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AHM3 / AHM3-RC / AHM3-SMTP

Multifunction Power Meter

User Manual

Menu

1 Safety Precautions

The manufacturer shall not be held responsible for failure to comply with the instructions in this manual.

The equipment must be installed and serviced only by qualified personnel.

Never work alone.

Prior to any work on or in the equipment, isolate the voltage inputs and auxiliary power supplies，short the secondary of all CT, but never short the secondary of PT.

Always use a properly rated voltage sensing device to conform that all power is off.

Risk of damaging device

- The voltage of the auxiliary power supply is beyond the rated range.
- The frequency of the power distribution system is beyond the rated range.
- The input polarity of the voltage or the current is wired improperly.

2 Description

General

This series multifunction power meters are designed to be used for the measurement and calculation of electrical variables such as voltage, current, frequency, power, power factor, energy, harmonic components, etc. in low-voltage power distribution. It is capable of single-phase, two-phase, or three-phase measurement and can be used in two-wire, three-wire, four-wire, TN, TT and IT systems.

Module

There are four interfaces on the meter for modules which are used to extend functions. Please pay attention to the following points when installing these modules.

a） Only one of communications modules (DM10-DM13) can be installed onto meter; Each module of DM11, DM12 and DM13 occupies two interfaces.

b） Only one time memory module can be installed onto the meter.

c） Up to four modules can be installed onto meter. Total width of all modules is 4.

d） Modules of same type of different types can be installed onto meter in compliance with the requirements of a) b) and c).

E.g. 1 Four DM2

E.g. 2 Two DM2+one DM7+one DM10

E.g. 3 One DM6+one DM8+one DM11

type	description	type	description
DM1	Memory: 8MB, include RTC	DM8	2 relay outputs
DM2	2 analog inputs：mA	DM9	1 AC digital input
DM3	2 analog inputs：PT100	DM10	Profibus-DP V0
DM4	2 analog inputs： J, K, E or N	DM11	Ethernet: Modbus/TCP, Web Server
DM5	2 analog outputs：mA	DM12	WIFI: Modbus/TCP
DM6	2 digital inputs and 2 digital outputs	DM13	GPRS: Modbus/TCP, SMS
DM7	4 digital inputs		

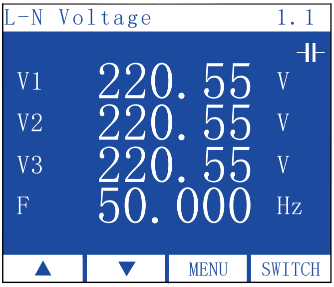
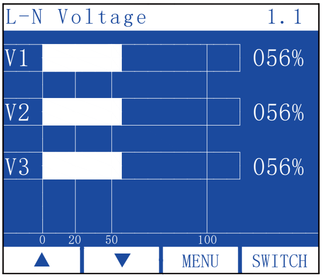
Measurement

- voltage
- current
- Load percent
- Power
- Power factor
- Frequency
- Demand
- Energy
- Total Harmonic Distortion
- Unbalance
- Up to 400/690 V can be connected directly. Higher voltages using voltage transforms.
- The ×/1A or ×/5A current transformers can be used

The following list shows variables which can be measured by AHM3 including relative variables calculated from basic electrical parameters.

Measurement variable	Instant	Max	Min	Demand	sum	unit
V1/V2/V3	√	√	√			[V,kV]
V12/V23/V31	√	√	√			[V,kV]
I1/I2/I3	√	√	√	√		[A,kA]
F	√	√	√			[Hz]
P/P1/P2/P3	√	√	√			[kW,MW,GW]
Q/Q1/Q2/Q3	√	√	√			[kvar,Mvar,Gvar]
S/S1/S2/S3	√	√	√			[kVA,MVA,GVA]
PF/PF1/PF2/PF3	√					-
EP+/EP-					√	[kWh,MWh, GWh]
EQ1/EQ2/EQ3/EQ4					√	[kvarh,Mvarh，Gvarh]
Spare Energy					√	
THDV1/THDV2/THDV3	√					[%]
THDI1/THDI2/THDI3	√					[%]
Harmonic RMS-U (1～63th)	√					[%]
Harmonic RMS-I (1～63th)	√					[%]
Unbalance-U	√					[%]
Unbalance-I	√					[%]
Hour meter						h:min

Measurement variable display example

	Left picture shows instantaneous three-phase voltage and frequency. Press ▲ or ▼ button to change to other interfaces. Press MENU button to return to main interface. Press SWITCH button to check corresponding bar graph interface.
	Left picture shows bar graph of three-phase voltage. Press ▲ or ▼ button to change to other interfaces. Press MENU button to return to main interface. Press SWITCH button to check corresponding measured variable interface.

Energy

Meter supports excellent energy metering functions as follows：

·Bi-direction energy metering

·Four-quadrant reactive energy metering

·Tariff energy metering (TOU)

·Spare energy metering

All the values of energy are calculated on the basis of secondary value, minimum resolution of which is 1Wh of 1varh. Provided the external PT or CT is connected, the value of primary energy increases or decreases by 1Wh (1varh) multiple rate.

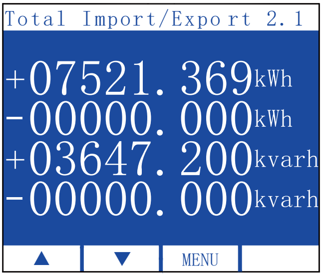
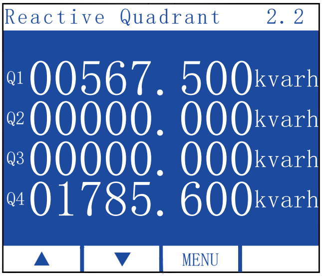
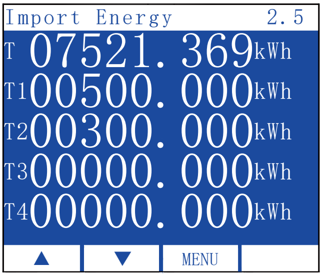
The maximum value of saved secondary energy is 2147483647 Wh, and the maximum value of displayed primary energy is 99999999999 kWh (99.9 billion kilowatt). Users can manually reset the energy data as per the specific needs.

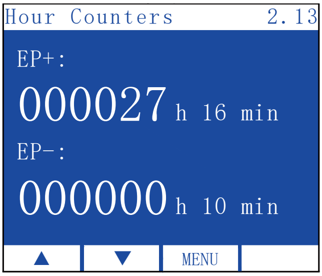
Spare Energy

Signal coming from a Generator. when the main line is cut off and a generator gives the power to the installation. The meters must measure and display the additional 6 Energies and 2 hour meters.

Tariff Energy

Meter supports tariff energy metering of sixteen time zones at most. The starting of a time zone is judged by meter according digital input status.

	Bi-direction energy EP+= 7521.369kWh EP- = 0kWh EQ+ = 3647.2kvarh EQ- = 0kvarh
	Four-quadrant reactive energy 1st quadrant: Q1 = 567.5kvarh 2nd quadrant: Q2 =0kvarh 3rd quadrant: Q3 =0kvarh 4th quadrant: Q4 = 1785.6kvarh
	Tariff import energy Total Energy(T) 7521.7kWh Tariff #1 Energy(T1) 500kWh Tariff #2 Energy(T2) 300kWh Tariff #3 Energy(T3) 0kWh Tariff #4 EnergyT4) 0kWh

	Hour Counters Energy Import (EP+): 27h16m Energy Export (EP-): 10m

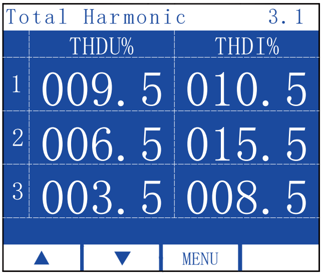
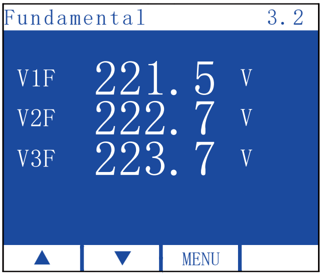
Harmonic

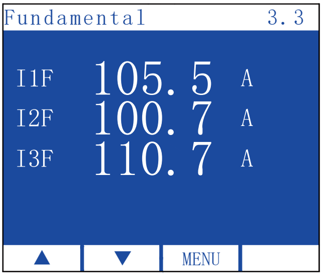
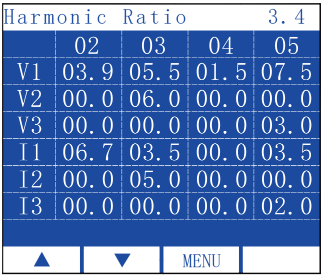
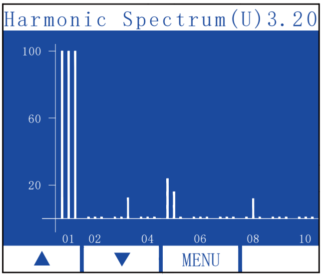
Meter supports harmonic content of grid. Detailed functions are as follows：

· Harmonic RMS (2-63th)

· Fundamental

· Bar graph

	THD_{V1}=9.5% THD_{V2}=6.5% THD_{V3}=3.5% THD_{I1}=10.5% THD_{I2}=15.5% THD_{I3}=8.5%
	Left picture shows voltage fundamental.

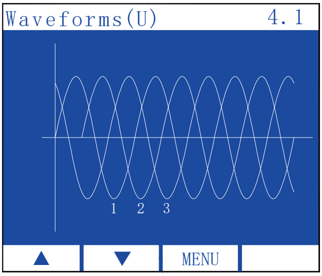
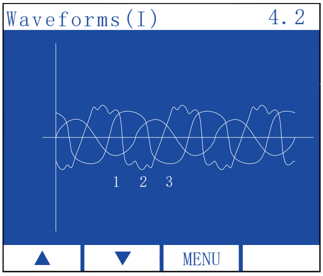
<table>
<tr>
<td>
</td>
<td>Left picture shows current fundamental.</td>
</tr>
<tr>
<td>
</td>
<td>Left picture shows harmonic distortion rate of three-phase voltage and current.</td>
</tr>
<tr>
<td>
</td>
<td>Bar graph of harmonic content of three-phase voltage. Bar graph of each harmonic shows V1, V2 and V3 from left to right. Left picture shows
3th THD_{V3}: 12%
5th THD_{V1}: 24%
5th THD_{V2}: 16%
8th THD_{V2}: 11%</td>
</tr>
</table>

Power Quality

Meter supports monitoring and analyzing power quality of grid. Measured parameters are as follows:

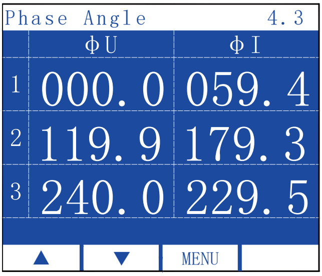
1）Waveform

Real-time display waveform of three-phase voltage and current. Waveform, phase sequence and distortion can be judged directly.

	Left picture shows real-time waveform of three-phase voltage. "1,2,3" correspond to "V1, V2, V3".
	Left picture shows real-time waveform of three-phase current. "1,2,3" correspond to "I1, I2, I3".

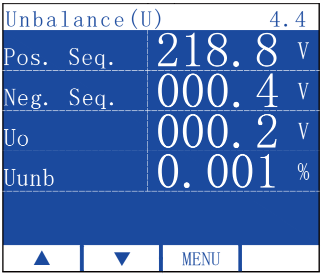
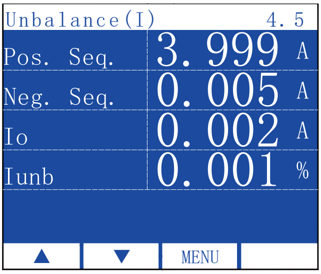
2）Phase angle of voltage and current

Phase angle of voltage and current of each phase is displayed directly. Phase angle of Phase A voltage is defaulted as 0°. Phase angle of other signals are displayed as relative to Phase A voltage (Unit：°).

	Phase angle of three-phase voltage and three-phase current.

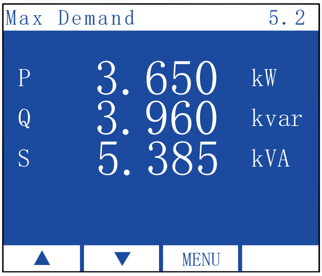
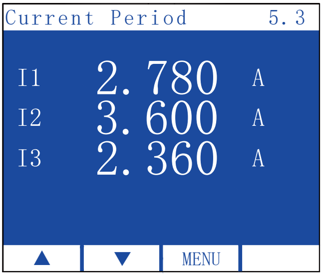
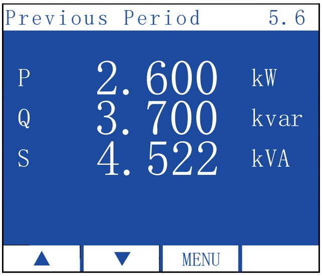
Unbalance

Electrical parameters of three-phase system are divided into three symmetrical components which are positive-sequence component, negative-sequence component and zero-sequence component according to symmetrical component method. The ratio of RMS values of negative-sequence component and positive-sequence component is defined as three-phase unbalance in the condition that power system is in normal operation mode.

<table>
<tr>
<td>
</td>
<td>Unbalance-U
Positive sequence value=218.8V
Negative sequence value=0.4V
Zero sequence value=0.2V
Voltage unbalance value=0.001%</td>
</tr>
<tr>
<td>
</td>
<td>Unbalance-I
Positive sequence value=3.999A
Negative sequence value=0.005A
Zero sequence value=0.002A
Current unbalance value=0.001%</td>
</tr>
</table>

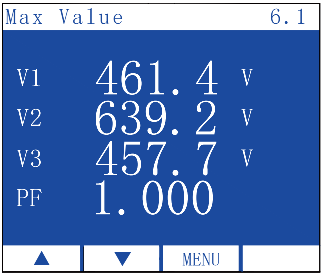
Demand

Meter supports six independent demand recording channels which can measure maximum demand value, present demand value and previous demand value of three-phase current, total active power, total reactive power, total apparent power.

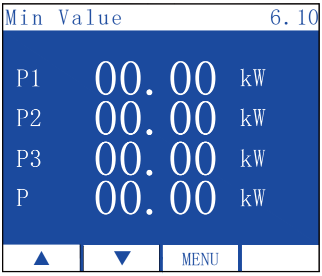
	Left picture shows maximum demand value of three phase total active, reactive and apparent power.
	Left picture shows present demand value of three-phase current.
	Left picture shows previous demand value of three-phase total active, reactive and apparent power.

Max/Min

When the measured value is maximum or minimum value at a moment, meter will record this value in non-volatile memory. These maximum or minimum values include three-phase voltage, line voltage, frequency, three-phase current, three-phase and total active power, three-phase and total reactive power, three-phase and total apparent power and total power factor. Following list shows the operation method of checking instantaneous value, maximum value and minimum value of three-phase voltage and frequency.



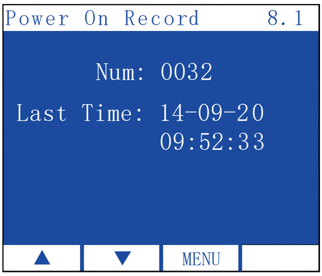
Left picture shows maximum value of three-phase voltage and frequency



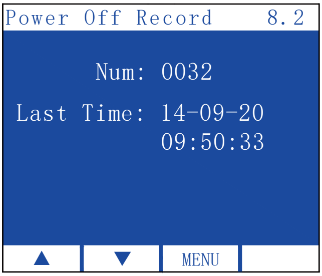
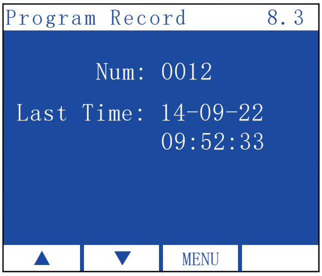
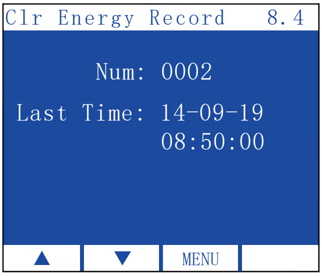
Left picture shows minimum value of three-phase and total active power

Event

Meter supports recording information of power on, power off, programming and energy clearance when it is equipped with DM1 module. Each type of record includes total pieces and latest occurring time of the event. This information is checked through display interface or read through communication.

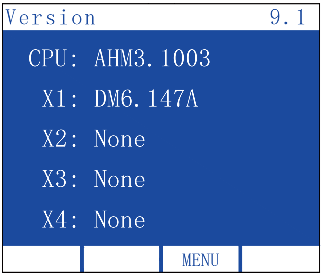


Left picture shows “Power on record” including 32 times of power on and latest power on time.

	Left picture shows “Power off record” including 32 times of power off and latest power off time.
	Left picture shows “Program record” including 12 times of programming and latest programming time.
	Left picture shown “energy clearance record” including 2 times of energy clearance and latest energy clearance time.

Device information

This interface shows the software version of meter and connection of modules.

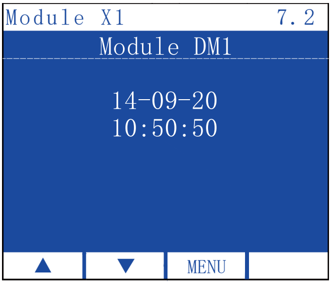


Left picture shows software version of meter and module. None indicates that there is no connection or wrong connection to the interface.

Modules

Meter supports four interfaces for connecting extension modules.

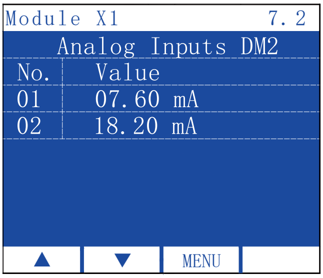
Memory Module (DM1)



This module provides time information and supports data storage function. Left picture shows time information.

Analogue Input Modules (DM2, DM3, DM4)

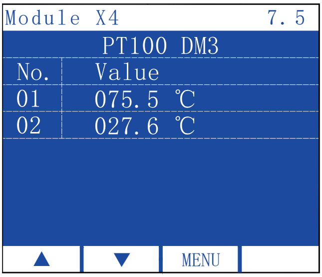
DM2 is used to measure 4~20mA signal. DM3 is used to measure PT100 signal. DM3 is used to measure J, K, E thermal couple signal. Display interfaces of measured value are shown as follows:



Left picture shows measured value of analogue input.

First analogue input is 7.6mA;

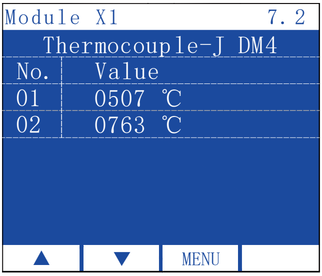
Second analogue input is 18.2mA.



Left picture show measured value of PT100 thermal resistor.

First temperature is 75.5ºC

Second temperature is 27.6ºC



Left picture shows measured value of thermal couple with graduation number J.

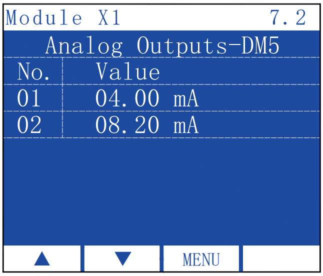
First temperature is 507º C

Second temperature is 763º C

Analogue Output Module (DM5)

Instantaneous electrical parameters are change into DC current signal output through DM5 module. If this module is installed onto meter, relative interface will be displayed. The current value shown in the interface is theoretical value in present status.

Analogue output items and range are programmed through meter.



Left picture shows theoretical value of analogue output.

First analogue output value is 4mA; second analogue output value is 8.2mA.

Digital Input

Digital input adopts dry contact mode. There is internal power supply for digital input so that there is no need for external power supply.

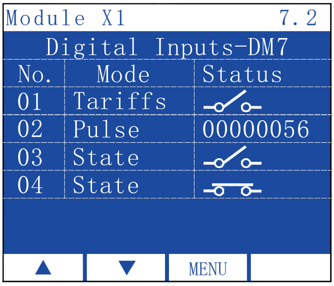
There are four working modes for digital input as follows:

1) State monitoring mode: It is used to monitor the state of breaker, the position of handcart, etc. The state of digital inputs can be indicated locally or read remotely through communication.

2) Pulse counter mode: Meter counts pulse numbers from input terminal. Pulse counting adds one when meter receives one pulse.

3) Spare energy synchronization: Terminal status is used as synchronization signal. Spare energy metering starts after meter received the signal. This function is effective in DM9 module.

4) Tariff energy setting mode: This function is valid in DM7 module. Digital input is used for setting tariffs. There are sixteen kinds of tariffs. Meter accumulates energy of present period to corresponding tariff period. The function is effective in DM7 module.



Left picture shows working modes of four digital input.

Digital input 1 is in tariff energy status.

Digital input 2 is in pulse counting status with pulse number 56.

Digital input 3 is for Spare energy.

Digital input 4 is for check status, and there is input signal.

Relay Output

Meter supports two relay outputs. More relay outputs are realized by connecting DM8 module to meter.

The relay output has three working modes: Energy pulse, remote control and alarm mode.

The relay output module (DM8) has two working modes: remote control and alarm mode.

Parameters like working mode, alarm item, limit value, time delay and hysteresis should be set. The data format of limit value is the secondary integer data.

1) Energy pulse output mode

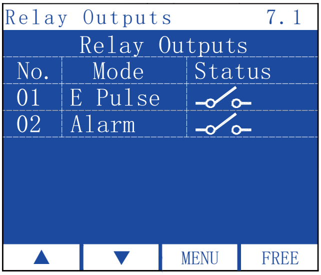
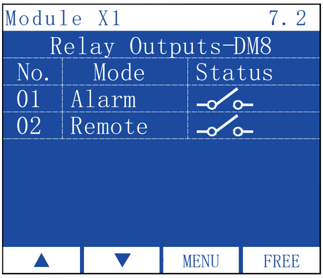
Meter supports bi-directional active and reactive energy pulse output function through relay output. Pulse frequency is smaller than 1Hz.

2) Remote control output mode

Receiving command PC or PLC through communication, the relay which supports electric level manner or pulse manner can be in motion or be released.

3) Alarm mode

High alarm indicates the relay acts in case of the measuring value more than the alarm value, while low alarm indicates the relay acts in case of the measuring value less than that alarm value. Only when all the terms spurring the relay alarm do not work, the meter has been turned off power or any software shields the alarm function, does the relay be released.

<table>
<tr>
<td>
</td>
<td>Left picture shows working mode of relay outputs of meter.
Relay output 1 is energy pulse mode;
Relay output 2 is alarm mode.</td>
</tr>
<tr>
<td>
</td>
<td>Left picture shows working mode of relay outputs of module.
Relay output 1 is alarm mode;
Relay output 2 is remote control mode.</td>
</tr>
</table>

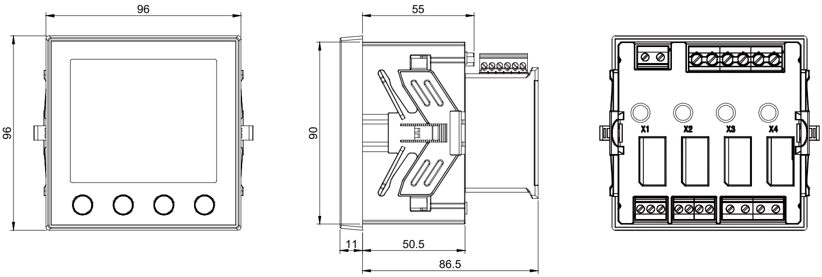
Communication

This series power meter provides an RS-485 slave port and adopts Modbus-RTU protocol. All devices are connected in a bus line by twisted-conductor and shielded cable. Up to 32 stations can be connected together in a segment. The cable at the start and end of a segment is terminated with resistors.

One more communication is realized by connecting extension module to meter. As for detailed information, please refer to user manual of DM10, DM11, DM12 and DM13.

3 Installation

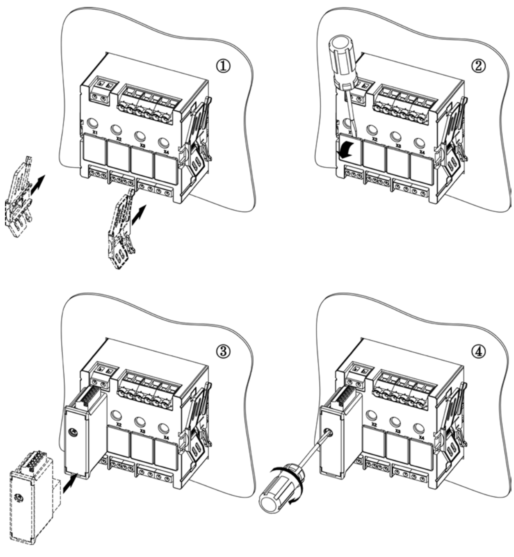
Dimensions



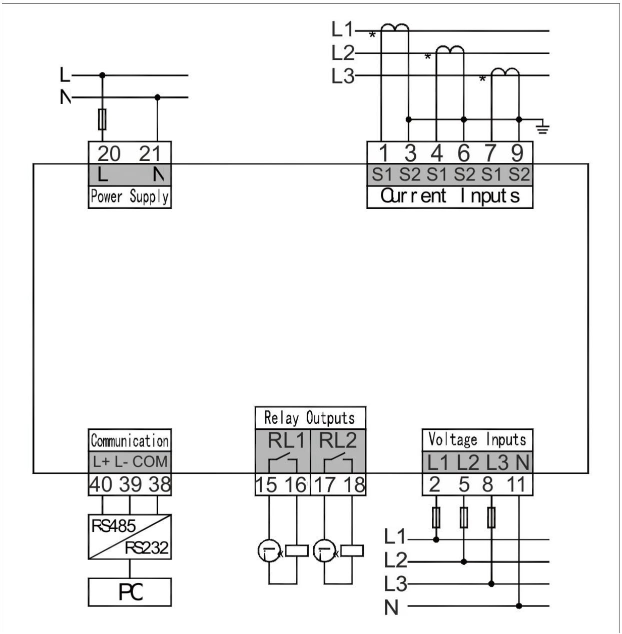
Mounting

1) Cut a hole in the panel measuring 91×91 mm^2.
2) Take out the power meter and loosen the clips.
3) Insert the meter into the cutout from outside.
4) Insert the clips and fix the meter.

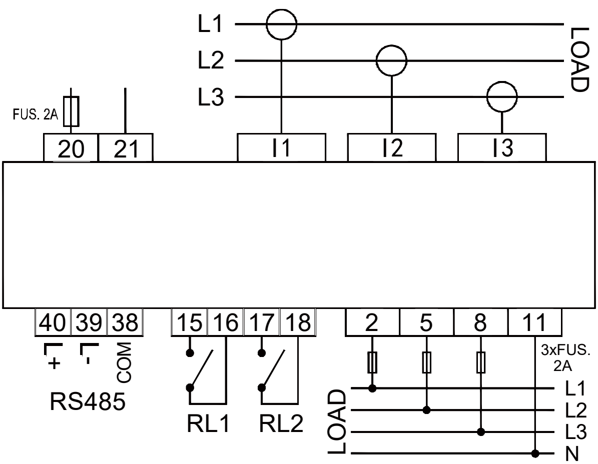
Wiring



Typical Wiring Diagrams for AHM3 and AHM3-SMTP



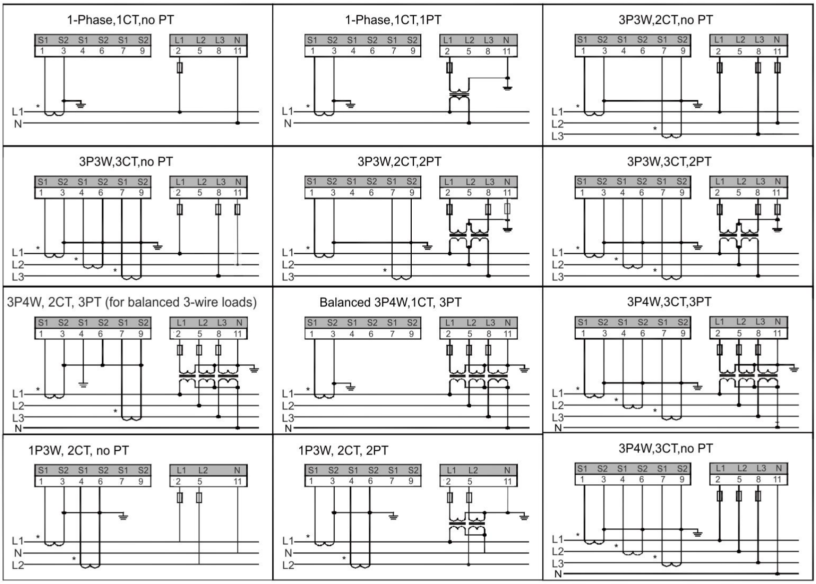
Typical Wiring Diagrams for AHM3-RC and AHM3-SMTP-RC



Note:

1. Auxiliary power supply: AC/DC (80~270)V
2. Rated current of fuse: 0.5A

Signal Wiring Diagrams



Note：

(a) External wiring mode should be the same as internal wiring mode of meter. Otherwise, measured information of meter will be not correct (Please refer to 5.5 for detailed setting method).

(b) Meter measures AC voltage and current signals. Please do not connect DC signals to input terminals of meter.

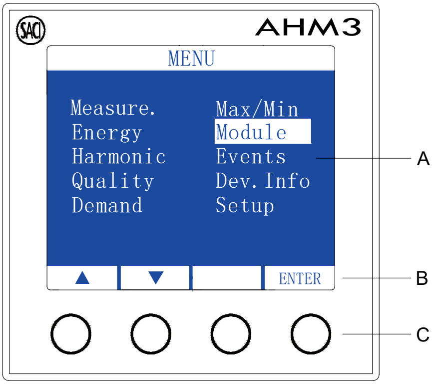
(c) Voltage input: The external PT should be applied when the input voltage exceeds the rated value. Accuracy of external PT should be equal to or better than measurement accuracy of meter. For easy maintenance, it is suggested to use the terminal blocks;

(d) Current input: The external CT should be applied when the input current exceeds the rated value. Accuracy of external CT should be equal to or better than measurement accuracy of meter. If other meters are also connected to a same CT, please connect them in serial. Before removing the current input wires, the primary circuit loop of CT should be cut off, or the secondary circuit loop should be shorted. For easy maintenance, it is suggested to use the terminal blocks;

(e) Make sure phase sequence and direction of three-phase voltage and current are consistent with each other. Otherwise, the values and signs will be incorrect.

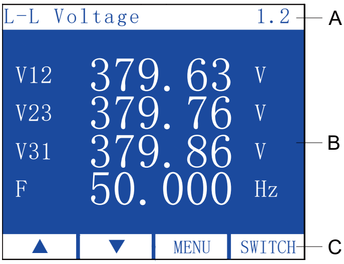
4 Operation

Panel



A: Display window B: Key Function indication C: Touch-key

Display



A: measured information indication;

B: display different data and graph information;

C: function button

- Up-left part of each display interface indicates measured information;
- Up-right part of each display interface indicates page number;
- Data window shows value of measured information;
- Lower part of each display interface shows the functions of buttons.

Setup button

Parameters of meter are set through buttons by user.

Sign	Function instruction
▲	Move upward; switch to previous page; change parameters; increase number at selected bit
▼	Move downward; switch to the following page; change parameters
◀	Move leftward to modify or display data in cyclic order
SWITCH	Switch between data and bar graph
MENU	Return to Main menu directly
ESC	Return to upper level of menu; cancel modification
ENTER	Enter selected item
EDIT	Modify selected item
ENTER	Confirm modification
	Not effective

Method of changing numbers

Press ◀ button to select a bit, and then press ▲ button to increase the number at selected bit in cyclic order.

Enter and exit programming status

● Enter programming status

First, press ▲ or ▼ button to select Setup item; second press ENTER to enter programming interface; third, select User setting and input correct password to start programming and parameter setting. (Password is defaulted as 0001. It can be changed by user.)

● Exit programming status

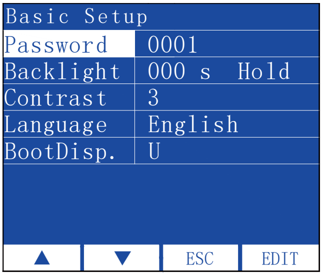
First, return to first level of programming menu; second, press ESC button to see Yes or No; third, select Yes to save modified data and return to main menu, or select No to cancel modification and return to main menu.

Setup Menu Overview

Programming menu of meter adopts hierarchical structure as follows.

