The maximum demand of I2=4A.</p>



	<p>The maximum demand of I3=5A.</p>
	<p>The maximum demand of P=3600W.</p>
	<p>The maximum demand of Q=2500var.</p>
	<p>The maximum demand of S=5700VA.</p>


7.3 Button operation setting





Long press the " " key. When the main menu is displayed as "rEd", press the " " or " " key to select "PrG" to enter the password authentication interface. Press the " " or " " key to enter the password (the system initial password is 0001), then press " " key to enter the parameter setting interface. (Note: If the interface does not change after entering the password and pressing the " " key, it means that the password is incorrect.)


The use of keys in operation: " " or " " key is used for menu switching at the same level and value addition and subtraction, " " key is the function key for up and down, and " " key is used to enter the lower menu and confirm after modifying the value.

How to increase or decrease the value of digits: Press the " " key to move the cursor to the numerical digit to be modified and press the " " key to modify the corresponding numerical digit.

After the data (or options) of the third-level menu is changed, it will take effect only if you press the " " key to return to the second-level menu. Press the " " key to return to the second level menu, no changes will be made (that is, the changes will not take effect).

If you want to exit the parameter setting interface, you can go back to the first level menu of the parameter setting interface first. Press the " " key and the meter will prompt "SRE-YES". There are three options for operation at this time:

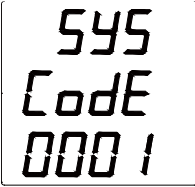
- (1) Save and exit: press the " " key to save the setting parameters and exit.
- (2) Exit without saving press the " " or " " key to switch to "SRE-no", and then press the " " key to exit without saving the setting parameters.

(3) Keep the setting state: Press the "" key to indicate that it will not exit and continue to maintain the parameter setting state.

7.3.1 Setup menu structure

The parameter setting adopts the hierarchical structure management method: the 3 rows of digital display from top to bottom correspond to the 1st, 2nd and 3rd level menu information respectively. The menu structure diagram is shown in the following figure:

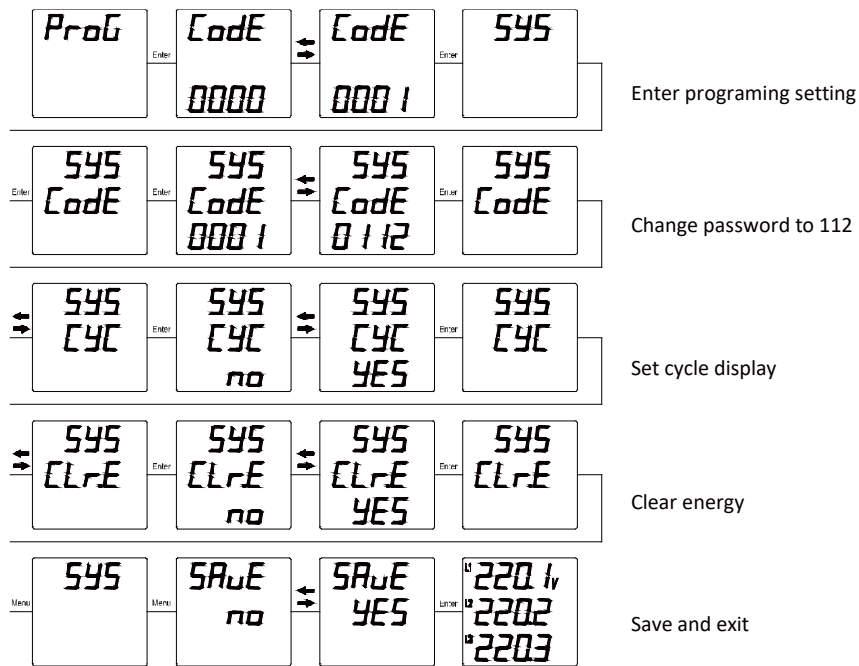
Table 4-7 Setup menu description

The 1 st level	The 2 nd level	The 3 rd level	Description
System setting 545	Code	0000~9999	 Password
	CYC	no/YES	NO: no cycle YES: Cycle display, interval of 3 seconds
	LIGH	0-180	Backlight display time
	DISP	U, I, etc	The first screen displayed when power on
	ALr	0 30~120	0: Turn off off-limit alarm function 30~120: off-limit value
	CLrE	no/YES	NO: no clearing YES: clear energy data
	CLrD	no/YES	NO: no clearing YES: clear demand data
Signal input 1nPE	nEe	n33 n34 n12	n33: 3P3W n34: 3P4W n12: 1P2W
	PE 1	0~9999 kV	Primary voltage
	PE 2	0~690 V	Secondary voltage
	CE 1	0~9999 kA	Primary current
	CE 2	0~6 A	Secondary current
	F	50Hz/60Hz	Grid frequency
The 1 st communication Com1	Addr	0001~0247	Set meter address: 1~247
	BAUD	2.400~19.20	Baud rate: 2400, 4800, 9600, 19200...
	Data format DATA	nB1 oB1 EB1 nB2	nB1: no check,1 stop bit oB1: odd check EB1: even check nB2: no check,2 stop bits
Demand dnd	TYPE	1P95	1P95 : Current and Power