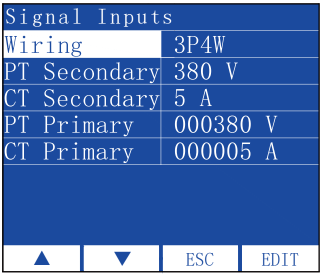
Basic Setup	Password-Backlight-Contrast -Language-BootDisplay
Signal Inputs	Wiring-PT Secondary-CT Secondary -PT Primary-CT Primary
COM1 Port	Address—BaudRate—Parity
Relay Outputs	Mode—Relevant Parameter
Demand	Mode-Time
Time	Date
Thermocouple	Type—correct
Analog Output	Item-Mode-Zero-Full
Digital Input	Mode—Relevant Parameter
Clear	Energy-Demand-Max/Min-Event-Pluse -Counters-Records

Basic Setup



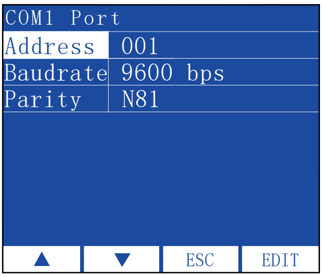
Password	0001-9999
Backlight	000s-999s 000s-backlight constant on
Contrast	0-7
Language	English
BootDisp	Set first display interface after power on. This interface can be set as U, I, P, E, THD, Waveform, Demand and Max/Min

Signal Input Setup



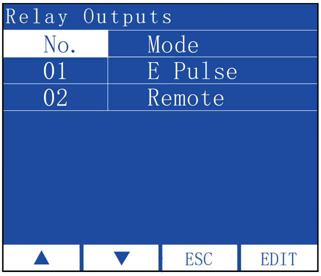
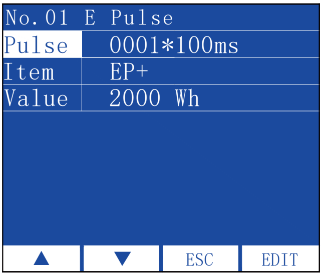
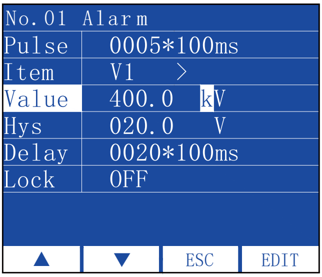
Wring	1P2W,3P3W,3P4W,1P3W
PT Secondary	0-690V
CT Secondary	0-6A
PT Primary	0-999999V
CT Primary	0-999999A

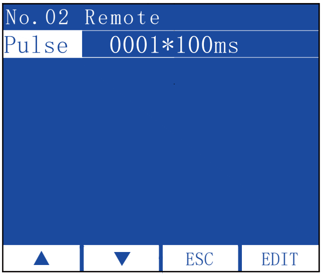
Communication Setup



Address	1~247
Baud rate	1200~38400bps
Parity	E81, O81,N81,N82

Relay Output Setup

	There are four working modes of relay output which are energy pulse, remote communication and alarm. Energy pulse working mode is only effective for meter.	
	Energy pulse output mode	
	Pulse	(Energy pulse width) (0~9999)×100ms
	Item	EP+: kwh+ EP-: kwh- EQ+: kvarh+ EQ-: kvarh-
	Value	Secondary energy value corresponding to one energy pulse
	Alarm output mode	
	Pulse	Pulse width: (0~9999)×100ms
	Item	See following list
	Value	Limit value（Primary）
	Hys	Hysteresis value（Primary）
	Delay	Delay time: (0~9999)×100ms
	Lock	Interlock: ON/OFF

<table>
<tr><td rowspan="2">
</td><td colspan="2">Remote control output mode</td></tr>
<tr><td>Pulse</td><td>Pulse width:0~ ms</td></tr>
</table>

Alarm items are shown in following list

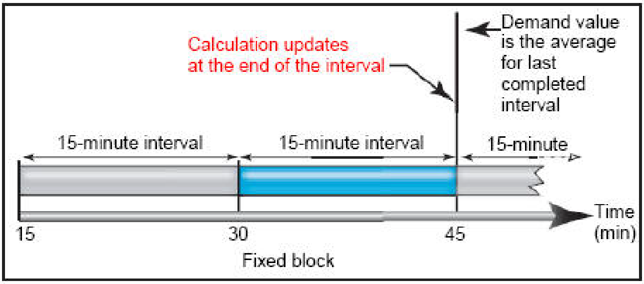
Item	Format	Instruction
OFF		Off
DI	0-5	Digital input linkage of selected channel, the relay output copy the state of the digital input
THDi <	xx.xx%	Current harmonic distortion rate low alarm
THDi >		Current harmonic distortion rate high alarm
THDv <		Voltage harmonic distortion rate low alarm
THDv >		Voltage harmonic distortion rate high alarm
Iunb <	xxx.x %	Current unbalance low alarm
Iunb >		Current unbalance high alarm
Vunb <		Voltage unbalance low alarm
Vunb >		Voltage unbalance high alarm
F <	xx.xx Hz	Grid frequency low alarm
F >		Grid frequency high alarm
PF <	x.xxx	Total power factor low alarm
PF >		Total power factor high alarm
S <	xxxx _VA	Total apparent power low alarm
S >		Total apparent power high alarm
Q <	xxxx _var	Total reactive power low alarm
Q >		Total reactive power high alarm

P <	xxxx _W	Total active power low alarm
P >		Total active power high alarm
Io <	x.xxx _A	Zero-sequence current low alarm
Io >		Zero-sequence current high alarm
Iavg >		Current average value low alarm
Iavg <		Current average value high alarm
I <		One of three phases currents low alarm
I >		One of three phases currents high alarm
I3 <		I3 currents low alarm
I3 >		I3 currents high alarm
I2 <		I2 currents low alarm
I2 >		I2 currents high alarm
I1 <		I1 currents low alarm
I1 >		I1 currents high alarm
Vllavg <	xxx.x _V	Line voltage average value low alarm
Vllavg >		Line voltage average value high alarm
Vlnavg <		Phase voltage average value low alarm
Vlnavg >		Phase voltage average value high alarm
Vll <		One of three line-voltages low alarm
Vll >		One of three line-voltages high alarm
V31 <		V31 voltages low alarm
V31 >		V31 voltages high alarm
V23 <		V23 voltages low alarm
V23 >		V23 voltages high alarm
V12 <		V12 voltages low alarm
V12 >		V12 voltages high alarm
Vln <		One of three phases voltages low alarm
Vln >		One of three phases voltages high alarm
V3 <		V3 voltages low alarm

V3 >		V3 voltages high alarm
V2 <		V2 voltages low alarm
V2 >		V2 voltages high alarm
V1 <		V1 voltages low alarm
V1 >		V1 voltages high alarm

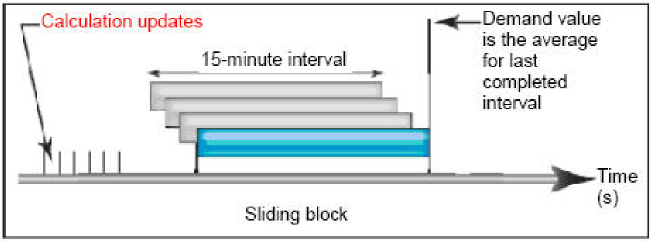
Demand Setup

A demand is the average value of a quantity, such as power, over a specified period of time.
Power demand is calculated using arithmetical integration of power values during a period of time divided by the length of the period. The result is equivalent to the energy accumulated during the period of time divided by the length of the period.
Current demand is calculated using arithmetical integration of the current r.m.s. values during a period of time, divided by the length of period.
The power meter handles the intervals duration to calculate the demand. It can implement several methods:
Fixed block interval: the intervals are consecutive; the power meter calculates and updates the demand at the end of each interval.



Note: 15min is only an example.

Sliding block interval: the intervals are sliding. The power meter calculates and updates the demand at the sliding speed.



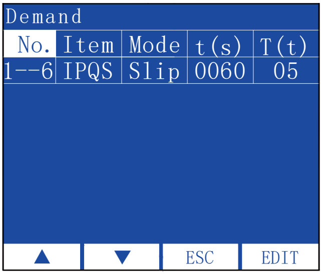
Note: 15min is only an example.

Relative time parameters are set as t (sliding time, unit: minute) and T (sliding block interval, unit: minute)

Fixed interval mode means that demand average value of T minutes is calculated for every T block, and then the value is judged and record. Demand of one month is record automatically at a fixed time.

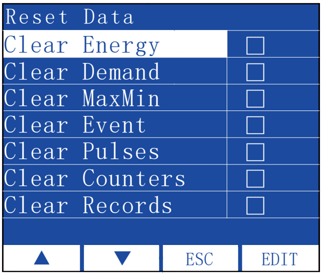
Sliding interval mode means than demand average value of latest T minutes is calculated, and then the value is judged and record. Demand of one month is record automatically at a fixed time.

Synchronous mode means that the demand measurement is controlled by external signals which come from digital inputs of DM6 and DM7. When digital input module is in synchronous status and one of its digital inputs acts, the demand measurement starts; when all digital inputs stop, the demand measurement also stops.



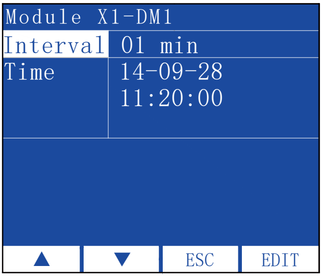
No.	1-6
Item	I1,I2,I3,P,Q,S
Mode	Slip/Fixed/Syn
t	
T	T=n*t, n:

Reset Data



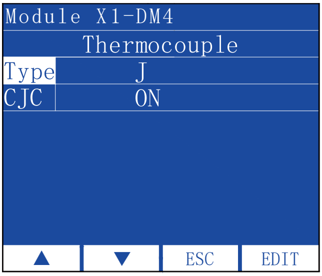
Parameters of energy, demand, Max./Min. value and Event are cleared in this interface. If the parameters are cleared, the relative value will be zero and not be reset; If energy is cleared, a piece of energy clearance SOE is made.

Memory Module Setup



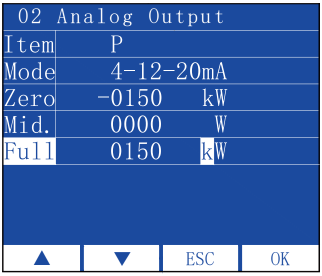
Interval	Data record Interval 0~99min
Time	Setup real-time-clock

Thermocouple Module Setup



Type	J,K,E,N
CJC	Cold junction Compensation: ON/OFF

Analogue Output Setup



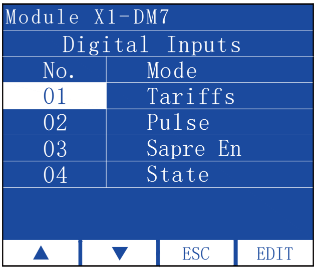
Item	See following list
Mode	4-12-20mA
Zero	Zero scale (Primary)
Mid.	Middle scale (Primary)
Full	Full scale (Primary)

Analogue output items are shown in following list:

Lower limit value and upper limit value of analog output are primary values. Upper limit value should not be larger than two times of rated value. 4-12-20mA analog output mode is only valid for active power, reactive power, apparent power and power factor.

Item	Format	Instruction
OFF		Off
V1	xxx.x __V	Voltage
V2		
V3		
V12		
V23		
V31		
I1	x.xxx __A	Current
I2		
I3		
In		
P1	x.xxx __W	Active Power
P2		
P3		
P		
Q1	x.xxx __var	Reactive Power
Q2		
Q3		
Q		
S1	x.xxx __VA	Apparent Power
S2		
S3		
S		
PF1	x.xxx	Power Factor
PF2		
PF3		
PF		
F	xx.xx Hz	Frequency

Digital Input Setup



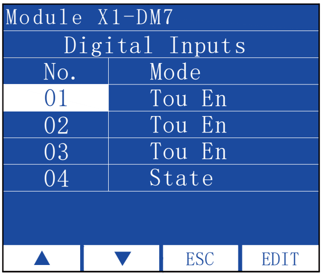
There are four working modes of digital input.

1)Tariff energy (effective in DM7 module)

2)Pulse counting

3)Spare energy (effective in DM9 module)

4)Status monitoring



DM7 module is used for setting tariffs from its first digital input. There are four digital inputs available. Tariff is judged by meter according to digital input status. Status 0000 corresponds to T1, and Status 1111 corresponds to T16. See following list for detailed information.

Detailed corresponding relation is shown in following list. "0" indicates the digital input is open, and "1" indicates the digital input is closed.

DI4	DI3	DI2	DI1	Tariff
0	0	0	0	T1
0	0	0	1	T2
0	0	1	0	T3
0	0	1	1	T4
0	1	0	0	T5
0	1	0	1	T6
0	1	1	0	T7
0	1	1	1	T8
1	0	0	0	T9
1	0	0	1	T10

1	0	1	0	T11
1	0	1	1	T12
1	1	0	0	T13
1	1	0	1	T14
1	1	1	0	T15
1	1	1	1	T16

Program example

E.g. select wiring mode as three phase three wire, set primary value of PT as 6kV, and set secondary value of PT as 100V.

5 Communication

Meter is defaulted to be equipped with one RS-485 communication adopting Modbus-RTU protocol. Other communication modes such as Profibus-DP, GPRS, Ethernet and WIFI can be realized by connecting module to meter. As for detailed information, please refer to user manual of communication modules DM10, DM11, DM12 and DM13.

6 Maintenance and Troubleshooting

Communication

First ensure the communication settings of meter, such as, slave address, baud rate, check mode, etc. are in compliance with that of host equipment. In case more than one meters does not send back the data, please check if the connection of communication bus on site is correct, and if the RS485 converter is running regularly.

The data being display is not what you expert

Verify appropriate voltage and current are offered to the meter, and you can use a multimeter to measure the voltage signal. What's more, when necessary, the clamp ammeter can be used to measure the current signal.

Verify the connection of signal wiring is appropriate, for example, the homonymous ends of current signal and phase sequence of each phase should be correct. The meter can display the value of active power, signal of which is negative only in case of generating electricity, while in regular situation, positive. However, the wrong connection of input or output wires, or wrong connection of phase sequence may lead to irregular display of power value. This series of meters allow modifying the directions of homonymous ends of current, and you can set up reverse current in setting menu.

The electric quantity displayed by the meter is primary grid value, and it will be incorrect if the multiple rate of PT or CT set in the meter is different from that of PT or CT used practically. Besides, the measuring range of voltage and current inside the meter and wiring grid should be adjusted according to practical wiring mode on site, to keep right display of parameters.

Energy is inaccurate

The energy is accumulated based on the measurement of power. First observe whether the power value of meter is in compliance with practical load. The meter supports bi-direction energy metering. In case the wiring mode is incorrect, and the total active power is negative, the reverse active energy, not the forward active energy, will be accumulated.

The problem happening most frequently on site is that the input or output wires are connected reversely, which will cause the phase active power to be negative. Besides, the wrong phase sequence will also lead to incorrect display of electric energy.

The display is blank

Make sure appropriate auxiliary power supply is provided for the meter, for the auxiliary power supply with voltage beyond the stipulated range may damage the meter absolutely. The voltage of auxiliary power supply can be measured by multimeter. If it turns out to be correct, and the meter displays nothing, please try electrifying the meter once again.

7 Technical specifications

<table>
<tr><th colspan="4">Electric Characteristics</th></tr>
<tr><td rowspan="5">Accuracy</td><td colspan="2">Voltage and current</td><td>0.2%</td></tr>
<tr><td colspan="2">Power, Power Factor</td><td>0.5%</td></tr>
<tr><td colspan="2">Frequency</td><td>±0.01Hz</td></tr>
<tr><td colspan="2">Active power</td><td>IEC62053-22, class 0.5S
AHM3RC-SMTP (IEC62053-21, class 1)</td></tr>
<tr><td colspan="2">Reactive power</td><td>IEC62053-23, class 2</td></tr>
<tr><td colspan="3">Data update rate</td><td>1s</td></tr>
<tr><td rowspan="9">Input</td><td colspan="2">Wiring mode</td><td>1P2W, 3P3W, 3P4W, 1P3W</td></tr>
<tr><td rowspan="3">Voltage</td><td>Rated value</td><td>400 VAC L-N (690 VAC L-L)</td></tr>
<tr><td>Overload</td><td>1.2Vln</td></tr>
<tr><td>Impedance</td><td>>1MΩ</td></tr>
<tr><td rowspan="4">Current</td><td>Rated value</td><td>1A or 5A</td></tr>
<tr><td rowspan="2">Overload</td><td>Continuous: 1.2In</td></tr>
<tr><td>Instantaneous: 10In/5s</td></tr>
<tr><td>burden</td><td><0.1VA</td></tr>
</table>

		Rated value	<20mΩ
	Grid frequency		(45~65)Hz
Auxiliary supply	Working range		AC/DC (80~270) V
	consumption		≤ 10VA
Energy pulse output			2 photocouple outputs, pulse width (80±20%) ms
Digital input			Dry contact input, isolation: 2000VAC
Relay output			Contact rated at AC 250V/5A or DC 30V/5A
			Isolation： 2500VAC
Communications			
RS485 port			Modbus-RTU, 2-wire, up to 38400bps
Mechanical Characteristics			
IP index	IP65 (front panel) and IP20 (meter body)		
Dimensions	96×96×55mm		
Environmental Characteristics			
Operating temperature			(-10~60)ºC
Storage temperature			(-25~70)ºC
Relative humidity			(5~95)% (no gel)
Insulation			IEC 61010-1
Electromagnetic Compatibility			
Immunity to electrostatic discharge			IEC 61000-4-2-Level III
Immunity to radio-frequency field			IEC 61000-4-3- Level III
Immunity to electrical fast transients/bursts			IEC 61000-4-4- Level IV
Immunity to impulse waves			IEC 61000-4-5- Level IV
Immunity to conducted disturbances			IEC 61000-4-6- Level III
Immunity to power frequency magnetic fields			IEC 61000-4-8- Level III
Immunity to voltage dips and short interruptions			IEC 61000-4-11- Level III

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AHM3 / AHM3-RC

Multifunction Power Meter

Modbus-RTU

Menu

1. Overview

This user manual is the operation instruction for AHM3 multifunction power meter with Modbus-RTU protocol, which is used to help thirty party to operate and develop this meter.

2. Communication

2.1 Physical layer

Communication interface should be connected by shielded twisted-pair. Thirty-two meters are supposed to be connected to a same busbar at most. Terminal resistance should be connected to both ends of busbar. Communication speed is 1200~38400bps which can be set. Defaulted communication speed is 9600bps. Byte transmission format is composed of one start bit, eight data bits, no check bit or one odd bit or one even check bit, one or two stop bits.

2.2 Communication protocol

Message format

Address field	Function code field	Data field	Check field
one byte	one byte	N bytes	two bytes

◆ **Address code**

Address code is slave address with range of 1-247. Other addresses are reserved.

◆ **Function code field**

Function code field indicates the executive function of addressed terminal. Meaning and function of function codes supported by meter is shown in the following list.

Code	Meaning
0x01	Read coils
0x02	Read input discrete
0x03/0x04	Read data register value
0x05	Write Single Coil
0x06	Write Single Register
0x0F	Write Multiple Coils
0x10	Write Multiple Registers
0x14	Read File record
0x0E	Reset Data

◆ **Data code**

Data code includes the data which is needed by a terminal device when it performs a function or the data collected from a terminal device when it responses to an inquiry. These data may be numbers, referenced address or setting value. For example, when the function code tells a terminal device to read a register, the data field should indicate the terminal device that which register it should begin from and how much data it should read. The data code sent back from a terminal device includes data length and corresponding data. Data adopts BIG END mode which means low byte is after high byte.

◆ **Check code**

Cyclical Redundancy Check (CRC16) field occupies two bytes including a 16-bit binary value. CRC value will be calculated by transmission equipment and be added to a data frame. When the receiving equipment receives the data, it will calculate CRC value again, and then it compares the two CRC values. If the two values are not equal to each other, an error will be detected.

2.3 Modbus-RTU communication protocol format

2.3.1 Read coils (FC 0x01)

Request					
Frame structure	Address code	Function code	data code		CRC
			Start address	Number of relay	
Byte	1 byte	1 byte	2 bytes	2 bytes	2 bytes
Data range	1~247	0x01	0x0000 (fixed)	0x0001~0x0002	CRC
Message example	0x01	0x01	0x00 0x00	0x00 0x02	0xBD 0xCB
Response					
frame structure	address code	function code	data code		CRC
			byte of register	register value	
Byte	1 byte	1 byte	1 byte	1 byte	2 bytes
Message example	0x01	0x01	0x01	0x03	0x11 0x89

Remark: The register value in the slave response indicates the status of the relay. Beginning from the lowest bit of the byte, each number corresponds to the status of a relay output. "1" indicates the relay is closed, while "0" indicates the relay is cut off. In the upper list, the register value "0x03" corresponds to "0000 0011" in binary system which means the first and second relays are closed.

2.3.2 Read input discrete (FC 0x02)

Request					
Frame structure	address	function code	data		CRC
			start address	number	
Byte	1 byte	1 byte	2 bytes	2 bytes	2 bytes
Data range	1~247	0x02	0x0000 (fixed)	0x0001~0x000C	CRC16
Message example	0x01	0x02	0x00 0x00	0x00 0x01	0x79 0xC9
Response					
Data structure	address data	function code	data		CRC
			byte of register	register value	
Byte	1 byte	1 byte	1 byte	1 byte	2 bytes
Message example	0x01	0x02	0x01	0x01	0x20 0x49

Remark: The register value in the slave response indicates the status of digital input. Beginning from the lowest bit of the byte, each number corresponds to the status of a digital input. "1" indicates the switch is closed, while "0" indicates the switch is open. In the upper list the register value "0x01" is "0000 0001" in binary system which means first loop of digital input is closed.

2.3.3 Read data register value (FC 0x03/0x04)

Request					
Frame structure	address code	function code	data		CRC
			Start address	number of register	
Byte	1 byte	1 byte	2 bytes	2 bytes	2 bytes
data range	1~247	0x03/ 0x04		Max. 100	CRC16
message example	0x01	0x03	0x00 0x06	0x00 0x06	0Xe4 0x36
Response					
frame structure	address code	function code	data		CRC
			byte of register	register value	
byte	1 byte	1 byte	1 byte	12 bytes	2 bytes
message example	0x01	0x03	0x0C	12-byte data	CRC16

Remark: The initial register address in host inquiry is the initial address of the data collected from primary or secondary power grid. The number of register indicates the length of the data. In the upper list the register address "0x00 0x00" indicates the initial address of phase voltage float data of three phases, and the number of register "0x00 0x06" indicates the length of the data is 6 (three float data occupies six registers).

2.3.4 Write Single Coil (FC 0x05)

Request					
frame structure	address code	function code	data code		CRC
			Start address	relay action value	
byte	1byte	1byte	2 bytes	2 bytes	2 bytes
data range	1~247	0x05	0x0000~ 0x0003	0xFF00/0x0000	CRC16
message example	0x01	0x05	0x00 0x00	0xFF 0x00	0x8C 0x3A
Response					
frame structure	address code	function code	data code		CRC
			initial relay address	relay action value	
byte	1 byte	1 byte	2 bytes	2 bytes	2 bytes
message example	0x01	0x05	0x00 0x00	0xFF 0x00	0x8C 0x3A

Remark: In host request, the relay action value "0xFF00" indicates the relay is closed, while "0x0000" indicates the relay is open. If user wants to perform remotely control operation, please make sure the relay is working in "remotely control" mode.

2.3.5 Write Single Register (FC 0x06)

Request					
frame structure	address code	function code	data code		CRC
			Register Address	preset data	
byte	1byte	1byte	2 bytes	2 bytes	2 bytes
data range	1~247	0x06	0x0000~ 0xFFFF	0x0000~ 0xFFFF	CRC16
message example	0x01	0x06	0x00 0x00	0xAA 0x55	0x37 0x55
Response					
frame structure	address code	function code	data code		CRC
			Register Address	preset data	
byte	1 byte	1 byte	2 bytes	2 bytes	2 bytes
message example	0x01	0x06	0x00 0x00	0xAA 0x55	0x37 0x55

Remark: Not all registers can be modified. As for specific information, please refer to communication address list.

2.3.6 Write Multiple Coils (FC 0x0F)

Request

frame structure	address code	function code	data code				CRC
			initial relay address	number of relay	number of data byte	relay action value	
byte	1 byte	1 byte	2 bytes	2 bytes	1 byte	1 byte	2 bytes
data range	1~247	0x0F	0x0000 (fixed)	0x0001~ 0x0004	0x01		CRC16
message example	0x01	0x0F	0x00 0x00	0x00 0x02	0x01	0x03	0x9E 0x96

Response

frame structure	address code	function code	data code		CRC check code
			initial relay address	number of relay	
byte	1 byte	1byte	2bytes	2bytes	2 bytes
message example	0x01	0x0F	0x00 0x00	0x00 0x02	0Xd4 0x0A

Remark: In the host inquiry, beginning from the lowest bit of relay action value, each bit corresponds to a relay output. “1” indicates the relay is closed, while “0” indicates the relay is open. In the upper list, relay action value “0x03”is “0000 0111”in binary system, which means the first and second relays are closed.

2.3.7 Write Multiple Registers (FC 0x10)

Request

frame structure	address code	function code	data code				CRC
			initial relay address	relay length	relay byte	written value	
byte	1 byte	1 byte	2 bytes	2 bytes	1 byte	2N bytes	2 byte
data range	1～247	0x10	0x080A	0x0001	N		CRC16
message example	0x01	0x10	0x08 0x0A	0x00 0x01	0x02	0x0064	0x2ED1

Request

frame structure	address code	function code	data code		CRC
			initial relay address	relay length	
byte	1 byte	1 byte	2 bytes	2 bytes	2 bytes
message example	0x01	0x10	0x08 0x0A	0x00 0x01	0x2ED1

Remark: Please strictly follow the Meter setting information address list in appendix when writing setting register. Do not change the reserved data. Written data should not exceed set range. Wrong operation may cause meter damaged.

2.3.8 Read File record (FC 0x14)

Request

Function	1 byte	0x14
Byte counting	1 byte	0x07
Sub-request x, parameter type	1 byte	0x06
Sub-request x, file number	2 bytes	0x0000-0x0007
Sub-request x, event log number	2 bytes	0x0000-0xFDE7
Sub-request x, event log length	2 bytes	N

Response

Function code	1 byte	0x14
Response data length	1 byte	0x07~0xF5
Sub-request x, file length	1 byte	0x07~0xF5
Sub-request x, parameter type	1 byte	6
Sub-request x, event log data	N×2 bytes	...

Send sub-request file number, event log number and event log length description of message

Event log	File number	Event log number	Event log length
Data log	0x0004	0x0000~0x000F: 0: latest piece of data log 1: second piece of data log from the latest piece of data log ... 32000: 32001th piece of data log from the latest piece of data log	1~32

Example for reading file

Request								
frame structure	address code	function code	data code					CRC
			byte counting	parameter type	file number	event log number	event log length	
byte	1 byte	1 byte	1 byte	1 byte	2 bytes	2 bytes	2 bytes	2 bytes
data range	1~247	0x14	0x07	0x06	0x0004	0~65000	1~32	CRC
message	0x01	0x14	0x07	0x06	0x0004	0x0000	0x0020	0x093C

Response								
frame structure	address code	function code	data code				CRC
			response data length	response file length	parameter type	log data	
byte	1 byte	1 byte	1 byte	1 byte	1 byte	64 bytes	2 bytes
message	0x01	0x14	0x42	0x41	0x06	log data	CRC

Read electric data log format

Meter supports 32000 pieces of data log at most. Each data log contains eight electric parameter data. The interval of data log is set by pressing buttons on meter or through communication. Please refer to communication address list. Historical data frame contains thirty-two words. First three words are time data. The other twenty-nine words are electric parameter data. Electric parameter data is secondary value. Description of data frame is shown in following list.

Parameter	**Format**	**Unit**
Recording time	Int	High byte:year low byte:month

Recording time	Int	High byte: day low byte: hour
Recording time	Int	High byte: minute low byte: second
V1	Int	0.1V
V2	Int	0.1V
V3	Int	0.1V
V12	Int	0.1V
V23	Int	0.1V
V31	Int	0.1V
I1	Int	0.001A
I2	Int	0.001A
I3	Int	0.001A
P	Int	1W
Q	Int	1var
S	Int	1VA
F	Int	0.01Hz
THDv1	Int	0.01%
THDv2	Int	0.01%
THDv3	Int	0.01%
THDI1	Int	0.01%
THDI2	Int	0.01%
THDI3	Int	0.01%
kWh+	Long	1Wh
kWh-	Long	1Wh
kvarh+	Long	1varh
kvarh-	Long	1varh
kVAh	Long	1VAh
User set1	Int	
User set2	Int	
User set3	Int	

User set4	Int	
User set5	Int	
User set6	Int	

Take reading the latest piece of log as example. Data type is hexadecimal.

Host request: 01 14 07 06 00 04 00 00 00 20 09 3C

Slave response: 01 14 42 41 06

0E 0A	17 0D	04 09	00 00	00 00	00 00	00 00	00 00
y:m	d:h	m:s	V1	V2	V3	V12	V23
00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00
V31	I1	I2	I3	P	Q	S	F
00 00	00 00	00 00	00 00	00 00	00 00	00 00 0F 20	
THDv1	THDv2	THDv3	THDI1	THDI2	THDI3	kWh+	

00 00 00 00	00 00 1A 28	00 00 00 00	00 00 1E 37	74 89
kWh-	kvarh+	kvarh-	kVAh	CRC

2.3.9 Reset data (FC 0x0E)

Request							
frame structure	address code	function code	data code				CRC
			initial relay address	Password	ID Reset	ID value	
byte	1 byte	1 byte	2 bytes	2 bytes	1 byte	1 bytes	2 byte
data range	1~247	0x0E	0xAACC	0x0001	N	0xFF	CRC16
message example	0x01	0x0E	0xAA0xCC	0x00 x01	0x01	0xFF	0x760D
Request							

frame structure	address code	function code	data code				CRC
			initial relay address	Password	ID Reset	ID value	
byte	1 byte	1 byte	2 bytes	2 bytes	1 byte	1 bytes	2 byte
data range	1～247	0x0E	0xAACC	0x0001	N	0xFF	CRC16
message example	0x01	0x0E	0xAACC	0x00 x01	0x01	0xFF	0x760D

Remark: This code can reset date of energy, Demand, MaxMin, Event, Pulses, and so on.

Password: This value should equal User's Password;

Id Reset:

0x01: Clear Energy   0x02: Clear Demand   0x03: Clear MaxMin

0x04: Clear Event   0x05: Clear Pulses   0x06: Clear Counters

0x07: Clear Record

Id value:

The value must be 0xff.

2.4 Data format

2.4.1 32-bit float format

32-bit float type data follows IEEE-754 format. Byte sequence of data adopts big-end mode which means low byte is after high byte.

Float type data of three phase voltages are shown in the following list.

Address(Hex)	Data(Hex)	Description
0006-0007	435C-8000	V1 = 0x435C8000 = 220.5V
0008-0009	4360-4CCD	V2 = 0x43604CCD = 224.3V
000A-000B	435E-B333	V3 = 0x435EB333 = 222.7V

2.4.2 16-bit integer format

16-bit integer type data adopts two's complement storage mode. Byte sequence of data adopts big-endian mode which means low byte is after high byte.

Int data of three phase voltages harmonic are shown in the following list.

Address(Hex)	Data(Hex)	Description
0210	0230	THDv1 = 0x0230 = 5.6%
0211	0172	THDv2 = 0x0172 = 3.7%
0212	0096	THDv3 = 0x0096 = 1.5%

2.4.3 32-bit long integer format

32-bit integer type data adopts two's complement storage mode. Byte sequence of data adopts big-end mode which means low byte is after high byte.

Long data of energy accumulation time are shown in the following list.

Address(Hex)	Data(Hex)	Description
0054-0055	0020-152A	Hour meter-EP+ = 2102570s
0056-0057	0000-37CD	Hour meter-EP- = 14285s

3. Communication address information list

3.1 Basic parameters

Address	Format	Description	Unit	R/W
0000-0005	----	----	----	----
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	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	1st Quadrant Reactive Energy - EQL+	kvarh	R
004E-004F	Float	2nd Quadrant Reactive Energy - EQC+	kvarh	R
0050-0051	Float	3rd Quadrant Reactive Energy - EQL-	kvarh	R
0052-0053	Float	4th Quadrant Reactive Energy - EQC-	kvarh	R
0054-0055	Long	Hour meter-EP+	s	R
0056-0057	Long	Hour meter-EP-	s	R
0058-0059	Float	Spare Import Active Energy	kWh	R
005A-005B	Float	Spare Export Active Energy	kWh	R
005C-005D	Float	Spare Import Reactive Energy	kvarh	R
005E-005F	Float	Spare Export Reactive Energy	kvarh	R
0060-0061	Float	Spare Apparent Energy	kVAh	R
0062-0063	Float	Spare Energy - EQL+	kvarh	R
0064-0065	Float	Spare Energy - EQC+	kvarh	R
0066-0067	Float	Spare Energy - EQL-	kvarh	R
0068-0069	Float	Spare Energy - EQC-	kvarh	R
006A-006B	Float	Hour meter - Spare EP+	s	R
006C-006D	Float	Hour meter - Spare EP-	s	R
006E-006F	Float	Total tariff import energy	kWh	R
0070-0071	Float	Tariff #1 import energy	kWh	R

0072-0073	Float	Tariff #2 import energy	kWh	R
0074-0075	Float	Tariff #3 import energy	kWh	R
0076-0077	Float	Tariff #4 import energy	kWh	R
0078-0079	Float	Tariff #5 import energy	kWh	R
007A-007B	Float	Tariff #6 import energy	kWh	R
007C-007D	Float	Tariff #7 import energy	kWh	R
007E-007F	Float	Tariff #8 import energy	kWh	R
0080-0081	Float	Tariff #9 import energy	kWh	R
0082-0083	Float	Tariff #10 import energy	kWh	R
0084-0085	Float	Tariff #11 import energy	kWh	R
0086-0087	Float	Tariff #12 import energy	kWh	R
0088-0089	Float	Tariff #13 import energy	kWh	R
008A-008B	Float	Tariff #14 import energy	kWh	R
008C-008D	Float	Tariff #15 import energy	kWh	R
008E-008F	Float	Tariff #16 import energy	kWh	R
0090-0091	Float	Total tariff export energy	kWh	R
0092-0093	Float	Tariff #1 export energy	kWh	R
0094-0095	Float	Tariff #2 export energy	kWh	R
0096-0097	Float	Tariff #3 export energy	kWh	R
0098-0099	Float	Tariff #4 export energy	kWh	R
009A-009B	Float	Tariff #5 export energy	kWh	R
009C-009D	Float	Tariff #6 export energy	kWh	R
009E-009F	Float	Tariff #7 export energy	kWh	R
00A0-00A1	Float	Tariff #8 export energy	kWh	R
00A2-00A3	Float	Tariff #9 export energy	kWh	R
00A4-00A5	Float	Tariff #10 export energy	kWh	R
00A6-00A7	Float	Tariff #11 export energy	kWh	R
00A8-00A9	Float	Tariff #12 export energy	kWh	R
00AA-00AB	Float	Tariff #13 export energy	kWh	R

00AC-00AD	Float	Tariff #14 export energy	kWh	R
00AE-00AF	Float	Tariff #15 export energy	kWh	R
00B0-00B1	Float	Tariff #16 export energy	kWh	R
00B2-00B3	Float	Max. value-V1	V	R
00B4-00B5	Float	Max. value-V2	V	R
00B6-00B7	Float	Max. value-V3	V	R
00B8-00B9	Float	Max. value-V12	V	R
00BA-00BB	Float	Max. value-V23	V	R
00BC-00BD	Float	Max. value-V31	V	R
00BE-00BF	Float	Max. value-I1	A	R
00C0-00C1	Float	Max. value-I2	A	R
00C2-00C3	Float	Max. value-I3	A	R
00C4-00C5	Float	Max. value-In	A	R
00C6-00C7	Float	Max. value-P1	kW	R
00C8-00C9	Float	Max. value-P2	kW	R
00CA-00CB	Float	Max. value-P3	kW	R
00CC-00CD	Float	Max. value-P	kW	R
00CE-00CF	Float	Max. value-Q1	kvar	R
00D0-00D1	Float	Max. value-Q2	kvar	R
00D2-00D3	Float	Max. value-Q3	kvar	R
00D4-00D5	Float	Max. value-Q	kvar	R
00D6-00D7	Float	Max. value-S1	kVA	R
00D8-00D9	Float	Max. value-S2	kVA	R
00DA-00DB	Float	Max. value-S3	kVA	R
00DC-00DD	Float	Max. value-S	kVA	R
00DE-00DF	Float	Max. value-PF		R
00E0-00E1	Float	Max. value-F	Hz	R
00E2-00E3	Float	Max. value-Average Vph-n	V	R
00E4-00E5	Float	Max. value-Average Vph-ph	V	R

00E6-00E7	Float	Max. value-Average I	A	R
00E8-00E9	Float	Min. value-V1	A	R
00EA-00EB	Float	Min. value-V2	A	R
00EC-00ED	Float	Min. value-V3	A	R
00EE-00EF	Float	Min. value-V12	V	R
00F0-00F1	Float	Min. value-V23	V	R
00F2-00F3	Float	Min. value-V31	V	R
00F4-00F5	Float	Min. value-I1	A	R
00F6-00F7	Float	Min. value-I2	A	R
00F8-00F9	Float	Min. value-I3	A	R
00FA-00FB	Float	Min. value-In	A	R
00FC-00FD	Float	Min. value-P1	kW	R
00FE-00FF	Float	Min. value-P2	kW	R
0100-0101	Float	Min. value-P3	kW	R
0102-0103	Float	Min. value-P	kW	R
0104-0105	Float	Min. value-Q1	kvar	R
0106-0107	Float	Min. value-Q2	kvar	R
0108-0109	Float	Min. value-Q3	kvar	R
010A-010B	Float	Min. value-Q	kvar	R
010C-010D	Float	Min. value-S1	kVA	R
010E-010F	Float	Min. value-S2	kVA	R
0110-0111	Float	Min. value-S3	kVA	R
0112-0113	Float	Min. value-S	kVA	R
0114-0115	Float	Min. value-PF		R
0116-0117	Float	Min. value-F	Hz	R
0118-0119	Float	Min. value-Average Vph-n	V	R
011A-011B	Float	Min. value-Average Vph-ph	V	R
011C-011D	Float	Min. value-Average I	A	R
011E-011F	Float	Max. demand value -I1	A	R

0120-0121	Float	Max. demand value -I2	A	R
0122-0123	Float	Max. demand value -I3	A	R
0124-0125	Float	Max. demand value -P	W	R
0126-0127	Float	Max. demand value -Q	var	R
0128-0129	Float	Max. demand value -S	VA	R
012A-012D	--			
012E-012F	Float	Present demand value -I1	A	R
0130-0131	Float	Present demand value -I2	A	R
0132-0133	Float	Present demand value -I3	A	R
0134-0135	Float	Present demand value -P	kW	R
0136-0137	Float	Present demand value -Q	kvar	R
0138-0139	Float	Present demand value -S	kVA	R
013A-013D	--			
013E-013F	Float	Previous demand value -I1	A	R
0140-0141	Float	Previous demand value -I2	A	R
0142-0143	Float	Previous demand value -I3	A	R
0144-0145	Float	Previous demand value -P	kW	R
0146-0147	Float	Previous demand value -Q	kvar	R
0148-0149	Float	Previous demand value -S	kVA	R
014A-014F	--			
0150-0151	Float	Total cost of import energy	$	R
0152-0153	Float	Cost of Tariff #1 import energy	$	R
0154-0155	Float	Cost of Tariff #2 import energy	$	R
0156-0157	Float	Cost of Tariff #3 import energy	$	R
0158-0159	Float	Cost of Tariff #4 import energy	$	R
015A-015B	Float	Cost of Tariff #5 import energy	$	R
015C-015D	Float	Cost of Tariff #6 import energy	$	R
015E-015F	Float	Cost of Tariff #7 import energy	$	R
0160-0161	Float	Cost of Tariff #8 import energy	$	R

0162-0163	Float	Cost of Tariff #9 import energy	$	R
0164-0165	Float	Cost of Tariff #10 import energy	$	R
0166-0167	Float	Cost of Tariff #11 import energy	$	R
0168-0169	Float	Cost of Tariff #12 import energy	$	R
016A-016B	Float	Cost of Tariff #13 import energy	$	R
016C-016D	Float	Cost of Tariff #14 import energy	$	R
016E-016F	Float	Cost of Tariff #15 import energy	$	R
0170-0171	Float	Cost of Tariff #16 import energy	$	R
0172-0173	Float	Total cost of export energy	$	R
0174-0175	Float	Cost of Tariff #1 export energy	$	R
0176-0177	Float	Cost of Tariff #2 export energy	$	R
0178-0179	Float	Cost of Tariff #3 export energy	$	R
017A-017B	Float	Cost of Tariff #4 export energy	$	R
017C-017D	Float	Cost of Tariff #5 export energy	$	R
017E-017F	Float	Cost of Tariff #6 export energy	$	R
0180-0181	Float	Cost of Tariff #7 export energy	$	R
0182-0183	Float	Cost of Tariff #8 export energy	$	R
0184-0185	Float	Cost of Tariff #9 export energy	$	R
0186-0187	Float	Cost of Tariff #10 export energy	$	R
0188-0189	Float	Cost of Tariff #11 export energy	$	R
018A-018B	Float	Cost of Tariff #12 export energy	$	R
018C-018D	Float	Cost of Tariff #13 export energy	$	R
018E-018F	Float	Cost of Tariff #14 export energy	$	R
0190-0191	Float	Cost of Tariff #15 export energy	$	R
0192-0193	Float	Cost of Tariff #16 export energy	$	R
0194-0195	Float	CO2 Emissions of import energy	kg	R
0196-0197	Float	CO2 Emissions of Tariff #1 import energy	kg	R
0198-0199	Float	CO2 Emissions of Tariff #2 import energy	kg	R
019A-019B	Float	CO2 Emissions of Tariff #3 import energy	kg	R

019C-019D	Float	CO2 Emissions of Tariff #4 import energy	kg	R
019E-019F	Float	CO2 Emissions of Tariff #5 import energy	kg	R
01A0-01A1	Float	CO2 Emissions of Tariff #6 import energy	kg	R
01A2-01A3	Float	CO2 Emissions of Tariff #7 import energy	kg	R
01A4-01A5	Float	CO2 Emissions of Tariff #8 import energy	kg	R
01A6-01A7	Float	CO2 Emissions of Tariff #9 import energy	kg	R
01A8-01A9	Float	CO2 Emissions of Tariff #10 import energy	kg	R
01AA-01AB	Float	CO2 Emissions of Tariff #11 import energy	kg	R
01AC-01AD	Float	CO2 Emissions of Tariff #12 import energy	kg	R
01AE-01AF	Float	CO2 Emissions of Tariff #13 import energy	kg	R
01B0-01B1	Float	CO2 Emissions of Tariff #14 import energy	kg	R
01B2-01B3	Float	CO2 Emissions of Tariff #15 import energy	kg	R
01B4-01B5	Float	CO2 Emissions of Tariff #16 import energy	kg	R
01B6-01B7	Float	CO2 Emissions of export energy	kg	R
01B8-01B9	Float	CO2 Emissions of Tariff #1 export energy	kg	R
01BA-01BB	Float	CO2 Emissions of Tariff #2 export energy	kg	R
01BC-01BD	Float	CO2 Emissions of Tariff #3 export energy	kg	R
01BE-01BF	Float	CO2 Emissions of Tariff #4 export energy	kg	R
01C0-01C1	Float	CO2 Emissions of Tariff #5 export energy	kg	R
01C2-01C3	Float	CO2 Emissions of Tariff #6 export energy	kg	R
01C4-01C5	Float	CO2 Emissions of Tariff #7 export energy	kg	R
01C6-01C7	Float	CO2 Emissions of Tariff #8 export energy	kg	R
01C8-01C9	Float	CO2 Emissions of Tariff #9 export energy	kg	R
01CA-01CB	Float	CO2 Emissions of Tariff #10 export energy	kg	R
01CC-01CD	Float	CO2 Emissions of Tariff #11 export energy	kg	R
01CE-01CF	Float	CO2 Emissions of Tariff #12 export energy	kg	R
01D0-01D1	Float	CO2 Emissions of Tariff #13 export energy	kg	R
01D2-01D3	Float	CO2 Emissions of Tariff #14 export energy	kg	R
01D4-01D5	Float	CO2 Emissions of Tariff #15 export energy	kg	R

01D6-01D7	Float	CO2 Emissions of Tariff #16 export energy	kg	R
01D8-01D9	Float	Load percentage	%	R
01DA-01EF	--			
01F0	Int	High byte-year,Low byte-month		R
01F1	Int	High byte-day,Low byte-hour		R
01F2	Int	High byte-minute,Low byte-second		R
01F3	Int	High byte-week		R
01F4-01F5	Long	Meter Status bit31-7: Reserved Bit6: active power import/export Bit5: current overload Bit4: voltage overload Bit3: X4 module status Bit2: X3 module status Bit1: X2 module status Bit0: X1 module status		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	V	R
0207	Int	Negative-sequence component of voltage	V	R
0208	Int	Zero-sequence component of voltage	V	R
0209	Int	Unbalance factor of voltage	%	R
020A	--			
020B	Int	Positive-sequence component of current	A	R
020C	Int	Negative-sequence component of current	A	R
020D	Int	Zero-sequence component of current	A	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-I2	0.01%	R
0215	Int	THD-I3	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	24th harmonic ratio-V1	0.01%	R
0239	Int	25th harmonic ratio-V1	0.01%	R
023A	Int	26th harmonic ratio-V1	0.01%	R
023B	Int	27th harmonic ratio-V1	0.01%	R
023C	Int	28th harmonic ratio-V1	0.01%	R
023D	Int	29th harmonic ratio-V1	0.01%	R
023E	Int	30th harmonic ratio-V1	0.01%	R
023F	Int	31th harmonic ratio-V1	0.01%	R
0240	Int	32th harmonic ratio-V1	0.01%	R
0241	Int	33th harmonic ratio-V1	0.01%	R
0242	Int	34th harmonic ratio-V1	0.01%	R
0243	Int	35th harmonic ratio-V1	0.01%	R
0244	Int	36th harmonic ratio-V1	0.01%	R
0245	Int	37th harmonic ratio-V1	0.01%	R
0246	Int	38th harmonic ratio-V1	0.01%	R
0247	Int	39th harmonic ratio-V1	0.01%	R
0248	Int	40th harmonic ratio-V1	0.01%	R
0249	Int	41th harmonic ratio-V1	0.01%	R
024A	Int	42th harmonic ratio-V1	0.01%	R
024B	Int	43th harmonic ratio-V1	0.01%	R
024C	Int	44th harmonic ratio-V1	0.01%	R
024D	Int	45th harmonic ratio-V1	0.01%	R
024E	Int	46th harmonic ratio-V1	0.01%	R
024F	Int	47th harmonic ratio-V1	0.01%	R
0250	Int	48th harmonic ratio-V1	0.01%	R
0251	Int	49th harmonic ratio-V1	0.01%	R
0252	Int	50th harmonic ratio-V1	0.01%	R
0253	Int	51th harmonic ratio-V1	0.01%	R
0254	Int	52th harmonic ratio-V1	0.01%	R

0255	Int	53^{th} harmonic ratio-V1	0.01%	R
0256	Int	54^{th} harmonic ratio-V1	0.01%	R
0257	Int	55^{th} harmonic ratio-V1	0.01%	R
0258	Int	56^{th} harmonic ratio-V1	0.01%	R
0259	Int	57^{th} harmonic ratio-V1	0.01%	R
025A	Int	58^{th} harmonic ratio-V1	0.01%	R
025B	Int	59^{th} harmonic ratio-V1	0.01%	R
025C	Int	60^{th} harmonic ratio-V1	0.01%	R
025D	Int	61^{th} harmonic ratio-V1	0.01%	R
025E	Int	62^{th} harmonic ratio-V1	0.01%	R
025F	Int	63^{th} harmonic ratio-V1	0.01%	R
0260	Int	2^{nd} harmonic ratio-V2	0.01%	R
0261	Int	3^{rd} harmonic ratio-V2	0.01%	R
0262	Int	4^{th} harmonic ratio-V2	0.01%	R
0263	Int	5^{th} harmonic ratio-V2	0.01%	R
0264	Int	6^{th} harmonic ratio-V2	0.01%	R
0265	Int	7^{th} harmonic ratio-V2	0.01%	R
0266	Int	8^{th} harmonic ratio-V2	0.01%	R
0267	Int	9^{th} harmonic ratio-V2	0.01%	R
0268	Int	10^{th} harmonic ratio-V2	0.01%	R
0269	Int	11^{th} harmonic ratio-V2	0.01%	R
026A	Int	12^{th} harmonic ratio-V2	0.01%	R
026B	Int	13^{th} harmonic ratio-V2	0.01%	R
026C	Int	14^{th} harmonic ratio-V2	0.01%	R
026D	Int	15^{th} harmonic ratio-V2	0.01%	R
026E	Int	16^{th} harmonic ratio-V2	0.01%	R
026F	Int	17^{th} harmonic ratio-V2	0.01%	R
0270	Int	18^{th} harmonic ratio-V2	0.01%	R
0271	Int	19^{th} harmonic ratio-V2	0.01%	R

0272	Int	20th harmonic ratio-V2	0.01%	R
0273	Int	21th harmonic ratio-V2	0.01%	R
0274	Int	22th harmonic ratio-V2	0.01%	R
0275	Int	23th harmonic ratio-V2	0.01%	R
0276	Int	24th harmonic ratio-V2	0.01%	R
0277	Int	25th harmonic ratio-V2	0.01%	R
0278	Int	26th harmonic ratio-V2	0.01%	R
0279	Int	27th harmonic ratio-V2	0.01%	R
027A	Int	28th harmonic ratio-V2	0.01%	R
027B	Int	29th harmonic ratio-V2	0.01%	R
027C	Int	30th harmonic ratio-V2	0.01%	R
027D	Int	31th harmonic ratio-V2	0.01%	R
027E	Int	32th harmonic ratio-V2	0.01%	R
027F	Int	33th harmonic ratio-V2	0.01%	R
0280	Int	34th harmonic ratio-V2	0.01%	R
0281	Int	35th harmonic ratio-V2	0.01%	R
0282	Int	36th harmonic ratio-V2	0.01%	R
0283	Int	37th harmonic ratio-V2	0.01%	R
0284	Int	38th harmonic ratio-V2	0.01%	R
0285	Int	39th harmonic ratio-V2	0.01%	R
0286	Int	40th harmonic ratio-V2	0.01%	R
0287	Int	41th harmonic ratio-V2	0.01%	R
0288	Int	42th harmonic ratio-V2	0.01%	R
0289	Int	43th harmonic ratio-V2	0.01%	R
028A	Int	44th harmonic ratio-V2	0.01%	R
028B	Int	45th harmonic ratio-V2	0.01%	R
028C	Int	46th harmonic ratio-V2	0.01%	R
028D	Int	47th harmonic ratio-V2	0.01%	R
028E	Int	48th harmonic ratio-V2	0.01%	R

028F	Int	49^{th} harmonic ratio-V2	0.01%	R
0290	Int	50^{th} harmonic ratio-V2	0.01%	R
0291	Int	51^{th} harmonic ratio-V2	0.01%	R
0292	Int	52^{th} harmonic ratio-V2	0.01%	R
0293	Int	53^{th} harmonic ratio-V2	0.01%	R
0294	Int	54^{th} harmonic ratio-V2	0.01%	R
0295	Int	55^{th} harmonic ratio-V2	0.01%	R
0296	Int	56^{th} harmonic ratio-V2	0.01%	R
0297	Int	57^{th} harmonic ratio-V2	0.01%	R
0298	Int	58^{th} harmonic ratio-V2	0.01%	R
0299	Int	59^{th} harmonic ratio-V2	0.01%	R
029A	Int	60^{th} harmonic ratio-V2	0.01%	R
029B	Int	61^{th} harmonic ratio-V2	0.01%	R
029C	Int	62^{th} harmonic ratio-V2	0.01%	R
029D	Int	63^{th} harmonic ratio-V2	0.01%	R
029E	Int	2^{nd} harmonic ratio-V3	0.01%	R
029F	Int	3^{rd} harmonic ratio-V3	0.01%	R
02A0	Int	4^{th} harmonic ratio-V3	0.01%	R
02A1	Int	5^{th} harmonic ratio-V3	0.01%	R
02A2	Int	6^{th} harmonic ratio-V3	0.01%	R
02A3	Int	7^{th} harmonic ratio-V3	0.01%	R
02A4	Int	8^{th} harmonic ratio-V3	0.01%	R
02A5	Int	9^{th} harmonic ratio-V3	0.01%	R
02A6	Int	10^{th} harmonic ratio-V3	0.01%	R
02A7	Int	11^{th} harmonic ratio-V3	0.01%	R
02A8	Int	12^{th} harmonic ratio-V3	0.01%	R
02A9	Int	13^{th} harmonic ratio-V3	0.01%	R
02AA	Int	14^{th} harmonic ratio-V3	0.01%	R
02AB	Int	15^{th} harmonic ratio-V3	0.01%	R

02AC	Int	16th harmonic ratio-V3	0.01%	R
02AD	Int	17th harmonic ratio-V3	0.01%	R
02AE	Int	18th harmonic ratio-V3	0.01%	R
02AF	Int	19th harmonic ratio-V3	0.01%	R
02B0	Int	20th harmonic ratio-V3	0.01%	R
02B1	Int	21th harmonic ratio-V3	0.01%	R
02B2	Int	22th harmonic ratio-V3	0.01%	R
02B3	Int	23th harmonic ratio-V3	0.01%	R
02B4	Int	24th harmonic ratio-V3	0.01%	R
02B5	Int	25th harmonic ratio-V3	0.01%	R
02B6	Int	26th harmonic ratio-V3	0.01%	R
02B7	Int	27th harmonic ratio-V3	0.01%	R
02B8	Int	28th harmonic ratio-V3	0.01%	R
02B9	Int	29th harmonic ratio-V3	0.01%	R
02BA	Int	30th harmonic ratio-V3	0.01%	R
02BB	Int	31th harmonic ratio-V3	0.01%	R
02BC	Int	32th harmonic ratio-V3	0.01%	R
02BD	Int	33th harmonic ratio-V3	0.01%	R
02BE	Int	34th harmonic ratio-V3	0.01%	R
02BF	Int	35th harmonic ratio-V3	0.01%	R
02C0	Int	36th harmonic ratio-V3	0.01%	R
02C1	Int	37th harmonic ratio-V3	0.01%	R
02C2	Int	38th harmonic ratio-V3	0.01%	R
02C3	Int	39th harmonic ratio-V3	0.01%	R
02C4	Int	40th harmonic ratio-V3	0.01%	R
02C5	Int	41th harmonic ratio-V3	0.01%	R
02C6	Int	42th harmonic ratio-V3	0.01%	R
02C7	Int	43th harmonic ratio-V3	0.01%	R
02C8	Int	44th harmonic ratio-V3	0.01%	R

02C9	Int	45th harmonic ratio-V3	0.01%	R
02CA	Int	46th harmonic ratio-V3	0.01%	R
02CB	Int	47th harmonic ratio-V3	0.01%	R
02CC	Int	48th harmonic ratio-V3	0.01%	R
02CD	Int	49th harmonic ratio-V3	0.01%	R
02CE	Int	50th harmonic ratio-V3	0.01%	R
02CF	Int	51th harmonic ratio-V3	0.01%	R
02D0	Int	52th harmonic ratio-V3	0.01%	R
02D1	Int	53th harmonic ratio-V3	0.01%	R
02D2	Int	54th harmonic ratio-V3	0.01%	R
02D3	Int	55th harmonic ratio-V3	0.01%	R
02D4	Int	56th harmonic ratio-V3	0.01%	R
02D5	Int	57th harmonic ratio-V3	0.01%	R
02D6	Int	58th harmonic ratio-V3	0.01%	R
02D7	Int	59th harmonic ratio-V3	0.01%	R
02D8	Int	60th harmonic ratio-V3	0.01%	R
02D9	Int	61th harmonic ratio-V3	0.01%	R
02DA	Int	62th harmonic ratio-V3	0.01%	R
02DB	Int	63th harmonic ratio-V3	0.01%	R
02DC	Int	2nd harmonic ratio-I1	0.01%	R
02DD	Int	3rd harmonic ratio-I1	0.01%	R
02DE	Int	4th harmonic ratio-I1	0.01%	R
02DF	Int	5th harmonic ratio-I1	0.01%	R
02E0	Int	6th harmonic ratio-I1	0.01%	R
02E1	Int	7th harmonic ratio-I1	0.01%	R
02E2	Int	8th harmonic ratio-I1	0.01%	R
02E3	Int	9th harmonic ratio-I1	0.01%	R
02E4	Int	10th harmonic ratio-I1	0.01%	R
02E5	Int	11th harmonic ratio-I1	0.01%	R

02E6	Int	12^{th} harmonic ratio-I1	0.01%	R
02E7	Int	13^{th} harmonic ratio-I1	0.01%	R
02E8	Int	14^{th} harmonic ratio-I1	0.01%	R
02E9	Int	15^{th} harmonic ratio-I1	0.01%	R
02EA	Int	16^{th} harmonic ratio-I1	0.01%	R
02EB	Int	17^{th} harmonic ratio-I1	0.01%	R
02EC	Int	18^{th} harmonic ratio-I1	0.01%	R
02ED	Int	19^{th} harmonic ratio-I1	0.01%	R
02EE	Int	20^{th} harmonic ratio-I1	0.01%	R
02EF	Int	21^{th} harmonic ratio-I1	0.01%	R
02F0	Int	22^{th} harmonic ratio-I1	0.01%	R
02F1	Int	23^{th} harmonic ratio-I1	0.01%	R
02F2	Int	24^{th} harmonic ratio-I1	0.01%	R
02F3	Int	25^{th} harmonic ratio-I1	0.01%	R
02F4	Int	26^{th} harmonic ratio-I1	0.01%	R
02F5	Int	27^{th} harmonic ratio-I1	0.01%	R
02F6	Int	28^{th} harmonic ratio-I1	0.01%	R
02F7	Int	29^{th} harmonic ratio-I1	0.01%	R
02F8	Int	30^{th} harmonic ratio-I1	0.01%	R
02F9	Int	31^{th} harmonic ratio-I1	0.01%	R
02FA	Int	32^{th} harmonic ratio-I1	0.01%	R
02FB	Int	33^{th} harmonic ratio-I1	0.01%	R
02FC	Int	34^{th} harmonic ratio-I1	0.01%	R
02FD	Int	35^{th} harmonic ratio-I1	0.01%	R
02FE	Int	36^{th} harmonic ratio-I1	0.01%	R
02FF	Int	37^{th} harmonic ratio-I1	0.01%	R
0300	Int	38^{th} harmonic ratio-I1	0.01%	R
0301	Int	39^{th} harmonic ratio-I1	0.01%	R
0302	Int	40^{th} harmonic ratio-I1	0.01%	R

0303	Int	41^{th} harmonic ratio-I1	0.01%	R
0304	Int	42^{th} harmonic ratio-I1	0.01%	R
0305	Int	43^{th} harmonic ratio-I1	0.01%	R
0306	Int	44^{th} harmonic ratio-I1	0.01%	R
0307	Int	45^{th} harmonic ratio-I1	0.01%	R
0308	Int	46^{th} harmonic ratio-I1	0.01%	R
0309	Int	47^{th} harmonic ratio-I1	0.01%	R
030A	Int	48^{th} harmonic ratio-I1	0.01%	R
030B	Int	49^{th} harmonic ratio-I1	0.01%	R
030C	Int	50^{th} harmonic ratio-I1	0.01%	R
030D	Int	51^{th} harmonic ratio-I1	0.01%	R
030E	Int	52^{th} harmonic ratio-I1	0.01%	R
030F	Int	53^{th} harmonic ratio-I1	0.01%	R
0310	Int	54^{th} harmonic ratio-I1	0.01%	R
0311	Int	55^{th} harmonic ratio-I1	0.01%	R
0312	Int	56^{th} harmonic ratio-I1	0.01%	R
0313	Int	57^{th} harmonic ratio-I1	0.01%	R
0314	Int	58^{th} harmonic ratio-I1	0.01%	R
0315	Int	59^{th} harmonic ratio-I1	0.01%	R
0316	Int	60^{th} harmonic ratio-I1	0.01%	R
0317	Int	61^{th} harmonic ratio-I1	0.01%	R
0318	Int	62^{th} harmonic ratio-I1	0.01%	R
0319	Int	63^{th} harmonic ratio-I1	0.01%	R
031A	Int	2^{nd} harmonic ratio-I2	0.01%	R
031B	Int	3^{rd} harmonic ratio-I2	0.01%	R
031C	Int	4^{th} harmonic ratio-I2	0.01%	R
031D	Int	5^{th} harmonic ratio-I2	0.01%	R
031E	Int	6^{th} harmonic ratio-I2	0.01%	R
031F	Int	7^{th} harmonic ratio-I2	0.01%	R

0320	Int	8^{th} harmonic ratio-I2	0.01%	R
0321	Int	9^{th} harmonic ratio-I2	0.01%	R
0322	Int	10^{th} harmonic ratio-I2	0.01%	R
0323	Int	11^{th} harmonic ratio-I2	0.01%	R
0324	Int	12^{th} harmonic ratio-I2	0.01%	R
0325	Int	13^{th} harmonic ratio-I2	0.01%	R
0326	Int	14^{th} harmonic ratio-I2	0.01%	R
0327	Int	15^{th} harmonic ratio-I2	0.01%	R
0328	Int	16^{th} harmonic ratio-I2	0.01%	R
0329	Int	17^{th} harmonic ratio-I2	0.01%	R
032A	Int	18^{th} harmonic ratio-I2	0.01%	R
032B	Int	19^{th} harmonic ratio-I2	0.01%	R
032C	Int	20^{th} harmonic ratio-I2	0.01%	R
032D	Int	21^{th} harmonic ratio-I2	0.01%	R
032E	Int	22^{th} harmonic ratio-I2	0.01%	R
032F	Int	23^{th} harmonic ratio-I2	0.01%	R
0330	Int	24^{th} harmonic ratio-I2	0.01%	R
0331	Int	25^{th} harmonic ratio-I2	0.01%	R
0332	Int	26^{th} harmonic ratio-I2	0.01%	R
0333	Int	27^{th} harmonic ratio-I2	0.01%	R
0334	Int	28^{th} harmonic ratio-I2	0.01%	R
0335	Int	29^{th} harmonic ratio-I2	0.01%	R
0336	Int	30^{th} harmonic ratio-I2	0.01%	R
0337	Int	31^{th} harmonic ratio-I2	0.01%	R
0338	Int	32^{th} harmonic ratio-I2	0.01%	R
0339	Int	33^{th} harmonic ratio-I2	0.01%	R
033A	Int	34^{th} harmonic ratio-I2	0.01%	R
033B	Int	35^{th} harmonic ratio-I2	0.01%	R
033C	Int	36^{th} harmonic ratio-I2	0.01%	R

033D	Int	37th harmonic ratio-I2	0.01%	R
033E	Int	38th harmonic ratio-I2	0.01%	R
033F	Int	39th harmonic ratio-I2	0.01%	R
0340	Int	40th harmonic ratio-I2	0.01%	R
0341	Int	41th harmonic ratio-I2	0.01%	R
0342	Int	42th harmonic ratio-I2	0.01%	R
0343	Int	43th harmonic ratio-I2	0.01%	R
0344	Int	44th harmonic ratio-I2	0.01%	R
0345	Int	45th harmonic ratio-I2	0.01%	R
0346	Int	46th harmonic ratio-I2	0.01%	R
0347	Int	47th harmonic ratio-I2	0.01%	R
0348	Int	48th harmonic ratio-I2	0.01%	R
0349	Int	49th harmonic ratio-I2	0.01%	R
034A	Int	50th harmonic ratio-I2	0.01%	R
034B	Int	51th harmonic ratio-I2	0.01%	R
034C	Int	52th harmonic ratio-I2	0.01%	R
034D	Int	53th harmonic ratio-I2	0.01%	R
034E	Int	54th harmonic ratio-I2	0.01%	R
034F	Int	55th harmonic ratio-I2	0.01%	R
0350	Int	56th harmonic ratio-I2	0.01%	R
0351	Int	57th harmonic ratio-I2	0.01%	R
0352	Int	58th harmonic ratio-I2	0.01%	R
0353	Int	59th harmonic ratio-I2	0.01%	R
0354	Int	60th harmonic ratio-I2	0.01%	R
0355	Int	61th harmonic ratio-I2	0.01%	R
0356	Int	62th harmonic ratio-I2	0.01%	R
0357	Int	63th harmonic ratio-I2	0.01%	R
0358	Int	2nd harmonic ratio-I3	0.01%	R
0359	Int	3rd harmonic ratio-I3	0.01%	R