	<i>nodE</i>	<i>SLIP</i> <i>FIH</i>	<i>SLIP</i> : Slip mode <i>FIH</i> : Fixed mode
	<i>t</i>	0001~9999	Update time
	<i>nt</i>	0001~9999	Interval time

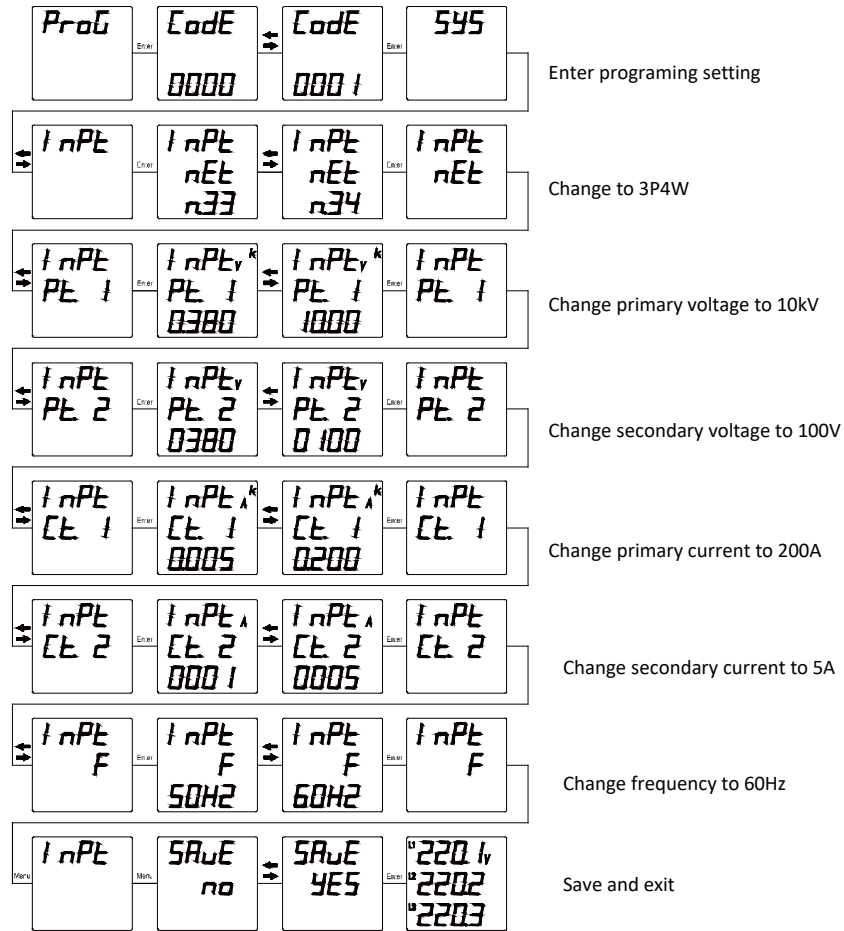
7.3.2 System setting

If the user password is changed to 112, the cycle display is turned on, and the energy data is cleared, the menu operation steps are as follows:



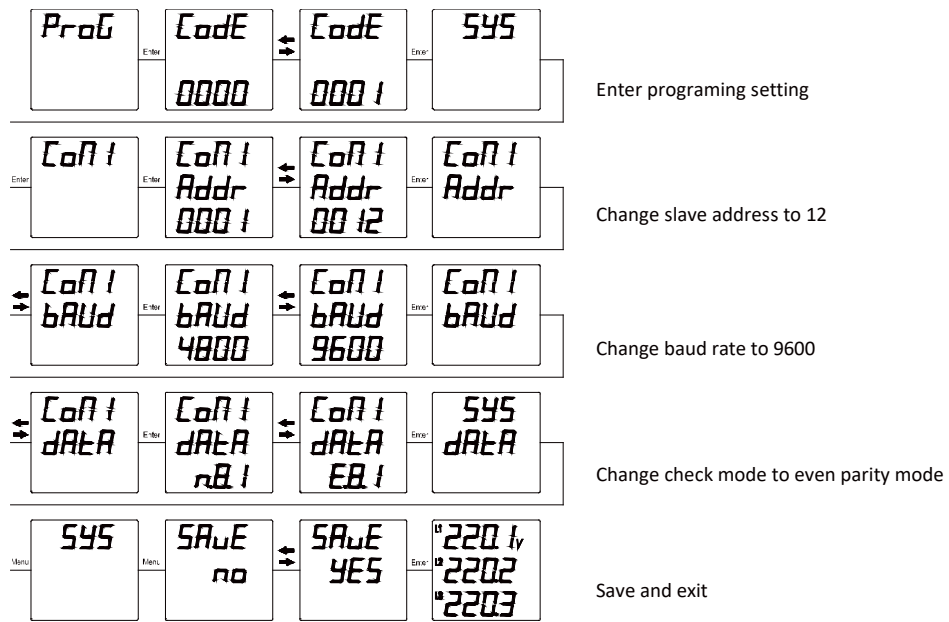
7.3.3 Signal input setting

If the parameters are set as 10kV/100V, 2000A/5A, 60Hz, the menu operation steps are as follows:



7.3.4 Communication setting

If the communication address of the instrument is set to 12, the baud rate is 9600bps, and the data format is E81 even parity mode, the menu operation steps are as follows:



8. TECHNICAL SPECIFICATIONS

Input	
Voltage range	3 x 462 / 800 V A.C.
Frequency range	45 to 65 Hz
Max. input voltage	1.2 × Un, continuously 2 × Un para 10 s
Load	1.6 MΩ/per phase
Current range	X/5 o X/1 programmable
Max. input current	2 × In, continuously 10 × In for 5 s (max. 50 A)
Load	Max. 0.2 VA per phase
Power supply	
Power supply	80-270 V C.A./C.C.
Own consumption	< 5 VA
Environmental conditions	
Temperature range	-25 to 70 °C
Storage temperature	-30 to 80 °C
Humidity range	<95% SC (DIN 400040)
Altitude	< 4000 m
Mechanical characteristics	
Enclosure material	ABS, UL94 V0
Protection degree	IP64 front IP20 housing
Mounting	Panel 96 x 96
Max. cable cross-section	Auxiliary voltage, voltage and current 6mm ²
Galvanic separation	Between inputs, outputs and auxiliary voltage: >1000MΩ
Weight	320g
Serial interface	
Type	RS-485 three wires
Baud rate	1200 / 2400 / 4800 / 9600 / 19200 bps configurable
Data bits	8
Parity	No parity / Parity configurable
Stop bit	1 / 2 configurable
Isolation	2000 VAC (1 min)
Electrical characteristics and safety	
Standards IEC	IEC 62053-22:2003 IEC 62053-23:2003 IEC 61010-1:2001 IEC 61000-2-11 IEC 60068-2-30
EMC	IEC 61000-4-2

	IEC 61000-4-3 IEC 61000-4-4 IEC 61000-4-5 IEC 61000-4-6 IEC 61000-4-8 IEC 61000-4-11
--	---

9. Ordering information

9.1 Specifications

It is possible to order the equipment with a specific configuration (consult sales team).

9.2 Disclaimer

SACI reserves the right to modify any of the contents of this document without prior notice.



MULTIFUNCTION POWER METER

ASM3 PV ModBus-RTU MANUAL

Index

1. OVERVIEW	3
2. COMMUNICATION	3
2.1 PHYSICAL LAYER	3
2.2 COMMUNICATION PROTOCOL.....	3
2.3 MESSAGE FORMAT COMMAND	5
2.3.1 Read data register value (Function code 0x03/0x04)	5
2.3.2 Write single register (Function code 0x06)	6
2.3.3 Write setting register (Function code 0x10)	8
2.3.4 Clear data (Function code 0x0E)	9
2.4 DATA FORMAT	10
2.4.1 32bit floating format.....	10
2.4.2 16bit integer format.....	10
2.4.3 32bit integer format.....	10
3. COMMUNICATION ADDRESS INFORMATION LIST	10
3.1 BASIC PARAMETERS	11
3.2 HARMONIC DATA	15
3.2 PARAMETER SETTING.....	22

1. Overview

The communication protocol describes the operation instructions of ASM3-PV under the Modbus-RTU protocol in detail, so that it can be used and developed by third parties.

2. Communication

2.1 Physical layer

The communication interface should be connected by shielded twisted pair. A bus can connect up to 32 devices, and a terminating resistor can be used at the beginning and end of the bus. The communication rate can be set from 1200 to 19200bps, the default is 9600bps; the byte transmission format is 1 start bit, 8 data bits, no parity bit or 1 odd/even parity bit, 1/2 stop bit.

2.2 Communication protocol

Message format

Address code	Function code	Data code	Check code
1 byte	1 byte	N bytes	2 bytes

◆**Address code:** Slave address, address range 1-247, other addresses are reserved.

◆**Function code:** Indicates what function the addressed terminal performs. The following table lists the Function codes supported by the meter, along with their meanings and functions.

Code	Description
0x03/0x04	Read data register value
0x06	Write single register
0x10	Write multiple registers
0x0E	Clear data

◆**Data code:** It contains the data required by the terminal to perform a specific function or the data collected when the terminal responds to a query. The contents of

these data may be numerical values, reference addresses or setting values. For example: Function code tells the terminal to read a register, the data field needs to indicate which register to start from and how many data to read, and the data returned by the slave data code contains the data length and corresponding data.

◆**Check code:** The error check (CRC16) field occupies two bytes and contains a 16-bit binary value. The CRC value is calculated by the transmitting device, and then appended to the data frame. The receiving device recalculates the CRC value when receiving the data, and then compares it with the received CRC value. If the two values are not equal, it indicates that an error occurred in the communication .

2.3 Message Format Command

2.3.1 Read data register value (Function code 0x03/0x04)

Request					
Frame structure	Address code	Function code	Data code		Check code
			Start register address	Number of registers	
Bytes	1 byte	1 byte	2 bytes	2 bytes	2 bytes
Data range	1~247	0x03/0x04	0x0000~0xFFFF	Maximum 100	CRC16
Message example	0x01	0x03	0x00 0x06	0x00 0x06	0x25C9
Response					
Frame structure	Address code	Function code	Data code		Check code
			Register bytes	Register value	
Bytes	1 byte	1 byte	1 byte	12 bytes	2 bytes
Message example	0x01	0x03	0x0C	12 bytes	CRC16

Notice:

The start register address of the host request is the first address of the data of the primary grid or secondary grid to be queried, and the number of registers is the length of the query data. As in the above example, start register address "0x00 0x06" represents the float data address of the three-phase phase voltage, and the number of registers "0x00 0x06" represents the data length of 6 (3 float data occupies 6 registers).