035A	Int	4th harmonic ratio-I3	0.01%	R
035B	Int	5th harmonic ratio-I3	0.01%	R
035C	Int	6th harmonic ratio-I3	0.01%	R
035D	Int	7th harmonic ratio-I3	0.01%	R
035E	Int	8th harmonic ratio-I3	0.01%	R
035F	Int	9th harmonic ratio-I3	0.01%	R
0360	Int	10th harmonic ratio-I3	0.01%	R
0361	Int	11th harmonic ratio-I3	0.01%	R
0362	Int	12th harmonic ratio-I3	0.01%	R
0363	Int	13th harmonic ratio-I3	0.01%	R
0364	Int	14th harmonic ratio-I3	0.01%	R
0365	Int	15th harmonic ratio-I3	0.01%	R
0366	Int	16th harmonic ratio-I3	0.01%	R
0367	Int	17th harmonic ratio-I3	0.01%	R
0368	Int	18th harmonic ratio-I3	0.01%	R
0369	Int	19th harmonic ratio-I3	0.01%	R
036A	Int	20th harmonic ratio-I3	0.01%	R
036B	Int	21th harmonic ratio-I3	0.01%	R
036C	Int	22th harmonic ratio-I3	0.01%	R
036D	Int	23th harmonic ratio-I3	0.01%	R
036E	Int	24th harmonic ratio-I3	0.01%	R
036F	Int	25th harmonic ratio-I3	0.01%	R
0370	Int	26th harmonic ratio-I3	0.01%	R
0371	Int	27th harmonic ratio-I3	0.01%	R
0372	Int	28th harmonic ratio-I3	0.01%	R
0373	Int	29th harmonic ratio-I3	0.01%	R
0374	Int	30th harmonic ratio-I3	0.01%	R
0375	Int	31th harmonic ratio-I3	0.01%	R
0376	Int	32th harmonic ratio-I3	0.01%	R

0377	Int	33th harmonic ratio-I3	0.01%	R
0378	Int	34th harmonic ratio-I3	0.01%	R
0379	Int	35th harmonic ratio-I3	0.01%	R
037A	Int	36th harmonic ratio-I3	0.01%	R
037B	Int	37th harmonic ratio-I3	0.01%	R
037C	Int	38th harmonic ratio-I3	0.01%	R
037D	Int	39th harmonic ratio-I3	0.01%	R
037E	Int	40th harmonic ratio-I3	0.01%	R
037F	Int	41th harmonic ratio-I3	0.01%	R
0380	Int	42th harmonic ratio-I3	0.01%	R
0381	Int	43th harmonic ratio-I3	0.01%	R
0382	Int	44th harmonic ratio-I3	0.01%	R
0383	Int	45th harmonic ratio-I3	0.01%	R
0384	Int	46th harmonic ratio-I3	0.01%	R
0385	Int	47th harmonic ratio-I3	0.01%	R
0386	Int	48th harmonic ratio-I3	0.01%	R
0387	Int	49th harmonic ratio-I3	0.01%	R
0388	Int	50th harmonic ratio-I3	0.01%	R
0389	Int	51th harmonic ratio-I3	0.01%	R
038A	Int	52th harmonic ratio-I3	0.01%	R
038B	Int	53th harmonic ratio-I3	0.01%	R
038C	Int	54th harmonic ratio-I3	0.01%	R
038D	Int	55th harmonic ratio-I3	0.01%	R
038E	Int	56th harmonic ratio-I3	0.01%	R
038F	Int	57th harmonic ratio-I3	0.01%	R
0390	Int	58th harmonic ratio-I3	0.01%	R
0391	Int	59th harmonic ratio-I3	0.01%	R
0392	Int	60th harmonic ratio-I3	0.01%	R
0393	Int	61th harmonic ratio-I3	0.01%	R

0394	Int	62^{th} harmonic ratio-I3	0.01%	R
0395	Int	63^{th} harmonic ratio-I3	0.01%	R

3.3 Module data

Address	Format	Description	Unit	R/W
0506	Int	State of digital input,0:off,1:on Bit0:X1-DI1 Bit1:X1-DI2 Bit2:X1-DI3 Bit3:X1-DI4 Bit4:X2-DI1 Bit5:X2-DI2 Bit6:X2-DI3 Bit7:X2-DI4 Bit8:X3-DI1 Bit9:X3-DI2 Bit10:X3-DI3 Bit11:X3-DI4 Bit12:X4-DI1 Bit13:X4-DI2 Bit14:X4-DI3 Bit15:X4-DI4		R
0507	Int	State of relay output,0:off,1:on Bit0:main body-DO1 Bit1:main body-DO2 Bit2:X1-DO1 Bit3:X1-DO2 Bit4:X2-DO1 Bit5:X2-DO2 Bit6:X3-DO1 Bit7:X3-DO2 Bit8:X4-DO1 Bit9:X4-DO2		R

0508	Int	Analogue output value: X1-AO1	0.001mA	R
0509	Int	Analogue output value: X1-AO2	0.001mA	R
050A	Int	Analogue output value: X2-AO1	0.001mA	R
050B	Int	Analogue output value: X2-AO2	0.001mA	R
050C	Int	Analogue output value: X3-AO1	0.001mA	R
050D	Int	Analogue output value: X3-AO2	0.001mA	R
050E	Int	Analogue output value: X4-AO1	0.001mA	R
050F	Int	Analogue output value: X4-AO2	0.001mA	R
0510	Int	Analogue input value: X1-AI1(4-20mA)	0.001mA	R
0511	Int	Analogue input value: X1-AI2(4-20mA)	0.001mA	R
0512	Int	Analogue input value: X2-AI1(4-20mA)	0.001mA	R
0513	Int	Analogue input value: X2-AI2(4-20mA)	0.001mA	R
0514	Int	Analogue input value: X3-AI1(4-20mA)	0.001mA	R
0515	Int	Analogue input value: X3-AI2(4-20mA)	0.001mA	R
0516	Int	Analogue input value: X4-AI1(4-20mA)	0.001mA	R
0517	Int	Analogue input value: X4-AI2(4-20mA)	0.001mA	R
0518	Int	Analogue input value: X1-AI1(PT100)	0.1°C	R
0519	Int	Analogue input value: X1-AI2(PT100)	0.1 °C	R
051A	Int	Analogue input value: X2-AI1(PT100)	0.1 °C	R
051B	Int	Analogue input value: X2-AI2(PT100)	0.1 °C	R
051C	Int	Analogue input value: X3-AI1(PT100)	0.1℃	R
051D	Int	Analogue input value: X3-AI2(PT100)	0.1 °C	R
051E	Int	Analogue input value: X4-AI1(PT100)	0.1 °C	R
051F	Int	Analogue input value: X4-AI2(PT100)	0.1 °C	R
0520	Int	Analogue input value: X1-AI1(TC)	1 °C	R
0521	Int	Analogue input value: X1-AI2(TC)	1 °C	R
0523	Int	Analogue input value: X2-AI1(TC)	1 °C	R
0524	Int	Analogue input value: X2-AI2(TC)	1 °C	R
0525	Int	Analogue input value: X3-AI1(TC)	1 °C	R

0526	Int	Analogue input value: X3-AI2(TC)	1 °C	R
0527	Int	Analogue input value: X4-AI1(TC)	1 °C	R
0528	Int	Analogue input value: X4-AI2(TC)	1 °C	R
0528-0529	Long	Pulse counter: X1-1		R
052A-052B	Long	Pulse counter: X1-2		R
052C-052D	Long	Pulse counter: X1-3		R
052E-052F	Long	Pulse counter: X1-4		R
0530-0531	Long	Pulse counter: X2-1		R
0532-0533	Long	Pulse counter: X2-2		R
0534-0535	Long	Pulse counter: X2-3		R
0536-0537	Long	Pulse counter: X2-4		R
0538-0539	Long	Pulse counter: X3-1		R
053A-053B	Long	Pulse counter: X3-2		R
053C-053D	Long	Pulse counter: X3-3		R
053E-053F	Long	Pulse counter: X3-4		R
0540-0541	Long	Pulse counter: X4-1		R
0542-0543	Long	Pulse counter: X4-2		R
0544-0545	Long	Pulse counter: X4-3		R
0546-0547	Long	Pulse counter: X4-4		R

3.4 Module data

Address	Format	Description	Unit	R/W
0760-0767	char	MCU revision. Example: AHM3.1008		R
0768-076F	char	X1 revision		R
0770-0777	char	X2 revision		R
0778-077F	char	X3 revision		R
0780-0787	char	X4 revision		R

3.5 Setup Parameters

Address	Format	Description1	Description2	R/W
0800	Int	High byte	X1 0:no module 1:DM1 module 2:DM2 module 3:DM3 module ...... 13:DM13 module	R
		Low byte	X2 0:no module 1:DM1 module 2:DM2 module 3:DM3 module ...... 13:DM13 module	
0801	Int	High byte	X3 0:no module 1:DM1 module 2:DM2 module 3:DM3 module ...... 13:DM13 module	R
		Low byte	X4 0:no module 1:DM1 module 2:DM2 module 3:DM3 module ...... 13:DM13 module	

0802	Int	Password	0-9999	R
0803	Int	High byte	Default Display interface 0: U 1: I 2: P 3: Energy 4: THD 5: Waveform 6: Demand 7: Max/Min	R/W
0804	Int	High byte	Langue 0:English	R/W
		Low byte	Contrast:0-5	R/W
0805	Int	High byte	Back light delay time:1-255s 0:usually ON	R/W
		Low byte	Data recording interval 1-255min	R/W
0806	Int	High byte	Address: 1-247	R/W
		Low byte	Baud rate 0: 1200bps 1: 2400bps 2: 4800bps 3: 9600bps 4: 19200bps 5: 38400bps	
0807	Int	High byte	Parity 0: N,8,1 1: O,8,1 2: E,8,1 3: N,8,2	R/W

0808-0809	Int	--	--	R/W
080A	Int	High byte	Wiring 0: 3P4W 1: 3P3W 2: 1P2W 3:1P3W	R/W
080B	--			
080C-080D	Long	PT primary	1~999999V	R/W
080E-080F	Long	CT primary	1~999999A	R/W
0810	Int	PT secondary	1~999V	R/W
0811	Int	CT secondary	1~6A	R/W
0812	Int	Item of Record 1#	0: V1 1: V2 2: V3 3: V12 4: V23 5: V31 6: I1 7: I2 8: I3 9: In 10: P1 11: P2 12: P3 13: P 14: Q1 15: Q2 16: Q3 17: Q 18: S1	

			19: S2 20: S3 21: S 22: PF1 23: PF2 24: PF3 25: PF 26: F 27: Unavg 28: Ulavg 29: Iavg 30: Phase angle of V1 31: Phase angle of V2 32: Phase angle of V3 33: Phase angle of I1 34: Phase angle of I2 35: Phase angle of I3 36: Positive-sequence component of voltage 37: Negative-sequence component of voltage 38: Zero-sequence component of voltage 39: Unbalance factor of voltage 40: Reserved 41: Positive-sequence component of current 42: Negative-sequence component of current 43: Zero-sequence component of	

			current 44: Unbalance factor of current 45: Reserved 46: THD-V1 47: THD-V2 48: THD-V3 49: THD-I1 50: THD-I1 51: THD-I1 52: Fundamental value -V1 53: Fundamental value -V2 54: Fundamental value -V3 55: Fundamental value -I1 56: Fundamental value -I2 57: Fundamental value -I3	
0813	Int	Item of Record 2#	the same as above	R
0814	Int	Item of Record 3#	the same as above	R
0815	Int	Item of Record 4#	the same as above	R
0816	Int	Item of Record 5#	the same as above	R
0817	Int	Item of Record 6#	the same as above	R
0818-081F	--			
0820	Int	Unit price of Tariff #1 import energy	0.01$/kWh	
0821	Int	Unit price of Tariff #2 import energy	0.01$/kWh	

0822	Int	Unit price of Tariff #3 import energy	0.01$/kWh	
0823	Int	Unit price of Tariff #4 import energy	0.01$/kWh	
0824	Int	Unit price of Tariff #5 import energy	0.01$/kWh	
0825	Int	Unit price of Tariff #6 import energy	0.01$/kWh	
0826	Int	Unit price of Tariff #7 import energy	0.01$/kWh	
0827	Int	Unit price of Tariff #8 import energy	0.01$/kWh	
0828	Int	Unit price of Tariff #9 import energy	0.01$/kWh	
0829	Int	Unit price of Tariff #10 import energy	0.01$/kWh	
082A	Int	Unit price of Tariff #11 import energy	0.01$/kWh	
082B	Int	Unit price of Tariff #12 import energy	0.01$/kWh	
082C	Int	Unit price of Tariff #13 import energy	0.01$/kWh	
082D	Int	Unit price of Tariff #14 import energy	0.01$/kWh	
082E	Int	Unit price of Tariff #15 import energy	0.01$/kWh	
082F	Int	Unit price of Tariff #16 import energy	0.01$/kWh	
0830	Int	Unit price of Tariff #1 export energy	0.01$/kWh	

0831	Int	Unit price of Tariff #2 export energy	0.01$/kWh	
0832	Int	Unit price of Tariff #3 export energy	0.01$/kWh	
0833	Int	Unit price of Tariff #4 export energy	0.01$/kWh	
0834	Int	Unit price of Tariff #5 export energy	0.01$/kWh	
0835	Int	Unit price of Tariff #6 export energy	0.01$/kWh	
0836	Int	Unit price of Tariff #7 export energy	0.01$/kWh	
0837	Int	Unit price of Tariff #8 export energy	0.01$/kWh	
0838	Int	Unit price of Tariff #9 export energy	0.01$/kWh	
0839	Int	Unit price of Tariff #10 export energy	0.01$/kWh	
083A	Int	Unit price of Tariff #11 export energy	0.01$/kWh	
083B	Int	Unit price of Tariff #12 export energy	0.01$/kWh	
083C	Int	Unit price of Tariff #13 export energy	0.01$/kWh	
083D	Int	Unit price of Tariff #14 export energy	0.01$/kWh	
083E	Int	Unit price of Tariff #15 export energy	0.01$/kWh	
083F	Int	Unit price of Tariff #16 export energy	0.01$/kWh	

0840	Int	CO2 Emissions of Tariff #1 import energy	0.01kg/kWh	
0841	Int	CO2 Emissions of Tariff #2 import energy	0.01kg/kWh	
0842	Int	CO2 Emissions of Tariff #3 import energy	0.01kg/kWh	
0843	Int	CO2 Emissions of Tariff #4 import energy	0.01kg/kWh	
0844	Int	CO2 Emissions of Tariff #5 import energy	0.01kg/kWh	
0845	Int	CO2 Emissions of Tariff #6 import energy	0.01kg/kWh	
0846	Int	CO2 Emissions of Tariff #7 import energy	0.01kg/kWh	
0847	Int	CO2 Emissions of Tariff #8 import energy	0.01kg/kWh	
0848	Int	CO2 Emissions of Tariff #9 import energy	0.01kg/kWh	
0849	Int	CO2 Emissions of Tariff #10 import energy	0.01kg/kWh	

084A	Int	CO2 Emissions of Tariff #11 import energy	0.01kg/kWh	
084B	Int	CO2 Emissions of Tariff #12 import energy	0.01kg/kWh	
084C	Int	CO2 Emissions of Tariff #13 import energy	0.01kg/kWh	
084D	Int	CO2 Emissions of Tariff #14 import energy	0.01kg/kWh	
084E	Int	CO2 Emissions of Tariff #15 import energy	0.01kg/kWh	
084F	Int	CO2 Emissions of Tariff #16 import energy	0.01kg/kWh	
0850	Int	CO2 Emissions of Tariff #1 export energy	0.01kg/kWh	
0851	Int	CO2 Emissions of Tariff #2 export energy	0.01kg/kWh	
0852	Int	CO2 Emissions of Tariff #3 export energy	0.01kg/kWh	
0853	Int	CO2 Emissions of Tariff #4 export energy	0.01kg/kWh	

0854	Int	CO2 Emissions of Tariff #5 export energy	0.01kg/kWh	
0855	Int	CO2 Emissions of Tariff #6 export energy	0.01kg/kWh	
0856	Int	CO2 Emissions of Tariff #7 export energy	0.01kg/kWh	
0857	Int	CO2 Emissions of Tariff #8 export energy	0.01kg/kWh	
0858	Int	CO2 Emissions of Tariff #9 export energy	0.01kg/kWh	
0859	Int	CO2 Emissions of Tariff #10 export energy	0.01kg/kWh	
085A	Int	CO2 Emissions of Tariff #11 export energy	0.01kg/kWh	
085B	Int	CO2 Emissions of Tariff #12 export energy	0.01kg/kWh	
085C	Int	CO2 Emissions of Tariff #13 export energy	0.01kg/kWh	
085D	Int	CO2 Emissions of Tariff #14 export energy	0.01kg/kWh	

085E	Int	CO2 Emissions of Tariff #15 export energy	0.01kg/kWh	
085F	Int	CO2 Emissions of Tariff #16 export energy	0.01kg/kWh	
0860	Int	Item	analogue output: X1-AO1 0: OFF 1: V1 2: V2 3: V3 4: V12 5: V23 6: V31 7: I1 8: I2 9: I3 10: In 11: Pa 12: Pb 13: Pc 14: P 15: Q1 16: Q2 17: Q3 18: Q 19: S1 20: S2 21: S3 22: S 23: PF1 24: PF2 25: PF3 26: PF 27: F	R/W
0861	Int	mode	Analogue output: X1-AO1 0: 4~20 mA 1: 0~20 mA 2: 4~12~20 mA	R/W
0862-0863	Long	Down scale	Analogue output: X1-AO1 primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V	R/W

			current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Setting parameter value should be smaller than two times of rated value.	
0864-0865	Long	Middle scale	the same as above	R/W
0866-0867	Long	Full scale	the same as above	R/W
0868	Int	Item	analogue output: X1-AO2 0: OFF 1: V1 2: V2 3: V3 4: V12 5: V23 6: V31 7: I1 8: I2 9: I3 10: In 11: Pa 12: Pb 13: Pc 14: P 15: Q1 16: Q2 17: Q3 18: Q 19: S1 20: S2 21: S3 22: S 23: PF1 24: PF2 25: PF3 26: PF 27: F	R/W
0869	Int	mode	Analogue output: X1-AO2 0: 4~20 mA 1: 0~20 mA 2: 4~12~20 mA	R/W
086A-086B	Long	Down scale	Analogue output: X1-AO2 primary grid data	R/W

			$0\text{-}9999*10^n$ (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Setting parameter value should be smaller than two times of rated value.	
086C-086D	Long	Middle scale	the same as above	
086E-086F	Long	Full scale	the same as above	R/W
0870	Int	Item	analogue output: X2-AO1 0: OFF 1: V1 2: V2 3: V3 4: V12 5: V23 6: V31 7: I1 8: I2 9: I3 10: In 11: Pa 12: Pb 13: Pc 14: P 15: Q1 16: Q2 17: Q3 18: Q 19: S1 20: S2 21: S3 22: S 23: PF1 24: PF2 25: PF3 26: PF 27: F	R/W
0871	Int	mode	Analogue output: X2-AO1 0: 4~20 mA 1: 0~20 mA 2: 4~12~20 mA	R/W

0872-0873	Long	Down scale	Analogue output: X1-AO1 primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Setting parameter value should be smaller than two times of rated value.	R/W
0874-0875	Long	Middle scale	the same as above	
0876-0877	Long	Full scale	the same as above	R/W
0878	Int	Item	analogue output: X2-AO2 0: OFF 1: V1 2: V2 3: V3 4: V12 5: V23 6: V31 7: I1 8: I2 9: I3 10: In 11: Pa 12: Pb 13: Pc 14: P 15: Q1 16: Q2 17: Q3 18: Q 19: S1 20: S2 21: S3 22: S 23: PF1 24: PF2 25: PF3 26: PF 27: F	R/W
0879	Int	mode	Analogue output: X2-AO2 0: 4~20 mA	R/W

			1: 0~20 mA 2: 4~12~20 mA	
087A-087B	Long	Down scale	Analogue output: X1-AO2 primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Setting parameter value should be smaller than two times of rated value.	R/W
087C-087D	Long	Middle scale	the same as above	
087E-087F	Long	Full scale	the same as above	R/W
0880	Int	Item	analogue output: X3-AO1 0: OFF 1: V1 2: V2 3: V3 4: V12 5: V23 6: V31 7: I1 8: I2 9: I3 10: In 11: Pa 12: Pb 13: Pc 14: P 15: Q1 16: Q2 17: Q3 18: Q 19: S1 20: S2 21: S3 22: S 23: PF1 24: PF2 25: PF3 26: PF 27: F	R/W

0881	Int	mode	Analogue output: X3-AO1 0: 4~20 mA 1: 0~20 mA 2: 4~12~20 mA	R/W
0882-0883	Long	Down scale	Analogue output: X3-AO1 primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Setting parameter value should be smaller than two times of rated value.	R/W
0884-0885	Long	Middle scale	the same as above	
0886-0887	Long	Full scale	the same as above	R/W
0888	Int	Item	analogue output: X3-AO2 0: OFF 1: V1 2: V2 3: V3 4: V12 5: V23 6: V31 7: I1 8: I2 9: I3 10: In 11: Pa 12: Pb 13: Pc 14: P 15: Q1 16: Q2 17: Q3 18: Q 19: S1 20: S2 21: S3 22: S 23: PF1 24: PF2	R/W

			25: PF3 26: PF 27: F	
0889	Int	mode	Analogue output: X3-AO2 0: 4~20 mA 1: 0~20 mA 2: 4~12~20 mA	R/W
088A-088B	Long	Down scale	Analogue output: X3-AO2 primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Setting parameter value should be smaller than two times of rated value.	R/W
088C-088D	Long	Middle scale	the same as above	
088E-088F	Long	Full scale	the same as above	R/W
0890	Int	Item	analogue output: X4-AO1 0: OFF 1: V1 2: V2 3: V3 4: V12 5: V23 6: V31 7: I1 8: I2 9: I3 10: In 11: Pa 12: Pb 13: Pc 14: P 15: Q1 16: Q2 17: Q3 18: Q 19: S1 20: S2	R/W

			21: S3 22: S 23: PF1 24: PF2 25: PF3 26: PF 27: F	
0891	Int	mode	Analogue output: X4-AO1 0: 4~20 mA 1: 0~20 mA 2: 4~12~20 mA	R/W
0892-0893	Long	Down scale	Analogue output: X4-AO1 primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Setting parameter value should be smaller than two times of rated value.	R/W
0894-0895	Long	Middle scale	the same as above	
0896-0897	Long	Full scale	the same as above	R/W
0898	Int	Item	analogue output: X4-AO2 0: OFF 1: V1 2: V2 3: V3 4: V12 5: V23 6: V31 7: I1 8: I2 9: I3 10: In 11: Pa 12: Pb 13: Pc 14: P 15: Q1 16: Q2	R/W

			17: Q3 18: Q 19: S1 20: S2 21: S3 22: S 23: PF1 24: PF2 25: PF3 26: PF 27: F	
0899	Int	mode	Analogue output: X4-AO2 0: 4~20 mA 1: 0~20 mA 2: 4~12~20 mA	R/W
089A-089B	Long	Down scale	Analogue output: X4-AO2 primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Setting parameter value should be smaller than two times of rated value.	R/W
089C-089D	Long	Middle scale	the same as above	
089E-089F	Long	Full scale	the same as above	R/W
08A0-08AF	--			
08B0	Int	Demand item of first to sixth channels	0:IPQS (fixed) Include six electric parameters which are I1 I2,I3,P,Q,S	R/W
08B1	Int	Mode of demand	0: slip block mode 1: fixed block mode 2: 4:synchronous mode	R/W
08B2	Int	Slip time(t)	1-9999s	R/W

08B3	Int	Demand period(T)	1-30t	R/W
0894-089B	--			
08BC	Int	High byte: X1-DI1 mode Low byte: X1-DI2 mode	0:state monitor 1:pulse counter 2:Spare energy 3:tariff energy 4:synchronous demand	R/W
08BD	Int	High byte: X1-DI3 mode Low byte: X1-DI4 mode	0:state monitor 1:pulse counter 2:Spare energy 3:tariff energy 4:synchronous demand	R/W
08BE	Int	High byte: X2-DI1 mode Low byte: X2-DI2 mode	0:state monitor 1:pulse counter 2:Spare energy 3:tariff energy 4:synchronous demand	R/W
08BF	Int	High byte: X2-DI3 mode Low byte: X2-DI4 mode	0:state monitor 1:pulse counter 2:Spare energy 3:tariff energy 4:synchronous demand	R/W
08C0	Int	High byte: X3-DI1 mode Low byte: X3-DI2 mode	0:state monitor 1:pulse counter 2:Spare energy 3:tariff energy 4:synchronous demand	R/W
08C1	Int	High byte: X3-DI3 mode Low byte: X3-DI4 mode	0:state monitor 1:pulse counter	R/W

			2:Spare energy 3:tariff energy 4:synchronous demand	
08C2	Int	High byte: X4-DI1 mode Low byte: X4-DI2 mode	0:state monitor 1:pulse counter 2:Spare energy 3:tariff energy 4:synchronous demand	R/W
08C3	Int	High byte: X4-DI3 mode Low byte: X4-DI4 mode	0:state monitor 1:pulse counter 2:Spare energy 3:tariff energy 4:synchronous demand	R/W
08C4-08C7	--			
08C8	Int	High byte:X1-TC Thermocouple type	0:K 1:J 2:E 3:N	R/W
		Low byte:X1-code junction compensation	0:OFF 1:ON(default)	R/W
08C9	Int	High byte:X2-TC Thermocouple type	0:K 1:J 2:E 3:N	R/W
		Low byte:X2-code junction compensation	0:OFF 1:ON(default)	R/W
08CA	Int	High byte:X3-TC Thermocouple type	0:K 1:J 2:E 3:N	R/W

		Low byte:X3-code junction compensation	0:OFF 1:ON(default)	R/W
08CB		High byte:X4-TC Thermocouple type	0:K 1:J 2:E 3:N	R/W
		Low byte:X4-code junction compensation	0:OFF 1:ON(default)	R/W
08CC	Int	Relay output Main body-DO1 mode	0: OFF 1: remote control 2: alarm 3: energy pulse	R/W
08CD	Int	Relay output Main body-DO1 Pulse width	0.1~99.9ms 0.0: no pulse	R/W
08CE	Int	Relay output Main body-DO1 Alarm item select	0: V1 > 1: V1 < 2: V2 > 3: V2 < 4: V3 > 5: V3 < 6: Vn > 7: Vn < 8: V12 > 9: V12 < 10: V23 > 11: V23 < 12: V31 > 13: V31 <	R/W

			14: Vl >	
			15: Vl <	
			16:Uavg>	
			17:Uavg<	
			18:Vavg>	
			19:Vavg<	
			20: I1 >	
			21: I1 <	
			22: I2 >	
			23: I2 <	
			24: I3 >	
			25: I3 <	
			26: I >	
			27: I <	
			24: Iavg >	
			29: Iavg <	
			30: In >	
			31: In<	
			32: P >	
			33: P <	
			34: Q >	
			35: Q <	
			26: S >	
			37: S <	
			38: PF>	
			39: PF<	
			40: F >	
			41: F <	
			42: Uunb >	
			43: Uunb <	

			44: Iunb > 45: Iunb < 46: THDu > 47: THDu < 48: THDi > 49: THDi < 50: DIx	
			Energy pulse select: 0: kWh+ 1: kWh- 2: kvarh+ 3: kvarh-	
08CF-08D0	Long	Relay output Main body -DO1 limit value	primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Uunb /Iunb /THDu /THDi : 0.01% Setting parameter value should be smaller than two times of rated value. If it is switch linkage, this value corresponds to the No. of digital input. 0:X1-D1 1:X1-DI2 2:X1-DI3 3:X1-DI4	R/W

			4:X2-DI1 5:X2-DI2 6:X2-DI3 7:X2-DI4 8:X3-DI1 9:X3-DI2 10:X3-DI3 11:X3-DI4 12:X4-DI1 13:X4-DI2 14:X4-DI3 15:X4-DI4	
			Energy pulse constant: 0～9999, secondary grid data. (Wh/imp)/(varh/imp)	
08D1-08D2	Long	Relay output Main body-DO1 hysteresis	primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Uunb /Iunb /THDu /THDi : 0.01% Setting parameter value should be smaller than two times of rated value.	R/W
08D3	Int	Relay output Main body-DO1 Alarm delay time	0~99.99s	R/W
08D4	Int	Relay output	0:OFF	R/W

		Main body-DO1 Alarm interlock	1:ON	
08D5	Int	Relay output Main body-DO2 mode	0: OFF 1: remote control 2: alarm 3: energy pulse	R/W
08D6	Int	Relay output Main body-DO2 Pulse width	0.1~99.9ms 0.0: no pulse	R/W
08D7		Relay output Main body-DO2 Alarm item select	0: V1 > 1: V1 < 2: V2 > 3: V2 < 4: V3 > 5: V3 < 6: Vn > 7: Vn < 8: V12 > 9: V12 < 10: V23 > 11: V23 < 12: V31 > 13: V31 < 14: Vl > 15: Vl < 16:Uavg> 17:Uavg< 18:Vavg> 19:Vavg< 20: I1 >	R/W

			21: I1 < 22: I2 > 23: I2 < 24: I3 > 25: I3 < 26: I > 27: I < 24: Iavg > 29: Iavg < 30: In > 31: In < 32: P > 33: P < 34: Q > 35: Q < 26: S > 37: S < 38: PF> 39: PF< 40: F > 41: F < 42: Uunb > 43: Uunb < 44: Iunb > 45: Iunb < 46: THDu > 47: THDu < 48: THDi > 49: THDi < 50: DIx	

			Energy pulse select: 0: kWh+ 1: kWh- 2: kvarh+ 3: kvarh-	
08D8-08D9		Relay output Main body -DO2 limit value	primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Uunb /Iunb /THDu /THDi : 0.01% Setting parameter value should be smaller than two times of rated value. If it is switch linkage, this value corresponds to the No. of digital input. 0:X1-D1 1:X1-DI2 2:X1-DI3 3:X1-DI4 4:X2-DI1 5:X2-DI2 6:X2-DI3 7:X2-DI4 8:X3-DI1 9:X3-DI2 10:X3-DI3	R/W

			11:X3-DI4 12:X4-DI1 13:X4-DI2 14:X4-DI3 15:X4-DI4	
			Energy pulse constant: 0~9999 (Wh/imp)/(varh/imp)	
08DA-08DB		Relay output Main body-DO2 hysteresis	primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Uunb /Iunb /THDu /THDi : 0.01% Setting parameter value should be smaller than two times of rated value.	R/W
08DC	Int	Relay output Main body-DO2 Alarm delay time	0~99.99s	R/W
08DD	Int	Relay output Main body-DO2 Alarm interlock	0:OFF 1:ON	R/W
08DE	Int	Relay output	0: OFF	R/W

		X1-DO1 mode	1: remote control 2: alarm	
08DF	Int	Relay output X1-DO1 pulse width	0.0: no pulse 0.1~99.9ms	R/W
08E0	Int	Relay output X1-DO1 alarm select	0: V1 > 1: V1 < 2: V2 > 3: V2 < 4: V3 > 5: V3 < 6: Vn > 7: Vn < 8: V12 > 9: V12 < 10: V23 > 11: V23 < 12: V31 > 13: V31 < 14: Vl > 15: Vl < 16:Uavg> 17:Uavg< 18:Vavg> 19:Vavg< 20: I1 > 21: I1 < 22: I2 > 23: I2 < 24: I3 > 25: I3 <	R/W

			26: I > 27: I < 24: Iavg > 29: Iavg < 30: In > 31: In < 32: P > 33: P < 34: Q > 35: Q < 26: S > 37: S < 38: PF> 39: PF< 40: F > 41: F < 42: Uunb > 43: Uunb < 44: Iunb > 45: Iunb < 46: THDu > 47: THDu < 48: THDi > 49: THDi < 50: DIx	
08E1-08E2	Long	Relay output X1-DO1 limit value	primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA,	R/W

			PF: 0.001 F: 0.01Hz Uunb /Iunb /THDu /THDi : 0.01% Setting parameter value should be smaller than two times of rated value. If it is switch linkage, this value corresponds to the No. of digital input. 0:X1-D1 1:X1-DI2 2:X1-DI3 3:X1-DI4 4:X2-DI1 5:X2-DI2 6:X2-DI3 7:X2-DI4 8:X3-DI1 9:X3-DI2 10:X3-DI3 11:X3-DI4 12:X4-DI1 13:X4-DI2 14:X4-DI3 15:X4-DI4	
08E3-08E4	Long	Relay output X1-DO1 hysteresis value	primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA,	R/W