2.3.2 Write single register (Function code 0x06)

Request					
Frame structure	Address code	Function code	Data code		Check code
			Register address	Register data	
Bytes	1 byte	1 byte	2 bytes	2 bytes	2 bytes
Data range	1~247	0x06	0x0000~0xFFFF	0x0000~0xFFFF	CRC16
Message example	0x01	0x06	0x00 0x00	0xAA 0x55	0x3755
Response					
Frame structure	Address code	Function code	Data code		Check code
			Register address	Register data	
Bytes	1 byte	1 byte	2 bytes	2 bytes	2 bytes
Message example	0x01	0x06	0x00 0x00	0xAA 0x55	0x3755

Notice:

Not all registers can be modified. For details, please refer to the address information table.

2.3.3 Write setting register (Function code 0x10)

Request							
Frame structure	Address code	Function code	Data code				Check code
			Register start address	Register length	Register bytes	Write value	
Bytes	1 byte	1 byte	2 bytes	2 bytes	1 byte	2N bytes	2 bytes
Data range	1~247	0x10	0x080A	0x0001	N		CRC16
Message example	0x01	0x10	0x08 0x0A voltage range	0x00 0x01	0x02	0x0064	0x2ED1
Response							
Frame structure	Address code	Function code	Data code		Check code		
			Register start address	Register length			
Bytes	1 byte	1 byte	2 bytes	2 bytes	2 bytes		
Message example	0x01	0x10	0x08 0x0A	0x00 0x01	0x23AB		

Notice:

When writing the setting register, please strictly follow the meter setting information address table in the appendix of the meter. Do not try to modify the unused area, and the written data is not allowed to exceed the setting range. Wrong writing to the setting register may cause the instrument to work abnormally, please operate with caution.

2.3.4 Clear data (Function code 0x0E)

Request							
Frame structure	Address code	Function code	Data code				Check code
			Initial register address	Password	Data reset number	Number value	
Bytes	1 byte	1 byte	2 bytes	2 bytes	1 byte	1 byte	2 bytes
Data range	1~247	0x0E	0xAACC	0x0001	0x00~0xFF	0xFF	CRC16
Message example	0x01	0x0E	0xAACC	0x0001	0x01	0xFF	0x760D
Response							
Frame structure	Address code	Function code	Data code				Check code
			Initial register address	Password	Data reset number	Number value	
Bytes	1 byte	1 byte	2 bytes	2 bytes	1 byte	1 byte	2 bytes
Data range	1~247	0x0E	0xAACC	0x0001	0x00~0xFF	0xFF	CRC16
Message example	0x01	0x0E	0xAACC	0x0001	0x01	0xFF	0x760D

Notice:

The Function code can clear data such as electric energy, demand, extreme value, and event records.

Password: user password;

Data reset number:

0x01: Clear energy 0x02: Clear demand 0x03: Clear extreme value

Number value:

The value must be 0xff.

2.4 Data format

2.4.1 32bit floating format

32bit floating point format data follows the IEEE-754 format. The byte order of the data adopts the big endian method, with the high byte first and the low byte last.

Address(Hex)	Data(Hex)	Description
0000-0001	435C-8000	0x435C8000 = 220.5
0002-0003	4360-4CCD	0x43604CCD = 224.3
0004-0005	435E-B333	0x435EB333 = 222.7

2.4.2 16bit integer format

The 16bit integer format data adopts the complement storage method. The byte order of the data adopts the big endian method, with the high byte first and the low byte last.

Address(Hex)	Data(Hex)	Description
0000	0230	0x0230 = 560
0001	0172	0x0172 = 370
0002	0096	0x0096 = 150

2.4.3 32bit integer format

The 32bit integer format data adopts the complement storage method. The byte order of the data adopts the big endian method, with the high byte first and the low byte last.

Address(Hex)	Data(Hex)	Description
0000-0001	0007-A120	0x0007A120 = 500000
0002-0003	0000-07D0	0x000007D0 = 2000
0004-0005	FFFF-FDF0	0xFFFFFDF0 = -528

3. Communication address information list

3.1 Basic parameters

Address	Format	Description	Unit	R/W
0006-0007	Float	V1	V	R
0008-0009	Float	V2	V	R
000A-000B	Float	V3	V	R
000C-000D	Float	V12	V	R
000E-000F	Float	V23	V	R
0010-0011	Float	V31	V	R
0012-0013	Float	I1	A	R
0014-0015	Float	I2	A	R
0016-0017	Float	I3	A	R
0018-0019	Float	In(3P4W)	A	R
001A-001B	Float	P1	kW	R
001C-001D	Float	P2	kW	R
001E-001F	Float	P3	kW	R
0020-0021	Float	P	kW	R
0022-0023	Float	Q1	kvar	R
0024-0025	Float	Q2	kvar	R
0026-0027	Float	Q3	kvar	R
0028-0029	Float	Q	kvar	R
002A-002B	Float	S1	kVA	R
002C-002D	Float	S2	kVA	R
002E-002F	Float	S3	kVA	R
0030-0031	Float	S	kVA	R
0032-0033	Float	PF1	-	R
0034-0035	Float	PF2	-	R
0036-0037	Float	PF3	-	R
0038-0039	Float	PF	-	R
003A-003B	Float	F	Hz	R

003C-003D	Float	Average value of Vph-n	V	R
003E-003F	Float	Average value of Vph-ph	V	R
0040-0041	Float	Average current	A	R
0042-0043	Float	Import Active Energy	kWh	R
0044-0045	Float	Export Active Energy	kWh	R
0046-0047	Float	Import Reactive Energy	kvarh	R
0048-0049	Float	Export Reactive Energy	kvarh	R
004A-004B	Float	Apparent Energy	kVAh	R
004C-004D	Float	1 st Quadrant Reactive Energy - EQL+	kvarh	R
004E-004F	Float	2 nd Quadrant Reactive Energy - EQC+	kvarh	R
0050-0051	Float	3 rd Quadrant Reactive Energy - EQL-	kvarh	R
0052-0053	Float	4 th Quadrant Reactive Energy - EQC-	kvarh	R
0054-0081	--	--		
0082-0083		Max value-V1	V	R
0084-0085		Max value-V2	V	R
0086-0087		Max value-V3	V	R
0088-0089		Max value-V12	V	R
008A-008B		Max value-V23	V	R
008C-008D		Max value-V31	V	R
008E-008F		Max value-I1	A	R
0090-0091		Max value-I2	A	R
0092-0093		Max value-I3	A	R
0094-0095		Max value-In	A	R
0096-0097		Max value-P1	kW	R
0098-0099		Max value-P2	kW	R
009A-009B		Max value-P3	kW	R
009C-009D		Max value-P	kW	R
009E-009F		Max value-Q1	kvar	R
00A0-00A1		Max value-Q2	kvar	R

00A2-00A3		Max value-Q3	kvar	R
00A4-00A5		Max value-Q	kvar	R
00A6-00A7		Max value-S1	kVA	R
00A8-00A9		Max value-S2	kVA	R
00AA-00AB		Max value-S3	kVA	R
00AC-00AD		Max value-S	kVA	R
00AE-00AF		Max value-PF		R
00B0-00B1		Max value-F	Hz	R
00B2-00B3		Max value-Average Vph-n	V	R
00B4-00B5		Max value-Average Vph-pn	V	R
00B6-00B7		Max value-Average I	A	R
00B8-00B9		Min value-V1	V	R
00BA-00BB		Min value-V2	V	R
00BC-00BD		Min value-V3	V	R
00BE-00BF		Min value-V12	V	R
00C0-00C1		Min value-V23	V	R
00C2-00C3		Min value-V31	V	R
00C4-00C5		Min value-I1	A	R
00C6-00C7		Min value-I2	A	R
00C8-00C9		Min value-I3	A	R
00CA-00CB		Min value-In	A	R
00CC-00CD		Min value-P1	kW	R
00CE-00CF		Min value-P2	kW	R
00D0-00D1		Min value-P3	kW	R
00D2-00D3		Min value-P	kW	R
00D4-00D5		Min value-Q1	kvar	R
00D6-00D7		Min value-Q2	kvar	R
00D8-00D9		Min value-Q3	kvar	R
00DA-00DB		Min value-Q	kvar	R

00DC-00DD		Min value-S1	kVA	R
00DE-00DF		Min value-S2	kVA	R
00E0-00E1		Min value-S3	kVA	R
00E2-00E3		Min valuS	kVA	R
00E4-00E5		Min value-PF		R
00E6-00E7		Min value-F	Hz	R
00E8-00E9		Min value-Average Vph-n	V	R
00EA-00EB		Min value-Average Vph-pn	V	R
00EC-00ED		Min value-Average I	A	R
00EE-00EF	Float	Max. demand value -I1	A	R
00F0-00F1	Float	Max. demand value -I2	A	R
00F2-00F3	Float	Max. demand value -I3	A	R
00F4-00F5	Float	Max. demand value -P	W	R
00F6-00F7	Float	Max. demand value -Q	var	R
00F8-00F9	Float	Max. demand value -S	VA	R
00FA-00FD	--	--		
00FE-00FF	Float	Present demand value -I1	A	R
0100-0101	Float	Present demand value -I2	A	R
0102-0103	Float	Present demand value -I3	A	R
0104-0105	Float	Present demand value -P	kW	R
0106-0107	Float	Present demand value -Q	kvar	R
0108-0109	Float	Present demand value -S	kVA	R
010A-010D	--	--	--	
010E-010F	Float	Previous demand value -I1	A	R
0110-0111	Float	Previous demand value -I2	A	R
0112-0113	Float	Previous demand value -I3	A	R
0114-0115	Float	Previous demand value -P	kW	R
0116-0117	Float	Previous demand value -Q	kvar	R