			PF: 0.001 F: 0.01Hz Uunb /Iunb /THDu /THDi : 0.01% Setting parameter value should be smaller than two times of rated value.	
08E5	Int	Relay output X1-DO1 delay time	0~99.99s	R/W
08E6	Int	Relay output X1-DO1 interlock	0:OFF 1:ON	R/W
08E7	Int	Relay output X1-DO2 mode	0:OFF 1:remote control 2:alarm	R/W
08E8	Int	Relay output X1-DO2 pulse width	0.0: no pulse 0.1~99.9ms	R/W
08E9	Int	Relay output X1-DO2 alarm select	0: V1 > 1: V1 < 2: V2 > 3: V2 < 4: V3 > 5: V3 < 6: Vn > 7: Vn < 8: V12 > 9: V12 < 10: V23 > 11: V23 < 12: V31 > 13: V31 < 14: Vl >	R/W

			15: Vl < 16:Uavg> 17:Uavg< 18:Vavg> 19:Vavg< 20: I1 > 21: I1 < 22: I2 > 23: I2 < 24: I3 > 25: I3 < 26: I > 27: I < 24: Iavg > 29: Iavg < 30: In > 31: In < 32: P > 33: P < 34: Q > 35: Q < 26: S > 37: S < 38: PF> 39: PF< 40: F > 41: F < 42: Uunb > 43: Uunb < 44: Iunb >	

			45: Iunb < 46: THDu > 47: THDu < 48: THDi > 49: THDi < 50: DIx	
08EA-08EB	Long	Relay output X1-DO2 limit value	primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Uunb /Iunb /THDu /THDi : 0.01% Setting parameter value should be smaller than two times of rated value. If it is switch linkage, this value corresponds to the No. of digital input. 0:X1-D1 1:X1-DI2 2:X1-DI3 3:X1-DI4 4:X2-DI1 5:X2-DI2 6:X2-DI3 7:X2-DI4 8:X3-DI1 9:X3-DI2	R/W

			10:X3-DI3 11:X3-DI4 12:X4-DI1 13:X4-DI2 14:X4-DI3 15:X4-DI4	
08EC-08ED	Long	Relay output X1-DO2 hysteresis value	primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Uunb /Iunb /THDu /THDi : 0.01% Setting parameter value should be smaller than two times of rated value.	R/W
08EE	Int	Relay output X1-DO2 delay time	0~99.99s	R/W
08EF	Int	Relay output X1-DO2 interlock	0:OFF 1:ON	R/W
08F0	Int	Relay output X2-DO1 mode	0:OFF 1:remote control 2:alarm	R/W
08F1	Int	Relay output X2-DO1 pulse width	0.0: no pulse 0.1~99.9ms	R/W
08F2	Int	Relay output X2-DO1 alarm select	0: V1 > 1: V1 < 2: V2 > 3: V2 <	R/W

			4: V3 > 5: V3 < 6: Vn > 7: Vn < 8: V12 > 9: V12 < 10: V23 > 11: V23 < 12: V31 > 13: V31 < 14: Vl > 15: Vl < 16:Uavg> 17:Uavg< 18:Vavg> 19:Vavg< 20: I1 > 21: I1 < 22: I2 > 23: I2 < 24: I3 > 25: I3 < 26: I > 27: I < 24: Iavg > 29: Iavg < 30: In > 31: In < 32: P > 33: P <	

			34: Q > 35: Q < 26: S > 37: S < 38: PF> 39: PF< 40: F > 41: F < 42: Uunb > 43: Uunb < 44: Iunb > 45: Iunb < 46: THDu > 47: THDu < 48: THDi > 49: THDi < 50: DIx	
08F3-08F4	Long	Relay output X2-DO1 limit value	primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Uunb /Iunb /THDu /THDi : 0.01% Setting parameter value should be smaller than two times of rated value. If it is switch linkage, this value corresponds to the No. of digital	R/W

			input. 0:X1-D1 1:X1-DI2 2:X1-DI3 3:X1-DI4 4:X2-DI1 5:X2-DI2 6:X2-DI3 7:X2-DI4 8:X3-DI1 9:X3-DI2 10:X3-DI3 11:X3-DI4 12:X4-DI1 13:X4-DI2 14:X4-DI3 15:X4-DI4	
08F5-08F6	Long	Relay output X2-DO1 hysteresis value	primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Uunb /Iunb /THDu /THDi : 0.01% Setting parameter value should be smaller than two times of rated value.	R/W
08F7	Int	Relay output X2-DO1 delay time	0~99.99s	R/W

08F8	Int	Relay output X2-DO1 interlock	0:OFF 1:ON	R/W
08F9	Int	Relay output X2-DO2 mode	0:OFF 1:remote control 2:alarm	R/W
08FA	Int	Relay output X2-DO2 pulse width	0.0: no pulse 0.1～99.9ms	R/W
08FB	Int	Relay output X2-DO2 alarm select	0: V1 > 1: V1 < 2: V2 > 3: V2 < 4: V3 > 5: V3 < 6: Vn > 7: Vn < 8: V12 > 9: V12 < 10: V23 > 11: V23 < 12: V31 > 13: V31 < 14: Vl > 15: Vl < 16:Uavg> 17:Uavg< 18:Vavg> 19:Vavg< 20: I1 > 21: I1 < 22: I2 >	R/W

			23: I2 < 24: I3 > 25: I3 < 26: I > 27: I < 24: Iavg > 29: Iavg < 30: In > 31: In < 32: P > 33: P < 34: Q > 35: Q < 26: S > 37: S < 38: PF> 39: PF< 40: F > 41: F < 42: Uunb > 43: Uunb < 44: Iunb > 45: Iunb < 46: THDu > 47: THDu < 48: THDi > 49: THDi < 50: DIx	
08FC-08FD	Long	Relay output X2-DO2 limit value	primary grid data 0-9999*10^n (n=0,3,6)	R/W

			ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Uunb /Iunb /THDu /THDi : 0.01% Setting parameter value should be smaller than two times of rated value. If it is switch linkage, this value corresponds to the No. of digital input. 0:X1-D1 1:X1-DI2 2:X1-DI3 3:X1-DI4 4:X2-DI1 5:X2-DI2 6:X2-DI3 7:X2-DI4 8:X3-DI1 9:X3-DI2 10:X3-DI3 11:X3-DI4 12:X4-DI1 13:X4-DI2 14:X4-DI3 15:X4-DI4	
08FE-08FF	Long	Relay output X2-DO2 hysteresis value	primary grid data 0-9999*10^n (n=0,3,6)	R/W

			ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Uunb /Iunb /THDu /THDi : 0.01% Setting parameter value should be smaller than two times of rated value.	
0900	Int	Relay output X2-DO2 delay time	0~99.99s	R/W
0901	Int	Relay output X2-DO2 interlock	0:OFF 1:ON	R/W
0902	Int	Relay output X3-DO1 mode	0:OFF 1:remote control 2:alarm	R/W
0903	Int	Relay output X3-DO1 pulse width	0.0: no pulse 0.1～99.9ms	R/W
0904	Int	Relay output X3-DO1 alarm select		R/W
0905-0906	Long	Relay output X3-DO1 limit value	primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Uunb /Iunb /THDu /THDi : 0.01% Setting parameter value should be smaller than two times of rated	R/W

			value. If it is switch linkage, this value corresponds to the No. of digital input. 0:X1-D1 1:X1-DI2 2:X1-DI3 3:X1-DI4 4:X2-DI1 5:X2-DI2 6:X2-DI3 7:X2-DI4 8:X3-DI1 9:X3-DI2 10:X3-DI3 11:X3-DI4 12:X4-DI1 13:X4-DI2 14:X4-DI3 15:X4-DI4	
0907-0908	Long	Relay output X3-DO1 hysteresis value	primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Uunb /Iunb /THDu /THDi : 0.01% Setting parameter value should be smaller than two times of rated	R/W

			value.	
0909	Int	Relay output X3-DO1 delay time	0~99.99s	R/W
090A	Int	Relay output X3-DO1 interlock	0:OFF 1:ON	R/W
090B	Int	Relay output X3-DO2 mode	0:OFF 1:remote control 2:alarm	R/W
090C	Int	Relay output X3-DO2 pulse width	0.0: no pulse 0.1~99.9ms	R/W
090D	Int	Relay output X3-DO2 alarm select	0: V1 > 1: V1 < 2: V2 > 3: V2 < 4: V3 > 5: V3 < 6: Vn > 7: Vn < 8: V12 > 9: V12 < 10: V23 > 11: V23 < 12: V31 > 13: V31 < 14: Vl > 15: Vl < 16:Uavg> 17:Uavg< 18:Vavg> 19:Vavg<	R/W

			20: I1 > 21: I1 < 22: I2 > 23: I2 < 24: I3 > 25: I3 < 26: I > 27: I < 24: Iavg > 29: Iavg < 30: In > 31: In < 32: P > 33: P < 34: Q > 35: Q < 26: S > 37: S < 38: PF> 39: PF< 40: F > 41: F < 42: Uunb > 43: Uunb < 44: Iunb > 45: Iunb < 46: THDu > 47: THDu < 48: THDi > 49: THDi <	

			50: DIx	
090E-090F	Long	Relay output X3-DO2 limit value	primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Uunb /Iunb /THDu /THDi : 0.01% Setting parameter value should be smaller than two times of rated value. If it is switch linkage, this value corresponds to the No. of digital input. 0:X1-D1 1:X1-DI2 2:X1-DI3 3:X1-DI4 4:X2-DI1 5:X2-DI2 6:X2-DI3 7:X2-DI4 8:X3-DI1 9:X3-DI2 10:X3-DI3 11:X3-DI4 12:X4-DI1 13:X4-DI2 14:X4-DI3	R/W

			15:X4-DI4	
0910-0911	Long	Relay output X3-DO2 hysteresis value	primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Uunb /Iunb /THDu /THDi : 0.01% Setting parameter value should be smaller than two times of rated value.	R/W
0912	Int	Relay output X3-DO2 delay time	0~99.99s	R/W
0913	Int	Relay output X3-DO2 interlock	0:OFF 1:ON	R/W
0914	Int	Relay output X4-DO1 mode	0:OFF 1:remote control 2:alarm	R/W
0915	Int	Relay output X4-DO1 pulse width	0.0: no pulse 0.1~99.9ms	R/W
0916	Int	Relay output X4-DO1 alarm select	0: V1 > 1: V1 < 2: V2 > 3: V2 < 4: V3 > 5: V3 < 6: Vn > 7: Vn < 8: V12 >	R/W

			9: V12 < 10: V23 > 11: V23 < 12: V31 > 13: V31 < 14: Vl > 15: Vl < 16:Uavg> 17:Uavg< 18:Vavg> 19:Vavg< 20: I1 > 21: I1 < 22: I2 > 23: I2 < 24: I3 > 25: I3 < 26: I > 27: I < 24: Iavg > 29: Iavg < 30: In > 31: In < 32: P > 33: P < 34: Q > 35: Q < 26: S > 37: S < 38: PF>	

			39: PF< 40: F > 41: F < 42: Uunb > 43: Uunb < 44: Iunb > 45: Iunb < 46: THDu > 47: THDu < 48: THDi > 49: THDi < 50: DIx	
0917-0918	Long	Relay output X4-DO1 limit value	primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Uunb /Iunb /THDu /THDi : 0.01% Setting parameter value should be smaller than two times of rated value. If it is switch linkage, this value corresponds to the No. of digital input. 0:X1-D1 1:X1-DI2 2:X1-DI3 3:X1-DI4	R/W

			4:X2-DI1 5:X2-DI2 6:X2-DI3 7:X2-DI4 8:X3-DI1 9:X3-DI2 10:X3-DI3 11:X3-DI4 12:X4-DI1 13:X4-DI2 14:X4-DI3 15:X4-DI4	
0919-091A	Long	Relay output X4-DO1 hysteresis value	primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Uunb /Iunb /THDu /THDi : 0.01% Setting parameter value should be smaller than two times of rated value.	R/W
091B	Int	Relay output X4-DO1 delay time	0~99.99s	R/W
091C	Int	Relay output X4-DO1 interlock	0:OFF 1:ON	R/W
091D	Int	Relay output X4-DO2 mode	0:OFF 1:remote control 2:alarm	R/W

091E	Int	Relay output X4-DO2 pulse width	0.0: no pulse 0.1~99.9ms	R/W
091F	Int	Relay output X4-DO2 alarm select	0: V1 > 1: V1 < 2: V2 > 3: V2 < 4: V3 > 5: V3 < 6: Vn > 7: Vn < 8: V12 > 9: V12 < 10: V23 > 11: V23 < 12: V31 > 13: V31 < 14: Vl > 15: Vl < 16:Uavg> 17:Uavg< 18:Vavg> 19:Vavg< 20: I1 > 21: I1 < 22: I2 > 23: I2 < 24: I3 > 25: I3 < 26: I > 27: I <	R/W

			24: Iavg > 29: Iavg < 30: In > 31: In < 32: P > 33: P < 34: Q > 35: Q < 26: S > 37: S < 38: PF> 39: PF< 40: F > 41: F < 42: Uunb > 43: Uunb < 44: Iunb > 45: Iunb < 46: THDu > 47: THDu < 48: THDi > 49: THDi < 50: DIx	
0920-0921	Long	Relay output X4-DO2 limit value	primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz	R/W

			Uunb /Iunb /THDu /THDi : 0.01% Setting parameter value should be smaller than two times of rated value. If it is switch linkage, this value corresponds to the No. of digital input. 0:X1-D1 1:X1-DI2 2:X1-DI3 3:X1-DI4 4:X2-DI1 5:X2-DI2 6:X2-DI3 7:X2-DI4 8:X3-DI1 9:X3-DI2 10:X3-DI3 11:X3-DI4 12:X4-DI1 13:X4-DI2 14:X4-DI3 15:X4-DI4	
0922-0923	Long	Relay output X4-DO2 hysteresis value	primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz	R/W

			Uunb /Iunb /THDu /THDi : 0.01% Setting parameter value should be smaller than two times of rated value.	
0924	Int	Relay output X4-DO2 delay time	0~99.99s	R/W
0925	Int	Relay output X4-DO2 interlock	0:OFF 1:ON	R/W
0926	Int	Ethernet Module Set	High byte: DHCP 0: invalid 1: dynamic allocation ip address Low byte: Connect Mode 0:Server; 1: Client	R/W
0927	Int		Port number	R/W
0928-092F	RJ45 : char[4][]		Char[4][4] [0][4] Local IP [1][4] Remote IP [2][4] subnet mask [3][4] gateway address	R/W
0930-0932	RJ45 : char[6]		MAC Address	R
0933	Int		High byte: DHCP 0: invalid 1: dynamic allocation ip address Low byte: Connect Mode 0:Server; 1: Client	R/W
0934	Int		Port number	R/W
0935-0954	Int		WI-FI:	R/W

		WI-FI Module Set	Char[4][16] [0][16] Local IP [1][16] Remote IP [2][16] subnet mask [3][16] gateway address	
0955-0957	Int		MAC Address: Char[6]	R
0958	Int		High byte: WIFI Mode 1: Station（default） 2: SoftAP 3: Station+SoftAP Low byte: Encryption 0: WEP; 1: WPA/WPA2 Psk; 2: NONE	R/W
0959-0968	Int		WIFI Network Name: Char[32]	R/W
0969	Int		High byte: WEPpassword length 0: unlimited 1: ACSII 2: 13 ACSII Low byte: IO1 0: None 1: FC Mode 2:HDC Mode	R/W
096A-0971	Int		Char[16]: WEP password	R/W
0972-0981	Int		Char[32]: WAP/WAP2 password	R/W
0982-0987	Int		Char[12]: HEX format E.g. 0x30 0x32 0x30 0x36 0x30 0x33 0x30 0x32 0x2E 0x30 0x32 0x30 Firmware version: 02060302.020	R/W
0988	Int	GPRS Module Set	High byte: DHCP 0: invalid 1: dynamic allocation ip address Low byte: Connect Mode	R/W

			0:Server; 1: Client	
0989	Int		Port number	R/W
098A-0999	Int		GPRS: Address Char[2][16] [0][16] Local IP [1][16] Remote IP	R/W
099A-099B	Int		Char[4] GPRS Mode Set: Char[0] : GPRS Switch 0: OFF 1:ON Char[1] : GPRS Mode 0: SMS 1:SMS+GPRS Char[2] : GPRS connection Mode 0: IP 1:DOMAIN NAME Char[3] : reserved	R/W
099C-09A7	Int		Char[24]: DN E.g. www.jcsepi.com	R/W
09A8-09AF	Int		Char[16]: SMS center number E.g. +34 xxx xxx xxx	R/W
09B0-9B7	Int		Char[16]: Administrator number E.g. +34 xxx xxx xxx	R/W
09B8-09CF	Int		Char[3][16]: User number E.g. Char[0][16]: +34 xxx xxx xxx Char[1][16]: +34 xxx xxx xxx Char[2][16]: +34 xxx xxx xxx	R/W
09D0-09D7	Int		Char[16]: Company name E.g. SACI	R/W
09D8-09DB	Int		Char[8]: User ID	R/W
09DC-09ED	Int		Char[36]: APN[36]	R/W
09EE-09F9	Int		Char[24]: APN_UserName	R/W
09FA-0A03	Int		Char[20]: APN_UserCode	R/W

0A04-0A05	Int		Char[4]: Heartbeat time	R/W
0A06-0A09	Int		Char[8]: Set password	R/W
0A0A-0AFF	--			

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AHM3-SMTP/AHM3RC-SMTP

Multifunction Power Meter

-Modbus-RTU

Rev 1.1

Menu

1. Overview

This user manual is the operation instruction for AHM3 multifunction power meter with Modbus-RTU protocol, which is used to help thirty party to operate and develop this meter.

2. Communication

2.1 Physical layer

Communication interface should be connected by shielded twisted-pair. Thirty two meters are supposed to be connected to a same busbar at most. Terminal resistance should be connected to both ends of busbar. Communication speed is 1200～38400bps which can be set. Defaulted communication speed is 9600bps. Byte transmission format is composed of one start bit, eight data bits, no check bit or one odd bit or one even check bit, one or two stop bits.

2.2 Communication protocol

Message format

Address field	Function code field	Data field	Check field
one byte	one byte	N bytes	two bytes

◆ **Address code**

Address code is slave address with range of 1-247. Other addresses are reserved.

◆ **Function code field**

Function code field indicates the executive function of addressed terminal. Meaning and function of function codes supported by meter is shown in the following list.

Code	Meaning
0x01	Read coils
0x02	Read input discrete
0x03/0x04	Read data register value
0x05	Write Single Coil
0x06	Write Single Register
0x0F	Write Multiple Coils
0x10	Write Multiple Registers
0x14	Read File record
0x0E	Reset Data

◆ **Data code**

Data code includes the data which is needed by a terminal device when it performs a function or the data collected from a terminal device when it responses to an inquiry. These data may be numbers, referenced address or setting value. For example, when the function code tells a terminal device to read a register, the data field should indicate the terminal device that which register it should begin from and how much data it should read. The data code sent back from a terminal device includes data length and corresponding data. Data adopts BIG END mode which means low byte is after high byte.

◆ **Check code**

Cyclical Redundancy Check (CRC16) field occupies two bytes including a 16-bit binary value. CRC value will be calculated by transmission equipment and be added to a data frame. When the receiving equipment receives the data, it will calculate CRC value again, and then it compares the two CRC values. If the two values are not equal to each other, an error will be detected.

2.3 Modbus-RTU communication protocol format

2.3.1 Read coils (FC 0x01)

Request					
Frame structure	Address code	Function code	data code		CRC
			Start address	Number of relay	
Byte	1 byte	1 byte	2 bytes	2 bytes	2 bytes
Data range	1～247	0x01	0x0000（fixed）	0x0001～0x0002	CRC
Message example	0x01	0x01	0x00 0x00	0x00 0x02	0xBD 0xCB
Response					
frame structure	address code	function code	data code		CRC
			byte of register	register value	
Byte	1 byte	1 byte	1 byte	1 byte	2 bytes
Message example	0x01	0x01	0x01	0x03	0x11 0x89

Remark: The register value in the slave response indicates the status of the relay. Beginning from the lowest bit of the byte, each number corresponds to the status of a relay output. “1” indicates the relay is closed, while “0” indicates the relay is cut off. In the upper list, the register value “0x03” corresponds to “0000 0011” in binary system which means the first and second relays are closed.

2.3.2 Read input discretes（FC 0x02）

Request					
Frame structure	address	function code	data		CRC
			start address	number	
Byte	1 byte	1 byte	2 bytes	2 bytes	2 bytes
Data range	1～247	0x02	0x0000（fixed）	0x0001～0x000C	CRC16
Message example	0x01	0x02	0x00 0x00	0x00 0x01	0x79 0xC9

Response					
Data structure	address data	function code	data		CRC
			byte of register	register value	
Byte	1 byte	1 byte	1 byte	1 byte	2 bytes
Message example	0x01	0x02	0x01	0x01	0x20 0x49

Remark: The register value in the slave response indicates the status of digital input. Beginning from the lowest bit of the byte, each number corresponds to the status of a digital input. “1” indicates the switch is closed, while “0” indicates the switch is open. In the upper list the register value “0x01” is “0000 0001” in binary system which means first loop of digital input is closed.

2.3.3 Read data register value（FC 0x03/0x04）

Request					
Frame structure	address code	function code	data		CRC
			Start address	number of register	
Byte	1 byte	1 byte	2 bytes	2 bytes	2 bytes
data range	1～247	0x03/ 0x04		Max. 100	CRC16
message example	0x01	0x03	0x00 0x06	0x00 0x06	0Xe4 0x36
Response					
frame structure	address code	function code	data		CRC
			byte of register	register value	
byte	1 byte	1 byte	1 byte	12 bytes	2 bytes
message example	0x01	0x03	0x0C	12-byte data	CRC16

Remark: The initial register address in host inquiry is the initial address of the data collected from primary or secondary power grid. The number of register indicates the length of the data. In the upper list the register address "0x00 0x00" indicates the initial address of phase voltage float data of three phases, and the number of register "0x00 0x06" indicates the length of the data is 6 (three float data occupies six registers).

2.3.4 Write Single Coil（FC 0x05）

Request					
frame structure	address code	function code	data code		CRC
			Start address	relay action value	
byte	1byte	1byte	2 bytes	2 bytes	2 bytes
data range	1～247	0x05	0x0000～0x0003	0xFF00/0x0000	CRC16
message example	0x01	0x05	0x00 0x00	0xFF 0x00	0x8C 0x3A

Response					
frame structure	address code	function code	data code		CRC
			initial relay address	relay action value	
byte	1 byte	1 byte	2 bytes	2 bytes	2 bytes
message example	0x01	0x05	0x00 0x00	0xFF 0x00	0x8C 0x3A

Remark: In host request, the relay action value “0xFF00” indicates the relay is closed, while “0x0000” indicates the relay is open. If user wants to perform remotely control operation, please make sure the relay is working in “remotely control” mode.

2.3.5 Write Single Register（FC 0x06）

Request					
frame structure	address code	function code	data code		CRC
			Register Address	preset data	
byte	1byte	1byte	2 bytes	2 bytes	2 bytes
data range	1～247	0x06	0x0000～0xFFFF	0x0000～0xFFFF	CRC16
message example	0x01	0x06	0x00 0x00	0xAA 0x55	0x37 0x55
Response					
frame structure	address code	function code	data code		CRC
			Register Address	preset data	
byte	1 byte	1 byte	2 bytes	2 bytes	2 bytes
message example	0x01	0x06	0x00 0x00	0xAA 0x55	0x37 0x55

Remark: Not all registers can be modified. As for specific information, please refer to communication address list.

2.3.6 Write Multiple Coils（FC 0x0F）

Request							
frame structure	address code	function code	data code				CRC
			initial relay address	number of relay	number of data byte	relay action value	
byte	1 byte	1 byte	2 bytes	2 bytes	1 byte	1 byte	2 bytes
data range	1～247	0x0F	0x0000（fixed）	0x0001～0x0004	0x01		CRC16
message example	0x01	0x0F	0x00 0x00	0x00 0x02	0x01	0x03	0x9E 0x96

Response					
frame structure	address code	function code	data code		CRC check code
			initial relay address	number of relay	
byte	1 byte	1byte	2bytes	2bytes	2 bytes
message example	0x01	0x0F	0x00 0x00	0x00 0x02	0Xd4 0x0A

Remark: In the host inquiry, beginning from the lowest bit of relay action value, each bit corresponds to a relay output. “1” indicates the relay is closed, while “0” indicates the relay is open. In the upper list, relay action value “0x03”is “0000 0111”in binary system, which means the first and second relays are closed.

2.3.7 Write Multiple Registers（FC 0x10）

Request							
frame structure	address code	function code	data code				CRC
			initial relay address	relay length	relay byte	written value	
byte	1 byte	1 byte	2 bytes	2 bytes	1 byte	2N bytes	2 byte
data range	1～247	0x10	0x080A	0x0001	N		CRC16
message example	0x01	0x10	0x08 0x0A	0x00 0x01	0x02	0x0064	0x2ED1

Request					
frame structure	address code	function code	data code		CRC
			initial relay address	relay length	
byte	1 byte	1 byte	2 bytes	2 bytes	2 bytes
message example	0x01	0x10	0x08 0x0A	0x00 0x01	0x2ED1

Remark:Please strictly follow the Meter setting information address list in appendix when writing setting register. Do not change the reserved data. Written data should not exceed set range. Wrong operation may cause meter damaged.

2.3.8 Read File record (FC 0x14)

Request

Function	1 byte	0x14
Byte counting	1 byte	0x07
Sub-request x, parameter type	1 byte	0x06
Sub-request x, file number	2 bytes	0x0000-0x0007
Sub-request x, event log number	2 bytes	0x0000-0xFDE7
Sub-request x, event log length	2 bytes	N

Response

Function code	1 byte	0x14
Response data length	1 byte	0x07～0xF5
Sub-request x, file length	1 byte	0x07～0xF5
Sub-request x, parameter type	1 byte	6
Sub-request x, event log data	N×2 bytes	...

Send sub-request file number, event log number and event log length description of message

Event log	File number	Event log number	Event log length
SOE event	0x0000	0x0000～0x00BF 0x0000: latest piece of SOE event 0x0001: second piece of SOE event from the latest piece of SOE event ... 0x001F: 191st piece of SOE event from the	7

		latest piece of SOE event	
Data log	0x0004	0x0000～0x000F: 0: latest piece of data log 1: second piece of data log from the latest piece of data log ... 32000: 32001th piece of data log from the latest piece of data log	32
Over-voltage	0x0008	0x0000-0x00BF: 0x0000: latest piece of over-voltage data record 0x0001: second piece of over-voltage data record from the latest piece ... 0x00BF: 191st piece of over-voltage data record from the latest piece	9
Under-voltage	0x0009	0x0000-0x00BF: 0x0000:latest piece of under-voltage data record 0x0001: second piece	9

		of under-voltage data record from the latest piece ... 0x00BF: 191st piece of under-voltage data record from the latest piece	
Over-current	0x000A	0x0000-0x00BF: 0x0000: latest piece of over-current data record 0x0001: second piece of over-current data record from the latest piece ... 0x00BF: 191st piece of over-current data record from the latest piece	9
Under-current	0x000B	0x0000-0x00BF: 0x0000:latest piece of under-current data record 0x0001: second piece of under-current data record from the latest piece ...	9

		0x00BF: 191st piece of under-current data record from the latest piece	
Over-power	0x000C	0x0000-0x00BF: 0x0000: latest piece of over-power data record 0x0001:second piece of over-power data record from the latest piece ... 0x00BF: 191st piece of over-power data record from the latest piece	9
Under-power	0x000D	0x0000-0x00BF: 0x0000:latest piece of under-power data record 0x0001:second piece of under-power data record from the latest piece ... 0x00BF: 191st piece of under-power data record from the latest piece	9

Example for reading file

Read SOE event recording:

Request								
Frame structure	Address code	Function code	Data code					Check code
			Byte counting	Parameter type	File No.	Recording No.	Record length	
Byte	1 byte	1 byte	1 byte	1 byte	2 byte	2 byte	2 byte	2v
Data range	1～247	0x14	0x07	0x06	0x0000	0～191	7	CRC16
Message example	01	0x14	0x07	0x06	0x0000	0x0000	0x0007	0xB8E6

response							
Frame structure	Address code	Function code	Data code				Check code
			Response data length	File response length	Parameters type	Data record	
Byte	1 byte	1 byte	1 byte	1 byte	1 byte	14 byte	2 byte
Message example	0x01	0x14	0x1A	0x19	0x06	SOE data record	CRC16

The meter has 192 pieces of SOE event record, recording the digital input, time and status of relay output action. The resolution is 1ms.

Format description of SOE event data record:

Year, month, day, hour, minute, second(6byte) + DI change status(2byte) + DI present status (2byte) + DO change status (2byte) + DO present status (2byte).

Year, month, day, hour, minute, second： time when SOE event occurs.

DI change status: status bit which is changed corresponding to each channel of digital input starting from the lowest bit of the byte. 1 means action and 0 means no action.

DI present status: status value corresponding to each channel of digital input starting from the lowest bit of the byte. 1 means action status and 0 means reset status.

DO change status: status bit which is changed corresponding to each channel of relay output starting from the lowest bit of the byte. 1 means action and 0 means no action.

DO present status: status value corresponding to each channel of relay output starting from the lowest bit of the byte. 1 means action status and 0 means reset status.

Example:

Host request：01 14 07 06 00 00 00 00 00 07 B8 E6

Slave response：01 14 1A 19 06

0E 03 05 08 14 01 00 02 00 03 00 02 00 00

①　②　③

xx xx

CRC

①：0E 03 05 08 14 01

Year month day hour minute second

Indicate that the time of DI status change: 5th March, 2014, 08:20:01

②： 00 02 00 03

"00 02" indicates the DI status change.Convert 0x0002 to binary: 0000 0000 0000 0010, bit0 corresponds to the first digital input, and bit1 corresponds to the second digital input. The 2nd digital input status changes, while the other channel's status is unchanged.

"00 03" indicates the present DI status. Convert 0x0003 to binary: 0000 0000 0000 0011, bit0 corresponds to the first DI, and bit1 corresponds to the second DI. The present first and second DI are in the state of 1, and are in the action state.With the status change (00 02), it indicates that the present 1st channel status has not changed, the status is still 1; the 2nd DI status becomes 1, that is, the status changes from 0 to 1; the other DI are in reset status.

③： 00 02 00 00

"00 02" indicates relay output status change. Convert 0x0002 to binary: 0000 0000 0000 0010, bit0 corresponds to the first relay output, and bit1 corresponds to the second relay output. The output status of the 2nd relay is changed, and the status of other channels is unchanged.

“00 00” indicates the present relay output status. Convert 0x0000 to binary: 0000 0000 0000 0000 , bit0 corresponds to the first relay output, and bit1 corresponds to the second relay output. The present relay is in the reset state. With the status change (00 02), it indicates that the current 1st status has not changed, the status is still 0; the 2nd relay output state becomes 0, that is, the status changes from 1 to 0; the other relays are in the reset status.

Request									
frame structure	address code	function code	data code						CRC
			byte counting	parameter type	file number	event log number	event log length		
byte	1 byte	1 byte	1 byte	1 byte	2 bytes	2 bytes	2 bytes		2 bytes
data range	1～247	0x14	0x07	0x06	0x0004	0～65000	1～32		CRC
message	0x01	0x14	0x07	0x06	0x0004	0x0000	0x0020		0x093C

Response							
frame structure	address code	function code	data code				CRC
			response data length	response file length	parameter type	log data	
byte	1 byte	1 byte	1 byte	1 byte	1 byte	64 bytes	2 bytes
message	0x01	0x14	0x42	0x41	0x06	log data	CRC

Read electric data log format

Meter supports 32000 pieces of data log at most. Each data log contains eight electric parameter data. The interval of data log is set by pressing buttons on meter or through communication. Please refer to communication address list.

Historical data frame contains thirty two words. First three words are time data. The other twenty nine words are electric parameter data. Electric parameter data is secondary value. Description of data frame is shown in following list.