0118-0119	Float	Previous demand value -S	kVA	R

3.2 Harmonic data

Address	Format	Description	Unit	R/W
0200	Int	Phase angle of V1(default 0°)	0.1°	R
0201	Int	Phase angle of V2	0.1°	R
0202	Int	Phase angle of V3	0.1°	R
0203	Int	Phase angle of I1	0.1°	R
0204	Int	Phase angle of I2	0.1°	R
0205	Int	Phase angle of I3	0.1°	R
0206	Int	Positive-sequence component of voltage	0.1V	R
0207	Int	Negative-sequence component of voltage	0.1V	R
0208	Int	Zero-sequence component of voltage	0.1V	R
0209	Int	Unbalance factor of voltage		R
020A	--	--	--	
020B	Int	Positive-sequence component of current	0.001A	R
020C	Int	Negative-sequence component of current	0.001A	R
020D	Int	Zero-sequence component of current	0.001A	R
020E	Int	Unbalance factor of current		R
020F	--	--	--	
0210	Int	THD-V1	0.01%	R
0211	Int	THD-V2	0.01%	R
0212	Int	THD-V3	0.01%	R
0213	Int	THD-I1	0.01%	R
0214	Int	THD-I1	0.01%	R
0215	Int	THD-I1	0.01%	R
0216	Int	Fundamental value -V1	0.1V	R
0217	Int	Fundamental value -V2	0.1V	R

0218	Int	Fundamental value -V3	0.1V	R
0219	Int	Fundamental value -I1	0.001A	R
021A	Int	Fundamental value -I2	0.001A	R
021B	Int	Fundamental value -I3	0.001A	R
021C	Int	Harmonic content -V1	0.1V	R
021D	Int	Harmonic content -V2	0.1V	R
021E	Int	Harmonic content -V3	0.1V	R
021F	Int	Harmonic content -I1	0.001A	R
0220	Int	Harmonic content -I2	0.001A	R
0221	Int	Harmonic content -I3	0.001A	R
0222	Int	2 ND harmonic ratio-V1	0.01%	R
0223	Int	3 rd harmonic ratio-V1	0.01%	R
0224	Int	4 th harmonic ratio-V1	0.01%	R
0225	Int	5 th harmonic ratio-V1	0.01%	R
0226	Int	6 th harmonic ratio-V1	0.01%	R
0227	Int	7 th harmonic ratio-V1	0.01%	R
0228	Int	8 th harmonic ratio-V1	0.01%	R
0229	Int	9 th harmonic ratio-V1	0.01%	R
022A	Int	10 th harmonic ratio-V1	0.01%	R
022B	Int	11 th harmonic ratio-V1	0.01%	R
022C	Int	12 th harmonic ratio-V1	0.01%	R
022D	Int	13 th harmonic ratio-V1	0.01%	R
022E	Int	14 th harmonic ratio-V1	0.01%	R
022F	Int	15 th harmonic ratio-V1	0.01%	R
0230	Int	16 th harmonic ratio-V1	0.01%	R
0231	Int	17 th harmonic ratio-V1	0.01%	R
0232	Int	18 th harmonic ratio-V1	0.01%	R
0233	Int	19 th harmonic ratio-V1	0.01%	R
0234	Int	20 th harmonic ratio-V1	0.01%	R

0235	Int	21 th harmonic ratio-V1	0.01%	R
0236	Int	22 th harmonic ratio-V1	0.01%	R
0237	Int	23 th harmonic ratio-V1	0.01%	R
0238	Int	24 th harmonic ratio-V1	0.01%	R
0239	Int	25 th harmonic ratio-V1	0.01%	R
023A	Int	26 th harmonic ratio-V1	0.01%	R
023B	Int	27 th harmonic ratio-V1	0.01%	R
023C	Int	28 th harmonic ratio-V1	0.01%	R
023D	Int	29 th harmonic ratio-V1	0.01%	R
023E	Int	30 th harmonic ratio-V1	0.01%	R
023F	Int	31 th harmonic ratio-V1	0.01%	R
0240	Int	2 nd harmonic ratio-V2	0.01%	R
0241	Int	3 rd harmonic ratio-V2	0.01%	R
0242	Int	4 th harmonic ratio-V2	0.01%	R
0243	Int	5 th harmonic ratio-V2	0.01%	R
0244	Int	6 th harmonic ratio-V2	0.01%	R
0245	Int	7 th harmonic ratio-V2	0.01%	R
0246	Int	8 th harmonic ratio-V2	0.01%	R
0247	Int	9 th harmonic ratio-V2	0.01%	R
0248	Int	10 th harmonic ratio-V2	0.01%	R
0249	Int	11 th harmonic ratio-V2	0.01%	R
024A	Int	12 th harmonic ratio-V2	0.01%	R
024B	Int	13 th harmonic ratio-V2	0.01%	R
024C	Int	14 th harmonic ratio-V2	0.01%	R
024D	Int	15 th harmonic ratio-V2	0.01%	R
024E	Int	16 th harmonic ratio-V2	0.01%	R
024F	Int	17 th harmonic ratio-V2	0.01%	R
0250	Int	18 th harmonic ratio-V2	0.01%	R
0251	Int	19 th harmonic ratio-V2	0.01%	R