Parameter	**Format**	**Unit**
Recording time	Int	High byte:year low byte:month
Recording time	Int	High byte:day low byte:hour
Recording time	Int	High byte:minute low byte:second
V1	Int	0.1V
V2	Int	0.1V
V3	Int	0.1V
V12	Int	0.1V
V23	Int	0.1V
V31	Int	0.1V
I1	Int	0.001A
I2	Int	0.001A
I3	Int	0.001A
P	Int	1W
Q	Int	1var
S	Int	1VA
F	Int	0.01Hz
THDv1	Int	0.01%
THDv2	Int	0.01%
THDv3	Int	0.01%
THDI1	Int	0.01%
THDI2	Int	0.01%
THDI3	Int	0.01%
kWh+	Long	1Wh
kWh-	Long	1Wh
kvarh+	Long	1varh

kvarh-	Long	1varh
kVAh	Long	1VAh
User set1	Int	
User set2	Int	
User set3	Int	
User set4	Int	
User set5	Int	
User set6	Int	

Take reading the latest piece of log as example. Data type is hexadecimal.

Host request: 01 14 07 06 00 04 00 00 00 20 09 3C

Slave response: 01 14 42 41 06

0E 0A	17 0D	04 09	00 00	00 00	00 00	00 00	00 00
y:m	d:h	m:s	V1	V2	V3	V12	V23
00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00
V31	I1	I2	I3	P	Q	S	F
00 00	00 00	00 00	00 00	00 00	00 00	00 00 0F 20	
THDv1	THDv2	THDv3	THDI1	THDI2	THDI3	Wh+	

00 00 00 00	00 00 1A 28	00 00 00 00	00 00 1E 37	74 89
Wh-	varh+	varh-	VAh	CRC

AHM3-SMTP electric data format:

pt = PT1/PT2 voltage ratio

ct = Ct1/CT2 current ratio

Voltage = V1 * pt/10 (V)

Current = I1 * ct/1000 (A)

Power = P1 * pt * ct/1000 (kW)

Frequency = F/100 (Hz)

Energy = (kWh+) * pt * ct /1000 (kWh)

PT： CT：

AHM3RC-SMTP electric data format:

pt = PT1/PT2 voltage ratio

ct = Ct1/100 current ratio

VOLTAGE unit 0.1V

CURRENT unit 0.01A

POWER unit 0.01kW

ENERGY unit 0.01kWh

Voltage = V1 * pt/10 (V)

Current = I1 * ct/100 (A)

Power = P * pt * ct/100 (kW)

Frequency = F/100 (Hz)

Energy = (kWh+)*pt*ct/100 (kWh)

Read over-voltage event record:

request								
Frame structure	Address code	Function code	Data code					Check code
			Byte counting	Parameter type	File No.	Record No.	Record length	
Byte	1 byte	1 byte	1 byte	1 byte	2 byte	2 byte	2 byte	2 byte
Data range	1～247	0x14	0x07	0x06	0x0008	0～BF	1～9	CRC16
Message example	0x01	0x14	0x07	0x06	0x0003	0x0000	0x0009	0x7D22

Response							
Frame structure	Address code	Function code	Data code				Check code
			Response data length	File response length	Parameter type	Data record	

Byte	1 byte	1 byte	1 byte	1 byte	1 byte	18 byte	2 byte
Message example	0x01	0x14	0x14	0x13	0x06	Over-voltage record	CRC16

Over-voltage, under-voltage, over-current, under-current, over-power, under-power record

The device can record up to 192 pieces of events, including over-voltage, under-voltage, over-current, under-current, over-power and under-power. Voltage, current, and power judgment processing are performed every 250 ms. Record the start time, end time, and corresponding voltage or current or power extremes of the event. The threshold and hysteresis of voltage, current and power are set by communication.

Data format：

Year, month, day, hour, minute, second(start time) (6byte) + Year, month, day, hour, minute, second(end time) (6byte) + extreme value (6byte)

Example for over-voltage：

Host request：01 14 07 06 00 08 00 00 00 09 7D 22

Slave response：01 14 14 13 06

0E 03 05 08 14 01 0E 03 05 08 14 11 11 D0 11 D1 11 D2 4E 59

① ② ③ ④ ⑤ CRC

①over-voltage start time 0E 03 05 08 14 01

Year month day hour minute second

Start time：5th, March, 2014. 08:20:01

②over-voltage end time 0E 03 05 08 14 11

Year month day hour minute second

End time：5th, March, 2014. 08:20:11

③ ④ ⑤：voltage maximum during over-voltage(3P4W is phase voltage while 3P3W is line voltage).

③11 D0: voltage extreme value 456.0 V；

④11 D1: voltage extreme value 456.1 V；

⑤11 D2: voltage extreme value 456.2 V；

AHM3-SMTP primary side value-the primary value*PT ratio/10 unit V，

AHM3RC-SMTP primary side value=the primary value* PT ratio/10 unit V

Example for over-current：

Host request：01 14 07 06 00 0A 00 00 00 09 A1 23

Slave response：01 14 14 13 06

0E 03 05 08 15 18 0E 03 05 08 15 21 15 E0 13 88 13 87 CD 7A

① ② ③ ④ ⑤ CRC

①over-current start time 0E 03 05 08 15 18

Year month day hour minute second

Start time：5th, March, 2014. 08:21:24

②over-current end time 0E 03 05 08 15 21

Year month day hour minute second

End time：5th, March, 2014. 08:21:33

③ ④ ⑤：current maximum during over-current

③ 15 E0: current extreme value 5.600 A；

④ 13 88: current extreme value 5.000 A；

⑤ 13 87: current extreme value 4.999 A；

AHM3-SMTP primary side value-the primary value*CT ratio/1000 unit A，

AHM3RC-SMTP primary side value=the primary value* current rated value/1000 unit A

Example for over-power：

Host request：01 14 07 06 00 0C 00 00 00 09 29 23

Slave response：01 14 14 13 06

0E 03 05 08 15 30 0E 03 05 08 15 32 17 E0 00 00 17 E0 49 F5

① ② ③ ④ ⑤ CRC

①over-power start time 0E 03 05 08 15 30

Year month day hour minute second

start time： 5th, March, 2014. 08:21:48

②over-power end time 0E 03 05 08 15 32

Year month day hour minute second

end time： 5th, March, 2014. 08:21:50

③ ④ ⑤： total active power, reactive power, apparent power maximum during over-power

③ 17 E0: total active power extreme value 6112 W；

④ 00 00: total reactive power extreme value 0000 var；

⑤ 17 E0: total apparent power extreme value 6112 VA；

AHM3-STMP primary side value-the primary value*PT ratio*CT ratio/1000 unit kW

AHM3RC-STMPprimary side value=the primary value*PT ratio*current rated value/10000 unit kW

2.3.9 Reset data（FC 0x0E）

Request							
frame structure	address code	function code	data code				CRC
			initial relay address	Password	ID Reset	ID value	
byte	1 byte	1 byte	2 bytes	2 bytes	1 byte	1 bytes	2 byte
data range	1～247	0x0E	0xAACC	0x0001	N	0xFF	CRC16
message example	0x01	0x0E	0xAA0xCC	0x00 x01	0x01	0xFF	0x760D

Request				
frame	address	function	data code	CRC

structure	code	code	initial relay address	Password	ID Reset	ID value	
byte	1 byte	1 byte	2 bytes	2 bytes	1 byte	1 bytes	2 byte
data range	1～247	0x0E	0xAACC	0x0001	N	0xFF	CRC16
message example	0x01	0x0E	0xAACC	0x00 x01	0x01	0xFF	0x760D

Remark: This code can reset date of energy,Demand,MaxMin,Event , Pulses, and so on.

Password: This value should equal User's Password;

Id Reset:

0x01: Clear Energy 0x02: Clear Demand 0x03: Clear MaxMin

0x04: Clear Event 0x05: Clear Pulses 0x06: Clear Counters

0x07: Clear SOE 0x08: Clear Alarm 0x09: Clear Record

Id value:

The value must be 0xff.

2.4 Data format

2.4.1 32-bit float format

32-bit float type data follows IEEE-754 format. Byte sequence of data adopts big-end mode which means low byte is after high byte.

Float type data of three phase voltages are shown in the following list.

Address(Hex)	Data(Hex)	Description
0006-0007	435C-8000	V1 = 0x435C8000 = 220.5V
0008-0009	4360-4CCD	V2 = 0x43604CCD = 224.3V
000A-000B	435E-B333	V3 = 0x435EB333 = 222.7V

2.4.2 16-bit integer format

16-bit integer type data adopts two's complement storage mode. Byte sequence of data adopts big-endian mode which means low byte is after high byte.

Int data of three phase voltages harmonic are shown in the following list.

Address(Hex)	Data(Hex)	Description
0210	0230	THDv1 = 0x0230 = 5.6%
0211	0172	THDv2 = 0x0172 = 3.7%
0212	0096	THDv3 = 0x0096 = 1.5%

2.4.3 32-bit long integer format

32-bit integer type data adopts two's complement storage mode. Byte sequence of data adopts big-end mode which means low byte is after high byte.

Long data of energy accumulation time are shown in the following list.

Address(Hex)	Data(Hex)	Description
0054-0055	0020-152A	Hour meter-EP+ = 2102570s
0056-0057	0000-37CD	Hour meter-EP- = 14285s

3. Communication address information list

3.1 Basic parameters

Address	Format	Description	Unit	R/W
0000-0005	----	----	----	----
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	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	1st Quadrant Reactive Energy - EQL+	kvarh	R
004E-004F	Float	2nd Quadrant Reactive Energy - EQC+	kvarh	R
0050-0051	Float	3rd Quadrant Reactive Energy - EQL-	kvarh	R
0052-0053	Float	4th Quadrant Reactive Energy - EQC-	kvarh	R
0054-0055	Long	Hour meter-EP+	s	R
0056-0057	Long	Hour meter-EP-	s	R
0058-0059	Float	Spare Import Active Energy	kWh	R
005A-005B	Float	Spare Export Active Energy	kWh	R
005C-005D	Float	Spare Import Reactive Energy	kvarh	R
005E-005F	Float	Spare Export Reactive Energy	kvarh	R
0060-0061	Float	Spare Apparent Energy	kVAh	R
0062-0063	Float	Spare Energy - EQL+	kvarh	R
0064-0065	Float	Spare Energy - EQC+	kvarh	R
0066-0067	Float	Spare Energy - EQL-	kvarh	R
0068-0069	Float	Spare Energy - EQC-	kvarh	R
006A-006B	Float	Hour meter - Spare EP+	s	R
006C-006D	Float	Hour meter - Spare EP-	s	R
006E-006F	Float	Total tariff import energy	kWh	R
0070-0071	Float	Tariff #1 import energy	kWh	R

0072-0073	Float	Tariff #2 import energy	kWh	R
0074-0075	Float	Tariff #3 import energy	kWh	R
0076-0077	Float	Tariff #4 import energy	kWh	R
0078-0079	Float	Tariff #5 import energy	kWh	R
007A-007B	Float	Tariff #6 import energy	kWh	R
007C-007D	Float	Tariff #7 import energy	kWh	R
007E-007F	Float	Tariff #8 import energy	kWh	R
0080-0081	Float	Tariff #9 import energy	kWh	R
0082-0083	Float	Tariff #10 import energy	kWh	R
0084-0085	Float	Tariff #11 import energy	kWh	R
0086-0087	Float	Tariff #12 import energy	kWh	R
0088-0089	Float	Tariff #13 import energy	kWh	R
008A-008B	Float	Tariff #14 import energy	kWh	R
008C-008D	Float	Tariff #15 import energy	kWh	R
008E-008F	Float	Tariff #16 import energy	kWh	R
0090-0091	Float	Total tariff export energy	kWh	R
0092-0093	Float	Tariff #1 export energy	kWh	R
0094-0095	Float	Tariff #2 export energy	kWh	R
0096-0097	Float	Tariff #3 export energy	kWh	R
0098-0099	Float	Tariff #4 export energy	kWh	R
009A-009B	Float	Tariff #5 export energy	kWh	R
009C-009D	Float	Tariff #6 export energy	kWh	R
009E-009F	Float	Tariff #7 export energy	kWh	R
00A0-00A1	Float	Tariff #8 export energy	kWh	R
00A2-00A3	Float	Tariff #9 export energy	kWh	R
00A4-00A5	Float	Tariff #10 export energy	kWh	R
00A6-00A7	Float	Tariff #11 export energy	kWh	R
00A8-00A9	Float	Tariff #12 export energy	kWh	R
00AA-00AB	Float	Tariff #13 export energy	kWh	R

00AC-00AD	Float	Tariff #14 export energy	kWh	R
00AE-00AF	Float	Tariff #15 export energy	kWh	R
00B0-00B1	Float	Tariff #16 export energy	kWh	R
00B2-00B3	Float	Max. value-V1	V	R
00B4-00B5	Float	Max. value-V2	V	R
00B6-00B7	Float	Max. value-V3	V	R
00B8-00B9	Float	Max. value-V12	V	R
00BA-00BB	Float	Max. value-V23	V	R
00BC-00BD	Float	Max. value-V31	V	R
00BE-00BF	Float	Max. value-I1	A	R
00C0-00C1	Float	Max. value-I2	A	R
00C2-00C3	Float	Max. value-I3	A	R
00C4-00C5	Float	Max. value-In	A	R
00C6-00C7	Float	Max. value-P1	kW	R
00C8-00C9	Float	Max. value-P2	kW	R
00CA-00CB	Float	Max. value-P3	kW	R
00CC-00CD	Float	Max. value-P	kW	R
00CE-00CF	Float	Max. value-Q1	kvar	R
00D0-00D1	Float	Max. value-Q2	kvar	R
00D2-00D3	Float	Max. value-Q3	kvar	R
00D4-00D5	Float	Max. value-Q	kvar	R
00D6-00D7	Float	Max. value-S1	kVA	R
00D8-00D9	Float	Max. value-S2	kVA	R
00DA-00DB	Float	Max. value-S3	kVA	R
00DC-00DD	Float	Max. value-S	kVA	R
00DE-00DF	Float	Max. value-PF		R
00E0-00E1	Float	Max. value-F	Hz	R
00E2-00E3	Float	Max. value-Average Vph-n	V	R
00E4-00E5	Float	Max. value-Average Vph-ph	V	R

00E6-00E7	Float	Max. value-Average I	A	R
00E8-00E9	Float	Min. value-V1	A	R
00EA-00EB	Float	Min. value-V2	A	R
00EC-00ED	Float	Min. value-V3	A	R
00EE-00EF	Float	Min. value-V12	V	R
00F0-00F1	Float	Min. value-V23	V	R
00F2-00F3	Float	Min. value-V31	V	R
00F4-00F5	Float	Min. value-I1	A	R
00F6-00F7	Float	Min. value-I2	A	R
00F8-00F9	Float	Min. value-I3	A	R
00FA-00FB	Float	Min. value-In	A	R
00FC-00FD	Float	Min. value-P1	kW	R
00FE-00FF	Float	Min. value-P2	kW	R
0100-0101	Float	Min. value-P3	kW	R
0102-0103	Float	Min. value-P	kW	R
0104-0105	Float	Min. value-Q1	kvar	R
0106-0107	Float	Min. value-Q2	kvar	R
0108-0109	Float	Min. value-Q3	kvar	R
010A-010B	Float	Min. value-Q	kvar	R
010C-010D	Float	Min. value-S1	kVA	R
010E-010F	Float	Min. value-S2	kVA	R
0110-0111	Float	Min. value-S3	kVA	R
0112-0113	Float	Min. value-S	kVA	R
0114-0115	Float	Min. value-PF		R
0116-0117	Float	Min. value-F	Hz	R
0118-0119	Float	Min. value-Average Vph-n	V	R
011A-011B	Float	Min. value-Average Vph-ph	V	R
011C-011D	Float	Min. value-Average I	A	R
011E-011F	Float	Max. demand value -I1	A	R

0120-0121	Float	Max. demand value -I2	A	R
0122-0123	Float	Max. demand value -I3	A	R
0124-0125	Float	Max. demand value -P	W	R
0126-0127	Float	Max. demand value -Q	var	R
0128-0129	Float	Max. demand value -S	VA	R
012A-012D	--			
012E-012F	Float	Present demand value -I1	A	R
0130-0131	Float	Present demand value -I2	A	R
0132-0133	Float	Present demand value -I3	A	R
0134-0135	Float	Present demand value -P	kW	R
0136-0137	Float	Present demand value -Q	kvar	R
0138-0139	Float	Present demand value -S	kVA	R
013A-013D	--			
013E-013F	Float	Previous demand value -I1	A	R
0140-0141	Float	Previous demand value -I2	A	R
0142-0143	Float	Previous demand value -I3	A	R
0144-0145	Float	Previous demand value -P	kW	R
0146-0147	Float	Previous demand value -Q	kvar	R
0148-0149	Float	Previous demand value -S	kVA	R
014A-014F	--			
0150-0151	Float	Total cost of import energy	$	R
0152-0153	Float	Cost of Tariff #1 import energy	$	R
0154-0155	Float	Cost of Tariff #2 import energy	$	R
0156-0157	Float	Cost of Tariff #3 import energy	$	R
0158-0159	Float	Cost of Tariff #4 import energy	$	R
015A-015B	Float	Cost of Tariff #5 import energy	$	R
015C-015D	Float	Cost of Tariff #6 import energy	$	R
015E-015F	Float	Cost of Tariff #7 import energy	$	R
0160-0161	Float	Cost of Tariff #8 import energy	$	R

0162-0163	Float	Cost of Tariff #9 import energy	$	R
0164-0165	Float	Cost of Tariff #10 import energy	$	R
0166-0167	Float	Cost of Tariff #11 import energy	$	R
0168-0169	Float	Cost of Tariff #12 import energy	$	R
016A-016B	Float	Cost of Tariff #13 import energy	$	R
016C-016D	Float	Cost of Tariff #14 import energy	$	R
016E-016F	Float	Cost of Tariff #15 import energy	$	R
0170-0171	Float	Cost of Tariff #16 import energy	$	R
0172-0173	Float	Total cost of export energy	$	R
0174-0175	Float	Cost of Tariff #1 export energy	$	R
0176-0177	Float	Cost of Tariff #2 export energy	$	R
0178-0179	Float	Cost of Tariff #3 export energy	$	R
017A-017B	Float	Cost of Tariff #4 export energy	$	R
017C-017D	Float	Cost of Tariff #5 export energy	$	R
017E-017F	Float	Cost of Tariff #6 export energy	$	R
0180-0181	Float	Cost of Tariff #7 export energy	$	R
0182-0183	Float	Cost of Tariff #8 export energy	$	R
0184-0185	Float	Cost of Tariff #9 export energy	$	R
0186-0187	Float	Cost of Tariff #10 export energy	$	R
0188-0189	Float	Cost of Tariff #11 export energy	$	R
018A-018B	Float	Cost of Tariff #12 export energy	$	R
018C-018D	Float	Cost of Tariff #13 export energy	$	R
018E-018F	Float	Cost of Tariff #14 export energy	$	R
0190-0191	Float	Cost of Tariff #15 export energy	$	R
0192-0193	Float	Cost of Tariff #16 export energy	$	R
0194-0195	Float	CO2 Emissions of import energy	kg	R
0196-0197	Float	CO2 Emissions of Tariff #1 import energy	kg	R
0198-0199	Float	CO2 Emissions of Tariff #2 import energy	kg	R
019A-019B	Float	CO2 Emissions of Tariff #3 import energy	kg	R

019C-019D	Float	CO2 Emissions of Tariff #4 import energy	kg	R
019E-019F	Float	CO2 Emissions of Tariff #5 import energy	kg	R
01A0-01A1	Float	CO2 Emissions of Tariff #6 import energy	kg	R
01A2-01A3	Float	CO2 Emissions of Tariff #7 import energy	kg	R
01A4-01A5	Float	CO2 Emissions of Tariff #8 import energy	kg	R
01A6-01A7	Float	CO2 Emissions of Tariff #9 import energy	kg	R
01A8-01A9	Float	CO2 Emissions of Tariff #10 import energy	kg	R
01AA-01AB	Float	CO2 Emissions of Tariff #11 import energy	kg	R
01AC-01AD	Float	CO2 Emissions of Tariff #12 import energy	kg	R
01AE-01AF	Float	CO2 Emissions of Tariff #13 import energy	kg	R
01B0-01B1	Float	CO2 Emissions of Tariff #14 import energy	kg	R
01B2-01B3	Float	CO2 Emissions of Tariff #15 import energy	kg	R
01B4-01B5	Float	CO2 Emissions of Tariff #16 import energy	kg	R
01B6-01B7	Float	CO2 Emissions of export energy	kg	R
01B8-01B9	Float	CO2 Emissions of Tariff #1 export energy	kg	R
01BA-01BB	Float	CO2 Emissions of Tariff #2 export energy	kg	R
01BC-01BD	Float	CO2 Emissions of Tariff #3 export energy	kg	R
01BE-01BF	Float	CO2 Emissions of Tariff #4 export energy	kg	R
01C0-01C1	Float	CO2 Emissions of Tariff #5 export energy	kg	R
01C2-01C3	Float	CO2 Emissions of Tariff #6 export energy	kg	R
01C4-01C5	Float	CO2 Emissions of Tariff #7 export energy	kg	R
01C6-01C7	Float	CO2 Emissions of Tariff #8 export energy	kg	R
01C8-01C9	Float	CO2 Emissions of Tariff #9 export energy	kg	R
01CA-01CB	Float	CO2 Emissions of Tariff #10 export energy	kg	R
01CC-01CD	Float	CO2 Emissions of Tariff #11 export energy	kg	R
01CE-01CF	Float	CO2 Emissions of Tariff #12 export energy	kg	R
01D0-01D1	Float	CO2 Emissions of Tariff #13 export energy	kg	R
01D2-01D3	Float	CO2 Emissions of Tariff #14 export energy	kg	R
01D4-01D5	Float	CO2 Emissions of Tariff #15 export energy	kg	R

01D6-01D7	Float	CO2 Emissions of Tariff #16 export energy	kg	R
01D8-01D9	Float	Load percentage	%	R
01DA-01E1	--			
01E2	Int	Pieces of SOE event record		
01E3	Int	Pieces of over-voltage record		
01E4	Int	Pieces of under-voltage record		
01E5	Int	Pieces of over-current record		
01E6	Int	Pieces of under-current record		
01E7	Int	Pieces of overload record		
01E8	Int	Pieces of underload record		
01E9	Int	Added pieces of SOE event record		
01EA	Int	Added pieces of alarm record		
01EB-01EF				
01F0	Int	High byte-year,Low byte-month		R
01F1	Int	High byte-day,Low byte-hour		R
01F2	Int	High byte-minute,Low byte-second		R
01F3	Int	High byte-week		R
01F4-01F5	Long	Meter Status bit31-7: Reserved Bit6: active power import/export Bit5: current overload Bit4: voltage overlaod Bit3: X4 module status Bit2: X3 module status Bit1: X2 module status Bit0: X1 module status		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	V	R
0207	Int	Negative-sequence component of voltage	V	R
0208	Int	Zero-sequence component of voltage	V	R
0209	Int	Unbalance factor of voltage	%	R
020A	--			
020B	Int	Positive-sequence component of current	A	R
020C	Int	Negative-sequence component of current	A	R
020D	Int	Zero-sequence component of current	A	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-I2	0.01%	R
0215	Int	THD-I3	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	32^{th} harmonic ratio-V1	0.01%	R
0241	Int	33^{th} harmonic ratio-V1	0.01%	R
0242	Int	34^{th} harmonic ratio-V1	0.01%	R
0243	Int	35^{th} harmonic ratio-V1	0.01%	R
0244	Int	36^{th} harmonic ratio-V1	0.01%	R
0245	Int	37^{th} harmonic ratio-V1	0.01%	R
0246	Int	38^{th} harmonic ratio-V1	0.01%	R
0247	Int	39^{th} harmonic ratio-V1	0.01%	R
0248	Int	40^{th} harmonic ratio-V1	0.01%	R
0249	Int	41^{th} harmonic ratio-V1	0.01%	R
024A	Int	42^{th} harmonic ratio-V1	0.01%	R
024B	Int	43^{th} harmonic ratio-V1	0.01%	R
024C	Int	44^{th} harmonic ratio-V1	0.01%	R
024D	Int	45^{th} harmonic ratio-V1	0.01%	R
024E	Int	46^{th} harmonic ratio-V1	0.01%	R
024F	Int	47^{th} harmonic ratio-V1	0.01%	R
0250	Int	48^{th} harmonic ratio-V1	0.01%	R
0251	Int	49^{th} harmonic ratio-V1	0.01%	R
0252	Int	50^{th} harmonic ratio-V1	0.01%	R
0253	Int	51^{th} harmonic ratio-V1	0.01%	R
0254	Int	52^{th} harmonic ratio-V1	0.01%	R

0255	Int	53th harmonic ratio-V1	0.01%	R
0256	Int	54th harmonic ratio-V1	0.01%	R
0257	Int	55th harmonic ratio-V1	0.01%	R
0258	Int	56th harmonic ratio-V1	0.01%	R
0259	Int	57th harmonic ratio-V1	0.01%	R
025A	Int	58th harmonic ratio-V1	0.01%	R
025B	Int	59th harmonic ratio-V1	0.01%	R
025C	Int	60th harmonic ratio-V1	0.01%	R
025D	Int	61th harmonic ratio-V1	0.01%	R
025E	Int	62th harmonic ratio-V1	0.01%	R
025F	Int	63th harmonic ratio-V1	0.01%	R
0260	Int	2nd harmonic ratio-V2	0.01%	R
0261	Int	3rd harmonic ratio-V2	0.01%	R
0262	Int	4th harmonic ratio-V2	0.01%	R
0263	Int	5th harmonic ratio-V2	0.01%	R
0264	Int	6th harmonic ratio-V2	0.01%	R
0265	Int	7th harmonic ratio-V2	0.01%	R
0266	Int	8th harmonic ratio-V2	0.01%	R
0267	Int	9th harmonic ratio-V2	0.01%	R
0268	Int	10th harmonic ratio-V2	0.01%	R
0269	Int	11th harmonic ratio-V2	0.01%	R
026A	Int	12th harmonic ratio-V2	0.01%	R
026B	Int	13th harmonic ratio-V2	0.01%	R
026C	Int	14th harmonic ratio-V2	0.01%	R
026D	Int	15th harmonic ratio-V2	0.01%	R
026E	Int	16th harmonic ratio-V2	0.01%	R
026F	Int	17th harmonic ratio-V2	0.01%	R
0270	Int	18th harmonic ratio-V2	0.01%	R
0271	Int	19th harmonic ratio-V2	0.01%	R

0272	Int	20^{th} harmonic ratio-V2	0.01%	R
0273	Int	21^{th} harmonic ratio-V2	0.01%	R
0274	Int	22^{th} harmonic ratio-V2	0.01%	R
0275	Int	23^{th} harmonic ratio-V2	0.01%	R
0276	Int	24^{th} harmonic ratio-V2	0.01%	R
0277	Int	25^{th} harmonic ratio-V2	0.01%	R
0278	Int	26^{th} harmonic ratio-V2	0.01%	R
0279	Int	27^{th} harmonic ratio-V2	0.01%	R
027A	Int	28^{th} harmonic ratio-V2	0.01%	R
027B	Int	29^{th} harmonic ratio-V2	0.01%	R
027C	Int	30^{th} harmonic ratio-V2	0.01%	R
027D	Int	31^{th} harmonic ratio-V2	0.01%	R
027E	Int	32^{th} harmonic ratio-V2	0.01%	R
027F	Int	33^{th} harmonic ratio-V2	0.01%	R
0280	Int	34^{th} harmonic ratio-V2	0.01%	R
0281	Int	35^{th} harmonic ratio-V2	0.01%	R
0282	Int	36^{th} harmonic ratio-V2	0.01%	R
0283	Int	37^{th} harmonic ratio-V2	0.01%	R
0284	Int	38^{th} harmonic ratio-V2	0.01%	R
0285	Int	39^{th} harmonic ratio-V2	0.01%	R
0286	Int	40^{th} harmonic ratio-V2	0.01%	R
0287	Int	41^{th} harmonic ratio-V2	0.01%	R
0288	Int	42^{th} harmonic ratio-V2	0.01%	R
0289	Int	43^{th} harmonic ratio-V2	0.01%	R
028A	Int	44^{th} harmonic ratio-V2	0.01%	R
028B	Int	45^{th} harmonic ratio-V2	0.01%	R
028C	Int	46^{th} harmonic ratio-V2	0.01%	R
028D	Int	47^{th} harmonic ratio-V2	0.01%	R
028E	Int	48^{th} harmonic ratio-V2	0.01%	R

028F	Int	49th harmonic ratio-V2	0.01%	R
0290	Int	50th harmonic ratio-V2	0.01%	R
0291	Int	51th harmonic ratio-V2	0.01%	R
0292	Int	52th harmonic ratio-V2	0.01%	R
0293	Int	53th harmonic ratio-V2	0.01%	R
0294	Int	54th harmonic ratio-V2	0.01%	R
0295	Int	55th harmonic ratio-V2	0.01%	R
0296	Int	56th harmonic ratio-V2	0.01%	R
0297	Int	57th harmonic ratio-V2	0.01%	R
0298	Int	58th harmonic ratio-V2	0.01%	R
0299	Int	59th harmonic ratio-V2	0.01%	R
029A	Int	60th harmonic ratio-V2	0.01%	R
029B	Int	61th harmonic ratio-V2	0.01%	R
029C	Int	62th harmonic ratio-V2	0.01%	R
029D	Int	63th harmonic ratio-V2	0.01%	R
029E	Int	2nd harmonic ratio-V3	0.01%	R
029F	Int	3rd harmonic ratio-V3	0.01%	R
02A0	Int	4th harmonic ratio-V3	0.01%	R
02A1	Int	5th harmonic ratio-V3	0.01%	R
02A2	Int	6th harmonic ratio-V3	0.01%	R
02A3	Int	7th harmonic ratio-V3	0.01%	R
02A4	Int	8th harmonic ratio-V3	0.01%	R
02A5	Int	9th harmonic ratio-V3	0.01%	R
02A6	Int	10th harmonic ratio-V3	0.01%	R
02A7	Int	11th harmonic ratio-V3	0.01%	R
02A8	Int	12th harmonic ratio-V3	0.01%	R
02A9	Int	13th harmonic ratio-V3	0.01%	R
02AA	Int	14th harmonic ratio-V3	0.01%	R
02AB	Int	15th harmonic ratio-V3	0.01%	R

02AC	Int	16^{th} harmonic ratio-V3	0.01%	R
02AD	Int	17^{th} harmonic ratio-V3	0.01%	R
02AE	Int	18^{th} harmonic ratio-V3	0.01%	R
02AF	Int	19^{th} harmonic ratio-V3	0.01%	R
02B0	Int	20^{th} harmonic ratio-V3	0.01%	R
02B1	Int	21^{th} harmonic ratio-V3	0.01%	R
02B2	Int	22^{th} harmonic ratio-V3	0.01%	R
02B3	Int	23^{th} harmonic ratio-V3	0.01%	R
02B4	Int	24^{th} harmonic ratio-V3	0.01%	R
02B5	Int	25^{th} harmonic ratio-V3	0.01%	R
02B6	Int	26^{th} harmonic ratio-V3	0.01%	R
02B7	Int	27^{th} harmonic ratio-V3	0.01%	R
02B8	Int	28^{th} harmonic ratio-V3	0.01%	R
02B9	Int	29^{th} harmonic ratio-V3	0.01%	R
02BA	Int	30^{th} harmonic ratio-V3	0.01%	R
02BB	Int	31^{th} harmonic ratio-V3	0.01%	R
02BC	Int	32^{th} harmonic ratio-V3	0.01%	R
02BD	Int	33^{th} harmonic ratio-V3	0.01%	R
02BE	Int	34^{th} harmonic ratio-V3	0.01%	R
02BF	Int	35^{th} harmonic ratio-V3	0.01%	R
02C0	Int	36^{th} harmonic ratio-V3	0.01%	R
02C1	Int	37^{th} harmonic ratio-V3	0.01%	R
02C2	Int	38^{th} harmonic ratio-V3	0.01%	R
02C3	Int	39^{th} harmonic ratio-V3	0.01%	R
02C4	Int	40^{th} harmonic ratio-V3	0.01%	R
02C5	Int	41^{th} harmonic ratio-V3	0.01%	R
02C6	Int	42^{th} harmonic ratio-V3	0.01%	R
02C7	Int	43^{th} harmonic ratio-V3	0.01%	R
02C8	Int	44^{th} harmonic ratio-V3	0.01%	R

02C9	Int	45^{th} harmonic ratio-V3	0.01%	R
02CA	Int	46^{th} harmonic ratio-V3	0.01%	R
02CB	Int	47^{th} harmonic ratio-V3	0.01%	R
02CC	Int	48^{th} harmonic ratio-V3	0.01%	R
02CD	Int	49^{th} harmonic ratio-V3	0.01%	R
02CE	Int	50^{th} harmonic ratio-V3	0.01%	R
02CF	Int	51^{th} harmonic ratio-V3	0.01%	R
02D0	Int	52^{th} harmonic ratio-V3	0.01%	R
02D1	Int	53^{th} harmonic ratio-V3	0.01%	R
02D2	Int	54^{th} harmonic ratio-V3	0.01%	R
02D3	Int	55^{th} harmonic ratio-V3	0.01%	R
02D4	Int	56^{th} harmonic ratio-V3	0.01%	R
02D5	Int	57^{th} harmonic ratio-V3	0.01%	R
02D6	Int	58^{th} harmonic ratio-V3	0.01%	R
02D7	Int	59^{th} harmonic ratio-V3	0.01%	R
02D8	Int	60^{th} harmonic ratio-V3	0.01%	R
02D9	Int	61^{th} harmonic ratio-V3	0.01%	R
02DA	Int	62^{th} harmonic ratio-V3	0.01%	R
02DB	Int	63^{th} harmonic ratio-V3	0.01%	R
02DC	Int	2^{nd} harmonic ratio-I1	0.01%	R
02DD	Int	3^{rd} harmonic ratio-I1	0.01%	R
02DE	Int	4^{th} harmonic ratio-I1	0.01%	R
02DF	Int	5^{th} harmonic ratio-I1	0.01%	R
02E0	Int	6^{th} harmonic ratio-I1	0.01%	R
02E1	Int	7^{th} harmonic ratio-I1	0.01%	R
02E2	Int	8^{th} harmonic ratio-I1	0.01%	R
02E3	Int	9^{th} harmonic ratio-I1	0.01%	R
02E4	Int	10^{th} harmonic ratio-I1	0.01%	R
02E5	Int	11^{th} harmonic ratio-I1	0.01%	R

02E6	Int	12^{th} harmonic ratio-I1	0.01%	R
02E7	Int	13^{th} harmonic ratio-I1	0.01%	R
02E8	Int	14^{th} harmonic ratio-I1	0.01%	R
02E9	Int	15^{th} harmonic ratio-I1	0.01%	R
02EA	Int	16^{th} harmonic ratio-I1	0.01%	R
02EB	Int	17^{th} harmonic ratio-I1	0.01%	R
02EC	Int	18^{th} harmonic ratio-I1	0.01%	R
02ED	Int	19^{th} harmonic ratio-I1	0.01%	R
02EE	Int	20^{th} harmonic ratio-I1	0.01%	R
02EF	Int	21^{th} harmonic ratio-I1	0.01%	R
02F0	Int	22^{th} harmonic ratio-I1	0.01%	R
02F1	Int	23^{th} harmonic ratio-I1	0.01%	R
02F2	Int	24^{th} harmonic ratio-I1	0.01%	R
02F3	Int	25^{th} harmonic ratio-I1	0.01%	R
02F4	Int	26^{th} harmonic ratio-I1	0.01%	R
02F5	Int	27^{th} harmonic ratio-I1	0.01%	R
02F6	Int	28^{th} harmonic ratio-I1	0.01%	R
02F7	Int	29^{th} harmonic ratio-I1	0.01%	R
02F8	Int	30^{th} harmonic ratio-I1	0.01%	R
02F9	Int	31^{th} harmonic ratio-I1	0.01%	R
02FA	Int	32^{th} harmonic ratio-I1	0.01%	R
02FB	Int	33^{th} harmonic ratio-I1	0.01%	R
02FC	Int	34^{th} harmonic ratio-I1	0.01%	R
02FD	Int	35^{th} harmonic ratio-I1	0.01%	R
02FE	Int	36^{th} harmonic ratio-I1	0.01%	R
02FF	Int	37^{th} harmonic ratio-I1	0.01%	R
0300	Int	38^{th} harmonic ratio-I1	0.01%	R
0301	Int	39^{th} harmonic ratio-I1	0.01%	R
0302	Int	40^{th} harmonic ratio-I1	0.01%	R

0303	Int	41^{th} harmonic ratio-I1	0.01%	R
0304	Int	42^{th} harmonic ratio-I1	0.01%	R
0305	Int	43^{th} harmonic ratio-I1	0.01%	R
0306	Int	44^{th} harmonic ratio-I1	0.01%	R
0307	Int	45^{th} harmonic ratio-I1	0.01%	R
0308	Int	46^{th} harmonic ratio-I1	0.01%	R
0309	Int	47^{th} harmonic ratio-I1	0.01%	R
030A	Int	48^{th} harmonic ratio-I1	0.01%	R
030B	Int	49^{th} harmonic ratio-I1	0.01%	R
030C	Int	50^{th} harmonic ratio-I1	0.01%	R
030D	Int	51^{th} harmonic ratio-I1	0.01%	R
030E	Int	52^{th} harmonic ratio-I1	0.01%	R
030F	Int	53^{th} harmonic ratio-I1	0.01%	R
0310	Int	54^{th} harmonic ratio-I1	0.01%	R
0311	Int	55^{th} harmonic ratio-I1	0.01%	R
0312	Int	56^{th} harmonic ratio-I1	0.01%	R
0313	Int	57^{th} harmonic ratio-I1	0.01%	R
0314	Int	58^{th} harmonic ratio-I1	0.01%	R
0315	Int	59^{th} harmonic ratio-I1	0.01%	R
0316	Int	60^{th} harmonic ratio-I1	0.01%	R
0317	Int	61^{th} harmonic ratio-I1	0.01%	R
0318	Int	62^{th} harmonic ratio-I1	0.01%	R
0319	Int	63^{th} harmonic ratio-I1	0.01%	R
031A	Int	2^{nd} harmonic ratio-I2	0.01%	R
031B	Int	3^{rd} harmonic ratio-I2	0.01%	R
031C	Int	4^{th} harmonic ratio-I2	0.01%	R
031D	Int	5^{th} harmonic ratio-I2	0.01%	R
031E	Int	6^{th} harmonic ratio-I2	0.01%	R
031F	Int	7^{th} harmonic ratio-I2	0.01%	R

0320	Int	8th harmonic ratio-I2	0.01%	R
0321	Int	9th harmonic ratio-I2	0.01%	R
0322	Int	10th harmonic ratio-I2	0.01%	R
0323	Int	11th harmonic ratio-I2	0.01%	R
0324	Int	12th harmonic ratio-I2	0.01%	R
0325	Int	13th harmonic ratio-I2	0.01%	R
0326	Int	14th harmonic ratio-I2	0.01%	R
0327	Int	15th harmonic ratio-I2	0.01%	R
0328	Int	16th harmonic ratio-I2	0.01%	R
0329	Int	17th harmonic ratio-I2	0.01%	R
032A	Int	18th harmonic ratio-I2	0.01%	R
032B	Int	19th harmonic ratio-I2	0.01%	R
032C	Int	20th harmonic ratio-I2	0.01%	R
032D	Int	21th harmonic ratio-I2	0.01%	R
032E	Int	22th harmonic ratio-I2	0.01%	R
032F	Int	23th harmonic ratio-I2	0.01%	R
0330	Int	24th harmonic ratio-I2	0.01%	R
0331	Int	25th harmonic ratio-I2	0.01%	R
0332	Int	26th harmonic ratio-I2	0.01%	R
0333	Int	27th harmonic ratio-I2	0.01%	R
0334	Int	28th harmonic ratio-I2	0.01%	R
0335	Int	29th harmonic ratio-I2	0.01%	R
0336	Int	30th harmonic ratio-I2	0.01%	R
0337	Int	31th harmonic ratio-I2	0.01%	R
0338	Int	32th harmonic ratio-I2	0.01%	R
0339	Int	33th harmonic ratio-I2	0.01%	R
033A	Int	34th harmonic ratio-I2	0.01%	R
033B	Int	35th harmonic ratio-I2	0.01%	R
033C	Int	36th harmonic ratio-I2	0.01%	R

033D	Int	37^{th} harmonic ratio-I2	0.01%	R
033E	Int	38^{th} harmonic ratio-I2	0.01%	R
033F	Int	39^{th} harmonic ratio-I2	0.01%	R
0340	Int	40^{th} harmonic ratio-I2	0.01%	R
0341	Int	41^{th} harmonic ratio-I2	0.01%	R
0342	Int	42^{th} harmonic ratio-I2	0.01%	R
0343	Int	43^{th} harmonic ratio-I2	0.01%	R
0344	Int	44^{th} harmonic ratio-I2	0.01%	R
0345	Int	45^{th} harmonic ratio-I2	0.01%	R
0346	Int	46^{th} harmonic ratio-I2	0.01%	R
0347	Int	47^{th} harmonic ratio-I2	0.01%	R
0348	Int	48^{th} harmonic ratio-I2	0.01%	R
0349	Int	49^{th} harmonic ratio-I2	0.01%	R
034A	Int	50^{th} harmonic ratio-I2	0.01%	R
034B	Int	51^{th} harmonic ratio-I2	0.01%	R
034C	Int	52^{th} harmonic ratio-I2	0.01%	R
034D	Int	53^{th} harmonic ratio-I2	0.01%	R
034E	Int	54^{th} harmonic ratio-I2	0.01%	R
034F	Int	55^{th} harmonic ratio-I2	0.01%	R
0350	Int	56^{th} harmonic ratio-I2	0.01%	R
0351	Int	57^{th} harmonic ratio-I2	0.01%	R
0352	Int	58^{th} harmonic ratio-I2	0.01%	R
0353	Int	59^{th} harmonic ratio-I2	0.01%	R
0354	Int	60^{th} harmonic ratio-I2	0.01%	R
0355	Int	61^{th} harmonic ratio-I2	0.01%	R
0356	Int	62^{th} harmonic ratio-I2	0.01%	R
0357	Int	63^{th} harmonic ratio-I2	0.01%	R
0358	Int	2^{nd} harmonic ratio-I3	0.01%	R
0359	Int	3^{rd} harmonic ratio-I3	0.01%	R

035A	Int	4^{th} harmonic ratio-I3	0.01%	R
035B	Int	5^{th} harmonic ratio-I3	0.01%	R
035C	Int	6^{th} harmonic ratio-I3	0.01%	R
035D	Int	7^{th} harmonic ratio-I3	0.01%	R
035E	Int	8^{th} harmonic ratio-I3	0.01%	R
035F	Int	9^{th} harmonic ratio-I3	0.01%	R
0360	Int	10^{th} harmonic ratio-I3	0.01%	R
0361	Int	11^{th} harmonic ratio-I3	0.01%	R
0362	Int	12^{th} harmonic ratio-I3	0.01%	R
0363	Int	13^{th} harmonic ratio-I3	0.01%	R
0364	Int	14^{th} harmonic ratio-I3	0.01%	R
0365	Int	15^{th} harmonic ratio-I3	0.01%	R
0366	Int	16^{th} harmonic ratio-I3	0.01%	R
0367	Int	17^{th} harmonic ratio-I3	0.01%	R
0368	Int	18^{th} harmonic ratio-I3	0.01%	R
0369	Int	19^{th} harmonic ratio-I3	0.01%	R
036A	Int	20^{th} harmonic ratio-I3	0.01%	R
036B	Int	21^{th} harmonic ratio-I3	0.01%	R
036C	Int	22^{th} harmonic ratio-I3	0.01%	R
036D	Int	23^{th} harmonic ratio-I3	0.01%	R
036E	Int	24^{th} harmonic ratio-I3	0.01%	R
036F	Int	25^{th} harmonic ratio-I3	0.01%	R
0370	Int	26^{th} harmonic ratio-I3	0.01%	R
0371	Int	27^{th} harmonic ratio-I3	0.01%	R
0372	Int	28^{th} harmonic ratio-I3	0.01%	R
0373	Int	29^{th} harmonic ratio-I3	0.01%	R
0374	Int	30^{th} harmonic ratio-I3	0.01%	R
0375	Int	31^{th} harmonic ratio-I3	0.01%	R
0376	Int	32^{th} harmonic ratio-I3	0.01%	R

0377	Int	33th harmonic ratio-I3	0.01%	R
0378	Int	34th harmonic ratio-I3	0.01%	R
0379	Int	35th harmonic ratio-I3	0.01%	R
037A	Int	36th harmonic ratio-I3	0.01%	R
037B	Int	37th harmonic ratio-I3	0.01%	R
037C	Int	38th harmonic ratio-I3	0.01%	R
037D	Int	39th harmonic ratio-I3	0.01%	R
037E	Int	40th harmonic ratio-I3	0.01%	R
037F	Int	41th harmonic ratio-I3	0.01%	R
0380	Int	42th harmonic ratio-I3	0.01%	R
0381	Int	43th harmonic ratio-I3	0.01%	R
0382	Int	44th harmonic ratio-I3	0.01%	R
0383	Int	45th harmonic ratio-I3	0.01%	R
0384	Int	46th harmonic ratio-I3	0.01%	R
0385	Int	47th harmonic ratio-I3	0.01%	R
0386	Int	48th harmonic ratio-I3	0.01%	R
0387	Int	49th harmonic ratio-I3	0.01%	R
0388	Int	50th harmonic ratio-I3	0.01%	R
0389	Int	51th harmonic ratio-I3	0.01%	R
038A	Int	52th harmonic ratio-I3	0.01%	R
038B	Int	53th harmonic ratio-I3	0.01%	R
038C	Int	54th harmonic ratio-I3	0.01%	R
038D	Int	55th harmonic ratio-I3	0.01%	R
038E	Int	56th harmonic ratio-I3	0.01%	R
038F	Int	57th harmonic ratio-I3	0.01%	R
0390	Int	58th harmonic ratio-I3	0.01%	R
0391	Int	59th harmonic ratio-I3	0.01%	R
0392	Int	60th harmonic ratio-I3	0.01%	R
0393	Int	61th harmonic ratio-I3	0.01%	R

0394	Int	62th harmonic ratio-I3	0.01%	R
0395	Int	63th harmonic ratio-I3	0.01%	R

3.3 Module data

Address	Format	Description	Unit	R/W
0506	Int	State of digital input,0:off,1:on Bit0:X1-DI1 Bit1:X1-DI2 Bit2:X1-DI3 Bit3:X1-DI4 Bit4:X2-DI1 Bit5:X2-DI2 Bit6:X2-DI3 Bit7:X2-DI4 Bit8:X3-DI1 Bit9:X3-DI2 Bit10:X3-DI3 Bit11:X3-DI4 Bit12:X4-DI1 Bit13:X4-DI2 Bit14:X4-DI3 Bit15:X4-DI4		R
0507	Int	State of relay output,0:off,1:on Bit0:main body-DO1 Bit1:main body-DO2 Bit2:X1-DO1 Bit3:X1-DO2 Bit4:X2-DO1 Bit5:X2-DO2 Bit6:X3-DO1 Bit7:X3-DO2 Bit8:X4-DO1 Bit9:X4-DO2		R

0508	Int	Analogue output value: X1-AO1	0.001mA	R
0509	Int	Analogue output value: X1-AO2	0.001mA	R
050A	Int	Analogue output value: X2-AO1	0.001mA	R
050B	Int	Analogue output value: X2-AO2	0.001mA	R
050C	Int	Analogue output value: X3-AO1	0.001mA	R
050D	Int	Analogue output value: X3-AO2	0.001mA	R
050E	Int	Analogue output value: X4-AO1	0.001mA	R
050F	Int	Analogue output value: X4-AO2	0.001mA	R
0510	Int	Analogue input value: X1-AI1(4-20mA)	0.001mA	R
0511	Int	Analogue input value: X1-AI2(4-20mA)	0.001mA	R
0512	Int	Analogue input value: X2-AI1(4-20mA)	0.001mA	R
0513	Int	Analogue input value: X2-AI2(4-20mA)	0.001mA	R
0514	Int	Analogue input value: X3-AI1(4-20mA)	0.001mA	R
0515	Int	Analogue input value: X3-AI2(4-20mA)	0.001mA	R
0516	Int	Analogue input value: X4-AI1(4-20mA)	0.001mA	R
0517	Int	Analogue input value: X4-AI2(4-20mA)	0.001mA	R
0518	Int	Analogue input value: X1-AI1(PT100)	0.1℃	R
0519	Int	Analogue input value: X1-AI2(PT100)	0.1℃	R
051A	Int	Analogue input value: X2-AI1(PT100)	0.1℃	R
051B	Int	Analogue input value: X2-AI2(PT100)	0.1℃	R
051C	Int	Analogue input value: X3-AI1(PT100)	0.1℃	R
051D	Int	Analogue input value: X3-AI2(PT100)	0.1℃	R
051E	Int	Analogue input value: X4-AI1(PT100)	0.1℃	R
051F	Int	Analogue input value: X4-AI2(PT100)	0.1℃	R
0520	Int	Analogue input value: X1-AI1(TC)	1℃	R
0521	Int	Analogue input value: X1-AI2(TC)	1℃	R
0523	Int	Analogue input value: X2-AI1(TC)	1℃	R
0524	Int	Analogue input value: X2-AI2(TC)	1℃	R
0525	Int	Analogue input value: X3-AI1(TC)	1℃	R

0526	Int	Analogue input value: X3-AI2(TC)	1℃	R
0527	Int	Analogue input value: X4-AI1(TC)	1℃	R
0528	Int	Analogue input value: X4-AI2(TC)	1℃	R
0528-0529	Long	Pulse counter: X1-1		R
052A-052B	Long	Pulse counter: X1-2		R
052C-052D	Long	Pulse counter: X1-3		R
052E-052F	Long	Pulse counter: X1-4		R
0530-0531	Long	Pulse counter: X2-1		R
0532-0533	Long	Pulse counter: X2-2		R
0534-0535	Long	Pulse counter: X2-3		R
0536-0537	Long	Pulse counter: X2-4		R
0538-0539	Long	Pulse counter: X3-1		R
053A-053B	Long	Pulse counter: X3-2		R
053C-053D	Long	Pulse counter: X3-3		R
053E-053F	Long	Pulse counter: X3-4		R
0540-0541	Long	Pulse counter: X4-1		R
0542-0543	Long	Pulse counter: X4-2		R
0544-0545	Long	Pulse counter: X4-3		R
0546-0547	Long	Pulse counter: X4-4		R

3.4 Module data

Address	Format	Description	Unit	R/W
0760-0767	char	MCU revision 。Example: AHM3.1008		R
0768-076F	char	X1 revision		R
0770-0777	char	X2 revision		R
0778-077F	char	X3 revision		R
0780-0787	char	X4 revision		R

3.5 Setup Parameters

Address	Format	Description1	Description2	R/W
0800	Int	High byte	X1 0:no module 1:DM1 module 2:DM2 module 3:DM3 module ...... 13:DM13 module	R
		Low byte	X2 0:no module 1:DM1 module 2:DM2 module 3:DM3 module ...... 13:DM13 module	
0801	Int	High byte	X3 0:no module 1:DM1 module 2:DM2 module 3:DM3 module ...... 13:DM13 module	R
		Low byte	X4 0:no module 1:DM1 module 2:DM2 module 3:DM3 module ...... 13:DM13 module	

0802	Int	Password	0-9999	R
0803	Int	High byte	Default Display interface 0: U 1: I 2: P 3: Energy 4: THD 5: Waveform 6: Demand 7: Max/Min	R/W
0804	Int	High byte	Langue 0:English	R/W
		Low byte	Contrast:0-5	R/W
0805	Int	High byte	Back light delay time:1-255s 0:usually ON	R/W
		Low byte	Data recording interval 1-255min	R/W
0806	Int	High byte	Address: 1-247	R/W
		Low byte	Baud rate 0: 1200bps 1: 2400bps 2: 4800bps 3: 9600bps 4: 19200bps 5: 38400bps	
0807	Int	High byte	Parity 0: N,8,1 1: O,8,1 2: E,8,1 3: N,8,2	R/W

0808-0809	--	--	--	--
080A	Int	High byte	Wiring 0: 3P4W 1: 3P3W 2: 1P2W	R/W
080B	--			
080C-080D	Long	PT primary	1～999999V	R/W
080E-080F	Long	CT primary	1～999999A	R/W
0810	Int	PT secondary	1～999V	R/W
0811	Int	CT secondary	1～6A	R/W
0812	Int	Item of Record 1#	0: V1 1: V2 2: V3 3: V12 4: V23 5: V31 6: I1 7: I2 8: I3 9: In 10: P1 11: P2 12: P3 13: P 14: Q1 15: Q2 16: Q3 17: Q 18: S1 19: S2	

			20: S3 21: S 22: PF1 23: PF2 24: PF3 25: PF 26: F 27: Unavg 28: Ulavg 29: Iavg 30: Phase angle of V1 31: Phase angle of V2 32: Phase angle of V3 33: Phase angle of I1 34: Phase angle of I2 35: Phase angle of I3 36: Positive-sequence component of voltage 37: Negative-sequence component of voltage 38: Zero-sequence component of voltage 39: Unbalance factor of voltage 40: Reserved 41: Positive-sequence component of current 42: Negative-sequence component of current 43: Zero-sequence component of current	

			44: Unbalance factor of current 45: Reserved 46: THD-V1 47: THD-V2 48: THD-V3 49: THD-I1 50: THD-I1 51: THD-I1 52: Fundamental value -V1 53: Fundamental value -V2 54: Fundamental value -V3 55: Fundamental value -I1 56: Fundamental value -I2 57: Fundamental value -I3	
0813	Int	Item of Record 2#	the same as above	R
0814	Int	Item of Record 3#	the same as above	R
0815	Int	Item of Record 4#	the same as above	R
0816	Int	Item of Record 5#	the same as above	R
0817	Int	Item of Record 6#	the same as above	R
0818	Int	DIV_U	0: 1 1:10 All the voltages values send by communications must to be affected by DIV_V. The values must to be divided by DIV_V	R/W
0819	Int	DIV_P	0: 1, 1: 1000, 2:100000	R/W

			All the powers values send by communications, active powers, reactive powers and apparent powers, must to be affected by DIV_P.	
081A-081F	--			
0820	Int	Unit price of Tariff #1 import energy	0.01$/kWh	
0821	Int	Unit price of Tariff #2 import energy	0.01$/kWh	
0822	Int	Unit price of Tariff #3 import energy	0.01$/kWh	
0823	Int	Unit price of Tariff #4 import energy	0.01$/kWh	
0824	Int	Unit price of Tariff #5 import energy	0.01$/kWh	
0825	Int	Unit price of Tariff #6 import energy	0.01$/kWh	
0826	Int	Unit price of Tariff #7 import energy	0.01$/kWh	
0827	Int	Unit price of Tariff #8 import energy	0.01$/kWh	
0828	Int	Unit price of Tariff #9 import energy	0.01$/kWh	
0829	Int	Unit price of Tariff #10 import energy	0.01$/kWh	
082A	Int	Unit price of Tariff #11 import energy	0.01$/kWh	
082B	Int	Unit price of Tariff #12 import energy	0.01$/kWh	
082C	Int	Unit price of Tariff	0.01$/kWh	

		#13 import energy		
082D	Int	Unit price of Tariff #14 import energy	0.01$/kWh	
082E	Int	Unit price of Tariff #15 import energy	0.01$/kWh	
082F	Int	Unit price of Tariff #16 import energy	0.01$/kWh	
0830	Int	Unit price of Tariff #1 export energy	0.01$/kWh	
0831	Int	Unit price of Tariff #2 export energy	0.01$/kWh	
0832	Int	Unit price of Tariff #3 export energy	0.01$/kWh	
0833	Int	Unit price of Tariff #4 export energy	0.01$/kWh	
0834	Int	Unit price of Tariff #5 export energy	0.01$/kWh	
0835	Int	Unit price of Tariff #6 export energy	0.01$/kWh	
0836	Int	Unit price of Tariff #7 export energy	0.01$/kWh	
0837	Int	Unit price of Tariff #8 export energy	0.01$/kWh	
0838	Int	Unit price of Tariff #9 export energy	0.01$/kWh	
0839	Int	Unit price of Tariff #10 export energy	0.01$/kWh	
083A	Int	Unit price of Tariff #11 export energy	0.01$/kWh	

083B	Int	Unit price of Tariff #12 export energy	0.01$/kWh	
083C	Int	Unit price of Tariff #13 export energy	0.01$/kWh	
083D	Int	Unit price of Tariff #14 export energy	0.01$/kWh	
083E	Int	Unit price of Tariff #15 export energy	0.01$/kWh	
083F	Int	Unit price of Tariff #16 export energy	0.01$/kWh	
0840	Int	CO2 Emissions of Tariff #1 import energy	0.01kg/kWh	
0841	Int	CO2 Emissions of Tariff #2 import energy	0.01kg/kWh	
0842	Int	CO2 Emissions of Tariff #3 import energy	0.01kg/kWh	
0843	Int	CO2 Emissions of Tariff #4 import energy	0.01kg/kWh	
0844	Int	CO2 Emissions of Tariff #5 import energy	0.01kg/kWh	
0845	Int	CO2 Emissions of Tariff #6 import energy	0.01kg/kWh	
0846	Int	CO2 Emissions of Tariff #7 import	0.01kg/kWh	

		energy		
0847	Int	CO2 Emissions of Tariff #8 import energy	0.01kg/kWh	
0848	Int	CO2 Emissions of Tariff #9 import energy	0.01kg/kWh	
0849	Int	CO2 Emissions of Tariff #10 import energy	0.01kg/kWh	
084A	Int	CO2 Emissions of Tariff #11 import energy	0.01kg/kWh	
084B	Int	CO2 Emissions of Tariff #12 import energy	0.01kg/kWh	
084C	Int	CO2 Emissions of Tariff #13 import energy	0.01kg/kWh	
084D	Int	CO2 Emissions of Tariff #14 import energy	0.01kg/kWh	
084E	Int	CO2 Emissions of Tariff #15 import energy	0.01kg/kWh	
084F	Int	CO2 Emissions of Tariff #16 import energy	0.01kg/kWh	
0850	Int	CO2 Emissions of Tariff #1 export	0.01kg/kWh	

		energy		
0851	Int	CO2 Emissions of Tariff #2 export energy	0.01kg/kWh	
0852	Int	CO2 Emissions of Tariff #3 export energy	0.01kg/kWh	
0853	Int	CO2 Emissions of Tariff #4 export energy	0.01kg/kWh	
0854	Int	CO2 Emissions of Tariff #5 export energy	0.01kg/kWh	
0855	Int	CO2 Emissions of Tariff #6 export energy	0.01kg/kWh	
0856	Int	CO2 Emissions of Tariff #7 export energy	0.01kg/kWh	
0857	Int	CO2 Emissions of Tariff #8 export energy	0.01kg/kWh	
0858	Int	CO2 Emissions of Tariff #9 export energy	0.01kg/kWh	
0859	Int	CO2 Emissions of Tariff #10 export energy	0.01kg/kWh	
085A	Int	CO2 Emissions of Tariff #11 export	0.01kg/kWh	

		energy		
085B	Int	CO2 Emissions of Tariff #12 export energy	0.01kg/kWh	
085C	Int	CO2 Emissions of Tariff #13 export energy	0.01kg/kWh	
085D	Int	CO2 Emissions of Tariff #14 export energy	0.01kg/kWh	
085E	Int	CO2 Emissions of Tariff #15 export energy	0.01kg/kWh	
085F	Int	CO2 Emissions of Tariff #16 export energy	0.01kg/kWh	
0860	Int	Item	analogue output: X1-AO1 0: OFF 1: V1 2: V2 3: V3 4: V12 5: V23 6: V31 7: I1 8: I2 9: I3 10: In 11: Pa 12: Pb 13: Pc 14: P 15: Q1 16: Q2 17: Q3 18: Q 19: S1 20: S2 21: S3 22: S 23: PF1 24: PF2	R/W

			25: PF3 26: PF 27: F	
0861	Int	mode	Analogue output: X1-AO1 0: 4～20 mA 1: 0～20 mA 2: 4～12～20 mA	R/W
0862-0863	Long	Down scale	Analogue output: X1-AO1 primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Setting parameter value should be smaller than two times of rated value.	R/W
0864-0865	Long	Middle scale	the same as above	R/W
0866-0867	Long	Full scale	the same as above	R/W
0868	Int	Item	analogue output: X1-AO2 0: OFF 1: V1 2: V2 3: V3 4: V12 5: V23 6: V31 7: I1 8: I2 9: I3 10: In 11: Pa 12: Pb 13: Pc 14: P 15: Q1 16: Q2 17: Q3 18: Q 19: S1 20: S2	R/W

			21: S3 22: S 23: PF1 24: PF2 25: PF3 26: PF 27: F	
0869	Int	mode	Analogue output: X1-AO2 0: 4～20 mA 1: 0～20 mA 2: 4～12～20 mA	R/W
086A-086B	Long	Down scale	Analogue output: X1-AO2 primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Setting parameter value should be smaller than two times of rated value.	R/W
086C-086D	Long	Middle scale	the same as above	
086E-086F	Long	Full scale	the same as above	R/W
0870	Int	Item	analogue output: X2-AO1 0: OFF 1: V1 2: V2 3: V3 4: V12 5: V23 6: V31 7: I1 8: I2 9: I3 10: In 11: Pa 12: Pb 13: Pc 14: P 15: Q1 16: Q2	R/W

			17: Q3 18: Q 19: S1 20: S2 21: S3 22: S 23: PF1 24: PF2 25: PF3 26: PF 27: F	
0871	Int	mode	Analogue output: X2-AO1 0: 4～20 mA 1: 0～20 mA 2: 4～12～20 mA	R/W
0872-0873	Long	Down scale	Analogue output: X1-AO1 primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Setting parameter value should be smaller than two times of rated value.	R/W
0874-0875	Long	Middle scale	the same as above	
0876-0877	Long	Full scale	the same as above	R/W
0878	Int	Item	analogue output: X2-AO2 0: OFF 1: V1 2: V2 3: V3 4: V12 5: V23 6: V31 7: I1 8: I2 9: I3 10: In 11: Pa 12: Pb	R/W

			13: Pc 14: P 15: Q1 16: Q2 17: Q3 18: Q 19: S1 20: S2 21: S3 22: S 23: PF1 24: PF2 25: PF3 26: PF 27: F	
0879	Int	mode	Analogue output: X2-AO2 0: 4～20 mA 1: 0～20 mA 2: 4～12～20 mA	R/W
087A-087B	Long	Down scale	Analogue output: X1-AO2 primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Setting parameter value should be smaller than two times of rated value.	R/W
087C-087D	Long	Middle scale	the same as above	
087E-087F	Long	Full scale	the same as above	R/W
0880	Int	Item	analogue output: X3-AO1 0: OFF 1: V1 2: V2 3: V3 4: V12 5: V23 6: V31 7: I1 8: I2	R/W

			9: I3 10: In 11: Pa 12: Pb 13: Pc 14: P 15: Q1 16: Q2 17: Q3 18: Q 19: S1 20: S2 21: S3 22: S 23: PF1 24: PF2 25: PF3 26: PF 27: F	
0881	Int	mode	Analogue output: X3-AO1 0: 4～20 mA 1: 0～20 mA 2: 4～12～20 mA	R/W
0882-0883	Long	Down scale	Analogue output: X3-AO1 primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Setting parameter value should be smaller than two times of rated value.	R/W
0884-0885	Long	Middle scale	the same as above	
0886-0887	Long	Full scale	the same as above	R/W
0888	Int	Item	analogue output: X3-AO2 0: OFF 1: V1 2: V2 3: V3 4: V12	R/W

			5: V23 6: V31 7: I1 8: I2 9: I3 10: In 11: Pa 12: Pb 13: Pc 14: P 15: Q1 16: Q2 17: Q3 18: Q 19: S1 20: S2 21: S3 22: S 23: PF1 24: PF2 25: PF3 26: PF 27: F	
0889	Int	mode	Analogue output: X3-AO2 0: 4～20 mA 1: 0～20 mA 2: 4～12～20 mA	R/W
088A-088B	Long	Down scale	Analogue output: X3-AO2 primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Setting parameter value should be smaller than two times of rated value.	R/W
088C-088D	Long	Middle scale	the same as above	
088E-088F	Long	Full scale	the same as above	R/W
0890	Int	Item	analogue output: X4-AO1 0: OFF	R/W

			1: V1 2: V2 3: V3 4: V12 5: V23 6: V31 7: I1 8: I2 9: I3 10: In 11: Pa 12: Pb 13: Pc 14: P 15: Q1 16: Q2 17: Q3 18: Q 19: S1 20: S2 21: S3 22: S 23: PF1 24: PF2 25: PF3 26: PF 27: F	
0891	Int	mode	Analogue output: X4-AO1 0: 4～20 mA 1: 0～20 mA 2: 4～12～20 mA	R/W
0892-0893	Long	Down scale	Analogue output: X4-AO1 primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Setting parameter value should be smaller than two times of rated value.	R/W
0894-0895	Long	Middle scale	the same as above	
0896-0897	Long	Full scale	the same as above	R/W