0252	Int	20 th harmonic ratio-V2	0.01%	R
0253	Int	21 th harmonic ratio-V2	0.01%	R
0254	Int	22 th harmonic ratio-V2	0.01%	R
0255	Int	23 th harmonic ratio-V2	0.01%	R
0256	Int	24 th harmonic ratio-V2	0.01%	R
0257	Int	25 th harmonic ratio-V2	0.01%	R
0258	Int	26 th harmonic ratio-V2	0.01%	R
0259	Int	27 th harmonic ratio-V2	0.01%	R
025A	Int	28 th harmonic ratio-V2	0.01%	R
025B	Int	29 th harmonic ratio-V2	0.01%	R
025C	Int	30 th harmonic ratio-V2	0.01%	R
025D	Int	31 th harmonic ratio-V2	0.01%	R
025E	Int	2 nd harmonic ratio-V3	0.01%	R
025F	Int	3 rd harmonic ratio-V3	0.01%	R
0260	Int	4 th harmonic ratio-V3	0.01%	R
0261	Int	5 th harmonic ratio-V3	0.01%	R
0262	Int	6 th harmonic ratio-V3	0.01%	R
0263	Int	7 th harmonic ratio-V3	0.01%	R
0264	Int	8 th harmonic ratio-V3	0.01%	R
0265	Int	9 th harmonic ratio-V3	0.01%	R
0266	Int	10 th harmonic ratio-V3	0.01%	R
0267	Int	11 th harmonic ratio-V3	0.01%	R
0268	Int	12 th harmonic ratio-V3	0.01%	R
0269	Int	13 th harmonic ratio-V3	0.01%	R
026A	Int	14 th harmonic ratio-V3	0.01%	R
026B	Int	15 th harmonic ratio-V3	0.01%	R
026C	Int	16 th harmonic ratio-V3	0.01%	R
026D	Int	17 th harmonic ratio-V3	0.01%	R
026E	Int	18 th harmonic ratio-V3	0.01%	R

026F	Int	19 th harmonic ratio-V3	0.01%	R
0270	Int	20 th harmonic ratio-V3	0.01%	R
0271	Int	21 th harmonic ratio-V3	0.01%	R
0272	Int	22 th harmonic ratio-V3	0.01%	R
0273	Int	23 th harmonic ratio-V3	0.01%	R
0274	Int	24 th harmonic ratio-V3	0.01%	R
0275	Int	25 th harmonic ratio-V3	0.01%	R
0276	Int	26 th harmonic ratio-V3	0.01%	R
0277	Int	27 th harmonic ratio-V3	0.01%	R
0278	Int	28 th harmonic ratio-V3	0.01%	R
0279	Int	29 th harmonic ratio-V3	0.01%	R
027A	Int	30 th harmonic ratio-V3	0.01%	R
027B	Int	31 th harmonic ratio-V3	0.01%	R
027C	Int	2 ND harmonic ratio-I1	0.01%	R
027D	Int	3 rd harmonic ratio-I1	0.01%	R
027E	Int	4 th harmonic ratio-I1	0.01%	R
027F	Int	5 th harmonic ratio-I1	0.01%	R
0280	Int	6 th harmonic ratio-I1	0.01%	R
0281	Int	7 th harmonic ratio-I1	0.01%	R
0282	Int	8 th harmonic ratio-I1	0.01%	R
0283	Int	9 th harmonic ratio-I1	0.01%	R
0284	Int	10 th harmonic ratio-I1	0.01%	R
0285	Int	11 th harmonic ratio-I1	0.01%	R
0286	Int	12 th harmonic ratio-I1	0.01%	R
0287	Int	13 th harmonic ratio-I1	0.01%	R
0288	Int	14 th harmonic ratio-I1	0.01%	R
0289	Int	15 th harmonic ratio-I1	0.01%	R
028A	Int	16 th harmonic ratio-I1	0.01%	R
028B	Int	17 th harmonic ratio-I1	0.01%	R

028C	Int	18 th harmonic ratio-I1	0.01%	R
028D	Int	19 th harmonic ratio-I1	0.01%	R
028E	Int	20 th harmonic ratio-I1	0.01%	R
028F	Int	21 th harmonic ratio-I1	0.01%	R
0290	Int	22 th harmonic ratio-I1	0.01%	R
0291	Int	23 th harmonic ratio-I1	0.01%	R
0292	Int	24 th harmonic ratio-I1	0.01%	R
0293	Int	25 th harmonic ratio-I1	0.01%	R
0294	Int	26 th harmonic ratio-I1	0.01%	R
0295	Int	27 th harmonic ratio-I1	0.01%	R
0296	Int	28 th harmonic ratio-I1	0.01%	R
0297	Int	29 th harmonic ratio-I1	0.01%	R
0298	Int	30 th harmonic ratio-I1	0.01%	R
0299	Int	31 th harmonic ratio-I1	0.01%	R
029A	Int	2 nd harmonic ratio-I2	0.01%	R
029B	Int	3 rd harmonic ratio-I2	0.01%	R
029C	Int	4 th harmonic ratio-I2	0.01%	R
029D	Int	5 th harmonic ratio-I2	0.01%	R
029E	Int	6 th harmonic ratio-I2	0.01%	R
029F	Int	7 th harmonic ratio-I2	0.01%	R
02A0	Int	8 th harmonic ratio-I2	0.01%	R
02A1	Int	9 th harmonic ratio-I2	0.01%	R
02A2	Int	10 th harmonic ratio-I2	0.01%	R
02A3	Int	11 th harmonic ratio-I2	0.01%	R
02A4	Int	12 th harmonic ratio-I2	0.01%	R
02A5	Int	13 th harmonic ratio-I2	0.01%	R
02A6	Int	14 th harmonic ratio-I2	0.01%	R
02A7	Int	15 th harmonic ratio-I2	0.01%	R
02A8	Int	16 th harmonic ratio-I2	0.01%	R

02A9	Int	17 th harmonic ratio-I2	0.01%	R
02AA	Int	18 th harmonic ratio-I2	0.01%	R
02AB	Int	19 th harmonic ratio-I2	0.01%	R
02AC	Int	20 th harmonic ratio-I2	0.01%	R
02AD	Int	21 th harmonic ratio-I2	0.01%	R
02AE	Int	22 th harmonic ratio-I2	0.01%	R
02AF	Int	23 th harmonic ratio-I2	0.01%	R
02B0	Int	24 th harmonic ratio-I2	0.01%	R
02B1	Int	25 th harmonic ratio-I2	0.01%	R
02B2	Int	26 th harmonic ratio-I2	0.01%	R
02B3	Int	27 th harmonic ratio-I2	0.01%	R
02B4	Int	28 th harmonic ratio-I2	0.01%	R
02B5	Int	29 th harmonic ratio-I2	0.01%	R
02B6	Int	30 th harmonic ratio-I2	0.01%	R
02B7	Int	31 th harmonic ratio-I2	0.01%	R
02B8	Int	2 nd harmonic ratio-I3	0.01%	R
02B9	Int	3 rd harmonic ratio-I3	0.01%	R
02BA	Int	4 th harmonic ratio-I3	0.01%	R
02BB	Int	5 th harmonic ratio-I3	0.01%	R
02BC	Int	6 th harmonic ratio-I3	0.01%	R
02BD	Int	7 th harmonic ratio-I3	0.01%	R
02BE	Int	8 th harmonic ratio-I3	0.01%	R
02BF	Int	9 th harmonic ratio-I3	0.01%	R
02C0	Int	10 th harmonic ratio-I3	0.01%	R
02C1	Int	11 th harmonic ratio-I3	0.01%	R
02C2	Int	12 th harmonic ratio-I3	0.01%	R
02C3	Int	13 th harmonic ratio-I3	0.01%	R
02C4	Int	14 th harmonic ratio-I3	0.01%	R
02C5	Int	15 th harmonic ratio-I3	0.01%	R

02C6	Int	16 th harmonic ratio-I3	0.01%	R
02C7	Int	17 th harmonic ratio-I3	0.01%	R
02C8	Int	18 th harmonic ratio-I3	0.01%	R
02C9	Int	19 th harmonic ratio-I3	0.01%	R
02CA	Int	20 th harmonic ratio-I3	0.01%	R
02CB	Int	21 th harmonic ratio-I3	0.01%	R
02CC	Int	22 th harmonic ratio-I3	0.01%	R
02CD	Int	23 th harmonic ratio-I3	0.01%	R
02CE	Int	24 th harmonic ratio-I3	0.01%	R
02CF	Int	25 th harmonic ratio-I3	0.01%	R
02D0	Int	26 th harmonic ratio-I3	0.01%	R
02D1	Int	27 th harmonic ratio-I3	0.01%	R
02D2	Int	28 th harmonic ratio-I3	0.01%	R
02D3	Int	29 th harmonic ratio-I3	0.01%	R
02D4	Int	30 th harmonic ratio-I3	0.01%	R
02D5	Int	31 th harmonic ratio-I3	0.01%	R

3.2 Parameter setting

Address (hex)	Format	Data content	Data description	R/W
0800-0801	Reserved			
0802	Int	High byte: cyclic display	0x01: cyclic display, !(0x01): no cyclic display	R/W
		Low byte: Over-limit alarm flashing value	0: Turn off limit violation alarm display 1-180	
0803	Int	High byte: boot display interface	0:U 1:I 2:F,3:P 4:PF 5:EP 6:THD	R/W
		Low byte: backlight time setting	1-255s 0: constant on	R/W

0804-0805	--			
0806	Int	High byte: #1 meter address	1-247	R/W
		Low byte: #1 baud rate	0: 1200bps 1: 2400bps 2: 4800bps 3: 9600bps 4: 19200bps 5: 38400bps	
0807	Int	High byte:#1 check format	0: N,8,1 1: E,8,1 2: O,8,1 3: N,8,2	R/W
0808-0809	--			
080A	Int	High byte: wiring method	0: 3P4W 1: 3P3W 2: 1P2W	R/W
		Low byte: grid frequency	0: 50Hz 1: 60Hz	R/W
080B	--			
080C-080D	Long	Initial voltage setting	1~999999V	R/W
080E-080F	Long	Initial current setting	1~999999A	R/W
0810	Int	voltage range setting	1~690V	R/W
0811	Int	Current range setting	1~6A	R/W
0812-0817	Reserved			
0818	Int	Demand item	The default is three-phase circuit, active and reactive apparent power.	R
0819	Int	#1 Demand work mode	0: slip block 1: fixed block	R/W
081A	Int	#1Demand work mode (t)	1~9999s	R/W
081B	Int	#1Demand calculation cycle (T)	1~30t	R/W
081C	Int	Extreme value	0~9999 min 0: historical extreme value 1-9999: interval extreme value	R/W