0898	Int	Item	analogue output: X4-AO2 0: OFF 1: V1 2: V2 3: V3 4: V12 5: V23 6: V31 7: I1 8: I2 9: I3 10: In 11: Pa 12: Pb 13: Pc 14: P 15: Q1 16: Q2 17: Q3 18: Q 19: S1 20: S2 21: S3 22: S 23: PF1 24: PF2 25: PF3 26: PF 27: F	R/W
0899	Int	mode	Analogue output: X4-AO2 0: 4～20 mA 1: 0～20 mA 2: 4～12～20 mA	R/W
089A-089B	Long	Down scale	Analogue output: X4-AO2 primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Setting parameter value should be smaller than two times of rated value.	R/W

089C-089D	Long	Middle scale	the same as above	
089E-089F	Long	Full scale	the same as above	R/W
08A0-08AF	--			
08B0	Int	Demand item of first to sixth channels	0:IPQS（fixed） Include six electric parameters which are I1 I2,I3,P,Q,S	R/W
08B1	Int	Mode of demand	0: slip block mode 1: fixed block mode 2: 4:synchronous mode	R/W
08B2	Int	Slip time(t)	1-9999s	R/W
08B3	Int	Demand period(T)	1-30t	R/W
0894-089B	--			
08BC	Int	High byte: X1-DI1 mode Low byte: X1-DI2 mode	0:state monitor 1:pulse counter 2:Spare energy 3:tariff energy 4:synchronous demand	R/W
08BD	Int	High byte: X1-DI3 mode Low byte: X1-DI4 mode	0:state monitor 1:pulse counter 2:Spare energy 3:tariff energy 4:synchronous demand	R/W
08BE	Int	High byte: X2-DI1 mode Low byte: X2-DI2 mode	0:state monitor 1:pulse counter 2:Spare energy 3:tariff energy 4:synchronous demand	R/W
08BF	Int	High byte: X2-DI3 mode Low byte: X2-DI4 mode	0:state monitor 1:pulse counter	R/W

			2:Spare energy 3:tariff energy 4:synchronous demand	
08C0	Int	High byte: X3-DI1 mode Low byte: X3-DI2 mode	0:state monitor 1:pulse counter 2:Spare energy 3:tariff energy 4:synchronous demand	R/W
08C1	Int	High byte: X3-DI3 mode Low byte: X3-DI4 mode	0:state monitor 1:pulse counter 2:Spare energy 3:tariff energy 4:synchronous demand	R/W
08C2	Int	High byte: X4-DI1 mode Low byte: X4-DI2 mode	0:state monitor 1:pulse counter 2:Spare energy 3:tariff energy 4:synchronous demand	R/W
08C3	Int	High byte: X4-DI3 mode Low byte: X4-DI4 mode	0:state monitor 1:pulse counter 2:Spare energy 3:tariff energy 4:synchronous demand	R/W
08C4-08C7				
08C8	Int	High byte:X1-TC Thermocouple type	0:K 1:J 2:E 3:N	R/W
		Low byte:X1-code junction compensation	0:OFF 1:ON(default)	R/W

08C9	Int	High byte:X2-TC Thermocouple type	0:K 1:J 2:E 3:N	R/W
		Low byte:X2-code junction compensation	0:OFF 1:ON(default)	R/W
08CA	Int	High byte:X3-TC Thermocouple type	0:K 1:J 2:E 3:N	R/W
		Low byte:X3-code junction compensation	0:OFF 1:ON(default)	R/W
08CB		High byte:X4-TC Thermocouple type	0:K 1:J 2:E 3:N	R/W
		Low byte:X4-code junction compensation	0:OFF 1:ON(default)	R/W
08CC	Int	Relay output Main body-DO1 mode	0: OFF 1: remote control 2: alarm 3: energy pulses 4: logic alarm	R/W
08CD	Int	Relay output Main body-DO1 Pulse width	0.1～99.9s 0.0: no pulse	R/W
08CE	Int	Main body-DO1 Mode is alarm mode.	0: V1 > 1: V1 < 2: V2 > 3: V2 <	

			4: V3 > 5: V3 < 6: Vn > 7: Vn < 8: V12 > 9: V12 < 10: V23 > 11: V23 < 12: V31 > 13: V31 < 14: Vl > 15: Vl < 16:Uavg> 17:Uavg< 18:Vavg> 19:Vavg< 20: I1 > 21: I1 < 22: I2 > 23: I2 < 24: I3 > 25: I3 < 26: I > 27: I < 24: Iavg > 29: Iavg < 30: In > 31: In < 32: P > 33: P <	

			34: Q > 35: Q < 26: S > 37: S < 38: PF> 39: PF< 40: F > 41: F < 42: Uunb > 43: Uunb < 44: Iunb > 45: Iunb < 46: THDu > 47: THDu < 48: THDi > 49: THDi < 50: DIx	
		Main body-DO1 Mode is logic alarm mode: Relay output Main body-DO1 Low Alarm delay time	0～99.99s	
08CF-08D0	Long	Main body-DO1 Mode is alarm mode.	primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Uunb /Iunb /THDu /THDi : 0.01%	R/W

			Setting parameter value should be smaller than two times of rated value. If it is switch linkage, this value corresponds to the No. of digital input. 0:X1-D1 1:X1-DI2 2:X1-DI3 3:X1-DI4 4:X2-DI1 5:X2-DI2 6:X2-DI3 7:X2-DI4 8:X3-DI1 9:X3-DI2 10:X3-DI3 11:X3-DI4 12:X4-DI1 13:X4-DI2 14:X4-DI3 15:X4-DI4	
		Main body-DO1 Mode is logic alarm mode. Main body -DO1 High limit value(V1 V2 V3)	primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V	R/W
08D1-08D2	Long	Main body-DO1 Mode is alarm mode. Relay output DO1 hysteresis value	primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A	R/W

			power: 1W/var/VA, PF: 0.001 F: 0.01Hz Uunb /Iunb /THDu /THDi : 0.01% Setting parameter value should be smaller than two times of rated value.	
		Main body-DO1 Mode is logic alarm mode. Main body -DO1 Low limit value(V1 V2 V3)	primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V	
08D3	Int	Main body-DO1 Mode is alarm mode: Main body-DO1 delay time	0～99.99s	R/W
		Main body-DO1 Mode is logic alarm mode: Relay output Main body-DO1 High Alarm delay time	0～99.99s	
08D4	Int	Relay output Main body-DO1 Alarm interlock	0:OFF 1:ON	R/W
08D5	Int	Relay output Main body-DO2 mode	0: OFF 1: remote control 2: alarm 3: energy pulse 4: logic alarm	R/W
08D6	Int	Relay output Main body-DO2 Pulse	0.1～99.9s 0.0: no pulse	R/W

		width		
08D7	Int	Main body-DO2 Mode is alarm mode.	0: V1 > 1: V1 < 2: V2 > 3: V2 < 4: V3 > 5: V3 < 6: Vn > 7: Vn < 8: V12 > 9: V12 < 10: V23 > 11: V23 < 12: V31 > 13: V31 < 14: Vl > 15: Vl < 16:Uavg> 17:Uavg< 18:Vavg> 19:Vavg< 20: I1 > 21: I1 < 22: I2 > 23: I2 < 24: I3 > 25: I3 < 26: I > 27: I < 24: Iavg >	

			29: Iavg < 30: In > 31: In < 32: P > 33: P < 34: Q > 35: Q < 26: S > 37: S < 38: PF> 39: PF< 40: F > 41: F < 42: Uunb > 43: Uunb < 44: Iunb > 45: Iunb < 46: THDu > 47: THDu < 48: THDi > 49: THDi < 50: DIx	
		Main body-DO2 Mode is logic alarm mode: Relay output Main body-DO2 Low Alarm delay time	0～99.99s	
08D8-08D9	Long	Main body-DO2 Mode is alarm mode.	primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V	R/W

			current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Uunb /Iunb /THDu /THDi : 0.01% Setting parameter value should be smaller than two times of rated value. If it is switch linkage, this value corresponds to the No. of digital input. 0:X1-D1 1:X1-DI2 2:X1-DI3 3:X1-DI4 4:X2-DI1 5:X2-DI2 6:X2-DI3 7:X2-DI4 8:X3-DI1 9:X3-DI2 10:X3-DI3 11:X3-DI4 12:X4-DI1 13:X4-DI2 14:X4-DI3 15:X4-DI4	
		Main body-DO2 Mode is logic alarm mode. Main body –DO2 High	primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V	R/W

		limit value(V1 V2 V3)		
08DA-08DB	Long	Main body-DO2 Mode is alarm mode. Relay output DO2 hysteresis value	primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Uunb /Iunb /THDu /THDi : 0.01% Setting parameter value should be smaller than two times of rated value.	R/W
		Main body-DO2 Mode is logic alarm mode. Main body –DO2 Low limit value(V1 V2 V3)	primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V	
08DC	Int	Main body-DO2 Mode is alarm mode: Main body-DO2 delay time	0～99.99s	R/W
		Main body-DO2 Mode is logic alarm mode: Relay output Main body-DO2 High Alarm delay time	0～99.99s	
08DD	Int	Relay output Main body-DO1 Alarm interlock	0:OFF 1:ON	R/W

08DE	Int	Relay output X1-DO1 mode	0: OFF 1: remote control 2: alarm	R/W
08DF	Int	Relay output X1-DO1 pulse width	0.0: no pulse 0.1～99.9ms	R/W
08E0	Int	Relay output X1-DO1 alarm select	0: V1 > 1: V1 < 2: V2 > 3: V2 < 4: V3 > 5: V3 < 6: Vn > 7: Vn < 8: V12 > 9: V12 < 10: V23 > 11: V23 < 12: V31 > 13: V31 < 14: Vl > 15: Vl < 16:Uavg> 17:Uavg< 18:Vavg> 19:Vavg< 20: I1 > 21: I1 < 22: I2 > 23: I2 < 24: I3 >	R/W

			25: I3 < 26: I > 27: I < 24: Iavg > 29: Iavg < 30: In > 31: In < 32: P > 33: P < 34: Q > 35: Q < 26: S > 37: S < 38: PF> 39: PF< 40: F > 41: F < 42: Uunb > 43: Uunb < 44: Iunb > 45: Iunb < 46: THDu > 47: THDu < 48: THDi > 49: THDi < 50: DIx	
08E1-08E2	Long	Relay output X1-DO1 limit value	primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A	R/W

			power: 1W/var/VA, PF: 0.001 F: 0.01Hz Uunb /Iunb /THDu /THDi : 0.01% Setting parameter value should be smaller than two times of rated value. If it is switch linkage, this value corresponds to the No. of digital input. 0:X1-D1 1:X1-DI2 2:X1-DI3 3:X1-DI4 4:X2-DI1 5:X2-DI2 6:X2-DI3 7:X2-DI4 8:X3-DI1 9:X3-DI2 10:X3-DI3 11:X3-DI4 12:X4-DI1 13:X4-DI2 14:X4-DI3 15:X4-DI4	
08E3-08E4	Long	Relay output X1-DO1 hysteresis value	primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A	R/W

			power: 1W/var/VA, PF: 0.001 F: 0.01Hz Uunb /Iunb /THDu /THDi : 0.01% Setting parameter value should be smaller than two times of rated value.	
08E5	Int	Relay output X1-DO1 delay time	0～99.99s	R/W
08E6	Int	Relay output X1-DO1 interlock	0:OFF 1:ON	R/W
08E7	Int	Relay output X1-DO2 mode	0:OFF 1:remote control 2:alarm	R/W
08E8	Int	Relay output X1-DO2 pulse width	0.0: no pulse 0.1～99.9ms	R/W
08E9	Int	Relay output X1-DO2 alarm select	0: V1 > 1: V1 < 2: V2 > 3: V2 < 4: V3 > 5: V3 < 6: Vn > 7: Vn < 8: V12 > 9: V12 < 10: V23 > 11: V23 < 12: V31 > 13: V31 <	R/W

			14: Vl > 15: Vl < 16:Uavg> 17:Uavg< 18:Vavg> 19:Vavg< 20: I1 > 21: I1 < 22: I2 > 23: I2 < 24: I3 > 25: I3 < 26: I > 27: I < 24: Iavg > 29: Iavg < 30: In > 31: In < 32: P > 33: P < 34: Q > 35: Q < 26: S > 37: S < 38: PF> 39: PF< 40: F > 41: F < 42: Uunb > 43: Uunb <	

			44: Iunb > 45: Iunb < 46: THDu > 47: THDu < 48: THDi > 49: THDi < 50: DIx	
08EA-08EB	Long	Relay output X1-DO2 limit value	primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Uunb /Iunb /THDu /THDi : 0.01% Setting parameter value should be smaller than two times of rated value. If it is switch linkage, this value corresponds to the No. of digital input. 0:X1-D1 1:X1-DI2 2:X1-DI3 3:X1-DI4 4:X2-DI1 5:X2-DI2 6:X2-DI3 7:X2-DI4 8:X3-DI1	R/W

			9:X3-DI2 10:X3-DI3 11:X3-DI4 12:X4-DI1 13:X4-DI2 14:X4-DI3 15:X4-DI4	
08EC-08ED	Long	Relay output X1-DO2 hysteresis value	primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Uunb /Iunb /THDu /THDi : 0.01% Setting parameter value should be smaller than two times of rated value.	R/W
08EE	Int	Relay output X1-DO2 delay time	0～99.99s	R/W
08EF	Int	Relay output X1-DO2 interlock	0:OFF 1:ON	R/W
08F0	Int	Relay output X2-DO1 mode	0:OFF 1:remote control 2:alarm	R/W
08F1	Int	Relay output X2-DO1 pulse width	0.0: no pulse 0.1～99.9ms	R/W
08F2	Int	Relay output X2-DO1 alarm select	0: V1 > 1: V1 < 2: V2 >	R/W

			3: V2 < 4: V3 > 5: V3 < 6: Vn > 7: Vn < 8: V12 > 9: V12 < 10: V23 > 11: V23 < 12: V31 > 13: V31 < 14: Vl > 15: Vl < 16:Uavg> 17:Uavg< 18:Vavg> 19:Vavg< 20: I1 > 21: I1 < 22: I2 > 23: I2 < 24: I3 > 25: I3 < 26: I > 27: I < 24: Iavg > 29: Iavg < 30: In > 31: In < 32: P >	

			33: P < 34: Q > 35: Q < 26: S > 37: S < 38: PF> 39: PF< 40: F > 41: F < 42: Uunb > 43: Uunb < 44: Iunb > 45: Iunb < 46: THDu > 47: THDu < 48: THDi > 49: THDi < 50: DIx	
08F3-08F4	Long	Relay output X2-DO1 limit value	primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Uunb /Iunb /THDu /THDi : 0.01% Setting parameter value should be smaller than two times of rated value. If it is switch linkage, this value	R/W

			corresponds to the No. of digital input. 0:X1-D1 1:X1-DI2 2:X1-DI3 3:X1-DI4 4:X2-DI1 5:X2-DI2 6:X2-DI3 7:X2-DI4 8:X3-DI1 9:X3-DI2 10:X3-DI3 11:X3-DI4 12:X4-DI1 13:X4-DI2 14:X4-DI3 15:X4-DI4	
08F5-08F6	Long	Relay output X2-DO1 hysteresis value	primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Uunb /Iunb /THDu /THDi : 0.01% Setting parameter value should be smaller than two times of rated value.	R/W
08F7	Int	Relay output	0～99.99s	R/W

		X2-DO1 delay time		
08F8	Int	Relay output X2-DO1 interlock	0:OFF 1:ON	R/W
08F9	Int	Relay output X2-DO2 mode	0:OFF 1:remote control 2:alarm	R/W
08FA	Int	Relay output X2-DO2 pulse width	0.0: no pulse 0.1～99.9ms	R/W
08FB	Int	Relay output X2-DO2 alarm select	0: V1 > 1: V1 < 2: V2 > 3: V2 < 4: V3 > 5: V3 < 6: Vn > 7: Vn < 8: V12 > 9: V12 < 10: V23 > 11: V23 < 12: V31 > 13: V31 < 14: Vl > 15: Vl < 16:Uavg> 17:Uavg< 18:Vavg> 19:Vavg< 20: I1 > 21: I1 <	R/W

			22: I2 > 23: I2 < 24: I3 > 25: I3 < 26: I > 27: I < 24: Iavg > 29: Iavg < 30: In > 31: In < 32: P > 33: P < 34: Q > 35: Q < 26: S > 37: S < 38: PF> 39: PF< 40: F > 41: F < 42: Uunb > 43: Uunb < 44: Iunb > 45: Iunb < 46: THDu > 47: THDu < 48: THDi > 49: THDi < 50: DIx	
08FC-08FD	Long	Relay output	primary grid data	R/W

		X2-DO2 limit value	0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Uunb /Iunb /THDu /THDi : 0.01% Setting parameter value should be smaller than two times of rated value. If it is switch linkage, this value corresponds to the No. of digital input. 0:X1-D1 1:X1-DI2 2:X1-DI3 3:X1-DI4 4:X2-DI1 5:X2-DI2 6:X2-DI3 7:X2-DI4 8:X3-DI1 9:X3-DI2 10:X3-DI3 11:X3-DI4 12:X4-DI1 13:X4-DI2 14:X4-DI3 15:X4-DI4	
08FE-08FF	Long	Relay output	primary grid data	R/W

		X2-DO2 hysteresis value	0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Uunb /Iunb /THDu /THDi : 0.01% Setting parameter value should be smaller than two times of rated value.	
0900	Int	Relay output X2-DO2 delay time	0～99.99s	R/W
0901	Int	Relay output X2-DO2 interlock	0:OFF 1:ON	R/W
0902	Int	Relay output X3-DO1 mode	0:OFF 1:remote control 2:alarm	R/W
0903	Int	Relay output X3-DO1 pulse width	0.0: no pulse 0.1～99.9ms	R/W
0904	Int	Relay output X3-DO1 alarm select		R/W
0905-0906	Long	Relay output X3-DO1 limit value	primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Uunb /Iunb /THDu /THDi : 0.01% Setting parameter value should	R/W

			be smaller than two times of rated value. If it is switch linkage, this value corresponds to the No. of digital input. 0:X1-D1 1:X1-DI2 2:X1-DI3 3:X1-DI4 4:X2-DI1 5:X2-DI2 6:X2-DI3 7:X2-DI4 8:X3-DI1 9:X3-DI2 10:X3-DI3 11:X3-DI4 12:X4-DI1 13:X4-DI2 14:X4-DI3 15:X4-DI4	
0907-0908	Long	Relay output X3-DO1 hysteresis value	primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Uunb /Iunb /THDu /THDi : 0.01% Setting parameter value should	R/W

			be smaller than two times of rated value.	
0909	Int	Relay output X3-DO1 delay time	0～99.99s	R/W
090A	Int	Relay output X3-DO1 interlock	0:OFF 1:ON	R/W
090B	Int	Relay output X3-DO2 mode	0:OFF 1:remote control 2:alarm	R/W
090C	Int	Relay output X3-DO2 pulse width	0.0: no pulse 0.1～99.9ms	R/W
090D	Int	Relay output X3-DO2 alarm select	0: V1 > 1: V1 < 2: V2 > 3: V2 < 4: V3 > 5: V3 < 6: Vn > 7: Vn < 8: V12 > 9: V12 < 10: V23 > 11: V23 < 12: V31 > 13: V31 < 14: Vl > 15: Vl < 16:Uavg> 17:Uavg< 18:Vavg>	R/W

			19:Vavg< 20: I1 > 21: I1 < 22: I2 > 23: I2 < 24: I3 > 25: I3 < 26: I > 27: I < 24: Iavg > 29: Iavg < 30: In > 31: In < 32: P > 33: P < 34: Q > 35: Q < 26: S > 37: S < 38: PF> 39: PF< 40: F > 41: F < 42: Uunb > 43: Uunb < 44: Iunb > 45: Iunb < 46: THDu > 47: THDu < 48: THDi >	

			49: THDi < 50: DIx	
090E-090F	Long	Relay output X3-DO2 limit value	primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Uunb /Iunb /THDu /THDi : 0.01% Setting parameter value should be smaller than two times of rated value. If it is switch linkage, this value corresponds to the No. of digital input. 0:X1-D1 1:X1-DI2 2:X1-DI3 3:X1-DI4 4:X2-DI1 5:X2-DI2 6:X2-DI3 7:X2-DI4 8:X3-DI1 9:X3-DI2 10:X3-DI3 11:X3-DI4 12:X4-DI1 13:X4-DI2	R/W

			14:X4-DI3 15:X4-DI4	
0910-0911	Long	Relay output X3-DO2 hysteresis value	primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Uunb /Iunb /THDu /THDi : 0.01% Setting parameter value should be smaller than two times of rated value.	R/W
0912	Int	Relay output X3-DO2 delay time	0～99.99s	R/W
0913	Int	Relay output X3-DO2 interlock	0:OFF 1:ON	R/W
0914	Int	Relay output X4-DO1 mode	0:OFF 1:remote control 2:alarm	R/W
0915	Int	Relay output X4-DO1 pulse width	0.0: no pulse 0.1～99.9ms	R/W
0916	Int	Relay output X4-DO1 alarm select	0: V1 > 1: V1 < 2: V2 > 3: V2 < 4: V3 > 5: V3 < 6: Vn > 7: Vn <	R/W

			8: V12 >		
			9: V12 <		
			10: V23 >		
			11: V23 <		
			12: V31 >		
			13: V31 <		
			14: Vl >		
			15: Vl <		
			16:Uavg>		
			17:Uavg<		
			18:Vavg>		
			19:Vavg<		
			20: I1 >		
			21: I1 <		
			22: I2 >		
			23: I2 <		
			24: I3 >		
			25: I3 <		
			26: I >		
			27: I <		
			24: Iavg >		
			29: Iavg <		
			30: In >		
			31: In <		
			32: P >		
			33: P <		
			34: Q >		
			35: Q <		
			26: S >		
			37: S <		

			38: PF> 39: PF< 40: F > 41: F < 42: Uunb > 43: Uunb < 44: Iunb > 45: Iunb < 46: THDu > 47: THDu < 48: THDi > 49: THDi < 50: DIx	
0917-0918	Long	Relay output X4-DO1 limit value	primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Uunb /Iunb /THDu /THDi : 0.01% Setting parameter value should be smaller than two times of rated value. If it is switch linkage, this value corresponds to the No. of digital input. 0:X1-D1 1:X1-DI2 2:X1-DI3	R/W

			3:X1-DI4 4:X2-DI1 5:X2-DI2 6:X2-DI3 7:X2-DI4 8:X3-DI1 9:X3-DI2 10:X3-DI3 11:X3-DI4 12:X4-DI1 13:X4-DI2 14:X4-DI3 15:X4-DI4	
0919-091A	Long	Relay output X4-DO1 hysteresis value	primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001 F: 0.01Hz Uunb /Iunb /THDu /THDi : 0.01% Setting parameter value should be smaller than two times of rated value.	R/W
091B	Int	Relay output X4-DO1 delay time	0～99.99s	R/W
091C	Int	Relay output X4-DO1 interlock	0:OFF 1:ON	R/W
091D	Int	Relay output X4-DO2 mode	0:OFF 1:remote control	R/W

			2:alarm	
091E	Int	Relay output X4-DO2 pulse width	0.0: no pulse 0.1～99.9ms	R/W
091F	Int	Relay output X4-DO2 alarm select	0: V1 > 1: V1 < 2: V2 > 3: V2 < 4: V3 > 5: V3 < 6: Vn > 7: Vn < 8: V12 > 9: V12 < 10: V23 > 11: V23 < 12: V31 > 13: V31 < 14: Vl > 15: Vl < 16:Uavg> 17:Uavg< 18:Vavg> 19:Vavg< 20: I1 > 21: I1 < 22: I2 > 23: I2 < 24: I3 > 25: I3 < 26: I >	R/W

			27: I < 24: Iavg > 29: Iavg < 30: In > 31: In < 32: P > 33: P < 34: Q > 35: Q < 26: S > 37: S < 38: PF> 39: PF< 40: F > 41: F < 42: Uunb > 43: Uunb < 44: Iunb > 45: Iunb < 46: THDu > 47: THDu < 48: THDi > 49: THDi < 50: DIx	
0920-0921	Long	Relay output X4-DO2 limit value	primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001	R/W

			F: 0.01Hz Uunb /Iunb /THDu /THDi : 0.01% Setting parameter value should be smaller than two times of rated value. If it is switch linkage, this value corresponds to the No. of digital input. 0:X1-D1 1:X1-DI2 2:X1-DI3 3:X1-DI4 4:X2-DI1 5:X2-DI2 6:X2-DI3 7:X2-DI4 8:X3-DI1 9:X3-DI2 10:X3-DI3 11:X3-DI4 12:X4-DI1 13:X4-DI2 14:X4-DI3 15:X4-DI4	
0922-0923	Long	Relay output X4-DO2 hysteresis value	primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V current: 0.001A power: 1W/var/VA, PF: 0.001	R/W

			F: 0.01Hz Uunb /Iunb /THDu /THDi : 0.01% Setting parameter value should be smaller than two times of rated value.	
0924	Int	Relay output X4-DO2 delay time	0～99.99s	R/W
0925	Int	Relay output X4-DO2 interlock	0:OFF 1:ON	R/W
0926	Int	Ethernet Module Set	High byte: DHCP 0: invalid 1: dynamic allocation ip address Low byte: Connect Mode 0:Server; 1: Client	R/W
0927	Int		Port number	R/W
0928-092F	RJ45 : char[4][]		Char[4][4] [0][4] Local IP [1][4] Remote IP [2][4] subnet mask [3][4] gateway address	R/W
0930-0932	RJ45 : char[6]		MAC Address	R
0933	Int		High byte: DHCP 0: invalid 1: dynamic allocation ip address Low byte: Connect Mode 0:Server; 1: Client	R/W
0934	Int		Port number	R/W

0935-0954	Int	WI-FI Module Set	WI-FI: Char[4][16] [0][16] Local IP [1][16] Remote IP [2][16] subnet mask [3][16] gateway address	R/W
0955-0957	Int		MAC Address: Char[6]	R
0958	Int		High byte: WIFI Mode 1: Station（default） 2: SoftAP 3: Station+SoftAP Low byte: Encryption 0: WEP; 1: WPA/WPA2 Psk; 2: NONE	R/W
0959-0968	Int		WIFI Network Name: Char[32]	R/W
0969	Int		High byte: WEPpassword length 0: unlimited 1: ACSII 2: 13 ACSII Low byte: IO1 0: None 1: FC Mode 2:HDC Mode	R/W
096A-0971	Int		Char[16]: WEP password	R/W
0972-0981	Int		Char[32]: WAP/WAP2 password	R/W
0982-0987	Int		Char[12]: HEX format E.g. 0x30 0x32 0x30 0x36 0x30 0x33 0x30 0x32 0x2E 0x30 0x32 0x30 Firmware version: 02060302.020	R/W
0988	Int	GPRS Module Set	High byte: DHCP 0: invalid 1: dynamic allocation ip address	R/W

			Low byte: Connect Mode 0:Server; 1: Client	
0989	Int		Port number	R/W
098A-0999	Int		GPRS: Address Char[2][16] [0][16] Local IP [1][16] Remote IP	R/W
099A-099B	Int		Char[4] GPRS Mode Set: Char[0] : GPRS Switch 0: OFF 1:ON Char[1] : GPRS Mode 0: SMS 1:SMS+GPRS Char[2] : GPRS connection Mode 0: IP 1:DOMAIN NAME Char[3] : reserved	R/W
099C-09A7	Int		Char[24]: DN E.g. www.jcsepi.com	R/W
09A8-09AF	Int		Char[16]: SMS center number E.g. +34 xxx xxx xxx	R/W
09B0-9B7	Int		Char[16]: Administrator number E.g. +34 xxx xxx xxx	R/W
09B8-09CF	Int		Char[3][16]: User number E.g. Char[0][16]: +34 xxx xxx xxx Char[1][16]: +34 xxx xxx xxx Char[2][16]: +34 xxx xxx xxx	R/W
09D0-09D7	Int		Char[16]: Company name E.g. SACI	R/W
09D8-09DB	Int		Char[8]: User ID	R/W
09DC-09ED	Int		Char[36]: APN[36]	R/W
09EE-09F9	Int		Char[24]: APN_UserName	R/W

09FA-0A03	Int		Char[20]: APN_UserCode	R/W
0A04-0A05	Int		Char[4]: Heartbeat time	R/W
0A06-0A09	Int		Char[8]: Set password	R/W
0A0A-0A0B	Long	Over-voltage alarm value(3P3W is line voltage while 3P4W is phase voltage)	primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V	R/W
0A0C-0A0D	Long	Over-voltage alarm value hysteresis	primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V	R/W
0A0E-0A0F	Long	Under-voltage alarm value(3P3W is line voltage while 3P4W is phase voltage)	primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V	R/W
0A10-0A11	Long	Under-voltage alarm value hysteresis	primary grid data 0-9999*10^n (n=0,3,6) ratio: voltage: 0.1V	R/W
0A12-0A13	Long	Over-current alarm value	primary grid data 0-9999*10^n (n=0,3,6) ratio: current: 0.001A	R/W
0A14-0A15	Long	Over-current alarm value hysteresis	primary grid data 0-9999*10^n (n=0,3,6) ratio: current: 0.001A	R/W
0A16-0A17	Long	Under-current alarm value	primary grid data 0-9999*10^n (n=0,3,6) ratio: current: 0.001A	R/W
0A18-0A19	Long	Under-current alarm value hysteresis	primary grid data 0-9999*10^n (n=0,3,6) ratio: current: 0.001A	R/W

0A1A-0A1B	Long	Overload alarm value	primary grid data 0-9999*10^n (n=0,3,6) ratio: power: 1W	R/W
0A1C-0A1D	Long	Overload alarm value hysteresis	primary grid data 0-9999*10^n (n=0,3,6) ratio: power: 1W	R/W
0A1E-0A1F	Long	Underload alarm value	primary grid data 0-9999*10^n (n=0,3,6) ratio: power: 1W	R/W
0A20-0A21	Long	Underload alarm value hysteresis	primary grid data 0-9999*10^n (n=0,3,6) ratio: power: 1W	R/W
0A22-0A2F				
0A30	Int	http port number	Port number(For web-server)	R/W
0A31	Int	SMTP port number(reserve)	Port number(For SMTP)	R/W
0A32-0A33	Int	Device ID	Device ID char[4]	R/W
0A34-0A39	Int	Reserve		
0A3A-0A3B	Int	Email sending total enable	Char[0] : email sending alarm total allowed Char[1] : recipient 1 effective (compulsory) Char[2] : recipient 2 effective Char[3] : recipient 3 effective	R/W
0A3C-0A3D	Int	Public DNS server IP address	DNS Server IP char[4]	R/W
0A3E-0A3F	Int	STMP client server IP	STMP Server IP char[4]	R/W

0A40	Int	STMP client server domain	STMP Server domain char[32]	R/W
0A50	Int	Sender email address	From address char[32]	R/W
0A60	Int	Sender email password （authorized）	From Password char[32]	R/W
0A70	Int	recipient 1 email address	To1 address char[32]	R/W
0A80	Int	recipient 2 email address	To2 address char[32]	R/W
0A90	Int	recipient 3 email address	To3 address char[32]	R/W

3.6 Read added event record

Address	Format	Description	Unit	R/W
0B00-0B04	Int	The latest piece of SOE record： 0B00: 1：DI 2： DO 0B01-0B03: Char[6] action time 0B04: high byte：which channel；low byte：current status		R
0B05-0B09	Int	The 1st piece of SOE record before the current piece		R
0B0A-0B0E	Int	The 2nd piece of SOE record before the current piece		R
…	…	…		..
0B9B-0B9F	Int	The 31st piece of SOE record before the current piece		R
0BA0-0BA9	Int	The latest piece of alarm record: 0BA0: Alarm type：01：over-voltage alarm； 02：under-voltage alarm； 03：over-current alarm； 04：under-current alarm； 05：overload alarm； 06：underload alarm；		R

		0BA1-0BA3: Char[6] alarm start time 0BA4-0BA6: Char[6] alarm end time 0BA7-0BA9:alarm extreme value Over-voltage, over current, overload correspond to the maximum; Under-voltage, under-current, underload correspond to the minimum; Unit：0.1V /0.001A/1W		
0BAA-0BB3	Int	The 1st piece of alarm record before the current piece		R
…	…	…	…	…
0CD6-0CDF	Int	The 31st piece of alarm record before the current piece		R